

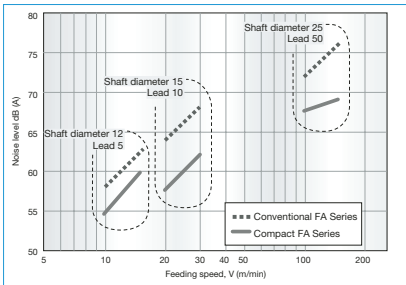
**B-3-1.1 Compact FA Series PSS Type, USS Type, and FSS Type**

**1. Features**

In order to respond quickly to a wide range of needs, NSK keeps end-deflector recirculation system ball screws, which offer high-speed and low-noise operation and compact design, in standard inventories as the Compact FA Series. The exceptionally high performance ball screws are ready for use in a variety of fields such as semiconductor manufacturing equipment, LCD manufacturing equipment, chip mounting equipment, measuring apparatus, food and medical equipment, and automotive manufacturing equipment.

**●Quieter sound**

The operating noise level of ball screws has been reduced by 6 dB, about half of what is sensed by the ear.

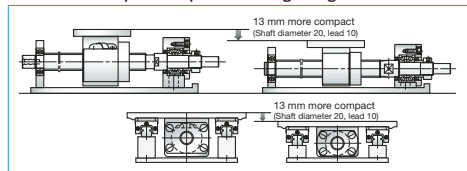


(Microphone was positioned at a distance of 400 mm for all noise levels)

**Fig. 1 Comparison of noise level**

**●Compact**

The outside diameter of the ball nut is as much as 30% smaller than those of existing NSK products. This contributes to more compact design of all sorts of equipment and devices such as low-profile positioning stages.



**Fig. 2 Comparison of FA Type and Compact FA Series PSS Type**

**●High speed**

The permissible rotational speed up to 5 000 min<sup>-1</sup>. This capability dramatically expands the range of service conditions. Please refer to the dimension tables for details of the permissible rotational speed.

**●A grease fitting is provided as a standard equipment**

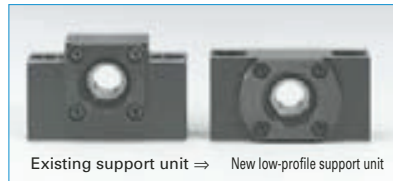
The new ball screw type is equipped with a grease fitting (M5 × 0.8) as a standard equipment. Two lubrication ports are provided to facilitate easy maintenance.

**●Storage seal**

Compact, thin plastic seal is available. Nut outside diameter is compact compare with the return tube recirculation system.

**●Low-profile design**

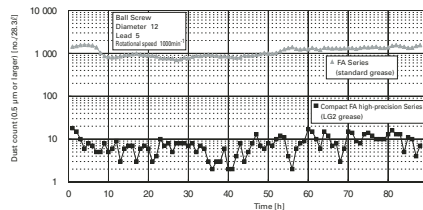
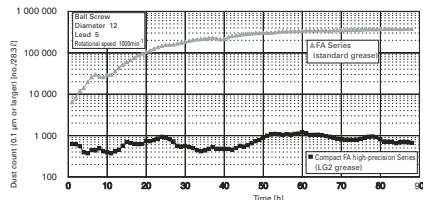
The low-profile support units especially compatible with the compact FA Series are available for a superb space-saving design.



**Fig. 3 Comparison of support units**

**●Low dust generation LG2 grease (USS Type)**

The dust count is approximately 1/100 that of the existing FA series. It is suitable for applications in clean environments.



**Fig. 4 Comparison of dust count**

**●Easy stroke setting (FSS Type)**

Flexible stroke setting with fixed-simple support by means of mounting support unit (simple support side) directly onto ball screw thread outside diameter. Proprietary support unit (simple support side) is available from NSK.



**Fig.5 Flexible stroke setting**

**2. Order of the dimension table**

For each type, it is arranged in order from small diameter to large.

**3. Dimension tables**

Dimension tables show shapes/sizes as well as specification factors of each shaft diameter/lead combination. Tables also contain data as follows:

**●Stroke**

Nominal stroke: A reference for your use.  
Maximum stroke: The limit stroke that the nut can move. The figure is obtained by subtracting the nut length from the effective threaded length (L<sub>1</sub>).

**●Lead accuracy**

PSS Type, C5 grade; USS Type, C3 grade; FSS Type, Ct7 grade

T: Travel compensation

e<sub>p</sub>: Tolerance on specified travel

v<sub>0</sub>: Travel variation

See "Technical Description: Lead Accuracy" (page B37) for the details of the codes.

**●Permissible rotational speed**

d · n: Limited by the relative peripheral speed between the screw shaft and the nut.

Critical speed: Limited by the natural frequency of a ball screw shaft. Critical speed depends on the supporting condition of screw shaft.

The lower of the two criteria, the d-n and critical speed, will determine the overall permissible rotational speed of the ball screw. For details, see "Technical Description: Permissible Rotational Speed" (page B47).

**4. Other**

The seal of the ball screw and end deflector are made of synthetic resin. Consult NSK when using our ball screws under extreme environments or in special environments, or if using special lubricant or oil.

The NSK K1 cannot be mounted to the compact FA Series.

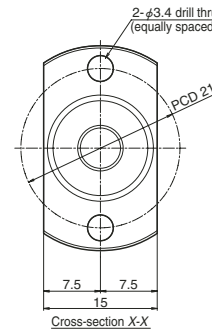
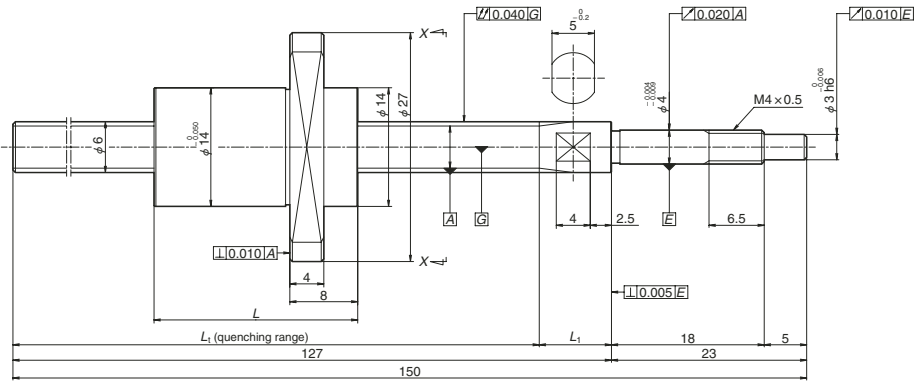
For special environments, see pages B70 and D2. For lubrications, see pages B67 and D13.

Note: For details of standard stock products, contact NSK.

**Table 1 Combinations of screw shaft diameter and lead**

Screw shaft diameter	Lead										
	5	8	10	12	15	20	25	30	40	50	60
6				B109							
8				B111		B111					
10	B113 B133		B113								
12	B115 B135		B115 B139			B115		B115			
15	B117 B137		B117 B141			B119 B141		B119			
20	B121		B121 B143			B123 B143		B123	B125		B125
25	B127		B127 B145			B129 B145	B129 B145	B131		B131	

## Compact FA PSS Type



**NSK**

Screw shaft  $\phi 6$

Lead 8, 12

Unit: mm

### Ball screw specification

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

### Recommended

For drive side  
(Fixed)

WBK04-01M (square)
WBK04-11M (round)

Ball screw No.	Screw shaft diameter $d$	Lead $l$	Effective turns of balls	Basic load ratings (N)		Maximum stroke	Nut length $L$	Screw shaft dimensions	
				Dynamic $C_d$	Static $C_{0a}$			$L_1$	$L_2$
<b>PSS0608NAD0150</b>	6	8	2	550	715	97.5	16	118.5	8.5
<b>PSS0608NBD0150</b>			4	1 180	1 760	89.5	24	118.5	8.5
<b>PSS0612NAD0150</b>		12	2	550	715	92	20	117	10
<b>PSS0612NBD0150</b>			4	1 180	1 760	80	32	117	10

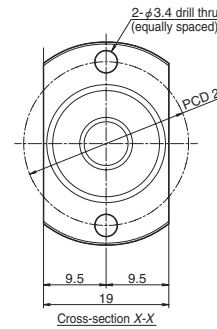
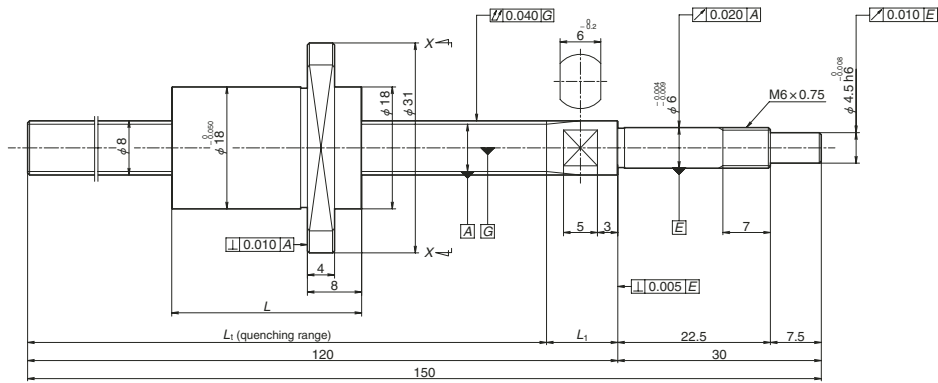
Notes: 1. Contact NSK if permissible rotational speed is to be exceeded.

Target value $T$	Lead accuracy		Dynamic preload torque (N-cm)	Mass (kg)	Permissible rotational speed ( $\text{min}^{-1}$ ) *1	Internal spatial volume of nut ( $\text{cm}^3$ )	Standard volume of grease replenishing ( $\text{cm}^3$ )
	Error $e_p$	Variation $v_u$					
0	20	18	~0.5	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 page B389 for details.

## Compact FA PSS Type



**NSK**

Screw shaft  $\phi 8$

Lead 10, 15

Unit: mm

### Ball screw specification

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

### Recommended

For drive side  
(Fixed)

WBK06-01M ( square)
WBK06-11M ( round)

Ball screw No.	Screw shaft diameter $d$	Lead $l$	Effective turns of balls	Basic load ratings (N)		Maximum stroke	Nut length $L$	Screw shaft dimensions	
				Dynamic $C_d$	Static $C_{0a}$			$L_1$	$L_2$
<b>PSS0810NAD0150</b>	8	10	2	910	1 260	86.5	18	109.5	10.5
<b>PSS0810NBD0150</b>			4	1 950	3 080	76.5	28	109.5	10.5
<b>PSS0815NAD0150</b>		15	2	910	1 260	80	22	107	13
<b>PSS0815NBD0150</b>			4	1 950	3 080	65	37	107	13

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

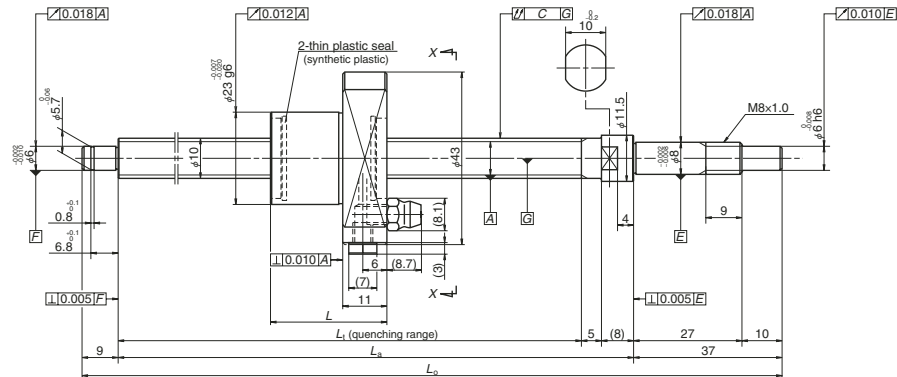
Target value $T$	Lead accuracy		Dynamic preload torque (N-cm)	Mass (kg)	Permissible rotational speed ( $\text{min}^{-1}$ ) *1	Internal spatial volume of nut ( $\text{cm}^3$ )	Standard volume of grease replenishing ( $\text{cm}^3$ )
	Error $e_p$	Variation $v_u$					
0	20	18	~0.5	0.09	5 000	0.4	0.2
				0.11		0.5	0.3
				0.1		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 page B389 for details.

## Compact FA PSS Type

(Medium, High helix lead)



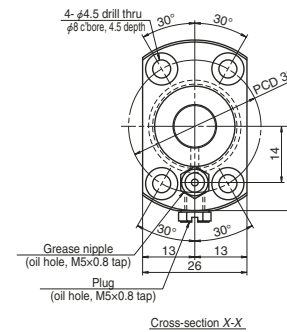
## Nut model: BSS

**NSK**

Screw shaft  $\phi 10$

Lead 5, 10

Unit: mm



### Ball screw specification

Preload type	Override ball preload (P-preload)
Ball diameter/screw shaft root diameter	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 (low-profile, square)	WBK08S-01B (low-profile, square)
WBK08-11B (round, high load)	

Ball screw No.	Screw shaft diameter $d$	Lead $l$	Basic load ratings (N)		Stroke		Nut length $L$	Screw shaft dimensions		
			Dynamic $C_d$	Static $C_{0a}$	Nominal $L_1$	Max. $L_2$		$L_3$	$L_4$	$L_5$
<b>PSS1005N1D0171</b>	10	5	2 930	4 790	50	83	29	112	125	171
<b>PSS1005N1D0221</b>					100	133		162	175	221
<b>PSS1005N1D0321</b>					200	233		262	275	321
<b>PSS1005N1D0421</b>					300	333		362	375	421
<b>PSS1005N1D0521</b>					400	433		462	475	521
<b>PSS1010N1D0221</b>		10	1 970	3 010	100	130	32	162	175	221
<b>PSS1010N1D0321</b>					200	230		262	275	321
<b>PSS1010N1D0421</b>					300	330		362	375	421
<b>PSS1010N1D0521</b>					400	430		462	475	521

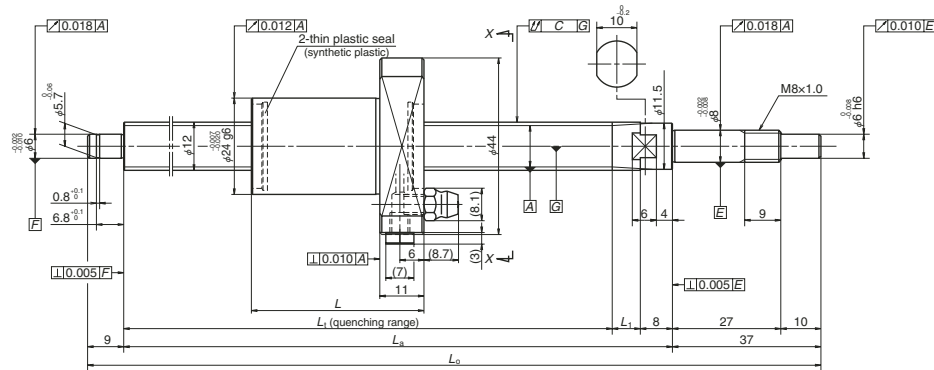
- Notes: 1. Indicates ball screw preload control value. Approximately 2.0 N-cm of torque is added due to thin plastic seals.  
2. Contact NSK if permissible rotational speed is to be exceeded.  
3. Service temperature range is 0 to 80°C.

Lead accuracy			Shaft run-out $C$	Dynamic preload torque (N-cm) *1	Mass (kg)	Permissible rotational speed (min <sup>-1</sup> ) *2		
Target value $T$	Error $e_p$	Variation $v_u$				Fixed	Simple	Standard volume of grease replenishing (cm <sup>3</sup> )
0	0.020	0.018	0.030	0.7 - 3.3	0.3	5 000	0.8	0.4
	0.020	0.018	0.045	0.7 - 3.3	0.3			
	0.023	0.018	0.060	0.6 - 4.3	0.3			
	0.025	0.020	0.070	0.6 - 4.3	0.4			
	0.027	0.020	0.085	0.4 - 4.9	0.5			
	0.020	0.018	0.045	0.7 - 3.3	0.3	5 000	0.7	0.4
	0.023	0.018	0.060	0.6 - 4.3	0.4			
	0.025	0.020	0.070	0.6 - 4.3	0.4			
	0.027	0.020	0.085	0.4 - 4.9	0.5			

4. Use of NSK support unit is recommended. Refer to page B389 for details.  
5. Recommended quantity of grease is about 50% of ball nut's internal space. See page D16 for details.

### Compact FA PSS Type

(Fine, Medium, High helix lead)



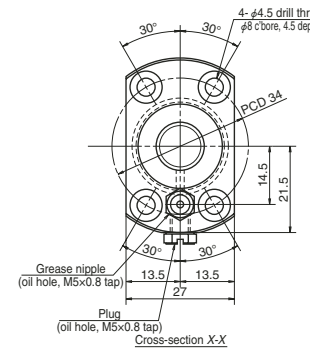
### Nut model: BSS

**NSK**

Screw shaft  $\phi 12$

Lead 5, 10, 20, 30

Unit: mm



#### Ball screw specification

Preload type	Oversize ball preload (P-preload)
Ball diameter/screw shaft root diameter	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 (low-profile, square)	WBK08S-01B (low-profile, square)
WBK08-11B (round, high load)	

Ball screw No.	Screw shaft diameter <i>d</i>	Lead <i>l</i>	Basic load ratings (N)		Stroke		Nut length <i>L</i>	Screw shaft dimensions			
			Dynamic <i>C<sub>s</sub></i>	Static <i>C<sub>0a</sub></i>	Nominal	Max. <i>L<sub>1</sub>-L</i>		<i>L<sub>1</sub></i>	<i>L<sub>2</sub></i>	<i>L<sub>0</sub></i>	<i>L<sub>1</sub></i>
PSS1205N1D0171	12	5	3 200	5 860	50	80	30	110	125	171	7
PSS1205N1D0221					100	130		160	175	221	
PSS1205N1D0321					200	230		260	275	321	
PSS1205N1D0421					300	330		360	375	421	
PSS1205N1D0521					400	430		460	475	521	
PSS1205N1D0621					500	530		560	575	621	
PSS1210N1D0221		10	3 200	5 860	100	117	43	160	175	221	7
PSS1210N1D0321					200	217		260	275	321	
PSS1210N1D0421					300	317		360	375	421	
PSS1210N1D0521					400	417		460	475	521	
PSS1210N1D0621					500	517		560	575	621	
PSS1220N1D0271					20	2 150		3 610	100	158	
PSS1220N1D0371		200	258	308			325		371		
PSS1220N1D0471		300	358	408			425		471		
PSS1220N1D0571		400	458	508			525		571		
PSS1220N1D0671		500	558	608			625		671		
PSS1230N1D0271		30	2 150	3 610			100		133	70	203
PSS1230N1D0371					200	233	303	325	371		
PSS1230N1D0471	300				333	403	425	471			
PSS1230N1D0571	400				433	503	525	571			
PSS1230N1D0671	500				533	603	625	671			

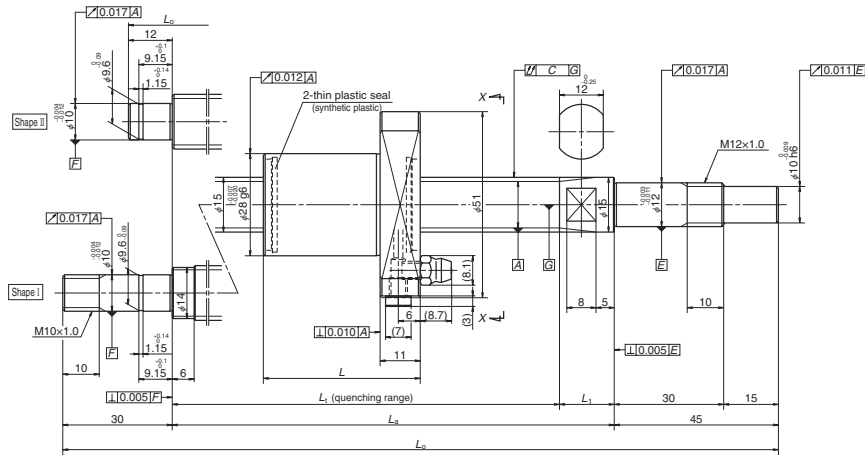
- Notes: 1. Indicates ball screw preload control value. Approximately 2.0 N-cm of torque is added due to thin plastic seals.  
2. Contact NSK if permissible rotational speed is to be exceeded.  
3. Service temperature range is 0 to 80°C.

Lead accuracy			Shaft run-out <i>C</i>	Dynamic preload torque (N-cm) *1	Mass (kg)	Permissible rotational speed (min <sup>-1</sup> ) *4	Internal spatial volume of nut (cm <sup>3</sup> )	Standard volume of grease replenishing (cm <sup>3</sup> )			
Target value <i>T</i>	Error <i>e<sub>p</sub></i>	Variation <i>v<sub>u</sub></i>									
0	0.020	0.018	0.030	0.7 - 3.3	0.3	5 000	1.0	0.5			
	0.020	0.018	0.045	0.7 - 3.3	0.3						
	0.023	0.018	0.060	0.6 - 4.3	0.4						
	0.025	0.020	0.070	0.6 - 4.3	0.5						
	0.027	0.020	0.085	0.6 - 4.3	0.6						
	0.030	0.023	0.085	0.4 - 4.9	0.7						
	0.020	0.018	0.045	0.7 - 3.3	0.4	5 000	1.0	0.5			
	0.023	0.018	0.060	0.6 - 4.3	0.5						
	0.025	0.020	0.070	0.6 - 4.3	0.5						
	0.027	0.020	0.085	0.6 - 4.3	0.6						
	0.030	0.023	0.085	0.4 - 4.9	0.7						
	0.023	0.018	0.060	0.9 - 4.9	0.5				5 000	1.2	0.6
	0.027	0.020	0.070	0.9 - 4.9	0.6						
	0.030	0.023	0.085	0.6 - 5.9	0.7						
	0.030	0.023	0.110	0.6 - 5.9	0.8						
	0.023	0.018	0.045	1.4 - 4.5	0.5	5 000	1.5	0.8			
	0.023	0.018	0.060	0.9 - 4.9	0.6						
	0.027	0.020	0.070	0.9 - 4.9	0.7						
0.030	0.023	0.085	0.6 - 5.9	0.7							
0.030	0.023	0.110	0.6 - 5.9	0.8							
0.030	0.023	0.110	0.6 - 5.9	0.8							

4. Use of NSK support unit is recommended. Refer to page B389 for details.  
5. Recommended quantity of grease is about 50% of ball nut's internal space. See page D16 for details.

**Compact FA PSS Type**

(Fine, Medium lead)



**Nut model: BSS**



**Screw shaft ø15**

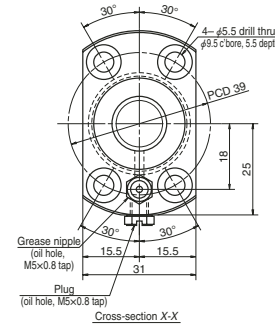
**Lead 5, 10**

Unit: mm

Ball screw specification	
Preload type	Over-size ball preload (P-preload)
Ball diameter/screw shaft root diameter	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 (low-profile, square)	WBK10-01B (low-profile, square)	WBK12S-01B (low-profile, square)
WBK12-11 (round)	WBK10-11 (round)	



Ball screw No.	Screw shaft diameter <i>d</i>	Lead <i>l</i>	Basic load ratings (N)		Stroke		Nut length <i>L</i>	Screw shaft dimensions			
			Dynamic <i>C<sub>a</sub></i>	Static <i>C<sub>0a</sub></i>	Nominal	Max. <i>L<sub>1</sub>-L</i>		<i>L<sub>1</sub></i>	<i>L<sub>a</sub></i>	<i>L<sub>o</sub></i>	<i>L<sub>1</sub></i>
PSS1505N1D0211	15	5	5 460	10 200	50	109	30	139	154	211	15
PSS1505N1D0261					100	159		189	204	261	
PSS1505N1D0361					200	259		289	304	361	
PSS1505N1D0461					300	359		389	404	461	
PSS1505N1D0561					400	459		489	504	561	
PSS1505N1D0661					500	559		589	604	661	
PSS1505N1D0761		600	659	689	704	761					
PSS1510N1D0261		10	5 460	10 200	100	146	43	189	204	261	15
PSS1510N1D0361					200	246		289	304	361	
PSS1510N1D0461					300	346		389	404	461	
PSS1510N1D0561					400	446		489	504	561	
PSS1510N1D0661					500	546		589	604	661	
PSS1510N1D0761	600				646	689		704	761		
PSS1510N1D0879	700				746	789		804	879		
PSS1510N1D0979	800				846	889		904	979		
PSS1510N1D1179	1 000				1 046	1 089		1 104	1 179		

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

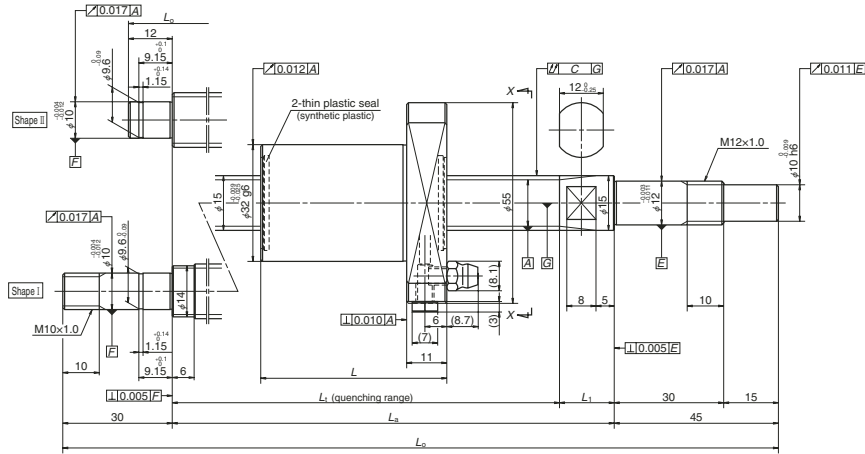
Unit: mm

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

4. Use of NSK support unit is recommended. Refer to page B389 for details.  
 5. Recommended quantity of grease is about 50% of ball nut's internal space. See page D16 for details.

**Compact FA PSS Type**

(Medium, High helix lead)



**Nut model: BSS**



Screw shaft ø15

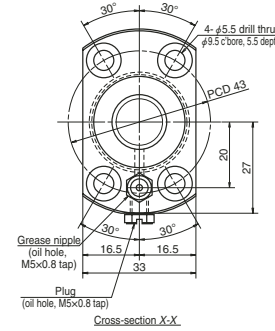
Lead 20, 30

Unit: mm

Ball screw specification	
Preload type	Oversize ball preload (P-preload)
Ball diameter/screw shaft root diameter	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 (low-profile, square)	WBK10-01B (low-profile, square)	WBK12S-01B (low-profile, square)
WBK12-11 (round)	WBK10-11 (round)	



Unit: mm

Ball screw No.	Screw shaft diameter <i>d</i>	Lead <i>l</i>	Basic load ratings (N)		Stroke		Nut length <i>L</i>	Screw shaft dimensions			
			Dynamic <i>C<sub>a</sub></i>	Static <i>C<sub>0s</sub></i>	Nominal	Max. <i>L<sub>1</sub>-L</i>		<i>L<sub>1</sub></i>	<i>L<sub>a</sub></i>	<i>L<sub>s</sub></i>	<i>L<sub>i</sub></i>
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					30	30		5 070	8 730	100	
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				

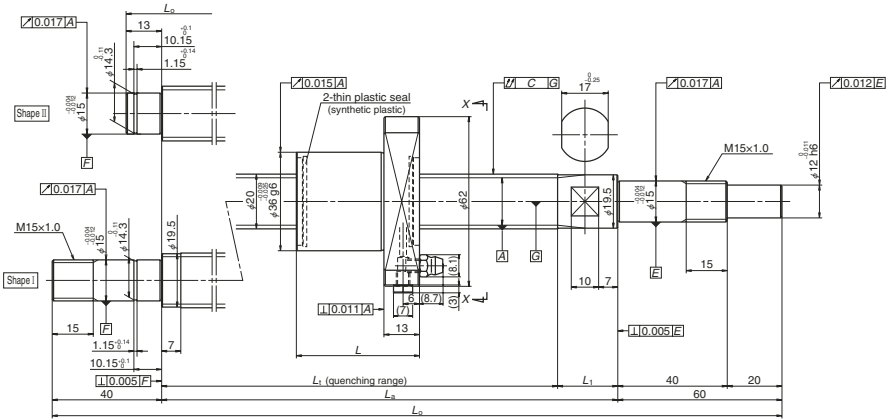
Notes: 1. Indicates ball screw preload control value. Approximately 2.0 N-cm of torque is added due to thin plastic seals.  
2. Contact NSK if permissible rotational speed is to be exceeded.  
3. Service temperature range is 0 to 80°C.

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

4. Use of NSK support unit is recommended. Refer to page B389 for details.  
5. Recommended quantity of grease is about 50% of ball nut's internal space. See page D16 for details.

**Compact FA PSS Type**

(Fine, Medium lead)



**Nut model: BSS**



Screw shaft ø20

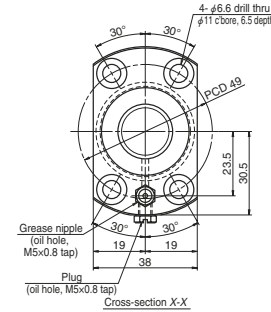
Lead 5, 10

Unit: mm

Ball screw specification	
Preload type	Oversize ball preload (P-preload)
Ball diameter/screw shaft root diameter	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 (low-profile, square)	WBK15-01B (low-profile, square)	WBK15S-01B (low-profile, square)
WBK15-11 (round)	WBK15-11 (round)	



Ball screw No.	Screw shaft diameter <i>d</i>	Lead <i>l</i>	Basic load ratings (N)		Stroke		Nut length <i>L</i>	Screw shaft dimensions								
			Dynamic <i>C<sub>a</sub></i>	Static <i>C<sub>0a</sub></i>	Nominal	Max. <i>L<sub>1</sub>-L</i>		<i>L<sub>1</sub></i>	<i>L<sub>a</sub></i>	<i>L<sub>o</sub></i>	<i>L<sub>i</sub></i>					
PSS2005N1D0323	20	5	8 790	18 500	150	197	31	228	250	323	22					
PSS2005N1D0373					200	247		278	300	373						
PSS2005N1D0473					300	347		378	400	473						
PSS2005N1D0573					400	447		478	500	573						
PSS2005N1D0673					500	547		578	600	673						
PSS2005N1D0773					600	647		678	700	773						
PSS2005N1D0873					700	747		778	800	873						
PSS2005N1D1000					800	847		878	900	1 000						
PSS2010N1D0387					10	8 790		18 500	200	247		45	292	314	387	22
PSS2010N1D0487									300	347			392	414	487	
PSS2010N1D0587	400	447	492	514			587									
PSS2010N1D0687	500	547	592	614			687									
PSS2010N1D0787	600	647	692	714			787									
PSS2010N1D0887	700	747	792	814			887									
PSS2010N1D1014	800	847	892	914			1 014									
PSS2010N1D1214	1 000	1 047	1 092	1 114			1 214									
PSS2010N1D1414	1 200	1 247	1 292	1 314			1 414									

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

Unit: mm

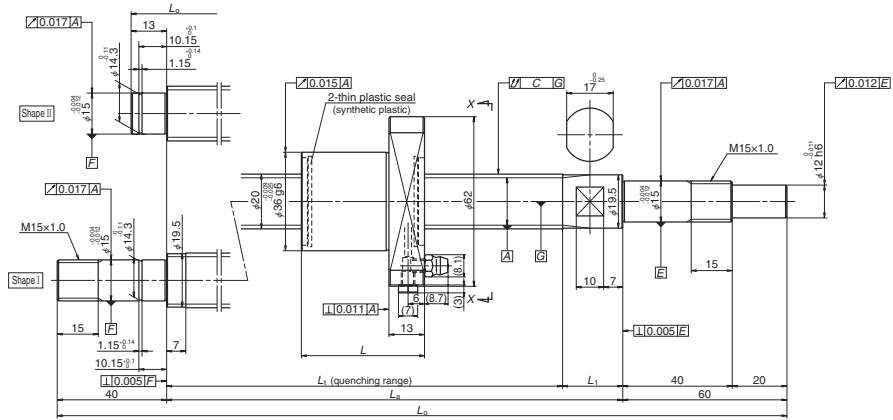
Left shaft end (opposite driven side)	Lead accuracy			Shaft run-out <i>C</i>	Dynamic preload torque (N-cm) *1	Mass (kg)	Permissible rotational speed (min <sup>-1</sup> ) *2		Internal spatial volume of nut (cm <sup>3</sup> )	Standard volume of grease replenishing (cm <sup>3</sup> )		
	Target value <i>T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

4. Use of NSK support unit is recommended. Refer to page B389 for details.  
5. Recommended quantity of grease is about 50% of ball nut's internal space. See page D16 for details.



**Compact FA PSS Type**

**(High helix lead)**



**Nut model: BSS**



**Screw shaft ø20**

**Lead 20, 30**

Unit: mm

Ball screw specification	
Preload type	Oversize ball preload (P-preload)
Ball diameter/screw shaft root diameter	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 (low-profile, square)	WBK15-01B (low-profile, square)	WBK15S-01B (low-profile, square)
WBK15-11 (round)	WBK15-11 (round)	

Ball screw No.	Screw shaft diameter <i>d</i>	Lead <i>l</i>	Basic load ratings (N)		Stroke		Nut length <i>L</i>	Screw shaft dimensions															
			Dynamic <i>C<sub>a</sub></i>	Static <i>C<sub>0s</sub></i>	Nominal	Max. <i>L<sub>1</sub>-L</i>		<i>L<sub>1</sub></i>	<i>L<sub>a</sub></i>	<i>L<sub>s</sub></i>	<i>L<sub>1</sub></i>												
												<i>C<sub>a</sub></i>	<i>C<sub>0s</sub></i>	Nominal	Max. <i>L<sub>1</sub>-L</i>	<i>L<sub>1</sub></i>	<i>L<sub>a</sub></i>	<i>L<sub>s</sub></i>	<i>L<sub>1</sub></i>				
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					30	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																

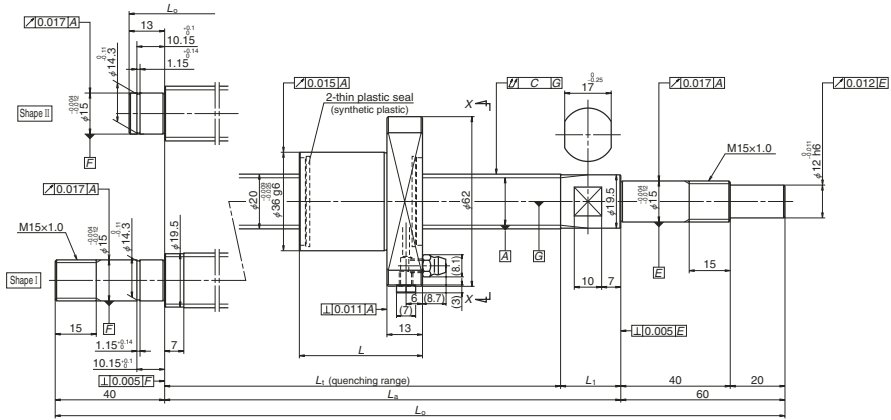
- Notes: 1. Indicates ball screw preload control value. Approximately 2.0 N·cm of torque is added due to thin plastic seals.  
2. Contact NSK if permissible rotational speed is to be exceeded.  
3. Service temperature range is 0 to 80°C.

Left shaft end (opposite side driven side)	Lead accuracy			Shaft run-out <i>C</i>	Dynamic preload torque (N·cm) <sup>*1</sup>	Mass (kg)	Permissible rotational speed (min <sup>-1</sup> ) <sup>*2</sup>		Internal spatial volume of nut (cm <sup>3</sup> )	Standard volume of grease replenishing (cm <sup>3</sup> )
	Target value <i>T</i>	Error <i>e<sub>p</sub></i>	Variation <i>v<sub>u</sub></i>				Fixed-Simple	Fixed-Fixed		
II	0.027	0.020	0.060	1.4 – 11.8	1.6	5 000	—	3.2	1.6	
II	0.030	0.023	0.060	1.4 – 11.8	1.8	5 000	—			
II	0.030	0.023	0.075	1.4 – 11.8	2.0	5 000	—			
II	0.035	0.025	0.095	1.4 – 11.8	2.3	5 000	—			
II	0.040	0.027	0.095	0.8 – 13.8	2.5	3 700	—			
I	0.040	0.027	0.120	0.8 – 13.8	2.8	3 000	4 500			
I	0.046	0.030	0.120	0.8 – 13.8	3.3	2 000	3 000			
I	0.054	0.035	0.160	0.8 – 13.8	3.8	1 400	2 100			
I	0.065	0.040	0.200	0.8 – 13.8	4.7	800	1 200			
II	0.023	0.018	0.050	1.6 – 9.8	1.4	5 000	—			4.6
II	0.027	0.020	0.060	1.4 – 11.8	1.7	5 000	—			
II	0.030	0.023	0.060	1.4 – 11.8	1.9	5 000	—			
II	0.030	0.023	0.075	1.4 – 11.8	2.1	5 000	—			
II	0.035	0.025	0.095	1.4 – 11.8	2.4	5 000	—			
II	0.040	0.027	0.095	0.8 – 13.8	2.6	3 900	—			
I	0.040	0.027	0.120	0.8 – 13.8	2.9	3 100	4 600			
I	0.046	0.030	0.120	0.8 – 13.8	3.4	2 100	3 000			
I	0.054	0.035	0.160	0.8 – 13.8	3.9	1 500	2 200			

4. Use of NSK support unit is recommended. Refer to page B389 for details.  
5. Recommended quantity of grease is about 50% of ball nut's internal space. See page D16 for details.

**Compact FA PSS Type**

(Ultra high helix lead)



**Nut model: BSS**



Screw shaft ø20

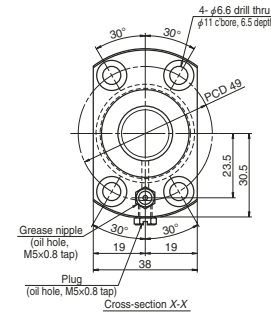
Lead 40, 60

Unit: mm

Ball screw specification	
Preload type	Oversize ball preload (P-preload)
Ball diameter/screw shaft root diameter	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 (low-profile, square)	WBK15-01B (low-profile, square)	WBK15S-01B (low-profile, square)
WBK15-11 (round)	WBK15-11 (round)	



Ball screw No.	Screw shaft diameter <i>d</i>	Lead <i>l</i>	Basic load ratings (N)		Stroke		Nut length <i>L</i>	Screw shaft dimensions			
			Dynamic <i>C<sub>a</sub></i>	Static <i>C<sub>0a</sub></i>	Nominal	Max. <i>L<sub>1</sub>-L</i>		<i>L<sub>1</sub></i>	<i>L<sub>a</sub></i>	<i>L<sub>b</sub></i>	<i>L<sub>i</sub></i>
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		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.  
 3. Service temperature range is 0 to 80°C.

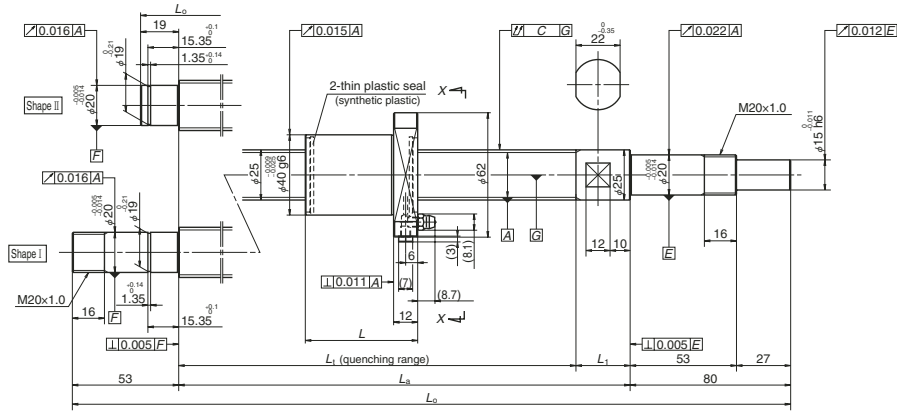
Unit: mm

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

4. Use of NSK support unit is recommended. Refer to page B389 for details.  
 5. Recommended quantity of grease is about 50% of ball nut's internal space. See page D16 for details.

**Compact FA PSS Type**

(Fine lead)



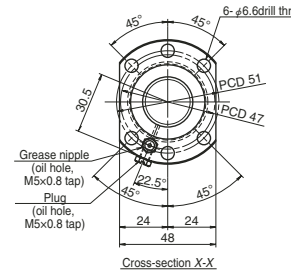
**Nut model: BSS**

**NSK**

Screw shaft  $\phi 25$

Lead 5, 10

Unit: mm



**Ball screw specification**

Preload type	Oversize ball preload (P-preload)
Ball diameter/screw shaft root diameter	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)	WBK20-01 (square)	WBK20S-01 (square)
WBK20-11 (round)	WBK20-11 (round)	

Ball screw No.	Screw shaft diameter <i>d</i>	Lead <i>l</i>	Basic load ratings (N)		Stroke		Nut length <i>L</i>	Screw shaft dimensions				
			Dynamic <i>C<sub>s</sub></i>	Static <i>C<sub>0s</sub></i>	Nominal <i>L<sub>i</sub>-L</i>	Max. <i>L<sub>i</sub>-L</i>		<i>L<sub>i</sub></i>	<i>L<sub>a</sub></i>	<i>L<sub>o</sub></i>	<i>L<sub>i</sub></i>	
PSS2505N1D0349	25	5	9 760	23 600	150	191	32	223	250	349	27	
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		27
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.  
 3. Service temperature range is 0 to 80°C.

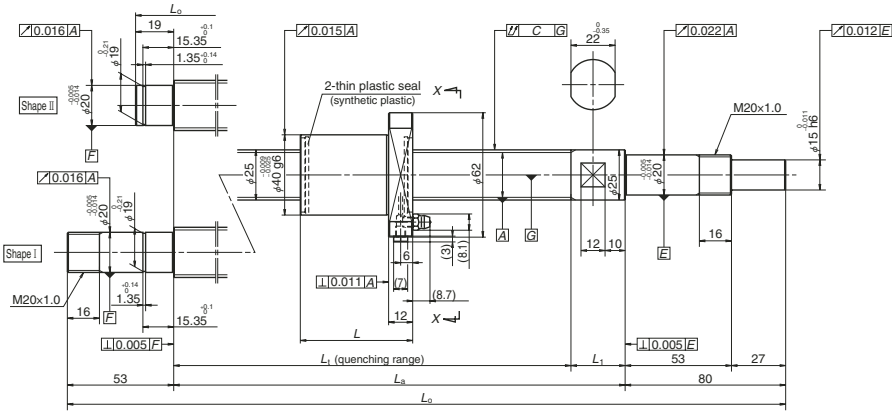
Unit: mm

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

4. Use of NSK support unit is recommended. Refer to page B389 for details.  
 5. Recommended quantity of grease is about 50% of ball nut's internal space. See page D16 for details.

**Compact FA PSS Type**

(Medium, High helix lead)



**Nut model: BSS**



Screw shaft  $\phi 25$

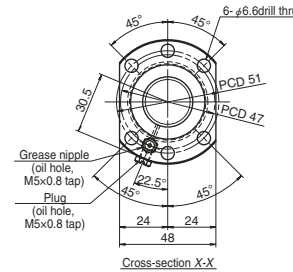
Lead 20, 25

Unit: mm

Ball screw specification	
Preload type	Oversize ball preload (P-preload)
Ball diameter/screw shaft root diameter	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)	WBK20-01 (square)	WBK20S-01 (square)
WBK20-11 (round)	WBK20-11 (round)	



Ball screw No.	Screw shaft diameter $d$	Lead $l$	Basic load ratings (N)		Stroke		Nut length $L$	Screw shaft dimensions				
			Dynamic $C_a$	Static $C_{0a}$	Nominal $L_1-L$	Max. $L_1-L$		$L_1$	$L_a$	$L_o$	$L_1$	
PSS2520N1D0729	25	20	6 560	14 600	500	550	54	604	630	729	26	
PSS2520N1D0829					600	650		704	730	829		
PSS2520N1D0929					700	750		804	830	929		
PSS2520N1D1029					800	850		904	930	1 029		
PSS2520N1D1263					1 000	1 050		1 104	1 130	1 263		
PSS2520N1D1463					1 200	1 250		1 304	1 330	1 463		
PSS2520N1D1863					1 600	1 650		1 704	1 730	1 863		
PSS2520N1D2263					2 000	2 050		2 104	2 130	2 263		
PSS2525N1D0779		25	6 560	14 600	500	587	63	650	680	779		30
PSS2525N1D0879					600	687		750	780	879		
PSS2525N1D0979					700	787		850	880	979		
PSS2525N1D1079					800	887		950	980	1 079		
PSS2525N1D1313					1 000	1 087		1 150	1 180	1 313		
PSS2525N1D1513					1 200	1 287		1 350	1 380	1 513		
PSS2525N1D1913					1 600	1 687		1 750	1 780	1 913		
PSS2525N1D2313					2 000	2 087		2 150	2 180	2 313		

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

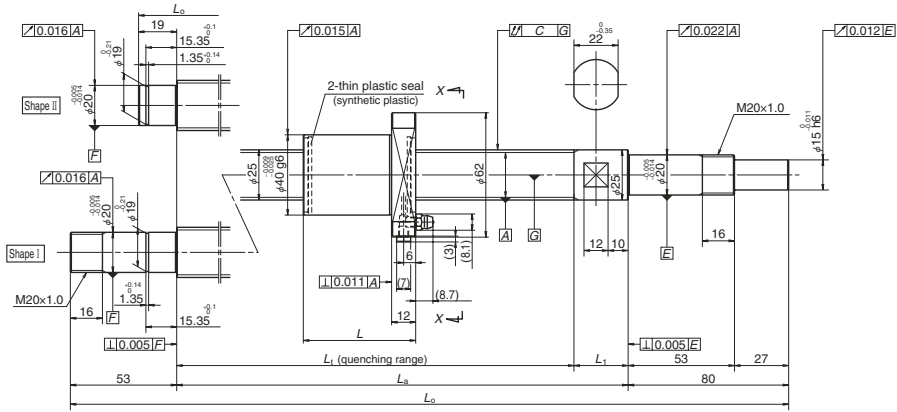
Unit: mm

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

4. Use of NSK support unit is recommended. Refer to page B389 for details.  
5. Recommended quantity of grease is about 50% of ball nut's internal space. See page D16 for details.

**Compact FA PSS Type**

(High helix, Ultra high helix lead)



**Nut model: BSS**



Screw shaft  $\phi 25$

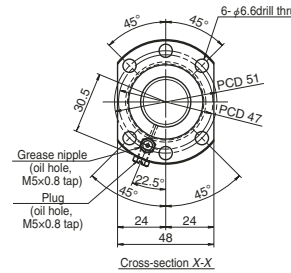
Lead 30, 50

Unit: mm

Ball screw specification	
Preload type	Oversize ball preload (P-preload)
Ball diameter/screw shaft root diameter	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)	WBK20-01 (square)	WBK20S-01 (square)
WBK20-11 (round)	WBK20-11 (round)	



Ball screw No.	Screw shaft diameter $d$	Lead $l$	Basic load ratings (N)		Stroke		Nut length $L$	Screw shaft dimensions			
			Dynamic $C_a$	Static $C_{0a}$	Nominal	Max. $L_1-L$		$L_1$	$L_a$	$L_o$	$L_1$
PSS2530N1D0779	25	30	6 560	14 600	500	576	74	650	680	779	30
PSS2530N1D0879					600	676		750	780	879	
PSS2530N1D0979					700	776		850	880	979	
PSS2530N1D1079					800	876		950	980	1 079	
PSS2530N1D1313					1 000	1 076		1 150	1 180	1 313	
PSS2530N1D1513					1 200	1 276		1 350	1 380	1 513	
PSS2530N1D1913					1 600	1 676		1 750	1 780	1 913	
PSS2530N1D2313		2 000	2 076	2 150	2 180	2 313					
PSS2550N1D0829		50	6 560	14 600	500	576	114	690	730	829	40
PSS2550N1D0929					600	676		790	830	929	
PSS2550N1D1029					700	776		890	930	1 029	
PSS2550N1D1129					800	876		990	1 030	1 129	
PSS2550N1D1363					1 000	1 076		1 190	1 230	1 363	
PSS2550N1D1563					1 200	1 276		1 390	1 430	1 563	
PSS2550N1D1963	1 600				1 676	1 790		1 830	1 963		
PSS2550N1D2363	2 000	2 076	2 190	2 230	2 363						

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

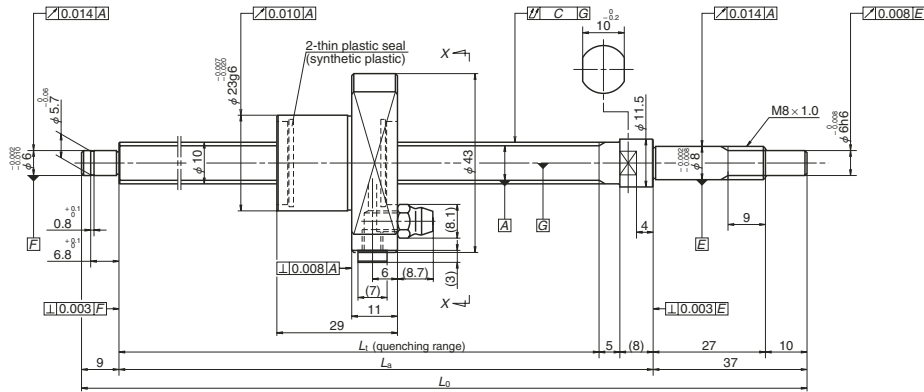
Unit: mm

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

4. Use of NSK support unit is recommended. Refer to page B389 for details.  
5. Recommended quantity of grease is about 50% of ball nut's internal space. See page D16 for details.

## Compact FA USS Type

(Medium lead)



Ball screw No.	Screw shaft diameter $d$	Lead $l$	Basic load ratings (N)		Stroke		Screw shaft dimensions		
			Dynamic $C_d$	Static $C_{0a}$	Nominal	Max. $L_1-L$	$L_1$	$L_0$	$L_2$
<b>USS1005N1D0221</b>	10	5	2 930	4 790	100	133	162	175	221
<b>USS1005N1D0321</b>					200	233	262	275	321
<b>USS1005N1D0521</b>					400	433	462	475	521

- Notes: 1. Indicates ball screw preload control value. Approximately 0.5 N-cm of torque is added due to thin plastic seals.  
2. Contact NSK if permissible rotational speed is to be exceeded.  
3. Service temperature range is 0 to 80°C.

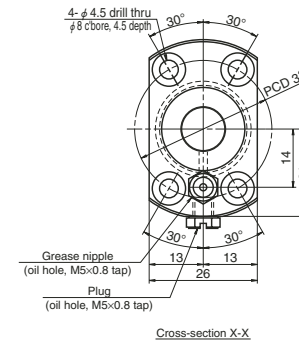
## Nut model: BSS

**NSK**

Screw shaft  $\phi 10$

Lead 5

Unit: mm



### Ball screw specification

Preload type	Oversize ball preload (P-preload)
Ball diameter/screw shaft root diameter	2.000 / 8.2
Ball circle dia.	10.3
Accuracy grade/axial play	C3 / 0
Factory-packed grease	NSK grease LR2

### Recommended support unit

For drive side (Fixed)	For opposite to drive side (Simple)
WBK08-01B (low-profile, square)	WBK08S-01B (low-profile, square)
WBK08-11 (round)	WBK08S-01C (square, clean)
WBK08-01C (square, clean)	
WBK08-11C (round, clean)	

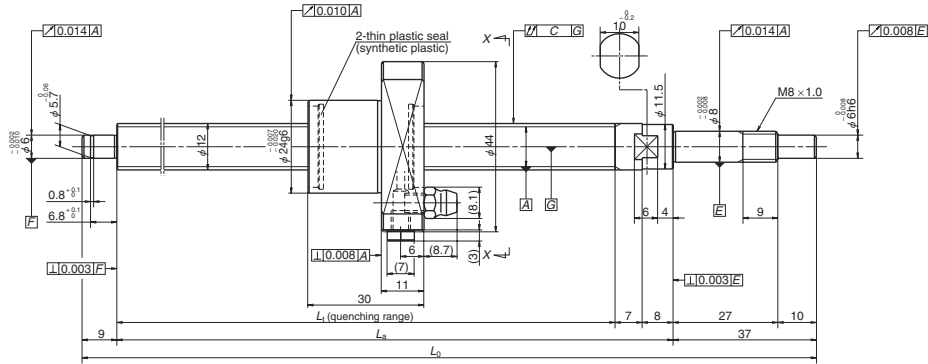
Unit: mm

Target value $T$	Lead accuracy		Shaft run-out $C$	Dynamic preload torque (N-cm) *1	Mass (kg)	Permissible rotational speed (min) <sup>-1</sup> *2	Internal spatial volume of nut (cm <sup>3</sup> )	Standard volume of grease replenishing (cm <sup>3</sup> )
	Error $e_0$	Variation $V_0$						
0	0.010	0.008	0.035	0.2-1.8	0.3	5 000	0.8	0.4
	0.012	0.008	0.045	0.2-2.0	0.3			
	0.015	0.010	0.070	0.2-3.0	0.5			

4. Use of NSK support unit is recommended. See page B389 for details.

**Compact FA USS Type**

(Fine lead)



Ball screw No.	Screw shaft diameter <i>d</i>	Lead <i>l</i>	Basic load ratings (N)		Stroke		Screw shaft dimensions		
			Dynamic <i>C<sub>d</sub></i>	Static <i>C<sub>0a</sub></i>	Nominal	Max. <i>L<sub>1</sub>-L</i>	<i>L<sub>1</sub></i>	<i>L<sub>a</sub></i>	<i>L<sub>0</sub></i>
<b>USS1205N1D0221</b>	12	5	3 200	5 860	100	130	160	175	221
<b>USS1205N1D0321</b>					200	230	260	275	321
<b>USS1205N1D0621</b>					500	530	560	575	621

- Notes:
1. Indicates ball screw preload control value. Approximately 0.5 N-cm of torque is added due to thin plastic seals.
  2. Contact NSK if permissible rotational speed is to be exceeded.
  3. Service temperature range is 0 to 80°C.

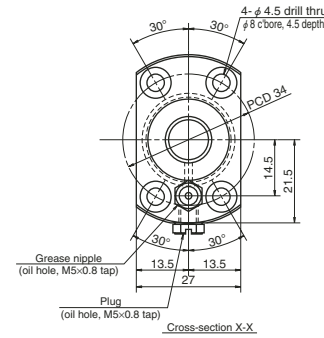
**Nut model: BSS**

**NSK**

**Screw shaft ø12**

**Lead 5**

Unit: mm



**Ball screw specification**

Preload type	Oversize ball preload (P-preload)
Ball diameter/screw shaft root diameter	2.000 / 10.2
Ball circle dia.	12.3
Accuracy grade/axial play	C3 / 0
Factory-packed grease	NSK grease LR2

**Recommended support unit**

For drive side (Fixed)	For opposite to drive side (Simple)
WBK08-01B (low-profile, square)	WBK08S-01B (low-profile, square)
WBK08-11 (round)	WBK08S-01C (square, clean)
WBK08-01C (square, clean)	
WBK08-11C (round, clean)	

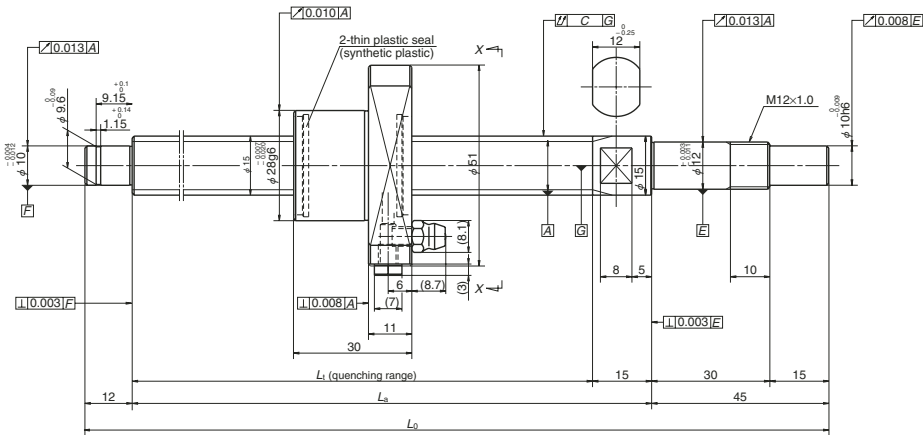
Unit: mm

Target value <i>T</i>	Lead accuracy		Shaft run-out <i>C</i>	Dynamic preload torque (N-cm) *1	Mass (kg)	Permissible rotational speed (min) <sup>-1</sup> *2	Internal spatial volume of nut (cm <sup>3</sup> )	Standard volume of grease replenishing (cm <sup>3</sup> )
	Error <i>e<sub>0</sub></i>	Variation <i>V<sub>0</sub></i>						
0	0.010	0.008	0.035	0.2-1.8	0.3	5 000	1.0	0.5
	0.012	0.008	0.045	0.2-2.0	0.3			
	0.016	0.012	0.070	0.2-3.0	0.7			

4. Use of NSK support unit is recommended. See page B389 for details.

## Compact FA USS Type

(Fine lead)



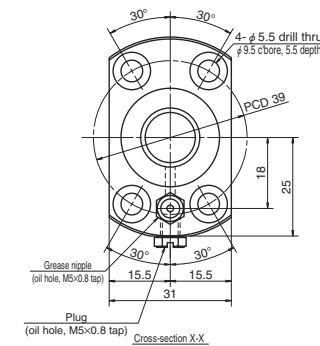
## Nut model: BSS

**NSK**

Screw shaft  $\phi 15$

Lead 5

Unit: mm



### Ball screw specification

Preload type	Oversize ball preload (P-preload)
Ball diameter/screw shaft root diameter	2.778 / 12.6
Ball circle dia.	15.5
Accuracy grade/axial play	C3 / 0
Factory-packed grease	NSK grease LR2

### Recommended support unit

For drive side (Fixed)	For opposite to drive side (Simple)
WBK12-01B (low-profile, square)	WBK12S-01B (low-profile, square)
WBK12-11 (round)	WBK12S-01C (square, clean)
WBK12-01C (square, clean)	
WBK12-11C (round, clean)	

Ball screw No.	Screw shaft diameter $d$	Lead $l$	Basic load ratings (N)		Stroke		Screw shaft dimensions		
			Dynamic $C_d$	Static $C_{0a}$	Nominal	Max. $L_1$ - $L$	$L_1$	$L_0$	$L_2$
<b>USS1505N1D0261</b>	15	5	5 460	10 200	100	159	189	204	261
<b>USS1505N1D0361</b>					200	259	289	304	361
<b>USS1505N1D0561</b>					400	459	489	504	561
<b>USS1505N1D0761</b>					600	659	689	704	761

- Notes: 1. Indicates ball screw preload control value. Approximately 0.5 N-cm of torque is added due to thin plastic seals.  
2. Contact NSK if permissible rotational speed is to be exceeded.  
3. Service temperature range is 0 to 80°C.

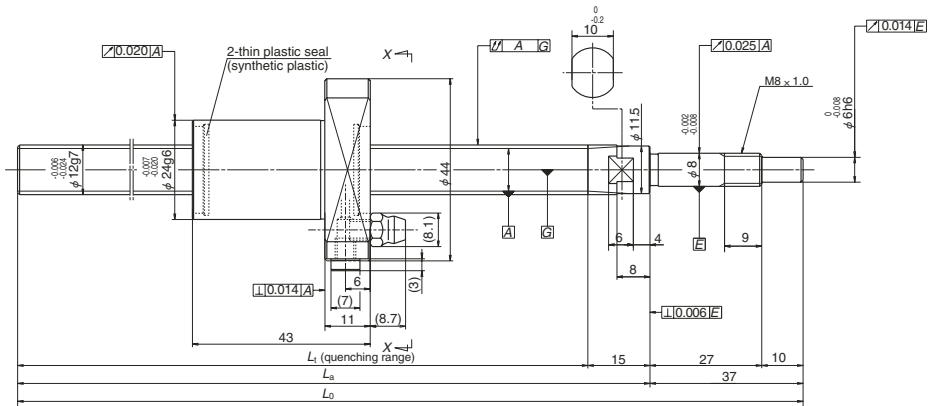
Target value $T$	Lead accuracy		Shaft run-out $C$	Dynamic preload torque (N-cm) *1	Mass (kg)	Permissible rotational speed (min <sup>-1</sup> ) *2	Internal spatial volume of nut (cm <sup>3</sup> )	Standard volume of grease replenishing (cm <sup>3</sup> )
	Error $e_p$	Variation $V_i$						
0	0.010	0.008	0.025	0.2-5.0	0.5	5 000	2.0	1.0
	0.012	0.008	0.035	0.2-5.0	0.6	5 000		
	0.015	0.010	0.045	0.2-6.0	0.9	5 000		
	0.018	0.013	0.060	0.2-8.0	1.1	3 600		

4. Use of NSK support unit is recommended. See page B389 for details.



# Compact FA FSS Type

(Medium lead)



Ball screw No.	Screw shaft diameter <i>d</i>	Lead <i>l</i>	Basic load ratings (N)		Screw shaft dimensions		
			Dynamic <i>C<sub>s</sub></i>	Static <i>C<sub>0a</sub></i>	<i>L<sub>1</sub></i>	<i>L<sub>a</sub></i>	<i>L<sub>o</sub></i>
<b>FSS1210N1D0400</b>	12	10	3 200	5 860	348	363	400
<b>FSS1210N1D0600</b>					548	563	600
<b>FSS1210N1D0900</b>					848	863	900

- Notes: 1. Indicates ball screw preload control value. Approximately 2.0 N-cm of torque is added due to thin plastic seals.  
 2. Service temperature range is 0 to 80°C.  
 3. Use of NSK support unit is recommended. See page B389 for details.

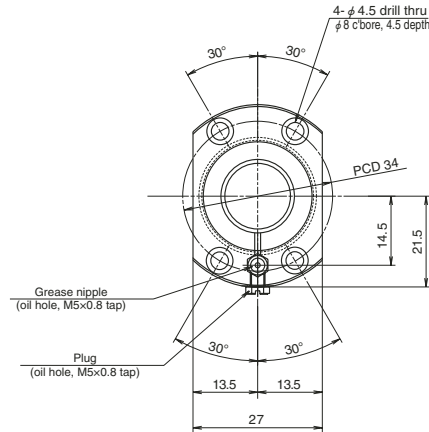
# Nut model: BSS

**NSK**

Screw shaft ø12

Lead 10

Unit: mm



### Ball screw specification

Ball diameter/screw shaft root diameter	2.000 / 10.2
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 (low-profile, square)	WBK12SF-01B (low-profile, square)

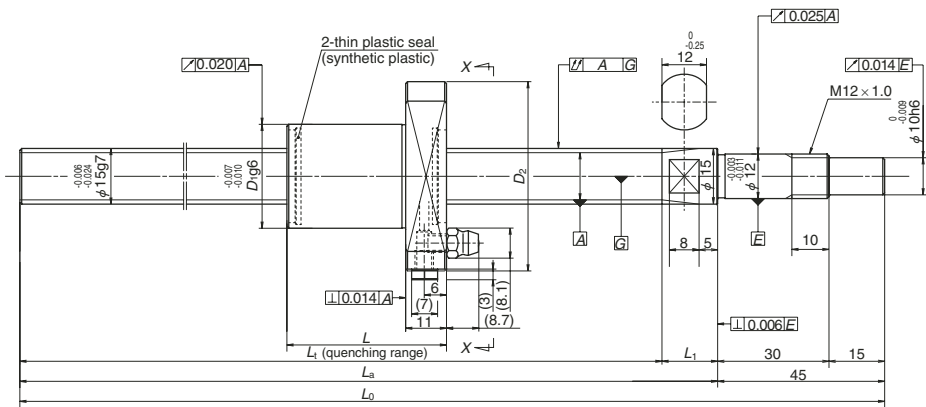
Unit: mm

Target value <i>T</i>	Lead accuracy		Shaft run-out <i>A</i>	Mass (kg)	Internal spatial volume of nut (cm <sup>3</sup> )	Standard volume of grease replenishing (cm <sup>3</sup> )
	Error <i>e<sub>s</sub></i>	Variation <i>V<sub>300</sub></i>				
0	0.120	0.052	0.080	0.5	1.0	0.5
	0.195		0.120			
	0.310		0.180			

4. Permissible rotational speed varies when using cut screw shaft. It is necessary to calculate two items below, and whichever smaller is the permissible rotational speed.  
 \*Critical speed which is the resonance vibration of the shaft (page B47).  
 \*Maximum rotational speed 5 000 min<sup>-1</sup>

**Compact FA FSS Type**

(Medium, High helix lead)



Ball screw No.	Screw shaft diameter <i>d</i>	Lead <i>l</i>	Basic load ratings (N)		Screw shaft dimensions			
			Dynamic <i>C<sub>a</sub></i>	Static <i>C<sub>0a</sub></i>	<i>L<sub>1</sub></i>	<i>L<sub>2</sub></i>	<i>L<sub>3</sub></i>	<i>L<sub>4</sub></i>
<b>FSS1510N1D0500</b>	15	10	5 460	10 200	440	455	500	15
<b>FSS1510N1D1000</b>					940	955	1 000	
<b>FSS1510N1D1450</b>					1 390	1 405	1 450	
<b>FSS1520N1D0500</b>	20	20	5 070	8 730	437	455	500	18
<b>FSS1520N1D1000</b>					937	955	1 000	
<b>FSS1520N1D1450</b>					1 387	1 405	1 450	

- Notes: 1. Indicates ball screw preload control value. Approximately 2.0 N·cm of torque is added due to thin plastic seals.  
 2. Service temperature range is 0 to 80°C.  
 3. Use of NSK support unit is recommended. See page B389 for details.

