

B-3-2.3 Finished Shaft End Ball Screws Made of Stainless Steel KA Type

◇ **Ball screw sizes are arranged in the order of the page number.**

The table begins 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.

◇ **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. The figure is obtained by subtracting the nut length (plus some allowance) from the screw threaded length (L).

● **Lead accuracy**

Lead accuracy is C3 and C5 grades.

T : Travel compensation;

e_p : Tolerance on specified travel;

v_u : Travel variation

See "Technical Description: Lead error" (Page B41) 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, $d \cdot n$ and Critical Speed, will determine the overall Permissible Rotational Speed of the ball screw. For details, see "Technical Description: Permissible rotational speed" (Page B51).

◇ **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.

◇ **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.

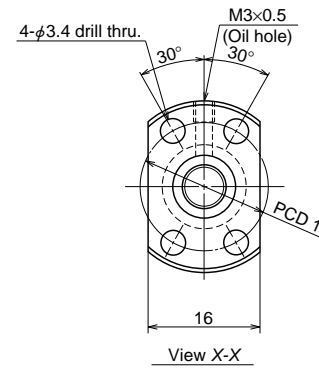
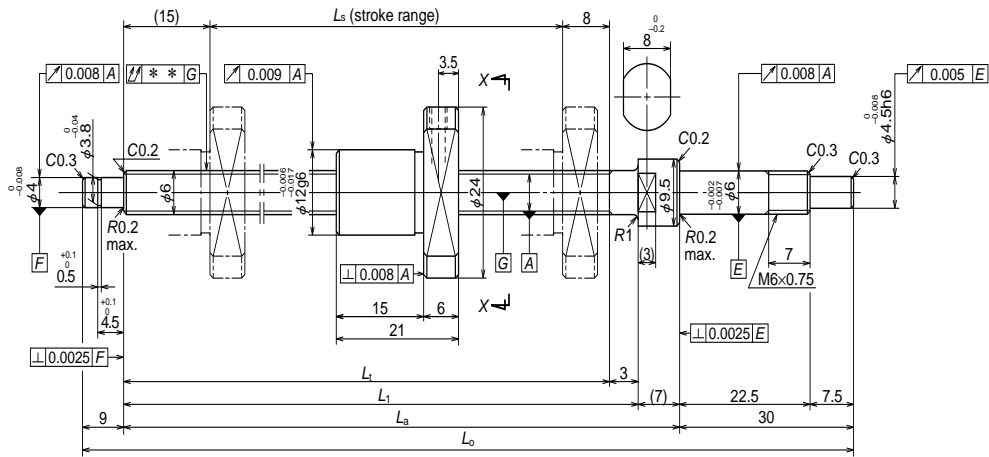
For special environments, refer to Pages B74 and D2. Refer to Pages B71 and D13 for lubricants.

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

Table 1 Combinations of screw shaft diameter and lead

Lead (mm) \ Screw shaft diameter (mm)	1	2
6	B359	
8	B361	B363
10		B365
12		B369
15		
16		B379
20		

4	5	10	20
B367			
	B371	B373	
		B375	B377
			B381



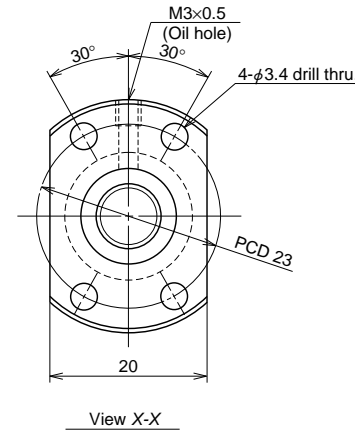
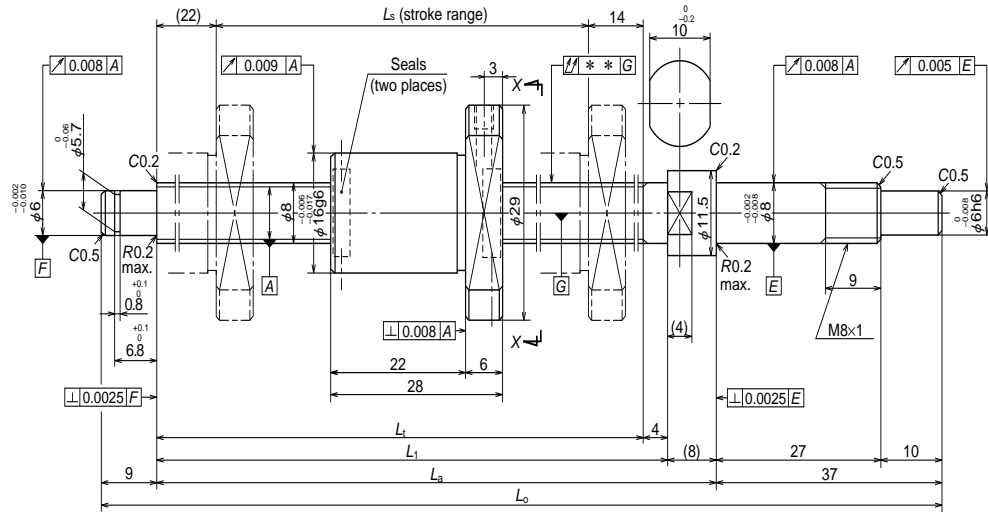
Ball screw specifications

