

# PRECISION MACHINE COMPONENTS

## STANDARD ITEMS

LINEAR GUIDES

BALL SCREWS

SUPPORT UNITS

MONOCARRIERS

LUBRICATION

MEGATORQUE MOTORS

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LINEAR GUIDES

BALL SCREWS

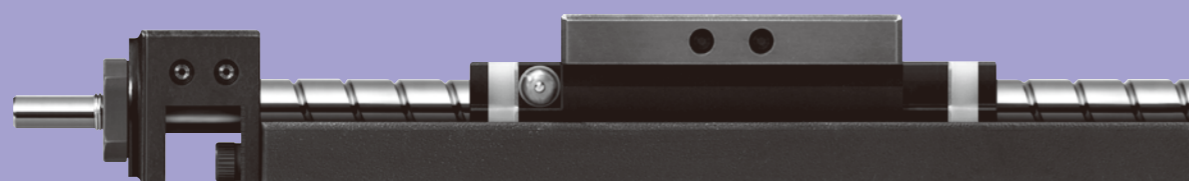
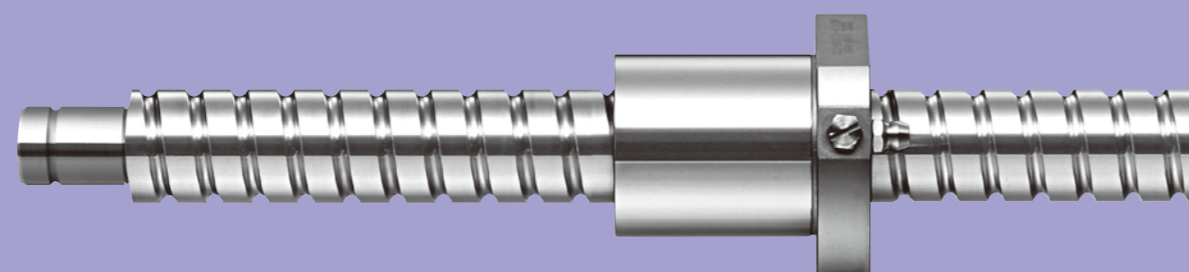
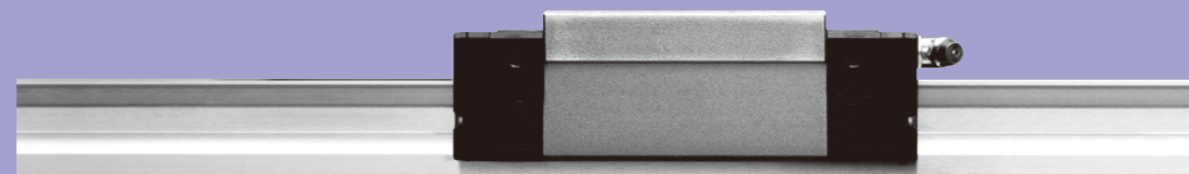
SUPPORT UNITS

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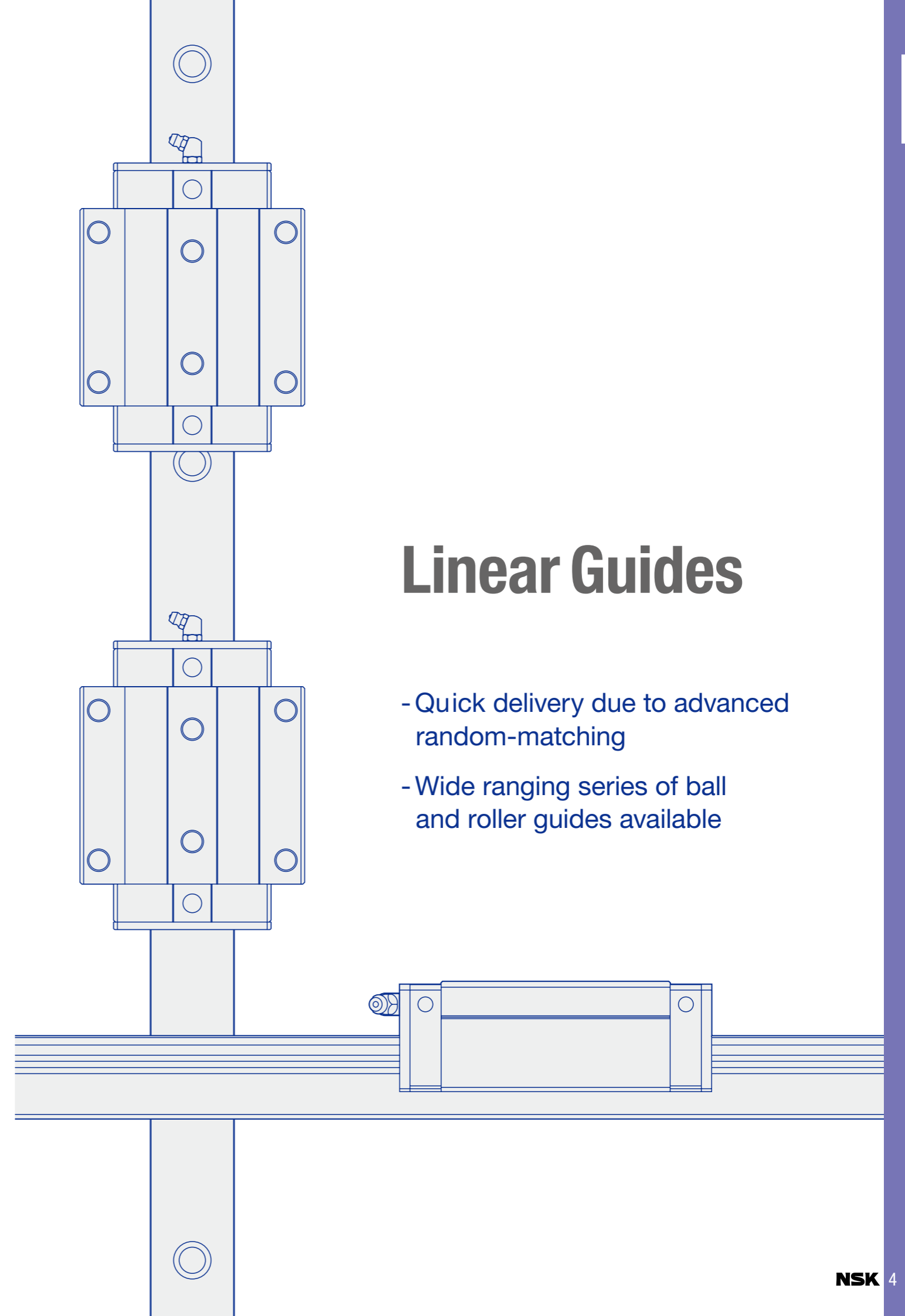
MEGATORQUE MOTORS

# Contents



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 NSK Linear Guide Monocarrier NSK K1 Megatorque Motor


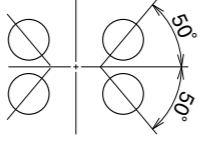

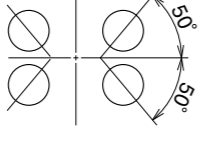

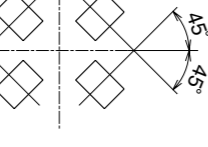

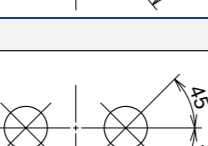
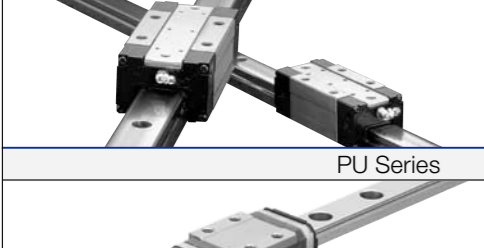
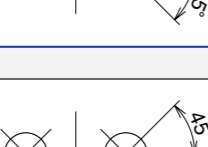
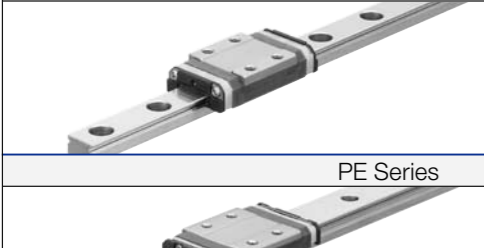
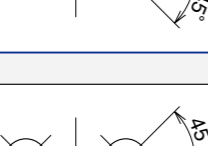
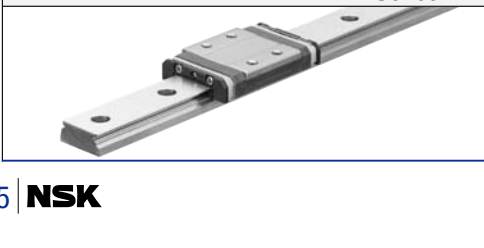
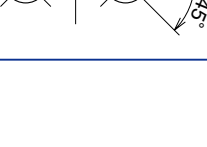
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# Linear Guides

- Quick delivery due to advanced random-matching
- Wide ranging series of ball and roller guides available

## Types of Linear Guides

Series		Features	Ball slide model				Size & Preload		Dimension table
		<p><b>LH Series</b></p> <ul style="list-style-type: none"> <li>NSK basic series</li> <li>General versatility for heavy-duty applications</li> <li>Large load carrying capacity against vertical direction</li> <li>Stainless steel is available (#15-30).</li> </ul> <p><b>SH Series</b></p> <ul style="list-style-type: none"> <li>Silent and smooth featured LH incorporated with retainer piece</li> </ul>	AN, BN	AL, BL	AN, AL	BN, BL	Size	Preload	Page 11-14 19-24
			EM, GM	EM	GM	LH/SH15	Slight preload ZZ		
EM, GM	EM	GM	LH/SH20						
EM, GM	EM	GM	LH/SH25						
EM, GM	EM	GM	LH/SH30						
EM, GM	EM	GM	LH/SH35						
EM, GM	EM	GM	LH/SH45						
EM, GM	EM	GM	LH/SH55						
EM, GM	EM	GM	LH65						
		<p><b>LS Series</b></p> <ul style="list-style-type: none"> <li>Compact designed NSK basic series</li> <li>General versatility for fine application</li> <li>Large load carrying capacity against vertical direction</li> <li>Stainless steel is available (#15-35).</li> </ul> <p><b>SS Series</b></p> <ul style="list-style-type: none"> <li>Silent and smooth featured LS incorporated with retainer piece</li> </ul>	AL, CL	AL	CL	Size	Preload	Page 15-18 25-28	
			EM, JM	EM	JM	LS/SS15	Slight preload ZZ		
EM, JM	EM	JM	LS/SS20						
EM, JM	EM	JM	LS/SS25						
EM, JM	EM	JM	LS/SS30						
EM, JM	EM	JM	LS/SS35						
		<ul style="list-style-type: none"> <li>A roller guide with super high load capacity and rigidity</li> <li>Super high accuracy and smooth motion</li> <li>Highly dust proof and maintenance free</li> </ul>	AL, BL	AN, BN	AL, AN	BL, BN	Size	Preload	Page 29-34
			EM, GM	EM	GM	RA15	Medium preload Z		
EM, GM	EM	GM	RA20						
EM, GM	EM	GM	RA25						
EM, GM	EM	GM	RA30						
EM, GM	EM	GM	RA35						
EM, GM	EM	GM	RA45						
EM, GM	EM	GM	RA55						
EM, GM	EM	GM	RA65						
		<ul style="list-style-type: none"> <li>Wide rail type linear guide</li> <li>Ideal for use of single rail</li> <li>Large load carrying capacity against vertical direction</li> </ul>	EL	EL	EL	Size	Preload	Page 35-36	
			EL	EL	LW17	Slight preload ZZ			
EL	EL	LW21							
EL	EL	LW27							
EL	EL	LW35							
EL	EL	LW50							
		<ul style="list-style-type: none"> <li>Low price linear guide best fit for transportation equipments</li> <li>Long-term maintenance free by regularly equipped NSK K1</li> </ul>	AN	AN	AN	Size	Preload	Page 37-38	
			AN	AN	TS15	Maximum clearance 60 μm S			
AN	AN	TS20							
AN	AN	TS25							
AN	AN	TS30							
AN	AN	TS35							
		<ul style="list-style-type: none"> <li>Lightweight designed miniature linear guide</li> <li>Reduced noise and smooth motion</li> <li>High corrosion resistance (stainless steel)</li> </ul>	AL, TR, UR, BL	AL, TR	BL, UR	Size	Preload	Page 39-40	
			AL, TR, UR, BL	AL, TR	BL, UR	PU05	Maximum clearance 3 μm ZT		
AL, TR, UR, BL	AL, TR	BL, UR	PU07						
AL, TR, UR, BL	AL, TR	BL, UR	PU09						
AL, TR, UR, BL	AL, TR	BL, UR	PU12						
AL, TR, UR, BL	AL, TR	BL, UR	PU15						
		<ul style="list-style-type: none"> <li>Lightweight designed wide rail miniature linear guide</li> <li>Ideal for use of single rail</li> <li>Reduced noise and smooth motion</li> <li>High corrosion resistance (stainless steel)</li> </ul>	AR, TR, UR, BR	AR, TR	BR, UR	Size	Preload	Page 41-42	
			AR, TR, UR, BR	AR, TR	BR, UR	PE05	Maximum clearance 3 μm ZT		
AR, TR, UR, BR	AR, TR	BR, UR	PE07						
AR, TR, UR, BR	AR, TR	BR, UR	PE09						
AR, TR, UR, BR	AR, TR	BR, UR	PE12						
AR, TR, UR, BR	AR, TR	BR, UR	PE15						

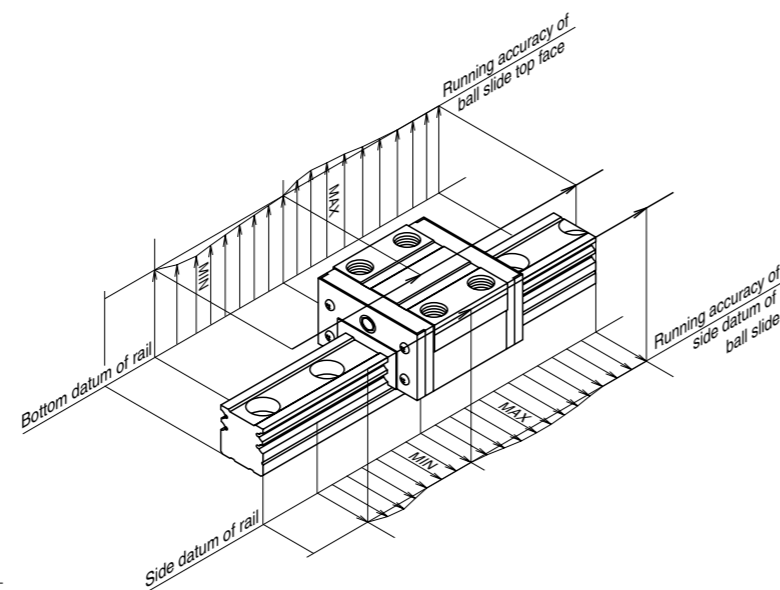
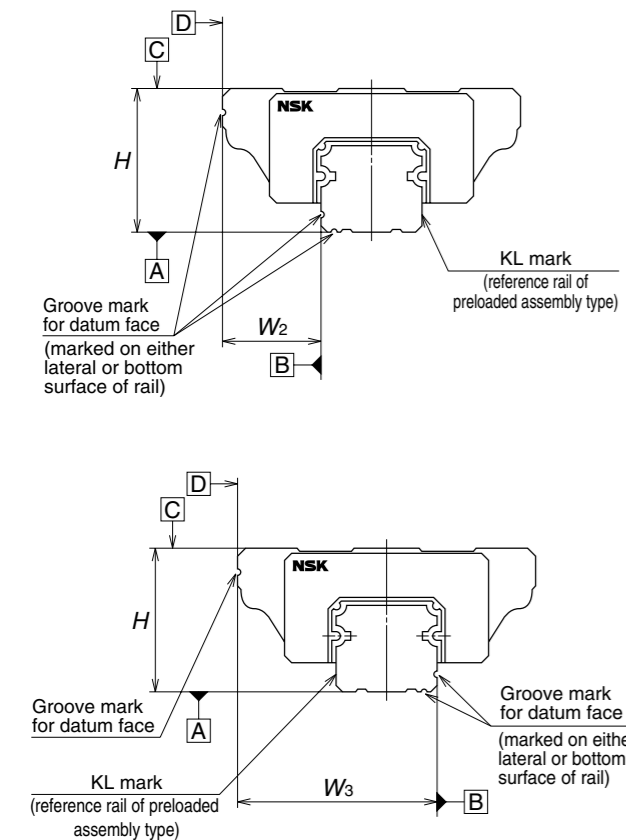
## Accuracy

### Accuracy Standard

- Table 1, Figure 1 and Figure 2 show accuracy characteristics.

**Table 1 Definition of accuracy**

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



**Fig. 1 Assembled accuracy (height and width)**

**Fig. 2 Running parallelism of ball slide**

**Assembly dimension tolerance of random-matching type**

Unit:  $\mu\text{m}$

Series	LH/SH Series	LS/SS Series	RA Series	LW Series	TS Series	PU/PE Series
Size	15 – 35	45 – 65	15 – 35	15 – 65	17 – 50	15 – 35
Mounting height $H$	$\pm 20$	$\pm 30$	$\pm 20$	$\pm 20$	$\pm 20$	$\pm 100$
Variation of mounting height $H$	15*1 30*2	20*1 30*2	15*1 30*2	15*1 30*2	15*1 30*2	– 15*1 30*2
Mounting width $W_2$ or $W_3$	$\pm 30$	$\pm 35$	$\pm 30$	$\pm 25$	$\pm 30$	– $\pm 20$
Variation of Mounting width $W_2$ or $W_3$	25	30	25	20	25	– 20

\*1 Variation of mounting height  $H$  is specified on one rail.

\*2 Variation of mounting height  $H$  is specified on multiple rails.

**Running parallelism tolerance of random-matching type: A//C or B//D**

Unit:  $\mu\text{m}$

Rail length (mm) over or under	LH/SH Series LS/SS Series LW Series PU/PE Series	RA Series	TS Series
– 50	6	4.5	Max. 100
50 – 80	6	5	
80 – 125	6.5	5.5	
125 – 200	7	6	
200 – 250	8	7	
250 – 315	9	8	
315 – 400	11	9	
400 – 500	12	10	
500 – 630	14	12	
630 – 800	16	14	
800 – 1 000	18	16	
1 000 – 1 250	20	17	
1 250 – 1 600	23	19	
1 600 – 2 000	26	21	
2 000 – 2 500	29	22	
2 500 – 3 150	32	25	
3 150 – 4 000	34	30	

**Available rail length (max. length)**

Unit: mm

Series	LH/SH Series		LS/SS Series		RA Series	TS Series	PU Series	PE Series	LW Series	
	Std. steel	Stainless	Std. steel	Stainless	Std. steel	Std. steel	Stainless	Stainless	Size	Std. steel
05	–	–	–	–	–	–	210	150	17	1 000
07	–	–	–	–	–	–	375	600	21	1 600
09	–	–	–	–	–	–	600	800	27	2 000
12	–	–	–	–	–	–	800	1 000	35	2 400
15	2 000	1 800	2 000	1 800	2 000	1 960	1 000	1 200	50	3 000
20	3 960	3 500	3 960	3 500	3 000	2 920	–	–		
25	3 960	3 500	3 960	3 500	3 000	4 000	–	–		
30	4 000	3 500	4 000	3 500	3 500	4 040	–	–		
35	4 000	–	4 000	3 500	3 500	4 040	–	–		
45	3 990	–	–	–	3 500	–	–	–		
55	3 960	–	–	–	3 500	–	–	–		
65	3 900	–	–	–	3 500	–	–	–		

## Accessories

### Double Seal and Protector

- Double seal (a combination of two end seals) to enhance seal function.
- Protector (a steel plate added on end seal) to prevent high temperature fine particles, such as welding spatter and other foreign matter, from entering the ball slide.

- When a double seal or protector is installed, the ball slide becomes longer by the sizes shown in Tables 2 and 3.
- When attaching a grease fitting to the end-cap after the double seal or protector is equipped, a connector, shown in Fig. 3, is required. Please specify the connector set when ordering.

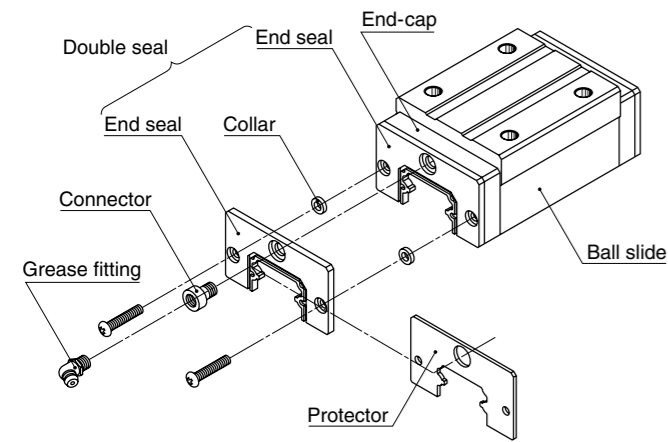


Fig. 3

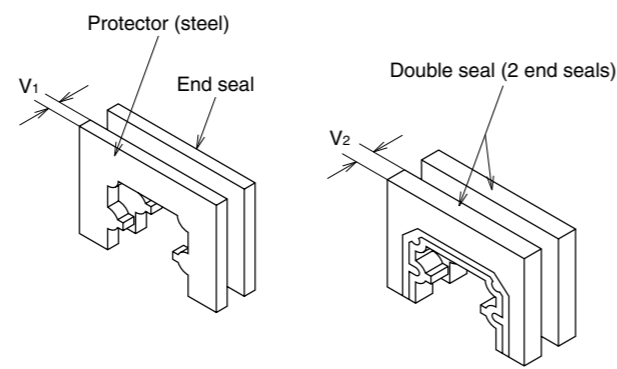


Fig. 4

Table 2 Double-seal set

Model No.	Part No.		Increased thickness V <sub>2</sub>
	Without connector	With connector	
LH/SH15	LH15WS-01	***	2.5
LH/SH20	LH20WS-01	LH20WSC-01	2.5
LH/SH25	LH25WS-01	LH25WSC-01	2.8
LH/SH30	LH30WS-01	LH30WSC-01	3.6
LH/SH35	LH35WS-01	LH35WSC-01	3.6
LH/SH45	LH45WS-01	LH45WSC-01	4.3
LH/SH55	LH55WS-01	LH55WSC-01	4.3
LH65	LH65WS-01	LH65WSC-01	4.9
LS/SS15	LS15WS-01	***	2.8
LS/SS20	LS20WS-01	LS20WSC-01	2.5
LS/SS25	LS25WS-01	LS25WSC-01	2.8
LS/SS30	LS30WS-01	LS30WSC-01	3.6
LS/SS35	LS35WS-01	LS35WSC-01	3.6
LW17	LW17WS-01	***	2.6
LW21	LW21WS-01	LW21WSC-01	2.8
LW27	LW27WS-01	LW27WSC-01	2.5
LW35	LW35WS-01	LW35WSC-01	3
LW50	LW50WS-01	LW50WSC-01	3.6

Table 3 Protector set

Model No.	Part No.		Increased thickness V <sub>1</sub>
	Without connector	With connector	
LH/SH15	LH15PT-01	***	2.7
LH/SH20	LH20PT-01	LH20PTC-01	2.9
LH/SH25	LH25PT-01	LH25PTC-01	3.2
LH/SH30	LH30PT-01	LH30PTC-01	4.2
LH/SH35	LH35PT-01	LH35PTC-01	4.2
LH/SH45	LH45PT-01	LH45PTC-01	4.9
LH/SH55	LH55PT-01	LH55PTC-01	4.9
LH65	LH65PT-01	LH65PTC-01	5.5
LS/SS15	LS15PT-01	***	3
LS/SS20	LS20PT-01	LS20PTC-01	2.7
LS/SS25	LS25PT-01	LS25PTC-01	3.2
LS/SS30	LS30PT-01	LS30PTC-01	4.2
LS/SS35	LS35PT-01	LS35PTC-01	4.2
LW17	LW17PT-01	***	3.2
LW21	LW21PT-01	LW21PTC-01	3.2
LW27	LW27PT-01	LW27PTC-01	2.9
LW35	LW35PT-01	LW35PTC-01	3.6
LW50	LW50PT-01	LW50PTC-01	4.2

\*\*\* Consult with NSK when attaching a connector to a drive-in type grease fitting.

### Cap to Cover Bolt Hole for Rail Mounting

- After the rail is mounted to the machine base, a cap is used to cover the bolt hole to prevent foreign matter from clogging up the hole or from entering the ball slide (Fig. 5).
- The cap for the bolt hole is made of synthetic resin, which is superb in its resistance to oil and wear.

- Table 4 shows sizes of the bolts for each model number as well as reference numbers of caps.
- To insert a cap into the rail bolt hole, use a flat tool (Fig. 6). Pound the cap gradually until its top becomes flush with the rail top face.

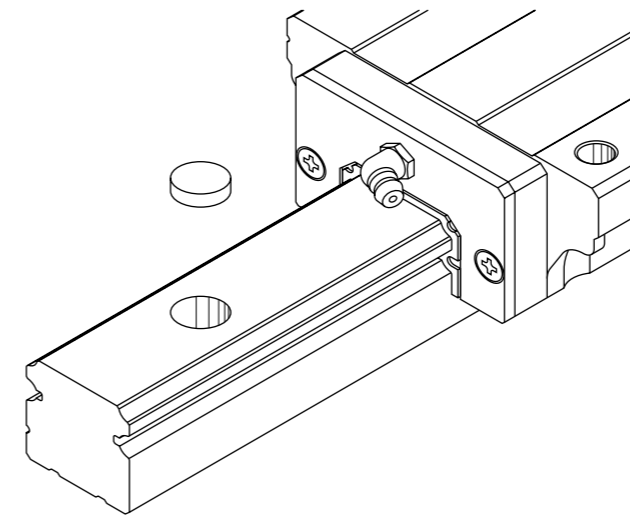


Fig. 5

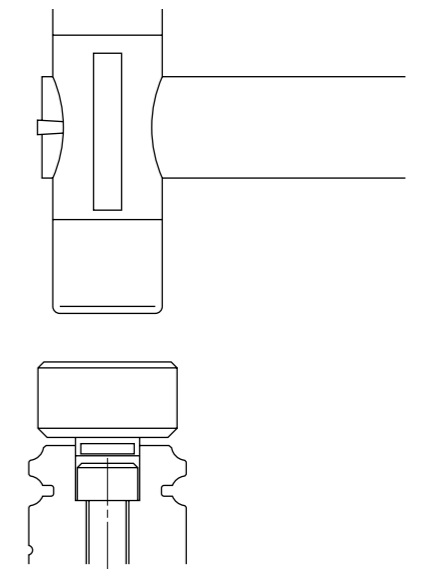
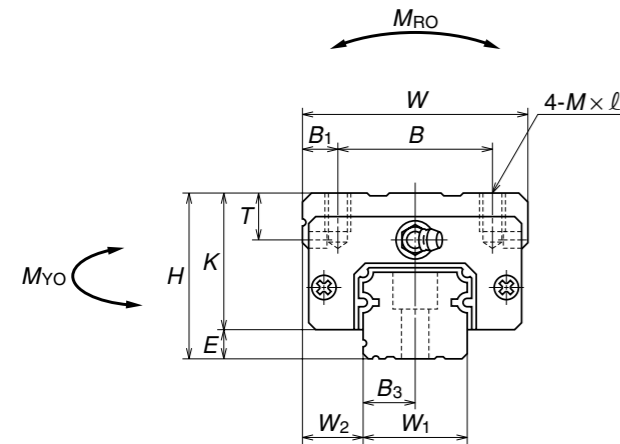


Fig. 6

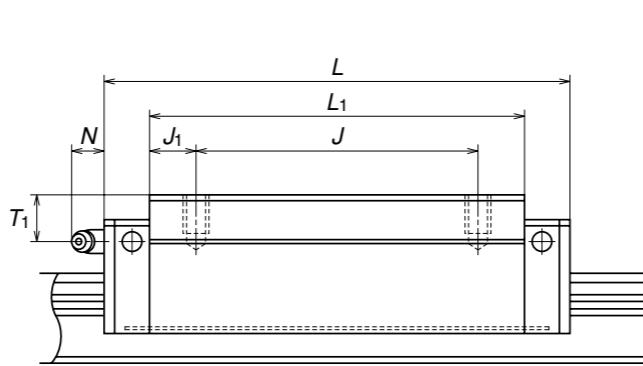
Table 4 Caps to cover rail bolt hole

Model No.	Bolt to secure rail	Cap Part No.	Quantity /case
SS15 (for M3) LS15 (for M3) PU09 (TR, UR) PU12 (TR, UR) PU15 PE09 (TR, UR)	M3	LG-CAP/M3	20
SH15 SS15 (for M4) LH15 LS15 (for M4) RA15 LW17 LW21 LW27 TS15	M4	LG-CAP/M4	20
SH20 SS20 LH20 LS20 RA20 TS20	M5	LG-CAP/M5	20
SH25 SS25 SS30 LH25 LS25 LS30 RA25 LW35 TS25	M6	LG-CAP/M6	20
SH30 SH35 SS35 LH30 LH35 LS35 RA30 RA35 LW50 TS30 TS35	M8	LG-CAP/M8	20
LH45 RA45	M12	LG-CAP/M12	20
LH55 RA55	M14	LG-CAP/M14	20
LH65 RA65	M16	LG-CAP/M16	20

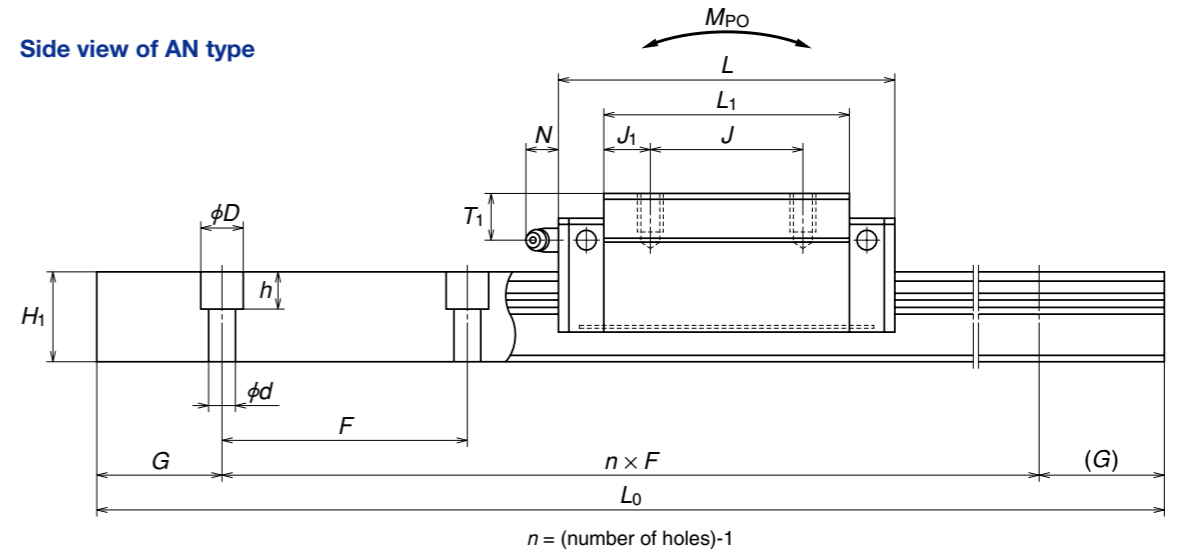
Front view of AL and AN, BL and BN types



Side view of BN type



Side view of AN type



Unit: mm

Model No.	Assembly			Ball slide											Rail					Basic load rating					Ball diameter		Weight				
	Height H	E	W <sub>2</sub>	Width W	Length L	Mounting hole			B <sub>1</sub>	L <sub>1</sub>	J <sub>1</sub>	K	T	Grease fitting			Width W <sub>1</sub>	Height H <sub>1</sub>	Pitch F	Mounting bolt hole d x D x h	B <sub>3</sub>	G	Max. length (Single rail) L <sub>0max</sub> ( ) for stainless	Static moment			D <sub>w</sub>	Ball slide (kg)	Rail (kg/m)		
						B	J	M x pitch x l						Mounting hole size	T <sub>1</sub>	N								C (N)	C <sub>0</sub> (N)	M <sub>RO</sub> (N·m)				M <sub>PO</sub> (N·m)	M <sub>YO</sub> (N·m)
LH15AN LH15BN	28	4.6	9.5	34	55 74	26	26	M4x0.7x6	4	39 58	6.5 16	23.4	8	phi3	8.5	3.3	15	15	60	4.5x7.5x5.3	7.5	20	2 000 (1 800)	10 800 14 600	20 700 32 000	108 166	95 216	80 181	3.175	0.18 0.26	1.6
LH20AN LH20BN	30	5	12	44	69.8 91.8	32	36 50	M5x0.8x6	6	50 72	7 11	25	12	M6x0.75	5	11	20	18	60	6x9.5x8.5	10	20	3 960 (3 500)	17 400 23 500	32 500 50 500	219 340	185 420	155 355	3.968	0.33 0.48	2.6
LH25AL LH25AN LH25BL LH25BN	36 40 36 40	7	12.5	48	79 107	35	35 50	M6x1x6 M6x1x9 M6x1x6 M6x1x9	6.5	58 86	11.5 18	29 33 29 33	12	M6x0.75	6 10 6 10	11	23	22	60	7x11x9	11.5	20	3 960 (3 500)	25 600 34 500	46 000 71 000	360 555	320 725	267 610	4.762	0.46 0.55 0.69 0.82	3.6
LH30AL LH30AN LH30BL LH30BN	42 45 42 45	9	16	60	85.6 124.6	40	40 60	M8x1.25x8 M8x1.25x10 M8x1.25x8 M8x1.25x10	10	59 98	9.5 19	33 36 33 36	14	M6x0.75	7 10 7 10	11	28	26	80	9x14x12	14	20	4 000 (3 500)	31 000 46 000	51 500 91 500	490 870	350 1 030	292 865	5.556	0.69 0.77 1.16 1.3	5.2
LH35AL LH35AN LH35BL LH35BN	48 55 48 55	9.5	18	70	109 143	50	50 72	M8x1.25x8 M8x1.25x12 M8x1.25x8 M8x1.25x12	10	80 114	15 21	38.5 45.5 38.5 45.5	15	M6x0.75	8 15 8 15	11	34	29	80	9x14x12	17	20	4 000	47 500 61 500	80 500 117 000	950 1 380	755 1 530	630 1 280	6.350	1.2 1.5 1.7 2.1	7.2
LH45AN LH45BN	70	14	20.5	86	139 171	60	60 80	M10x1.5x17	13	105 137	22.5 28.5	56	17	Rc1/8	20	13	45	38	105	14x20x17	22.5	22.5	3 990	81 000 99 000	140 000 187 000	2 140 2 860	1 740 3 000	1 460 2 520	7.937	3.0 3.9	12.3
LH55AN LH55BN	80	15	23.5	100	163 201	75	75 95	M12x1.75x18	12.5	126 164	25.5 34.5	65	18	Rc1/8	21	13	53	44	120	16x23x20	26.5	30	3 960	119 000 146 000	198 000 264 000	3 600 4 850	3 000 5 150	2 510 4 350	9.525	4.7 6.1	16.9
LH65AN LH65BN	90	16	31.5	126	193 253	76	70 120	M16x2x20	25	147 207	38.5 43.5	74	23	Rc1/8	19	13	63	53	150	18x26x22	31.5	35	3 900	181 000 235 000	281 000 410 000	6 150 8 950	4 950 10 100	4 150 8 450	11.906	7.7 10.8	24.3

Note 1: External appearance of stainless steel ball slides differs from those of carbon steel ball slides.

Note 2: Basic dynamic load rating C is a load that allows for a 50-km rating fatigue life and is a vertical and constant load on the ball slide mounting surface. To convert C to C<sub>100</sub> for a 100-km fatigue life, divide C by 1.26.

### Part number for ball slide only

Example:

**LAH 25 AN S Z-K**

Random-matching ball slide  
Size  
Shape/height

Accessories  
K: With NSK K1  
F: Fluoride low-temperature chrome plating + AS2 grease  
F50: Fluoride low-temperature chrome plating + LG2 grease

S: Stainless steel (LH15 to LH30 only)  
No code: Carbon steel

Preload  
Z: Slight preload (standard)

### Part number for rail only

Example:

**L1H 25 1000 L C N \*\*\* PC Z**

Random-matching rail  
Size  
Rail length (mm)  
Shape (L: Standard)  
Material/surface treatment  
Butting rail specification  
N: Non-butting L: Butting

Preload  
Z: Slight preload (standard)

Accuracy: PC (only PC grade is available)

NSK control number (\*\*\*) is required when making inquiries

### Part number for assembly (ball slide + rail)

Example:

**LH 25 1000 AN C 2 \*\*\* PC Z**

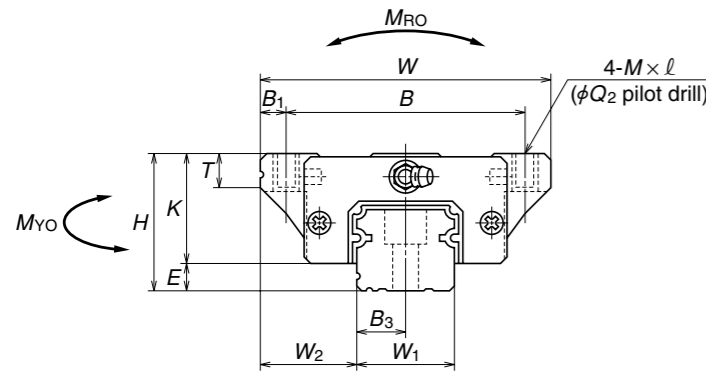
Series  
Size  
Rail length (mm)  
Shape/height  
Material/surface treatment  
C: Carbon steel (NSK standard)  
K: Stainless steel  
D: Carbon steel + surface treatment  
H: Stainless steel + surface treatment

Preload Z: Slight preload (standard)  
Accuracy: PC (only PC grade is available)  
KC (with NSK K1)  
NSK control number (\*\*\*) is required when making inquiries  
Number of ball slides per rail

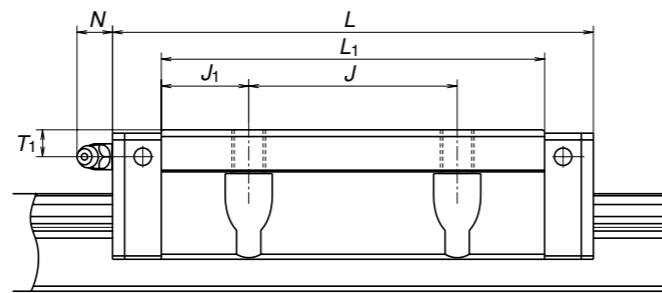


## Ball Slide Models: EM, GM

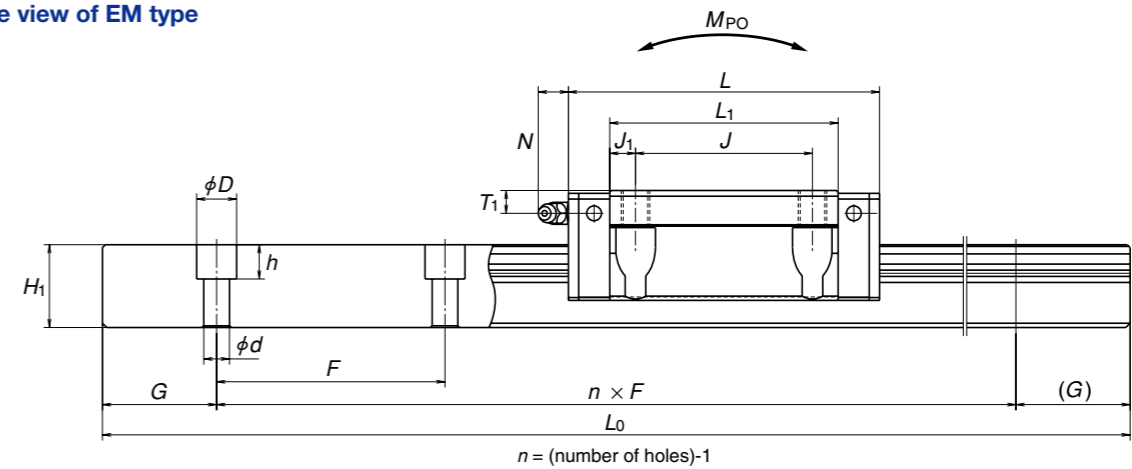
Front view of EM and GM types



Side view of GM type



Side view of EM type



Unit: mm

Model No.	Assembly			Ball slide														Rail					Basic load rating					Ball diameter		Weight			
	Height H	E	W <sub>2</sub>	Width W	Length L	Mounting hole				Q <sub>2</sub>	B <sub>1</sub>	L <sub>1</sub>	J <sub>1</sub>	K	T	Grease fitting			Width W <sub>1</sub>	Height H <sub>1</sub>	Pitch F	Mounting bolt hole d x D x h	B <sub>3</sub>	G	Max. length (Single rail) L <sub>0max</sub> ( ) for stainless	Dynamic C (N)	Static C <sub>0</sub> (N)	Static moment			D <sub>w</sub>	Ball slide (kg)	Rail (kg/m)
						M x pitch x l	Q <sub>2</sub>	B <sub>1</sub>	L <sub>1</sub>							J <sub>1</sub>	K	T										Mounting hole size	T <sub>1</sub>	N			
LH15EM LH15GM	24	4.6	16	47	55 74	38	30	M5x0.8x7	4.4	4.5	39 58	4.5 14	19.4	8	phi3	4.5	3.3	15	15	60	4.5x7.5x5.3	7.5	20	2 000 (1 800)	10 800 14 600	20 700 32 000	108 166	94.5 216	79.5 181	3.175	0.17 0.25	1.6	
LH20EM LH20GM	30	5	21.5	63	69.8 91.8	53	40	M6x1x9.5	5.3	5	50 72	5 16	25	10	M6x0.75	5	11	20	18	60	6x9.5x8.5	10	20	3 960 (3 500)	17 400 23 500	32 500 50 500	219 340	185 420	155 355	3.968	0.45 0.65	2.6	
LH25EM LH25GM	36	7	23.5	70	79 107	57	45	M8x1.25x10 (M8x1.25x11.5)	6.8	6.5	58 86	6.5 20.5	29	11 (12)	M6x0.75	6	11	23	22	60	7x11x9	11.5	20	3 960 (3 500)	25 600 34 500	46 000 71 000	360 555	320 725	267 610	4.762	0.63 0.93	3.6	
LH30EM LH30GM	42	9	31	90	98.6 124.6	72	52	M10x1.5x12 (M10x1.5x14.5)	8.6	9	72 98	10 23	33	11 (15)	M6x0.75	7	11	28	26	80	9x14x12	14	20	4 000 (3 500)	35 500 46 000	63 000 91 500	600 870	505 1 030	425 865	5.556	1.2 1.6	5.2	
LH35EM LH35GM	48	9.5	33	100	109 143	82	62	M10x1.5x13	8.6	9	80 114	9 26	38.5	12	M6x0.75	8	11	34	29	80	9x14x12	17	20	4 000	47 500 61 500	80 500 117 000	950 1 380	755 1 530	630 1 280	6.35	1.7 2.4	7.2	
LH45EM LH45GM	60	14	37.5	120	139 171	100	80	M12x1.75x15	10.5	10	105 137	12.5 28.5	46	13	Rc1/8	10	13	45	38	105	14x20x17	22.5	22.5	3 990	81 000 99 000	140 000 187 000	2 140 2 860	1 740 3 000	1 460 2 520	7.937	3 3.9	12.3	
LH55EM LH55GM	70	15	43.5	140	163 201	116	95	M14x2x18	12.5	12	126 164	15.5 34.5	55	15	Rc1/8	11	13	53	44	120	16x23x20	26.5	30	3 990	119 000 146 000	198 000 264 000	3 600 4 850	3 000 5 150	2 510 4 350	9.525	5 6.5	16.9	
LH65EM LH65GM	90	16	53.5	170	193 253	142	110	M16x2x24	14.6	14	147 207	18.5 48.5	74	23	Rc1/8	19	13	63	53	150	18x26x22	31.5	35	3 900	181 000 235 000	281 000 410 000	6 150 8 950	4 950 10 100	4 150 8 450	11.906	10 14.1	24.3	

Note 1: Parenthesized dimensions are for items made of stainless steel.

Note 2: External appearance of stainless steel ball slides differs from those of carbon steel ball slides.

Note 3: Basic dynamic load rating C is a load that allows for a 50-km rating fatigue life and is a vertical and constant load on the ball slide mounting surface. To convert C to C<sub>100</sub> for a 100-km fatigue life, divide C by 1.26.

Part number for ball slide only

Example:

**LAH 25 EM S Z - K**

Random-matching ball slide  
Size  
Shape/height

Accessories  
K: With NSK K1  
F: Fluoride low-temperature chrome plating + AS2 grease  
F50: Fluoride low-temperature chrome plating + LG2 grease

S: Stainless steel (LH15 to LH30 only)  
No code: Carbon steel

Preload  
Z: Slight preload (standard)

Part number for rail only

Example:

**L1H 25 1000 L C N \*\*\* PC Z**

Random-matching rail  
Size  
Rail length (mm)  
Shape (L: Standard)  
Material/surface treatment  
Butting rail specification  
N: Non-butting L: Butting

Preload  
Z: Slight preload (standard)

Accuracy: PC (only PC grade is available)

NSK control number (\*\*\* is required when making inquiries)

Part number for assembly (ball slide + rail)

Example:

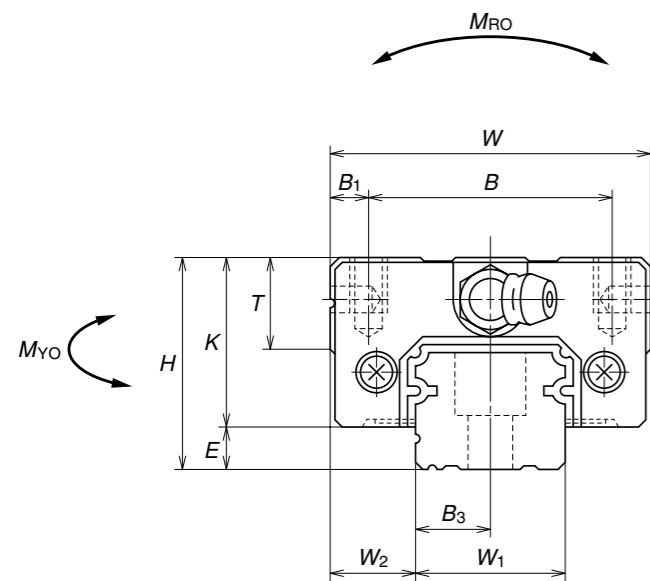
**LH 25 1000 EM C 2 \*\*\* PC Z**

Series  
Size  
Rail length (mm)  
Shape/height  
Material/surface treatment  
C: Carbon steel (NSK standard)  
K: Stainless steel  
D: Carbon steel + surface treatment  
H: Stainless steel + surface treatment

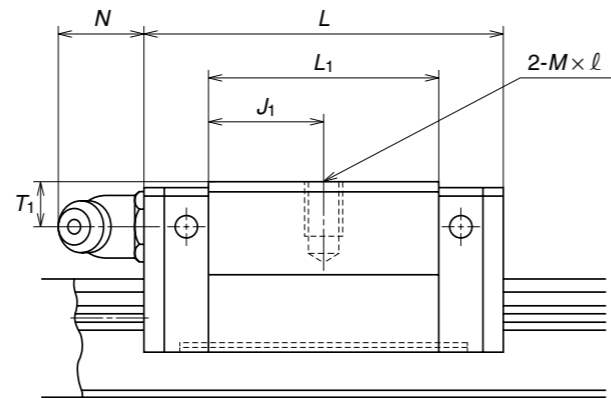
Preload Z: Slight preload (standard)  
Accuracy: PC (only PC grade is available) KC (with NSK K1)  
NSK control number (\*\*\* is required when making inquiries)  
Number of ball slides per rail

## Ball Slide Models: CL, AL

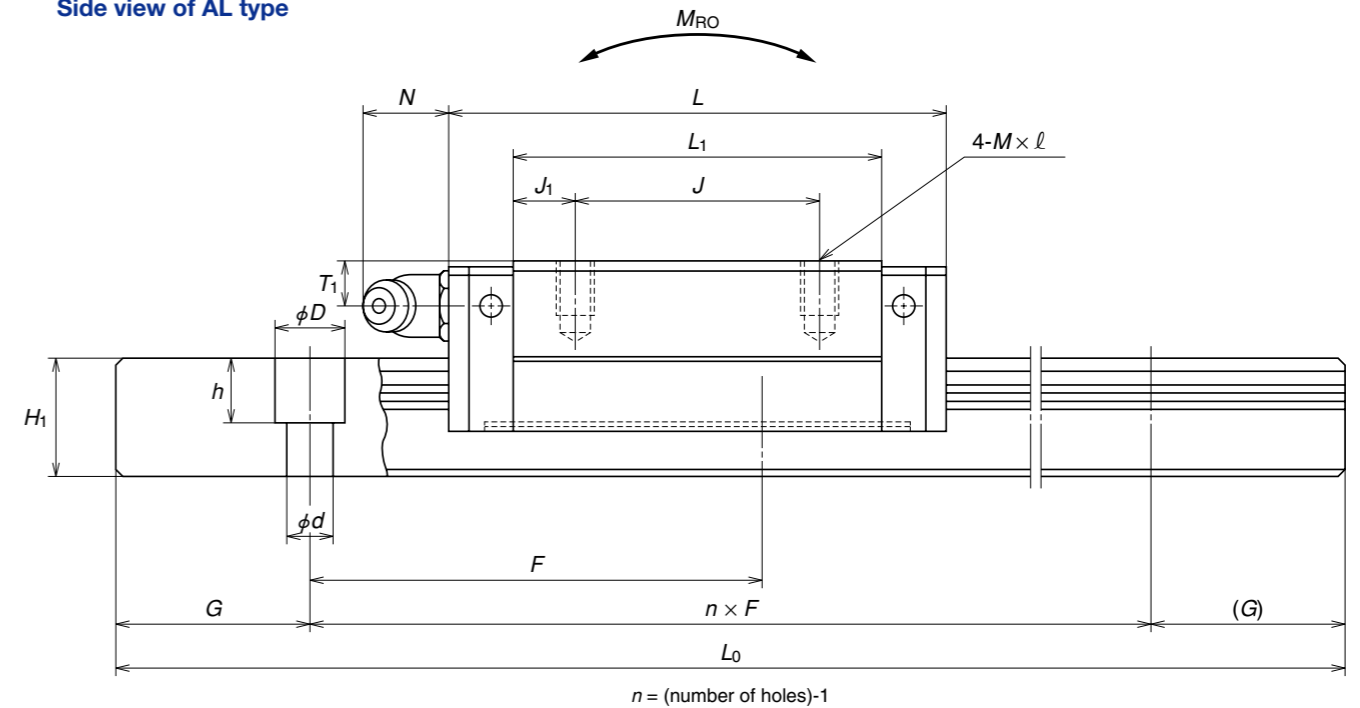
Front view of AL and CL types



Side view of CL type



Side view of AL type



Unit: mm

Model No.	Assembly			Ball slide													Rail							Basic load rating					Ball diameter	Weight	
	Height H	E	W <sub>2</sub>	Width W	Length L	Mounting hole			B <sub>1</sub>	L <sub>1</sub>	J <sub>1</sub>	K	T	Grease fitting			Width W <sub>1</sub>	Height H <sub>1</sub>	Pitch F	Mounting bolt hole d x D x h	B <sub>3</sub>	G	Max. length (Single rail) L <sub>0max</sub> ( ) for stainless	Dynamic C (N)	Static C <sub>0</sub> (N)	Static moment			D <sub>w</sub>	Ball slide (kg)	Rail (kg/m)
						B	J	M x pitch x l						Mounting hole size	T <sub>1</sub>	N										M <sub>RO</sub> (N·m)	M <sub>PO</sub> (N·m)	M <sub>YO</sub> (N·m)			
<b>LS15CL</b> <b>LS15AL</b>	24	4.6	9.5	34	40.4 56.8	26	— 26	M4x0.7x6	4	23.6 40	11.8 7	19.4	10	— phi3	6	3	15	12.5	60	*3.5x6x4.5 4.5x7.5x5.3	7.5	20	2 000 (1 700)	5 400 8 350	9 100 16 900	45.5 84.5	24.5 77	20.5 64.5	2.778	0.14 0.20	1.4
<b>LS20CL</b> <b>LS20AL</b>	28	6	11	42	47.2 65.2	32	— 32	M5x0.8x7	5	30 48	15 8	22	12	M6x0.75	5.5	11	20	15.5	60	6x9.5x8.5	10	20	3 960 (3 500)	7 900 11 700	13 400 23 500	91.5 160	46.5 133	39 111	3.175	0.19 0.28	2.3
<b>LS25CL</b> <b>LS25AL</b>	33	7	12.5	48	59.6 81.6	35	— 35	M6x1x9	6.5	38 60	19 12.5	26	12	M6x0.75	7	11	23	18	60	7x11x9	11.5	20	3 960 (3 500)	12 700 18 800	20 800 36 500	164 286	91 258	76 217	3.968	0.34 0.51	3.1
<b>LS30CL</b> <b>LS30AL</b>	42	9	16	60	67.4 96.4	40	— 40	M8x1.25x12	10	42 71	21 15.5	33	13	M6x0.75	8	11	28	23	80	7x11x9	14	20	4 000 (3 500)	18 700 28 800	29 600 55 000	282 520	139 435	116 365	4.762	0.58 0.85	4.8
<b>LS35CL</b> <b>LS35AL</b>	48	10.5	18	70	77 108	50	— 50	M8x1.25x12	10	49 80	24.5 15	37.5	14	M6x0.75	8.5	11	34	27.5	80	9x14x12	17	20	4 000 (3 500)	26 000 40 000	40 000 74 500	465 865	220 695	185 580	5.556	0.86 1.3	7.0

Note 1: External appearance of stainless steel ball slides differs from those of carbon steel ball slides.

Note 2: Basic dynamic load rating C is a load that allows for a 50-km rating fatigue life and is a vertical and constant load on the ball slide mounting surface.

To convert C to C<sub>100</sub> for a 100-km fatigue life, divide C by 1.26.

\*Standard mounting hole of LS15 rail is for M3 bolts (Hole size: 3.5x6x4.5).

If you require mounting hole for M4 bolts (Hole size: 4.5x7.5x5.3), please specify when ordering.

### Part number for ball slide only

Example:

**LAS 25 AL S Z-K**

Random-matching ball slide

Size  
Shape/height

S: Stainless steel  
No code: Carbon steel (NSK standard)

Accessories  
K: With NSK K1  
F: Fluoride low-temperature chrome plating + AS2 grease  
F50: Fluoride low-temperature chrome plating + LG2 grease

Preload  
Z: Slight preload (standard)

### Part number for rail only

Example:

**L1S 25 1000 L C N \*\*\* PC Z**

Random-matching rail

Size  
Rail length (mm)

Shape

(L: Standard, LS15 mounting hole for M3 specification  
T: LS15 mounting hole for M4 specification)

Material/surface treatment

Preload  
Z: Slight preload (standard)

Accuracy: PC  
(only PC grade is available)

NSK control number  
(\*\*\* is required when making inquiries)

Butting rail specification  
N: Non-butting L: Butting

### Part number for assembly (ball slide + rail)

Example:

**LS 25 1000 AL C 2 \*\*\* PC Z**

Series  
Size  
Rail length (mm)  
Shape/height

Material/surface treatment  
C: Carbon steel (NSK standard)  
K: Stainless steel  
D: Carbon steel + surface treatment  
H: Stainless steel + surface treatment

Preload Z: Slight preload (standard)

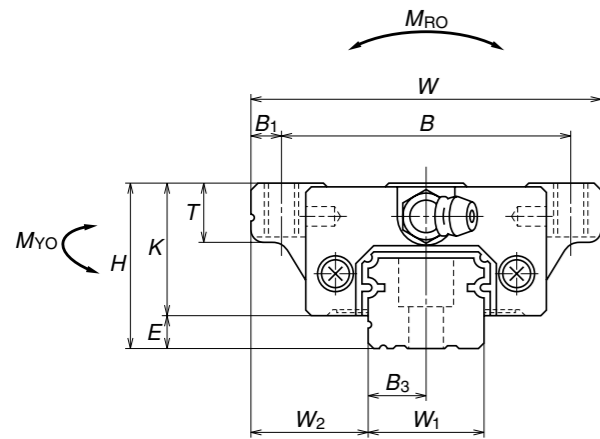
Accuracy: PC (only PC grade is available)  
KC (with NSK K1)

NSK control number  
(\*\*\* is required when making inquiries)

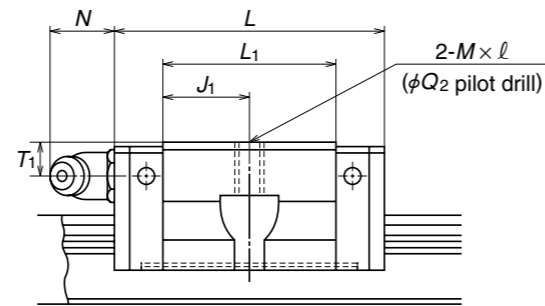
Number of ball slides per rail

## Ball Slide Models: JM, EM

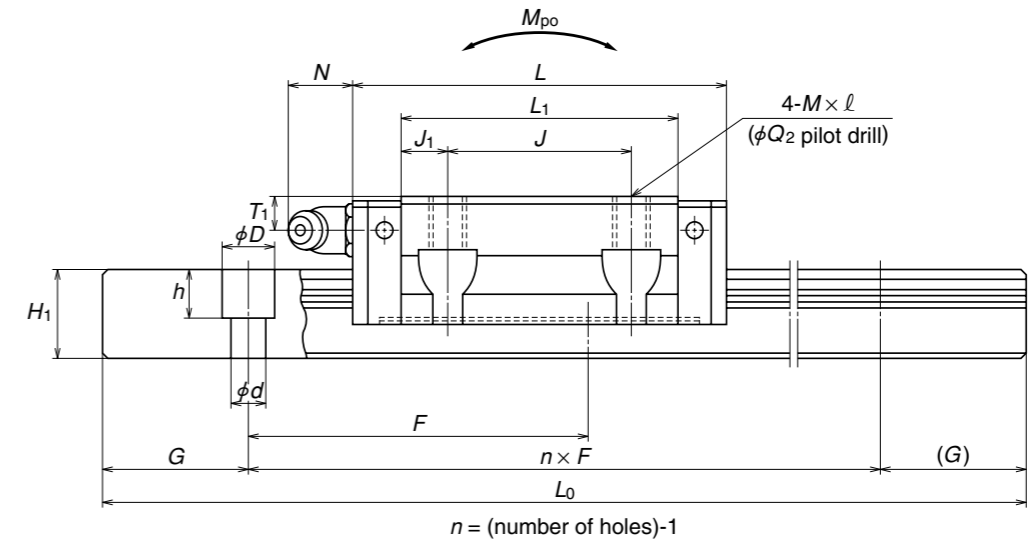
Front view of JM and EM types



Side view of JM type



Side view of EM type



Unit: mm

Model No.	Assembly			Ball slide													Rail					Basic load rating					Ball diameter	Weight				
	Height H	E	W <sub>2</sub>	Width W	Length L	Mounting hole				B <sub>1</sub>	L <sub>1</sub>	J <sub>1</sub>	K	T	Grease fitting			Width W <sub>1</sub>	Height H <sub>1</sub>	Pitch F	Mounting bolt hole d × D × h	B <sub>3</sub>	G	Max. length (Single rail) L <sub>0max</sub> ( ) for stainless	Dynamic C (N)	Static C <sub>0</sub> (N)	Static moment			D <sub>w</sub>	Ball slide (kg)	Rail (kg/m)
						B	J	Q <sub>1</sub> × l	Q <sub>2</sub>						Mounting hole size	T <sub>1</sub>	N										M <sub>RO</sub> (N·m)	M <sub>PO</sub> (N·m)	M <sub>YO</sub> (N·m)			
<b>LS15JM</b>	24	4.6	18.5	52	40.4	41	—	M5×0.8×7	4.4	5.5	23.6	11.8	19.4	8	φ3	6	3	15	12.5	60	*3.5×6×4.5	7.5	20	2 000 (1 700)	5 400	9 100	45.5	24.5	20.5	2.778	0.17	1.4
<b>LS15EM</b>					56.8	26					40	7									4.5×7.5×5.3			8 350	16 900	84.5	77	64.5		0.26		
<b>LS20JM</b>	28	6	19.5	59	47.2	49	—	M6×1×9	5.3	5	30	15	22	10	M6×0.75	5.5	11	20	15.5	60	6×9.5×8.5	10	20	3 960 (3 500)	7 900	13 400	91.5	46.5	39	3.175	0.24	2.3
<b>LS20EM</b>					65.2	32		(M6×1×9.5)			48	8												11 700	23 500	160	133	111		0.35		
<b>LS25JM</b>	33	7	25	73	59.6	60	—	M8×1.25×10	6.8	6.5	38	19	26	11	M6×0.75	7	11	23	18	60	7×11×9	11.5	20	3 960 (3 500)	12 700	20 800	164	91	76	3.968	0.44	3.1
<b>LS25EM</b>					81.6	35		(M8×1.25×11.5)			60	12.5		(12)										18 800	36 500	286	258	217		0.66		
<b>LS30JM</b>	42	9	31	90	67.4	72	—	M10×1.5×12	8.6	9	42	21	33	11	M6×0.75	8	11	28	23	80	7×11×9	14	20	4 000 (3 500)	18 700	29 600	282	139	116	4.762	0.76	4.8
<b>LS30EM</b>					96.4	40		(M10×1.5×14.5)			71	15.5		(15)										28 800	55 000	520	435	365		1.2		
<b>LS35JM</b>	48	10.5	33	100	77	82	—	M10×1.5×13	8.6	9	49	24.5	37.5	12	M6×0.75	8.5	11	34	27.5	80	9×14×12	17	20	4 000 (3 500)	26 000	40 000	465	220	185	5.556	1.2	7
<b>LS35EM</b>					108	50		(M10×1.5×14.5)			80	15		(15)										40 000	74 500	865	695	580		1.7		

Note 1: Parenthesized dimensions are for items made of stainless steel.

Note 2: External appearance of stainless steel ball slides differs from those of carbon steel ball slides.

Note 3: Basic dynamic load rating C is a load that allows for a 50-km rating fatigue life and is a vertical and constant load on the ball slide mounting surface.

To convert C to C<sub>100</sub> for a 100-km fatigue life, divide C by 1.26.

\*Standard mounting hole of LS15 rail is for M3 bolts (Hole size: 3.5×6×4.5). If you require mounting hole for M4 bolts (Hole size: 4.5×7.5×5.3), please specify when ordering.

### Part number for ball slide only

Example:

**LAS 25 EM S Z - K**

Random-matching ball slide

Size

Shape/height

S: Stainless steel  
No code: Carbon steel (NSK standard)

Accessories  
K: With NSK K1  
F: Fluoride low-temperature chrome plating + AS2 grease  
F50: Fluoride low-temperature chrome plating + LG2 grease

Preload  
Z: Slight preload (standard)

### Part number for rail only

Example:

**L1S 25 1000 L C N \*\*\* PC Z**

Random-matching rail

Size

Rail length (mm)

Shape

(L: Standard, LS15 mounting hole for M3 specification  
T: LS15 mounting hole for M4 specification)

Material/surface treatment

Preload  
Z: Slight preload (standard)

Accuracy: PC  
(only PC grade is available)

NSK control number  
(\*\*\* is required when making inquiries)

Butting rail specification  
N: Non-butting L: Butting

### Part number for assembly (ball slide + rail)

Example:

**LS 25 1000 EM C 2 \*\*\* PC Z**

Series

Size

Rail length (mm)

Shape/height

Material/surface treatment

C: Carbon steel (NSK standard)

K: Stainless steel

D: Carbon steel + surface treatment

H: Stainless steel + surface treatment

Preload Z: Slight preload (standard)

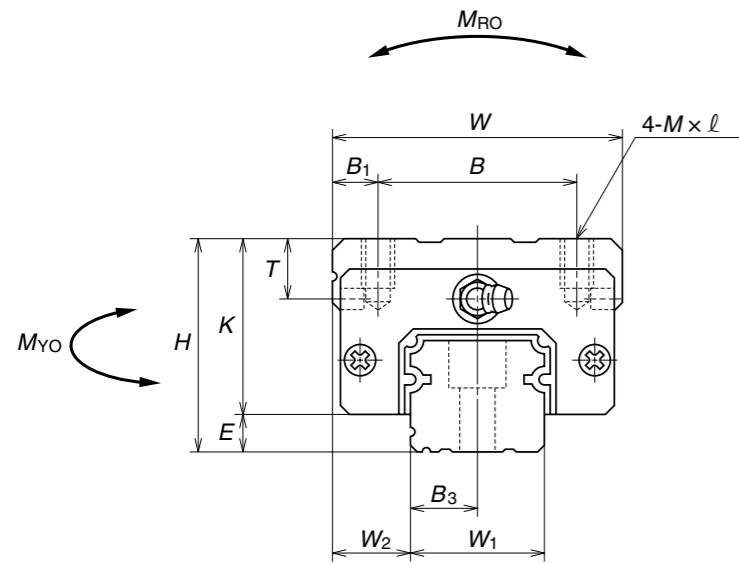
Accuracy: PC (only PC grade is available)  
KC (with NSK K1)

NSK control number  
(\*\*\* is required when making inquiries)

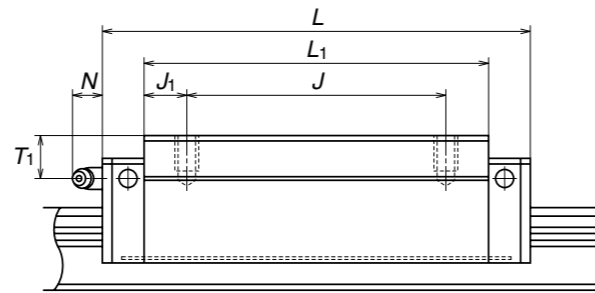
Number of ball slides per rail

## Ball Slide Models: AN, BN

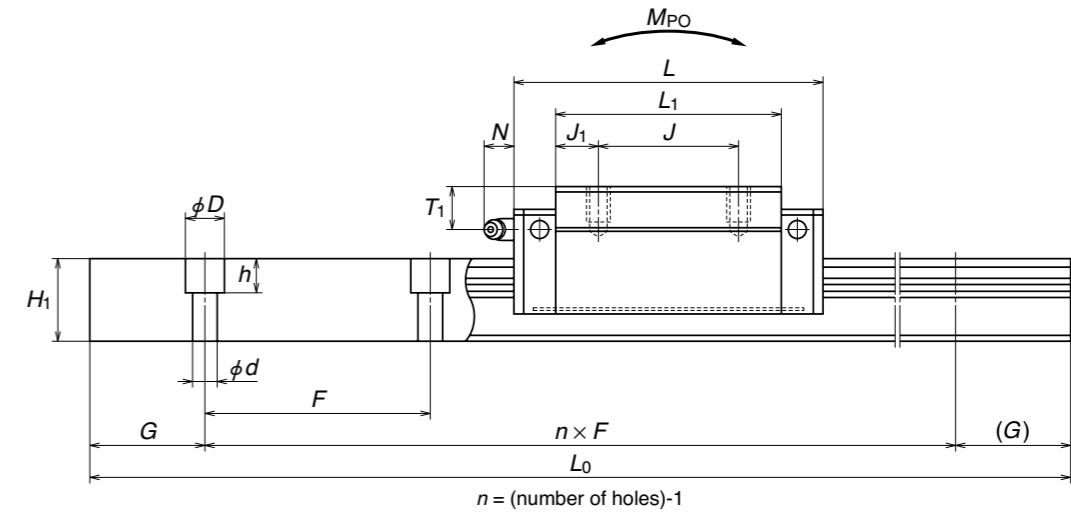
Front view of AN and BN types



Side view of BN type



Side view of AN type



Unit: mm

Model No.	Assembly			Ball slide													Rail						Basic load rating					Ball diameter	Weight		
	Height H	E	W <sub>2</sub>	Width W	Length L	Mounting hole			B <sub>1</sub>	L <sub>1</sub>	J <sub>1</sub>	K	T	Grease fitting			Width W <sub>1</sub>	Height H <sub>1</sub>	Pitch F	Mounting bolt hole d x D x h	B <sub>3</sub>	G	Max. length (Single rail) L <sub>0max</sub> ( ) for stainless	Dynamic C (N)	Static C <sub>0</sub> (N)	Static moment			D <sub>w</sub>	Ball slide (kg)	Rail (kg/m)
						B	J	M x pitch x l						Mounting hole size	T <sub>1</sub>	N										M <sub>RO</sub> (N·m)	M <sub>PO</sub> (N·m)	M <sub>YO</sub> (N·m)			
SH15AN SH15BN	28	4.6	9.5	34	55 74	26	26	M4×0.7×6	4	39 58	6.5 16	23.4	8	φ3	8.5	3.3	15	15	60	4.5×7.5×5.3	7.5	20	2 000 (1 800)	10 100 13 400	18 800 28 200	98 147	87 193	73 162	3.175	0.18 0.26	1.6
SH20AN SH20BN	30	5	12	44	69.8 91.8	32	36 50	M5×0.8×6	6	50 72	7 11	25	12	M6×0.75	5	11	20	18	60	6×9.5×8.5	10	20	3 960 (3 500)	16 300 21 600	29 600 44 500	199 298	167 360	141 305	3.968	0.33 0.48	2.6
SH25AN SH25BN	40	7	12.5	48	79 107	35	35 50	M6×1×9	6.5	58 86	11.5 18	33	12	M6×0.75	10	11	23	22	60	7×11×9	11.5	20	3 960 (3 500)	22 400 32 000	37 500 62 500	295 490	246 615	207 515	4.762	0.55 0.82	3.6
SH30AN SH30BN	45	9	16	60	85.6 124.6	40	40 60	M8×1.25×10	10	59 98	9.5 19	36	14	M6×0.75	10	11	28	26	80	9×14×12	14	20	4 000 (3 500)	31 000 46 000	51 500 91 500	490 870	365 1 060	305 885	5.556	0.77 1.3	5.2
SH35AN SH35BN	55	9.5	18	70	109 143	50	50 72	M8×1.25×12	10	80 114	15 21	45.5	15	M6×0.75	15	11	34	29	80	9×14×12	17	20	4 000	47 500 61 500	80 500 117 000	950 1 380	780 1 600	655 1 340	6.35	1.5 2.1	7.2
SH45AN SH45BN	70	14	20.5	86	139 171	60	60 80	M10×1.5×17	13	105 137	22.5 28.5	56	17	Rc1/8	20	13	45	38	105	14×20×17	22.5	22.5	3 990	76 500 94 500	128 000 175 000	1 970 2 680	1 550 2 760	1 300 2 320	7.937	3.0 3.9	12.3
SH55AN SH55BN	80	15	23.5	100	163 201	75	75 95	M12×1.75×18	12.5	126 164	25.5 34.5	65	18	Rc1/8	21	13	53	44	120	16×23×20	26.5	30	3 960	113 000 140 000	181 000 247 000	3 300 4 550	2 640 4 800	2 210 4 050	9.525	4.7 6.1	16.9

Note 1: External appearance of stainless steel ball slides differs from those of carbon steel ball slides.

Note 2: Basic dynamic load rating C is a load that allows for a 50-km rating fatigue life and is a vertical and constant load on the ball slide mounting surface. To convert C to C<sub>100</sub> for a 100-km fatigue life, divide C by 1.26.

Part number for ball slide only

Example:

**SAH 25 AN S Z-K**

Random-matching ball slide  
Size  
Shape/height  
S: Stainless steel (SH15 to SH30 only)  
No code: Carbon steel (NSK standard)

Accessories  
K: With NSK K1  
F: Fluoride low-temperature chrome plating + AS2 grease  
F50: Fluoride low-temperature chrome plating + LG2 grease  
Preload  
Z: Slight preload (standard)

Part number for rail only

Example:

**L1H 25 1000 L C N \*\*\* PC Z**

Random-matching rail  
Size  
Rail length (mm)  
Shape (L: Standard)  
Material/surface treatment  
Butting rail specification  
N: Non-butting L: Butting

Preload  
Z: Slight preload (standard)  
Accuracy: PC (only PC grade is available)  
NSK control number (\*\*\* is required when making inquiries)

Part number for assembly (ball slide + rail)

Example:

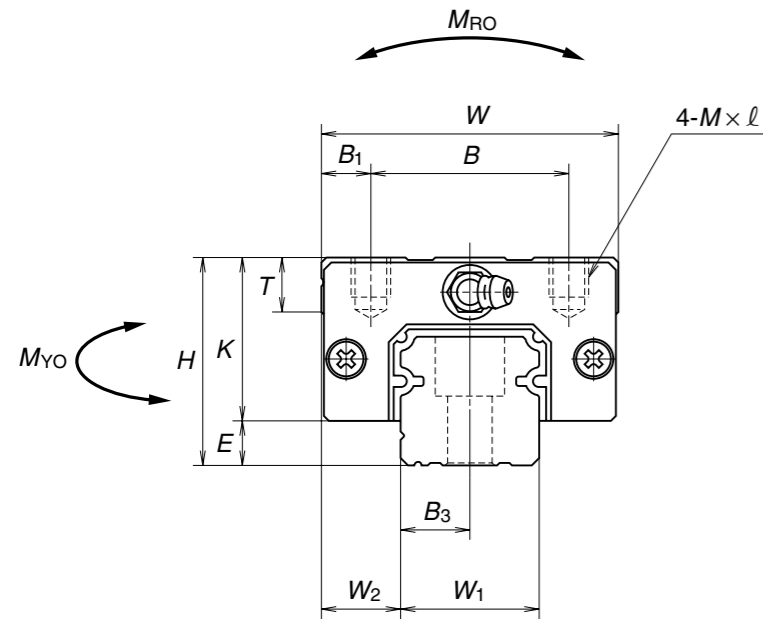
**SH 25 1000 AN C 2 \*\*\* PC Z**

Series  
Size  
Rail length (mm)  
Shape/height  
Material/surface treatment  
C: Carbon steel (NSK standard)  
K: Stainless steel  
D: Carbon steel + surface treatment  
H: Stainless steel + surface treatment

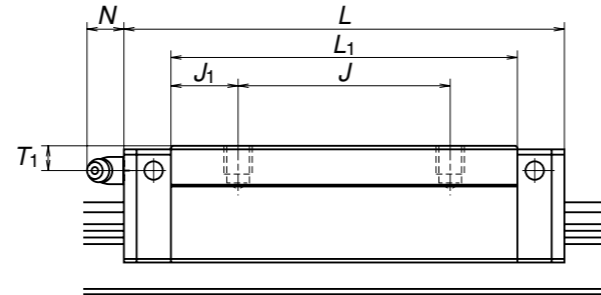
Preload Z: Slight preload (standard)  
Accuracy: PC (only PC grade is available)  
KC (with NSK K1)  
NSK control number (\*\*\* is required when making inquiries)  
Number of ball slides per rail

## Ball Slide Models: AL, BL

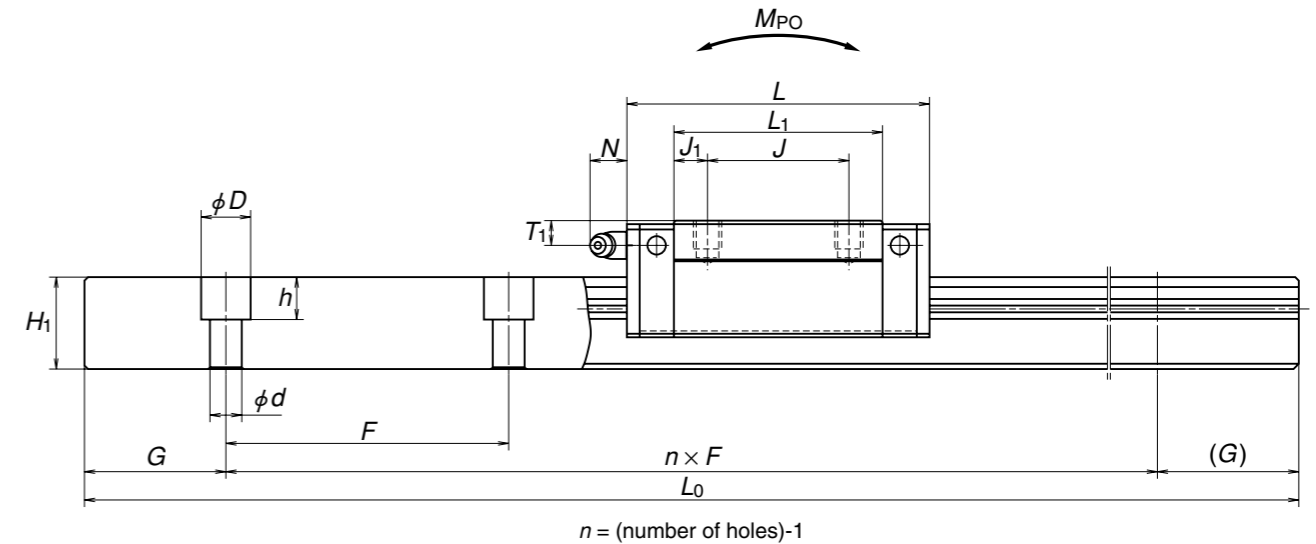
Front view of AL and BL types



Side view of BL type



Side view of AL type



Unit: mm

Model No.	Assembly			Ball slide													Rail						Basic load rating					Ball diameter	Weight		
	Height	E	W <sub>2</sub>	Width	Length	Mounting hole			B <sub>1</sub>	L <sub>1</sub>	J <sub>1</sub>	K	T	Grease fitting			Width	Height	Pitch	Mounting bolt hole	B <sub>3</sub>	G	Max. length (Single rail) L <sub>0max</sub> ( ) for stainless	Dynamic	Static	Static moment			D <sub>w</sub>	Ball slide (kg)	Rail (kg/m)
						B	J	M × pitch × ℓ						Mounting hole size	T <sub>1</sub>	N										W <sub>1</sub>	H <sub>1</sub>	F			
SH25AL SH25BL	36	7	12.5	48	79 107	35	35	M6×1×6	6.5	58 86	11.5 18	29	12	M6×0.75	6	11	23	22	60	7×11×9	11.5	20	3 960 (3 500)	22 400 32 000	37 500 62 500	295 490	246 615	207 515	4.762	0.46 0.69	3.6
SH30AL SH30BL	42	9	16	60	85.6 124.6	40	40	M8×1.25×8	10	59 98	9.5 19	33	14	M6×0.75	7	11	28	26	80	9×14×12	14	20	4 000 (3 500)	31 000 46 000	51 500 91 500	490 870	365 1 060	305 885	5.556	0.69 1.16	5.2
SH35AL SH35BL	48	9.5	18	70	109 143	50	50	M8×1.25×8	10	80 114	15 21	38.5	15	M6×0.75	8	11	34	29	80	9×14×12	17	20	4 000	47 500 61 500	80 500 117 000	950 1 380	780 1 600	655 1 340	6.35	1.2 1.7	7.2

Note 1: External appearance of stainless steel ball slides differs from those of carbon steel ball slides.

Note 2: Basic dynamic load rating C is a load that allows for a 50-km rating fatigue life and is a vertical and constant load on the ball slide mounting surface. To convert C to C<sub>100</sub> for a 100-km fatigue life, divide C by 1.26.

### Part number for ball slide only

Example:

**SAH 25 AL S Z-K**

Random-matching ball slide  
Size  
Shape/height  
S: Stainless steel (SH15 to SH30 only)  
No code: Carbon steel (NSK standard)

Accessories  
K: With NSK K1  
F: Fluoride low-temperature chrome plating + AS2 grease  
F50: Fluoride low-temperature chrome plating + LG2 grease  
Preload  
Z: Slight preload (standard)

### Part number for rail only

Example:

**L1H 25 1000 L C N \*\*\* PC Z**

Random-matching rail  
Size  
Rail length (mm)  
Shape (L: Standard)  
Material/surface treatment  
Butting rail specification  
N: Non-butting L: Butting

Preload  
Z: Slight preload (standard)  
Accuracy: PC (only PC grade is available)  
NSK control number (\*\* is required when making inquiries)

### Part number for assembly (ball slide + rail)

Example:

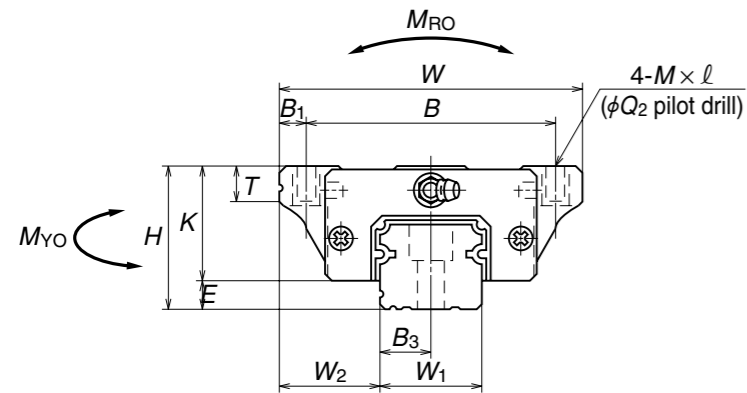
**SH 25 1000 AL C 2 \*\*\* PC Z**

Series  
Size  
Rail length (mm)  
Shape/height  
Material/surface treatment  
C: Carbon steel (NSK standard)  
K: Stainless steel  
D: Carbon steel + surface treatment  
H: Stainless steel + surface treatment

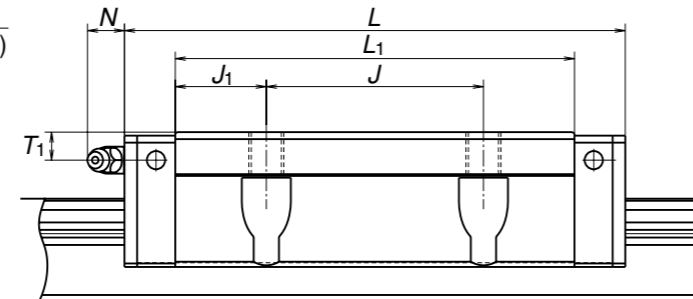
Preload Z: Slight preload (standard)  
Accuracy: PC (only PC grade is available)  
KC (with NSK K1)  
NSK control number (\*\* is required when making inquiries)  
Number of ball slides per rail

## Ball Slide Models: EM, GM

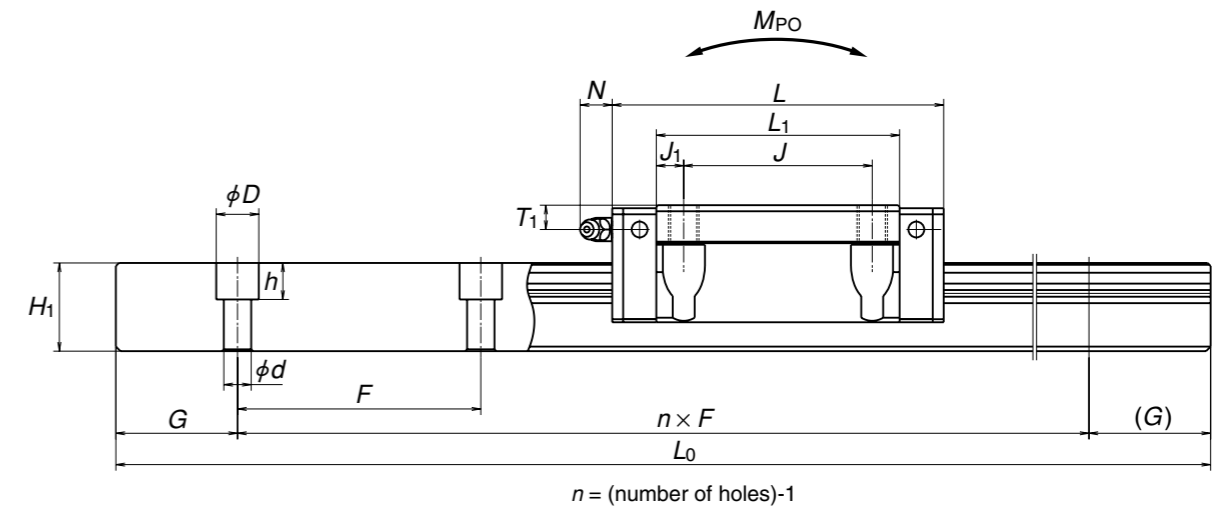
Front view of EM and GM types



Side view of GM type



Side view of EM type



Unit: mm

Model No.	Assembly			Ball slide													Rail						Basic load rating					Ball diameter	Weight				
	Height H	E	W <sub>2</sub>	Width W	Length L	Mounting hole				Q <sub>2</sub>	B <sub>1</sub>	L <sub>1</sub>	J <sub>1</sub>	K	T	Grease fitting			Width W <sub>1</sub>	Height H <sub>1</sub>	Pitch F	Mounting bolt hole d x D x h	B <sub>3</sub>	G	Max. length (Single rail) L <sub>0max</sub> ( ) for stainless	Dynamic C (N)	Static C <sub>0</sub> (N)	Static moment			D <sub>w</sub>	Ball slide (kg)	Rail (kg/m)
						M x pitch x l	Q <sub>1</sub> x l	Mounting hole size	T <sub>1</sub>							N	M <sub>RO</sub> (N·m)	M <sub>PO</sub> (N·m)										M <sub>VO</sub> (N·m)					
SH15EM SH15GM	24	4.6	16	47	55 74	38	30	M5x0.8x7	4.4	4.5	39 58	4.5 14	19.4	8	phi3	4.5	3.3	15	15	60	4.5x7.5x5.3	7.5	20	2 000 (1 800)	10 100 13 400	18 800 28 200	98 147	87 193	73 162	3.175	0.17 0.25	1.6	
SH20EM SH20GM	30	5	21.5	63	69.8 91.8	53	40	M6x1x9.5	5.3	5	50 72	5 16	25	10	M6x0.75	5	11	20	18	60	6x9.5x8.5	10	20	3 960 (3 500)	16 300 21 600	29 600 44 500	199 298	167 360	141 305	3.968	0.45 0.65	2.6	
SH25EM SH25GM	36	7	23.5	70	79 107	57	45	M8x1.25x10 (M8x1.25x11.5)	6.8	6.5	58 86	6.5 20.5	29	11 (12)	M6x0.75	6	11	23	22	60	7x11x9	11.5	20	3 960 (3 500)	22 400 32 000	37 500 62 500	295 490	246 615	207 515	4.762	0.63 0.93	3.6	
SH30EM SH30GM	42	9	31	90	98.6 124.6	72	52	M10x1.5x12 (M10x1.5x14.5)	8.6	9	72 98	10 23	33	11 (15)	M6x0.75	7	11	28	26	80	9x14x12	14	20	4 000 (3 500)	35 500 46 000	63 000 91 500	600 870	540 1 060	450 885	5.556	1.2 1.6	5.2	
SH35EM SH35GM	48	9.5	33	100	109 143	82	62	M10x1.5x13	8.6	9	80 114	9 26	38.5	12	M6x0.75	8	11	34	29	80	9x14x12	17	20	4 000	47 500 61 500	80 500 117 000	950 1 380	780 1 600	655 1 340	6.35	1.7 2.4	7.2	
SH45EM SH45GM	60	14	37.5	120	139 171	100	80	M12x1.75x15	10.5	10	105 137	12.5 28.5	46	13	Rc1/8	10	13	45	38	105	14x20x17	22.5	22.5	3 990	76 500 94 500	128 000 175 000	1 970 2 680	1 550 2 760	1 300 2 320	7.937	3.0 3.9	12.3	
SH55EM SH55GM	70	15	43.5	140	163 201	116	95	M14x2x18	12.5	12	126 164	15.5 34.5	55	15	Rc1/8	11	13	53	44	120	16x23x20	26.5	30	3 960	113 000 140 000	181 000 247 000	3 300 4 550	2 640 4 800	2 210 4 050	9.525	5.0 6.5	16.9	

Note 1: Dimensions in parentheses are for items made of stainless steel.

Note 2: External appearance of stainless steel ball slides differs from those of carbon steel ball slides.

Note 3: Basic dynamic load rating C is a load that allows for a 50-km rating fatigue life and is a vertical and constant load on the ball slide mounting surface. To convert C to C<sub>100</sub> for a 100-km fatigue life, divide C by 1.26.

### Part number for ball slide only

Example:

**SAH 25 EM S Z-K**

Random-matching ball slide  
Size  
Shape/height  
S: Stainless steel (SH15 to SH30 only)  
No code: Carbon steel (NSK standard)

Accessories  
K: With NSK K1  
F: Fluoride low-temperature chrome plating + AS2 grease  
F50: Fluoride low-temperature chrome plating + LG2 grease  
Preload  
Z: Slight preload (standard)

### Part number for rail only

Example:

**L1H 25 1000 L C N \*\*\* PC Z**

Random-matching rail  
Size  
Rail length (mm)  
Shape (L: Standard)  
Material/surface treatment  
Butting rail specification  
N: Non-butting L: Butting

Preload  
Z: Slight preload (standard)  
Accuracy: PC (only PC grade is available)  
NSK control number (\*\*\* is required when making inquiries)

### Part number for assembly (ball slide + rail)

Example:

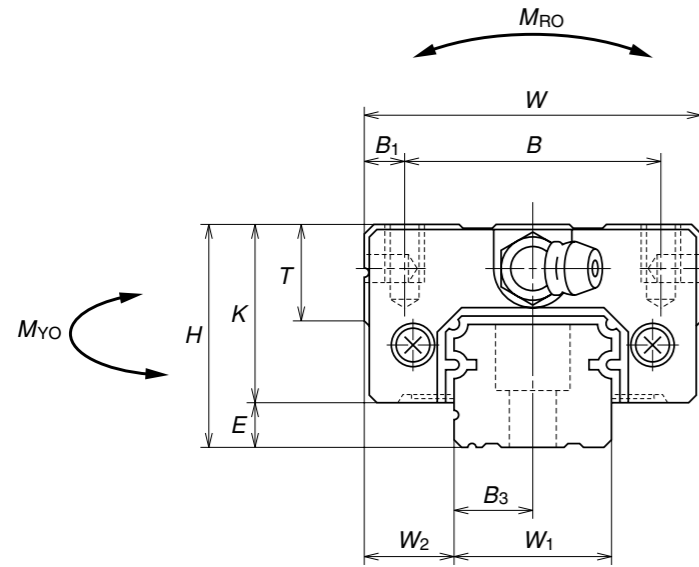
**SH 25 1000 EM C 2 \*\*\* PC Z**

Series  
Size  
Rail length (mm)  
Shape/height  
Material/surface treatment  
C: Carbon steel (NSK standard)  
K: Stainless steel  
D: Carbon steel + surface treatment  
H: Stainless steel + surface treatment

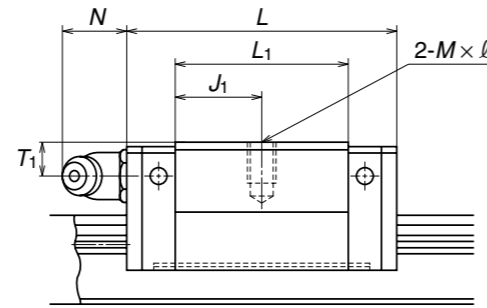
Preload Z: Slight preload (standard)  
Accuracy: PC (only PC grade is available)  
KC (with NSK K1)  
NSK control number (\*\*\* is required when making inquiries)  
Number of ball slides per rail

## Ball Slide Models: AL, CL

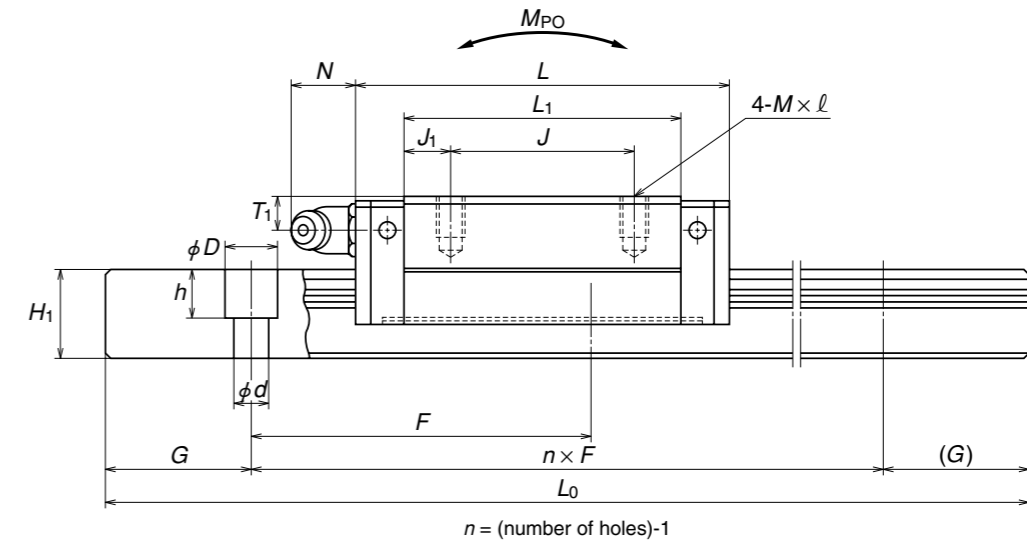
Front view of AL and CL types



Side view of CL type



Side view of AL type



Model No.	Assembly			Ball slide													Rail						Basic load rating					Ball diameter	Weight		
	Height H	E	W <sub>2</sub>	Width W	Length L	Mounting hole			B <sub>1</sub>	L <sub>1</sub>	J <sub>1</sub>	K	T	Grease fitting			Width W <sub>1</sub>	Height H <sub>1</sub>	Pitch F	Mounting bolt hole d x D x h	B <sub>3</sub>	G	Max. length (Single rail) L <sub>0max</sub> ( ) for stainless	Dynamic C (N)	Static C <sub>0</sub> (N)	Static moment			D <sub>w</sub>	Ball slide (kg)	Rail (kg/m)
						B	J	M x pitch x l						Mounting hole size	T <sub>1</sub>	N										M <sub>RO</sub> (N·m)	M <sub>PO</sub> (N·m)	M <sub>YO</sub> (N·m)			
<b>SS15CL</b> <b>SS15AL</b>	24	4.6	9.5	34	40.4 56.8	26	- 26	M4x0.7x6	4	23.6 40	11.8 7	19.4	10	phi 3	6	3	15	12.5	60	*3.5x6x4.5 4.5x7.5x5.3	7.5	20	2 000 (1 700)	4 900 7 900	7 800 15 600	39 78	21.1 73.5	17.7 61.5	2.778	0.14 0.2	1.4
<b>SS20CL</b> <b>SS20AL</b>	28	6	11	42	47.2 65.2	32	- 32	M5x0.8x7	5	30 48	15 8	22	12	M6x0.75	5.5	11	20	15.5	60	6x9.5x8.5	10	20	3 960 (3 500)	7 250 11 100	11 800 21 800	80 149	40.5 124	34 104	3.175	0.19 0.28	2.3
<b>SS25CL</b> <b>SS25AL</b>	33	7	12.5	48	59.6 81.6	35	- 35	M6x1x9	6.5	38 60	19 12.5	26	12	M6x0.75	7	11	23	18	60	7x11x9	11.5	20	3 960 (3 500)	12 700 17 900	20 800 33 500	164 266	96.5 242	81 203	3.968	0.34 0.51	3.1
<b>SS30CL</b> <b>SS30AL</b>	42	9	16	60	67.4 96.4	40	- 40	M8x1.25x12	10	42 71	21 15.5	33	13	M6x0.75	8	11	28	23	80	7x11x9	14	20	4 000 (3 500)	18 700 27 300	29 600 50 500	282 480	153 415	128 350	4.762	0.58 0.85	4.8
<b>SS35CL</b> <b>SS35AL</b>	48	10.5	18	70	77 108	50	- 50	M8x1.25x12	10	49 80	24.5 15	37.5	14	M6x0.75	8.5	11	34	27.5	80	9x14x12	17	20	4 000 (3 500)	26 000 38 000	40 000 68 500	465 800	234 620	196 520	5.556	0.86 1.3	7

Note 1: External appearance of stainless steel ball slides differs from those of carbon steel ball slides.

Note 2: Basic dynamic load rating C is a load that allows for a 50-km rating fatigue life and is a vertical and constant load on the ball slide mounting surface.

To convert C to C<sub>100</sub> for a 100-km fatigue life, divide C by 1.26.

\*Standard mounting hole of SS15 rail is for M3 bolts (Hole size: 3.5x6x4.5).

If you require mounting hole for M4 bolts (Hole size: 4.5x7.5x5.3), please specify when ordering.