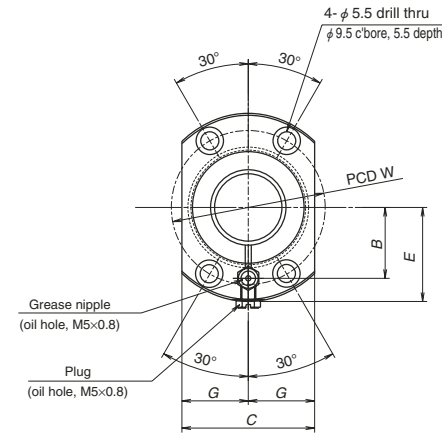
**Nut model: BSS**



Screw shaft  $\phi 15$

Lead 10, 20

Unit: mm



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

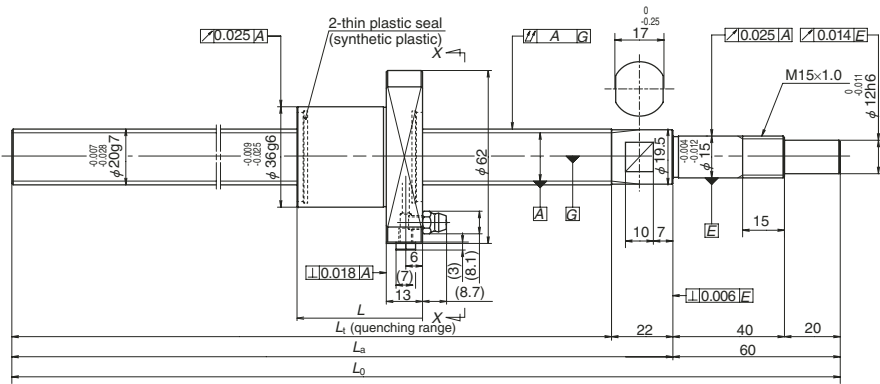
Recommended support unit	
For drive side (Fixed)	For opposite to drive side (Simple)
WBK12-01B (low-profile, square)	WBK15SF-01B (low-profile, square)

Nut dimensions								Lead accuracy			Shaft run-out <i>A</i>	Mass (kg)	Internal spatial volume of nut (cm <sup>3</sup> )	Standard volume of grease replenishing (cm <sup>3</sup> )	
<i>L</i>	<i>D<sub>1</sub></i>	<i>D<sub>2</sub></i>	<i>W</i>	<i>B</i>	<i>C</i>	<i>E</i>	<i>G</i>	Target value <i>T</i>	Error <i>e<sub>o</sub></i>	Variation <i>V<sub>300</sub></i>					
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	0.155	0.052	0.070	1.0	2.8	1.4	
									0.310			0.125			1.7
									0.490			0.200			2.3

4. Permissible rotational speed varies when using cut screw shaft. It is necessary to calculate two items below, and whichever smaller is the permissible rotational speed.  
 \*Critical speed which is the resonance vibration of the shaft (page B47).  
 \*Maximum rotational speed 5 000 min<sup>-1</sup>

**Compact FA FSS Type**

(Medium, High helix lead)



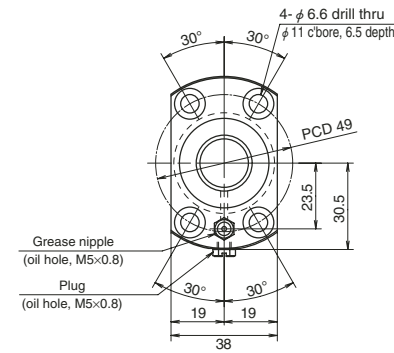
**Nut model: BSS**



**Screw shaft ø20**

**Lead 10, 20**

Unit: mm



**Ball screw specification**

Ball diameter/screw shaft root diameter	3.175 / 17.2
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 (low-profile, square)	WBK20SF-01B (low-profile, square)

Ball screw No.	Screw shaft diameter <i>d</i>	Lead <i>l</i>	Basic load ratings (N)		Screw shaft dimensions		
			Dynamic <i>C<sub>a</sub></i>	Static <i>C<sub>0a</sub></i>	<i>L<sub>1</sub></i>	<i>L<sub>a</sub></i>	<i>L<sub>o</sub></i>
<b>FSS2010N1D0600</b>	20	10	8 790	18 500	518	540	600
<b>FSS2010N1D1000</b>					918	940	1 000
<b>FSS2010N1D1450</b>					1 368	1 390	1 450
<b>FSS2020N1D0600</b>	20	20	5 900	11 700	518	540	600
<b>FSS2020N1D1000</b>					918	940	1 000
<b>FSS2020N1D1450</b>					1 368	1 390	1 450

- Notes: 1. Indicates ball screw preload control value. Approximately 2.0 N·cm of torque is added due to thin plastic seals.  
 2. Service temperature range is 0 to 80°C.  
 3. Use of NSK support unit is recommended. See page B389 for details.

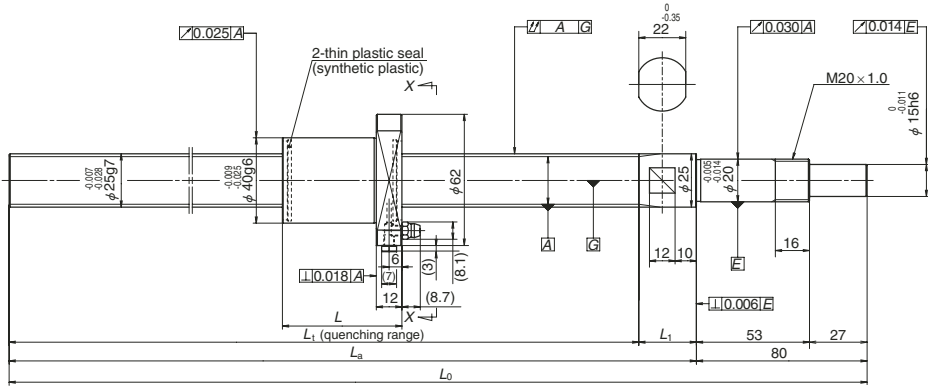
Unit: mm

Nut length <i>L</i>	Lead accuracy			Shaft run-out <i>A</i>	Mass (kg)	Internal spatial volume of nut (cm <sup>3</sup> )	Standard volume of grease replenishing (cm <sup>3</sup> )
	Target value <i>T</i>	Error <i>e<sub>p</sub></i>	Variation <i>V<sub>300</sub></i>				
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	0.195	0.052	0.085	1.8	3.2	1.6
		0.310		0.125	2.7		
		0.490		0.200	3.8		

4. Permissible rotational speed varies when using cut screw shaft. It is necessary to calculate two items below, and whichever smaller is the permissible rotational speed.  
 \*Critical speed which is the resonance vibration of the shaft (page B47).  
 \*Maximum rotational speed 5 000 min<sup>-1</sup>

**Compact FA FSS Type**

(Fine, Medium, High helix lead)



**Nut model: BSS**



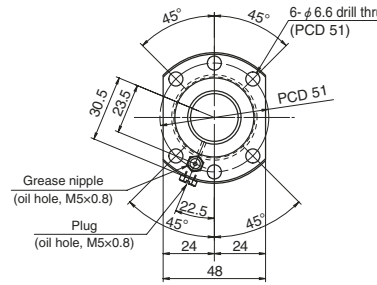
**Screw shaft ø25**

**Lead 10, 20, 25**

Unit: mm

Ball screw specification	
Ball diameter/screw shaft root diameter	3.175 / 22.2
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)	WBK25SF-01 (square)



Unit: mm

Ball screw No.	Screw shaft diameter <i>d</i>	Lead <i>l</i>	Basic load ratings (N)		Screw shaft dimensions			
			Dynamic <i>C<sub>d</sub></i>	Static <i>C<sub>0a</sub></i>	<i>L<sub>1</sub></i>	<i>L<sub>3</sub></i>	<i>L<sub>0</sub></i>	<i>L<sub>1</sub></i>
<b>FSS2510N1D0600</b>	25	10	12 800	32 300	493	520	600	27
<b>FSS2510N1D1000</b>					893	920	1 000	
<b>FSS2510N1D1450</b>					1 343	1 370	1 450	
<b>FSS2520N1D0600</b>		20	6 560	14 600	494	520	600	26
<b>FSS2520N1D1000</b>					894	920	1 000	
<b>FSS2520N1D1450</b>					1 344	1 370	1 450	
<b>FSS2525N1D0600</b>		25	6 560	14 600	490	520	600	30
<b>FSS2525N1D1000</b>					890	920	1 000	
<b>FSS2525N1D1450</b>					1 340	1 370	1 450	

Nut length <i>L</i>	Lead accuracy			Shaft run-out <i>A</i>	Mass (kg)	Internal spatial volume of nut (cm <sup>3</sup> )	Standard volume of grease replenishing (cm <sup>3</sup> )
	Target value <i>T</i>	Error <i>e<sub>p</sub></i>	Variation <i>V<sub>300</sub></i>				
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	0.155	0.052	0.065	2.6	3.9	2.0
		0.310		0.090	4.0		
		0.490		0.130	5.8		
63	0	0.155	0.052	0.065	2.6	4.3	2.2
		0.310		0.090	4.1		
		0.490		0.130	5.8		

Notes: 1. Indicates ball screw preload control value. Approximately 2.0 N-cm of torque is added due to thin plastic seals.  
 2. Service temperature range is 0 to 80°C.  
 3. Use of NSK support unit is recommended. See page B389 for details.

4. Permissible rotational speed varies when using cut screw shaft. It is necessary to calculate two items below, and whichever smaller is the permissible rotational speed.  
 \*Critical speed which is the resonance vibration of the shaft (page B47).  
 \*Maximum rotational speed 5 000 min<sup>-1</sup>

### B-3-1.2 High Speed SS Series HSS Type

#### ◆ Features

The HMS and HMD series, originally developed for machine tools, are an addition to NSK's lineup of standard ball screws. They have a wide range of applications, from general machines to high performance machines such as those requiring high speed and precision.

#### ● High speed

The new recirculation system that utilizes NSK's high speed and low noise technology more than doubles the  $d \cdot n$  value from 70 000 to 160 000.

To extend the range of the lead to 20mm, high speed operation of over 60m/min. is possible.

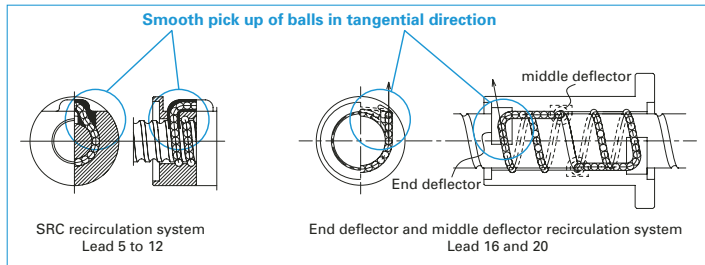


Fig 1 Ball recirculation system

Table 1 Allowable feed speed of combinations of shaft diameter and lead

shaft diameter [mm] \ Lead [mm]	5	10	12	16	20
32	25m/min	50m/min			
40		40m/min	48m/min	64m/min	80m/min
45		35m/min			
50		32m/min	38m/min		

\* Allowable speed needs to be calculated. See the permissible rotational speed in the dimensions table.

#### ● Low noise and vibrations

Compared to our conventional products, the average noise level has been reduced by more than 6dB, reducing the number of colliding balls and recirculation parts thanks to high speed, low noise technology.

The vibration level of the nut has also been reduced drastically.

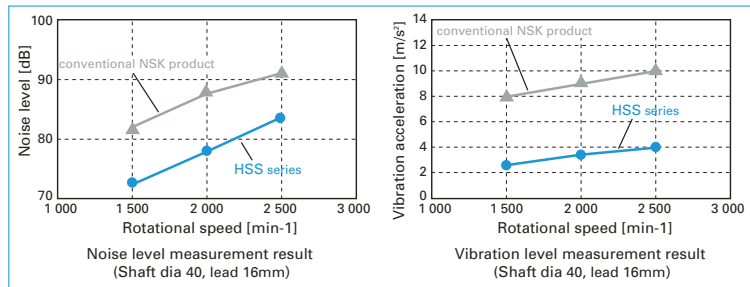


Table 2

#### ● Installation

Installation dimension are the same as those of a conventional SS series.

#### ● Compact

Achieved high-level stiffness and high load capacity equivalent to that of double nut preload by changing the double nut preload to the offset preload of a single nut, and compact sized nut. Adopted thin seals axially and shorten nut length.

#### ● Blank shaft ends

The blank shaft ends can be customized according to customers' requests. See page B27 in NSK's recommended design when drawing up plans for a shaft end. The support units available on page B389 in the case of NSK's recommended design. See "Technical Description: Shaft End Processing" (page B86) for procedures of shaft end processing and precautions.

#### ● Oil supply

2 oil holes, M6×1.0, are provided in the nut flange periphery at the end of the nut flange. A plug is standardly screwed into the periphery of the nut flange.

#### ◇ Specifications

#### ● Accuracy grade and axial play

The available standard accuracy grade and axial play are shown in Table 2.

Table 2 Accuracy grade and axial play

Accuracy grade	C5
Axial play	0 mm (preloaded)

#### ● Dimension tables

Shape dimensions and specifications are listed for every shaft diameter and lead. See Table 3, the "List of pages".

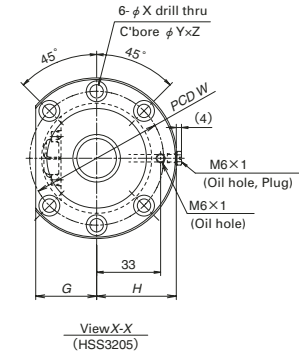
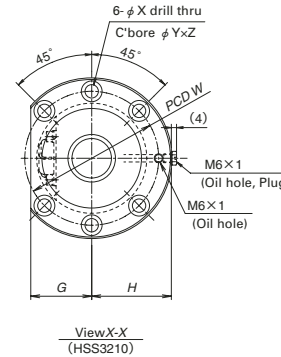
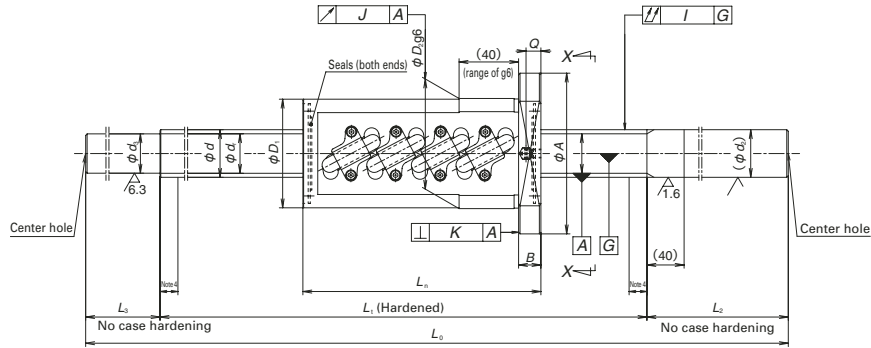
#### ◇ Other

The seal of the ball screw and recirculation parts are made of synthetic resin. Consult NSK when using the ball screws under extreme environments or special environments, or using special lubricant or oil.

For special environments, see pages B70 and D2. See pages B67 and D13 for lubricants.

Table 3 Combinations of screw shaft diameter and lead

Screw shaft diameter [mm] \ Lead [mm]	5	10	12	16	20
32	B149	B149			
40		B151	B151	B153	B153
45		B155			
50		B155	B155		



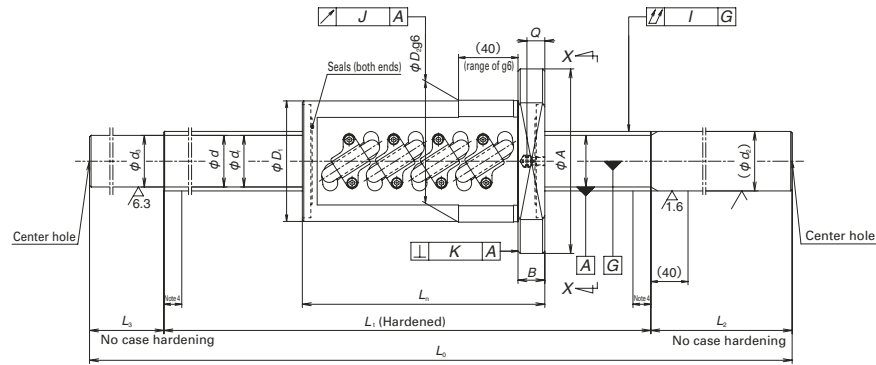
Reference No.	Screw shaft dia. $d$	Lead $l$	Ball dia. $D_w$	Ball circle dia. $d_m$	Root dia. $d_r$	Effective balls turns Tune × Circuits	Basic load rating(N)			Dynamic friction torque, median (N·cm)	Ball nut dimensions							
							Dynamic $C_d$	Static $C_{sa}$	Preload (N)		Diamete		Flange			Overall length		
											$D_1$	$D_2$	$A$	$G$	$H$	$B$	$L_1$	$W$
HSS3205N1D0650	32	5	3.175	32.5	29.2	2.5X2	18500	56100	920	17.0	57	58	85	32	42	13	89	71
HSS3205N1D0950																		
HSS3205N1D1250																		
HSS3205N1D1550																		
HSS3205N1D1850																		
HSS3210N1D0850	32	10	6.350	33.0	26.4	2.5X2	46300	108000	2310	59.5	73	74	108	41	53.5	15	160	90
HSS3210N1D1050																		
HSS3210N1D1450																		
HSS3210N1D1850																		
HSS3210N1D2250																		

- Notes: 1. Service temperature range is 0 to 60°C.  
 2. Use of NSK support unit is recommended. See page B389 for details.  
 3. Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use. See page D13 for details.  
 4. Imperfect hardened areas for one lead exists on both ends of a screw. Exercise care when stroke setting.  
 5. Permissible rotational speed: Calculated values obtained from the critical speed between the threaded length and NSK's recommended shaft end design. See page B27.

Bolt hole		Oil hole		Screw shaft dimension						Lead accuracy			Run-out			Permissible rotational speed (min <sup>-1</sup> )		Internal spatial volume of nut (cm <sup>3</sup> )	Standard volume of grease replenishing (cm <sup>3</sup> )
				Threaded length $L_1$	Shaft end, right		Shaft end, left		Overall length $L_0$	Travel compensation $T$	Deviation $e_p$	Variation $V_u$	Shaft straightness $I$	Nut O.D. eccentricity $J$	Flange perpendicularity $K$	Installation			
					$d_2$	$L_2$	$d_3$	$L_3$								Fixed-Free support	Fixed-Fixed support		
6.6	11	6.5	8	400	200	50	650	-0.010	0.025	0.020	0.055	0.019	0.013	5.2	5000	5000	10	5	
				600	250	100	950	-0.014	0.030	0.023	0.065			7.0	5000	5000			
				900	320	29.2	100	1250	-0.022	0.040	0.027			0.080	8.7	5000			5000
				1150	300	100	1550	-0.028	0.046	0.030	0.100			10.5	3500	4700			
				1450	300	100	1850	-0.035	0.054	0.035	0.130			12.2	2200	2900			
9	14	8.5	10	500	250	100	850	-0.012	0.027	0.020	0.065	0.019	0.013	8.9	5000	5000	43	22	
				700	250	100	1050	-0.017	0.035	0.025	0.080			10.0	5000	5000			
				1050	320	26.4	100	1450	-0.025	0.046	0.030			0.100	12.2	4100			5000
				1450	300	100	1850	-0.035	0.054	0.035	0.130			14.3	2100	2800			
				1850	300	100	2250	-0.045	0.065	0.040	0.170			16.5	1200	1700			

High Speed SS HSS Type

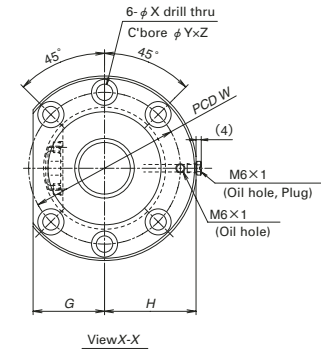
(Fine lead)



Nut models: ZFRC

NSK

Screw shaft  $\phi$  40  
Lead 10, 12



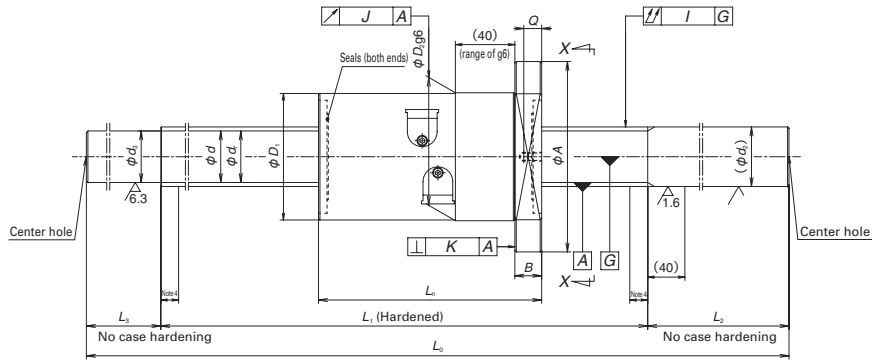
Reference No.	Screw shaft dia. $d$	Lead $l$	Ball dia. $D_w$	Ball circle dia. $d_m$	Root dia. $d_r$	Effective balls turns Tune $\times$ Circuits	Basic load rating(N)			Dynamic friction torque, median (N-cm)	Ball nut dimensions							
							Dynamic $C_d$	Static $C_{sa}$	Preload (N)		Diamete		Flange			Overall length		
											$D_1$	$D_2$	$A$	$G$	$H$	$B$	$L_1$	$W$
HSS4010N1D0950	40	10	6.350	41.0	34.4	2.5X2	52000	137000	2600	74.5	81	82	124	47	61.5	18	163	102
HSS4010N1D1450																		
HSS4010N1D2100																		
HSS4010N1D2900																		
HSS4012N1D1450																		
HSS4012N1D2100	40	12	7.144	41.5	34.1	2.5X2	61000	155000	3050	96.0	85	86	128	48	63.5	18	187	106
HSS4012N1D2900																		

- Notes: 1. Service temperature range is 0 to 60°C.  
 2. Use of NSK support unit is recommended. See page B389 for details.  
 3. Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use. See page D13 for details.  
 4. Imperfect hardened areas for one lead exists on both ends of a screw. Exercise care when stroke setting.  
 5. Permissible rotational speed: Calculated values obtained from the critical speed between the threaded length and NSK's recommended shaft end design. See page B27.

Bolt hole			Screw shaft dimension							Lead accuracy			Run-out			Permissible rotational speed (min <sup>-1</sup> )			Internal spatial volume of nut (cm <sup>3</sup> )	Standard volume of grease replenishing (cm <sup>3</sup> )									
			Oil hole	Threaded length	Shaft end, right		Shaft end, left		Overall length	Travel compensation	Deviation	Variation	Shaft straightness	Nut O.D. eccentricity	Flange perpendicularity	Mass (kg)	Installation												
					$X$	$Y$	$Z$	$Q$									$L_1$	$d_2$			$L_2$	$d_3$	$L_3$	$L_0$	$T$	$e_p$	$V_u$	$I$	$J$
11	17.5	11	12	600	250	100	950	-0.014	0.030	0.023	0.050	0.025	0.015	13.5	4000	4000	52	26											
																			1050	300	100	1450	-0.025	0.046	0.030	0.070	17.9	4000	4000
																			1600	350	150	2100	-0.039	0.054	0.035	0.110	23.5	2200	3000
																			2400	350	150	2900	-0.058	0.077	0.046	0.140	30.5	900	1300
11	17.5	11	12	1050	300	100	1450	-0.025	0.046	0.030	0.070	0.025	0.015	19.1	4000	4000	67	34											
																			1600	350	150	2100	-0.039	0.054	0.035	0.110	24.8	2200	3000
																			2400	350	150	2900	-0.058	0.077	0.046	0.140	31.8	900	1300

**High Speed SS HSS Type**

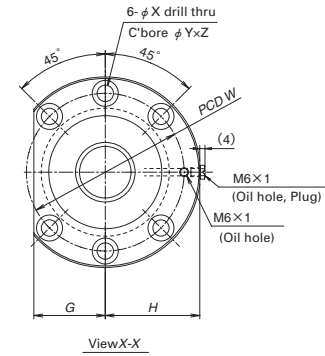
(Fine · medium lead)



**Nut models: EM**

**NSK**

**Screw shaft φ 40  
Lead 16, 20**



Reference No.	Screw shaft dia. <i>d</i>	Lead <i>l</i>	Ball dia. <i>D<sub>w</sub></i>	Ball circle dia. <i>d<sub>m</sub></i>	Root dia. <i>d<sub>r</sub></i>	Effective balls turns Tune × Circuits	Basic load rating(N)			Dynamic friction torque, median (N·cm)	Ball nut dimensions							
							Dynamic <i>C<sub>d</sub></i>	Static <i>C<sub>sta</sub></i>	Preload (N)		Diamete		Flange			Overall length		
											<i>D<sub>1</sub></i>	<i>D<sub>2</sub></i>	<i>A</i>	<i>G</i>	<i>H</i>	<i>B</i>	<i>L<sub>n</sub></i>	<i>W</i>
<b>HSS4016N1D1450</b>	40	16	7.144	41.5	34.1	3.7X1	57100	130000	2850	104.0	85	86	128	48	63.5	18	160	106
<b>HSS4016N1D2100</b>																		
<b>HSS4016N1D2900</b>																		
<b>HSS4020N1D1450</b>	40	20	7.144	41.5	34.1	3.7X1	57100	130000	2850	116.5	85	86	128	48	63.5	18	192	106
<b>HSS4020N1D2100</b>																		
<b>HSS4020N1D2900</b>																		

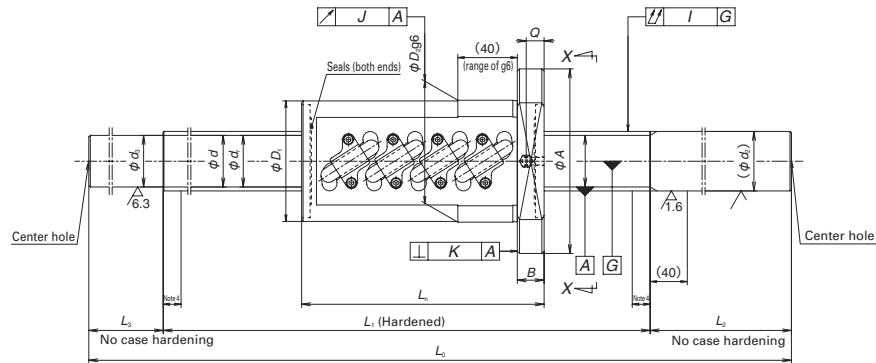
- Notes: 1. Service temperature range is 0 to 60°C.  
 2. Use of NSK support unit is recommended. See page B389 for details.  
 3. Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use. See page D13 for details.  
 4. Imperfect hardened areas for one lead exists on both ends of a screw. Exercise care when stroke setting.  
 5. Permissible rotational speed: Calculated values obtained from the critical speed between the threaded length and NSK's recommended shaft end design. See page B27.

Bolt hole	Oil hole	Screw shaft dimension					Lead accuracy			Run-out			Permissible rotational speed (min <sup>-1</sup> )			Internal spatial volume of nut (cm <sup>3</sup> )	Standard volume of grease replenishing (cm <sup>3</sup> )			
		Threaded length	Shaft end, right		Shaft end, left		Overall length	Travel compensation	Deviation	Variation	Shaft straightness	Nut O.D. eccentricity	Flange perpendicularity	Mass (kg)	Installation					
			<i>L<sub>1</sub></i>	<i>d<sub>2</sub></i>	<i>L<sub>2</sub></i>	<i>d<sub>3</sub></i>									<i>L<sub>3</sub></i>			<i>T</i>	<i>e<sub>p</sub></i>	<i>V<sub>i</sub></i>
11	17.5	11	11	1050	300	100	1450	-0.025	0.046	0.030	0.070	0.025	0.015	19.2	4000	4000	40	20		
				1600	40	350	34.1	150	2100	-0.039	0.054			0.035	0.110	25.0			2200	3000
				2400	350	150	2900	-0.058	0.077	0.046	0.140			32.2	900	1300				
11	17.5	11	11	1050	300	100	1450	-0.025	0.046	0.030	0.070	0.025	0.015	20.3	4000	4000	47	24		
				1600	40	350	34.4	150	2100	-0.039	0.054			0.035	0.110	26.2			2200	3000
				2400	350	150	2900	-0.058	0.077	0.046	0.140			33.5	900	1300				



**High Speed SS HSS Type**

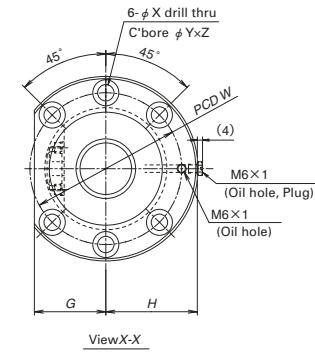
(Fine lead)



**Nut models: ZFRC**



**Screw shaft φ 45, 50  
Lead 10, 12**



Reference No.	Screw shaft dia. <i>d</i>	Lead <i>l</i>	Ball dia. <i>D<sub>w</sub></i>	Ball circle dia. <i>d<sub>m</sub></i>	Root dia. <i>d<sub>r</sub></i>	Effective balls turns Tune × Circuits	Basic load rating(N)			Dynamic friction torque, median (N·cm)	Ball nut dimensions							
							Dynamic <i>C<sub>d</sub></i>	Static <i>C<sub>sta</sub></i>	Preload (N)		Diamete		Flange			Overall length		
											<i>D<sub>1</sub></i>	<i>D<sub>2</sub></i>	<i>A</i>	<i>G</i>	<i>H</i>	<i>B</i>	<i>L<sub>1</sub></i>	<i>W</i>
<b>HSS4510N1D1450</b>	45	10	6.350	46.0	39.4	2.5X2	54200	155000	2710	82.0	87	88	132	50	65.5	18	163	110
<b>HSS4510N1D2100</b>																		
<b>HSS4510N1D2900</b>																		
<b>HSS5010N1D1450</b>	50	10	6.350	51.0	44.4	2.5X2	57700	175000	2880	92.0	92	93	135	51	67	18	163	113
<b>HSS5010N1D1850</b>																		
<b>HSS5010N1D2350</b>																		
<b>HSS5010N1D2900</b>																		
<b>HSS5012N1D1450</b>	50	12	7.938	51.5	43.2	2.5X2	77600	214000	3880	136.5	99	100	146	55	72.5	22	193	122
<b>HSS5012N1D2100</b>																		
<b>HSS5012N1D2900</b>																		

- Notes: 1. Service temperature range is 0 to 60°C.  
 2. Use of NSK support unit is recommended. See page B389 for details.  
 3. Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use. See page D13 for details.  
 4. Imperfect hardened areas for one lead exists on both ends of a screw. Exercise care when stroke setting.  
 5. Permissible rotational speed: Calculated values obtained from the critical speed between the threaded length and NSK's recommended shaft end design. See page B27.

Unit : mm

Bolt hole	Oil hole	Screw shaft dimension							Lead accuracy			Run-out			Permissible rotational speed (min <sup>-1</sup> )		Internal spatial volume of nut (cm <sup>3</sup> )	Standard volume of grease replenishing (cm <sup>3</sup> )			
		Threaded length	Shaft end, right		Shaft end, left		Overall length <i>L<sub>0</sub></i>	Travel compensation <i>T</i>	Deviation <i>e<sub>p</sub></i>	Variation <i>V<sub>0</sub></i>	Shaft straightness <i>I</i>	Nut O.D. eccentricity <i>J</i>	Flange perpendicularity <i>K</i>	Mass (kg)	Installation						
			<i>L<sub>1</sub></i>	<i>d<sub>2</sub></i>	<i>L<sub>2</sub></i>	<i>d<sub>3</sub></i>									<i>L<sub>3</sub></i>	Fixed-Free support			Fixed-Fixed support		
11	17.5	11	12	1050	300	39.4	150	2100	-0.039	0.054	0.035	0.110	0.025	0.015	22.0	3500	3500	58	29		
				1600											150	2900	38.2			1100	1500
				2400											150	2900	38.2			1100	1500
11	17.5	11	12	1050	300	44.4	100	1450	-0.025	0.046	0.030	0.070	0.025	0.015	26.3	3200	3200	64	32		
				1450											100	1850	31.9			3200	3200
				1850											150	2350	38.8			2100	2900
				2400											150	2900	46.5			1200	1700
14	20	13	12	1050	300	43.2	100	1450	-0.025	0.046	0.030	0.070	0.025	0.015	28.5	3200	3200	99	50		
				1600											150	2100	37.3			2800	3200
				2400											150	2900	48.2			1200	1600

**B-3-1.3 Finished Shaft End MA type, FA type, SA type**

**1. Order of the dimension tables**

The tables begin with the smallest shaft diameter of each MA, FA, and SA type ball screws, and proceeds to the larger sizes. If ball screws have the same shaft diameter, those with smaller leads appear first. Page numbers of shaft diameter and lead combinations are shown in Table 1.

**2. Dimension tables**

Dimension tables show shapes/sizes as well as specification factors of each shaft diameter/lead combination. Tables also contain data as follows:

● **Stroke**

Nominal stroke: A reference for your use.  
Maximum stroke: The limit stroke that the nut can move. The figure is obtained by subtracting the nut length from the effective threaded length ( $L_i$ ).

● **Lead accuracy**

Lead accuracy is either C3 or C5 grades  
 $T$  : Travel compensation  
 $e_p$  : Tolerance on specified travel  
 $v_u$  : Travel variation  
See "Technical Description: Lead Accuracy"

**Table 1 Combinations of screw shaft diameter and lead**

Lead (mm) \ Screw shaft diameter (mm)	1	1.5	2	2.5	4	5	6
4	B159						
6	B161						
8	B163	B165	B167				
10			B169	B171	B181		
12			B173	B175		B183	
14						B187	
15							
16			B177	B179		B195	
20					B217	B219	
25					B221	B223	B225
28						B229	B233
						B231	B235
32						B237	B241
						B239	B243
36							
40						B255	
45							
50							

(page B37) for the details of the codes.

● **Permissible rotational speed**

$d \cdot n$ : Limited by the relative peripheral speed between the screw shaft and the nut.

Critical speed: Limited by the natural frequency of a ball screw shaft. Critical speed depends on the supporting condition of screw shaft.

The lower of the two criteria, the  $d \cdot n$  and critical speed, will determine the overall permissible rotational speed of the ball screw. For details, see "Technical Description: Permissible Rotational Speed" (page B47).

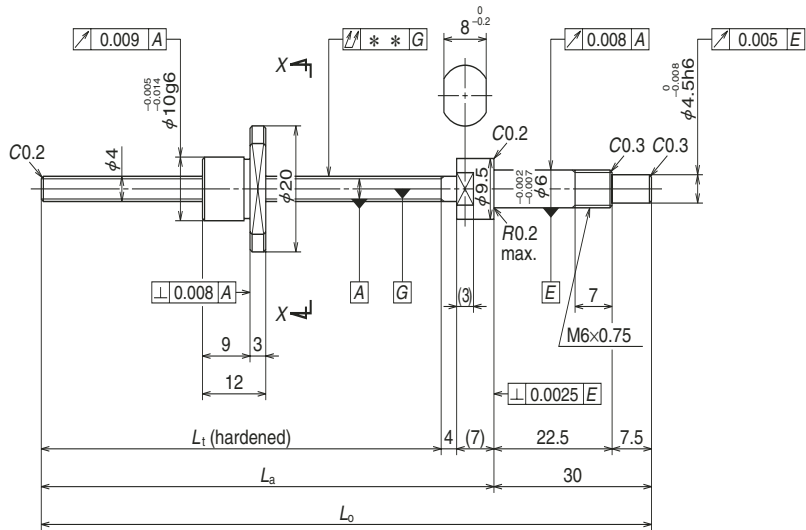
**3. Other**

The seal of the ball screw, ball recirculating deflector, and end cap are made of synthetic resin. Consult NSK when using our ball screws under extreme environments or in special environments, or if using special lubricant or oil. For special environments, see pages B70 and D2. For lubricants, see pages B67 and D13. Note: For details of standard stock products, contact NSK.

	8	10	12	16	20	25	32	40	50
		B185							
B189		B191			B193				
				B197			B199		
		B201			B203			B205	
		B227			B207	B209			B211
B245	B247	B249				B213	B215		
	B251								
	B253								
B257	B259	B263							
	B261	B265							
	B267								
	B269								
	B271								

**Finished shaft end MA Type**

(Fine lead)



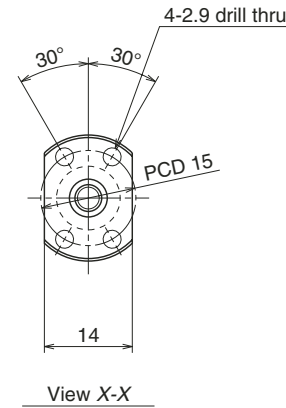
**Nut models: MPFD, MSFD**

**NSK**

**Screw shaft ø4**

**Lead 1**

Unit: mm



**Ball screw specifications**

Ball screw specifications		
Product classification	Preloaded	Precise clearance
Shaft dia. x Lead / Direction of turn	4 x 1 / Right	
Preload / Ball recirculation	P-preload / Deflector (bridge type)	
Ball dia. / Ball circle dia.	0.800 / 4.2	
Screw shaft root diameter	3.2	
Effective turns of balls	1 x 2	
Accuracy grade / Preload / Axial play	C3 / Z	C3 / T
Basic load rating (N)	Dynamic C <sub>a</sub>	315
	Static C <sub>0a</sub>	370
Axial play	0	0.005 or less
Preload (N)	19.6	—
Dynamic friction torque, (N.cm)	1.0 or less	0.3 or less
Spacer ball	None	
Factory-packed grease	NSK grease PS2	

**Recommended support unit**

**For drive side (Fixed)**

WBK06-01A (square)

WBK06-11 (round)

Unit: mm

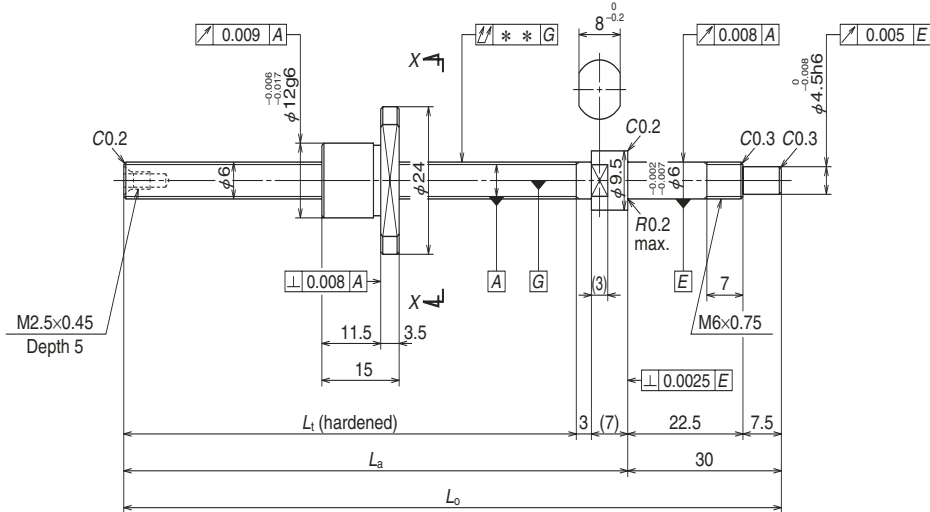
Ball screw No.		Stroke	
		Nominal	Maximum (L <sub>t</sub> —Nut length)
Preloaded (MPFD)	Precise clearance (MSFD)		
<b>W0400MA-1PY-C3Z1</b>	<b>W0400MA-2Y-C3T1</b>	20	32
<b>W0400MA-3PY-C3Z1</b>	<b>W0400MA-4Y-C3T1</b>	40	52
<b>W0401MA-1PY-C3Z1</b>	<b>W0401MA-2Y-C3T1</b>	70	82

- Notes: 1. We recommend NSK support unit. See page B389 for details.  
 2. Use of NSK grease PS2 is recommended. Apply to screw shaft surface when replenishing. See page D16 for details.  
 3. Ball nut does not have seal.  
 4. Contact NSK if the permissible rotational speed is to be exceeded.

Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> ) Supporting condition
L <sub>t</sub>	L <sub>a</sub>	L <sub>o</sub>	T	e <sub>o</sub>	v <sub>u</sub>			
44	55	85	0	0.008	0.008	0.015	0.024	3 000
64	75	105	0	0.008	0.008	0.020	0.026	3 000
94	105	135	0	0.008	0.008	0.025	0.028	3 000

## Finished shaft end MA Type

(Fine lead)



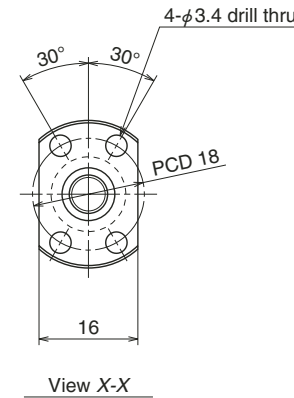
## Nut models: MPFD, MSFD

**NSK**

Screw shaft  $\phi 6$

Lead 1

Unit: mm



### Ball screw specifications

Product classification		Preloaded	Precise clearance
Shaft dia. x Lead / Direction of turn		6 x 1 / Right	
Preload / Ball recirculation		P-preload / Deflector (bridge)	
Ball dia. / Ball circle dia.		0.800 / 6.2	
Screw shaft root diameter		5.2	
Effective turns of balls		1 x 3	
Accuracy grade / Preload / Axial play		C3 / Z	C3 / T
Basic load rating (N)	Dynamic $C_a$	575	
	Static $C_{0a}$	925	
Axial play		0	0.005 or less
Preload (N)		24.5	—
Dynamic friction torque, (N·cm)		1.3 or less	0.3 or less
Spacer ball		None	
Factory-packed grease		NSK grease PS2	

### Recommended support unit

#### For drive side (Fixed)

WBK06-01A (square)

WBK06-11 (round)

Unit: mm

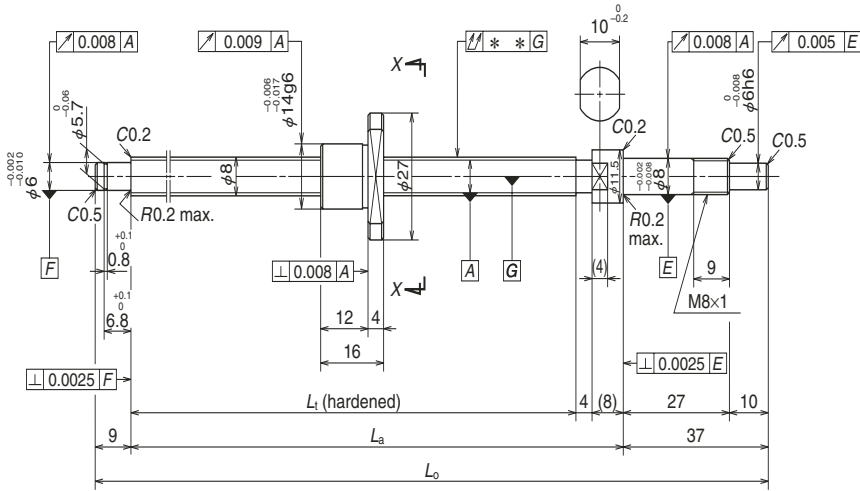
Ball screw No.		Stroke	
		Nominal	Maximum ( $L_t$ —Nut length)
Preloaded (MPFD)	Precise clearance (MSFD)		
<b>W0600MA-1PY-C3Z1</b>	<b>W0600MA-2Y-C3T1</b>	40	50
<b>W0601MA-1PY-C3Z1</b>	<b>W0601MA-2Y-C3T1</b>	70	80
<b>W0601MA-3PY-C3Z1</b>	<b>W0601MA-4Y-C3T1</b>	100	110

- Notes: 1. We recommend NSK support unit. See page B389 for details.  
 2. Use of NSK grease PS2 is recommended. Apply to screw shaft surface when replenishing. See page D16 for details.  
 3. Ball nut does not have seal.  
 4. Contact NSK if the permissible rotational speed is to be exceeded.

Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> ) Supporting condition
$L_t$	$L_a$	$L_o$	$T$	$e_b$	$v_u$			
65	75	105	0	0.008	0.008	0.015	0.039	3 000
95	105	135	0	0.008	0.008	0.020	0.045	3 000
125	135	165	0	0.010	0.008	0.025	0.051	3 000

**Finished shaft end MA Type**

(Fine lead)



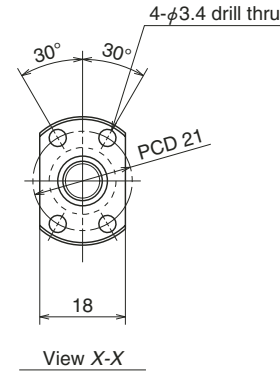
**Nut models: MPFD, MSFD**



**Screw shaft ø8**

**Lead 1**

Unit: mm



**Ball screw specifications**

Product classification		Preloaded	Precise clearance
Shaft dia. x Lead / Direction of turn		8 x 1 / Right	
Preload / Ball recirculation		P-preload / Deflector (bridge)	
Ball dia. / Ball circle dia.		0.800 / 8.2	
Screw shaft root diameter		7.2	
Effective turns of balls		1 x 3	
Accuracy grade / Preload / Axial play		C3 / Z	C3 / T
Basic load rating (N)	Dynamic $C_a$	670	
	Static $C_{0a}$	1 290	
Axial play		0	0.005 or less
Preload (N)		29.4	—
Dynamic friction torque, (N·cm)		1.8 or less	0.5 or less
Spacer ball		None	
Factory-packed grease		NSK grease PS2	

**Recommended support unit**

For drive side (Fixed)	For opposite to drive side (Simple)
WBK08-01A (square)	WBK08S-01 (square)
WBK08-11 (round)	

Unit: mm

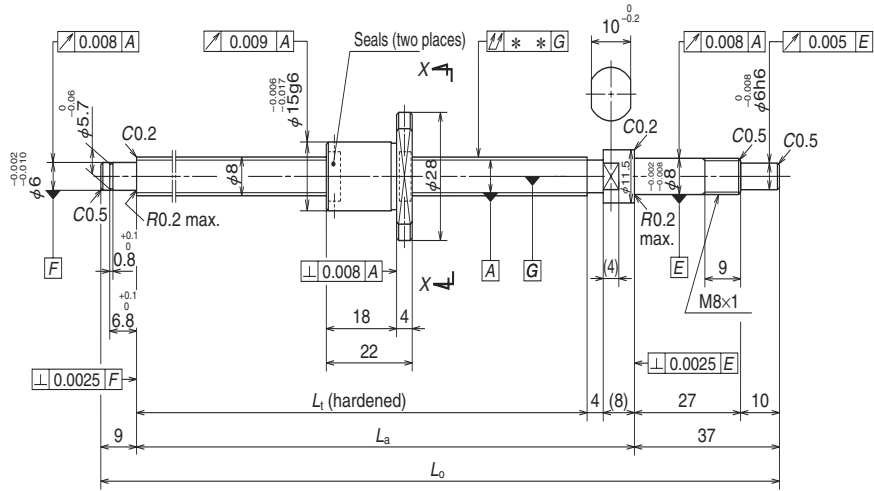
Ball screw No.		Stroke	
		Nominal	Maximum ( $L_t$ —Nut length)
Preloaded (MPFD)	Precise clearance (MSFD)		
<b>W0800MA-1PY-C3Z1</b>	<b>W0800MA-2Y-C3T1</b>	40	64
<b>W0801MA-1PY-C3Z1</b>	<b>W0801MA-2Y-C3T1</b>	70	94
<b>W0801MA-3PY-C3Z1</b>	<b>W0801MA-4Y-C3T1</b>	100	124
<b>W0802MA-1PY-C3Z1</b>	<b>W0802MA-2Y-C3T1</b>	150	174

- Notes: 1. We recommend NSK support unit. See page B389 for details.  
 2. Use of NSK grease PS2 is recommended. Apply to screw shaft surface when replenishing. See page D16 for details.  
 3. Ball nut does not have seal.  
 4. Contact NSK if the permissible rotational speed is to be exceeded.

Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )
$L_t$	$L_a$	$L_0$	$T$	$e_b$	$v_u$			
80	92	138	0	0.008	0.008	0.025	0.073	3 000
110	122	168	0	0.010	0.008	0.030	0.084	3 000
140	152	198	0	0.010	0.008	0.030	0.095	3 000
190	202	248	0	0.010	0.008	0.035	0.11	3 000

**Finished shaft end MA Type**

(Fine lead)



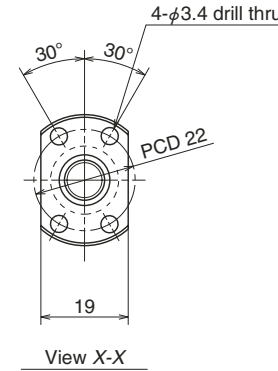
**Nut models: MPFD, MSFD**

**NSK**

**Screw shaft ø8**

**Lead 1.5**

Unit: mm



**Ball screw specifications**

Product classification	Preloaded	Precise clearance
Shaft dia. x Lead / Direction of turn	8 x 1.5 / Right	
Preload / Ball recirculation	P-preload / Deflector (bridge)	
Ball dia. / Ball circle dia.	1.000 / 8.3	
Screw shaft root diameter	7.0	
Effective turns of balls	1 x 3	
Accuracy grade / Preload / Axial play	C3 / Z	C3 / T
Basic load rating (N)	Dynamic C <sub>a</sub>	1 080
	Static C <sub>0a</sub>	1 980
Axial play	0	0.005 or less
Preload (N)	49.0	—
Dynamic friction torque, (N·cm)	2.0 or less	0.5 or less
Spacer ball	None	
Factory-packed grease	NSK grease PS2	

**Recommended support unit**

For drive side (Fixed)	For opposite to drive side (Simple)
WBK08-01A (square)	WBK08S-01 (square)
WBK08-11 (round)	

Unit: mm

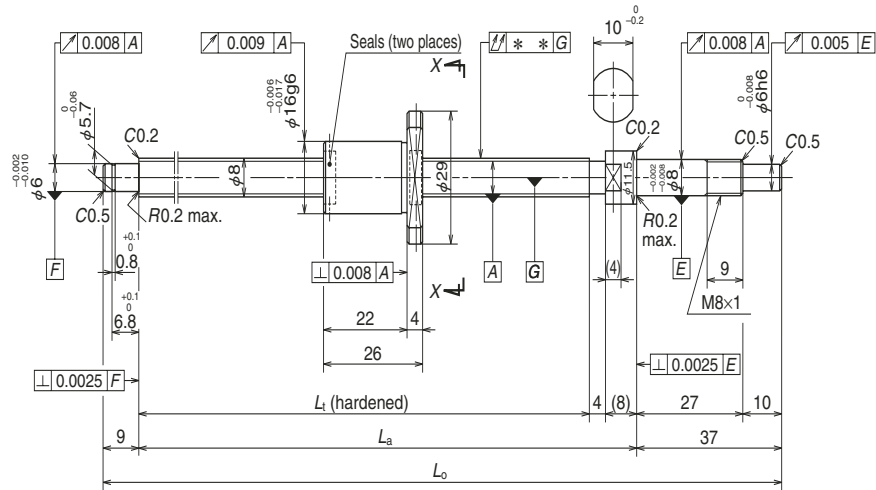
Ball screw No.		Stroke	
		Nominal	Maximum (L <sub>t</sub> —Nut length)
Preloaded (MPFD)	Precise clearance (MSFD)		
<b>W0800MA-3PY-C3Z1.5</b>	<b>W0800MA-4Y-C3T1.5</b>	40	58
<b>W0801MA-5PY-C3Z1.5</b>	<b>W0801MA-6Y-C3T1.5</b>	70	88
<b>W0801MA-7PY-C3Z1.5</b>	<b>W0801MA-8Y-C3T1.5</b>	100	118
<b>W0802MA-3PY-C3Z1.5</b>	<b>W0802MA-4Y-C3T1.5</b>	150	168

Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )
L <sub>t</sub>	L <sub>a</sub>	L <sub>o</sub>	T	e <sub>0</sub>	v <sub>u</sub>			
80	92	138	0	0.008	0.008	0.025	0.082	3 000
110	122	168	0	0.010	0.008	0.030	0.093	3 000
140	152	198	0	0.010	0.008	0.030	0.10	3 000
190	202	248	0	0.010	0.008	0.035	0.12	3 000

- Notes: 1. We recommend NSK support unit. See page B389 for details.  
 2. Use of NSK grease PS2 is recommended. Apply to screw shaft surface when replenishing. See page D16 for details.  
 3. Contact NSK if the permissible rotational speed is to be exceeded.

## Finished shaft end MA Type

(Fine lead)



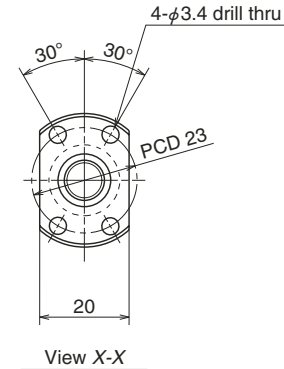
## Nut models: MPFD, MSFD

**NSK**

Screw shaft ø8

Lead 2

Unit: mm



### Ball screw specifications

Product classification		Preloaded	Precise clearance
Shaft dia. x Lead / Direction of turn		8 x 2 / Right	
Preload / Ball recirculation		P-preload / Deflector (bridge)	
Ball dia. / Ball circle dia.		1.200 / 8.3	
Screw shaft root diameter		6.9	
Effective turns of balls		1 x 3	
Accuracy grade / Preload / Axial play		C3 / Z	C3 / T
Basic load rating (N)	Dynamic $C_d$	1 320	
	Static $C_{0a}$	2 210	
Axial play		0	0.005 or less
Preload (N)		49.0	—
Dynamic friction torque, (N·cm)		2.0 or less	0.5 or less
Spacer ball		None	
Factory-packed grease		NSK grease PS2	

### Recommended support unit

For drive side (Fixed)	For opposite to drive side (Simple)
WBK08-01A (square)	WBK08S-01 (square)
WBK08-11 (round)	

Unit: mm

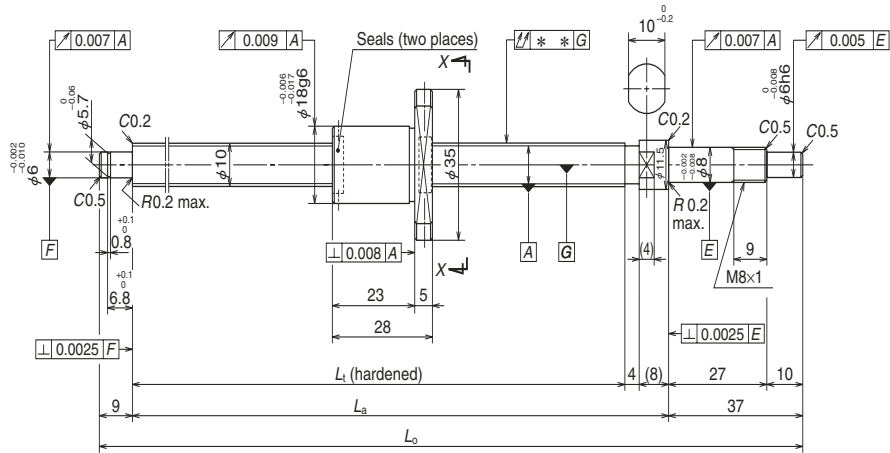
Ball screw No.		Stroke	
		Nominal	Maximum ( $L_t$ —Nut length)
Preloaded (MPFD)	Precise clearance (MSFD)		
<b>W0800MA-5PY-C3Z2</b>	<b>W0800MA-6Y-C3T2</b>	40	54
<b>W0801MA-9PY-C3Z2</b>	<b>W0801MA-10Y-C3T2</b>	70	84
<b>W0801MA-11PY-C3Z2</b>	<b>W0801MA-12Y-C3T2</b>	100	114
<b>W0802MA-5PY-C3Z2</b>	<b>W0802MA-6Y-C3T2</b>	150	164

- Notes: 1. We recommend NSK support unit. See page B389 for details.  
 2. Use of NSK grease PS2 is recommended. Apply to screw shaft surface when replenishing. See page D16 for details.  
 3. Contact NSK if the permissible rotational speed is to be exceeded.

Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )
$L_t$	$L_a$	$L_o$	$T$	$e_b$	$v_u$			
80	92	138	0	0.008	0.008	0.025	0.09	3 000
110	122	168	0	0.010	0.008	0.030	0.10	3 000
140	152	198	0	0.010	0.008	0.030	0.11	3 000
190	202	248	0	0.010	0.008	0.035	0.13	3 000

## Finished shaft end MA Type

(Fine lead)



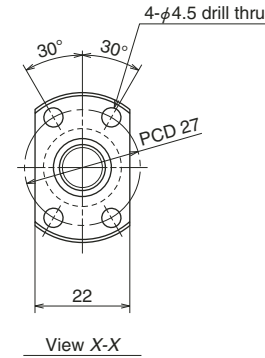
## Nut models: MPFD, MSFD

**NSK**

Screw shaft  $\phi 10$

Lead 2

Unit: mm



### Ball screw specifications

Product classification	Preloaded	Precise clearance
Shaft dia. x Lead / Direction of turn	10 x 2 / Right	
Preload / Ball recirculation	P-preload / Deflector (bridge)	
Ball dia. / Ball circle dia.	1.200 / 10.3	
Screw shaft root diameter	8.9	
Effective turns of balls	1 x 3	
Accuracy grade / Preload / Axial play	C3 / Z	C3 / T
Basic load rating (N)	Dynamic $C_a$	1 490
	Static $C_{0a}$	2 850
Axial play	0	0.005 or less
Preload (N)	58.8	—
Dynamic friction torque, (N.cm)	0.1 - 2.4	0.5 or less
Spacer ball	None	
Factory-packed grease	NSK grease PS2	

### Recommended support unit

For drive side (Fixed)	For opposite to drive side (Simple)
WBK08-01A (square)	WBK08S-01 (square)
WBK08-11 (round)	

Unit: mm

Ball screw No.		Stroke	
		Nominal	Maximum ( $L_t$ —Nut length)
Preloaded (MPFD)	Precise clearance (MSFD)		
<b>W1001MA-1PY-C3Z2</b>	<b>W1001MA-2Y-C3T2</b>	50	72
<b>W1001MA-3PY-C3Z2</b>	<b>W1001MA-4Y-C3T2</b>	100	122
<b>W1002MA-1PY-C3Z2</b>	<b>W1002MA-2Y-C3T2</b>	150	172
<b>W1002MA-3PY-C3Z2</b>	<b>W1002MA-4Y-C3T2</b>	200	222

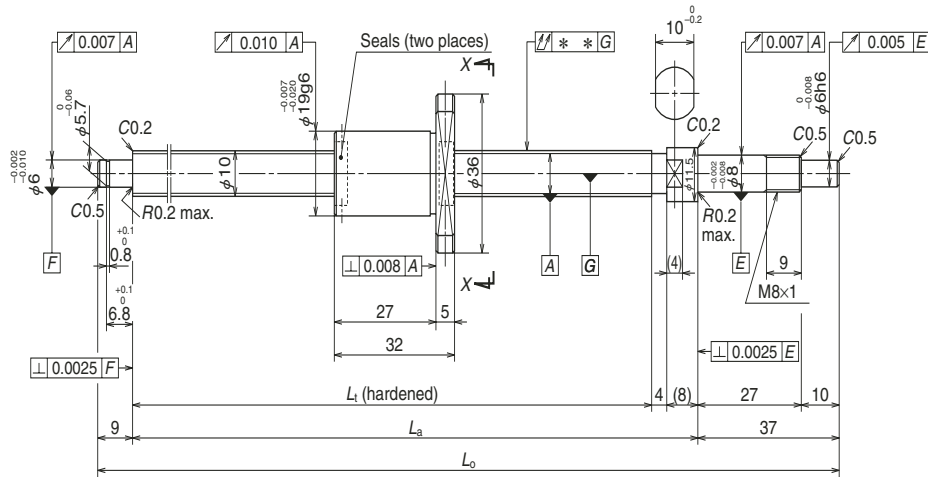
- Notes: 1. We recommend NSK support unit. See page B389 for details.  
 2. Use of NSK grease PS2 is recommended. Apply to screw shaft surface when replenishing. See page D16 for details.  
 3. Contact NSK if the permissible rotational speed is to be exceeded.

Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )
$L_t$	$L_a$	$L_o$	T	$e_a$	$v_a$			
100	112	158	0	0.008	0.008	0.020	0.13	3 000
150	162	208	0	0.010	0.008	0.030	0.16	3 000
200	212	258	0	0.010	0.008	0.030	0.19	3 000
250	262	308	0	0.012	0.008	0.030	0.22	3 000



## Finished shaft end MA Type

(Fine lead)



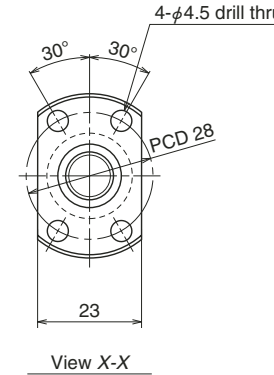
## Nut models: MPFD, MSFD

**NSK**

Screw shaft  $\phi 10$

Lead 2.5

Unit: mm



### Ball screw specifications

Product classification		Preloaded	Precise clearance
Shaft dia. x Lead / Direction of turn		10 x 2.5 / Right	
Preload / Ball recirculation		P-preload / Deflector (bridge)	
Ball dia. / Ball circle dia.		1.588 / 10.4	
Screw shaft root diameter		8.6	
Effective turns of balls		1 x 3	
Accuracy grade / Preload / Axial play		C3 / Z	C3 / T
Basic load rating (N)	Dynamic $C_a$	2 130	
	Static $C_{0a}$	3 640	
Axial play		0	0.005 or less
Preload (N)		98.1	—
Dynamic friction torque, (N.cm)		0.2 - 2.9	0.5 or less
Spacer ball		None	
Factory-packed grease		NSK grease PS2	

### Recommended support unit

For drive side (Fixed)	For opposite to drive side (Simple)
WBK08-01A (square)	WBK08S-01 (square)
WBK08-11 (round)	

Unit: mm

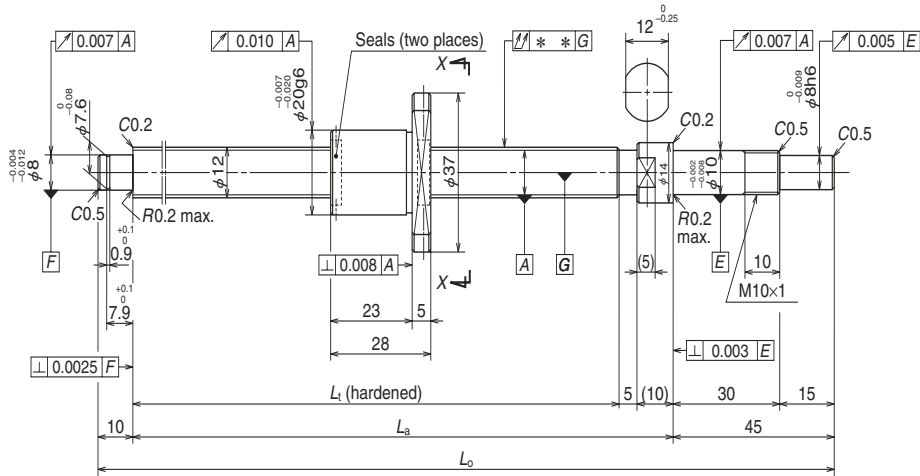
Ball screw No.		Stroke	
		Nominal	Maximum ( $L_t$ —Nut length)
Preloaded (MPFD)	Precise clearance (MSFD)		
<b>W1001MA-5PY-C3Z2.5</b>	<b>W1001MA-6Y-C3T2.5</b>	50	68
<b>W1001MA-7PY-C3Z2.5</b>	<b>W1001MA-8Y-C3T2.5</b>	100	118
<b>W1002MA-5PY-C3Z2.5</b>	<b>W1002MA-6Y-C3T2.5</b>	150	168
<b>W1002MA-7PY-C3Z2.5</b>	<b>W1002MA-8Y-C3T2.5</b>	200	218

- Notes: 1. We recommend NSK support unit. See page B389 for details.  
 2. Use of NSK grease PS2 is recommended. Apply to screw shaft surface when replenishing. See page D16 for details.  
 3. Contact NSK if the permissible rotational speed is to be exceeded.

Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> ) Supporting condition Fixed - Simple support
$L_t$	$L_a$	$L_0$	$T$	$e_a$	$v_a$			
100	112	158	0	0.008	0.008	0.020	0.14	3 000
150	162	208	0	0.010	0.008	0.030	0.17	3 000
200	212	258	0	0.010	0.008	0.030	0.20	3 000
250	262	308	0	0.012	0.008	0.030	0.23	3 000

## Finished shaft end MA Type

(Fine lead)



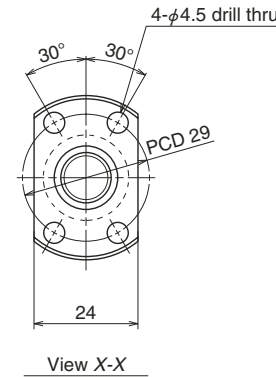
## Nut models: MPFD, MSFD

**NSK**

Screw shaft ø12

Lead 2

Unit: mm



Ball screw specifications		
Product classification	Preloaded	Precise clearance
Shaft dia. x Lead / Direction of turn	12 x 2 / Right	
Preload / Ball recirculation	P-preload / Deflector (bridge)	
Ball dia. / Ball circle dia.	1.200 / 12.3	
Screw shaft root diameter	10.9	
Effective turns of balls	1 x 3	
Accuracy grade / Preload / Axial play	C3 / Z	C3 / T
Basic load rating (N)	Dynamic $C_a$	1 660
	Static $C_{0a}$	3 620
Axial play	0	0.005 or less
Preload (N)	98.1	—
Dynamic friction torque, (N·cm)	0.4 - 3.4	1.0 or less
Spacer ball	None	
Factory-packed grease	NSK grease PS2	

### Recommended support unit

For drive side (Fixed)	For opposite to drive side (Simple)
WBK10-01A (square)	WBK10S-01 (square)
WBK10-11 (round)	

Unit: mm

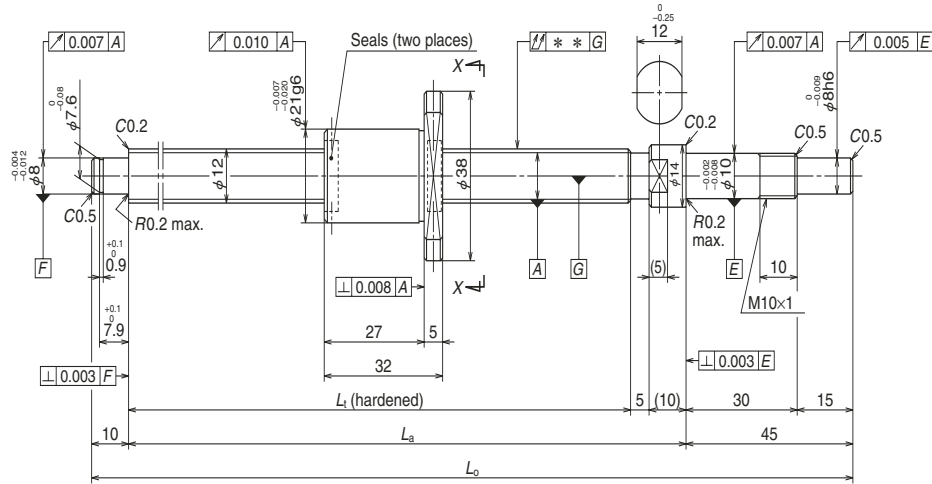
Ball screw No.		Stroke	
		Nominal	Maximum ( $L_t$ —Nut length)
Preloaded (MPFD)	Precise clearance (MSFD)		
<b>W1201MA-1PY-C3Z2</b>	<b>W1201MA-2Y-C3T2</b>	50	82
<b>W1201MA-3PY-C3Z2</b>	<b>W1201MA-4Y-C3T2</b>	100	132
<b>W1202MA-1PY-C3Z2</b>	<b>W1202MA-2Y-C3T2</b>	150	182
<b>W1202MA-3PY-C3Z2</b>	<b>W1202MA-4Y-C3T2</b>	200	232
<b>W1203MA-1PY-C3Z2</b>	<b>W1203MA-2Y-C3T2</b>	250	282

- Notes: 1. We recommend NSK support unit. See page B389 for details.  
 2. Use of NSK grease PS2 is recommended. Apply to screw shaft surface when replenishing. See page D16 for details.  
 3. Contact NSK if the permissible rotational speed is to be exceeded.

Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )
$L_t$	$L_a$	$L_o$	$T$	$e_a$	$v_a$			
110	125	180	0	0.010	0.008	0.020	0.20	3 000
160	175	230	0	0.010	0.008	0.030	0.24	3 000
210	225	280	0	0.012	0.008	0.030	0.28	3 000
260	275	330	0	0.012	0.008	0.040	0.32	3 000
310	325	380	0	0.012	0.008	0.040	0.36	3 000

## Finished shaft end MA Type

(Fine lead)



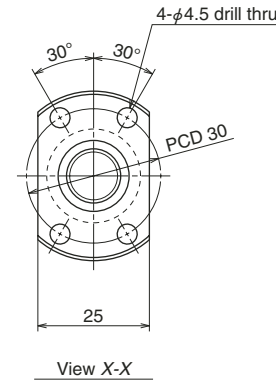
## Nut models: MPFD, MSFD

**NSK**

Screw shaft  $\phi 12$

Lead 2.5

Unit: mm



### Ball screw specifications

Product classification	Preloaded	Precise clearance
Shaft dia. x Lead / Direction of turn	12 x 2.5 / Right	
Preload / Ball recirculation	P-preload / Deflector (bridge)	
Ball dia. / Ball circle dia.	1.588 / 12.4	
Screw shaft root diameter	10.6	
Effective turns of balls	1 x 3	
Accuracy grade / Preload / Axial play	C3 / Z	C3 / T
Basic load rating (N)	Dynamic $C_a$	2 360
	Static $C_{0a}$	4 540
Axial play	0	0.005 or less
Preload (N)	98.1	—
Dynamic friction torque, (N·cm)	0.4 - 3.4	1.0 or less
Spacer ball	None	
Factory-packed grease	NSK grease PS2	

### Recommended support unit

For drive side (Fixed)	For opposite to drive side (Simple)
WBK10-01A (square)	WBK10S-01 (square)
WBK10-11 (round)	

Unit: mm

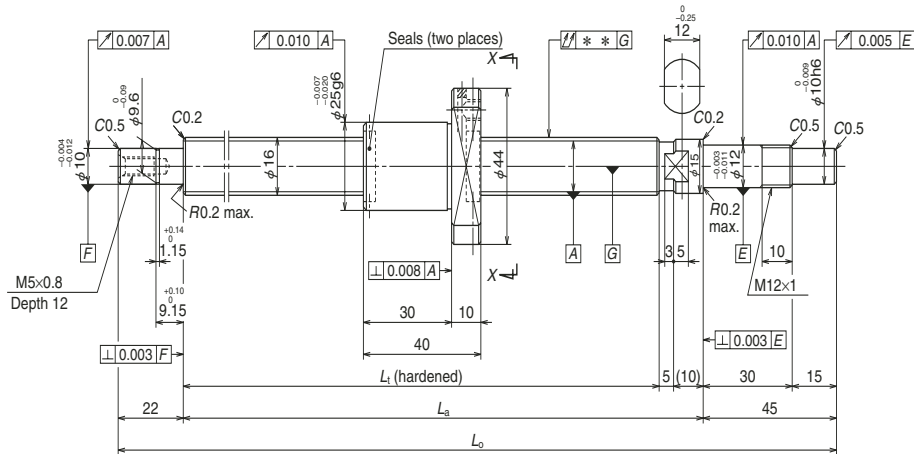
Ball screw No.		Stroke	
		Nominal	Maximum ( $L_t$ —Nut length)
Preloaded (MPFD)	Precise clearance (MSFD)		
<b>W1201MA-5PY-C3Z2.5</b>	<b>W1201MA-6Y-C3T2.5</b>	50	78
<b>W1201MA-7PY-C3Z2.5</b>	<b>W1201MA-8Y-C3T2.5</b>	100	128
<b>W1202MA-5PY-C3Z2.5</b>	<b>W1202MA-6Y-C3T2.5</b>	150	178
<b>W1202MA-7PY-C3Z2.5</b>	<b>W1202MA-8Y-C3T2.5</b>	200	228
<b>W1203MA-3PY-C3Z2.5</b>	<b>W1203MA-4Y-C3T2.5</b>	250	278

- Notes: 1. We recommend NSK support unit. See page B389 for details.  
 2. Use of NSK grease PS2 is recommended. Apply to screw shaft surface when replenishing. See page D16 for details.  
 3. Contact NSK if the permissible rotational speed is to be exceeded.

Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )
$L_t$	$L_a$	$L_o$	$T$	$e_a$	$v_a$			
110	125	180	0	0.010	0.008	0.020	0.21	3 000
160	175	230	0	0.010	0.008	0.030	0.25	3 000
210	225	280	0	0.012	0.008	0.030	0.29	3 000
260	275	330	0	0.012	0.008	0.040	0.33	3 000
310	325	380	0	0.012	0.008	0.040	0.37	3 000

## Finished shaft end MA Type

(Fine lead)



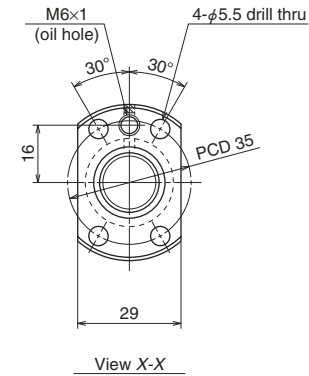
## Nut models: MPFD, MSFD

**NSK**

Screw shaft  $\phi 16$

Lead 2

Unit: mm



### Ball screw specifications

Product classification	Preloaded	Precise clearance
Shaft dia. x Lead / Direction of turn	16 x 2 / Right	
Preload / Ball recirculation	P-preload / Deflector (bridge)	
Ball dia. / Ball circle dia.	1.588 / 16.4	
Screw shaft root diameter	14.6	
Effective turns of balls	1 x 4	
Accuracy grade / Preload / Axial play	C3 / Z	C3 / T
Basic load rating (N)	Dynamic $C_d$	3 510
	Static $C_0$	8 450
Axial play	0	0.005 or less
Preload (N)	147	—
Dynamic friction torque, (N·cm)	0.5 - 4.9	1.5 or less
Spacer ball	None	
Factory-packed grease	NSK grease PS2	
Internal spatial volume of nut (cm <sup>3</sup> )	1.6	
Standard volume of grease replenishing (cm <sup>3</sup> )	0.8	

### Recommended support unit

For drive side (Fixed)	For opposite to drive side (Simple)
WBK12-01A (square)	WBK12S-01 (square)
WBK12-11 (round)	

Unit: mm

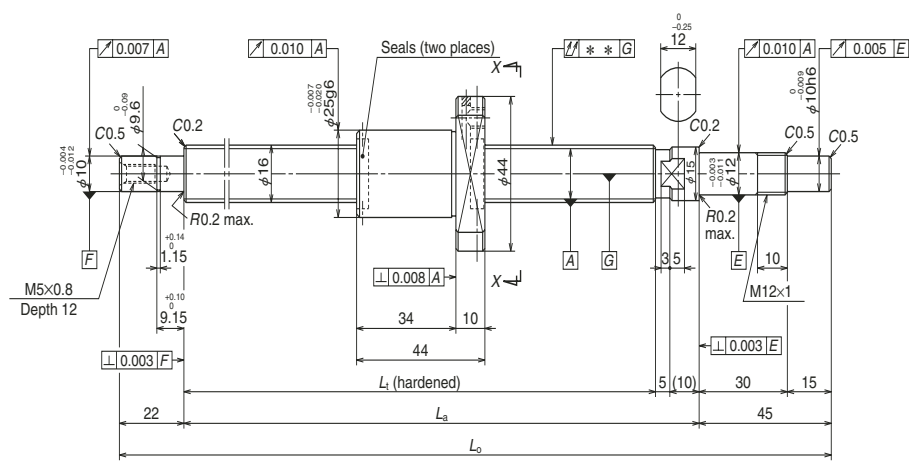
Ball screw No.		Stroke	
Preloaded (MPFD)	Precise clearance (MSFD)	Nominal	Maximum ( $L_1$ —Nut length)
<b>W1601MA-1PY-C3Z2</b>	<b>W1601MA-2Y-C3T2</b>	50	99
<b>W1601MA-3PY-C3Z2</b>	<b>W1601MA-4Y-C3T2</b>	100	149
<b>W1602MA-1PY-C3Z2</b>	<b>W1602MA-2Y-C3T2</b>	150	199
<b>W1602MA-3PY-C3Z2</b>	<b>W1602MA-4Y-C3T2</b>	200	249
<b>W1603MA-1PY-C3Z2</b>	<b>W1603MA-2Y-C3T2</b>	300	349

- Notes: 1. We recommend NSK support unit. See page B389 for details.  
 2. Use of NSK grease PS2 is recommended. Recommended quantity of grease is about 50% of ball nut's internal space. See page D16 for details.  
 3. Contact NSK if the permissible rotational speed is to be exceeded.

Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	
$L_1$	$L_a$	$L_o$	$T$	$e_p$	$v_u$			Supporting condition	
							Fixed - Simple support	Fixed - Fixed	
139	154	221	0	0.010	0.008	0.020	0.41	3 000	3 000
189	204	271	0	0.010	0.008	0.020	0.48	3 000	3 000
239	254	321	0	0.012	0.008	0.030	0.55	3 000	3 000
289	304	371	0	0.012	0.008	0.030	0.62	3 000	3 000
389	404	471	0	0.013	0.010	0.035	0.77	3 000	3 000

## Finished shaft end MA Type

(Fine lead)



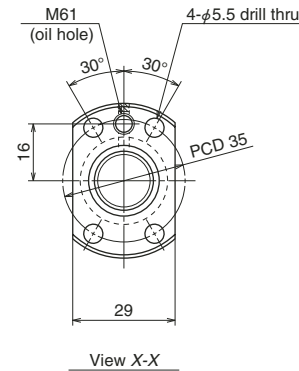
## Nut models: MPFD, MSFD

**NSK**

Screw shaft ø16

Lead 2.5

Unit: mm



Ball screw specifications		
Product classification	Preloaded	Precise clearance
Shaft dia. x Lead / Direction of turn	16 x 2.5 / Right	
Preload / Ball recirculation	P-preload / Deflector (bridge)	
Ball dia. / Ball circle dia.	1.588 / 16.4	
Screw shaft root diameter	14.6	
Effective turns of balls	1 x 4	
Accuracy grade / Preload / Axial play	C3 / Z	C3 / T
Basic load rating (N)	Dynamic $C_d$	3 510
	Static $C_{0s}$	8 450
Axial play	0	0.005 or less
Preload (N)	147	—
Dynamic friction torque, (N·cm)	0.5 - 4.9	1.5 or less
Spacer ball	None	
Factory-packed grease	NSK grease PS2	
Internal spatial volume of nut (cm <sup>3</sup> )	1.6	
Standard volume of grease replenishing (cm <sup>3</sup> )	0.8	

### Recommended support unit

For drive side (Fixed)	For opposite to drive side (Simple)
WBK12-01A (square)	WBK12S-01 (square)
WBK12-11 (round)	

Unit: mm

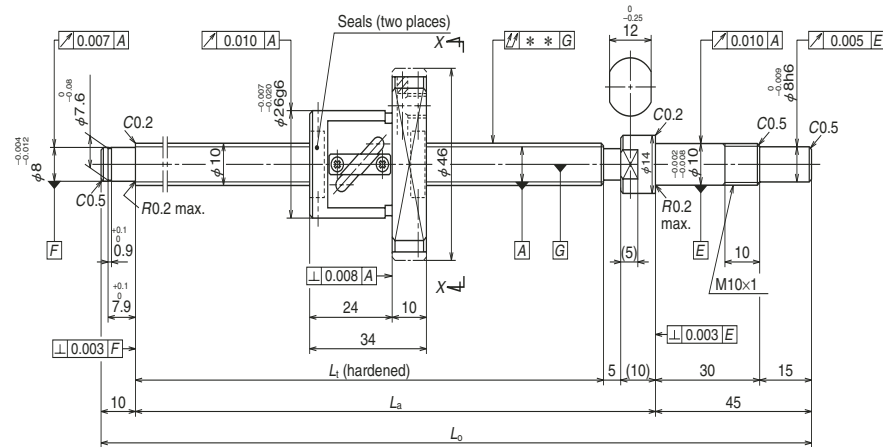
Ball screw No.		Stroke	
Preloaded (MPFD)	Precise clearance (MSFD)	Nominal	Maximum ( $L_1$ —Nut length)
<b>W1601MA-5PY-C3Z2.5</b>	<b>W1601MA-6Y-C3T2.5</b>	50	95
<b>W1601MA-7PY-C3Z2.5</b>	<b>W1601MA-8Y-C3T2.5</b>	100	145
<b>W1602MA-5PY-C3Z2.5</b>	<b>W1602MA-6Y-C3T2.5</b>	150	195
<b>W1602MA-7PY-C3Z2.5</b>	<b>W1602MA-8Y-C3T2.5</b>	200	245
<b>W1603MA-3PY-C3Z2.5</b>	<b>W1603MA-4Y-C3T2.5</b>	300	345

- Notes: 1. We recommend NSK support unit. See page B389 for details.  
 2. Use of NSK grease PS2 is recommended. Recommended quantity of grease is about 50% of ball nut's internal space. See page D16 for details.  
 3. Contact NSK if permissible rotational speed is to be exceeded.

Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	
$L_1$	$L_2$	$L_3$	$T$	$e_p$	$v_u$			Supporting condition	
								Fixed - Simple support	Fixed - Fixed
139	154	221	0	0.010	0.008	0.020	0.42	3 000	3 000
189	204	271	0	0.010	0.008	0.020	0.49	3 000	3 000
239	254	321	0	0.012	0.008	0.030	0.57	3 000	3 000
289	304	371	0	0.012	0.008	0.030	0.64	3 000	3 000
389	404	471	0	0.013	0.010	0.035	0.79	3 000	3 000

## Finished shaft end FA Type

(Fine lead)



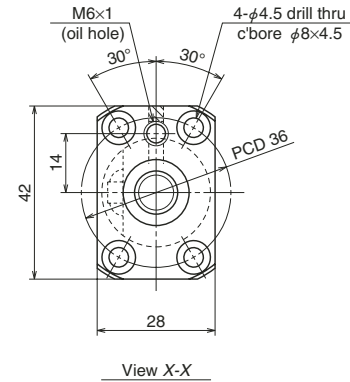
## Nut models: PFT, SFT

**NSK**

Screw shaft  $\phi 10$

Lead 4

Unit: mm



### Ball screw specifications

Product classification	Preloaded	Precise clearance	
Shaft dia. x Lead / Direction of turn	10 x 4 / Right		
Preload / Ball recirculation	P-preload / Return tube		
Ball dia. / Ball circle dia.	2.000 / 10.3		
Screw shaft root diameter	8.2		
Effective turns of balls	2.5 x 1		
Accuracy grade / Preload / Axial play	C3 / Z	C3 / T	
Basic load rating (N)	Dynamic $C_d$	1 730	2 740
	Static $C_0$	2 230	4 450
Axial play	0	0.005 or less	
Preload (N)	98.1	—	
Dynamic friction torque, (N·cm)	0.5 - 3.9	1.0 or less	
Spacer ball	Yes	None	
Factory-packed grease	NSK grease PS2		
Internal spatial volume of nut (cm <sup>3</sup> )	0.8		
Standard volume of grease replenishing (cm <sup>3</sup> )	0.4		

### Recommended support unit

For drive side (Fixed)	For opposite to drive side (Simple)
WBK10-01A (square)	WBK10S-01 (square)
WBK10-11 (round)	

Unit: mm

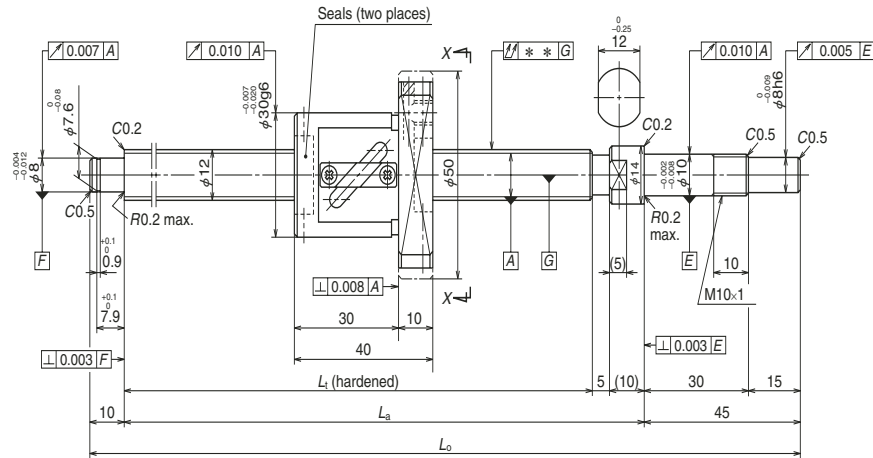
Ball screw No.		Stroke	
		Nominal	Maximum ( $L_t$ —Nut length)
Preloaded (PFT)	Precise clearance (SFT)		
<b>W1001FA-1P-C3Z4</b>	<b>W1001FA-2-C3T4</b>	50	76
<b>W1001FA-3P-C3Z4</b>	<b>W1001FA-4-C3T4</b>	100	126
<b>W1002FA-1P-C3Z4</b>	<b>W1002FA-2-C3T4</b>	150	176
<b>W1002FA-3P-C3Z4</b>	<b>W1002FA-4-C3T4</b>	200	226
<b>W1003FA-1P-C3Z4</b>	<b>W1003FA-2-C3T4</b>	250	276
<b>W1003FA-3P-C3Z4</b>	<b>W1003FA-4-C3T4</b>	300	326

Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> ) Supporting condition Fixed - Simple support
$L_t$	$L_0$	$L_n$	T	$e_p$	$v_u$			
110	125	180	0	0.010	0.008	0.020	0.26	3 000
160	175	230	0	0.010	0.008	0.030	0.28	3 000
210	225	280	0	0.012	0.008	0.030	0.31	3 000
260	275	330	0	0.012	0.008	0.040	0.34	3 000
310	325	380	0	0.012	0.008	0.040	0.37	3 000
360	375	430	0	0.013	0.010	0.050	0.39	3 000

- Notes: 1. We recommend NSK support unit. See page B389 for details.  
 2. Use of NSK grease PS2 is recommended. Recommended quantity of grease is about 50% of ball nut's internal space. See page D16 for details.  
 3. Contact NSK if permissible rotational speed is to be exceeded.

## Finished shaft end FA Type

(Fine lead)



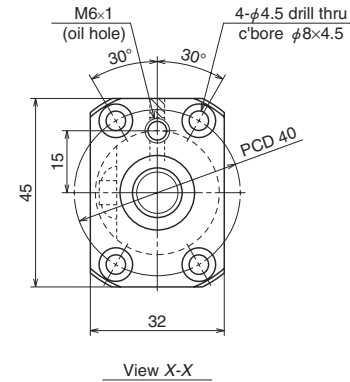
## Nut models: PFT, SFT

**NSK**

Screw shaft ø12

Lead 5

Unit: mm



### Ball screw specifications

Product classification		Preloaded	Precise clearance
Shaft dia. x Lead / Direction of turn		12 x 5 / Right	
Preload / Ball recirculation		P-preload / Return tube	
Ball dia. / Ball circle dia.		2.381 / 12.3	
Screw shaft root diameter		9.8	
Effective turns of balls		2.5 x 1	
Accuracy grade / Preload / Axial play		C3 / Z	C3 / T
Basic load rating (N)	Dynamic C <sub>a</sub>	2 370	3 760
	Static C <sub>0a</sub>	3 160	6 310
Axial play		0	0.005 or less
Preload (N)		98.1	—
Dynamic friction torque, (N·cm)		1.0 - 4.4	1.0 or less
Spacer ball		Yes	None
Factory-packed grease		NSK grease PS2	
Internal spatial volume of nut (cm <sup>3</sup> )		1.2	
Standard volume of grease replenishing (cm <sup>3</sup> )		0.6	

### Recommended support unit

For drive side (Fixed)	For opposite to drive side (Simple)
WBK10-01A (square)	WBK10S-01 (square)
WBK10-11 (round)	

Unit: mm

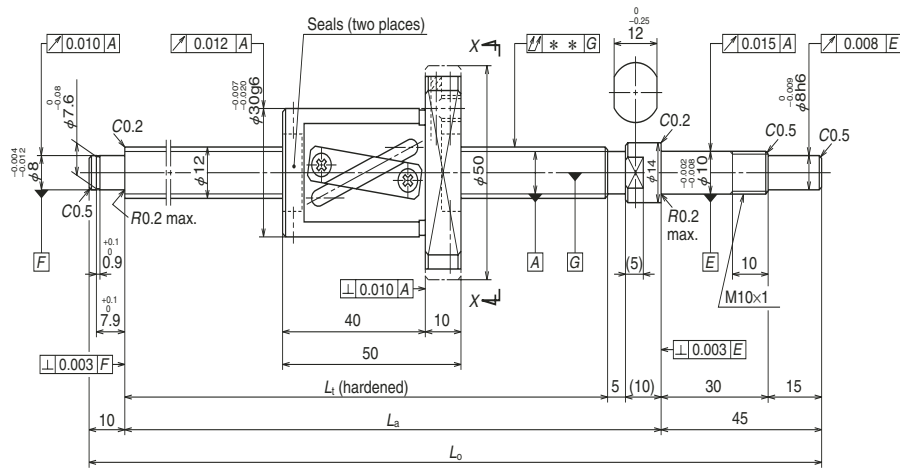
Ball screw No.		Stroke	
		Nominal	Maximum (L <sub>i</sub> —Nut length)
Preloaded (PFT)	Precise clearance (SFT)		
<b>W1201FA-1P-C3Z5</b>	<b>W1201FA-2-C3T5</b>	50	70
<b>W1201FA-3P-C3Z5</b>	<b>W1201FA-4-C3T5</b>	100	120
<b>W1202FA-1P-C3Z5</b>	<b>W1202FA-2-C3T5</b>	150	170
<b>W1202FA-3P-C3Z5</b>	<b>W1202FA-4-C3T5</b>	200	220
<b>W1203FA-1P-C3Z5</b>	<b>W1203FA-2-C3T5</b>	250	270
<b>W1204FA-1P-C3Z5</b>	<b>W1204FA-2-C3T5</b>	350	370
<b>W1205FA-1P-C3Z5</b>	<b>W1205FA-2-C3T5</b>	450	470

- Notes: 1. We recommend NSK support unit. See page B389 for details.  
 2. Use of NSK grease PS2 is recommended. Recommended quantity of grease is about 50% of ball nut's internal space. See page D16 for details.  
 3. Contact NSK if permissible rotational speed is to be exceeded.

Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> ) Supporting condition Fixed - Simple support
L <sub>i</sub>	L <sub>0</sub>	L <sub>o</sub>	T	e <sub>p</sub>	v <sub>u</sub>			
110	125	180	0	0.010	0.008	0.020	0.35	3 000
160	175	230	0	0.010	0.008	0.030	0.38	3 000
210	225	280	0	0.012	0.008	0.030	0.42	3 000
260	275	330	0	0.012	0.008	0.040	0.46	3 000
310	325	380	0	0.012	0.008	0.040	0.50	3 000
410	425	480	0	0.015	0.010	0.050	0.58	3 000
510	525	580	0	0.016	0.012	0.065	0.66	3 000

## Finished shaft end FA Type

(Medium lead)



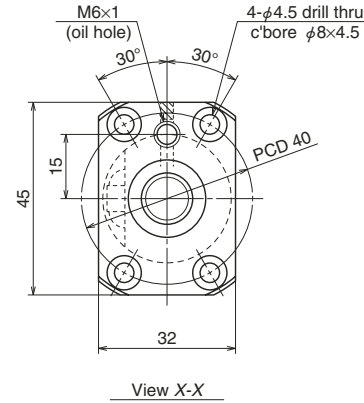
## Nut models: LPFT, LSFT

**NSK**

Screw shaft  $\phi 12$

Lead 10

Unit: mm



### Ball screw specifications

Product classification	Preloaded	Precise clearance
Shaft dia. x Lead / Direction of turn	12 x 10 / Right	
Preload / Ball recirculation	P-preload / Return tube	
Ball dia. / Ball circle dia.	2.381 / 12.5	
Screw shaft root diameter	10.0	
Effective turns of balls	2.5 x 1	
Accuracy grade / Preload / Axial play	C5 / Z	C5 / T
Basic load rating (N)	Dynamic $C_d$	2 360
	Static $C_0$	3 240
Dynamic $C_d$	2 360	3 750
Static $C_0$	3 240	6 480
Axial play	0	0.005 or less
Preload (N)	98.1	—
Dynamic friction torque, (N.cm)	1.0 - 4.9	1.5 or less
Spacer ball	Yes	None
Factory-packed grease	NSK grease LR3	
Internal spatial volume of nut (cm <sup>3</sup> )	1.4	
Standard volume of grease replenishing (cm <sup>3</sup> )	0.7	

### Recommended support unit

For drive side (Fixed)	For opposite to drive side (Simple)
WBK10-01A (square)	WBK10S-01 (square)
WBK10-11 (round)	

Unit: mm

Ball screw No.		Stroke	
		Nominal	Maximum ( $L_1$ —Nut length)
Preloaded (LPFT)	Precise clearance (LSFT)		
<b>W1201FA-5P-C5Z10</b>	<b>W1201FA-6-C5T10</b>	100	110
<b>W1202FA-5P-C5Z10</b>	<b>W1202FA-6-C5T10</b>	150	160
<b>W1203FA-3P-C5Z10</b>	<b>W1203FA-4-C5T10</b>	250	260
<b>W1204FA-3P-C5Z10</b>	<b>W1204FA-4-C5T10</b>	350	360
<b>W1205FA-3P-C5Z10</b>	<b>W1205FA-4-C5T10</b>	450	460

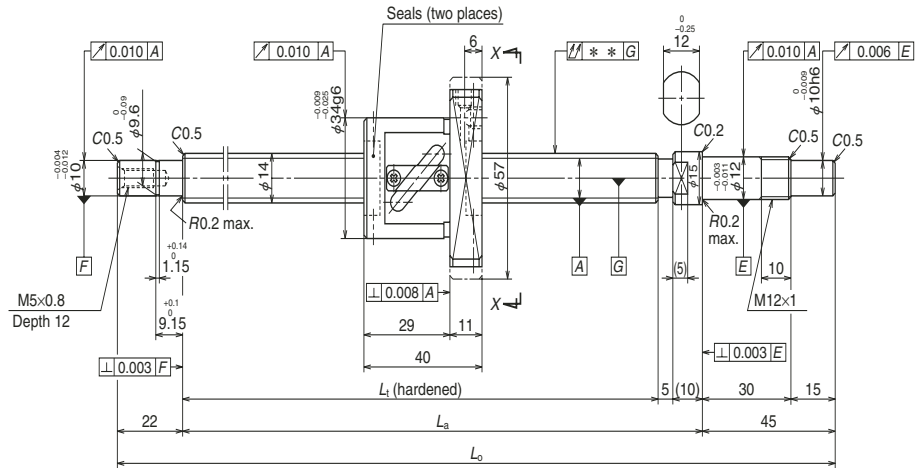
- Notes: 1. We recommend NSK support unit. See page B389 for details.  
 2. Use of NSK grease LR3 is recommended. Recommended quantity of grease is about 50% of ball nut's internal space. See page D16 for details.  
 3. Contact NSK if the permissible rotational speed is to be exceeded.

Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> ) Supporting condition Fixed - Simple support
$L_1$	$L_0$	$L_2$	$T$	$e_p$	$v_d$			
160	175	230	0	0.020	0.018	0.035	0.43	3 000
210	225	280	0	0.023	0.018	0.035	0.47	3 000
310	325	380	0	0.023	0.018	0.050	0.56	3 000
410	425	480	0	0.027	0.020	0.060	0.64	3 000
510	525	580	0	0.030	0.023	0.075	0.72	3 000



## Finished shaft end FA Type

(Fine lead)



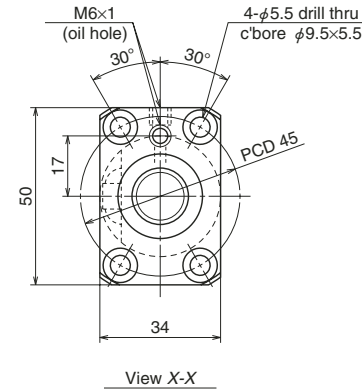
## Nut models: PFT, SFT

**NSK**

Screw shaft  $\phi 14$

Lead 5

Unit: mm



### Ball screw specifications

Product classification	Preloaded	Precise clearance
Shaft dia. x Lead / Direction of turn	14 x 5 / Right	
Preload / Ball recirculation	P-preload / Return tube	
Ball dia. / Ball circle dia.	3.175 / 14.5	
Screw shaft root diameter	11.2	
Effective turns of balls	2.5 x 1	
Accuracy grade / Preload / Axial play	C3 / Z	C3 / T
Basic load rating (N)	Dynamic $C_a$	4 280
	Static $C_{0a}$	5 840
Axial play	0	0.005 or less
Preload (N)	147	—
Dynamic friction torque, (N.cm)	1.5 - 6.9	2.0 or less
Spacer ball	Yes	None
Factory-packed grease	NSK grease LR3	
Internal spatial volume of nut (cm <sup>3</sup> )	2.2	
Standard volume of grease replenishing (cm <sup>3</sup> )	1.1	

### Recommended support unit

For drive side (Fixed)	For opposite to drive side (Simple)
WBK12-01A (square)	WBK12S-01 (square)
WBK12-11 (round)	

Unit: mm

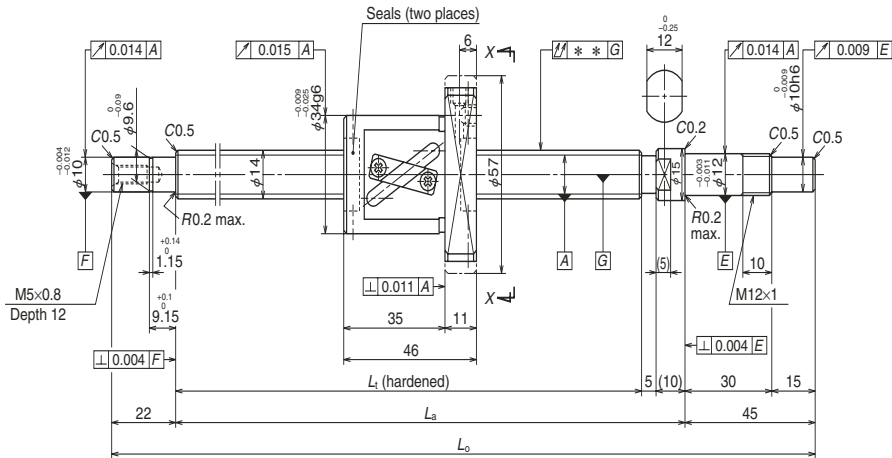
Ball screw No.		Stroke	
		Nominal	Maximum ( $L_t$ —Nut length)
Preloaded (PFT)	Precise clearance (SFT)		
<b>W1401FA-1P-C3Z5</b>	<b>W1401FA-2-C3T5</b>	100	149
<b>W1402FA-1P-C3Z5</b>	<b>W1402FA-2-C3T5</b>	150	199
<b>W1403FA-1P-C3Z5</b>	<b>W1403FA-2-C3T5</b>	250	299
<b>W1404FA-1P-C3Z5</b>	<b>W1404FA-2-C3T5</b>	350	399
<b>W1405FA-1P-C3Z5</b>	<b>W1405FA-2-C3T5</b>	450	499
<b>W1406FA-1P-C3Z5</b>	<b>W1406FA-2-C3T5</b>	600	649

Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	
								Supporting condition	
$L_t$	$L_a$	$L_o$	T	$e_p$	$v_u$		Fixed - Simple support	Fixed - Fixed	
189	204	271	0	0.010	0.008	0.020	0.52	3 000	3 000
239	254	321	0	0.012	0.008	0.030	0.57	3 000	3 000
339	354	421	0	0.013	0.010	0.035	0.67	3 000	3 000
439	454	521	0	0.015	0.010	0.045	0.77	3 000	3 000
539	554	621	0	0.016	0.012	0.045	0.87	3 000	3 000
689	704	771	0	0.018	0.013	0.055	1.0	3 000	3 000

- Notes: 1. We recommend NSK support unit. See page B389 for details.  
 2. Use of NSK grease LR3 is recommended. Recommended quantity of grease is about 50% of ball nut's internal space. See page D16 for details.  
 3. Contact NSK if the permissible rotational speed is to be exceeded.

## Finished shaft end FA Type

(Medium lead)



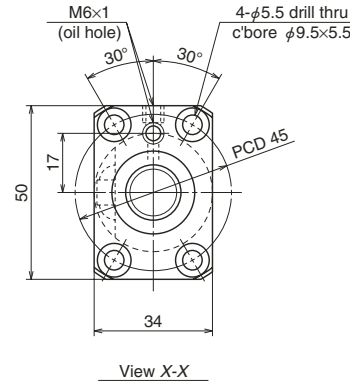
## Nut models: LPFT, LSFT

**NSK**

Screw shaft ø14

Unit: mm

Lead 8



### Ball screw specifications

Product classification		Preloaded	Precise clearance
Shaft dia. x Lead / Direction of turn		14 × 8 / Right	
Preload / Ball recirculation		P-preload / Return tube	
Ball dia. / Ball circle dia.		3.175 / 14.5	
Screw shaft root diameter		11.2	
Effective turns of balls		2.5 × 1	
Accuracy grade / Preload / Axial play		C5 / Z	C5 / T
Basic load rating (N)	Dynamic C <sub>s</sub>	4 280	6 790
	Static C <sub>0s</sub>	5 840	11 700
Axial play		0	0.005 or less
Preload (N)		147	—
Dynamic friction torque, (N·cm)		1.5 – 7.8	2.4 or less
Spacer ball		Yes	None
Factory-packed grease		NSK grease LR3	
Internal spatial volume of nut (cm <sup>3</sup> )		2.1	
Standard volume of grease replenishing (cm <sup>3</sup> )		1.1	

### Recommended support unit

For drive side (Fixed)	For opposite to drive side (Simple)
WBK12-01A (square)	WBK12S-01 (square)
WBK12-11 (round)	

Unit: mm

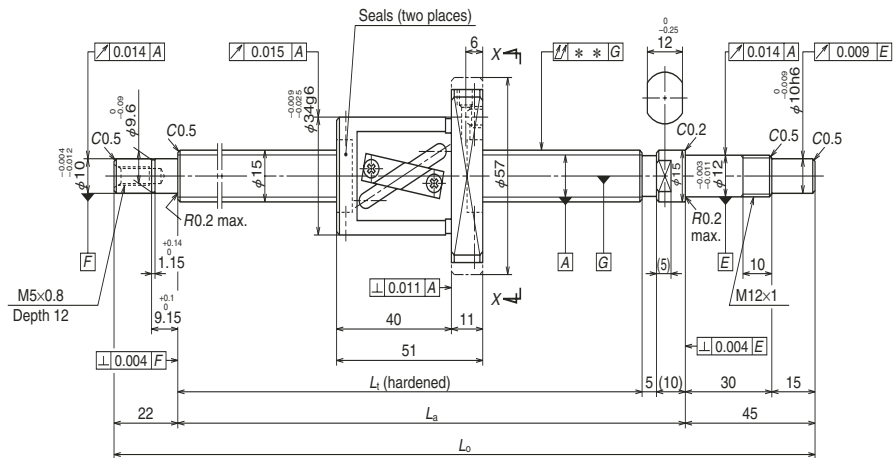
Ball screw No.		Stroke	
Preloaded (LPFT)	Precise clearance (LSFT)	Nominal	Maximum (L <sub>1</sub> —Nut length)
<b>W1401FA-3P-C5Z8</b>	<b>W1401FA-4-C5T8</b>	100	143
<b>W1402FA-3P-C5Z8</b>	<b>W1402FA-4-C5T8</b>	150	193
<b>W1402FA-5P-C5Z8</b>	<b>W1402FA-6-C5T8</b>	200	243
<b>W1403FA-3P-C5Z8</b>	<b>W1403FA-4-C5T8</b>	250	293
<b>W1403FA-5P-C5Z8</b>	<b>W1403FA-6-C5T8</b>	300	343
<b>W1404FA-3P-C5Z8</b>	<b>W1404FA-4-C5T8</b>	350	393
<b>W1404FA-5P-C5Z8</b>	<b>W1404FA-6-C5T8</b>	400	443
<b>W1405FA-3P-C5Z8</b>	<b>W1405FA-4-C5T8</b>	450	493
<b>W1405FA-5P-C5Z8</b>	<b>W1405FA-6-C5T8</b>	500	543
<b>W1406FA-3P-C5Z8</b>	<b>W1406FA-4-C5T8</b>	550	593
<b>W1406FA-5P-C5Z8</b>	<b>W1406FA-6-C5T8</b>	600	643
<b>W1407FA-1P-C5Z8</b>	<b>W1407FA-2-C5T8</b>	700	743

- Notes: 1. We recommend NSK support unit. See page B389 for details.  
 2. Use of NSK grease LR3 is recommended. Recommended quantity of grease is about 50% of ball nut's internal space. See page D16 for details.  
 3. Contact NSK if the permissible rotational speed is to be exceeded.

Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	
L <sub>1</sub>	L <sub>2</sub>	L <sub>0</sub>	T	e <sub>p</sub>	v <sub>0</sub>			Supporting condition	
							Fixed - Simple support		Fixed - Fixed
189	204	271	0	0.020	0.018	0.025	0.56	3 000	3 000
239	254	321	0	0.023	0.018	0.035	0.61	3 000	3 000
289	304	371	0	0.023	0.018	0.035	0.67	3 000	3 000
339	354	421	0	0.025	0.020	0.040	0.72	3 000	3 000
389	404	471	0	0.025	0.020	0.040	0.78	3 000	3 000
439	454	521	0	0.027	0.020	0.050	0.83	3 000	3 000
489	504	571	0	0.027	0.020	0.050	0.88	3 000	3 000
539	554	621	0	0.030	0.023	0.050	0.94	3 000	3 000
589	604	671	0	0.030	0.023	0.065	0.99	3 000	3 000
639	654	721	0	0.035	0.025	0.065	1.0	3 000	3 000
689	704	771	0	0.035	0.025	0.065	1.1	3 000	3 000
789	804	871	0	0.035	0.025	0.085	1.2	2 800	3 000

## Finished shaft end FA Type

(Medium lead)

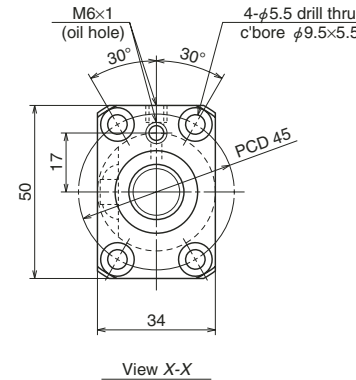


## Nut models: LPFT, LSFT

**NSK**

Screw shaft  $\phi 15$

Unit: mm Lead 10



### Recommended support unit

For drive side (Fixed)	For opposite to drive side (Simple)
WBK12-01A (square)	WBK12S-01 (square)
WBK12-11 (round)	

Ball screw specifications		
Product classification	Preloaded	Precise clearance
Shaft dia. x Lead / Direction of turn	15 x 10 / Right	
Preload / Ball recirculation	P-preload / Return tube	
Ball dia. / Ball circle dia.	3.175 / 15.5	
Screw shaft root diameter	12.2	
Effective turns of balls	2.5 x 1	
Accuracy grade / Preload / Axial play	C5 / Z	C5 / T
Basic load rating (N)	Dynamic $C_s$	4 450
	Static $C_0$	6 380
7 070	12 800	
Axial play	0	0.005 or less
Preload (N)	147	—
Dynamic friction torque, (N-cm)	1.5 - 7.8	2.4 or less
Spacer ball	Yes	None
Factory-packed grease	NSK grease LR3	
Internal spatial volume of nut (cm <sup>3</sup> )	2.3	
Standard volume of grease replenishing (cm <sup>3</sup> )	1.2	

Unit: mm

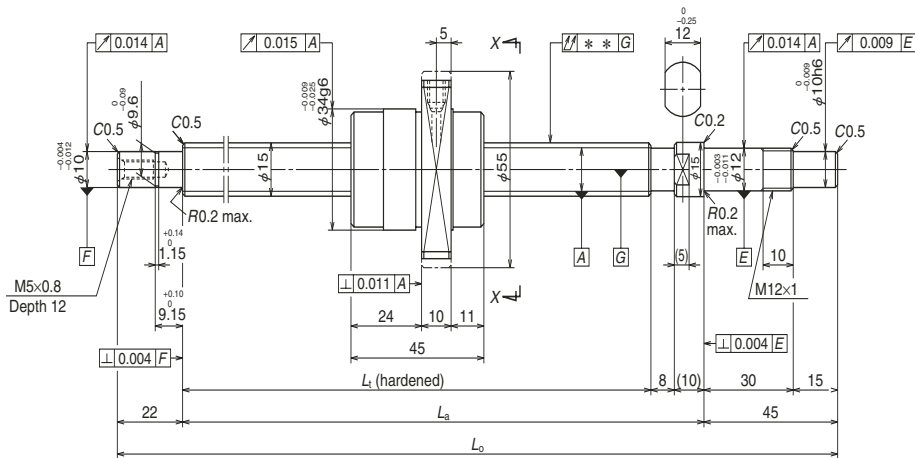
Ball screw No.		Stroke	
Preloaded (LPFT)	Precise clearance (LSFT)	Nominal	Maximum ( $L_1$ —Nut length)
<b>W1501FA-1P-C5Z10</b>	<b>W1501FA-2-C5T10</b>	100	138
<b>W1502FA-1P-C5Z10</b>	<b>W1502FA-2-C5T10</b>	150	188
<b>W1502FA-3P-C5Z10</b>	<b>W1502FA-4-C5T10</b>	200	238
<b>W1503FA-1P-C5Z10</b>	<b>W1503FA-2-C5T10</b>	250	288
<b>W1503FA-3P-C5Z10</b>	<b>W1503FA-4-C5T10</b>	300	338
<b>W1504FA-1P-C5Z10</b>	<b>W1504FA-2-C5T10</b>	350	388
<b>W1504FA-3P-C5Z10</b>	<b>W1504FA-4-C5T10</b>	400	438
<b>W1505FA-1P-C5Z10</b>	<b>W1505FA-2-C5T10</b>	450	488
<b>W1505FA-3P-C5Z10</b>	<b>W1505FA-4-C5T10</b>	500	538
<b>W1506FA-1P-C5Z10</b>	<b>W1506FA-2-C5T10</b>	550	588
<b>W1506FA-3P-C5Z10</b>	<b>W1506FA-4-C5T10</b>	600	638
<b>W1507FA-1P-C5Z10</b>	<b>W1507FA-2-C5T10</b>	700	738
<b>W1508FA-1P-C5Z10</b>	<b>W1508FA-2-C5T10</b>	800	838
<b>W1510FA-1P-C5Z10</b>	<b>W1510FA-2-C5T10</b>	1 000	1 038

- Notes: 1. We recommend NSK support unit. See page B389 for details.  
 2. Use of NSK grease LR3 is recommended. Recommended quantity of grease is about 50% of ball nut's internal space. See page D16 for details.  
 3. Contact NSK if the permissible rotational speed is to be exceeded.

Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	
$L_1$	$L_a$	$L_o$	T	$e_p$	$v_o$			Supporting condition	
							Fixed - Simple support	Fixed - Fixed	
189	204	271	0	0.020	0.018	0.025	0.61	3 000	3 000
239	254	321	0	0.023	0.018	0.035	0.67	3 000	3 000
289	304	371	0	0.023	0.018	0.035	0.74	3 000	3 000
339	354	421	0	0.025	0.020	0.040	0.80	3 000	3 000
389	404	471	0	0.025	0.020	0.040	0.86	3 000	3 000
439	454	521	0	0.027	0.020	0.050	0.93	3 000	3 000
489	504	571	0	0.027	0.020	0.050	1.0	3 000	3 000
539	554	621	0	0.030	0.023	0.050	1.1	3 000	3 000
589	604	671	0	0.030	0.023	0.065	1.1	3 000	3 000
639	654	721	0	0.035	0.025	0.065	1.2	3 000	3 000
689	704	771	0	0.035	0.025	0.065	1.2	3 000	3 000
789	804	871	0	0.035	0.025	0.085	1.4	3 000	3 000
889	904	971	0	0.040	0.027	0.085	1.5	2 400	3 000
1 089	1 104	1 171	0	0.046	0.030	0.110	1.8	1 590	2 250

## Finished shaft end FA Type

(Medium lead)



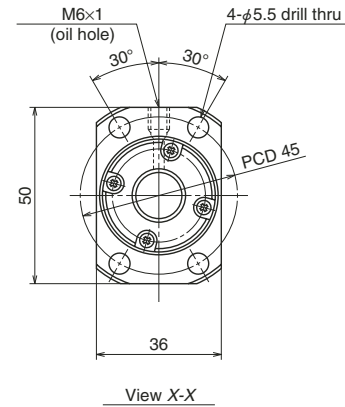
## Nut models: UPFC, USFC

**NSK**

Screw shaft  $\phi 15$

Unit: mm

Lead 20



View X-X

### Recommended support unit

For drive side (Fixed)	For opposite to drive side (Simple)
WBK12-01A (square)	WBK12S-01 (square)
WBK12-11 (round)	

Ball screw specifications		
Product classification	Preloaded	Precise clearance
Shaft dia. x Lead / Direction of turn	15 x 20 / Right	
Preload / Ball recirculation	P-preload / End cap	
Ball dia. / Ball circle dia.	3.175 / 15.5	
Screw shaft root diameter	12.2	
Effective turns of balls	1.7 x 1	
Accuracy grade / Preload / Axial play	C5 / Z	C5 / T
Basic load rating (N)	Dynamic $C_d$	3 870
	Static $C_0$	5 070
	Dynamic $C_d$	5 820
	Static $C_0$	8 730
Axial play	0	0.005 or less
Preload (N)	147	—
Dynamic friction torque, (N-cm)	1.5 - 7.8	2.4 or less
Spacer ball	Yes	None
Factory-packed grease	NSK grease LR3	
Internal spatial volume of nut (cm <sup>3</sup> )	1.9	
Standard volume of grease replenishing (cm <sup>3</sup> )	1.0	

Unit: mm

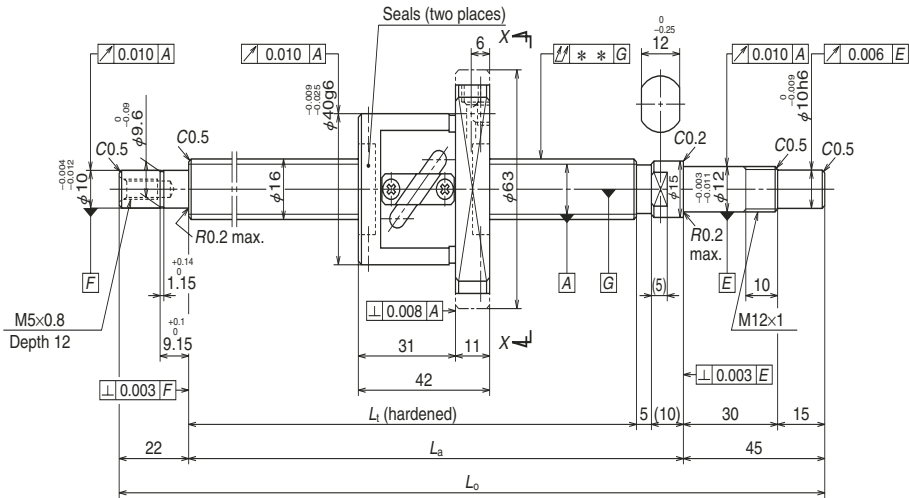
Ball screw No.		Stroke	
		Nominal	Maximum ( $L_1$ —Nut length)
Preloaded (UPFC)	Precise clearance (USFC)		
<b>W1501FA-3PG-C5Z20</b>	<b>W1501FA-4G-C5T20</b>	100	141
<b>W1502FA-5PG-C5Z20</b>	<b>W1502FA-6G-C5T20</b>	150	191
<b>W1502FA-7PG-C5Z20</b>	<b>W1502FA-8G-C5T20</b>	200	241
<b>W1503FA-5PG-C5Z20</b>	<b>W1503FA-6G-C5T20</b>	250	291
<b>W1503FA-7PG-C5Z20</b>	<b>W1503FA-8G-C5T20</b>	300	341
<b>W1504FA-5PG-C5Z20</b>	<b>W1504FA-6G-C5T20</b>	350	391
<b>W1504FA-7PG-C5Z20</b>	<b>W1504FA-8G-C5T20</b>	400	441
<b>W1505FA-5PG-C5Z20</b>	<b>W1505FA-6G-C5T20</b>	450	491
<b>W1505FA-7PG-C5Z20</b>	<b>W1505FA-8G-C5T20</b>	500	541
<b>W1506FA-5PG-C5Z20</b>	<b>W1506FA-6G-C5T20</b>	550	591
<b>W1506FA-7PG-C5Z20</b>	<b>W1506FA-8G-C5T20</b>	600	641
<b>W1507FA-3PG-C5Z20</b>	<b>W1507FA-4G-C5T20</b>	700	741
<b>W1508FA-3PG-C5Z20</b>	<b>W1508FA-4G-C5T20</b>	800	841
<b>W1510FA-3PG-C5Z20</b>	<b>W1510FA-4G-C5T20</b>	1 000	1 041

- Notes: 1. We recommend NSK support unit. See page B389 for details.  
 2. Use of NSK grease LR3 is recommended. Recommended quantity of grease is about 50% of ball nut's internal space. See page D16 for details.  
 3. Contact NSK if the permissible rotational speed is to be exceeded.

Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	
								Supporting condition	
$L_1$	$L_2$	$L_0$	$T$	$e_p$	$v_u$			Fixed - Simple support	Fixed - Fixed
186	204	271	0	0.020	0.018	0.025	0.61	3 000	3 000
236	254	321	0	0.023	0.018	0.035	0.68	3 000	3 000
286	304	371	0	0.023	0.018	0.035	0.75	3 000	3 000
336	354	421	0	0.025	0.020	0.040	0.81	3 000	3 000
386	404	471	0	0.025	0.020	0.040	0.88	3 000	3 000
436	454	521	0	0.027	0.020	0.050	0.95	3 000	3 000
486	504	571	0	0.027	0.020	0.050	1.0	3 000	3 000
536	554	621	0	0.030	0.023	0.050	1.1	3 000	3 000
586	604	671	0	0.030	0.023	0.065	1.1	3 000	3 000
636	654	721	0	0.035	0.025	0.065	1.2	3 000	3 000
686	704	771	0	0.035	0.025	0.065	1.3	3 000	3 000
786	804	871	0	0.035	0.025	0.085	1.4	3 000	3 000
886	904	971	0	0.040	0.027	0.085	1.5	2 400	3 000
1 086	1 104	1 171	0	0.046	0.030	0.110	1.8	1 590	2 240

## Finished shaft end FA Type

(Fine lead)



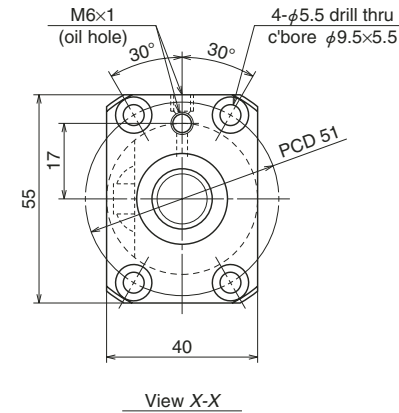
## Nut models: PFT, SFT

**NSK**

Screw shaft  $\phi 16$

Lead 5

Unit: mm



### Ball screw specifications

Product classification	Preloaded	Precise clearance
Shaft dia. x Lead / Direction of turn	16 x 5 / Right	
Preload / Ball recirculation	P-preload / Return tube	
Ball dia. / Ball circle dia.	3.175 / 16.5	
Screw shaft root diameter	13.2	
Effective turns of balls	2.5 x 1	
Accuracy grade / Preload / Axial play	C3 / Z	C3 / T
Basic load rating (N)	Dynamic $C_a$	4 620
	Static $C_{0a}$	7 330
Axial play	Preload (N)	147
	Dynamic friction torque, (N.cm)	1.5 - 7.8
Spacer ball	Yes	None
Factory-packed grease	NSK grease LR3	
Internal spatial volume of nut (cm <sup>3</sup> )	2.6	
Standard volume of grease replenishing (cm <sup>3</sup> )	1.3	

### Recommended support unit

For drive side (Fixed)	For opposite to drive side (Simple)
WBK12-01A (square)	WBK12S-01 (square)
WBK12-11 (round)	

Unit: mm

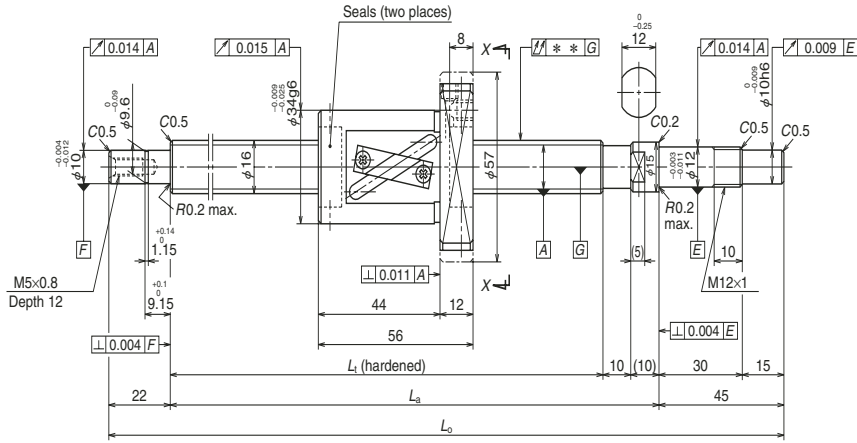
Ball screw No.		Stroke	
Preloaded (PFT)	Precise clearance (SFT)	Nominal	Maximum ( $L_1$ —Nut length)
<b>W1601FA-1P-C3Z5</b>	<b>W1601FA-2-C3T5</b>	100	147
<b>W1602FA-1P-C3Z5</b>	<b>W1602FA-2-C3T5</b>	200	247
<b>W1603FA-1P-C3Z5</b>	<b>W1603FA-2-C3T5</b>	300	347
<b>W1604FA-1P-C3Z5</b>	<b>W1604FA-2-C3T5</b>	400	447
<b>W1606FA-1P-C3Z5</b>	<b>W1606FA-2-C3T5</b>	600	647
<b>W1608FA-1P-C3Z5</b>	<b>W1608FA-2-C3T5</b>	800	847

Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	
$L_1$	$L_a$	$L_0$	T	$e_p$	$v_u$			Supporting condition	
							Fixed - Simple support	Fixed - Fixed	
189	204	271	0	0.010	0.008	0.020	0.70	3 000	3 000
289	304	371	0	0.012	0.008	0.030	0.83	3 000	3 000
389	404	471	0	0.013	0.010	0.035	0.97	3 000	3 000
489	504	571	0	0.015	0.010	0.045	1.1	3 000	3 000
689	704	771	0	0.018	0.013	0.055	1.4	3 000	3 000
889	904	971	0	0.021	0.015	0.075	1.6	2 570	3 000

- Notes: 1. We recommend NSK support unit. See page B389 for details.  
 2. Use of NSK grease LR3 is recommended. Recommended quantity of grease is about 50% of ball nut's internal space. See page D16 for details.  
 3. Contact NSK if the permissible rotational speed is to be exceeded.