Shaft dia. x Lead / Direction of turn	6×1/Right	
Preload / Ball recirculation	P preload / Deflector	
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)	147	
Dynamic friction torque, (N·cm)	1.3 or less	
Spacer ball	None	
Factory packed grease	Refer to the remarks 1. below.	

Ball screw No.	Stroke		Thread length			
	Nominal	Maximum	L_1	L_1	L_a	L_o
W0601KA-3PY-C3Z1	100	102	125	128	135	174

Lead accuracy			Shaft run-out ** ↑↓	Mass (kg)	Permissible rotational speed N (min ⁻¹)
T	e_p	v_u			Supporting condition
0	0.010	0.008	0.025	0.06	Fixed - Simple support 3000

- Remarks
1. Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use. Refer to Page D13 for details. NSK Clean Grease LG2 is recommended.
 2. Nut does not have a seal.
 3. Contact NSK if permissible rotational speed is to be exceeded.



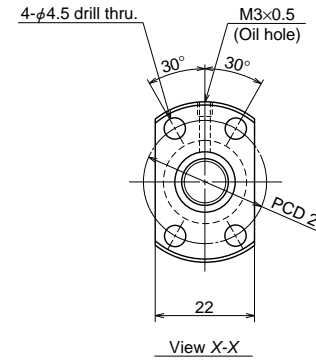
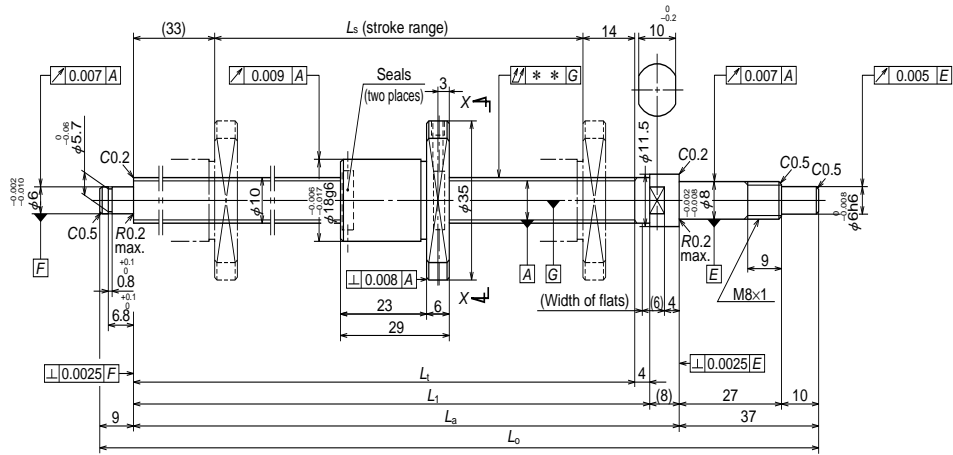
Ball screw specifications		
Shaft dia. x Lead / Direction of turn	8x2/Right	
Preload / Ball recirculation	P preload / Deflector	
Ball dia. / Ball circle dia.	1.200/8.3	
Screw shaft root diameter	6.9	
Effective turns of balls	1x3	
Accuracy grade / Preload	C3/Z	
Basic load rating (N)	Dynamic C_a	1080
	Static C_{0a}	1630
Axial play	0	
Preload (N)	49.0	
Dynamic friction torque, (N·cm)	2.0 or less	
Spacer ball	None	
Factory packed grease	Refer to the remarks 1. below.	
Internal spatial volume of nut (cm ³)	0.34	
Standard volume of grease replenishing (cm ³)	0.17	