Part number for ball slide only

Example:

**SAS 25 AL S Z-K**

Random-matching ball slide

Size  
Shape/height

S: Stainless steel (SS15 to SS35 only)  
No code: Carbon steel (NSK standard)

Accessories  
K: With NSK K1  
F: Fluoride low-temperature chrome plating + AS2 grease  
F50: Fluoride low-temperature chrome plating + LG2 grease

Preload  
Z: Slight preload (standard)

Part number for rail only

Example:

**L1S 25 1000 L C N \*\*\* PC Z**

Random-matching rail

Size  
Rail length (mm)

Shape

(L: Standard, LS15 mounting hole for M3 specification  
T: LS15 mounting hole for M4 specification)

Material/surface treatment

Preload  
Z: Slight preload (standard)

Accuracy: PC (only PC grade is available)

NSK control number (\*\*\*) is required when making inquiries)

Butting rail specification  
N: Non-butting L: Butting

Part number for assembly (ball slide + rail)

Example:

**SS 25 1000 AL C 2 \*\*\* PC Z**

Series  
Size  
Rail length (mm)  
Shape/height

Material/surface treatment  
C: Carbon steel (NSK standard)  
K: Stainless steel  
D: Carbon steel + surface treatment  
H: Stainless steel + surface treatment

Preload Z: Slight preload (standard)

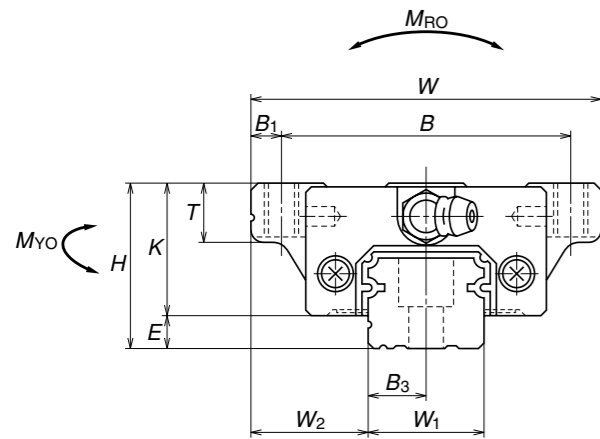
Accuracy: PC (only PC grade is available)  
KC (with NSK K1)

NSK control number (\*\*\*) is required when making inquiries)

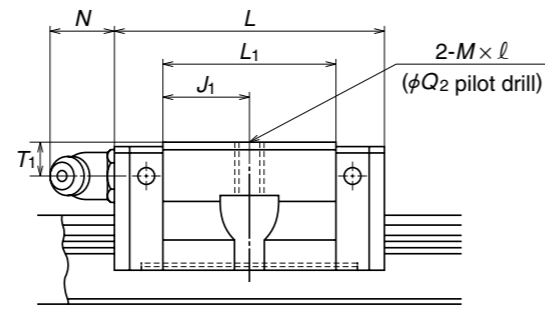
Number of ball slides per rail

## Ball Slide Models: JM, EM

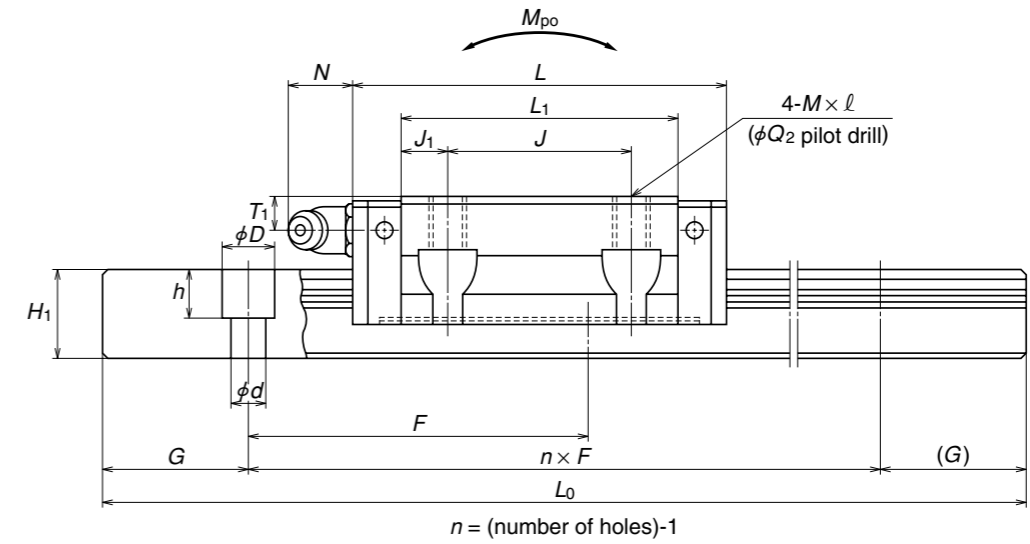
Front view of JM and EM types



Side view of JM type



Side view of EM type

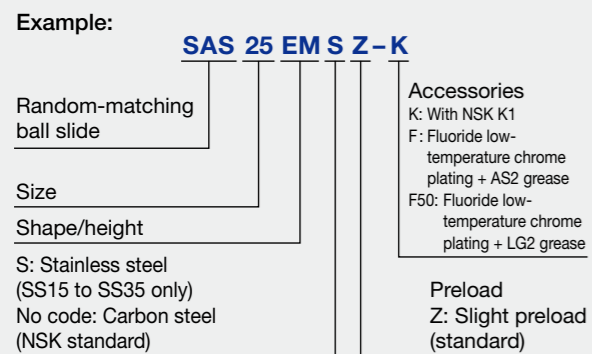


Model No.	Assembly			Ball slide													Rail						Basic load rating					Ball diameter	Weight				
	Height H	E	W <sub>2</sub>	Width W	Length L	Mounting hole				Q <sub>2</sub>	B <sub>1</sub>	L <sub>1</sub>	J <sub>1</sub>	K	T	Grease fitting			Width W <sub>1</sub>	Height H <sub>1</sub>	Pitch F	Mounting bolt hole d x D x h	B <sub>3</sub>	G	Max. length (Single rail) L <sub>0max</sub> ( ) for stainless	Dynamic C (N)	Static C <sub>0</sub> (N)	Static moment			D <sub>w</sub>	Ball slide (kg)	Rail (kg/m)
						M x pitch x l	Q <sub>2</sub>	Mounting hole size	T <sub>1</sub>							N	M <sub>RO</sub> (N·m)	M <sub>PO</sub> (N·m)										M <sub>YO</sub> (N·m)					
<b>SS15JM</b> <b>SS15EM</b>	24	4.6	18.5	52	40.4 56.8	41	- 26	M5×0.8×7	4.4	5.5	23.6 40	11.8 7	19.4	8	phi3	6	3	15	12.5	60	*3.5×6×4.5 4.5×7.5×5.3	7.5	20	2 000 (1 700)	4 900 7 900	7 800 15 600	39 78	21.1 73.5	17.7 61.5	2.778	0.17 0.26	1.4	
<b>SS20JM</b> <b>SS20EM</b>	28	6	19.5	59	47.2 65.2	49	- 32	M6×1×9 (M6×1×9.5)	5.3	5	30 48	15 8	22	10	M6×0.75	5.5	11	20	15.5	60	6×9.5×8.5	10	20	3 960 (3 500)	7 250 11 100	11 800 21 800	80 149	40.5 124	34 104	3.175	0.24 0.35	2.3	
<b>SS25JM</b> <b>SS25EM</b>	33	7	25	73	59.6 81.6	60	- 35	M8×1.25×10 (M8×1.25×11.5)	6.8	6.5	38 60	19 12.5	26	11 (12)	M6×0.75	7	11	23	18	60	7×11×9	11.5	20	3 960 (3 500)	12 700 17 900	20 800 33 500	164 266	96.5 242	81 203	3.968	0.44 0.66	3.1	
<b>SS30JM</b> <b>SS30EM</b>	42	9	31	90	67.4 96.4	72	- 40	M10×1.5×12 (M10×1.5×14.5)	8.6	9	42 71	21 15.5	33	11 (15)	M6×0.75	8	11	28	23	80	7×11×9	14	20	4 000 (3 500)	18 700 27 300	29 600 50 500	282 480	153 415	128 350	4.762	0.76 1.2	4.8	
<b>SS35JM</b> <b>SS35EM</b>	48	10.5	33	100	77 108	48	- 50	M10×1.5×13 (M10×1.5×14.5)	8.6	9	49 80	24.5 15	37.5	12 (15)	M6×0.75	8.5	11	34	27.5	80	9×14×12	17	20	4 000 (3 500)	26 000 38 000	40 000 68 500	465 800	234 620	196 520	5.556	1.2 1.7	7	

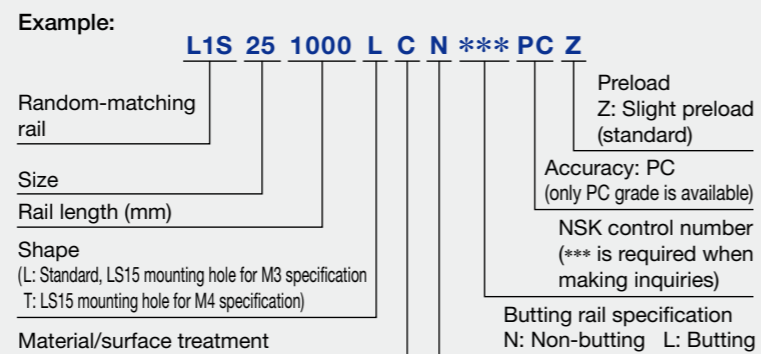
Note 1: Dimensions in parentheses are for items made of stainless steel.  
Note 2: External appearance of stainless steel ball slides differs from those of carbon steel ball slides.

Note 3: Basic dynamic load rating C is a load that allows for a 50-km rating fatigue life and is a vertical and constant load on the ball slide mounting surface.  
To convert C to C<sub>100</sub> for a 100-km fatigue life, divide C by 1.26.  
\*Standard mounting hole of SS15 rail is for M3 bolts (Hole size: 3.5×6×4.5).  
If you require mounting hole for M4 bolts (Hole size: 4.5×7.5×5.3), please specify when ordering.

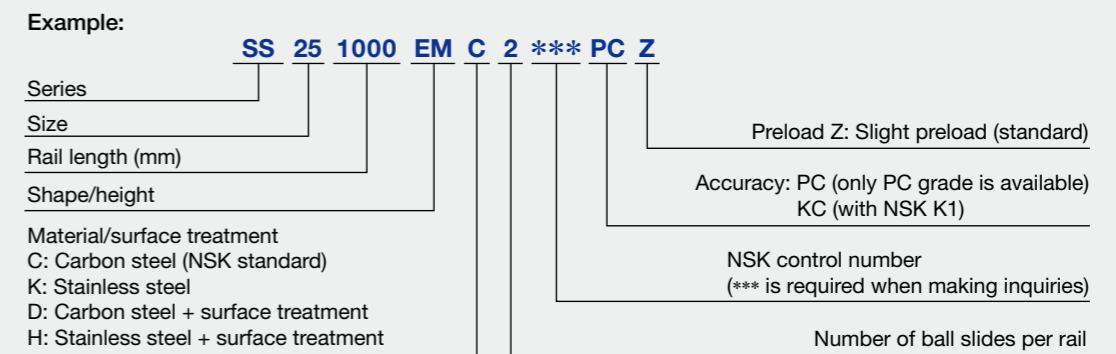
Part number for ball slide only



Part number for rail only



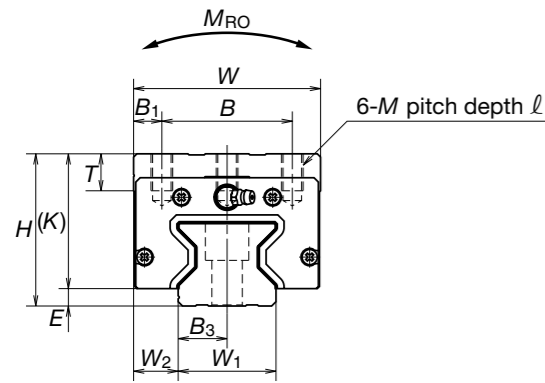
Part number for assembly (ball slide + rail)



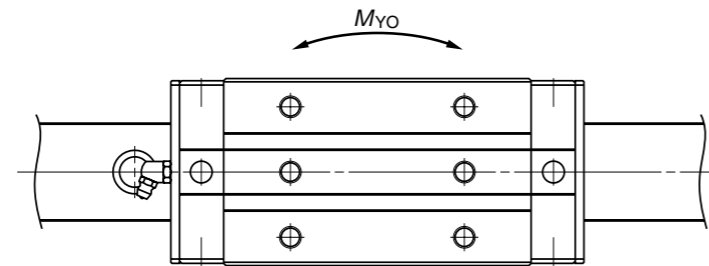


## Roller Slide Models: AN, BN

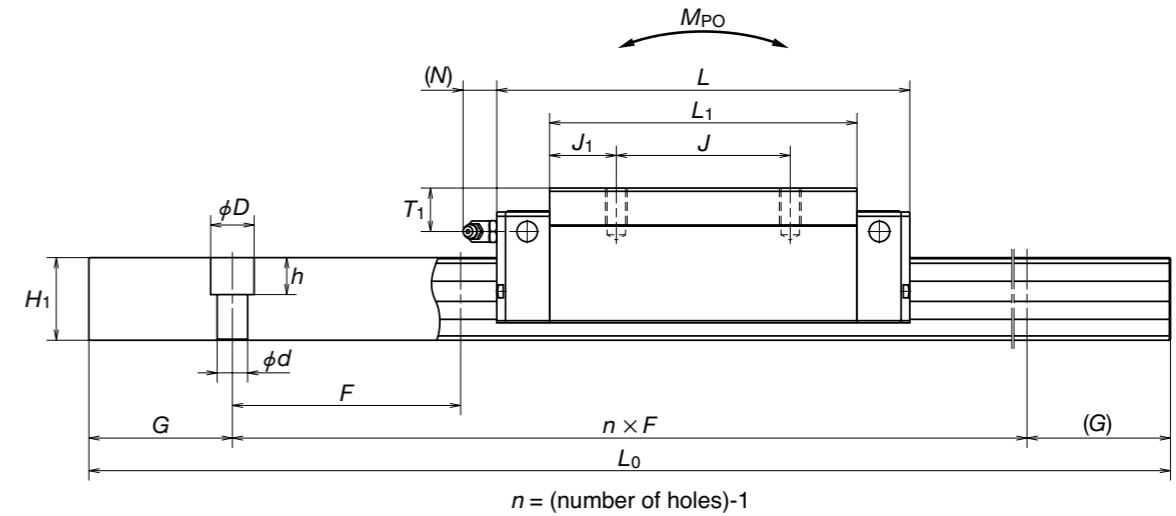
Front view of AN and BN types



Upper view of AN and BN types



Side view of AN and BN types



Unit: mm

Model No.	Assembly			Roller slide													Rail					Basic load rating					Weight				
	Height H	E	W <sub>2</sub>	Width W	Length L	Mounting hole			B <sub>1</sub>	L <sub>1</sub>	J <sub>1</sub>	K	T	Grease fitting			Width W <sub>1</sub>	Height H <sub>1</sub>	Pitch F	Mounting bolt hole d × D × h	B <sub>3</sub>	G	Max. length (Single rail) L <sub>0max</sub>	Dynamic C (N)	Static C <sub>0</sub> (N)	Static moment			Roller slide (kg)	Rail (kg/m)	
						B	J	M × pitch × l						Mounting hole size	T <sub>1</sub>	N										M <sub>RO</sub> (N·m)	M <sub>PO</sub> (N·m)	M <sub>VO</sub> (N·m)			
RA25AN RA25BN	40	5	12.5	48	97.5 115.5	35	35 50	M6×1×9	6.5	65.5 83.5	15.25 16.75	35	12	M6×0.75	10	11		23	24	30	7×11×9	11.5	20	3 000	29 200 35 400	72 700 92 900	970 1 240	760 1 240	760 1 240	0.60 0.91	3.4
RA30AN RA30BN	45	6.5	16	60	110.8 135.4	40	40 60	M8×1.25×11	10	74 98.6	17 19.3	38.5	14	M6×0.75	10	11		28	28	40	9×14×12	14	20	3 500	38 900 47 600	93 500 121 000	1 670 2 170	1 140 1 950	1 140 1 950	1.0 1.3	4.9
RA35AN RA35BN	55	6.5	18	70	123.8 152	50	50 72	M8×1.25×12	10	83.2 111.4	16.6 19.7	48.5	15	M6×0.75	15	11		34	31	40	9×14×12	17	20	3 500	53 300 67 400	129 000 175 000	2 810 3 810	1 800 3 250	1 800 3 250	1.6 2.1	6.8
RA45AN RA45BN	70	8	20.5	86	154 190	60	60 80	M10×1.5×17	13	105.4 141.4	22.7 30.7	62	17	Rc1/8	14	14		45	38	52.5	14×20×17	22.5	22.5	3 500	92 800 116 000	229 000 305 000	6 180 8 240	4 080 7 150	4 080 7 150	3.0 4.1	10.9
RA55AN RA55BN	80	9	23.5	100	184 234	75	75 95	M12×1.75×18	12.5	128 178	26.5 41.5	71	18	Rc1/8	21	14		53	43.5	60	16×23×20	26.5	30	3 500	129 000 168 000	330 000 462 000	10 200 14 300	7 060 13 600	7 060 13 600	4.9 6.7	14.6
RA65AN RA65BN	90	13	31.5	126	228.4 302.5	76	70 120	M16×2×20	25	155.4 229.5	42.7 54.75	77	22	Rc1/8	19	14		63	55	75	18×26×22	31.5	35	3 500	210 000 288 000	504 000 756 000	19 200 28 700	12 700 28 600	12 700 28 600	9.3 12.2	22.0

Note: Basic load rating complies with ISO standards (ISO14728-1, ISO14728-2).  
If above basic dynamic load rating (100-km rating) is converted into 50-km rating, use the following formula: C<sub>50km</sub> = 1.23 × C<sub>100km</sub>.

Part number for roller slide only

Example:

**RAA 25 AN P6 Z**

Random-matching roller slide

Size

Shape/height

Preload  
Z: Medium preload (standard)

Accuracy:  
P6 (only P6 grade is available)  
K6 (with NSK K1)

Part number for rail only

Example:

**R1A 25 1000 L C N \*\*\* P6 Z**

Random-matching rail

Size  
Rail length (mm)

Shape (L: Standard)

Material/surface treatment

Preload  
Z: Medium preload (standard)

Accuracy: P6 (only P6 grade is available)  
NSK control number (\*\* is required when making inquiries)

Butting specification  
N: Non-butting L: Butting

Part number for assembly (roller slide + rail)

Example:

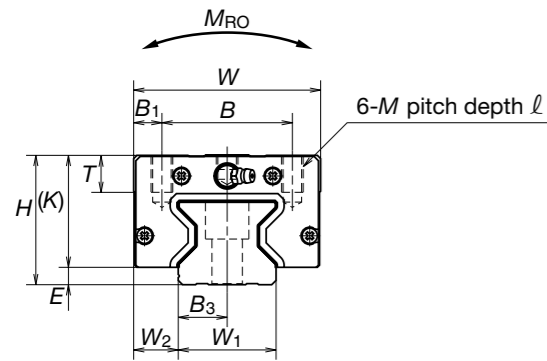
**RA 25 1000 AN C 2 \*\*\* P6 Z**

Series  
Size  
Rail length (mm)  
Shape/height  
Material/surface treatment  
C: Carbon steel (NSK standard)  
D: Carbon steel + surface treatment  
Number of roller slides per rail

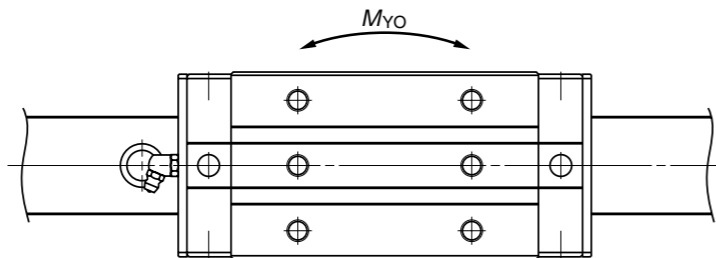
Preload Z: Medium preload (standard)  
Accuracy: P6 (only P6 grade is available)  
K6 (with NSK K1)  
NSK control number (\*\* is required when making inquiries)

## Roller Slide Models: AL, BL

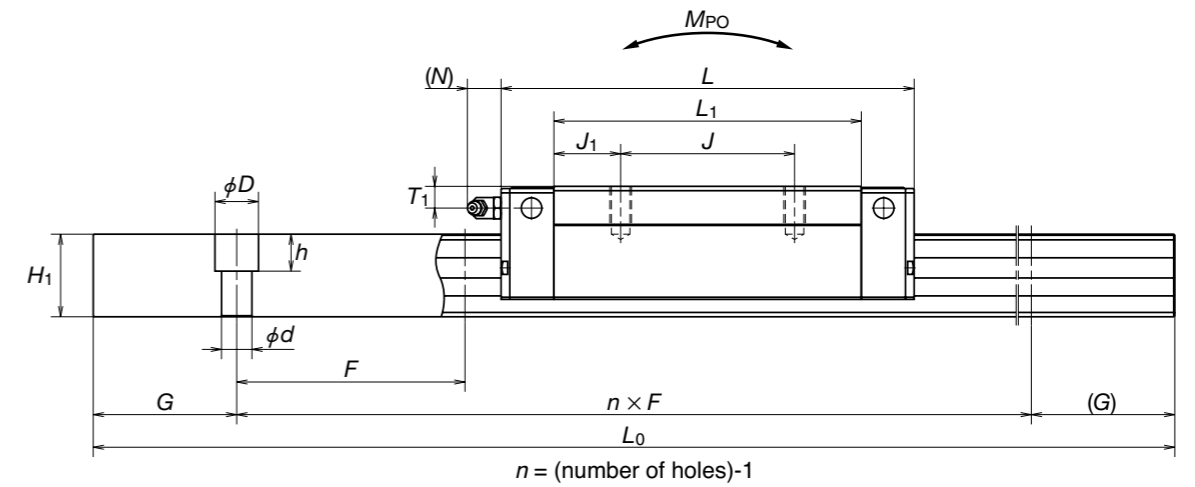
Front view of AL and BL types



Upper view of AL and BL types



Side view of AL and BL types



Unit: mm

Model No.	Assembly			Roller slide													Rail					Basic load rating					Weight				
	Height H	E	W <sub>2</sub>	Width W	Length L	Mounting hole			B <sub>1</sub>	L <sub>1</sub>	J <sub>1</sub>	K	T	Grease fitting			Width W <sub>1</sub>	Height H <sub>1</sub>	Pitch F	Mounting bolt hole d × D × h	B <sub>3</sub>	G	Max. length (Single rail) L <sub>0max</sub>	Dynamic C (N)	Static C <sub>0</sub> (N)	Static moment			Roller slide (kg)	Rail (kg/m)	
						B	J	M × pitch × l						Mounting hole size	T <sub>1</sub>	N										M <sub>RO</sub> (N·m)	M <sub>PO</sub> (N·m)	M <sub>YO</sub> (N·m)			
RA25AL RA25BL	36	5	12.5	48	97.5 115.5	35	35 50	M6×1×8	6.5	65.5 83.5	15.25 16.75	31	12	M6×0.75	6	11		23	24	30	7×11×9	11.5	20	3 000	29 200 35 400	72 700 92 900	970 1 240	760 1 240	760 1 240	0.45 0.80	3.4
RA30AL RA30BL	42	6.5	16	60	110.8 135.4	40	40 60	M8×1.25×11	10	74 98.6	17 19.3	35.5	14	M6×0.75	7	11		28	28	40	9×14×12	14	20	3 500	38 900 47 600	93 500 121 000	1 670 2 170	1 140 1 950	1 140 1 950	0.85 1.1	4.9
RA35AL RA35BL	48	6.5	18	70	123.8 152	50	50 72	M8×1.25×12	10	83.2 111.4	16.6 19.7	41.5	15	M6×0.75	8	11		34	31	40	9×14×12	17	20	3 500	53 300 67 400	129 000 175 000	2 810 3 810	1 800 3 250	1 800 3 250	1.2 1.7	6.8
RA45AL RA45BL	60	8	20.5	86	154 190	60	60 80	M10×1.5×16	13	105.4 141.4	22.7 30.7	52	17	Rc1/8	10	14		45	38	52.5	14×20×17	22.5	22.5	3 500	92 800 116 000	229 000 305 000	6 180 8 240	4 080 7 150	4 080 7 150	2.5 3.4	10.9
RA55AL RA55BL	70	9	23.5	100	184 234	75	75 95	M12×1.75×18	12.5	128 178	26.5 41.5	61	18	Rc1/8	11	14		53	43.5	60	16×23×20	26.5	30	3 500	129 000 168 000	330 000 462 000	10 200 14 300	7 060 13 600	7 060 13 600	4.1 5.7	14.6

Note: Basic load rating complies with ISO standards (ISO14728-1, ISO14728-2).  
If above basic dynamic load rating (100-km rating) is converted into 50-km rating, use the following formula: C<sub>50 km</sub> = 1.23 × C<sub>100 km</sub>.

Part number for roller slide only

Example:

**RAA 25 AL P6 Z**

Random-matching roller slide

Size

Shape/height

Preload  
Z: Medium preload (standard)

Accuracy:  
P6 (only P6 grade is available)  
K6 (with NSK K1)

Part number for rail only

Example:

**R1A 25 1000 L C N \*\*\* P6 Z**

Random-matching rail

Size  
Rail length (mm)

Shape (L: Standard)

Material/surface treatment

Preload  
Z: Medium preload (standard)

Accuracy: P6 (only P6 grade is available)  
NSK control number (\*\* is required when making inquiries)

Butting specification  
N: Non-butting L: Butting

Part number for assembly (roller slide + rail)

Example:

**RA 25 1000 AL C 2 \*\*\* P6 Z**

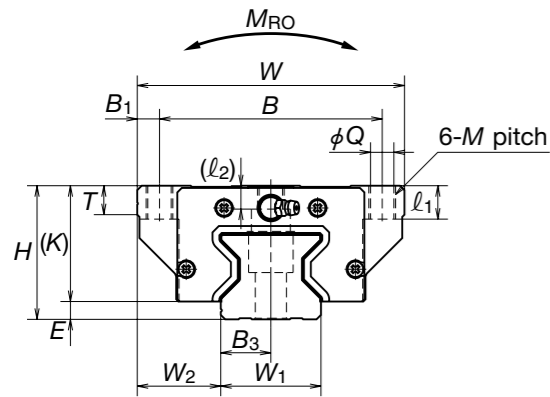
Series  
Size  
Rail length (mm)  
Shape/height  
Material/surface treatment  
C: Carbon steel (NSK standard)  
D: Carbon steel + surface treatment  
Number of roller slides per rail

Preload Z: Medium preload (standard)  
Accuracy: P6 (only P6 grade is available)  
K6 (with NSK K1)

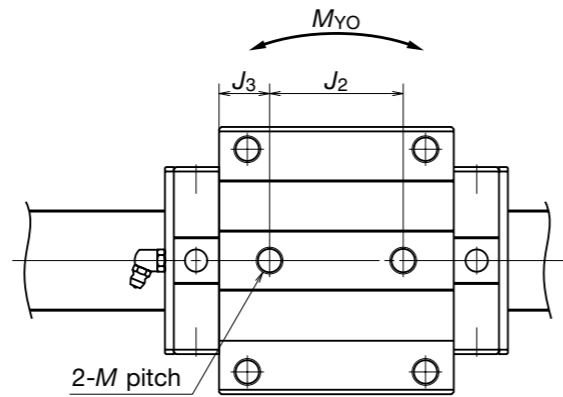
NSK control number (\*\* is required when making inquiries)

## Roller Slide Models: EM, GM

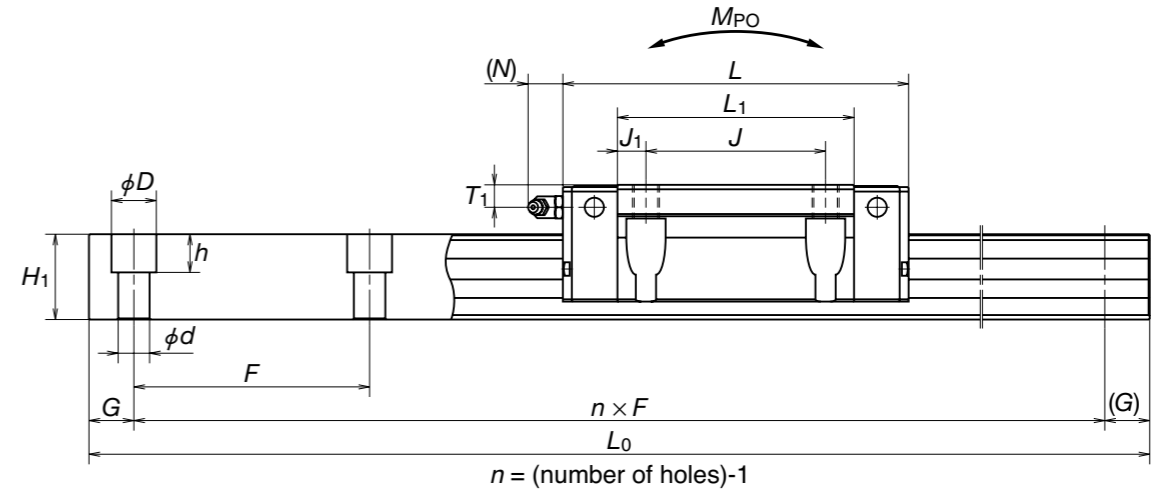
Front view of EM and GM types



Upper view of EM and GM types



Side view of EM and GM types

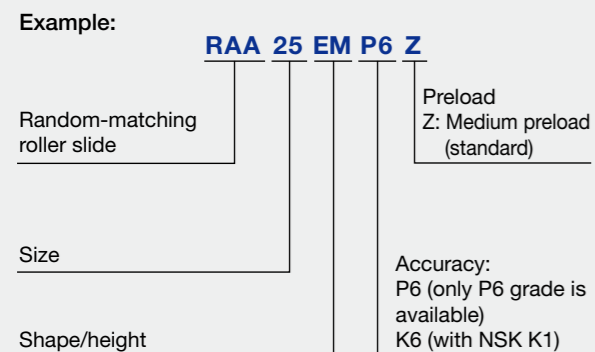


Unit: mm

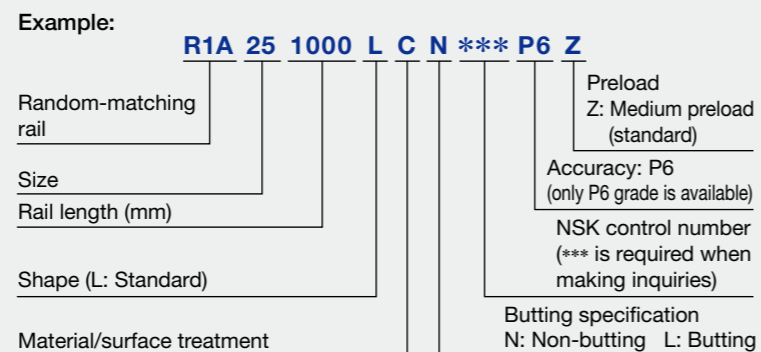
Model No.	Assembly			Roller slide													Rail					Basic load rating					Weight						
	Height H	E	W <sub>2</sub>	Width W	Length L	Mounting hole						Grease fitting							Width W <sub>1</sub>	Height H <sub>1</sub>	Pitch F	Mounting bolt hole d × D × h	B <sub>3</sub>	G	Max. length (Single rail) L <sub>0max</sub>	Dynamic C (N)	Static C <sub>0</sub> (N)	Static moment			Roller slide (kg)	Rail (kg/m)	
						B	J	J <sub>2</sub>	M × pitch × l <sub>1</sub> (l <sub>2</sub> )	Q × l <sub>1</sub> (l <sub>2</sub> )	B <sub>1</sub>	L <sub>1</sub>	J <sub>1</sub>	J <sub>3</sub>	K	T	Mounting hole size	T <sub>1</sub>										N	M <sub>RO</sub> (N·m)	M <sub>PO</sub> (N·m)			M <sub>YO</sub> (N·m)
<b>RA25EM</b> <b>RA25GM</b>	36	5	23.5	70	97.5 115.5	57	45	40	M8×1.25×10 (11)	6.8×10 (11)	6.5	65.5 83.5	10.25 19.25	12.75 21.75	31	11	M6×0.75	6	11	23	24	30	7×11×9	11.5	20	3 000	29 200 35 400	72 700 92 900	970 1 240	760 1 240	760 1 240	0.80 1.1	3.4
<b>RA30EM</b> <b>RA30GM</b>	42	6.5	31	90	110.8 135.4	72	52	44	M10×1.5×12 (12.5)	8.6×12 (12.5)	9	74 98.6	11 23.3	15 27.3	35.5	11	M6×0.75	7	11	28	28	40	9×14×12	14	20	3 500	38 900 47 600	93 500 121 000	1 670 2 170	1 140 1 950	1 140 1 950	1.3 1.7	4.9
<b>RA35EM</b> <b>RA35GM</b>	48	6.5	33	100	123.8 152	82	62	52	M10×1.5×13 (7)	8.6×13 (7)	9	83.2 111.4	10.6 24.7	15.6 29.7	41.5	12	M6×0.75	8	11	34	31	40	9×14×12	17	20	3 500	53 300 67 400	129 000 175 000	2 810 3 810	1 800 3 250	1 800 3 250	1.7 2.3	6.8
<b>RA45EM</b> <b>RA45GM</b>	60	8	37.5	120	154 190	100	80	60	M12×1.75×15 (10.5)	10.5×15 (10.5)	10	105.4 141.4	12.7 30.7	22.7 40.7	52	13	Rc1/8	10	14	45	38	52.5	14×20×17	22.5	22.5	3 500	92 800 116 000	229 000 305 000	6 180 8 240	4 080 7 150	4 080 7 150	3.2 4.3	10.9
<b>RA55EM</b> <b>RA55GM</b>	70	9	43.5	140	184 234	116	95	70	M14×2×18 (13)	12.5×18 (13)	12	128 178	16.5 41.5	29 54	61	15	Rc1/8	11	14	53	43.5	60	16×23×20	26.5	30	3 500	129 000 168 000	330 000 462 000	10 200 14 300	7 060 13 600	7 060 13 600	5.4 7.5	14.6
<b>RA65EM</b> <b>RA65GM</b>	90	13	53.5	170	228.4 302.5	142	110	82	M16×2×24 (18.5)	14.6×24 (18.5)	14	155.4 229.5	22.7 59.75	36.7 73.75	77	22	Rc1/8	19	14	63	55	75	18×26×22	31.5	35	3 500	210 000 288 000	504 000 756 000	19 200 28 700	12 700 28 600	12 700 28 600	12.2 16.5	22.0

Note: Basic load rating complies with ISO standards (ISO14728-1, ISO14728-2).  
If above basic dynamic load rating (100-km rating) is converted into 50-km rating, use the following formula: C<sub>50 km</sub> = 1.23 × C<sub>100 km</sub>.

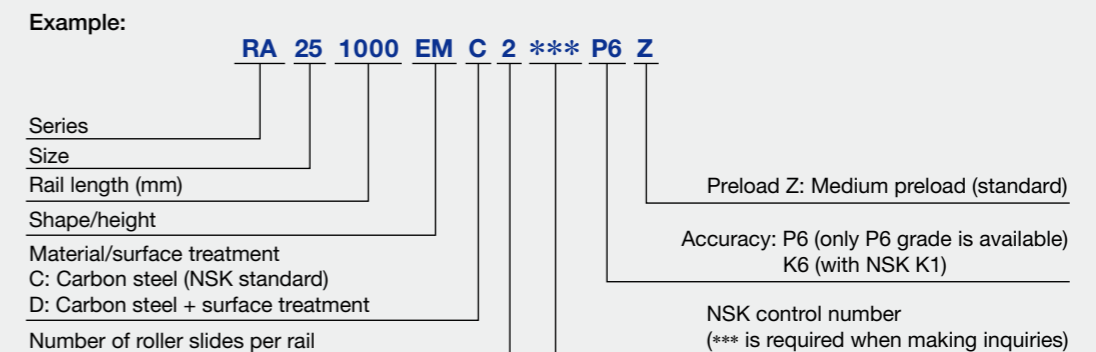
Part number for roller slide only



Part number for rail only

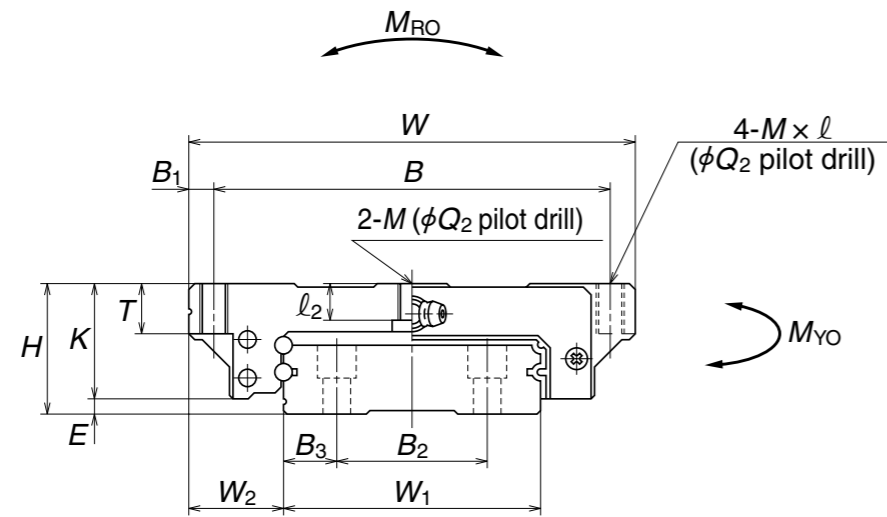


Part number for assembly (roller slide + rail)

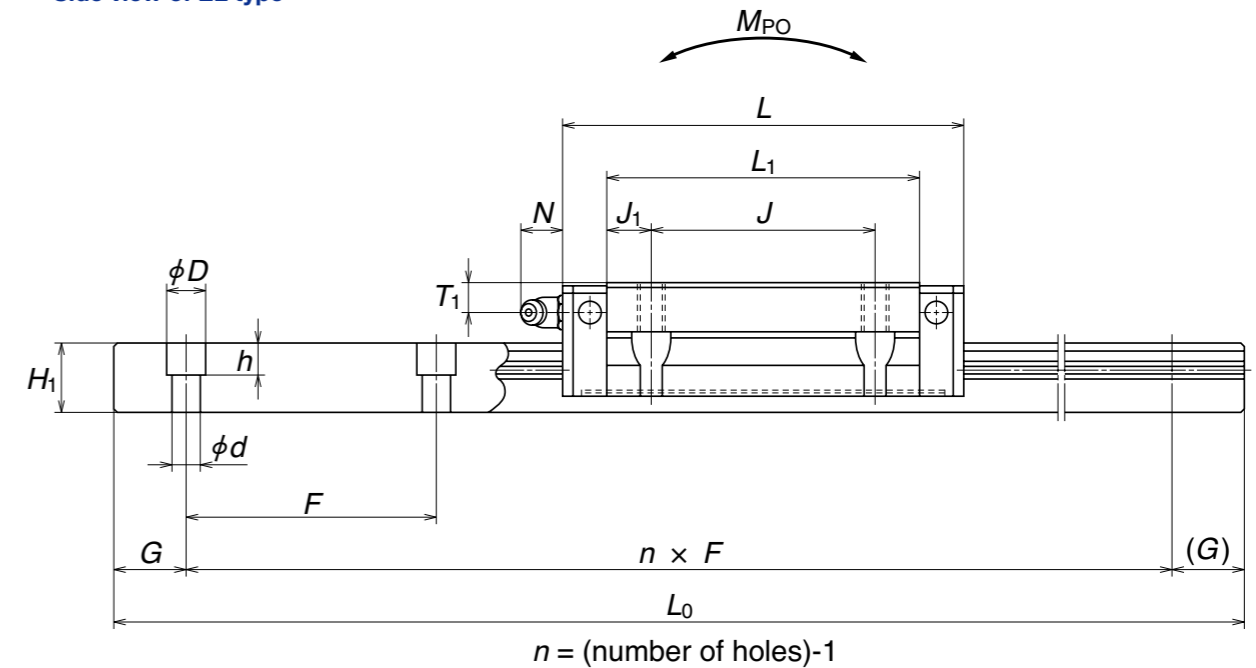


## Ball Slide Model: EL

Front view of EL type



Side view of EL type



Unit: mm

Model No.	Assembly			Ball slide														Rail							Basic load rating					Ball diameter	Weight			
	Height H	E	W <sub>2</sub>	Width W	Length L	Mounting hole										Grease fitting				Width W <sub>1</sub>	Height H <sub>1</sub>	Pitch B <sub>2</sub>	Mounting bolt hole d x D x h	G (recommended)	Max. length (Single rail) L <sub>0max</sub>	Dynamic C (N)	Static C <sub>0</sub> (N)	Static moment			D <sub>w</sub>	Ball slide (kg)	Rail (kg/m)	
						B	J	M x pitch x l	l <sub>2</sub>	Q <sub>2</sub>	B <sub>1</sub>	L <sub>1</sub>	J <sub>1</sub>	K	T	Hole size	T <sub>1</sub>	N	M <sub>RO</sub> (N·m)									M <sub>PO</sub> (N·m)	M <sub>YO</sub> (N·m)					
<b>LW17EL</b>	17	2.5	13.5	60	51.4	53	26	M4×0.7×6	3.2	3.3	3.5	35	4.5	14.5	6	φ3	4	3	33	8.7	18	40	4.5×7.5×5.3	7.5	15	1 000	5 600	11 300	135	44	37	2.381	0.2	2.1
<b>LW21EL</b>	21	3	15.5	68	58.8	60	29	M5×0.8×8	3.7	4.4	4	41	6	18	8	M6×0.75	4.5	11	37	10.5	22	50	4.5×7.5×5.3	7.5	15	1 600	6 450	13 900	185	65.5	55	2.381	0.3	2.9
<b>LW27EL</b>	27	4	19	80	74	70	40	M6×1×10	6	5.3	5	56	8	23	10	M6×0.75	6	11	42	15	24	60	4.5×7.5×5.3	9	20	2 000	12 800	26 900	400	171	143	3.175	0.5	4.7
<b>LW35EL</b>	35	4	25.5	120	108	107	60	M8×1.25×14	9	6.8	6.5	84	12	31	14	M6×0.75	8	11	69	19	40	80	7×11×9	14.5	20	2 400	33 000	66 500	1 690	645	545	4.762	1.5	9.6
<b>LW50EL</b>	50	4.5	36	162	140.6	144	80	M10×1.5×18	14	8.6	9	108	14	45.5	18	Rc1/8	14	14	90	24	60	80	9×14×12	15	20	3 000	61 500	117 000	3 900	1 530	1 280	6.350	4.0	15.8

Note: Basic dynamic load rating C is a load that allows for a 50-km rating fatigue life and is a vertical and constant load on the ball slide mounting surface.  
To convert C to C<sub>100</sub> for a 100-km fatigue life, divide C by 1.26.

### Part number for ball slide only

Example:

**LAW 17 EL Z - K**

Random-matching ball slide

Size

Shape/height

Accessories  
K: With NSK K1  
F: Fluoride low-temperature chrome plating + AS2 grease  
F50: Fluoride low-temperature chrome plating + LG2 grease

Preload  
Z: Slight preload (standard)

### Part number for rail only

Example:

**L1W 17 0950 L C N \*\*\* PC Z**

Random-matching rail

Size

Rail length (mm)

Shape (L: Standard)

Material/surface treatment

\*Butting rail specification  
N: Non-butting L: Butting

Preload  
Z: Slight preload (standard)

Accuracy: PC  
(only PC grade is available)

NSK control number  
(\*\*\* is required when making inquiries)

### Part number for assembly (ball slide + rail)

Example:

**LW 35 1000 EL C 2 \*\*\* PC Z**

Series

Size

Rail length (mm)

Shape/height

Material/surface treatment

Number of ball slides per rail

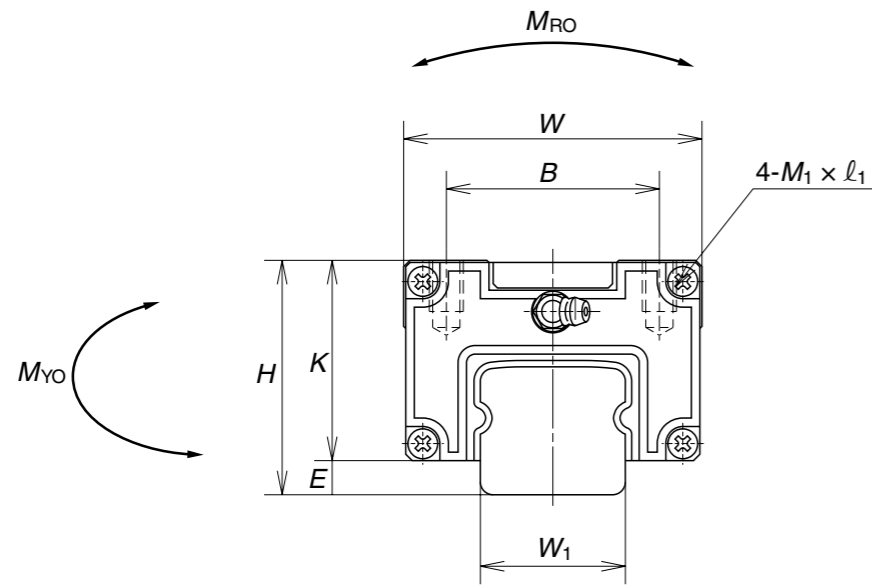
Preload Z: Slight preload (standard)

Accuracy: PC (only PC grade is available)  
KC (with NSK K1)

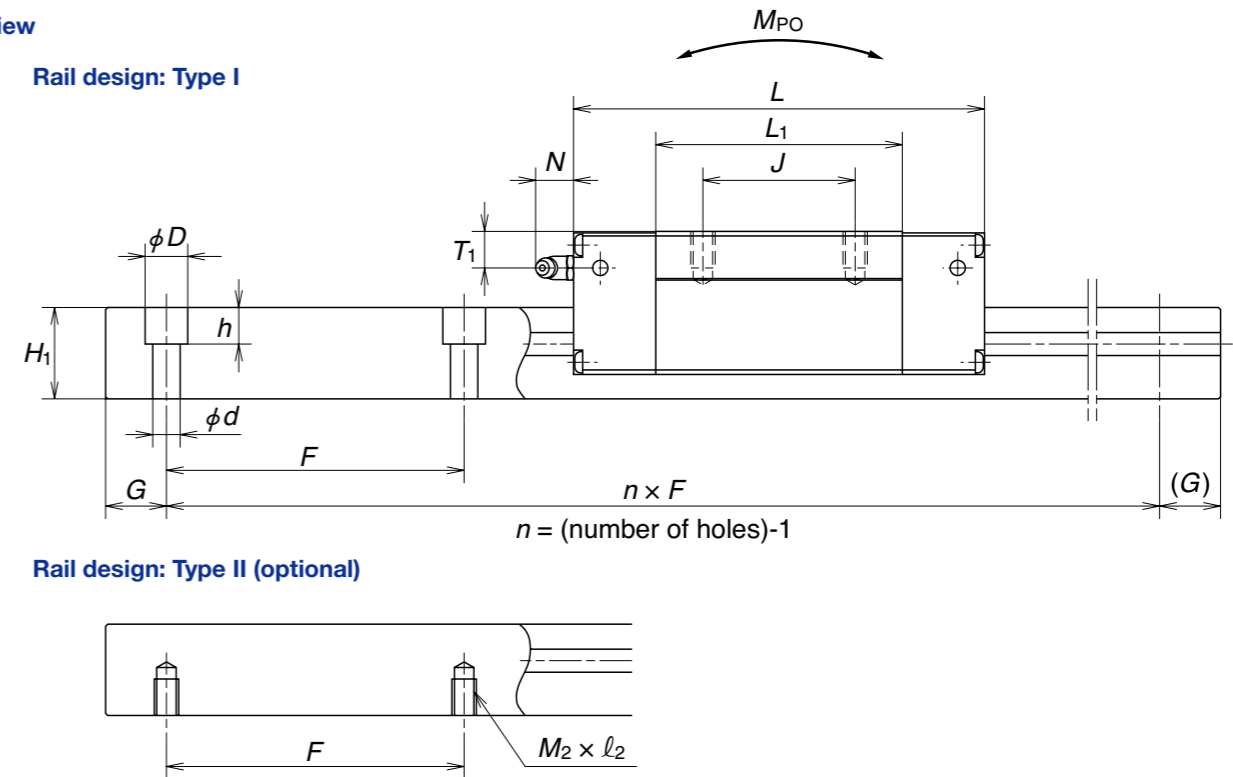
NSK control number  
(\*\*\* is required when making inquiries)

## Ball Slide Model: AN

Front view



Side view



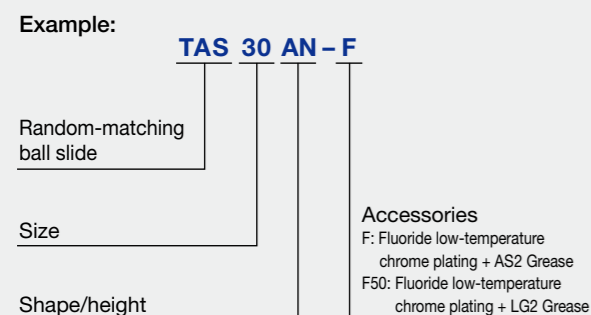
Unit: mm

Model No.	Assembly		Ball slide										Rail					Basic load rating					Ball diameter	Mass			
	Height <i>H</i> <sup>+0.1</sup>	<i>E</i>	Width <i>W</i>	Length <i>L</i>	Tapped hole					Grease fitting			Width <i>W</i> <sub>1</sub>	Height <i>H</i> <sub>1</sub>	Pitch <i>F</i>	Mounting hole		<i>G</i> (recomm- ended)	Max. length (Single rail) <i>L</i> <sub>0max</sub>	Dynamic <i>C</i> (N)	Static <i>C</i> <sub>0</sub> (N)	Allowable static moment load			<i>D</i> <sub>w</sub>	Ball slide (kg)	Rail (kg/m)
					<i>B</i>	<i>J</i>	<i>M</i> <sub>1</sub> × pitch × <i>l</i> <sub>1</sub>	<i>L</i> <sub>1</sub>	<i>K</i>	Screw size	<i>T</i> <sub>1</sub>	<i>N</i>				Type I <i>d</i> × <i>D</i> × <i>h</i>	Type II <i>M</i> <sub>2</sub> × pitch × <i>l</i> <sub>2</sub>					<i>M</i> <sub>RO</sub> (N·m)	<i>M</i> <sub>PO</sub> (N·m)	<i>M</i> <sub>YO</sub> (N·m)			
<b>TS15AN</b>	28	3	34	72.2	26	26	M4×0.7×6	39	25	φ3	6.5	(5)	15	14	120	4.5×7.5×5.3	M4×0.7×6	20	1 960	9 800	11 800	92	64	64	3.968	0.21	1.5
<b>TS20AN</b>	30	3	44	87	32	36	M5×0.8×8	50	27	M6 × 0.75	6.5	(14)	20	15	120	6×9.5×8.5	M5×0.8×8	20	2 920	15 700	19 100	196	137	137	4.762	0.37	2.1
<b>TS25AN</b>	40	4	48	100	35	35	M6×1×9	58	36	M6 × 0.75	9.5	(14)	23	20	120	7×11×9	M6×1×9	20	4 000	21 800	26 000	320	217	217	5.556	0.47	3.4
<b>TS30AN</b>	45	6.5	60	115	40	40	M8×1.25×10	70	38.5	M6 × 0.75	9.5	(14)	28	25	160	9×14×12	M8×1.25×12	20	4 040*	31 000	37 500	565	395	395	6.350	0.77	5.3
<b>TS35AN</b>	55	8	70	135.8	50	50	M8×1.25×12	81.8	47	M6 × 0.75	12	(14)	34	30	160	9 × 14 × 12	M8×1.25×12	20	4 040*	46 500	53 000	970	635	635	7.937	1.3	7.7

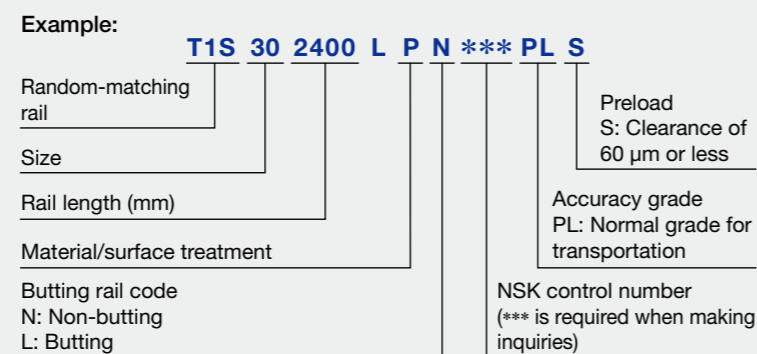
Note 1: TS series does not have a ball retainer. Be aware that balls fall out when the ball slide is withdrawn from the rail.  
Note 2: Consult with NSK when using a TS series in a single rail configuration.

Note 3: Basic dynamic load rating *C* is a load that allows for a 50-km rating fatigue life and is a vertical and constant load on the ball slide mounting surface. To convert *C* to *C*<sub>100</sub> for a 100-km fatigue life, divide *C* by 1.26.  
\*Maximum length of fluoride low-temperature chrome plated products is 4 000 (G=80).

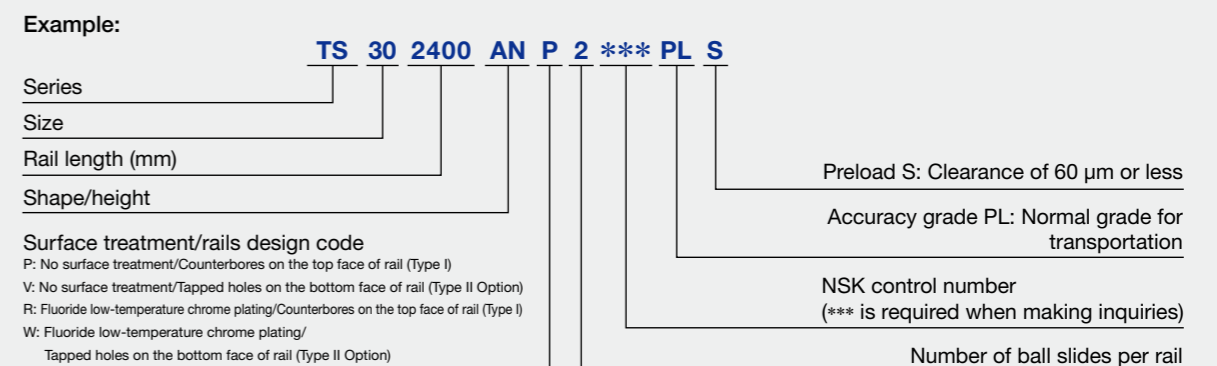
### Part number for ball slide only



### Part number for rail only

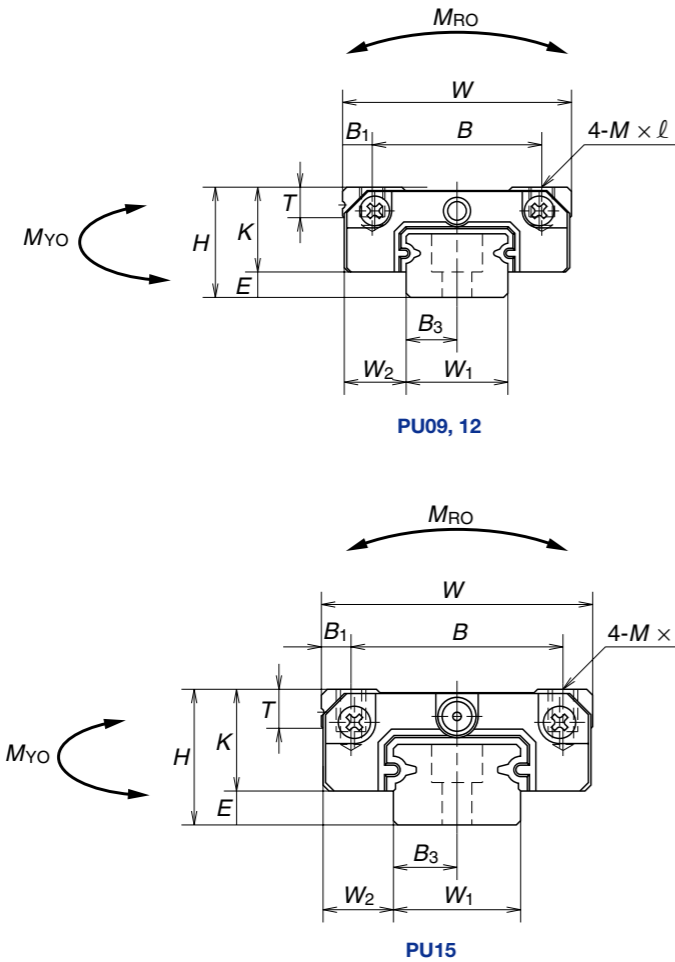


### Part number for assembly (ball slide + rail)

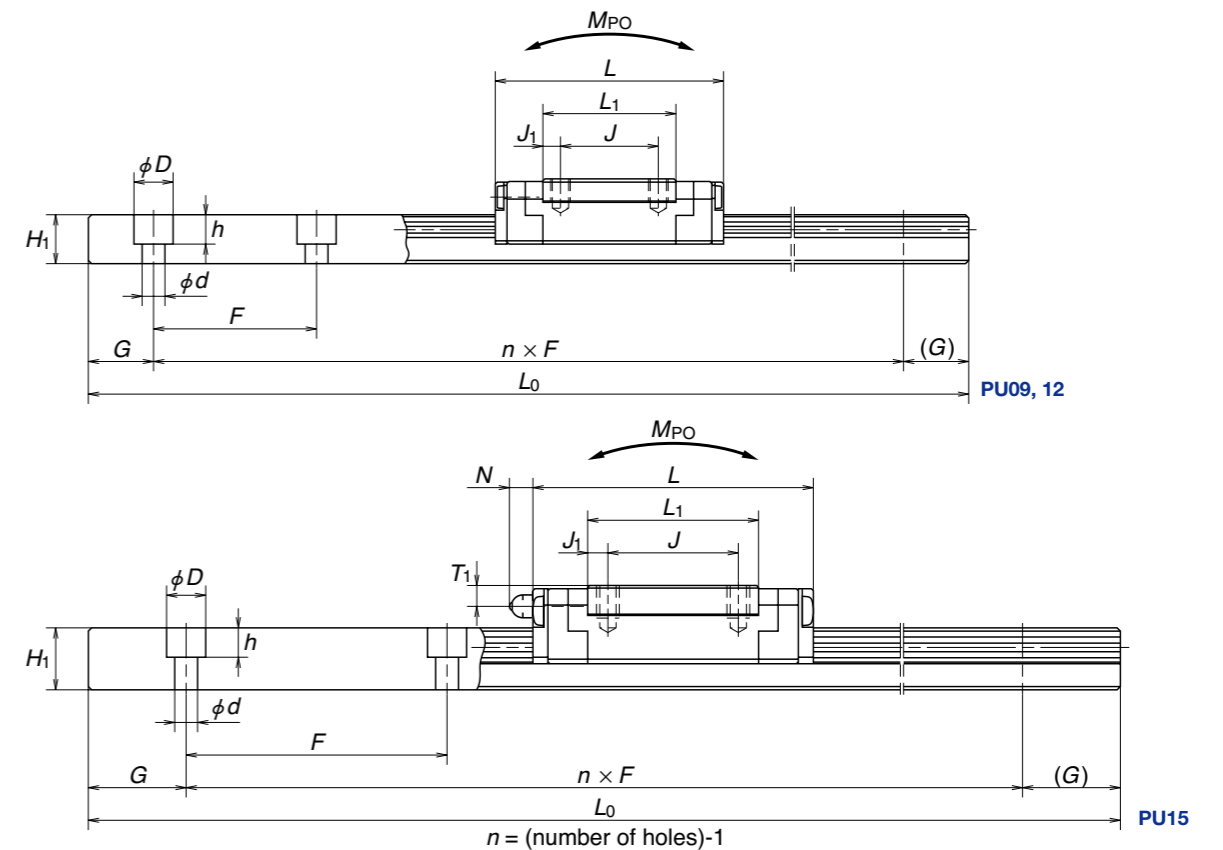


## Ball Slide Models: TR, AR, AL, UR, BL

Front view



Side view

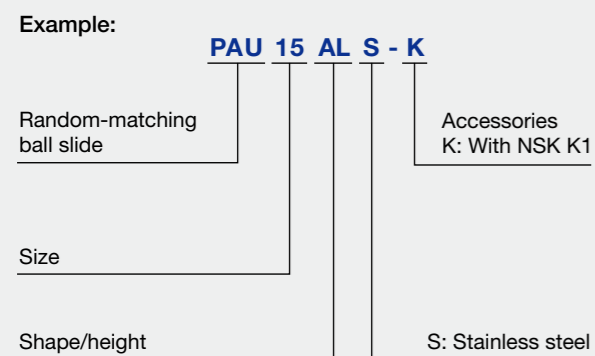


Model No.	Assembly			Ball slide													Rail					Basic load rating					Ball diameter	Weight			
	Height	E	W <sub>2</sub>	Width	Length	Mounting hole			B <sub>1</sub>	L <sub>1</sub>	J <sub>1</sub>	K	T	Grease fitting			Width	Height	Pitch	Mounting bolt hole	B <sub>3</sub>	G	Max. length (Single rail)	Dynamic	Static	Static moment			D <sub>w</sub>	Ball slide (g)	Rail (g/100 mm)
						B	J	M × pitch × l						Mounting hole size	T <sub>1</sub>	N										W <sub>1</sub>	H <sub>1</sub>	F			
PU09TR	10	2.2	5.5	20	30	15	10	M3×0.5×3	2.5	19.6	4.8	7.8	2.6	—	—	—	9	5.5	20	3.5×6×4.5	4.5	7.5	600	1 490	2 150	10	6.1	6.1	1.5875	16	35
PU09UR					41		16			30.6	7.3												2 100	3 500	16.4	15.6	15.6		25		
PU12TR	13	3	7.5	27	35	20	15	M3×0.5×3.5	3.5	20.4	2.7	10	3.4	—	—	—	12	7.5	25	3.5×6×4.5	6	10	800	2 830	3 500	21.7	11.4	11.4	2.3812	32	65
PU12UR					48.7		20			20	34.1													7.05	4 000	5 700	35	28.3		28.3	
PU15AL	16	4	8.5	32	43	25	20	M3×0.5×5	3.5	26.2	3.1	12	4.4	φ3	3.2	(3.6)	15	9.5	40	3.5×6×4.5	7.5	15	1 000	5 550	6 600	49.5	25.6	25.6	3.175	59	105
PU15BL					61		25			25	44.2													9.6	8 100	11 300	54.5	69.5		69.5	

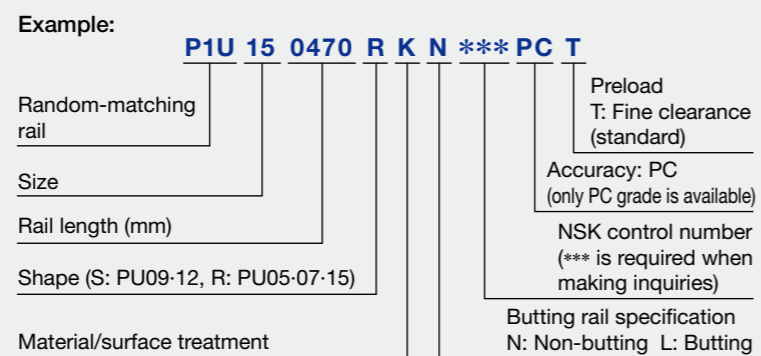
Unit: mm

Note: Basic dynamic load rating C is a load that allows for a 50-km rating fatigue life and is a vertical and constant load on the ball slide mounting surface. To convert C to C<sub>100</sub> for a 100-km fatigue life, divide C by 1.26.

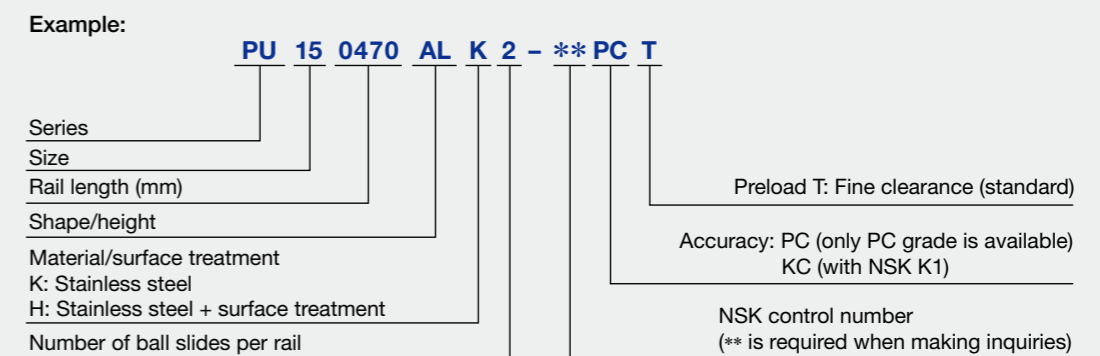
### Part number for ball slide only



### Part number for rail only

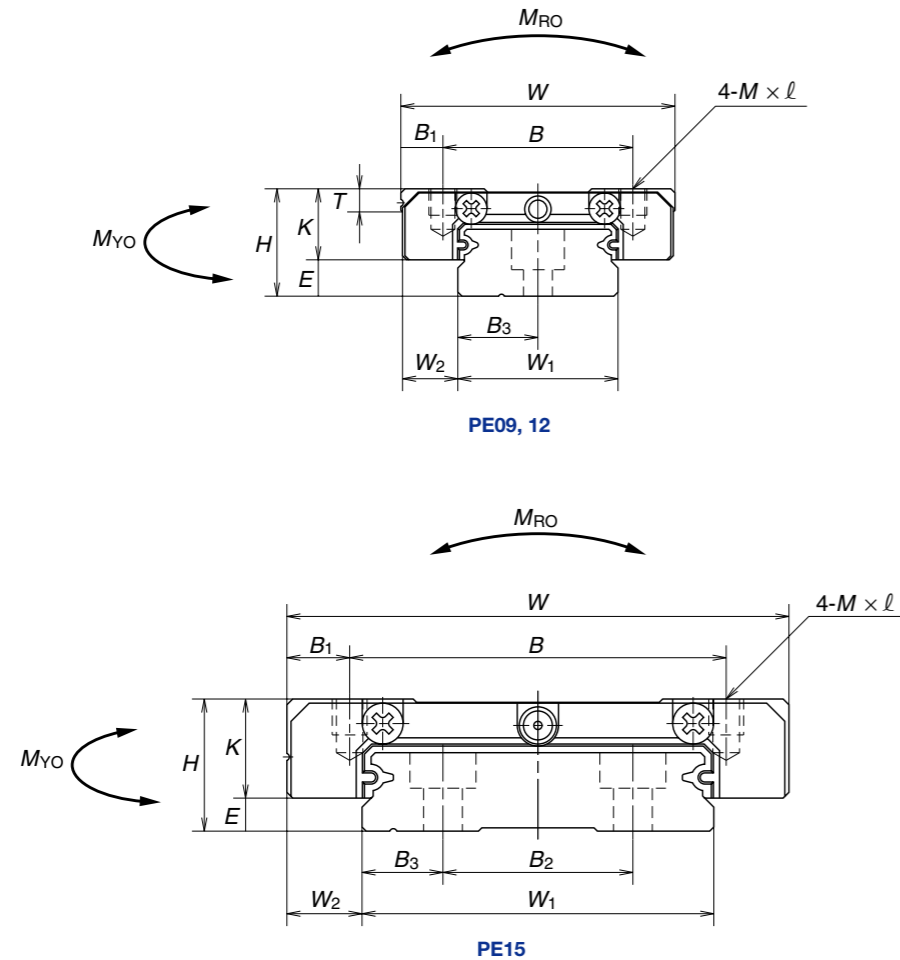


### Part number for assembly (ball slide + rail)

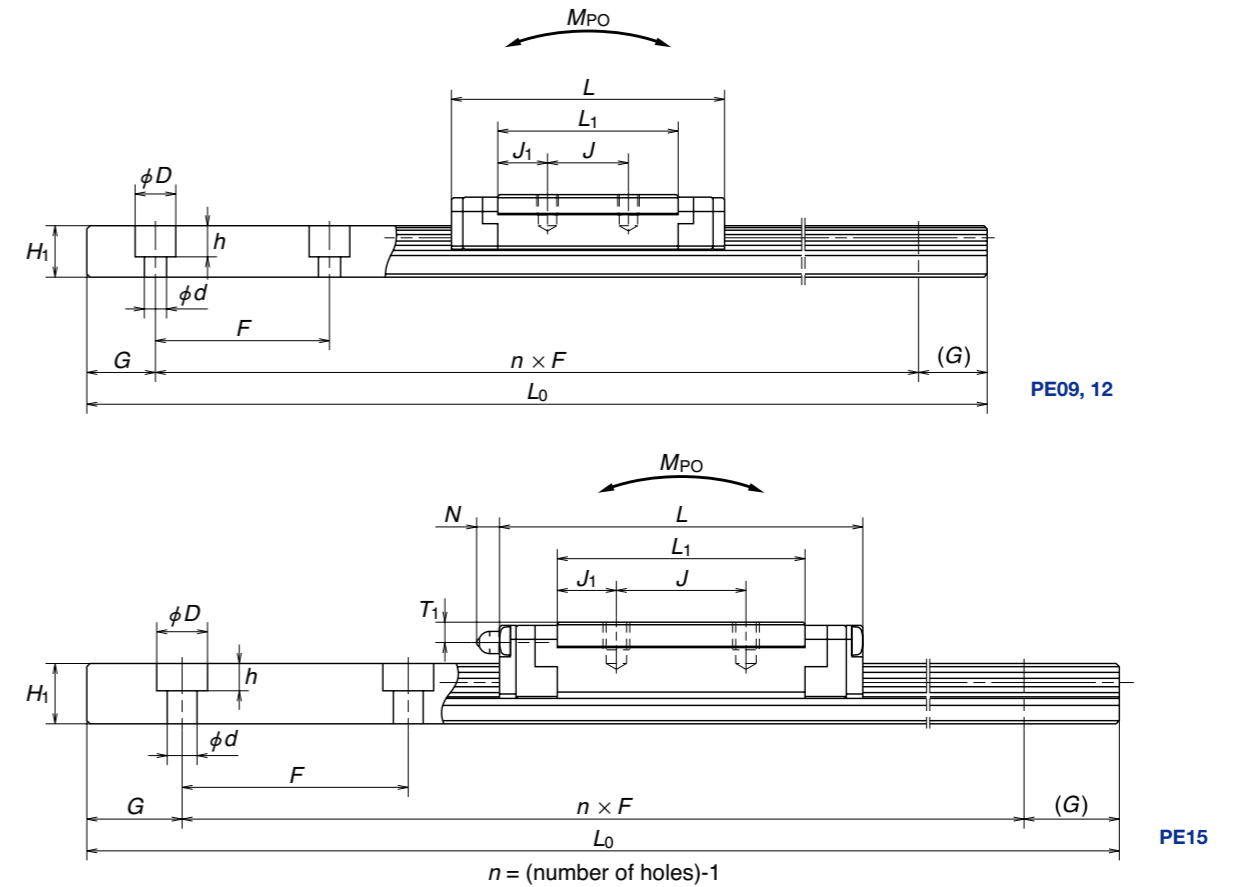


## Ball Slide Models: AR, TR, UR, BR

Front view

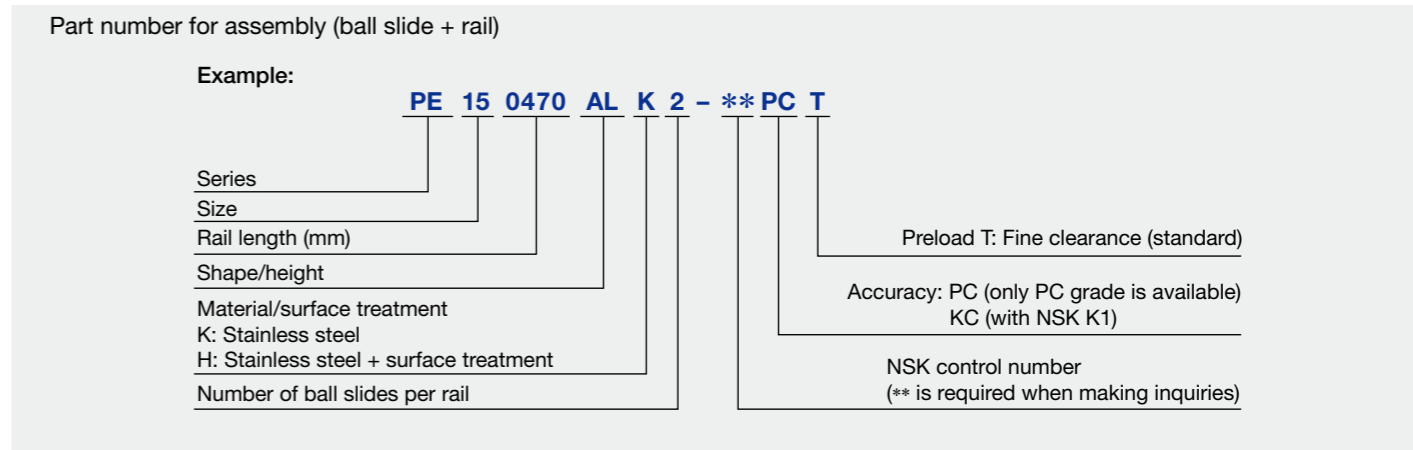
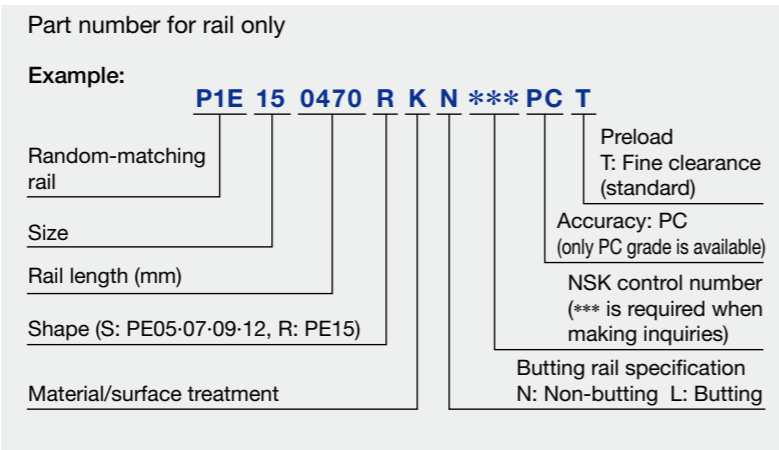
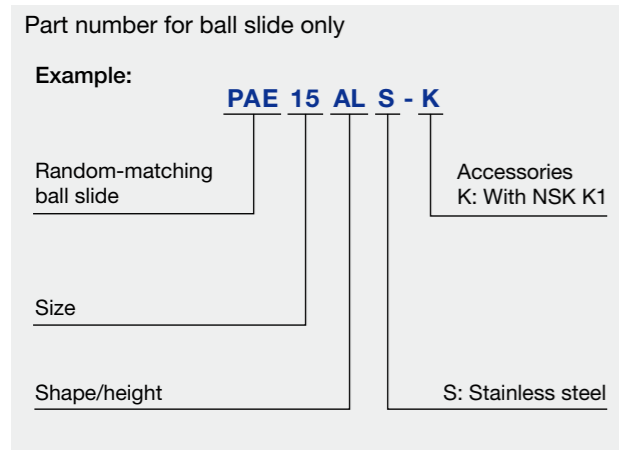


Side view



Model No.	Assembly			Ball slide										Rail					Basic load rating					Ball diameter	Weight							
	Height H	E	W <sub>2</sub>	Width W	Length L	Mounting hole			B <sub>1</sub>	L <sub>1</sub>	J <sub>1</sub>	K	T	Grease fitting			Width W <sub>1</sub>	Height H <sub>1</sub>	Pitch B <sub>2</sub>	Mounting bolt hole d x D x h	B <sub>3</sub>	G	Max. length (Single rail) L <sub>0max</sub>	Dynamic C (N)	Static C <sub>0</sub> (N)	Static moment			D <sub>w</sub>	Ball slide (g)	Rail (g/100 mm)	
						B	J	M x pitch x l						Mounting hole size	T <sub>1</sub>	N										M <sub>RO</sub> (N·m)	M <sub>PO</sub> (N·m)	M <sub>VO</sub> (N·m)				
PE09TR	12	4	6	30	39.8	21	12	M3x0.5x3	4.5	26.6	7.3	8	2.8	-	-	-	18	7.5	-	30	3.5x6x4.5	9	10	800	3 000	4 500	36.5	17.3	17.3	2	35	95
PE09UR	12	4	6	30	51.2	23	24	M3x0.5x3	3.5	38	7	8	2.8	-	-	-	18	7.5	-	30	3.5x6x4.5	9	10	800	4 000	6 700	54.5	37.5	37.5	2	50	95
PE12AR	14	4	8	40	45	28	15	M3x0.5x4	6	31	8	10	3.2	-	-	-	24	8.5	-	40	4.5x8x4.5	12	15	1 000	4 350	6 350	70.5	29.3	29.3	2.3812	66	140
PE12BR	14	4	8	40	60	28	28	M3x0.5x4	6	46	9	10	3.2	-	-	-	24	8.5	-	40	4.5x8x4.5	12	15	1 000	5 800	9 550	106	63.5	63.5	2.3812	98	140
PE15AR	16	4	9	60	56.6	45	20	M4x0.7x4.5	7.5	38.4	9.2	12	4.1	phi 3	3.2	(3.3)	42	9.5	23	40	4.5x8x4.5	9.5	15	1 200	7 600	10 400	207	59	59	3.175	140	275
PE15BR	16	4	9	60	76	45	35	M4x0.7x4.5	7.5	57.8	11.4	12	4.1	phi 3	3.2	(3.3)	42	9.5	23	40	4.5x8x4.5	9.5	15	1 200	10 300	16 000	320	135	135	3.175	211	275

Note: Basic dynamic load rating C is a load that allows for a 50-km rating fatigue life and is a vertical and constant load on the ball slide mounting surface. To convert C to C<sub>100</sub> for a 100-km fatigue life, divide C by 1.26.



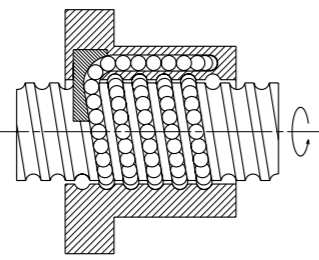
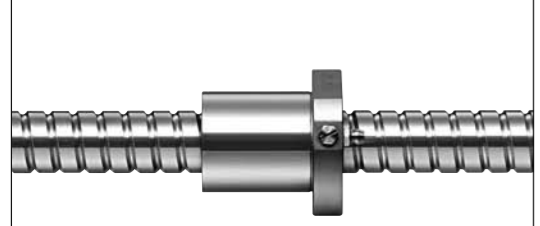
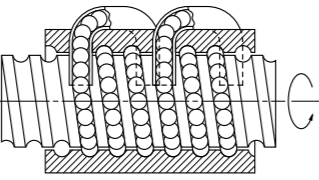
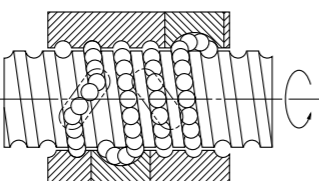
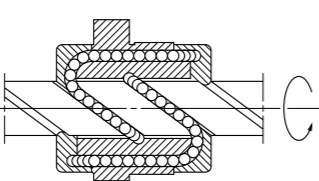
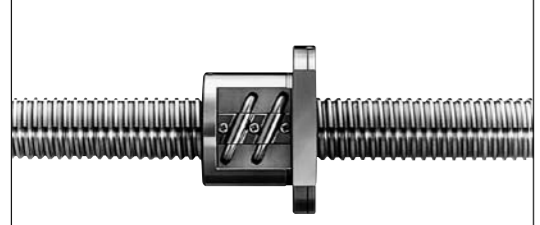
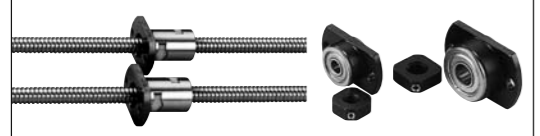







# Ball Screws

- High speed, quiet and compact
- Variety of nut types, shaft diameters and screw leads



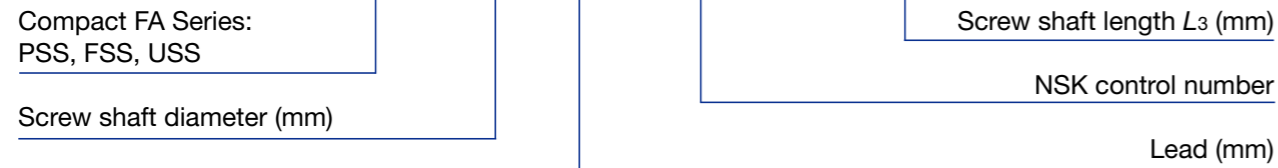
## Types of Ball Screws

Series		Features	Type	Specifications					Dimension table			
				Accuracy grade	Nut system	Shaft dia.	Lead	Max. stroke		Preload		
Compact FA Series		 <p><b>End-deflector Type</b></p> <ul style="list-style-type: none"> <li>• Easy-to-implement and ready-to-use ball screw with finished shaft-end</li> <li>• Quiet and compact, newly designed series 6 dB noise reduction, 10–30% smaller nut</li> <li>• High-speed operation of up to 5 000 min<sup>-1</sup></li> <li>• New type of contact seal is equipped.</li> <li>• Low-profile designed support unit (bearing) is available.</li> </ul> <p>PSS Series: Basic series FSS Series: Transportation series USS Series: High accuracy series</p>	PSS	C5	End-deflector	10	5, 10	400	P-preload	Page 53 – 72		
	12					5, 10, 20, 30	500					
	15					5, 10, 20, 30	1 000					
	20					5, 10, 20, 30, 40, 60	2 000					
	25					5, 10, 20, 25, 30, 50	2 000					
	12		10	800								
FSS	Ct7		End-deflector	15	10, 20	1 300						
				20	10, 20	1 300						
				25	10, 20, 25	1 250						
USS	C3		End-deflector	10	5	400						
				12	5	500						
A and S Series			 <p><b>Tube Type</b></p>  <p><b>Deflector Type</b></p>  <p><b>End-cap Type</b></p> <ul style="list-style-type: none"> <li>• Easy-to-implement and ready-to-use ball screw with finished shaft-end</li> <li>• Variety of shaft diameter and lead combinations available</li> </ul> <p>• MA Series: Miniature automation series • FA Series: Factory automation series • KA Series: Stainless automation series • SS Series: Blank shaft-end series</p>	MA	C3	Deflector Type	4	1		70	P-preload	Page 87 – 122
	6						1	100				
	8						1, 1.5, 2	150				
	10						2, 2.5	200				
	12	2, 2.5					250					
	16	2, 2.5		300								
FA	C3, C5	Tube Type		10	4	300						
				12	5, 10	450						
	C5	Tube/End-Cap		14	5, 8	700						
				15	10, 20	1 000						
				16	5, 16, 32	1 200						
KA	C3, C5	Deflector/Tube		20	10, 20, 40	1 600						
				25	20, 25, 50	2 000						
SS	C5	Tube Type		32	25, 32	2 600						
				6	1	100						
				8	1, 2	150						
				10	2, 4	300						
				12	2, 5, 10	450						
				15	10, 20	1 000						
				16	2	300						
				20	20	1 000						
				20	4, 5	944						
				25	4, 5, 6, 10	1 419						
SS	C5	Deflector Type		25	5, 10	1 412						
				28	5, 6	1 114						
			32	5, 6, 8, 10	1 700							
			32	5, 10,	1 680							
			36	10	1 897							
			40	5, 8, 10, 12	2 383							
			40	10	2 257							
			45	10	2 397							
			50	10	2 497							
			50	10	2 457							
V and R Series (Rolled Ball Screw)		<p>RMA Series</p> <ul style="list-style-type: none"> <li>• Precision rolled miniature ball screw series with finished shaft-end</li> <li>• Low-cost and compact design series</li> <li>• Easy-to-handle by providing compact support bearing unit</li> </ul>	RMA	Ct7	Deflector Type	6	1	200	Clearance max. 0.02	Page 197 – 208		
	8					1, 1.5, 2	200					
	10					2	250					
	12					2	250					
	R Series (Rolled Ball Screw)					 <p><b>RNFTL</b></p>  <p><b>RNFBL</b></p>  <p><b>RNCT</b></p>  <p><b>RNFLCL</b></p>  <p><b>RNSTL</b></p> <ul style="list-style-type: none"> <li>• General accuracy grade (Ct10) rolled ball screw series</li> <li>• Compatible with a variety of nut mounting styles</li> <li>• Low-cost and short delivery</li> <li>• Interchangeable screw shaft and ball nut</li> </ul>	Shaft dia.	Lead				
R Series (Rolled Ball Screw)		RNFTL	RNFBL	RNCT	RNFCL			RNSTL				
10	3, 6	6	3	–	–							
12	8, 12	8	–	12	–							
14	4, 5	4, 5	4, 5	–	4, 5							
15	–	–	–	20	–							
16	10, 16	–	–	16, 32	–							
18	8	8	8	–	8							
20	5, 10, 20	5, 10	5	20, 40	5, 10							
25	5, 10, 25	5, 10	5, 10	25, 50	5, 10							
28	6	6	6	–	6							
32	10, 32	10	10	32, 64	10							
36	10	10	10	–	10							
40	10, 40	10	10	40, 80	–							
45	12	–	12	–	12							
50	10, 16	–	10, 16	50	–							

## Part Number for Ball Screws

### Part number for Compact FA Series ball screw

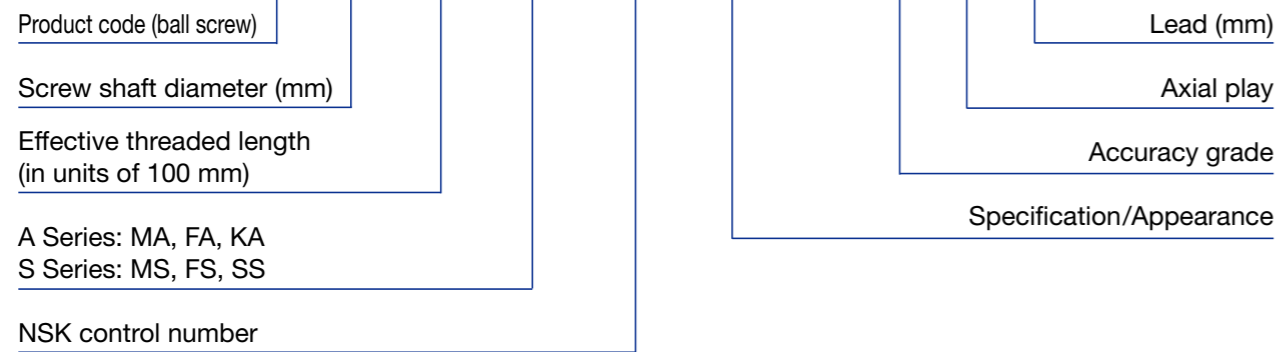
Example: **PSS1520N1D-0561**



- PSS:** Compact, low noise and high speed
- FSS:** Compact FA for transportation
- USS:** High accuracy compact FA

### Part number for A and S Series ball screw

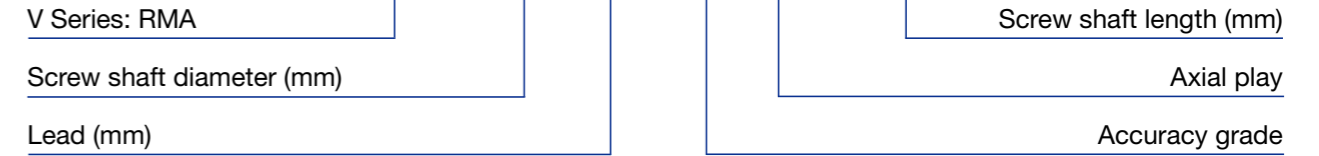
Example: **W1603FA-7PGX-C5Z32**



- MA:** Miniature ball screw
- FA:** Ball screw for factory automation
- KA:** Stainless steel ball screw
- MS:** MA series with blank shaft-end
- FS:** FA series with blank shaft-end
- SS:** Ball screw for machine tools with blank shaft-end

### Part number for V Series ball screw

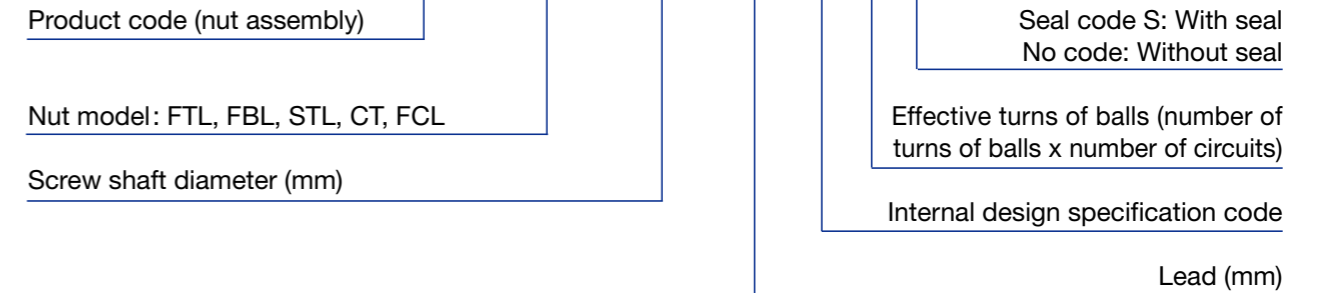
Example: **RMA1202C7S-250**



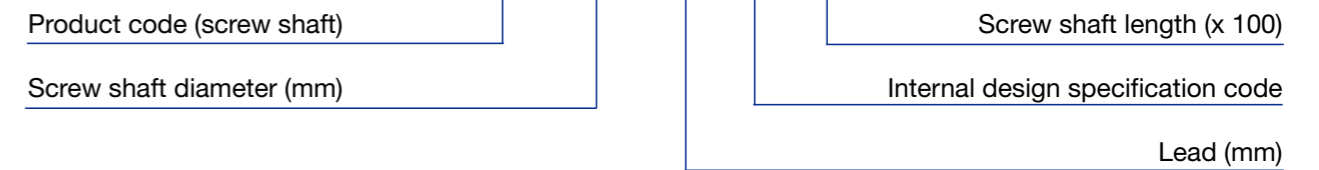
**RMA:** Miniature rolled ball screw

### Part number for R Series rolled ball screw

Example for nut assembly: **RNFTL2510A5S**



Example for screw shaft: **RS2510A20**



- FTL:** Flanged tube type
- FBL:** Flanged tube type (circular)
- STL:** Square tube type
- CT:** V-thread (no flange) tube type
- FCL:** Flanged end-cap type

Please indicate the nut assembly and screw shaft part number when ordering.

## Standard Ball Screw Series

### Shaft Diameter and Lead Matrices

NSK provides a variety of standard ball screw series, shown in the following matrices.

**KA Series shaft diameter and lead matrix**

Unit: mm

Shaft dia.	Lead					
	1	2	4	5	10	20
6	P 145					
8	P 147	P 149				
10		P 151	P 153			
12		P 155		P 157	P 159	
15					P 161	P 163
16		P 165				
20						P 167

**Standard ball screws: Shaft diameter and lead matrix**

Unit: mm

Shaft dia.	Lead																	
	1	1.5	2	2.5	4	5	6	8	10	12	16	20	25	30	32	40	50	60
4	P 87 (MA)																	
6	P 89 (MA)																	
8	P 91 (MA)	P 93 (MA)	P 95 (MA)															
10			P 97 (MA)	P 99 (MA)	P 101 (FA)	P 53 (PSS) P 81 (USS)			P 53 (PSS)									
12			P 103 (MA)	P 105 (MA)		P 55 (PSS) P 83 (USS) P 107 (FA)			P 55 (PSS) P 109 (FA) P 73 (FSS)			P 55 (PSS)		P 55 (PSS)				
14						P 111 (FA)		P 113 (FA)										
15						P 57 (PSS) P 85 (USS)			P 57 (PSS) P 75 (FSS) P 115 (FA)			P 59 (PSS) P 75 (FSS) P 117 (FA)		P 59 (PSS)				
16			P 119 (MA)	P 121 (MA)		P123 (FA)					P 125 (FA)				P 127 (FA)			
20					P 169 (SS)	P 61 (PSS) P 169 (SS)			P 61 (PSS) P 77 (FSS) P 129 (FA)			P 63 (PSS) P 77 (FSS) P 131 (FA)		P 63 (PSS)		P 65 (PSS) P 133 (FA)		P 65 (PSS)
25					P 171 (SS)	P 67 (PSS) P 171,173 (SS)	P 171 (SS)		P 67 (PSS) P 79 (FSS) P 173,175 (SS)			P 69 (PSS) P 79 (FSS) P 135 (FA)	P 69 (PSS) P 79 (FSS) P 137 (FA)	P 71 (PSS)			P 71 (PSS) P 139 (FA)	
28						P175,177 (SS)	P175,177 (SS)											
30																		
32						P 179,181,183 (SS)	P179,181 (SS)	P 181 (SS)	P 183,185,187 (SS)				P 141 (FA)		P 143 (FA)			
36									P185,187 (SS)									
40						P 185 (SS)		P 189 (SS)	P 189,191,193 (SS)	P189,191 (SS)								
45									P 195 (SS)									
50									P193,195 (SS)									

## Standard Ball Screws Series

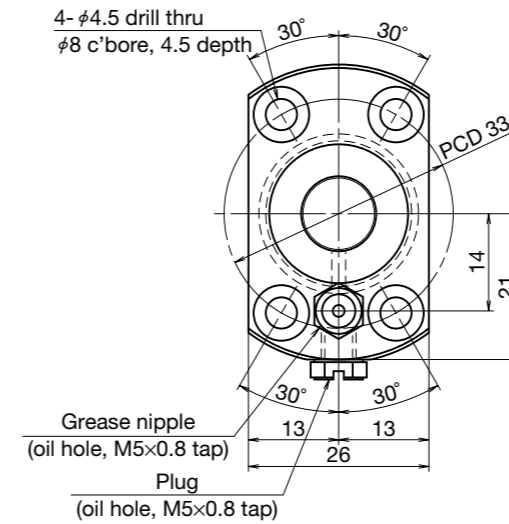
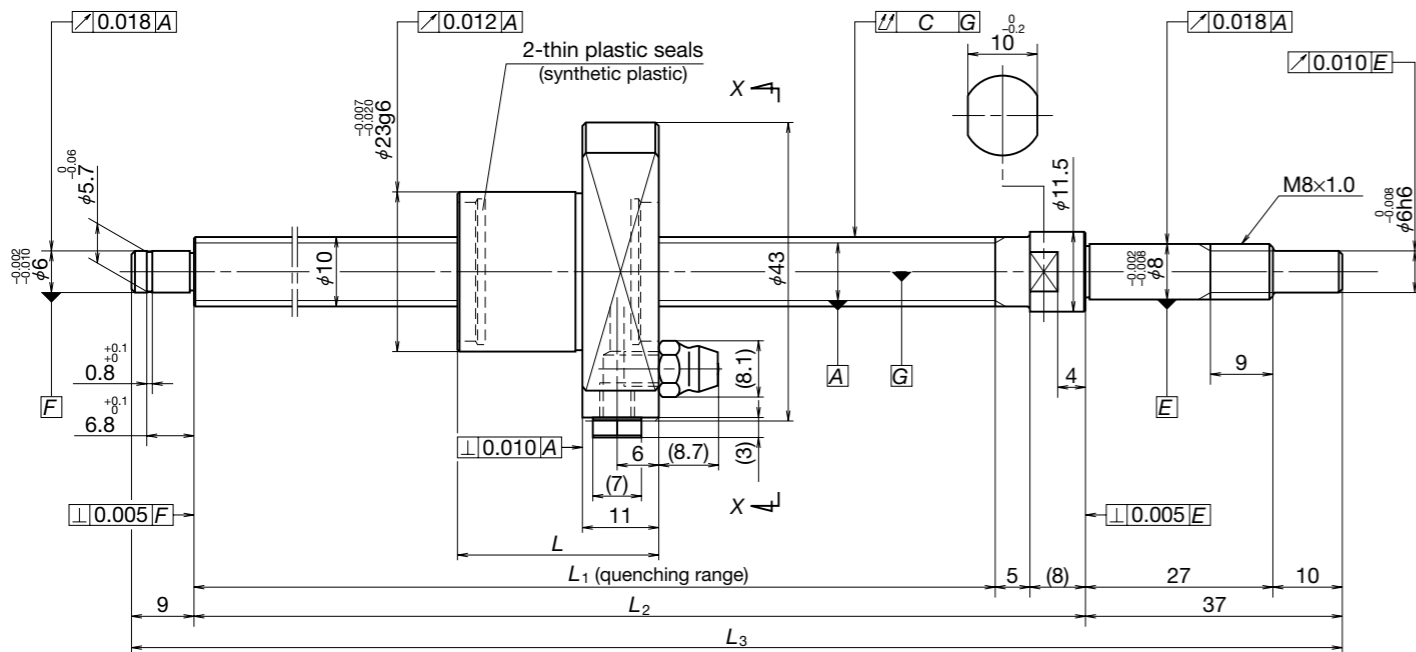
**V Series shaft diameter and lead matrix** Unit: mm

Shaft dia.	Lead		
	1	1.5	2
6	P 197		
8	P 199	P 201	P 203
10			P 205
12			P 207

**R Series shaft diameter and lead matrix**

Unit: mm

Shaft dia.	Lead														
	3	4	5	6	8	10	12	16	20	25	32	40	50	64	80
10	P 209,217			P 209,215											
12					P 209,215		P 213,221								
14		P 209,215,217,219	P 209,215,217,219												
15									P 221						
16						P 209		P 213,221			P 223				
18					P 209,215,217,219										
20			P 209,215,217,219			P 209,215,219			P 213,221			P 223			
25			P 209,215,217,219			P 209,215,217,219				P 213,221			P 223		
28				P 211,215,217,219											
32						P 211,215,217,219					P 213,221			P 223	
36						P 211,215,217,219									
40						P 211,215,217						P 213,221			P 223
45							P 211,217,219								
50						P 211,217		P 211,217					P 221		



View X-X

Unit: mm

Ball Screw Specifications	
Preload type	Oversized ball preload (P-preload)
Ball diameter / Screw shaft root diameter	2.000 / 8.2
Ball circle diameter	10.3
Accuracy grade / Axial play	C5 / 0
Factory-packed grease	NSK Grease PS2

Recommended Support Unit	Fixed side	Simple support side
WBK08-01B (square)	○	
WBK08S-01B (square)		○
WBK08-11B (round)	○	

Unit: mm

Part number	Screw shaft diameter $d$	Lead $l$	Basic load ratings (N)		Stroke		Nut length $L$	Screw shaft length			Lead accuracy			Shaft run-out $C$	Dynamic preload torque (N·cm) *1	Mass (kg)	Limiting speeds (min <sup>-1</sup> )	Nut internal space (cm <sup>3</sup> )	Standard volume of grease replenishing (cm <sup>3</sup> )
			Dynamic $C_a$	Static $C_{0a}$	Nominal	Max. $L_1 - L$		$L_1$	$L_a$	$L_3$	Target value $T$	Error $\theta_p$	Variation $\nu_U$				Fixed - Support		
<b>PSS1005N1D0171</b>	10	5	2 930	4 790	50	83	29	112	125	171	0	0.020	0.018	0.030	0.7 - 3.3	0.3	5 000	0.8	0.4
<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	10	1 970	3 010	100	130	32	162	175	221	0	0.020	0.018	0.045	0.7 - 3.3	0.3	5 000	0.7	0.4
<b>PSS1010N1D0321</b>					200	230		262	275	321									
<b>PSS1010N1D0421</b>					300	330		362	375	421									
<b>PSS1010N1D0521</b>					400	430		462	475	521									

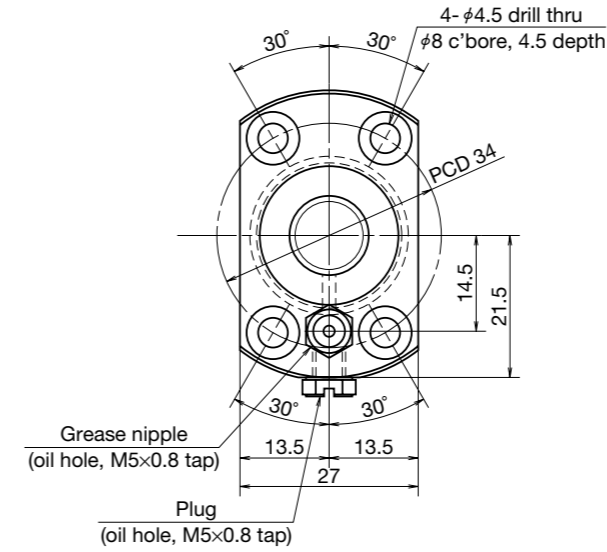
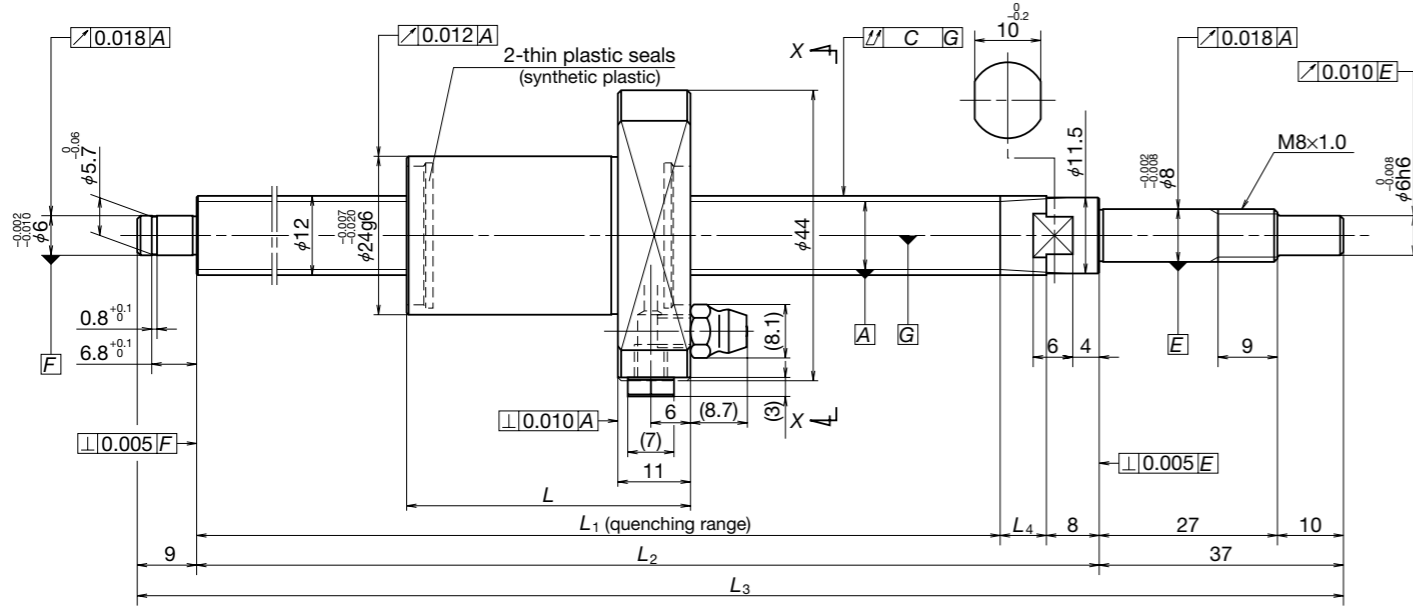
\*1 Indicates ball screw preload control value. About 2.0 N·cm of torque is added due to thin plastic seal.  
Note 1: Service temperature range is 0 to 80°C.