## Finished shaft end FA Type

(High helix lead)



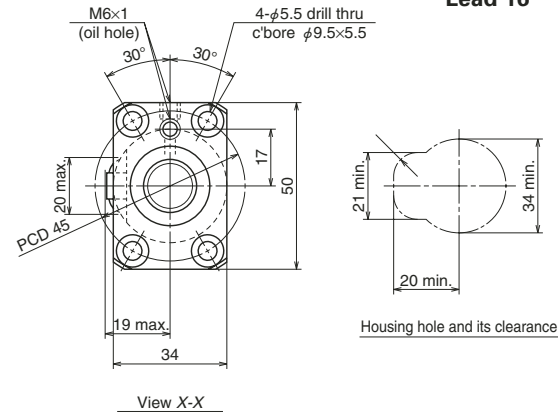
## Nut models: LPFT, LSFT

NSK

Unit: mm

### Screw shaft $\phi 16$

Lead 16



### Recommended support unit

For drive side (Fixed)	For opposite to drive side (Simple)
WBK12-01A (square)	WBK12S-01 (square)
WBK12-11 (round)	

Ball screw specifications		
Product classification	Preloaded	Precise clearance
Shaft dia. x Lead / Direction of turn	16 x 16 / Right	
Preload / Ball recirculation	P-preload / Return tube	
Ball dia. / Ball circle dia.	3.175 / 16.75	
Screw shaft root diameter	13.4	
Effective turns of balls	1.5 x 1	
Accuracy grade / Preload / Axial play	C5 / Z	C5 / T
Basic load rating (N)	Dynamic $C_a$	3 600 / 4 710
	Static $C_{0a}$	5 410 / 8 110
Axial play	0	0.005 or less
Preload (N)	147	—
Dynamic friction torque, (N·cm)	1.5 - 7.8	2.4 or less
Spacer ball	Yes	None
Factory-packed grease	NSK grease LR3	
Internal spatial volume of nut (cm <sup>3</sup> )	2.1	
Standard volume of grease replenishing (cm <sup>3</sup> )	1.1	

Unit: mm

Ball screw No.		Stroke	
		Nominal	Maximum ( $L_t$ —Nut length)
Preloaded (LPFT)	Precise clearance (LSFT)		
<b>W1601FA-3P-C5Z16</b>	<b>W1601FA-4-C5T16</b>	100	128
<b>W1602FA-3P-C5Z16</b>	<b>W1602FA-4-C5T16</b>	150	178
<b>W1602FA-5P-C5Z16</b>	<b>W1602FA-6-C5T16</b>	200	228
<b>W1603FA-3P-C5Z16</b>	<b>W1603FA-4-C5T16</b>	250	278
<b>W1603FA-5P-C5Z16</b>	<b>W1603FA-6-C5T16</b>	300	328
<b>W1604FA-3P-C5Z16</b>	<b>W1604FA-4-C5T16</b>	350	378
<b>W1604FA-5P-C5Z16</b>	<b>W1604FA-6-C5T16</b>	400	428
<b>W1605FA-1P-C5Z16</b>	<b>W1605FA-2-C5T16</b>	450	478
<b>W1605FA-3P-C5Z16</b>	<b>W1605FA-4-C5T16</b>	500	528
<b>W1606FA-3P-C5Z16</b>	<b>W1606FA-4-C5T16</b>	550	578
<b>W1606FA-5P-C5Z16</b>	<b>W1606FA-6-C5T16</b>	600	628
<b>W1607FA-1P-C5Z16</b>	<b>W1607FA-2-C5T16</b>	700	728
<b>W1608FA-3P-C5Z16</b>	<b>W1608FA-4-C5T16</b>	800	828
<b>W1610FA-1P-C5Z16</b>	<b>W1610FA-2-C5T16</b>	1 000	1 028

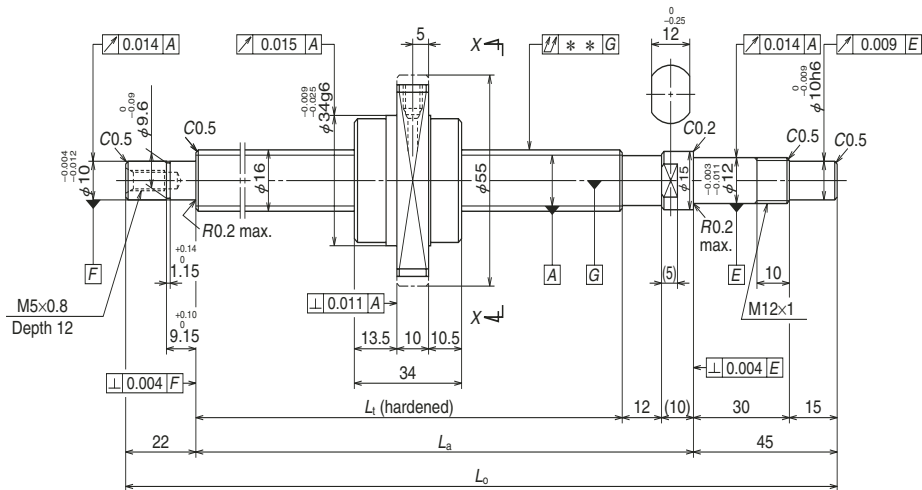
- Notes: 1. We recommend NSK support unit. See page B389 for details.  
 2. Use of NSK grease LR3 is recommended. Recommended quantity of grease is about 50% of ball nut's internal space. See page D16 for details.

Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	
								Supporting condition	
$L_t$	$L_a$	$L_o$	$T$	$e_p$	$v_u$		Fixed - Simple support	Fixed - Fixed	
184	204	271	0	0.020	0.018	0.025	0.69	3 000	3 000
234	254	321	0	0.023	0.018	0.035	0.77	3 000	3 000
284	304	371	0	0.023	0.018	0.035	0.84	3 000	3 000
334	354	421	0	0.025	0.020	0.040	0.92	3 000	3 000
384	404	471	0	0.025	0.020	0.040	0.99	3 000	3 000
434	454	521	0	0.027	0.020	0.050	1.1	3 000	3 000
484	504	571	0	0.027	0.020	0.050	1.1	3 000	3 000
534	554	621	0	0.030	0.023	0.050	1.2	3 000	3 000
584	604	671	0	0.030	0.023	0.065	1.3	3 000	3 000
634	654	721	0	0.035	0.025	0.065	1.4	3 000	3 000
684	704	771	0	0.035	0.025	0.065	1.4	3 000	3 000
784	804	871	0	0.035	0.025	0.085	1.6	3 000	3 000
884	904	971	0	0.040	0.027	0.085	1.7	2 690	3 000
1 084	1 104	1 171	0	0.046	0.030	0.110	2.0	1 770	2 480

3. Contact NSK if permissible rotational speed is to be exceeded.

## Finished shaft end FA Type

(Ultra high helix lead)



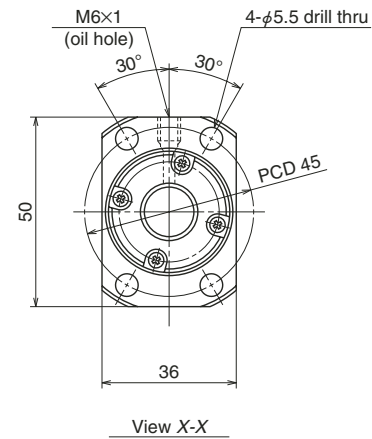
## Nut models: UPFC, USFC

**NSK**

Screw shaft  $\phi 16$

Lead 32

Unit: mm



### Ball screw specifications

Product classification	Preloaded	Precise clearance
Shaft dia. x Lead / Direction of turn	16 x 32 / Right	
Preload / Ball recirculation	P-preload / End cap	
Ball dia. / Ball circle dia.	3.175 / 16.75	
Screw shaft root diameter	13.4	
Effective turns of balls	0.7 x 2	
Accuracy grade / Preload / Axial play	C5 / Z	C5 / T
Basic load rating (N)	Dynamic $C_d$	4 000
	Static $C_{0s}$	6 690
Axial play	0	0.005 or less
Preload (N)	118	—
Dynamic friction torque, (N.cm)	1.5 - 9.8	2.4 or less
Spacer ball	None	
Factory-packed grease	NSK grease LR3	
Internal spatial volume of nut (cm <sup>3</sup> )	2.0	
Standard volume of grease replenishing (cm <sup>3</sup> )	1.0	

### Recommended support unit

For drive side (Fixed)	For opposite to drive side (Simple)
WBK12-01A (square)	WBK12S-01 (square)
WBK12-11 (round)	

Unit: mm

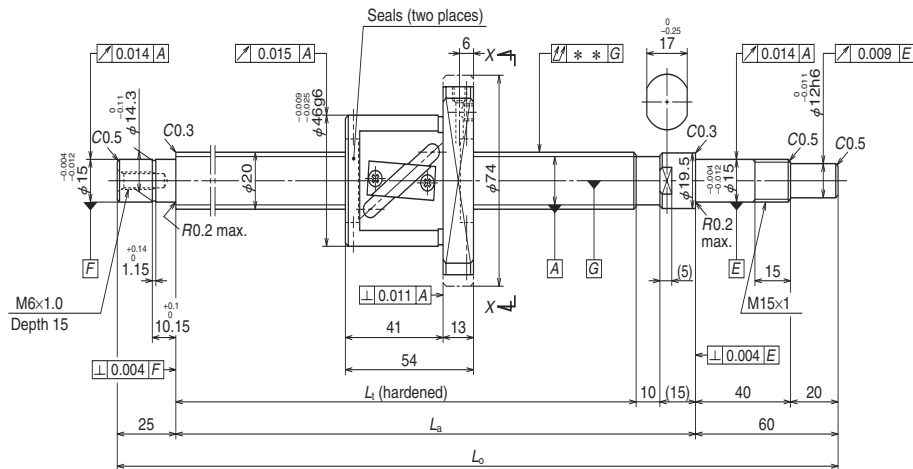
Ball screw No.		Stroke	
Preloaded (UPFC)	Precise clearance (USFC)	Nominal	Maximum ( $L_n$ —Nut length)
<b>W1603FA-7PGX-C5Z32</b>	<b>W1603FA-8GX-C5T32</b>	300	348
<b>W1605FA-5PGX-C5Z32</b>	<b>W1605FA-6GX-C5T32</b>	500	548
<b>W1608FA-5PGX-C5Z32</b>	<b>W1608FA-6GX-C5T32</b>	800	848
<b>W1612FA-1PGX-C5Z32</b>	<b>W1612FA-2GX-C5T32</b>	1 200	1 248

- Notes: 1. We recommend NSK support unit. See page B389 for details.  
 2. Use of NSK grease LR3 is recommended. Recommended quantity of grease is about 50% of ball nut's internal space. See page D16 for details.  
 3. Ball nut does not have seal.  
 4. Contact NSK if the permissible rotational speed is to be exceeded.

Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	
$L_1$	$L_a$	$L_o$	T	$e_p$	$v_u$			Supporting condition	
								Fixed - Simple support	Fixed - Fixed
382	404	471	0	0.025	0.020	0.040	0.90	3 000	3 000
582	604	671	0	0.030	0.023	0.065	1.2	3 000	3 000
882	904	971	0	0.040	0.027	0.085	1.7	2 630	3 000
1 282	1 304	1 371	0	0.054	0.035	0.150	2.3	1 240	1 740

## Finished shaft end FA Type

(Medium lead)



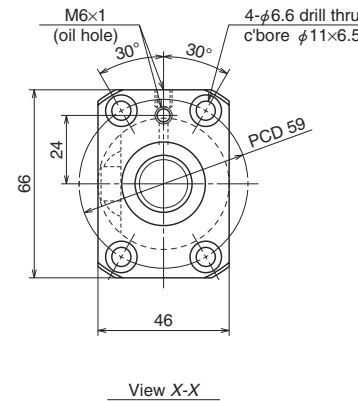
## Nut models: LPFT, LSFT

**NSK**

Screw shaft ø20

Lead 10

Unit: mm



View X-X

### Ball screw specifications

Product classification		Preloaded	Precise clearance
Shaft dia. x Lead / Direction of turn		20 x 10 / Right	
Preload / Ball recirculation		P-preload / Return tube	
Ball dia. / Ball circle dia.		3.969 / 21	
Screw shaft root diameter		16.9	
Effective turns of balls		2.5 x 1	
Accuracy grade / Preload / Axial play		C5 / Z	C5 / T
Basic load rating (N)	Dynamic C <sub>a</sub>	6 880	10 900
	Static C <sub>0a</sub>	10 800	21 700
Axial play		0	0.005 or less
Preload (N)		196	—
Dynamic friction torque, (N·cm)		2.0 - 11.8	2.9 or less
Spacer ball		Yes	None
Factory-packed grease		NSK grease LR3	
Internal spatial volume of nut (cm <sup>3</sup> )		4.7	
Standard volume of grease replenishing (cm <sup>3</sup> )		2.4	

### Recommended support unit

For drive side (Fixed)	For opposite to drive side (Simple)
WBK15-01A (square)	WBK15S-01 (square)
WBK15-11 (round)	

Unit: mm

Ball screw No.		Stroke	
		Nominal	Maximum (L <sub>1</sub> —Nut length)
Preloaded (LPFT)	Precise clearance (LSFT)		
<b>W2002FA-1P-C5Z10</b>	<b>W2002FA-2-C5T10</b>	200	235
<b>W2003FA-1P-C5Z10</b>	<b>W2003FA-2-C5T10</b>	300	335
<b>W2004FA-1P-C5Z10</b>	<b>W2004FA-2-C5T10</b>	400	435
<b>W2005FA-1P-C5Z10</b>	<b>W2005FA-2-C5T10</b>	500	535
<b>W2006FA-1P-C5Z10</b>	<b>W2006FA-2-C5T10</b>	600	635
<b>W2007FA-1P-C5Z10</b>	<b>W2007FA-2-C5T10</b>	700	735
<b>W2008FA-1P-C5Z10</b>	<b>W2008FA-2-C5T10</b>	800	835
<b>W2009FA-1P-C5Z10</b>	<b>W2009FA-2-C5T10</b>	900	935
<b>W2010FA-1P-C5Z10</b>	<b>W2010FA-2-C5T10</b>	1 000	1 035
<b>W2011FA-1P-C5Z10</b>	<b>W2011FA-2-C5T10</b>	1 100	1 135
<b>W2012FA-1P-C5Z10</b>	<b>W2012FA-2-C5T10</b>	1 200	1 235

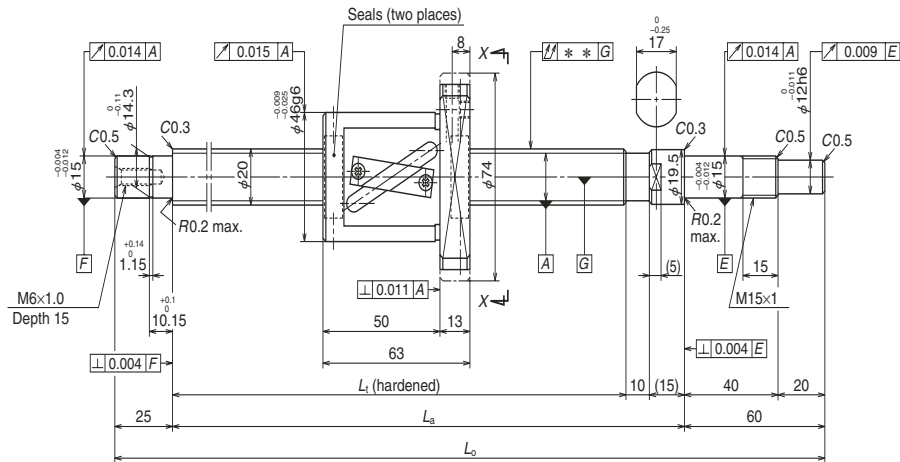
- Notes: 1. We recommend NSK support unit. See page B389 for details.  
 2. Use of NSK grease LR3 is recommended. Recommended quantity of grease is about 50% of ball nut's internal space. See page D16 for details.  
 3. Contact NSK if the permissible rotational speed is to be exceeded.

Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	
								Supporting condition	
L <sub>1</sub>	L <sub>a</sub>	L <sub>0</sub>	T	e <sub>p</sub>	v <sub>0</sub>		Fixed - Simple support	Fixed - Fixed	
289	314	399	0	0.023	0.018	0.035	1.4	3 000	3 000
389	414	499	0	0.025	0.020	0.040	1.6	3 000	3 000
489	514	599	0	0.027	0.020	0.050	1.9	3 000	3 000
589	614	699	0	0.030	0.023	0.065	2.1	3 000	3 000
689	714	799	0	0.035	0.025	0.065	2.3	3 000	3 000
789	814	899	0	0.035	0.025	0.085	2.5	3 000	3 000
889	914	999	0	0.040	0.027	0.085	2.8	3 000	3 000
989	1 014	1 099	0	0.040	0.027	0.110	3.0	2 680	3 000
1 089	1 114	1 199	0	0.046	0.030	0.110	3.2	2 210	3 000
1 189	1 214	1 299	0	0.046	0.030	0.150	3.4	1 840	2 570
1 289	1 314	1 399	0	0.054	0.035	0.150	3.7	1 570	2 190



## Finished shaft end FA Type

(High helix lead)



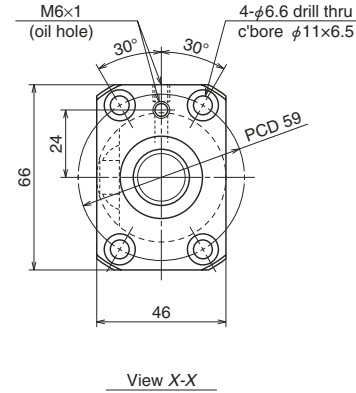
## Nut models: LPFT, LSFT

**NSK**

Screw shaft ø20

Lead 20

Unit: mm



### Recommended support unit

For drive side (Fixed)	For opposite to drive side (Simple)
WBK15-01A (square)	WBK15S-01 (square)
WBK15-11 (round)	

### Ball screw specifications

Product classification	Preloaded	Precise clearance
Shaft dia. x Lead / Direction of turn	20 x 20 / Right	
Preload / Ball recirculation	P-preload / Return tube	
Ball dia. / Ball circle dia.	3.969 / 21	
Screw shaft root diameter	16.9	
Effective turns of balls	1.5 x 1	
Accuracy grade / Preload / Axial play	C5 / Z	C53 / T
Basic load rating (N)	Dynamic $C_a$	5 370
	Static $C_{0a}$	8 450
Dynamic $C_a$	7 040	
Static $C_{0a}$	12 700	
Axial play	0	0.005 or less
Preload (N)	196	—
Dynamic friction torque, (N·cm)	2.0 - 11.8	2.9 or less
Spacer ball	Yes	None
Factory-packed grease	NSK grease LR3	
Internal spatial volume of nut (cm <sup>3</sup> )	4.2	
Standard volume of grease replenishing (cm <sup>3</sup> )	2.1	

Unit: mm

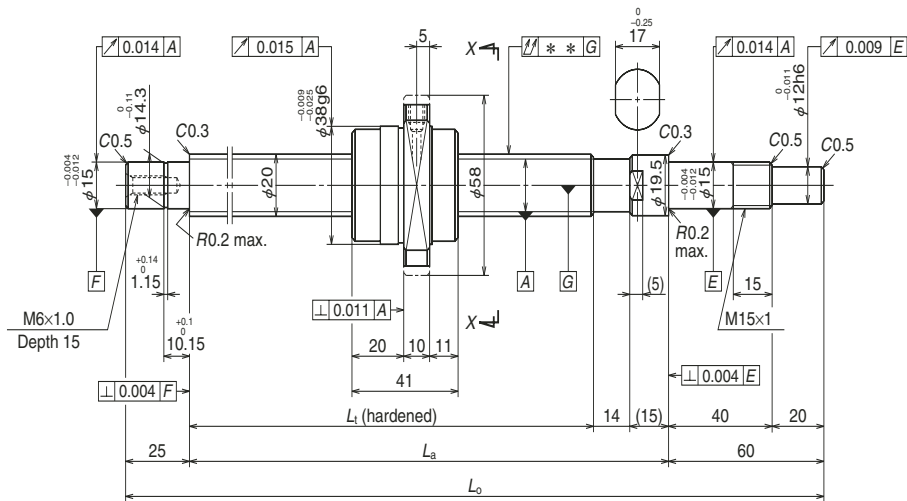
Ball screw No.		Stroke	
Preloaded (LPFT)	Precise clearance (LSFT)	Nominal	Maximum ( $L_1$ —Nut length)
<b>W2003FA-3P-C5Z20</b>	<b>W2003FA-4-C5T20</b>	200	247
<b>W2004FA-3P-C5Z20</b>	<b>W2004FA-4-C5T20</b>	300	347
<b>W2005FA-3P-C5Z20</b>	<b>W2005FA-4-C5T20</b>	400	447
<b>W2006FA-3P-C5Z20</b>	<b>W2006FA-4-C5T20</b>	500	547
<b>W2007FA-3P-C5Z20</b>	<b>W2007FA-4-C5T20</b>	600	647
<b>W2008FA-3P-C5Z20</b>	<b>W2008FA-4-C5T20</b>	700	747
<b>W2009FA-3P-C5Z20</b>	<b>W2009FA-4-C5T20</b>	800	847
<b>W2010FA-3P-C5Z20</b>	<b>W2010FA-4-C5T20</b>	900	947
<b>W2011FA-3P-C5Z20</b>	<b>W2011FA-4-C5T20</b>	1 000	1 047
<b>W2012FA-3P-C5Z20</b>	<b>W2012FA-4-C5T20</b>	1 100	1 147
<b>W2015FA-1P-C5Z20</b>	<b>W2015FA-2-C5T20</b>	1 400	1 447

- Notes: 1. We recommend NSK support unit. See page B389 for details.  
 2. Use of NSK grease LR3 is recommended. Recommended quantity of grease is about 50% of ball nut's internal space. See page D16 for details.  
 3. Contact NSK if the permissible rotational speed is to be exceeded.

Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	
$L_1$	$L_a$	$L_o$	T	$e_p$	$v_u$			Supporting condition	
								Fixed - Simple support	Fixed - Fixed
310	335	420	0	0.023	0.018	0.040	1.6	3 000	3 000
410	435	520	0	0.027	0.020	0.050	1.8	3 000	3 000
510	535	620	0	0.030	0.023	0.050	2.0	3 000	3 000
610	635	720	0	0.030	0.023	0.065	2.3	3 000	3 000
710	735	820	0	0.035	0.025	0.085	2.5	3 000	3 000
810	835	920	0	0.040	0.027	0.085	2.7	3 000	3 000
910	935	1 020	0	0.040	0.027	0.110	3.0	3 000	3 000
1 010	1 035	1 120	0	0.046	0.030	0.110	3.2	2 590	3 000
1 110	1 135	1 220	0	0.046	0.030	0.110	3.4	2 140	2 970
1 210	1 235	1 320	0	0.046	0.030	0.150	3.7	1 790	2 500
1 510	1 535	1 620	0	0.054	0.035	0.180	4.4	1 140	1 610

## Finished shaft end FA Type

(Ultra high helix lead)



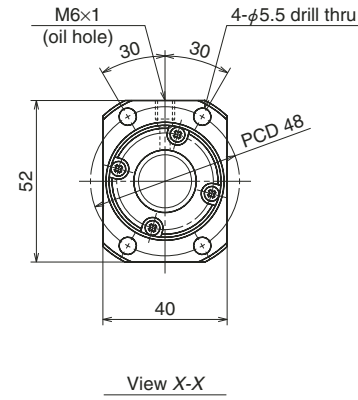
## Nut models: UPFC, USFC

NSK

Screw shaft ø20

Lead 40

Unit: mm



Ball screw specifications		
Product classification	Preloaded	Precise clearance
Shaft dia. x Lead / Direction of turn	20 x 40 / Right	
Preload / Ball recirculation	P-preload / End cap	
Ball dia. / Ball circle dia.	3.175 / 20.75	
Screw shaft root diameter	17.4	
Effective turns of balls	0.7 x 2	
Accuracy grade / Preload / Axial play	C5 / Z	C5 / T
Basic load rating (N)	Dynamic $C_a$	4 490
	Static $C_{0a}$	8 640
Axial play	0	0.005 or less
Preload (N)	148	—
Dynamic friction torque, (N·cm)	2.0 - 11.8	2.9 or less
Spacer ball	None	
Factory-packed grease	NSK grease LR3	
Internal spatial volume of nut (cm <sup>3</sup> )	2.8	
Standard volume of grease replenishing (cm <sup>3</sup> )	1.4	

### Recommended support unit

For drive side (Fixed)	For opposite to drive side (Simple)
WBK15-01A (square)	WBK15S-01 (square)
WBK15-11 (round)	

Unit: mm

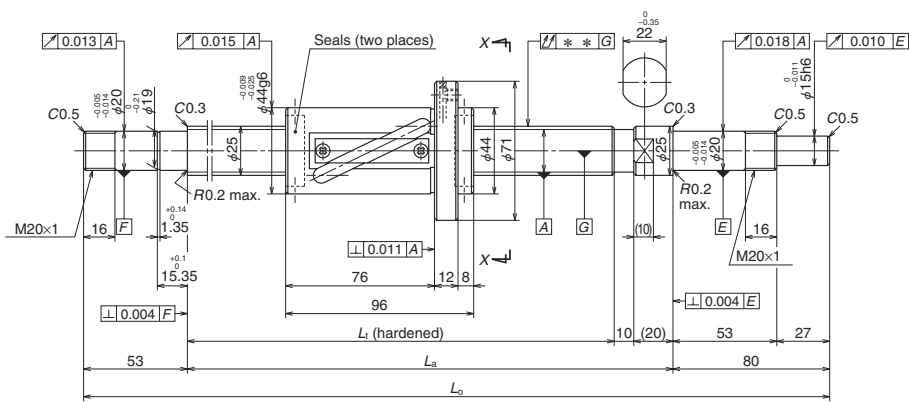
Ball screw No.		Stroke	
		Nominal	Maximum ( $L_t$ —Nut length)
Preloaded (UPFC)	Precise clearance (USFC)		
<b>W2005FA-5PGX-C5Z40</b>	<b>W2005FA-6GX-C5T40</b>	400	465
<b>W2007FA-5PGX-C5Z40</b>	<b>W2007FA-6GX-C5T40</b>	600	665
<b>W2009FA-5PGX-C5Z40</b>	<b>W2009FA-6GX-C5T40</b>	800	865
<b>W2011FA-5PGX-C5Z40</b>	<b>W2011FA-6GX-C5T40</b>	1 000	1 065
<b>W2013FA-1PGX-C5Z40</b>	<b>W2013FA-2GX-C5T40</b>	1 200	1 265
<b>W2017FA-1PGX-C5Z40</b>	<b>W2017FA-2GX-C5T40</b>	1 600	1 665

Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	
								Supporting condition	
$L_t$	$L_a$	$L_o$	$T$	$e_p$	$v_a$		Fixed - Simple support	Fixed - Fixed	
506	535	620	0	0.030	0.023	0.050	1.7	3 000	3 000
706	735	820	0	0.035	0.025	0.085	2.2	3 000	3 000
906	935	1 020	0	0.040	0.027	0.110	2.7	3 000	3 000
1 106	1 135	1 220	0	0.046	0.030	0.110	3.1	2 170	3 000
1 306	1 335	1 420	0	0.054	0.035	0.150	3.6	1 550	2 160
1 706	1 735	1 820	0	0.065	0.040	0.230	4.6	910	1 270

- Notes: 1. We recommend NSK support unit. See page B389 for details.  
 2. Use of NSK grease LR3 is recommended. Recommended quantity of grease is about 50% of ball nut's internal space. See page D16 for details.  
 3. Ball nut does not have seal.  
 4. Contact NSK if the permissible rotational speed is to be exceeded.

## Finished shaft end FA Type

(Medium lead)



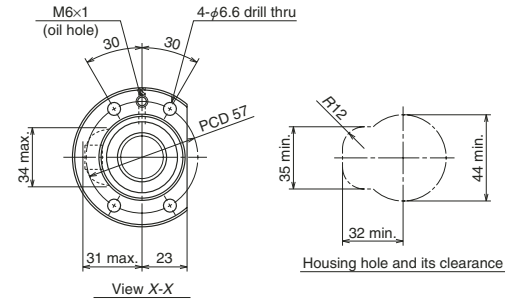
## Nut models: LPFT, LSFT

**NSK**

Screw shaft ø25

Lead 20

Unit: mm



### Ball screw specifications

Product classification	Preloaded	Precise clearance
Shaft dia. x Lead / Direction of turn	25 x 20 / Right	
Preload / Ball recirculation	P-preload / Return tube	
Ball dia. / Ball circle dia.	4.762 / 26.25	
Screw shaft root diameter	21.3	
Effective turns of balls	2.5 x 1	
Accuracy grade / Preload / Axial play	C5 / Z	C5 / T
Basic load rating (N)	Dynamic $C_d$	9 900
	Static $C_0$	15 700
	Dynamic $C_d$	16 400
	Static $C_0$	32 800
Axial play	0	0.005 or less
Preload (N)	343	—
Dynamic friction torque, (N·cm)	3.9 - 24.5	4.9 or less
Spacer ball	Yes	None
Factory-packed grease	NSK grease LR3	
Internal spatial volume of nut (cm <sup>3</sup> )	12	
Standard volume of grease replenishing (cm <sup>3</sup> )	6	

### Recommended support unit

For drive side (Fixed)	For opposite to drive side	
	(Fixed)	(Simple)
WBK20-01 (square)	WBK20-01 (square)	WBK20S-01 (square)
WBK20-11 (round)	WBK20-11 (round)	

Unit: mm

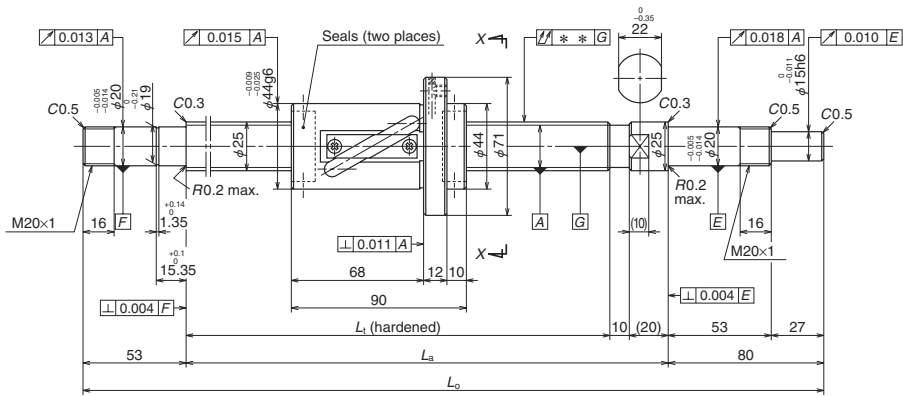
Ball screw No.		Stroke	
		Nominal	Maximum (L <sub>1</sub> —Nut length)
Preloaded (LPFT)	Precise clearance (LSFT)		
<b>W2507FA-1P-C5Z20</b>	<b>W2507FA-2-C5T20</b>	600	654
<b>W2509FA-1P-C5Z20</b>	<b>W2509FA-2-C5T20</b>	800	854
<b>W2511FA-1P-C5Z20</b>	<b>W2511FA-2-C5T20</b>	1 000	1 054
<b>W2513FA-1P-C5Z20</b>	<b>W2513FA-2-C5T20</b>	1 200	1 254
<b>W2515FA-1P-C5Z20</b>	<b>W2515FA-2-C5T20</b>	1 400	1 454
<b>W2517FA-1P-C5Z20</b>	<b>W2517FA-2-C5T20</b>	1 600	1 654
<b>W2521FA-1P-C5Z20</b>	<b>W2521FA-2-C5T20</b>	2 000	2 054

- Notes:
- We recommend NSK support unit. See page B389 for details.
  - Use of NSK grease LR3 is recommended. Recommended quantity of grease is about 50% of ball nut's internal space. See page D16 for details.
  - Contact NSK if the permissible rotational speed is to be exceeded.

Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	
L <sub>1</sub>	L <sub>a</sub>	L <sub>0</sub>	T	e <sub>p</sub>	v <sub>l</sub>			Supporting condition	
								Fixed - Simple support	Fixed - Fixed
750	780	913	0	0.035	0.025	0.055	4.0	2 800	2 800
950	980	1 113	0	0.040	0.027	0.070	4.7	2 800	2 800
1 150	1 180	1 313	0	0.046	0.030	0.090	5.4	2 560	2 800
1 350	1 380	1 513	0	0.054	0.035	0.090	6.2	1 840	2 550
1 550	1 580	1 713	0	0.054	0.035	0.120	6.9	1 390	1 940
1 750	1 780	1 913	0	0.065	0.040	0.120	7.6	1 080	1 520
2 150	2 180	2 313	0	0.077	0.046	0.160	9.1	710	1 000

**Finished shaft end FA Type**

**(High helix lead)**



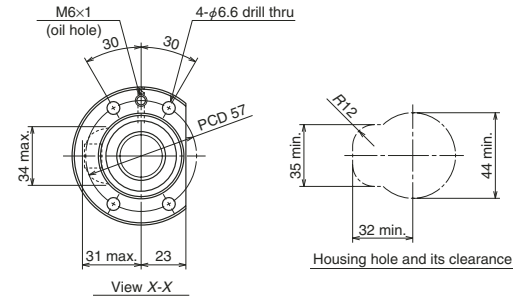
**Nut models: LPFT, LSFT**

**NSK**

**Screw shaft ø25**

**Lead 25**

Unit: mm



Ball screw specifications		
Product classification	Preloaded	Precise clearance
Shaft dia. x Lead / Direction of turn	25 x 25 / Right	
Preload / Ball recirculation	P-preload / Return tube	
Ball dia. / Ball circle dia.	4.762 / 26.25	
Screw shaft root diameter	21.3	
Effective turns of balls	1.5 x 1	
Accuracy grade / Preload / Axial play	C5 / Z	C5 / T
Basic load rating (N)	Dynamic C <sub>a</sub>	7 730
	Static C <sub>0a</sub>	12 700
Axial play	0	0.005 or less
Preload (N)	294	—
Dynamic friction torque, (N·cm)	3.9 - 24.5	4.9
Spacer ball	Yes	None
Factory-packed grease	NSK grease LR3	
Internal spatial volume of nut (cm <sup>3</sup> )	7.5	
Standard volume of grease replenishing (cm <sup>3</sup> )	3.8	

**Recommended support unit**

For drive side (Fixed)	For opposite to drive side	
	(Fixed)	(Simple)
WBK20-01 (square)	WBK20-01 (square)	WBK20S-01 (square)
WBK20-11 (round)	WBK20-11 (round)	

Unit: mm

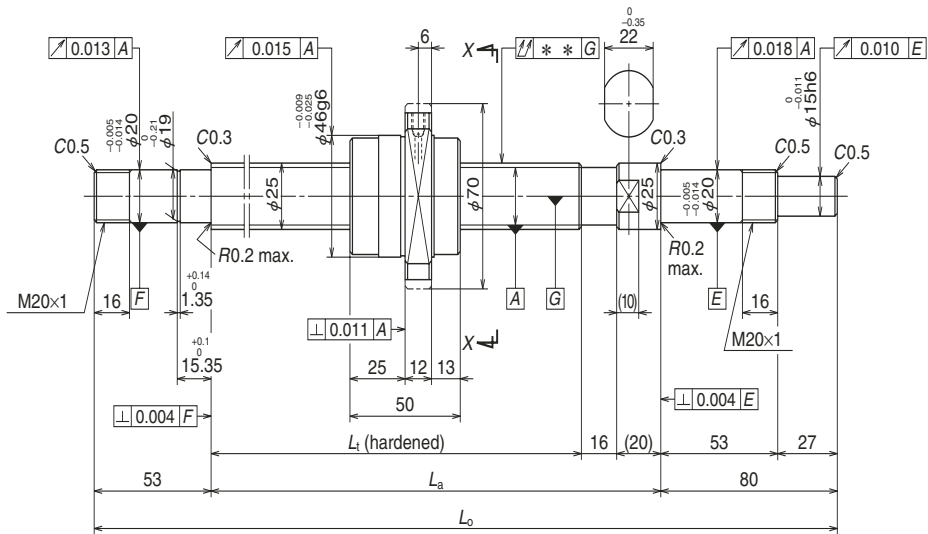
Ball screw No.		Stroke	
		Nominal	Maximum (L <sub>1</sub> —Nut length)
Preloaded (LPFT)	Precise clearance (LSFT)		
<b>W2507FA-3P-C5Z25</b>	<b>W2507FA-4-C5T25</b>	600	660
<b>W2509FA-3P-C5Z25</b>	<b>W2509FA-4-C5T25</b>	800	860
<b>W2511FA-3P-C5Z25</b>	<b>W2511FA-4-C5T25</b>	1 000	1 060
<b>W2513FA-3P-C5Z25</b>	<b>W2513FA-4-C5T25</b>	1 200	1 260
<b>W2515FA-3P-C5Z25</b>	<b>W2515FA-4-C5T25</b>	1 400	1 460
<b>W2517FA-3P-C5Z25</b>	<b>W2517FA-4-C5T25</b>	1 600	1 660
<b>W2521FA-3P-C5Z25</b>	<b>W2521FA-4-C5T25</b>	2 000	2 060

Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	
L <sub>1</sub>	L <sub>a</sub>	L <sub>s</sub>	T	e <sub>p</sub>	v <sub>0</sub>			Supporting condition	
							Fixed - Simple support		Fixed - Fixed
750	780	913	0	0.035	0.025	0.055	4.0	2 800	2 800
950	980	1 113	0	0.040	0.027	0.070	4.7	2 800	2 800
1 150	1 180	1 313	0	0.046	0.030	0.090	5.4	2 540	2 800
1 350	1 380	1 513	0	0.054	0.035	0.090	6.2	1 830	2 540
1 550	1 580	1 713	0	0.054	0.035	0.120	7.0	1 380	1 930
1 750	1 780	1 913	0	0.065	0.040	0.120	7.7	1 080	1 510
2 150	2 180	2 313	0	0.077	0.046	0.160	9.1	710	1 000

- Notes: 1. We recommend NSK support unit. See page B389 for details.  
 2. Use of NSK grease LR3 is recommended. Recommended quantity of grease is about 50% of ball nut's internal space. See page D16 for details.  
 3. Contact NSK if the permissible rotational speed is to be exceeded.

**Finished shaft end FA Type**

(Ultra high helix lead)



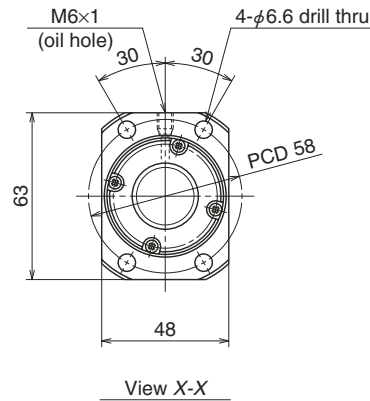
**Nut models: UPFC, USFC**

**NSK**

Screw shaft ø25

Lead 50

Unit: mm



**Ball screw specifications**

Product classification		Preloaded	Precise clearance
Shaft dia. x Lead / Direction of turn		25 x 50 / Right	
Preload / Ball recirculation		P-preload / End cap	
Ball dia. / Ball circle dia.		3.969 / 26	
Screw shaft root diameter		21.9	
Effective turns of balls		0.7 x 2	
Accuracy grade / Preload / Axial play		C5 / Z	C5 / T
Basic load rating (N)	Dynamic C <sub>a</sub>	6 690	
	Static C <sub>0a</sub>	13 500	
Axial play		0	0.005 or less
Preload (N)		196	—
Dynamic friction torque, (N.cm)		2.9 - 21.5	4.9 or less
Spacer ball		None	
Factory-packed grease		NSK grease LR3	
Internal spatial volume of nut (cm <sup>3</sup> )		4.2	
Standard volume of grease replenishing (cm <sup>3</sup> )		2.1	

**Recommended support unit**

For drive side (Fixed)	For opposite to drive side	
	(Fixed)	(Simple)
WBK20-01 (square)	WBK20-01 (square)	WBK20S-01 (square)
WBK20-11 (round)	WBK20-11 (round)	

Unit: mm

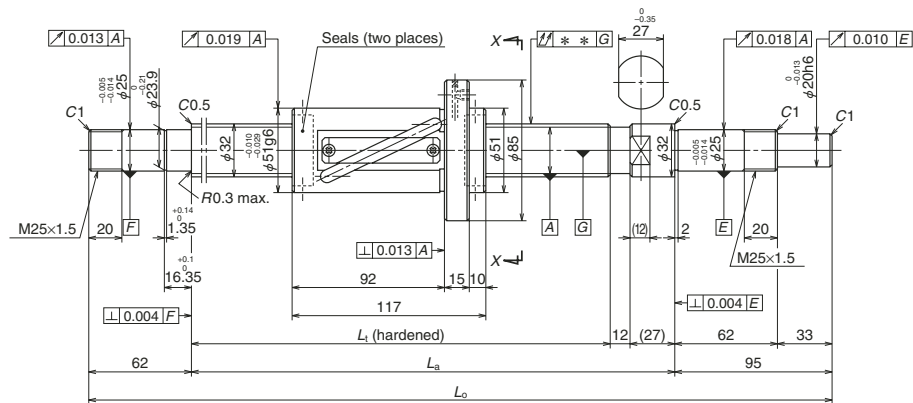
Ball screw No.		Stroke	
		Nominal	Maximum (L <sub>1</sub> —Nut length)
Preloaded (UPFC)	Precise clearance (USFC)		
<b>W2508FA-1PGX-C5Z50</b>	<b>W2508FA-2GX-C5T50</b>	700	794
<b>W2511FA-5PGX-C5Z50</b>	<b>W2511FA-6GX-C5T50</b>	1 000	1 094
<b>W2516FA-1PGX-C5Z50</b>	<b>W2516FA-2GX-C5T50</b>	1 500	1 594
<b>W2521FA-5PGX-C5Z50</b>	<b>W2521FA-6GX-C5T50</b>	2 000	2 094

Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	
L <sub>1</sub>	L <sub>a</sub>	L <sub>0</sub>	T	e <sub>p</sub>	v <sub>s</sub>			Supporting condition	
								Fixed - Simple support	Fixed - Fixed
844	880	1 013	0	0.040	0.027	0.070	4.1	2 800	2 800
1 144	1 180	1 313	0	0.046	0.030	0.090	5.3	2 550	2 800
1 644	1 680	1 813	0	0.065	0.040	0.120	7.2	1 230	1 710
2 144	2 180	2 313	0	0.077	0.046	0.160	9.1	720	1 010

- Notes: 1. We recommend NSK support unit. See page B389 for details.  
 2. Use of NSK grease LR3 is recommended. Recommended quantity of grease is about 50% of ball nut's internal space. See page D16 for details.  
 3. Ball nut does not have seal.  
 4. Contact NSK if the permissible rotational speed is to be exceeded.

## Finished shaft end FA Type

(Medium lead)



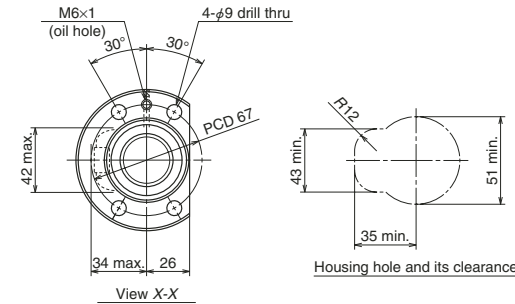
## Nut models: LPFT, LSFT

NSK

Screw shaft ø32

Lead 25

Unit: mm



Ball screw specifications		
Product classification	Preloaded	Precise clearance
Shaft dia. x Lead / Direction of turn	32 x 25 / Right	
Preload / Ball recirculation	P-preload / Return tube	
Ball dia. / Ball circle dia.	4.762 / 33.25	
Screw shaft root diameter	28.3	
Effective turns of balls	2.5 x 1	
Accuracy grade / Preload / Axial play	C5 / Z	C5 / T
Basic load rating (N)	Dynamic $C_d$	11 300
	Static $C_{0a}$	17 900
Dynamic friction torque, (N·cm)	Dynamic $C_d$	20 900
	Static $C_{0a}$	41 800
Axial play	0	0.005 or less
Preload (N)	441	—
Dynamic friction torque, (N·cm)	6.8 - 31.5	7.8 or less
Spacer ball	Yes	None
Factory-packed grease	NSK grease LR3	
Internal spatial volume of nut (cm <sup>3</sup> )	17.5	
Standard volume of grease replenishing (cm <sup>3</sup> )	8.8	

### Recommended support unit

For drive side (Fixed)	For opposite to drive side	
	(Fixed)	(Simple)
WBK25-01W (square)	WBK25-01W (square)	WBK25S-01W (square)
WBK25-11 (round)	WBK25-11 (round)	

Unit: mm

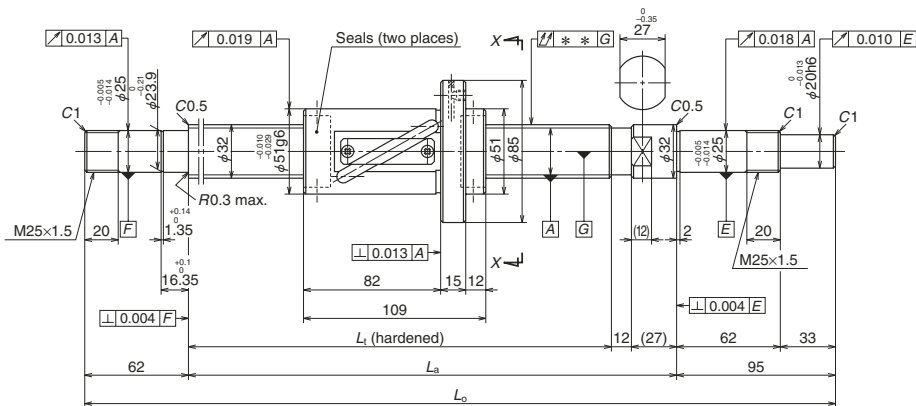
Ball screw No.		Stroke	
		Nominal	Maximum (L <sub>1</sub> —Nut length)
Preloaded (LPFT)	Precise clearance (LSFT)		
<b>W3211FA-1P-C5Z25</b>	<b>W3211FA-2-C5T25</b>	1 000	1 063
<b>W3216FA-1P-C5Z25</b>	<b>W3216FA-2-C5T25</b>	1 500	1 563
<b>W3221FA-1P-C5Z25</b>	<b>W3221FA-2-C5T25</b>	2 000	2 063
<b>W3227FA-1P-C5Z25</b>	<b>W3227FA-2-C5T25</b>	2 600	2 663

Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	
L <sub>1</sub>	L <sub>a</sub>	L <sub>0</sub>	T	e <sub>p</sub>	v <sub>i</sub>			Supporting condition	
								Fixed - Simple support	Fixed - Fixed
1 180	1 219	1 376	0	0.046	0.030	0.090	9.3	2 180	2 180
1 680	1 719	1 876	0	0.065	0.040	0.120	12.3	1 580	2 180
2 180	2 219	2 376	0	0.077	0.046	0.160	15.4	930	1 300
2 780	2 819	2 976	0	0.093	0.054	0.200	19.1	560	800

- Notes: 1. We recommend NSK support unit. See page B389 for details.  
 2. Use of NSK grease LR3 is recommended. Recommended quantity of grease is about 50% of ball nut's internal space. See page D16 for details.  
 3. Contact NSK if the permissible rotational speed is to be exceeded.

## Finished shaft end FA Type

(High helix lead)



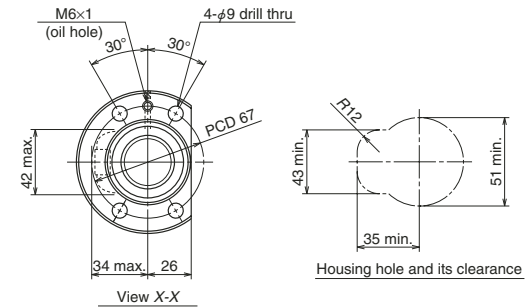
## Nut models: LPFT, LSFT

**NSK**

Screw shaft  $\phi 32$

Lead 32

Unit: mm



### Ball screw specifications

Product classification		Preloaded	Precise clearance
Shaft dia. x Lead / Direction of turn		32 x 32 / Right	
Preload / Ball recirculation		P-preload / Return tube	
Ball dia. / Ball circle dia.		4.762 / 33.25	
Screw shaft root diameter		28.3	
Effective turns of balls		1.5 x 1	
Accuracy grade / Preload / Axial play		C5 / Z	C5 / T
Basic load rating (N)	Dynamic $C_d$	8 800	11 500
	Static $C_0$	16 600	24 800
Axial play		0	0.005 or less
Preload (N)		392	—
Dynamic friction torque, (N·cm)		6.9 - 31.5	7.8 or less
Spacer ball		Yes	None
Factory-packed grease		NSK grease LR3	
Internal spatial volume of nut (cm <sup>3</sup> )		14	
Standard volume of grease replenishing (cm <sup>3</sup> )		7	

### Recommended support unit

For drive side (Fixed)	For opposite to drive side	
	(Fixed)	(Simple)
WBK25-01W (square)	WBK25-01W (square)	WBK25S-01W (square)
WBK25-11 (round)	WBK25-11 (round)	

Unit: mm

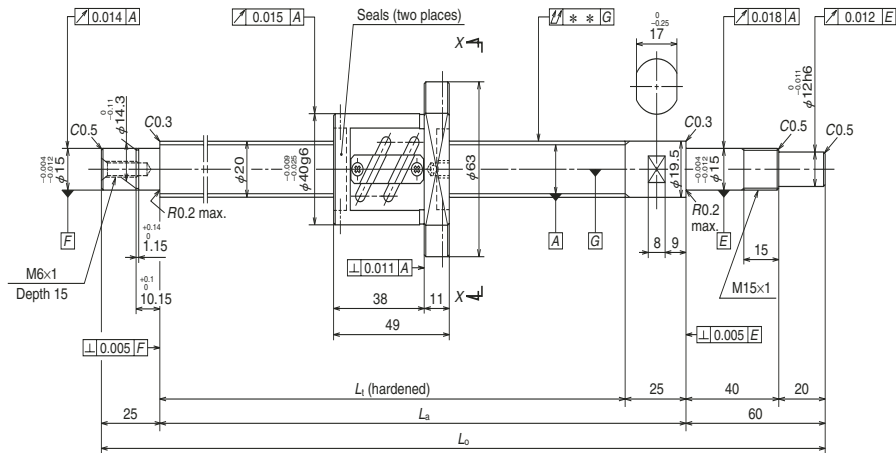
Ball screw No.		Stroke	
		Nominal	Maximum ( $L_1$ —Nut length)
Preloaded (LPFT)	Precise clearance (LSFT)		
<b>W3211FA-3P-C5Z32</b>	<b>W3211FA-4-C5T32</b>	1 000	1 071
<b>W3216FA-3P-C5Z32</b>	<b>W3216FA-4-C5T32</b>	1 500	1 571
<b>W3221FA-3P-C5Z32</b>	<b>W3221FA-4-C5T32</b>	2 000	2 071
<b>W3227FA-3P-C5Z32</b>	<b>W3227FA-4-C5T32</b>	2 600	2 671

- Notes: 1. We recommend NSK support unit. See page B389 for details.  
 2. Use of NSK grease LR3 is recommended. Recommended quantity of grease is about 50% of ball nut's internal space. See page D16 for details.  
 3. Contact NSK if the permissible rotational speed is to be exceeded.

Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	
$L_1$	$L_2$	$L_3$	$T$	$e_p$	$v_i$			Supporting condition	
								Fixed - Simple support	Fixed - Fixed
1 180	1 219	1 376	0	0.046	0.030	0.090	9.3	2 180	2 180
1 680	1 719	1 876	0	0.065	0.040	0.120	12.3	1 570	2 180
2 180	2 219	2 376	0	0.077	0.046	0.160	15.4	920	1 290
2 780	2 819	2 976	0	0.093	0.054	0.200	19.1	560	790

## Finished shaft end SA Type

(Fine lead)



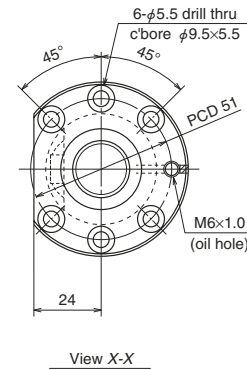
## Nut model: PFT

NSK

Screw shaft ø20

Lead 4

Unit: mm



### Ball screw specifications

Shaft dia. x Lead / Direction of turn	20 x 4 / Right	
Preload / Ball recirculation	P-preload / Return tube	
Ball dia. / Ball circle dia.	2.381 / 20.3	
Effective turns of balls	2.5 x 2	
Screw shaft root diameter	17.8	
Accuracy grade / Preload	C5 / Z	
Basic load rating (N)	Dynamic $C_0$	5 420
	Static $C_{0a}$	10 700
Preload (N)	294	
Dynamic friction torque, median, (N-cm)	3.9	
Spacer ball	Yes	
Factory-packed grease	<b>Refer to Notes 2.</b>	
Internal spatial volume of nut (cm <sup>3</sup> )	2.7	
Standard volume of grease replenishing (cm <sup>3</sup> )	1.4	

### Recommended support unit

For drive side (Fixed)	For opposite to drive side (Simple)
WBK15-01A (square)	WBK15S-01 (square)
WBK15-11 (round)	

Unit: mm

Ball screw No.	Stroke		Screw shaft length		
	Nominal	Maximum ( $L_t$ —Nut length)	$L_t$	$L_a$	$L_o$
<b>W2002SA-1P-C5Z4</b>	150	176	225	250	335
<b>W2002SA-2P-C5Z4</b>	200	226	275	300	385
<b>W2003SA-1P-C5Z4</b>	300	326	375	400	485
<b>W2004SA-1P-C5Z4</b>	400	426	475	500	585
<b>W2005SA-1P-C5Z4</b>	500	526	575	600	685
<b>W2006SA-1P-C5Z4</b>	600	626	675	700	785

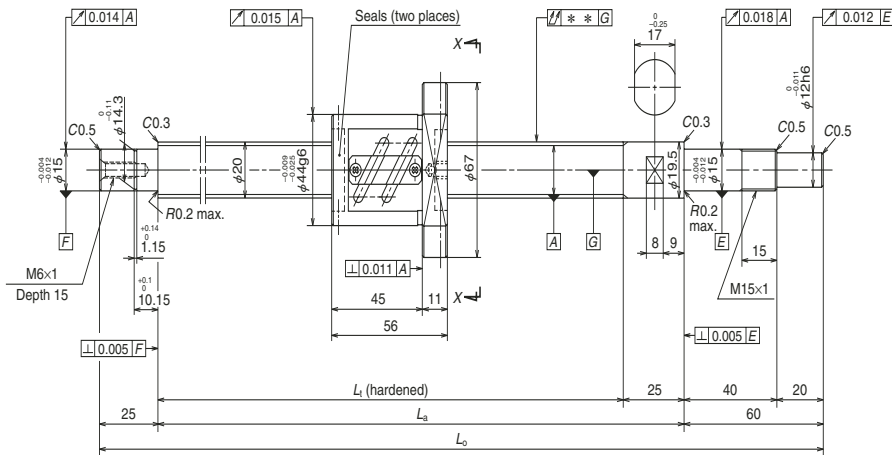
- Notes: 1. We recommend NSK support unit. See page B389 for details.  
 2. **Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.** See page D13 for details.  
 3. Contact NSK if the permissible rotational speed is to be exceeded.

Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	
$T$	$e_p$	$v_u$			Supporting condition	
					Fixed - Simple support	Fixed - Fixed
-0.005	0.023	0.018	0.045	1.1	3 000	3 000
-0.007	0.023	0.018	0.045	1.2	3 000	3 000
-0.009	0.025	0.020	0.055	1.5	3 000	3 000
-0.011	0.027	0.020	0.070	1.7	3 000	3 000
-0.014	0.030	0.023	0.085	1.9	3 000	3 000
-0.016	0.035	0.025	0.085	2.1	3 000	3 000



## Finished shaft end SA Type

(Fine lead)



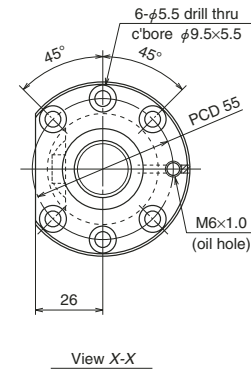
## Nut model: PFT

**NSK**

Screw shaft ø20

Lead 5

Unit: mm



### Ball screw specifications

Shaft dia. x Lead / Direction of turn	20 x 5 / Right	
Preload / Ball recirculation	P-preload / Return tube	
Ball dia. / Ball circle dia.	3.175 / 20.5	
Screw shaft root diameter	17.2	
Effective turns of balls	2.5 x 2	
Accuracy grade / Preload	C5 / Z	
Basic load rating (N)	Dynamic $C_a$	9 410
	Static $C_{0a}$	17 100
Preload (N)	490	
Dynamic friction torque, median, (N·cm)	7.8	
Spacer ball	Yes	
Factory-packed grease	<b>Refer to Notes 2.</b>	
Internal spatial volume of nut (cm <sup>3</sup> )	4.3	
Standard volume of grease replenishing (cm <sup>3</sup> )	2.2	

### Recommended support unit

For drive side (Fixed)	For opposite to drive side (Simple)
WBK15-01A (square)	WBK15S-01 (square)
WBK15-11 (round)	

Unit: mm

Ball screw No.	Stroke		Screw shaft length		
	Nominal	Maximum ( $L_1$ —Nut length)	$L_1$	$L_a$	$L_0$
<b>W2002SA-3P-C5Z5</b>	150	169	225	250	335
<b>W2002SA-4P-C5Z5</b>	200	219	275	300	385
<b>W2003SA-2P-C5Z5</b>	300	319	375	400	485
<b>W2004SA-2P-C5Z5</b>	400	419	475	500	585
<b>W2005SA-2P-C5Z5</b>	500	519	575	600	685
<b>W2007SA-1P-C5Z5</b>	700	719	775	800	885

Notes: 1. We recommend NSK support unit. See page B389 for details.

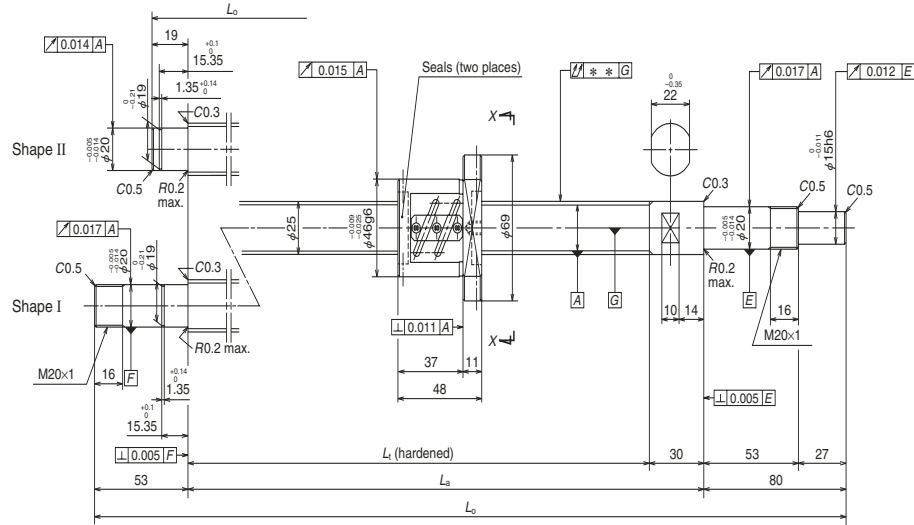
2. Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use. See page D13 for details.

3. Contact NSK if the permissible rotational speed is to be exceeded.

Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	
$T$	$e_p$	$v_u$			Supporting condition	
					Fixed - Simple support	Fixed - Fixed
-0.005	0.023	0.018	0.045	1.3	3 000	3 000
-0.007	0.023	0.018	0.045	1.4	3 000	3 000
-0.009	0.025	0.020	0.055	1.6	3 000	3 000
-0.011	0.027	0.020	0.070	1.8	3 000	3 000
-0.014	0.030	0.023	0.085	2.0	3 000	3 000
-0.019	0.035	0.025	0.110	2.5	3 000	3 000

# Finished shaft end SA Type

(Fine lead)



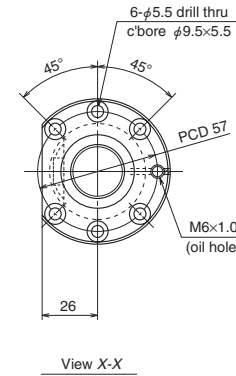
# Nut model: PFT



Screw shaft ø25

Lead 4

Unit: mm



### Ball screw specifications

Shaft dia. x Lead / Direction of turn	25 × 4 / Right	
Preload / Ball recirculation	P-preload / Return tube	
Ball dia. / Ball circle dia.	2.381 / 25.3	
Screw shaft root diameter	22.8	
Effective turns of balls	2.5 × 2	
Accuracy grade / Preload	C5 / Z	
Basic load rating (N)	Dynamic C <sub>o</sub>	6 020
	Static C <sub>0a</sub>	13 600
Preload (N)		290
Dynamic friction torque, median, (N·cm)		4.9
Spacer ball		Yes
Factory-packed grease		<b>Refer to Notes 2.</b>
Internal spatial volume of nut (cm <sup>3</sup> )		3.2
Standard volume of grease replenishing (cm <sup>3</sup> )		1.6

### Recommended support unit

For drive side (Fixed)	For opposite to drive side (Fixed) (Simple)	
WBK20-01 (square)	WBK20-01 (square)	WBK20S-01 (square)
WBK20-11 (round)	WBK20-11 (round)	

Unit: mm

Ball screw No.	Stroke		Screw shaft length		
	Nominal	Maximum (L <sub>1</sub> —Nut length)	L <sub>1</sub>	L <sub>a</sub>	L <sub>0</sub>
<b>W2502SA-1P-C5Z4</b>	150	172	220	250	349
<b>W2502SA-2P-C5Z4</b>	200	222	270	300	399
<b>W2503SA-1P-C5Z4</b>	300	322	370	400	499
<b>W2504SA-1P-C5Z4</b>	400	422	470	500	599
<b>W2505SA-1P-C5Z4</b>	500	522	570	600	733
<b>W2507SA-1P-C5Z4</b>	700	722	770	800	933

Notes: 1. We recommend NSK support unit. See page B389 for details.

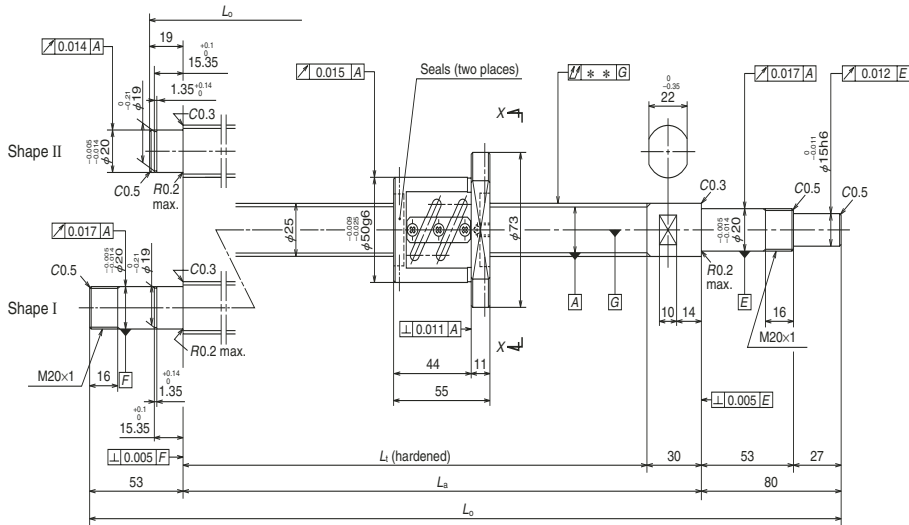
2. Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use. See page D13 for details.

3. Contact NSK if the permissible rotational speed is to be exceeded.

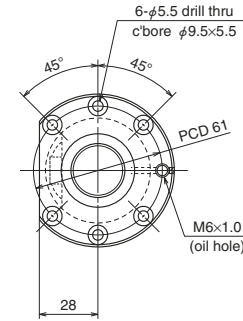
Left side shaft end	Lead accuracy			Shaft run- out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	
	T	e <sub>o</sub>	v <sub>u</sub>			Supporting condition	
						Fixed - Simple support	Fixed - Fixed
II	-0.005	0.023	0.018	0.035	1.6	2 800	—
II	-0.006	0.023	0.018	0.035	1.8	2 800	—
II	-0.009	0.025	0.020	0.040	2.2	2 800	—
II	-0.011	0.027	0.020	0.050	2.5	2 800	—
I	-0.014	0.030	0.023	0.060	3.0	2 800	2 800
I	-0.018	0.035	0.025	0.075	3.7	2 800	2 800

## Finished shaft end SA Type

(Fine lead)



## Nut model: PFT



View X-X

**NSK**

Screw shaft ø25

Lead 5

Unit: mm

### Ball screw specifications

Shaft dia. x Lead / Direction of turn	25 × 5 / Right	
Preload / Ball recirculation	P-preload / Return tube	
Ball dia. / Ball circle dia.	3.175 / 25.5	
Screw shaft root diameter	22.2	
Effective turns of balls	2.5 × 2	
Accuracy grade / Preload	C5 / Z	
Basic load rating (N)	Dynamic $C_a$	10 400
	Static $C_{0a}$	21 900
Preload (N)		540
Dynamic friction torque, median, (N·cm)		8.8
Spacer ball		Yes
Factory-packed grease		<b>Refer to Notes 2.</b>
Internal spatial volume of nut (cm <sup>3</sup> )		5.0
Standard volume of grease replenishing (cm <sup>3</sup> )		2.5

### Recommended support unit

For drive side (Fixed)	For opposite to drive side	
	(Fixed)	(Simple)
WBK20-01 (square)	WBK20-01 (square)	WBK20S-01 (square)
WBK20-11 (round)	WBK20-11 (round)	

Unit: mm

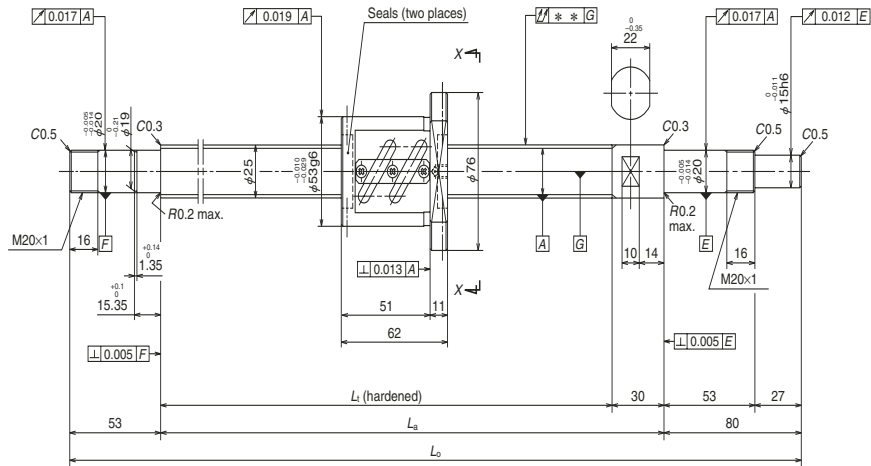
Ball screw No.	Stroke		Screw shaft length		
	Nominal	Maximum ( $L_t$ —Nut length)	$L_t$	$L_a$	$L_o$
<b>W2502SA-3P-C5Z5</b>	150	165	220	250	349
<b>W2502SA-4P-C5Z5</b>	200	215	270	300	399
<b>W2503SA-2P-C5Z5</b>	300	315	370	400	499
<b>W2504SA-2P-C5Z5</b>	400	415	470	500	599
<b>W2505SA-2P-C5Z5</b>	500	515	570	600	733
<b>W2506SA-1P-C5Z5</b>	600	615	670	700	833
<b>W2507SA-2P-C5Z5</b>	700	715	770	800	933
<b>W2509SA-1P-C5Z5</b>	900	915	970	1 000	1 133
<b>W2511SA-1P-C5Z5</b>	1 000	1 115	1 170	1 200	1 333

- Notes: 1. We recommend NSK support unit. See page B389 for details.  
 2. **Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.** See page D13 for details.  
 3. Contact NSK if the the permissible rotational speed is to be exceeded.