Clean support unit	For drive side	For opposite of drive side
WBK08-01C (square)	○	
WBK08-11C (round)	○	
WBK08S-01C (square)		○

Ball screw No.	Stroke		Thread length			
	Nominal	Maximum	L_t	L_1	L_a	L_o
W0802KA-5PY-C3Z2	150	154	190	194	202	248

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

Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min ⁻¹)
T	e_p	v_u			Supporting condition
0	0.010	0.008	0.035	0.13	Fixed - Simple support 3000



Ball screw specifications

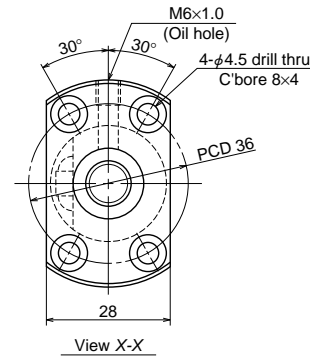
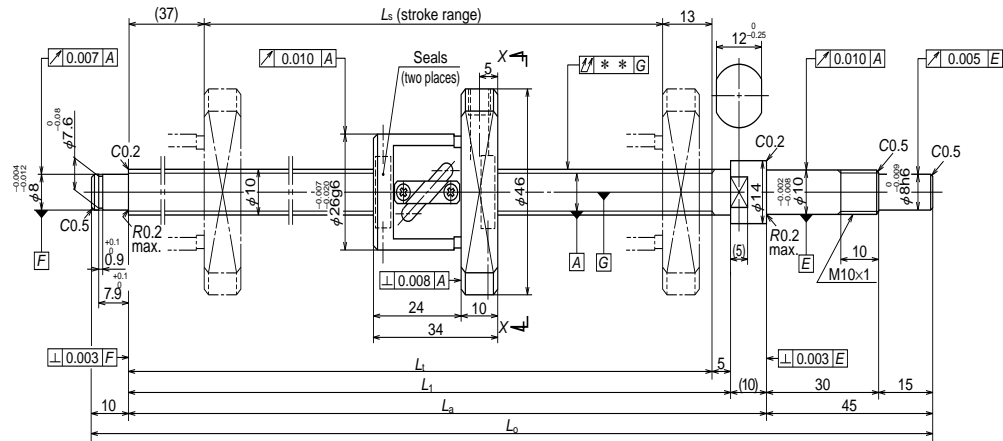
Shaft dia. x Lead / Direction of turn	10×2/Right	
Preload / Ball recirculation	P preload / Deflector	
Ball dia. / Ball circle dia.	1.200/10.3	
Screw shaft root diameter	8.9	
Effective turns of balls	1×3	
Accuracy grade / Preload	C3/Z	
Basic load rating (N)	Dynamic C_a	1210
	Static C_{0a}	2110
Axial play	0	
Preload (N)	58.8	
Dynamic friction torque, (N·cm)	0.10 – 2.5	
Spacer ball	None	
Factory packed grease	Refer to the remarks 1. below.	
Internal spatial volume of nut (cm ³)	0.44	
Standard volume of grease replenishing (cm ³)	0.22	

Clean support unit	For drive side	For opposite of drive side
WBK08-01C (square)	○	
WBK08-11C (round)	○	
WBK08S-01C (square)		○

Ball screw No.	Stroke		Thread length			
	Nominal	Maximum	L_1	L_1	L_a	L_o
W1002KA-3PY-C3Z2	200	203	250	254	262	308

Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min ⁻¹)
T	e_p	v_u			Supporting condition
0	0.012	0.008	0.030	0.22	Fixed - Simple support 3000