Note 2: Recommended quantity of grease is about 50% of nut's internal space. See page 314 for details.

# Ball Screws Compact FA Series

## Compact FA Series PSS Type

Screw Shaft  $\phi 12$  Lead 5, 10, 20, 30



View X-X

Unit: mm

Ball Screw Specifications	
Preload type	Oversized ball preload (P-preload)
Ball diameter / Screw shaft root diameter	2.000 / 10.2
Ball circle diameter	12.3
Accuracy grade / Axial play	C5 / 0
Factory-packed grease	NSK Grease PS2

Recommended Support Unit	Fixed side		Simple support side	
	Fixed side	Simple support side	Fixed side	Simple support side
WBK08-01B (square)	○			
WBK08S-01B (square)				○
WBK08-11B (round)	○			

Part number	Screw shaft diameter $d$	Lead $l$	Basic load ratings (N)		Stroke		Nut length $L$	Screw shaft length				Lead accuracy			Shaft run-out $C$	Dynamic preload torque (N·cm) *1	Mass (kg)	Limiting speeds (min <sup>-1</sup> )		Nut internal space (cm <sup>3</sup> )	Standard volume of grease replenishing (cm <sup>3</sup> )				
			Dynamic $C_a$	Static $C_{0a}$	Nominal	Max. $L_1 - L$		$L_1$	$L_2$	$L_3$	$L_4$	Target value $T$	Error $e_p$	Variation $v_U$				Fixed - Support							
																		Fixed	Support						
<b>PSS1205N1D0171</b>	12	5	3 200	5 860	50	80	30	110	125	171	7	0	0.020	0.018	0.030	0.7 - 3.3	0.3	5 000	1.0	0.5					
<b>PSS1205N1D0221</b>					100	130		160	175	221											0.020	0.018	0.045	0.7 - 3.3	0.3
<b>PSS1205N1D0321</b>					200	230		260	275	321											0.023	0.018	0.060	0.6 - 4.3	0.4
<b>PSS1205N1D0421</b>					300	330		360	375	421											0.025	0.020	0.070	0.6 - 4.3	0.5
<b>PSS1205N1D0521</b>					400	430		460	475	521											0.027	0.020	0.085	0.6 - 4.3	0.6
<b>PSS1205N1D0621</b>					500	530		560	575	621											0.030	0.023	0.085	0.4 - 4.9	0.7
<b>PSS1210N1D0221</b>	12	10	3 200	5 860	100	117	43	160	175	221	7	0	0.020	0.018	0.045	0.7 - 3.3	0.4	5 000	1.0	0.5					
<b>PSS1210N1D0321</b>					200	217		260	275	321											0.023	0.018	0.060	0.6 - 4.3	0.5
<b>PSS1210N1D0421</b>					300	317		360	375	421											0.025	0.020	0.070	0.6 - 4.3	0.5
<b>PSS1210N1D0521</b>					400	417		460	475	521											0.027	0.020	0.085	0.6 - 4.3	0.6
<b>PSS1210N1D0621</b>					500	517		560	575	621											0.030	0.023	0.085	0.4 - 4.9	0.7
<b>PSS1220N1D0271</b>	12	20	2 150	3 610	100	158	50	208	225	271	9	0	0.023	0.018	0.045	1.4 - 4.5	0.4	5 000	1.2	0.6					
<b>PSS1220N1D0371</b>					200	258		308	325	371											0.023	0.018	0.060	0.9 - 4.9	0.5
<b>PSS1220N1D0471</b>					300	358		408	425	471											0.027	0.020	0.070	0.9 - 4.9	0.6
<b>PSS1220N1D0571</b>					400	458		508	525	571											0.030	0.023	0.085	0.6 - 5.9	0.7
<b>PSS1220N1D0671</b>					500	558		608	625	671											0.030	0.023	0.110	0.6 - 5.9	0.8
<b>PSS1230N1D0271</b>	12	30	2 150	3 610	100	133	70	203	225	271	14	0	0.023	0.018	0.045	1.4 - 4.5	0.5	5 000	1.5	0.8					
<b>PSS1230N1D0371</b>					200	233		303	325	371											0.023	0.018	0.060	0.9 - 4.9	0.6
<b>PSS1230N1D0471</b>					300	333		403	425	471											0.027	0.020	0.070	0.9 - 4.9	0.7
<b>PSS1230N1D0571</b>					400	433		503	525	571											0.030	0.023	0.085	0.6 - 5.9	0.7
<b>PSS1230N1D0671</b>					500	533		603	625	671											0.030	0.023	0.110	0.6 - 5.9	0.8

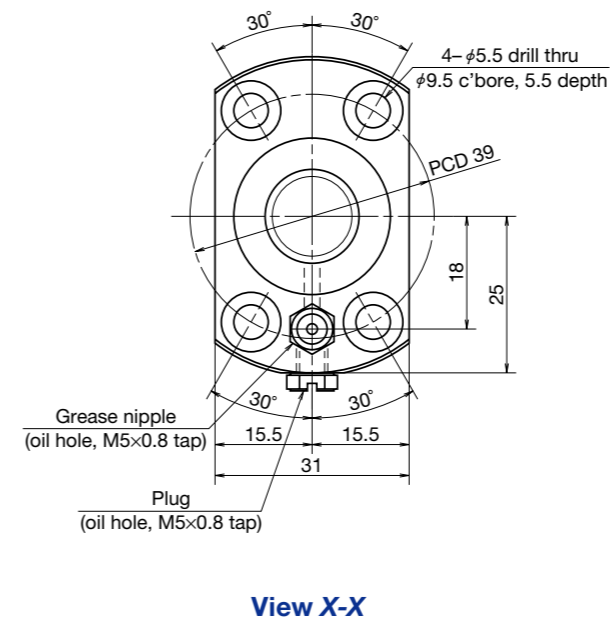
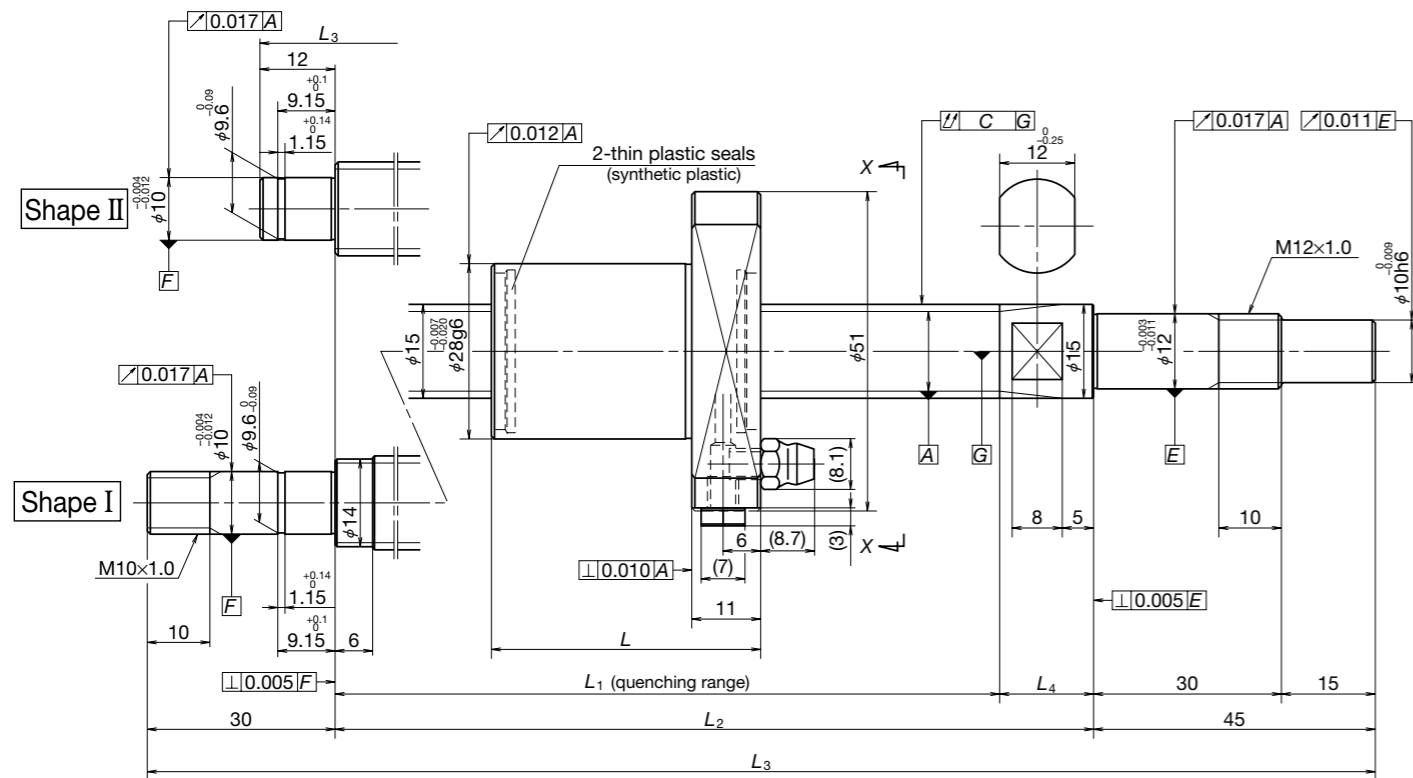
\*1 Indicates ball screw preload control value. About 2.0 N·cm of torque is added due to thin plastic seal.  
Note 1: Service temperature range is 0 to 80°C.

Note 2: Recommended quantity of grease is about 50% of nut's internal space. See page 314 for details.

# Ball Screws Compact FA Series

## Compact FA Series PSS Type

Screw Shaft  $\phi 15$  Lead 5, 10



Unit: mm

Ball Screw Specifications	
Preload type	Oversized ball preload (P-preload)
Ball diameter / Screw shaft root diameter	2.778 / 12.6
Ball circle diameter	15.5
Accuracy grade / Axial play	C5 / 0
Factory-packed grease	NSK Grease LR3

Recommended Support Unit	Unit: mm	
	Fixed side	Simple support side
WBK12-01B (square)	○	
WBK12S-01B (square)		○
WBK12-11 (round)	○	
WBK10-01B (square)		○
WBK10-11 (round)		○

Unit: mm

Part number	Screw shaft diameter $d$	Lead $l$	Basic load ratings (N)		Stroke		Nut length $L$	Screw shaft length				Left shaft end (opposite driven side)	Lead accuracy			Shaft run-out $C$	Dynamic preload torque (N-cm) *1	Mass (kg)	Limiting speeds (min <sup>-1</sup> )		Nut internal space (cm <sup>3</sup> )	Standard volume of grease replenishing (cm <sup>3</sup> )
			Dynamic $C_a$	Static $C_{0a}$	Nominal	Max. $L_1 - L$		$L_1$	$L_2$	$L_3$	$L_4$		Target value $T$	Error $\theta_p$	Variation $\nu_{ij}$				Fixed - Support	Fixed - Fixed		
PSS1505N1D0211	15	5	5 460	10 200	50	109	30	139	154	211	15	Shape II	0	0.020	0.018	0.035	0.2 - 6.9	0.5	5 000	-	2.0	1.0
PSS1505N1D0261					100	159		189	204	261				0.020	0.018	0.035	0.2 - 6.9	0.5				
PSS1505N1D0361					200	259		289	304	361				0.023	0.018	0.045	0.2 - 6.9	0.6				
PSS1505N1D0461					300	359		389	404	461				0.025	0.020	0.050	0.4 - 9.8	0.8				
PSS1505N1D0561					400	459		489	504	561				0.027	0.020	0.060	0.4 - 9.8	0.9				
PSS1505N1D0661					500	559		589	604	661				0.030	0.023	0.075	0.4 - 9.8	1.0				
PSS1505N1D0761					600	659		689	704	761				0.035	0.025	0.075	0.4 - 11.8	1.1	3 600			
PSS1510N1D0261	15	10	5 460	10 200	100	146	43	189	204	261	15	Shape II	0	0.020	0.018	0.035	0.6 - 7.4	0.6	5 000	-	2.0	1.0
PSS1510N1D0361					200	246		289	304	361				0.023	0.018	0.045	0.6 - 7.4	0.7				
PSS1510N1D0461					300	346		389	404	461				0.025	0.020	0.050	0.4 - 9.8	0.8				
PSS1510N1D0561					400	446		489	504	561				0.027	0.020	0.060	0.4 - 9.8	1.0				
PSS1510N1D0661					500	546		589	604	661				0.030	0.023	0.075	0.4 - 9.8	1.1				
PSS1510N1D0761					600	646		689	704	761				0.035	0.025	0.075	0.4 - 11.8	1.2				
PSS1510N1D0879					700	746		789	804	879				0.035	0.025	0.095	0.4 - 11.8	1.4	2 700	3 400		
PSS1510N1D0979					800	846		889	904	979				0.040	0.027	0.095	0.4 - 11.8	1.5	2 200	3 400		
PSS1510N1D1179					1 000	1 046		1 089	1 104	1 179				0.046	0.030	0.120	0.4 - 11.8	1.7	1 400	2 300		

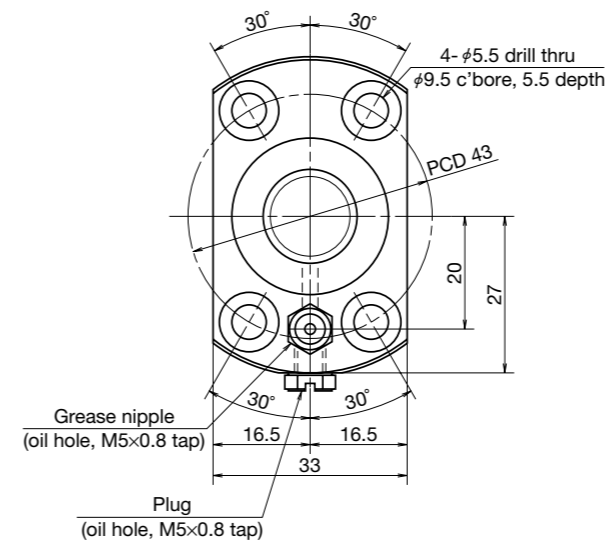
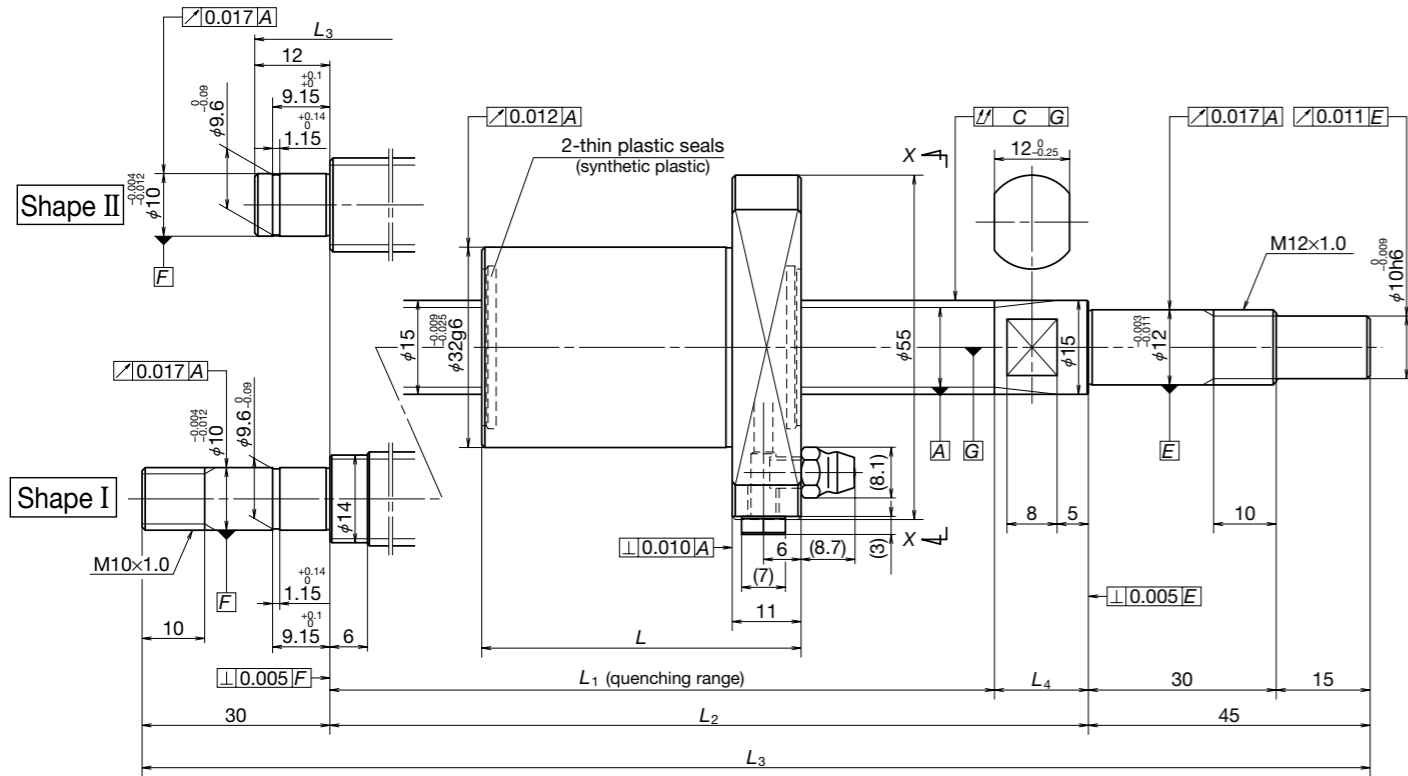
\*1 Indicates ball screw preload control value. About 2.0 N-cm of torque is added due to thin plastic seal.  
Note 1: Service temperature range is 0 to 80°C.

Note 2: Recommended quantity of grease is about 50% of nut's internal space. See page 314 for details.

# Ball Screws Compact FA Series

## Compact FA Series PSS Type

Screw Shaft  $\phi 15$  Lead 20, 30



View X-X

Unit: mm

Ball Screw Specifications	
Preload type	Oversized ball preload (P-preload)
Ball diameter / Screw shaft root diameter	3.175 / 12.2
Ball circle diameter	15.5
Accuracy grade / Axial play	C5 / 0
Factory-packed grease	NSK Grease LR3

Recommended Support Unit	Unit: mm	
	Fixed side	Simple support side
WBK12-01B (square)	○	
WBK12S-01B (square)		○
WBK12-11 (round)	○	
WBK10-01B (square)		○
WBK10-11 (round)		○

Unit: mm

Part number	Screw shaft diameter $d$	Lead $l$	Basic load ratings (N)		Stroke		Nut length $L$	Screw shaft length				Left shaft end (opposite driven side)	Lead accuracy			Shaft run-out $C$	Dynamic preload torque (N-cm) *1	Mass (kg)	Limiting speeds (min <sup>-1</sup> )		Nut internal space (cm <sup>3</sup> )	Standard volume of grease replenishing (cm <sup>3</sup> )		
			Dynamic $C_a$	Static $C_{0a}$	Nominal	Max. $L_1 - L$		$L_1$	$L_2$	$L_3$	$L_4$		Target value $T$	Error $\theta_p$	Variation $\nu_U$				Fixed - Support	Fixed - Fixed				
<b>PSS1520N1D0261</b>	15	20	5 070	8 730	100	135	51	186	204	261	18	Shape II	0	0.020	0.018	0.035	0.8 - 8.8	0.7	5 000	-	2.8	1.4		
<b>PSS1520N1D0361</b>					200	235		286	304	361				0.023	0.018	0.045	0.8 - 8.8	0.8						
<b>PSS1520N1D0461</b>					300	335		386	404	461				0.025	0.020	0.050	0.8 - 10.8	0.9						
<b>PSS1520N1D0561</b>					400	435		486	504	561				0.027	0.020	0.060	0.8 - 10.8	1.1						
<b>PSS1520N1D0661</b>					500	535		586	604	661				0.030	0.023	0.075	0.8 - 10.8	1.2						
<b>PSS1520N1D0761</b>					600	635		686	704	761				0.035	0.025	0.075	0.8 - 13.8	1.3						
<b>PSS1520N1D0879</b>					700	735		786	804	879				0.035	0.025	0.095	0.8 - 13.8	1.5					2 900	4 200
<b>PSS1520N1D0979</b>					800	835		886	904	979				0.040	0.027	0.095	0.8 - 13.8	1.6					2 200	3 300
<b>PSS1520N1D1179</b>					1 000	1 035		1 086	1 104	1 179				0.046	0.030	0.120	0.8 - 13.8	1.9					1 500	2 200
<b>PSS1530N1D0311</b>	15	30	5 070	8 730	100	159	71	230	254	311	24	Shape II	0	0.023	0.018	0.035	1.2 - 9.3	0.8	5 000	-	3.4	1.7		
<b>PSS1530N1D0411</b>					200	259		330	354	411				0.025	0.020	0.050	0.8 - 10.8	1.0						
<b>PSS1530N1D0511</b>					300	359		430	454	511				0.027	0.020	0.060	0.8 - 10.8	1.1						
<b>PSS1530N1D0611</b>					400	459		530	554	611				0.030	0.023	0.060	0.8 - 10.8	1.2						
<b>PSS1530N1D0711</b>					500	559		630	654	711				0.030	0.023	0.075	0.8 - 13.8	1.4					4 500	
<b>PSS1530N1D0811</b>					600	659		730	754	811				0.035	0.025	0.095	0.8 - 13.8	1.5					3 300	
<b>PSS1530N1D0929</b>					700	759		830	854	929				0.040	0.027	0.095	0.8 - 13.8	1.6					2 600	3 800
<b>PSS1530N1D1029</b>					800	859		930	954	1 029				0.040	0.027	0.120	0.8 - 13.8	1.8					2 000	3 000
<b>PSS1530N1D1229</b>					1 000	1 059		1 130	1 154	1 229				0.046	0.030	0.120	0.8 - 13.8	2.0					1 400	2 000

\*1 Indicates ball screw preload control value. About 2.0 N-cm of torque is added due to thin plastic seal.  
Note 1: Service temperature range is 0 to 80°C.

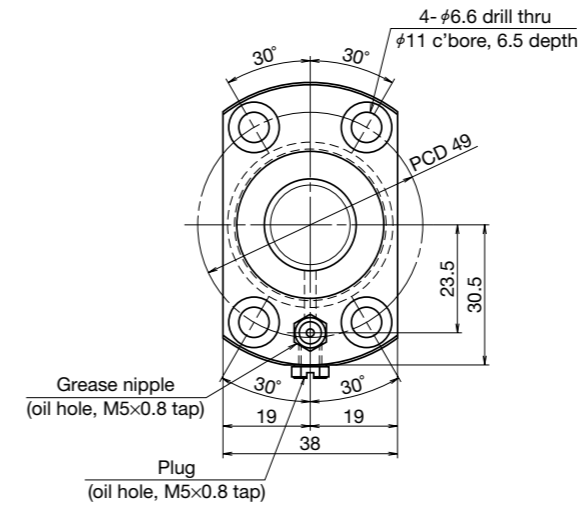
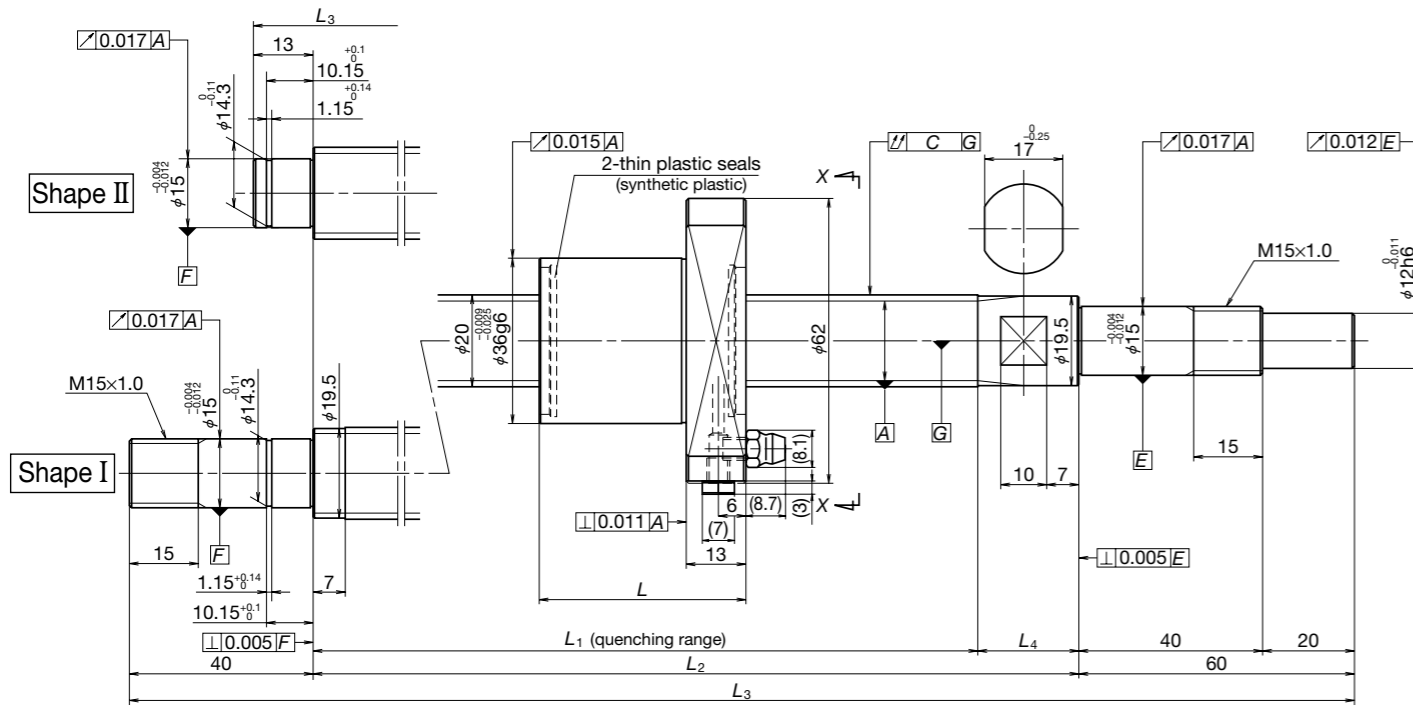
Note 2: Recommended quantity of grease is about 50% of nut's internal space. See page 314 for details.



# Ball Screws Compact FA Series

## Compact FA Series PSS Type

Screw Shaft  $\phi 20$  Lead 5, 10



View X-X

Unit: mm

Ball Screw Specifications	
Preload type	Oversized ball preload (P-preload)
Ball diameter / Screw shaft root diameter	3.175 / 17.2
Ball circle diameter	20.5
Accuracy grade / Axial play	C5 / 0
Factory-packed grease	NSK Grease LR3

Recommended Support Unit	Support Unit	
	Fixed side	Simple support side
WBK15-01B (square)	○	○
WBK15S-01B (square)		○
WBK15-11 (round)	○	○

Part number	Screw shaft diameter $d$	Lead $l$	Basic load ratings (N)		Stroke		Nut length $L$	Screw shaft length				Left shaft end (opposite driven side)	Lead accuracy			Shaft run-out $C$	Dynamic preload torque (N-cm) *1	Mass (kg)	Limiting speeds (min <sup>-1</sup> )		Nut internal space (cm <sup>3</sup> )	Standard volume of grease replenishing (cm <sup>3</sup> )		
			Dynamic $C_a$	Static $C_{0a}$	Nominal	Max. $L_1 - L$		$L_1$	$L_2$	$L_3$	$L_4$		Target value $T$	Error $\theta_p$	Variation $\nu_U$				Fixed - Support	Fixed - Fixed				
																							Fixed - Support	Fixed - Fixed
<b>PSS2005N1D0323</b>	20	5	8 790	18 500	150	197	31	228	250	323	22	Shape II	0	0.023	0.018	0.045	0.6 - 7.4	1.0	5 000	-	3.4	1.7		
<b>PSS2005N1D0373</b>					200	247		278	300	373				0.023	0.018	0.045	0.6 - 7.4	1.1						
<b>PSS2005N1D0473</b>					300	347		378	400	473				0.025	0.020	0.050	0.6 - 7.4	1.3						
<b>PSS2005N1D0573</b>					400	447		478	500	573				0.027	0.020	0.060	0.4 - 9.8	1.5						
<b>PSS2005N1D0673</b>					500	547		578	600	673				0.030	0.023	0.075	0.4 - 9.8	1.7						
<b>PSS2005N1D0773</b>					600	647		678	700	773				0.035	0.025	0.075	0.4 - 9.8	1.9						
<b>PSS2005N1D0873</b>					700	747		778	800	873				0.035	0.025	0.095	0.4 - 9.8	2.2						
<b>PSS2005N1D1000</b>					800	847		878	900	1 000				0.040	0.027	0.095	0.4 - 11.8	2.4					4 000	4 700
<b>PSS2010N1D0387</b>	20	10	8 790	18 500	200	247	45	292	314	387	22	Shape II	0	0.023	0.018	0.045	1.2 - 9.3	1.2	5 000	-	3.2	1.6		
<b>PSS2010N1D0487</b>					300	347		392	414	487				0.025	0.020	0.050	1.2 - 9.3	1.4						
<b>PSS2010N1D0587</b>					400	447		492	514	587				0.027	0.020	0.060	0.8 - 10.8	1.7						
<b>PSS2010N1D0687</b>					500	547		592	614	687				0.030	0.023	0.075	0.8 - 10.8	1.9						
<b>PSS2010N1D0787</b>					600	647		692	714	787				0.035	0.025	0.075	0.8 - 10.8	2.1						
<b>PSS2010N1D0887</b>					700	747		792	814	887				0.035	0.025	0.095	0.8 - 10.8	2.4						
<b>PSS2010N1D1014</b>					800	847		892	914	1 014				0.040	0.027	0.120	0.8 - 13.8	2.6					3 100	4 600
<b>PSS2010N1D1214</b>					1 000	1 047		1 092	1 114	1 214				0.046	0.030	0.120	0.8 - 13.8	3.1					2 100	3 100
<b>PSS2010N1D1414</b>					1 200	1 247		1 292	1 314	1 414				0.054	0.035	0.160	0.8 - 13.8	3.6					1 500	2 200

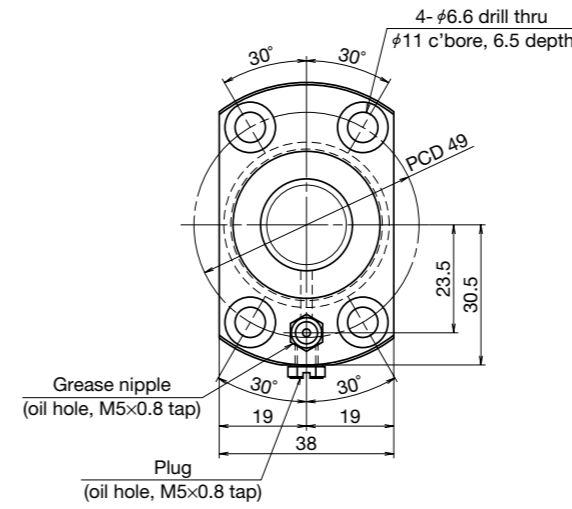
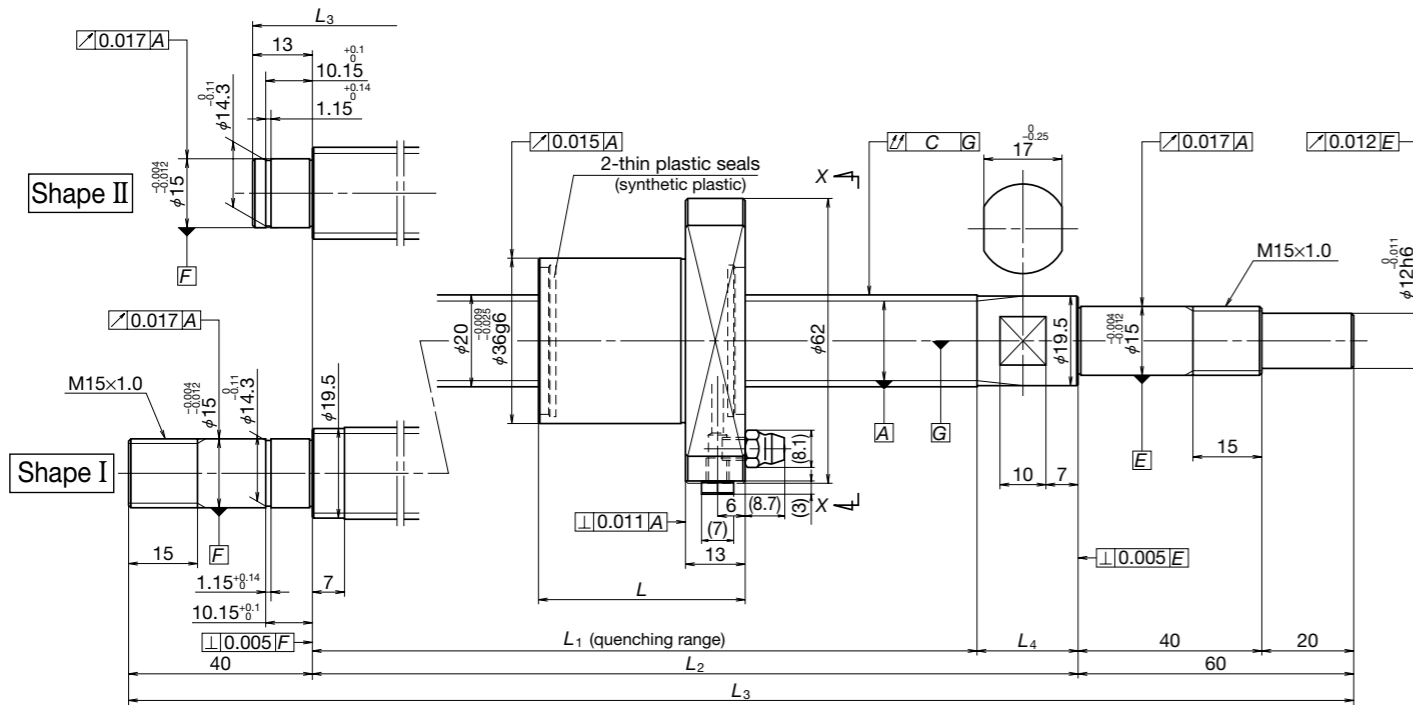
\*1 Indicates ball screw preload control value. About 2.0 N-cm of torque is added due to thin plastic seal.  
Note 1: Service temperature range is 0 to 80°C.

Note 2: Recommended quantity of grease is about 50% of nut's internal space. See page 314 for details.

# Ball Screws Compact FA Series

## Compact FA Series PSS Type

Screw Shaft  $\phi 20$  Lead 20, 30



View X-X

Unit: mm

Ball Screw Specifications	
Preload type	Oversized ball preload (P-preload)
Ball diameter / Screw shaft root diameter	3.175 / 17.2
Ball circle diameter	20.5
Accuracy grade / Axial play	C5 / 0
Factory-packed grease	NSK Grease LR3

Recommended Support Unit	Unit: mm	
	Fixed side	Simple support side
WBK15-01B (square)	○	○
WBK15S-01B (square)		○
WBK15-11 (round)	○	○

Part number	Screw shaft diameter $d$	Lead $l$	Basic load ratings (N)		Stroke		Nut length $L$	Screw shaft length				Left shaft end (opposite driven side)	Lead accuracy			Shaft run-out $C$	Dynamic preload torque (N-cm) *1	Mass (kg)	Limiting speeds (min <sup>-1</sup> )		Nut internal space (cm <sup>3</sup> )	Standard volume of grease replenishing (cm <sup>3</sup> )			
			Dynamic $C_a$	Static $C_{0a}$	Nominal	Max. $L_1 - L$		$L_1$	$L_2$	$L_3$	$L_4$		Target value $T$	Error $\theta_p$	Variation $\nu_u$				Fixed - Support	Fixed - Fixed					
																							Fixed - Support	Fixed - Fixed	
<b>PSS2020N1D0508</b>	20	20	5 900	11 700	300	359	54	413	435	508	22	Shape II	0	0.027	0.020	0.060	1.4 - 11.8	1.6	5 000	-	3.2	1.6			
<b>PSS2020N1D0608</b>					400	459		513	535	608				0.030	0.023	0.060	1.4 - 11.8	1.8							
<b>PSS2020N1D0708</b>					500	559		613	635	708				0.030	0.023	0.075	1.4 - 11.8	2.0							
<b>PSS2020N1D0808</b>					600	659		713	735	808				0.035	0.025	0.095	1.4 - 11.8	2.3							
<b>PSS2020N1D0908</b>					700	759		813	835	908				0.040	0.027	0.095	0.8 - 13.8	2.5					3 700	4 500	
<b>PSS2020N1D1035</b>					800	859		913	935	1 035				0.040	0.027	0.120	0.8 - 13.8	2.8					3 000		
<b>PSS2020N1D1235</b>					1 000	1 059		1 113	1 135	1 235				0.046	0.030	0.120	0.8 - 13.8	3.3					2 000		3 000
<b>PSS2020N1D1435</b>					1 200	1 259		1 313	1 335	1 435				0.054	0.035	0.160	0.8 - 13.8	3.8					1 400		2 100
<b>PSS2020N1D1835</b>					1 600	1 659		1 713	1 735	1 835				0.065	0.040	0.200	0.8 - 13.8	4.7					800		1 200
<b>PSS2030N1D0408</b>	20	30	5 900	11 700	200	234	74	308	335	408	27	Shape II	0	0.023	0.018	0.050	1.6 - 9.8	1.4	5 000	-	4.6	2.3			
<b>PSS2030N1D0508</b>					300	334		408	435	508				0.027	0.020	0.060	1.4 - 11.8	1.7							
<b>PSS2030N1D0608</b>					400	434		508	535	608				0.030	0.023	0.060	1.4 - 11.8	1.9							
<b>PSS2030N1D0708</b>					500	534		608	635	708				0.030	0.023	0.075	1.4 - 11.8	2.1							
<b>PSS2030N1D0808</b>					600	634		708	735	808				0.035	0.025	0.095	1.4 - 11.8	2.4					3 900		
<b>PSS2030N1D0908</b>					700	734		808	835	908				0.040	0.027	0.095	0.8 - 13.8	2.6					3 100	4 600	
<b>PSS2030N1D1035</b>					800	834		908	935	1 035				0.040	0.027	0.120	0.8 - 13.8	2.9					3 100	4 600	
<b>PSS2030N1D1235</b>					1 000	1 034		1 108	1 135	1 235				0.046	0.030	0.120	0.8 - 13.8	3.4					2 100	3 000	
<b>PSS2030N1D1435</b>					1 200	1 234		1 308	1 335	1 435				0.054	0.035	0.160	0.8 - 13.8	3.9					1 500	2 200	

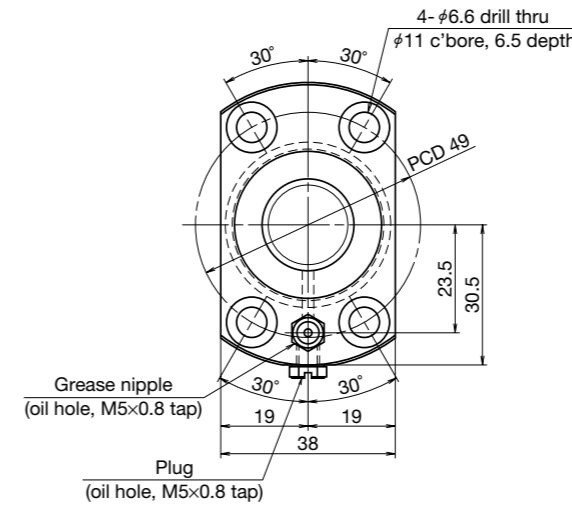
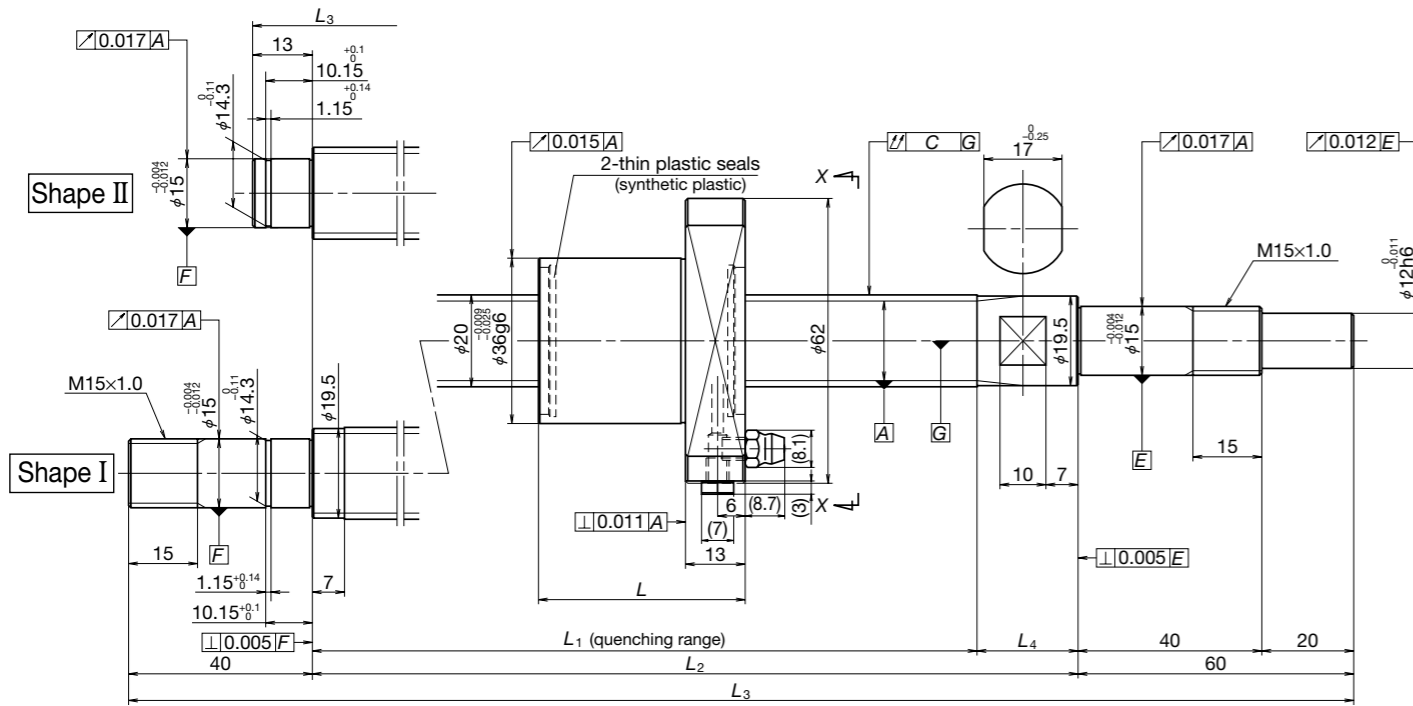
\*1 Indicates ball screw preload control value. About 2.0 N-cm of torque is added due to thin plastic seal.  
Note 1: Service temperature range is 0 to 80°C.

Note 2: Recommended quantity of grease is about 50% of nut's internal space. See page 314 for details.

# Ball Screws Compact FA Series

## Compact FA Series PSS Type

Screw Shaft  $\phi 20$  Lead 40, 60



View X-X

Unit: mm

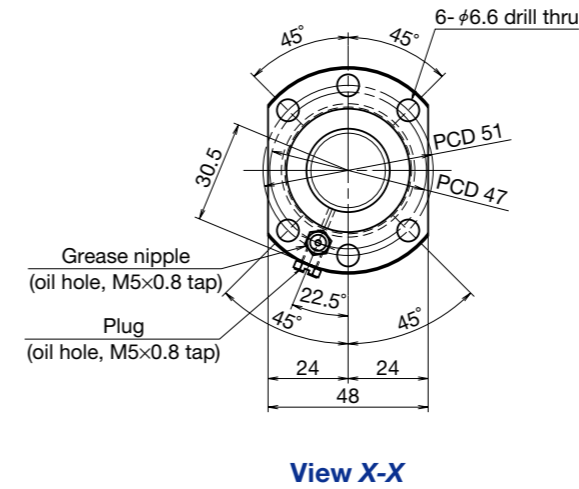
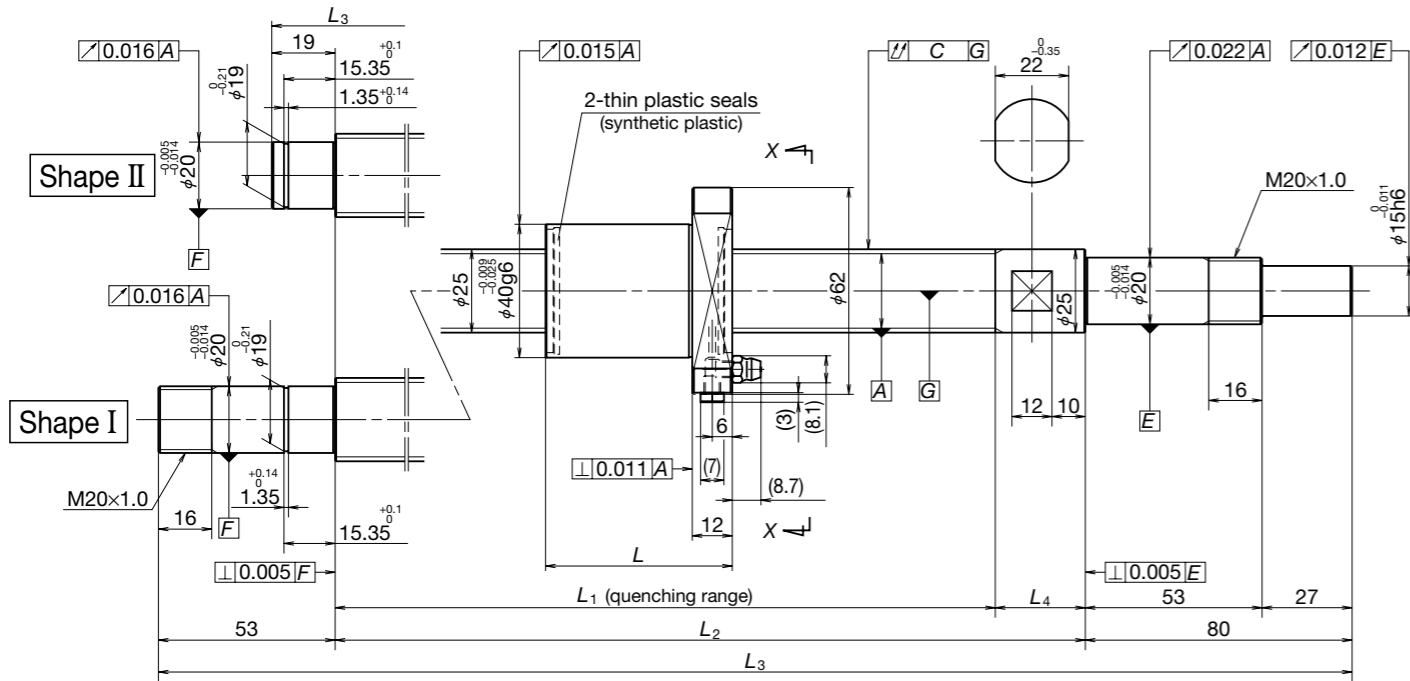
Ball Screw Specifications	
Preload type	Oversized ball preload (P-preload)
Ball diameter / Screw shaft root diameter	3.175 / 17.2
Ball circle diameter	20.5
Accuracy grade / Axial play	C5 / 0
Factory-packed grease	NSK Grease LR3

Recommended Support Unit	Unit: mm	
	Fixed side	Simple support side
WBK15-01B (square)	○	○
WBK15S-01B (square)		○
WBK15-11 (round)	○	○

Part number	Screw shaft diameter $d$	Lead $l$	Basic load ratings (N)		Stroke		Nut length $L$	Screw shaft length				Left shaft end (opposite driven side)	Lead accuracy			Shaft run-out $C$	Dynamic preload torque (N-cm) *1	Mass (kg)	Limiting speeds (min <sup>-1</sup> )		Nut internal space (cm <sup>3</sup> )	Standard volume of grease replenishing (cm <sup>3</sup> )
			Dynamic $C_a$	Static $C_{0a}$	Nominal	Max. $L_1 - L$		$L_1$	$L_2$	$L_3$	$L_4$		Target value $T$	Error $\theta_p$	Variation $\nu_U$				Fixed - Support	Fixed - Fixed		
<b>PSS2040N1D0658</b>	20	40	5 900	11 700	400	461	92	553	585	658	32	Shape II	0	0.030	0.023	0.075	2.2 - 12.8	2.1	5 000	-	5.3	2.7
<b>PSS2040N1D0758</b>					500	561		653	685	758				0.035	0.025	0.075	2.2 - 12.8	2.4				
<b>PSS2040N1D0858</b>					600	661		753	785	858				0.035	0.025	0.095	2.2 - 12.8	2.6				
<b>PSS2040N1D0958</b>					700	761		853	885	958				0.040	0.027	0.095	1.8 - 14.8	2.8				
<b>PSS2040N1D1085</b>					800	861		953	985	1 085				0.040	0.027	0.120	1.8 - 14.8	3.1				
<b>PSS2040N1D1285</b>					1 000	1 061		1 153	1 185	1 285				0.046	0.030	0.160	1.8 - 14.8	3.6				
<b>PSS2040N1D1485</b>					1 200	1 261		1 353	1 385	1 485				0.054	0.035	0.160	1.8 - 14.8	4.1				
<b>PSS2040N1D1885</b>					1 600	1 661		1 753	1 785	1 885				0.065	0.040	0.200	1.8 - 14.8	5.1				
<b>PSS2040N1D2285</b>					2 000	2 061		2 153	2 185	2 285				0.077	0.046	0.240	1.8 - 14.8	6.0				
<b>PSS2060N1D0708</b>					20	60		5 900	11 700	400				464	129	593	635	708				
<b>PSS2060N1D0808</b>	500	564	693	735			808			0.035	0.025	0.095	2.7 - 13.8	2.6								
<b>PSS2060N1D0908</b>	600	664	793	835			908			0.035	0.025	0.095	2.7 - 13.8	2.9								
<b>PSS2060N1D1008</b>	700	764	893	935			1 008			0.040	0.027	0.120	1.8 - 14.8	3.1								
<b>PSS2060N1D1135</b>	800	864	993	1 035			1 135			0.040	0.027	0.120	1.8 - 14.8	3.4								
<b>PSS2060N1D1335</b>	1 000	1 064	1 193	1 235			1 335			0.046	0.030	0.160	1.8 - 14.8	3.9								
<b>PSS2060N1D1535</b>	1 200	1 264	1 393	1 435			1 535			0.054	0.035	0.160	1.8 - 14.8	4.4								
<b>PSS2060N1D1935</b>	1 600	1 664	1 793	1 835			1 935			0.065	0.040	0.200	1.8 - 14.8	5.4								
<b>PSS2060N1D2335</b>	2 000	2 064	2 193	2 235			2 335			0.077	0.046	0.240	1.8 - 14.8	6.3								

\*1 Indicates ball screw preload control value. About 2.0 N-cm of torque is added due to thin plastic seal.  
Note 1: Service temperature range is 0 to 80°C.

Note 2: Recommended quantity of grease is about 50% of nut's internal space. See page 314 for details.



Unit: mm

Ball Screw Specifications	
Preload type	Oversized ball preload (P-preload)
Ball diameter / Screw shaft root diameter	3.175 / 22.2
Ball circle diameter	25.5
Accuracy grade / Axial play	C5 / 0
Factory-packed grease	NSK Grease LR3

Recommended Support Unit	Unit: mm	
	Fixed side	Simple support side
WBK20-01B (square)	○	○
WBK20S-01B (square)	○	○
WBK20-11 (round)	○	○

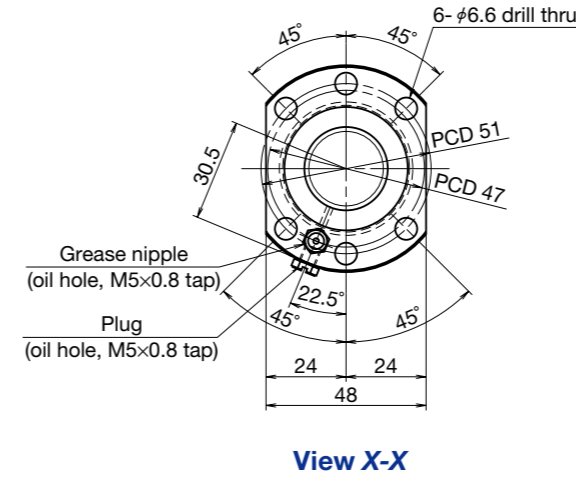
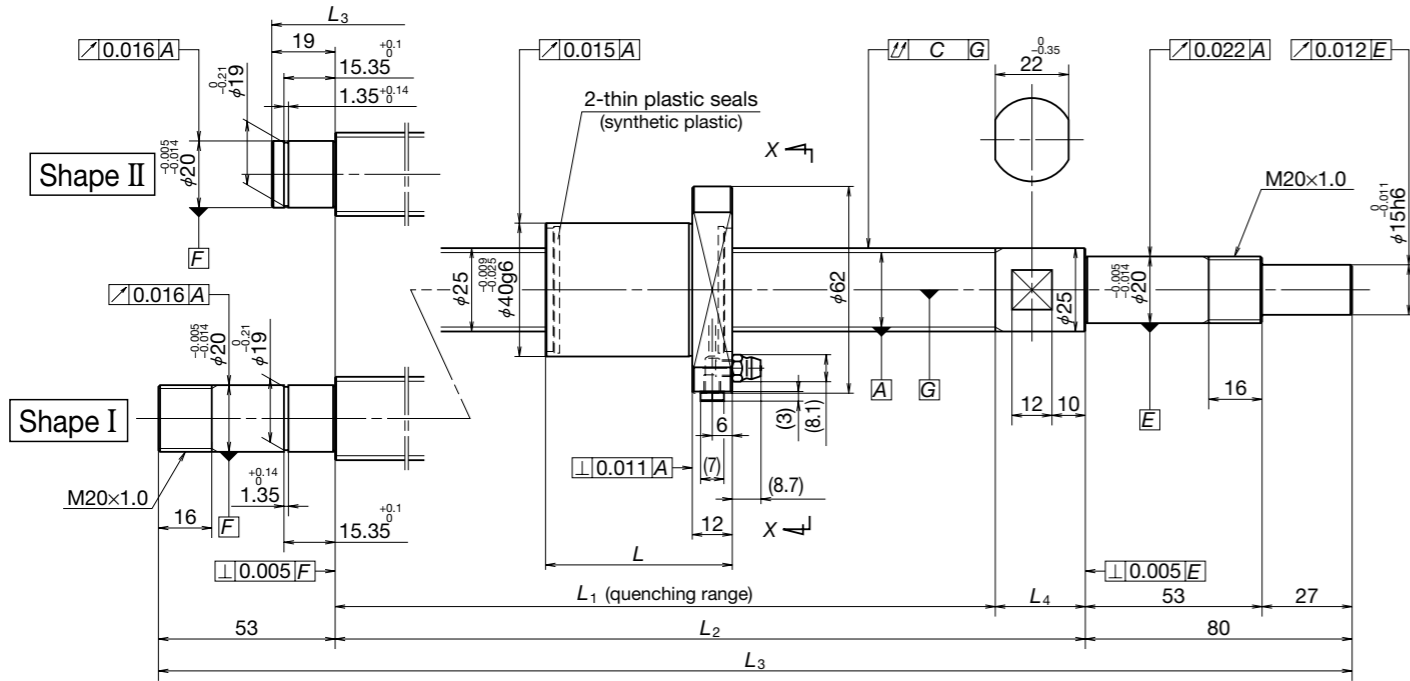
Part number	Screw shaft diameter $d$	Lead $l$	Basic load ratings (N)		Stroke		Nut length $L$	Screw shaft length				Left shaft end (opposite driven side)	Lead accuracy			Shaft run-out $C$	Dynamic preload torque (N-cm) *1	Mass (kg)	Limiting speeds (min <sup>-1</sup> )		Nut internal space (cm <sup>3</sup> )	Standard volume of grease replenishing (cm <sup>3</sup> )		
			Dynamic $C_a$	Static $C_{0a}$	Nominal	Max. $L_1 - L$		$L_1$	$L_2$	$L_3$	$L_4$		Target value $T$	Error $\theta_p$	Variation $\nu_U$				Fixed - Support	Fixed - Fixed				
																							Fixed - Support	Fixed - Fixed
<b>PSS2505N1D0349</b>	25	5	9 760	23 600	150	191	32	223	250	349	27	Shape II	0	0.023	0.018	0.035	1.2 - 9.3	1.5	5 000	-	4.4	2.2		
<b>PSS2505N1D0399</b>					200	241		273	300	399				0.023	0.018	0.035	1.2 - 9.3	1.6						
<b>PSS2505N1D0499</b>					300	341		373	400	499				0.025	0.020	0.040	1.2 - 9.3	2.0						
<b>PSS2505N1D0599</b>					400	441		473	500	599				0.027	0.020	0.045	1.2 - 9.3	2.3						
<b>PSS2505N1D0699</b>					500	541		573	600	699				0.030	0.023	0.055	0.8 - 10.8	2.7						
<b>PSS2505N1D0899</b>					700	741		773	800	899				0.035	0.025	0.065	0.8 - 10.8	3.4						
<b>PSS2505N1D0999</b>					800	841		873	900	999				0.040	0.027	0.065	0.8 - 10.8	3.7						
<b>PSS2505N1D1233</b>					1 000	1 041		1 073	1 100	1 233				0.046	0.030	0.080	0.8 - 13.8	4.5					4 100	4 000
<b>PSS2510N1D0549</b>					25	10		12 800	32 300	300				367	56	423	450	549					27	Shape II
<b>PSS2510N1D0649</b>	400	467	523	550			649			0.030	0.023	0.055	2.2 - 12.8	2.7										
<b>PSS2510N1D0749</b>	500	567	623	650			749			0.030	0.023	0.055	2.2 - 12.8	3.1										
<b>PSS2510N1D0849</b>	600	667	723	750			849			0.035	0.025	0.065	2.2 - 12.8	3.5										
<b>PSS2510N1D0949</b>	700	767	823	850			949			0.040	0.027	0.065	2.2 - 12.8	3.8										
<b>PSS2510N1D1049</b>	800	867	923	950			1 049			0.040	0.027	0.080	2.2 - 12.8	4.2		3 600								
<b>PSS2510N1D1283</b>	1 000	1 067	1 123	1 150			1 283			0.046	0.030	0.100	1.8 - 14.8	5.0		2 500	3 700							
<b>PSS2510N1D1883</b>	1 600	1 667	1 723	1 750			1 883			0.065	0.040	0.130	1.8 - 14.8	7.2		1 000	1 600							

\*1 Indicates ball screw preload control value. About 2.0 N-cm of torque is added due to thin plastic seal.  
Note 1: Service temperature range is 0 to 80°C.

Note 2: Recommended quantity of grease is about 50% of nut's internal space. See page 314 for details.

# Ball Screws Compact FA Series

## Compact FA Series PSS Type



Screw Shaft  $\phi 25$  Lead 20, 25

Unit: mm

Ball Screw Specifications	
Preload type	Oversized ball preload (P-preload)
Ball diameter / Screw shaft root diameter	3.175 / 22.2
Ball circle diameter	25.5
Accuracy grade / Axial play	C5 / 0
Factory-packed grease	NSK Grease LR3

Recommended Support Unit	Unit: mm	
	Fixed side	Simple support side
WBK20-01B (square)	○	○
WBK20S-01B (square)	○	○
WBK20-11 (round)	○	○

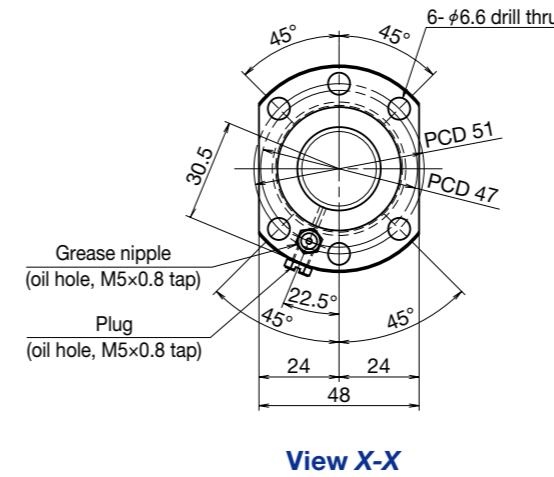
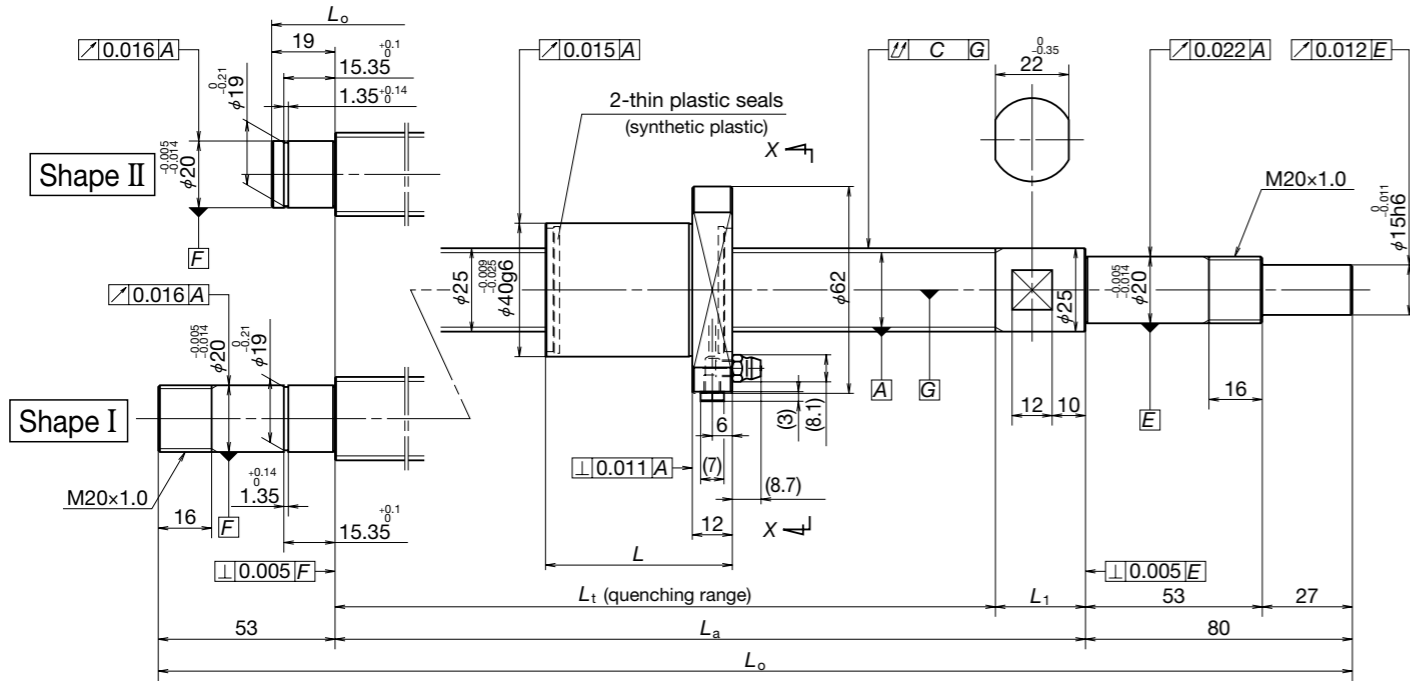
Part number	Screw shaft diameter $d$	Lead $l$	Basic load ratings (N)		Stroke		Nut length $L$	Screw shaft length				Left shaft end (opposite driven side)	Lead accuracy			Shaft run-out $C$	Dynamic preload torque (N-cm) *1	Mass (kg)	Limiting speeds (min <sup>-1</sup> )		Nut internal space (cm <sup>3</sup> )	Standard volume of grease replenishing (cm <sup>3</sup> )
			Dynamic $C_a$	Static $C_{0a}$	Nominal	Max. $L_1 - L$		$L_1$	$L_2$	$L_3$	$L_4$		Target value $T$	Error $\theta_p$	Variation $\nu_{ij}$				Fixed - Support	Fixed - Fixed		
<b>PSS2520N1D0729</b>	25	20	6 560	14 600	500	550	54	604	630	729	26	Shape II	0	0.030	0.023	0.055	2.2 - 12.8	3.1	5 000	3.9	2.0	
<b>PSS2520N1D0829</b>					600	650		704	730	829				0.035	0.025	0.065	2.2 - 12.8	3.4				
<b>PSS2520N1D0929</b>					700	750		804	830	929				0.040	0.027	0.065	2.2 - 12.8	3.8				
<b>PSS2520N1D1029</b>					800	850		904	930	1 029				0.040	0.027	0.080	2.2 - 12.8	4.2				
<b>PSS2520N1D1263</b>					1 000	1 050		1 104	1 130	1 263				0.046	0.030	0.100	1.8 - 14.8	5.0	2 600			3 800
<b>PSS2520N1D1463</b>					1 200	1 250		1 304	1 330	1 463				0.054	0.035	0.100	1.8 - 14.8	5.8	1 800			2 700
<b>PSS2520N1D1863</b>					1 600	1 650		1 704	1 730	1 863				0.065	0.040	0.130	1.8 - 14.8	7.3	1 100			1 600
<b>PSS2520N1D2263</b>					2 000	2 050		2 104	2 130	2 263				0.077	0.046	0.170	1.8 - 14.8	8.8	700			1 000
<b>PSS2525N1D0779</b>	25	25	6 560	14 600	500	587	63	650	680	779	30	Shape II	0	0.035	0.025	0.055	2.7 - 13.8	3.3	5 000	4.3	2.2	
<b>PSS2525N1D0879</b>					600	687		750	780	879				0.035	0.025	0.065	2.7 - 13.8	3.7				
<b>PSS2525N1D0979</b>					700	787		850	880	979				0.040	0.027	0.065	2.7 - 13.8	4.1				
<b>PSS2525N1D1079</b>					800	887		950	980	1 079				0.040	0.027	0.080	2.7 - 13.8	4.4				
<b>PSS2525N1D1313</b>					1 000	1 087		1 150	1 180	1 313				0.046	0.030	0.100	1.8 - 14.8	5.3	2 300			3 500
<b>PSS2525N1D1513</b>					1 200	1 287		1 350	1 380	1 513				0.054	0.035	0.100	1.8 - 14.8	6.0	1 700			2 600
<b>PSS2525N1D1913</b>					1 600	1 687		1 750	1 780	1 913				0.065	0.040	0.130	1.8 - 14.8	7.5	1 000			1 500
<b>PSS2525N1D2313</b>					2 000	2 087		2 150	2 180	2 313				0.077	0.046	0.170	1.8 - 14.8	9.1	700			1 000

\*1 Indicates ball screw preload control value. About 2.0 N-cm of torque is added due to thin plastic seal.  
Note 1: Service temperature range is 0 to 80°C.

Note 2: Recommended quantity of grease is about 50% of nut's internal space. See page 314 for details.

# Ball Screws Compact FA Series

## Compact FA Series PSS Type



Screw Shaft  $\phi 25$  Lead 30, 50

Unit: mm

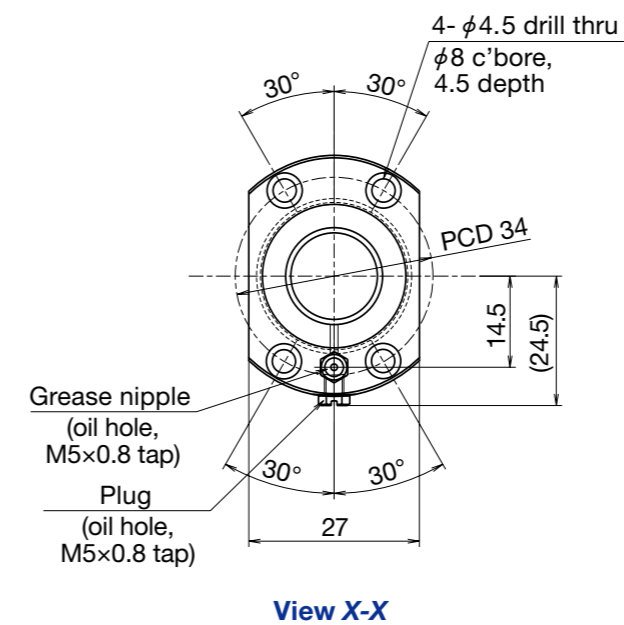
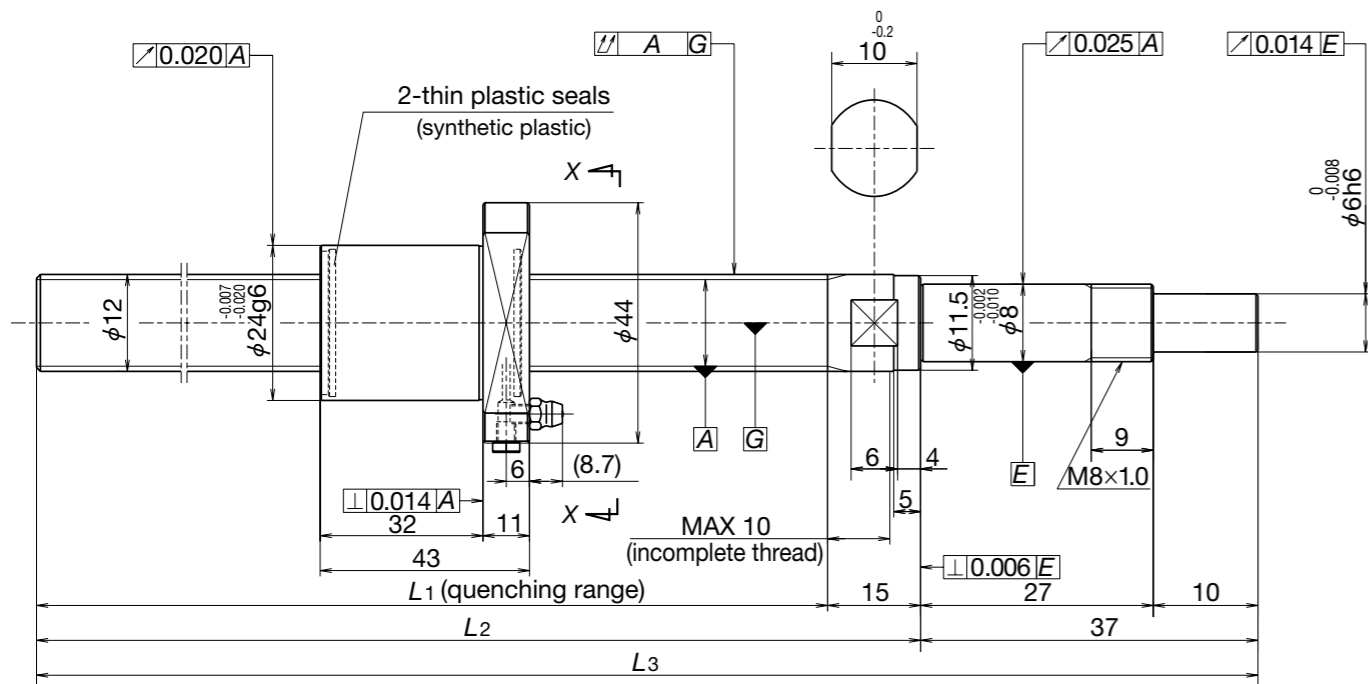
Ball Screw Specifications	
Preload type	Oversized ball preload (P-preload)
Ball diameter / Screw shaft root diameter	3.175 / 22.2
Ball circle diameter	25.5
Accuracy grade / Axial play	C5 / 0
Factory-packed grease	NSK Grease LR3

Recommended Support Unit	Unit: mm	
	Fixed side	Simple support side
WBK20-01 (square)	○	○
WBK20S-01 (square)	○	○
WBK20-11 (round)	○	○

Part number	Screw shaft diameter $d$	Lead $l$	Basic load ratings (N)		Stroke		Nut length $L$	Screw shaft length				Left shaft end (opposite driven side)	Lead accuracy			Shaft run-out $C$	Dynamic preload torque (N-cm) *1	Mass (kg)	Limiting speeds (min <sup>-1</sup> )		Nut internal space (cm <sup>3</sup> )	Standard volume of grease replenishing (cm <sup>3</sup> )		
			Dynamic $C_a$	Static $C_{0a}$	Nominal	Max. $L_1 - L$		$L_1$	$L_a$	$L_o$	$L_1$		Target value $T$	Error $\theta_p$	Variation $\nu_{ij}$				Fixed - Support	Fixed - Fixed				
																							$L_1$	$L_a$
<b>PSS2530N1D0779</b>	25	30	6 560	14 600	500	576	74	650	680	779	30	Shape II	0	0.035	0.025	0.055	2.7 - 13.8	3.4	5 000	—	5.5	2.8		
<b>PSS2530N1D0879</b>					600	676		750	780	879				0.035	0.025	0.065	2.7 - 13.8	3.7						
<b>PSS2530N1D0979</b>					700	776		850	880	979				0.040	0.027	0.065	2.7 - 13.8	4.1						
<b>PSS2530N1D1079</b>					800	876		950	980	1 079				0.040	0.027	0.080	2.7 - 13.8	4.5						
<b>PSS2530N1D1313</b>					1 000	1 076		1 150	1 180	1 313				0.046	0.030	0.100	1.8 - 14.8	5.3					2 300	3 600
<b>PSS2530N1D1513</b>					1 200	1 276		1 350	1 380	1 513				0.054	0.035	0.100	1.8 - 14.8	6.1					1 700	2 600
<b>PSS2530N1D1913</b>					1 600	1 676		1 750	1 780	1 913				0.065	0.040	0.130	1.8 - 14.8	7.6					1 000	1 500
<b>PSS2530N1D2313</b>					2 000	2 076		2 150	2 180	2 313				0.077	0.046	0.170	1.8 - 14.8	9.1					700	1 000
<b>PSS2550N1D0829</b>	25	50	6 560	14 600	500	576	114	690	730	829	40	Shape II	0	0.035	0.025	0.065	5.4 - 17.6	3.8	5 000	—	7.7	3.9		
<b>PSS2550N1D0929</b>					600	676		790	830	929				0.035	0.025	0.065	5.4 - 17.6	4.1						
<b>PSS2550N1D1029</b>					700	776		890	930	1 029				0.040	0.027	0.080	5.4 - 17.6	4.5						
<b>PSS2550N1D1129</b>					800	876		990	1 030	1 129				0.040	0.027	0.080	5.4 - 17.6	4.9						
<b>PSS2550N1D1363</b>					1 000	1 076		1 190	1 230	1 363				0.046	0.030	0.100	4.1 - 19.6	5.8					2 200	3 400
<b>PSS2550N1D1563</b>					1 200	1 276		1 390	1 430	1 563				0.054	0.035	0.100	4.1 - 19.6	6.5					1 600	2 500
<b>PSS2550N1D1963</b>					1 600	1 676		1 790	1 830	1 963				0.065	0.040	0.130	4.1 - 19.6	8.0					900	1 500
<b>PSS2550N1D2363</b>					2 000	2 076		2 190	2 230	2 363				0.077	0.046	0.170	4.1 - 19.6	9.6					600	1 000

\*1 Indicates ball screw preload control value. About 2.0 N-cm of torque is added due to thin plastic seal.  
Note 1: Service temperature range is 0 to 80°C.

Note 2: Recommended quantity of grease is about 50% of nut's internal space. See page 314 for details.



Unit: mm

Ball Screw Specifications	
Ball diameter / Screw shaft root diameter	2.000 / 10.2
Ball circle diameter	12.3
Accuracy grade / Axial play	Ct7 / 0.010 or less
Factory-packed grease	NSK Grease PS2

Recommended Support Unit	Fixed side	Simple support side
	WBK08-01B (square)	○
WBK12SF-01B (square)		○
WBK08-11B (round)	○	

Part number	Screw shaft diameter $d$	Lead $l$	Basic load ratings (N)		Screw shaft length			Lead accuracy			Shaft run-out $A$	Mass (kg)	Limiting speeds (min <sup>-1</sup> )	Nut internal space (cm <sup>3</sup> )	Standard volume of grease replenishing (cm <sup>3</sup> )
			Dynamic $C_a$	Static $C_{0a}$	$L_1$	$L_2$	$L_3$	Target value $T$	Error $e_p$	Variation $v_{300}$			Fixed - Support		
													5 000		
<b>FSS1210N1D0400</b>	12	10	3 200	5 860	348	363	400	0	0.120	0.052	0.080	0.4	5 000	1.0	0.5
<b>FSS1210N1D0600</b>	12	10	3 200	5 860	548	563	600	0	0.195	0.052	0.120	0.6	5 000	1.0	0.5
<b>FSS1210N1D0900</b>	12	10	3 200	5 860	848	863	900	0	0.310	0.052	0.180	0.8	2 000	1.0	0.5

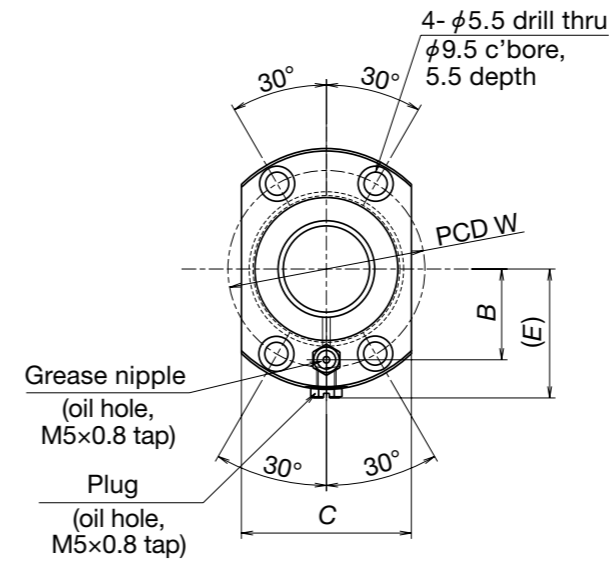
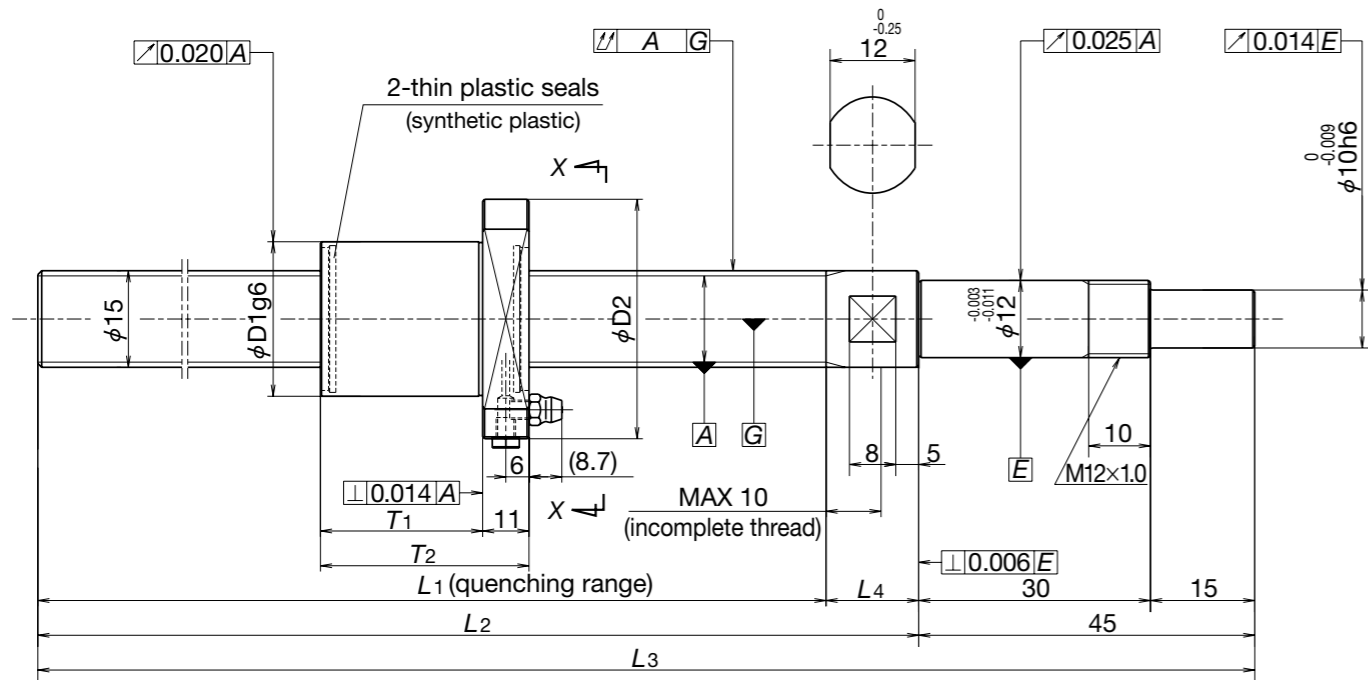
Note 1: Friction torque is about 2.0 N·cm due to thin plastic seal.  
 Note 2: Service temperature range is 0 to 80°C.

Note 3: Recommended quantity of grease is about 50% of nut's internal space. See page 314 for details.

# Ball Screws Compact FA Series

## Compact FA Series for Conveyor FSS Type

Screw Shaft  $\phi 15$  Lead 10, 20



View X-X

Unit: mm

Ball Screw Specifications	
Ball diameter / Screw shaft root diameter	2.778 / 12.6
Ball circle diameter	15.5
Accuracy grade / Axial play	Ct7 / 0.010 or less
Factory-packed grease	NSK Grease LR3

Recommended Support Unit	Unit: mm	
	Fixed side	Simple support side
WBK12-01B (square)	○	
WBK15SF-01B (square)		○
WBK12-11 (round)	○	

Unit: mm

Part number	Screw shaft diameter $d$	Lead $l$	Basic load ratings (N)		Screw shaft length				Nut dimensions							Lead accuracy			Shaft run-out $A$	Mass (kg)	Limiting speeds (min <sup>-1</sup> ) Fixed - Support	Nut internal space (cm <sup>3</sup> )	Standard volume of grease replenishing (cm <sup>3</sup> )	
			Dynamic $C_a$	Static $C_{0a}$	$L_1$	$L_2$	$L_3$	$L_4$	$T_1$	$T_2$	$D_1$	$D_2$	$W$	$B$	$C$	$E$	Target value $T$	Error $e_p$						Variation $v_{300}$
<b>FSS1510N1D0500</b>	15	10	5 460	10 200	440	455	500	15	32	43	28	51	39	18	31	28	0	0.155	0.052	0.070	0.7	5 000	2.0	1.0
<b>FSS1510N1D1000</b>					940	955	1 000	15	32	43	28	51	39	18	31	28				0.310				
<b>FSS1510N1D1450</b>					1 390	1 405	1 450	15	32	43	28	51	39	18	31	28				0.490				
<b>FSS1520N1D0500</b>	15	20	5 070	8 730	437	455	500	18	40	51	32	55	43	20	33	30	0	0.155	0.052	0.070	0.8	5 000	2.8	1.4
<b>FSS1520N1D1000</b>					937	955	1 000	18	40	51	32	55	43	20	33	30				0.310				
<b>FSS1520N1D1450</b>					1 387	1 405	1 450	18	40	51	32	55	43	20	33	30				0.490				

Note 1: Friction torque is about 2.0 N·cm due to thin plastic seal.  
Note 2: Service temperature range is 0 to 80°C.

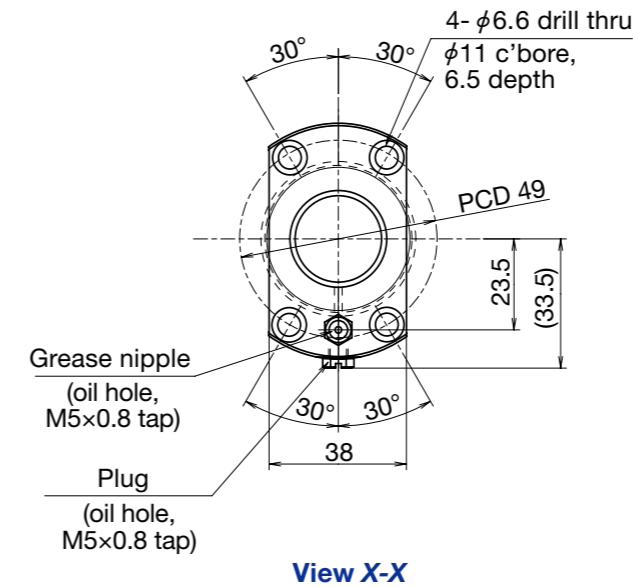
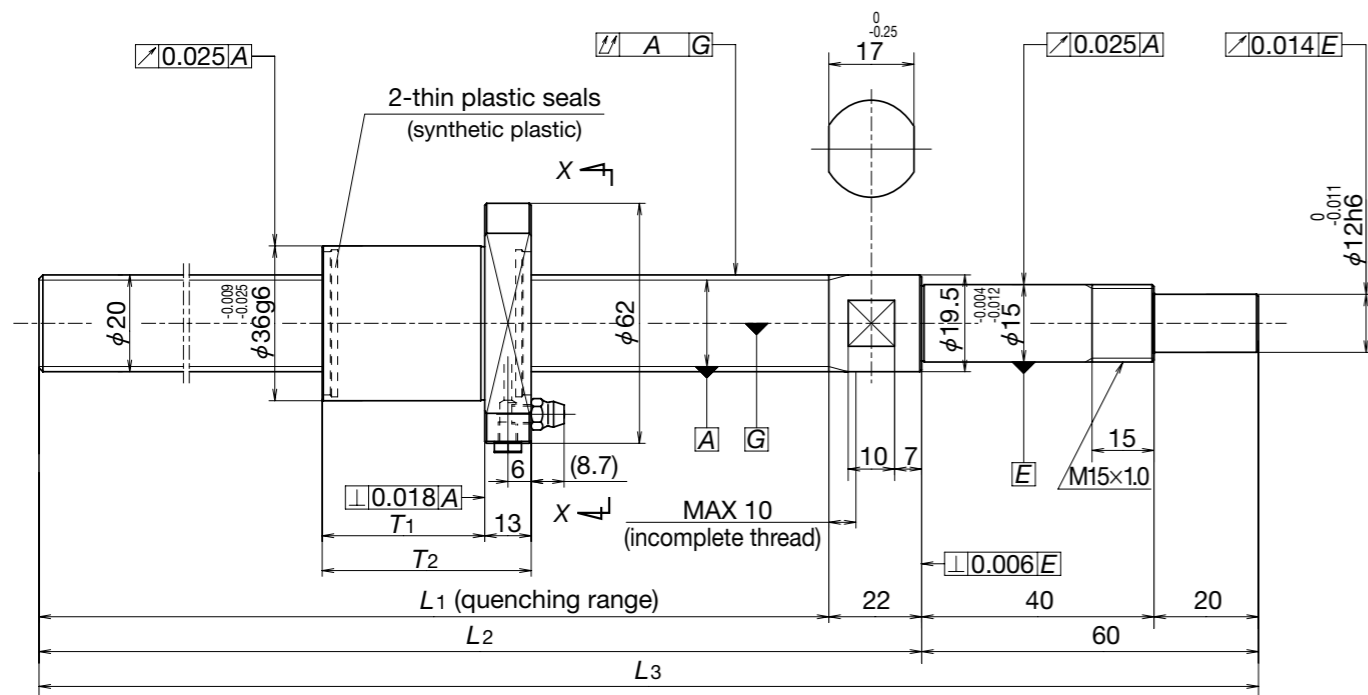
Note 3: Recommended quantity of grease is about 50% of nut's internal space. See page 314 for details.



# Ball Screws Compact FA Series

## Compact FA Series for Conveyor FSS Type

Screw Shaft  $\phi 20$  Lead 10, 20



Unit: mm

Ball Screw Specifications	
Ball diameter / Screw shaft root diameter	3.175 / 17.2
Ball circle diameter	20.5
Accuracy grade / Axial play	Ct7 / 0.010 or less
Factory-packed grease	NSK Grease LR3

Recommended Support Unit	Unit: mm	
	Fixed side	Simple support side
WBK15-01B (square)	○	
WBK20SF-01B (square)		○
WBK15-11 (round)	○	

Unit: mm

Part number	Screw shaft diameter $d$	Lead $l$	Basic load ratings (N)		Screw shaft length			Nut dimensions		Lead accuracy			Shaft run-out $A$	Mass (kg)	Limiting speeds (min <sup>-1</sup> )		Nut internal space (cm <sup>3</sup> )	Standard volume of grease replenishing (cm <sup>3</sup> )
			Dynamic $C_a$	Static $C_{0a}$	$L_1$	$L_2$	$L_3$	$T_1$	$T_2$	Target value $T$	Error $e_p$	Variation $v_{300}$			Fixed - Support			
<b>FSS2010N1D0600</b>	20	10	8 790	18 500	518	540	600	32	45	0	0.195	0.052	0.085	1.4	5 000		3.2	1.6
<b>FSS2010N1D1000</b>					918	940	1 000								0.310			
<b>FSS2010N1D1450</b>					1 368	1 390	1 450								0.490			
<b>FSS2020N1D0600</b>	20	20	5 900	11 700	518	540	600	41	54	0	0.195	0.052	0.085	1.5	5 000		3.2	1.6
<b>FSS2020N1D1000</b>					918	940	1 000								0.310			
<b>FSS2020N1D1450</b>					1 368	1 390	1 450								0.490			

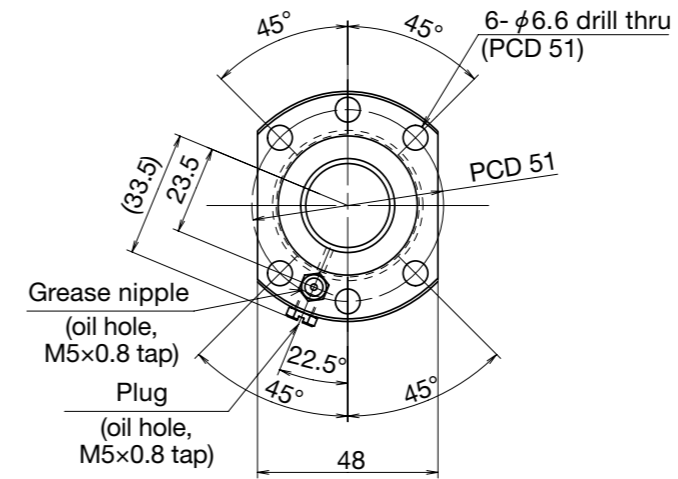
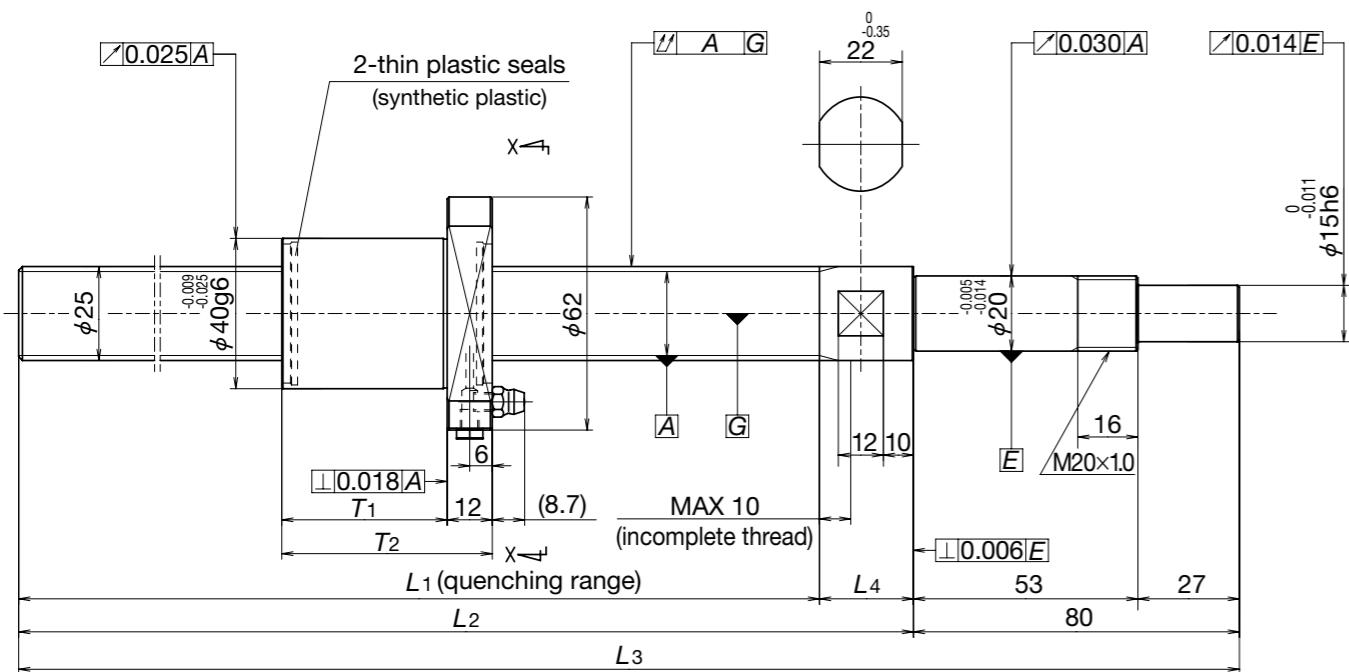
Note 1: Friction torque is about 2.0 N·cm due to thin plastic seal.  
Note 2: Service temperature range is 0 to 80°C.

Note 3: Recommended quantity of grease is about 50% of nut's internal space. See page 314 for details.