Left side shaft end	Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	
	$T$	$e_o$	$v_u$			Supporting condition	
						Fixed - Simple support	Fixed - Fixed
II	-0.005	0.023	0.018	0.035	1.8	2 800	—
II	-0.006	0.023	0.018	0.035	2.0	2 800	—
II	-0.009	0.025	0.020	0.040	2.3	2 800	—
II	-0.011	0.027	0.020	0.050	2.7	2 800	—
I	-0.014	0.030	0.023	0.060	3.1	2 800	2 800
I	-0.016	0.035	0.025	0.075	3.4	2 800	2 800
I	-0.018	0.035	0.025	0.075	3.8	2 800	2 800
I	-0.023	0.040	0.027	0.090	4.5	2 800	2 800
I	-0.028	0.046	0.030	0.120	5.2	2 480	2 800

## Finished shaft end SA Type

(Fine lead)



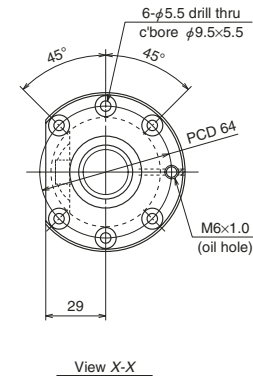
## Nut model: PFT

NSK

Screw shaft ø25

Lead 6

Unit: mm



Ball screw specifications		
Shaft dia. x Lead / Direction of turn	25 x 6 / Right	
Preload / Ball recirculation	P-preload / Return tube	
Ball dia. / Ball circle dia.	3.969 / 25.5	
Screw shaft root diameter	21.4	
Effective turns of balls	2.5 x 2	
Accuracy grade / Preload	C5 / Z	
Basic load rating (N)	Dynamic $C_a$	14 100
	Static $C_{0a}$	26 800
Preload (N)	685	
Dynamic friction torque, median, (N·cm)	13.8	
Spacer ball	Yes	
Factory-packed grease	Refer to Notes 2.	
Internal spatial volume of nut (cm <sup>3</sup> )	7.0	
Standard volume of grease replenishing (cm <sup>3</sup> )	3.5	

### Recommended support unit

For drive side (Fixed)	For opposite to drive side	
	(Fixed)	(Simple)
WBK20-01 (square)	WBK20-01 (square)	WBK20S-01 (square)
WBK20-11 (round)	WBK20-11 (round)	

Unit: mm

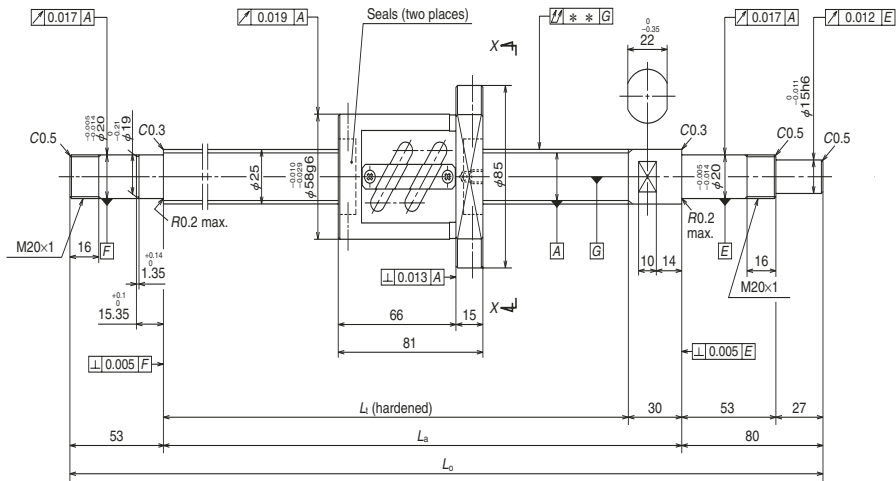
Ball screw No.	Stroke		Screw shaft length		
	Nominal	Maximum (L <sub>1</sub> —Nut length)	L <sub>1</sub>	L <sub>a</sub>	L <sub>0</sub>
<b>W2503SA-3P-C5Z6</b>	250	308	370	400	533
<b>W2505SA-3P-C5Z6</b>	450	508	570	600	733
<b>W2507SA-3P-C5Z6</b>	650	708	770	800	933
<b>W2511SA-2P-C5Z6</b>	1 050	1 108	1 170	1 200	1 333

- Notes: 1. We recommend NSK support unit. See page B389 for details.  
 2. Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use. See page D13 for details.  
 3. Contact NSK if the permissible rotational speed is to be exceeded.

Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	
T	e <sub>p</sub>	v <sub>u</sub>			Supporting condition	
					Fixed - Simple support	Fixed - Fixed
-0.009	0.025	0.020	0.050	2.5	2 800	2 800
-0.014	0.030	0.023	0.060	3.2	2 800	2 800
-0.018	0.035	0.025	0.075	3.9	2 800	2 800
-0.028	0.046	0.030	0.120	5.2	2 410	2 800

### Finished shaft end SA Type

(Fine lead)



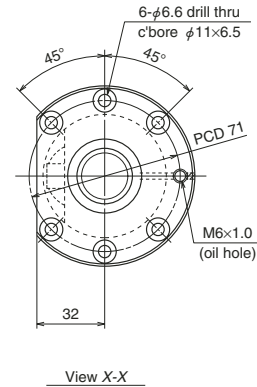
### Nut model: PFT

NSK

Screw shaft ø25

Lead 10

Unit: mm



Ball screw specifications		
Shaft dia. x Lead / Direction of turn	25 × 10 / Right	
Preload / Ball recirculation	P-preload / Return tube	
Ball dia. / Ball circle dia.	4.762 / 25.5	
Screw shaft root diameter	20.5	
Effective turns of balls	1.5 × 2	
Accuracy grade / Preload	C5 / Z	
Basic load rating (N)	Dynamic $C_a$	11 600
	Static $C_{0a}$	19 000
Preload (N)	585	
Dynamic friction torque, median, (N·cm)	13.8	
Spacer ball	Yes	
Factory-packed grease	<b>Refer to Notes 2.</b>	
Internal spatial volume of nut (cm <sup>3</sup> )	9.5	
Standard volume of grease replenishing (cm <sup>3</sup> )	4.8	

### Recommended support unit

For drive side (Fixed)	For opposite to drive side	
	(Fixed)	(Simple)
WBK20-01 (square)	WBK20-01 (square)	WBK20S-01 (square)
WBK20-11 (round)	WBK20-11 (round)	

Unit: mm

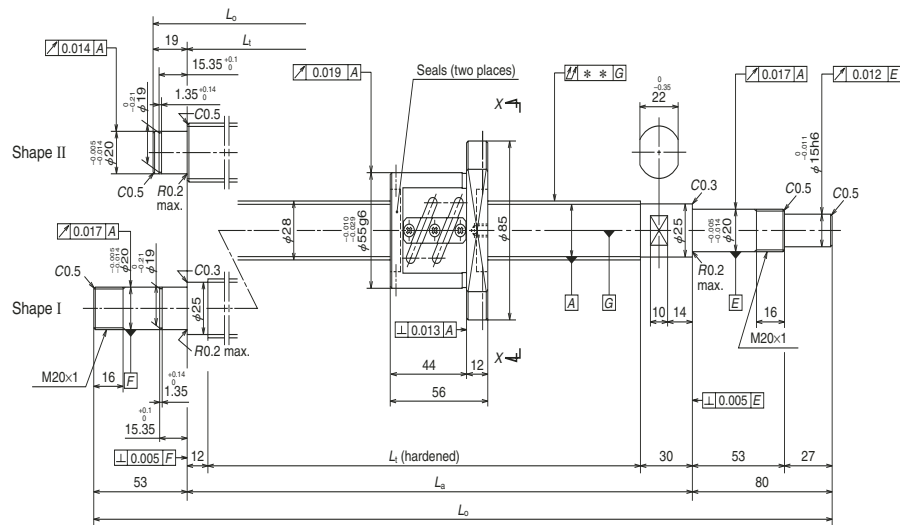
Ball screw No.	Stroke		Screw shaft length		
	Nominal	Maximum ( $L_1$ —Nut length)	$L_1$	$L_a$	$L_c$
<b>W2503SA-4P-C5Z10</b>	250	289	370	400	533
<b>W2505SA-4P-C5Z10</b>	450	489	570	600	733
<b>W2507SA-4P-C5Z10</b>	650	689	770	800	933
<b>W2509SA-2P-C5Z10</b>	850	889	970	1 000	1 133
<b>W2511SA-3P-C5Z10</b>	1 050	1 089	1 170	1 200	1 333
<b>W2514SA-1P-C5Z10</b>	1 350	1 389	1 470	1 500	1 633

- Notes: 1. We recommend NSK support unit. See page B389 for details.  
 2. Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use. See page D13 for details.  
 3. Contact NSK if the permissible rotational speed is to be exceeded.

Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	
$T$	$e_p$	$v_u$			Supporting condition	
					Fixed - Simple support	Fixed - Fixed
-0.009	0.025	0.020	0.050	3.2	2 800	2 800
-0.014	0.030	0.023	0.060	3.8	2 800	2 800
-0.018	0.035	0.025	0.075	4.5	2 800	2 800
-0.023	0.040	0.027	0.090	5.2	2 800	2 800
-0.028	0.046	0.030	0.120	5.9	2 340	2 800
-0.035	0.054	0.035	0.150	6.9	1 470	2 050

## Finished shaft end SA Type

(Fine lead)



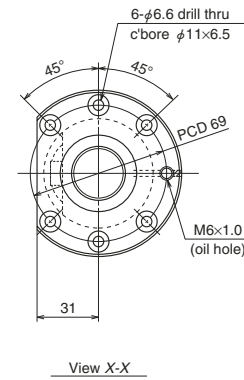
## Nut model: PFT

NSK

Screw shaft  $\phi 28$

Lead 5

Unit: mm



Ball screw specifications		
Shaft dia. x Lead / Direction of turn	28 x 5 / Right	
Preload / Ball recirculation	P-preload / Return tube	
Ball dia. / Ball circle dia.	3.175 / 28.5	
Screw shaft root diameter	25.2	
Effective turns of balls	2.5 x 2	
Accuracy grade / Preload	C5 / Z	
Basic load rating (N)	Dynamic $C_d$	11 000
	Static $C_{0a}$	24 400
Preload (N)		540
Dynamic friction torque, median, (N-cm)		9.8
Spacer ball		Yes
Factory-packed grease		<b>Refer to Notes 2.</b>
Internal spatial volume of nut (cm <sup>3</sup> )		6.0
Standard volume of grease replenishing (cm <sup>3</sup> )		3.0

### Recommended support unit

For drive side (Fixed)	For opposite to drive side	
	(Fixed)	(Simple)
WBK20-01 (square)	WBK20-01 (square)	WBK20S-01 (square)
WBK20-11 (round)	WBK20-11 (round)	

Unit: mm

Ball screw No.	Stroke		Screw shaft length		
	Nominal	Maximum (L <sub>1</sub> —Nut length)	L <sub>1</sub>	L <sub>a</sub>	L <sub>o</sub>
<b>W2802SA-1P-C5Z5</b>	200	214	270	300	399
<b>W2803SA-1P-C5Z5</b>	300	314	370	400	499
<b>W2804SA-1P-C5Z5</b>	400	414	470	500	599
<b>W2805SA-1P-C5Z5</b>	450	502	558	600	733
<b>W2807SA-1P-C5Z5</b>	650	702	758	800	933
<b>W2809SA-1P-C5Z5</b>	850	902	958	1 000	1 133
<b>W2811SA-1P-C5Z5</b>	1 050	1 102	1 158	1 200	1 333

Notes: 1. We recommend NSK support unit. See page B389 for details.

2. Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use. See page D13 for details.

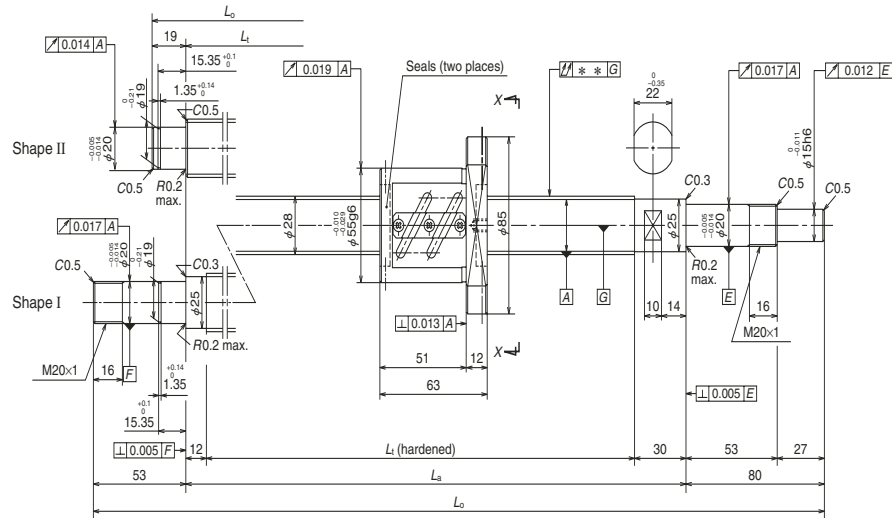
3. Contact NSK if the permissible rotational speed is to be exceeded.

Left side shaft end	Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	
	T	e <sub>o</sub>	v <sub>u</sub>			Supporting condition	
						Fixed - Simple support	Fixed - Fixed
II	-0.006	0.023	0.018	0.035	2.5	2 500	—
II	-0.009	0.025	0.020	0.040	2.9	2 500	—
II	-0.011	0.027	0.020	0.050	3.3	2 500	—
I	-0.014	0.030	0.023	0.060	3.8	2 500	2 500
I	-0.018	0.035	0.025	0.075	4.7	2 500	2 500
I	-0.024	0.040	0.027	0.090	5.6	2 500	2 500
I	-0.028	0.046	0.030	0.120	6.5	2 500	2 500



## Finished shaft end SA Type

(Fine lead)



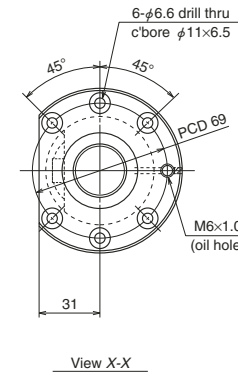
Nut model: PFT

**NSK**

Screw shaft ø28

Lead 6

Unit: mm



Ball screw specifications		
Shaft dia. x Lead / Direction of turn	28 x 6 / Right	
Preload / Ball recirculation	P-preload / Return tube	
Ball dia. / Ball circle dia.	3.175 / 28.5	
Screw shaft root diameter	25.2	
Effective turns of balls	2.5 x 2	
Accuracy grade / Preload	C5 / Z	
Basic load rating (N)	Dynamic $C_a$	11 000
	Static $C_{0a}$	24 400
Preload (N)	540	
Dynamic friction torque, median, (N·cm)	11.8	
Spacer ball	Yes	
Factory-packed grease	Refer to Notes 2.	
Internal spatial volume of nut (cm <sup>3</sup> )	6.0	
Standard volume of grease replenishing (cm <sup>3</sup> )	3.0	

### Recommended support unit

For drive side (Fixed)	For opposite to drive side	
	(Fixed)	(Simple)
WBK20-01 (square)	WBK20-01 (square)	WBK20S-01 (square)
WBK20-11 (round)	WBK20-11 (round)	

Unit: mm

Ball screw No.	Stroke		Screw shaft length		
	Nominal	Maximum (L <sub>1</sub> —Nut length)	L <sub>1</sub>	L <sub>a</sub>	L <sub>0</sub>
<b>W2803SA-3P-C5Z6</b>	250	307	370	400	499
<b>W2805SA-3P-C5Z6</b>	450	507	570	600	699
<b>W2807SA-3P-C5Z6</b>	650	695	758	800	933
<b>W2809SA-3P-C5Z6</b>	850	895	958	1 000	1 133
<b>W2811SA-3P-C5Z6</b>	1 050	1 095	1 158	1 200	1 333

Notes: 1. We recommend NSK support unit. See page B389 for details.

2. Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use. See page D13 for details.

3. Contact NSK if the permissible rotational speed is to be exceeded.

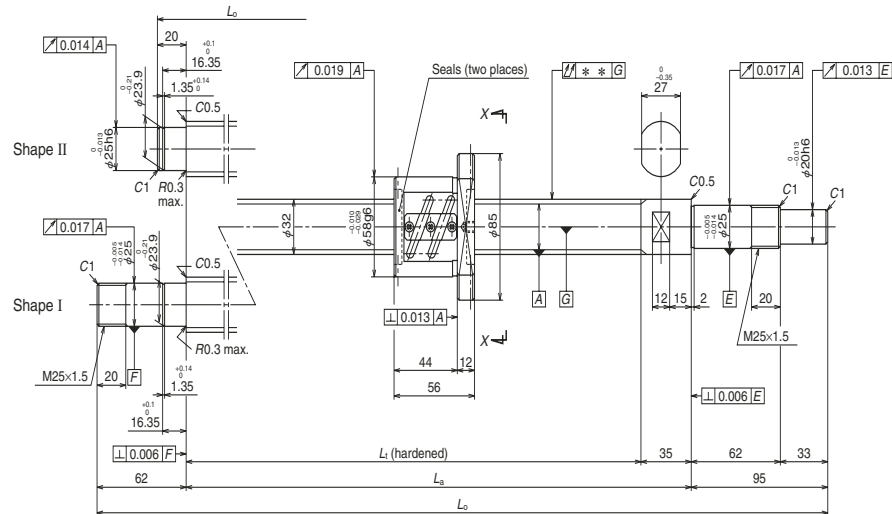
Left side shaft end	Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	
	T	e <sub>0</sub>	v <sub>u</sub>			Supporting condition	
						Fixed - Simple support	Fixed - Fixed
II	-0.009	0.025	0.020	0.040	3.0	2 500	—
II	-0.014	0.030	0.023	0.060	3.9	2 500	—
I	-0.018	0.035	0.025	0.075	4.9	2 500	2 500
I	-0.023	0.040	0.027	0.090	5.8	2 500	2 500
I	-0.028	0.046	0.030	0.120	6.6	2 500	2 500





## Finished shaft end SA Type

(Fine lead)



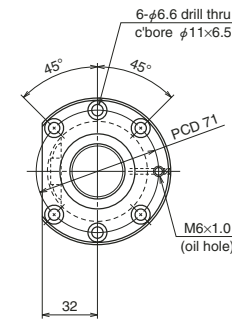
## Nut model: PFT

**NSK**

Screw shaft  $\phi 32$

Lead 5

Unit: mm



View X-X

### Ball screw specifications

Shaft dia. x Lead / Direction of turn	32 x 5 / Right	
Preload / Ball recirculation	P-preload / Return tube	
Ball dia. / Ball circle dia.	3.175 / 32.5	
Screw shaft root diameter	29.2	
Effective turns of balls	2.5 x 2	
Accuracy grade / Preload	C5 / Z	
Basic load rating (N)	Dynamic $C_d$	11 600
	Static $C_{0a}$	28 000
Preload (N)	590	
Dynamic friction torque, median, (N·cm)	11.8	
Spacer ball	Yes	
Factory-packed grease	Refer to Notes 2.	
Internal spatial volume of nut (cm <sup>3</sup> )	7.0	
Standard volume of grease replenishing (cm <sup>3</sup> )	3.5	

### Recommended support unit

For drive side (Fixed)	For opposite to drive side	
	(Fixed)	(Simple)
WBK25-01W (square)	WBK25-01W (square)	WBK25S-01W (square)
WBK25-11 (round)	WBK25-11 (round)	

Unit: mm

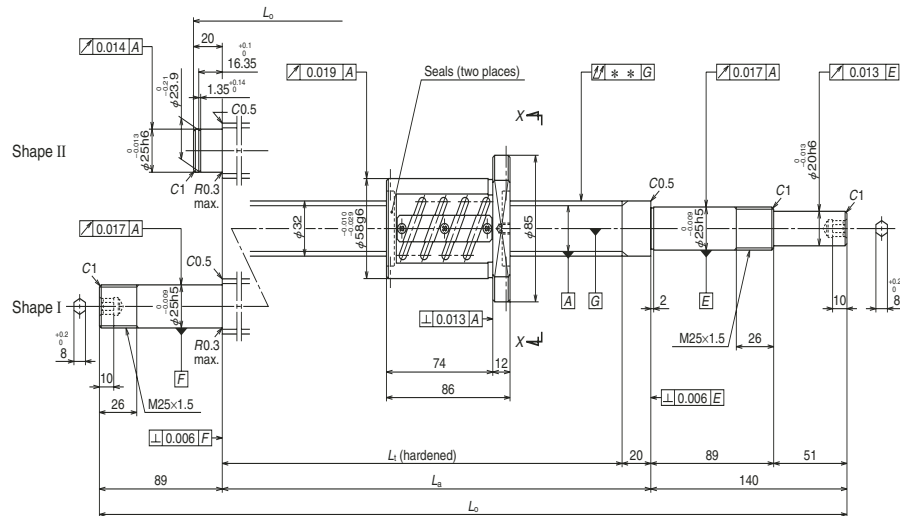
Ball screw No.	Stroke		Screw shaft length		
	Nominal	Maximum ( $L_1$ -Nut length)	$L_1$	$L_a$	$L_0$
<b>W3202SA-1P-C5Z5</b>	150	209	265	300	415
<b>W3203SA-1P-C5Z5</b>	250	309	365	400	515
<b>W3204SA-1P-C5Z5</b>	350	409	465	500	615
<b>W3205SA-1P-C5Z5</b>	450	509	565	600	715
<b>W3206SA-1P-C5Z5</b>	550	609	665	700	857
<b>W3207SA-1P-C5Z5</b>	650	709	765	800	957
<b>W3209SA-1P-C5Z5</b>	850	909	965	1 000	1 157
<b>W3211SA-1P-C5Z5</b>	1 050	1 109	1 165	1 200	1 357
<b>W3214SA-1P-C5Z5</b>	1 350	1 409	1 465	1 500	1 657

- Notes: 1. We recommend NSK support unit. See page B389 for details.  
 2. Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use. See page D13 for details.  
 3. Contact NSK if the permissible rotational speed is to be exceeded.

Left side shaft end	Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	
	$T$	$e_p$	$v_u$			Supporting condition	
						Fixed - Simple support	Fixed - Fixed
II	-0.006	0.023	0.018	0.040	3.1	2 180	—
II	-0.009	0.025	0.020	0.050	3.7	2 180	—
II	-0.011	0.027	0.020	0.050	4.2	2 180	—
II	-0.014	0.030	0.023	0.060	4.8	2 180	—
I	-0.016	0.035	0.025	0.075	5.6	2 180	2 180
I	-0.018	0.035	0.025	0.075	6.1	2 180	2 180
I	-0.023	0.040	0.027	0.090	7.3	2 180	2 180
I	-0.028	0.046	0.030	0.120	8.5	2 180	2 180
I	-0.035	0.054	0.035	0.150	10.2	2 070	2 180

## Finished shaft end SA Type

(Fine lead)



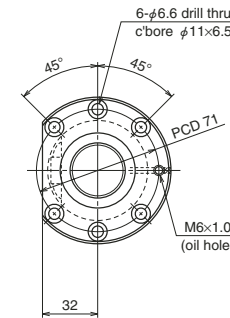
## Nut model: ZFT

**NSK**

Screw shaft ø32

Lead 5

Unit: mm



### Ball screw specifications

Shaft dia. x Lead / Direction of turn	32 x 5 / Right	
Preload / Ball recirculation	Z-preload / Return tube	
Ball dia. / Ball circle dia.	3.175 / 32.5	
Screw shaft root diameter	29.2	
Effective turns of balls	2.5 x 2	
Accuracy grade / Preload	C5 / Z	
Basic load rating (N)	Dynamic $C_a$	18 500
	Static $C_{0a}$	56 100
Preload (N)	1 270	
Dynamic friction torque, median, (N·cm)	23.5	
Spacer ball	None	
Factory-packed grease	Refer to Notes 2.	
Internal spatial volume of nut (cm <sup>3</sup> )	10	
Standard volume of grease replenishing (cm <sup>3</sup> )	5	

### Recommended support unit

For drive side, for opposite to drive side (Fixed)

WBK25DF-31H (round)

Unit: mm

Ball screw No.	Stroke		Screw shaft length		
	Nominal	Maximum (L <sub>t</sub> —Nut length)	L <sub>t</sub>	L <sub>a</sub>	L <sub>0</sub>
<b>W3202SA-2Z-C5Z5</b>	150	194	280	300	460
<b>W3203SA-2Z-C5Z5</b>	250	294	380	400	560
<b>W3204SA-2Z-C5Z5</b>	350	394	480	500	660
<b>W3205SA-2Z-C5Z5</b>	450	494	580	600	760
<b>W3206SA-2Z-C5Z5</b>	550	594	680	700	929
<b>W3207SA-2Z-C5Z5</b>	650	694	780	800	1 029
<b>W3209SA-2Z-C5Z5</b>	850	894	980	1 000	1 229
<b>W3211SA-2Z-C5Z5</b>	1 050	1 094	1 180	1 200	1 429
<b>W3214SA-2Z-C5Z5</b>	1 350	1 394	1 480	1 500	1 729

Left side shaft end	Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	
	T	e <sub>0</sub>	v <sub>u</sub>			Supporting condition	
						Fixed - Simple support	Fixed - Fixed
II	-0.007	0.023	0.018	0.040	3.5	2 180	—
II	-0.009	0.025	0.020	0.050	4.1	2 180	—
II	-0.012	0.027	0.020	0.060	4.7	2 180	—
II	-0.014	0.030	0.023	0.060	5.3	2 180	—
I	-0.016	0.035	0.025	0.075	6.1	2 180	2 180
I	-0.019	0.035	0.025	0.090	6.7	2 180	2 180
I	-0.024	0.040	0.027	0.090	7.9	2 180	2 180
I	-0.028	0.046	0.030	0.120	9.0	2 180	2 180
I	-0.036	0.054	0.035	0.150	10.8	2 040	2 180

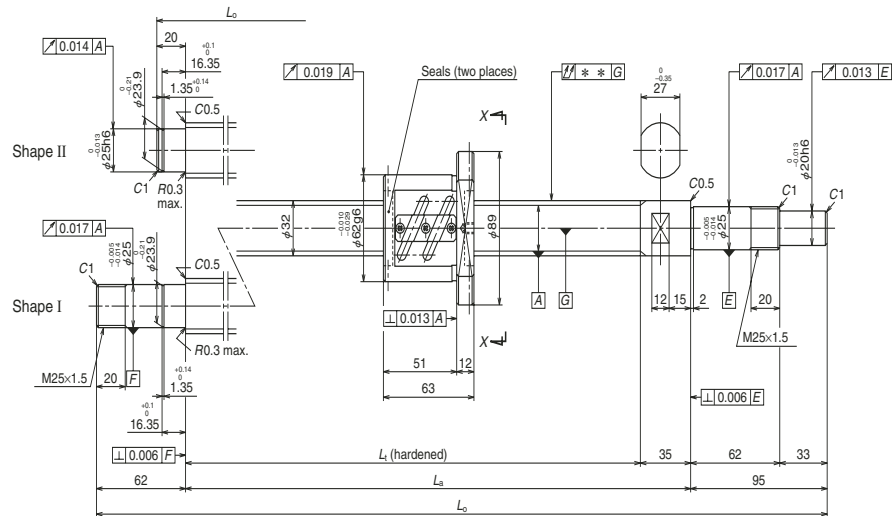
Notes: 1. We recommend NSK support unit. See page B389 for details.

2. Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use. See page D13 for details.

3. Contact NSK if the permissible rotational speed is to be exceeded.

## Finished shaft end SA Type

(Fine lead)



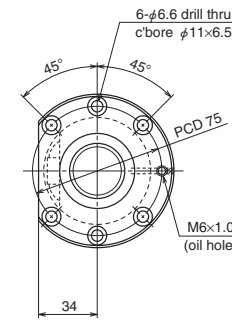
## Nut model: PFT

**NSK**

Screw shaft  $\phi 32$

Lead 6

Unit: mm



View X-X

### Ball screw specifications

Shaft dia. x Lead / Direction of turn	32 x 6 / Right	
Preload / Ball recirculation	P-preload / Return tube	
Ball dia. / Ball circle dia.	3.969 / 32.5	
Screw shaft root diameter	28.4	
Effective turns of balls	2.5 x 2	
Accuracy grade / Preload	C5 / Z	
Basic load rating (N)	Dynamic $C_a$	15 500
	Static $C_{0a}$	34 700
Preload (N)		780
Dynamic friction torque, median, (N-cm)		15.7
Spacer ball		Yes
Factory-packed grease		<b>Refer to Notes 2.</b>
Internal spatial volume of nut (cm <sup>3</sup> )		9.5
Standard volume of grease replenishing (cm <sup>3</sup> )		4.8

### Recommended support unit

For drive side (Fixed)	For opposite to drive side	
	(Fixed)	(Simple)
WBK25-01W (square)	WBK25-01W (square)	WBK25S-01W (square)
WBK25-11 (round)	WBK25-11 (round)	

Unit: mm

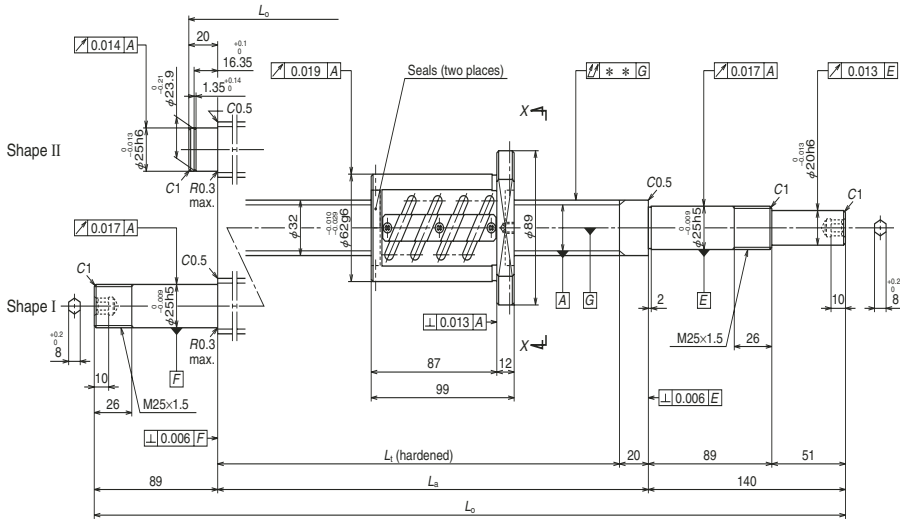
Ball screw No.	Stroke		Screw shaft length		
	Nominal	Maximum (L <sub>1</sub> -Nut length)	L <sub>1</sub>	L <sub>a</sub>	L <sub>o</sub>
<b>W3203SA-3P-C5Z6</b>	250	302	365	400	515
<b>W3205SA-3P-C5Z6</b>	450	502	565	600	715
<b>W3207SA-3P-C5Z6</b>	650	702	765	800	957
<b>W3209SA-3P-C5Z6</b>	850	902	965	1 000	1 157
<b>W3211SA-3P-C5Z6</b>	1 050	1 102	1 165	1 200	1 357
<b>W3214SA-3P-C5Z6</b>	1 350	1 402	1 465	1 500	1 657

- Notes: 1. We recommend NSK support unit. See page B389 for details.  
 2. Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use. See page D13 for details.  
 3. Contact NSK if the permissible rotational speed is to be exceeded.

Left side shaft end	Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	
	T	e <sub>o</sub>	v <sub>u</sub>			Supporting condition	
						Fixed - Simple support	Fixed - Fixed
II	-0.009	0.025	0.020	0.050	3.8	2 180	—
II	-0.014	0.030	0.023	0.060	5.0	2 180	—
I	-0.018	0.035	0.025	0.075	6.3	2 180	2 180
I	-0.023	0.040	0.027	0.090	7.4	2 180	2 180
I	-0.028	0.046	0.030	0.120	8.5	2 180	2 180
I	-0.035	0.054	0.035	0.150	10.2	2 020	2 180

**Finished shaft end SA Type**

(Fine lead)



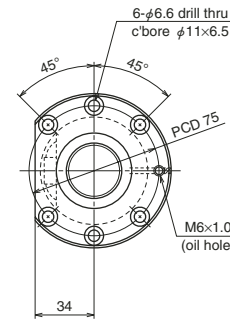
**Nut model: ZFT**

**NSK**

**Screw shaft  $\phi 32$**

**Lead 6**

Unit: mm



View X-X

**Ball screw specifications**

Shaft dia. x Lead / Direction of turn	32 x 6 / Right	
Preload / Ball recirculation	Z-preload / Return tube	
Ball dia. / Ball circle dia.	3.969 / 32.5	
Screw shaft root diameter	28.4	
Effective turns of balls	2.5 x 2	
Accuracy grade / Preload	C5 / Z	
Basic load rating (N)	Dynamic $C_d$	24 700
	Static $C_{0a}$	69 400
Preload (N)		1 710
Dynamic friction torque, median, (N-cm)		35.0
Spacer ball		None
Factory-packed grease		<b>Refer to Notes 2.</b>
Internal spatial volume of nut (cm <sup>3</sup> )		14
Standard volume of grease replenishing (cm <sup>3</sup> )		7

**Recommended support unit**

**For drive side, for opposite to drive side (Fixed)**

WBK25DF-31H (round)

Unit: mm

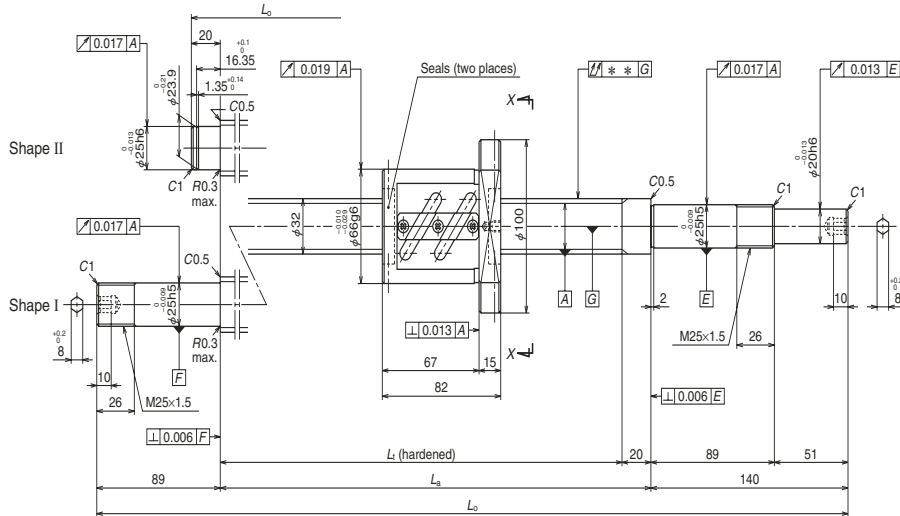
Ball screw No.	Stroke		Screw shaft length		
	Nominal	Maximum ( $L_t$ —Nut length)	$L_t$	$L_a$	$L_o$
<b>W3203SA-4Z-C5Z6</b>	250	281	380	400	560
<b>W3205SA-4Z-C5Z6</b>	450	481	580	600	760
<b>W3207SA-4Z-C5Z6</b>	650	681	780	800	1 029
<b>W3209SA-4Z-C5Z6</b>	850	881	980	1 000	1 229
<b>W3211SA-4Z-C5Z6</b>	1 050	1 081	1 180	1 200	1 429
<b>W3214SA-4Z-C5Z6</b>	1 350	1 381	1 480	1 500	1 729

Left side shaft end	Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	
	$T$	$e_p$	$v_u$			Supporting condition	
						Fixed - Simple support	Fixed - Fixed
II	-0.009	0.025	0.020	0.050	4.5	2 180	—
II	-0.014	0.030	0.023	0.060	5.6	2 180	—
I	-0.019	0.035	0.025	0.090	7.0	2 180	2 180
I	-0.024	0.040	0.027	0.090	8.1	2 180	2 180
I	-0.028	0.046	0.030	0.120	9.3	2 180	2 180
I	-0.036	0.054	0.035	0.150	11.0	2 000	2 180

- Notes: 1. We recommend NSK support unit. See page B389 for details.  
 2. Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use. See page D13 for details.  
 3. Contact NSK if the permissible rotational speed is to be exceeded.

## Finished shaft end SA Type

(Fine lead)



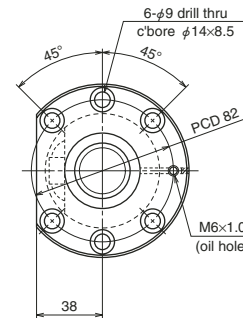
## Nut model: ZFT

**NSK**

Screw shaft ø32

Lead 8

Unit: mm



View X-X

### Ball screw specifications

Shaft dia. x Lead / Direction of turn	32 x 8 / Right	
Preload / Ball recirculation	Z-preload / Return tube	
Ball dia. / Ball circle dia.	4.762 / 32.5	
Screw shaft root diameter	27.5	
Effective turns of balls	2.5 x 1	
Accuracy grade / Preload	C5 / Z	
Basic load rating (N)	Dynamic $C_d$	17 500
	Static $C_{0a}$	41 000
Preload (N)	1 320	
Dynamic friction torque, median, (N·cm)	31.0	
Spacer ball	None	
Factory-packed grease	<b>Refer to Notes 2.</b>	
Internal spatial volume of nut (cm <sup>3</sup> )	13	
Standard volume of grease replenishing (cm <sup>3</sup> )	6.5	

### Recommended support unit

**For drive side, for opposite to drive side (Fixed)**

WBK25DF-31H (round)

Unit: mm

Ball screw No.	Stroke		Screw shaft length		
	Nominal	Maximum (L <sub>t</sub> —Nut length)	L <sub>t</sub>	L <sub>a</sub>	L <sub>o</sub>
<b>W3203SA-5Z-C5Z8</b>	250	298	380	400	560
<b>W3205SA-5Z-C5Z8</b>	450	498	580	600	760
<b>W3207SA-5Z-C5Z8</b>	650	698	780	800	1 029
<b>W3209SA-5Z-C5Z8</b>	850	898	980	1 000	1 229
<b>W3214SA-5Z-C5Z8</b>	1 350	1 398	1 480	1 500	1 729

Notes: 1. We recommend NSK support unit. See page B389 for details.

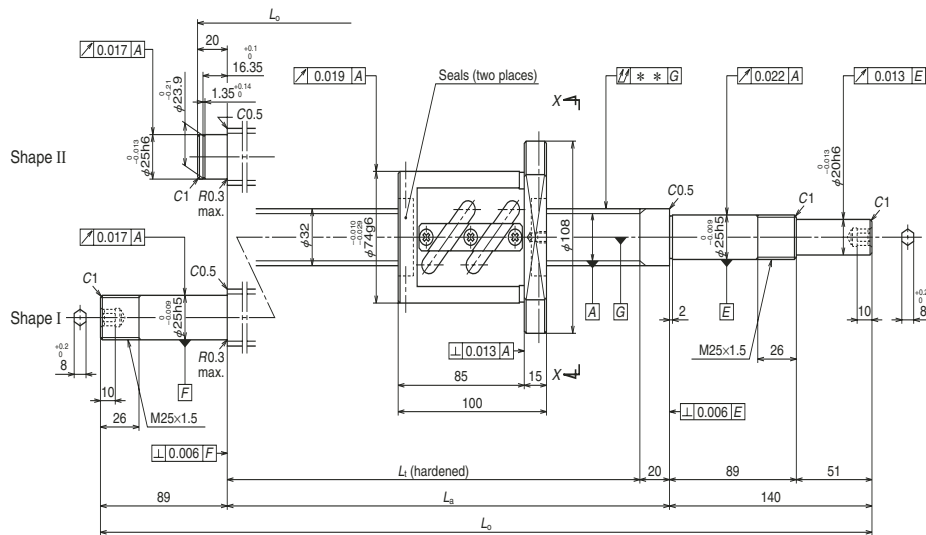
2. **Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.** See page D13 for details.

3. Contact NSK if the permissible rotational speed is to be exceeded.

Left side shaft end	Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	
	T	e <sub>p</sub>	v <sub>u</sub>			Supporting condition	
						Fixed - Simple support	Fixed - Fixed
II	-0.009	0.025	0.020	0.050	4.7	2 180	—
II	-0.014	0.030	0.023	0.060	5.8	2 180	—
I	-0.019	0.035	0.025	0.090	7.2	2 180	2 180
I	-0.024	0.040	0.027	0.090	8.3	2 180	2 180
I	-0.036	0.054	0.035	0.150	11.1	1 920	2 180

## Finished shaft end SA Type

(Fine lead)



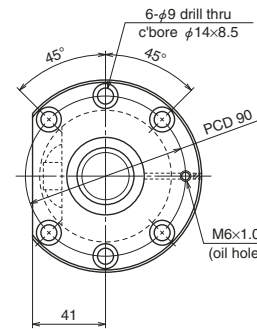
## Nut model: ZFT

**NSK**

Screw shaft  $\phi 32$

Lead 10

Unit: mm



View X-X

### Ball screw specifications

Shaft dia. x Lead / Direction of turn	32 x 10 / Right	
Preload / Ball recirculation	Z-preload / Return tube	
Ball dia. / Ball circle dia.	6.35 / 33	
Screw shaft root diameter	26.4	
Effective turns of balls	2.5 x 1	
Accuracy grade / Preload	C5 / Z	
Basic load rating (N)	Dynamic $C_d$	25 500
	Static $C_{0a}$	54 000
Preload (N)		1 960
Dynamic friction torque, median, (N·cm)		54.0
Spacer ball		None
Factory-packed grease		<b>Refer to Notes 2.</b>
Internal spatial volume of nut (cm <sup>3</sup> )		22
Standard volume of grease replenishing (cm <sup>3</sup> )		11

### Recommended support unit

**For drive side, for opposite to drive side (Fixed)**

WBK25DF-31H (round)

Unit: mm

Ball screw No.	Stroke		Screw shaft length		
	Nominal	Maximum ( $L_t$ —Nut length)	$L_t$	$L_a$	$L_0$
<b>W3203SA-6Z-C5Z10</b>	250	280	380	400	560
<b>W3204SA-3Z-C5Z10</b>	350	380	480	500	660
<b>W3205SA-6Z-C5Z10</b>	450	480	580	600	760
<b>W3206SA-3Z-C5Z10</b>	550	580	680	700	929
<b>W3207SA-6Z-C5Z10</b>	650	680	780	800	1 029
<b>W3209SA-6Z-C5Z10</b>	850	880	980	1 000	1 229
<b>W3211SA-5Z-C5Z10</b>	1 050	1 080	1 180	1 200	1 429
<b>W3214SA-6Z-C5Z10</b>	1 350	1 380	1 480	1 500	1 729
<b>W3217SA-1Z-C5Z10</b>	1 650	1 680	1 780	1 800	2 029

Left side shaft end	Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	
	$T$	$e_p$	$v_u$			Supporting condition	
						Fixed - Simple support	Fixed - Fixed
II	-0.009	0.025	0.020	0.050	5.5	2 180	—
II	-0.012	0.027	0.020	0.060	6.0	2 180	—
II	-0.014	0.030	0.023	0.060	6.6	2 180	—
I	-0.016	0.035	0.025	0.075	7.4	2 180	2 180
I	-0.019	0.035	0.025	0.090	7.9	2 180	2 180
I	-0.024	0.040	0.027	0.090	9.0	2 180	2 180
I	-0.028	0.046	0.030	0.120	10.1	2 180	2 180
I	-0.036	0.054	0.035	0.150	11.7	1 860	2 180
I	-0.043	0.065	0.040	0.200	13.3	1 280	1 820

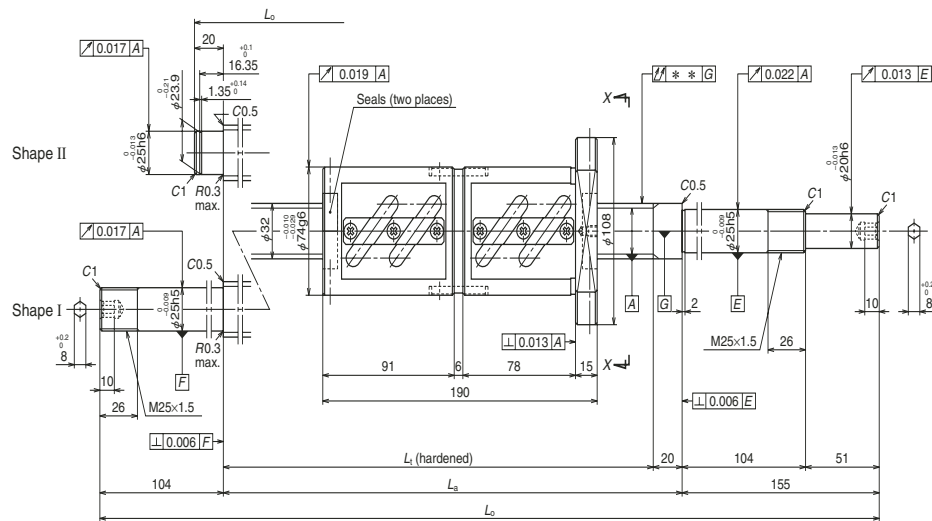
Notes: 1. We recommend NSK support unit. See page B389 for details.

2. Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use. See page D13 for details.

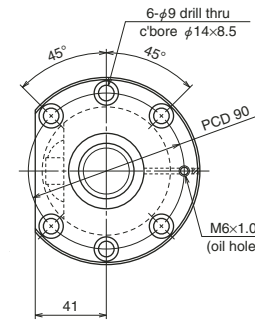
3. Contact NSK if the permissible rotational speed is to be exceeded.

## Finished shaft end SA Type

(Fine lead)



## Nut model: DFT



View X-X

**NSK**

Screw shaft  $\phi 32$

Lead 10

Unit: mm

### Ball screw specifications

Shaft dia. x Lead / Direction of turn	32 x 10 / Right	
Preload / Ball recirculation	D-preload / Return tube	
Ball dia. / Ball circle dia.	6.35 / 33	
Screw shaft root diameter	26.4	
Effective turns of balls	2.5 x 2	
Accuracy grade / Preload	C5 / Z	
Basic load rating (N)	Dynamic $C_d$	46 300
	Static $C_{0a}$	108 000
Preload (N)	3 230	
Dynamic friction torque, median, (N·cm)	83.0	
Spacer ball	None	
Factory-packed grease	<b>Refer to Notes 2.</b>	
Internal spatial volume of nut (cm <sup>3</sup> )	44	
Standard volume of grease replenishing (cm <sup>3</sup> )	22	

### Recommended support unit

**For drive side, for opposite to drive side (Fixed)**

WBK25DFD-31H (round)

Unit: mm

Ball screw No.	Stroke		Screw shaft length		
	Nominal	Maximum (L <sub>t</sub> —Nut length)	L <sub>t</sub>	L <sub>a</sub>	L <sub>o</sub>
<b>W3203SA-7D-C5Z10</b>	150	190	380	400	575
<b>W3204SA-4D-C5Z10</b>	250	290	480	500	675
<b>W3205SA-7D-C5Z10</b>	350	390	580	600	775
<b>W3206SA-4D-C5Z10</b>	450	490	680	700	959
<b>W3207SA-7D-C5Z10</b>	550	590	780	800	1 059
<b>W3209SA-7D-C5Z10</b>	750	790	980	1 000	1 259
<b>W3211SA-6D-C5Z10</b>	950	990	1 180	1 200	1 459
<b>W3214SA-7D-C5Z10</b>	1 250	1 290	1 480	1 500	1 759
<b>W3217SA-2D-C5Z10</b>	1 550	1 590	1 780	1 800	2 059

Notes: 1. We recommend NSK support unit. See page B389 for details.

2. **Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.** See page D13 for details.

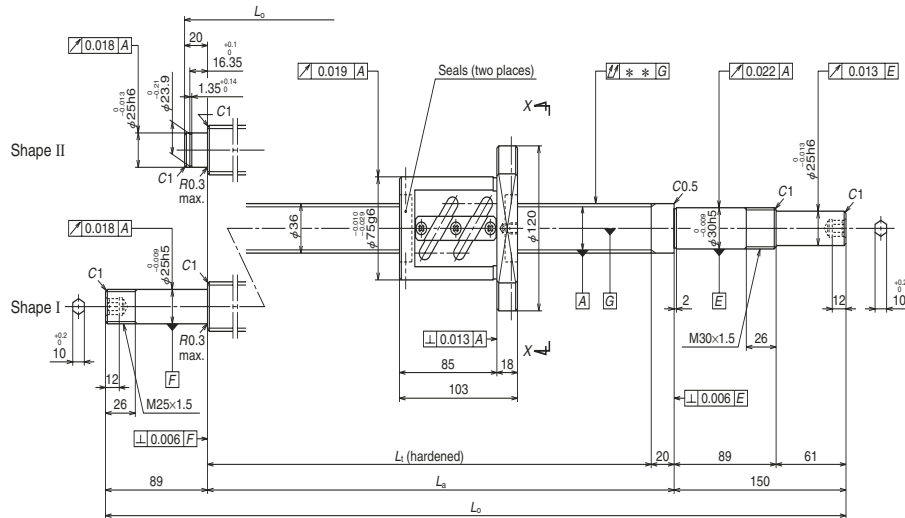
3. Contact NSK if the permissible rotational speed is to be exceeded.

Left side shaft end	Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	
	T	e <sub>o</sub>	v <sub>u</sub>			Supporting condition	
						Fixed - Simple support	Fixed - Fixed
II	-0.009	0.025	0.020	0.050	7.5	2 180	—
II	-0.012	0.027	0.020	0.060	8.1	2 180	—
II	-0.014	0.030	0.023	0.060	8.6	2 180	—
I	-0.016	0.035	0.025	0.075	9.5	2 180	2 180
I	-0.019	0.035	0.025	0.090	10.0	2 180	2 180
I	-0.024	0.040	0.027	0.120	11.1	2 180	2 180
I	-0.028	0.046	0.030	0.120	12.2	2 180	2 180
I	-0.036	0.054	0.035	0.150	13.8	1 980	2 180
I	-0.043	0.065	0.040	0.200	15.4	1 350	1 910



## Finished shaft end SA Type

(Fine lead)



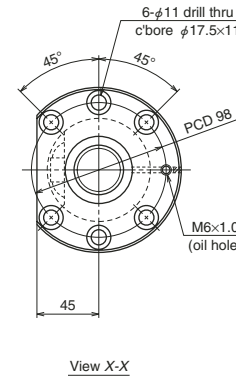
## Nut model: ZFT

**NSK**

Screw shaft  $\phi 36$

Lead 10

Unit: mm



Ball screw specifications		
Shaft dia. x Lead / Direction of turn	36 x 10 / Right	
Preload / Ball recirculation	Z-preload / Return tube	
Ball dia. / Ball circle dia.	6.35 / 37	
Screw shaft root diameter	30.4	
Effective turns of balls	2.5 x 1	
Accuracy grade / Preload	C5 / Z	
Basic load rating (N)	Dynamic $C_d$	27 200
	Static $C_0$	61 300
Preload (N)		2 060
Dynamic friction torque, median, (N·cm)		59.0
Spacer ball		None
Factory-packed grease		<b>Refer to Notes 2.</b>
Internal spatial volume of nut (cm <sup>3</sup> )		32
Standard volume of grease replenishing (cm <sup>3</sup> )		16

### Recommended support unit

For drive side (Fixed)	For opposite to drive side (Simple)
WBK30DF-31H (round)	WBK25DF-31H (round)

Unit: mm

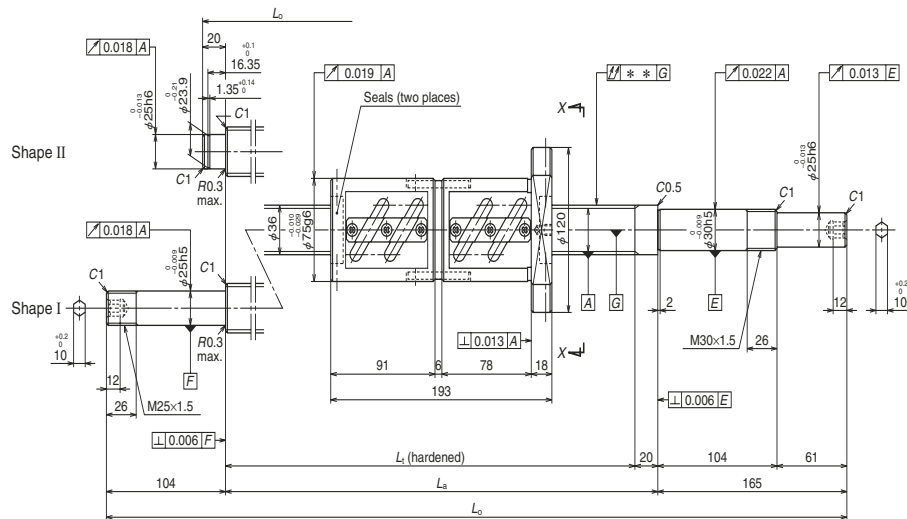
Ball screw No.	Stroke		Screw shaft length		
	Nominal	Maximum (L <sub>1</sub> —Nut length)	L <sub>1</sub>	L <sub>a</sub>	L <sub>0</sub>
<b>W3604SA-1Z-C5Z10</b>	350	377	480	500	670
<b>W3606SA-1Z-C5Z10</b>	550	577	680	700	870
<b>W3609SA-1Z-C5Z10</b>	850	877	980	1 000	1 239
<b>W3613SA-1Z-C5Z10</b>	1 250	1 277	1 380	1 400	1 639
<b>W3617SA-1Z-C5Z10</b>	1 650	1 677	1 780	1 800	2 039

Left side shaft end	Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	
	T	e <sub>p</sub>	v <sub>u</sub>			Supporting condition	
						Fixed - Simple support	Fixed - Fixed
II	-0.012	0.027	0.020	0.040	7.4	1 940	—
II	-0.016	0.035	0.025	0.050	8.8	1 940	—
I	-0.024	0.040	0.027	0.065	11.1	1 940	1 940
I	-0.033	0.054	0.035	0.100	13.9	1 940	1 940
I	-0.043	0.065	0.040	0.130	16.6	1 480	1 940

- Notes: 1. We recommend NSK support unit. See page B389 for details.  
 2. **Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.** See page D13 for details.  
 3. Contact NSK if the permissible rotational speed is to be exceeded.

## Finished shaft end SA Type

(Fine lead)



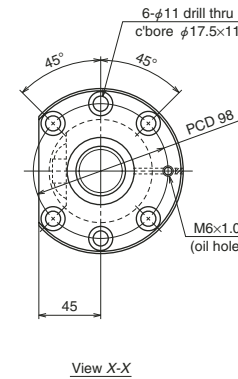
## Nut model: DFT

**NSK**

Screw shaft  $\phi 36$

Lead 10

Unit: mm



View X-X

### Ball screw specifications

Shaft dia. x Lead / Direction of turn	36 x 10 / Right	
Preload / Ball recirculation	D-preload / Return tube	
Ball dia. / Ball circle dia.	6.35 / 37	
Screw shaft root diameter	30.4	
Effective turns of balls	2.5 x 2	
Accuracy grade / Preload	C5 / Z	
Basic load rating (N)	Dynamic $C_d$	49 300
	Static $C_0$	123 000
Preload (N)	3 430	
Dynamic friction torque, median, (N-cm)	93.0	
Spacer ball	None	
Factory-packed grease	<b>Refer to Notes 2.</b>	
Internal spatial volume of nut (cm <sup>3</sup> )	64	
Standard volume of grease replenishing (cm <sup>3</sup> )	27	

### Recommended support unit

For drive side (Fixed)	For opposite to drive side (Fixed)
WBK30DFD-31H (round)	WBK25DFD-31H (round)

Unit: mm

Ball screw No.	Stroke		Screw shaft length		
	Nominal	Maximum ( $L_t$ —Nut length)	$L_t$	$L_a$	$L_b$
<b>W3604SA-2D-C5Z10</b>	250	287	480	500	685
<b>W3606SA-2D-C5Z10</b>	450	487	680	700	885
<b>W3609SA-2D-C5Z10</b>	750	787	980	1 000	1 269
<b>W3613SA-2D-C5Z10</b>	1 150	1 187	1 380	1 400	1 669
<b>W3617SA-2D-C5Z10</b>	1 550	1 587	1 780	1 800	2 069

Notes: 1. We recommend NSK support unit. See page B389 for details.

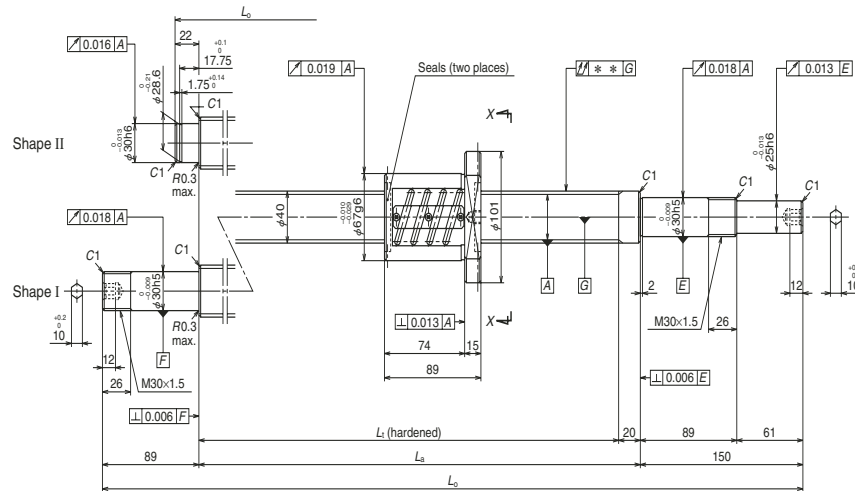
2. Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use. See page D13 for details.

3. Contact NSK if the permissible rotational speed is to be exceeded.

Left side shaft end	Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	
	$T$	$e_p$	$v_u$			Supporting condition	
						Fixed - Simple support	Fixed - Fixed
II	-0.012	0.027	0.020	0.040	9.3	1 940	—
II	-0.016	0.035	0.025	0.050	10.7	1 940	—
I	-0.024	0.040	0.027	0.080	13.1	1 940	1 940
I	-0.033	0.054	0.035	0.100	15.9	1 940	1 940
I	-0.043	0.065	0.040	0.130	18.6	1 540	1 940

## Finished shaft end SA Type

(Fine lead)



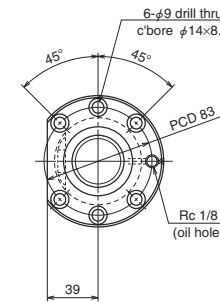
## Nut model: ZFT

**NSK**

Screw shaft ø40

Lead 5

Unit: mm



View X-X

### Ball screw specifications

Shaft dia. x Lead / Direction of turn	40 x 5 / Right	
Preload / Ball recirculation	Z-preload / Return tube	
Ball dia. / Ball circle dia.	3.175 / 40.5	
Screw shaft root diameter	37.2	
Effective turns of balls	2.5 x 2	
Accuracy grade / Preload	C5 / Z	
Basic load rating (N)	Dynamic $C_d$	20 200
	Static $C_{0a}$	70 600
Preload (N)	1 420	
Dynamic friction torque, median, (N·cm)	29.5	
Spacer ball	None	
Factory-packed grease	<b>Refer to Notes 2.</b>	
Internal spatial volume of nut (cm <sup>3</sup> )	14	
Standard volume of grease replenishing (cm <sup>3</sup> )	7	

### Recommended support unit

**For drive side, for opposite to drive side (Fixed)**

WBK30DF-31H (round)

Unit: mm

Ball screw No.	Stroke		Screw shaft length		
	Nominal	Maximum (L <sub>t</sub> —Nut length)	L <sub>t</sub>	L <sub>a</sub>	L <sub>0</sub>
<b>W4003SA-1Z-C5Z5</b>	250	291	380	400	572
<b>W4005SA-1Z-C5Z5</b>	450	491	580	600	772
<b>W4007SA-1Z-C5Z5</b>	650	691	780	800	1 039
<b>W4009SA-1Z-C5Z5</b>	850	891	980	1 000	1 239
<b>W4011SA-1Z-C5Z5</b>	1 050	1 091	1 180	1 200	1 439
<b>W4015SA-1Z-C5Z5</b>	1 450	1 491	1 580	1 600	1 839

Left side shaft end	Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	
	T	e <sub>p</sub>	v <sub>i</sub>			Supporting condition	
	Fixed - Simple support		Fixed - Fixed				
II	-0.009	0.025	0.020	0.035	6.3	1 750	—
II	-0.014	0.030	0.023	0.040	8.1	1 750	—
I	-0.019	0.035	0.025	0.065	10.3	1 750	1 750
I	-0.024	0.040	0.027	0.065	12.2	1 750	1 750
I	-0.028	0.046	0.030	0.080	14.0	1 750	1 750
I	-0.038	0.054	0.035	0.100	17.7	1 750	1 750

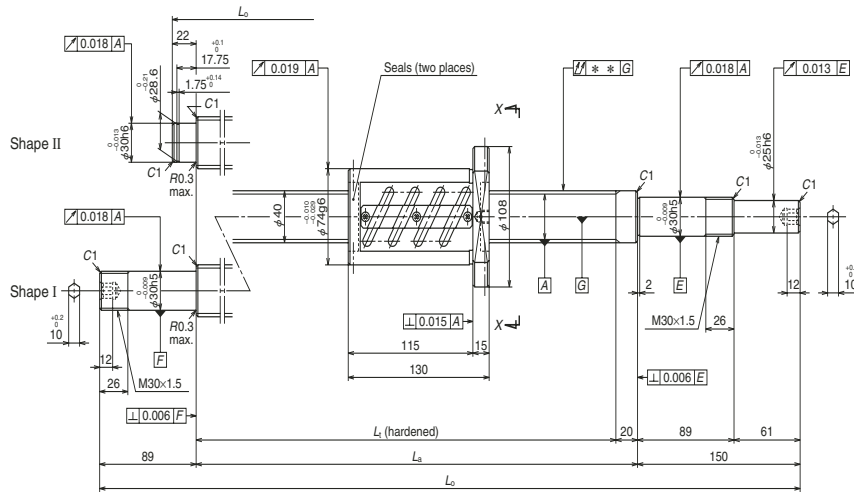
Notes: 1. We recommend NSK support unit. See page B389 for details.

2. **Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.** See page D13 for details.