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



Ball screw specifications

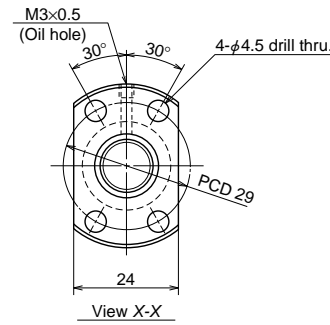
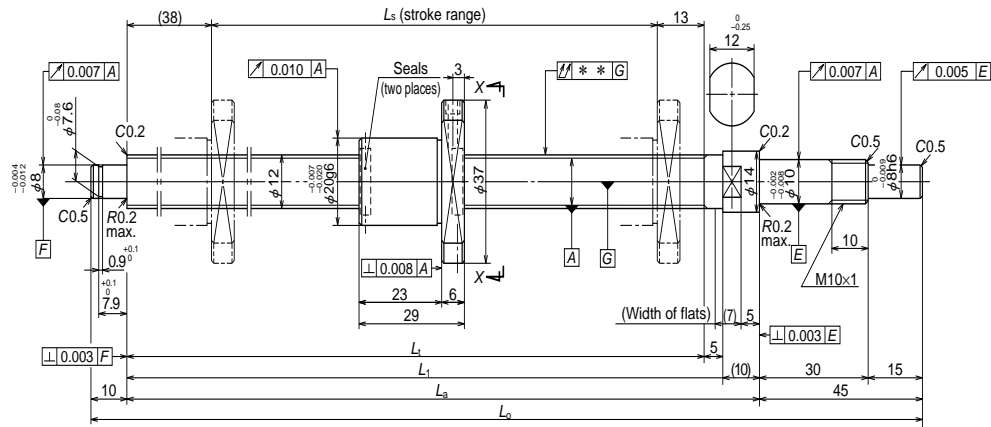
Shaft dia. x Lead / Direction of turn	10x4/Right	
Preload / Ball recirculation	P preload / Return tube	
Ball dia. / Ball circle dia.	2.000/10.3	
Screw shaft root diameter	8.2	
Effective turns of balls	2.5x1	
Accuracy grade / Preload	C3/Z	
Basic load rating (N)	Dynamic C_a	2250
	Static C_{0a}	3290
Axial play	0	
Preload (N)	98.1	
Dynamic friction torque, (N·cm)	0.5 – 3.9	
Spacer ball	None	
Factory packed grease	Refer to the remarks 1. below.	
Internal spatial volume of nut (cm ³)	0.8	
Standard volume of grease replenishing (cm ³)	0.4	

Clean support unit	For drive side	For opposite of drive side
WBK10-01C (square)	○	
WBK10-11C (round)	○	
WBK10S-01C (square)		○

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

Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min ⁻¹)
T	e_p	v_u			Supporting condition
0	0.010	0.008	0.030	0.29	3000
0	0.013	0.008	0.050	0.39	3000

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



Ball screw specifications

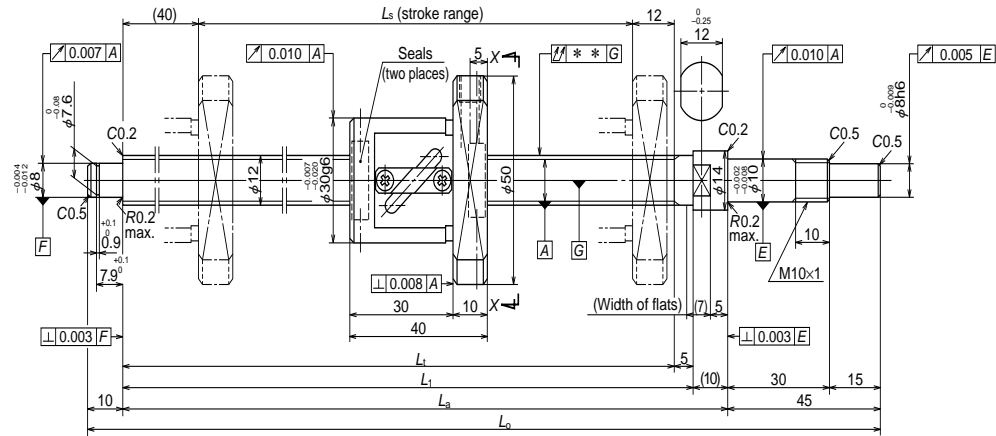
Shaft dia. x Lead / Direction of turn	12×2/Right	
Preload / Ball recirculation	P preload / Deflector	
Ball dia. / Ball circle dia.	1.200/12.3	
Screw shaft root diameter	10.9	
Effective turns of balls	1×3	
Accuracy grade / Preload	C3/Z	
Basic load rating (N)	Dynamic C_a	1360
	Static C_{0a}	2680
Axial play	0	
Preload (N)	98.1	
Dynamic friction torque, (N·cm)	0.4 – 3.4	
Spacer ball	None	
Factory packed grease	Refer to the remarks 1. below.	
Internal spatial volume of nut (cm ³)	0.53	
Standard volume of grease replenishing (cm ³)	0.27	

Clean support unit	For drive side	For opposite of drive side
WBK10-01C (square)	○	
WBK10-11C (round)	○	
WBK10S-01C (square)		○

Ball screw No.	Stroke		Thread length			
	Nominal	Maximum	L_1	L_1	L_a	L_a
W1203KA-1PY-C3Z2	250	259	310	315	325	380