# Ball Screws Compact FA Series

## Compact FA Series for Conveyor FSS Type

Screw Shaft  $\phi 25$  Lead 10, 20, 25



View X-X

Unit: mm

Ball Screw Specifications	
Ball diameter / Screw shaft root diameter	3.175 / 22.2
Ball circle diameter	25.5
Accuracy grade / Axial play	Ct7 / 0.010 or less
Factory-packed grease	NSK Grease LR3

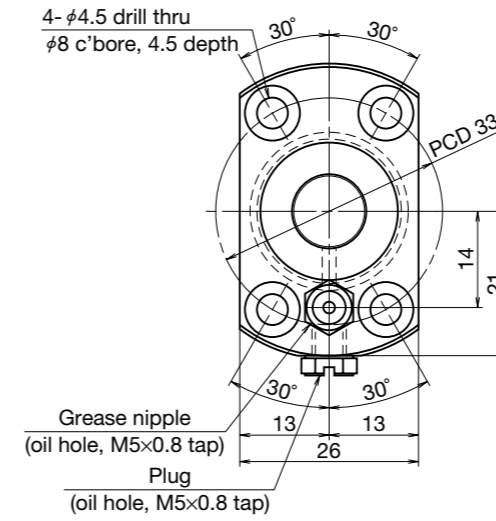
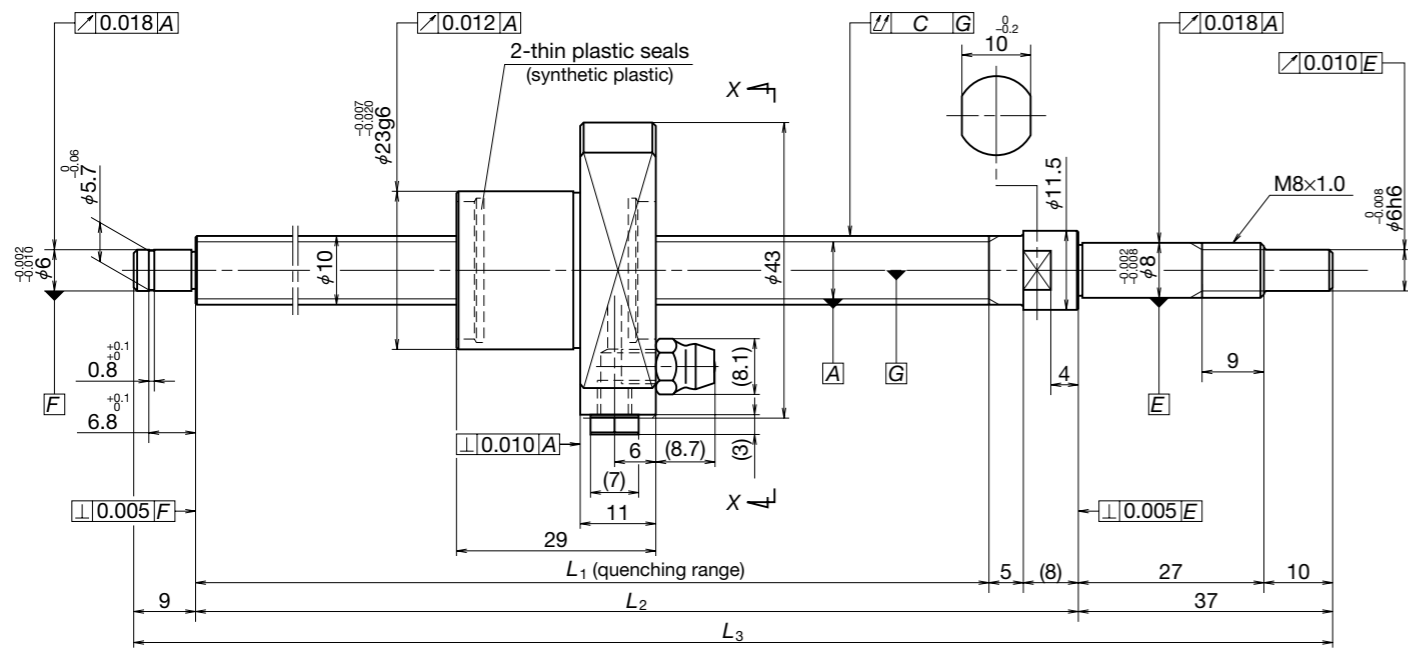
Recommended Support Unit	Unit: mm	
	Fixed side	Simple support side
WBK20-01 (square)	○	
WBK25SF-01 (square)		○
WBK20-11 (round)	○	

Unit: mm

Part number	Screw shaft diameter $d$	Lead $l$	Basic load ratings (N)		Screw shaft length				Nut dimensions		Lead accuracy			Shaft run-out $A$	Mass (kg)	Limiting speeds ( $\text{min}^{-1}$ )		Nut internal space ( $\text{cm}^3$ )	Standard volume of grease replenishing ( $\text{cm}^3$ )
			Dynamic $C_a$	Static $C_{0a}$	$L_1$	$L_2$	$L_3$	$L_4$	$T_1$	$T_2$	Target value $T$	Error $e_p$	Variation $v_{300}$			Fixed - Support			
<b>FSS2510N1D0600</b>	25	10	12 800	32 300	493	520	600	27	44	56	0	0.155	0.052	0.065	2.2	5 000		4.7	2.4
<b>FSS2510N1D1000</b>					893	920	1 000									0.310			
<b>FSS2510N1D1450</b>					1 343	1 370	1 450									0.490			
<b>FSS2520N1D0600</b>	25	20	6 560	14 600	494	520	600	26	42	54	0	0.155	0.052	0.065	2.3	5 000		3.9	2.0
<b>FSS2520N1D1000</b>					894	920	1 000									0.310			
<b>FSS2520N1D1450</b>					1 344	1 370	1 450									0.490			
<b>FSS2525N1D0600</b>	25	25	6 560	14 600	490	520	600	30	51	63	0	0.155	0.052	0.065	2.3	5 000		4.3	2.2
<b>FSS2525N1D1000</b>					890	920	1 000									0.310			
<b>FSS2525N1D1450</b>					1 340	1 370	1 450									0.490			

Note 1: Friction torque is about 2.0 N·cm due to thin plastic seal.  
 Note 2: Service temperature range is 0 to 80°C.

Note 3: Recommended quantity of grease is about 50% of nut's internal space. See page 314 for details.



View X-X

Unit: mm

Ball Screw Specifications	
Preload type	Oversized ball preload (P-preload)
Ball diameter / Screw shaft root diameter	2.000 / 8.2
Ball circle diameter	10.3
Accuracy grade / Axial play	C3 / 0
Factory-packed grease	NSK Grease LG2 with low particle emissions

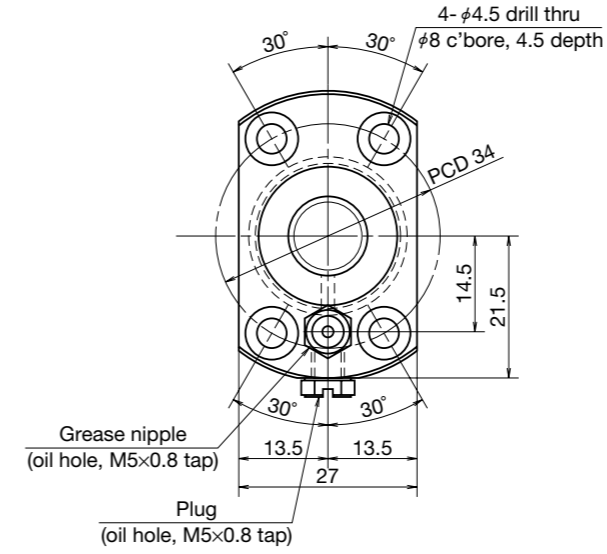
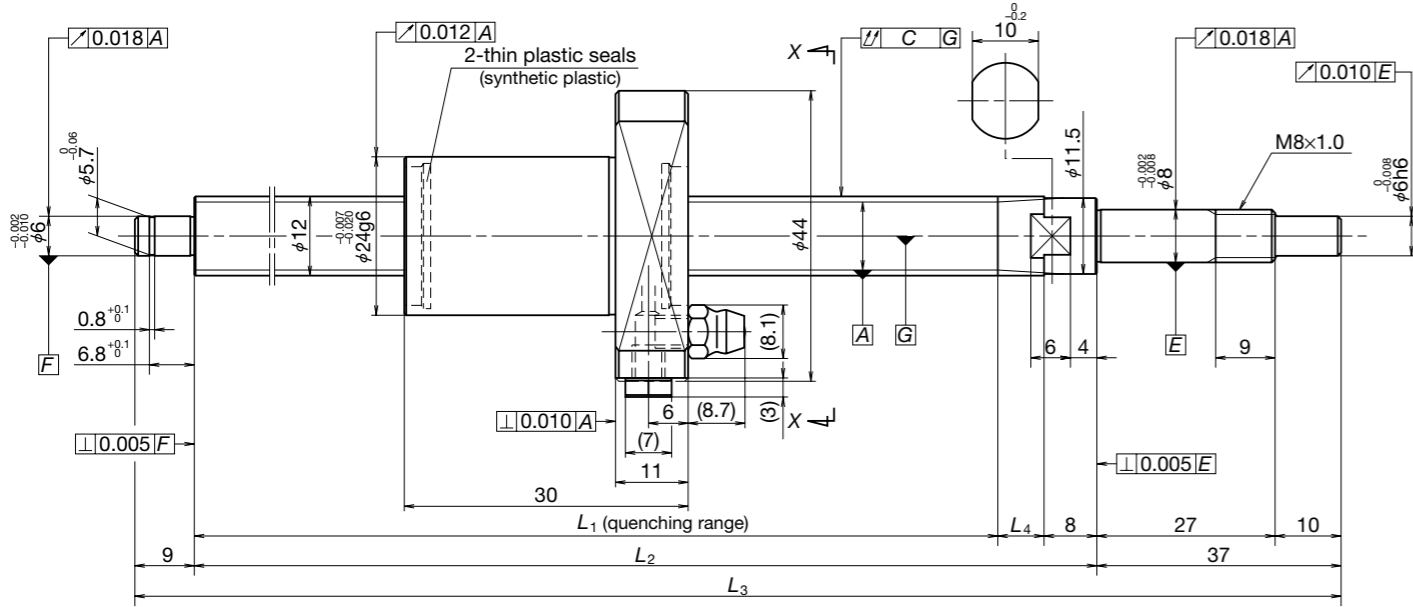
Recommended Support Unit	Unit: mm	
	Fixed side	Simple support side
WBK08-01B (square)	○	
WBK08S-01B (square)		○
WBK08-11B (round)	○	

Unit: mm

Part number	Screw shaft diameter $d$	Lead $l$	Basic load ratings (N)		Stroke		Screw shaft length			Lead accuracy			Shaft run-out $C$	Dynamic preload torque (N-cm) *1	Mass (kg)	Limiting speeds (min <sup>-1</sup> )	Nut internal space (cm <sup>3</sup> )	Standard volume of grease replenishing (cm <sup>3</sup> )
			Dynamic $C_a$	Static $C_{0a}$	Nominal	Max. $L_1 - L$	$L_1$	$L_2$	$L_3$	Target value $T$	Error $\theta_p$	Variation $\nu_U$				Fixed - Support		
<b>USS1005N1D0221</b>	10	5	2 930	4 790	100	133	162	175	221	0	0.010	0.008	0.035	0.2 – 1.3	0.3	5 000	0.8	0.4
<b>USS1005N1D0321</b>	10	5	2 930	4 790	200	233	262	275	321	0	0.012	0.008	0.045	0.2 – 2.0	0.3	5 000	0.8	0.4
<b>USS1005N1D0521</b>	10	5	2 930	4 790	400	433	462	475	521	0	0.015	0.010	0.070	0.2 – 3.0	0.5	5 000	0.8	0.4

\*1 Indicates ball screw preload control value. About 2.0 N-cm of torque is added due to thin plastic seal.  
Note 1: Service temperature range is 0 to 80°C.

Note 2: Recommended quantity of grease is about 50% of nut's internal space. See page 314 for details.



View X-X

Unit: mm

Ball Screw Specifications	
Preload type	Oversized ball preload (P-preload)
Ball diameter / Screw shaft root diameter	2.000 / 10.2
Ball circle diameter	12.3
Accuracy grade / Axial play	C3 / 0
Factory-packed grease	NSK Grease LG2 with low particle emissions

Recommended Support Unit	Fixed side		Simple support side	
	○	○	○	○
WBK08-01B (square)	○			
WBK08S-01B (square)				○
WBK08-11B (round)	○			

Part number	Screw shaft diameter $d$	Lead $l$	Basic load ratings (N)		Stroke		Nut length $L$	Screw shaft length				Lead accuracy			Shaft run-out $C$	Dynamic preload torque (N-cm) *1	Mass (kg)	Limiting speeds (min <sup>-1</sup> )		Nut internal space (cm <sup>3</sup> )	Standard volume of grease replenishing (cm <sup>3</sup> )
			Dynamic $C_a$	Static $C_{0a}$	Nominal	Max. $L_1 - L$		$L_1$	$L_2$	$L_3$	$L_4$	Target value $T$	Error $\theta_p$	Variation $\nu_u$				Fixed - Support			
																		Fixed	Support		
USS1205N1D0221	12	5	3 200	5 860	100	130	30	160	175	221	7	0	0.010	0.008	0.035	0.2 - 1.8	0.3	5 000	1.0	0.5	
USS1205N1D0321	12	5	3 200	5 860	200	230	30	260	275	321	7	0	0.012	0.008	0.045	0.2 - 2.0	0.4	5 000	1.0	0.5	
USS1205N1D0621	12	5	3 200	5 860	500	530	30	560	575	621	7	0	0.016	0.012	0.070	0.2 - 2.0	0.7	5 000	1.0	0.5	

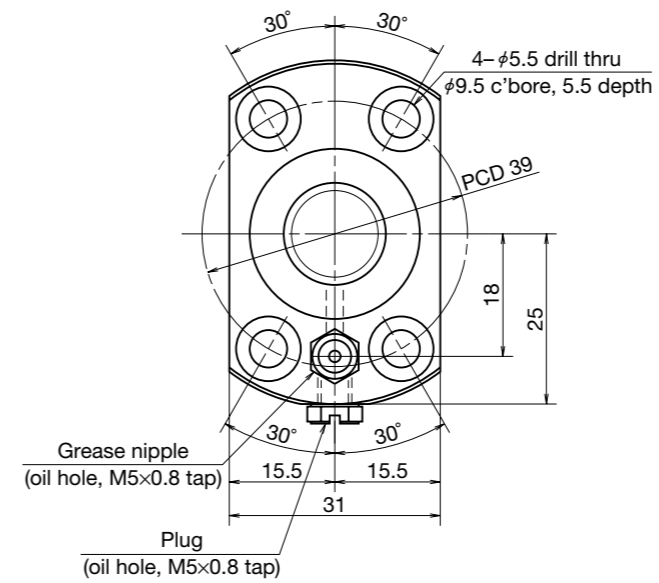
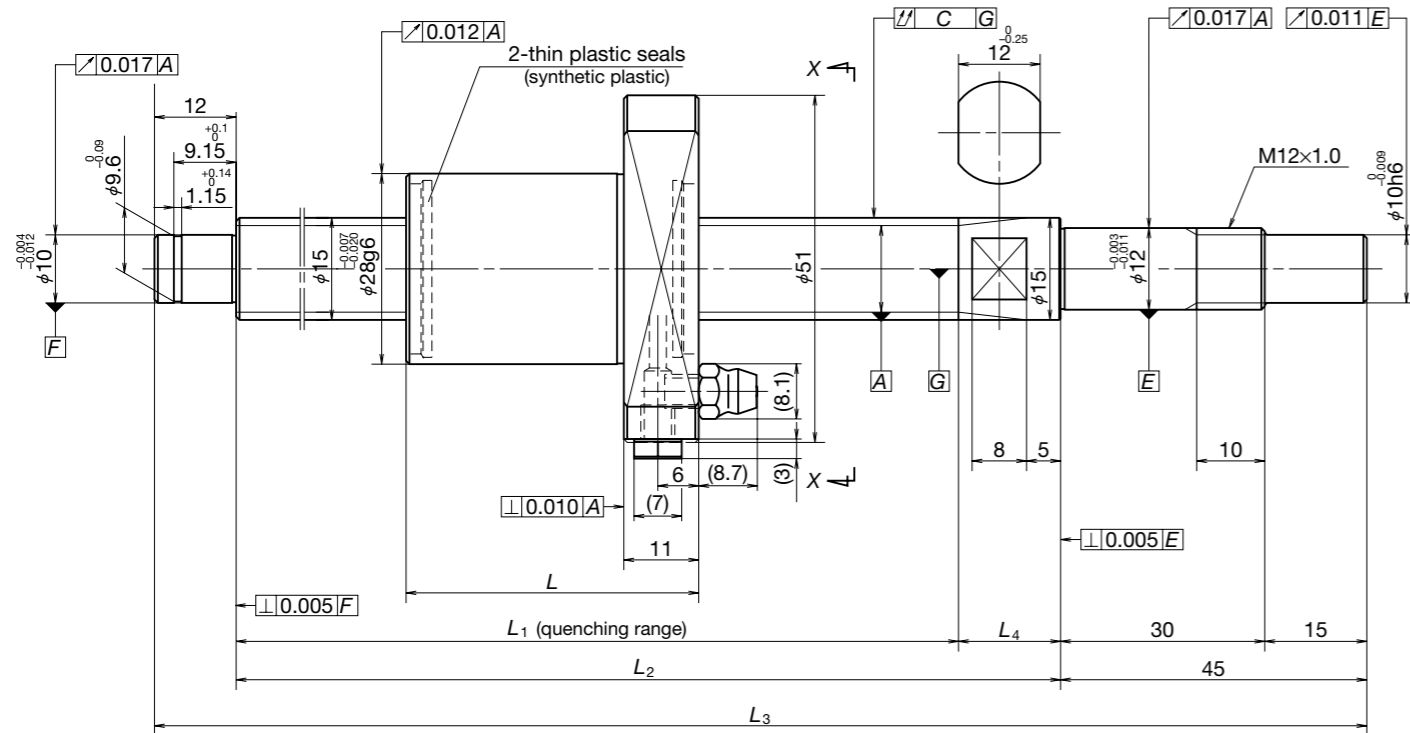
\*1 Indicates ball screw preload control value. About 2.0 N-cm of torque is added due to thin plastic seal.  
Note 1: Service temperature range is 0 to 80°C.

Note 2: Recommended quantity of grease is about 50% of nut's internal space. See page 314 for details.

# Ball Screws Compact FA Series

## Compact FA High Precision Series USS Type

Screw Shaft  $\phi 15$  Lead 5



View X-X

Unit: mm

Ball Screw Specifications	
Preload type	Oversized ball preload (P-preload)
Ball diameter / Screw shaft root diameter	2.778 / 12.6
Ball circle diameter	15.5
Accuracy grade / Axial play	C3 / 0
Factory-packed grease	NSK Grease LG2 with low particle emissions

Recommended Support Unit	Fixed side		Simple support side	
	○	○	○	○
WBK12-01B (square)	○			
WBK12S-01B (square)				○
WBK12-11 (round)	○			
WBK10-01B (square)				○
WBK10-11 (round)				○

Part number	Screw shaft diameter $d$	Lead $l$	Basic load ratings (N)		Stroke		Nut length $L$	Screw shaft length				Lead accuracy			Shaft run-out $C$	Dynamic preload torque (N-cm) *1	Mass (kg)	Limiting speeds (min <sup>-1</sup> )		Nut internal space (cm <sup>3</sup> )	Standard volume of grease replenishing (cm <sup>3</sup> )
			Dynamic $C_a$	Static $C_{0a}$	Nominal	Max. $L_1 - L$		$L_1$	$L_2$	$L_3$	$L_4$	Target value $T$	Error $\theta_p$	Variation $\nu_u$				Fixed - Support			
																		5 460	10 200		
<b>USS1505N1D0261</b>	15	5	5 460	10 200	100	159	30	189	204	261	15	0	0.010	0.008	0.025	0.2 - 5.0	0.5	5 000	2.0	1.0	
<b>USS1505N1D0361</b>	15	5	5 460	10 200	200	259	30	289	304	361	15	0	0.012	0.008	0.035	0.2 - 5.0	0.6	5 000	2.0	1.0	
<b>USS1505N1D0561</b>	15	5	5 460	10 200	400	459	30	489	504	561	15	0	0.015	0.010	0.045	0.2 - 6.0	0.9	5 000	2.0	1.0	
<b>USS1505N1D0761</b>	15	5	5 460	10 200	600	659	30	689	704	761	15	0	0.018	0.013	0.060	0.2 - 8.0	1.1	3 600	2.0	1.0	

\*1 Indicates ball screw preload control value. About 2.0 N-cm of torque is added due to thin plastic seal.  
Note 1: Service temperature range is 0 to 80°C.

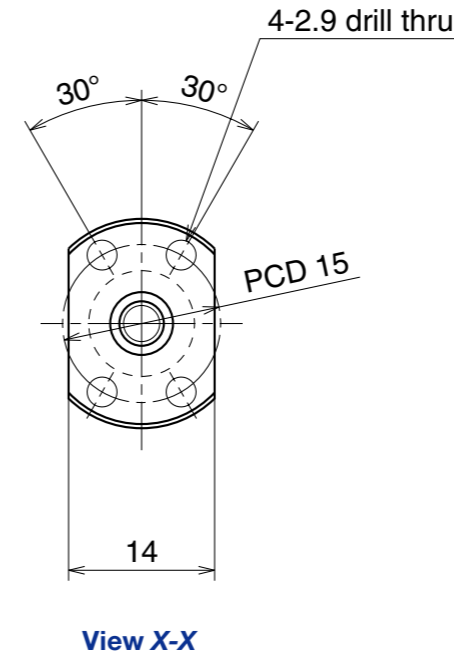
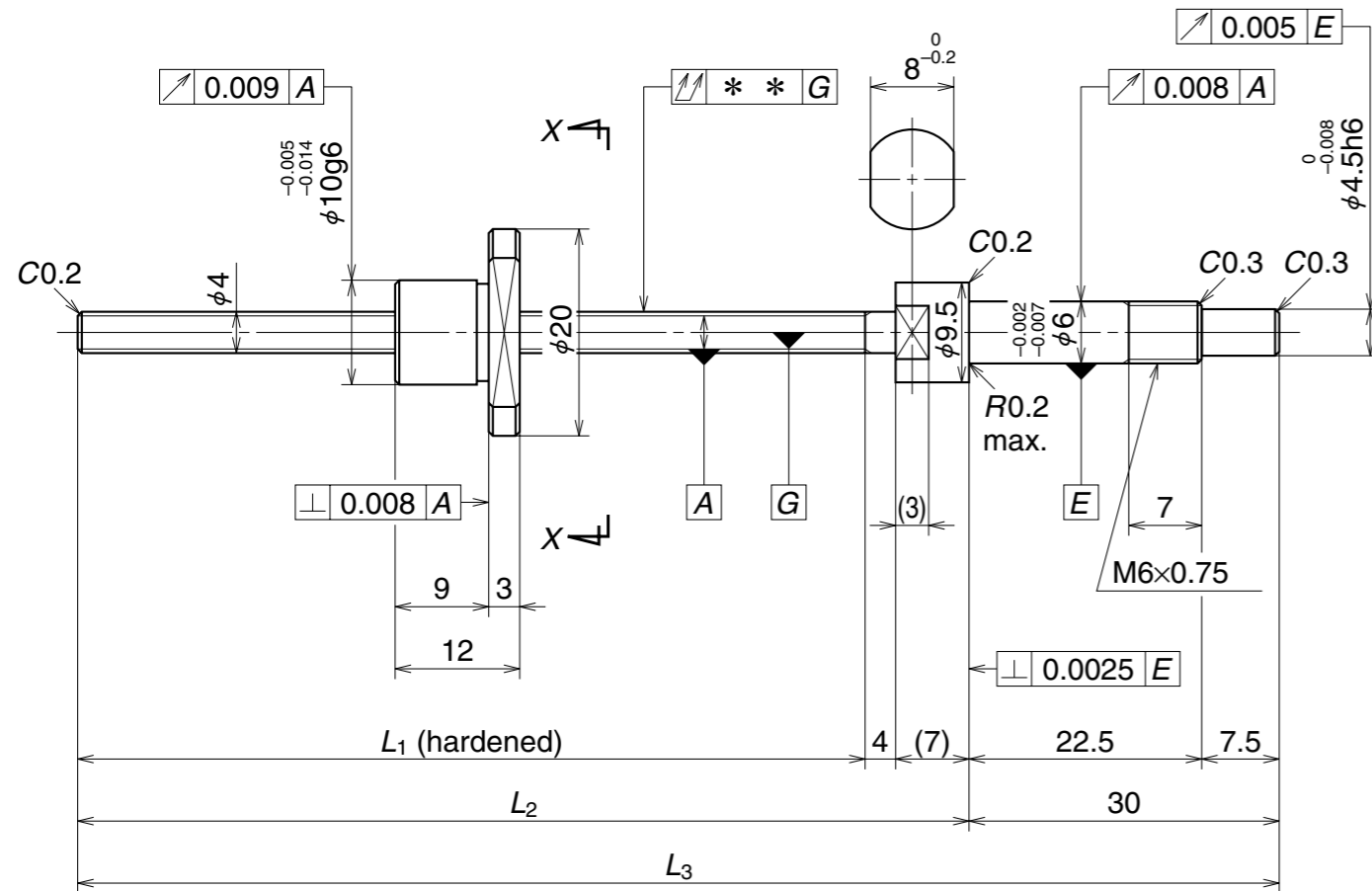
Note 2: Recommended quantity of grease is about 50% of nut's internal space. See page 314 for details.

# Ball Screws A Series: Finished Shaft End

Nut Model: MPFD

Screw Shaft  $\phi 4$  Lead 1

Unit: mm



Ball Screw Specifications		
Shaft dia. x Lead / Direction of turn	4 x 1 / Right	
Preload / Ball recirculation	P-preload / Deflector	
Ball dia. / Ball circle dia.	0.800 / 4.2	
Effective turns of balls	1 x 2	
Accuracy grade / Preload	C3 / Z	
Basic load rating (N)	Dynamic $C_a$	315
	Static $C_{0a}$	370
Axial play	0	
Dynamic friction torque (N·cm)	1.0 or less	
Spacer ball	None	
Factory-packed grease	NSK grease PS2	

Recommended Support Unit	
WBK06-01A (square)	
WBK06-11 (round)	

Unit: mm

Part number	Stroke		Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )
	Nominal	Maximum (L <sub>1</sub> -Nut length)	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	Target value $T$	Error $e_p$	Variation $v_u$			Supporting condition
<b>W0400MA-1PY-C3Z1</b>	20	32	44	55	85	0	0.008	0.008	0.015	0.024	3 000
<b>W0400MA-3PY-C3Z1</b>	40	52	64	75	105	0	0.008	0.008	0.020	0.026	3 000
<b>W0401MA-1PY-C3Z1</b>	70	82	94	105	135	0	0.008	0.008	0.025	0.028	3 000

Note 1: NSK grease PS2 is recommended. Apply to screw shaft surface when replenishing.

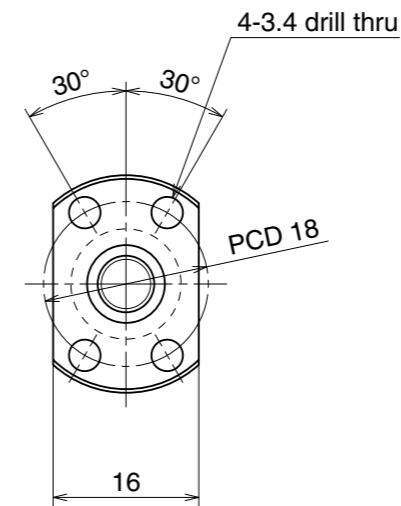
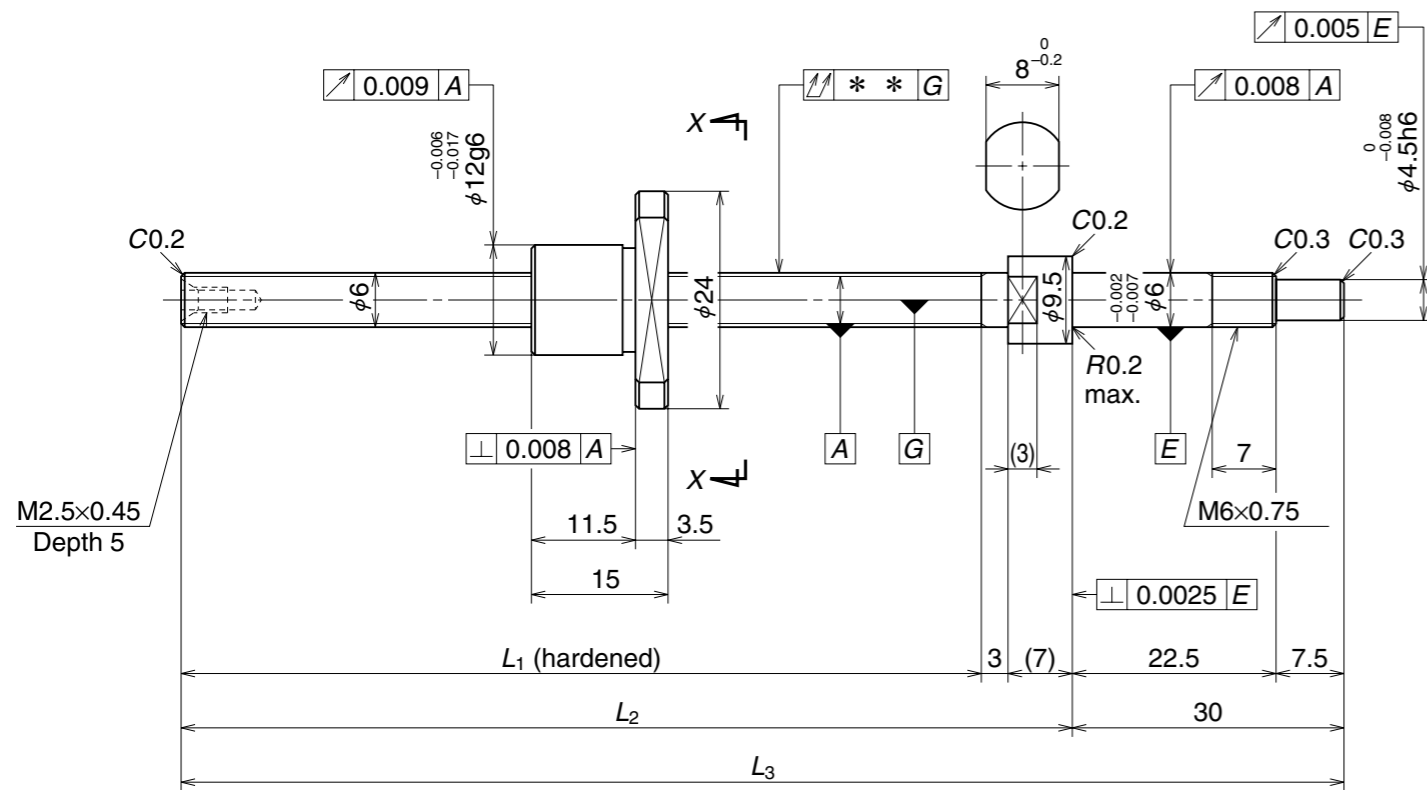
Note 2: Nut does not have seal.

# Ball Screws A Series: Finished Shaft End

Nut Model: MPFD

Screw Shaft  $\phi 6$  Lead 1

Unit: mm



View X-X

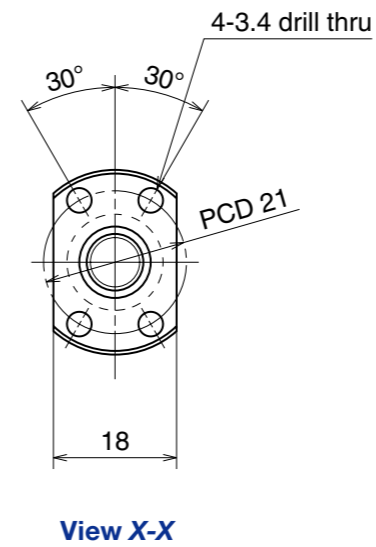
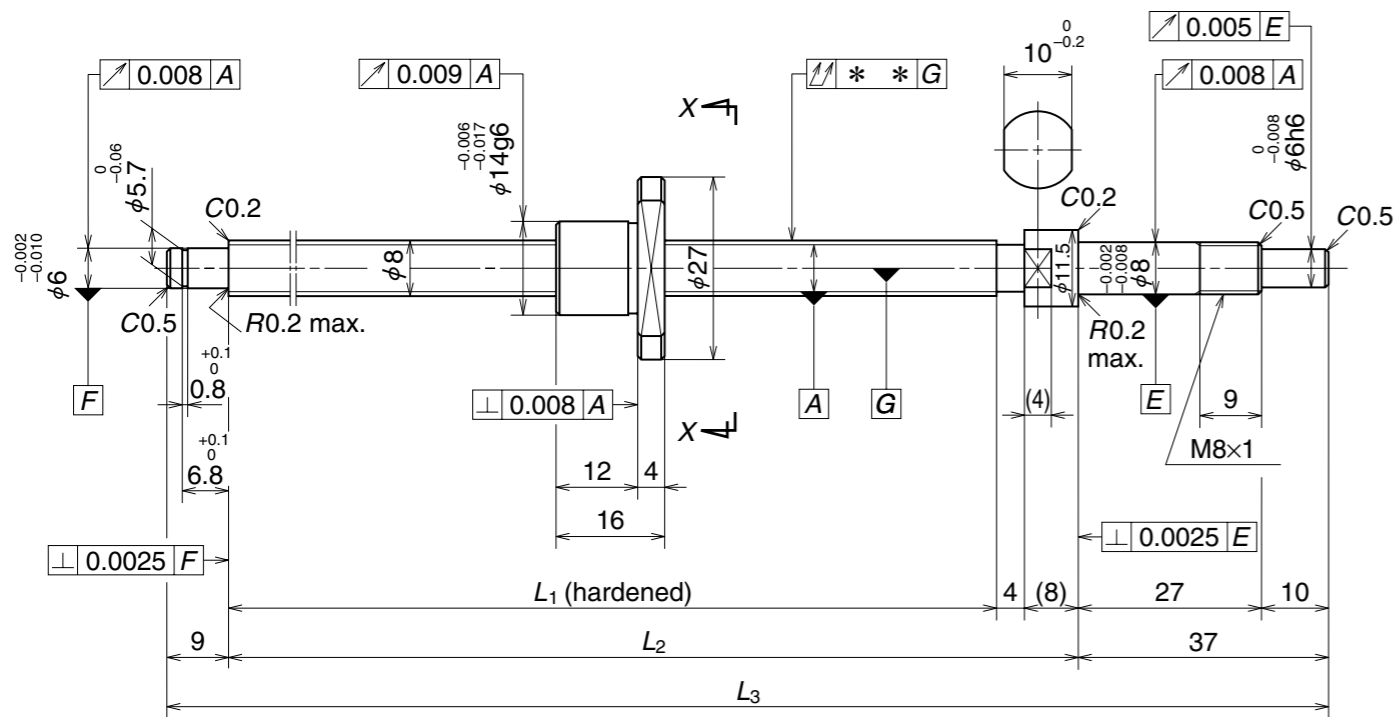
Ball Screw Specifications		
Shaft dia. x Lead / Direction of turn	6 x 1 / Right	
Preload / Ball recirculation	P-preload / Deflector	
Ball dia. / Ball circle dia.	0.800 / 6.2	
Effective turns of balls	1 x 3	
Accuracy grade / Preload	C3 / Z	
Basic load rating (N)	Dynamic $C_a$	575
	Static $C_{0a}$	925
Axial play	0	
Dynamic friction torque (N·cm)	1.3 or less	
Spacer ball	None	
Factory-packed grease	NSK grease PS2	

Recommended Support Unit	
WBK06-01A (square)	
WBK06-11 (round)	

Part number	Stroke		Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )
	Nominal	Maximum (L <sub>1</sub> -Nut length)	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	Target value T	Error e <sub>p</sub>	Variation v <sub>l</sub>			Supporting condition
											Fixed - Free
<b>W0600MA-1PY-C3Z1</b>	40	50	65	75	105	0	0.008	0.008	0.015	0.039	3 000
<b>W0601MA-1PY-C3Z1</b>	70	80	95	105	135	0	0.008	0.008	0.020	0.045	3 000
<b>W0601MA-3PY-C3Z1</b>	100	110	125	135	165	0	0.010	0.008	0.025	0.051	3 000

Note 1: NSK grease PS2 is recommended. Apply to screw shaft surface when replenishing.  
 Note 2: Nut does not have seal.

Unit: mm



Ball Screw Specifications		
Shaft dia. x Lead / Direction of turn	8 x 1 / Right	
Preload / Ball recirculation	P-preload / Deflector	
Ball dia. / Ball circle dia.	0.800 / 8.2	
Effective turns of balls	1 x 3	
Accuracy grade / Preload	C3 / Z	
Basic load rating (N)	Dynamic $C_a$	670
	Static $C_{0a}$	1 290
Axial play	0	
Dynamic friction torque (N·cm)	1.8 or less	
Spacer ball	None	
Factory-packed grease	NSK grease PS2	

Recommended Support Unit	Fixed side	Simple support side
	WBK08-01A (square)	○
WBK08S-01 (square)		○
WBK08-11 (round)	○	

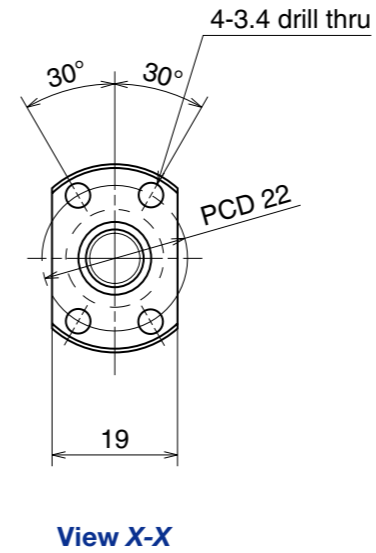
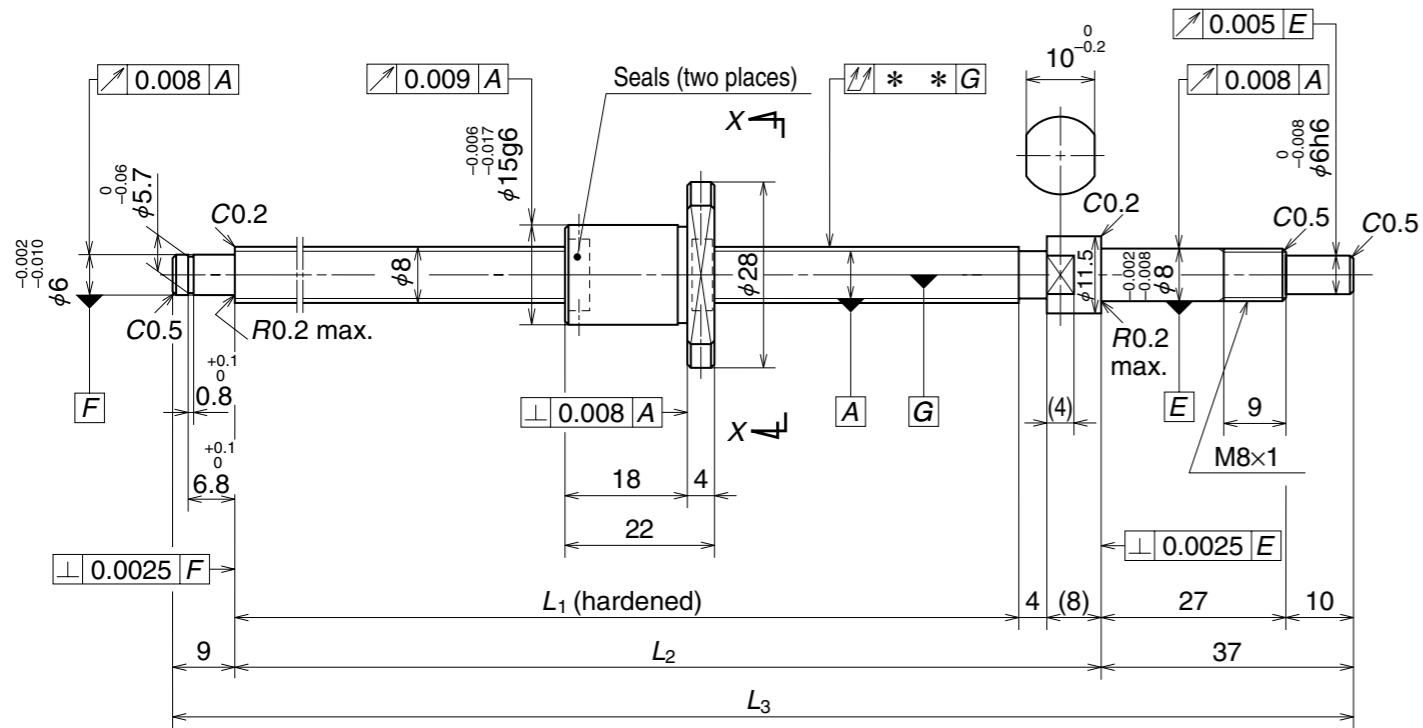
Unit: mm

Part number	Stroke		Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )
	Nominal	Maximum (L <sub>1</sub> -Nut length)	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	Target value $T$	Error $e_p$	Variation $v_u$			Supporting condition
											Fixed - Simple support
<b>W0800MA-1PY-C3Z1</b>	40	64	80	92	138	0	0.008	0.008	0.025	0.073	3 000
<b>W0801MA-1PY-C3Z1</b>	70	94	110	122	168	0	0.010	0.008	0.030	0.084	3 000
<b>W0801MA-3PY-C3Z1</b>	100	124	140	152	198	0	0.010	0.008	0.030	0.095	3 000
<b>W0802MA-1PY-C3Z1</b>	150	174	190	202	248	0	0.010	0.008	0.035	0.11	3 000

Note 1: NSK grease PS2 is recommended. Apply to screw shaft surface when replenishing.  
 Note 2: Nut does not have seal.



Unit: mm



Ball Screw Specifications		
Shaft dia. x Lead / Direction of turn	8 x 1.5 / Right	
Preload / Ball recirculation	P-preload / Deflector	
Ball dia. / Ball circle dia.	1.000 / 8.3	
Effective turns of balls	1 x 3	
Accuracy grade / Preload	C3 / Z	
Basic load rating (N)	Dynamic $C_a$	1 080
	Static $C_{0a}$	1 980
Axial play	0	
Dynamic friction torque (N·cm)	2.0 or less	
Spacer ball	None	
Factory-packed grease	NSK grease PS2	

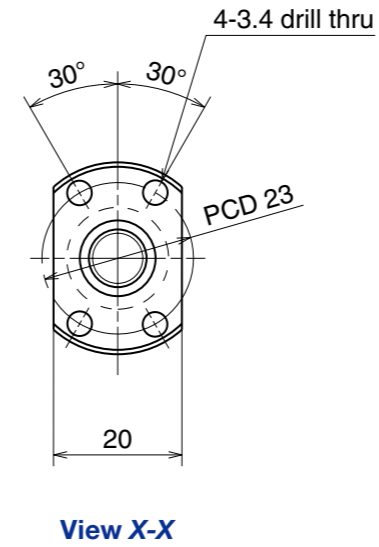
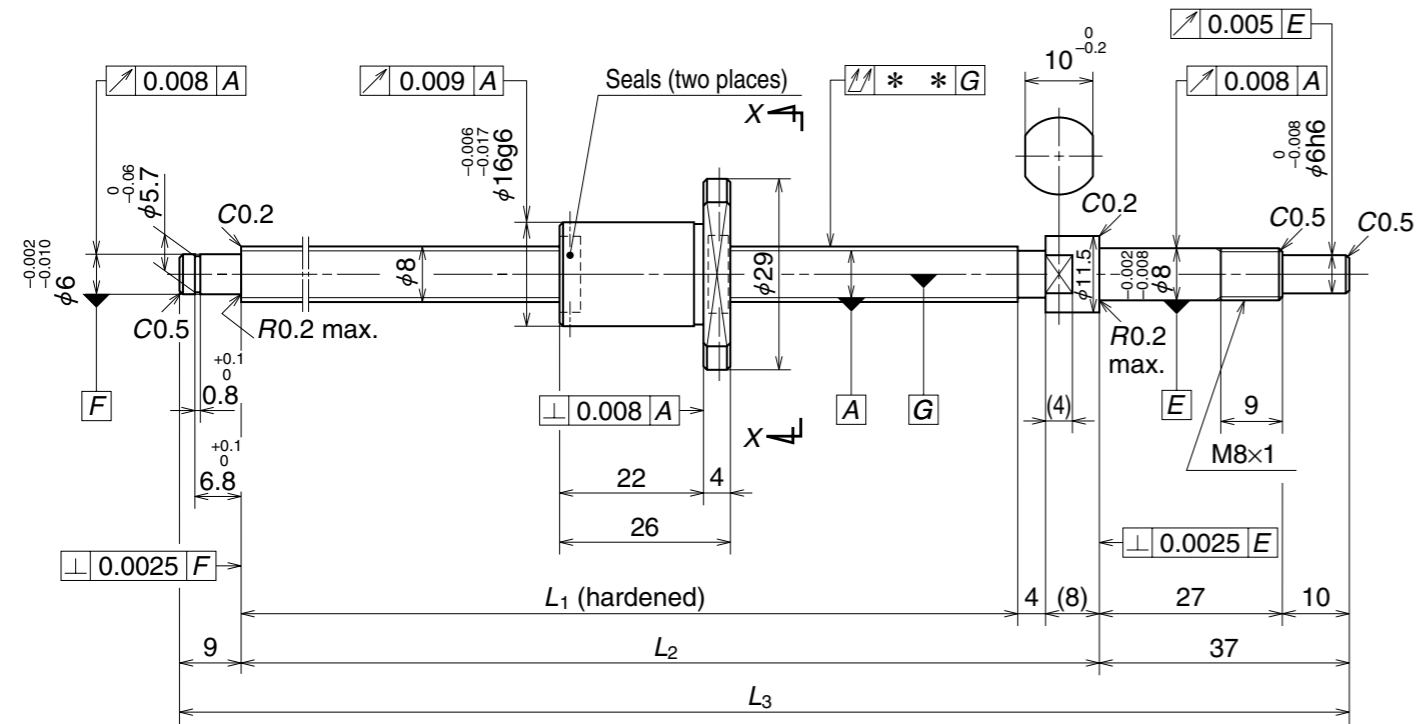
Recommended Support Unit	Fixed side	Simple support side
	WBK08-01A (square)	○
WBK08S-01 (square)		○
WBK08-11 (round)	○	

Unit: mm

Part number	Stroke		Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )
	Nominal	Maximum (L <sub>1</sub> -Nut length)	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	Target value $T$	Error $e_p$	Variation $v_u$			Supporting condition
											Fixed - Simple support
<b>W0800MA-3PY-C3Z1.5</b>	40	58	80	92	138	0	0.008	0.008	0.025	0.082	3 000
<b>W0801MA-5PY-C3Z1.5</b>	70	88	110	122	168	0	0.010	0.008	0.030	0.093	3 000
<b>W0801MA-7PY-C3Z1.5</b>	100	118	140	152	198	0	0.010	0.008	0.030	0.10	3 000
<b>W0802MA-3PY-C3Z1.5</b>	150	168	190	202	248	0	0.010	0.008	0.035	0.12	3 000

Note: NSK grease PS2 is recommended. Apply to screw shaft surface when replenishing.

Unit: mm



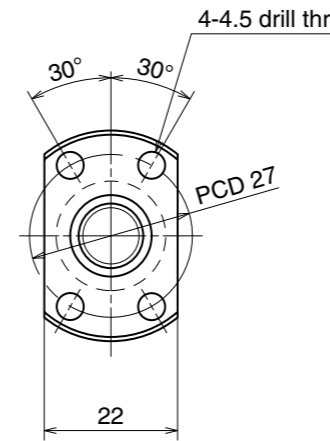
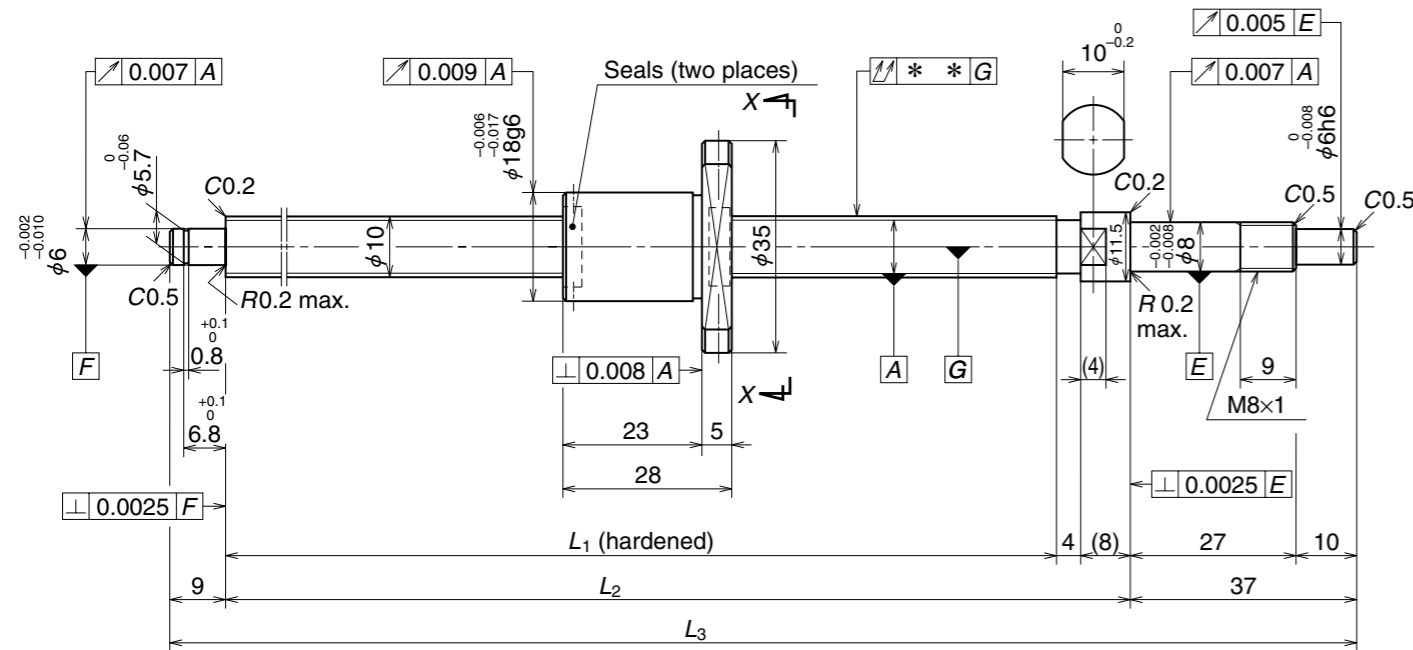
Ball Screw Specifications		
Shaft dia. x Lead / Direction of turn	8 x 2 / Right	
Preload / Ball recirculation	P-preload / Deflector	
Ball dia. / Ball circle dia.	1.200 / 8.3	
Effective turns of balls	1 x 3	
Accuracy grade / Preload	C3 / Z	
Basic load rating (N)	Dynamic $C_a$	1 320
	Static $C_{0a}$	2 210
Axial play	0	
Dynamic friction torque (N·cm)	2.0 or less	
Spacer ball	None	
Factory-packed grease	NSK grease PS2	

Recommended Support Unit	Fixed side	Simple support side
	WBK08-01A (square)	○
WBK08S-01 (square)		○
WBK08-11 (round)	○	

Unit: mm

Part number	Stroke		Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )
	Nominal	Maximum ( $L_1$ -Nut length)	$L_1$	$L_2$	$L_3$	Target value $T$	Error $e_p$	Variation $v_u$			Supporting condition
											Fixed - Simple support
<b>W0800MA-5PY-C3Z2</b>	40	54	80	92	138	0	0.008	0.008	0.025	0.09	3 000
<b>W0801MA-9PY-C3Z2</b>	70	84	110	122	168	0	0.010	0.008	0.030	0.10	3 000
<b>W0801MA-11PY-C3Z2</b>	100	114	140	152	198	0	0.010	0.008	0.030	0.11	3 000
<b>W0802MA-5PY-C3Z2</b>	150	164	190	202	248	0	0.010	0.008	0.035	0.13	3 000

Note: NSK grease PS2 is recommended. Apply to screw shaft surface when replenishing.



View X-X

Unit: mm

Ball Screw Specifications		
Shaft dia. x Lead / Direction of turn	10 x 2 / Right	
Preload / Ball recirculation	P-preload / Deflector	
Ball dia. / Ball circle dia.	1.200 / 10.3	
Effective turns of balls	1 x 3	
Accuracy grade / Preload	C3 / Z	
Basic load rating (N)	Dynamic $C_a$	1 490
	Static $C_{0a}$	2 850
Axial play	0	
Dynamic friction torque (N·cm)	0.1 - 2.4	
Spacer ball	None	
Factory-packed grease	NSK grease PS2	

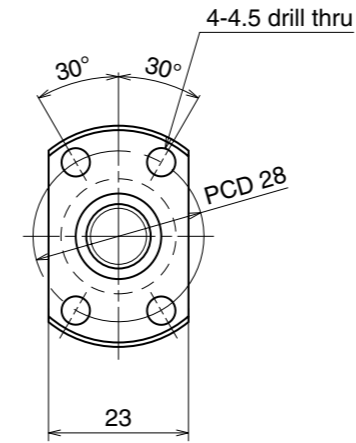
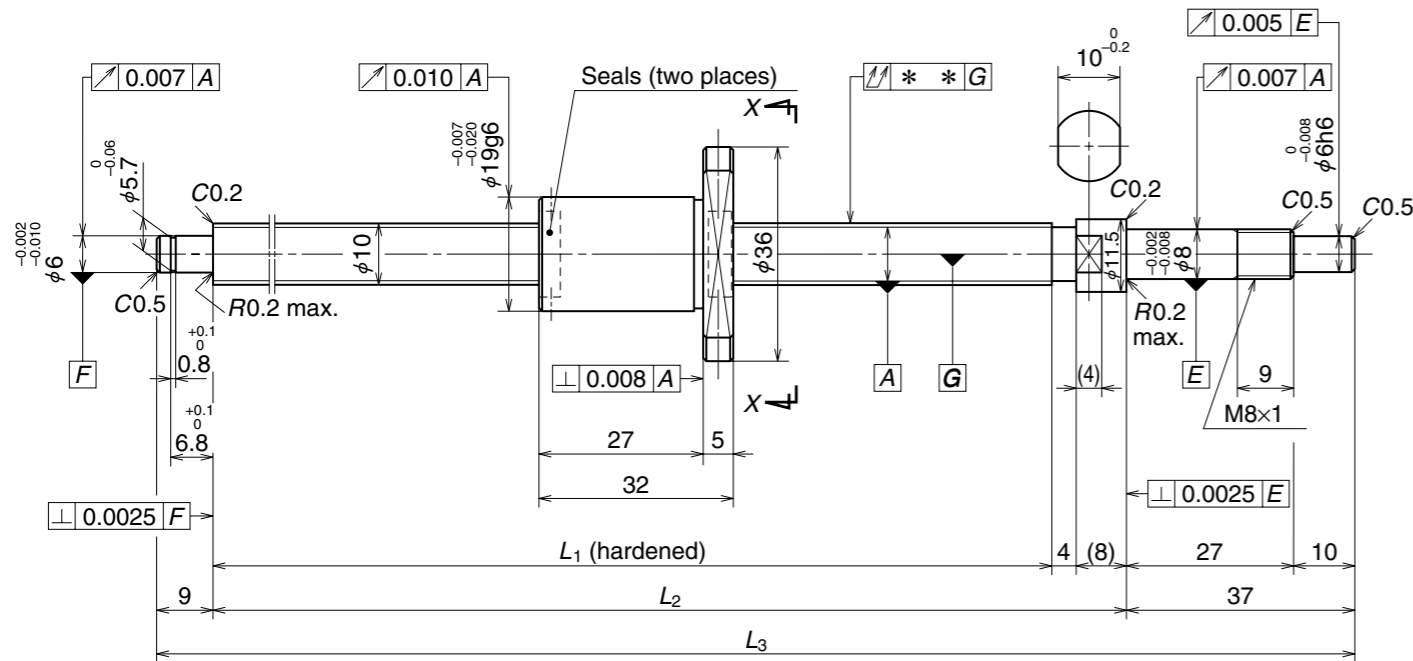
Recommended Support Unit	Fixed side	Simple support side
	WBK08-01A (square)	○
WBK08S-01 (square)		○
WBK08-11 (round)	○	

Unit: mm

Part number	Stroke		Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )
	Nominal	Maximum ( $L_1$ -Nut length)	$L_1$	$L_2$	$L_3$	Target value $T$	Error $e_p$	Variation $v_u$			Supporting condition
											Fixed - Simple support
<b>W1001MA-1PY-C3Z2</b>	50	72	100	112	158	0	0.008	0.008	0.020	0.13	3 000
<b>W1001MA-3PY-C3Z2</b>	100	122	150	162	208	0	0.010	0.008	0.030	0.16	3 000
<b>W1002MA-1PY-C3Z2</b>	150	172	200	212	258	0	0.010	0.008	0.030	0.19	3 000
<b>W1002MA-3PY-C3Z2</b>	200	222	250	262	308	0	0.012	0.008	0.030	0.22	3 000

Note: NSK grease PS2 is recommended. Apply to screw shaft surface when replenishing.

Unit: mm



View X-X

Ball Screw Specifications		
Shaft dia. x Lead / Direction of turn	10 x 2.5 / Right	
Preload / Ball recirculation	P-preload / Deflector	
Ball dia. / Ball circle dia.	1.588 / 10.4	
Effective turns of balls	1 x 3	
Accuracy grade / Preload	C3 / Z	
Basic load rating (N)	Dynamic $C_a$	2 130
	Static $C_{0a}$	3 640
Axial play	0	
Dynamic friction torque (N·cm)	0.2 - 2.9	
Spacer ball	None	
Factory-packed grease	NSK grease PS2	

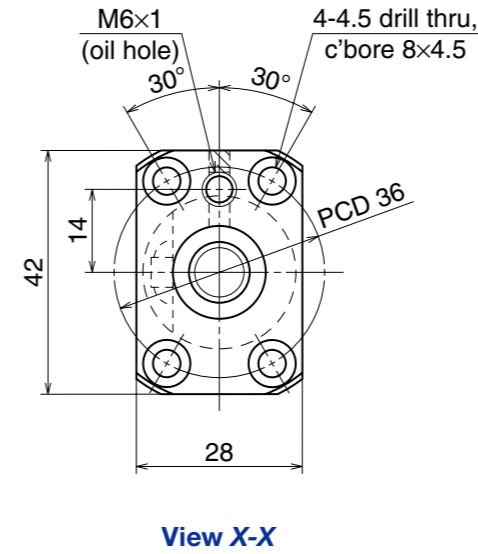
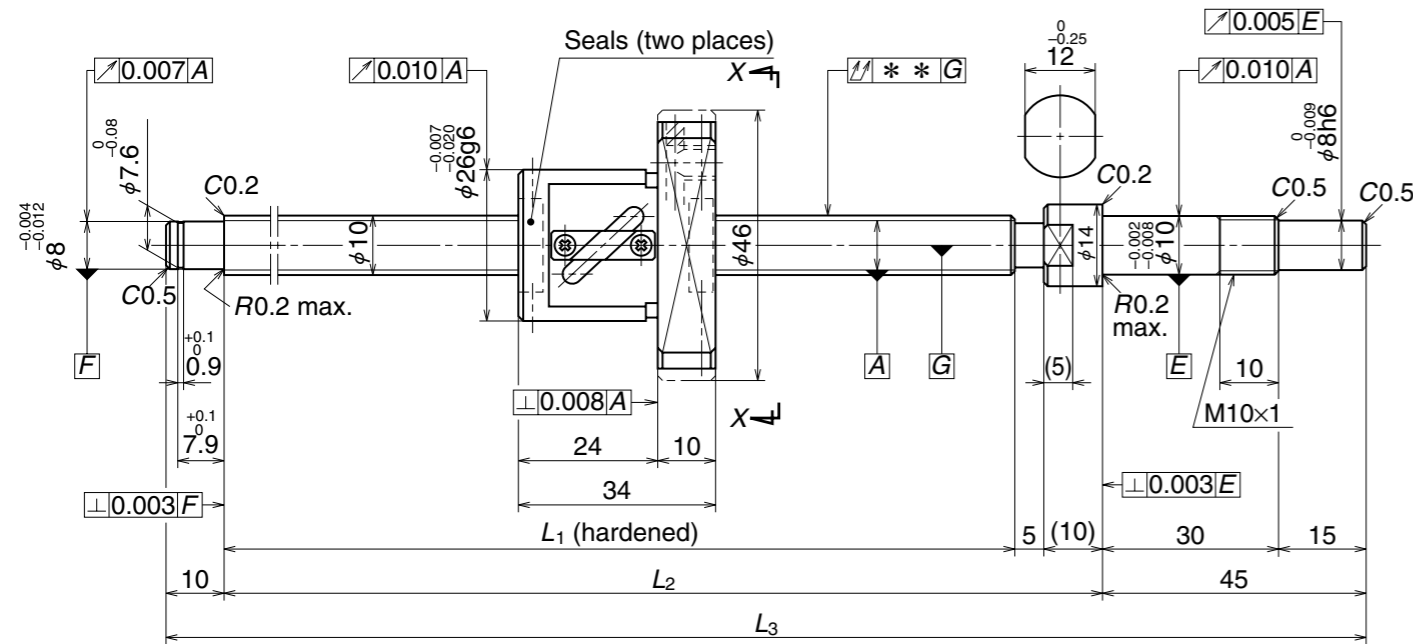
Recommended Support Unit	Fixed side	Simple support side
	WBK08-01A (square)	○
WBK08S-01 (square)		○
WBK08-11 (round)	○	

Unit: mm

Part number	Stroke		Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )
	Nominal	Maximum ( $L_1$ -Nut length)	$L_1$	$L_2$	$L_3$	Target value $T$	Error $e_p$	Variation $v_u$			Supporting condition
											Fixed - Simple support
<b>W1001MA-5PY-C3Z2.5</b>	50	68	100	112	158	0	0.008	0.008	0.020	0.14	3 000
<b>W1001MA-7PY-C3Z2.5</b>	100	118	150	162	208	0	0.010	0.008	0.030	0.17	3 000
<b>W1002MA-5PY-C3Z2.5</b>	150	168	200	212	258	0	0.010	0.008	0.030	0.20	3 000
<b>W1002MA-7PY-C3Z2.5</b>	200	218	250	262	308	0	0.012	0.008	0.030	0.23	3 000

Note: NSK grease PS2 is recommended. Apply to screw shaft surface when replenishing.

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	
Effective turns of balls	2.5 x 1	
Accuracy grade / Preload	C3 / Z	
Basic load rating (N)	Dynamic $C_a$	1 730
	Static $C_{0a}$	2 230
Axial play	0	
Dynamic friction torque (N·cm)	0.5 - 3.9	
Spacer ball	Yes	
Factory-packed grease	NSK grease PS2	
Internal spatial volume of nut (cm <sup>3</sup> )	0.8	

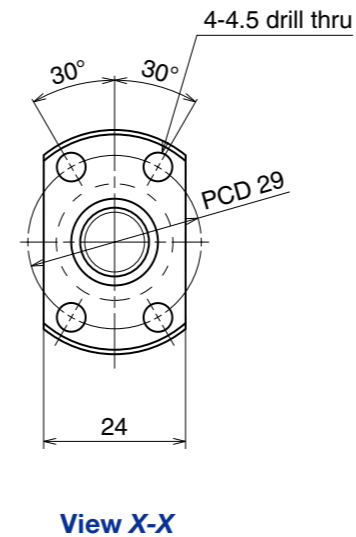
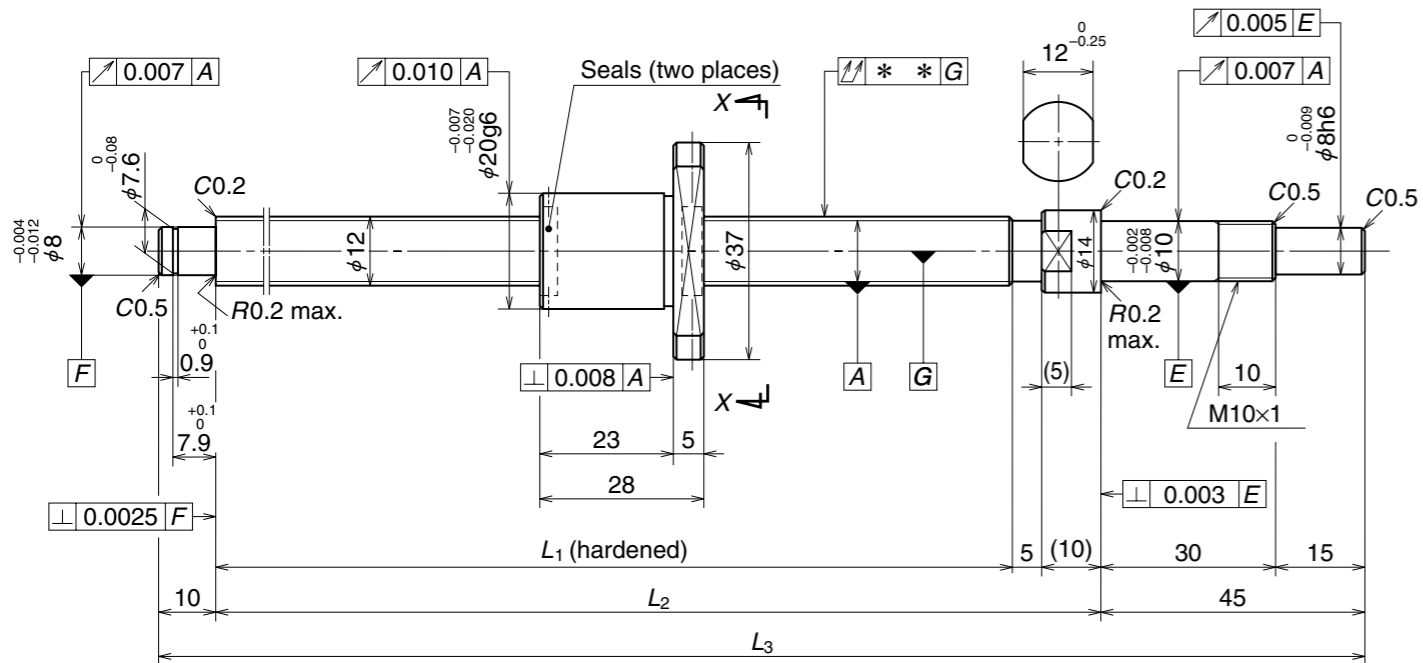
Recommended Support Unit	Fixed side	Simple support side
	WBK10-01A (square)	○
WBK10S-01 (square)		○
WBK10-11 (round)	○	

Unit: mm

Part number	Stroke		Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )
	Nominal	Maximum (L <sub>1</sub> -Nut length)	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	Target value $T$	Error $e_p$	Variation $v_u$			Supporting condition
											Fixed - Simple support
<b>W1001FA-1P-C3Z4</b>	50	76	110	125	180	0	0.010	0.008	0.020	0.26	3 000
<b>W1001FA-3P-C3Z4</b>	100	126	160	175	230	0	0.010	0.008	0.030	0.28	3 000
<b>W1002FA-1P-C3Z4</b>	150	176	210	225	280	0	0.012	0.008	0.030	0.31	3 000
<b>W1002FA-3P-C3Z4</b>	200	226	260	275	330	0	0.012	0.008	0.040	0.34	3 000
<b>W1003FA-1P-C3Z4</b>	250	276	310	325	380	0	0.012	0.008	0.040	0.37	3 000
<b>W1003FA-3P-C3Z4</b>	300	326	360	375	430	0	0.013	0.010	0.050	0.39	3 000

Note: NSK grease PS2 is recommended. Amount for replenishing should be about 50% of nut internal space capacity.

Unit: mm



Ball Screw Specifications		
Shaft dia. x Lead / Direction of turn	12 x 2 / Right	
Preload / Ball recirculation	P-preload / Deflector	
Ball dia. / Ball circle dia.	1.200 / 12.3	
Effective turns of balls	1 x 3	
Accuracy grade / Preload	C3 / Z	
Basic load rating (N)	Dynamic $C_a$	1 660
	Static $C_{0a}$	3 620
Axial play	0	
Dynamic friction torque (N·cm)	0.4 - 3.4	
Spacer ball	None	
Factory-packed grease	NSK grease PS2	

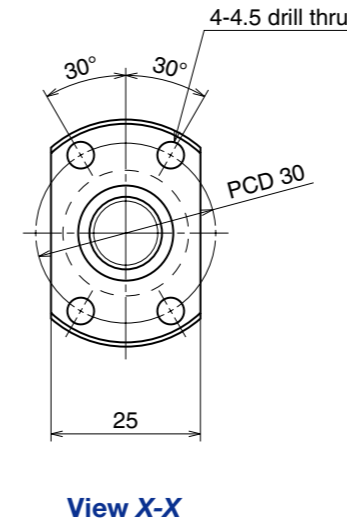
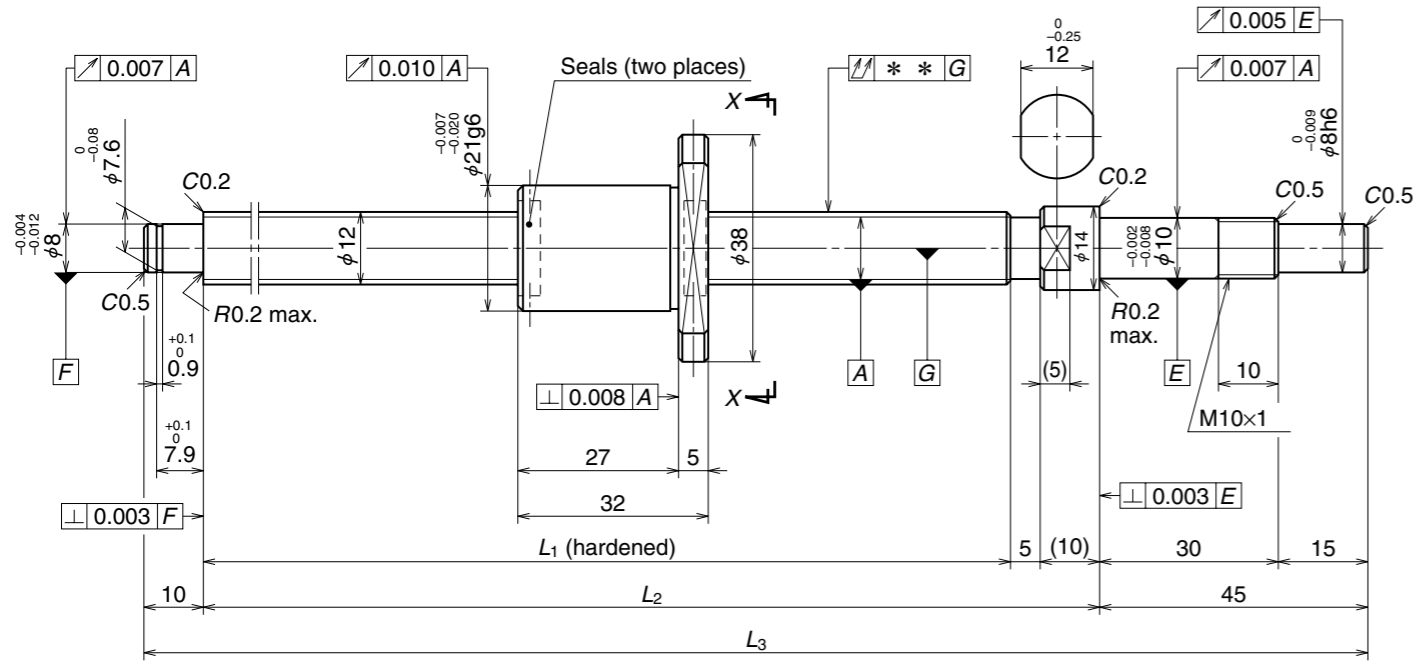
Recommended Support Unit	Fixed side	Simple support side
	WBK10-01A (square)	○
WBK10S-01 (square)		○
WBK10-11 (round)	○	

Unit: mm

Part number	Stroke		Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )
	Nominal	Maximum (L <sub>1</sub> -Nut length)	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	Target value $T$	Error $e_p$	Variation $v_u$			Supporting condition
											Fixed - Simple support
<b>W1201MA-1PY-C3Z2</b>	50	82	110	125	180	0	0.010	0.008	0.020	0.20	3 000
<b>W1201MA-3PY-C3Z2</b>	100	132	160	175	230	0	0.010	0.008	0.030	0.24	3 000
<b>W1202MA-1PY-C3Z2</b>	150	182	210	225	280	0	0.012	0.008	0.030	0.28	3 000
<b>W1202MA-3PY-C3Z2</b>	200	232	260	275	330	0	0.012	0.008	0.040	0.32	3 000
<b>W1203MA-1PY-C3Z2</b>	250	282	310	325	380	0	0.012	0.008	0.040	0.36	3 000

Note: NSK grease PS2 is recommended. Apply to screw shaft surface when replenishing.

Unit: mm



Ball Screw Specifications		
Shaft dia. x Lead / Direction of turn	12 x 2.5 / Right	
Preload / Ball recirculation	P-preload / Deflector	
Ball dia. / Ball circle dia.	1.588 / 12.4	
Effective turns of balls	1 x 3	
Accuracy grade / Preload	C3 / Z	
Basic load rating (N)	Dynamic $C_a$	2 360
	Static $C_{0a}$	4 540
Axial play	0	
Dynamic friction torque (N·cm)	0.4 - 3.4	
Spacer ball	None	
Factory-packed grease	NSK grease PS2	

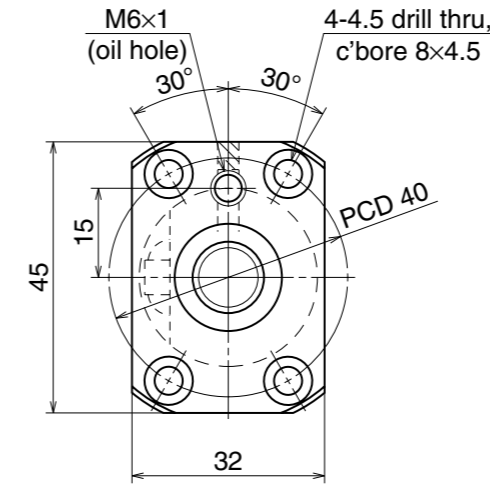
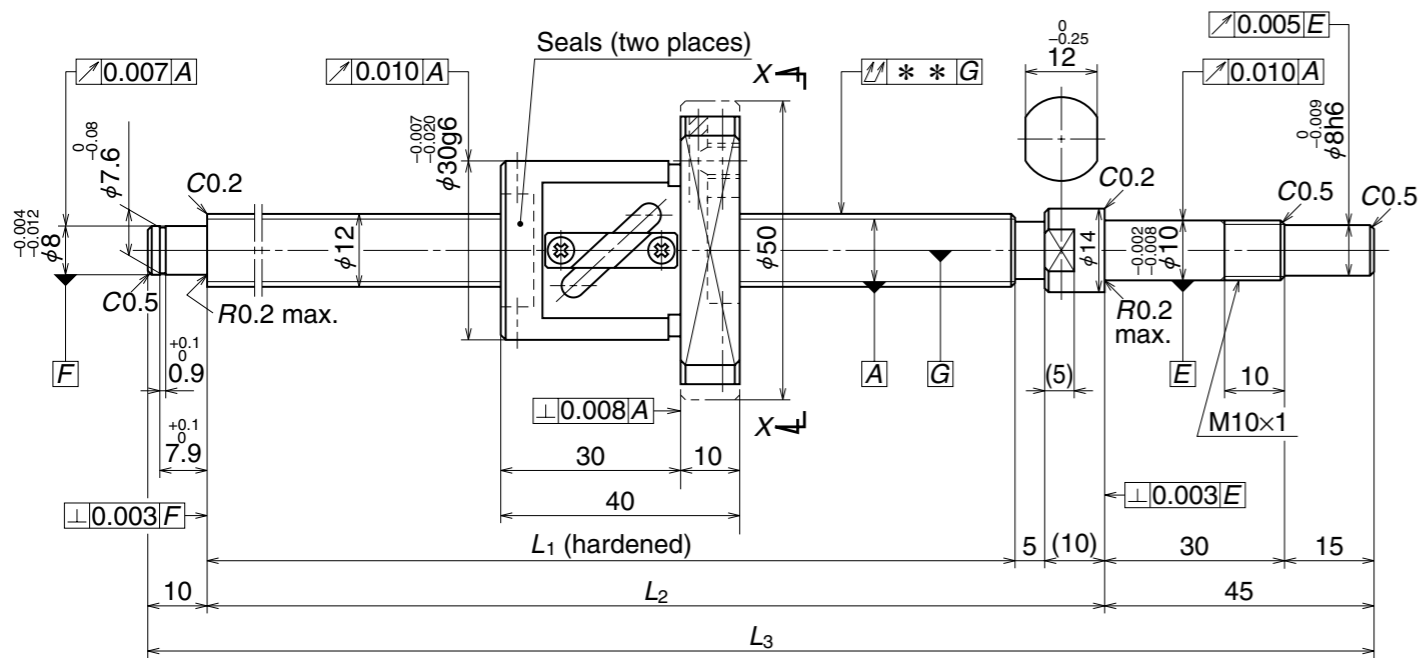
Recommended Support Unit	Fixed side	Simple support side
	WBK10-01A (square)	○
WBK10S-01 (square)		○
WBK10-11 (round)	○	

Unit: mm

Part number	Stroke		Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )
	Nominal	Maximum (L <sub>1</sub> -Nut length)	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	Target value T	Error e <sub>p</sub>	Variation v <sub>u</sub>			Supporting condition
											Fixed - Simple support
<b>W1201MA-5PY-C3Z2.5</b>	50	78	110	125	180	0	0.010	0.008	0.020	0.21	3 000
<b>W1201MA-7PY-C3Z2.5</b>	100	128	160	175	230	0	0.010	0.008	0.030	0.25	3 000
<b>W1202MA-5PY-C3Z2.5</b>	150	178	210	225	280	0	0.012	0.008	0.030	0.29	3 000
<b>W1202MA-7PY-C3Z2.5</b>	200	228	260	275	330	0	0.012	0.008	0.040	0.33	3 000
<b>W1203MA-3PY-C3Z2.5</b>	250	278	310	325	380	0	0.012	0.008	0.040	0.37	3 000

Note: NSK grease PS2 is recommended. Apply to screw shaft surface when replenishing.

Unit: mm



View X-X

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	
Effective turns of balls	2.5 x 1	
Accuracy grade / Preload	C3 / Z	
Basic load rating (N)	Dynamic $C_a$	2 370
	Static $C_{0a}$	3 160
Axial play	0	
Dynamic friction torque (N·cm)	1.0 - 4.4	
Spacer ball	Yes	
Factory-packed grease	NSK grease PS2	
Internal spatial volume of nut (cm <sup>3</sup> )	1.2	

Recommended Support Unit	Fixed side	Simple support side
	WBK10-01A (square)	○
WBK10S-01 (square)		○
WBK10-11 (round)	○	

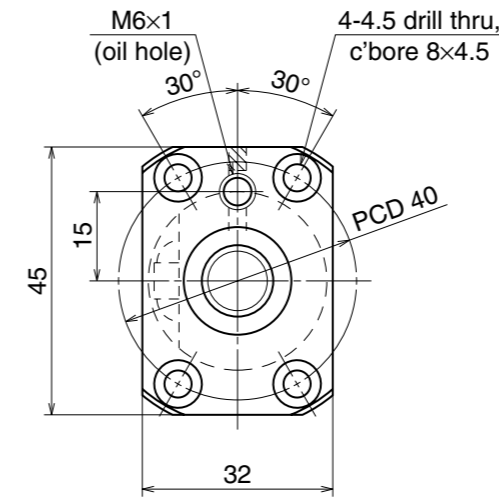
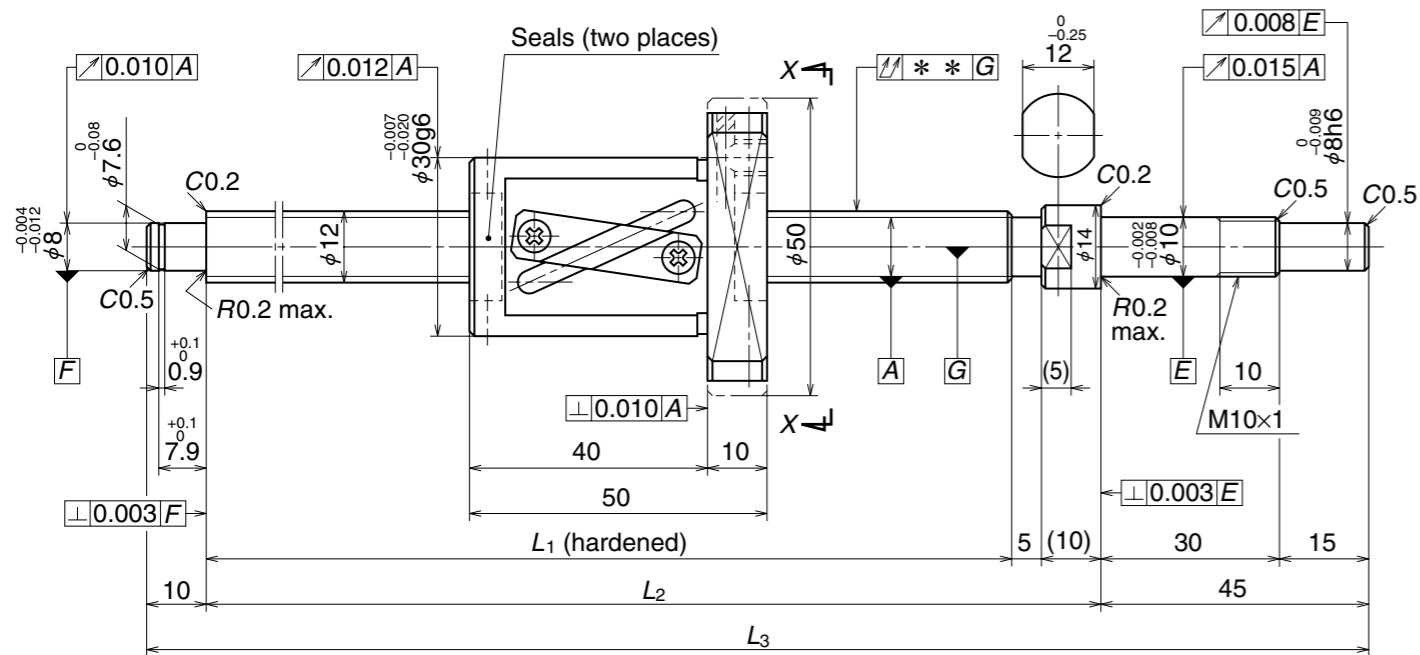
Unit: mm

Part number	Stroke		Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )
	Nominal	Maximum (L <sub>1</sub> -Nut length)	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	Target value $T$	Error $e_p$	Variation $v_u$			Supporting condition
											Fixed - Simple support
<b>W1201FA-1P-C3Z5</b>	50	70	110	125	180	0	0.010	0.008	0.020	0.35	3 000
<b>W1201FA-3P-C3Z5</b>	100	120	160	175	230	0	0.010	0.008	0.030	0.38	3 000
<b>W1202FA-1P-C3Z5</b>	150	170	210	225	280	0	0.012	0.008	0.030	0.42	3 000
<b>W1202FA-3P-C3Z5</b>	200	220	260	275	330	0	0.012	0.008	0.040	0.46	3 000
<b>W1203FA-1P-C3Z5</b>	250	270	310	325	380	0	0.012	0.008	0.040	0.50	3 000
<b>W1204FA-1P-C3Z5</b>	350	370	410	425	480	0	0.015	0.010	0.050	0.58	3 000
<b>W1205FA-1P-C3Z5</b>	450	470	510	525	580	0	0.016	0.012	0.065	0.66	3 000

Note: NSK grease PS2 is recommended. Amount for replenishing should be about 50% of nut internal space capacity.



Unit: mm



View X-X

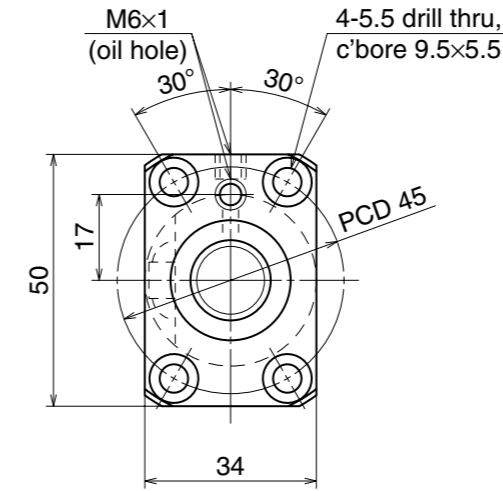
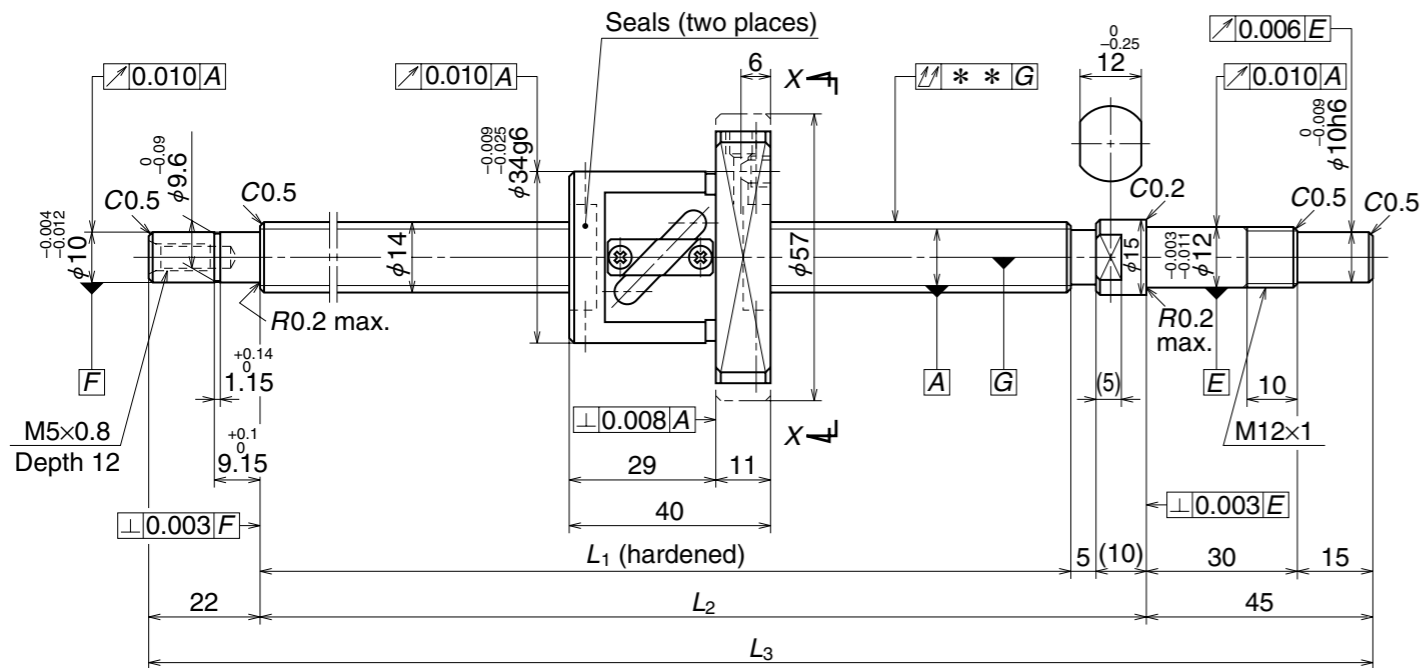
Ball Screw Specifications		
Shaft dia. x Lead / Direction of turn	12 x 10 / Right	
Preload / Ball recirculation	P-preload / Return tube	
Ball dia. / Ball circle dia.	2.381 / 12.5	
Effective turns of balls	2.5 x 1	
Accuracy grade / Preload	C5 / Z	
Basic load rating (N)	Dynamic $C_a$	2 360
	Static $C_{0a}$	3 240
Axial play	0	
Dynamic friction torque (N-cm)	1.0 - 4.9	
Spacer ball	Yes	
Factory-packed grease	NSK grease LR3	
Internal spatial volume of nut (cm <sup>3</sup> )	1.4	

Recommended Support Unit	Fixed side	Simple support side
	WBK10-01A (square)	○
WBK10S-01 (square)		○
WBK10-11 (round)	○	

Unit: mm

Part number	Stroke		Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )
	Nominal	Maximum (L <sub>1</sub> -Nut length)	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	Target value $T$	Error $e_p$	Variation $v_u$			Supporting condition
											Fixed - Simple support
<b>W1201FA-5P-C5Z10</b>	100	110	160	175	230	0	0.020	0.018	0.035	0.43	3 000
<b>W1202FA-5P-C5Z10</b>	150	160	210	225	280	0	0.023	0.018	0.035	0.47	3 000
<b>W1203FA-3P-C5Z10</b>	250	260	310	325	380	0	0.023	0.018	0.050	0.56	3 000
<b>W1204FA-3P-C5Z10</b>	350	360	410	425	480	0	0.027	0.020	0.060	0.64	3 000
<b>W1205FA-3P-C5Z10</b>	450	460	510	525	580	0	0.030	0.023	0.075	0.72	3 000

Note: NSK grease LR3 is recommended. Amount for replenishing should be about 50% of nut internal space capacity.



View X-X

Unit: mm

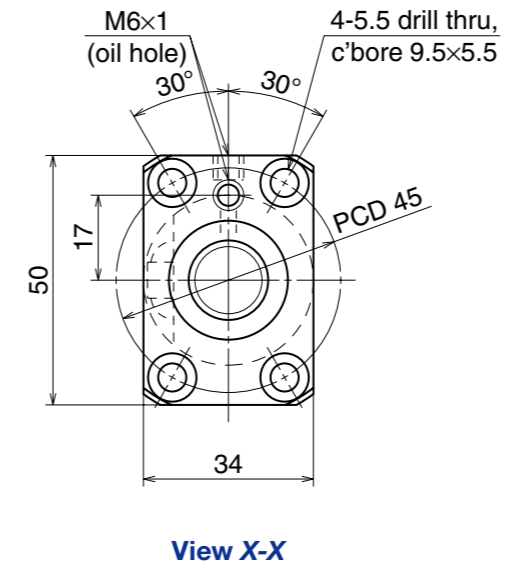
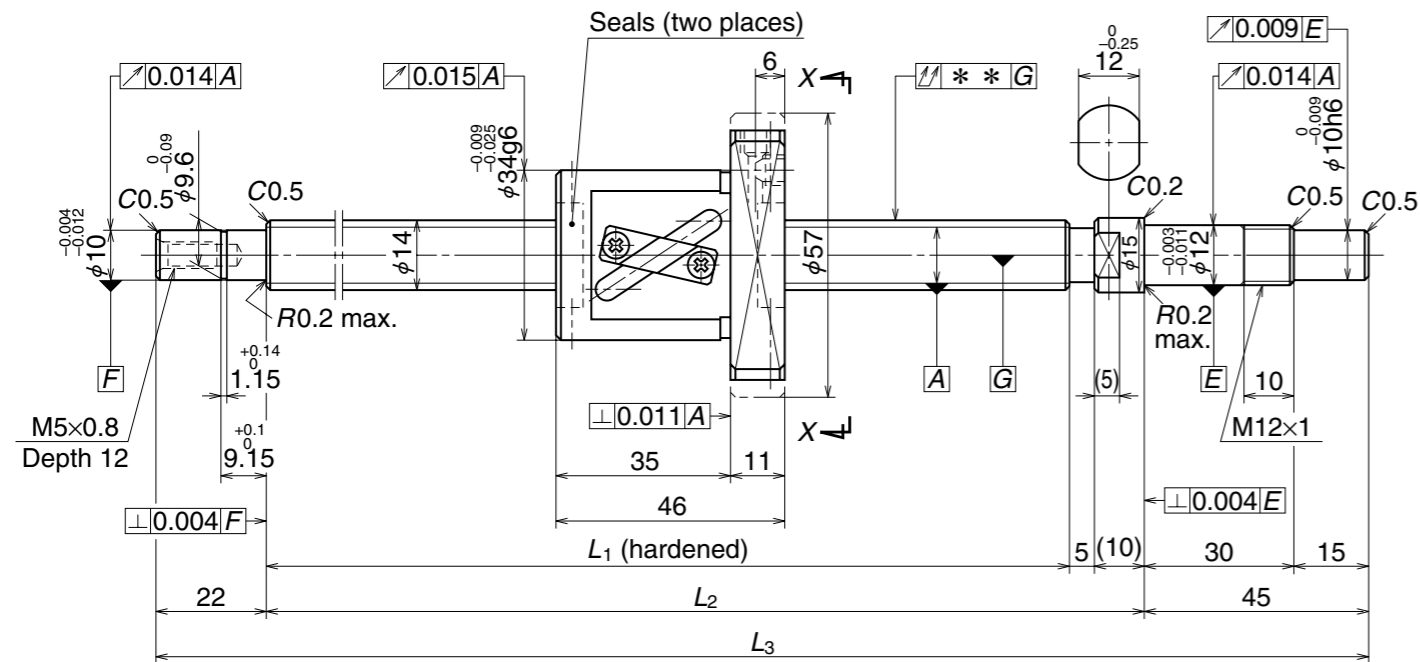
Ball Screw Specifications		
Shaft dia. x Lead / Direction of turn	14 x 5 / Right	
Preload / Ball recirculation	P-preload / Return tube	
Ball dia. / Ball circle dia.	3.175 / 14.5	
Effective turns of balls	2.5 x 1	
Accuracy grade / Preload	C3 / Z	
Basic load rating (N)	Dynamic $C_a$	4 280
	Static $C_{0a}$	5 840
Axial play	0	
Dynamic friction torque (N·cm)	1.5 – 6.9	
Spacer ball	Yes	
Factory-packed grease	NSK grease LR3	
Internal spatial volume of nut (cm <sup>3</sup> )	2.2	

Recommended Support Unit	Fixed side	Simple support side
	WBK12-01A (square)	○
WBK12S-01 (square)		○
WBK12-11 (round)	○	

Unit: mm

Part number	Stroke		Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	
	Nominal	Maximum (L <sub>1</sub> -Nut length)	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	Target value T	Error $\epsilon_p$	Variation $\nu_u$			Supporting condition	
											Fixed - Simple support	Fixed - Fixed
<b>W1401FA-1P-C3Z5</b>	100	149	189	204	271	0	0.010	0.008	0.020	0.52	3 000	3 000
<b>W1402FA-1P-C3Z5</b>	150	199	239	254	321	0	0.012	0.008	0.030	0.57	3 000	3 000
<b>W1403FA-1P-C3Z5</b>	250	299	339	354	421	0	0.013	0.010	0.035	0.67	3 000	3 000
<b>W1404FA-1P-C3Z5</b>	350	399	439	454	521	0	0.015	0.010	0.045	0.77	3 000	3 000
<b>W1405FA-1P-C3Z5</b>	450	499	539	554	621	0	0.016	0.012	0.045	0.87	3 000	3 000
<b>W1406FA-1P-C3Z5</b>	600	649	689	704	771	0	0.018	0.013	0.055	1.0	3 000	3 000

Note: NSK grease LR3 is recommended. Amount for replenishing should be about 50% of nut internal space capacity.



Unit: mm

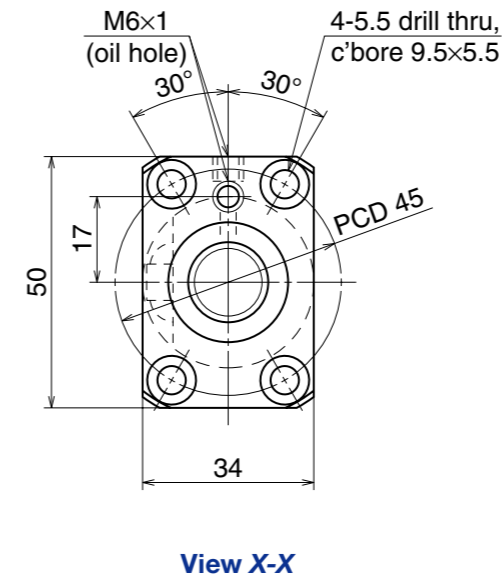
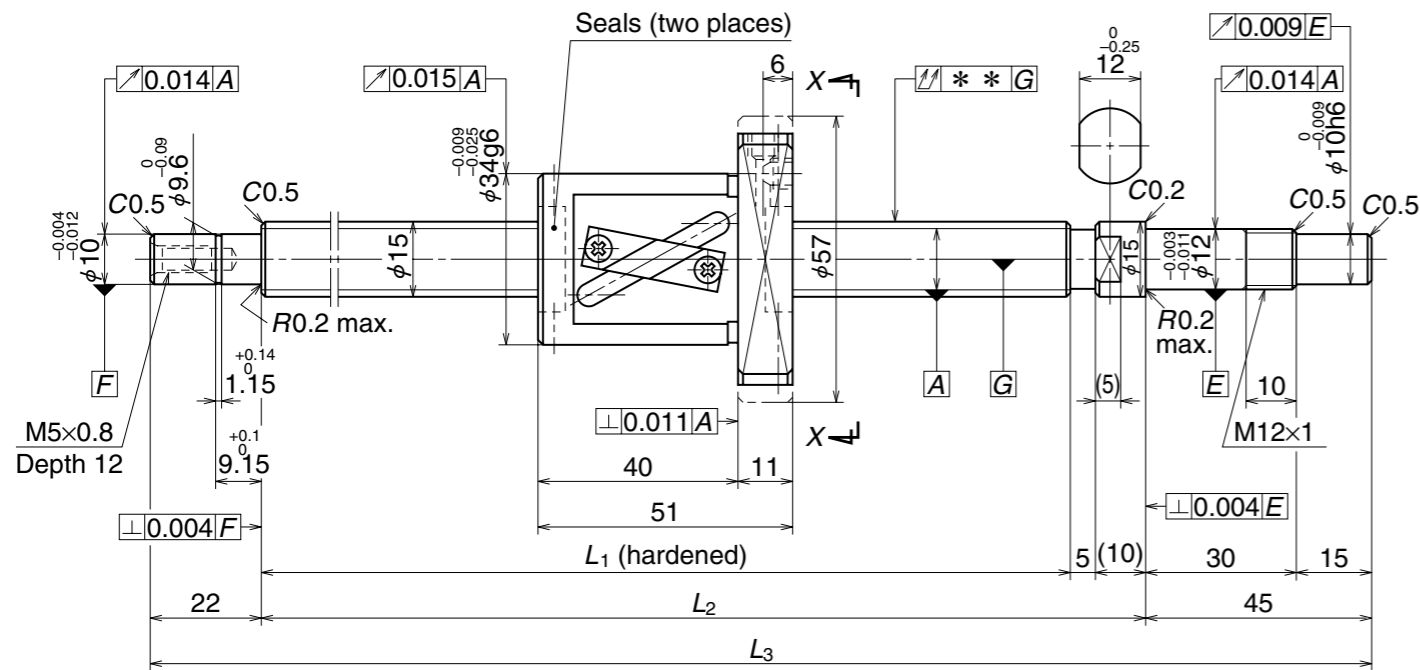
Ball Screw Specifications		
Shaft dia. x Lead / Direction of turn	14 x 8 / Right	
Preload / Ball recirculation	P-preload / Return tube	
Ball dia. / Ball circle dia.	3.175 / 14.5	
Effective turns of balls	2.5 x 1	
Accuracy grade / Preload	C5 / Z	
Basic load rating (N)	Dynamic $C_a$	4 280
	Static $C_{0a}$	5 840
Axial play	0	
Dynamic friction torque (N·cm)	1.5 - 7.8	
Spacer ball	Yes	
Factory-packed grease	NSK grease LR3	
Internal spatial volume of nut (cm <sup>3</sup> )	2.1	

Recommended Support Unit	Fixed side	Simple support side
WBK12-01A (square)	○	
WBK12S-01 (square)		○
WBK12-11 (round)	○	

Unit: mm

Part number	Stroke		Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	
	Nominal	Maximum (L <sub>1</sub> -Nut length)	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	Target value T	Error $\epsilon_p$	Variation $\nu_u$			Supporting condition	
											Fixed - Simple support	Fixed - Fixed
W1401FA-3P-C5Z8	100	143	189	204	271	0	0.020	0.018	0.025	0.56	3 000	3 000
W1402FA-3P-C5Z8	150	193	239	254	321	0	0.023	0.018	0.035	0.61	3 000	3 000
W1402FA-5P-C5Z8	200	243	289	304	371	0	0.023	0.018	0.035	0.67	3 000	3 000
W1403FA-3P-C5Z8	250	293	339	354	421	0	0.025	0.020	0.040	0.72	3 000	3 000
W1403FA-5P-C5Z8	300	343	389	404	471	0	0.025	0.020	0.040	0.78	3 000	3 000
W1404FA-3P-C5Z8	350	393	439	454	521	0	0.027	0.020	0.050	0.83	3 000	3 000
W1404FA-5P-C5Z8	400	443	489	504	571	0	0.027	0.020	0.050	0.88	3 000	3 000
W1405FA-3P-C5Z8	450	493	539	554	621	0	0.030	0.023	0.050	0.94	3 000	3 000
W1405FA-5P-C5Z8	500	543	589	604	671	0	0.030	0.023	0.065	0.99	3 000	3 000
W1406FA-3P-C5Z8	550	593	639	654	721	0	0.035	0.025	0.065	1.0	3 000	3 000
W1406FA-5P-C5Z8	600	643	689	704	771	0	0.035	0.025	0.065	1.1	3 000	3 000
W1407FA-1P-C5Z8	700	743	789	804	871	0	0.035	0.025	0.085	1.2	2 800	3 000

Note: NSK grease LR3 is recommended. Amount for replenishing should be about 50% of nut internal space capacity.