3. Contact NSK if the permissible rotational speed is to be exceeded.

**Finished shaft end SA Type**

(Fine lead)



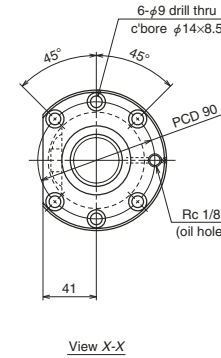
**Nut model: ZFT**

**NSK**

**Screw shaft ø40**

**Lead 8**

Unit: mm



**Ball screw specifications**

Shaft dia. x Lead / Direction of turn	40 x 8 / Right	
Preload / Ball recirculation	Z-preload / Return tube	
Ball dia. / Ball circle dia.	4.762 / 40.5	
Screw shaft root diameter	35.5	
Effective turns of balls	2.5 x 2	
Accuracy grade / Preload	C5 / Z	
Basic load rating (N)	Dynamic $C_d$	34 900
	Static $C_{0a}$	103 000
Preload (N)	2 450	
Dynamic friction torque, median, (N·cm)	64.0	
Spacer ball	None	
Factory-packed grease	<b>Refer to Notes 2.</b>	
Internal spatial volume of nut (cm <sup>3</sup> )	27	
Standard volume of grease replenishing (cm <sup>3</sup> )	14	

**Recommended support unit**

**For drive side, for opposite to drive side (Fixed)**

WBK30DF-31H (round)

Unit: mm

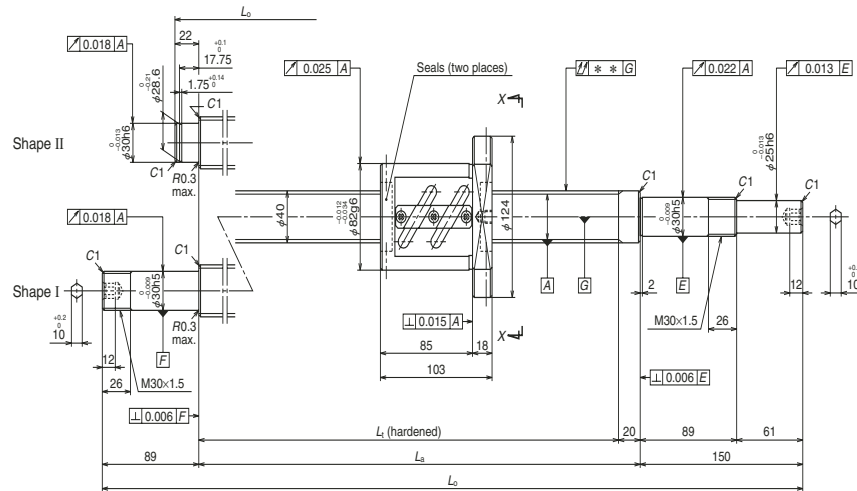
Ball screw No.	Stroke		Screw shaft length		
	Nominal	Maximum (L <sub>t</sub> —Nut length)	L <sub>t</sub>	L <sub>a</sub>	L <sub>o</sub>
<b>W4003SA-2Z-C5Z8</b>	200	250	380	400	572
<b>W4005SA-2Z-C5Z8</b>	400	450	580	600	772
<b>W4007SA-2Z-C5Z8</b>	600	650	780	800	1 039
<b>W4009SA-2Z-C5Z8</b>	800	850	980	1 000	1 239
<b>W4011SA-2Z-C5Z8</b>	1 000	1 050	1 180	1 200	1 439
<b>W4015SA-2Z-C5Z8</b>	1 400	1 450	1 580	1 600	1 839

Left side shaft end	Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	
	T	e <sub>p</sub>	v <sub>u</sub>			Supporting condition	
	Fixed - Simple support		Fixed - Fixed				
II	-0.009	0.025	0.020	0.035	7.4	1 750	—
II	-0.014	0.030	0.023	0.040	9.2	1 750	—
I	-0.019	0.035	0.025	0.065	11.3	1 750	1 750
I	-0.024	0.040	0.027	0.065	13.1	1 750	1 750
I	-0.028	0.046	0.030	0.080	14.9	1 750	1 750
I	-0.038	0.054	0.035	0.100	18.5	1 750	1 750

- Notes: 1. We recommend NSK support unit. See page B389 for details.  
 2. **Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.** See page D13 for details.  
 3. Contact NSK if the permissible rotational speed is to be exceeded.

## Finished shaft end SA Type

(Fine lead)



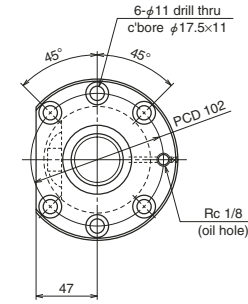
## Nut model: ZFT

**NSK**

Screw shaft ø40

Lead 10

Unit: mm



View X-X

### Ball screw specifications

Shaft dia. x Lead / Direction of turn	40 x 10 / Right	
Preload / Ball recirculation	Z-preload / Return tube	
Ball dia. / Ball circle dia.	6.35 / 41	
Screw shaft root diameter	34.4	
Effective turns of balls	2.5 x 1	
Accuracy grade / Preload	C5 / Z	
Basic load rating (N)	Dynamic $C_d$	28 600
	Static $C_0$	68 600
Preload (N)		2 160
Dynamic friction torque, median, (N·cm)		64.0
Spacer ball		None
Factory-packed grease		<b>Refer to Notes 2.</b>
Internal spatial volume of nut (cm <sup>3</sup> )		30
Standard volume of grease replenishing (cm <sup>3</sup> )		15

### Recommended support unit

**For drive side, for opposite to drive side (Fixed)**

WBK30DF-31H (round)

Unit: mm

Ball screw No.	Stroke		Screw shaft length		
	Nominal	Maximum (L <sub>t</sub> —Nut length)	L <sub>t</sub>	L <sub>a</sub>	L <sub>o</sub>
<b>W4004SA-1Z-C5Z10</b>	350	377	480	500	672
<b>W4005SA-3Z-C5Z10</b>	450	477	580	600	772
<b>W4006SA-1Z-C5Z10</b>	550	577	680	700	872
<b>W4007SA-3Z-C5Z10</b>	650	677	780	800	1 039
<b>W4009SA-3Z-C5Z10</b>	850	877	980	1 000	1 239
<b>W4011SA-3Z-C5Z10</b>	1 050	1 077	1 180	1 200	1 439
<b>W4013SA-1Z-C5Z10</b>	1 250	1 277	1 380	1 400	1 639
<b>W4015SA-3Z-C5Z10</b>	1 450	1 477	1 580	1 600	1 839
<b>W4017SA-1Z-C5Z10</b>	1 650	1 677	1 780	1 800	2 039
<b>W4023SA-1Z-C5Z10</b>	2 250	2 277	2 380	2 400	2 639

Notes: 1. We recommend NSK support unit. See page B389 for details.

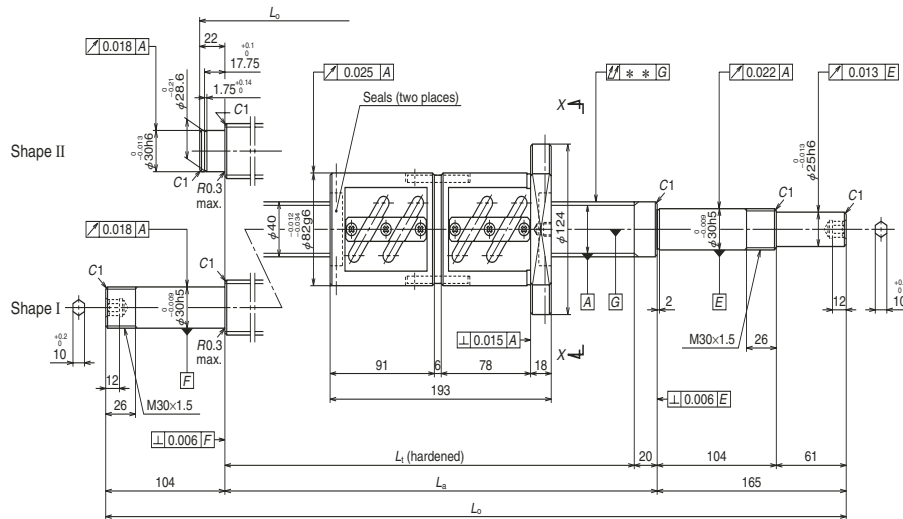
2. **Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.** See page D13 for details.

3. Contact NSK if the permissible rotational speed is to be exceeded.

Left side shaft end	Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	
	T	e <sub>p</sub>	v <sub>i</sub>			Supporting condition	
						Fixed - Simple support	Fixed - Fixed
II	-0.012	0.027	0.020	0.040	8.7	1 750	—
II	-0.014	0.030	0.023	0.040	9.6	1 750	—
II	-0.016	0.035	0.025	0.050	10.4	1 750	—
I	-0.019	0.035	0.025	0.065	11.7	1 750	1 750
I	-0.024	0.040	0.027	0.065	13.4	1 750	1 750
I	-0.028	0.046	0.030	0.080	15.1	1 750	1 750
I	-0.033	0.054	0.035	0.100	16.9	1 750	1 750
I	-0.038	0.054	0.035	0.100	18.6	1 750	1 750
I	-0.043	0.065	0.040	0.130	20.3	1 670	1 750
I	-0.057	0.077	0.046	0.170	25.5	930	1 320

## Finished shaft end SA Type

(Fine lead)



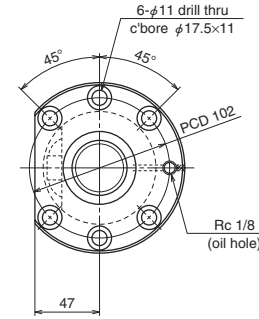
## Nut model: DFT

**NSK**

Screw shaft ø40

Lead 10

Unit: mm



View X-X

### Ball screw specifications

Shaft dia. x Lead / Direction of turn	40 x 10 / Right	
Preload / Ball recirculation	D-preload / Return tube	
Ball dia. / Ball circle dia.	6.35 / 41	
Screw shaft root diameter	34.4	
Effective turns of balls	2.5 x 2	
Accuracy grade / Preload	C5 / Z	
Basic load rating (N)	Dynamic $C_a$	52 000
	Static $C_{0a}$	137 000
Preload (N)	3 630	
Dynamic friction torque, median, (N·cm)	108	
Spacer ball	None	
Factory-packed grease	<b>Refer to Notes 2.</b>	
Internal spatial volume of nut (cm <sup>3</sup> )	59	
Standard volume of grease replenishing (cm <sup>3</sup> )	30	

### Recommended support unit

**For drive side, for opposite to drive side (Fixed)**

WBK30DFD-31H (round)

Unit: mm

Ball screw No.	Stroke		Screw shaft length		
	Nominal	Maximum ( $L_t$ —Nut length)	$L_t$	$L_a$	$L_0$
<b>W4004SA-2D-C5Z10</b>	250	287	480	500	687
<b>W4005SA-4D-C5Z10</b>	350	387	580	600	787
<b>W4006SA-2D-C5Z10</b>	450	487	680	700	887
<b>W4007SA-4D-C5Z10</b>	550	587	780	800	1 069
<b>W4009SA-4D-C5Z10</b>	750	787	980	1 000	1 269
<b>W4011SA-4D-C5Z10</b>	950	987	1 180	1 200	1 469
<b>W4013SA-2D-C5Z10</b>	1 150	1 187	1 380	1 400	1 669
<b>W4015SA-4D-C5Z10</b>	1 350	1 387	1 580	1 600	1 869
<b>W4017SA-2D-C5Z10</b>	1 550	1 587	1 780	1 800	2 069
<b>W4023SA-2D-C5Z10</b>	2 150	2 187	2 380	2 400	2 669

Notes: 1. We recommend NSK support unit. See page B389 for details.

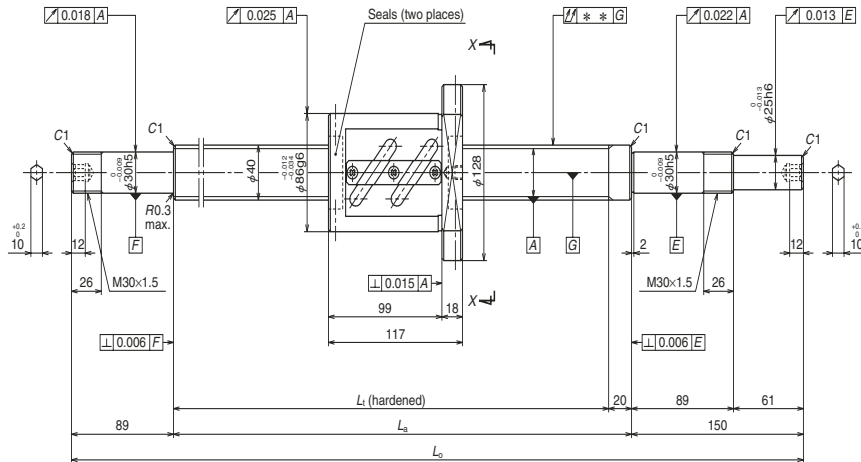
2. **Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.** See page D13 for details.

3. Contact NSK if the permissible rotational speed is to be exceeded.

Left side shaft end	Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	
	$T$	$e_p$	$v_u$			Supporting condition	
	Fixed - Simple support		Fixed - Fixed				
II	-0.012	0.027	0.020	0.040	11.0	1 750	—
II	-0.014	0.030	0.023	0.040	11.9	1 750	—
II	-0.016	0.035	0.025	0.050	12.7	1 750	—
I	-0.019	0.035	0.025	0.065	14.1	1 750	1 750
I	-0.024	0.040	0.027	0.080	15.8	1 750	1 750
I	-0.028	0.046	0.030	0.080	17.5	1 750	1 750
I	-0.033	0.054	0.035	0.100	19.3	1 750	1 750
I	-0.038	0.054	0.035	0.100	21.0	1 750	1 750
I	-0.043	0.065	0.040	0.130	22.7	1 750	1 750
I	-0.057	0.077	0.046	0.170	27.9	960	1 370

**Finished shaft end SA Type**

(Fine lead)



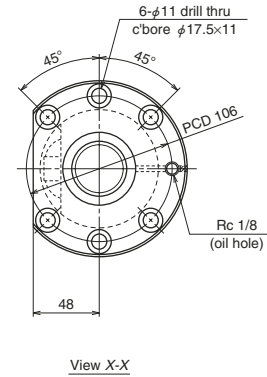
**Nut model: ZFT**

**NSK**

**Screw shaft ø40**

**Lead 12**

Unit: mm



Ball screw specifications		
Shaft dia. x Lead / Direction of turn	40 x 12 / Right	
Preload / Ball recirculation	Z-preload / Return tube	
Ball dia. / Ball circle dia.	7.144 / 41.5	
Screw shaft root diameter	34.1	
Effective turns of balls	2.5 x 1	
Accuracy grade / Preload	C5 / Z	
Basic load rating (N)	Dynamic $C_a$	33 600
	Static $C_{0a}$	77 500
Preload (N)	2 550	
Dynamic friction torque, median, (N·cm)	83.0	
Spacer ball	None	
Factory-packed grease	<b>Refer to Notes 2.</b>	
Internal spatial volume of nut (cm <sup>3</sup> )	33	
Standard volume of grease replenishing (cm <sup>3</sup> )	17	

**Recommended support unit**

For drive side, for opposite to drive side (Fixed)
WBK30DF-31H (round)

Unit: mm

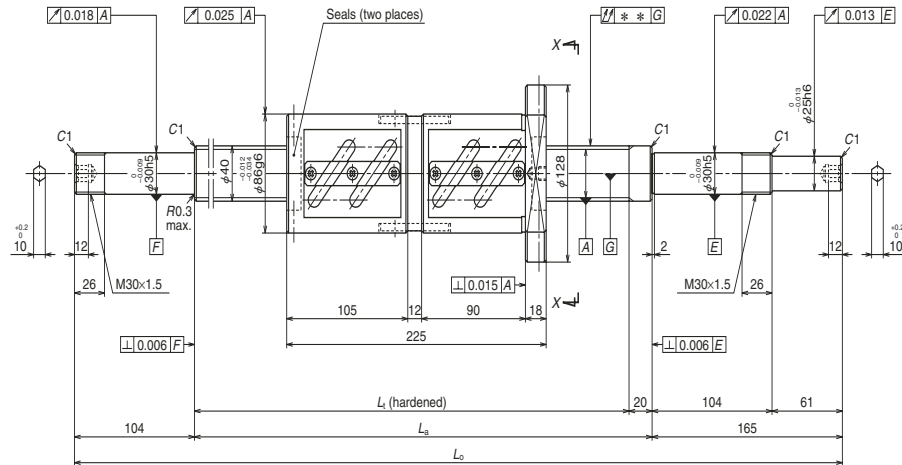
Ball screw No.	Stroke		Screw shaft length		
	Nominal	Maximum (Lt—Nut length)	L <sub>t</sub>	L <sub>a</sub>	L <sub>0</sub>
<b>W4006SA-3Z-C5Z12</b>	500	563	680	700	939
<b>W4009SA-5Z-C5Z12</b>	800	863	980	1 000	1 239
<b>W4013SA-3Z-C5Z12</b>	1 200	1 263	1 380	1 400	1 639
<b>W4017SA-3Z-C5Z12</b>	1 600	1 663	1 780	1 800	2 039
<b>W4024SA-1Z-C5Z12</b>	2 300	2 363	2 480	2 500	2 739

Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	
T	e <sub>p</sub>	v <sub>u</sub>			Supporting condition	
					Fixed - Simple support	Fixed - Fixed
-0.016	0.035	0.025	0.050	11.6	1 750	1 750
-0.024	0.040	0.027	0.065	14.2	1 750	1 750
-0.033	0.054	0.035	0.100	17.7	1 750	1 750
-0.043	0.065	0.040	0.130	21.2	1 670	1 750
-0.060	0.077	0.046	0.170	27.2	850	1 220

- Notes: 1. We recommend NSK support unit. See page B389 for details.  
 2. **Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.** See page D13 for details.  
 3. Contact NSK if the permissible rotational speed is to be exceeded.

## Finished shaft end SA Type

(Fine lead)



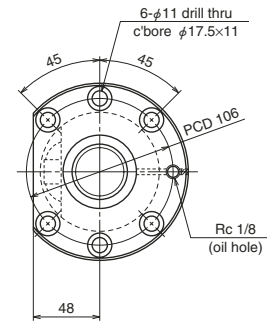
## Nut model: DFT

NSK

Screw shaft ø40

Lead 12

Unit: mm



View X-X

### Ball screw specifications

Shaft dia. x Lead / Direction of turn	40 x 12 / Right	
Preload / Ball recirculation	D-preload / Return tube	
Ball dia. / Ball circle dia.	7.144 / 41.5	
Screw shaft root diameter	34.1	
Effective turns of balls	2.5 x 2	
Accuracy grade / Preload	C5 / Z	
Basic load rating (N)	Dynamic $C_d$	61 000
	Static $C_{0a}$	155 000
Preload (N)	4 310	
Dynamic friction torque, median, (N·cm)	137	
Spacer ball	None	
Factory-packed grease	<b>Refer to Notes 2.</b>	
Internal spatial volume of nut (cm <sup>3</sup> )	76	
Standard volume of grease replenishing (cm <sup>3</sup> )	38	

### Recommended support unit

**For drive side, for opposite to drive side (Fixed)**

WBK30DFD-31H (round)

Unit: mm

Ball screw No.	Stroke		Screw shaft length		
	Nominal	Maximum ( $L_t$ —Nut length)	$L_t$	$L_a$	$L_o$
<b>W4006SA-4D-C5Z12</b>	400	455	680	700	969
<b>W4009SA-6D-C5Z12</b>	700	755	980	1 000	1 269
<b>W4013SA-4D-C5Z12</b>	1 100	1 155	1 380	1 400	1 669
<b>W4017SA-4D-C5Z12</b>	1 500	1 555	1 780	1 800	2 069
<b>W4024SA-2D-C5Z12</b>	2 200	2 255	2 480	2 500	2 769

Notes: 1. We recommend NSK support unit. See page B389 for details.

2. **Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.** See page D13 for details.

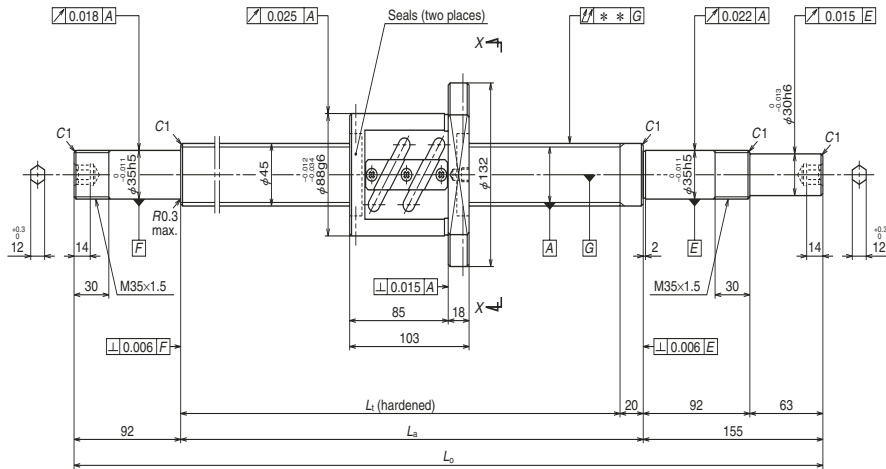
3. Contact NSK if the permissible rotational speed is to be exceeded.

Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	
$T$	$e_p$	$v_u$			Supporting condition	
					Fixed - Simple support	Fixed - Fixed
-0.016	0.035	0.025	0.050	14.8	1 750	1 750
-0.024	0.040	0.027	0.080	17.4	1 750	1 750
-0.033	0.054	0.035	0.100	20.9	1 750	1 750
-0.043	0.065	0.040	0.130	24.3	1 750	1 750
-0.060	0.077	0.046	0.170	30.4	880	1 260



## Finished shaft end SA Type

(Fine lead)



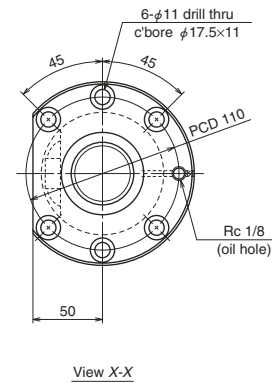
## Nut model: ZFT

NSK

Screw shaft ø45

Lead 10

Unit: mm



### Ball screw specifications

Shaft dia. x Lead / Direction of turn	45 x 10 / Right	
Preload / Ball recirculation	Z-preload / Return tube	
Ball dia. / Ball circle dia.	6.35 / 46	
Screw shaft root diameter	39.4	
Effective turns of balls	2.5 x 1	
Accuracy grade / Preload	C5 / Z	
Basic load rating (N)	Dynamic $C_d$	29 900
	Static $C_{0a}$	77 300
Preload (N)	2 260	
Dynamic friction torque, median, (N·cm)	69.0	
Spacer ball	None	
Factory-packed grease	<b>Refer to Notes 2.</b>	
Internal spatial volume of nut (cm <sup>3</sup> )	33	
Standard volume of grease replenishing (cm <sup>3</sup> )	17	

### Recommended support unit

For drive side, for opposite to drive side (Fixed)

WBK35DF-31H (round)

Unit: mm

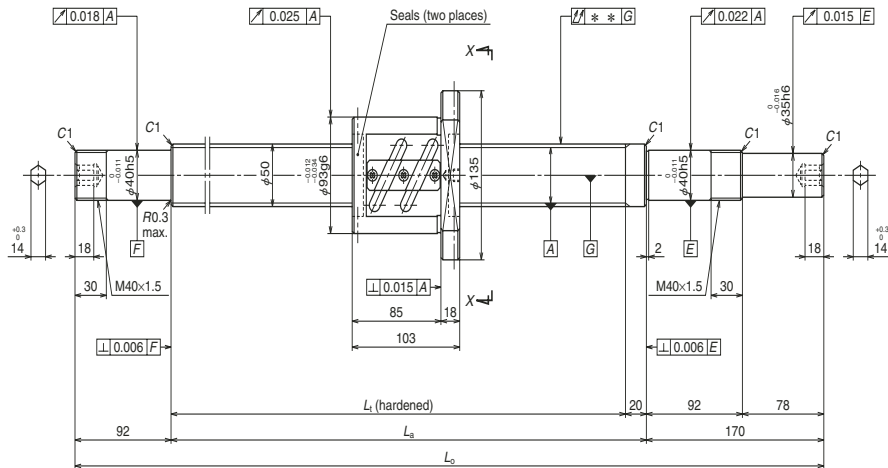
Ball screw No.	Stroke		Screw shaft length		
	Nominal	Maximum (L <sub>t</sub> —Nut length)	L <sub>t</sub>	L <sub>a</sub>	L <sub>0</sub>
<b>W4506SA-1Z-C5Z10</b>	550	577	680	700	947
<b>W4509SA-1Z-C5Z10</b>	850	877	980	1 000	1 247
<b>W4513SA-1Z-C5Z10</b>	1 250	1 277	1 380	1 400	1 647
<b>W4517SA-1Z-C5Z10</b>	1 650	1 677	1 780	1 800	2 047
<b>W4524SA-1Z-C5Z10</b>	2 350	2 377	2 480	2 500	2 747

- Notes: 1. We recommend NSK support unit. See page B389 for details.  
 2. **Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.** See page D13 for details.  
 3. Contact NSK if the permissible rotational speed is to be exceeded.

Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	
T	e <sub>p</sub>	v <sub>u</sub>			Supporting condition	
					Fixed - Simple support	Fixed - Fixed
-0.016	0.035	0.025	0.050	13.4	1 550	1 550
-0.024	0.040	0.027	0.065	16.7	1 550	1 550
-0.033	0.054	0.035	0.100	21.2	1 550	1 550
-0.043	0.065	0.040	0.130	25.6	1 550	1 550
-0.060	0.077	0.046	0.170	33.4	980	1 400

## Finished shaft end SA Type

(Fine lead)



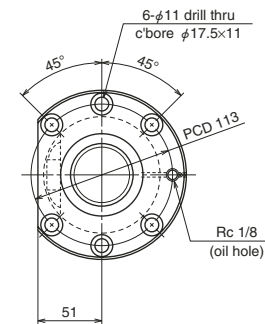
## Nut model: ZFT

**NSK**

Screw shaft ø50

Lead 10

Unit: mm



View X-X

### Ball screw specifications

Shaft dia. x Lead / Direction of turn	50 x 10 / Right	
Preload / Ball recirculation	Z-preload / Return tube	
Ball dia. / Ball circle dia.	6.35 / 51	
Screw shaft root diameter	44.4	
Effective turns of balls	2.5 x 1	
Accuracy grade / Preload	C5 / Z	
Basic load rating (N)	Dynamic $C_a$	31 800
	Static $C_{0a}$	87 400
Preload (N)	2 450	
Dynamic friction torque, median, (N·cm)	79.0	
Spacer ball	None	
Factory-packed grease	Refer to Notes 2.	
Internal spatial volume of nut (cm <sup>3</sup> )	37	
Standard volume of grease replenishing (cm <sup>3</sup> )	19	

### Recommended support unit

For drive side, for opposite to drive side (Fixed)

WBK40DF-31H (round)

Unit: mm

Ball screw No.	Stroke		Screw shaft length		
	Nominal	Maximum ( $L_t$ —Nut length)	$L_t$	$L_a$	$L_0$
<b>W5005SA-1Z-C5Z10</b>	450	477	580	600	862
<b>W5007SA-1Z-C5Z10</b>	650	677	780	800	1 062
<b>W5009SA-1Z-C5Z10</b>	850	877	980	1 000	1 262
<b>W5011SA-1Z-C5Z10</b>	1 050	1 077	1 180	1 200	1 462
<b>W5014SA-1Z-C5Z10</b>	1 350	1 377	1 480	1 500	1 762
<b>W5019SA-1Z-C5Z10</b>	1 850	1 877	1 980	2 000	2 262
<b>W5025SA-1Z-C5Z10</b>	2 450	2 477	2 580	2 600	2 862

Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	
$T$	$e_p$	$v_u$			Supporting condition	
					Fixed - Simple support	Fixed - Fixed
-0.014	0.030	0.023	0.050	14.8	1 400	1 400
-0.019	0.035	0.025	0.065	17.6	1 400	1 400
-0.024	0.040	0.027	0.080	20.3	1 400	1 400
-0.028	0.046	0.030	0.080	23.1	1 400	1 400
-0.036	0.054	0.035	0.100	27.3	1 400	1 400
-0.048	0.065	0.040	0.130	34.2	1 400	1 400
-0.062	0.093	0.054	0.170	42.5	1 020	1 400

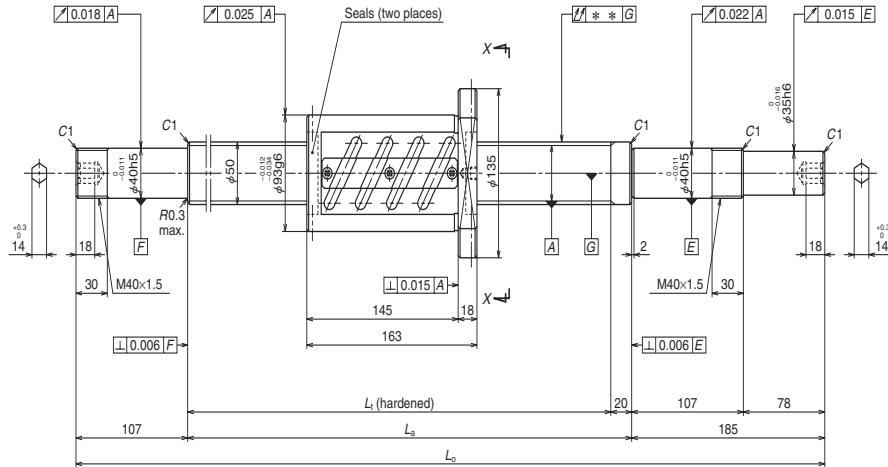
Notes: 1. We recommend NSK support unit. See page B389 for details.

2. Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use. See page D13 for details.

3. Contact NSK if the permissible rotational speed is to be exceeded.

## Finished shaft end SA Type

(Fine lead)



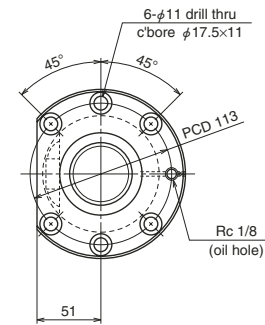
## Nut model: ZFT

**NSK**

Screw shaft ø50

Lead 10

Unit: mm



View X-X

### Ball screw specifications

Shaft dia. x Lead / Direction of turn	50 x 10 / Right	
Preload / Ball recirculation	Z-preload / Return tube	
Ball dia. / Ball circle dia.	6.35 / 51	
Screw shaft root diameter	44.4	
Effective turns of balls	2.5 x 2	
Accuracy grade / Preload	C5 / Z	
Basic load rating (N)	Dynamic $C_d$	57 700
	Static $C_{0a}$	175 000
Preload (N)	4 020	
Dynamic friction torque, median, (N·cm)	137	
Spacer ball	None	
Factory-packed grease	<b>Refer to Notes 2.</b>	
Internal spatial volume of nut (cm <sup>3</sup> )	59	
Standard volume of grease replenishing (cm <sup>3</sup> )	30	

### Recommended support unit

**For drive side, for opposite to drive side (Fixed)**

WBK40DFD-31H (round)

Unit: mm

Ball screw No.	Stroke		Screw shaft length		
	Nominal	Maximum ( $L_1$ —Nut length)	$L_1$	$L_a$	$L_0$
<b>W5005SA-2Z-C5Z10</b>	350	417	580	600	892
<b>W5007SA-2Z-C5Z10</b>	550	617	780	800	1 092
<b>W5009SA-2Z-C5Z10</b>	750	817	980	1 000	1 292
<b>W5011SA-2Z-C5Z10</b>	950	1 017	1 180	1 200	1 492
<b>W5014SA-2Z-C5Z10</b>	1 250	1 317	1 480	1 500	1 792
<b>W5019SA-2Z-C5Z10</b>	1 750	1 817	1 980	2 000	2 292
<b>W5025SA-2Z-C5Z10</b>	2 350	2 417	2 580	2 600	2 892

Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	
$T$	$e_p$	$v_u$			Supporting condition	
					Fixed - Simple support	Fixed - Fixed
-0.014	0.030	0.023	0.050	16.8	1 400	1 400
-0.019	0.035	0.025	0.065	19.6	1 400	1 400
-0.024	0.040	0.027	0.080	22.3	1 400	1 400
-0.028	0.046	0.030	0.080	25.1	1 400	1 400
-0.036	0.054	0.035	0.100	29.3	1 400	1 400
-0.048	0.065	0.040	0.130	36.2	1 400	1 400
-0.062	0.093	0.054	0.170	44.6	1 040	1 400

Notes: 1. We recommend NSK support unit. See page B389 for details.

2. **Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.** See page D13 for details.

3. Contact NSK if the permissible rotational speed is to be exceeded.

**B-3-1.4 Finished Shaft End Ball Screws Made of Stainless Steel KA Type**

**1. Order of the dimension tables**

The tables begin with the smallest shaft diameter ball screw, and proceeds to larger sizes. If ball screws have the same shaft diameter, those with smaller leads appear first. Page numbers of shaft diameter and lead combinations are shown in **Table 1**.

**2. Dimension tables**

The dimension tables show shapes/sizes as well as specification factors of each shaft diameter/lead combination. Tables also contain data as follows:

**●Stroke**

Nominal stroke : A reference for your use.  
Maximum stroke: The stroke limit that the nut can move.

**●Lead accuracy**

Lead accuracy is C3 and C5 grades.

- $T$  : Travel compensation
- $e_p$ : Tolerance on specified travel
- $v_v$ : Travel variation

See "Technical Description: Lead Accuracy" (page B37) for details of the codes.

**●Permissible rotational speed**

$d \cdot n$  : Limited by the relative peripheral speed between screw shaft and nut.

Critical speed: Limited by the natural frequency of a ball screw shaft. Critical speed depends on the supporting condition of screw shaft.

The lower of the two criteria, the  $d \cdot n$  and critical speed, will determine the overall permissible rotational speed of the ball screw. For details, see "Technical Description: Permissible Rotational Speed" (page B47).

**3. Material**

A martensitic stainless steel is used. A special heat treatment technology provides the ball groove section with sufficient hardness which produces high load carrying capacity and durability.

**4. Other**

Seal of the ball screw, ball recirculating deflector, and end cap are made of synthetic resin. Consult NSK when using the ball screws under extreme environments or special environments, or using special lubricant or oil. For special environments, see pages B70 and D2. See pages B67 and D13 for lubricants. Note: For details of standard stock products, contact NSK.

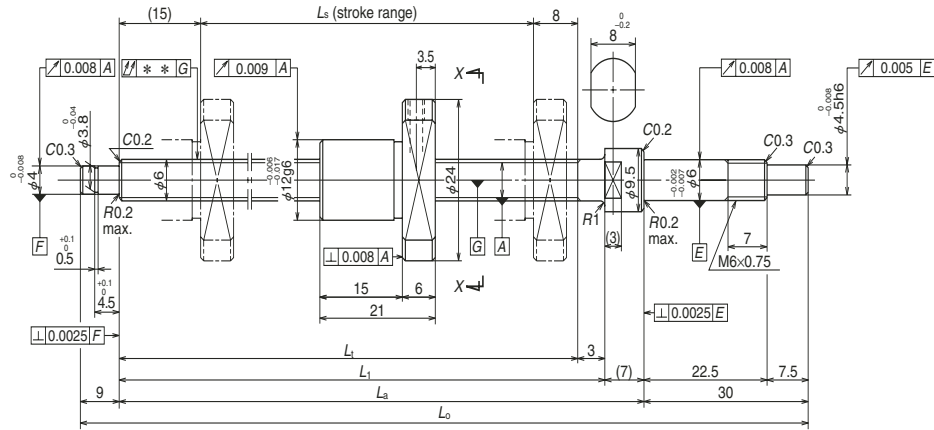
**Table 1 Combinations of screw shaft diameter and lead**

Screw shaft diameter (mm)	Lead (mm)	
	1	2
6	B275	
8	B277	B279
10		B281
12		B285
15		
16		B295
20		

4	5	10	20
B283			
	B287	B289	
		B291	B293
			B297

**Finished shaft end stainless steel product KA Type**

(Fine lead)



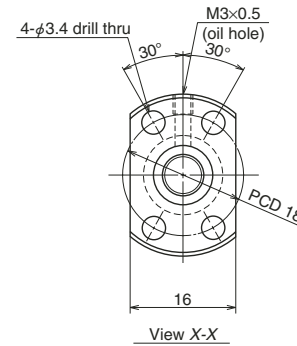
**Nut model: MPFD**

**NSK**

Screw shaft ø6

Lead 1

Unit: mm



**Ball screw specifications**

Shaft dia. x Lead / Direction of turn	6 × 1 / Right	
Preload / Ball recirculation	P-preload / Deflector (bridge)	
Ball dia. / Ball circle dia.	0.800 / 6.2	
Screw shaft root diameter	5.2	
Effective turns of balls	1 × 3	
Accuracy grade / Preload	C3 / Z	
Basic load rating (N)	Dynamic $C_a$	470
	Static $C_{0a}$	680
Axial play	0	
Preload (N)	24.5	
Dynamic friction torque, (N·cm)	1.3 or less	
Spacer ball	None	
Factory-packed grease	<b>Refer to Notes 1.</b>	

Unit: mm

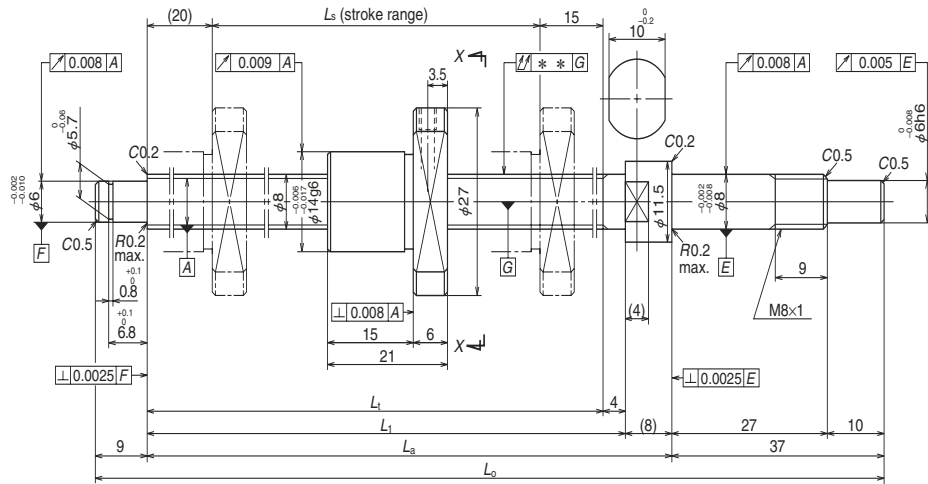
Ball screw No.	Stroke $L_s$		Thread length			
	Nominal	Maximum	$L_1$	$L_1$	$L_a$	$L_o$
<b>W0601KA-3PY-C3Z1</b>	100	102	125	128	135	174

Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	
T	$e_p$	$v_u$			Supporting condition	
0	0.010	0.008	0.025	0.06	Fixed - Simple support 3 000	

- Notes:
1. Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use. See page D13 for details. Use of NSK Clean Grease LG2 is recommended.
  2. Ball nut does not have seal.
  3. Contact NSK if the permissible rotational speed is to be exceeded.

**Finished shaft end stainless steel product KA Type**

(Fine lead)



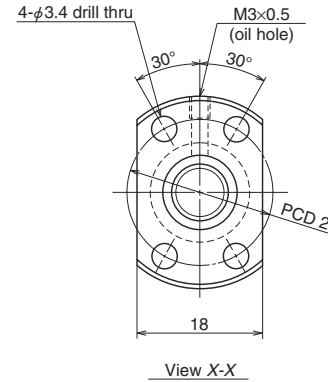
**Nut model: MPFD**

**NSK**

**Screw shaft ø8**

**Lead 1**

Unit: mm



Ball screw specifications		
Shaft dia. x Lead / Direction of turn	8 x 1 / Right	
Preload / Ball recirculation	P-preload / Deflector (bridge)	
Ball dia. / Ball circle dia.	0.800 / 8.2	
Screw shaft root diameter	7.2	
Effective turns of balls	1 x 3	
Accuracy grade / Preload	C3 / Z	
Basic load rating (N)	Dynamic $C_a$	545
	Static $C_{0a}$	955
Axial play		0
Preload (N)		29.4
Dynamic friction torque, (N·cm)		1.8 or less
Spacer ball		None
Factory-packed grease		<b>Refer to Notes 1.</b>

**Recommended support unit**

For drive side (Fixed)	For opposite to drive side (Free)
WBK08-01C (square, clean)	WBK08S-01C (square, clean)
WBK08-11C (round, clean)	

Unit: mm

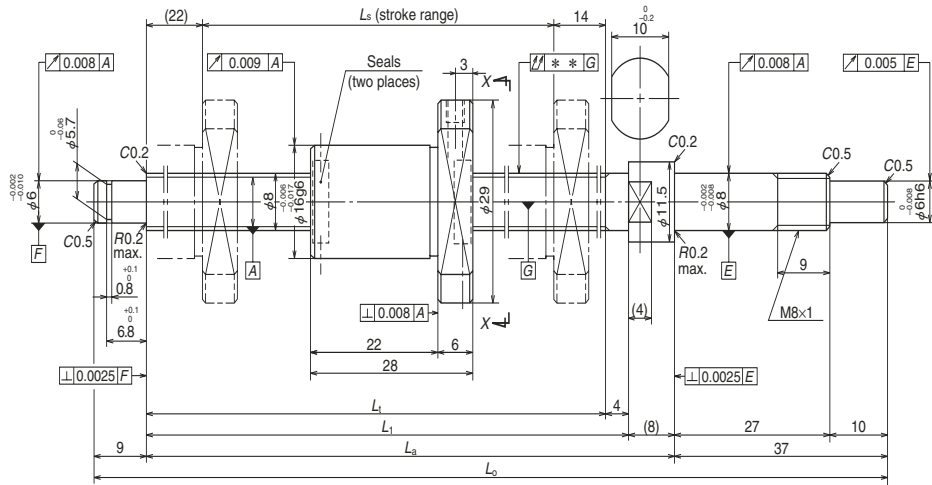
Ball screw No.	Stroke $L_s$		Thread length			
	Nominal	Maximum	$L_1$	$L_1$	$L_a$	$L_o$
<b>W0802KA-1PY-C3Z1</b>	150	155	190	194	202	248

Lead accuracy			Shaft run-out ** $\mu$	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )
$T$	$e_p$	$v_u$			Supporting condition
0	0.010	0.008	0.035	0.12	Fixed - Simple support 3 000

- Notes: **1. Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.**  
 See page D13 for details.  
 Use of NSK Clean Grease LG2 is recommended.  
**2.** Ball nut does not have seal.  
**3.** Contact NSK if the permissible rotational speed is to be exceeded.

**Finished shaft end stainless steel product KA Type**

(Fine lead)



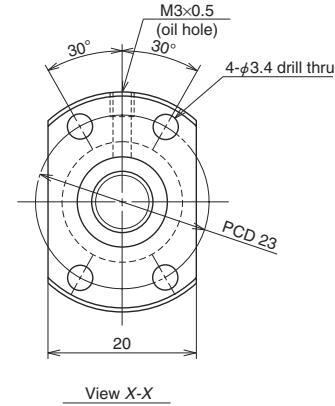
**Nut model: MPFD**

**NSK**

**Screw shaft ø8**

**Lead 2**

Unit: mm



**Ball screw specifications**

Shaft dia. x Lead / Direction of turn	8 × 2 / Right	
Preload / Ball recirculation	P-preload / Deflector (bridge)	
Ball dia. / Ball circle dia.	1.200 / 8.3	
Screw shaft root diameter	6.9	
Effective turns of balls	1 × 3	
Accuracy grade / Preload	C3 / Z	
Basic load rating (N)	Dynamic $C_a$	1 080
	Static $C_{0a}$	1 630
Axial play	0	
Preload (N)	49.0	
Dynamic friction torque, (N·cm)	2.0 or less	
Spacer ball	None	
Factory-packed grease	<b>Refer to Notes 1.</b>	
Internal spatial volume of nut (cm <sup>3</sup> )	0.34	
Standard volume of grease replenishing (cm <sup>3</sup> )	0.17	

**Recommended support unit**

For drive side (Fixed)	For opposite to drive side (Free)
WBK08-01C (square, clean)	WBK08S-01C (square, clean)
WBK08-11C (round, clean)	

Unit: mm

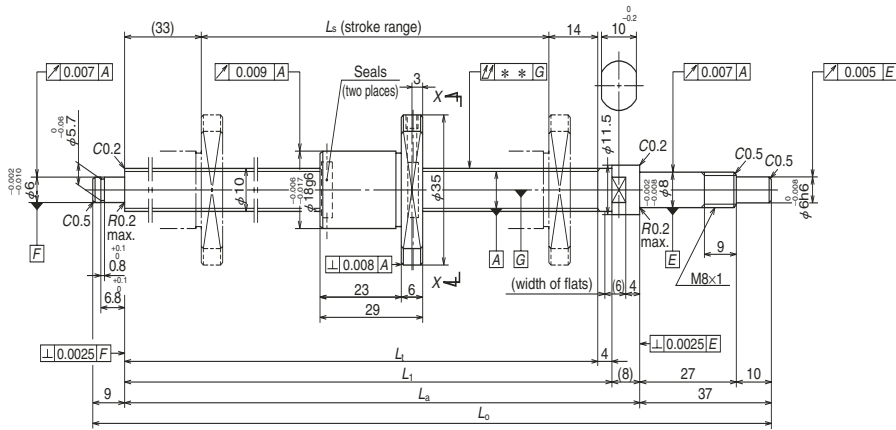
Ball screw No.	Stroke $L_s$		Thread length			
	Nominal	Maximum	$L_1$	$L_1$	$L_a$	$L_o$
<b>W0802KA-5PY-C3Z2</b>	150	154	190	194	202	248

Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )
T	$e_p$	$v_u$			Supporting condition
0	0.010	0.008	0.035	0.13	Fixed - Simple support 3 000

- Notes:
1. Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use. See page D13 for details. Use of NSK Clean Grease LG2 is recommended.
  2. Contact NSK if the permissible rotational speed is to be exceeded.

**Finished shaft end stainless steel product KA Type**

(Fine lead)



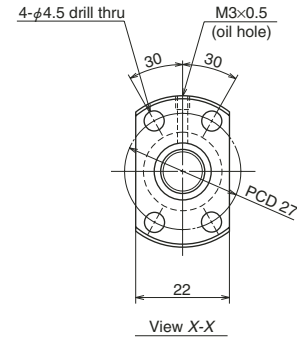
**Nut model: MPFD**

**NSK**

**Screw shaft ø10**

**Lead 2**

Unit: mm



**Ball screw specifications**

Shaft dia. x Lead / Direction of turn	10 x 2 / Right	
Preload / Ball recirculation	P-preload / Deflector (bridge)	
Ball dia. / Ball circle dia.	1.200 / 10.3	
Screw shaft root diameter	8.9	
Effective turns of balls	1 x 3	
Accuracy grade / Preload	C3 / Z	
Basic load rating (N)	Dynamic $C_a$	1 210
	Static $C_{0a}$	2 110
Axial play		0
Preload (N)		58.8
Dynamic friction torque, (N·cm)		0.10 – 2.5
Spacer ball		None
Factory-packed grease		<b>Refer to Notes 1.</b>
Internal spatial volume of nut (cm <sup>3</sup> )		0.44
Standard volume of grease replenishing (cm <sup>3</sup> )		0.22

**Recommended support unit**

For drive side (Fixed)	For opposite to drive side (Free)
WBK08-01C (square, clean)	WBK08S-01C (square, clean)
WBK08-11C (round, clean)	

Unit: mm

Ball screw No.	Stroke $L_s$		Thread length			
	Nominal	Maximum	$L_1$	$L_1$	$L_3$	$L_0$
<b>W1002KA-3PY-C3Z2</b>	200	203	250	254	262	308

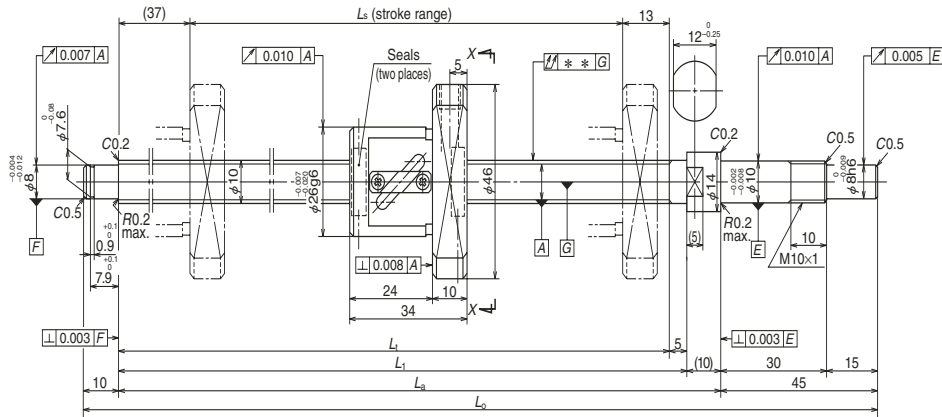
Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )
$T$	$e_p$	$v_u$			Supporting condition
0	0.012	0.008	0.030	0.22	Fixed - Simple support 3 000

- Notes:
- 1. Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.**  
See page D13 for details.  
Use of NSK Clean Grease LG2 is recommended.
  2. Contact NSK if the permissible rotational speed is to be exceeded.



**Finished shaft end stainless steel product KA Type**

(Fine lead)



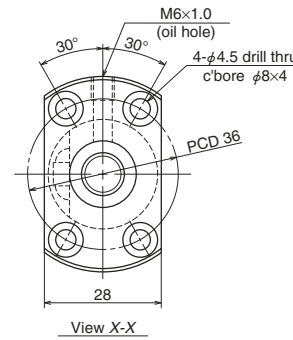
**Nut model: PFT**

**NSK**

**Screw shaft ø10**

**Lead 4**

Unit: mm



**Ball screw specifications**

Shaft dia. x Lead / Direction of turn	10 x 4 / Right	
Preload / Ball recirculation	P-preload / Return tube	
Ball dia. / Ball circle dia.	2.000 / 10.3	
Screw shaft root diameter	8.2	
Effective turns of balls	2.5 x 1	
Accuracy grade / Preload	C3 / Z	
Basic load rating (N)	Dynamic $C_d$	2 250
	Static $C_{0s}$	3 290
Axial play		0
Preload (N)		98.1
Dynamic friction torque, (N·cm)		0.5 – 3.9
Spacer ball		None
Factory-packed grease		<b>Refer to Notes 1.</b>
Internal spatial volume of nut (cm <sup>3</sup> )		0.8
Standard volume of grease replenishing (cm <sup>3</sup> )		0.4

**Recommended support unit**

For drive side (Fixed)	For opposite to drive side (Free)
WBK10-01C (square, clean)	WBK10S-01C (square, clean)
WBK10-11C (round, clean)	

Unit: mm

Ball screw No.	Stroke $L_s$		Thread length			
	Nominal	Maximum	$L_1$	$L_1$	$L_a$	$L_o$
<b>W1001KA-3P-C3Z4</b>	100	110	160	165	175	230
<b>W1003KA-3P-C3Z4</b>	300	310	360	365	375	430

Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )
$T$	$e_p$	$v_u$			Supporting condition
0	0.010	0.008	0.030	0.29	3 000
0	0.013	0.008	0.050	0.39	3 000

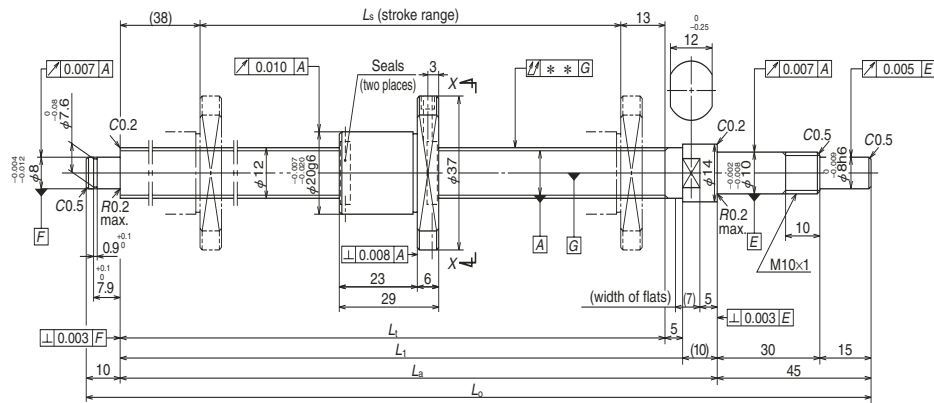
Notes: **1. Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.**

See page D13 for details.  
Use of NSK Clean Grease LG2 is recommended.

2. Contact NSK if the permissible rotational speed is to be exceeded.

**Finished shaft end stainless steel product KA Type**

(Fine lead)



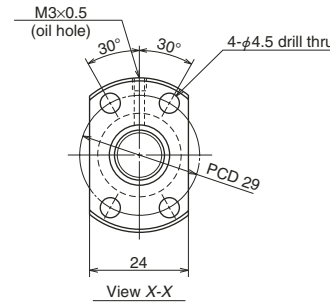
**Nut model: MPFD**

**NSK**

**Screw shaft ø12**

**Lead 2**

Unit: mm



**Ball screw specifications**

Shaft dia. x Lead / Direction of turn	12 x 2 / Right	
Preload / Ball recirculation	P-preload / Deflector (bridge)	
Ball dia. / Ball circle dia.	1.200 / 12.3	
Screw shaft root diameter	10.9	
Effective turns of balls	1 x 3	
Accuracy grade / Preload	C3 / Z	
Basic load rating (N)	Dynamic $C_a$	1 360
	Static $C_{0a}$	2 680
Axial play	0	
Preload (N)	98.1	
Dynamic friction torque, (N·cm)	0.4 – 3.4	
Spacer ball	None	
Factory-packed grease	<b>Refer to Notes 1.</b>	
Internal spatial volume of nut (cm <sup>3</sup> )	0.53	
Standard volume of grease replenishing (cm <sup>3</sup> )	0.27	

**Recommended support unit**

For drive side (Fixed)	For opposite to drive side (Free)
WBK10-01C (square, clean)	WBK10S-01C (square, clean)
WBK10-11C (round, clean)	

Unit: mm

Ball screw No.	Stroke $L_s$		Thread length			
	Nominal	Maximum	$L_1$	$L_1$	$L_a$	$L_o$
<b>W1201KA-3PY-C3Z2</b>	100	109	160	165	175	230
<b>W1203KA-1PY-C3Z2</b>	250	259	310	315	325	380

Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )
$T$	$e_p$	$v_u$			Supporting condition
0	0.010	0.008	0.030	0.24	3 000
0	0.012	0.008	0.040	0.36	3 000

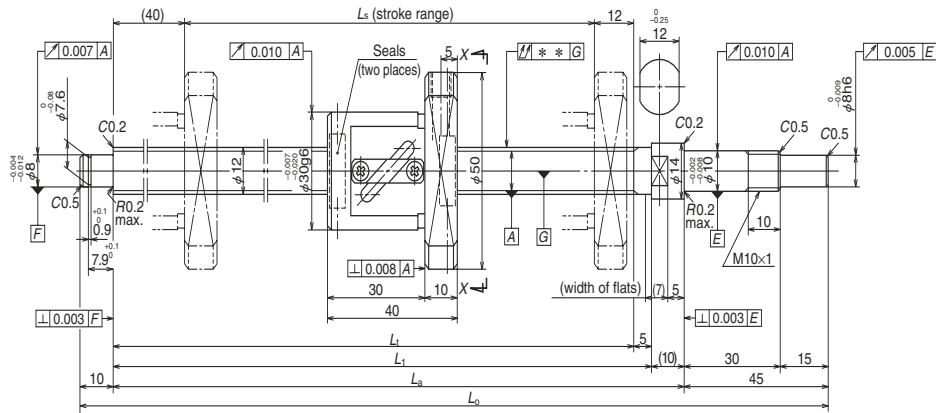
Notes: **1. Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.**

See page D13 for details.  
Use of NSK Clean Grease LG2 is recommended.

2. Contact NSK if the permissible rotational speed is to be exceeded.

**Finished shaft end stainless steel product KA Type**

(Fine lead)



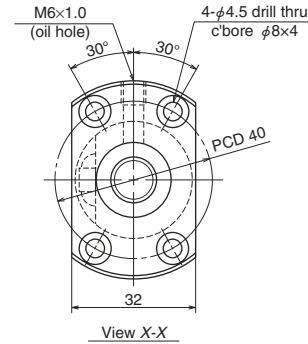
**Nut model: PFT**

**NSK**

**Screw shaft ø12**

**Lead 5**

Unit: mm



**Ball screw specifications**

Shaft dia. x Lead / Direction of turn	12 x 5 / Right	
Preload / Ball recirculation	P-preload / Return tube	
Ball dia. / Ball circle dia.	2.381 / 12.3	
Screw shaft root diameter	9.8	
Effective turns of balls	2.5 x 1	
Accuracy grade / Preload	C3 / Z	
Basic load rating (N)	Dynamic $C_d$	3 070
	Static $C_{0s}$	4 670
Axial play		0
Preload (N)		98.1
Dynamic friction torque, (N·cm)		1.0 – 4.4
Spacer ball		None
Factory-packed grease		<b>Refer to Notes 1.</b>
Internal spatial volume of nut (cm <sup>3</sup> )		1.2
Standard volume of grease replenishing (cm <sup>3</sup> )		0.6

**Recommended support unit**

For drive side (Fixed)	For opposite to drive side (Free)
WBK10-01C (square, clean)	WBK10S-01C (square, clean)
WBK10-11C (round, clean)	

Unit: mm

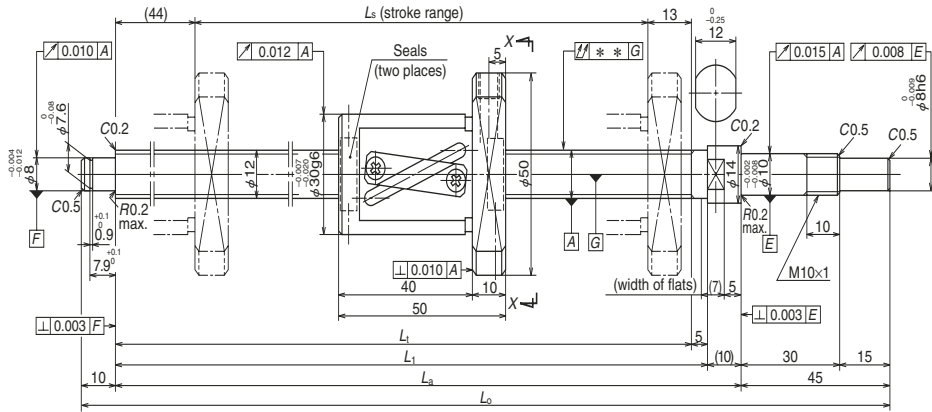
Ball screw No.	Stroke $L_s$		Thread length			
	Nominal	Maximum	$L_1$	$L_1$	$L_a$	$L_o$
<b>W1202KA-3P-C3Z5</b>	200	208	260	265	275	330
<b>W1205KA-1P-C3Z5</b>	450	458	510	515	525	580

Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )
$T$	$e_p$	$v_u$			Supporting condition
0	0.012	0.008	0.040	0.47	3 000
0	0.016	0.012	0.065	0.66	3 000

- Notes:
1. Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use. See page D13 for details. Use of NSK Clean Grease LG2 is recommended.
  2. Contact NSK if the permissible rotational speed is to be exceeded.

**Finished shaft end stainless steel product KA Type**

(Medium lead)



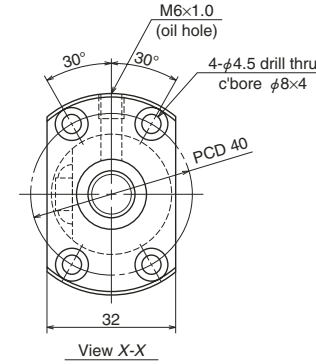
**Nut model: LPFT**

**NSK**

**Screw shaft  $\phi 12$**

**Lead 10**

Unit: mm



**Ball screw specifications**

Shaft dia. x Lead / Direction of turn	12 x 10 / Right	
Preload / Ball recirculation	P-preload / Return tube	
Ball dia. / Ball circle dia.	2.381 / 12.5	
Screw shaft root diameter	10.0	
Effective turns of balls	2.5 x 1	
Accuracy grade / Preload	C5 / Z	
Basic load rating (N)	Dynamic $C_d$	3 070
	Static $C_{0s}$	4 790
Axial play	0	
Preload (N)	98.1	
Dynamic friction torque, (N·cm)	1.0 – 4.9	
Spacer ball	None	
Factory-packed grease	<b>Refer to Notes 1.</b>	
Internal spatial volume of nut (cm <sup>3</sup> )	1.4	
Standard volume of grease replenishing (cm <sup>3</sup> )	0.7	

**Recommended support unit**

For drive side (Fixed)	For opposite to drive side (Free)
WBK10-01C (square, clean)	WBK10S-01C (square, clean)
WBK10-11C (round, clean)	

Unit: mm

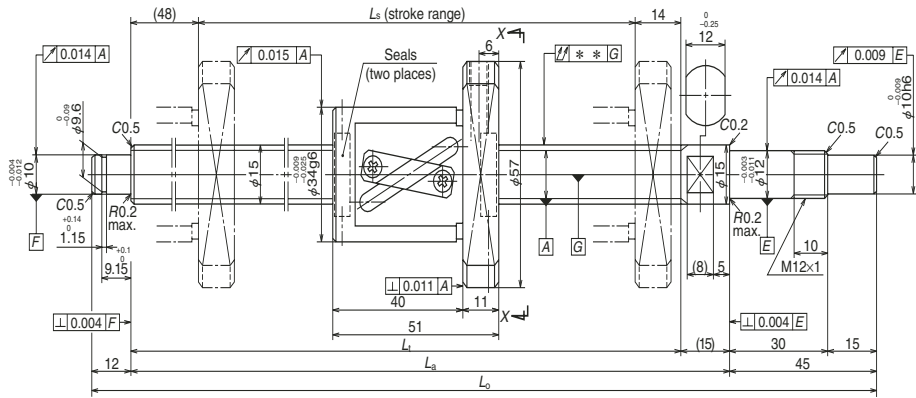
Ball screw No.	Stroke $L_s$		Thread length			
	Nominal	Maximum	$L_1$	$L_1$	$L_s$	$L_o$
<b>W1203KA-3P-C5Z10</b>	250	253	310	315	325	380
<b>W1205KA-3P-C5Z10</b>	450	453	510	515	525	580

Lead accuracy			Shaft run-out ** $\sqrt{t}$	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )
$T$	$e_p$	$v_u$			Supporting condition
0	0.023	0.018	0.050	0.56	3 000
0	0.030	0.023	0.075	0.72	3 000

- Notes:
1. Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use. See page D13 for details. Use of NSK Clean Grease LG2 is recommended.
  2. Contact NSK if the permissible rotational speed is to be exceeded.