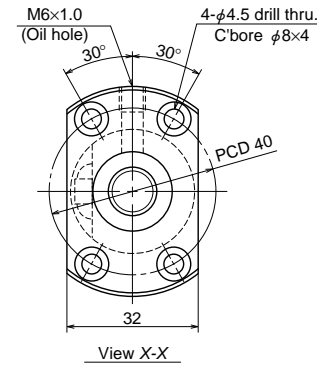
Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min ⁻¹)
T	e_p	v_u			Supporting condition
0	0.010	0.008	0.030	0.24	3000
0	0.012	0.008	0.040	0.36	3000

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



Ball screw No.	Stroke		Thread length			
	Nominal	Maximum	L ₁	L ₁	L _a	L _o
W1202KA-3P-C3Z5	200	208	260	265	275	330
W1205KA-1P-C3Z5	450	458	510	515	525	580

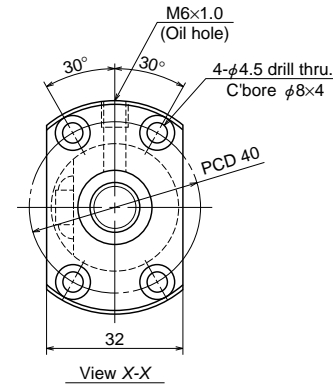
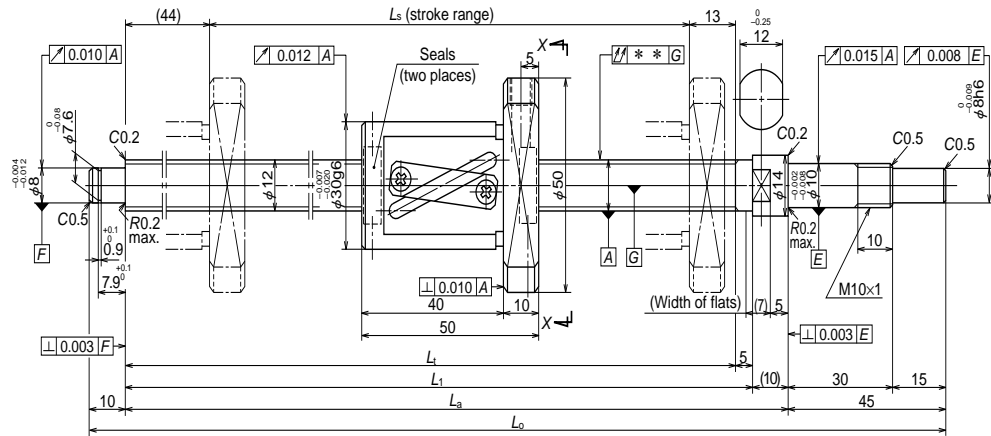
- Remarks **1. Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.**
 Refer to Page D13 for details.
 NSK Clean Grease LG2 is recommended.
2. Contact NSK if permissible rotational speed is to be exceeded.



Ball screw specifications		
Shaft dia. x Lead / Direction of turn	12x5/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	2.5x1	
Accuracy grade / Preload	C3/Z	
Basic load rating (N)	Dynamic C _a	3070
	Static C _{0a}	4670
Axial play	0	
Preload (N)	98.1	
Dynamic friction torque, (N·cm)	1.0 – 4.4	
Spacer ball	None	
Factory packed grease	Refer to the remarks 1. below.	
Internal spatial volume of nut (cm ³)	1.2	
Standard volume of grease replenishing (cm ³)	0.6	

Clean support unit	For drive side	For opposite of drive side
WBK10-01C (square)	○	
WBK10-11C (round)	○	
WBK10S-01C (square)		○

Lead accuracy			Shaft run-out ** ↑↓	Mass (kg)	Permissible rotational speed N (min ⁻¹)
T	e _p	v _u			Supporting condition
					Fixed - Simple support
0	0.012	0.008	0.040	0.47	3000
0	0.016	0.012	0.065	0.66	3000



Ball screw specifications

Shaft dia. x Lead / Direction of turn	12×10/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	2.5×1	
Accuracy grade / Preload	C5/Z	
Basic load rating (N)	Dynamic C_d	3070
	Static C_{0a}	4790
Axial play	0	
Preload (N)	98.1	
Dynamic friction torque, (N·cm)	1.0 – 4.9	
Spacer ball	None	
Factory packed grease	Refer to the remarks 1. below.	
Internal spatial volume of nut (cm ³)	1.4	
Standard volume of grease replenishing (cm ³)	0.7	