Unit: mm

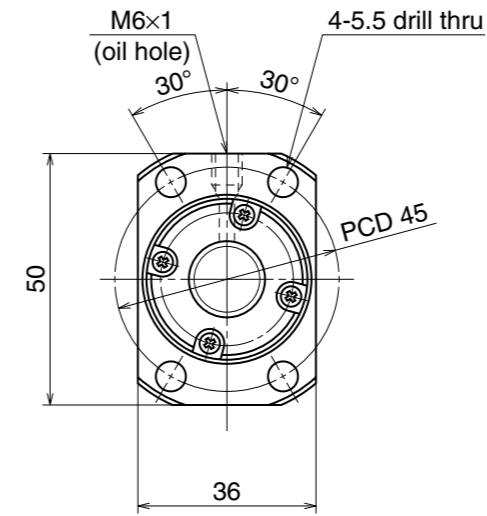
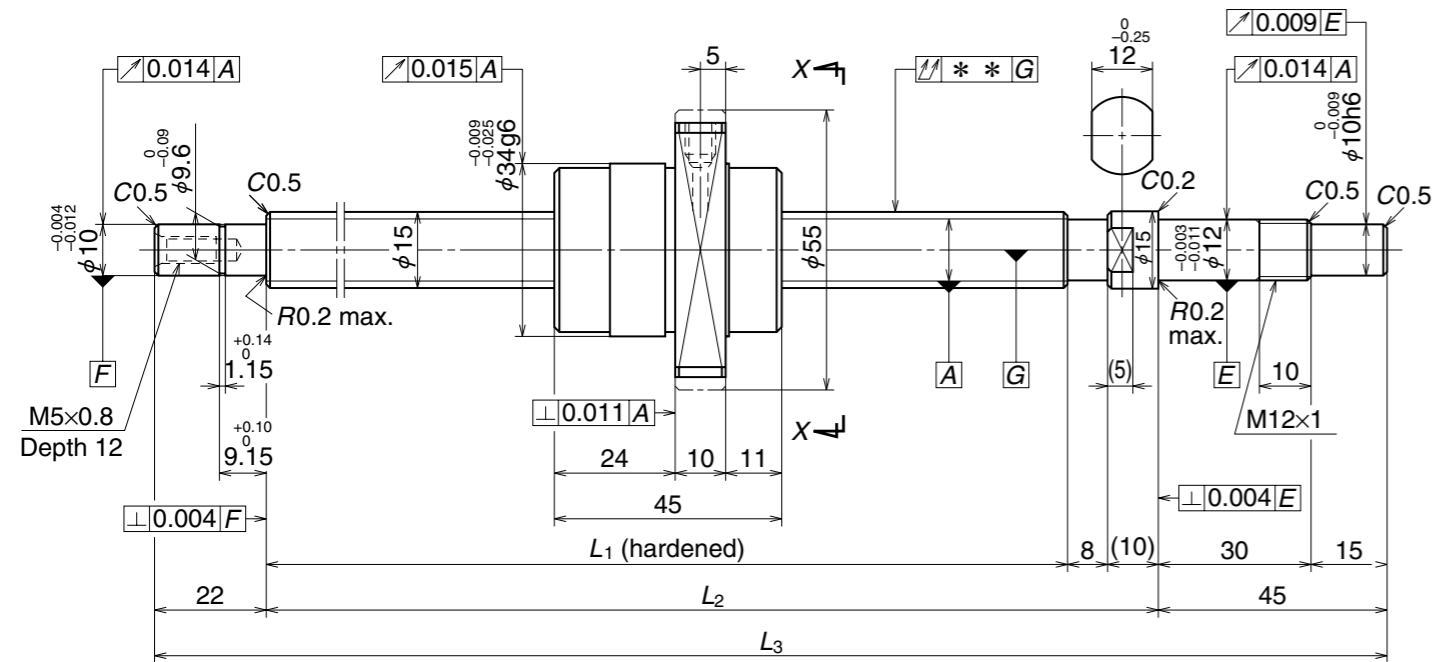
Ball Screw Specifications		
Shaft dia. x Lead / Direction of turn	15 x 10 / Right	
Preload / Ball recirculation	P-preload / Return tube	
Ball dia. / Ball circle dia.	3.175 / 15.5	
Effective turns of balls	2.5 x 1	
Accuracy grade / Preload	C5 / Z	
Basic load rating (N)	Dynamic $C_a$	4 450
	Static $C_{0a}$	6 380
Axial play	0	
Dynamic friction torque (N·cm)	1.5 – 7.8	
Spacer ball	Yes	
Factory-packed grease	NSK grease LR3	
Internal spatial volume of nut (cm <sup>3</sup> )	2.3	

Recommended Support Unit	Fixed side	Simple support side
	WBK12-01A (square)	○
WBK12S-01 (square)		○
WBK12-11 (round)	○	

Unit: mm

Part number	Stroke		Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	
	Nominal	Maximum (L <sub>1</sub> -Nut length)	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	Target value T	Error $\epsilon_p$	Variation $\nu_u$			Supporting condition	
											Fixed - Simple support	Fixed - Fixed
<b>W1501FA-1P-C5Z10</b>	100	138	189	204	271	0	0.020	0.018	0.025	0.61	3 000	3 000
<b>W1502FA-1P-C5Z10</b>	150	188	239	254	321	0	0.023	0.018	0.035	0.67	3 000	3 000
<b>W1502FA-3P-C5Z10</b>	200	238	289	304	371	0	0.023	0.018	0.035	0.74	3 000	3 000
<b>W1503FA-1P-C5Z10</b>	250	288	339	354	421	0	0.025	0.020	0.040	0.80	3 000	3 000
<b>W1503FA-3P-C5Z10</b>	300	338	389	404	471	0	0.025	0.020	0.040	0.86	3 000	3 000
<b>W1504FA-1P-C5Z10</b>	350	388	439	454	521	0	0.027	0.020	0.050	0.93	3 000	3 000
<b>W1504FA-3P-C5Z10</b>	400	438	489	504	571	0	0.027	0.020	0.050	1.0	3 000	3 000
<b>W1505FA-1P-C5Z10</b>	450	488	539	554	621	0	0.030	0.023	0.050	1.1	3 000	3 000
<b>W1505FA-3P-C5Z10</b>	500	538	589	604	671	0	0.030	0.023	0.065	1.1	3 000	3 000
<b>W1506FA-1P-C5Z10</b>	550	588	639	654	721	0	0.035	0.025	0.065	1.2	3 000	3 000
<b>W1506FA-3P-C5Z10</b>	600	638	689	704	771	0	0.035	0.025	0.065	1.2	3 000	3 000
<b>W1507FA-1P-C5Z10</b>	700	738	789	804	871	0	0.035	0.025	0.085	1.4	3 000	3 000
<b>W1508FA-1P-C5Z10</b>	800	838	889	904	971	0	0.040	0.027	0.085	1.5	2 400	3 000
<b>W1510FA-1P-C5Z10</b>	1 000	1 038	1 089	1 104	1 171	0	0.046	0.030	0.110	1.8	1 590	2 250

Note: NSK grease LR3 is recommended. Amount for replenishing should be about 50% of nut internal space capacity.



View X-X

Unit: mm

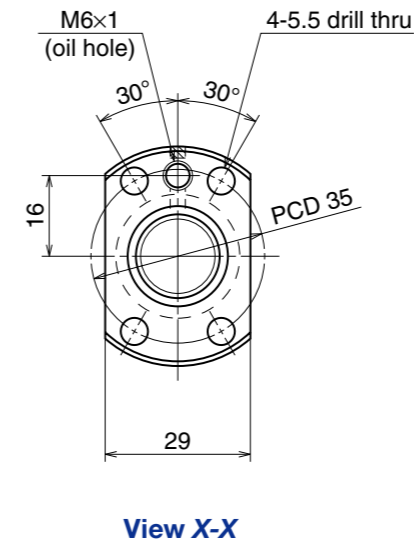
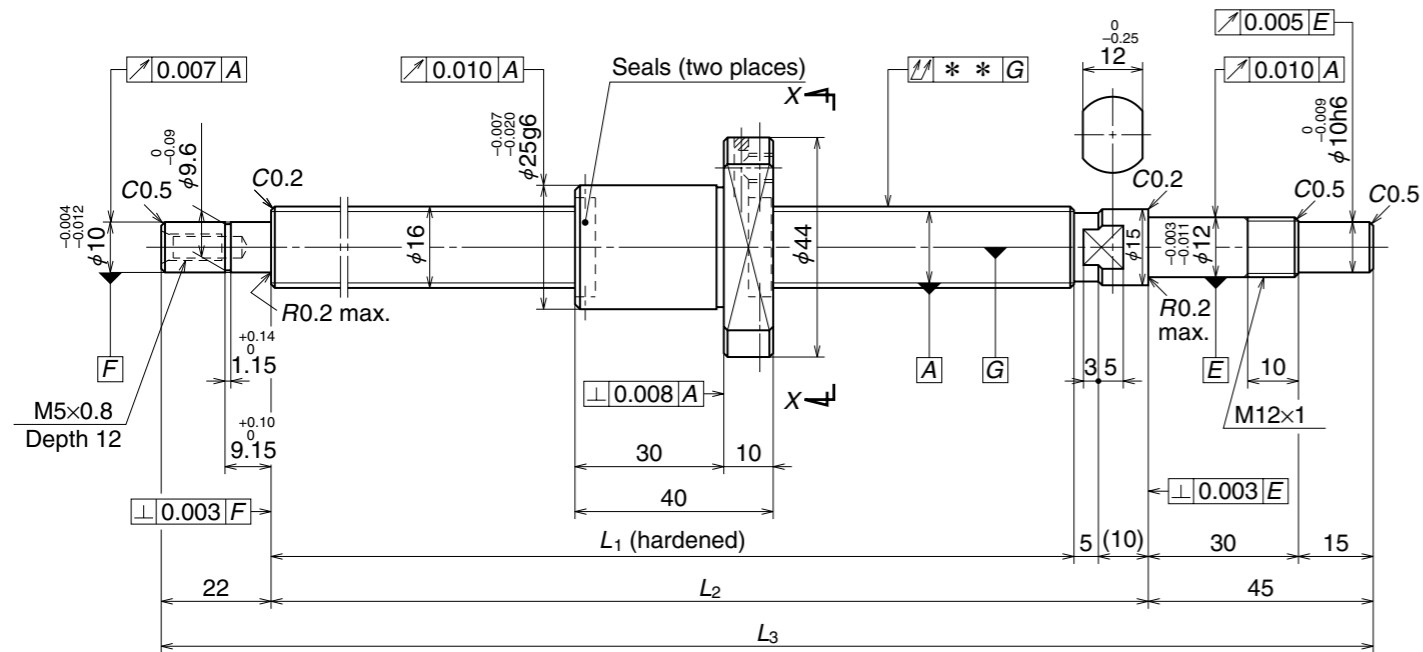
Ball Screw Specifications		
Shaft dia. x Lead / Direction of turn	15 x 20 / Right	
Preload / Ball recirculation	P-preload / End cap	
Ball dia. / Ball circle dia.	3.175 / 15.5	
Effective turns of balls	1.7 x 1	
Accuracy grade / Preload	C5 / Z	
Basic load rating (N)	Dynamic $C_a$	3 870
	Static $C_{0a}$	5 820
Axial play	0	
Dynamic friction torque (N·cm)	1.5 - 7.8	
Spacer ball	Yes	
Factory-packed grease	NSK grease LR3	
Internal spatial volume of nut (cm <sup>3</sup> )	1.9	

Recommended Support Unit	Fixed side	Simple support side
	WBK12-01A (square)	○
WBK12S-01 (square)		○
WBK12-11 (round)	○	

Unit: mm

Part number	Stroke		Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	
	Nominal	Maximum (L <sub>1</sub> -Nut length)	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	Target value T	Error $\epsilon_p$	Variation $\nu_u$			Supporting condition	
											Fixed - Simple support	Fixed - Fixed
W1501FA-3PG-C5Z20	100	141	186	204	271	0	0.020	0.018	0.025	0.61	3 000	3 000
W1502FA-5PG-C5Z20	150	191	236	254	321	0	0.023	0.018	0.035	0.68	3 000	3 000
W1502FA-7PG-C5Z20	200	241	286	304	371	0	0.023	0.018	0.035	0.75	3 000	3 000
W1503FA-5PG-C5Z20	250	291	336	354	421	0	0.025	0.020	0.040	0.81	3 000	3 000
W1503FA-7PG-C5Z20	300	341	386	404	471	0	0.025	0.020	0.040	0.88	3 000	3 000
W1504FA-5PG-C5Z20	350	391	436	454	521	0	0.027	0.020	0.050	0.95	3 000	3 000
W1504FA-7PG-C5Z20	400	441	486	504	571	0	0.027	0.020	0.050	1.0	3 000	3 000
W1505FA-5PG-C5Z20	450	491	536	554	621	0	0.030	0.023	0.050	1.1	3 000	3 000
W1505FA-7PG-C5Z20	500	541	586	604	671	0	0.030	0.023	0.065	1.1	3 000	3 000
W1506FA-5PG-C5Z20	550	591	636	654	721	0	0.035	0.025	0.065	1.2	3 000	3 000
W1506FA-7PG-C5Z20	600	641	686	704	771	0	0.035	0.025	0.065	1.3	3 000	3 000
W1507FA-3PG-C5Z20	700	741	786	804	871	0	0.035	0.025	0.085	1.4	3 000	3 000
W1508FA-3PG-C5Z20	800	841	886	904	971	0	0.040	0.027	0.085	1.5	2 400	3 000
W1510FA-3PG-C5Z20	1 000	1 041	1 086	1 104	1 171	0	0.046	0.030	0.110	1.8	1 590	2 240

Note: NSK grease LR3 is recommended. Amount for replenishing should be about 50% of nut internal space capacity.



Unit: mm

Ball Screw Specifications		
Shaft dia. x Lead / Direction of turn	16 x 2 / Right	
Preload / Ball recirculation	P-preload / Deflector	
Ball dia. / Ball circle dia.	1.588 / 16.4	
Effective turns of balls	1 x 4	
Accuracy grade / Preload	C3 / Z	
Basic load rating (N)	Dynamic $C_a$	3 510
	Static $C_{0a}$	8 450
Axial play	0	
Dynamic friction torque (N-cm)	0.5 - 4.9	
Spacer ball	None	
Factory-packed grease	NSK grease PS2	
Internal spatial volume of nut (cm <sup>3</sup> )	1.6	

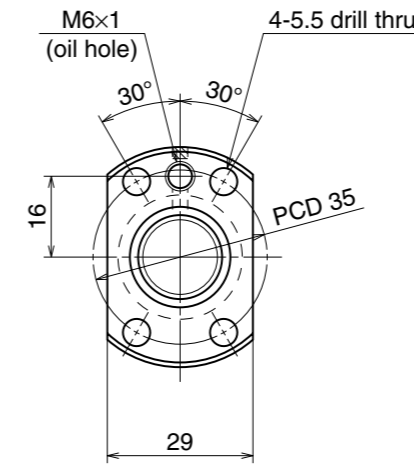
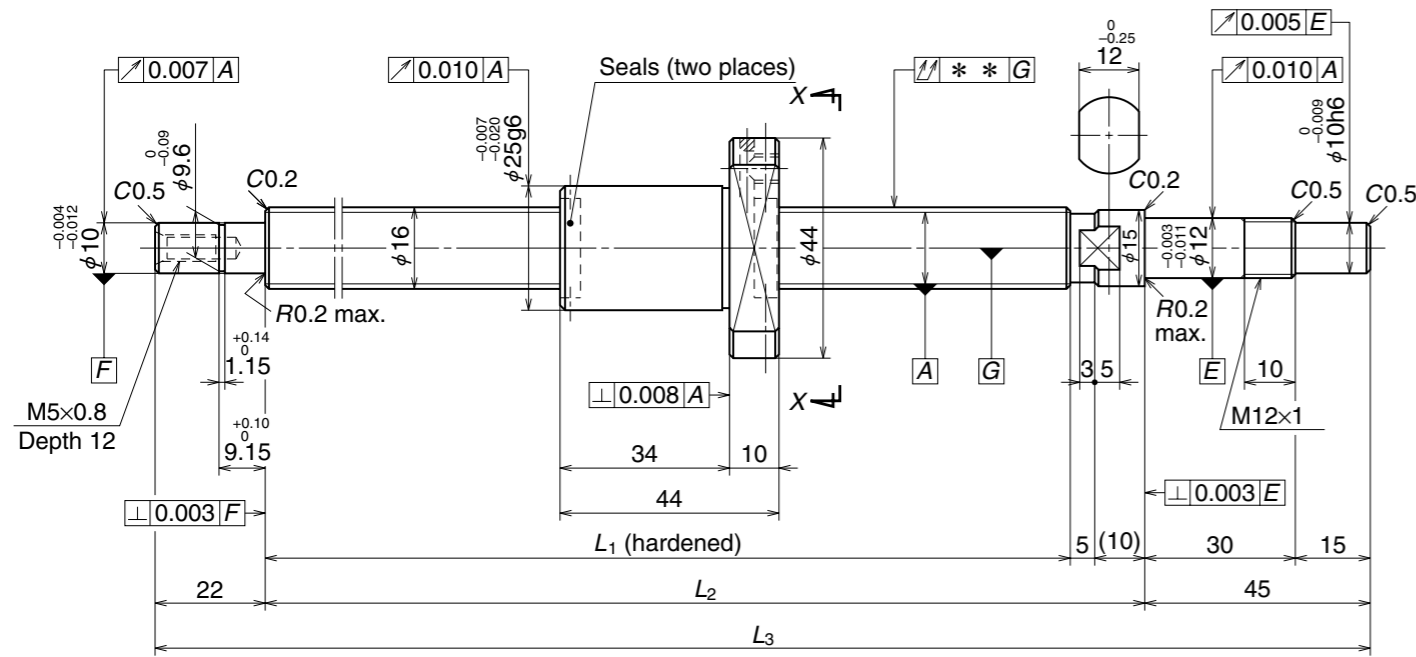
Recommended Support Unit	Fixed side	Simple support side
	WBK12-01A (square)	○
WBK12S-01 (square)		○
WBK12-11 (round)	○	

Unit: mm

Part number	Stroke		Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	
	Nominal	Maximum (L <sub>1</sub> -Nut length)	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	Target value $T$	Error $e_p$	Variation $v_u$			Supporting condition	
											Fixed - Simple support	Fixed - Fixed
<b>W1601MA-1PY-C3Z2</b>	50	99	139	154	221	0	0.010	0.008	0.020	0.41	3 000	3 000
<b>W1601MA-3PY-C3Z2</b>	100	149	189	204	271	0	0.010	0.008	0.020	0.48	3 000	3 000
<b>W1602MA-1PY-C3Z2</b>	150	199	239	254	321	0	0.012	0.008	0.030	0.55	3 000	3 000
<b>W1602MA-3PY-C3Z2</b>	200	249	289	304	371	0	0.012	0.008	0.030	0.62	3 000	3 000
<b>W1603MA-1PY-C3Z2</b>	300	349	389	404	471	0	0.013	0.010	0.035	0.77	3 000	3 000

Note: NSK grease PS2 is recommended. Amount for replenishing should be about 50% of nut internal space capacity.

Unit: mm



View X-X

Ball Screw Specifications		
Shaft dia. x Lead / Direction of turn	16 x 2.5 / Right	
Preload / Ball recirculation	P-preload / Deflector	
Ball dia. / Ball circle dia.	1.588 / 16.4	
Effective turns of balls	1 x 4	
Accuracy grade / Preload	C3 / Z	
Basic load rating (N)	Dynamic $C_a$	3 510
	Static $C_{0a}$	8 450
Axial play	0	
Dynamic friction torque (N·cm)	0.5 - 4.9	
Spacer ball	None	
Factory-packed grease	NSK grease PS2	
Internal spatial volume of nut (cm <sup>3</sup> )	1.6	

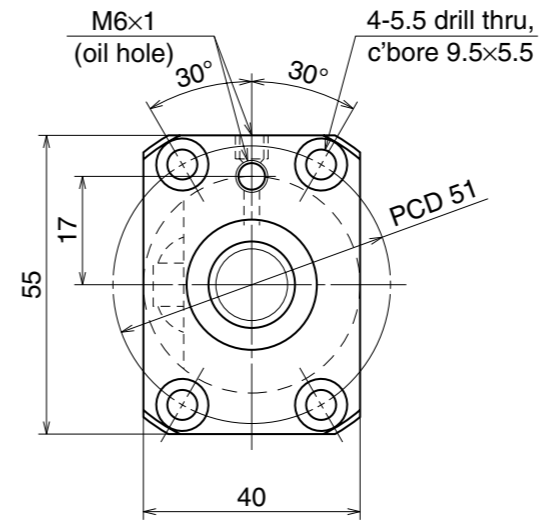
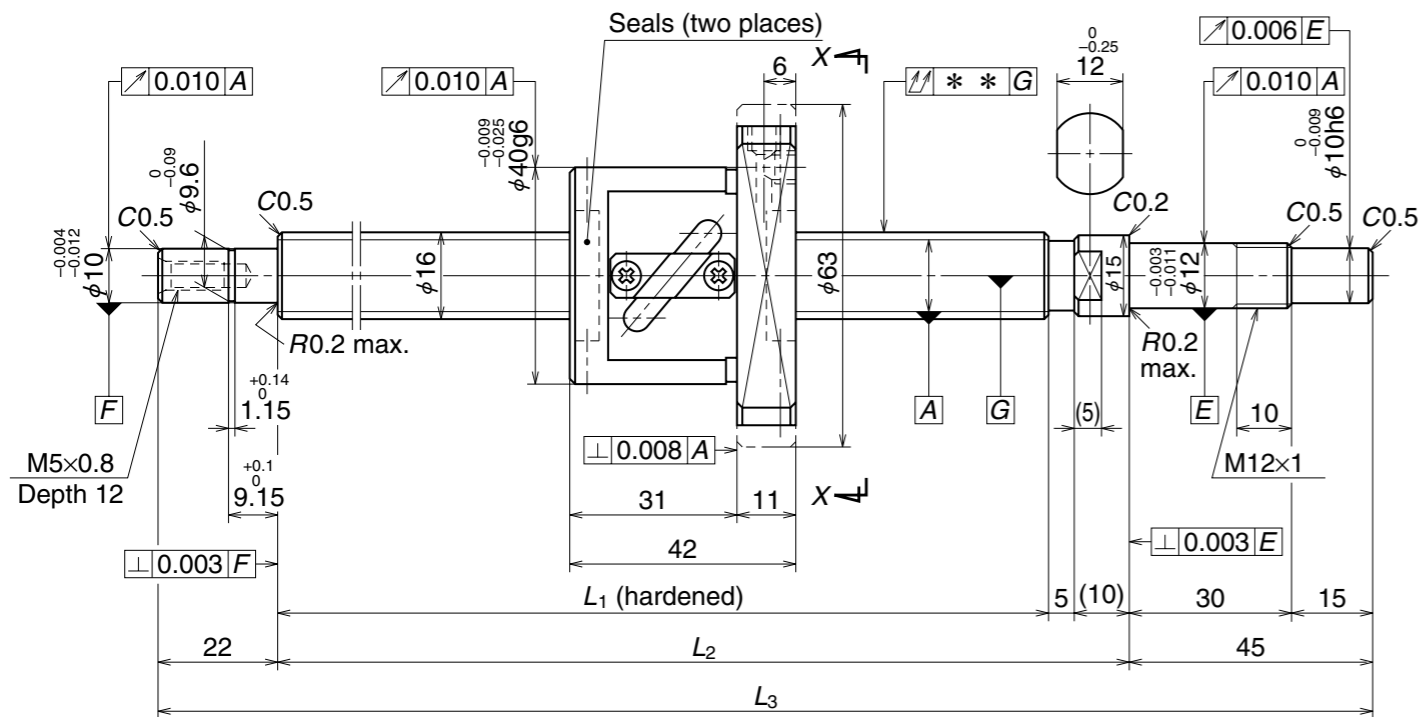
Recommended Support Unit	Fixed side	Simple support side
	WBK12-01A (square)	○
WBK12S-01 (square)		○
WBK12-11 (round)	○	

Unit: mm

Part number	Stroke		Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	
	Nominal	Maximum (L <sub>1</sub> -Nut length)	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	Target value T	Error $\epsilon_p$	Variation $\nu_u$			Supporting condition	
											Fixed - Simple support	Fixed - Fixed
<b>W1601MA-5PY-C3Z2.5</b>	50	95	139	154	221	0	0.010	0.008	0.020	0.42	3 000	3 000
<b>W1601MA-7PY-C3Z2.5</b>	100	145	189	204	271	0	0.010	0.008	0.020	0.49	3 000	3 000
<b>W1602MA-5PY-C3Z2.5</b>	150	195	239	254	321	0	0.012	0.008	0.030	0.57	3 000	3 000
<b>W1602MA-7PY-C3Z2.5</b>	200	245	289	304	371	0	0.012	0.008	0.030	0.64	3 000	3 000
<b>W1603MA-3PY-C3Z2.5</b>	300	345	389	404	471	0	0.013	0.010	0.035	0.79	3 000	3 000

Note: NSK grease PS2 is recommended. Amount for replenishing should be about 50% of nut internal space capacity.

Unit: mm



View X-X

Ball Screw Specifications		
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	
Effective turns of balls	2.5 x 1	
Accuracy grade / Preload	C3 / Z	
Basic load rating (N)	Dynamic $C_a$	4 620
	Static $C_{0a}$	6 750
Axial play	0	
Dynamic friction torque (N·cm)	1.5 – 7.8	
Spacer ball	Yes	
Factory-packed grease	NSK grease LR3	
Internal spatial volume of nut (cm <sup>3</sup> )	2.6	

Recommended Support Unit	Fixed side	Simple support side
	WBK12-01A (square)	○
WBK12S-01 (square)		○
WBK12-11 (round)	○	

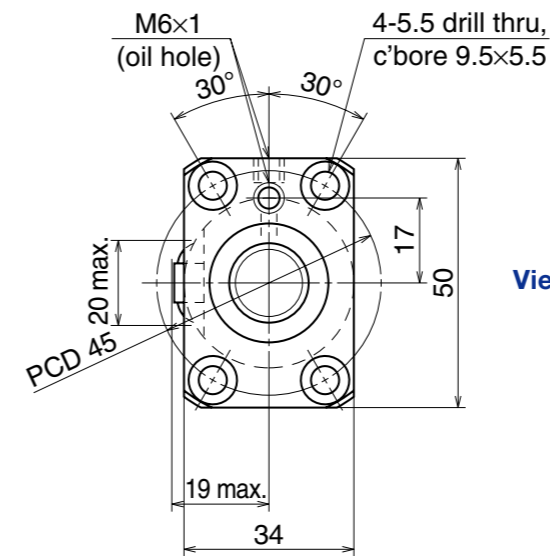
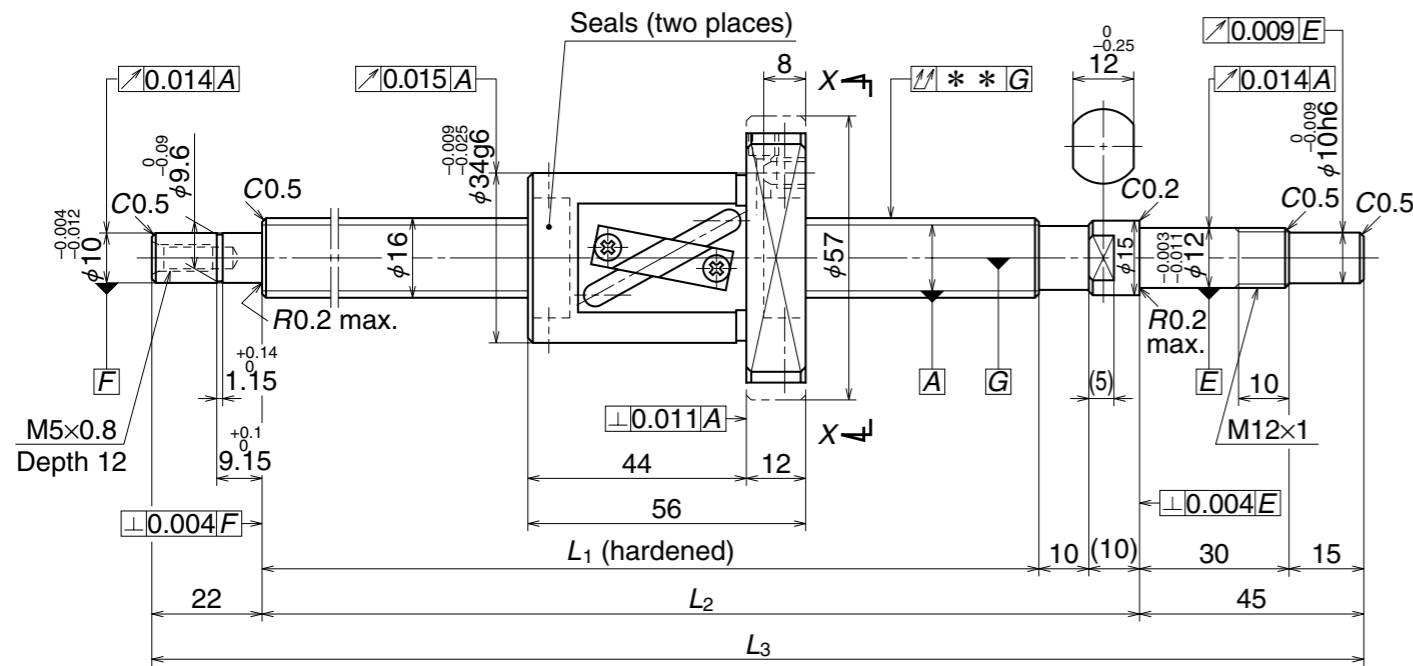
Unit: mm

Part number	Stroke		Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	
	Nominal	Maximum (L <sub>1</sub> -Nut length)	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	Target value T	Error $\epsilon_p$	Variation $\nu_u$			Supporting condition	
											Fixed - Simple support	Fixed - Fixed
<b>W1601FA-1P-C3Z5</b>	100	147	189	204	271	0	0.010	0.008	0.020	0.70	3 000	3 000
<b>W1602FA-1P-C3Z5</b>	200	247	289	304	371	0	0.012	0.008	0.030	0.83	3 000	3 000
<b>W1603FA-1P-C3Z5</b>	300	347	389	404	471	0	0.013	0.010	0.035	0.97	3 000	3 000
<b>W1604FA-1P-C3Z5</b>	400	447	489	504	571	0	0.015	0.010	0.045	1.1	3 000	3 000
<b>W1606FA-1P-C3Z5</b>	600	647	689	704	771	0	0.018	0.013	0.055	1.4	3 000	3 000
<b>W1608FA-1P-C3Z5</b>	800	847	889	904	971	0	0.021	0.015	0.075	1.6	2 570	3 000

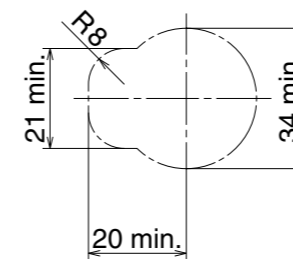
Note: NSK grease LR3 is recommended. Amount for replenishing should be about 50% of nut internal space capacity.



Unit: mm



View X-X



Housing hole and clearance

Ball Screw Specifications		
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	
Effective turns of balls	1.5 x 1	
Accuracy grade / Preload	C5 / Z	
Basic load rating (N)	Dynamic $C_a$	3 600
	Static $C_{0a}$	5 410
Axial play	0	
Dynamic friction torque (N·cm)	1.5 - 7.8	
Spacer ball	Yes	
Factory-packed grease	NSK grease LR3	
Internal spatial volume of nut (cm <sup>3</sup> )	2.1	

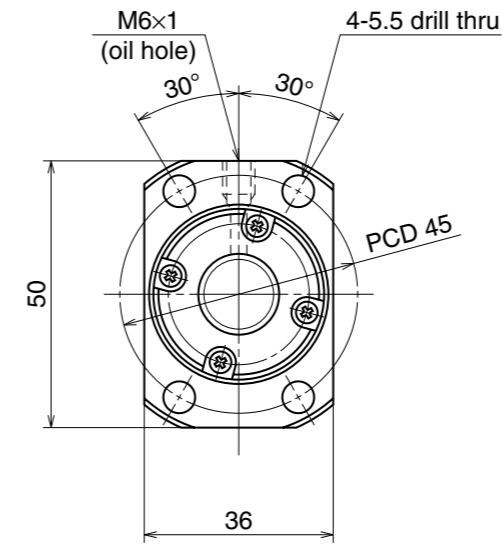
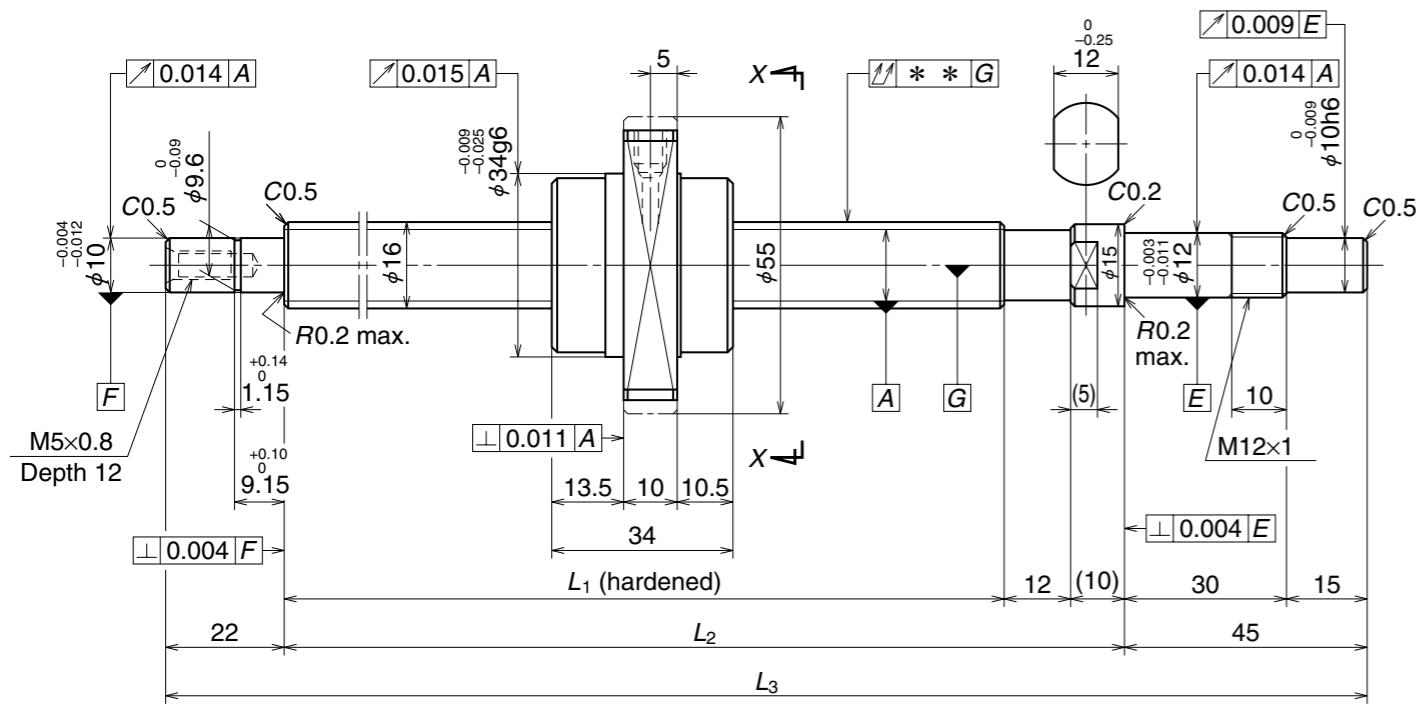
Recommended Support Unit	Fixed side	Simple support side
	WBK12-01A (square)	○
WBK12S-01 (square)		○
WBK12-11 (round)	○	

Unit: mm

Part number	Stroke		Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	
	Nominal	Maximum (L <sub>1</sub> -Nut length)	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	Target value T	Error $\epsilon_p$	Variation $\nu_u$			Supporting condition	
											Fixed - Simple support	Fixed - Fixed
W1601FA-3P-C5Z16	100	128	184	204	271	0	0.020	0.018	0.025	0.69	3 000	3 000
W1602FA-3P-C5Z16	150	178	234	254	321	0	0.023	0.018	0.035	0.77	3 000	3 000
W1602FA-5P-C5Z16	200	228	284	304	371	0	0.023	0.018	0.035	0.84	3 000	3 000
W1603FA-3P-C5Z16	250	278	334	354	421	0	0.025	0.020	0.040	0.92	3 000	3 000
W1603FA-5P-C5Z16	300	328	384	404	471	0	0.025	0.020	0.040	0.99	3 000	3 000
W1604FA-3P-C5Z16	350	378	434	454	521	0	0.027	0.020	0.050	1.1	3 000	3 000
W1604FA-5P-C5Z16	400	428	484	504	571	0	0.027	0.020	0.050	1.1	3 000	3 000
W1605FA-1P-C5Z16	450	478	534	554	621	0	0.030	0.023	0.050	1.2	3 000	3 000
W1605FA-3P-C5Z16	500	528	584	604	671	0	0.030	0.023	0.065	1.3	3 000	3 000
W1606FA-3P-C5Z16	550	578	634	654	721	0	0.035	0.025	0.065	1.4	3 000	3 000
W1606FA-5P-C5Z16	600	628	684	704	771	0	0.035	0.025	0.065	1.4	3 000	3 000
W1607FA-1P-C5Z16	700	728	784	804	871	0	0.035	0.025	0.085	1.6	3 000	3 000
W1608FA-3P-C5Z16	800	828	884	904	971	0	0.040	0.027	0.085	1.7	2 690	3 000
W1610FA-1P-C5Z16	1 000	1 028	1 084	1 104	1 171	0	0.046	0.030	0.110	2.0	1 770	2 480

Note: NSK grease LR3 is recommended. Amount for replenishing should be about 50% of nut internal space capacity.

Unit: mm



View X-X

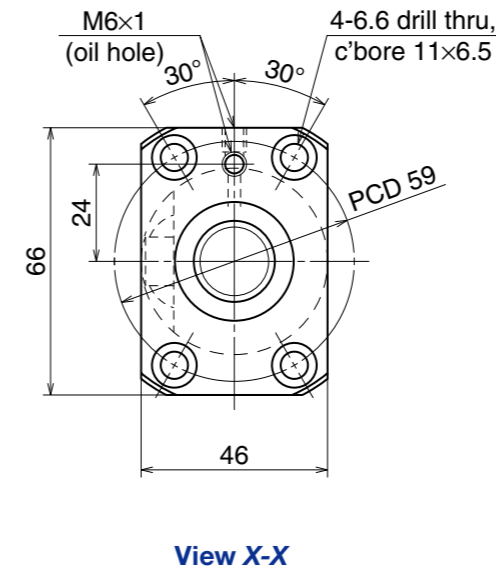
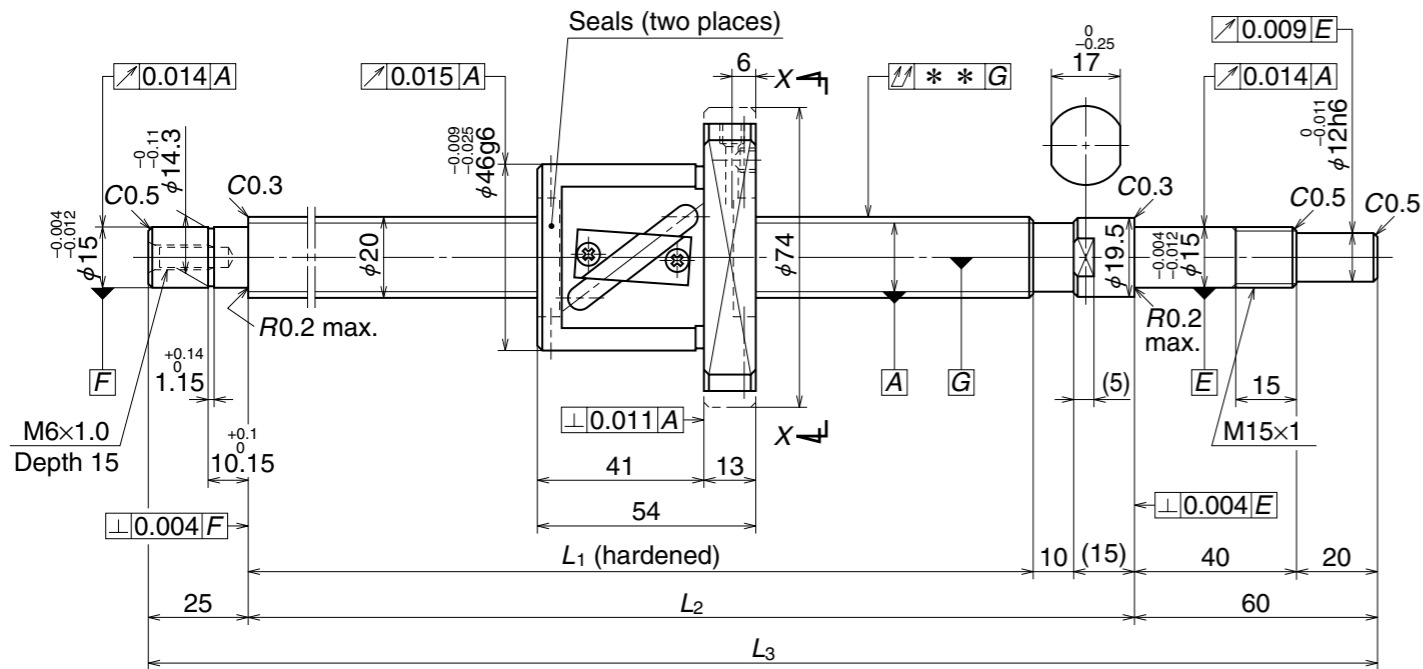
Ball Screw Specifications		
Shaft dia. x Lead / Direction of turn	16 x 32 / Right	
Preload / Ball recirculation	P-preload / End cap	
Ball dia. / Ball circle dia.	3.175 / 16.75	
Effective turns of balls	0.7 x 2	
Accuracy grade / Preload	C5 / Z	
Basic load rating (N)	Dynamic $C_a$	4 000
	Static $C_{0a}$	6 690
Axial play	0	
Dynamic friction torque (N·cm)	1.5 - 9.8	
Spacer ball	None	
Factory-packed grease	NSK grease LR3	
Internal spatial volume of nut (cm <sup>3</sup> )	2.0	

Recommended Support Unit	Fixed side	Simple support side
	WBK12-01A (square)	○
WBK12S-01 (square)		○
WBK12-11 (round)	○	

Unit: mm

Part number	Stroke		Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	
	Nominal	Maximum (L <sub>1</sub> -Nut length)	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	Target value T	Error $\epsilon_p$	Variation $\nu_u$			Supporting condition	
											Fixed - Simple support	Fixed - Fixed
<b>W1603FA-7PGX-C5Z32</b>	300	348	382	404	471	0	0.025	0.020	0.040	0.90	3 000	3 000
<b>W1605FA-5PGX-C5Z32</b>	500	548	582	604	671	0	0.030	0.023	0.065	1.2	3 000	3 000
<b>W1608FA-5PGX-C5Z32</b>	800	848	882	904	971	0	0.040	0.027	0.085	1.7	2 630	3 000
<b>W1612FA-1PGX-C5Z32</b>	1 200	1 248	1 282	1 304	1 371	0	0.054	0.035	0.150	2.3	1 240	1 740

Note 1: NSK grease LR3 is recommended. Amount for replenishing should be about 50% of nut internal space capacity.  
 Note 2: Nut does not have seal.



Unit: mm

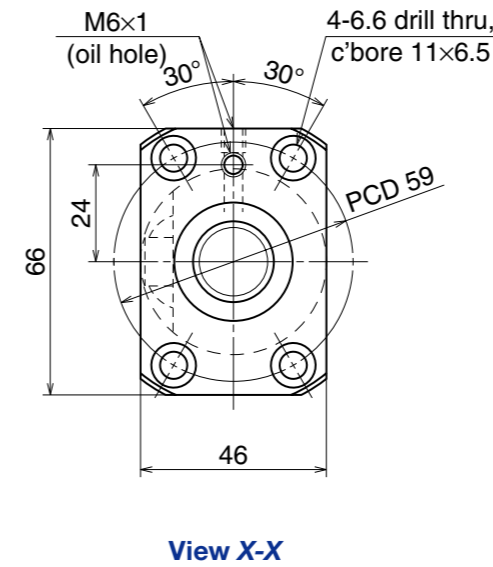
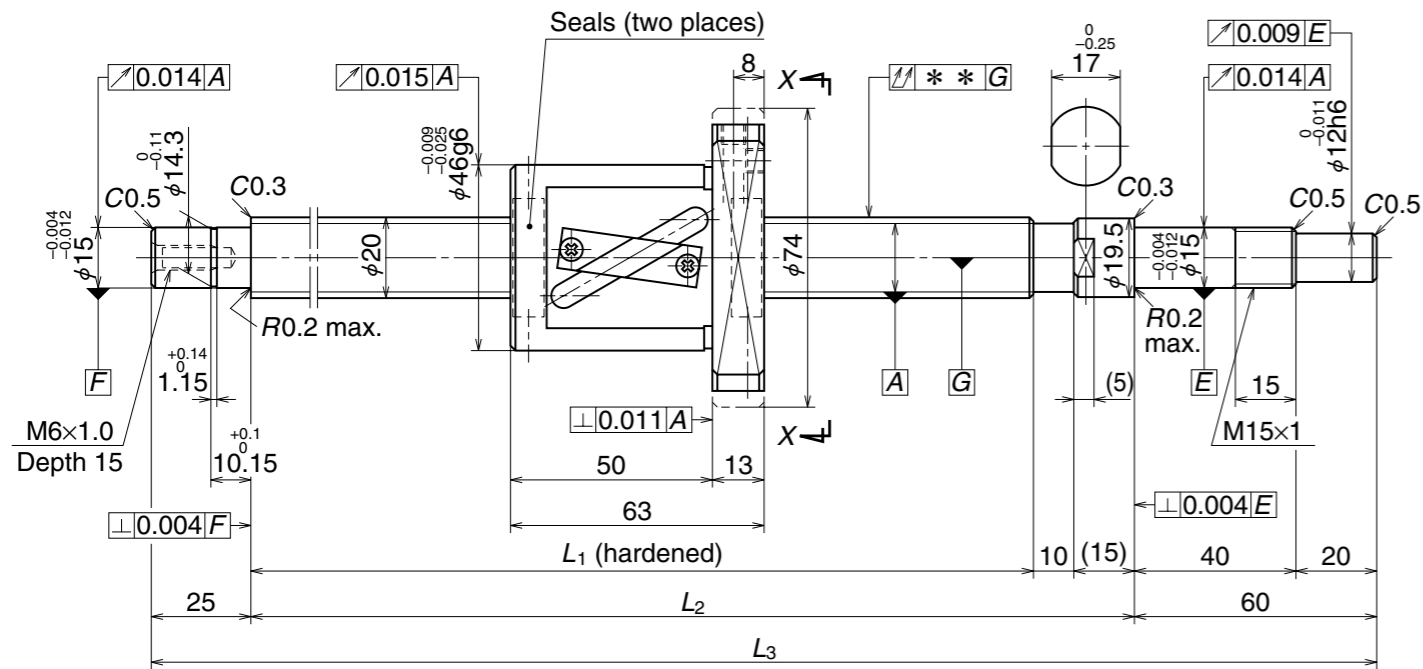
Ball Screw Specifications		
Shaft dia. x Lead / Direction of turn	20 x 10 / Right	
Preload / Ball recirculation	P-preload / Return tube	
Ball dia. / Ball circle dia.	3.969 / 21	
Effective turns of balls	2.5 x 1	
Accuracy grade / Preload	C5 / Z	
Basic load rating (N)	Dynamic $C_a$	6 880
	Static $C_{0a}$	10 800
Axial play	0	
Dynamic friction torque (N·cm)	2.0 - 11.8	
Spacer ball	Yes	
Factory-packed grease	NSK grease LR3	
Internal spatial volume of nut (cm <sup>3</sup> )	4.7	

Recommended Support Unit	Fixed side	Simple support side
	WBK15-01A (square)	○
WBK15S-01 (square)		○
WBK15-11 (round)	○	

Unit: mm

Part number	Stroke		Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	
	Nominal	Maximum (L <sub>1</sub> -Nut length)	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	Target value T	Error $\epsilon_p$	Variation $\nu_u$			Supporting condition	
											Fixed - Simple support	Fixed - Fixed
<b>W2002FA-1P-C5Z10</b>	200	235	289	314	399	0	0.023	0.018	0.035	1.4	3 000	3 000
<b>W2003FA-1P-C5Z10</b>	300	335	389	414	499	0	0.025	0.020	0.040	1.6	3 000	3 000
<b>W2004FA-1P-C5Z10</b>	400	435	489	514	599	0	0.027	0.020	0.050	1.9	3 000	3 000
<b>W2005FA-1P-C5Z10</b>	500	535	589	614	699	0	0.030	0.023	0.065	2.1	3 000	3 000
<b>W2006FA-1P-C5Z10</b>	600	635	689	714	799	0	0.035	0.025	0.065	2.3	3 000	3 000
<b>W2007FA-1P-C5Z10</b>	700	735	789	814	899	0	0.035	0.025	0.085	2.5	3 000	3 000
<b>W2008FA-1P-C5Z10</b>	800	835	889	914	999	0	0.040	0.027	0.085	2.8	3 000	3 000
<b>W2009FA-1P-C5Z10</b>	900	935	989	1 014	1 099	0	0.040	0.027	0.110	3.0	2 680	3 000
<b>W2010FA-1P-C5Z10</b>	1 000	1 035	1 089	1 114	1 199	0	0.046	0.030	0.110	3.2	2 210	3 000
<b>W2011FA-1P-C5Z10</b>	1 100	1 135	1 189	1 214	1 299	0	0.046	0.030	0.150	3.4	1 840	2 570
<b>W2012FA-1P-C5Z10</b>	1 200	1 235	1 289	1 314	1 399	0	0.054	0.035	0.150	3.7	1 570	2 190

Note: NSK grease LR3 is recommended. Amount for replenishing should be about 50% of nut internal space capacity.



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	
Effective turns of balls	1.5 x 1	
Accuracy grade / Preload	C5 / Z	
Basic load rating (N)	Dynamic $C_a$	5 370
	Static $C_{0a}$	8 450
Axial play	0	
Dynamic friction torque (N·cm)	2.0 - 11.8	
Spacer ball	Yes	
Factory-packed grease	NSK grease LR3	
Internal spatial volume of nut (cm <sup>3</sup> )	4.2	

Recommended Support Unit	Fixed side	Simple support side
	WBK15-01A (square)	○
WBK15S-01 (square)		○
WBK15-11 (round)	○	

Unit: mm

Part number	Stroke		Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	
	Nominal	Maximum (L <sub>1</sub> -Nut length)	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	Target value T	Error $\epsilon_p$	Variation $\nu_u$			Supporting condition	
											Fixed - Simple support	Fixed - Fixed
<b>W2003FA-3P-C5Z20</b>	200	247	310	335	420	0	0.023	0.018	0.040	1.6	3 000	3 000
<b>W2004FA-3P-C5Z20</b>	300	347	410	435	520	0	0.027	0.020	0.050	1.8	3 000	3 000
<b>W2005FA-3P-C5Z20</b>	400	447	510	535	620	0	0.030	0.023	0.050	2.0	3 000	3 000
<b>W2006FA-3P-C5Z20</b>	500	547	610	635	720	0	0.030	0.023	0.065	2.3	3 000	3 000
<b>W2007FA-3P-C5Z20</b>	600	647	710	735	820	0	0.035	0.025	0.085	2.5	3 000	3 000
<b>W2008FA-3P-C5Z20</b>	700	747	810	835	920	0	0.040	0.027	0.085	2.7	3 000	3 000
<b>W2009FA-3P-C5Z20</b>	800	847	910	935	1 020	0	0.040	0.027	0.110	3.0	3 000	3 000
<b>W2010FA-3P-C5Z20</b>	900	947	1 010	1 035	1 120	0	0.046	0.030	0.110	3.2	2 590	3 000
<b>W2011FA-3P-C5Z20</b>	1 000	1 047	1 110	1 135	1 220	0	0.046	0.030	0.110	3.4	2 140	2 970
<b>W2012FA-3P-C5Z20</b>	1 100	1 147	1 210	1 235	1 320	0	0.046	0.030	0.150	3.7	1 790	2 500
<b>W2015FA-1P-C5Z20</b>	1 400	1 447	1 510	1 535	1 620	0	0.054	0.035	0.180	4.4	1 140	1 610

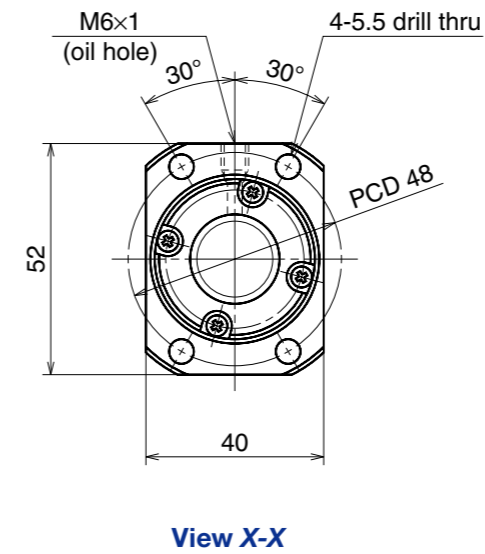
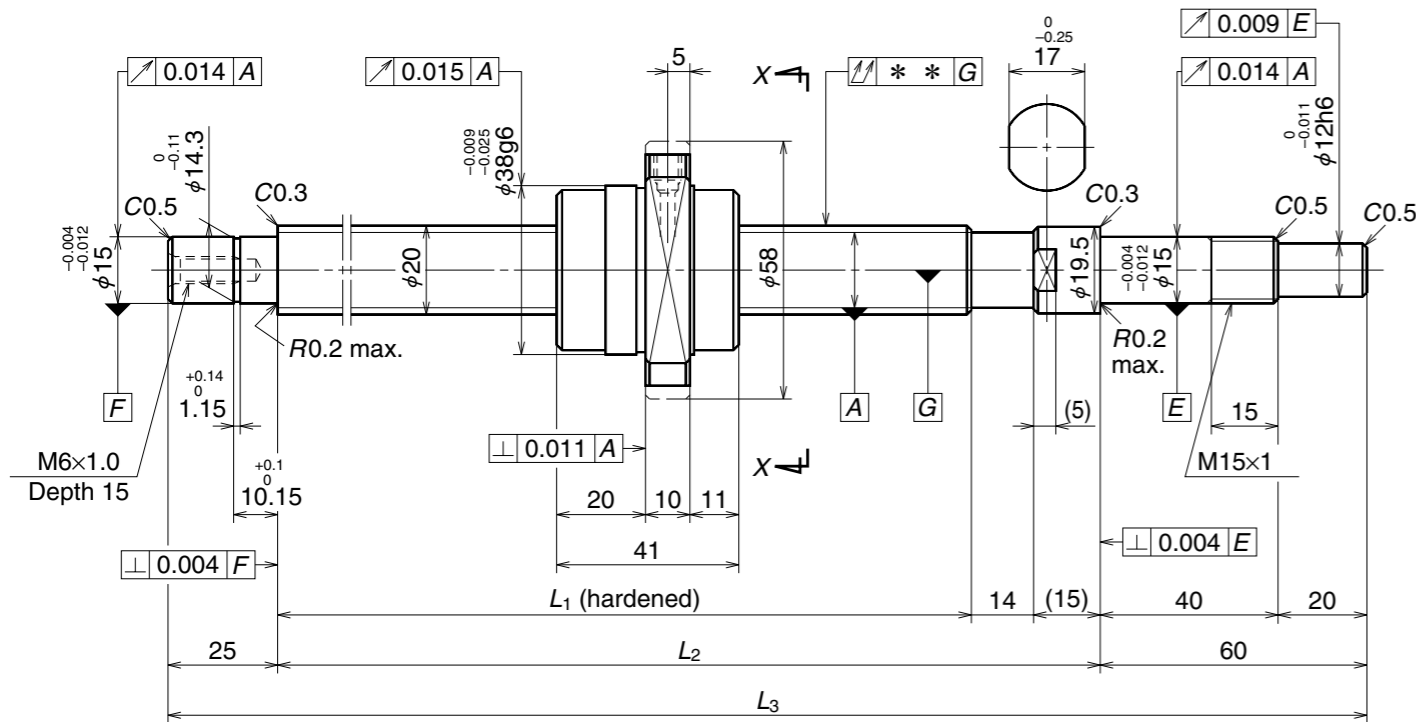
Note: NSK grease LR3 is recommended. Amount for replenishing should be about 50% of nut internal space capacity.

# Ball Screws A Series: Finished Shaft End

Nut Model: UPFC

Screw Shaft  $\phi 20$  Lead 40

Unit: mm



Ball Screw Specifications		
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	
Effective turns of balls	0.7 x 2	
Accuracy grade / Preload	C5 / Z	
Basic load rating (N)	Dynamic $C_a$	4 490
	Static $C_{0a}$	8 640
Axial play	0	
Dynamic friction torque (N·cm)	2.0 - 11.8	
Spacer ball	None	
Factory-packed grease	NSK grease LR3	
Internal spatial volume of nut (cm <sup>3</sup> )	2.8	

Recommended Support Unit	Fixed side	Simple support side
	WBK15-01A (square)	○
WBK15S-01 (square)		○
WBK15-11 (round)	○	

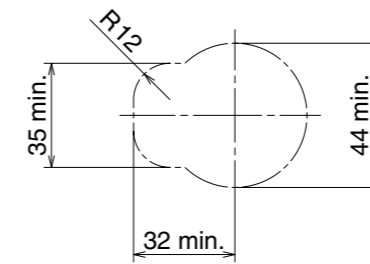
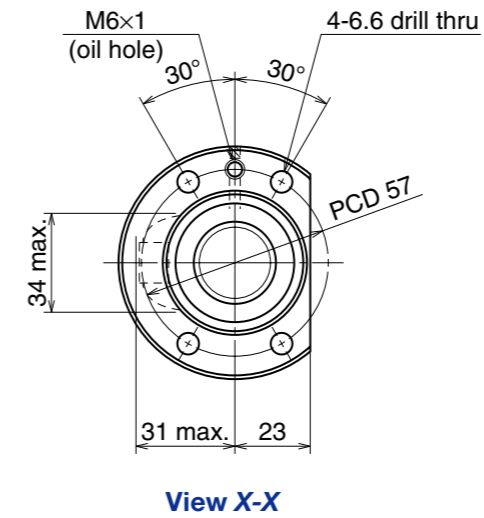
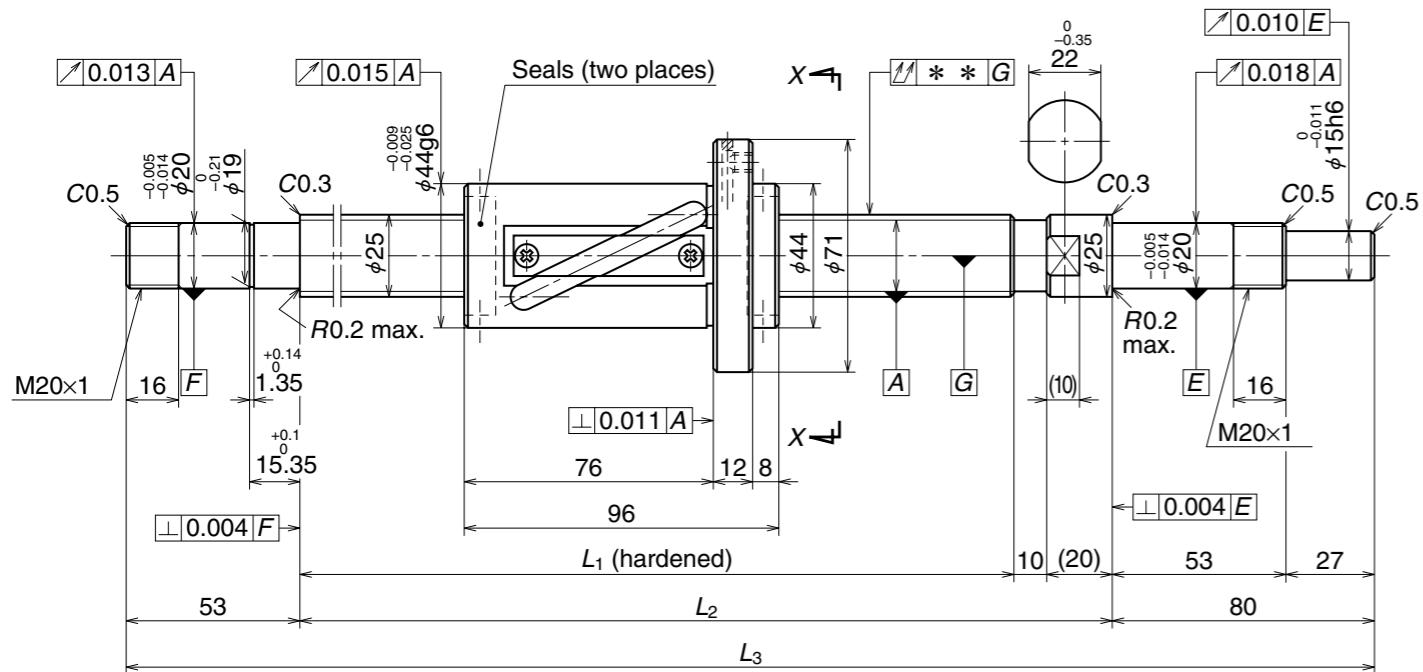
Ball Screws A Series

Unit: mm

Part number	Stroke		Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	
	Nominal	Maximum (L <sub>1</sub> -Nut length)	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	Target value T	Error $\epsilon_p$	Variation $\nu_u$			Supporting condition	
											Fixed - Simple support	Fixed - Fixed
<b>W2005FA-5PGX-C5Z40</b>	400	465	506	535	620	0	0.030	0.023	0.050	1.7	3 000	3 000
<b>W2007FA-5PGX-C5Z40</b>	600	665	706	735	820	0	0.035	0.025	0.085	2.2	3 000	3 000
<b>W2009FA-5PGX-C5Z40</b>	800	865	906	935	1 020	0	0.040	0.027	0.110	2.7	3 000	3 000
<b>W2011FA-5PGX-C5Z40</b>	1 000	1 065	1 106	1 135	1 220	0	0.046	0.030	0.110	3.1	2 170	3 000
<b>W2013FA-1PGX-C5Z40</b>	1 200	1 265	1 306	1 335	1 420	0	0.054	0.035	0.150	3.6	1 550	2 160
<b>W2017FA-1PGX-C5Z40</b>	1 600	1 665	1 706	1 735	1 820	0	0.065	0.040	0.230	4.6	910	1 270

Note 1: NSK grease LR3 is recommended. Amount for replenishing should be about 50% of nut internal space capacity.  
 Note 2: Nut does not have seal.

Unit: mm



Housing hole and clearance

Ball Screw Specifications		
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	
Effective turns of balls	2.5 x 1	
Accuracy grade / Preload	C5 / Z	
Basic load rating (N)	Dynamic $C_a$	9 900
	Static $C_{0a}$	16 400
Axial play	0	
Dynamic friction torque (N·cm)	3.9 – 24.5	
Spacer ball	Yes	
Factory-packed grease	NSK grease LR3	
Internal spatial volume of nut (cm <sup>3</sup> )	12	

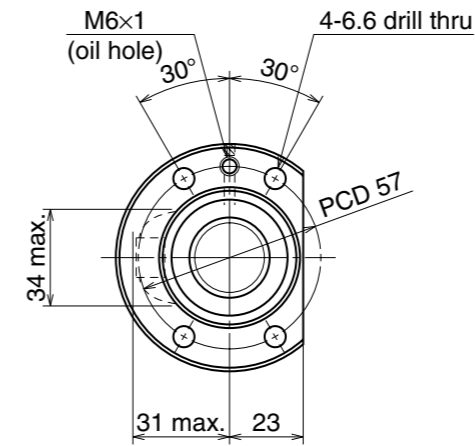
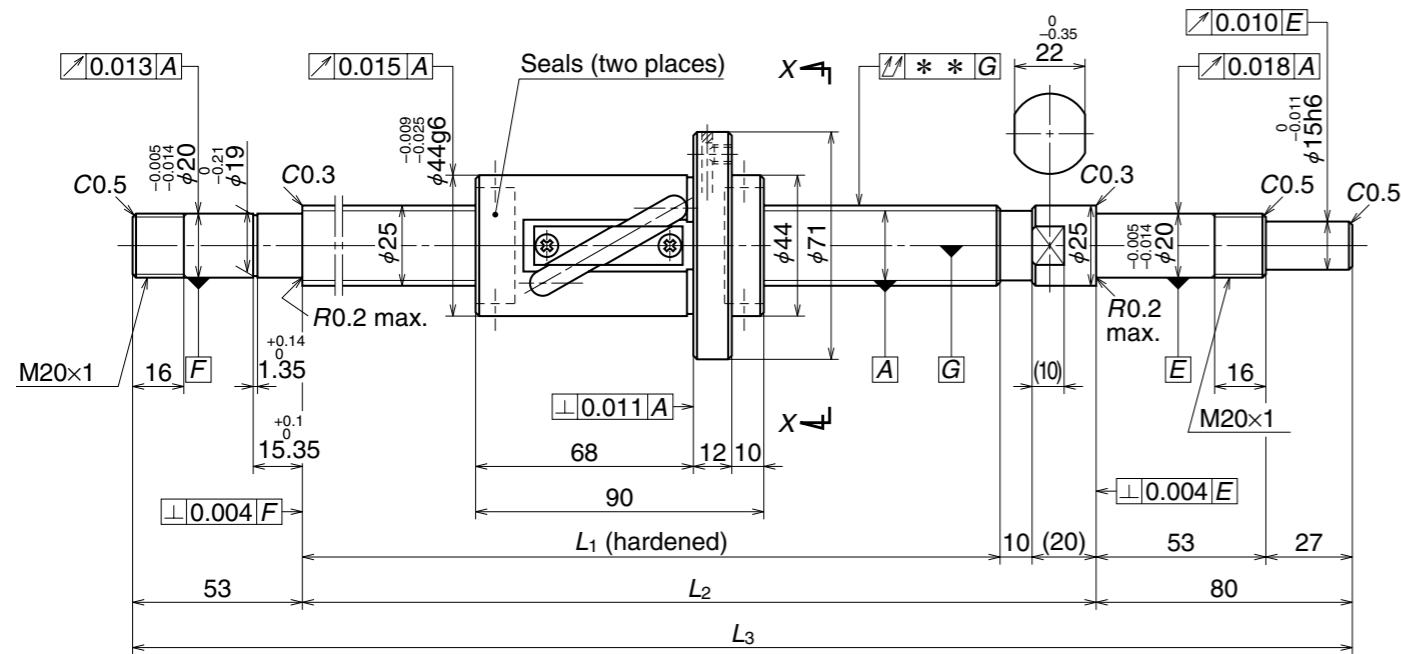
Recommended Support Unit	Fixed side	Simple support side
WBK20-01 (square)	○	○
WBK20S-01 (square)		○
WBK20-11 (round)	○	○

Unit: mm

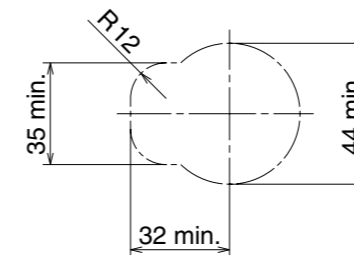
Part number	Stroke		Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	
	Nominal	Maximum ( $L_1$ -Nut length)	$L_1$	$L_2$	$L_3$	Target value $T$	Error $\epsilon_p$	Variation $\nu_u$			Supporting condition	
											Fixed - Simple support	Fixed - Fixed
<b>W2507FA-1P-C5Z20</b>	600	654	750	780	913	0	0.035	0.025	0.055	4.0	2 800	2 800
<b>W2509FA-1P-C5Z20</b>	800	854	950	980	1 113	0	0.040	0.027	0.070	4.7	2 800	2 800
<b>W2511FA-1P-C5Z20</b>	1 000	1 054	1 150	1 180	1 313	0	0.046	0.030	0.090	5.4	2 560	2 800
<b>W2513FA-1P-C5Z20</b>	1 200	1 254	1 350	1 380	1 513	0	0.054	0.035	0.090	6.2	1 840	2 550
<b>W2515FA-1P-C5Z20</b>	1 400	1 454	1 550	1 580	1 713	0	0.054	0.035	0.120	6.9	1 390	1 940
<b>W2517FA-1P-C5Z20</b>	1 600	1 654	1 750	1 780	1 913	0	0.065	0.040	0.120	7.6	1 080	1 520
<b>W2521FA-1P-C5Z20</b>	2 000	2 054	2 150	2 180	2 313	0	0.077	0.046	0.160	9.1	710	1 000

Note: NSK grease LR3 is recommended. Amount for replenishing should be about 50% of nut internal space capacity.

Unit: mm



View X-X



Housing hole and clearance

Ball Screw Specifications		
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	
Effective turns of balls	1.5 x 1	
Accuracy grade / Preload	C5 / Z	
Basic load rating (N)	Dynamic $C_a$	7 730
	Static $C_{0a}$	12 700
Axial play	0	
Dynamic friction torque (N·cm)	3.9 – 24.5	
Spacer ball	Yes	
Factory-packed grease	NSK grease LR3	
Internal spatial volume of nut (cm <sup>3</sup> )	7.5	

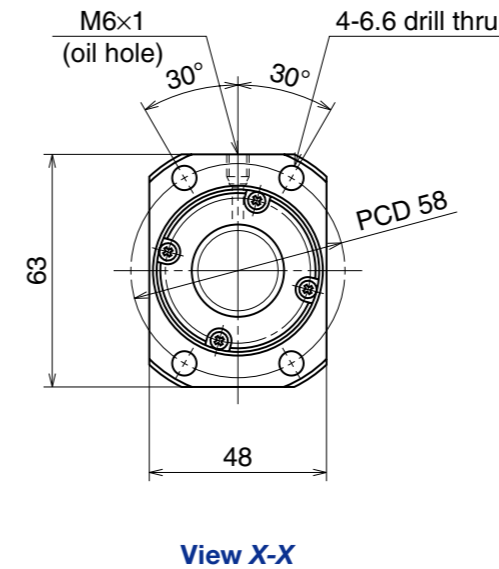
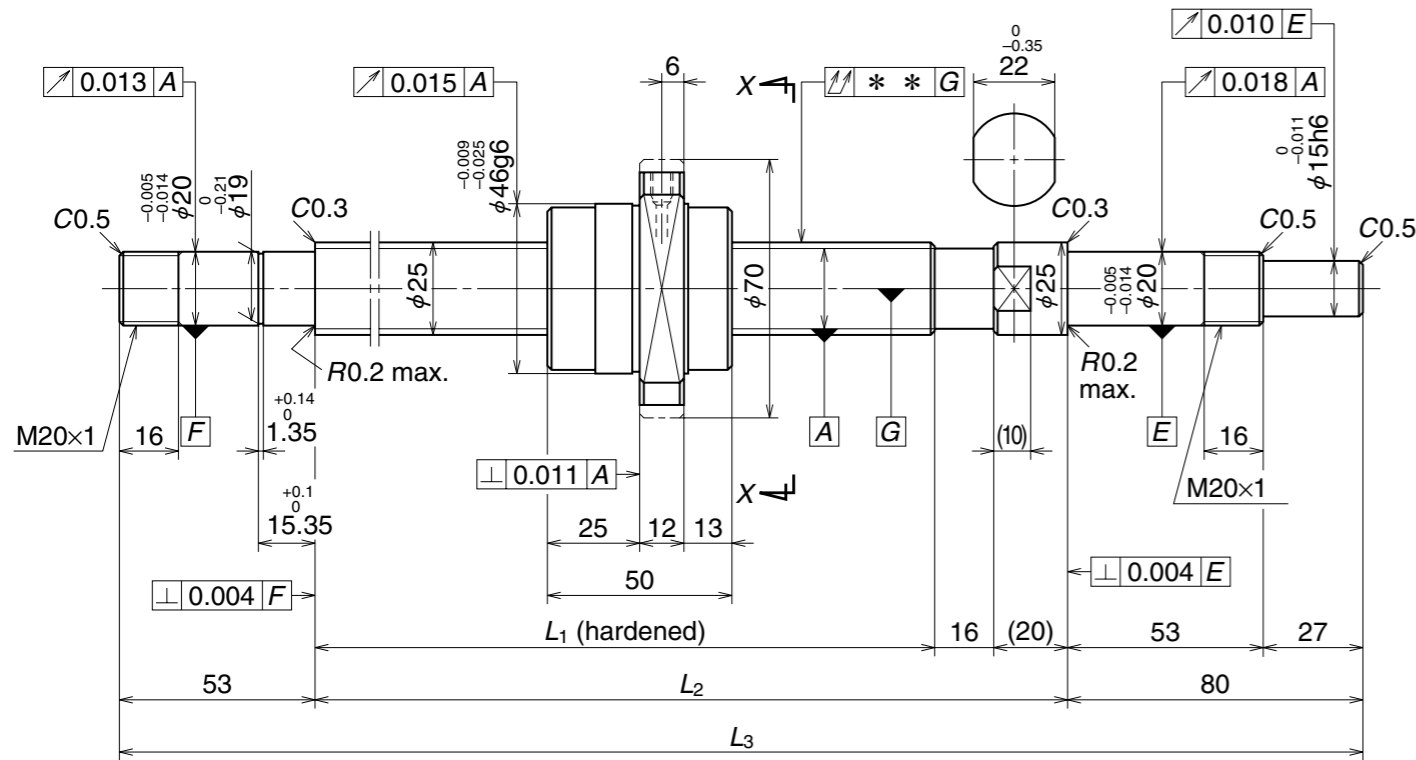
Recommended Support Unit	Fixed side	Simple support side
	WBK20-01 (square)	○
WBK20S-01 (square)		○
WBK20-11 (round)	○	○

Unit: mm

Part number	Stroke		Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	
	Nominal	Maximum (L <sub>1</sub> -Nut length)	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	Target value T	Error $\epsilon_p$	Variation $\nu_u$			Supporting condition	
											Fixed - Simple support	Fixed - Fixed
<b>W2507FA-3P-C5Z25</b>	600	660	750	780	913	0	0.035	0.025	0.055	4.0	2 800	2 800
<b>W2509FA-3P-C5Z25</b>	800	860	950	980	1 113	0	0.040	0.027	0.070	4.7	2 800	2 800
<b>W2511FA-3P-C5Z25</b>	1 000	1 060	1 150	1 180	1 313	0	0.046	0.030	0.090	5.4	2 540	2 800
<b>W2513FA-3P-C5Z25</b>	1 200	1 260	1 350	1 380	1 513	0	0.054	0.035	0.090	6.2	1 830	2 540
<b>W2515FA-3P-C5Z25</b>	1 400	1 460	1 550	1 580	1 713	0	0.054	0.035	0.120	7.0	1 380	1 930
<b>W2517FA-3P-C5Z25</b>	1 600	1 660	1 750	1 780	1 913	0	0.065	0.040	0.120	7.7	1 080	1 510
<b>W2521FA-3P-C5Z25</b>	2 000	2 060	2 150	2 180	2 313	0	0.077	0.046	0.160	9.1	710	1 000

Note: NSK grease LR3 is recommended. Amount for replenishing should be about 50% of nut internal space capacity.

Unit: mm



Ball Screw Specifications		
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	
Effective turns of balls	0.7 x 2	
Accuracy grade / Preload	C5 / Z	
Basic load rating (N)	Dynamic $C_a$	6 690
	Static $C_{0a}$	13 500
Axial play	0	
Dynamic friction torque (N·cm)	2.9 – 21.5	
Spacer ball	None	
Factory-packed grease	NSK grease LR3	
Internal spatial volume of nut (cm <sup>3</sup> )	4.2	

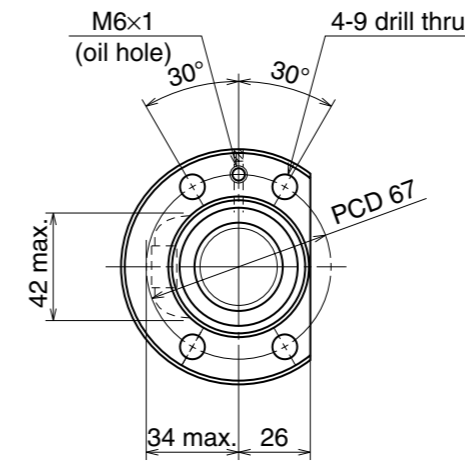
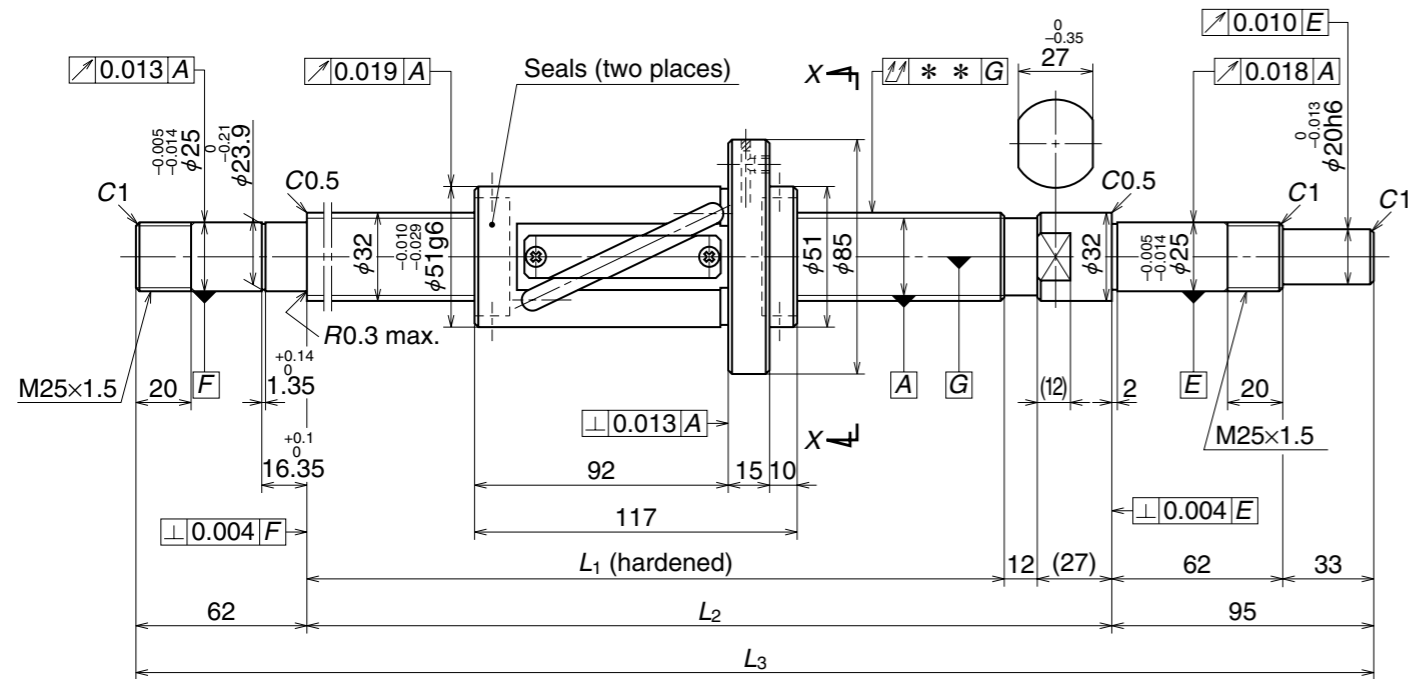
Recommended Support Unit	Fixed side	Simple support side
	WBK20-01 (square)	○
WBK20S-01 (square)		○
WBK20-11 (round)	○	○

Unit: mm

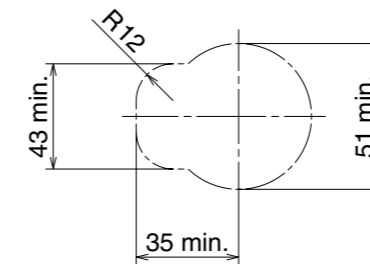
Part number	Stroke		Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	
	Nominal	Maximum (L <sub>1</sub> -Nut length)	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	Target value T	Error $\epsilon_p$	Variation $\nu_U$			Supporting condition	
											Fixed - Simple support	Fixed - Fixed
<b>W2508FA-1PGX-C5Z50</b>	700	794	844	880	1013	0	0.040	0.027	0.070	4.1	2 800	2 800
<b>W2511FA-5PGX-C5Z50</b>	1 000	1 094	1 144	1 180	1 313	0	0.046	0.030	0.090	5.3	2 550	2 800
<b>W2516FA-1PGX-C5Z50</b>	1 500	1 594	1 644	1 680	1 813	0	0.065	0.040	0.120	7.2	1 230	1 710
<b>W2521FA-5PGX-C5Z50</b>	2 000	2 094	2 144	2 180	2 313	0	0.077	0.046	0.160	9.1	720	1 010

Note 1: NSK grease LR3 is recommended. Amount for replenishing should be about 50% of nut internal space capacity.  
 Note 2: Nut does not have seal.





View X-X



Housing hole and clearance

Unit: mm

Ball Screw Specifications		
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	
Effective turns of balls	2.5 x 1	
Accuracy grade	C5 / Z	
Basic load rating (N)	Dynamic $C_a$	11 300
	Static $C_{0a}$	20 900
Axial play	0	
Dynamic friction torque (N·cm)	6.8 – 31.5	
Spacer ball	Yes	
Factory-packed grease	NSK grease LR3	
Internal spatial volume of nut (cm <sup>3</sup> )	17.5	

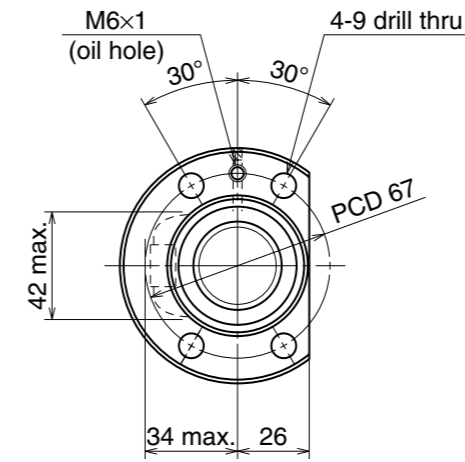
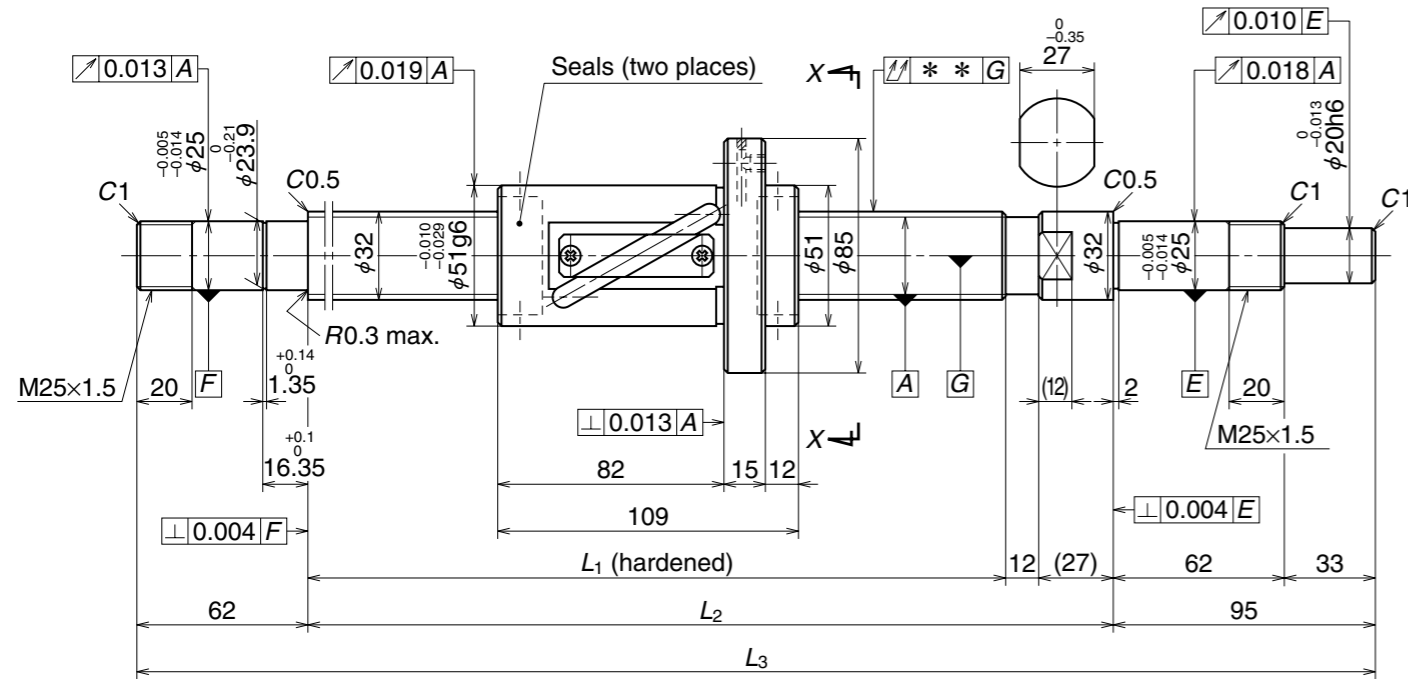
Recommended Support Unit	Fixed side	Simple support side
	WBK25-01W (square)	○
WBK25S-01W (square)		○
WBK25-11 (round)	○	○

Unit: mm

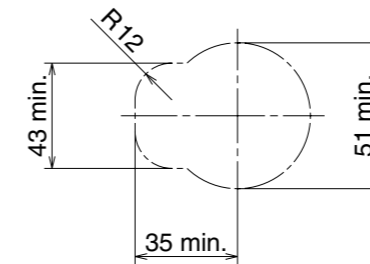
Part number	Stroke		Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	
	Nominal	Maximum (L <sub>1</sub> -Nut length)	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	Target value T	Error $\epsilon_p$	Variation $\nu_u$			Supporting condition	
											Fixed - Simple support	Fixed - Fixed
<b>W3211FA-1P-C5Z25</b>	1 000	1 063	1 180	1 219	1 376	0	0.046	0.030	0.090	9.3	2 180	2 180
<b>W3216FA-1P-C5Z25</b>	1 500	1 563	1 680	1 719	1 876	0	0.065	0.040	0.120	12.3	1 580	2 180
<b>W3221FA-1P-C5Z25</b>	2 000	2 063	2 180	2 219	2 376	0	0.077	0.046	0.160	15.4	930	1 300
<b>W3227FA-1P-C5Z25</b>	2 600	2 663	2 780	2 819	2 976	0	0.093	0.054	0.200	19.1	560	800

Note: NSK grease LR3 is recommended. Amount for replenishing should be about 50% of nut internal space capacity.

Unit: mm



View X-X



Housing hole and clearance

Ball Screw Specifications		
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	
Effective turns of balls	1.5 x 1	
Accuracy grade	C5 / Z	
Basic load rating (N)	Dynamic $C_a$	8 800
	Static $C_{0a}$	16 600
Axial play	0	
Dynamic friction torque (N·cm)	6.9 – 31.5	
Spacer ball	Yes	
Factory-packed grease	NSK grease LR3	
Internal spatial volume of nut (cm <sup>3</sup> )	14	

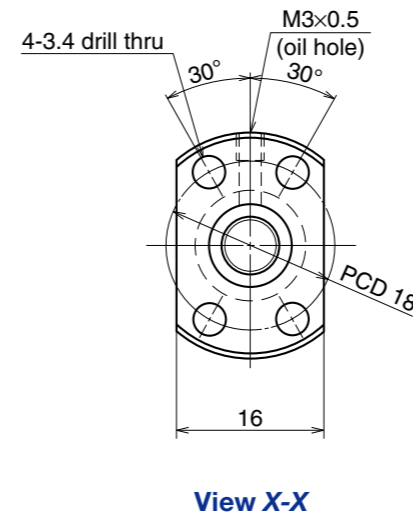
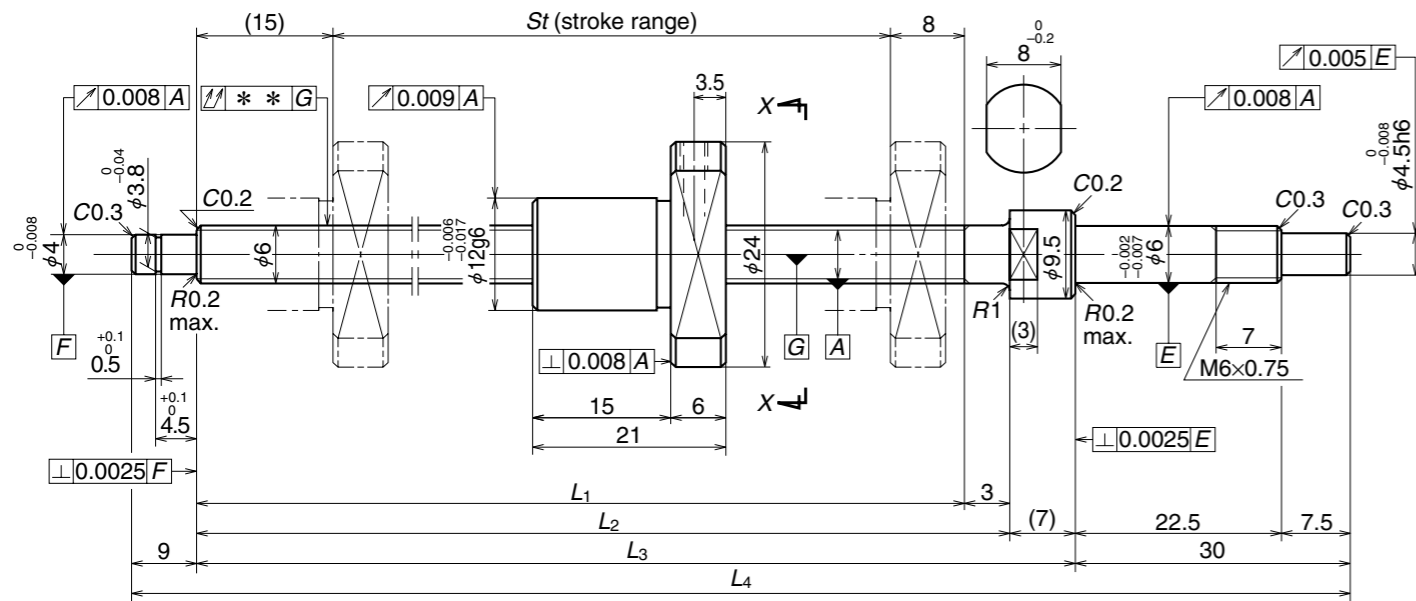
Recommended Support Unit	Fixed side	Simple support side
	WBK25-01W (square)	○
WBK25S-01W (square)		○
WBK25-11 (round)	○	○

Unit: mm

Part number	Stroke		Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )	
	Nominal	Maximum (L <sub>1</sub> -Nut length)	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	Target value T	Error $\epsilon_p$	Variation $\nu_u$			Supporting condition	
											Fixed - Simple support	Fixed - Fixed
<b>W3211FA-3P-C5Z32</b>	1 000	1 071	1 180	1 219	1 376	0	0.046	0.030	0.090	9.3	2 180	2 180
<b>W3216FA-3P-C5Z32</b>	1 500	1 571	1 680	1 719	1 876	0	0.065	0.040	0.120	12.3	1 570	2 180
<b>W3221FA-3P-C5Z32</b>	2 000	2 071	2 180	2 219	2 376	0	0.077	0.046	0.160	15.4	920	1 290
<b>W3227FA-3P-C5Z32</b>	2 600	2 671	2 780	2 819	2 976	0	0.093	0.054	0.200	19.1	560	790

Note: NSK grease LR3 is recommended. Amount for replenishing should be about 50% of nut internal space capacity.

Unit: mm



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

Ball Screws KA Series

Unit: mm

Part number	Stroke		Screw shaft length				Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )
	Nominal	Maximum	$L_1$	$L_2$	$L_3$	$L_4$	Target value $T$	Error $e_p$	Variation $v_u$			Supporting condition
<b>W0601KA-3PY-C3Z1</b>	100	102	125	128	135	174	0	0.010	0.008	0.025	0.06	3 000

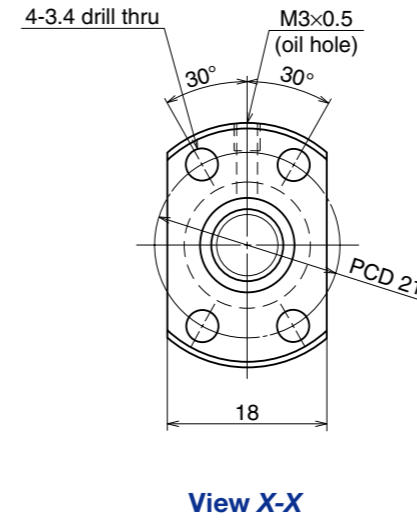
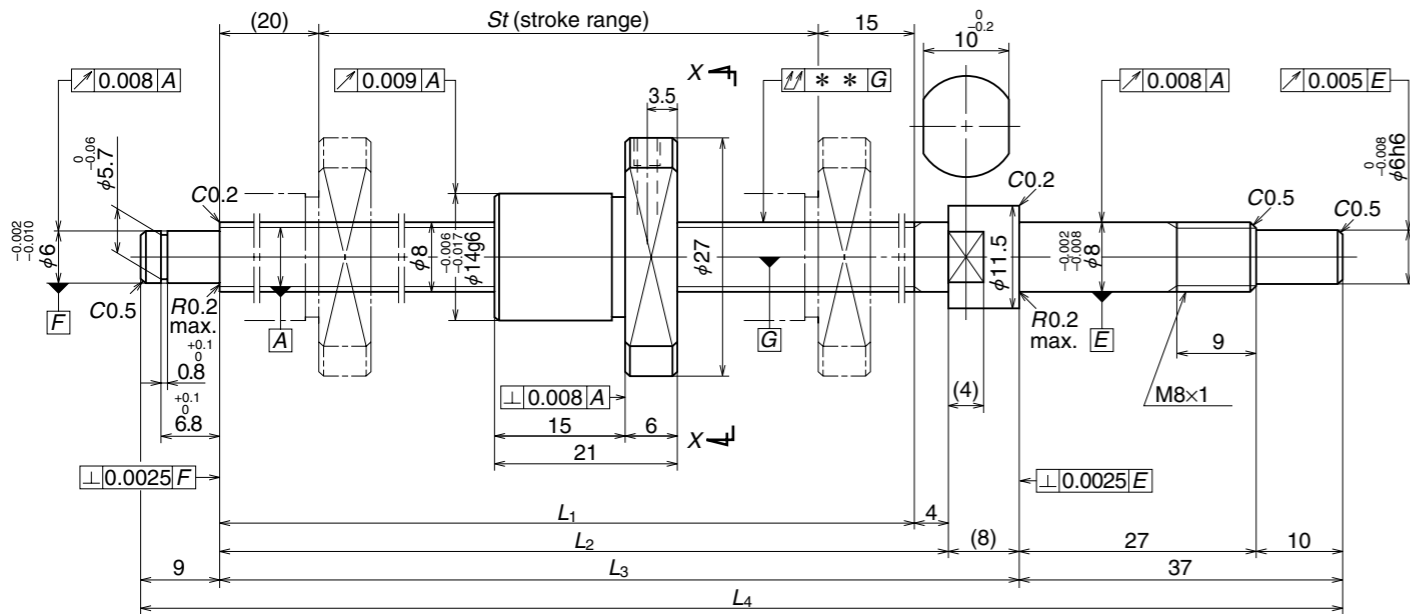
Note 1: Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.  
 Note 2: NSK Clean Grease LG2 is recommended. Apply to screw shaft surface when replenishing.  
 Note 3: Nut does not have seal.

# Ball Screws KA Series: Stainless Steel Product (Finished Shaft End)

Nut Model: MPFD

Screw Shaft  $\phi 8$  Lead 1

Unit: mm



Ball Screw Specifications		
Shaft dia. x Lead / Direction of turn	8 x 1 / Right	
Preload / Ball recirculation	P-preload / Deflector	
Ball dia. / Ball circle dia.	0.800 / 8.2	
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	
Dynamic friction torque (N·cm)	1.8 or less	
Spacer ball	None	
Factory-packed grease	Refer to Note 1 below	

Recommended Support Unit For Clean Environment Use	Unit: mm	
	Fixed side	Simple support side
WBK08-01C (square)	○	
WBK08S-01C (square)		○
WBK08-11C (round)	○	

Part number	Stroke		Screw shaft length				Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )
	Nominal	Maximum	$L_1$	$L_2$	$L_3$	$L_4$	Target value $T$	Error $e_p$	Variation $v_u$			Supporting condition
												Fixed - Simple support
<b>W0802KA-1PY-C3Z1</b>	150	155	190	194	202	248	0	0.010	0.008	0.035	0.12	3 000

Note 1: Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.  
 Note 2: NSK Clean Grease LG2 is recommended. Apply to screw shaft surface when replenishing.  
 Note 3: Nut does not have seal.