**Finished shaft end stainless steel product KA Type**

(Medium lead)



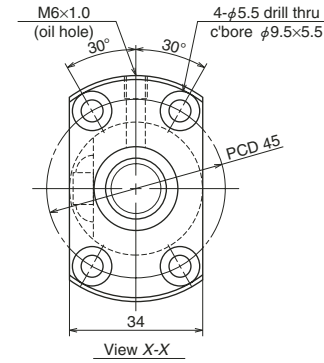
**Nut model: LPFT**

**NSK**

**Screw shaft ø15**

**Lead 10**

Unit: mm



**Ball screw specifications**

Shaft dia. x Lead / Direction of turn	15 x 10 / Right	
Preload / Ball recirculation	P-preload / Return tube	
Ball dia. / Ball circle dia.	3.175 / 15.5	
Screw shaft root diameter	12.2	
Effective turns of balls	2.5 x 1	
Accuracy grade / Preload	C5 / Z	
Basic load rating (N)	Dynamic $C_d$	5 780
	Static $C_0$	9 430
Axial play		0
Preload (N)		147
Dynamic friction torque, (N·cm)		1.5 – 7.9
Spacer ball		None
Factory-packed grease		<b>Refer to Notes 1.</b>
Internal spatial volume of nut (cm <sup>3</sup> )		2.3
Standard volume of grease replenishing (cm <sup>3</sup> )		1.4

**Recommended support unit**

For drive side (Fixed)	For opposite to drive side (Free)
WBK12-01C (square, clean)	WBK12S-01C (square, clean)
WBK12-11C (round, clean)	

Unit: mm

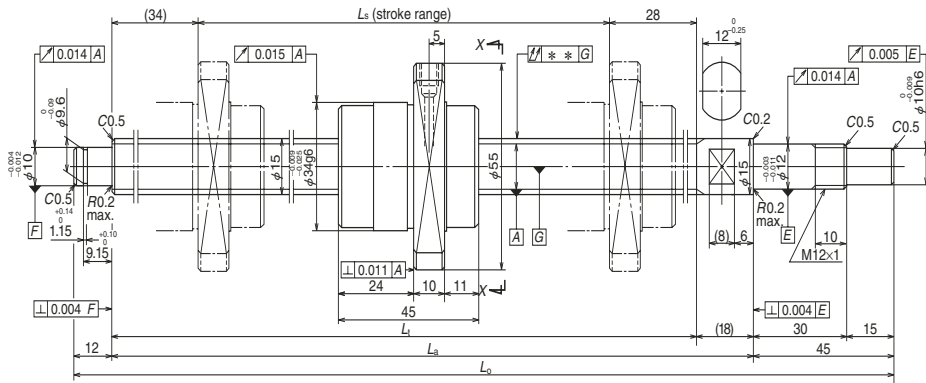
Ball screw No.	Stroke $L_s$		Thread length		
	Nominal	Maximum	$L_t$	$L_a$	$L_p$
<b>W1504KA-3P-C5Z10</b>	400	427	489	504	561
<b>W1506KA-3P-C5Z10</b>	600	627	689	704	761
<b>W1510KA-1P-C5Z10</b>	1 000	1 027	1 089	1 104	1 161

Lead accuracy			Shaft run-out ** $f_t$	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )
$T$	$e_p$	$v_u$			Supporting condition
0	0.027	0.020	0.050	0.99	Fixed - Simple support 3 000
0	0.035	0.025	0.065	1.2	3 000
0	0.046	0.030	0.110	1.7	1 610

- Notes: **1. Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.**  
 See page D13 for details.  
 Use of NSK Clean Grease LG2 is recommended.  
**2. Contact NSK if the permissible rotational speed is to be exceeded.**

**Finished shaft end stainless steel product KA Type**

(Medium lead)



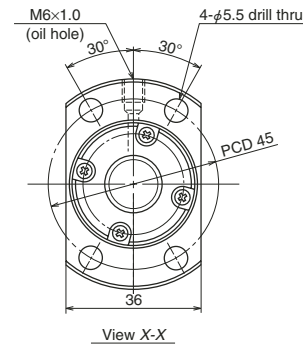
**Nut model: UPFC**

**NSK**

**Screw shaft ø15**

**Lead 20**

Unit: mm



**Ball screw specifications**

Shaft dia. x Lead / Direction of turn	15 x 20 / Right	
Preload / Ball recirculation	P-preload / End cap	
Ball dia. / Ball circle dia.	3.175 / 15.5	
Screw shaft root diameter	12.2	
Effective turns of balls	1.7 x 1	
Accuracy grade / Preload	C5 / Z	
Basic load rating (N)	Dynamic $C_d$	4 150
	Static $C_0$	6 450
Axial play	0	
Preload (N)	147	
Dynamic friction torque, (N·cm)	1.5 – 7.9	
Spacer ball	None	
Factory-packed grease	<b>Refer to Notes 1.</b>	
Internal spatial volume of nut (cm <sup>3</sup> )	1.9	
Standard volume of grease replenishing (cm <sup>3</sup> )	1.0	

**Recommended support unit**

For drive side (Fixed)	For opposite to drive side (Free)
WBK12-01C (square, clean)	WBK12S-01C (square, clean)
WBK12-11C (round, clean)	

Unit: mm

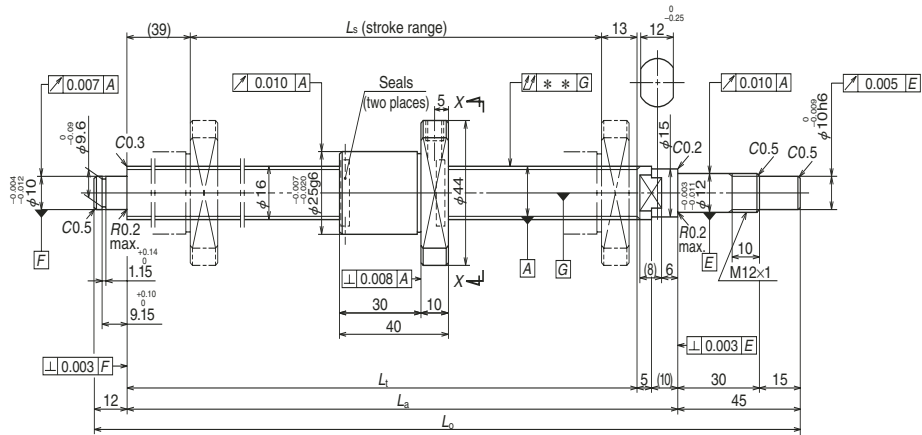
Ball screw No.	Stroke $L_s$		Thread length		
	Nominal	Maximum	$L_1$	$L_2$	$L_3$
<b>W1504KA-7PG-C5Z20</b>	400	424	486	504	561
<b>W1506KA-7PG-C5Z20</b>	600	624	686	704	761
<b>W1510KA-3PG-C5Z20</b>	1 000	1 024	1 086	1 104	1 161

Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )
$T$	$e_p$	$v_u$			Supporting condition
0	0.027	0.020	0.050	1.0	3 000
0	0.035	0.025	0.065	1.3	3 000
0	0.046	0.030	0.110	1.8	1 610

- Notes:
1. Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use. See page D13 for details. Use of NSK Clean Grease LG2 is recommended.
  2. Contact NSK if the permissible rotational speed is to be exceeded.

**Finished shaft end stainless steel product KA Type**

(Fine lead)



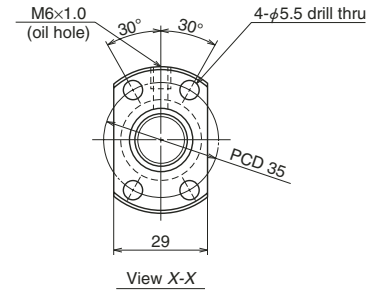
**Nut model: MPFD**

**NSK**

**Screw shaft ø16**

**Lead 2**

Unit: mm



**Ball screw specifications**

Shaft dia. x Lead / Direction of turn	16 x 2 / Right	
Preload / Ball recirculation	P-preload / Deflector (bridge)	
Ball dia. / Ball circle dia.	1.588 / 16.4	
Screw shaft root diameter	14.6	
Effective turns of balls	1 x 4	
Accuracy grade / Preload	C3 / Z	
Basic load rating (N)	Dynamic $C_d$	2 870
	Static $C_0$	6 250
Axial play	0	
Preload (N)	147	
Dynamic friction torque, (N·cm)	0.5 – 4.9	
Spacer ball	None	
Factory-packed grease	<b>Refer to Notes 1.</b>	
Internal spatial volume of nut (cm <sup>3</sup> )	1.6	
Standard volume of grease replenishing (cm <sup>3</sup> )	0.8	

**Recommended support unit**

For drive side (Fixed)	For opposite to drive side (Free)
WBK12-01C (square, clean)	WBK12S-01C (square, clean)
WBK12-11C (round, clean)	

Unit: mm

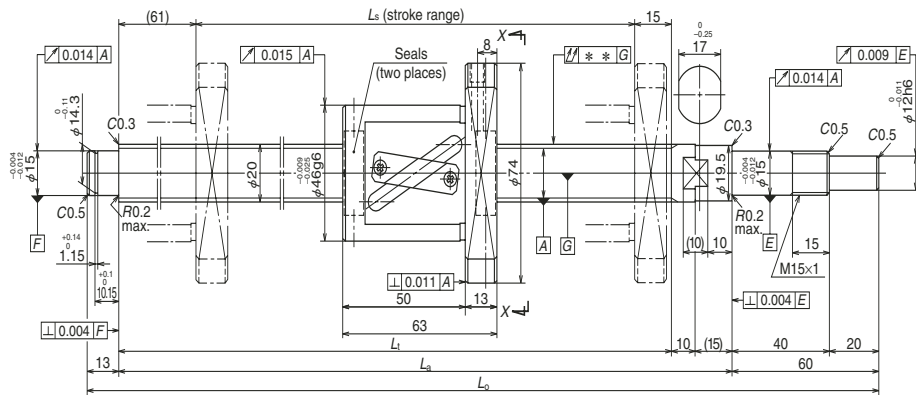
Ball screw No.	Stroke $L_s$		Thread length		
	Nominal	Maximum	$L_t$	$L_a$	$L_o$
<b>W1601KA-3PY-C3Z2</b>	100	137	189	204	261
<b>W1603KA-1PY-C3Z2</b>	300	337	389	404	461

Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )
$T$	$e_p$	$v_u$			Supporting condition
0	0.010	0.008	0.020	0.46	3 000
0	0.013	0.010	0.035	0.75	3 000

- Notes: **1. Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.**  
 See page D13 for details.  
 Use of NSK Clean Grease LG2 is recommended.  
**2. Contact NSK if the permissible rotational speed is to be exceeded.**

**Finished shaft end stainless steel product KA Type**

**(High helix lead)**



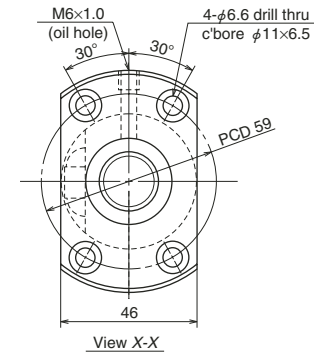
**Nut model: LPFT**

**NSK**

**Screw shaft ø20**

**Lead 20**

Unit: mm



**Ball screw specifications**

Shaft dia. x Lead / Direction of turn	20 x 20 / Right	
Preload / Ball recirculation	P-preload / Return tube	
Ball dia. / Ball circle dia.	3.969 / 21	
Screw shaft root diameter	16.9	
Effective turns of balls	1.5 x 1	
Accuracy grade / Preload	C5 / Z	
Basic load rating (N)	Dynamic $C_d$	5 760
	Static $C_{0s}$	9 370
Axial play	0	
Preload (N)	196	
Dynamic friction torque, (N·cm)	2.0 – 11.8	
Spacer ball	None	
Factory-packed grease	<b>Refer to Notes 1.</b>	
Internal spatial volume of nut (cm <sup>3</sup> )	4.2	
Standard volume of grease replenishing (cm <sup>3</sup> )	2.1	

**Recommended support unit**

For drive side (Fixed)	For opposite to drive side (Free)
WBK15-01C (square, clean)	WBK15S-01C (square, clean)
WBK15-11C (round, clean)	

Unit: mm

Ball screw No.	Stroke $L_s$		Thread length		
	Nominal	Maximum	$L_t$	$L_a$	$L_o$
<b>W2005KA-3P-C5Z20</b>	400	434	510	535	608
<b>W2007KA-3P-C5Z20</b>	600	634	710	735	808
<b>W2011KA-3P-C5Z20</b>	1 000	1 034	1 110	1 135	1 208

Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )
$T$	$e_p$	$v_u$			Supporting condition
0	0.030	0.023	0.050	2.0	Fixed - Simple support 3 000
0	0.035	0.025	0.085	2.5	3 000
0	0.046	0.030	0.110	3.4	2 160

- Notes:
1. Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use. See page D13 for details. Use of NSK Clean Grease LG2 is recommended.
  2. Contact NSK if the permissible rotational speed is to be exceeded.



**B-3-1.5 Blank Shaft End MS Type, FS Type, SS Type**

**1. Order of the dimension tables**

The dimension table begins with the smallest shaft diameter of each MS, FS and SS type ball screws, and proceed to larger sizes. If ball screws have the same shaft diameter, those with smaller leads appear first. Page numbers of shaft diameter and lead combinations are shown in the **Table 1**.

**2. Dimension tables**

The dimension tables show shapes/sizes as well as specification factors of each shaft diameter/lead combination. Tables also contain data as follows:

● **Lead accuracy**

Lead accuracy is either C3 or C5 grades.

*T* : Travel compensation

*e<sub>p</sub>* : Tolerance of specified travel

*v<sub>0</sub>* : Travel variation

See "Technical Description: Lead Accuracy" (page B37) for details of the codes.

● **Permissible rotational speed**

*d* • *n* : Limited by the relative peripheral speed between the screw shaft and the nut.

Critical speed : Limited by the natural frequency of a ball screw shaft. Critical speed depends on the supporting condition of screw shaft.

Criterion of maximum rotational speed

: 3 000 min<sup>-1</sup>

The lower of the two criteria, *d*•*n* and critical speed, will determine the overall permissible rotational speed of the ball screw. For details, see "Technical Description: Permissible Rotational Speed" (page B47).

**3. Shaft end processing**

MS, FS, and SS types require shaft end processing to your specification. The exclusive support units (page B389) are available to design the bearing seats. See "Configuration of shaft end" (page B27 and following pages) when

using a support unit. See "Technical Description: Shaft End Processing" (page B86) for procedures of shaft end processing and precautions.

**4. Other**

The seals of the ball screw, ball recirculating deflectors and end caps are made of synthetic resin. Consult NSK when using the ball screws under extreme environments or special environments, or using special lubricant or oil. For special environments, see pages B70 and D2. See pages B67 and D13 for lubricants. Note: For details of standard stock products, contact NSK.

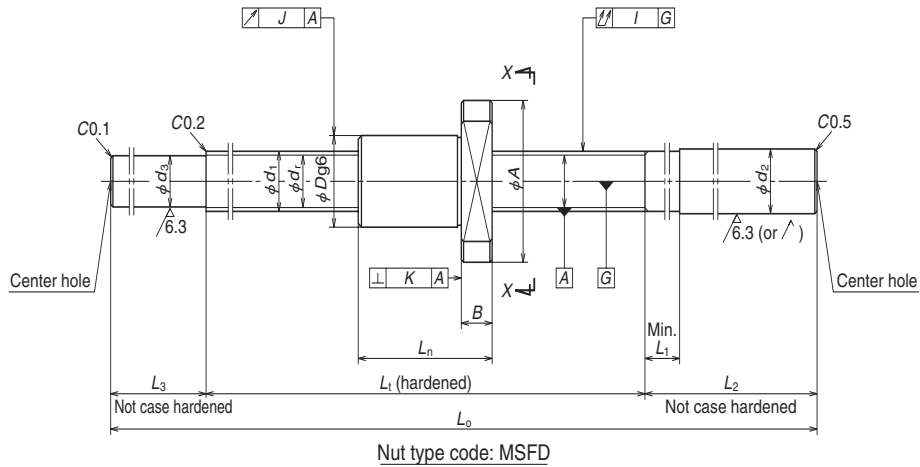
**Table 1 Combinations of screw shaft diameter and lead**

Screw shaft diameter(mm) \ Lead(mm)	1	1.5	2	2.5	4	5	6
4	B301						
6	B301						
8	B301	B303	B303				
10			B303	B305	B309		
12			B305	B305		B309	
14						B311	
15							
16		B307	B307			B315	
20					B321	B321	
25					B323	B323 B325	B323
28						B327 B329	B327 B329
32						B331 B333 B335	B331 B333
36							
40						B337	
45							
50							

	8	10	12	16	20	25	32	40	50
		B309							
B311		B311			B313				
				B315			B313		
		B315			B315			B313	
		B325 B327			B317	B317			B317
B333		B335 B337 B339				B319	B319		
		B337 B339							
		B341 B343 B345	B341 B343						
		B347							
		B345 B347							

**Blank shaft end MS type**

(Fine lead: Deflector (bridge) type)

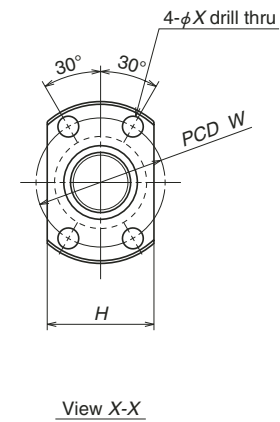


**Nut model: MSFD**

**NSK**

Screw shaft ø4, ø6, ø8,

Lead 1



Ball screw No.	Stroke Max. $L_1-L_n$	Screw shaft dia. $d_1$	Lead $l$	Ball dia. $D_w$	Ball circle dia. $d_m$	Root dia. $d_f$	Effective ball turns	Basic load rating (N)		Axial play Max.	Nut			
								Dynamic $C_a$	Static $C_{0a}$		Flange			
											Outside dia. $D$	$A$	$H$	$B$
W0400MS-1Y-C3T1	68	4	1	0.8	4.2	3.2	2	315	370	0.005	10	20	14	3
W0601MS-1Y-C3T1	110	6	1	0.8	6.2	5.2	3	575	925	0.005	12	24	16	3.5
W0801MS-1Y-C3T1	94	8	1	0.8	8.2	7.2	3	670	1 290	0.005	14	27	18	4
W0802MS-1Y-C3T1	174													

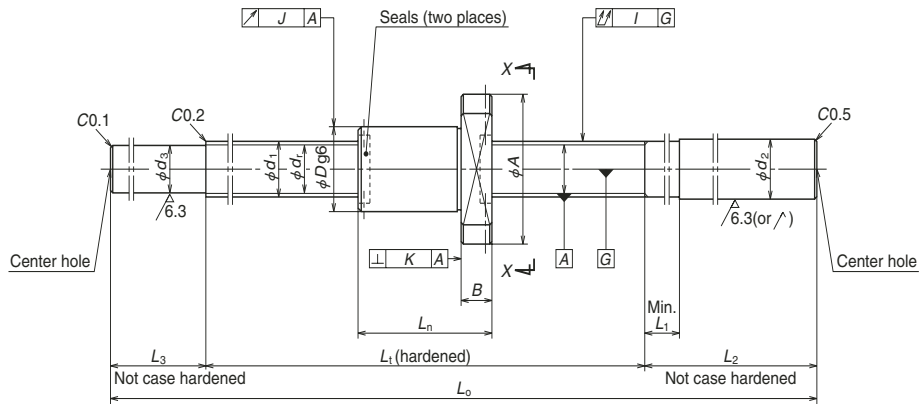
- Notes: 1. Use of NSK support unit is recommended. See page B389 for details.  
 2. Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use. See page D13 for details.  
 3. Ball nut does not have seal.  
 4. Permissible rotational speed is determined by d-n value and critical speed. See pages B47 and B299.

Unit: mm

dimensions			Screw shaft dimensions						Lead accuracy			Run-out			Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	
Overall length $L_n$	Bolt hole $W$ $X$		Threaded length $L_1$	Shaft end, right $d_2$ $L_1$ $L_2$		Shaft end, left $d_3$ $L_3$		Overall length $L_0$	$T$	Deviation $e_o$	Variation $v_u$	Shaft straightness $I$	Nut O.D. eccentricity $J$	Flange perpendicularity $K$			
12	15	2.9	80	6.0	4	40	3.3	10	130	0	0.008	0.008	0.030	0.009	0.008	0.026	3 000
15	18	3.4	125	8.0	4	50	5.3	15	190	0	0.010	0.008	0.030	0.009	0.008	0.063	3 000
16	21	3.4	110	10.2	4	60	7.3	25	195	0	0.010	0.008	0.030	0.009	0.008	0.11	3 000
			190						0.050				0.14				

**Blank shaft end MS type**

(Fine lead: Deflector (bridge) type)



Nut type code: MSFD

**Nut model: MSFD**

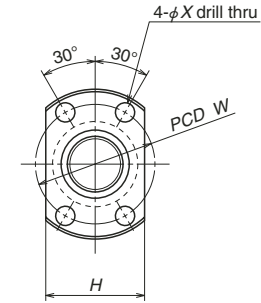


Screw shaft ø8

Lead 1.5, 2

Screw shaft ø10

Lead 2



View X-X

Ball screw No.	Stroke Max. $L_1-L_n$	Screw shaft dia. $d_1$	Lead $l$	Ball dia. $D_w$	Ball circle dia. $d_m$	Root dia. $d_t$	Effective ball turns	Basic load rating (N)		Axial play Max.	Nut			
								Dynamic $C_a$	Static $C_{0a}$		Outside dia.		Flange	
											$D$	$A$	$H$	$B$
<b>W0801MS-2Y-C3T1.5</b>	88	8	1.5	1.0	8.3	7.0	3	1 080	1 980	0.005	15	28	19	4
<b>W0802MS-2Y-C3T1.5</b>	168													
<b>W0801MS-3Y-C3T2</b>	84	8	2	1.2	8.3	6.9	3	1 320	2 210	0.005	16	29	20	4
<b>W0802MS-3Y-C3T2</b>	164													
<b>W1001MS-1Y-C3T2</b>	122	10	2	1.2	10.3	8.9	3	1 490	2 850	0.005	18	35	22	5
<b>W1002MS-1Y-C3T2</b>	222													

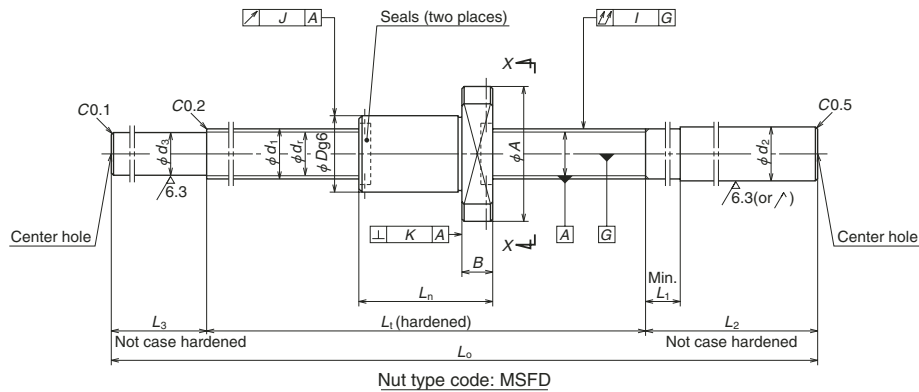
- Notes: 1. Use of NSK support unit is recommended. See page B389 for details.  
 2. Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use. See page D13 for details.  
 3. Permissible rotational speed is determined by d-n value and critical speed. See pages B47 and B299.

Unit: mm

dimensions			Screw shaft dimensions						Lead accuracy			Run-out			Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	
Overall length	Bolt hole		Threaded length	Shaft end, right		Shaft end, left		Overall length	Deviation	Variation	Shaft straightness	Nut O.D. eccentricity	Flange perpendicularity				
$L_n$	$W$	$X$	$L_1$	$d_2$	$L_1$	$L_2$	$d_3$	$L_3$	$L_0$	$T$	$e_p$	$v_u$	$I$	$J$	$K$		
22	22	3.4	110	10.2	4	60	7.2	25	195	0	0.010	0.008	0.030	0.009	0.008	0.12	3 000
			190						275				0.050			0.15	
26	23	3.4	110	10.2	4	60	7.0	25	195	0	0.010	0.008	0.030	0.009	0.008	0.12	3 000
			190						275				0.050			0.15	
28	27	4.5	150	12.2	4	70	9.0	30	250	0	0.010	0.008	0.035	0.009	0.008	0.22	3 000
			250						350		0.012		0.17				

**Blank shaft end MS type**

(Fine lead: Deflector (bridge) type)



**Nut model: MSFD**

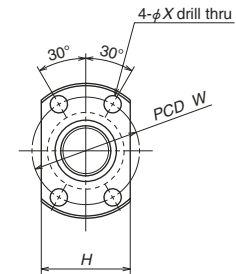


Screw shaft ø10

Lead 2.5

Screw shaft ø12

Lead 2, 2.5



View X-X

Ball screw No.	Stroke Max. $L_1-L_n$	Screw shaft dia. $d_1$	Lead $l$	Ball dia. $D_w$	Ball circle dia. $d_m$	Root dia. $d_r$	Effective ball turns	Basic load rating (N)		Axial play Max.	Nut			
								Dynamic $C_a$	Static $C_{0a}$		Outside dia.		Flange	
											$D$	$A$	$H$	$B$
<b>W1001MS-2Y-C3T2.5</b>	118	10	2.5	1.588	10.4	8.6	3	2 130	3 640	0.005	19	36	23	5
<b>W1002MS-2Y-C3T2.5</b>	218													
<b>W1202MS-1Y-C3T2</b>	182	12	2	1.200	12.3	10.9	3	1 660	3 620	0.005	20	37	24	5
<b>W1203MS-1Y-C3T2</b>	282													
<b>W1202MS-2Y-C3T2.5</b>	178	12	2.5	1.588	12.4	10.6	3	2 360	4 540	0.005	21	38	25	5
<b>W1203MS-2Y-C3T2.5</b>	278													

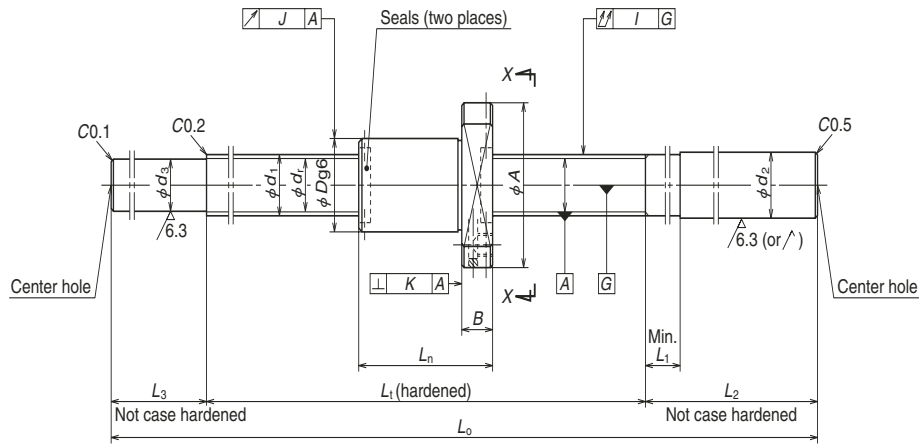
- Notes: 1. Use of NSK support unit is recommended. See page B389 for details.  
 2. Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use. See page D13 for details.  
 3. Permissible rotational speed is determined by d-n value and critical speed. See pages B47 and B299.

Unit: mm

dimensions			Screw shaft dimensions						Lead accuracy			Run-out			Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )
Overall length $L_n$	Bolt hole		Threaded length $L_1$	Shaft end, right		Shaft end, left		Overall length $L_0$	$T$	Deviation $e_p$	Variation $v_u$	Shaft straightness $I$	Nut O.D. eccentricity $J$	Flange perpendicularity $K$		
	$W$	$X$		$d_2$	$L_1$	$L_2$	$d_3$									
32	28	4.5	150	12.2	4	70	8.7	30	250	0	0.010	0.008	0.035	0.010	0.008	0.23
			250						350				0.050			0.28
28	29	4.5	210	14.2	5	80	11.0	35	325	0	0.012	0.008	0.050	0.010	0.008	0.36
			310						425				0.060			0.44
32	30	4.5	210	14.2	5	80	10.7	35	325	0	0.012	0.008	0.050	0.010	0.008	0.37
			310						425				0.060			0.45

**Blank shaft end MS type**

(Fine lead: Deflector (bridge) type)



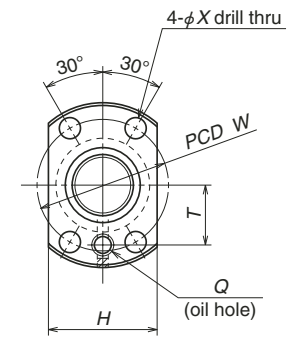
Nut type code: MSFD

**Nut model: MSFD**

**NSK**

Screw shaft ø16

Lead 2, 2.5



View X-X

Ball screw No.	Stroke Max. L <sub>r</sub> -L <sub>n</sub>	Screw shaft dia. d <sub>1</sub>	Lead l	Ball dia. D <sub>w</sub>	Ball circle dia. d <sub>m</sub>	Root dia. d <sub>r</sub>	Effective ball turns	Basic load rating (N)		Axial play Max.	Nut						
								Dynamic C <sub>a</sub>	Static C <sub>0a</sub>		Outside dia.				Overall length		Bolt hole
											D	A	H	B	L <sub>n</sub>	W	
<b>W1602MS-1Y-C3T2</b>	210	16	2	1.588	16.4	14.6	4	3 510	8 450	0.005	25	44	29	10	40	35	5.5
<b>W1604MS-1Y-C3T2</b>	360										44	29	10	40	35	5.5	
<b>W1602MS-2Y-C3T2.5</b>	206	16	2.5	1.588	16.4	14.6	4	3 510	8 450	0.005	25	44	29	10	44	35	5.5
<b>W1604MS-2Y-C3T2.5</b>	356										44	29	10	44	35	5.5	

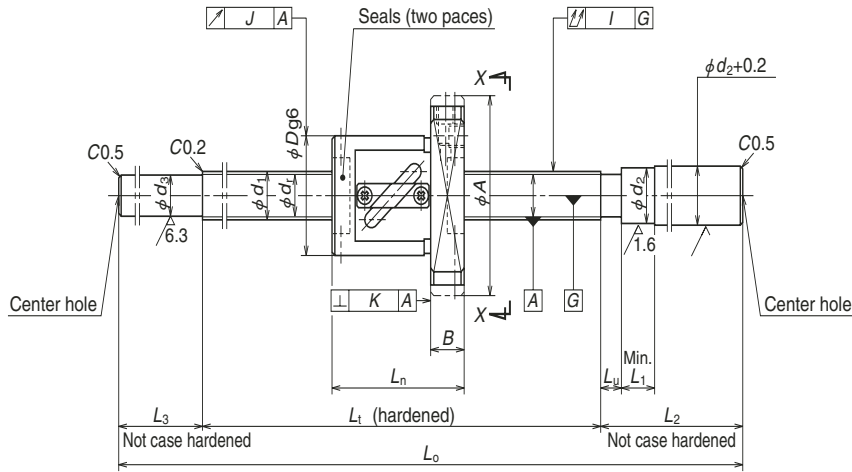
- Notes: 1. Use of NSK support unit is recommended. See page B389 for details.  
 2. **Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.** See page D13 for details.  
 3. Permissible rotational speed is determined by d-n value and critical speed. See pages B47 and B299.

Unit: mm

dimensions	Screw shaft dimensions							Lead accuracy			Run-out			Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	Internal spatial volume of nut (cm <sup>3</sup> )	Standard volume of grease replenishing (cm <sup>3</sup> )	
	Oil hole		Threaded length L <sub>t</sub>	Shaft end, right		Shaft end, left		Overall length L <sub>0</sub>	T	Deviation e <sub>s</sub>	Variation v <sub>u</sub>	Shaft straightness I	Nut O.D. eccentricity J					Flange perpendicularity K
	Q	T		d <sub>2</sub>	L <sub>1</sub>	L <sub>2</sub>	d <sub>3</sub>											
M6×1	16	250 400	16.2	30	100	14.7	40	390 540	0	0.012 0.013	0.008 0.010	0.035 0.050	0.010	0.008	0.71 0.93	3 000	1.5	0.8
M6×1	16	250 400	16.2	30	100	14.7	40	390 540	0	0.012 0.013	0.008 0.010	0.035 0.050	0.010	0.008	0.73 0.95	3 000	1.5	0.8

**Blank shaft end FS type**

(Fine, Medium lead: Tube type)



Nut type code: SFT, LSFT

Ball screw No.	Stroke Max. $L_1-L_n$	Screw shaft dia. $d_1$	Lead $l$	Ball dia. $D_w$	Ball circle dia. $d_m$	Root dia. $d_r$	Effective ball turns $\times$ Circuits	Basic load rating (N)		Axial play Max.	Nut										
								Dynamic $C_a$	Static $C_{0a}$		Outside dia. $D$	Flange				Overall length $L_n$	Bolt hole				
												$A$	$H$	$K$	$B$		$L_1$	$W$	$X$	$Y$	$Z$
<b>W1001FS-1-C3T4</b>	126							2 740	4 450	0.005	26	46	28	42	10	34	36	4.5	8	4.5	
<b>W1002FS-1-C3T4</b>	226	10	4	2.000	10.3	8.2	2.5×1	2 740	4 450	0.005	26	46	28	42	10	34	36	4.5	8	4.5	
<b>W1003FS-1-C3T4</b>	326																				
<b>W1201FS-1-C3T5</b>	110																				
<b>W1202FS-1-C3T5</b>	210	12	5	2.381	12.3	9.8	2.5×1	3 760	6 310	0.005	30	50	32	45	10	40	40	4.5	8	4.5	
<b>W1204FS-1-C3T5</b>	410																				
<b>W1202FS-2-C5T10</b>	200	12	10	2.381	12.5	10.0	2.5×1	3 750	6 480	0.005	30	50	32	45	10	50	40	4.5	8	4.5	
<b>W1204FS-2-C5T10</b>	400																				

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 3. Permissible rotational speed is determined by d-n value and critical speed. See pages B47 and B299.

**Nut models: SFT, LSFT**

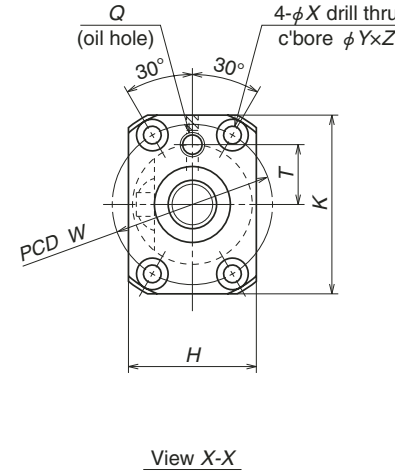


Screw shaft  $\phi 10$

Lead 4

Screw shaft  $\phi 12$

Lead 5, 10

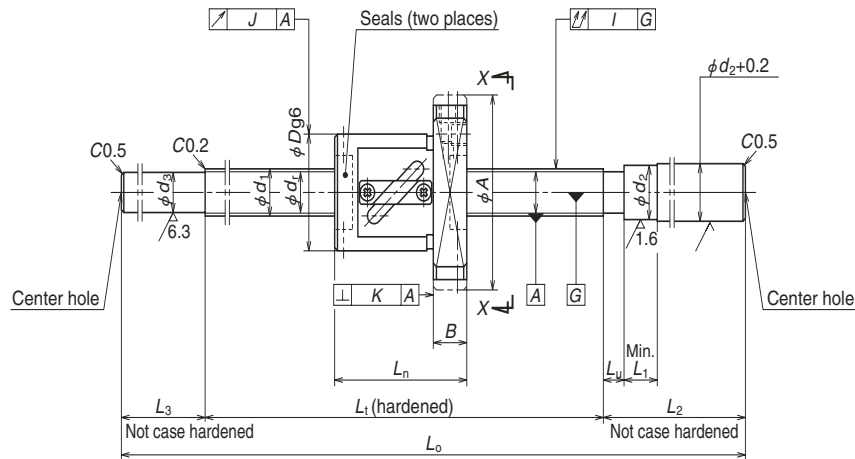


Unit: mm

dimensions	Screw shaft dimensions					Lead accuracy			Run-out			Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	Internal spatial volume of nut (cm <sup>3</sup> )	Standard volume of grease replenishing (cm <sup>3</sup> )			
	Oil hole $Q$	Threaded length $T$	Shaft end, right			Overall length $L_n$	Deviation $e_s$	Variation $v_u$	Shaft straightness $J$	Nut O.D. eccentricity $J$	Flange perpendicularity $K$							
			Shaft end, left $d_1$	$L_u$	$L_1$											$L_2$	$d_3$	$L_3$
M6×1 14	160					265	0	0.010	0.008	0.030	0.010	0.008	0.34	3 000	0.86	0.43		
	260	14	5	40	70	8.2	35	0	0.012	0.008							0.040	0.39
	360								0.013	0.010							0.050	0.45
M6×1 15	150					255	0	0.010	0.008	0.030	0.010	0.008	0.44	3 000	1.2	0.6		
	250	14	5	40	70	9.8	35	0	0.012	0.008							0.040	0.52
	450								0.015	0.010							0.065	0.67
M6×1 15	250					355	0	0.023	0.018	0.050	0.012	0.010	0.57	3 000	1.4	0.7		
	450	14	8	40	70	10.0	35	0	0.027	0.020							0.075	0.74

**Blank shaft end FS type**

(Fine, Medium lead: Tube type)



Nut type code: SFT, LSFT

Ball screw No.	Stroke Max. $L_c-L_n$	Screw shaft dia. $d_1$	Lead $l$	Ball dia. $D_w$	Ball circle dia. $d_m$	Root dia. $d_r$	Effective ball turns $\times$ Circuits	Basic load rating (N)		Axial play Max.	Nut										
								Dynamic $C_a$	Static $C_{0a}$		Outside dia. $D$	Flange				Overall length $L_n$	Bolt hole				
												$A$	$H$	$K$	$B$		$L_m$	$W$	$X$	$Y$	$Z$
<b>W1403FS-1-C3T5</b>	310	14	5	3.175	14.5	11.2	2.5x1	6 790	11 700	0.005	34	57	34	50	11	40	45	5.5	9.5	5.5	
<b>W1406FS-1-C3T5</b>	560																				
<b>W1405FS-1-C5T8</b>	454	14	8	3.175	14.5	11.2	2.5x1	6 790	11 700	0.005	34	57	34	50	11	46	45	5.5	9.5	5.5	
<b>W1408FS-1-C5T8</b>	754																				
<b>W1504FS-1-C5T10</b>	349	15	10	3.175	15.5	12.2	2.5x1	7 070	12 800	0.005	34	57	34	50	11	51	45	5.5	9.5	5.5	
<b>W1506FS-1-C5T10</b>	549																				
<b>W1509FS-1-C5T10</b>	849																				
<b>W1511FS-1-C5T10</b>	1 049																				

- Notes: 1. Use of NSK support unit is recommended. See page B389 for details.  
 2. Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use. See page D13 for details.  
 3. Permissible rotational speed is determined by d-n value and critical speed. See pages B47 and B299.

**Nut models: SFT, LSFT**

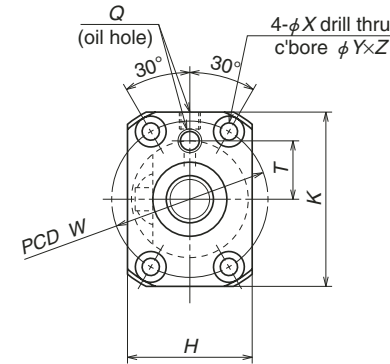
**NSK**

Screw shaft  $\phi 14$

Lead 5, 8

Screw shaft  $\phi 15$

Lead 10



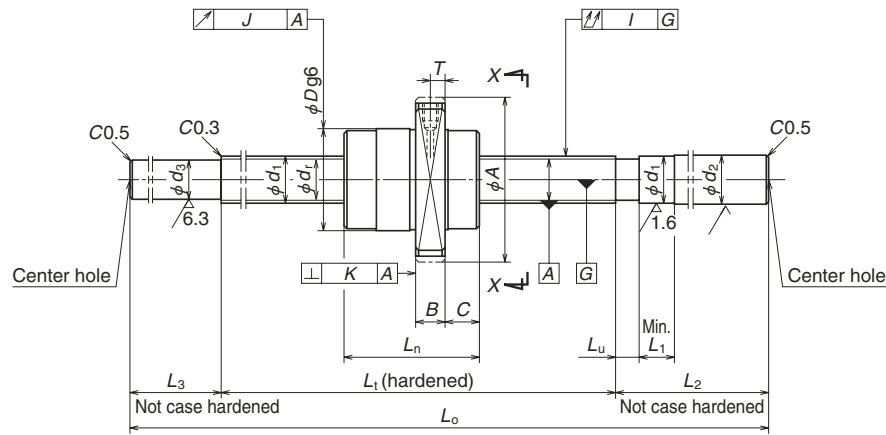
View X-X

Unit: mm

dimensions	Screw shaft dimensions										Lead accuracy			Run-out			Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	Internal spatial volume of nut (cm <sup>3</sup> )	Standard volume of grease replenishing (cm <sup>3</sup> )
	Oil hole		Shaft end, right				Shaft end, left		Overall length	T	Deviation $e_s$	Variation $v_u$	Shaft straightness I	Nut O.D. eccentricity J	Flange perpendicularity K					
	Q	T	$L_1$	$d_2$	$L_u$	$L_1$	$L_2$	$d_3$								$L_3$				
M6x1	17	350	15	5	40	100	11.2	40	490	0	0.013	0.010	0.035	0.012	0.008	0.78	3 000	2.0	1.0	
		600							740							1.0				
M6x1	17	500	15	8	40	100	11.2	40	640	0	0.027	0.020	0.065	0.015	0.011	1.0	3 000	2.0	1.0	
		800							940							1.3				
M6x1	17	400	15	8	40	120	12.2	50	570	0	0.025	0.020	0.050	0.015	0.011	1.0	3 000	2.3	1.2	
		600							770							1.3				
		900							1 070							1.7				
		1 100							1 270							1.9				

**Blank shaft end FS type**

(High helix, Ultra high helix: End cap type)

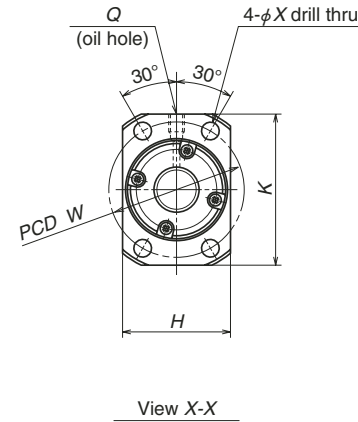


Nut type code: USFC

**Nut model: USFC**

**NSK**

Screw shaft  $\phi 15$   
Lead 20  
Screw shaft  $\phi 16$   
Lead 32  
Screw shaft  $\phi 20$   
Lead 40



Ball screw No.	Stroke Max. $L_t-L_n$	Screw shaft dia. $d_1$	Lead $l$	Ball dia. $D_w$	Ball circle dia. $d_m$	Root dia. $d_r$	Effective ball turns Turns x Circuits	Basic load rating (N)		Axial play Max.	Nut									
								Dynamic $C_a$	Static $C_{0a}$		Outside dia. $D$	Flange					Overall length $L_n$	Bolt hole		
												A	H	K	B	C		W	X	
<b>W1504FS-2G-C5T20</b>	355	15	20	3.175	15.5	12.2	1.7x1	5 070	8 730	0.005	34	55	36	50	10	11	45	45	5.5	
<b>W1506FS-2G-C5T20</b>	555																			
<b>W1509FS-2G-C5T20</b>	855																			
<b>W1511FS-2G-C5T20</b>	1 055																			
<b>W1609FS-2GX-C5T32</b>	866	16	32	3.175	16.75	13.4	0.7x2	4 000	6 690	0.005	34	55	36	50	10	10.5	34	45	5.5	
<b>W1613FS-1GX-C5T32</b>	1 266																			
<b>W2011FS-1GX-C5T40</b>	1 059	20	40	3.175	20.75	17.4	0.7x2	4 490	8 640	0.005	38	58	40	52	10	11	41	48	5.5	
<b>W2017FS-1GX-C5T40</b>	1 659																			

Unit: mm

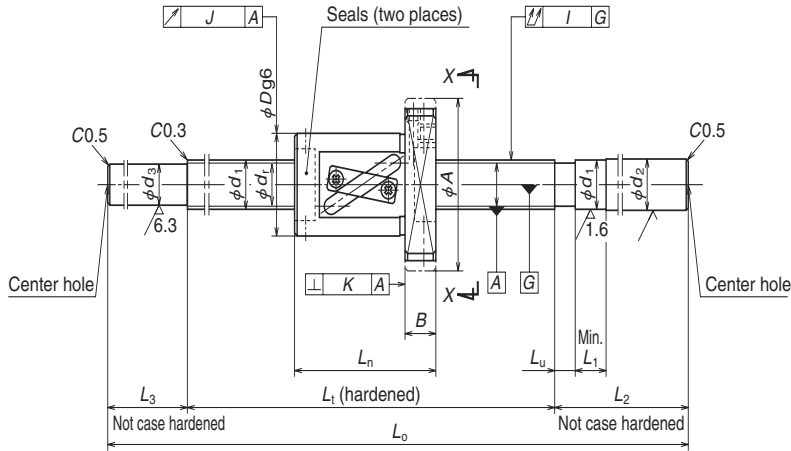
dimensions	Screw shaft dimensions					Lead accuracy			Run-out			Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	Internal spatial volume of nut (cm <sup>3</sup> )	Standard volume of grease replenishing (cm <sup>3</sup> )				
	Oil hole Q	Threaded length T	Shaft end, right $L_u$	Shaft end, left $L_1$	Overall length $L_2$	Lead accuracy $T$	Deviation $e_p$	Variation $v_u$	Shaft straightness I	Nut O.D. eccentricity J	Flange perpendicularity K								
M6x1	5	400	15.2	13	40	120	12.2	50	570	0	0.025	0.020	0.050	0.015	0.011	1.0	3 000	1.9	1.0
		600							770	0.030	0.023	0.065	1.3						
		900							1 070	0.040	0.027	0.110	1.7						
		1 100							1 270	0.046	0.030	0.150	2.0						
M6x1	5	900	16.2	19	40	150	13.4	60	1 110	0	0.040	0.027	0.110	0.015	0.011	1.9	3 000	2.0	1.0
		1 300							1 510	0.054	0.035	0.150	2.5						
M6x1	5	1 100	20.2	22	60	150	17.4	80	1 330	0	0.046	0.030	0.150	0.015	0.011	3.5	3 000	2.7	1.4
		1 700							1 930	0.065	0.040	0.200	4.9						

- Notes: 1. Use of NSK support unit is recommended. See page B389 for details.  
 2. Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use. See page D13 for details.  
 3. Permissible rotational speed is determined by d-n value and critical speed. See pages B47 and B299.



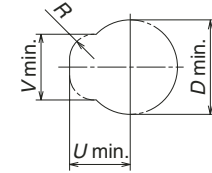
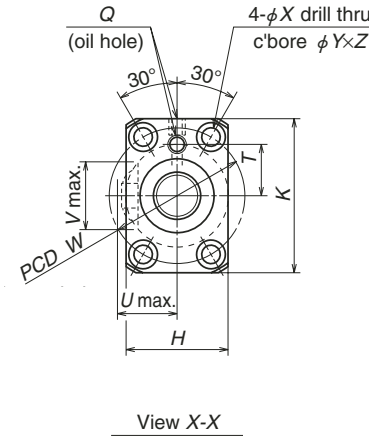
**Blank shaft end FS type**

(Fine, Medium, High helix lead: Tube type)



Nut type code: SFT, LSFT

**Nut models: SFT, LSFT**



Housing hole and its clearance  
(only applicable to shaft dia.  $\phi 16$ , lead 16)

Ball screw No.	Stroke Max. $L_t - L_n$	Screw shaft dia. $d_1$	Lead $l$	Ball dia. $D_w$	Ball circle dia. $d_m$	Root dia. $d_r$	Effective ball turns $\times$ Circuits	Basic load rating (N)		Axial play Max.	Nut											
								Dynamic $C_d$	Static $C_{0a}$		Outside dia. $D$	Flange			Overall length $L_n$	Bolt hole						
												$A$	$H$	$K$		$B$	$L_w$	$X$	$Y$	$Z$		
<b>W1605FS-1-C3T5</b>	458	16	5	3.175	16.5	13.2	2.5x1	7 330	13 500	0.005	40	63	40	55	11	42	51	5.5	9.5	5.5		
<b>W1609FS-1-C3T5</b>	858	16	5	3.175	16.5	13.2	2.5x1	7 330	13 500	0.005	40	63	40	55	11	42	51	5.5	9.5	5.5		
<b>W1606FS-1-C5T16</b>	544	16	16	3.175	16.75	13.4	1.5x1	4 710	8 110	0.005	34	57	34	50	12	56	45	5.5	9.5	5.5		
<b>W1611FS-1-C5T16</b>	1 044	16	16	3.175	16.75	13.4	1.5x1	4 710	8 110	0.005	34	57	34	50	12	56	45	5.5	9.5	5.5		
<b>W2009FS-1-C5T10</b>	846	20	10	3.969	21	16.9	2.5x1	10 900	21 700	0.005	46	74	46	66	13	54	59	6.6	11	6.5		
<b>W2013FS-1-C5T10</b>	1 246																					
<b>W2010FS-1-C5T20</b>	937	20	20	3.969	21	16.9	1.5x1	7 040	12 700	0.005	46	74	46	66	13	63	59	6.6	11	6.5		
<b>W2015FS-1-C5T20</b>	1 437																					

- Notes: 1. Use of NSK support unit is recommended. See page B389 for details.  
 2. Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use. See page D13 for details.  
 3. Permissible rotational speed is determined by d-n value and critical speed. See pages B47 and B299.

**NSK**

Screw shaft  $\phi 16$

Lead 5, 16

Screw shaft  $\phi 20$

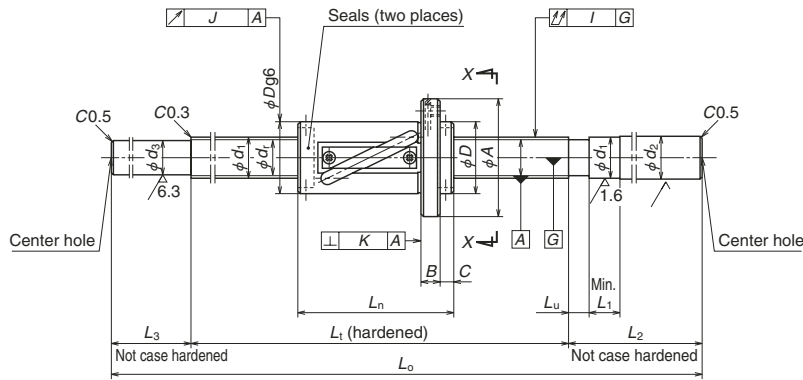
Lead 10, 20

Unit: mm

dimensions			Screw shaft dimensions					Lead accuracy		Run-out			Mass (kg)	Permissible rotational speed (min <sup>-1</sup> )	Internal spatial volume of nut (cm <sup>3</sup> )	Standard volume of grease replenishing (cm <sup>3</sup> )						
Projecting tube	Oil hole	Threaded length	Shaft end, right	Shaft end, left	Overall length	Deviation	Variation	Shaft straightness	Nut O.D. eccentricity	Flange perpendicularity												
$U$	$V$	$R$	$Q$	$T$	$L_1$	$d_2$	$L_u$	$L_1$	$L_2$	$d_3$	$L_3$	$L_0$	$T$	$e_p$	$v_u$	$I$	$J$	$K$				
—	—	—	M6x1	17	500 900	16.2	5	40	150	13.2	60	710 1110	0	0.015 0.021	0.010 0.015	0.055 0.095	0.012	0.008	1.4 1.9	3 000	2.6	1.3
19	20	8	M6x1	17	600 1100	16.2	10	40	150	13.4	60	810 1310	0	0.030 0.046	0.023 0.030	0.085 0.150	0.015	0.011	1.5 2.3	3 000	2.1	1.1
—	—	—	M6x1	24	900 1300	20.2	10	60	150	16.9	80	1130 1530	0	0.040 0.054	0.027 0.035	0.110 0.150	0.015	0.011	3.2 4.1	3 000	4.7	2.4
—	—	—	M6x1	24	1000 1500	20.2	13	60	150	16.9	80	1230 1730	0	0.040 0.054	0.027 0.035	0.110 0.200	0.015	0.011	3.6 4.8	3 000	4.2	2.1

**Blank shaft end FS type**

(Medium, High helix, Ultra high helix lead: End cap type)



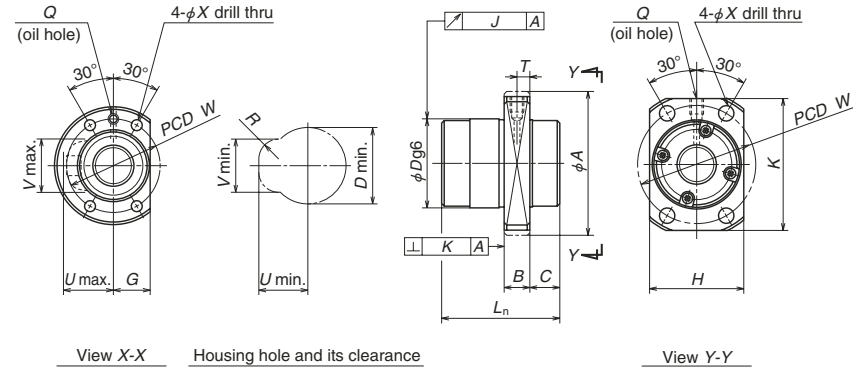
Nut type code: LSFT

**Nut models: LSFT, USFC**



Screw shaft ø25

Lead 20, 25, 50



Nut type code: USFC

Ball screw No.	Stroke Max. L <sub>1</sub> -L <sub>n</sub>	Screw shaft dia. d <sub>1</sub>	Lead l	Ball dia. D <sub>w</sub>	Ball circle dia. d <sub>m</sub>	Root dia. d	Effective ball turns × Circuits	Basic load rating (N)		Axial play Max.	Nut												
								Dynamic C <sub>a</sub>	Static C <sub>0a</sub>		Nut type code	Flange								Overall length L <sub>o</sub>	Bolt hole X		
												D	A	G	H	K	B	C	L			W	
<b>W2513FS-1-C5T20</b>	1 254	25	20	4.762	26.25	21.3	2.5x1	15 700	32 800	0.005	LSFT	44	71	23	—	—	12	8	96	57	6.6		
<b>W2521FS-1-C5T20</b>	2 054																						
<b>W2513FS-2-C5T25</b>	1 260	25	25	4.762	26.25	21.3	1.5x1	10 100	19 100	0.005	LSFT	44	71	23	—	—	12	10	90	57	6.6		
<b>W2521FS-2-C5T25</b>	2 060																						
<b>W2515FS-1GX-C5T50</b>	1 450	25	50	3.969	26	21.9	0.7x2	6 700	13 500	0.005	USFC	46	70	—	48	63	12	13	50	58	6.6		
<b>W2521FS-3GX-C5T50</b>	2 100																						

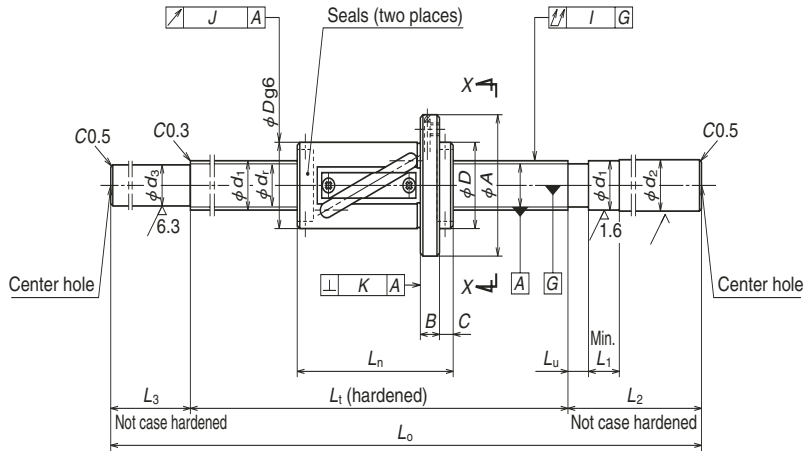
- Notes: 1. Use of NSK support unit is recommended. See page B389 for details.  
 2. Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use. See page D13 for details.  
 3. Permissible rotational speed is determined by d-n value and critical speed. See pages B47 and B299.

Unit: mm

dimensions			Screw shaft dimensions					Lead accuracy		Run-out			Mass (kg)	Permissible rotational speed (min <sup>-1</sup> )	Internal spatial volume of nut (cm <sup>3</sup> )	Standard volume of grease replenishing (cm <sup>3</sup> )						
Projecting tube	Oil hole	Threaded length	Shaft end, right	Shaft end, left	Overall length	Deviation	Variation	Shaft straightness	Nut O.D. eccentricity	Flange perpendicularity												
U	V	R	Q	T	L <sub>1</sub>	d <sub>2</sub>	L <sub>2</sub>	L <sub>1</sub>	L <sub>2</sub>	d <sub>3</sub>	L <sub>3</sub>	L <sub>o</sub>	T	e <sub>p</sub>	v <sub>u</sub>	I	J	K				
31	35	12	M6x1	—	1 350 2 150	25.2	13	70	200	21.3	100	1 650 2 450	0	0.054 0.077	0.035 0.046	0.120 0.160	0.015	0.011	6.8 9.8	2 800	12	6.0
32	34	12	M6x1	—	1 350 2 150	25.2	15	70	200	21.3	100	1 650 2 450	0	0.054 0.077	0.035 0.046	0.120 0.160	0.015	0.011	6.8 9.8	2 800	10	5.0
—	—	—	M6x1	6	1 500 2 150	25.2	26	70	200	21.9	100	1 800 2 450	0	0.054 0.077	0.035 0.046	0.120 0.160	0.015	0.011	7.3 9.8	2 800	5.3	2.7

**Blank shaft end FS type**

(Medium, High helix lead: Tube type)



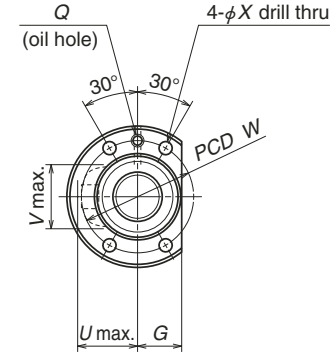
Nut type code: LSFT

**Nut model: LSFT**

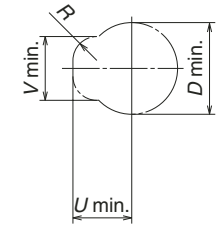
**NSK**

Screw shaft ø32

Lead 25, 32



View X-X



Housing hole and its clearance

Ball screw No.	Stroke Max. $L_1-L_n$	Screw shaft dia. $d_1$	Lead $l$	Ball dia. $D_w$	Ball circle dia. $d_m$	Root dia. $d_r$	Effective ball turns × Circuits	Basic load rating (N)		Axial play Max.	Nut							
								Dynamic $C_a$	Static $C_{0a}$		Outside dia. $D$	Flange			Overall length $L_n$	Bolt hole $W$	$X$	
												$G$	$B$	$C$				
<b>W3217FS-1-C5T25</b>	1 583	32	25	4.762	33.25	28.3	2.5×1	17 900	41 800	0.005	51	85	26	15	10	117	67	9
<b>W3227FS-1-C5T25</b>	2 583										85	26	15	10	117	67	9	
<b>W3217FS-2-C5T32</b>	1 591	32	32	4.762	33.25	28.3	1.5×1	11 500	24 800	0.005	51	85	26	15	12	109	67	9
<b>W3227FS-2-C5T32</b>	2 591										85	26	15	12	109	67	9	

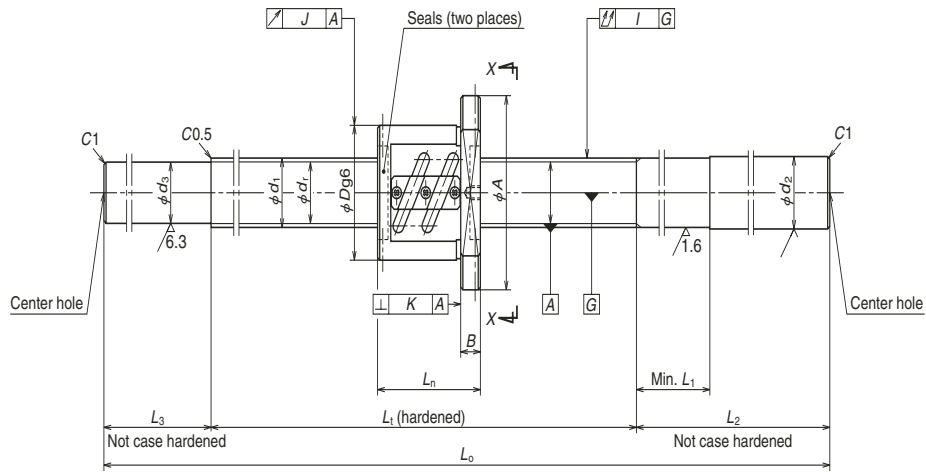
- Notes: 1. Use of NSK support unit is recommended. See page B389 for details.  
 2. Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use. See page D13 for details.  
 3. Permissible rotational speed is determined by d-n value and critical speed. See pages B47 and B299.

dimensions			Screw shaft dimensions					Lead accuracy			Run-out			Mass (kg)	Permissible rotational speed (min <sup>-1</sup> )	Internal spatial volume of nut (cm <sup>3</sup> )	Standard volume of grease replenishing (cm <sup>3</sup> )				
Projecting tube $U$	Oil hole $V$	$R$	Threaded length $L_1$	Shaft end, right $d_2$ $L_u$ $L_1$ $L_2$		Shaft end, left $d_3$ $L_3$		Overall length $L_0$	Lead compression $T$	Deviation $e_s$	Variation $v_u$	Shaft straightness $I$	Nut O.D. eccentricity $J$					Flange perpendicularity $K$			
34	42	12	M6×1	1 700 2 700	32.3	15	70	250	28.3	120	2 070 3 070	0	0.065 0.093	0.040 0.054	0.160 0.210	0.019	0.013	13.8 20.0	2 180	17	8.5
34	42	12	M6×1	1 700 2 700	32.3	19	70	250	28.3	120	2 070 3 070	0	0.065 0.093	0.040 0.054	0.160 0.210	0.019	0.013	13.9 20.0	2 180	15	7.5

Unit: mm

**Blank shaft end SS type**

(Fine lead: Tube type)



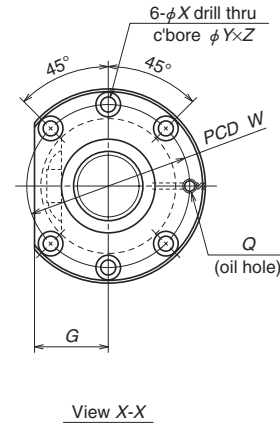
Nut type code: PFT

**Nut model: PFT**

**NSK**

Screw shaft ø20

Lead 4, 5



Ball screw No.	Stroke Max. $L_t - L_n$	Screw shaft dia. $d_1$	Lead $l$	Ball dia. $D_w$	Ball circle dia. $d_m$	Root dia. $d$	Effective ball turns x Circuits	Basic load rating (N)		Preload (N)	Dynamic friction torque, median (N·cm)	Nut						
								Dynamic $C_a$	Static $C_{0a}$			Outside dia. $D$	Flange			Overall length $L_n$	Bolt hole $X$	
													$A$	$G$	$B$			
<b>W2003SS-1P-C5Z4</b>	251	20	4	2.381	20.3	17.8	2.5x2	5 420	10 700	290	3.9	40	63	24	11	49	51	5.5
<b>W2005SS-1P-C5Z4</b>	451																	
<b>W2008SS-1P-C5Z4</b>	751																	
<b>W2003SS-2P-C5Z5</b>	244	20	5	3.175	20.5	17.2	2.5x2	9 410	17 100	490	7.8	44	67	26	11	56	55	5.5
<b>W2005SS-2P-C5Z5</b>	444																	
<b>W2007SS-1P-C5Z5</b>	644																	
<b>W2010SS-1P-C5Z5</b>	944																	

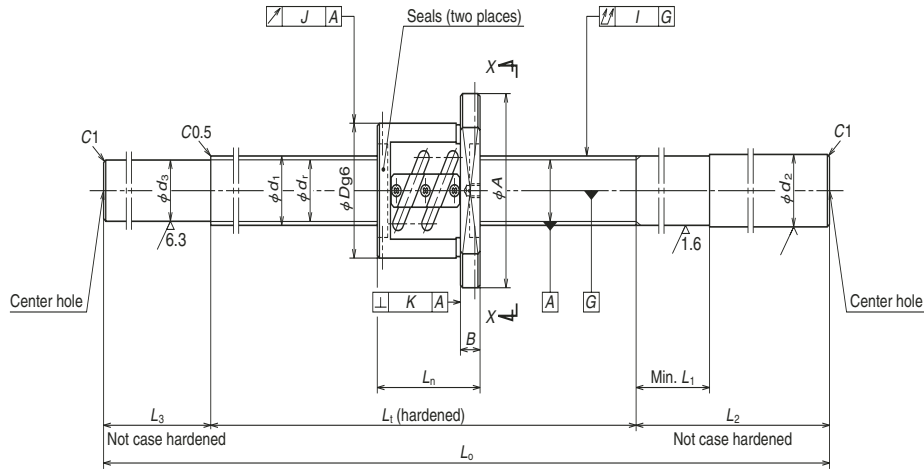
- Notes: 1. Use of NSK support unit is recommended. See page B389 for details.  
 2. Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use. See page D13 for details.  
 3. Permissible rotational speed is determined by d-n value and critical speed. See pages B47 and B299.