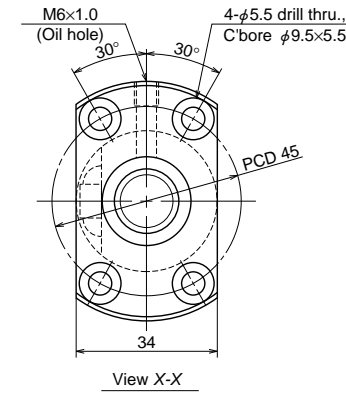
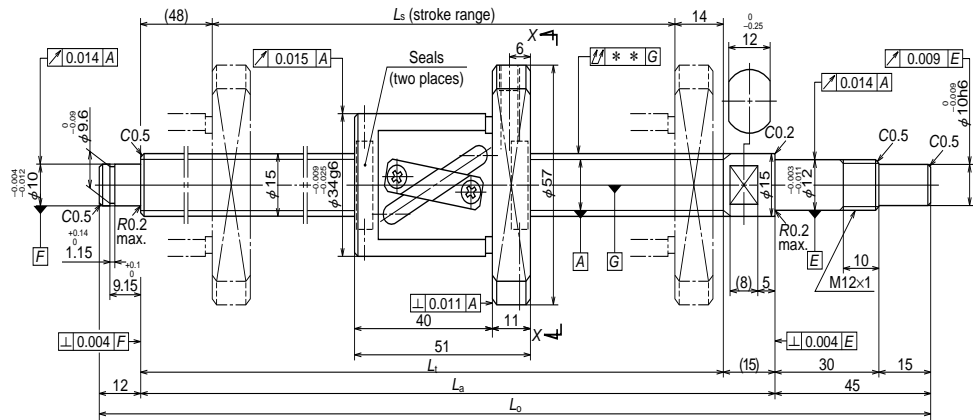
Clean support unit	For drive side	For opposite of drive side
WBK10-01C (square)	○	
WBK10-11C (round)	○	
WBK10S-01C (square)		○

Unit: mm

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

Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min ⁻¹)
T	e_p	v_u			Supporting condition
0	0.023	0.018	0.050	0.56	3000
0	0.030	0.023	0.075	0.72	3000

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



Ball screw specifications		
Shaft dia. x Lead / Direction of turn	15×10/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	2.5×1	
Accuracy grade / Preload	C5/Z	
Basic load rating (N)	Dynamic C_a	5780
	Static C_{0a}	9430
Axial play	0	
Preload (N)	147	
Dynamic friction torque, (N·cm)	1.5 – 7.9	
Spacer ball	None	
Factory packed grease	Refer to the remarks 1. below.	
Internal spatial volume of nut (cm ³)	2.3	
Standard volume of grease replenishing (cm ³)	1.4	

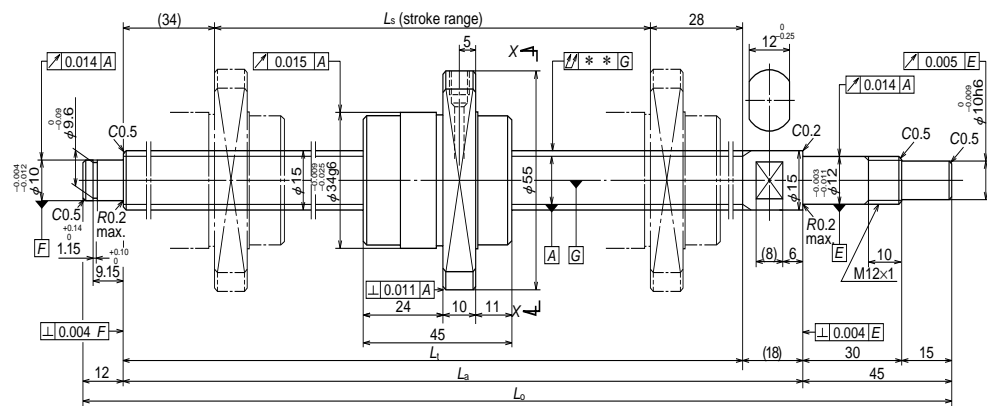
Clean support unit	For drive side	For opposite of drive side
WBK12-01C (square)	○	
WBK12-11C (round)	○	
WBK12S-01C (square)		○