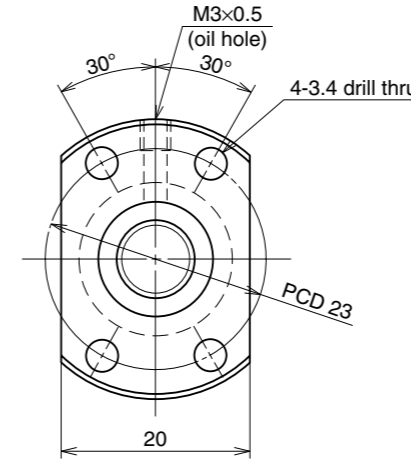
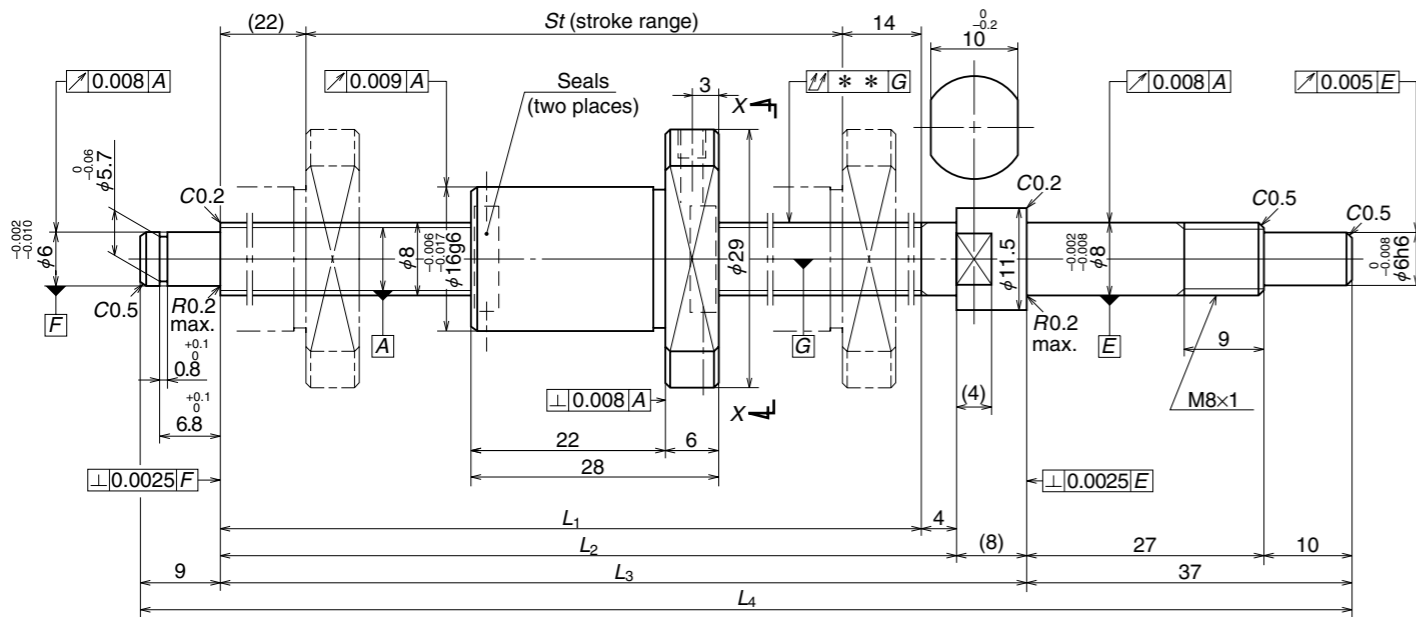
Ball Screws KA Series

# Ball Screws KA Series: Stainless Steel Product (Finished Shaft End)

Nut Model: MPFD

Screw Shaft  $\phi 8$  Lead 2

Unit: mm



View X-X

Ball Screw Specifications		
Shaft dia. x Lead / Direction of turn	8 x 2 / Right	
Preload / Ball recirculation	P-preload / Deflector	
Ball dia. / Ball circle dia.	1.200 / 8.3	
Effective turns of balls	1 x 3	
Accuracy grade / Preload	C3 / Z	
Basic load rating (N)	Dynamic $C_a$	1 080
	Static $C_{0a}$	1 630
Axial play	0	
Dynamic friction torque (N·cm)	2.0 or less	
Spacer ball	None	
Factory-packed grease	Refer to Note 1 below	

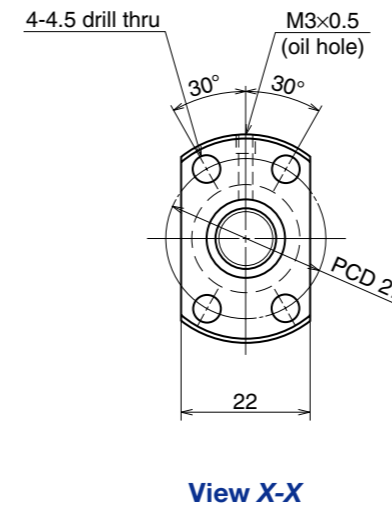
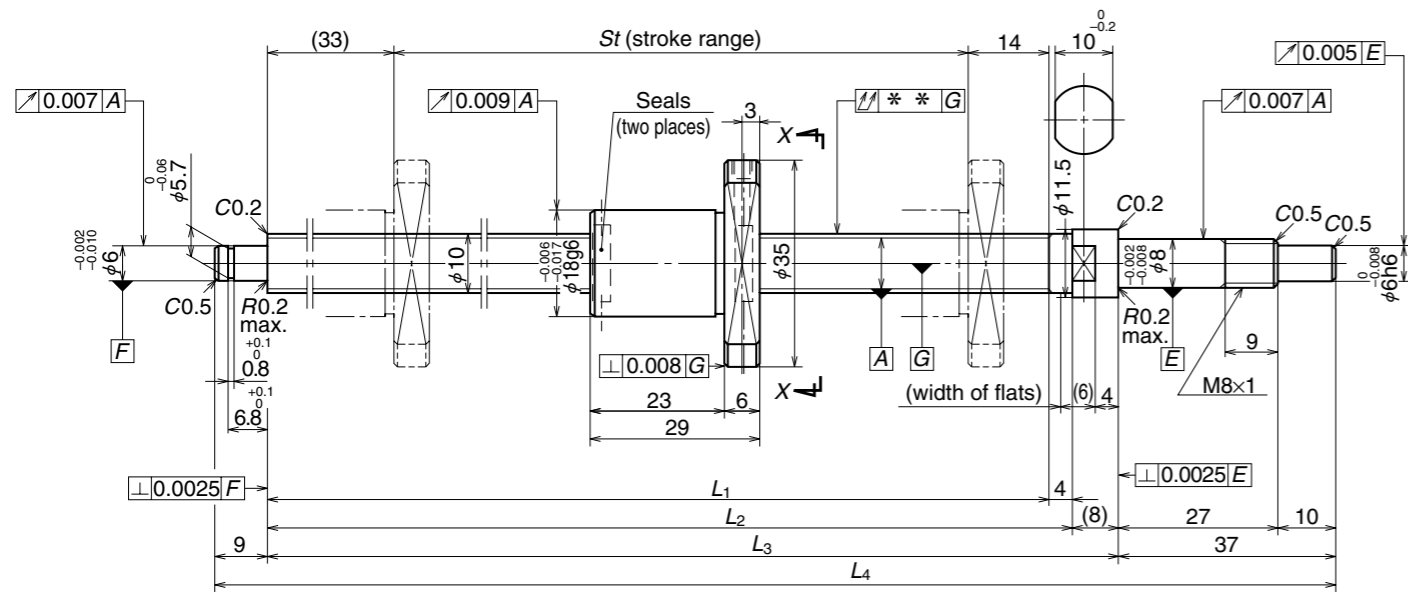
Recommended Support Unit For Clean Environment Use	Fixed side	Simple support side
	WBK08-01C (square)	○
WBK08S-01C (square)		○
WBK08-11C (round)	○	

Ball Screws KA Series

Unit: mm

Part number	Stroke		Screw shaft length				Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )
	Nominal	Maximum	$L_1$	$L_2$	$L_3$	$L_4$	Target value $T$	Error $e_p$	Variation $v_u$			Supporting condition
<b>W0802KA-5PY-C3Z2</b>	150	154	190	194	202	248	0	0.010	0.008	0.035	0.13	Fixed - Simple support 3 000

Note 1: Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.  
 Note 2: NSK Clean Grease LG2 is recommended. Apply to screw shaft surface when replenishing.



Unit: mm

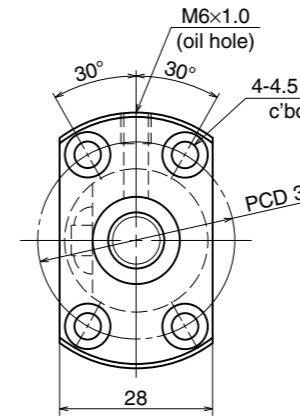
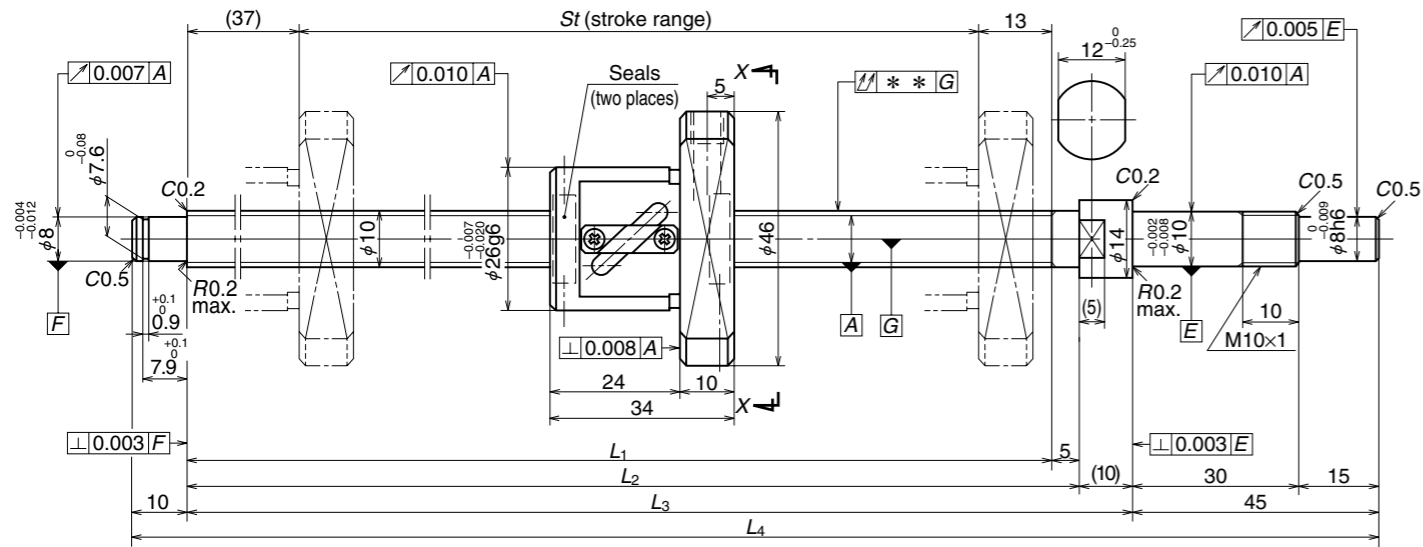
Ball Screw Specifications		
Shaft dia. x Lead / Direction of turn	10 x 2 / Right	
Preload / Ball recirculation	P-preload / Deflector	
Ball dia. / Ball circle dia.	1.200 / 10.3	
Effective turns of balls	1 x 3	
Accuracy grade / Preload	C3 / Z	
Basic load rating (N)	Dynamic $C_a$	1 210
	Static $C_{0a}$	2 110
Axial play	0	
Dynamic friction torque (N·cm)	0.10 - 2.5	
Spacer ball	None	
Factory-packed grease	Refer to Note 1 below	

Recommended Support Unit For Clean Environment Use	Fixed side	Simple support side
	WBK10-01C (square)	○
WBK10S-01C (square)		○
WBK10-11C (round)	○	

Unit: mm

Part number	Stroke		Screw shaft length				Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )
	Nominal	Maximum	$L_1$	$L_2$	$L_3$	$L_4$	Target value $T$	Error $e_p$	Variation $v_u$			Supporting condition
<b>W1002KA-3PY-C3Z2</b>	200	203	250	254	262	308	0	0.012	0.008	0.030	0.22	Fixed - Simple support 3 000

Note 1: Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.  
 Note 2: NSK Clean Grease LG2 is recommended. Apply to screw shaft surface when replenishing.



View X-X

Unit: mm

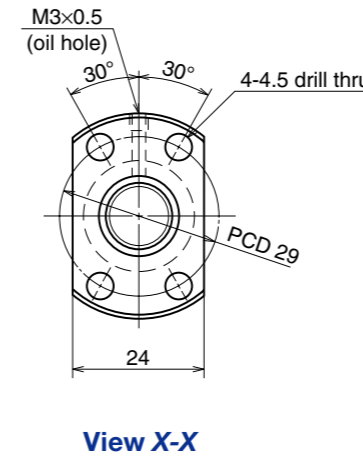
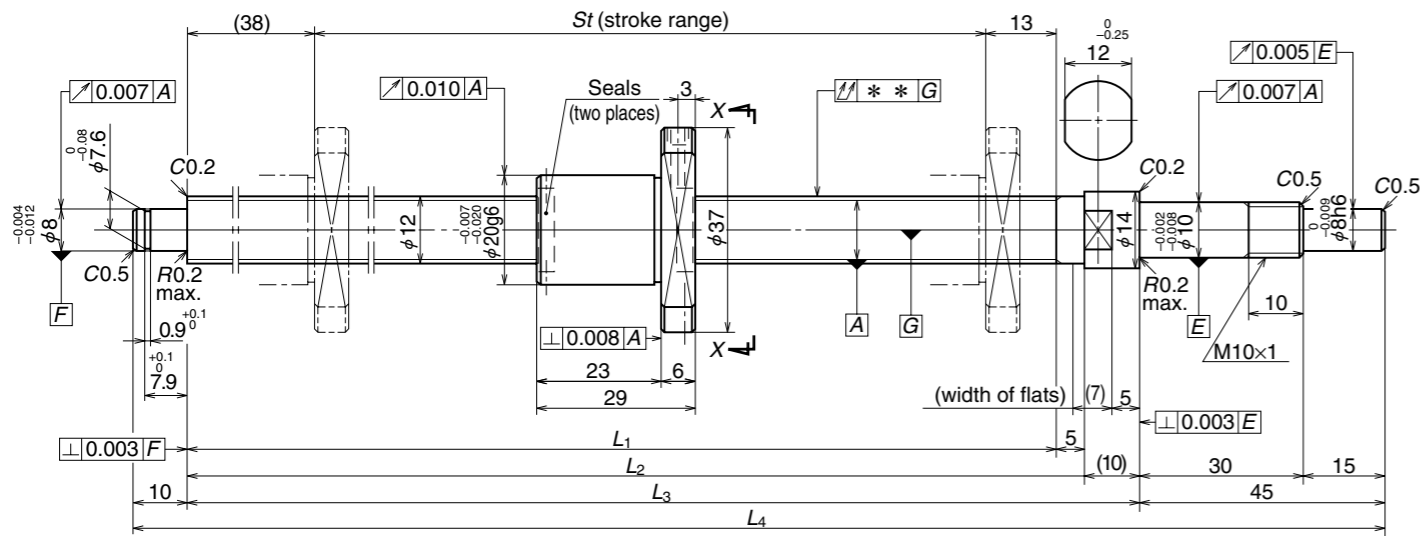
Ball Screw Specifications		
Shaft dia. x Lead / Direction of turn	10 x 4 / Right	
Preload / Ball recirculation	P-preload / Return tube	
Ball dia. / Ball circle dia.	2.000 / 10.3	
Effective turns of balls	2.5 x 1	
Accuracy grade / Preload	C3 / Z	
Basic load rating (N)	Dynamic $C_a$	2 250
	Static $C_{0a}$	3 290
Axial play	0	
Dynamic friction torque (N·cm)	0.5 - 3.9	
Spacer ball	None	
Factory-packed grease	Refer to Note 1 below	
Internal spatial volume of nut (cm <sup>3</sup> )	0.8	

Recommended Support Unit For Clean Environment Use	Fixed side	Simple support side
	WBK10-01C (square)	○
WBK10S-01C (square)		○
WBK10-11C (round)	○	

Unit: mm

Part number	Stroke		Screw shaft length				Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )
	Nominal	Maximum	$L_1$	$L_2$	$L_3$	$L_4$	Target value $T$	Error $e_p$	Variation $v_u$			Supporting condition
												Fixed - Simple support
<b>W1001KA-3P-C3Z4</b>	100	110	160	165	175	230	0	0.010	0.008	0.030	0.29	3 000
<b>W1003KA-3P-C3Z4</b>	300	310	360	365	375	430	0	0.013	0.008	0.050	0.39	3 000

Note 1: Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.  
 Note 2: NSK Clean Grease LG2 is recommended. Apply to screw shaft surface when replenishing.



Unit: mm

Ball Screw Specifications		
Shaft dia. x Lead / Direction of turn	12 x 2 / Right	
Preload / Ball recirculation	P-preload / Deflector	
Ball dia. / Ball circle dia.	1.200 / 12.3	
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	
Dynamic friction torque (N·cm)	0.4 - 3.4	
Spacer ball	None	
Factory-packed grease	Refer to Note 1 below	

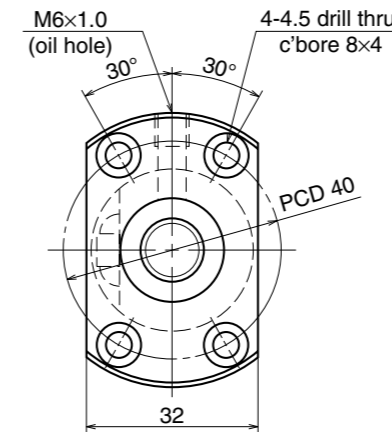
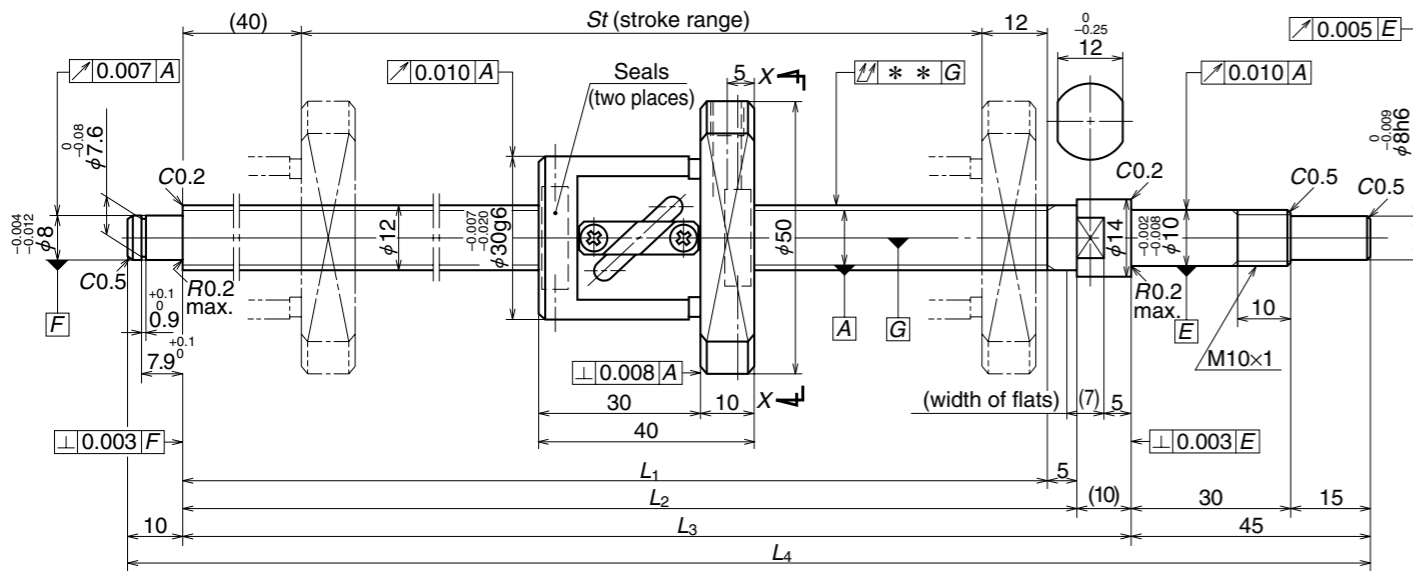
Recommended Support Unit For Clean Environment Use	Fixed side	Simple support side
	WBK10-01C (square)	○
WBK10S-01C (square)		○
WBK10-11C (round)	○	

Unit: mm

Part number	Stroke		Screw shaft length				Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )
	Nominal	Maximum	$L_1$	$L_2$	$L_3$	$L_4$	Target value $T$	Error $e_p$	Variation $v_u$			Supporting condition
												Fixed - Simple support
<b>W1201KA-3PY-C3Z2</b>	100	109	160	165	175	230	0	0.010	0.008	0.030	0.24	3 000
<b>W1203KA-1PY-C3Z2</b>	250	259	310	315	325	380	0	0.012	0.008	0.040	0.36	3 000

Note 1: Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.  
 Note 2: NSK Clean Grease LG2 is recommended. Apply to screw shaft surface when replenishing.





View X-X

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	
Effective turns of balls	2.5 x 1	
Accuracy grade / Preload	C3 / Z	
Basic load rating (N)	Dynamic $C_a$	3 070
	Static $C_{0a}$	4 670
Axial play	0	
Dynamic friction torque (N·cm)	1.0 – 4.4	
Spacer ball	None	
Factory-packed grease	Refer to Note 1 below	
Internal spatial volume of nut (cm <sup>3</sup> )	1.2	

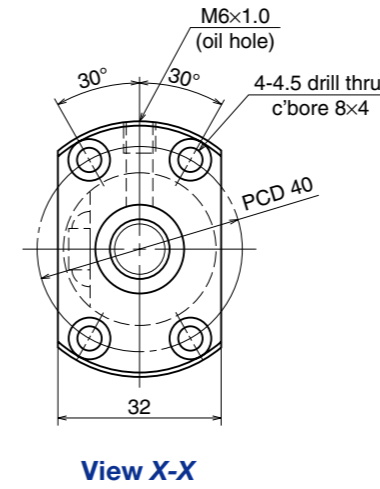
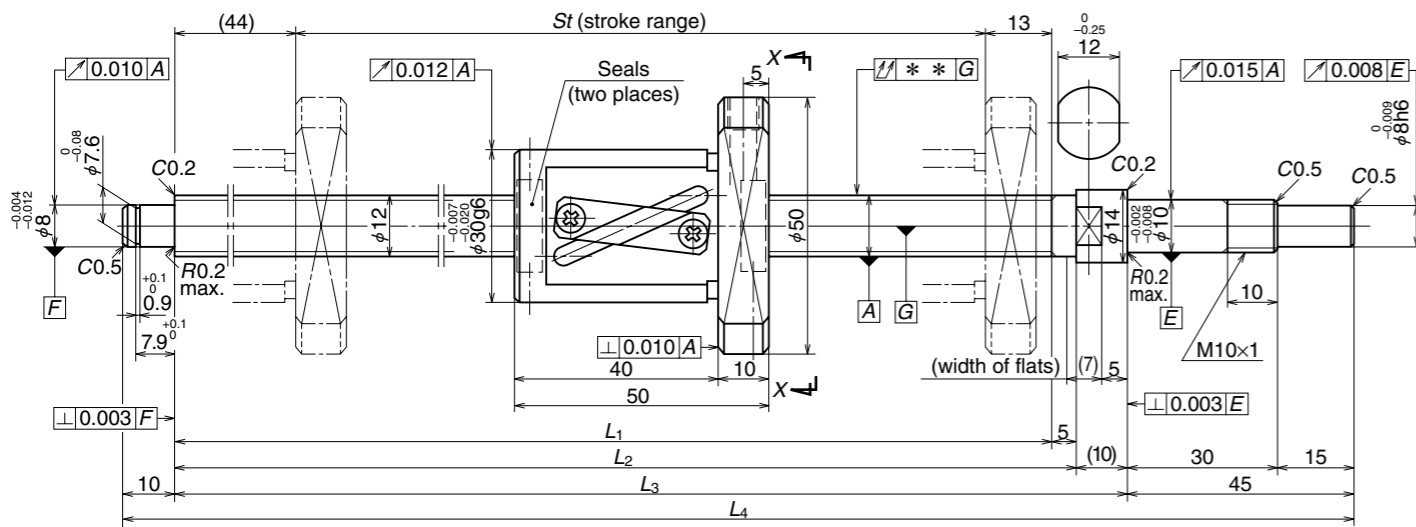
Recommended Support Unit For Clean Environment Use	Fixed side	Simple support side
	WBK10-01C (square)	○
WBK10S-01C (square)		○
WBK10-11C (round)	○	

Unit: mm

Part number	Stroke		Screw shaft length				Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )
	Nominal	Maximum	$L_1$	$L_2$	$L_3$	$L_4$	Target value $T$	Error $e_p$	Variation $v_u$			Supporting condition
												Fixed - Simple support
<b>W1202KA-3P-C3Z5</b>	200	208	260	265	275	330	0	0.012	0.008	0.040	0.47	3 000
<b>W1205KA-1P-C3Z5</b>	450	458	510	515	525	580	0	0.016	0.012	0.065	0.66	3 000

Note 1: Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.  
 Note 2: NSK Clean Grease LG2 is recommended. Amount for replenishing should be about 50% of nut internal space capacity.

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	
Effective turns of balls	2.5 x 1	
Accuracy grade / Preload	C5 / Z	
Basic load rating (N)	Dynamic $C_a$	3 070
	Static $C_{0a}$	4 790
Axial play	0	
Dynamic friction torque (N·cm)	1.0 – 4.9	
Spacer ball	None	
Factory-packed grease	Refer to Note 1 below	
Internal spatial volume of nut (cm <sup>3</sup> )	1.4	

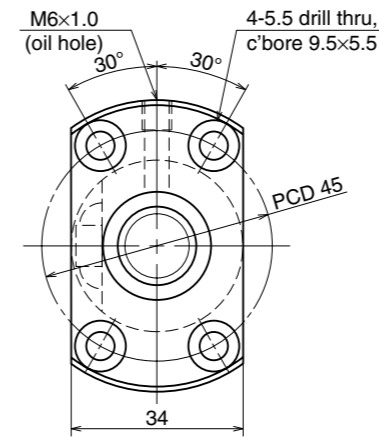
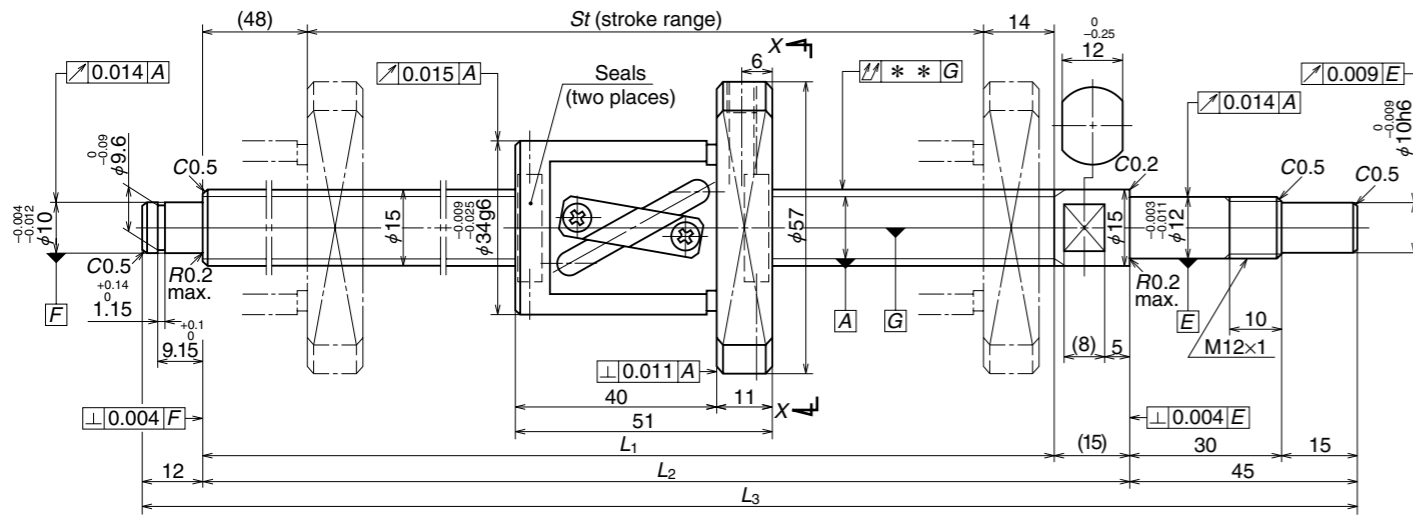
Recommended Support Unit For Clean Environment Use	Fixed side	Simple support side
	WBK10-01C (square)	○
WBK10S-01C (square)		○
WBK10-11C (round)	○	

Unit: mm

Part number	Stroke		Screw shaft length				Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )
	Nominal	Maximum	$L_1$	$L_2$	$L_3$	$L_4$	Target value $T$	Error $e_p$	Variation $v_u$			Supporting condition
												Fixed - Simple support
<b>W1203KA-3P-C5Z10</b>	250	253	310	315	325	380	0	0.023	0.018	0.050	0.56	3 000
<b>W1205KA-3P-C5Z10</b>	450	453	510	515	525	580	0	0.030	0.023	0.075	0.72	3 000

Note 1: Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.  
 Note 2: NSK Clean Grease LG2 is recommended. Amount for replenishing should be about 50% of nut internal space capacity.

Unit: mm



View X-X

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	
Effective turns of balls	2.5 x 1	
Accuracy grade / Preload	C5 / Z	
Basic load rating (N)	Dynamic $C_a$	5 780
	Static $C_{0a}$	9 430
Axial play	0	
Dynamic friction torque (N·cm)	1.5 - 7.9	
Spacer ball	None	
Factory-packed grease	Refer to Note 1 below	
Internal spatial volume of nut (cm <sup>3</sup> )	2.3	

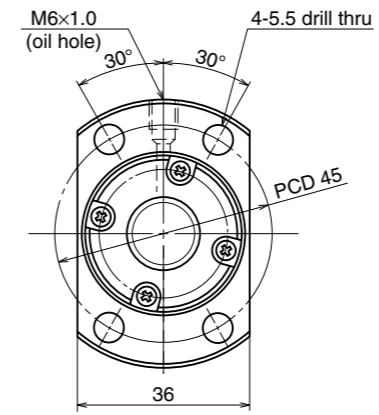
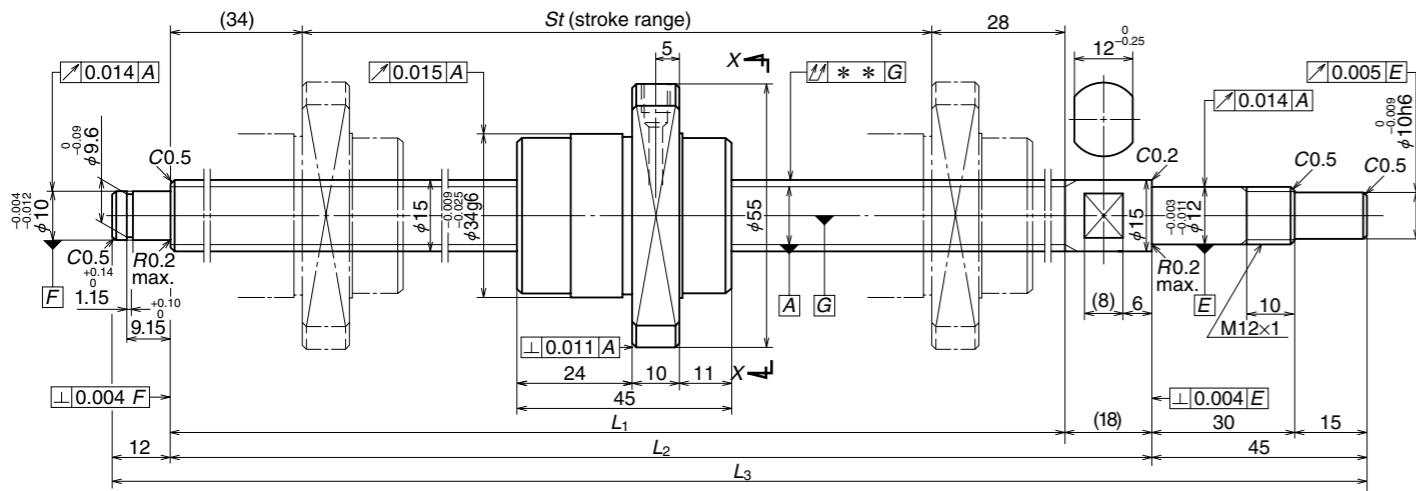
Recommended Support Unit For Clean Environment Use	Fixed side	Simple support side
	WBK12-01C (square)	○
WBK12S-01C (square)		○
WBK12-11C (round)	○	

Unit: mm

Part number	Stroke		Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )
	Nominal	Maximum	$L_1$	$L_2$	$L_3$	Target value $T$	Error $e_p$	Variation $v_u$			Supporting condition
											Fixed - Simple support
<b>W1504KA-3P-C5Z10</b>	400	427	489	504	561	0	0.027	0.020	0.050	0.99	3 000
<b>W1506KA-3P-C5Z10</b>	600	627	689	704	761	0	0.035	0.025	0.065	1.2	3 000
<b>W1510KA-1P-C5Z10</b>	1 000	1 027	1 089	1 104	1 161	0	0.046	0.030	0.110	1.7	1 610

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

Note 2: NSK Clean Grease LG2 is recommended. Amount for replenishing should be about 50% of nut internal space capacity.



View X-X

Unit: mm

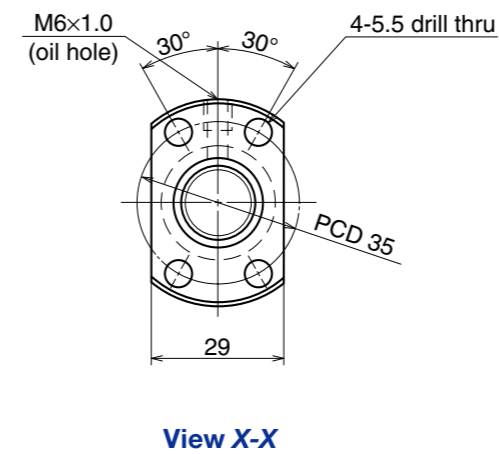
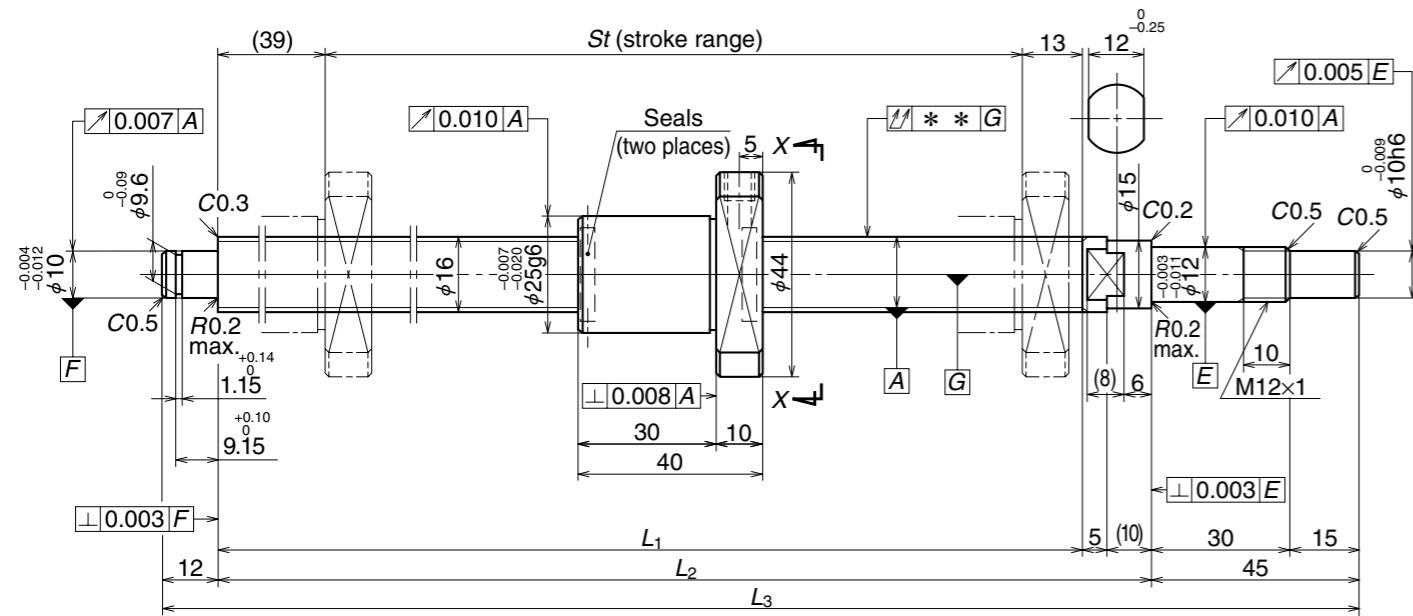
Ball Screw Specifications		
Shaft dia. x Lead / Direction of turn	15 x 20 / Right	
Preload / Ball recirculation	P-preload / End cap	
Ball dia. / Ball circle dia.	3.175 / 15.5	
Effective turns of balls	1.7 x 1	
Accuracy grade / Preload	C5 / Z	
Basic load rating (N)	Dynamic $C_a$	4 150
	Static $C_{0a}$	6 450
Axial play	0	
Dynamic friction torque (N·cm)	1.5 – 7.9	
Spacer ball	None	
Factory-packed grease	Refer to Note 1 below	
Internal spatial volume of nut (cm <sup>3</sup> )	1.9	

Recommended Support Unit For Clean Environment Use	Fixed side	Simple support side
	WBK12-01C (square)	○
WBK12S-01C (square)		○
WBK12-11C (round)	○	

Unit: mm

Part number	Stroke		Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )
	Nominal	Maximum	$L_1$	$L_2$	$L_3$	Target value $T$	Error $e_p$	Variation $v_u$			Supporting condition
<b>W1504KA-7PG-C5Z20</b>	400	424	486	504	561	0	0.027	0.020	0.050	1.0	3 000
<b>W1506KA-7PG-C5Z20</b>	600	624	686	704	761	0	0.035	0.025	0.065	1.3	3 000
<b>W1510KA-3PG-C5Z20</b>	1 000	1 024	1 086	1 104	1 161	0	0.046	0.030	0.110	1.8	1 610

Note 1: Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.  
 Note 2: NSK Clean Grease LG2 is recommended. Amount for replenishing should be about 50% of nut internal space capacity.



Unit: mm

Ball Screw Specifications		
Shaft dia. x Lead / Direction of turn	16 x 2 / Right	
Preload / Ball recirculation	P-preload / Deflector	
Ball dia. / Ball circle dia.	1.588 / 16.4	
Effective turns of balls	1 x 4	
Accuracy grade / Preload	C3 / Z	
Basic load rating (N)	Dynamic $C_a$	2 870
	Static $C_{0a}$	6 250
Axial play	0	
Dynamic friction torque (N·cm)	0.5 - 4.9	
Spacer ball	None	
Factory-packed grease	Refer to Note 1 below	
Internal spatial volume of nut (cm <sup>3</sup> )	1.6	

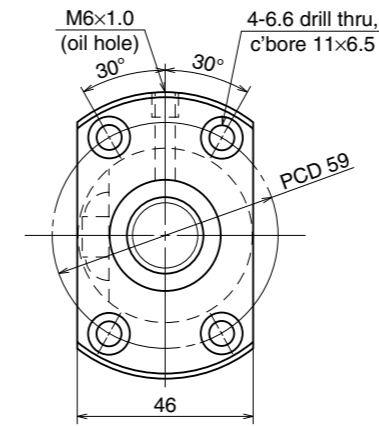
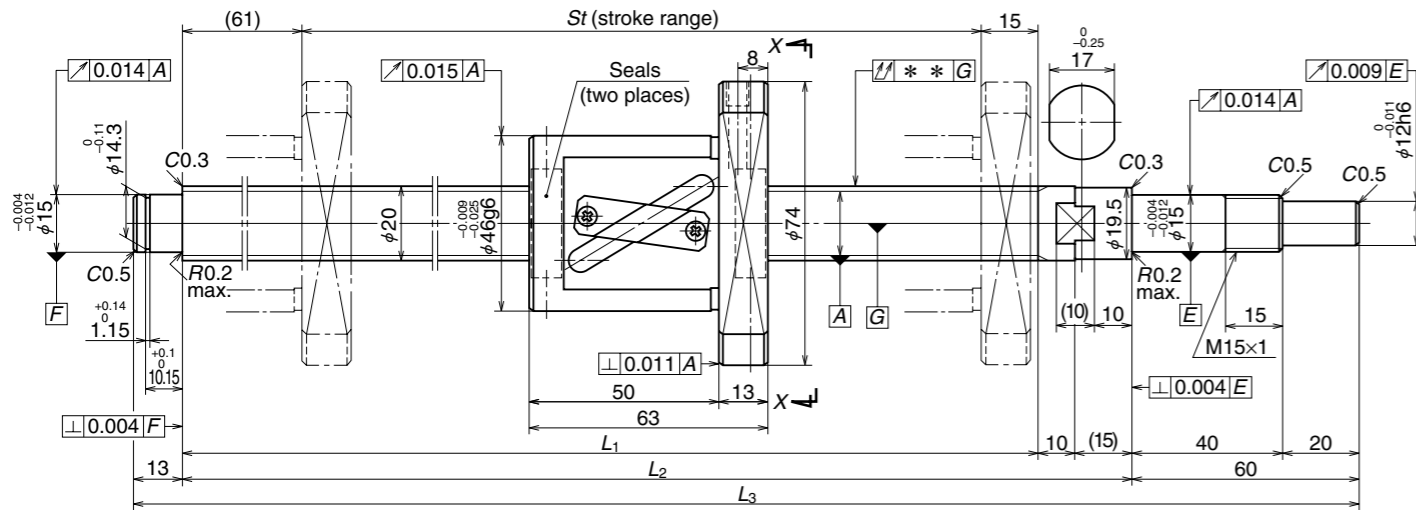
Recommended Support Unit For Clean Environment Use	Fixed side	Simple support side
	WBK12-01C (square)	○
WBK12S-01C (square)		○
WBK12-11C (round)	○	

Unit: mm

Part number	Stroke		Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )
	Nominal	Maximum	$L_1$	$L_2$	$L_3$	Target value $T$	Error $e_p$	Variation $v_u$			Supporting condition
											Fixed - Simple support
<b>W1601KA-3PY-C3Z2</b>	100	137	189	204	261	0	0.010	0.008	0.020	0.46	3 000
<b>W1603KA-1PY-C3Z2</b>	300	337	389	404	461	0	0.013	0.010	0.035	0.75	3 000

Note 1: Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.  
 Note 2: NSK Clean Grease LG2 is recommended. Amount for replenishing should be about 50% of nut internal space capacity.

Unit: mm



View X-X

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	
Effective turns of balls	1.5 x 1	
Accuracy grade / Preload	C5 / Z	
Basic load rating (N)	Dynamic $C_a$	5 760
	Static $C_{0a}$	9 370
Axial play	0	
Dynamic friction torque (N·cm)	2.0 - 11.8	
Spacer ball	None	
Factory-packed grease	Refer to Note 1 below	
Internal spatial volume of nut (cm <sup>3</sup> )	4.2	

Recommended Support Unit For Clean Environment Use	Fixed side	Simple support side
	WBK15-01C (square)	○
WBK15S-01C (square)		○
WBK15-11C (round)	○	

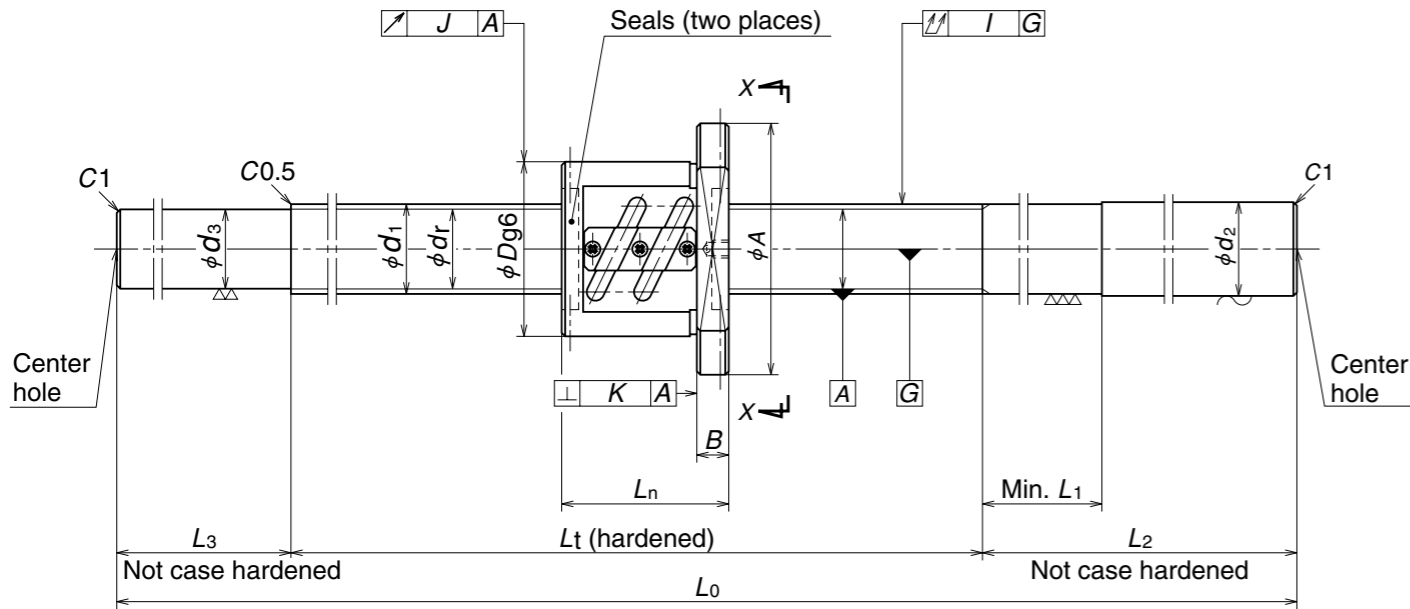
Unit: mm

Part number	Stroke		Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )
	Nominal	Maximum	$L_1$	$L_2$	$L_3$	Target value $T$	Error $e_p$	Variation $v_u$			Supporting condition
											Fixed - Simple support
<b>W2005KA-3P-C5Z20</b>	400	434	510	535	608	0	0.030	0.023	0.050	2.0	3 000
<b>W2007KA-3P-C5Z20</b>	600	634	710	735	808	0	0.035	0.025	0.085	2.5	3 000
<b>W2011KA-3P-C5Z20</b>	1 000	1 034	1 110	1 135	1 208	0	0.046	0.030	0.110	3.4	2 160

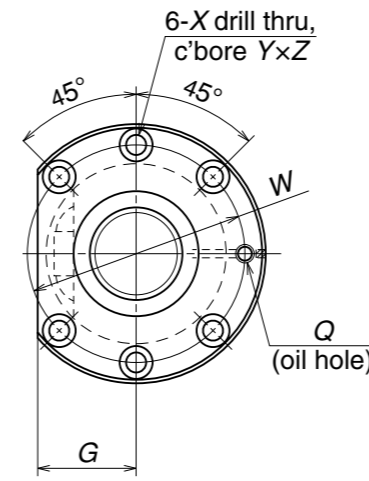
Note 1: Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.

Note 2: NSK Clean Grease LG2 is recommended. Amount for replenishing should be about 50% of nut internal space capacity.

Unit: mm



Nut type code: PFT



View X-X

Ball Screw Specifications		
Shaft dia. × Lead / Direction of turn	20 × 4 / Right	20 × 5 / Right
Preload / Ball recirculation	P-preload / Return tube	
Ball dia. / Ball circle dia.	2.381 / 20.3	3.175 / 20.5
Root dia.	17.8	17.2
Effective turns of balls	2.5 × 2	
Accuracy grade / Preload	C5 / Z	
Basic load rating (N)	Dynamic $C_a$	5 420
	Static $C_{0a}$	10 700
Axial play	0	
Preload (N)	290	490
Dynamic friction torque (N-cm)	3.9	7.8
Internal spatial volume of nut (cm <sup>3</sup> )	2.7	4.3

Recommended Support Unit	Fixed side	Simple support side
WBK15-01A (square)	○	
WBK15S-01 (square)		○
WBK15-11 (round)	○	

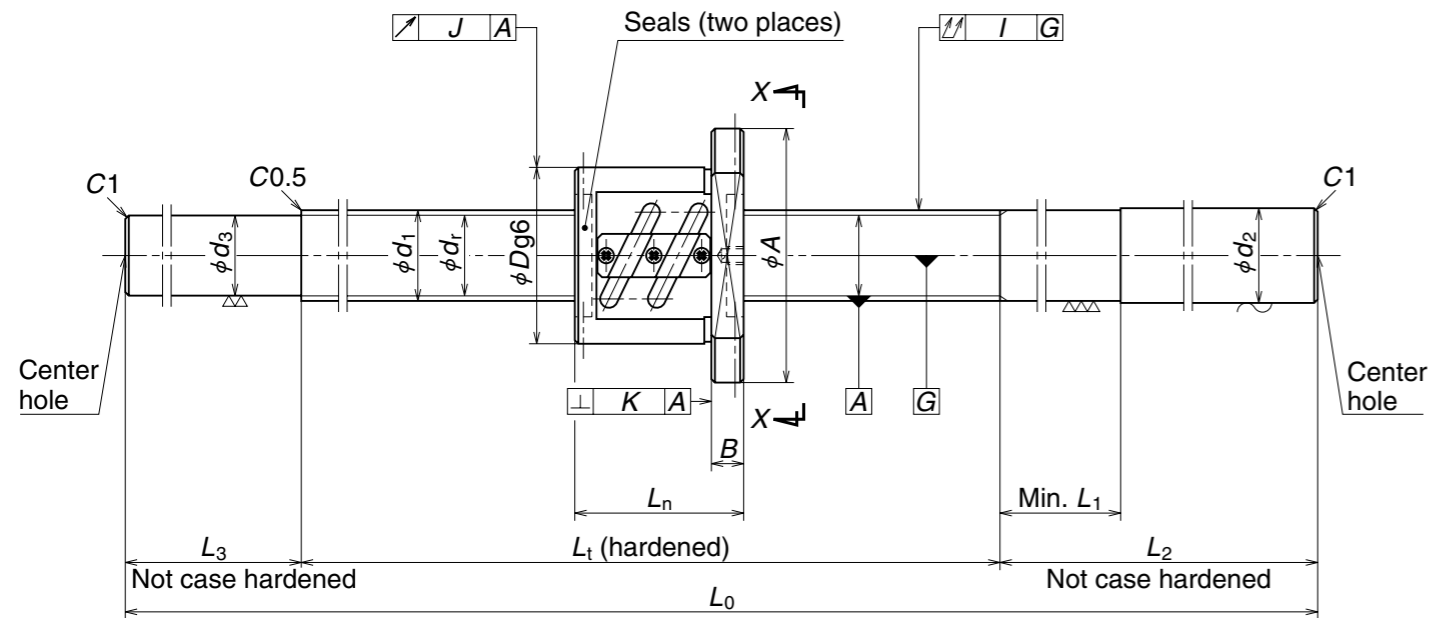
Part number	Stroke max. $L_1-L_n$	Screw shaft dia. $d_1$	Lead $l$	Nut dimensions										Screw shaft dimensions						Lead accuracy			Run-out			Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )							
				Outside dia. $D$	Flange			Overall length $L_n$	Bolt hole				Oil hole $Q$	Threaded length $L_1$	Shaft end, right			Shaft end, left		Overall length $L_0$	Target value $T$	Error $\epsilon_p$	Variation $\nu_u$	Shaft straightness $I$	Nut O.D. eccentricity $J$			Flange perpendicularity $K$						
					$A$	$G$	$B$		$W$	$X$	$Y$	$Z$			$d_2$	$L_1$	$L_2$	$d_3$	$L_3$															
<b>W2003SS-1P-C5Z4</b>	251	20	4	40	63	24	11	49	51	5.5	9.5	5.5	M6×1	300	20.2	40	150	17.8	—	450	-0.007	0.023	0.018	0.055	0.015	0.011	1.5	3 000						
<b>W2005SS-1P-C5Z4</b>	451													500			150		50										700	-0.012	0.027	0.020	0.085	2.0
<b>W2008SS-1P-C5Z4</b>	751													800			200		100										1 100	-0.019	0.035	0.025	0.140	2.9
<b>W2003SS-2P-C5Z5</b>	244	20	5	44	67	26	11	56	55	5.5	9.5	5.5	M6×1	300	20.2	40	150	17.2	—	450	-0.007	0.023	0.018	0.055	0.015	0.011	1.6	3 000						
<b>W2005SS-2P-C5Z5</b>	444													500			150		50										700	-0.012	0.027	0.020	0.085	2.2
<b>W2007SS-1P-C5Z5</b>	644													700			200		100										1 000	-0.017	0.035	0.025	0.110	2.8
<b>W2010SS-1P-C5Z5</b>	944													1 000			200		100										1 300	-0.024	0.040	0.027	0.180	3.5

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

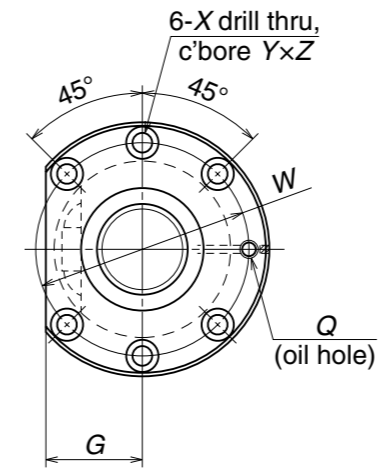
Amount for replenishing should be about 50% of nut internal space capacity.

Note 2: Permissible maximum rotational speed is determined by critical speed or permissible rotational speed shown in table.

Unit: mm



Nut type code: PFT



View X-X

Ball Screw Specifications			
Shaft dia. x Lead / Direction of turn	25 x 4 / Right	25 x 5 / Right	25 x 6 / Right
Preload / Ball recirculation	P-preload / Return tube		
Ball dia. / Ball circle dia.	2.381 / 25.3	3.175 / 25.5	3.969 / 25.5
Root dia.	22.8	22.2	21.4
Effective turns of balls	2.5 x 2		
Accuracy grade / Preload	C5 / Z		
Basic load rating (N)	Dynamic $C_a$	6 020	10 400
	Static $C_{0a}$	13 600	21 900
Axial play	0		
Preload (N)	290	540	690
Dynamic friction torque (N-cm)	4.9	8.8	13.8
Internal spatial volume of nut (cm <sup>3</sup> )	3.2	5.2	7.0

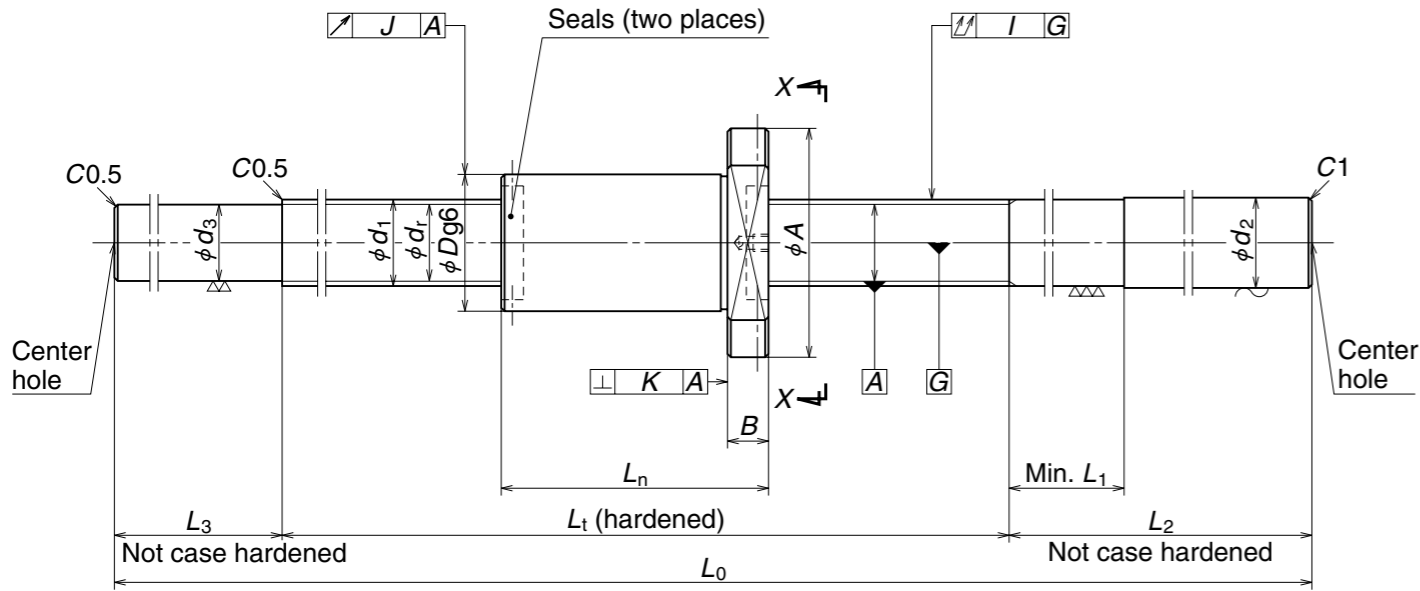
Recommended Support Unit	Fixed side	Simple support side
WBK20-01 (square)	○	○
WBK20S-01 (square)		○
WBK20-11 (round)	○	○

Part number	Stroke max. $L_t-L_n$	Screw shaft dia. $d_1$	Lead $l$	Nut dimensions									Screw shaft dimensions						Lead accuracy			Run-out			Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )		
				Outside dia. $D$	Flange			Overall length $L_n$	Bolt hole				Oil hole $Q$	Threaded length $L_t$	Shaft end, right			Shaft end, left		Overall length $L_0$	Target value $T$	Error $e_p$	Variation $u_u$	Shaft straightness $I$			Nut O.D. eccentricity $J$	Flange perpendicularity $K$
					$A$	$G$	$B$		$W$	$X$	$Y$	$Z$			$d_2$	$L_1$	$L_2$	$d_3$	$L_3$									
<b>W2503SS-1P-C5Z4</b>	252	25	4	46	69	26	11	48	57	5.5	9.5	5.5	M6x1	300	25.2	40	150	22.8	—	450	-0.007	0.023	0.018	0.040	0.015	0.011	2.2	2 800
<b>W2506SS-1P-C5Z4</b>	600													200			100		900								3.8	
<b>W2510SS-1P-C5Z4</b>	1 000													200			100		1 300								5.2	
<b>W2503SS-2P-C5Z5</b>	245	25	5	50	73	28	11	55	61	5.5	9.5	5.5	M6x1	300	25.2	40	200	22.2	—	500	-0.007	0.023	0.018	0.040	0.015	0.011	2.5	2 800
<b>W2505SS-1P-C5Z5</b>	500													200			50		750								3.4	
<b>W2508SS-1P-C5Z5</b>	800													250			100		1 150								4.8	
<b>W2512SS-1P-C5Z5</b>	1 200													300			100		1 600								6.3	
<b>W2504SS-1P-C5Z6</b>	338	25	6	53	76	29	11	62	64	5.5	9.5	5.5	M6x1	400	25.2	40	200	21.4	—	600	-0.010	0.025	0.020	0.050	0.019	0.013	3.0	2 800
<b>W2508SS-2P-C5Z6</b>	800													250			100		1 150								4.8	
<b>W2512SS-2P-C5Z6</b>	1 200													300			100		1 600								6.3	

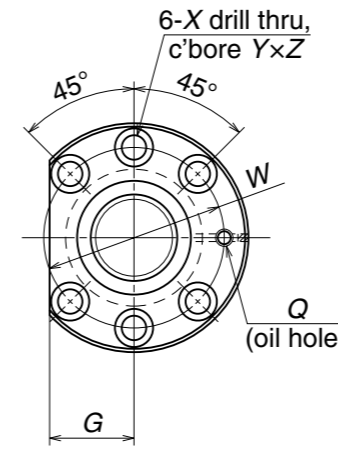
Note 1: Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.  
Amount for replenishing should be about 50% of nut internal space capacity.  
Note 2: Permissible maximum rotational speed is determined by critical speed or permissible rotational speed shown in table.



Unit: mm



Nut type code: ZFD



View X-X

Ball Screw Specifications		
Shaft dia. x Lead / Direction of turn	25 x 5 / Right	25 x 10 / Right
Preload / Ball recirculation	P-preload / Deflector	
Ball dia. / Ball circle dia.	3.175 / 25.75	4.762 / 26.25
Root dia.	22.4	21.3
Effective turns of balls	1 x 3	1 x 2
Accuracy grade / Preload	C5 / Z	
Basic load rating (N)	Dynamic $C_a$	9 790
	Static $C_{0a}$	22 900
Dynamic $C_{0a}$	11 400	21 400
Axial play	0	
Preload (N)	740	880
Dynamic friction torque (N-cm)	13.8	21.5
Internal spatial volume of nut (cm <sup>3</sup> )	5.4	9.0

Recommended Support Unit	Fixed side	Simple support side
WBK20-01 (square)	○	○
WBK20S-01 (square)		○
WBK20-11 (round)	○	○

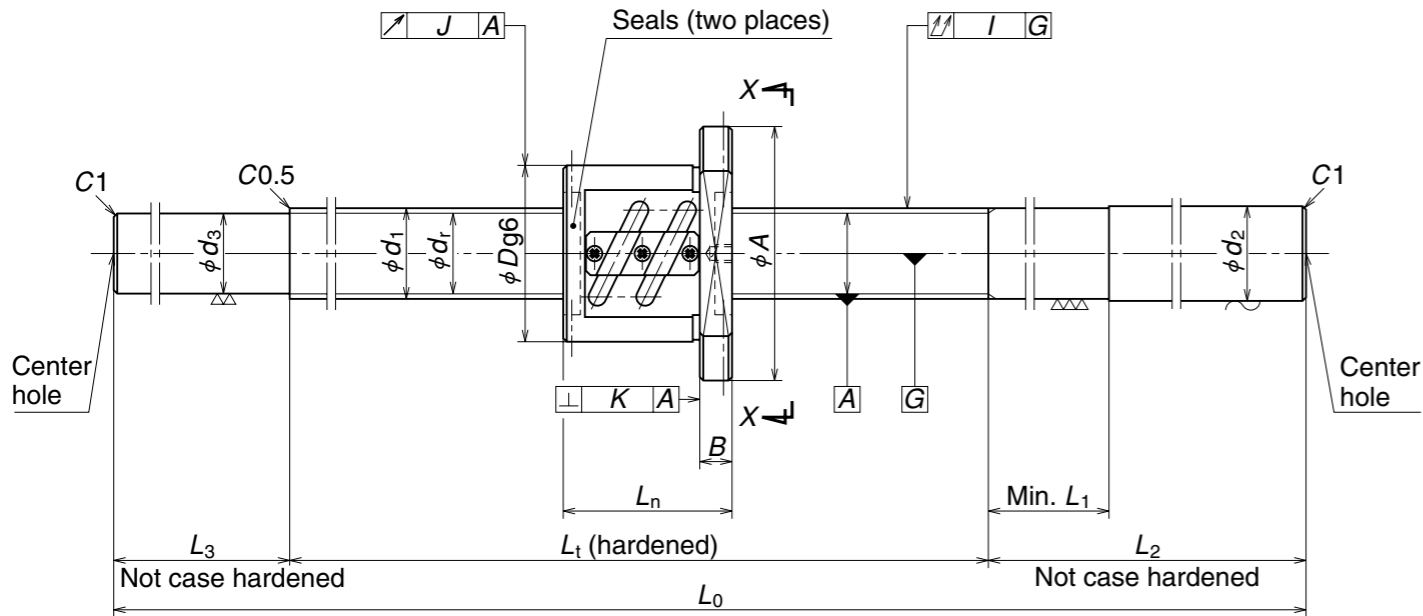
Part number	Stroke max. $L_1-L_n$	Screw shaft dia. $d_1$	Lead $l$	Nut dimensions									Screw shaft dimensions						Lead accuracy			Run-out			Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )								
				Outside dia. $D$	Flange			Overall length $L_n$	Bolt hole				Oil hole $Q$	Threaded length $L_1$	Shaft end, right			Shaft end, left		Overall length $L_0$	Target value $T$	Error $e_p$	Variation $u_u$	Shaft straightness $I$			Nut O.D. eccentricity $J$	Flange perpendicularity $K$						
					$A$	$G$	$B$		$W$	$X$	$Y$	$Z$			$d_2$	$L_1$	$L_2$	$d_3$	$L_3$															
<b>W2502SS-1ZY-C5Z5</b>	184	25	5	40	63	24	11	66	51	5.5	9.5	5.5	M6x1	250	25.2	40	200	22.4	100	950	-0.005	0.023	0.018	0.040	0.015	0.011	2.1	2 800						
<b>W2504SS-3ZY-C5Z5</b>	334													400													50		650	0.009	0.025	0.020	0.060	2.8
<b>W2506SS-2ZY-C5Z5</b>	534													600													100		950	-0.013	0.030	0.023	0.075	3.9
<b>W2509SS-1ZY-C5Z5</b>	834													900													100		1 250	-0.021	0.040	0.027	0.090	4.9
<b>W2512SS-3ZY-C5Z5</b>	1 134													1 200													100		1 600	-0.028	0.046	0.030	0.120	6.2
<b>W2504SS-4ZY-C5Z10</b>	312	25	10	42	69	26	15	88	55	6.6	11	6.5	M6x1	400	25.2	60	200	21.3	100	950	-0.008	0.025	0.020	0.060	0.015	0.011	3.0	2 800						
<b>W2506SS-3ZY-C5Z10</b>	512													600													100		950	-0.012	0.030	0.023	0.075	4.1
<b>W2508SS-3ZY-C5Z10</b>	712													800													100		1 150	-0.017	0.035	0.025	0.090	4.8
<b>W2511SS-1ZY-C5Z10</b>	1 012													1 100													100		1 500	-0.024	0.046	0.030	0.120	6.0
<b>W2515SS-2ZY-C5Z10</b>	1 412													1 200													100		1 900	-0.034	0.054	0.035	0.150	7.4

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

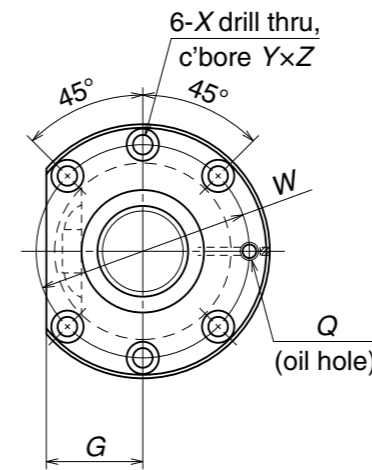
Amount for replenishing should be about 50% of nut internal space capacity.

Note 2: Permissible maximum rotational speed is determined by critical speed or permissible rotational speed shown in table.

Unit: mm



Nut type code: PFT



View X-X

Ball Screw Specifications			
Shaft dia. x Lead / Direction of turn	25 x 10 / Right	28 x 5 / Right	28 x 6 / Right
Preload / Ball recirculation	P-preload / Return tube		
Ball dia. / Ball circle dia.	4.762 / 25.5	3.175 / 28.5	
Root dia.	20.5	25.2	
Effective turns of balls	1.5 x 2	2.5 x 2	
Accuracy grade / Preload	C5 / Z		
Basic load rating (N)	Dynamic $C_a$	11 600	11 000
	Static $C_{0a}$	19 000	24 400
Axial play	0		
Preload (N)	590	540	
Dynamic friction torque (N-cm)	13.8	9.8	10.8
Internal spatial volume of nut (cm <sup>3</sup> )	9.7	6.1	

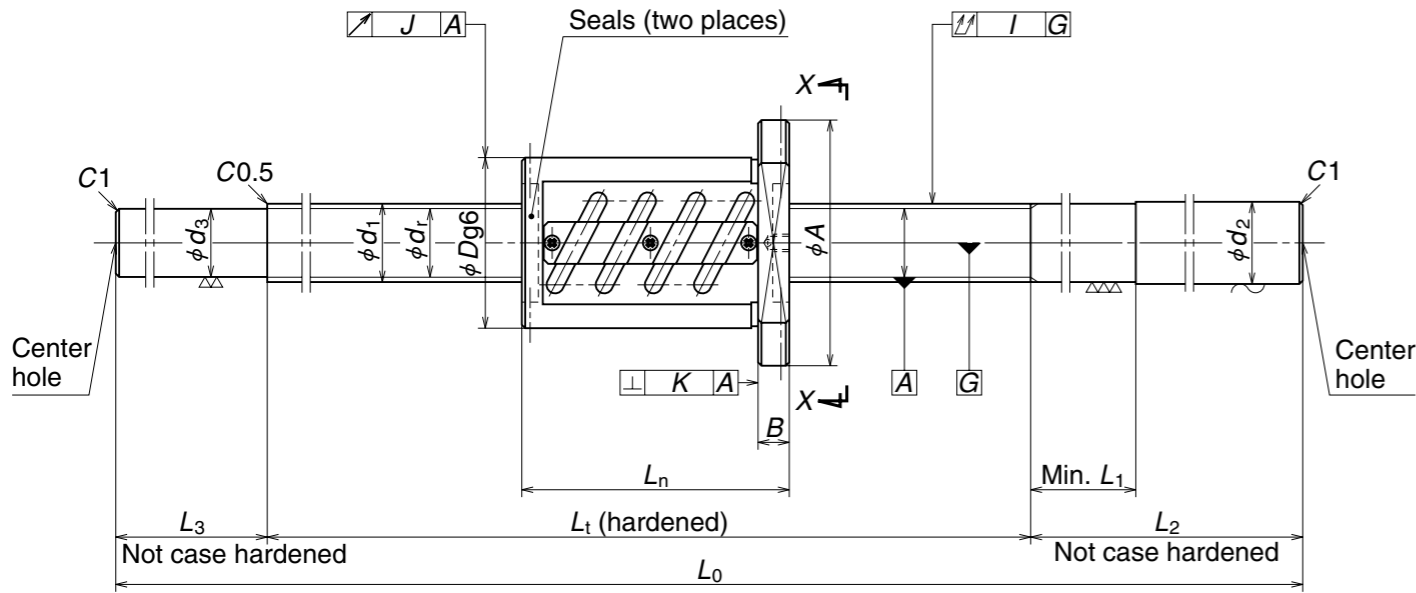
Recommended Support Unit	Fixed side	Simple support side
WBK20-01 (square)	○	○
WBK20S-01 (square)		○
WBK20-11 (round)	○	○

Part number	Stroke max. $L_t-L_n$	Screw shaft dia. $d_1$	Lead $l$	Nut dimensions									Screw shaft dimensions						Lead accuracy			Run-out			Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )		
				Outside dia. $D$	Flange			Overall length $L_n$	Bolt hole				Oil hole $Q$	Threaded length $L_t$	Shaft end, right		Shaft end, left		Overall length $L_0$	Target value $T$	Error $\epsilon_p$	Variation $\nu_u$	Shaft straightness $I$	Nut O.D. eccentricity $J$			Flange perpendicularity $K$	
					$A$	$G$	$B$		$W$	$X$	$Y$	$Z$			$d_2$	$L_1$	$L_2$	$d_3$										$L_3$
<b>W2504SS-2P-C5Z10</b>	319	25	10	58	85	32	15	81	71	6.6	11	6.5	M6x1	400	25.2	60	200	20.5	50	650	-0.010	0.025	0.020	0.060	0.019	0.013	3.8	2 800
<b>W2507SS-1P-C5Z10</b>	619													700			250		100	1 050	-0.017	0.035	0.025	0.090			5.1	
<b>W2510SS-2P-C5Z10</b>	919													1 000			250		100	1 350	-0.024	0.040	0.027	0.120			6.1	
<b>W2515SS-1P-C5Z10</b>	1 419													1 500			300		100	1 900	-0.036	0.054	0.035	0.150			8.0	
<b>W2804SS-1P-C5Z5</b>	344	28	5	55	85	31	12	56	69	6.6	11	6.5	M6x1	400	28.2	40	200	25.2	—	600	-0.010	0.025	0.020	0.050	0.019	0.013	3.7	2 500
<b>W2806SS-1P-C5Z5</b>	544													600			250		100	950	-0.014	0.030	0.023	0.075			5.2	
<b>W2808SS-1P-C5Z5</b>	744													800			250		100	1 150	-0.019	0.035	0.025	0.090			6.1	
<b>W2812SS-1P-C5Z5</b>	1 144													1 200			300		100	1 600	-0.029	0.046	0.030	0.120			8.1	
<b>W2804SS-3P-C5Z6</b>	337	28	6	55	85	31	12	63	69	6.6	11	6.5	M6x1	400	28.2	40	200	25.2	—	600	-0.010	0.025	0.020	0.050	0.019	0.013	3.8	2 500
<b>W2806SS-3P-C5Z6</b>	537													600			250		100	950	-0.014	0.030	0.023	0.075			5.3	
<b>W2808SS-3P-C5Z6</b>	737													800			250		100	1 150	-0.019	0.035	0.025	0.090			6.2	
<b>W2812SS-3P-C5Z6</b>	1 137													1 200			300		100	1 600	-0.029	0.046	0.030	0.120			8.2	

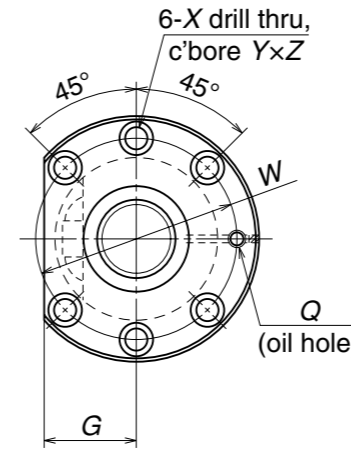
Note 1: Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.  
Amount for replenishing should be about 50% of nut internal space capacity.

Note 2: Permissible maximum rotational speed is determined by critical speed or permissible rotational speed shown in table.

Unit: mm



Nut type code: ZFT



View X-X

Ball Screw Specifications		
Shaft dia. × Lead / Direction of turn	28 × 5 / Right	28 × 6 / Right
Preload / Ball recirculation	Z-preload / Return tube	
Ball dia. / Ball circle dia.	3.175 / 28.5	
Root dia.	25.5	25.2
Effective turns of balls	2.5 × 2	
Accuracy grade / Preload	C5 / Z	
Basic load rating (N)	Dynamic $C_a$	17 400
	Static $C_{0a}$	48 800
Axial play	0	
Preload (N)	1 225	
Dynamic friction torque (N·cm)	21.5	22.5
Internal spatial volume of nut (cm <sup>3</sup> )	9.2	9.5

Recommended Support Unit	Fixed side	Simple support side
WBK20-01 (square)	○	○
WBK20S-01 (square)		○
WBK20-11 (round)	○	○

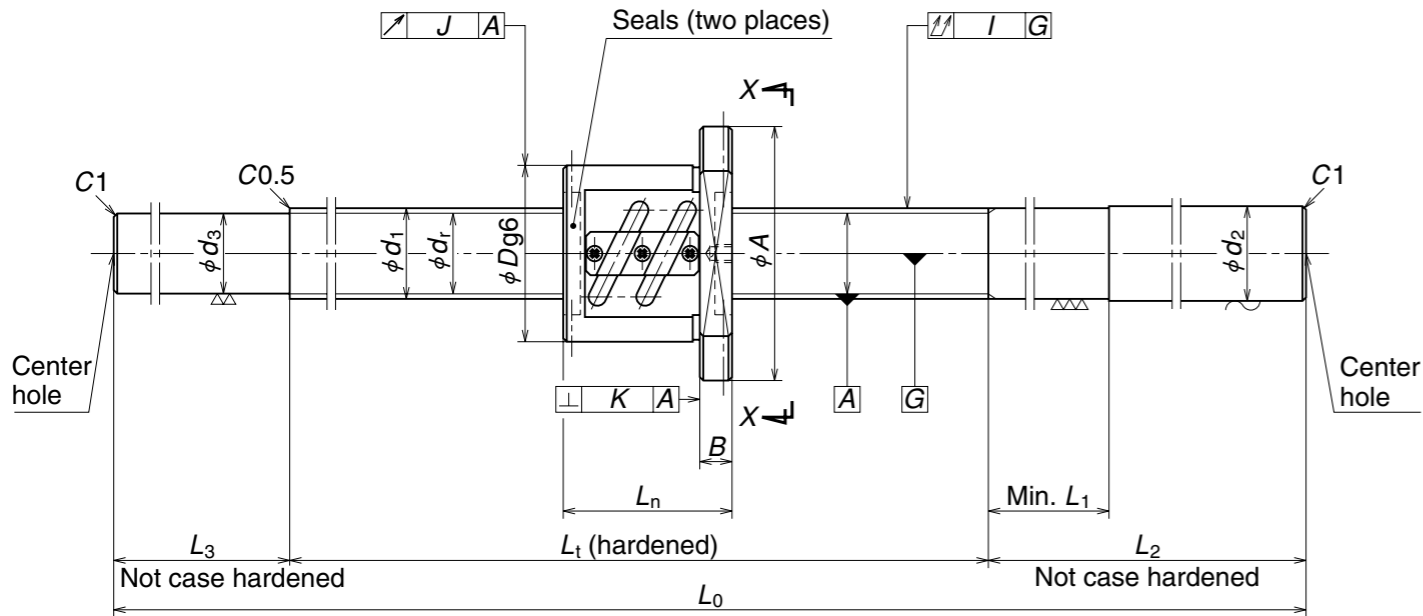
Part number	Stroke max. $L_t-L_n$	Screw shaft dia. $d_1$	Lead $l$	Nut dimensions									Screw shaft dimensions						Lead accuracy			Run-out			Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )		
				Outside dia. $D$	Flange			Overall length $L_n$	Bolt hole				Oil hole $Q$	Threaded length $L_t$	Shaft end, right			Shaft end, left		Overall length $L_0$	Target value $T$	Error $e_p$	Variation $v_u$	Shaft straightness $I$			Nut O.D. eccentricity $J$	Flange perpendicularity $K$
					$A$	$G$	$B$		$W$	$X$	$Y$	$Z$			$d_2$	$L_1$	$L_2$	$d_3$	$L_3$									
<b>W2804SS-2Z-C5Z5</b>	314	28	5	55	85	31	12	86	69	6.6	11	6.5	M6×1	400	28.2	40	200	25.2	—	600	-0.010	0.025	0.020	0.050	0.019	0.013	4.7	2 500
<b>W2806SS-2Z-C5Z5</b>	514													250			100		950	-0.014	0.030	0.023	0.075	5.5				
<b>W2808SS-2Z-C5Z5</b>	714													250			100		1 150	-0.019	0.035	0.025	0.090	6.4				
<b>W2812SS-2Z-C5Z5</b>	1 114													300			100		1 600	-0.029	0.046	0.030	0.120	8.4				
<b>W2804SS-4Z-C5Z6</b>	301	28	6	55	85	31	12	99	69	6.6	11	6.5	M6×1	400	28.2	40	200	25.2	—	600	-0.010	0.025	0.020	0.050	0.019	0.013	4.2	2 500
<b>W2806SS-4Z-C5Z6</b>	501													250			100		950	-0.014	0.030	0.023	0.075	5.7				
<b>W2808SS-4Z-C5Z6</b>	701													250			100		1 150	-0.019	0.035	0.025	0.090	6.6				
<b>W2812SS-4Z-C5Z6</b>	1 101													300			100		1 600	-0.029	0.046	0.030	0.120	8.6				

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

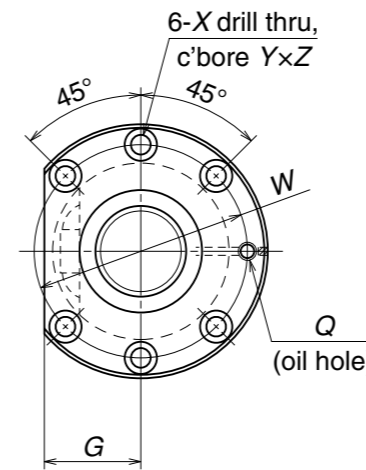
Amount for replenishing should be about 50% of nut internal space capacity.

Note 2: Permissible maximum rotational speed is determined by critical speed or permissible rotational speed shown in table.

Unit: mm



Nut type code: PFT



View X-X

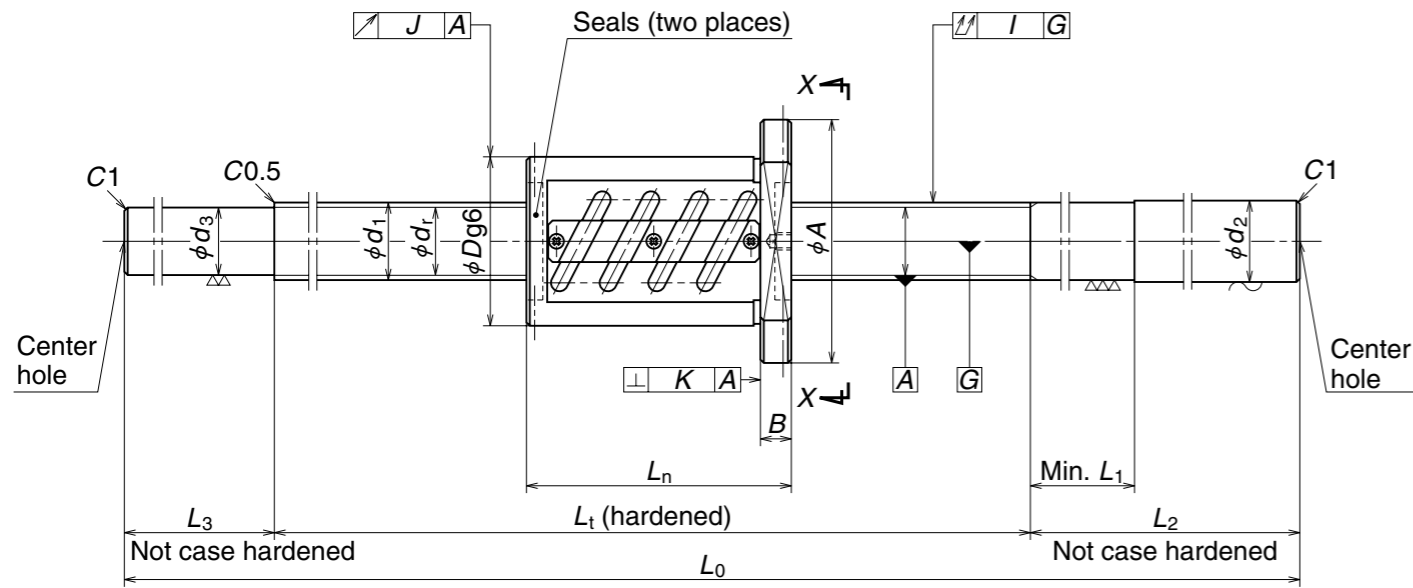
Ball Screw Specifications		
Shaft dia. x Lead / Direction of turn	32 x 5 / Right	32 x 6 / Right
Preload / Ball recirculation	P-preload / Return tube	
Ball dia. / Ball circle dia.	3.175 / 32.5	3.969 / 32.5
Root dia.	29.2	28.4
Effective turns of balls	2.5 x 2	
Accuracy grade / Preload	C5 / Z	
Basic load rating (N)	Dynamic $C_a$	11 600
	Static $C_{0a}$	28 000
Internal spatial volume of nut (cm <sup>3</sup> )	6.9	9.4
Axial play	0	
Preload (N)	590	780
Dynamic friction torque (N-cm)	10.8	15.6

Recommended Support Unit	Fixed side	Simple support side
WBK25-01W (square)	○	○
WBK25S-01W (square)		○
WBK25-11 (round)	○	○

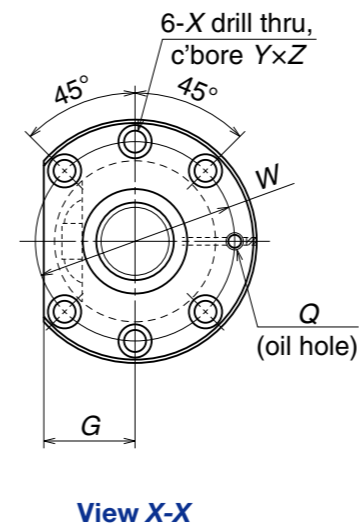
Part number	Stroke max. $L_1-L_n$	Screw shaft dia. $d_1$	Lead $l$	Nut dimensions									Screw shaft dimensions						Lead accuracy			Run-out			Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )		
				Outside dia. $D$	Flange			Overall length $L_n$	Bolt hole				Oil hole $Q$	Threaded length $L_t$	Shaft end, right			Shaft end, left		Overall length $L_0$	Target value $T$	Error $e_p$	Variation $v_u$	Shaft straightness $I$			Nut O.D. eccentricity $J$	Flange perpendicularity $K$
					$A$	$G$	$B$		$W$	$X$	$Y$	$Z$			$d_2$	$L_1$	$L_2$	$d_3$	$L_3$									
<b>W3204SS-1P-C5Z5</b>	344	32	5	58	85	32	12	56	71	6.6	11	6.5	M6x1	400	32.3	40	200	29.2	50	650	-0.010	0.025	0.020	0.060	0.019	0.013	4.8	2 180
<b>W3206SS-1P-C5Z5</b>	544													250			100		950		-0.014	0.030	0.023				0.075	
<b>W3208SS-1P-C5Z5</b>	744													250			100		1 150		-0.019	0.035	0.025				0.090	
<b>W3212SS-1P-C5Z5</b>	1 144													300			100		1 600		-0.029	0.046	0.030				0.120	
<b>W3215SS-1P-C5Z5</b>	1 444													300			100		1 900		-0.036	0.054	0.035				0.150	
<b>W3206SS-3P-C5Z6</b>	537	32	6	62	89	34	12	63	75	6.6	11	6.5	M6x1	600	32.3	40	250	28.4	100	950	-0.014	0.030	0.023	0.075	0.019	0.013	6.7	2 180
<b>W3210SS-1P-C5Z6</b>	937													300			100		1 400		-0.024	0.040	0.027				0.120	
<b>W3215SS-3P-C5Z6</b>	1 437													300			100		1 900		-0.036	0.054	0.035				0.150	

Note 1: Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.  
Amount for replenishing should be about 50% of nut internal space capacity.  
Note 2: Permissible maximum rotational speed is determined by critical speed or permissible rotational speed shown in table.

Unit: mm



Nut type code: ZFT



Ball Screw Specifications			
Shaft dia. × Lead / Direction of turn	32 × 5 / Right	32 × 6 / Right	32 × 8 / Right
Preload / Ball recirculation	Z-preload / Return tube		
Ball dia. / Ball circle dia.	3.175 / 32.5	3.969 / 32.5	4.762 / 32.5
Root dia.	29.2	28.4	27.5
Effective turns of balls	2.5 × 2		2.5 × 1
Accuracy grade / Preload	C5 / Z		
Basic load rating (N)	Dynamic $C_a$	18 500	24 700
	Static $C_{0a}$	56 100	69 400
Axial play	0		
Preload (N)	1 270	1 720	1 320
Dynamic friction torque (N·cm)	22.5	34.5	30.5
Internal spatial volume of nut (cm <sup>3</sup> )	10	15	7.9

Recommended Support Unit	Fixed side	Simple support side
WBK25-01W (square)	○	○
WBK25S-01W (square)		○
WBK25-11 (round)	○	○

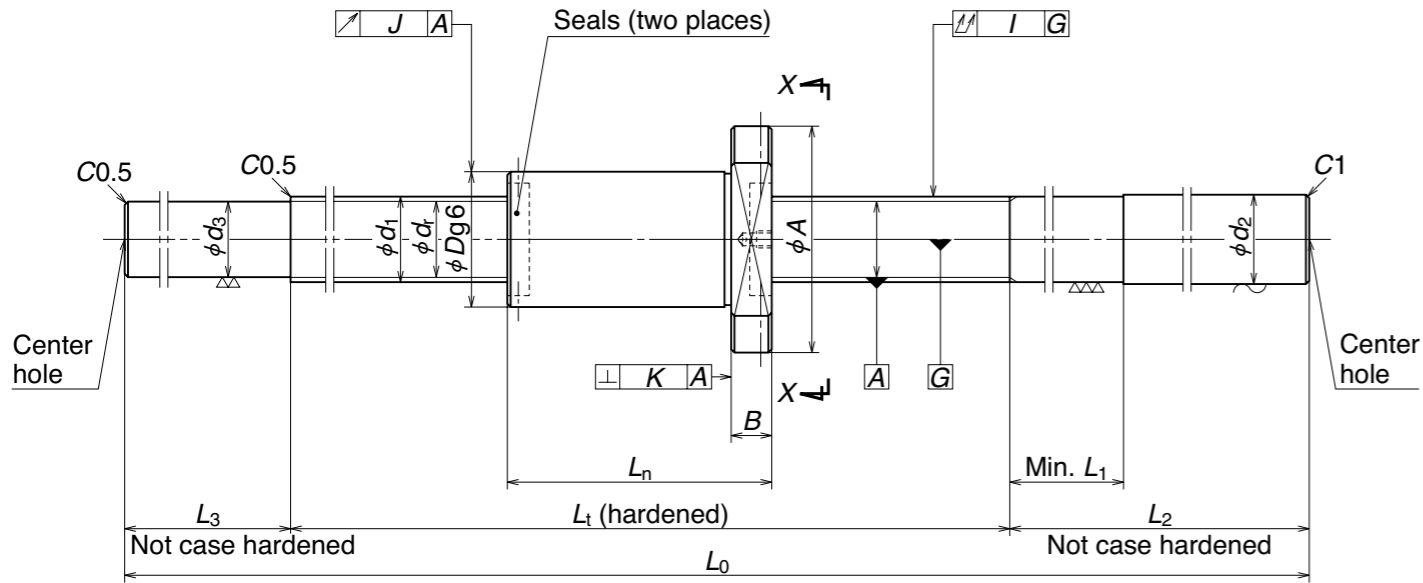
Part number	Stroke max. $L_t-L_n$	Screw shaft dia. $d_1$	Lead $l$	Nut dimensions									Screw shaft dimensions						Lead accuracy			Run-out			Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )			
				Outside dia. $D$	Flange			Overall length $L_n$	Bolt hole				Oil hole $Q$	Threaded length $L_t$	Shaft end, right			Shaft end, left		Overall length $L_0$	Target value $T$	Error $e_p$	Variation $\nu_U$	Shaft straightness $I$			Nut O.D. eccentricity $J$	Flange perpendicularity $K$	
					$A$	$G$	$B$		$W$	$X$	$Y$	$Z$			$d_2$	$L_1$	$L_2$	$d_3$	$L_3$										
<b>W3204SS-2Z-C5Z5</b>	314	32	5	58	85	32	12	86	71	6.6	11	6.5	M6×1	400	32.3	40	200	29.2	50	650	-0.010	0.025	0.020	0.060	0.019	0.013	5.1	2 180	
<b>W3206SS-2Z-C5Z5</b>	600													250			100		950		-0.014	0.030	0.023				0.075		6.9
<b>W3208SS-2Z-C5Z5</b>	800													250			100		1 150		-0.019	0.035	0.025				0.090		8.0
<b>W3212SS-2Z-C5Z5</b>	1 200													300			100		1 600		-0.029	0.046	0.030				0.120		10.1
<b>W3215SS-2Z-C5Z5</b>	1 500													300			100		1 900		-0.036	0.054	0.035				0.150		12.4
<b>W3206SS-4Z-C5Z6</b>	501	32	6	62	89	34	12	99	75	6.6	11	6.5	M6×1	600	32.3	40	250	28.4	100	950	-0.014	0.030	0.023	0.075	0.019	0.013	7.1	2 180	
<b>W3210SS-2Z-C5Z6</b>	1 000													300			100		1 400		-0.024	0.040	0.027				0.120		9.7
<b>W3215SS-4Z-C5Z6</b>	1 500													300			100		1 900		-0.036	0.054	0.035				0.150		12.6
<b>W3206SS-5Z-C5Z8</b>	518	32	8	66	100	38	15	82	82	9	14	8.5	M6×1	600	32.3	50	250	27.5	100	950	-0.014	0.030	0.023	0.075	0.019	0.013	7.3	2 180	
<b>W3210SS-3Z-C5Z8</b>	1 000													300			100		1 400		-0.024	0.040	0.027				0.120		9.8
<b>W3215SS-5Z-C5Z8</b>	1 500													300			100		1 900		-0.036	0.054	0.035				0.150		12.6

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

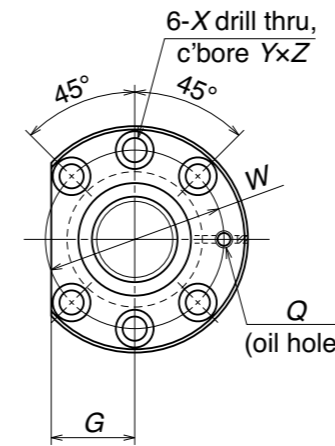
Amount for replenishing should be about 50% of nut internal space capacity.

Note 2: Permissible maximum rotational speed is determined by critical speed or permissible rotational speed shown in table.

Unit: mm



Nut type code: ZFD



View X-X

Ball Screw Specifications		
Shaft dia. × Lead / Direction of turn	32 × 5 / Right	32 × 10 / Right
Preload / Ball recirculation	Z-preload / Deflector	
Ball dia. / Ball circle dia.	3.175 / 32.75	6.35 / 33.75
Root dia.	29.4	27.1
Effective turns of balls	4	3
Accuracy grade / Preload	C5 / Z	
Basic load rating (N)	Dynamic $C_a$	14 200
	Static $C_{0a}$	40 700
Dynamic $C_{0a}$	25 900	52 800
Axial play	0	
Preload (N)	1 080	1 860
Dynamic friction torque (N-cm)	19.6	49
Internal spatial volume of nut (cm <sup>3</sup> )	22	23

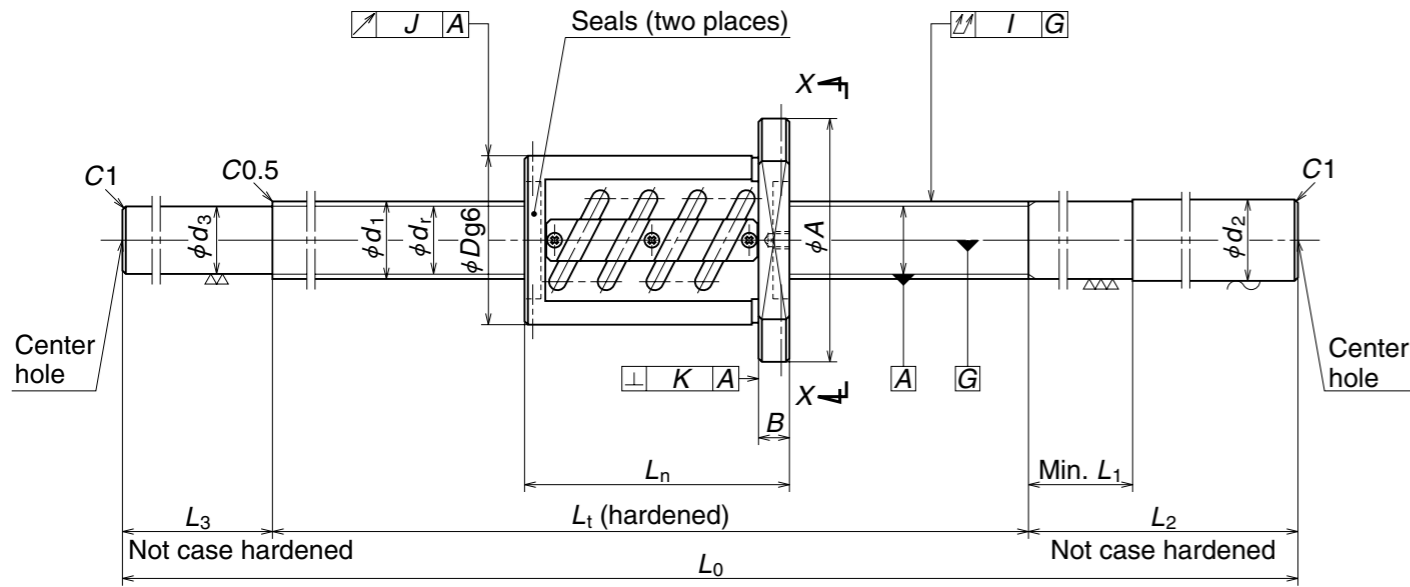
Recommended Support Unit	
WBK25DF-31 (round)	

Part number	Stroke max. $L_t-L_n$	Screw shaft dia. $d_1$	Lead $l$	Nut dimensions									Screw shaft dimensions						Lead accuracy			Run-out			Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )							
				Outside dia. $D$	Flange			Overall length $L_n$	Bolt hole				Oil hole $Q$	Threaded length $L_t$	Shaft end, right			Shaft end, left		Overall length $L_0$	Target value $T$	Error $\theta_p$	Variation $\nu_U$	Shaft straightness $I$			Nut O.D. eccentricity $J$	Flange perpendicularity $K$					
					$A$	$G$	$B$		$W$	$X$	$Y$	$Z$			$d_2$	$L_1$	$L_2$	$d_3$	$L_3$														
<b>W3204SS-3ZY-C5Z5</b>	323	32	5	48	75	29	12	77	61	6.6	11	6.5	M6×1	400	32.3	40	200	29.4	50	650	-0.009	0.025	0.020	0.060	0.015	0.011	4.6	2 180					
<b>W3206SS-6ZY-C5Z5</b>	523																250		100		950								-0.013	0.030	0.023	0.075	6.4
<b>W3209SS-1ZY-C5Z5</b>	823																250		100		1 250								-0.021	0.040	0.027	0.090	8.1
<b>W3212SS-3ZY-C5Z5</b>	1 123																300		100		1 600								-0.028	0.046	0.030	0.120	10.2
<b>W3216SS-1ZY-C5Z5</b>	1 523																300		100		2 000								-0.037	0.054	0.035	0.150	12.6
<b>W3205SS-3ZY-C5Z10</b>	380	32	10	54	88	34	15	120	70	9	14	8.5	M6×1	500	32.3	60	250	27.1	100	850	-0.010	0.027	0.020	0.075	0.019	0.013	6.2	2 180					
<b>W3207SS-3ZY-C5Z10</b>	580																250		100		1 050								-0.015	0.035	0.025	0.090	7.3
<b>W3210SS-6ZY-C5Z10</b>	880																300		100		1 400								-0.022	0.040	0.027	0.120	9.3
<b>W3214SS-3ZY-C5Z10</b>	1 280																350		120		1 870								-0.032	0.054	0.035	0.150	11.9
<b>W3218SS-3ZY-C5Z10</b>	1 680																350		120		2 270								-0.041	0.065	0.040	0.200	14.1

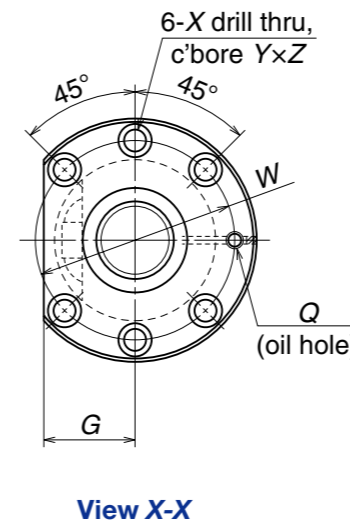
Note 1: Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use. Amount for replenishing should be about 50% of nut internal space capacity.