Unit: mm

dimensions		Screw shaft dimensions					Lead accuracy			Run-out			Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	Internal spatial volume of nut (cm <sup>3</sup> )	Standard volume of grease replenishing (cm <sup>3</sup> )			
Bolt hole	Oil hole	Threaded length	Shaft end, right		Shaft end, left	Overall length	Travel compensation	Deviation	Variation	Shaft straightness	Nut O.D. eccentricity	Flange perpendicularity							
Y	Z	Q	$L_1$	$d_2$	$L_1$	$L_2$	$d_3$	$L_3$	$L_o$	$T$	$e_p$	$v_u$	$I$	$J$	$K$				
9.5	5.5	M6x1	300		150		—	450	-0.007	0.023	0.018	0.055	0.015	0.011	1.5	3 000	2.7	1.4	
			500	20.2	40	150	17.8	50	700	-0.012	0.027	0.020			0.085				2.0
			800		200		100	1 100	-0.019	0.035	0.025	0.140			2.9				
9.5	5.5	M6x1	300		150		—	450	-0.007	0.023	0.018	0.055	0.015	0.011	1.6	3 000	4.3	2.2	
			500	20.2	40	150	17.2	50	700	-0.012	0.027	0.020			0.085				2.2
			700		200		100	1 000	-0.017	0.035	0.025	0.110			2.8				
			1 000		200		100	1 300	-0.024	0.040	0.027	0.180			3.5				

**Blank shaft end SS type**

(Fine lead: Tube type)



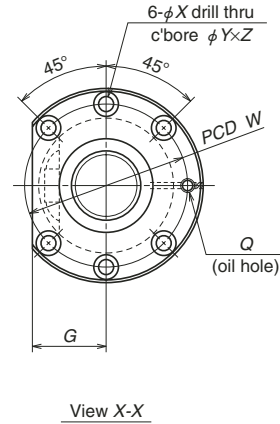
Nut type code: PFT

**Nut model: PFT**

**NSK**

Screw shaft ø25

Lead 4, 5, 6



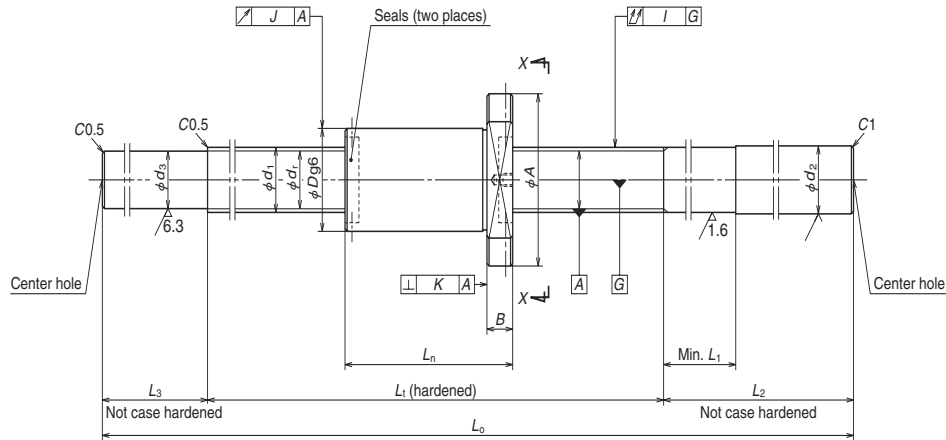
Ball screw No.	Stroke Max. $L_3 - L_0$	Screw shaft dia. $d_1$	Lead $l$	Ball dia. $D_w$	Ball circle dia. $d_m$	Root dia. $d_r$	Effective ball turns x Circuits	Basic load rating (N)		Preload (N)	Dynamic friction torque, median (N·cm)	Nut						
								Dynamic $C_a$	Static $C_{0a}$			Outside dia. $D$	Flange			Overall length $L_0$	Bolt hole $X$	
													$A$	$G$	$B$			
<b>W2503SS-1P-C5Z4</b>	252						2.5x2	6 020	13 600	290	4.9	46	69	26	11	48	57	5.5
<b>W2506SS-1P-C5Z4</b>	552	25	4	2.381	25.3	22.8	2.5x2	6 020	13 600	290	4.9	46	69	26	11	48	57	5.5
<b>W2510SS-1P-C5Z4</b>	952																	
<b>W2503SS-2P-C5Z5</b>	245																	
<b>W2505SS-1P-C5Z5</b>	445																	
<b>W2508SS-1P-C5Z5</b>	745																	
<b>W2512SS-1P-C5Z5</b>	1 145																	
<b>W2504SS-1P-C5Z6</b>	338																	
<b>W2508SS-2P-C5Z6</b>	738	25	6	3.969	25.5	21.4	2.5x2	14 100	26 800	690	13.8	53	76	29	11	62	64	5.5
<b>W2512SS-2P-C5Z6</b>	1 138																	

- Notes: 1. Use of NSK support unit is recommended. See page B389 for details.  
 2. Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use. See page D13 for details.  
 3. Permissible rotational speed is determined by d-n value and critical speed. See pages B47 and B299.

dimensions		Screw shaft dimensions				Lead accuracy			Run-out			Mass (kg)	Permissible rotational speed (min <sup>-1</sup> )	Internal spatial volume of nut (cm <sup>3</sup> )	Standard volume of grease replenishing (cm <sup>3</sup> )		
Bolt hole	Oil hole	Threaded length	Shaft end, right	Shaft end, left	Overall length	Travel compensation	Deviation	Variation	Shaft straightness	Nut O.D. eccentricity	Flange perpendicularity						
Y Z	Q	$L_1$	$d_2$ $L_1$ $L_2$	$d_3$ $L_3$	$L_0$	$T$	$e_p$	$v_u$	$I$	$J$	$K$						
9.5	5.5	M6x1	300	150	—	450	-0.007	0.023	0.018	0.040	0.015	0.011	2.2	2 800	3.2	1.6	
			600	25.2 40	200 22.8	100	900	-0.014	0.030	0.023			0.075				3.8
			1 000		200	100	1 300	-0.024	0.040	0.027			0.120				5.2
9.5	5.5	M6x1	300	200	—	500	-0.007	0.023	0.018	0.040	0.015	0.011	2.5	2 800	5.2	2.6	
			500	25.2 40	200 22.2	50	750	-0.012	0.027	0.020			0.060				3.4
			800		250	100	1 150	-0.019	0.035	0.025			0.090				4.8
			1 200		300	100	1 600	-0.029	0.046	0.030			0.120				6.3
9.5	5.5	M6x1	400	200	—	600	-0.010	0.025	0.020	0.050	0.019	0.013	3.0	2 800	7.0	3.5	
			800	25.2 40	250 21.4	100	1 150	-0.019	0.035	0.025			0.090				4.8
			1 200		300	100	1 600	-0.029	0.046	0.030			0.120				6.3

**Blank shaft end SS type**

(Fine lead: Deflector (bridge) type)



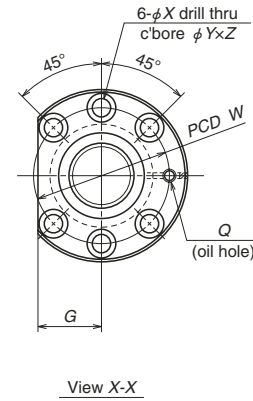
Nut type code: ZFD

**Nut model: ZFD**

**NSK**

Screw shaft  $\phi 25$

Lead 5, 10



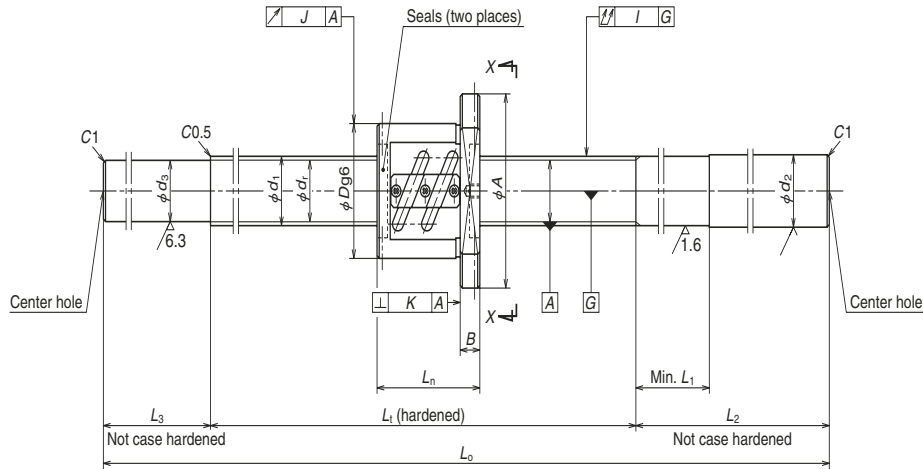
Ball screw No.	Stroke Max. $L_1-L_3$	Screw shaft dia. $d_1$	Lead $l$	Ball dia. $D_w$	Ball circle dia. $d_m$	Root dia. $d_r$	Effective ball turns x Circuits	Basic load rating (N)		Preload (N)	Dynamic friction torque, median (N·cm)	Nut												
								Dynamic $C_d$	Static $C_{0n}$			Outside dia. $D$	Flange			Overall length $L_1$	Bolt hole $W$	Bolt hole $X$						
													$A$	$G$	$B$									
W2502SS-1ZY-C5Z5	184																							
W2504SS-3ZY-C5Z5	334																							
W2506SS-2ZY-C5Z5	534	25	5	3.175	25.75	22.4	1x3	9 790	22 900	740	13.8	40	63	24	11	66	51	5.5						
W2509SS-1ZY-C5Z5	834																							
W2512SS-3ZY-C5Z5	1 134																							
W2504SS-4ZY-C5Z10	312																							
W2506SS-3ZY-C5Z10	512																							
W2508SS-3ZY-C5Z10	712	25	10	4.762	26.25	21.3	1x2	11 400	21 400	880	21.5	42	69	26	15	88	55	6.6						
W2511SS-1ZY-C5Z10	1 012																							
W2515SS-2ZY-C5Z10	1 412																							

- Notes: 1. Use of NSK support unit is recommended. See page B389 for details.  
 2. Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use. See page D13 for details.  
 3. Permissible rotational speed is determined by d-n value and critical speed. See pages B47 and B299.

dimensions		Screw shaft dimensions					Lead accuracy			Run-out			Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	Internal spatial volume of nut (cm <sup>3</sup> )	Standard volume of grease replenishing (cm <sup>3</sup> )			
Bolt hole Y	Oil hole Z	Threaded length $L_1$	Shaft end, right		Shaft end, left		Overall length $L_0$	Travel compensation $T$	Deviation $e_p$	Variation $v_u$	Shaft straightness $I$	Nut O.D. eccentricity $J$					Flange perpendicularity $K$		
			$d_2$	$L_1$	$L_2$	$d_3$												$L_3$	
9.5	5.5	M6x1	250		200		—	450	-0.005	0.023	0.018	0.040			2.1	2 800	5.4	2.7	
			400		200		50	650	-0.009	0.025	0.020	0.060			2.8				
			600	25.2	40	250	22.4	100	950	-0.013	0.030	0.023	0.075	0.015	0.011				3.9
			900			250		100	1 250	-0.021	0.040	0.027	0.090						4.9
			1 200			300		100	1 600	-0.028	0.046	0.030	0.120						6.2
11	6.5	M6x1	400		200		50	650	-0.008	0.025	0.020	0.060			3.0	2 800	9.0	4.5	
			600		250		100	950	-0.012	0.030	0.023	0.075			4.1				
			800	25.2	60	250	21.3	100	1 150	-0.017	0.035	0.025	0.090	0.015	0.011				4.8
			1 100			300		100	1 500	-0.024	0.046	0.030	0.120						6.0
			1 500			300		100	1 900	-0.034	0.054	0.035	0.150						7.4

**Blank shaft end SS type**

(Fine lead: Tube type)



Nut type code: PFT

**Nut model: PFT**

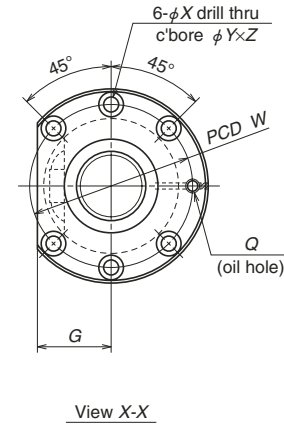
**NSK**

Screw shaft ø25

Lead 10

Screw shaft ø28

Lead 5, 6



View X-X

Unit: mm

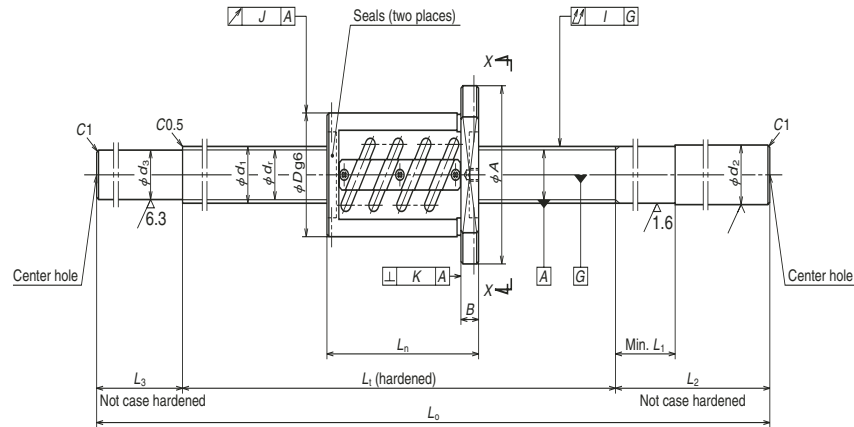
Ball screw No.	Stroke Max. L <sub>r</sub> -L <sub>n</sub>	Screw shaft dia. d <sub>1</sub>	Lead l	Ball dia. D <sub>w</sub>	Ball circle dia. d <sub>m</sub>	Root dia. d <sub>r</sub>	Effective ball turns x Circuits	Basic load rating (N)		Preload (N)	Dynamic friction torque, median (N·cm)	Nut						
								Dynamic C <sub>d</sub>	Static C <sub>0n</sub>			Outside dia. D	Flange			Overall length L	Bolt hole W	X
													A	G	B			
<b>W2504SS-2P-C5Z10</b>	319	25	10	4.762	25.5	20.5	1.5x2	11 600	19 000	590	13.8	58	85	32	15	81	71	6.6
<b>W2507SS-1P-C5Z10</b>	619																	
<b>W2510SS-2P-C5Z10</b>	919																	
<b>W2515SS-1P-C5Z10</b>	1 419																	
<b>W2804SS-1P-C5Z5</b>	344																	
<b>W2806SS-1P-C5Z5</b>	544	28	5	3.175	28.5	25.2	2.5x2	11 000	24 400	540	9.8	55	85	31	12	56	69	6.6
<b>W2808SS-1P-C5Z5</b>	744																	
<b>W2812SS-1P-C5Z5</b>	1 144																	
<b>W2804SS-3P-C5Z6</b>	337																	
<b>W2806SS-3P-C5Z6</b>	537																	
<b>W2808SS-3P-C5Z6</b>	737	28	6	3.175	28.5	25.2	2.5x2	11 000	24 400	540	10.8	55	85	31	12	63	69	6.6
<b>W2812SS-3P-C5Z6</b>	1 137																	

- Notes: 1. Use of NSK support unit is recommended. See page B389 for details.  
 2. Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use. See page D13 for details.  
 3. Permissible rotational speed is determined by d-n value and critical speed. See pages B47 and B299.

dimensions		Screw shaft dimensions					Lead accuracy			Run-out			Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	Internal spatial volume of nut (cm <sup>3</sup> )	Standard volume of grease replenishing (cm <sup>3</sup> )		
Bolt hole Y	Oil hole Z	Threaded length L <sub>1</sub>	Shaft end, right d <sub>2</sub>	Shaft end, left L <sub>1</sub>	L <sub>2</sub>	d <sub>3</sub>	L <sub>3</sub>	Overall length L <sub>0</sub>	Travel compensation T	Deviation e <sub>p</sub>	Variation v <sub>u</sub>	Shaft straightness I					Nut O.D. eccentricity J	Flange perpendicularity K
11	6.5	M6x1	400	25.2	60	200	50	650	-0.010	0.025	0.020	0.060	0.019	0.013	3.8	2 800	9.7	4.9
			700			250	100	1 050	-0.017	0.035	0.025	0.090			5.1			
			1 000			250	100	1 350	-0.024	0.040	0.027	0.120			6.1			
			1 500			300	100	1 900	-0.036	0.054	0.035	0.150			8.0			
11	6.5	M6x1	400	28.2	40	200	—	600	-0.010	0.025	0.020	0.050	0.019	0.013	3.7	2 500	6.1	3.1
			600			250	100	950	-0.014	0.030	0.023	0.075			5.2			
			800			250	100	1 150	-0.019	0.035	0.025	0.090			6.1			
			1 200			300	100	1 600	-0.029	0.046	0.030	0.120			8.1			
11	6.5	M6x1	400	28.2	40	200	—	600	-0.010	0.025	0.020	0.050	0.019	0.013	3.8	2 500	6.1	3.1
			600			250	100	950	-0.014	0.030	0.023	0.075			5.3			
			800			250	100	1 150	-0.019	0.035	0.025	0.090			6.2			
			1 200			300	100	1 600	-0.029	0.046	0.030	0.120			8.2			

**Blank shaft end SS type**

(Fine lead: Tube type)



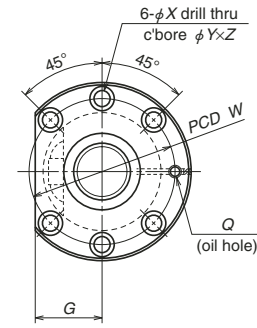
Nut type code: ZFT

**Nut model: ZFT**

**NSK**

Screw shaft ø28

Lead 5, 6



View X-X

Ball screw No.	Stroke Max. $L_1-L_n$	Screw shaft dia. $d_1$	Lead $l$	Ball dia. $D_w$	Ball circle dia. $d_m$	Root dia. $d_r$	Effective ball turns x Circuits	Basic load rating (N)		Preload (N)	Dynamic friction torque, median (N·cm)	Nut						
								Dynamic $C_a$	Static $C_{0a}$			Outside dia. $D$	Flange			Overall length $L_n$	Bolt hole $W$	$X$
													$A$	$G$	$B$			
<b>W2804SS-2Z-C5Z5</b>	314	28	5	3.175	28.5	25.2	2.5x2	17 400	48 800	1 225	21.5	55	85	31	12	86	69	6.6
<b>W2806SS-2Z-C5Z5</b>	514																	
<b>W2808SS-2Z-C5Z5</b>	714																	
<b>W2812SS-2Z-C5Z5</b>	1 114																	
<b>W2804SS-4Z-C5Z6</b>	301	28	6	3.175	28.5	25.2	2.5x2	17 400	48 800	1 225	22.5	55	85	31	12	99	69	6.6
<b>W2806SS-4Z-C5Z6</b>	501																	
<b>W2808SS-4Z-C5Z6</b>	701																	
<b>W2812SS-4Z-C5Z6</b>	1 101																	

- Notes: 1. Use of NSK support unit is recommended. See page B389 for details.  
 2. Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use. See page D13 for details.  
 3. Permissible rotational speed is determined by d-n value and critical speed. See pages B47 and B299.

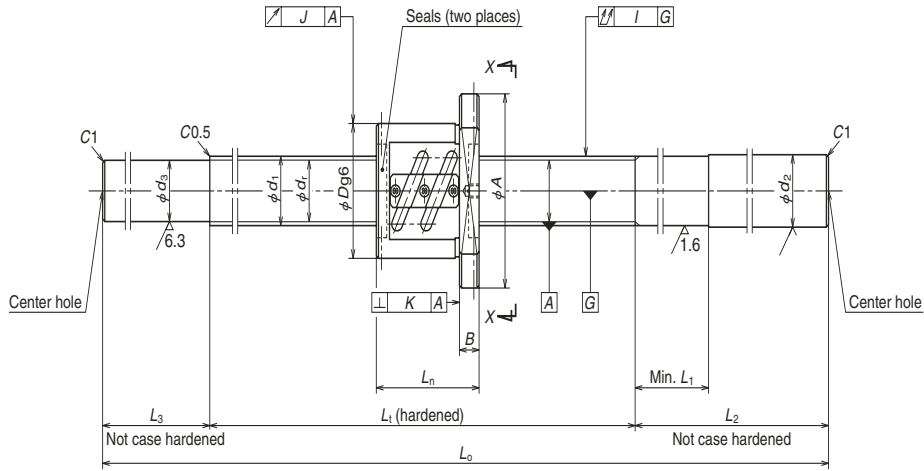
Unit: mm

dimensions		Screw shaft dimensions					Lead accuracy			Run-out			Mass (kg)	Permissible rotational speed N(min <sup>-1</sup> )	Internal spatial volume of nut (cm <sup>3</sup> )	Standard volume of grease replenishing (cm <sup>3</sup> )		
Bolt hole Y	Oil hole Z	Threaded length $L_1$	Shaft end, right		Shaft end, left		Overall length $L_0$	Travel compensation $T$	Deviation $e_p$	Variation $v_u$	Shaft straightness $I$	Nut O.D. eccentricity $J$					Flange perpendicularity $K$	
			$d_2$	$L_1$	$L_2$	$d_3$												$L_3$
11	6.5	M6x1	400	28.2	40	200	25.2	—	600	-0.010	0.025	0.020	0.050	0.019	0.013	2 500	9.2	4.6
			600			100		950	-0.014	0.030	0.023	0.075						
			800			100		1 150	-0.019	0.035	0.025	0.090						
			1 200			100		1 600	-0.029	0.046	0.030	0.120						
11	6.5	M6x1	400	28.2	40	200	25.2	—	600	-0.010	0.025	0.020	0.050	0.019	0.013	2 500	9.5	4.8
			600			100		950	-0.014	0.030	0.023	0.075						
			800			100		1 150	-0.019	0.035	0.025	0.090						
			1 200			100		1 600	-0.029	0.046	0.030	0.120						



**Blank shaft end SS type**

(Fine lead: Tube type)



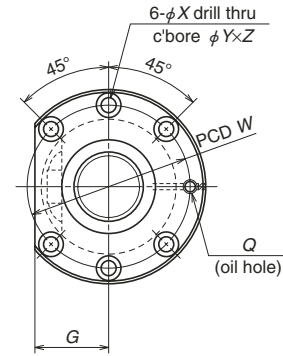
Nut type code: PFT

**Nut model: PFT**

**NSK**

Screw shaft ø32

Lead 5, 6



View X-X

Ball screw No.	Stroke Max. $L_1-L_n$	Screw shaft dia. $d_1$	Lead $l$	Ball dia. $D_b$	Ball circle dia. $d_m$	Root dia. $d_r$	Effective ball turns $\times$ Circuits	Basic load rating (N)			Preload (N)	Dynamic friction torque, median (N-cm)	Nut								
								Dynamic $C_a$	Static $C_{0a}$	Dynamic friction torque, median (N-cm)			Outside dia. $D$	Flange			Overall length $L_n$				
														$A$	$G$	$B$					
<b>W3204SS-1P-C5Z5</b>	344																				
<b>W3206SS-1P-C5Z5</b>	544																				
<b>W3208SS-1P-C5Z5</b>	744	32	5	3.175	32.5	29.2	2.5×2	11 600	28 000	590	10.8	58	85	32	12	56					
<b>W3212SS-1P-C5Z5</b>	1 144																				
<b>W3215SS-1P-C5Z5</b>	1 444																				
<b>W3206SS-3P-C5Z6</b>	537																				
<b>W3210SS-1P-C5Z6</b>	937	32	6	3.969	32.5	28.4	2.5×2	15 500	34 700	780	15.6	62	89	34	12	63					
<b>W3215SS-3P-C5Z6</b>	1 437																				

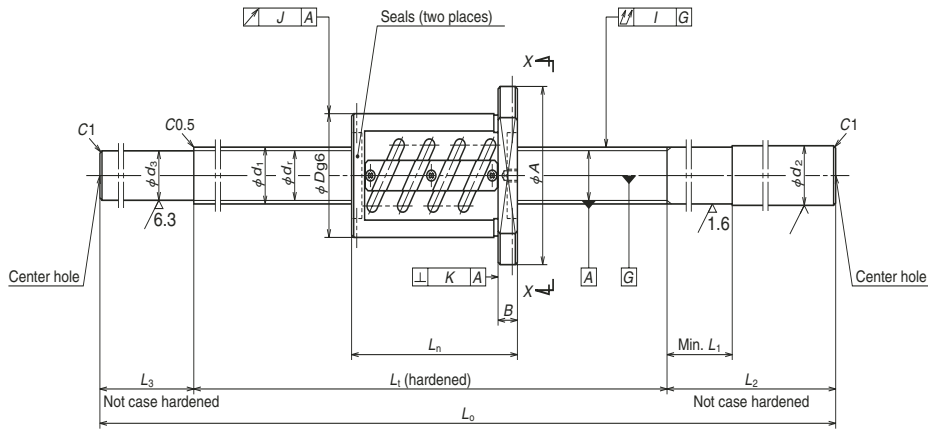
- Notes: 1. Use of NSK support unit is recommended. See page B389 for details.  
 2. **Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.** See page D13 for details.  
 3. Permissible rotational speed is determined by d-n value and critical speed. See pages B47 and B299.

dimensions				Screw shaft dimensions					Lead accuracy			Run-out			Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	Internal spatial volume of nut (cm <sup>3</sup> )	Standard volume of grease replenishing (cm <sup>3</sup> )				
Bolt hole		Oil hole	Threaded length	Shaft end, right		Shaft end, left		Overall length	Travel compensation	Deviation	Variation	Shaft straightness	Nut O.D. eccentricity	Flange perpendicularity								
W	X			Y	Z	$L_1$	$d_2$												$L_1$	$L_2$	$d_3$	$L_3$
71	6.6	11	6.5	M6x1	400	32.3	40	200	29.2	50	100	650	-0.010	0.025	0.020	0.060	0.019	0.013	4.8	2 180	6.9	3.5
					600			250		100		950	-0.014	0.030	0.023				6.5			
					800			300		100		1 150	-0.019	0.035	0.025				7.7			
					1 200			300		100		1 600	-0.029	0.046	0.030				10.3			
75	6.6	11	6.5	M6x1	600	32.3	40	250	28.4	100	100	950	-0.014	0.030	0.023	0.075	0.019	0.013	6.7	2 180	9.4	4.7
					1 000			300		100		1 400	-0.024	0.040	0.027				9.2			
					1 500			300		100		1 900	-0.036	0.054	0.035				12.1			
					1 500			300		100		1 900	-0.036	0.054	0.035				12.1			

Unit: mm

**Blank shaft end SS type**

(Fine lead: Tube type)



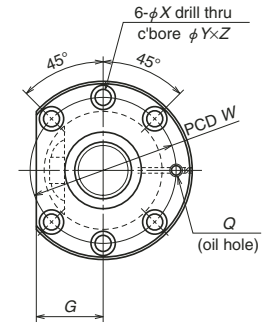
Nut type code: ZFT

**Nut model: ZFT**

**NSK**

Screw shaft ø32

Lead 5, 6, 8



View X-X

Unit: mm

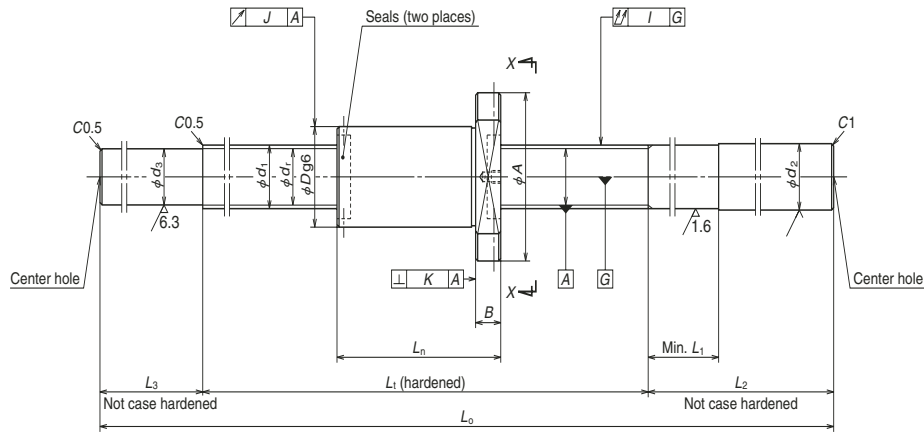
Ball screw No.	Stroke Max. L <sub>1</sub> -L <sub>n</sub>	Screw shaft dia. d <sub>1</sub>	Lead l	Ball dia. D <sub>v</sub>	Ball circle dia. d <sub>m</sub>	Root dia. d <sub>r</sub>	Effective ball turns × Circuits	Basic load rating (N)			Dynamic friction torque, median (N-cm)	Nut				
								Dynamic C <sub>a</sub>	Static C <sub>0a</sub>	Preload (N)		Outside dia. D	Flange			Overall length L <sub>n</sub>
													A	G	B	
W3204SS-2Z-C5Z5	314	32	5	3.175	32.5	29.2	2.5×2	18 500	56 100	1 270	22.5	58	85	32	12	86
W3206SS-2Z-C5Z5	514															
W3208SS-2Z-C5Z5	714															
W3212SS-2Z-C5Z5	1 114															
W3215SS-2Z-C5Z5	1 414															
W3206SS-4Z-C5Z6	501	32	6	3.969	32.5	28.4	2.5×2	24 700	69 400	1 720	34.5	62	89	34	12	99
W3210SS-2Z-C5Z6	901															
W3215SS-4Z-C5Z6	1 401															
W3206SS-5Z-C5Z8	518	32	8	4.762	32.5	27.5	2.5×1	17 500	41 000	1 320	30.5	66	100	38	15	82
W3210SS-3Z-C5Z8	918															
W3215SS-5Z-C5Z8	1 418															

- Notes: 1. Use of NSK support unit is recommended. See page B389 for details.  
 2. Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use. See page D13 for details.  
 3. Permissible rotational speed is determined by d-n value and critical speed. See pages B47 and B299.

dimensions				Screw shaft dimensions					Lead accuracy			Run-out			Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	Internal spatial volume of nut (cm <sup>3</sup> )	Standard volume of grease repackaging (cm <sup>3</sup> )			
Bolt hole		Oil hole	Threaded length	Shaft end, right		Shaft end, left		Overall length	Travel compensation	Deviation	Variation	Shaft straightness	Nut O.D. eccentricity	Flange perpendicularity							
W	X			Y	Z	L <sub>1</sub>	d <sub>2</sub>												L <sub>1</sub>	L <sub>2</sub>	d <sub>3</sub>
71	6.6	11	6.5	M6×1	400	32.3	40	200	50	650	-0.010	0.025	0.020	0.060	0.019	0.013	5.1	2 180	10	5.0	
					600			250	100	950	-0.014	0.030	0.023	0.075			6.9				
					800			250	29.2	100	1 150	-0.019	0.035	0.025			0.090				8.0
					1 200			300	100	1 600	-0.029	0.046	0.030	0.120			10.1				
					1 500			300	100	1 900	-0.036	0.054	0.035	0.150			12.4				
75	6.6	11	6.5	M6×1	600	32.3	40	250	—	950	-0.014	0.030	0.023	0.075	0.019	0.013	7.1	2 180	15	7.5	
					1 000			300	28.4	100	1 400	-0.024	0.040	0.027			0.120				9.7
					1 500			300	—	1 900	-0.036	0.054	0.035	0.150			12.6				
82	9	14	8.5	M6×1	600	32.3	50	250	—	950	-0.014	0.030	0.023	0.075	0.019	0.013	7.3	2 180	7.9	4.0	
					1 000			300	27.5	100	1 400	-0.024	0.040	0.027			0.120				9.8
					1 500			300	—	1 900	-0.036	0.054	0.035	0.150			12.6				

**Blank shaft end SS type**

(Fine lead: Deflector (bridge) type)



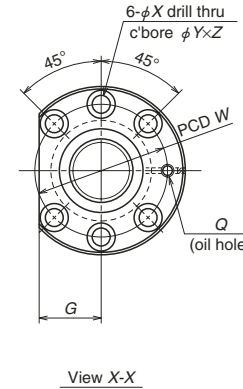
Nut type code: ZFD

**Nut model: ZFD**

**NSK**

Screw shaft ø32

Lead 5, 10



Unit: mm

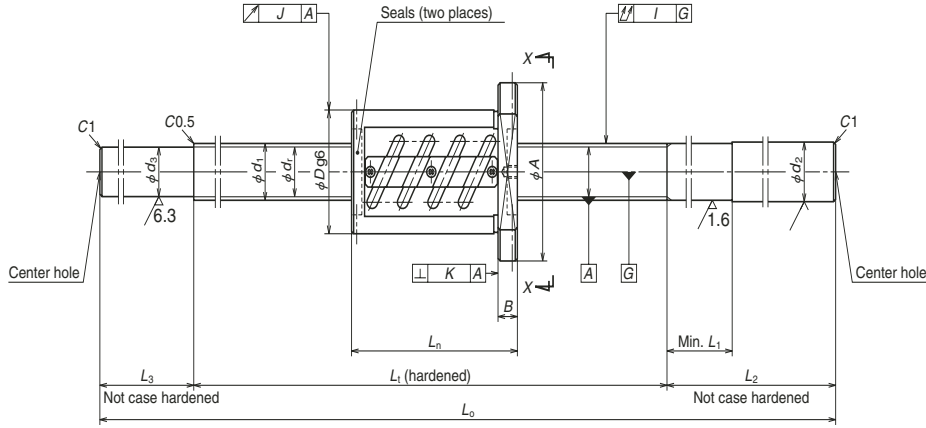
Ball screw No.	Stroke Max. $L_t-L_n$	Screw shaft dia. $d_1$	Lead $l$	Ball dia. $D_w$	Ball circle dia. $d_m$	Root dia. $d_r$	Effective ball turns $\times$ Circuits	Basic load rating (N)			Preload (N)	Dynamic friction torque, median (N-cm)	Nut							
								Dynamic $C_a$	Static $C_{0a}$	Dynamic friction torque, median (N-cm)			Flange				Overall length $L_n$			
													Outside dia. $D$	$A$	$G$	$B$				
<b>W3204SS-3ZY-C5Z5</b>	323																			
<b>W3206SS-6ZY-C5Z5</b>	523																			
<b>W3209SS-1ZY-C5Z5</b>	823	32	5	3.175	32.75	29.4	4	14 200	40 700	1 080	19.6	48	75	29	12	77				
<b>W3212SS-3ZY-C5Z5</b>	1 123																			
<b>W3216SS-1ZY-C5Z5</b>	1 523																			
<b>W3205SS-3ZY-C5Z10</b>	380																			
<b>W3207SS-3ZY-C5Z10</b>	580																			
<b>W3210SS-6ZY-C5Z10</b>	880	32	10	6.35	33.75	27.1	3	25 900	52 800	1 860	49.0	54	88	34	15	120				
<b>W3214SS-3ZY-C5Z10</b>	1 280																			
<b>W3218SS-3ZY-C5Z10</b>	1 680																			

- Notes: 1. Use of NSK support unit is recommended. See page B389 for details.  
 2. Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use. See page D13 for details.  
 3. Permissible rotational speed is determined by d-n value and critical speed. See pages B47 and B299.

dimensions				Screw shaft dimensions					Lead accuracy			Run-out			Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	Internal spatial volume of nut (cm <sup>3</sup> )	Standard volume of grease replenishing (cm <sup>3</sup> )		
Bolt hole		Oil hole		Threaded length	Shaft end, right		Shaft end, left		Overall length	Travel compensation	Deviation	Variation	Shaft straightness	Nut O.D. eccentricity					Flange perpendicularity	
W	X	Y	Z	Q	$L_1$	$d_2$	$L_1$	$L_2$	$d_3$	$L_3$	$L_0$	T	$e_p$	$v_u$					I	J
61	6.6	11	6.5	M6x1	400	32.3	40	200	50	650	-0.009	0.025	0.020	0.060	0.015	0.011	8.1	2 180	22	11
					600			100	950	-0.013	0.030	0.023	0.075							
					900			100	1 250	-0.021	0.040	0.027	0.120							
					1 200			100	1 600	-0.028	0.046	0.030	0.150							
70	9	14	8.5	M6x1	1 600	32.3	60	300	100	2 000	-0.037	0.054	0.035	0.150	0.019	0.013	9.3	2 180	23	12
					500			100	850	-0.010	0.027	0.020	0.075							
					700			100	1 050	-0.015	0.035	0.025	0.090							
					1 000			100	1 400	-0.022	0.040	0.027	0.120							
					1 400	32.3	350	120	120	1 870	-0.032	0.054	0.035	0.150	0.019	0.013	11.9	2 180	23	12
					1 800			120	2 270	-0.041	0.065	0.040	0.200							

**Blank shaft end SS type**

(Fine lead: Tube type)



Nut type code: ZFT

**Nut model: ZFT**

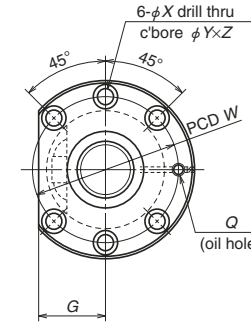
**NSK**

Screw shaft  $\phi 32, \phi 36$

Lead 10

Screw shaft  $\phi 40$

Lead 5



View X-X

Unit: mm

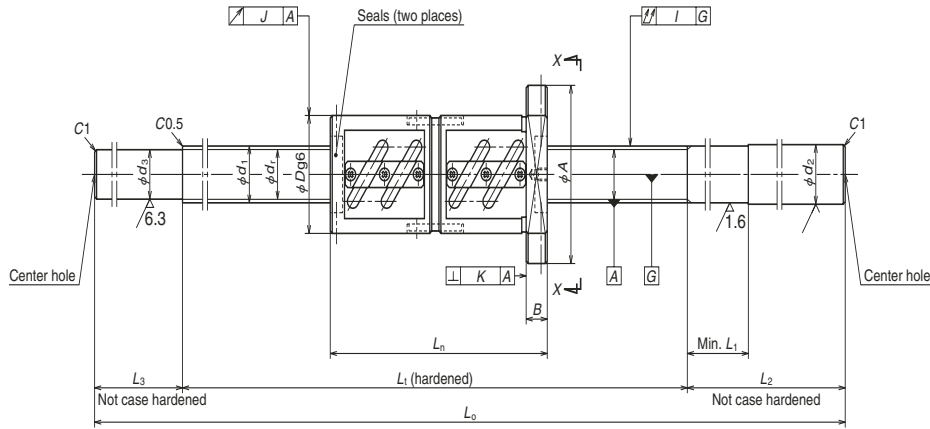
Ball screw No.	Stroke Max. $L_t - L_n$	Screw shaft dia. $d_1$	Lead $l$	Ball dia. $D_w$	Ball circle dia. $d_m$	Root dia. $d_r$	Effective ball turns $\times$ Circuits	Basic load rating (N)			Dynamic friction torque, median (N-cm)	Nut				
								Dynamic $C_a$	Static $C_{0a}$	Preload (N)		Outside dia. $D$	Flange			Overall length $L_n$
													A	G	B	
<b>W3205SS-1Z-C5Z10</b>	400	32	10	6.350	33	26.4	2.5x1	25 500	54 000	1 960	50	74	108	41	15	100
<b>W3207SS-1Z-C5Z10</b>	600															
<b>W3210SS-4Z-C5Z10</b>	900															
<b>W3214SS-1Z-C5Z10</b>	1 300															
<b>W3218SS-1Z-C5Z10</b>	1 700															
<b>W3607SS-1Z-C5Z10</b>	597	36	10	6.350	37	30.4	2.5x1	27 200	61 300	2 060	56	75	120	45	18	103
<b>W3612SS-1Z-C5Z10</b>	1 097															
<b>W3620SS-1Z-C5Z10</b>	1 897															
<b>W4006SS-1Z-C5Z5</b>	511	40	5	3.175	40.5	37.2	2.5x2	20 200	70 600	1 420	28.5	67	101	39	15	89
<b>W4010SS-1Z-C5Z5</b>	911															
<b>W4016SS-1Z-C5Z5</b>	1 511															

- Notes: 1. Use of NSK support unit is recommended. See page B389 for details.  
 2. **Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.**  
 See page D13 for details.  
 3. Permissible rotational speed is determined by d-n value and critical speed. See pages B47 and B299.

dimensions				Screw shaft dimensions					Lead accuracy			Run-out			Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	Internal spatial volume of nut (cm <sup>3</sup> )	Standard volume of grease replenishing (cm <sup>3</sup> )		
Bolt hole		Oil hole		Threaded length	Shaft end, right		Shaft end, left		Overall length	Travel compensation	Deviation	Variation	Shaft straightness	Nut O.D. eccentricity					Flange perpendicularity	
W	X	Y	Z	Q	$L_1$	$d_2$	$L_1$	$L_2$	$d_3$	$L_3$	$L_0$	T	$e_p$	$v_u$					I	J
90	9	14	8.5	M6x1	500	32.3	60	250	26.4	100	100	850	-0.012	0.027	0.020	0.075	0.019	0.013	7.5	
					700					1 050		-0.017	0.035	0.025	8.5					
					1 400					350		120	1 870	-0.034	0.054				0.035	13.1
					1 800					350		120	2 270	-0.043	0.065				0.040	15.2
98	11	17.5	11	M6x1	700	36.3	60	300	30.4	100	100	1 100	-0.017	0.035	0.025	0.065	0.019	0.013	10.9	
					1 200					350		120	1 670	-0.029	0.046				0.030	14.9
					2 000					350		120	2 470	-0.048	0.065				0.040	20.4
83	9	14	8.5	Rc1/8	600	40.3	50	300	37.2	100	100	1 000	-0.014	0.030	0.023	0.050	0.019	0.013	11.1	
					1 000					350		120	1 400	-0.024	0.040				0.027	14.8
					1 600					350		120	2 050	-0.038	0.054				0.035	20.8

**Blank shaft end SS type**

(Fine lead: Tube type)



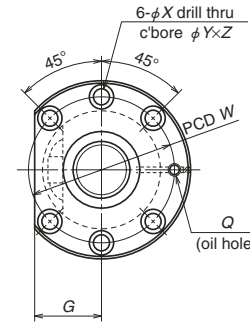
Nut type code: DFT

**Nut model: DFT**

**NSK**

Screw shaft ø32, ø36

Lead 10



View X-X

Ball screw No.	Stroke Max. $L_1-L_n$	Screw shaft dia. $d_1$	Lead $l$	Ball dia. $D_w$	Ball circle dia. $d_m$	Root dia. $d_r$	Effective ball turns $\times$ Circuits	Basic load rating (N)			Dynamic friction torque, median (N-cm)	Nut				
								Dynamic $C_a$	Static $C_{0a}$	Preload (N)		Outside dia. $D$	Flange			Overall length $L_n$
													A	G	B	
W3205SS-2D-C5Z10	310	32	10	6.350	33	26.4	2.5x2	46 300	108 000	3 240	83	74	108	41	15	190
W3207SS-2D-C5Z10	510															
W3210SS-5D-C5Z10	810															
W3214SS-2D-C5Z10	1 210															
W3218SS-2D-C5Z10	1 610															
W3607SS-2D-C5Z10	507	36	10	6.350	37	30.4	2.5x2	49 300	123 000	3 430	93	75	120	45	18	193
W3612SS-2D-C5Z10	1 007															
W3620SS-2D-C5Z10	1 807															

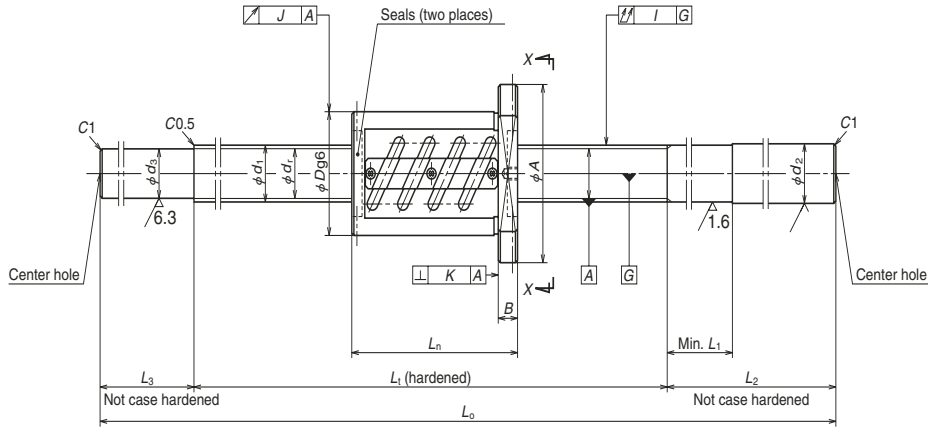
- Notes: 1. Use of NSK support unit is recommended. See page B389 for details.  
 2. Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use. See page D13 for details.  
 3. Permissible rotational speed is determined by d-n value and critical speed. See pages B47 and B299.

Unit: mm

dimensions				Screw shaft dimensions					Lead accuracy			Run-out			Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	Internal spatial volume of nut (cm <sup>3</sup> )	Standard volume of grease replenishing (cm <sup>3</sup> )			
Bolt hole		Oil hole	Threaded length	Shaft end, right		Shaft end, left		Overall length	Travel compensation	Deviation	Variation	Shaft straightness	Nut O.D. eccentricity	Flange perpendicularity							
W	X	Y		Z	Q	$L_1$	$d_2$												$L_1$	$L_2$	$d_3$
90	9	14	8.5	M6x1	1 000	32.3	60	300	26.4	100	1 400	-0.024	0.040	0.027	0.120	0.019	0.013	9.5	2 180	57	29
																		10.6			
																		15.1			
																		17.2			
98	11	17.5	11	M6x1	1 200	36.3	60	350	30.4	120	1 670	-0.029	0.046	0.030	0.100	0.019	0.013	12.8	1 940	67	34
																		16.8			
																		22.3			
																		22.3			

**Blank shaft end SS type**

(Fine lead: Tube type)



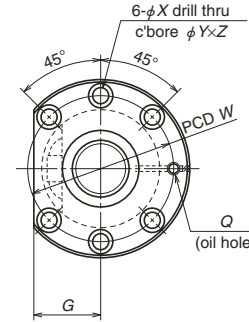
Nut type code: ZFT

**Nut model: ZFT**

**NSK**

Screw shaft ø40

Lead 8, 10, 12



View X-X

Unit: mm

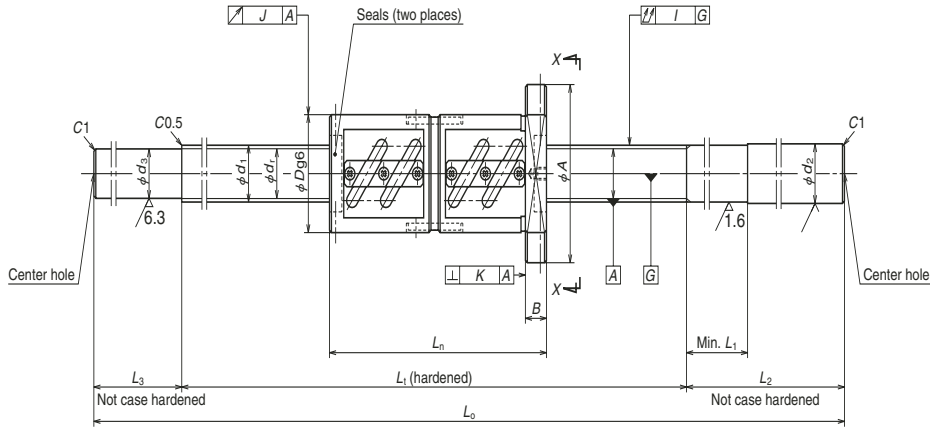
Ball screw No.	Stroke Max. $L_1-L_n$	Screw shaft dia. $d_1$	Lead $l$	Ball dia. $D_w$	Ball circle dia. $d_m$	Root dia. $d_r$	Effective ball turns × Circuits	Basic load rating (N)			Dynamic friction torque, median (N-cm)	Nut								
								Dynamic $C_a$	Static $C_{0a}$	Preload (N)		Outside dia. $D$	Flange			Overall length $L_n$				
													$A$	$G$	$B$					
<b>W4007SS-1Z-C5Z8</b>	570																			
<b>W4012SS-1Z-C5Z8</b>	1 070	40	8	4.762	40.5	35.5	2.5×2	34 900	103 000	2 450	64	74	108	41	15	130				
<b>W4018SS-1Z-C5Z8</b>	1 670																			
<b>W4007SS-2Z-C5Z10</b>	597																			
<b>W4010SS-2Z-C5Z10</b>	897																			
<b>W4014SS-1Z-C5Z10</b>	1 297	40	10	6.350	41	34.4	2.5×1	28 600	68 600	2 160	64	82	124	47	18	103				
<b>W4018SS-2Z-C5Z10</b>	1 697																			
<b>W4024SS-1Z-C5Z10</b>	2 297																			
<b>W4010SS-4Z-C5Z12</b>	883																			
<b>W4016SS-2Z-C5Z12</b>	1 483	40	12	7.144	41.5	34.1	2.5×1	33 600	77 500	2 550	83	86	128	48	18	117				
<b>W4025SS-1Z-C5Z12</b>	2 383																			

- Notes: 1. Use of NSK support unit is recommended. See page B389 for details.  
 2. Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use. See page D13 for details.  
 3. Permissible rotational speed is determined by d-n value and critical speed. See pages B47 and B299.

dimensions					Screw shaft dimensions					Lead accuracy			Run-out			Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	Internal spatial volume of nut (cm <sup>3</sup> )	Standard volume of grease replenishing (cm <sup>3</sup> )				
Bolt hole		Oil hole	Threaded length	Shaft end, right		Shaft end, left		Overall length	Travel compensation	Deviation	Variation	Shaft straightness	Nut O.D. eccentricity	Flange perpendicularity									
W	X			Y	Z	Q	$L_1$								$d_2$					$L_1$	$L_2$	$d_3$	$L_3$
90	9	14	8.5	Rc1/8	700	40.3	50	350	35.5	100	1 100	-0.017	0.035	0.025	0.065					13.0	1 750	27	14
					1 800			350		120	2 270	-0.043	0.065	0.040	0.130					23.5			
102	11	17.5	11	Rc1/8	700	40.3	60	300		100	1 100	-0.017	0.035	0.025	0.065					13.3			
					1 000			300		100	1 400	-0.024	0.040	0.027	0.080					15.9			
					1 400			350	34.4	120	1 870	-0.034	0.054	0.035	0.100	0.025	0.015			20.0	1 750	30	15
					1 800			350		120	2 270	-0.043	0.065	0.040	0.130					23.4			
					2 400			400		150	2 950	-0.058	0.077	0.046	0.170					29.4			
106	11	17.5	11	Rc1/8	1 000	40.3	70	300		100	1 400	-0.024	0.040	0.027	0.080					16.7			
					1 600			350	34.1	150	2 100	-0.038	0.054	0.035	0.130	0.025	0.015			22.9	1 750	35	18
					2 500			400		150	3 050	-0.060	0.077	0.046	0.170					31.1			

**Blank shaft end SS type**

(Fine lead: Tube type)



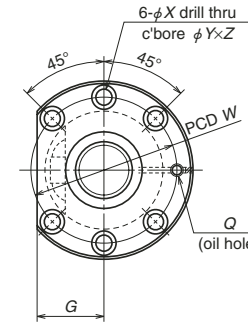
Nut type code: DFT

**Nut model: DFT**

**NSK**

Screw shaft ø40

Lead 10, 12



View X-X

Ball screw No.	Stroke Max. $L_1-L_n$	Screw shaft dia. $d_1$	Lead $l$	Ball dia. $D_w$	Ball circle dia. $d_m$	Root dia. $d_r$	Effective ball turns $\times$ Circuits	Basic load rating (N)			Dynamic friction torque, median (N-cm)	Nut								
								Dynamic $C_a$	Static $C_{0a}$	Preload (N)		Outside dia. $D$	Flange			Overall length $L_n$				
													A	G	B					
W4007SS-3D-C5Z10	507																			
W4010SS-3D-C5Z10	807																			
W4014SS-2D-C5Z10	1 207	40	10	6.350	41	34.4	2.5x2	52 000	137 000	3 630	108	82	124	47	18	193				
W4018SS-3D-C5Z10	1 607																			
W4024SS-2D-C5Z10	2 207																			
W4010SS-5D-C5Z12	775																			
W4016SS-3D-C5Z12	1 375	40	12	7.144	41.5	34.1	2.5x2	61 000	155 000	4 310	138	86	128	48	18	225				
W4025SS-2D-C5Z12	2 275																			

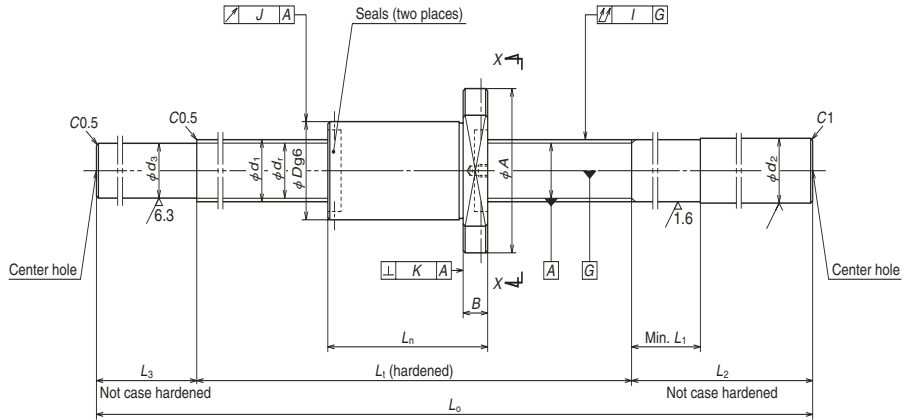
- Notes: 1. Use of NSK support unit is recommended. See page B389 for details.  
 2. Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use. See page D13 for details.  
 3. Permissible rotational speed is determined by d-n value and critical speed. See pages B47 and B299.

Unit: mm

dimensions				Screw shaft dimensions					Lead accuracy			Run-out			Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	Internal spatial volume of nut (cm <sup>3</sup> )	Standard volume of grease replenishing (cm <sup>3</sup> )					
Bolt hole		Oil hole	Threaded length	Shaft end, right		Shaft end, left		Overall length	Travel compensation	Deviation	Variation	Shaft straightness	Nut O.D. eccentricity	Flange perpendicularity									
W	X	Y		Z	Q	$L_1$	$d_2$												$L_1$	$L_2$	$d_3$	$L_3$	$L_0$
						700				300	100	1 100	-0.017	0.035	0.025	0.065				15.5			
						1 000				300	100	1 400	-0.024	0.040	0.027	0.080				18.1			
102	11	17.5	11	Rc1/8	1 400	40.3	60	350	34.4	120	1 870	-0.034	0.054	0.035	0.100	0.025	0.015			22.2	1 750	74	37
					1 800			350		120	2 270	-0.043	0.065	0.040	0.130					25.6			
					2 400			400		150	2 950	-0.058	0.077	0.046	0.170					31.6			
					1 000			300		100	1 400	-0.024	0.040	0.027	0.080					19.7			
106	11	17.5	11	Rc1/8	1 600	40.3	70	350	34.1	150	2 100	-0.038	0.054	0.035	0.130	0.025	0.015			25.8	1 750	93	47
					2 500			400		150	3 050	-0.060	0.077	0.046	0.170					34.0			

**Blank shaft end SS type**

(Fine lead: Deflector (bridge) type)



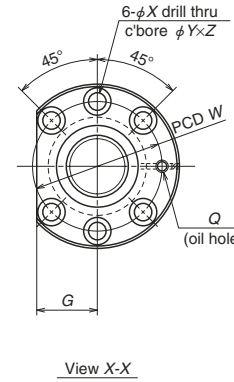
Nut type code: ZFD

**Nut model: ZFD**

**NSK**

Screw shaft  $\phi 40, \phi 50$

Lead 10



Unit: mm

Ball screw No.	Stroke Max. $L_1-L_n$	Screw shaft dia. $d_1$	Lead $l$	Ball dia. $D_w$	Ball circle dia. $d_m$	Root dia. $d_r$	Effective ball turns	Basic load rating (N)		Preload (N)	Dynamic friction torque, median (N·cm)	Nut				
								Dynamic $C_a$	Static $C_{0a}$			Outside dia. $D$	Flange			Overall length $L_n$
													$A$	$G$	$B$	
W4007SS-4ZY-C5Z10	557	40	10	6.350	41.75	35.1	4	38 400	93 300	2 840	83	62	104	40	18	143
W4010SS-6ZY-C5Z10	857															
W4014SS-3ZY-C5Z10	1 257															
W4018SS-4ZY-C5Z10	1 657															
W4024SS-3ZY-C5Z10	2 257															
W5007SS-1ZY-C5Z10	557	50	10	6.350	51.75	45.1	4	43 600	122 000	3 240	108	72	114	44	18	143
W5010SS-3ZY-C5Z10	857															
W5015SS-3ZY-C5Z10	1 357															
W5020SS-3ZY-C5Z10	1 857															
W5026SS-3ZY-C5Z10	2 457															

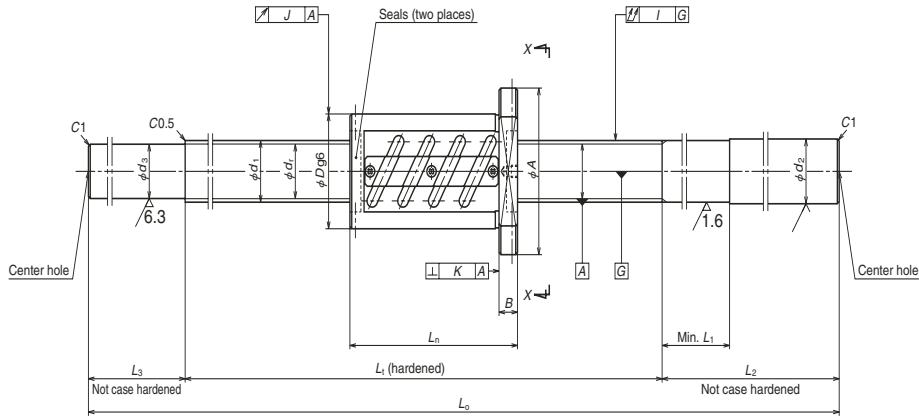
- Notes: 1. Use of NSK support unit is recommended. See page B389 for details.  
 2. Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use. See page D13 for details.  
 3. Permissible rotational speed is determined by d·n value and critical speed. See pages B47 and B299.

dimensions				Screw shaft dimensions					Lead accuracy			Run-out			Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	Internal spatial volume of nut (cm <sup>3</sup> )	Standard volume of grease replenishing (cm <sup>3</sup> )			
Bolt hole		Oil hole	Threaded length	Shaft end, right		Shaft end, left		Overall length	Travel compensation	Deviation	Variation	Shaft straightness	Nut O.D. eccentricity	Flange perpendicularity							
W	X	Y	Z	Q	$L_1$	$d_2$	$L_1$	$L_2$	$d_3$	$L_3$	$L_0$	T	$e_o$	$v_u$					I	J	K
82	11	17.5	11	Rc1/8	700	40.3	60	300	100	1 100	-0.015	0.035	0.025	0.065	0.019	0.013	12.1	1 750	32	16	
					1 000			300	100	1 400	-0.022	0.040	0.027	0.080							14.7
					1 400			350	120	1 870	-0.032	0.054	0.035	0.100							18.9
					1 800			350	120	2 270	-0.041	0.065	0.040	0.130							22.5
92	11	17.5	11	Rc1/8	2 400	50.3	60	400	150	2 950	-0.056	0.077	0.046	0.170	0.019	0.013	18.3	1 400	39	20	
					700			300	100	1 100	-0.015	0.035	0.025	0.065							18.3
					1 000			300	100	1 400	-0.022	0.040	0.027	0.080							22.5
					1 500			400	150	2 050	-0.034	0.054	0.035	0.130							31.8
2 000	400	150	2 550	-0.046	0.065	0.040	0.170	49.5	38.9												
										2 600	500	200	3 300	-0.060	0.093	0.054	0.220				



**Blank shaft end SS type**

(Fine lead: Tube type)



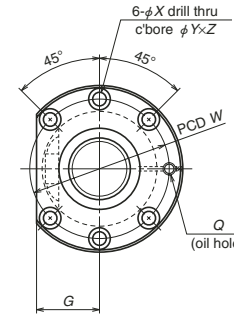
Nut type code: ZFT

**Nut model: ZFT**

**NSK**

Screw shaft  $\phi 45, \phi 50$

Lead 10



View X-X

Ball screw No.	Stroke Max. $L_t - L_n$	Screw shaft dia. $d_1$	Lead $l$	Ball dia. $D_w$	Ball circle dia. $d_m$	Root dia. $d_r$	Effective ball turns $\times$ Circuits	Basic load rating (N)			Dynamic friction torque, median (N-cm)	Nut									
								Dynamic $C_a$	Static $C_{0a}$	Preload (N)		Outside dia. $D$	Flange			Overall length $L_n$					
													A	G	B						
<b>W4510SS-1Z-C5Z10</b>	897																				
<b>W4516SS-1Z-C5Z10</b>	1 497	45	10	6.350	46	39.4	2.5x1	29 900	77 300	2 260	69	88	132	50	18	103					
<b>W4525SS-1Z-C5Z10</b>	2 397																				
<b>W5010SS-1Z-C5Z10</b>	897																				
<b>W5015SS-1Z-C5Z10</b>	1 397																				
<b>W5020SS-1Z-C5Z10</b>	1 897	50	10	6.350	51	44.4	2.5x1	31 800	87 400	2 450	78	93	135	51	18	103					
<b>W5026SS-1Z-C5Z10</b>	2 497																				
<b>W5010SS-2Z-C5Z10</b>	837																				
<b>W5015SS-2Z-C5Z10</b>	1 337																				
<b>W5020SS-2Z-C5Z10</b>	1 837	50	10	6.350	51	44.4	2.5x2	57 700	175 000	4 020	138	93	135	51	18	163					
<b>W5026SS-2Z-C5Z10</b>	2 437																				

- Notes: 1. Use of NSK support unit is recommended. See page B389 for details.  
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 3. Permissible rotational speed is determined by d-n value and critical speed. See pages B47 and B299.

Unit: mm

dimensions				Screw shaft dimensions					Lead accuracy			Run-out			Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	Internal spatial volume of nut (cm <sup>3</sup> )	Standard volume of grease replenishing (cm <sup>3</sup> )			
Bolt hole		Oil hole		Threaded length	Shaft end, right		Shaft end, left		Overall length	Travel compensation	Deviation	Variation	Shaft straightness	Nut O.D. eccentricity					Flange perpendicularity		
W	X	Y	Z		Q	$L_1$	$d_2$	$L_1$												$L_2$	$d_3$
110	11	17.5	11	Rc1/8	1 000		300	100	1 400	-0.024	0.040	0.027	0.080								
					1 600	45.3	60	400	39.4	150	2 150	-0.038	0.054	0.035	0.130	0.025	0.015	19.7	1 550	34	17
					2 500			450		150	3 100	-0.060	0.077	0.046	0.170			38.8			
					1 000		300	100	1 400	-0.024	0.040	0.027	0.080					23.8			
					1 500			400		150	2 050	-0.036	0.054	0.035	0.130			32.9			
113	11	17.5	11	Rc1/8	2 000	50.3	60	400	44.4	150	2 550	-0.048	0.065	0.040	0.170	0.025	0.015	39.8	1 400	37	19
					2 600			450		150	3 200	-0.062	0.093	0.054	0.220			48.9			
					1 000		300	100	1 400	-0.024	0.040	0.027	0.080					25.5			
					1 500			400		150	2 050	-0.036	0.054	0.035	0.130			34.6			
113	11	17.5	11	Rc1/8	2 000	50.3	60	400	44.4	150	2 550	-0.048	0.065	0.040	0.170	0.025	0.015	41.5	1 400	59	30
					2 600			450		150	3 200	-0.062	0.093	0.054	0.220			50.7			