Ball screw No.	Stroke		Thread length		
	Nominal	Maximum	L_1	L_a	L_o
W1504KA-3P-C5Z10	400	427	489	504	561
W1506KA-3P-C5Z10	600	627	689	704	761
W1510KA-1P-C5Z10	1000	1027	1089	1104	1161

Lead accuracy			Shaft run-out ** \uparrow	Mass (kg)	Permissible rotational speed N (min ⁻¹)
T	e_p	v_u			Supporting condition
					Fixed - Simple support
0	0.027	0.020	0.050	0.99	3000
0	0.035	0.025	0.065	1.2	3000
0	0.046	0.030	0.110	1.7	1610

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

Finished shaft end Stainless steel product KA Type (Ultra high helix lead) Dia. 15, Lead 20

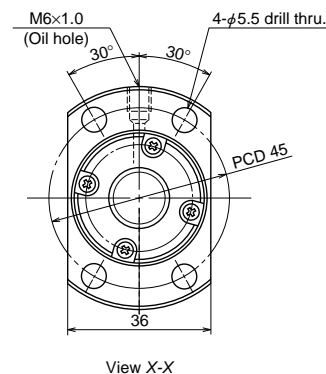


Nut models: UPFC



Stainless ø15×20

Unit: mm



Ball screw specifications		
Shaft dia. x Lead / Direction of turn	15×20/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	1.7×1	
Accuracy grade / Preload	C5/Z	
Basic load rating (N)	Dynamic C_a	4150
	Static C_{0a}	6450
Axial play	0	
Preload (N)	147	
Dynamic friction torque, (N·cm)	1.5 – 7.9	
Spacer ball	None	
Factory packed grease	Refer to the remarks 1. below.	
Internal spatial volume of nut (cm ³)	1.9	
Standard volume of grease replenishing (cm ³)	1.0	

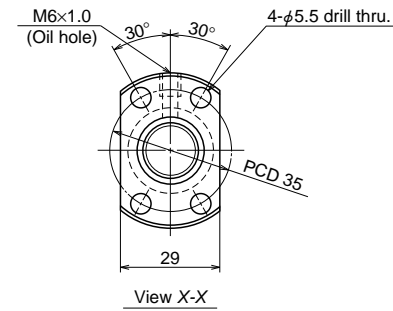
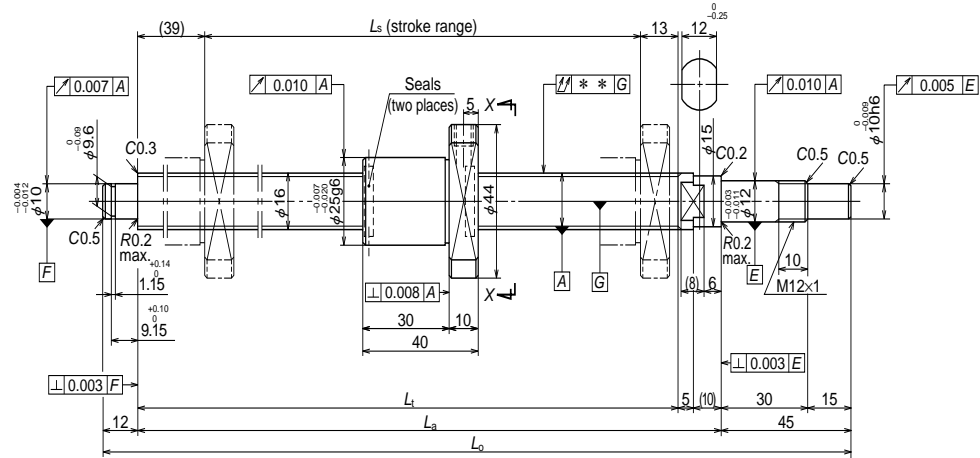
Clean support unit	For drive side	For opposite of drive side
WBK12-01C (square)	○	
WBK12-11C (round)	○	
WBK12S-01C (square)		○

Unit: mm

Ball screw No.	Stroke		Thread length		
	Nominal	Maximum	L_t	L_a	L_o
W1504KA-7PG-C5Z20	400	424	486	504	561
W1506KA-7PG-C5Z20	600	624	686	704	761
W1510KA-3PG-C5Z20	1000	1024	1086	1104	1161

Lead accuracy			Shaft run-out ** \uparrow	Mass (kg)	Permissible rotational speed N (min ⁻¹)
T	e_p	v_u			Supporting condition
					Fixed - Simple support
0	0.027	0.020	0.050	1.0	3000
0	0.035	0.025	0.065	1.3	3000
0	0.046	0.030	0.110	1.8	1610