Note 2: Permissible maximum rotational speed is determined by critical speed or permissible rotational speed shown in table.

Unit: mm



Nut type code: ZFT



Ball Screw Specifications			
Shaft dia. × Lead / Direction of turn	32 × 10 / Right	36 × 10 / Right	40 × 5 / Right
Preload / Ball recirculation	Z-preload / Return tube		
Ball dia. / Ball circle dia.	6.350 / 33	6.350 / 37	3.175 / 40.5
Root dia.	26.4	30.4	37.2
Effective turns of balls	2.5 × 1		2.5 × 2
Accuracy grade / Preload	C5 / Z		
Basic load rating (N)	Dynamic $C_a$	25 500	27 200
	Static $C_{0a}$	54 000	61 300
Axial play	0		
Preload (N)	1 960	2 060	1 420
Dynamic friction torque (N·cm)	50	56	28.5
Internal spatial volume of nut (cm <sup>3</sup> )	22	27	14

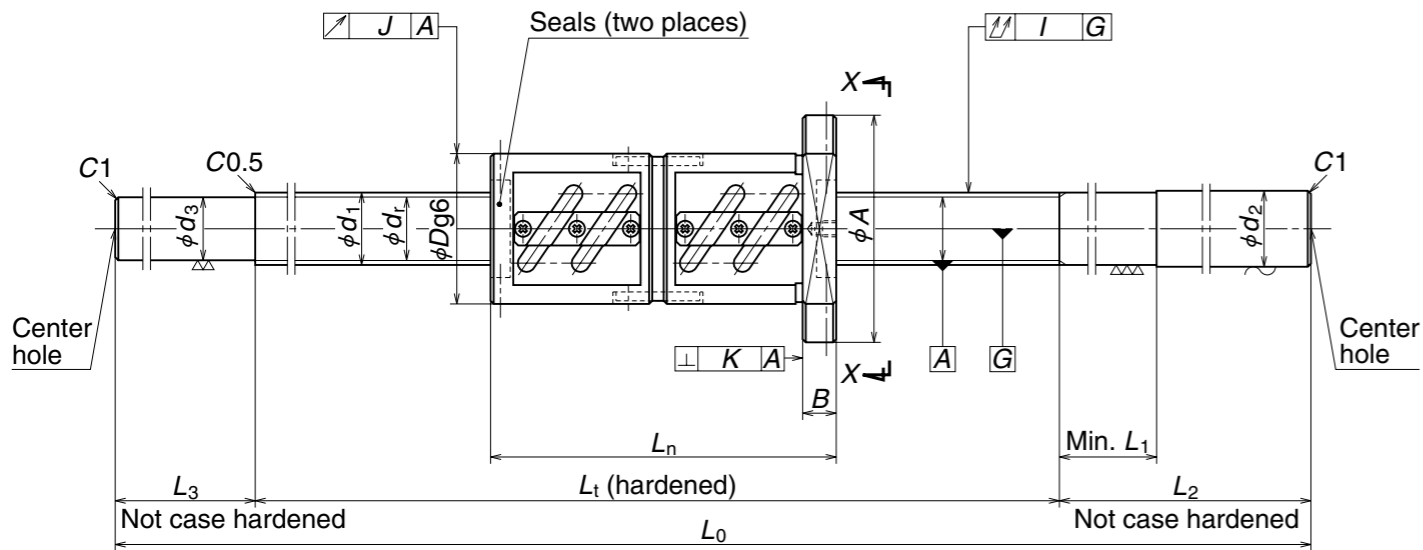
Recommended Support Unit		Fixed side	Simple support side
Screw shaft dia. 32	WBK25DF-31 (round)	○	○
Screw shaft dia. 36	WBK30DF-31 (round)	○	
	WBK25DF-31 (round)		○
Screw shaft dia. 40	WBK30DF-31 (round)	○	○

Part number	Stroke max. $L_1-L_n$	Screw shaft dia. $d_1$	Lead $l$	Nut dimensions									Screw shaft dimensions						Lead accuracy			Run-out			Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )				
				Outside dia. $D$	Flange			Overall length $L_n$	Bolt hole				Oil hole $Q$	Threaded length $L_1$	Shaft end, right		Shaft end, left		Overall length $L_0$	Target value $T$	Error $e_p$	Variation $v_u$	Shaft straightness $l$	Nut O.D. eccentricity $J$			Flange perpendicularity $K$			
					$A$	$G$	$B$		$W$	$X$	$Y$	$Z$			$d_2$	$L_1$	$L_2$	$d_3$										$L_3$		
<b>W3205SS-1Z-C5Z10</b>	400	32	10	74	108	41	15	100	90	9	11	8.5	M6×1	500	32.3	60	250	26.2	100	1 400	-0.024	0.040	0.027	0.120	0.019	0.013	7.5	2 180		
<b>W3207SS-1Z-C5Z10</b>	600													700			250		100								1 050		8.5	8.5
<b>W3210SS-4Z-C5Z10</b>	900													1 000			300		120								1 870		13.1	13.1
<b>W3214SS-1Z-C5Z10</b>	1 300													1 400			350		120								2 270		15.2	15.2
<b>W3218SS-1Z-C5Z10</b>	1 700													1 800			350		120								2 270		15.2	15.2
<b>W3607SS-1Z-C5Z10</b>	597	36	10	75	120	45	18	103	98	11	17.5	11	M6×1	700	36.3	60	300	30.4	100	1 670	-0.029	0.046	0.030	0.100	0.019	0.013	10.9	1 940		
<b>W3612SS-1Z-C5Z10</b>	1 097													1 200			350		120								1 670		14.9	14.9
<b>W3620SS-1Z-C5Z10</b>	1 897													2 000			350		120								2 470		20.4	20.4
<b>W4006SS-1Z-C5Z5</b>	511	40	5	67	101	39	15	89	83	9	14	8.5	Rc1/8	600	40.3	50	300	37.2	100	1 400	-0.024	0.040	0.027	0.080	0.019	0.013	11.1	1 750		
<b>W4010SS-1Z-C5Z5</b>	911													1 000			300		120								1 400		14.8	14.8
<b>W4016SS-1Z-C5Z5</b>	1 511													1 600			350		120								2 050		20.8	20.8

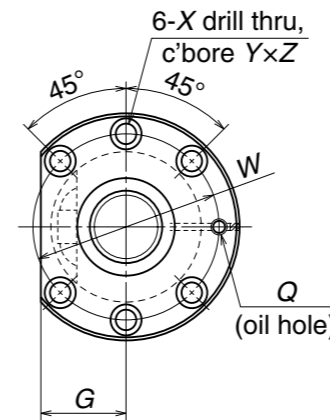
Note 1: Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use. Amount for replenishing should be about 50% of nut internal space capacity.

Note 2: Permissible maximum rotational speed is determined by critical speed or permissible rotational speed shown in table.

Unit: mm



Nut type code: DFT



View X-X

Ball Screw Specifications		
Shaft dia. × Lead / Direction of turn	32 × 10 / Right	36 × 10 / Right
Preload / Ball recirculation	D-preload / Return tube	
Ball dia. / Ball circle dia.	6.350 / 33	6.350 / 37
Root dia.	26.4	30.4
Effective turns of balls	2.5 × 2	
Accuracy grade / Preload	C5 / Z	
Basic load rating (N)	Dynamic $C_a$	46 300
	Static $C_{0a}$	108 000
Axial play	0	
Preload (N)	3 240	3 430
Internal spatial volume of nut (cm <sup>3</sup> )	57	67

Recommended Support Unit		Fixed side	Simple support side
Screw shaft dia. 32	WBK25DF-31 (round)	○	○
	WBK30DF-31 (round)	○	
Screw shaft dia. 36	WBK25DF-31 (round)		○

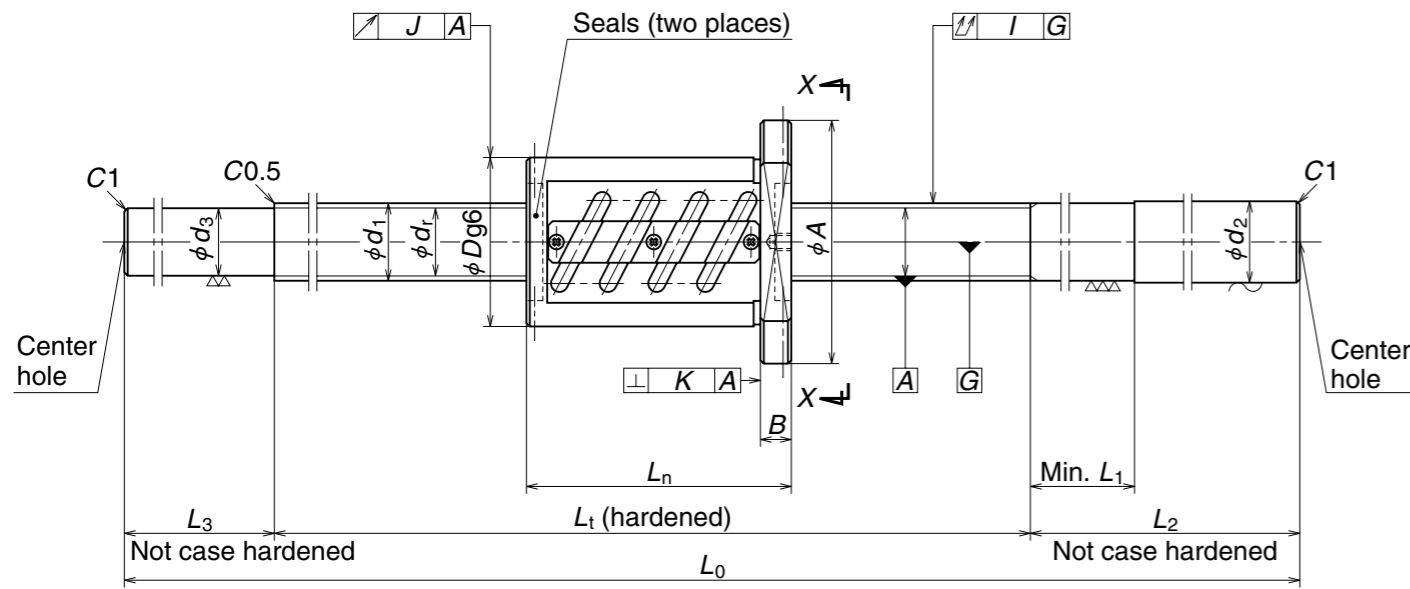
Part number	Stroke max. $L_t - L_n$	Screw shaft dia. $d_1$	Lead $l$	Nut dimensions									Screw shaft dimensions						Lead accuracy			Run-out			Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )																	
				Outside dia. $D$	Flange			Overall length $L_n$	Bolt hole				Oil hole $Q$	Threaded length $L_1$	Shaft end, right		Shaft end, left		Overall length $L_0$	Target value $T$	Error $e_p$	Variation $v_u$	Shaft straightness $I$	Nut O.D. eccentricity $J$			Flange perpendicularity $K$																
					$A$	$G$	$B$		$W$	$X$	$Y$	$Z$			$d_2$	$L_1$	$L_2$	$d_3$										$L_3$															
<b>W3205SS-2D-C5Z10</b>	310	32	10	74	108	41	15	190	90	9	14	8.5	M6×1	500	32.3	60	250	26.2	100	850	-0.012	0.027	0.020	0.075	0.019	0.013	9.5	2 180															
<b>W3207SS-2D-C5Z10</b>	510																250		100										1 050	-0.024	0.040	0.027	0.120	0.019	0.013	12.5							
<b>W3210SS-5D-C5Z10</b>	810																300		100										1 400								-0.034	0.054	0.035	0.150	0.019	0.013	15.1
<b>W3214SS-2D-C5Z10</b>	1 210																350		120										1 870														
<b>W3218SS-2D-C5Z10</b>	1 610																350		120										2 270								-0.017	0.035	0.025	0.065	0.019	0.013	12.8
<b>W3607SS-2D-C5Z10</b>	507	36	10	75	120	45	18	193	98	11	17.5	11	M6×1	700	36.3	60	300	30.4	100	1 100	-0.029	0.046	0.030	0.100	0.019	0.013	16.8	1 940															
<b>W3612SS-2D-C5Z10</b>	1 007													1 200			120		1 670										-0.048	0.065	0.040	0.130	0.019	0.013	22.3								
<b>W3620SS-2D-C5Z10</b>	1 807													2 000			120		2 470																								

Note 1: Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use. Amount for replenishing should be about 50% of nut internal space capacity.

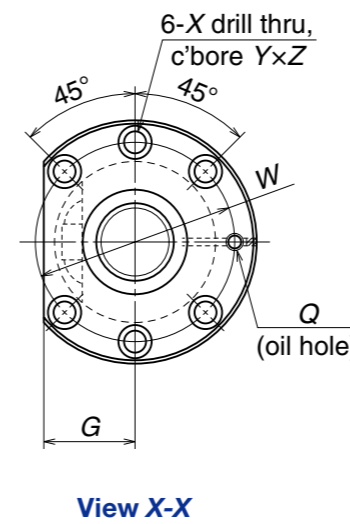
Note 2: Permissible maximum rotational speed is determined by critical speed or permissible rotational speed shown in table.



Unit: mm



Nut type code: ZFT



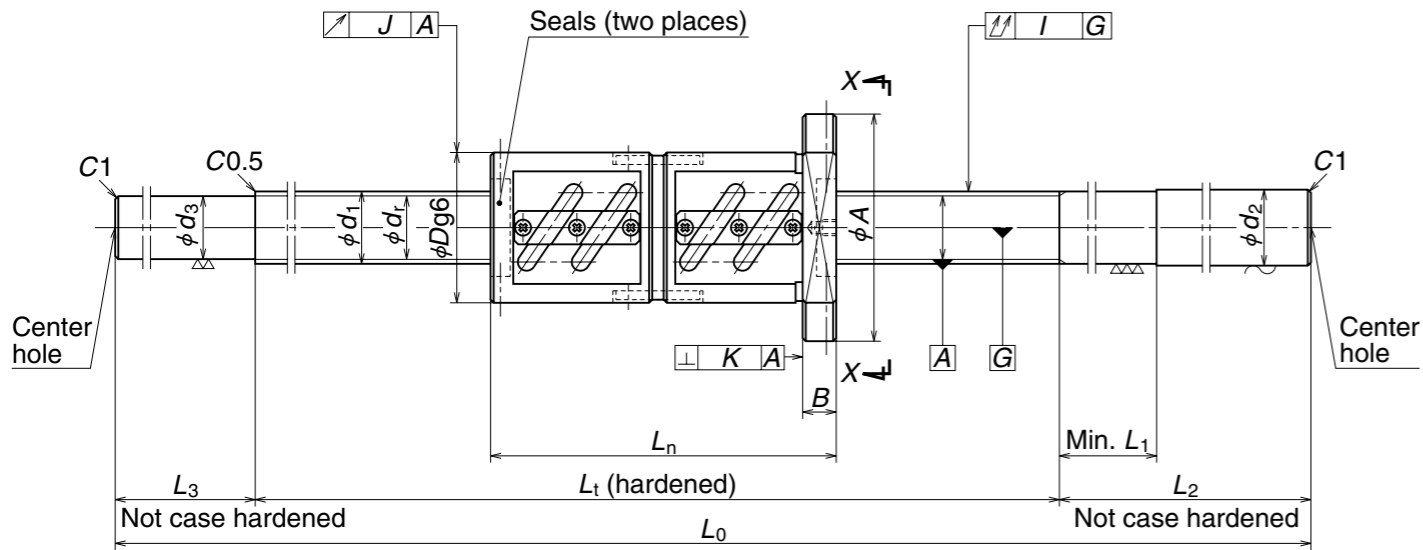
Ball Screw Specifications				
Shaft dia. × Lead / Direction of turn	40 × 8 / Right	40 × 10 / Right	40 × 12 / Right	
Preload / Ball recirculation	Z-preload / Return tube			
Ball dia. / Ball circle dia.	4.762 / 40.5	6.350 / 41	7.144 / 41.5	
Root dia.	35.5	34.4	34.1	
Effective turns of balls	2.5 × 2	2.5 × 1		
Accuracy grade / Preload	C5 / Z			
Basic load rating (N)	Dynamic $C_a$	34 900	28 600	33 600
	Static $C_{0a}$	103 000	68 600	77 500
Axial play	0			
Preload (N)	2 460	2 160	2 550	
Dynamic friction torque (N·cm)	64		83	
Internal spatial volume of nut (cm <sup>3</sup> )	27	30	35	

Recommended Support Unit	
WBK30DF-31 (round)	

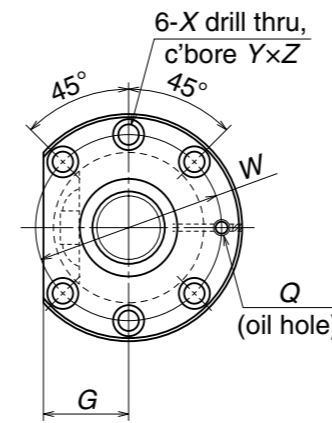
Part number	Stroke max. $L_t-L_n$	Screw shaft dia. $d_1$	Lead $l$	Nut dimensions									Screw shaft dimensions						Lead accuracy			Run-out			Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )			
				Outside dia. $D$	Flange			Overall length $L_n$	Bolt hole				Oil hole $Q$	Threaded length $L_t$	Shaft end, right			Shaft end, left		Overall length $L_0$	Target value $T$	Error $e_p$	Variation $v_u$	Shaft straightness $I$			Nut O.D. eccentricity $J$	Flange perpendicularity $K$	
					$A$	$G$	$B$		$W$	$X$	$Y$	$Z$			$d_2$	$L_1$	$L_2$	$d_3$	$L_3$										
<b>W4007SS-1Z-C5Z8</b>	570	40	8	74	108	41	15	130	90	9	14	8.5	Rc1/8	700	40.3	50	300	35.5	100	1 100	-0.017	0.035	0.025	0.065	0.019	0.013	13.0	1 750	
<b>W4012SS-1Z-C5Z8</b>	1 070													1 200			350		100		1 650	-0.029	0.046	0.030			0.100		18.0
<b>W4018SS-1Z-C5Z8</b>	1 670													1 800			350		120		2 270	-0.043	0.065	0.040			0.130		23.5
<b>W4007SS-2Z-C5Z10</b>	597	40	10	82	124	47	18	103	102	11	17.5	11	Rc1/8	700	40.3	60	300	34.4	100	1 400	-0.017	0.035	0.025	0.065	0.025	0.015	13.3	1 750	
<b>W4010SS-2Z-C5Z10</b>	897													1 000			300		100		1 400	-0.024	0.040	0.027			0.080		15.9
<b>W4014SS-1Z-C5Z10</b>	1 297													1 400			350		120		1 870	-0.034	0.054	0.035			0.100		20.0
<b>W4018SS-2Z-C5Z10</b>	1 697													1 800			350		120		2 270	-0.043	0.065	0.040			0.130		23.4
<b>W4024SS-1Z-C5Z10</b>	2 297													2 400			400		150		2 950	-0.058	0.077	0.046			0.170		29.4
<b>W4010SS-4Z-C5Z12</b>	883	40	12	86	128	48	18	117	106	11	17.5	11	Rc1/8	1 000	40.3	70	300	34.1	100	1 400	-0.024	0.040	0.027	0.080	0.025	0.015	16.7	1 750	
<b>W4016SS-2Z-C5Z12</b>	1 483													1 600			350		150		2 100	-0.038	0.054	0.035			0.130		22.9
<b>W4025SS-1Z-C5Z12</b>	2 383													2 500			400		150		3 050	-0.060	0.077	0.046			0.170		31.1

Note 1: Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.  
Amount for replenishing should be about 50% of nut internal space capacity.  
Note 2: Permissible maximum rotational speed is determined by critical speed or permissible rotational speed shown in table.

Unit: mm



Nut type code: DFT



View X-X

Ball Screw Specifications		
Shaft dia. × Lead / Direction of turn	40 × 10 / Right	40 × 12 / Right
Preload / Ball recirculation	D-preload / Return tube	
Ball dia. / Ball circle dia.	6.350 / 41	7.144 / 41.5
Root dia.	34.4	34.1
Effective turns of balls	2.5 × 2	
Accuracy grade / Preload	C5 / Z	
Basic load rating (N)	Dynamic $C_a$	52 000
	Static $C_{0a}$	137 000
Preload (N)	3 630	4 310
Dynamic friction torque (N·cm)	108	138
Internal spatial volume of nut (cm <sup>3</sup> )	740	93
Axial play	0	

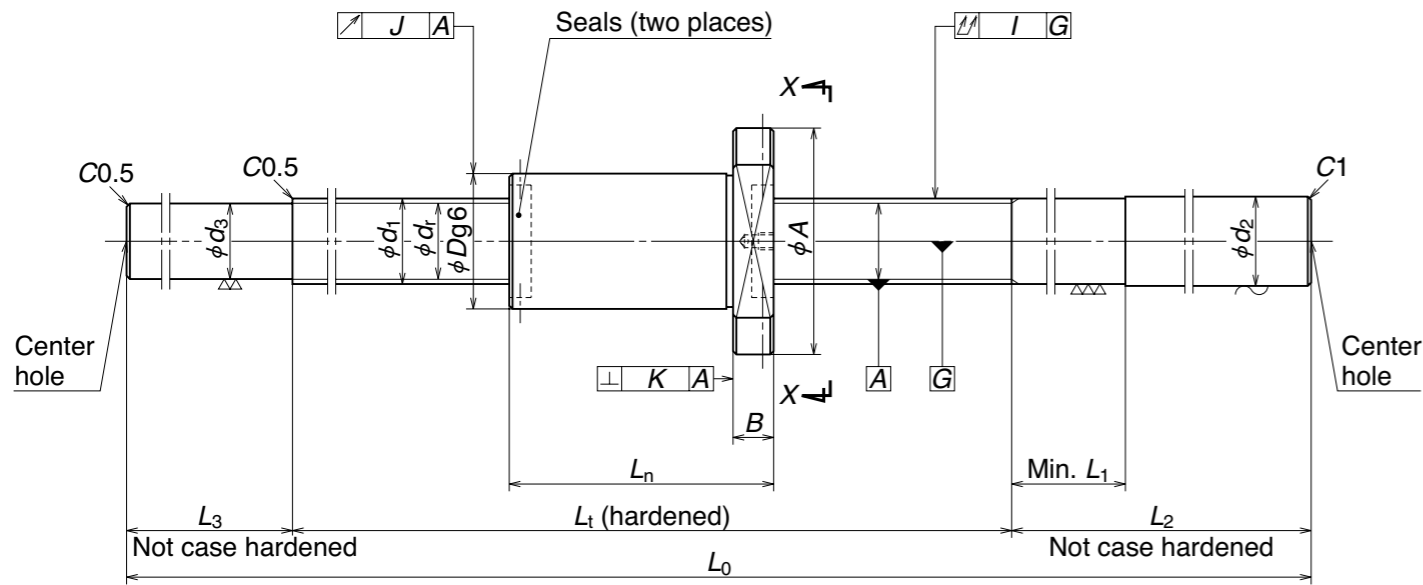
Recommended Support Unit	
WBK30DF-31 (round)	

Part number	Stroke max. $L_t-L_n$	Screw shaft dia. $d_1$	Lead $l$	Nut dimensions									Screw shaft dimensions						Lead accuracy			Run-out			Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )										
				Outside dia. $D$	Flange			Overall length $L_n$	Bolt hole				Oil hole $Q$	Threaded length $L_1$	Shaft end, right		Shaft end, left		Overall length $L_0$	Target value $T$	Error $e_p$	Variation $v_u$	Shaft straightness $I$	Nut O.D. eccentricity $J$			Flange perpendicularity $K$									
					$A$	$G$	$B$		$W$	$X$	$Y$	$Z$			$d_2$	$L_1$	$L_2$	$d_3$										$L_3$								
<b>W4007SS-3D-C5Z10</b>	507	40	10	82	124	47	18	193	102	11	17.5	11	Rc1/8	700	40.3	60	300	34.4	100	1 100	-0.017	0.035	0.025	0.065	0.025	0.015	15.5	1 750								
<b>W4010SS-3D-C5Z10</b>	807																												300	100	1 400	0.025	0.015	18.1		
<b>W4014SS-2D-C5Z10</b>	1 207																												350	120	1 870				22.2	
<b>W4018SS-3D-C5Z10</b>	1 607																												350	120	2 270					25.6
<b>W4024SS-2D-C5Z10</b>	2 207																												400	150	2 950					
<b>W4010SS-5D-C5Z12</b>	775	40	12	86	128	48	18	225	106	11	17.5	11	Rc1/8	1 000	40.3	70	300	34.1	100	1 400	-0.024	0.040	0.027	0.080	19.7	1 750										
<b>W4016SS-3D-C5Z12</b>	1 375																										350	150	2 100	0.025	0.015	25.8				
<b>W4025SS-2D-C5Z12</b>	2 275																										400	150	3 050				34.0			

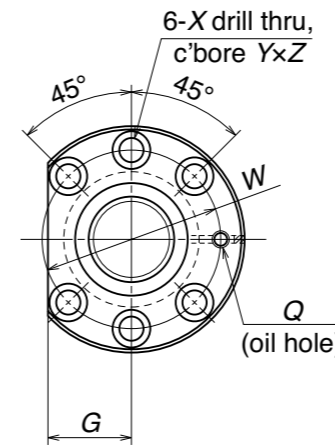
Note 1: Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use. Amount for replenishing should be about 50% of nut internal space capacity.

Note 2: Permissible maximum rotational speed is determined by critical speed or permissible rotational speed shown in table.

Unit: mm



Nut type code: ZFD



View X-X

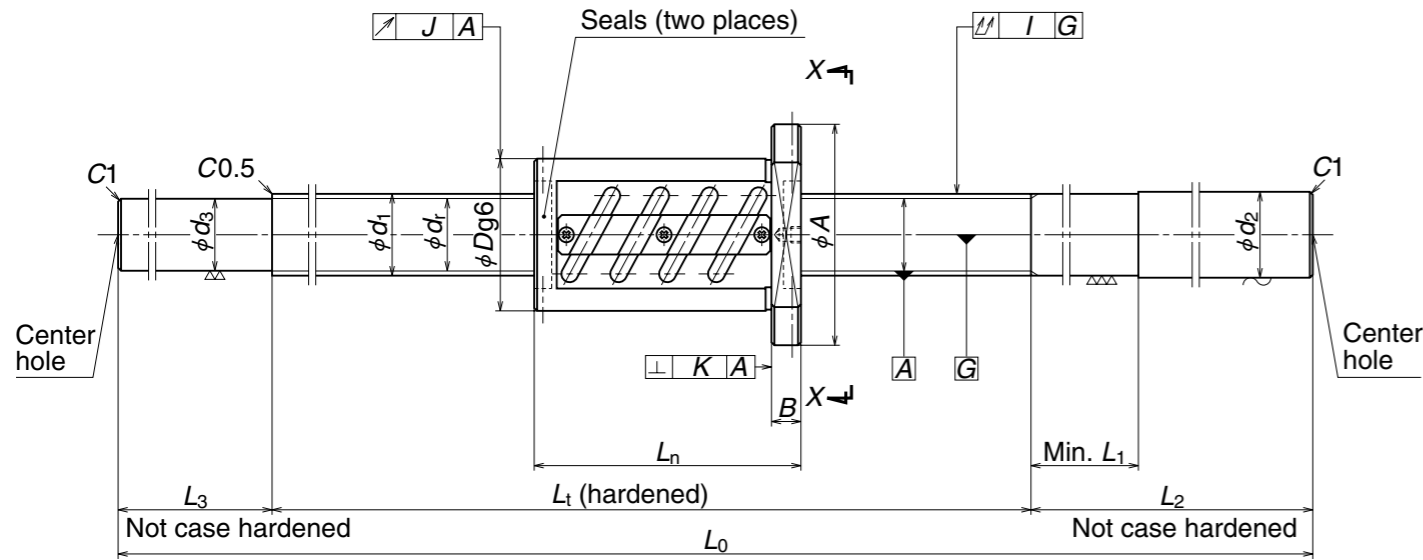
Ball Screw Specifications		
Shaft dia. × Lead / Direction of turn	40 × 10 / Right	50 × 10 / Right
Preload / Ball recirculation	Z-preload / Deflector	
Ball dia. / Ball circle dia.	6.350 / 41.75	6.350 / 51.75
Root dia.	35.1	45.1
Effective turns of balls	4	
Accuracy grade / Preload	C5 / Z	
Basic load rating (N)	Dynamic $C_a$	38 400
	Static $C_{0a}$	93 300
Axial play	0	
Preload (N)	2 840	3 240
Dynamic friction torque (N-cm)	83	108
Internal spatial volume of nut (cm <sup>3</sup> )	32	39

Recommended Support Unit	
Screw shaft dia. 40	WBK30DFD-31 (round)
Screw shaft dia. 50	WBK40DFD-31 (round)

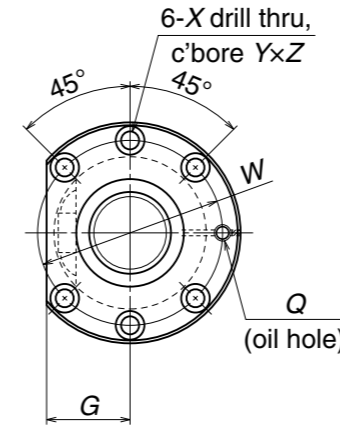
Part number	Stroke max. $L_t-L_n$	Screw shaft dia. $d_1$	Lead $l$	Nut dimensions									Screw shaft dimensions						Lead accuracy			Run-out			Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )				
				Outside dia. $D$	Flange			Overall length $L_n$	Bolt hole				Oil hole $Q$	Threaded length $L_1$	Shaft end, right		Shaft end, left		Overall length $L_0$	Target value $T$	Error $e_p$	Variation $v_u$	Shaft straightness $I$	Nut O.D. eccentricity $J$			Flange perpendicularity $K$			
					$A$	$G$	$B$		$W$	$X$	$Y$	$Z$			$d_2$	$L_1$	$L_2$	$d_3$										$L_3$		
<b>W4007SS-4ZY-C5Z10</b>	557	40	10	62	104	40	18	143	82	11	17.5	11	Rc1/8	700	40.3	60	300	35.1	100	1 100	-0.015	0.035	0.025	0.065	0.019	0.013	12.1	1 750		
<b>W4010SS-6ZY-C5Z10</b>	857													1 000			300		100		1 400	-0.022	0.040				0.027		0.080	14.7
<b>W4014SS-3ZY-C5Z10</b>	1 257													1 400			350		120		1 870	-0.032	0.054				0.035		0.100	18.9
<b>W4018SS-4ZY-C5Z10</b>	1 657													1 800			350		120		2 270	-0.041	0.065				0.040		0.170	22.5
<b>W4024SS-3ZY-C5Z10</b>	2 257													2 400			400		150		2 950	-0.056	0.077				0.046		0.170	28.5
<b>W5007SS-1ZY-C5Z10</b>	557	50	10	72	114	44	18	143	92	11	17.5	11	Rc1/8	700	50.3	60	300	45.1	100	1 100	-0.015	0.035	0.025	0.065	0.019	0.013	18.3	1 400		
<b>W5010SS-3ZY-C5Z10</b>	857													1 000			300		100		1 400	-0.022	0.040				0.027		0.080	22.5
<b>W5015SS-3ZY-C5Z10</b>	1 357													1 500			400		150		2 050	-0.034	0.054				0.035		0.130	31.8
<b>W5020SS-3ZY-C5Z10</b>	1 857													2 000			400		150		2 550	-0.046	0.065				0.040		0.170	38.9
<b>W5026SS-3ZY-C5Z10</b>	2 457													2 600			500		200		3 300	-0.060	0.093				0.054		0.220	49.5

Note 1: Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use. Amount for replenishing should be about 50% of nut internal space capacity.  
 Note 2: Permissible maximum rotational speed is determined by critical speed or permissible rotational speed shown in table.

Unit: mm



Nut type code: ZFT



View X-X

Ball Screw Specifications				
Shaft dia. × Lead / Direction of turn	45 × 10 / Right	50 × 10 / Right		
Preload / Ball recirculation	Z-preload / Return tube			
Ball dia. / Ball circle dia.	6.350 / 40	6.350 / 51		
Root dia.	39.4	44.4		
Effective turns of balls	2.5 × 1		2.5 × 2	
Accuracy grade / Preload	C5 / Z			
Basic load rating (N)	Dynamic $C_a$	29 900	31 800	57 700
	Static $C_{0a}$	77 300	87 400	175 000
Axial play	0			
Preload (N)	2 260	2 450	4 020	
Dynamic friction torque (N·cm)	69	78	138	
Internal spatial volume of nut (cm <sup>3</sup> )	34	37	59	

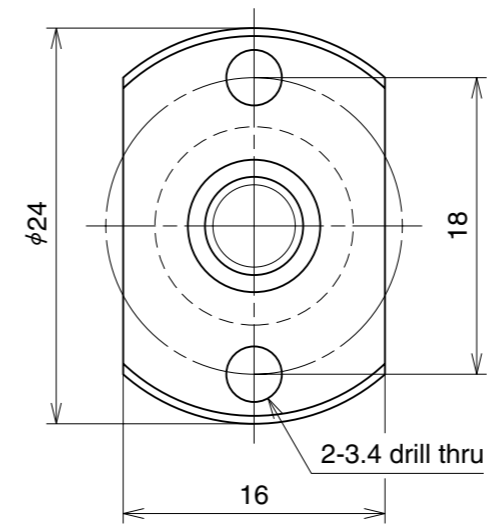
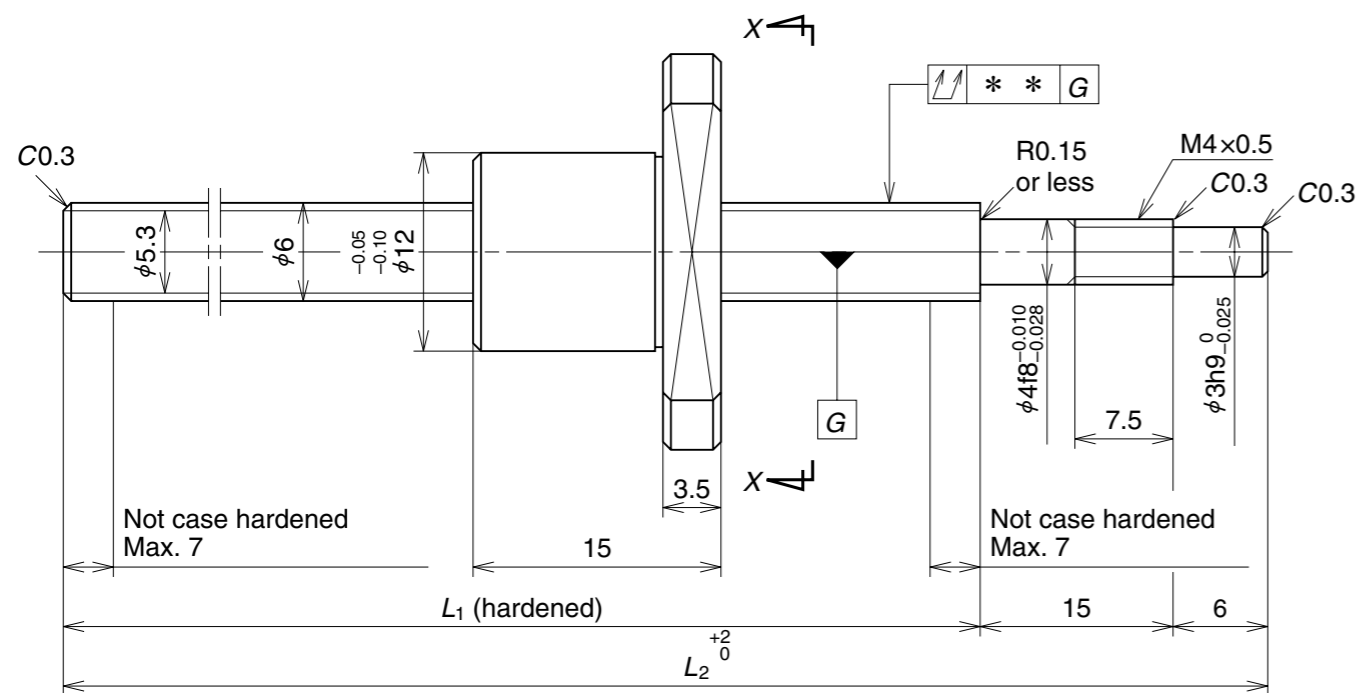
Recommended Support Unit	
Screw shaft dia. 45	WBK35DFD-31 (round)
Screw shaft dia. 50	WBK40DFD-31 (round)

Part number	Stroke max. $L_1-L_n$	Screw shaft dia. $d_1$	Lead $l$	Nut dimensions									Screw shaft dimensions						Lead accuracy			Run-out			Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )		
				Outside dia.		Flange		Overall length $L_n$	Bolt hole				Oil hole $Q$	Threaded length $L_1$	Shaft end, right		Shaft end, left		Overall length $L_0$	Target value $T$	Error $\epsilon_p$	Variation $\sigma_u$	Shaft straightness $I$	Nut O.D. eccentricity $J$			Flange perpendicularity $K$	
				$D$	$A$	$G$	$B$		$W$	$X$	$Y$	$Z$			$d_2$	$L_1$	$L_2$	$d_3$										$L_3$
<b>W4510SS-1Z-C5Z10</b>	897	45	10	88	132	50	18	103	110	11	17.5	11	Rc1/8	1 000	45.3	60	300	39.4	100	1 400	-0.024	0.040	0.027	0.080	0.025	0.015	19.7	1 550
<b>W4516SS-1Z-C5Z10</b>	1 497													400			150		2 150		-0.038	0.054	0.035	0.130			28.1	
<b>W4525SS-1Z-C5Z10</b>	2 397													450			150		3 100		-0.060	0.077	0.046	0.170			38.8	
<b>W5010SS-1Z-C5Z10</b>	897	50	10	93	135	51	18	103	113	11	17.5	11	Rc1/8	1 000	50.3	60	300	44.4	100	1 400	-0.024	0.040	0.027	0.080	0.025	0.015	23.8	1 400
<b>W5015SS-1Z-C5Z10</b>	1 397													400			150		2 050		-0.036	0.054	0.035	0.130			32.9	
<b>W5020SS-1Z-C5Z10</b>	1 897													400			150		2 550		-0.048	0.065	0.040	0.170			39.8	
<b>W5026SS-1Z-C5Z10</b>	2 497													450			150		3 200		-0.062	0.093	0.054	0.220			48.9	
<b>W5010SS-2Z-C5Z10</b>	867	50	10	93	135	51	18	163	113	11	17.5	11	Rc1/8	1 000	50.3	60	300	44.4	100	1 400	-0.024	0.040	0.027	0.080	0.025	0.015	25.5	1 400
<b>W5015SS-2Z-C5Z10</b>	1 337													400			150		2 050		-0.036	0.054	0.035	0.130			34.6	
<b>W5020SS-2Z-C5Z10</b>	1 837													400			150		2 550		-0.048	0.065	0.040	0.170			41.5	
<b>W5026SS-2Z-C5Z10</b>	2 437													450			150		3 200		-0.062	0.093	0.054	0.220			50.7	

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

Amount for replenishing should be about 50% of nut internal space capacity.

Note 2: Permissible maximum rotational speed is determined by critical speed or permissible rotational speed shown in table.



View X-X

Unit: mm

Ball Screw Specifications		
Shaft dia. x Lead / Direction of turn	6 x 1 / Right	
Ball recirculation	Deflector	
Ball dia. / Ball circle dia.	0.800 / 6.2	
Root dia.	5.2	
Effective turns of balls	1 x 3	
Accuracy grade / Axial play	Ct7 / S	
Basic load rating (N)	Dynamic $C_a$	520
	Static $C_{0a}$	925
Axial play	0.020 or less	
Dynamic friction torque (N·cm)	1.0 or less	
Spacer ball	None	

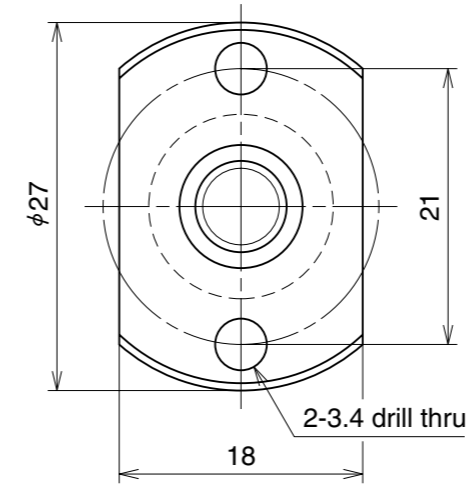
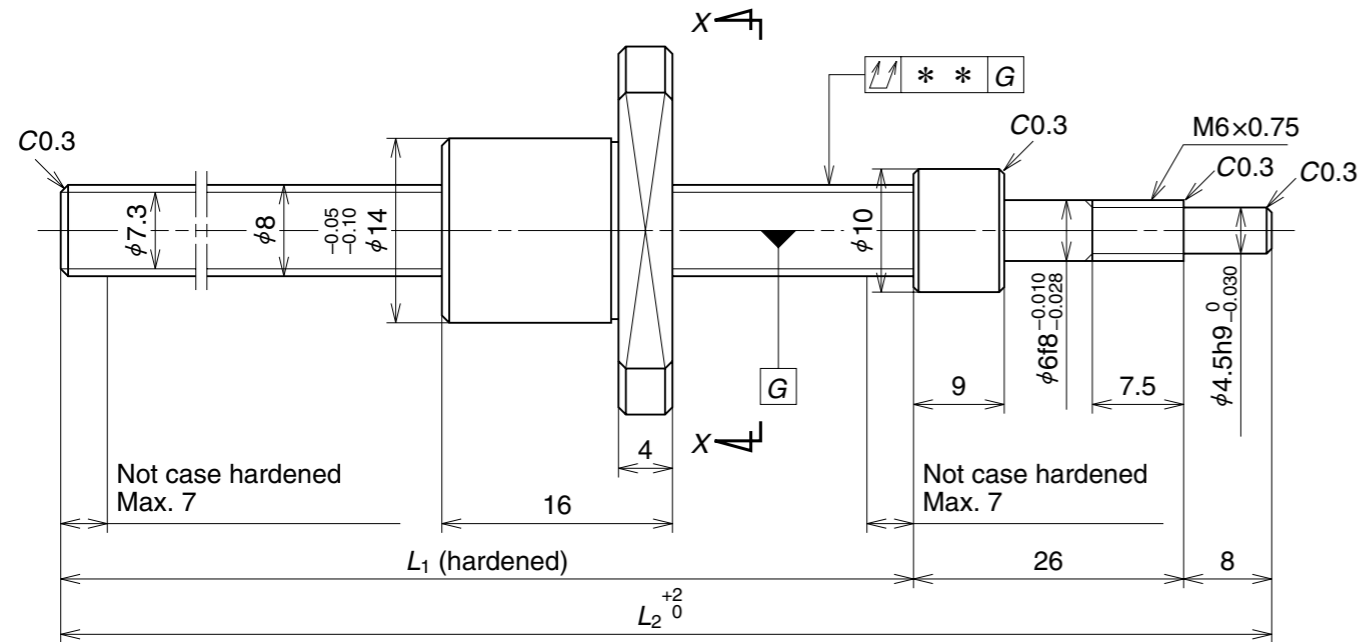
Recommended Support Unit	
WBK04R-11 (round, fixed side)	

Unit: mm

Part number	Stroke		Screw shaft length		Lead accuracy			Shaft run-out**	Mass (kg)	Permissible rotational speed $N$ ( $\text{min}^{-1}$ )
	Nominal	Maximum ( $L_1$ -Nut length)	$L_1$	$L_2$	Target value $T$	Error $\theta_p$	Variation $v_{300}$			
<b>RMA0601C7S-160</b>	100	124	139	160	0	0.052	0.052	0.060	0.045	3 000
<b>RMA0601C7S-260</b>	200	224	239	260	0	0.085	0.052	0.090	0.065	3 000

Note 1: Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.  
Apply to screw shaft surface when replenishing.

Note 2: Permissible maximum rotational speed is determined by critical speed or permissible rotational speed shown in table.



View X-X

Unit: mm

Ball Screw Specifications		
Shaft dia. x Lead / Direction of turn	8 x 1 / Right	
Ball recirculation	Deflector	
Ball dia. / Ball circle dia.	0.800 / 8.2	
Root dia.	7.2	
Effective turns of balls	1 x 3	
Accuracy grade / Axial play	Ct7 / S	
Basic load rating (N)	Dynamic $C_a$	600
	Static $C_{0a}$	1 290
Axial play	0.020 or less	
Dynamic friction torque (N·cm)	1.0 or less	
Spacer ball	None	

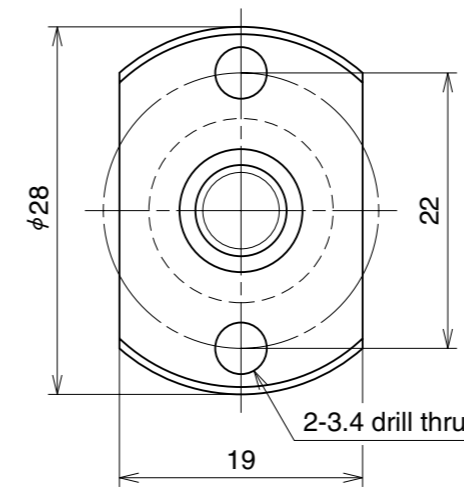
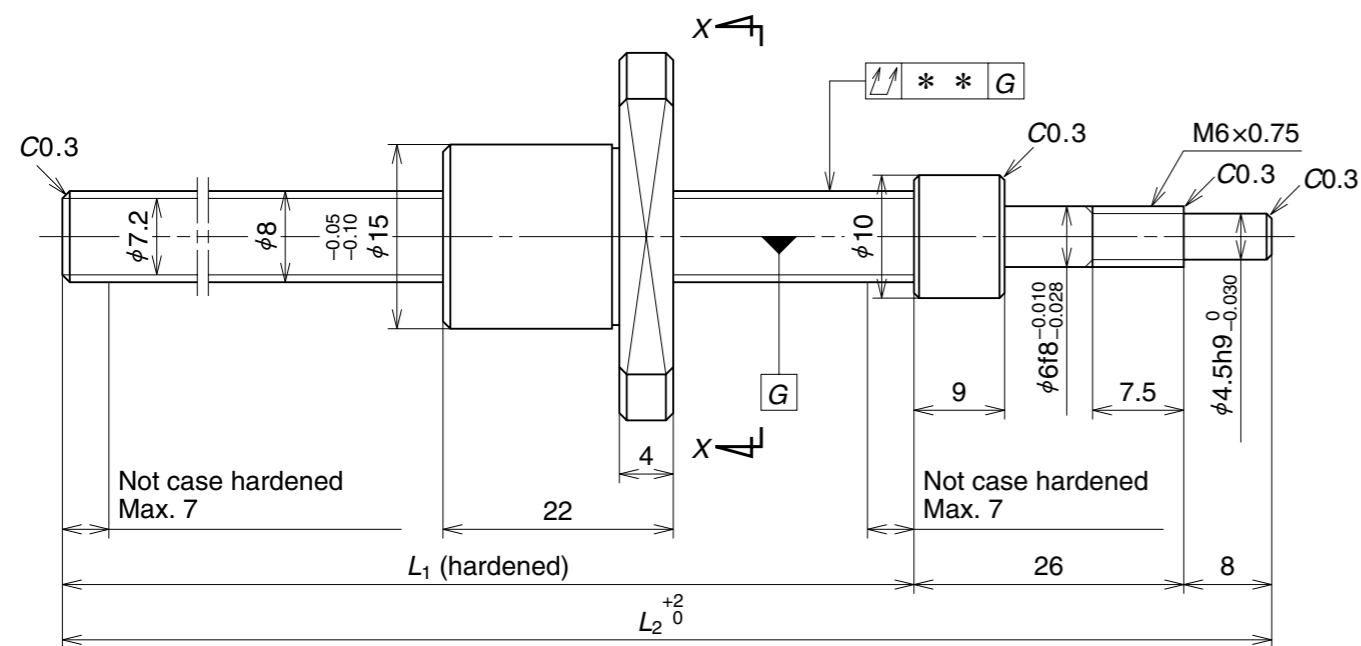
Recommended Support Unit	
WBK06R-11 (round, fixed side)	

Part number	Stroke		Screw shaft length		Lead accuracy			Shaft run-out**	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )
	Nominal	Maximum (L <sub>1</sub> -Nut length)	L <sub>1</sub>	L <sub>2</sub>	Target value T	Error $\theta_p$	Variation $v_{300}$			
<b>RMA0801C7S-180</b>	100	130	146	180	0	0.052	0.052	0.060	0.085	3 000
<b>RMA0801C7S-280</b>	200	230	246	280	0	0.085	0.052	0.090	0.12	3 000

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

Apply to screw shaft surface when replenishing.

Note 2: Permissible maximum rotational speed is determined by critical speed or permissible rotational speed shown in table.



View X-X

Unit: mm

Ball Screw Specifications		
Shaft dia. x Lead / Direction of turn	8 x 1.5 / Right	
Ball recirculation	Deflector	
Ball dia. / Ball circle dia.	1.000 / 8.3	
Root dia.	7.0	
Effective turns of balls	1 x 3	
Accuracy grade / Axial play	Ct7 / S	
Basic load rating (N)	Dynamic $C_a$	810
	Static $C_{0a}$	1 590
Axial play	0.020 or less	
Dynamic friction torque (N·cm)	1.0 or less	
Spacer ball	None	

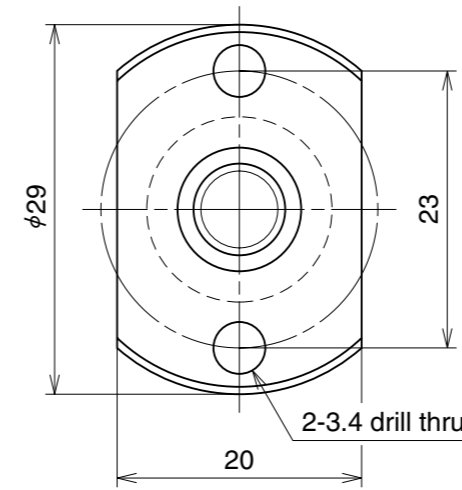
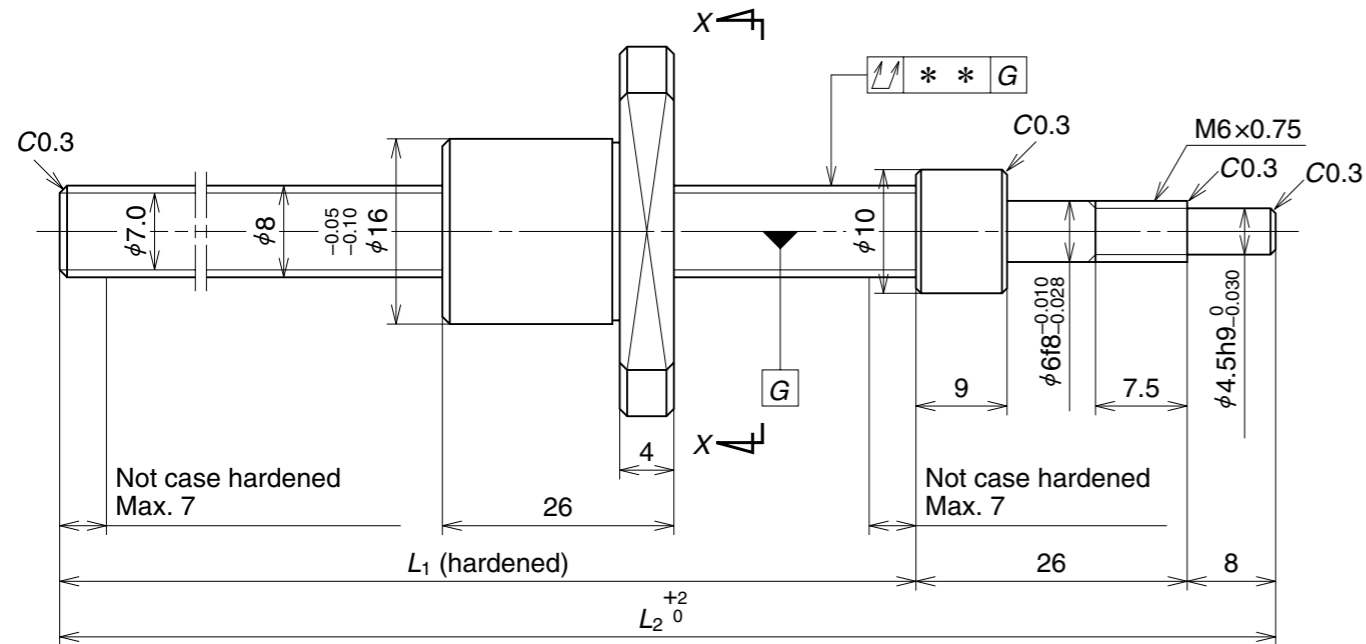
Recommended Support Unit	
WBK06R-11 (round, fixed side)	

Part number	Stroke		Screw shaft length		Lead accuracy			Shaft run-out**	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )
	Nominal	Maximum (L <sub>1</sub> -Nut length)	L <sub>1</sub>	L <sub>2</sub>	Target value T	Error $\theta_p$	Variation $v_{300}$			
<b>RMA0801.5C7S-180</b>	100	124	146	180	0	0.052	0.052	0.060	0.093	3 000
<b>RMA0801.5C7S-280</b>	200	224	246	280	0	0.085	0.052	0.090	0.13	3 000

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

Apply to screw shaft surface when replenishing.

Note 2: Permissible maximum rotational speed is determined by critical speed or permissible rotational speed shown in table.



View X-X

Unit: mm

Ball Screw Specifications		
Shaft dia. x Lead / Direction of turn	8 x 2 / Right	
Ball recirculation	Deflector	
Ball dia. / Ball circle dia.	1.200 / 8.3	
Root dia.	6.9	
Effective turns of balls	1 x 3	
Accuracy grade / Axial play	Ct7 / S	
Basic load rating (N)	Dynamic $C_a$	1 070
	Static $C_{0a}$	1 950
Axial play	0.020 or less	
Dynamic friction torque (N·cm)	1.0 or less	
Spacer ball	None	

Recommended Support Unit	
WBK06R-11 (round, fixed side)	

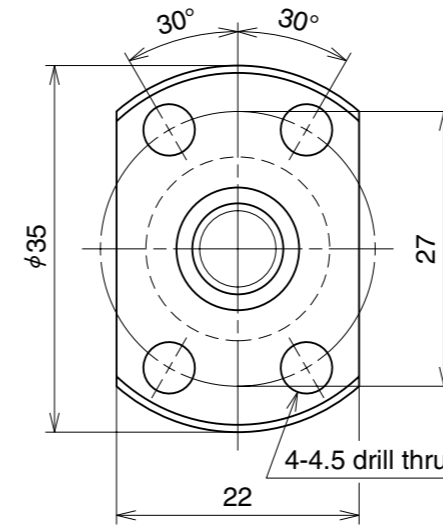
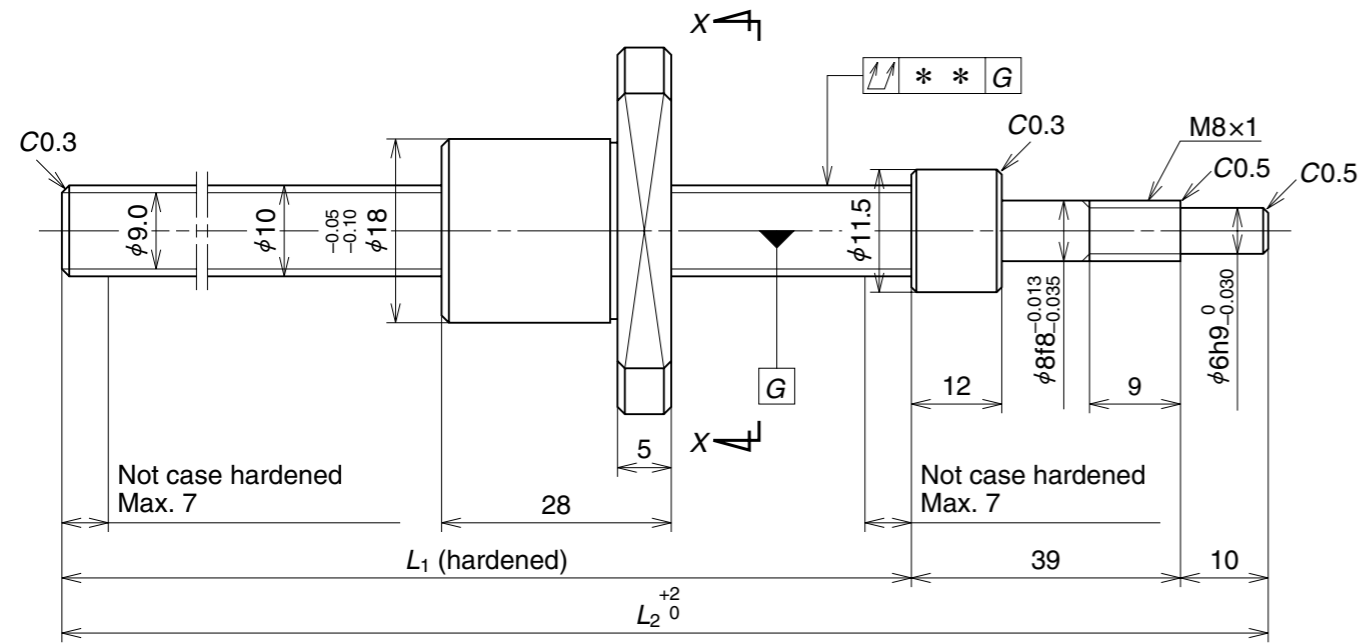
Part number	Stroke		Screw shaft length		Lead accuracy			Shaft run-out**	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )
	Nominal	Maximum ( $L_1$ -Nut length)	$L_1$	$L_2$	Target value $T$	Error $\theta_p$	Variation $v_{300}$			
<b>RMA0802C7S-180</b>	100	120	146	180	0	0.052	0.052	0.060	0.10	3 000
<b>RMA0802C7S-280</b>	200	220	246	280	0	0.085	0.052	0.090	0.14	3 000

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

Apply to screw shaft surface when replenishing.

Note 2: Permissible maximum rotational speed is determined by critical speed or permissible rotational speed shown in table.





View X-X

Unit: mm

Ball Screw Specifications		
Shaft dia. x Lead / Direction of turn	10 x 2 / Right	
Ball recirculation	Deflector	
Ball dia. / Ball circle dia.	1.200 / 10.3	
Root dia.	8.9	
Effective turns of balls	1 x 3	
Accuracy grade / Axial play	Ct7 / S	
Basic load rating (N)	Dynamic $C_a$	1 210
	Static $C_{0a}$	2 510
Axial play	0.020 or less	
Dynamic friction torque (N·cm)	1.0 or less	
Spacer ball	None	

Recommended Support Unit	
WBK08-01A (square, fixed side)	
WBK08-11 (round, fixed side)	

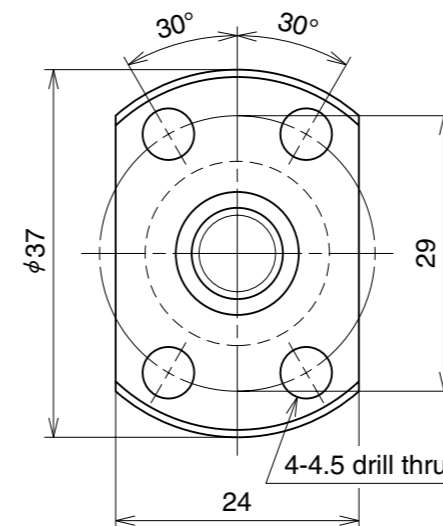
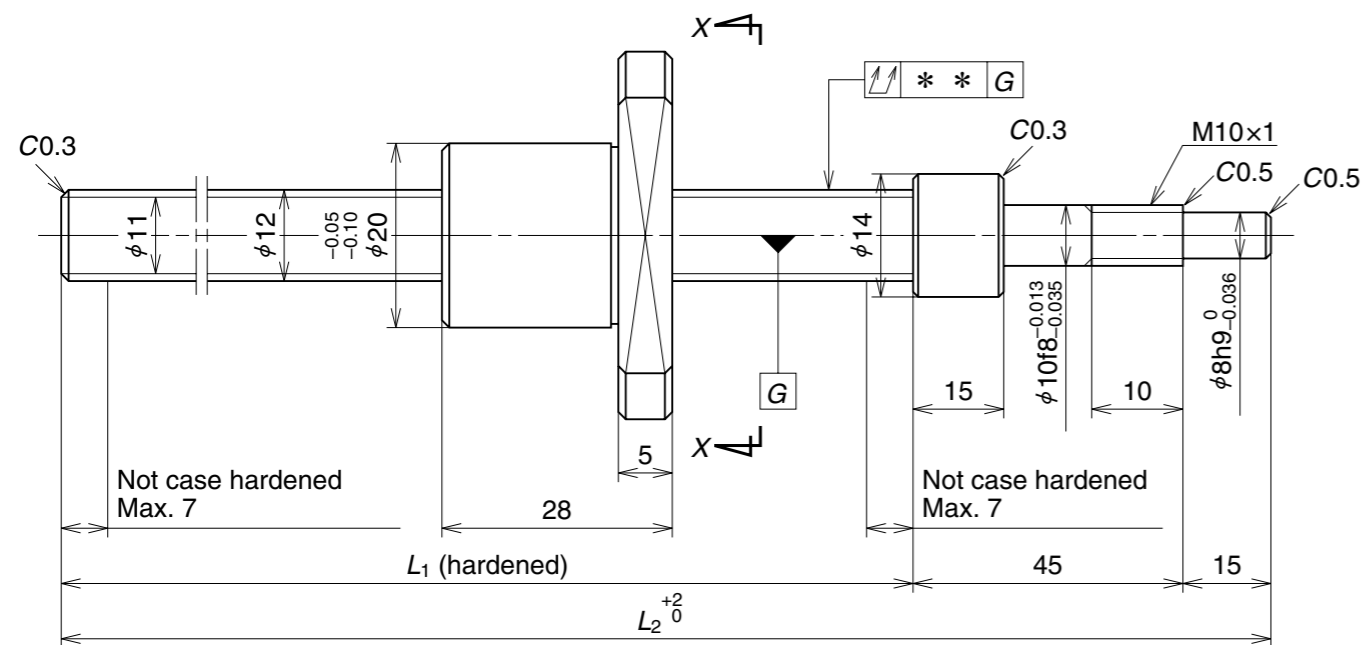
Unit: mm

Part number	Stroke		Screw shaft length		Lead accuracy			Shaft run-out**	Mass (kg)	Permissible rotational speed N (min <sup>-1</sup> )
	Nominal	Maximum ( $L_1$ -Nut length)	$L_1$	$L_2$	Target value $T$	Error $\theta_p$	Variation $v_{300}$			
<b>RMA1002C7S-250</b>	150	173	201	250	0	0.085	0.052	0.070	0.19	3 000
<b>RMA1002C7S-350</b>	250	273	301	350	0	0.085	0.052	0.100	0.25	3 000

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

Apply to screw shaft surface when replenishing.

Note 2: Permissible maximum rotational speed is determined by critical speed or permissible rotational speed shown in table.



View X-X

Unit: mm

Ball Screw Specifications		
Shaft dia. x Lead / Direction of turn	12 x 2 / Right	
Ball recirculation	Deflector	
Ball dia. / Ball circle dia.	1.200 / 12.3	
Root dia.	10.9	
Effective turns of balls	1 x 3	
Accuracy grade / Axial play	Ct7 / S	
Basic load rating (N)	Dynamic $C_a$	1 350
	Static $C_{0a}$	3 190
Axial play	0.020 or less	
Dynamic friction torque (N·cm)	1.0 or less	
Spacer ball	None	

Recommended Support Unit	
WBK10-01A (square, fixed side)	
WBK10-11 (round, fixed side)	

Unit: mm

Part number	Stroke		Screw shaft length		Lead accuracy			Shaft run-out**	Mass (kg)	Permissible rotational speed $N$ ( $\text{min}^{-1}$ )
	Nominal	Maximum ( $L_1$ -Nut length)	$L_1$	$L_2$	Target value $T$	Error $\theta_p$	Variation $v_{300}$			
<b>RMA1202C7S-250</b>	150	162	190	250	0	0.060	0.052	0.070	0.26	3 000
<b>RMA1202C7S-350</b>	250	262	290	350	0	0.085	0.052	0.100	0.34	3 000

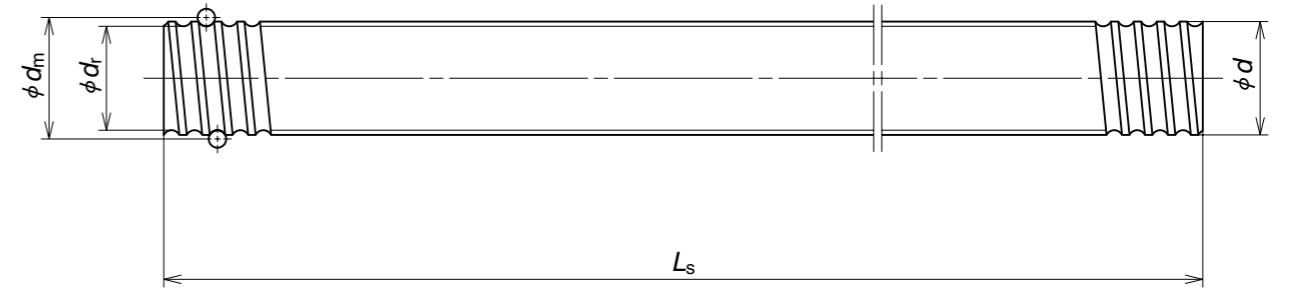
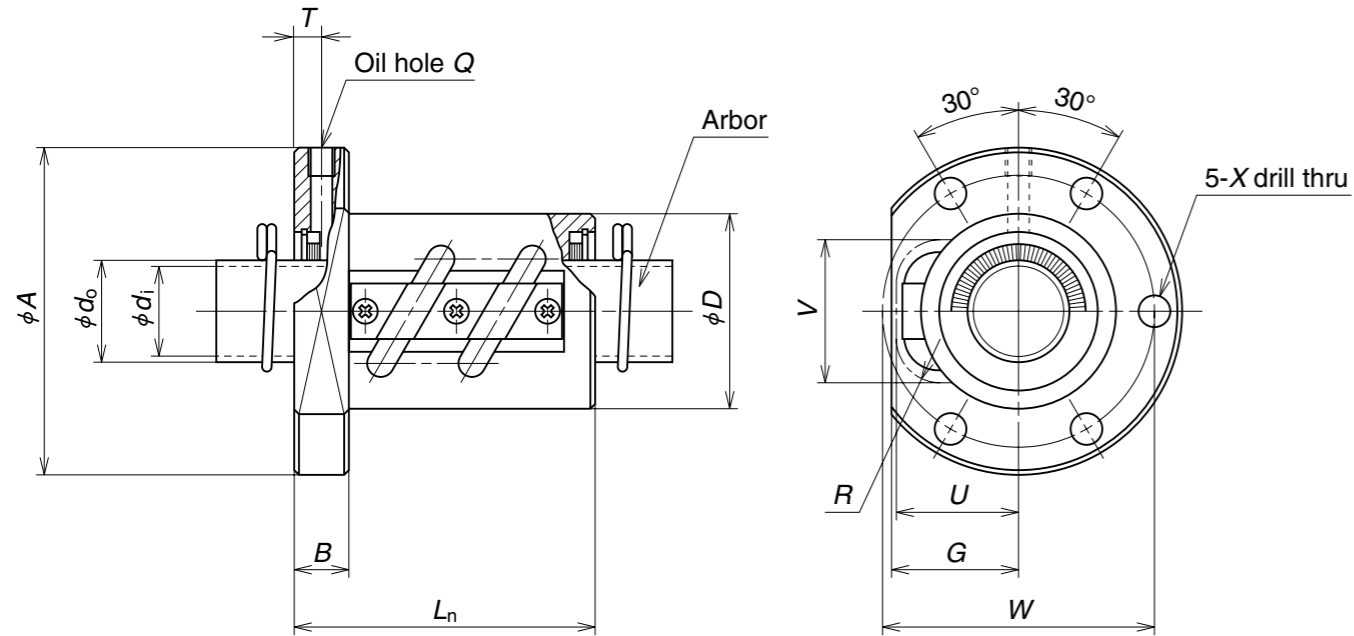
Note 1: Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.  
Apply to screw shaft surface when replenishing.

Note 2: Permissible maximum rotational speed is determined by critical speed or permissible rotational speed shown in table.

# Ball Screws R Series: Rolled Ball Screws

Nut Model: RNFTL

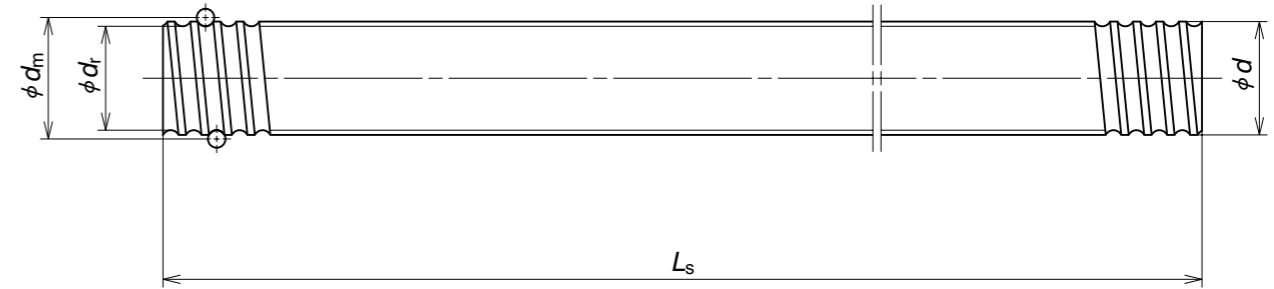
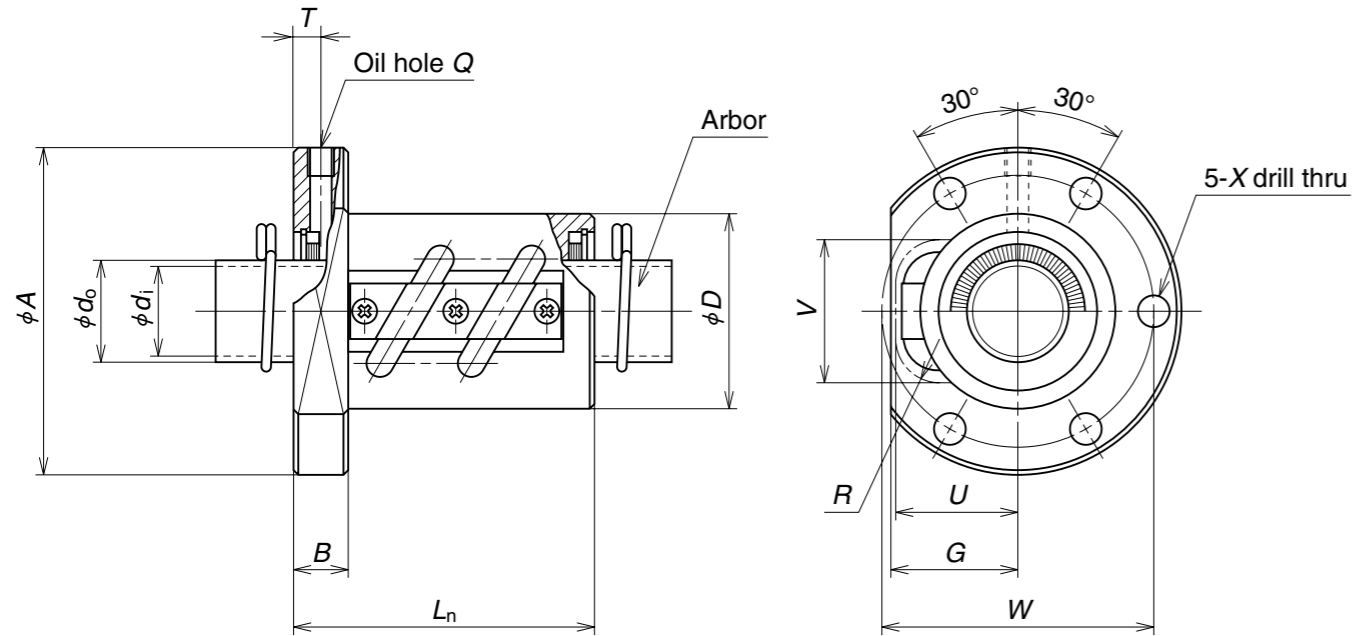
Tube type: Flanged nut



Part number	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 turns of balls Turns × Circuits	Basic load rating (N)		Axial play max.	Ball nut dimensions				Ball nut dimensions							Nut mass (kg)	Arbor		Screw shaft			Shaft mass/m (kg)	Internal spatial volume of nut (cm <sup>3</sup> )	Standard volume of grease replenishing (cm <sup>3</sup> )		
							Dynamic <i>C<sub>a</sub></i>	Static <i>C<sub>0a</sub></i>		Outside dia.		Length <i>L<sub>n</sub></i>	Bolt hole <i>W</i>	Oil hole <i>X</i>	Oil hole <i>Q</i>	Projecting tube <i>T</i>	Projecting tube <i>U</i>	Projecting tube <i>V</i>	Projecting tube <i>R</i>	Outside dia. <i>d<sub>0</sub></i>		Bore <i>d<sub>i</sub></i>	Standard length		Screw shaft number						
										<i>D</i>	<i>A</i>												<i>G</i>	<i>B</i>		<i>L<sub>s</sub></i>				<i>L<sub>s</sub></i>	
<b>RNFTL 1003A3.5</b>	10	3	2.381	10.65	8.1	3.5×1	3 780	6 730	0.10	20	40	15	6	34	30	4.5	M3×0.5	3.0	15	15	7	0.092	8.1	6.1	400	800	<b>RS1003A**</b>	0.50			
<b>RNFTL 1006A2.5S</b>	10	6	2.381	10.65	8.1	2.5×1	2 830	4 810	0.10	20	40	15	6	36	30	4.5	M3×0.5	3.5	15	15	5	0.095	8.1	6.1	400	800	<b>RS1006A**</b>	0.56	1.1	0.6	
<b>RNFTL 1208A2.5S</b>	12	8	2.778	12.65	9.6	2.5×1	3 730	6 560	0.10	25	45	19	8	46	35	4.5	M3×0.5	5.5	19	18	7	0.18	9.6	7.6	400	800	<b>RS1208A**</b>	0.74	1.8	0.9	
<b>RNFTL 1404A3.5S</b>	14	4	2.778	14.5	11.5	3.5×1	5 370	10 800	0.10	25	50	19	10	43	40	4.5	M6×1	5.0	19	20	7	0.20	11.5	9.5	500	1 000	<b>RS1404A**</b>	1.02	2.0	1.0	
<b>RNFTL 1405A2.5</b>	14	5	3.175	14.5	11.0	2.5×1	5 260	9 720	0.10	30	50	22	10	45	40	4.5	M6×1	5.0	22	21	8	0.26	11.0	9.0	500	1 000	<b>RS1405A**</b>	1.00	2.4	1.2	
<b>RNFTL 1610A2.5</b>	16	10	3.175	16.75	13.3	2.5×1	5 660	11 500	0.10	30	53	23	10	54	41	5.5	M6×1	5.5	23	22.5	8	0.28	13.3	11.3	500	1 000	1 500	<b>RS1610A**</b>	1.37	2.7	1.4
<b>RNFTL 1610A2.5S</b>																															
<b>RNFTL 1808A3.5</b>	18	8	4.762	18.5	13.6	3.5×1	13 200	25 800	0.15	34	63	27	12	58	49	6.6	M6×1	6.0	27	27	8	0.43	13.6	11.6	500	1 000	1 500	<b>RS1808A**</b>	1.60	5.2	2.6
<b>RNFTL 1808A3.5S</b>																															
<b>RNFTL 2005A2.5</b>	20	5	3.175	20.5	17.0	2.5×1	6 360	14 200	0.10	40	60	28	10	46	50	4.5	M6×1	5.0	28	27	10	0.42	17.0	14.6	500	1 000	2 000	<b>RS2005A**</b>	2.17	3.5	1.8
<b>RNFTL 2005A2.5S</b>																															
<b>RNFTL 2010A2.5</b>	20	10	4.762	21.25	16.2	2.5×1	10 900	21 800	0.15	40	67	30	12	59	53	6.6	M6×1	6.0	30	29	12	0.55	16.2	13.8	500	1 000	2 000	<b>RS2010A**</b>	2.18	7.1	3.6
<b>RNFTL 2010A2.5S</b>																															
<b>RNFTL 2505A5</b>	25	5	3.175	25.5	22.0	2.5×2	12 800	36 300	0.10	42	71	28	12	66	57	6.6	M6×1	6.0	28	31	10	0.62	22.0	19.6	1 000	2 000	2 500	<b>RS2505A**</b>	3.47	6.5	3.3
<b>RNFTL 2505A5S</b>																															
<b>RNFTL 2510A2.5</b>	25	10	6.35	26	19.0	2.5×1	17 500	35 200	0.20	44	80	34	15	62	62	9	M6×1	7.5	34	37	17	0.75	19.0	16.6	1 000	2 000	2 500	<b>RS2510A**</b>	3.13	13	6.5
<b>RNFTL 2510A2.5S</b>																															
<b>RNFTL 2510A5</b>						80	34	15			92	62	9	M6×1	7.5	34	37	17													
<b>RNFTL 2510A5S</b>																															

Note 1: Protruding portion of tube does not interfere with ball nut housing if its dimensions corresponding to U and V are large enough.  
 Note 2: Actual screw shaft length may become slightly longer than nominal length  $L_s$  due to manufacturing tolerance.  
 Note 3: Seals are provided in the nut; therefore, external dimensions of those with seals are the same as those without.  
 In ball nut side view drawing, above the center line there is a seal, and beneath it there is no seal.  
 Seal for those with shaft diameter of 14 mm or less is made of synthetic resin. Seal for those of 16 mm or more is a brush-seal.

Note 4: Nut assembly with arbor and screw shaft are separate at time of delivery.  
 Note 5: Value obtained by dividing standard screw length by 100 mm will be entered at end of the part number where marked with \*\*.  
 Note 6: Internal spatial volume of nut and volume of grease to be replenished are values for linear guides with seals. Recommended amount for replenishing is approximately 50% of nut's internal space capacity. For linear guides without seals, apply grease to screw shaft surface or move ball nut by hand while filling them with grease so that grease permeates all areas.



Part number	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 turns of balls Turns × Circuits	Basic load rating (N)		Axial play max.	Ball nut dimensions				Ball nut dimensions						Nut mass (kg)	Arbor		Screw shaft			Shaft mass/m (kg)	Internal spatial volume of nut (cm <sup>3</sup> )	Standard volume of grease replenishing (cm <sup>3</sup> )																															
							Dynamic <i>C<sub>a</sub></i>	Static <i>C<sub>oa</sub></i>		Outside dia.		Length	Bolt hole	Oil hole	Projecting tube		Outside dia.	Bore	Standard length			Screw shaft number																																					
										<i>D</i>	<i>A</i>				<i>G</i>	<i>B</i>			<i>L<sub>n</sub></i>		<i>W</i>		<i>X</i>	<i>Q</i>	<i>T</i>				<i>U</i>	<i>V</i>	<i>R</i>	<i>d<sub>0</sub></i>	<i>d<sub>i</sub></i>	<i>L<sub>s</sub></i>																									
<b>RNFTL 2806A2.5</b>	28	6	3.175	28.5	25.0	2.5×1	7 430	20 300	0.10	50	79	33	15	55	65	6.6	M6×1	7.5	33	34	10	0.85	25.0	22.6	1 000	2 000	2 500	<b>RS2806A**</b>	4.47	5.9	3.0																												
<b>RNFTL 2806A2.5S</b>																														8.4	4.2																												
<b>RNFTL 2806A5</b>																														79	65	6.6	M6×1	7.5	33	34	10	1.07																					
<b>RNFTL 2806A5S</b>																																																											
<b>RNFTL 3210A5</b>	32	10	6.35	33.75	27.0	2.5×2	35 700	92 200	0.20	55	97	39	18	97	75	11	M6×1	9.0	39	42	17	1.55	27.0	24.6	1 000	2 000	3 000	<b>RS3210A**</b>	5.53	29	15																												
<b>RNFTL 3210A5S</b>																																																											
<b>RNFTL 3610A2.5</b>	36	10	6.35	37	30.0	2.5×1	21 000	51 000	0.20	60	102	42	18	68	80	11	M6×1	9.0	42	46	17	1.47	30.0	27.6	1 000	2 000	3 000	<b>RS3610A**</b>	6.91	21	11																												
<b>RNFTL 3610A2.5S</b>																														33	17																												
<b>RNFTL 3610A5</b>																														98	80	11	M6×1	9.0	42	46	17	1.80																					
<b>RNFTL 3610A5S</b>																																																											
<b>RNFTL 4010A7</b>	40	10	6.35	41.75	35.0	3.5×2	53 500	164 000	0.20	65	114	44	20	120	90	14	M6×1	10.0	44	50	20	2.49	35.0	31.8	2 000	3 000	4 000	<b>RS4010**</b>	8.87	42	21																												
<b>RNFTL 4010A7S</b>																																																											
<b>RNFTL 4512A5</b>	45	12	7.144	46.5	39.0	2.5×2	49 600	147 000	0.23	70	130	47	22	116	100	18	M6×1	11.0	47	55	20	3.07	39.0	35.8	2 000	3 000	4 000	<b>RS4512**</b>	11.16	49	25																												
<b>RNFTL 4512A5S</b>																																																											
<b>RNFTL 5010A7</b>	50	10	6.35	51.75	45.0	3.5×2	59 500	205 000	0.20	80	140	52	22	122	110	18	M6×1	11.0	52	59	20	4.06	45.0	41.8	2 000	3 000	4 000	<b>RS5010**</b>	14.15	53	27																												
<b>RNFTL 5010A7S</b>																																																											
<b>RNFTL 5016A5</b>	50	16	9.525	52	42.0	2.5×2	99 900	293 000	0.23	85	163	57	28	146	125	22	M6×1	14.0	57	63	25	6.42	42.0	38.8	2 000	3 000	4 000	<b>RS5016**</b>	13.48	94	47																												
<b>RNFTL 5016A5S</b>																																																											

Note 1: Protruding portion of tube does not interfere with ball nut housing if its dimensions corresponding to U and V are large enough.

Note 2: Actual screw shaft length may become slightly longer than nominal length *L<sub>s</sub>* due to manufacturing tolerance.

Note 3: Seals are provided in the nut; therefore, external dimensions of those with seals are the same as those without.

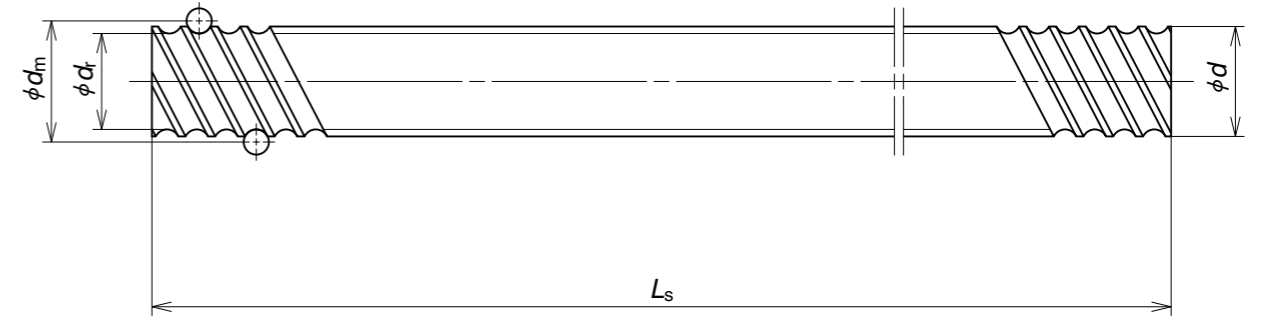
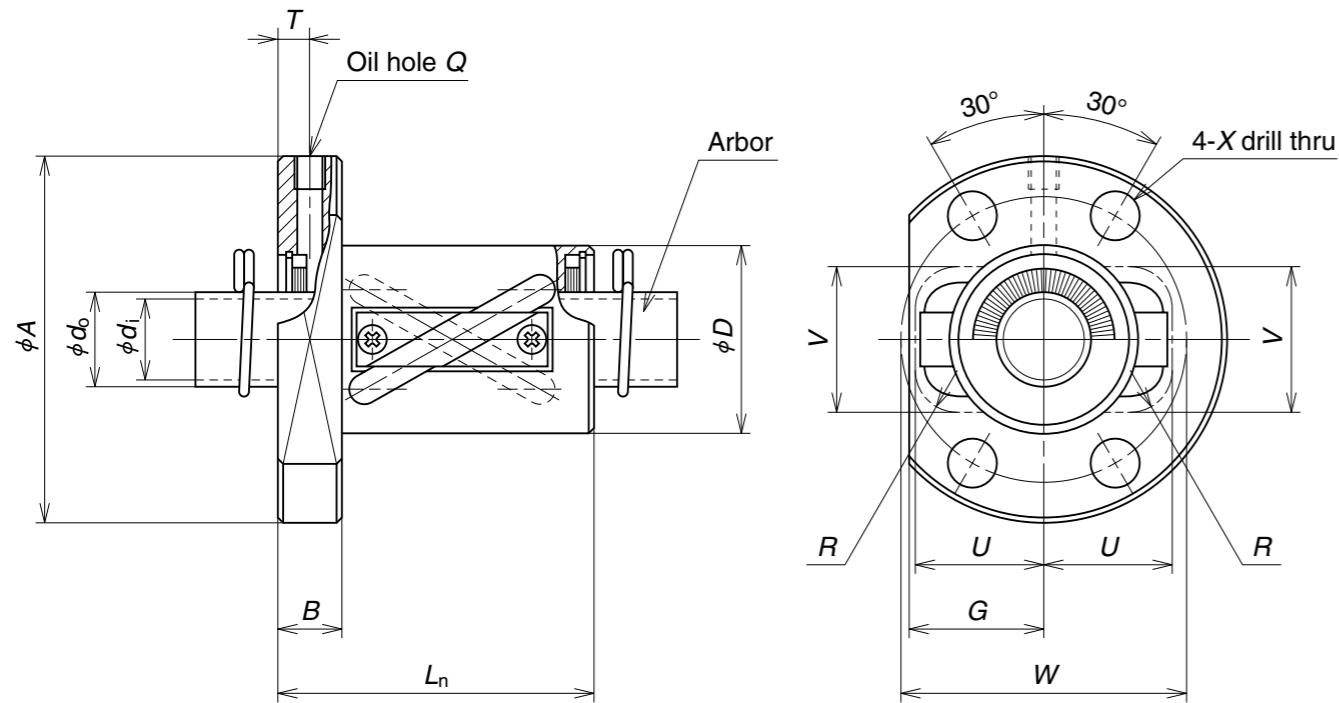
In nut side view drawing, above the center line there is a seal, and beneath it there is no seal.

Seal is a brush-seal.

Note 4: Nut assembly with arbor and screw shaft are separate at time of delivery.

Note 5: Value obtained by dividing standard screw length by 100 mm will be entered at end of the part number where marked with \*\*.

Note 6: Internal spatial volume of nut and volume of grease to be replenished are values for linear guides with seals. Recommended amount for replenishing is approximately 50% of nut's internal space capacity. For linear guides without seals, apply grease to screw shaft surface or move ball nut by hand while filling them with grease so that grease permeates all areas.

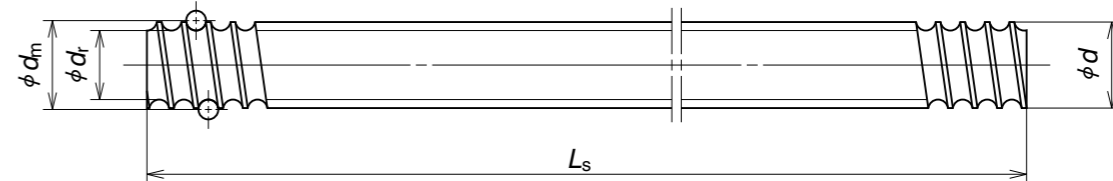
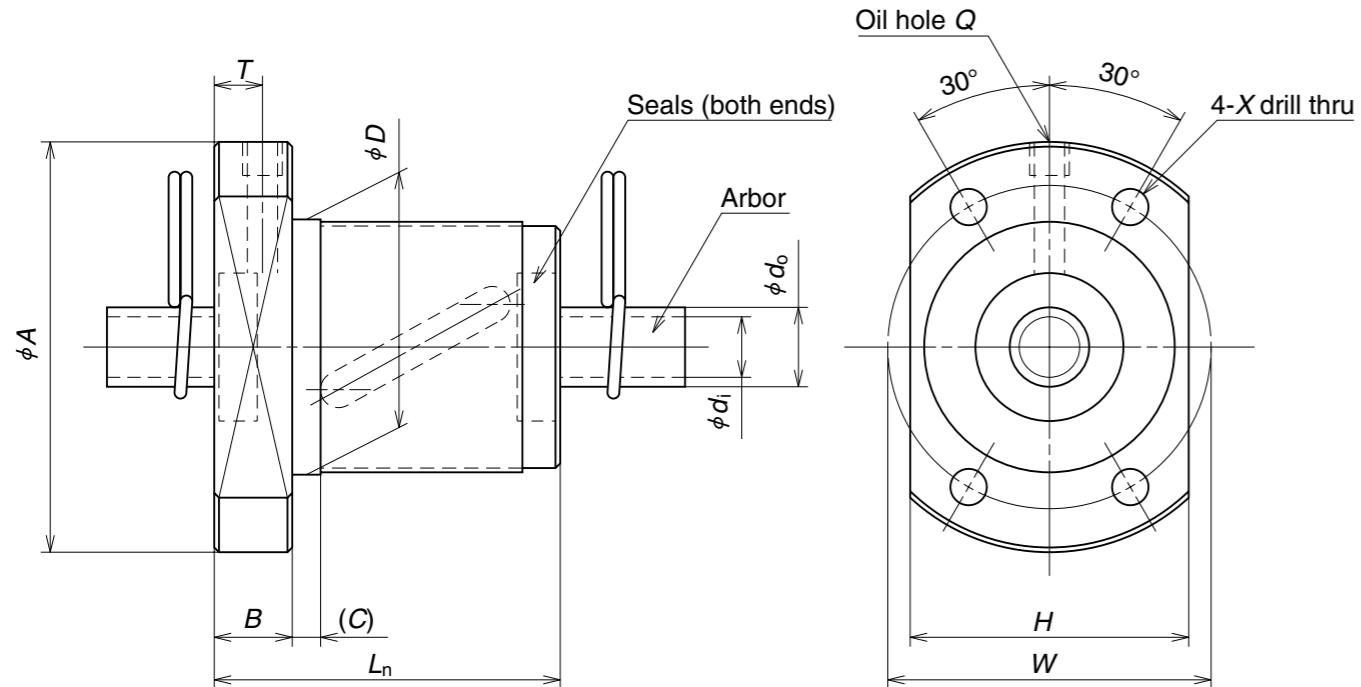


Unit: mm

Part number	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 turns of balls Turns × Circuits	Basic load rating (N)		Axial play max.	Ball nut dimensions				Ball nut dimensions						Nut mass (kg)	Arbor		Screw shaft			Shaft mass/m (kg)	Internal spatial volume of nut (cm <sup>3</sup> )	Standard volume of grease replenishing (cm <sup>3</sup> )			
							Dynamic <i>C<sub>a</sub></i>	Static <i>C<sub>0a</sub></i>		Outside dia. <i>D</i>	Flange			Length <i>L<sub>n</sub></i>	Bolt hole <i>W</i>	Oil hole <i>X</i>	Oil hole <i>Q</i>	Oil hole <i>T</i>	Projecting tube			Outside dia. <i>d<sub>0</sub></i>	Bore <i>d<sub>i</sub></i>	Standard length							
											<i>A</i>	<i>G</i>	<i>B</i>						<i>U</i>		<i>V</i>			<i>R</i>	<i>L<sub>s</sub></i>				Screw shaft number		
<b>RNFTL 1212A3</b>	12	12	2.381	12.65	10.1	1.5×2	3 360	6 270	0.10	24	44	17	8	44	34	4.5	M3×0.5	4.0	17	16	5	0.16	10.1	8.1	400	800		<b>RS1212A**</b>		0.74	1.7
<b>RNFTL 1616A3</b> <b>RNFTL 1616A3S</b>	16	16	2.778	16.65	13.6	1.5×2	4 880	9 650	0.10	30	55	22	10	50	43	6.6	M6×1	5.0	22	22	7	0.29	13.6	11.6	500	1 000	1 500	<b>RS1616A**</b>	1.37	2.8	1.4
<b>RNFTL 2020A3</b> <b>RNFTL 2020A3S</b>	20	20	3.175	20.75	17.3	1.5×2	7 010	15 400	0.10	35	68	25	12	59	52	9	M6×1	6.0	25	27	8	0.49	17.3	14.9	500	1 000	2 000	<b>RS2020A**</b>	2.19	4.9	2.5
<b>RNFTL 2525A3</b> <b>RNFTL 2525A3S</b>	25	25	3.969	26	22.0	1.5×2	10 500	24 100	0.12	45	80	31	12	69	63	9	M6×1	6.0	31	32	10	0.80	22.0	19.6	1 000	2 000	2 500	<b>RS2525A**</b>	3.43	9.1	4.6
<b>RNFTL 3232A3</b> <b>RNFTL 3232A3S</b>	32	32	4.762	33.25	28.0	1.5×2	15 300	37 100	0.15	55	100	37	15	84	80	11	M6×1	7.5	37	40	12	1.46	28.0	25.6	1 000	2 000	3 000	<b>RS3232A**</b>	5.71	19	9.5
<b>RNFTL 4040A3</b> <b>RNFTL 4040A3S</b>	40	40	6.35	41.75	35.0	1.5×2	24 400	61 600	0.20	70	120	46	18	103	95	14	M6×1	9.0	46	49	15	2.69	35.0	31.8	2 000	3 000	4 000	<b>RS4040A**</b>	8.82	39	20

Note 1: Protruding portion of tube does not interfere with ball nut housing if its dimensions corresponding to U and V are large enough.  
 Note 2: Actual screw shaft length may become slightly longer than nominal length *L<sub>s</sub>* due to manufacturing tolerance.  
 Note 3: Seals are provided in the nut; therefore, external dimensions of those with seals are the same as those without.  
 In ball nut side view drawing, above the center line there is a seal, and beneath it there is no seal.  
 Seal for those with shaft diameter of 14 mm or less is made of synthetic resin. Seal for those of 16 mm or more is a brush-seal.

Note 4: Nut assembly with arbor and screw shaft are separate at time of delivery.  
 Note 5: Value obtained by dividing standard screw length by 100 mm will be entered at end of the part number where marked with \*\*.  
 Note 6: Internal spatial volume of nut and volume of grease to be replenished are values for linear guides with seals. Recommended amount for replenishing is approximately 50% of nut's internal space capacity. For linear guides without seals, apply grease to screw shaft surface or move ball nut by hand while filling them with grease so that grease permeates all areas.