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



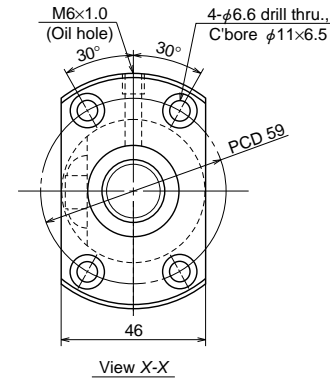
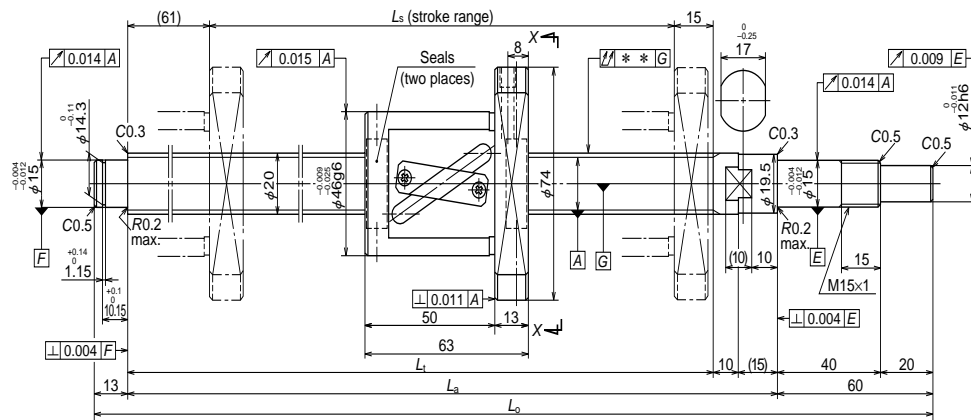
Ball screw specifications		
Shaft dia. x Lead / Direction of turn	16x2/Right	
Preload / Ball recirculation	P preload / Deflector	
Ball dia. / Ball circle dia.	1.588/16.4	
Screw shaft root diameter	14.6	
Effective turns of balls	1x4	
Accuracy grade / Preload	C3/Z	
Basic load rating (N)	Dynamic C_a	2870
	Static C_{0a}	6250
Axial play	0	
Preload (N)	147	
Dynamic friction torque, (N·cm)	0.5 – 4.9	
Spacer ball	None	
Factory packed grease	Refer to the remarks 1. below.	
Internal spatial volume of nut (cm ³)	1.6	
Standard volume of grease replenishing (cm ³)	0.8	

Clean support unit	For drive side	For opposite of drive side
WBK12-01C (square)	○	
WBK12-11C (round)	○	
WBK12S-01C (square)		○

Ball screw No.	Stroke		Thread length		
	Nominal	Maximum	L_1	L_a	L_0
W1601KA-3PY-C3Z2	100	137	189	204	261
W1603KA-1PY-C3Z2	300	337	389	404	461

Lead accuracy			Shaft run-out ** \uparrow	Mass (kg)	Permissible rotational speed N (min ⁻¹)
T	e_p	v_u			Supporting condition
0	0.010	0.008	0.020	0.46	3000
0	0.013	0.010	0.035	0.75	3000

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



Ball screw specifications		
Shaft dia. x Lead / Direction of turn	20×20/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	1.5×1	
Accuracy grade / Preload	C5/Z	
Basic load rating (N)	Dynamic C_a	5760
	Static C_{0a}	9370
Axial play	0	
Preload (N)	196	
Dynamic friction torque, (N·cm)	2.0 - 11.8	
Spacer ball	None	
Factory packed grease	Refer to the remarks 1. below.	
Internal spatial volume of nut (cm ³)	4.2	
Standard volume of grease replenishing (cm ³)	2.1	

Clean support unit	For drive side	For opposite of drive side
WBK15-01C (square)	○	
WBK15-11C (round)	○	
WBK15S-01C (square)		○

Unit: mm

Ball screw No.	Stroke		Thread length		
	Nominal	Maximum	L_1	L_a	L_o
W2005KA-3P-C5Z20	400	434	510	535	608
W2007KA-3P-C5Z20	600	634	710	735	808
W2011KA-3P-C5Z20	1000	1034	1110	1135	1208

Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min ⁻¹)
T	e_p	v_u			Supporting condition
					Fixed - Simple support
0	0.030	0.023	0.050	2.0	3000
0	0.035	0.025	0.085	2.5	3000
0	0.046	0.030	0.110	3.4	2160

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