Unit: mm

Part number	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 turns of balls Turns × Circuits	Basic load rating (N)		Axial play max.	Ball nut dimensions				Ball nut dimensions					Nut mass (kg)	Arbor		Screw shaft			Shaft mass/m (kg)	Internal spatial volume of nut (cm <sup>3</sup> )	Standard volume of grease replenishing (cm <sup>3</sup> )		
							Dynamic <i>C<sub>a</sub></i>	Static <i>C<sub>0a</sub></i>		Outside dia.		Flange		Length Overall length <i>L<sub>n</sub></i>	Bolt hole <i>W</i>	Oil hole <i>X</i>	Oil hole <i>Q</i>	Oil hole <i>T</i>		Outside dia. <i>d<sub>0</sub></i>	Bore <i>d<sub>i</sub></i>	Standard length		Screw shaft number					
										<i>D</i>	<i>A</i>	<i>H</i>	<i>B</i>									<i>(C)</i>	<i>L<sub>s</sub></i>						
<b>RNFBL 1006A2.5S</b>	10	6	2.381	10.65	8.1	2.5×1	2 830	4 810	0.10	26	42	29	8	36	3	34	4.5	M3×0.5	5.0	0.16	8.1	6.1	400	800		<b>RS1006A**</b>	0.56	1.1	0.6
<b>RNFBL 1208A2.5S</b>	12	8	2.778	12.65	9.6	2.5×1	3 730	6 560	0.10	29	45	32	8	44	3	37	4.5	M3×0.5	5.5	0.21	9.6	7.6	400	800		<b>RS1208A**</b>	0.81	1.6	0.8
<b>RNFBL 1404A3.5S</b>	14	4	2.778	14.5	11.5	3.5×1	5 370	10 800	0.10	31	50	37	10	40	4	40	4.5	M6×1	5.0	0.25	11.5	9.5	500	1 000		<b>RS1404A**</b>	1.02	2.4	1.2
<b>RNFBL 1405A2.5S</b>	14	5	3.175	14.5	11.0	2.5×1	5 260	9 720	0.10	32	50	38	10	40	4	40	4.5	M6×1	5.0	0.26	11.0	9.0	500	1 000		<b>RS1405A**</b>	1.00	1.9	1.0
<b>RNFBL 1808A3.5S</b>	18	8	4.762	18.5	13.6	3.5×1	13 200	25 800	0.15	50	80	60	12	61	4	65	6.6	M6×1	6.0	1.00	13.6	11.6	500	1 000	1 500	<b>RS1808A**</b>	1.60	5.8	2.9
<b>RNFBL 2005A2.5S</b>	20	5	3.175	20.5	17.0	2.5×1	6 360	14 200	0.10	40	60	46	10	40	4	50	4.5	M6×1	5.0	0.37	17.0	14.6	500	1 000	2 000	<b>RS2005A**</b>	2.17	2.8	1.4
<b>RNFBL 2010A2.5S</b>	20	10	4.762	21.25	16.2	2.5×1	10 900	21 800	0.15	52	82	64	12	61	5	67	6.6	M6×1	6.0	1.05	16.2	13.8	500	1 000	2 000	<b>RS2010A**</b>	2.18	7.6	3.8
<b>RNFBL 2505A2.5S</b>	25	5	3.175	25.5	22.0	2.5×1	7 070	18 200	0.10	43	67	50	10	40	4	55	5.5	M6×1	5.0	0.40	22.0	19.6	1 000	2 000	2 500	<b>RS2505A**</b>	3.47	3.5	1.8
2.5×2						12 800	36 300	55						0.50						4.7								2.4	
<b>RNFBL 2510A2.5S</b>	25	10	6.35	26	19.0	2.5×1	17 500	35 200	0.20	60	96	72	15	66	5	78	9.0	M6×1	7.5	1.52	19.0	16.6	1 000	2 000	2 500	<b>RS2510A**</b>	3.13	14	7.0
2.5×2						31 800	70 300	96						1.99						19								9.5	
<b>RNFBL 2806A2.5S</b>	28	6	3.175	28.5	25.0	2.5×1	7 430	20 300	0.10	50	80	60	12	47	5	65	6.6	M6×1	6.0	0.70	25.0	22.6	1 000	2 000	2 500	<b>RS2806A**</b>	4.47	4.5	2.3
2.5×2						13 500	40 600	65						0.87						7.6								3.8	
<b>RNFBL 3210A2.5S</b>	32	10	6.35	33.75	27.0	2.5×1	19 700	46 100	0.20	67	103	78	15	67	5	85	9.0	M6×1	7.5	1.72	27.0	24.6	1 000	2 000	3 000	<b>RS3210A**</b>	5.53	20	10
2.5×2						35 700	92 200	97						2.25						28								14	
<b>RNFBL 3610A2.5S</b>	36	10	6.35	37	30.0	2.5×1	21 000	51 000	0.20	70	110	82	17	69	5	90	11.0	M6×1	8.5	1.97	30.0	27.6	1 000	2 000	3 000	<b>RS3610A**</b>	6.91	21	11
2.5×2						31 800	102 000	99						2.53						29								15	
<b>RNFBL 4010A5S</b>	40	10	6.35	41.75	35.0	2.5×2	40 100	116 000	0.20	76	116	88	17	99	5	96	11.0	M6×1	8.5	2.86	35.0	31.8	2 000	3 000	4 000	<b>RS4010A**</b>	8.87	36	18

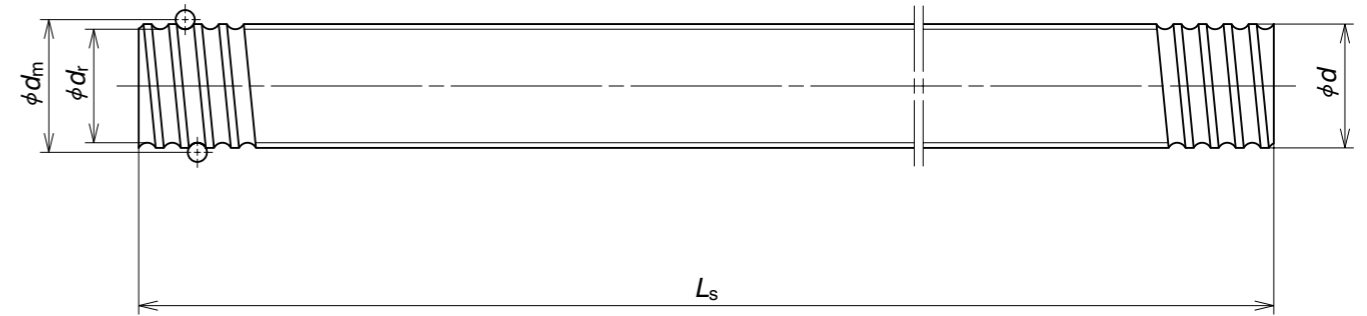
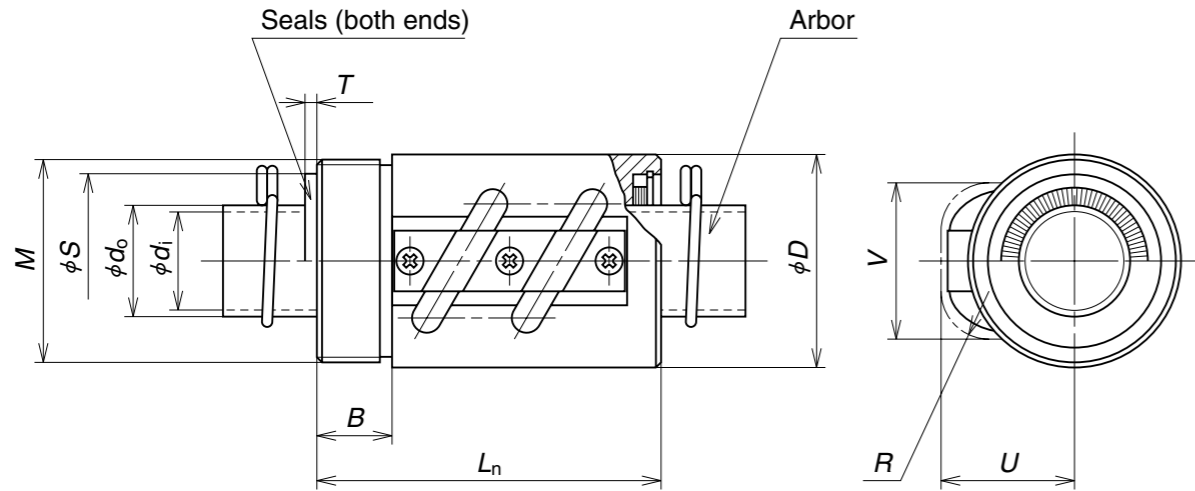
Note 1: Actual screw shaft length may be slightly longer than nominal length *L<sub>s</sub>* due to manufacturing tolerance.

Note 2: Nut assembly with arbor and screw shaft are separate at time of delivery.

Note 3: Value obtained by dividing standard screw length by 100 mm will be entered at end of the part number where marked with \*\*.

Note 4: Seal for those with shaft diameter of 14 mm or less is made of synthetic resin. Seal for those of 16 mm or more is a brush-seal.

Note 5: Internal spatial volume of nut and volume of grease to be replenished are values for linear guides with seals. Recommended amount for replenishing is approximately 50% of nut's internal space capacity. For linear guides without seals, apply grease to screw shaft surface or move ball nut by hand while filling them with grease so that grease permeates all areas.

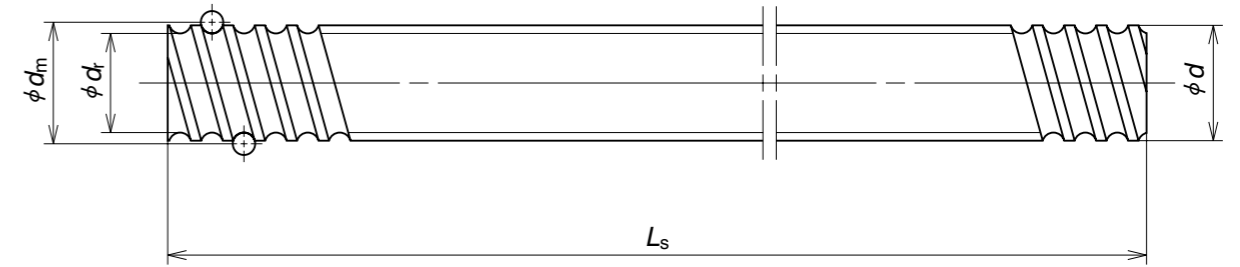
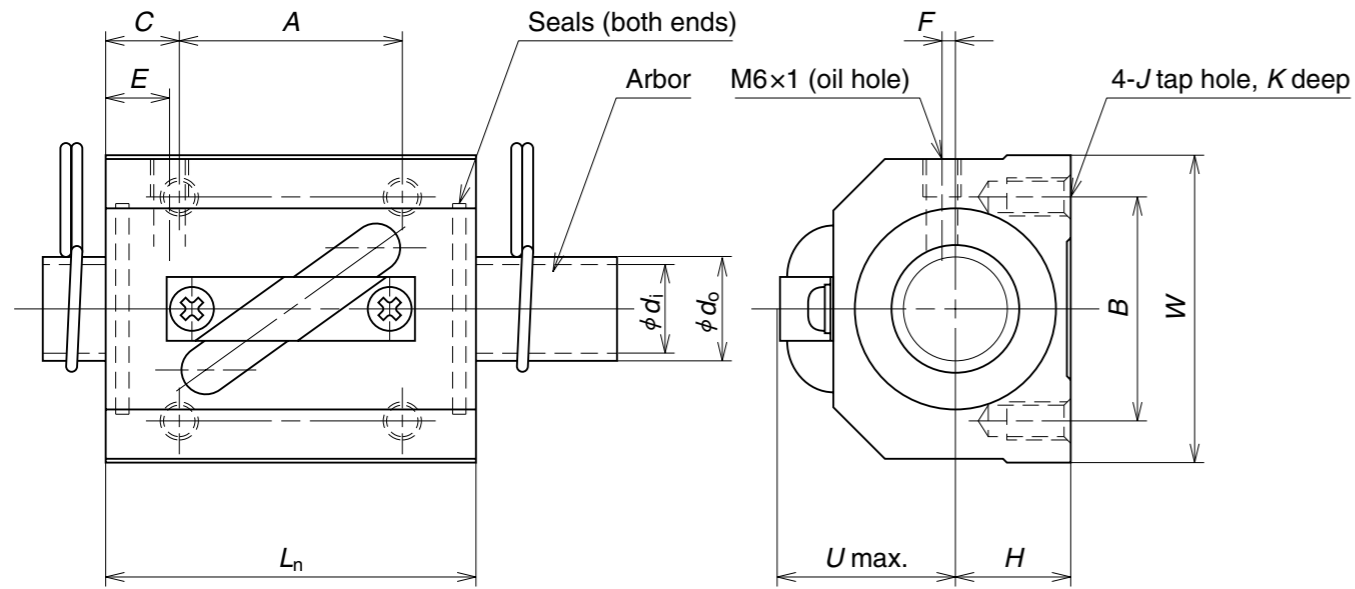


Unit: mm

Part number	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 turns of balls Turns × Circuits	Basic load rating (N)		Axial play max.	Ball nut dimensions			Ball nut dimensions				Nut mass (kg)	Seal dimensions		Arbor		Screw shaft			Shaft mass/m (kg)	Internal spatial volume of nut (cm <sup>3</sup> )	Standard volume of grease replenishing (cm <sup>3</sup> )	
							Dynamic <i>C<sub>a</sub></i>	Static <i>C<sub>oa</sub></i>		Outside dia. <i>D</i>	Flange <i>M</i>	<i>B</i>	Length <i>L<sub>n</sub></i>	Projecting tube <i>U</i>	<i>V</i>	<i>R</i>		Diameter <i>S</i>	Thickness <i>T</i>	Outside dia. <i>d<sub>0</sub></i>	Bore <i>d<sub>i</sub></i>	Standard length		Screw shaft number				
																						<i>C<sub>a</sub></i>	<i>C<sub>oa</sub></i>					<i>L<sub>s</sub></i>
<b>RNCT 1003A3.5</b>	10	3	2.381	10.65	8.1	3.5×1	3 780	6 730	0.10	20	M18×1	10	38	15	15	7	0.049			8.1	6.1	400	800	<b>RS1003A**</b>	0.50			
<b>RNCT 1404A3.5S</b>	14	4	2.778	14.5	11.5	3.5×1	5 370	10 800	0.10	25	M24×1	10	43	19	20	7	0.083			11.5	9.5	500	1 000	<b>RS1404A**</b>	1.02	2.7	1.4	
<b>RNCT 1405A2.5S</b>	14	5	3.175	14.5	11.0	2.5×1	5 260	9 720	0.10	30	M26×1.5	10	45	22	21	8	0.15			11.0	9.0	500	1 000	<b>RS1405A**</b>	1.00	3.1	1.6	
<b>RNCT 1808A3.5</b>	18	8	4.762	18.5	13.6	3.5×1	13 200	25 800	0.15	34	M32×1.5	12	58	27	27	8	0.21	28.5	2.5	13.6	11.6	500	1 000	1 500	<b>RS1808A**</b>	1.66	6.6	3.3
<b>RNCT 1808A3.5S</b>																												
<b>RNCT 2005A2.5</b>	20	5	3.175	20.5	17.0	2.5×1	6 360	14 200	1.10	40	M36×1.5	12	48	28	27	10	0.28	29.5	2.5	17.0	14.6	500	1 000	2 000	<b>RS2005A**</b>	2.17	4.8	2.4
<b>RNCT 2005A2.5S</b>																												
<b>RNCT 2505A5</b>	25	5	3.175	25.5	22.0	2.5×2	12 800	36 300	0.10	42	M40×1.5	15	69	28	31	10	0.38	34.5	2.5	22.0	19.6	1 000	2 000	2 500	<b>RS2505A**</b>	3.47	8.4	4.2
<b>RNCT 2505A5S</b>																												
<b>RNCT 2510A5</b>	25	10	6.35	26	19.0	2.5×2	31 800	70 300	0.20	44	M42×1.5	15	92	34	37	17	0.49	38.5	2.5	19.0	16.6	1 000	2 000	2 500	<b>RS2510A**</b>	3.13	21	1
<b>RNCT 2510A5S</b>																												
<b>RNCT 2806A5</b>	28	6	3.175	28.5	25.0	2.5×2	13 500	40 600	0.10	50	M45×1.5	15	79	33	34	10	0.68	37.5	2.5	25.0	22.6	1 000	2 000	2 500	<b>RS2806A**</b>	4.47	9.7	4.9
<b>RNCT 2806A5S</b>																												
<b>RNCT 3210A5</b>	32	10	6.35	33.75	27.0	2.5×2	35 700	92 200	0.20	55	M50×1.5	18	97	39	42	17	0.79	45.5	2.5	27.0	24.6	1 000	2 000	3 000	<b>RS3210A**</b>	5.53	32	16
<b>RNCT 3210A5S</b>																												
<b>RNCT 3610A5</b>	36	10	6.35	37	30.0	2.5×2	38 100	102 000	0.20	60	M55×2	18	98	42	46	17	0.97	50.5	3.0	30.0	27.6	1 000	2 000	3 000	<b>RS3610A**</b>	6.91	32	16
<b>RNCT 3610A5S</b>																												
<b>RNCT 4010A7</b>	40	10	6.35	41.75	35.0	3.5×2	53 500	164 000	0.20	65	M60×2	25	125	44	50	20	1.37	54.5	3.0	35.0	31.8	2 000	3 000	4 000	<b>RS4010A**</b>	8.87	51	26
<b>RNCT 4010A7S</b>																												
<b>RNCT 4512A5</b>	45	12	7.144	46.5	39.0	2.5×2	46 900	147 000	0.23	70	M65×2	30	124	47	55	20	1.42	60.5	3.0	39.0	35.8	2 000	3 000	4 000	<b>RS4512A**</b>	11.16	60	30
<b>RNCT 4512A5S</b>																												
<b>RNCT 5010A7</b>	50	10	6.35	51.75	45.0	3.5×2	59 500	205 000	0.20	80	M75×2	40	140	52	59	20	2.41	64.5	3.0	45.0	41.8	2 000	3 000	4 000	<b>RS5010A**</b>	14.15	76	38
<b>RNCT 5010A7S</b>																												
<b>RNCT 5016A5</b>	50	16	9.525	52	42.0	2.5×2	99 900	293 000	0.23	85	M80×2	40	158	57	63	25	3.14	68.5	3.0	42.0	38.8	2 000	3 000	4 000	<b>RS5016A**</b>	13.48	114	57
<b>RNCT 5016A5S</b>																												

Note 1: Protruding portion of tube does not interfere with ball nut housing if its dimensions corresponding to U and V are large enough.  
 Note 2: Actual screw shaft length may become slightly longer than nominal length *L<sub>s</sub>* due to manufacturing tolerance.  
 Note 3: Seal cannot be installed in V-thread side but may be installed in opposite side.  
 Seal is provided in nut; therefore, external dimensions of those with seal are the same as those without.  
 In ball nut side view drawing, above the center line there is a seal, and beneath it there is no seal.  
 Seal for those with shaft diameter of 14 mm or less is made of synthetic resin. Seal for those of 16 mm or more is a brush-seal.  
 There is no seal on V-thread side for RNCT1404A3.5S and RNCT1405A2.5S.

Note 4: Nut assembly with arbor and screw shaft are separate at time of delivery.  
 Note 5: Value obtained by dividing standard screw length by 100 mm will be entered at end of the part number where marked with \*\*.  
 Note 6: Internal spatial volume of nut and volume of grease to be replenished are values for linear guides with seals. Recommended amount for replenishing is approximately 50% of nut's internal space capacity. For linear guides without seals, apply grease to screw shaft surface or move ball nut by hand while filling them with grease so that grease permeates all areas.



Part number	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 turns of balls Turns × Circuits	Basic load rating (N)		Axial play max.	Ball nut dimensions			Ball nut dimensions							Nut mass (kg)	Arbor		Screw shaft			Shaft mass/m (kg)	Internal spatial volume of nut (cm <sup>3</sup> )	Standard volume of grease replenishing (cm <sup>3</sup> )		
							Dynamic <i>C<sub>a</sub></i>	Static <i>C<sub>0a</sub></i>		Length <i>L<sub>n</sub></i>	Width <i>W</i>	Center height <i>H</i>	Bolt hole			Oil hole					Outside dia. <i>d<sub>0</sub></i>	Bore <i>d<sub>i</sub></i>	Standard length		Screw shaft number					
													<i>A</i>	<i>B</i>	<i>C</i>	<i>J</i>	<i>K</i>	<i>E</i>	<i>F</i>				<i>U</i>	<i>L<sub>s</sub></i>						
							<i>L<sub>n</sub></i>	<i>W</i>		<i>H</i>	<i>A</i>	<i>B</i>	<i>C</i>	<i>J</i>	<i>K</i>	<i>E</i>	<i>F</i>	<i>U</i>	<i>d<sub>0</sub></i>		<i>d<sub>i</sub></i>	<i>L<sub>s</sub></i>			Screw shaft number					
<b>RNSTL 1404A3.5S</b>	14	4	2.778	14.5	11.5	3.5×1	5 370	10 800	0.10	38	34	13	22	26	8	M4	7	7	3	20	0.20	11.5	9.5	500	1 000		<b>RS1404A**</b>	1.02	1.6	0.8
<b>RNSTL 1405A2.5S</b>	14	5	3.175	14.5	11.0	2.5×1	5 260	9 720	0.10	38	34	13	22	26	8	M4	7	7	3	21	0.20	11.0	9.0	500	1 000		<b>RS1405A**</b>	1.00	1.8	0.9
<b>RNSTL 1808A3.5S</b>	18	8	4.762	18.5	13.6	3.5×1	13 200	25 800	0.15	56	48	17	35	35	10.5	M6	10	8	3	26	0.31	13.6	11.6	500	1 000	1 500	<b>RS1808A**</b>	1.60	3.4	1.7
<b>RNSTL 2005A2.5S</b>	20	5	3.175	20.5	17.0	2.5×1	6 360	14 200	0.10	38	48	17	22	35	8	M6	9	6	2	27	0.24	17.0	14.6	500	1 000	2 000	<b>RS2005A**</b>	2.17	2.5	1.3
<b>RNSTL 2010A2.5S</b>	20	10	4.762	21.25	16.2	2.5×1	10 900	21 800	0.15	58	48	18	35	35	11.5	M6	10	10	2	28	0.35	16.2	13.8	500	1 000	2 000	<b>RS2010A**</b>	2.18	6.3	3.2
<b>RNSTL 2505A2.5S</b>	25	5	3.175	25.5	22.0	2.5×1	7 070	18 200	0.10	35	60	20	22	40	6.5	M8	10	6	0	27	0.31	22.0	19.6	1 000	2 000	2 500	<b>RS2505A**</b>	3.47	2.6	1.3
<b>RNSTL 2510A5S</b>	25	10	6.35	26	19.0	2.5×2	31 800	70 300	0.20	94	60	23	60	40	17	M8	12	10	0	32	1.32	19.0	16.6	1 000	2 000	2 500	<b>RS2510A**</b>	3.13	18	9.0
<b>RNSTL 2806A2.5S</b>	28	6	3.175	28.5	25.0	2.5×1	7 430	20 300	0.10	42	60	22	18	40	12	M8	12	8	0	32	0.65	25.0	22.6	1 000	2 000	2 500	<b>RS2806A**</b>	4.47	3.5	1.8
<b>RNSTL 2806A5S</b>						2.5×2	13 500	40 600		67	60	22	40	40	13.5		1.04	7.0	3.5											
<b>RNSTL 3210A2.5S</b>	32	10	6.35	33.75	27.0	2.5×1	19 700	46 100	0.20	64	70	26	45	50	9.5	M8	12	10	0	38	1.12	27.0	24.6	1 000	2 000	3 000	<b>RS3210A**</b>	5.53	18	9.0
<b>RNSTL 3210A5S</b>						2.5×2	35 700	92 200		94	70	26	60	50	17		1.75	27	14											
<b>RNSTL 3610A2.5S</b>	36	10	6.35	37	30.0	2.5×1	21 000	51 000	0.20	64	86	29	45	60	9.5	M10	16	11	0	41	1.76	30.0	27.6	1 000	2 000	3 000	<b>RS3610A**</b>	6.91	18	9.0
<b>RNSTL 3610A5S</b>						2.5×2	38 100	102 000		96	86	29	60	60	18		2.64	27	14											
<b>RNSTL 4512A5S</b>	45	12	7.144	46.5	39.0	2.5×2	49 600	147 000	0.23	115	100	36	75	75	20	M12	20	13	0	46	1.22	39.0	35.8	2 000	3 000	4 000	<b>RS4512A**</b>	11.16	47	24

Note 1: Actual screw shaft length may be slightly longer than nominal length *L<sub>s</sub>* due to manufacturing tolerance.

Note 2: Nut assembly with arbor and screw shaft are separate at time of delivery.

Note 3: Value obtained by dividing standard screw length by 100 mm will be entered at end of the part number where marked with \*\*.

Note 4: Seal for those with shaft diameter of 14 mm or less is made of synthetic resin. Seal for those of 18 mm or more is a brush-seal.

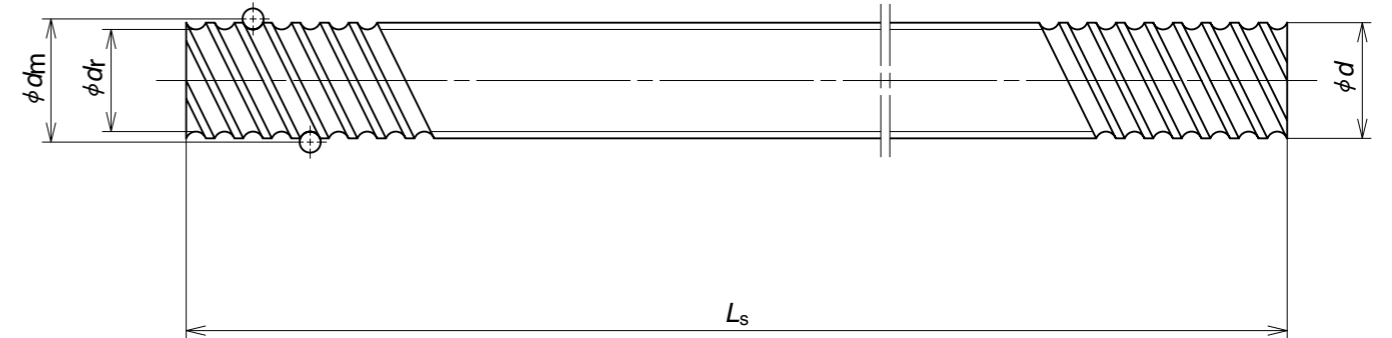
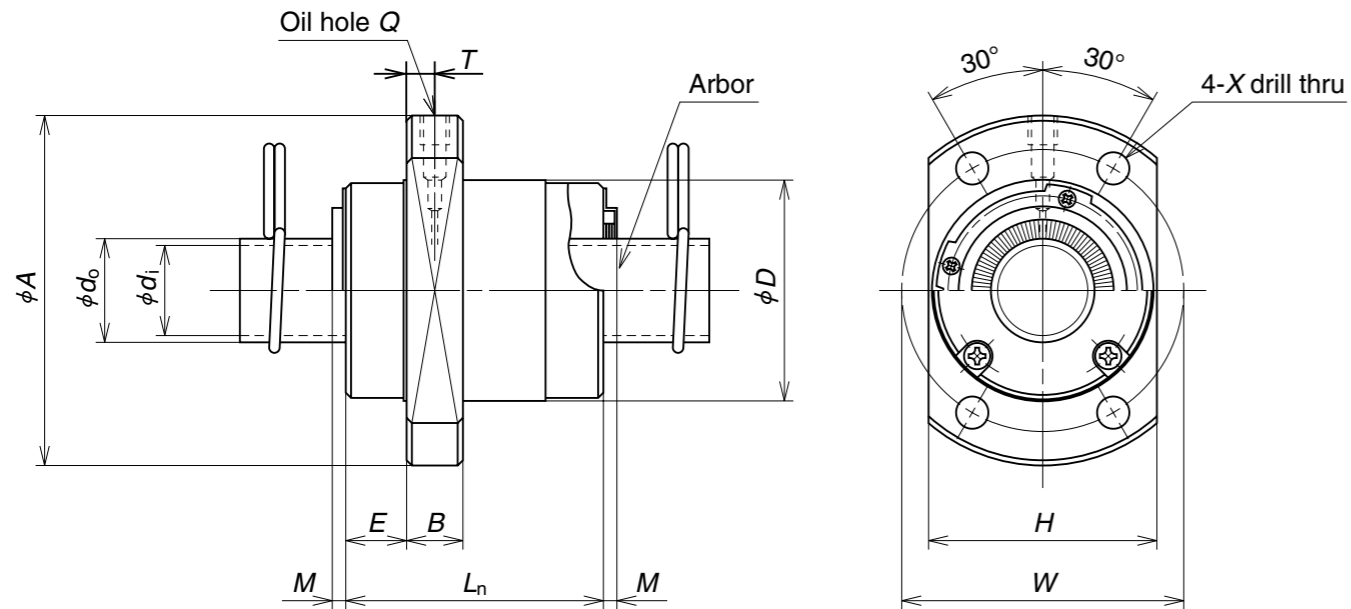
Note 5: Internal spatial volume of nut and volume of grease to be replenished are values for linear guides with seals. Recommended amount for replenishing is approximately 50% of nut's internal space capacity. For linear guides without seals, apply grease to screw shaft surface or move ball nut by hand while filling them with grease so that grease permeates all areas.



# Ball Screws R Series: Rolled Ball Screws

## Nut Model: RNFCL

End-cap type, flanged nut



Unit: mm

Part number	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 turns of balls Turns × Circuits	Basic load rating (N)		Axial play max.	Ball nut dimensions				Ball nut dimensions				Nut mass (kg)	Arbor		Screw shaft			Shaft mass/m (kg)	Internal spatial volume of nut (cm <sup>3</sup> )	Standard volume of grease replenishing (cm <sup>3</sup> )					
							Dynamic <i>C<sub>a</sub></i>	Static <i>C<sub>0a</sub></i>		Outside dia.		Flange		Length		Bolt hole			Oil hole		Outside dia. <i>d<sub>0</sub></i>	Bore <i>d<sub>i</sub></i>	Standard length				Screw shaft number				
										<i>D</i>	<i>A</i>	<i>H</i>	<i>B</i>	<i>E</i>	<i>L<sub>n</sub></i>	<i>M</i>	<i>W</i>		<i>X</i>	<i>Q</i>			<i>T</i>					<i>L<sub>s</sub></i>			
<b>RNFCL 1212A3</b>	12	12	2.381	12.65	10.1	1.7×2	3 740	6 640	0.10	26	44	28	6	9	30	—	35	4.5	M3×0.5	3.0	0.12	10.1	8.1	400	800	—	<b>RS1212A**</b>	0.74	—	—	
<b>RNFCL 1212A6</b>						1.7×4	6 780	13 300																							
<b>RNFCL 1520A3</b>	15	20	3.175	15.5	12.2	1.7×2	6 730	12 300	0.10	33	51	35	10	11	45	—	42	4.5	M6×1	5.0	0.28	12.2	10.2	500	1 000	1 500	<b>RS1520A**</b>	1.15	3.3	1.7	
<b>RNFCL 1520A3S</b>						1.7×4	6 730	12 300																							
<b>RNFCL 1616A3</b>	16	16	2.778	16.65	13.5	1.7×2	5 430	10 400	0.10	32	53	34	10	10	38	—	42	4.5	M6×1	5.0	0.23	13.5	11.5	500	1 000	1 500	<b>RS1616A**</b>	1.37	2.6	1.3	
<b>RNFCL 1616A3S</b>						1.7×4	9 860	20 800																					3	—	—
<b>RNFCL 1616A6</b>						1.7×2	5 430	10 400																					—	—	—
<b>RNFCL 1616A6S</b>						1.7×4	9 860	20 800																					3	—	—
<b>RNFCL 2020A3</b>	20	20	3.175	20.75	17.3	1.7×2	7 810	16 500	0.10	39	62	41	10	11.5	46	—	50	5.5	M6×1	5.0	0.37	17.3	14.9	500	1 000	2 000	<b>RS2020A**</b>	2.19	4.4	2.2	
<b>RNFCL 2020A3S</b>						1.7×4	7 810	16 500																					3	—	—
<b>RNFCL 2020A6</b>						1.7×2	7 810	16 500																					—	—	—
<b>RNFCL 2020A6S</b>						1.7×4	14 200	33 000																					3	—	—
<b>RNFCL 2525A3</b>	25	25	3.969	26	22.0	1.7×2	11 700	25 800	0.12	47	74	49	12	13	55	—	60	6.6	M6×1	6.0	0.62	22.0	19.6	1 000	2 000	2 500	<b>RS2525A**</b>	3.43	8.2	4.1	
<b>RNFCL 2525A3S</b>						1.7×4	11 700	25 800																					3	—	—
<b>RNFCL 2525A6</b>						1.7×2	11 700	25 800																					—	—	—
<b>RNFCL 2525A6S</b>						1.7×4	21 200	51 500																					3	—	—
<b>RNFCL 3232A3</b>	32	32	4.762	33.25	28.0	1.7×2	17 100	40 500	0.15	58	92	60	12	16	70	—	74	9	M6×1	5.5	1.10	28.0	25.6	1 000	2 000	3 000	<b>RS3232A**</b>	5.71	16	8.0	
<b>RNFCL 3232A3S</b>						1.7×4	17 100	40 500																					3	—	—
<b>RNFCL 3232A6</b>						1.7×2	17 100	40 500																					—	—	—
<b>RNFCL 3232A6S</b>						1.7×4	31 000	81 000																					3	—	—
<b>RNFCL 4040A3</b>	40	40	6.35	41.75	35.0	1.7×2	27 200	67 900	0.20	73	114	75	15	19.5	85	—	93	11	M6×1	6.5	2.09	35.0	31.8	2 000	3 000	4 000	<b>RS4040A**</b>	8.82	32	16	
<b>RNFCL 4040A3S</b>						1.7×4	27 200	67 900																					3.5	—	—
<b>RNFCL 4040A6</b>						1.7×2	27 200	67 900																					—	—	—
<b>RNFCL 4040A6S</b>						1.7×4	49 300	136 000																					3.5	—	—
<b>RNFCL 5050A3</b>	50	50	7.938	52.25	44.0	1.7×2	40 600	106 000	0.25	90	135	92	20	21.5	107	—	112	14	M6×1	7.0	3.90	44.0	40.8	2 000	3 000	4 000	<b>RS5050A**</b>	13.81	64	32	
<b>RNFCL 5050A3S</b>						1.7×4	40 600	106 000																					3.5	—	—
<b>RNFCL 5050A6</b>						1.7×2	40 600	106 000																					—	—	—
<b>RNFCL 5050A6S</b>						1.7×4	73 700	212 000																					3.5	—	—

Note 1: Actual screw shaft length may be slightly longer than nominal length *L<sub>s</sub>* due to manufacturing tolerance.

Note 2: Nut assembly with arbor and screw shaft are separate at time of delivery.

Note 3: Value obtained by dividing standard screw length by 100 mm will be entered at end of the part number where marked with \*\*.

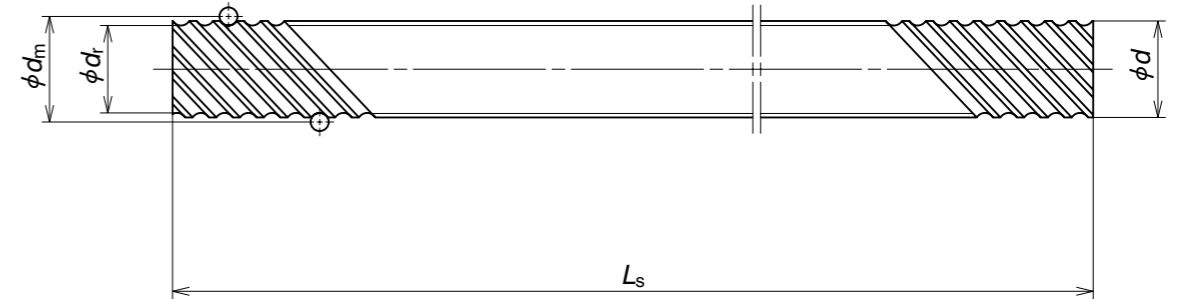
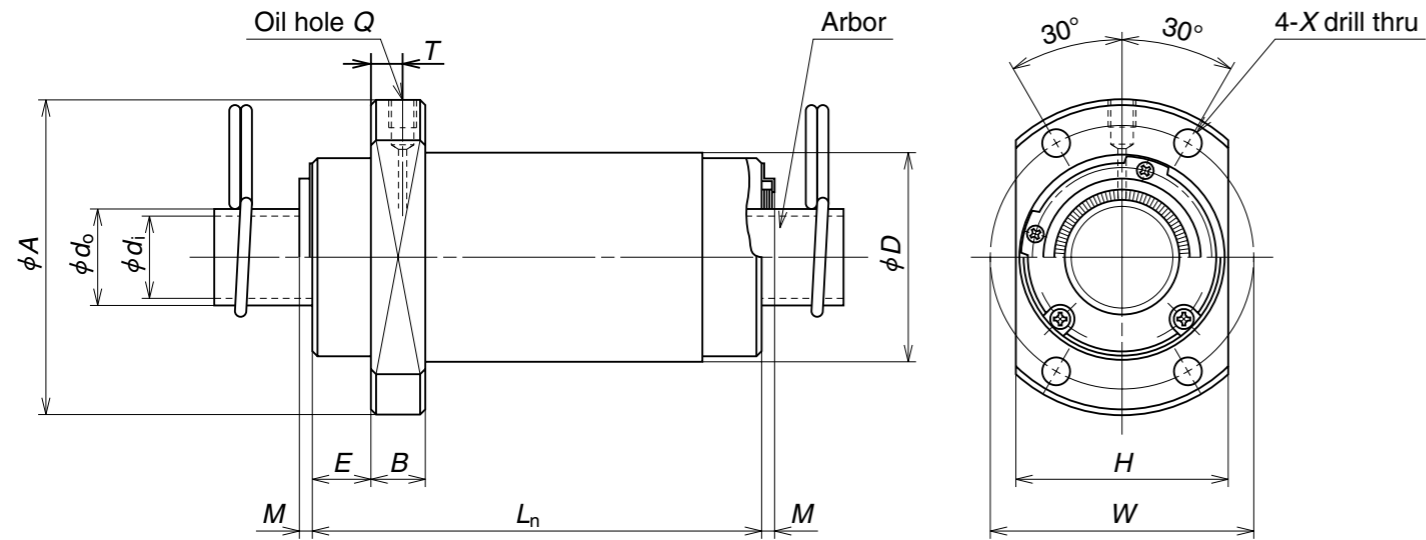
Note 4: Length of nut becomes longer (2 x *M*) for those with seal; seal is a brush-seal.

Note 5: Internal spatial volume of nut and volume of grease to be replenished are values for linear guides with seals. Recommended amount for replenishing is approximately 50% of nut's internal space capacity. For linear guides without seals, apply grease to screw shaft surface or move ball nut by hand while filling them with grease so that grease permeates all areas.

# Ball Screws R Series: Rolled Ball Screws

Nut Model: RNFCL

End-cap type, flanged nut



Unit: mm

Part number	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 turns of balls Turns × Circuits	Basic load rating (N)		Axial play max.	Ball nut dimensions				Ball nut dimensions				Nut mass (kg)	Arbor		Screw shaft				Shaft mass/m (kg)	Internal spatial volume of nut (cm <sup>3</sup> )	Standard volume of grease replenishing (cm <sup>3</sup> )				
							Dynamic <i>C<sub>a</sub></i>	Static <i>C<sub>0a</sub></i>		Outside dia.		Flange		Length		Bolt hole			Oil hole		Outside dia. <i>d<sub>0</sub></i>	Bore <i>d<sub>i</sub></i>	Standard length								
										<i>D</i>	<i>A</i>	<i>H</i>	<i>B</i>	<i>E</i>	<i>L<sub>n</sub></i>	<i>M</i>	<i>W</i>		<i>X</i>	<i>Q</i>			<i>T</i>	<i>L<sub>s</sub></i>							
																												Screw shaft number	kg	cm <sup>3</sup>	cm <sup>3</sup>
<b>RNFCL 1632A2</b>	16	32	2.778	16.65	13.5	0.7×4	4 600	8 460	0.10	32	50	34	10	10	34	—	41	4.5	M6×1	5.5	0.21	13.5	11.5	500	1 000	1 500	<b>RS1632A**</b>				
<b>RNFCL 1632A2S</b>						3	—	0.33							3.9	2.0															
<b>RNFCL 1632A3</b>						66	—	0.33							4.1	2.1															
<b>RNFCL 1632A3S</b>						3	—	0.33							4.1	2.1															
<b>RNFCL 1632A6</b>						66	—	0.33							4.1	2.1															
<b>RNFCL 1632A6S</b>	3	—	0.33	4.1	2.1																										
<b>RNFCL 2040A2</b>	20	40	3.175	20.75	17.3	0.7×4	6 610	13 600	0.10	38	58	40	10	11	41	—	48	5.5	M6×1	5.5	0.31	17.3	14.9	500	1 000	1 500	2 000	<b>RS2040A**</b>	2.15	4.1	2.1
<b>RNFCL 2040A2S</b>						3	—	0.53							6.3	3.2															
<b>RNFCL 2040A3</b>						81	—	0.53							7.0	3.5															
<b>RNFCL 2040A3S</b>						3	—	0.53							7.0	3.5															
<b>RNFCL 2040A6</b>						81	—	0.53							7.0	3.5															
<b>RNFCL 2040A6S</b>	3	—	0.53	7.0	3.5																										
<b>RNFCL 2550A2</b>	25	50	3.969	26	22.0	0.7×4	9 870	21 200	0.12	46	70	48	12	13	50	—	58	6.6	M6×1	7.0	0.53	22.0	19.6	1 000	2 000	2 500	<b>RS2550A**</b>	3.37	8.4	4.2	
<b>RNFCL 2550A2S</b>						3	—	0.91							14	7.0															
<b>RNFCL 2550A3</b>						100	—	0.91							15	7.5															
<b>RNFCL 2550A3S</b>						3	—	0.91							15	7.5															
<b>RNFCL 2550A6</b>						100	—	0.91							15	7.5															
<b>RNFCL 2550A6S</b>	3	—	0.91	15	7.5																										
<b>RNFCL 3264A3</b>	32	64	4.762	33.25	28.0	1.7×2	17 100	40 500	0.15	58	92	60	12	15.5	—	—	74	9	M6×1	7.5	1.76	28.0	25.6	1 000	2 000	3 000	4 000	<b>RS3264A**</b>	5.63	24	12
<b>RNFCL 3264A3S</b>						3	—	1.76							26	13															
<b>RNFCL 3264A6</b>						—	—	1.76							26	13															
<b>RNFCL 3264A6S</b>						3	—	1.76							26	13															
<b>RNFCL 4080A3</b>	40	80	6.35	41.75	35.0	1.7×2	27 200	67 900	0.20	73	114	75	15	19	—	—	93	11	M6×1	10	3.44	35.0	31.8	2 000	3 000	4 000	5 000	<b>RS4080A**</b>	8.69	52	26
<b>RNFCL 4080A3S</b>						3.5	—	3.44							55	28															
<b>RNFCL 4080A6</b>						—	—	3.44							55	28															
<b>RNFCL 4080A6S</b>						3.5	—	3.44							55	28															

Note 1: Actual screw shaft length may be slightly longer than nominal length *L<sub>s</sub>* due to manufacturing tolerance.

Note 2: Nut assembly with arbor and screw shaft are separate at time of delivery.

Note 3: Value obtained by dividing standard screw length by 100 mm will be entered at end of the part number where marked with \*\*.

Note 4: Length of nut becomes longer (2 x *M*) for those with seal; seal is a brush-seal.

Note 5: Internal spatial volume of nut and volume of grease to be replenished are values for linear guides with seals. Recommended amount for replenishing is approximately 50% of nut's internal space capacity. For linear guides without seals, apply grease to screw shaft surface or move ball nut by hand while filling them with grease so that grease permeates all areas.

## Life

Despite its ideal design, the Linear Guide and Ball Screw, even when used in appropriate conditions, deteriorate and eventually become unusable after a certain operation period. This period can be referred to as either “fatigue life,” reduced by flaking, or “accuracy life,” reduced by deterioration of precision due to wear.

## Fatigue Life

Fatigue life of the Linear Guide and Ball Screw can be estimated by basic dynamic load rating (Linear Guide:  $C$ ; Ball Screw:  $C_a$ ), as is done for rolling bearings.

### 1. Basic dynamic load rating $C, C_a$

Basic dynamic load rating is the basic directional load that allows 90% of the group of the same products to be operated 50 km (Linear Guide) or  $10^6$  rev (Ball Screw) under the same conditions without causing flaking by rolling contact fatigue. Basic dynamic load ratings are shown in the dimension tables.

Regarding the basic directional load, in the case of the Linear Guide, it is a constant load applied in the downward direction to the center of the ball slide. In the case of the Ball Screw, it is a constant axial load.

### 2. How to calculate fatigue life

#### 1) Life calculation

Fatigue life is defined as a total travel distance (LG) or rotation number (BS) in general. Fatigue life is obtained by the following formulas.

- Linear Guide
  - For balls as rolling element  $L = 50 \times \left( \frac{C}{f_w \cdot F_m} \right)^3$  (km)
  - For rollers as rolling element  $L = 50 \times \left( \frac{C}{f_w \cdot F_m} \right)^{\frac{10}{3}}$  (km)
- Ball Screw
  - $L = 10^6 \times \left( \frac{C_a}{f_w \cdot F_m} \right)^3$  (rev)

In this formula:

- $L$ : Rating fatigue life
- $C, C_a$ : Basic dynamic load rating (N)
- $F_m$ : Basic directional load (N)
- $f_w$ : Load factor (coefficient by operating condition)

#### 2) Conversion of fatigue life into time-life

- Linear Guide  $L_t = \frac{L}{0.06 \times V_m}$  (hr)
- Ball Screw  $L_t = \frac{L}{60 \cdot n}$  (hr)

In this formula:

- $L_t$ : Time-life
- $V_m$ : Average speed (m / min)
- $n$ : Average rotational speed ( $\text{min}^{-1}$ )

#### Load factor: $f_w$

Smooth operation without impact	1.0–1.2
Normal operation	1.2–1.5
Operation associated with impact or vibration	1.5–3.0

Setting a very long fatigue life requires a larger product and is not economical. Below are the general target values of operating life for machines. (reference)

#### Rough indication of time-life in general

Machine tools	20 000 hours
Industrial machines	10 000 hours
Automatic control system	15 000 hours
Measuring equipment	15 000 hours

### 3. Mean load

If the basic directional load often varies, calculate life by obtaining the mean load, which gives the equivalent fatigue life under varying load conditions.

#### 1) When load and travel distance (LG) or rotational speed (BS) shift stepwise (Fig. 1)

Mean load  $F_m$  can be obtained by the formulas below.

- Linear Guide

For balls as rolling element

$$F_m = \left( \frac{F_1^3 \cdot l_1 + F_2^3 \cdot l_2 + \dots + F_n^3 \cdot l_n}{l} \right)^{\frac{1}{3}}$$

For rollers as rolling element

$$F_m = \left( \frac{F_1^{10} \cdot l_1 + F_2^{10} \cdot l_2 + \dots + F_n^{10} \cdot l_n}{l} \right)^{\frac{3}{10}}$$

- Ball Screw

$$F_m = \left( \frac{F_1^3 \cdot n_1 \cdot t_1 + F_2^3 \cdot n_2 \cdot t_2 + \dots + F_n^3 \cdot n_n \cdot t_n}{n_1 \cdot t_1 + n_2 \cdot t_2 + \dots + n_n \cdot t_n} \right)^{\frac{1}{3}}$$

$$N_m = \frac{n_1 \cdot t_1 + n_2 \cdot t_2 + \dots + n_n \cdot t_n}{t_1 + t_2 + \dots + t_n}$$

In this formula:

- $F_m$ : Average load
- $l_n$ : Travel distance by load  $F_n$
- $n_n$ : Rotational speed by load  $F_n$
- $t_n$ : Operating time by load  $F_n$

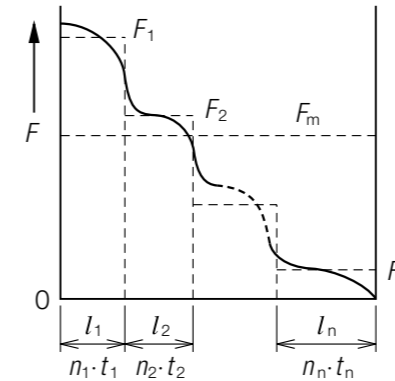


Fig. 1 Stepwise load change

#### 2) When load changes almost linearly (Fig. 2)

Approximate mean effective load  $F_m$  can be obtained by the following formula.

$$F_m \approx \frac{1}{3} (F_{\min} + F_{\max})$$

- $F_{\min}$ : Minimum value of load (N)
- $F_{\max}$ : Maximum value of load (N)

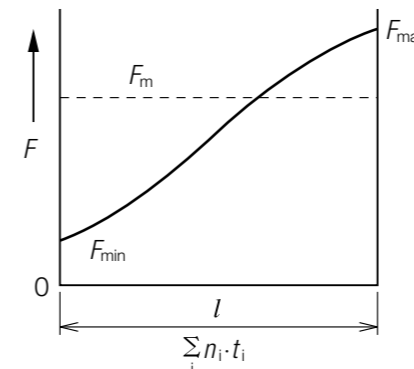


Fig. 2 Linear load change

#### 3) When load changes in sinusoidal pattern (Fig. 3,4)

At time of (a):  $F_m = 0.65 F_{\max}$

At time of (b):  $F_m = 0.75 F_{\max}$

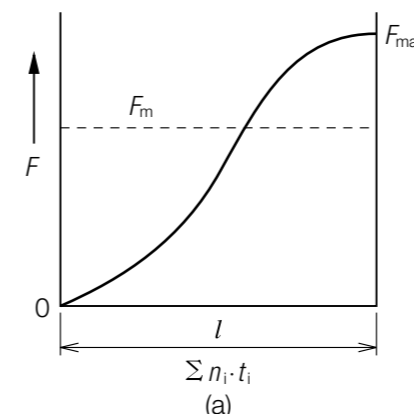


Fig. 3 Load that changes in sinusoidal pattern

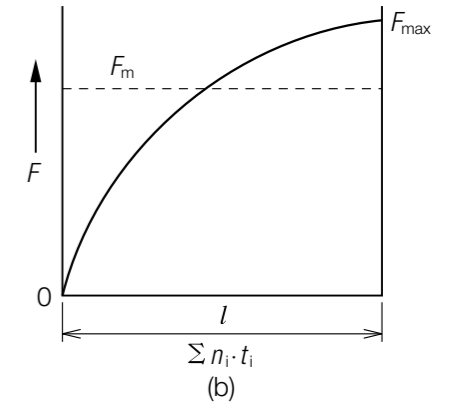


Fig. 4 Load that changes in sinusoidal pattern

### 4. Dynamic equivalent load

- Load applied to the Linear Guide (ball slide load) comes from various directions such as up/down and right/left and/or as moment load. Sometimes more than one type of load is applied simultaneously. Sometimes the volume and direction of the load may change.

Various loads cannot be used as they are to calculate the life of the Linear Guide. Therefore, it is necessary to use a hypothetical load on the ball slide with a constant volume, which would generate a value equivalent to an actual fatigue life. This is called “dynamic equivalent load.” For actual calculation, refer to A-3-2.2 (3) How to calculate dynamic equivalent load of “Precision Machine Components” Catalog E3162.

### 5. Basic static load rating $C_0, C_{0a}$

- When an excessive load or a momentary large impact is applied to the Linear Guide and the Ball Screw, local permanent deformation takes place on the balls and on the rolling contact surface. After exceeding a certain level, the deformation hampers smooth rolling operation.
- Basic static load rating is a static load when: [Permanent deformation of the balls] + [Permanent deformation of the rolling contact surfaces] becomes approximately 0.0001 times that of the ball diameter.
- In the case of the Linear Guide,  $C_0$  is a load that is applied in a downward direction toward the center of the ball slide.
- In the case of the Ball Screw,  $C_{0a}$  is an axial load.
- Values of the basic static load rating  $C_0$  or  $C_{0a}$  are shown in the “Dimension Table” and “Basic Load Rating” table (Monocarrier).
- In compliance with the ISO 14728-2 standard for the basic static load rating, the  $C_0$  of the Linear Guide has been revised, which is approximately 1.0 to 1.5 times higher than conventional values.

## 6. Basic static moment load rating

Generally, the Linear Guide uses a set of two rails and four ball slides for the guide way of one axis. Under some operating conditions, static moment load should be taken into account.

" $M_0$ ," which is the limit of static moment load in such use, is shown in the "Dimension Table for Linear Guide" as well as the same definition of basic static load rating. There are three  $M_0$  defined by three different moment directions.  $M_{R0}$  is the limit of static moment load of rolling direction,  $M_{P0}$  is the load of pitching direction, and  $M_{Y0}$  is the load of yawing direction.

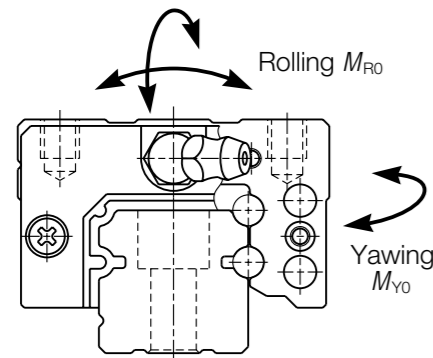
## 7. Basic load rating by load direction

The basic load rating of the Linear Guide is considered to be a downward load on the ball slide and is indicated in the dimension tables as the dynamic load rating  $C$  and the static load rating  $C_0$ , respectively. However, the load may be applied to a ball slide in upward or lateral directions in actual use. In such cases, the basic load rating is compensated as shown in Table 1. The basic dynamic load rating of the RA and TS Series is the same in  $C$  and  $C_0$  for all load directions, up, down, and lateral, while the LH Series has different basic load ratings depending on the load direction, as shown in the table.

**Table 1 Basic load rating by load direction**

Series	Load rating			Basic dynamic load rating			Basic static load rating			
	Load direction	Downward	Upward	Lateral	Downward	Upward	Lateral	Downward	Upward	Lateral
LH, LS, SH, SS, LW		$C$	$C$	$0.84C$	$C_0$	$0.78C_0$	$0.65C_0$	$C_0$	$C_0$	$C_0$
RA, TS, PU, PE		$C$	$C$	$C$	$C_0$	$C_0$	$C_0$	$C_0$	$C_0$	$C_0$

Pitching  $M_{P0}$



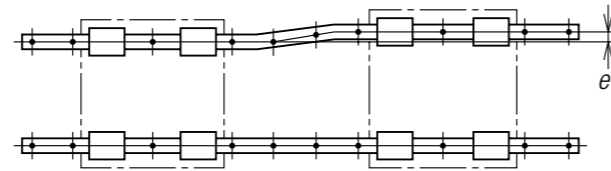
**Moment load directions**

## 8. Effect of mounting error

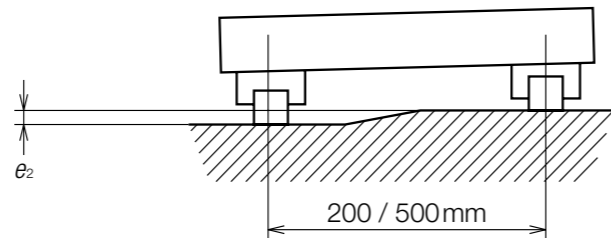
Excessive mounting error significantly reduces the life of the Linear Guide and Ball Screw. Therefore, NSK recommends the following permissible values of mounting error.

### 1) Linear Guide

Of the three major factors affected by mounting error, NSK focuses on life. By the NSK standard, permissible values of mounting error are values that allow 5 000 km or longer life under the following conditions.



**Mounting error (parallelism)**



**Mounting error (height)**

### Permissible values of parallelism for LH and SH Series

Unit:  $\mu\text{m}$

Value	Preload	Model number								
		H15	H20	H25	H30	H35	H45	H55	H65	H85
Permissible values of parallelism in two rails $e_1$	ZZ	18	20	25	30	35	45	55	70	90
Permissible values of parallelism (height) in two rails $e_2$	ZZ	330 $\mu\text{m}$ / 500mm								

### Permissible values of parallelism for LS and SS Series

Unit:  $\mu\text{m}$

Value	Preload	Model number				
		S15	S20	S25	S30	S35
Permissible values of parallelism in two rails $e_1$	ZZ	15	17	20	25	30
Permissible values of parallelism (height) in two rails $e_2$	ZZ	330 $\mu\text{m}$ / 500 mm				

### Permissible values of parallelism for RA Series

Unit:  $\mu\text{m}$

Value	Preload	Model number							
		RA15	RA20	RA25	RA30	RA35	RA45	RA55	RA65
Permissible values of parallelism in two rails $e_1$	ZZ	5	7	9	11	13	17	19	30
Permissible values of parallelism (height) in two rails $e_2$	ZZ	150 $\mu\text{m}$ / 500 mm							

### Permissible values of parallelism for PU and PE Series

Unit:  $\mu\text{m}$

Value	Preload	PU					PE				
		05	07	09	12	15	05	07	09	12	15
Permissible values of parallelism in two rails $e_1$	ZT	10	12	15	20	25	10	12	15	18	22
Permissible values of parallelism (height) in two rails $e_2$	ZT	150 $\mu\text{m}$ / 200 mm					50 $\mu\text{m}$ / 200 mm				

### Permissible values of parallelism for LW Series

Unit:  $\mu\text{m}$

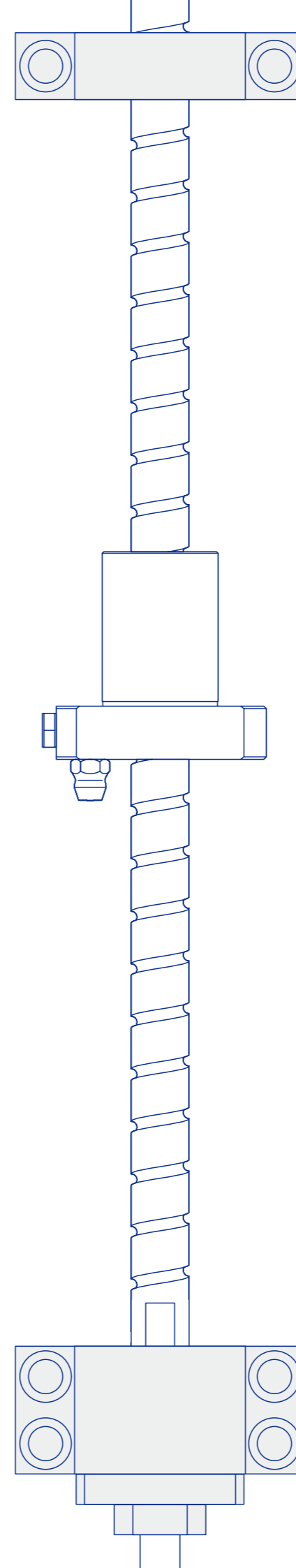
Value	Preload	Model number				
		LW17	LW21	LW27	LW35	LW50
Permissible values of parallelism in two rails $e_1$	ZZ	9	9	13	23	34
Permissible values of parallelism (height) in two rails $e_2$	ZZ	45 $\mu\text{m}$ / 500 mm				

### 2) Ball Screw

If moment load or radial load is applied to the Ball Screw, it adversely affects Ball Screw function and shortens its life. Watch for eccentric load that induces moment or radial load.

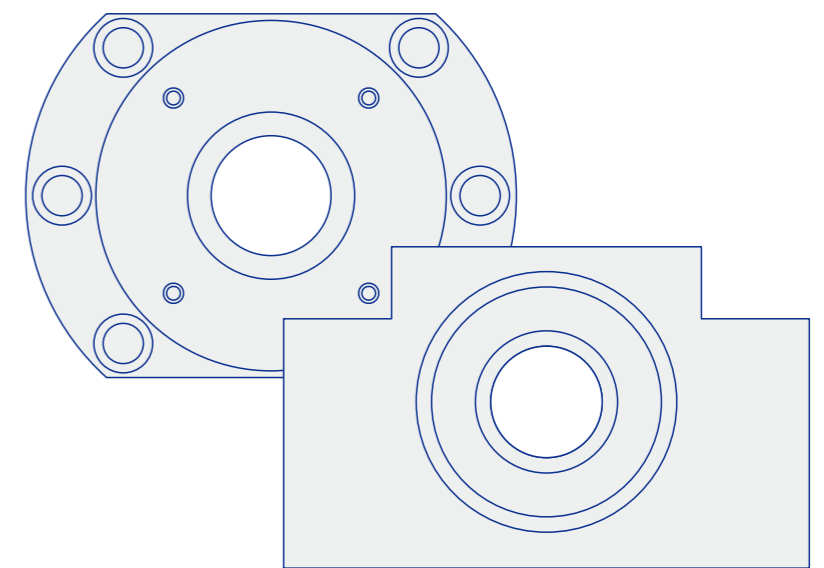
In general, the following values are recommended as control values of permissible mounting error.

Misalignment in inclination ..... 1 / 2 000 or under  
Eccentricity ..... 20  $\mu\text{m}$  or under






## Support Units

- Shapes available to fit all standard ball screws
- Standard stock item, allowing for short delivery time



## Types of Support Units

### Support unit categories

Application	Shape	Support side	Bearing in use	Bearing bore Bearing seat diameter	Page		
Small equipment, light load	Square	WBK**-01*		Fixed support side	Angular contact ball bearing	$\phi 6 - \phi 25$	233 -
		WBK**S-01*		Simple support side	Deep groove ball bearing	$\phi 6 - \phi 25$	237 -
		WBK**SF-01*		Simple support side	Deep groove ball bearing	$\phi 12, \phi 15$ (exclusive for VFA type)	237 -

Application	Shape	Support side	Bearing in use	Bearing bore Bearing seat diameter	Page		
Small equipment, light load	Round	Fixed support side	WBK**R-11 (support kit)		Deep groove ball bearing (arranged to have angular contact)	$\phi 4, \phi 6$ (exclusive for RMA and RMS types)	239
			WBK**-11*		Angular contact ball bearing	$\phi 6 - \phi 25$	241
Machine tools, heavy load	Round	Fixed support side	WBK**DF*-31		Thrust angular contact ball bearing	$\phi 17 - \phi 40$	243 -

### Part number for Support Unit

**For light load**

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

Support Unit: WBK

Size

Mounting  
No code: Fixed support side  
S: Simple support side  
SF: Simple support side (for FSS)  
R: Fixed support side (for miniature ball screws)

No code or A: For general use  
B: For compact FA  
C: For clean environment use

01: Square type  
11: Round type

\* In case of simple support unit, be careful that 12 or less size codes do not represent internal bores of bearing. Please refer to the dimensional table for internal bore of bearing.

**For heavy load**

Example: **WBK 25 DF - 31**

Support Unit: WBK

Size (internal bore of bearing)

Bearing combination  
DF: Face to face duplex combination  
DFD: Face to face triplex combination  
DFF: Face to face quadruplex combination

### Classification

Ball screw support units are classified into categories by shape (see above table). Select the type that best suits your particular needs.

### Features

#### 1) Bearings and seal

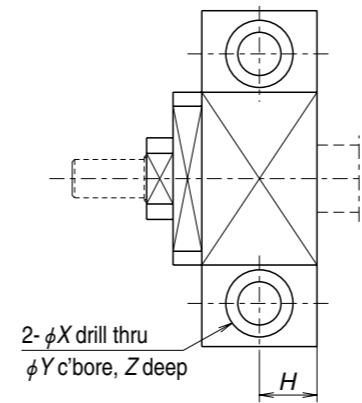
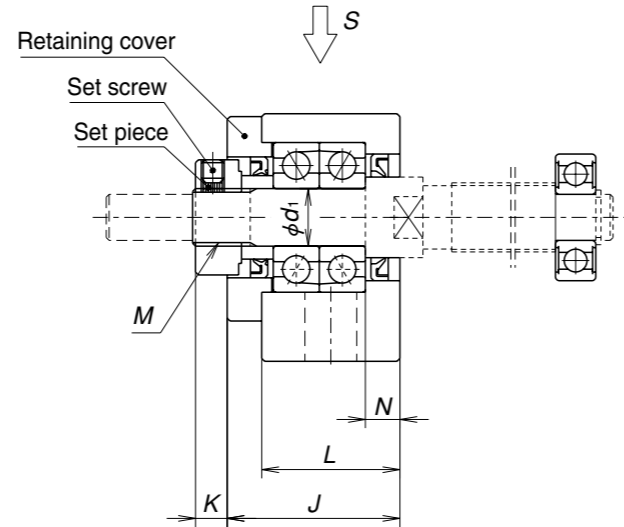
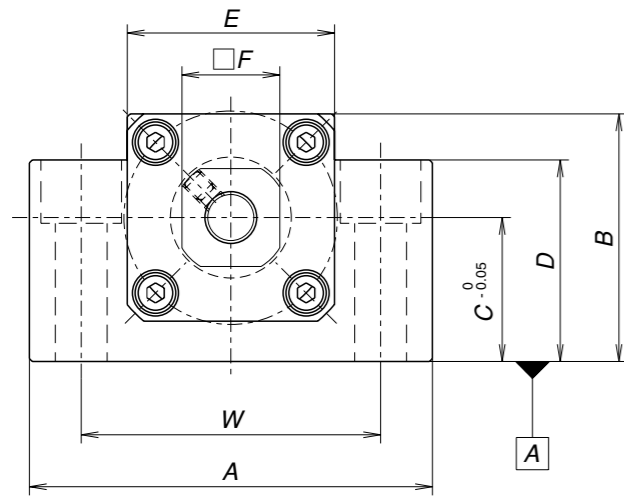
On the fixed support side, the angular contact ball bearing is used. It has great rigidity and low friction torque, which match the rigidity of the ball screw. The thrust angular contact ball bearing with high precision and great rigidity is another choice for the fixed support side.

An oil seal is installed on the fixed support side used with an angular contact ball bearing. Fine clearance may occur with this seal.

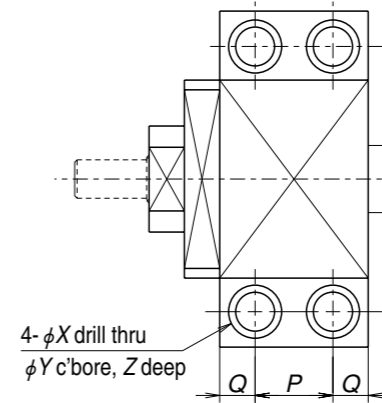
A deep-groove ball bearing with a shield on both sides is used on the simple support side.

#### 2) Locknut is provided

A locknut with fine grade finish is provided to fix the bearing with high precision.



View S (WBK06-15)



View S (WBK17-25)

Part number	Tightening torque (reference) [N·cm]	
	Locknut	Set screw
WBK06-**	190	69 (M3)
WBK08-**	230	69 (M3)
WBK10-**	280	147 (M4)
WBK12-**	630	147 (M4)
WBK15-**	790	147 (M4)
WBK17-**	910	147 (M4)
WBK20-**	1 670	147 (M4)
WBK25-**	2 060	490 (M6)

### Fixed support side support unit (square type)

Units: mm

Part number	Use	$d_1$	A	B	C	D	E	F	L	J	K	N	Counterbore dimensions						Mass (kg)	Locknut screw M	Attached bearing for support side	
													H	P	Q	W	X	Y				Z
WBK06-01A*	General	6	42	25	13	20	18	12	20	20	5.5	3.5	10	—	—	30	5.5	9.5	11	0.15	M6×0.75	—
WBK08-01A*	General	8	52	32	17	26	25	14	23	23	7	4	11.5	—	—	38	6.6	11	12	0.25	M8×1	606ZZ
WBK08-01B	Low-profile type		62	31	15.5	31	—		21.5	25.5	4.5	3.5	11			46	9	14	18	0.3		606ZZ
WBK08-01C*	Clean environment		52	32	17	26	25		23	23	7	4	11.5			38	6.6	11	12	0.25		606VV
WBK10-01A	General	10	70	43	25	35	36	17	24	30	5.5	6	12	—	—	52	9	14	11	0.5	M10×1	608ZZ
WBK10-01B	Low-profile type			38	20	38	—									19	0.45	608ZZ				
WBK10-01C	Clean environment			43	25	35	36									11	0.5	608VV				
WBK12-01A	General	12	70	43	25	35	36	19	24	30	5.5	6	12	—	—	52	9	14	11	0.5	M12×1	6000ZZ
WBK12-01B	Low-profile type			38	20	38	—									19	0.4	6000ZZ				
WBK12-01C	Clean environment			43	25	35	36									11	0.5	6000VV				
WBK15-01A	General	15	80	50	30	40	41	22	25	31	12	5	12.5	—	—	60	11	17	15	0.7	M15×1	6002ZZ
WBK15-01B	Low-profile type			42	22	42	—									23	0.6	6002ZZ				
WBK15-01C	Clean environment			50	30	40	41									15	0.7	6002VV				
WBK17-01A	General	17	86	64	39	55	50	24	35	44	7	7	—	19	8	68	9	14	11	1.3	M17×1	6203ZZ
WBK20-01	General	20	95	58	30	45	56	30	42	52	10	10	—	22	10	75	11	17	15	1.4	M20×1	6204ZZ
WBK25-01W	General	25	105	68	35	25	66	36	48	61	13	14	—	30	9	85	11	—	—	1.9	M25×1.5	6205ZZ

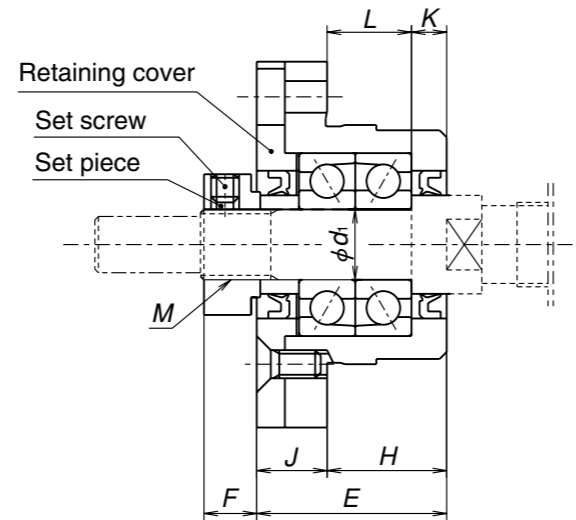
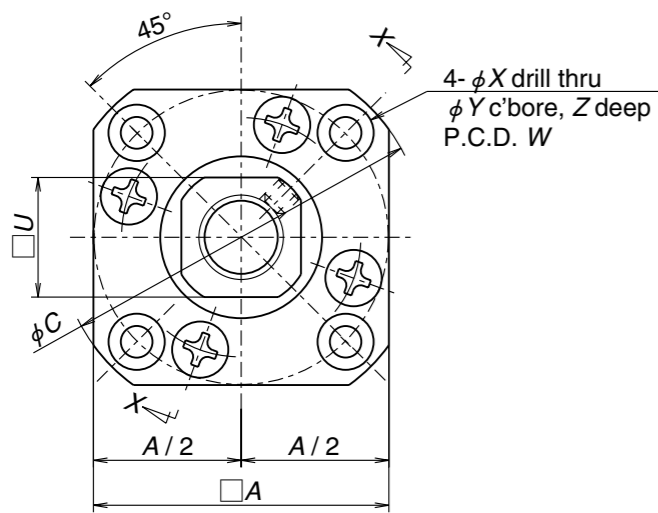
\*For retaining cover side of WBK06-01A, WBK08-01A, and WBK08-01C there are no seals.

Note 1: Use datum face A for mounting to machine base.

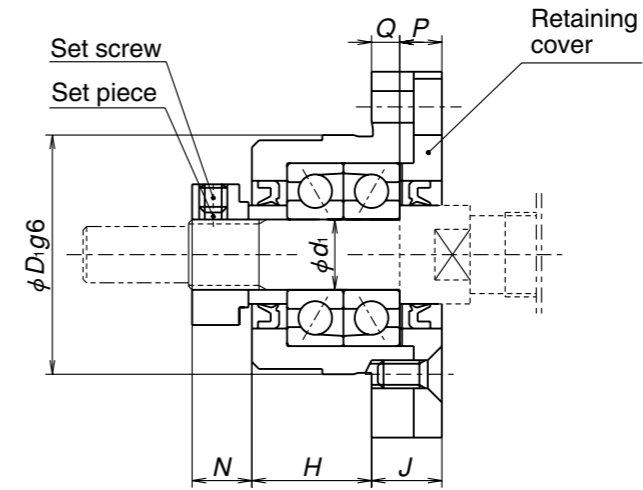
Note 2: Tighten set screw after locknut has been adjusted and tightened.

Note 3: Brass pad (set piece), provided with unit, is inserted into locknut set screw hole. Set screw is then inserted and tightened over pad.

Note 4: Deep groove ball bearing and snap ring are attached.



View X-X (example 1)



View X-X (example 2)

Part number	Tightening torque (reference) [N·cm]	
	Locknut	Set screw
WBK06-**	190	69 (M3)
WBK08-**	230	69 (M3)
WBK10-**	280	147 (M4)
WBK12-**	630	147 (M4)
WBK15-**	790	147 (M4)
WBK17-**	910	147 (M4)
WBK20-**	1 670	147 (M4)
WBK25-**	2 060	490 (M6)

### Fixed support side support unit (round type)

Units: mm

Part number	Use	$d_1$	A	C	$D_1$	E	H	L	K	F	N	U	P	Q	Counterbore dimensions					Mass (kg)	Locknut screw M	Attached bearing for support side
															J	W	X	Y	Z			
<b>WBK06-11*</b>	General	6	28	35	22	20	13	9.5	3.5	5.5	6.5	12	4.5	2.5	7	28	2.9	5.5	3.5	0.1	M6×0.75	—
<b>WBK08-11*</b>	General	8	35	43	28	23	14	10	4	7	8	14	5	4	9	35	3.4	6.5	4	0.15	M8×1	606ZZ
<b>WBK08-11B</b>	Low-profile type		42	52	34	25.5	15.5	12	3.5	4.5	7		6		10	42	4.5	8		0.2		608ZZ
<b>WBK08-11C*</b>	Clean environment		35	43	28	23	14	10	4	7	8		5		9	35	3.4	6.5		0.15		606VV
<b>WBK10-11</b>	General	10	42	52	34	27	17	12	5	7.5	8.5	17	6	4	10	42	4.5	8	4	0.2	M10×1	608ZZ
<b>WBK10-11C</b>	Clean environment		42	52	34	27	17	12	5	7.5	8.5		6		10	42	4.5	8		4		0.2
<b>WBK12-11</b>	General	12	44	54	36	27	17	12	5	7.5	8.5	19	6	4	10	44	4.5	8	4	0.25	M12×1	6000ZZ
<b>WBK12-11C</b>	Clean environment		44	54	36	27	17	12	5	7.5	8.5		6		10	44	4.5	8		4		0.25
<b>WBK15-11</b>	General	15	52	63	40	32	17	11	6	12	14	22	8	7	15	50	5.5	9.5	6	0.4	M15×1	6002ZZ
<b>WBK15-11C</b>	Clean environment		52	63	40	32	17	11	6	12	14		8		7	15	50	5.5		9.5		6
<b>WBK20-11</b>	General	20	68	85	57	52	30	20	10	10	14	30	14	8	22	70	6.6	11	10	1.1	M20×1	6204ZZ
<b>WBK25-11</b>	General	25	79	98	63	57	30	20	10	13	20	36	17	10	27	80	9	15	13	1.5	M25×1.5	6205ZZ

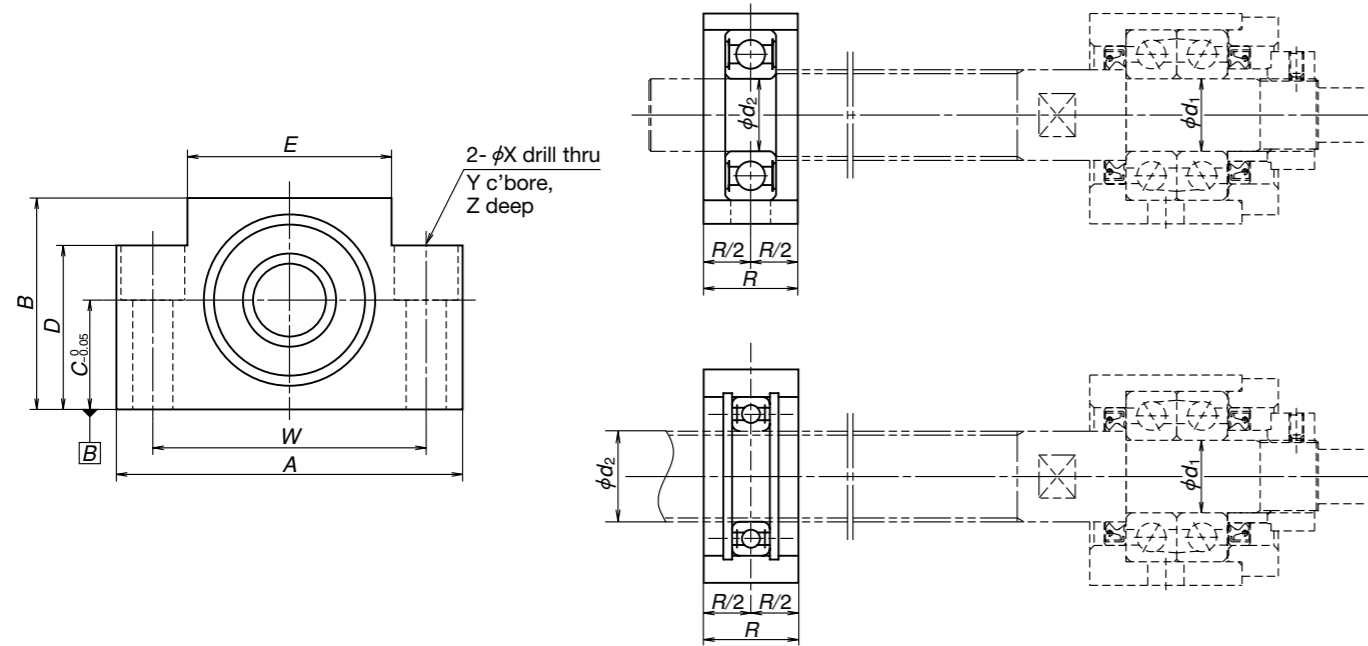
\*For retaining cover side of WBK06-01A, WBK08-01A, and WBK08-01C there are no seals.

Note 1: Tighten set screw after locknut has been adjusted and tightened.

Note 2: Brass pad (set piece), provided with unit, is inserted into locknut set screw hole. Set screw is then inserted and tightened over pad.

Note 3: Deep groove ball bearing and snap ring are attached.





Simple support side support unit (square type)

Unit: mm

Part number	Use	d <sub>2</sub>	A	B	C	D	E	R	Counterbore dimensions				Mass (kg)
									W	X	Y	Z	
WBK08S-01	General	6	52	32	17	26	25	15	38	6.6	11	12	0.15
WBK08S-01B	Low-profile type		62	31	15.5	31	-	16	46	9	14	18	0.2
WBK08S-01C	Clean environment		52	32	17	26	25	15	38	6.6	11	12	0.15
WBK10S-01	General	8	70	43	25	35	36	20	52	9	14	11	0.4
WBK10S-01C	Clean environment												
WBK12S-01	General	10	70	43	25	35	36	20	52	9	14	11	0.35
WBK12S-01B	Low-profile type			38	20	38	-					19	0.4
WBK12S-01C	Clean environment			43	25	35	36					11	0.35
WBK12SF-01	*1	12	70	43	25	35	36	20	52	9	14	11	0.32
WBK12SF-01B	*2	12	62	31	15.5	31	-	18	46	9	14	18	0.17
WBK15S-01	General	15	80	50	30	40	41	20	60	9	14	11	0.45
WBK15S-01B	Low-profile type			42	22	42	-					23	0.4
WBK15S-01C	Clean environment			50	30	40	41					11	0.45
WBK15SF-01	*1	15	70	43	25	35	36	20	52	9	14	11	0.3
WBK15SF-01B	*2	15	70	38	20	38	-	18	52	9	14	19	0.24
WBK17S-01	General	17	86	64	39	55	50	23	68	9	14	11	0.8
WBK20S-01	General	20	95	58	30	45	56	26	75	11	17	15	0.8
WBK20SF-01B	*2	20	80	42	22	42	-	22	60	11	17	23	0.33
WBK25S-01W	General	25	105	68	35	25	66	30	85	11	-	-	0.9
WBK25SF-01	*2	25	95	58	30	45	56	22	75	11	17	15	0.54

Note: Use datum face B to mount to machine base.

\*1 Simple support side support unit for Ball Screws for Conveyers (VFA type). Unit supports outer screw shafts.

\*2 Simple support side support unit for Compact FA Series for Conveyers. Unit supports outer screw shafts.

### Support unit specifications

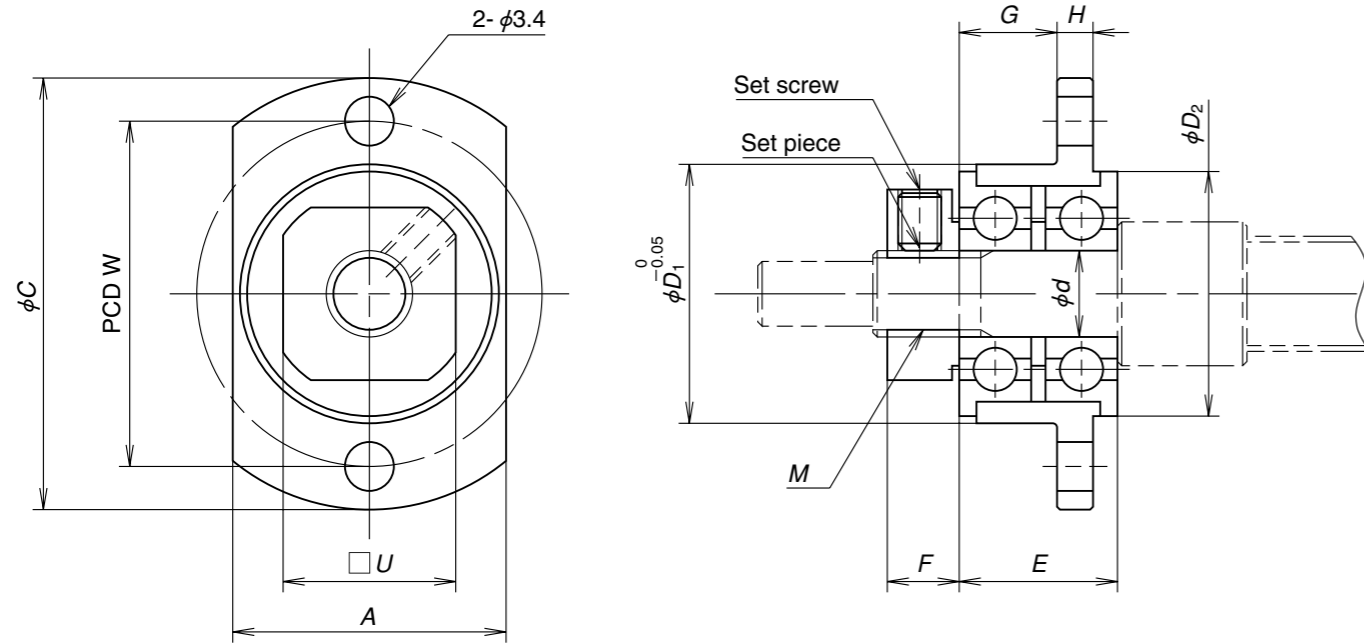
Part number	Use	Fixed support side support unit				Simple support side support unit		
		Basic dynamic load rating C <sub>a</sub> (N)	Load limit (N)	Stiffness (N/μm)	Maximum starting torque (N·cm)	Part number	Bearing part No.	Radial direction Basic dynamic load rating C (N)
WBK06-01A	General	2 670	1 040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

\* Simple support side support unit for Compact FA Series for Conveyers (FSS type). Unit supports outer screw shafts.

## Support Units for Light Load and Small Equipment

### Support Kits for Ball Screws for Transfer Equipment

Support kits are for RMA type Ball Screw. In case of RMA1002 or larger rolled ball screws, please use other support units.



Unit: mm

Part number	A	C	d	D <sub>1</sub>	D <sub>2</sub>	E	F	G	H	W	U	M
<b>WBK04R-11</b>	14	25	4	13	12.5	9	5	5	2.5	19	10	M4×0.5
<b>WBK06R-11</b>	19	30	6	18	17	11	5	6.8	2.5	24	12	M6×0.75

Part number	Applicable ball screw	Locknut tightening torque (reference) [N·cm]	Set screw tightening torque (reference) [N·cm]
<b>WBK04R-11</b>	RMA0601	100	38 (M2.5)
<b>WBK06R-11</b>	RMA0801	190	69 (M3)
	RMA0801.5		
	RMA0802		

Note 1: Oscillate bearings slowly so they fall into place in which run-out of mounting face is minimal, and then tighten locknut.

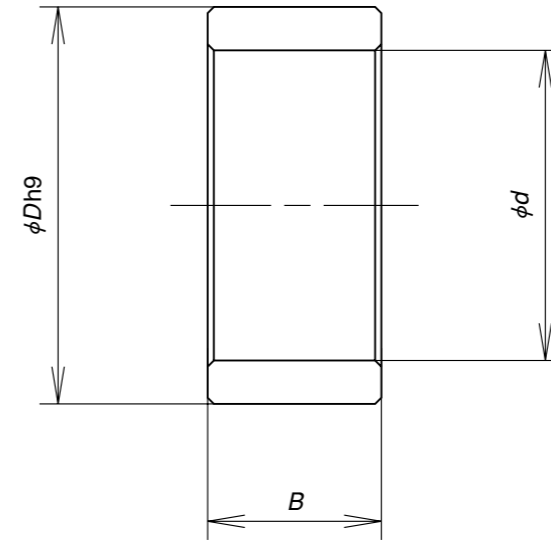
Note 2: Support kit is on provisional shaft (bolt) during shipping.

Note 3: When securing support unit on shaft, insert set piece (brass pad) that is provided with support unit into locknut screw hole, and then tighten set screw.

### Spacer

The shaft requires a spacer on the journal where the ball thread is cut through the bearing shoulder.

This is commonly required for the R Series' transportation ball screw shaft when mounting the support unit on the fixed support side.



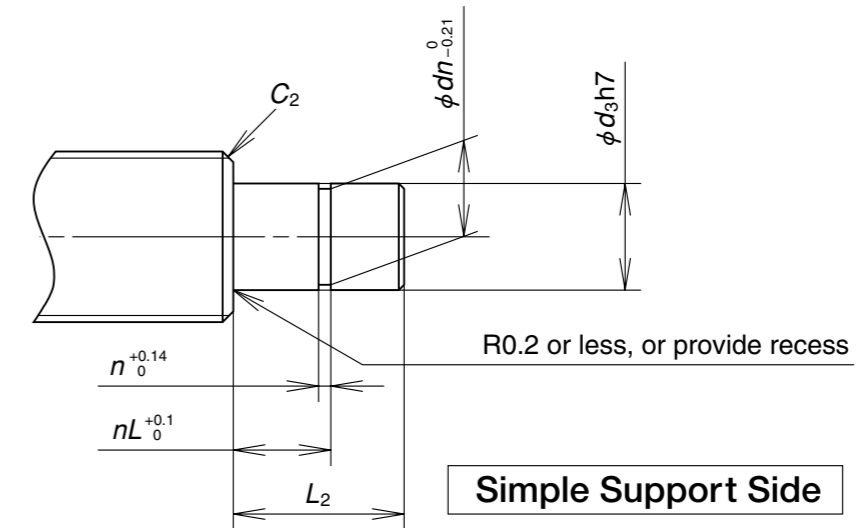
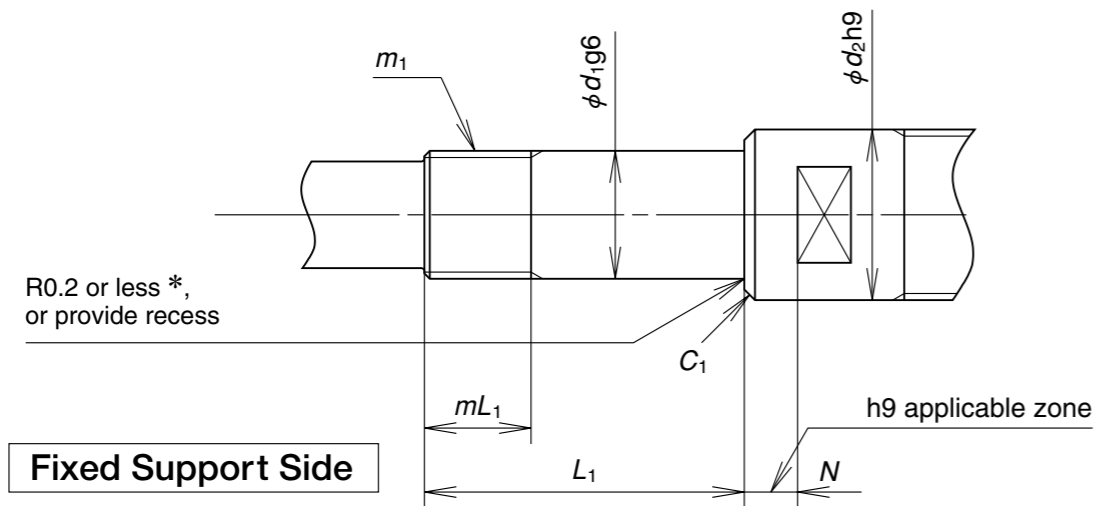
Unit: mm

Part number	Internal diameter d	Outside diameter D	Width B	Applicable support unit
<b>WBK06K</b>	6	9.5	5.0	WBK06-**
<b>WBK08K</b>	8	11.5	5.5	WBK08-**
<b>WBK10K</b>	10	14.5	5.5	WBK10-**
<b>WBK12K</b>	12	15.0	5.6	WBK12-**
<b>WBK15K</b>	15	19.5	10.0	WBK15-**
<b>WBK17K</b>	17	24.4	7.0	WBK17-**
<b>WBK20K</b>	20	25.5	11.0	WBK20-**
<b>WBK25K</b>	25	32.0	14.0	WBK25-**

### Screw Shaft-End Configuration

Dimensions of the shaft-end configurations for light load and small equipment support units are shown in the table below. When using a spacer with a ball screw for

transportation, add the width of the spacer (B from table of spacer dimensions on page 240) to  $L_1$  below.



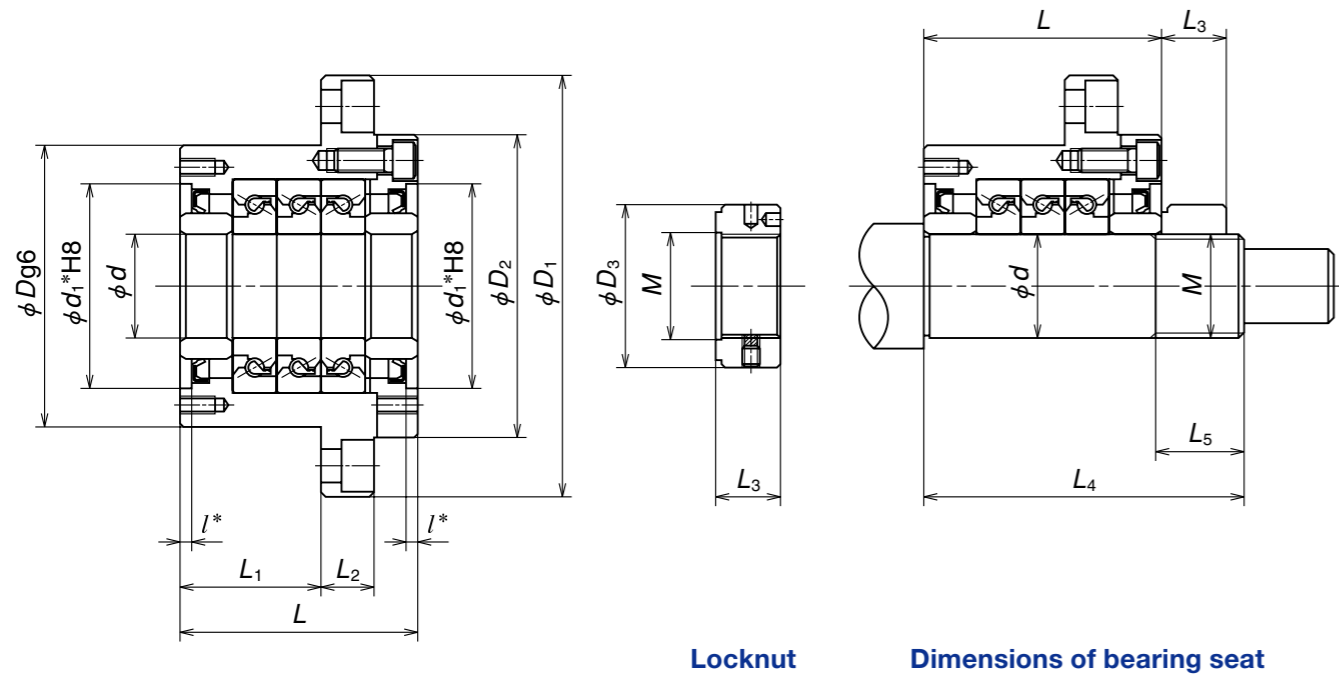
Radius marked with \* above is 0.15 or less for WBK04R-11 and WBK06R-11.

Units: mm

Part number	Fixed support side						
	Bearing journal		Locknut thread		Sealing part		Chamfer
	$d_1$	$L_1$	$m_1$	$mL_1$	$d_2$	$N$	$C_1$
<b>WBK06-**</b>	6	22.5	M6×0.75	7	9.5	3.5	0.2
<b>WBK08-**</b>	8	27	M8×1	9	11.5	4	0.2
<b>WBK10-**</b>	10	30	M10×1	10	14	6	0.2
<b>WBK12-**</b>	12	30	M12×1	10	15	6	0.2
<b>WBK15-**</b>	15	40	M15×1	15	19.5	5	0.3
<b>WBK17-**</b>	17	46	M17×1	17	24	7	0.3
<b>WBK20-**</b>	20	53	M20×1	16	25	10	0.3
<b>WBK25-**</b>	25	62	M25×1.5	20	32	14	0.5
<b>WBK04R-11</b>	4	15	M4×0.5	7.5	—	—	0.3
<b>WBK06R-11</b>	6	17	M6×0.75	7.5	—	—	0.3

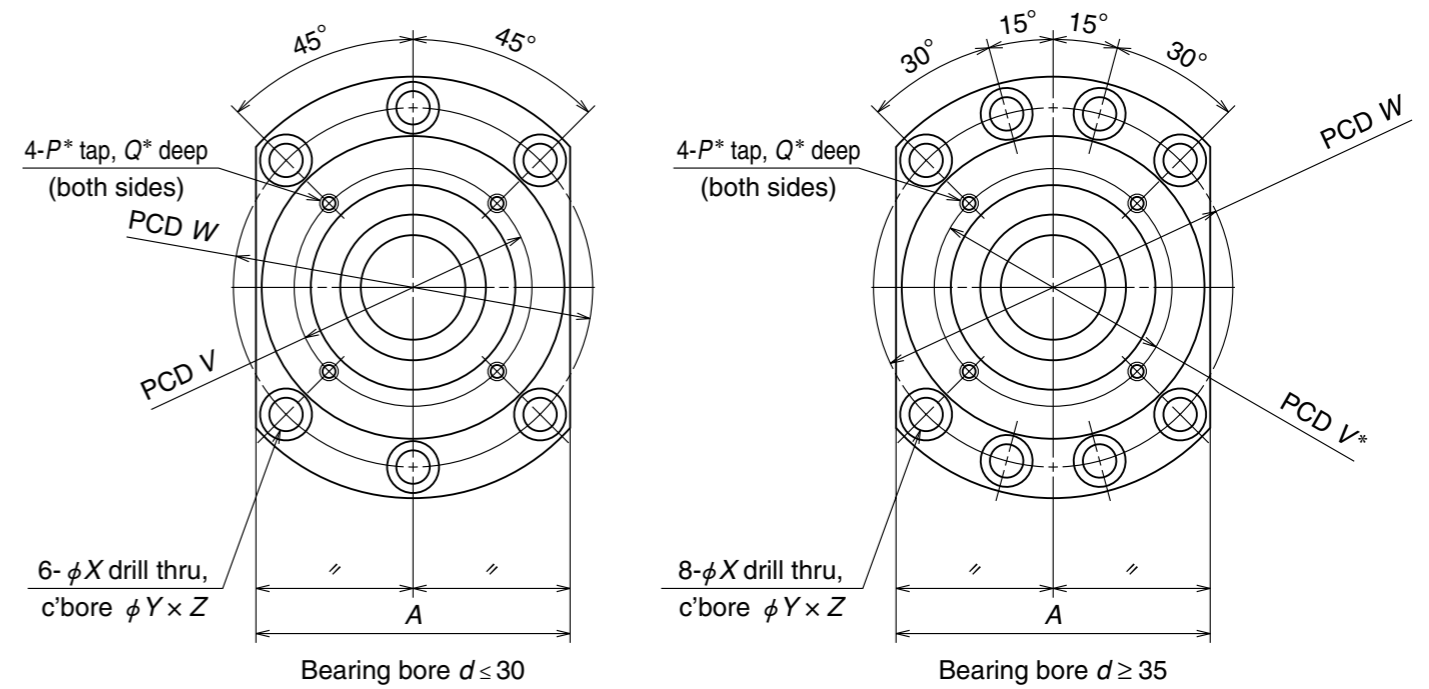
Units: mm

Part number	Simple support side					
	Bearing journal		Snap ring groove			Chamfer
	$d_3$	$L_2$	$n$	$dn$	$nL$	$C_2$
—	—	—	—	—	—	—
<b>WBK08S-**</b>	6	9	0.8	5.7	6.8	0.2
<b>WBK10S-**</b>	8	10	0.9	7.6	7.9	0.2
<b>WBK12S-**</b>	10	22	1.15	9.6	9.15	0.5
<b>WBK15S-**</b>	15	25	1.15	14.3	10.15	0.5
<b>WBK17S-**</b>	17	16	1.15	16.2	13.15	0.5
<b>WBK20S-**</b>	20	19	1.35	19	15.35	0.5
<b>WBK25S-**</b>	25	20	1.35	23.9	16.35	0.5



Locknut

Dimensions of bearing seat



Bearing bore  $d \le 30$

Bearing bore  $d \ge 35$

Unit: mm

Support unit number	Support unit																Basic dynamic load rating $C_a$ (N)	Permissible axial load (N)	Preload (N)	Axial rigidity (N/ $\mu$ m)	Maximum starting torque (N-cm)	Locknut			Mass (kg)	Bearing seat for unit			
	$d$	$D$	$D_1$	$D_2$	$L$	$L_1$	$L_2$	$A$	$W$	$X$	$Y$	$Z$	$d_1^*$	$l^*$	$V^*$	$P^*$						$Q^*$	$M$	$D_3$		$L_3$	$d$	$L_4$	$L_5$
WBK 17DF-31	17	70	106	72	60	32	15	80	88	9	14	8.5	45	3	58	M5	10	21 900	26 600	2 150	750	19	M17×1	37	18	1.9	17	81	23
WBK 20DF-31	20	70	106	72	60	32	15	80	88	9	14	8.5	45	3	58	M5	10	21 900	26 600	2 150	750	19	M20×1	40	18	1.9	20	81	23
WBK 25DF-31	25	85	130	90	66	33	18	100	110	11	17.5	11	57	4	70	M6	12	28 500	40 500	3 150	1 000	29	M25×1.5	45	20	3.1	25	89	26
WBK 25DFD-31					46 500	81 500												4 300	1 470	39	3.4	104							
WBK 30DF-31	30	85	130	90	66	33	18	100	110	11	17.5	11	57	4	70	M6	12	29 200	43 000	3 350	1 030	30	M30×1.5	50	20	3.0	30	89	26
WBK 30DFD-31					47 500	86 000												4 500	1 520	40	3.3	104							
WBK 35DF-31	35	95	142	102	66	33	18	106	121	11	17.5	11	69	4	80	M6	12	31 000	50 000	3 800	1 180	34	M35×1.5	55	22	3.4	35	92	30
WBK 35DFD-31					50 500	100 000												5 200	1 710	45	4.3	107							
WBK 35DF-31					50 500	100 000												7 650	2 350	59	5.0	122							
WBK 40DF-31	40	95	142	102	66	33	18	106	121	11	17.5	11	69	4	80	M6	12	31 500	52 000	3 900	1 230	36	M40×1.5	60	22	3.6	40	92	30
WBK 40DFD-31					51 500	104 000												5 300	1 810	47	4.2	107							
WBK 40DF-31					51 500	104 000												7 850	2 400	61	4.7	122							

Note 1: Rigidity  
Values in the Table are theoretical values obtained from the elastic deformation between groove and balls.

Note 2: Starting torque  
Starting torque indicates torque due to the preload of the bearing. It does not include seal torque.

Note 3: The tolerance of the shaft bearing seat  
We recommend h5 class of the fits tolerance.

\*Pilot diameter and tapped screws marked with asterisk are used for seal unit installation for NSK standard hollow shaft ball screws. They also can be used for dust cover and damper installation.

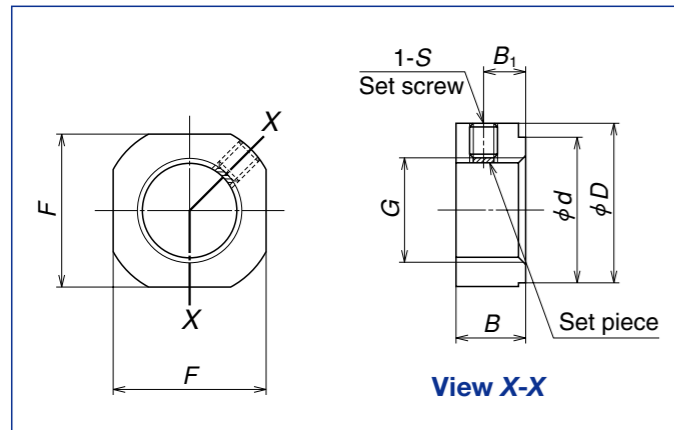
Note 4: Grease is packed into bearing. It is not necessary to apply grease before use.

In addition to support units, NSK has other components for ball screws, as shown below.

with minimum inclination. NSK locknuts exclusive for ball screws help to reduce this inclination.

### Locknuts

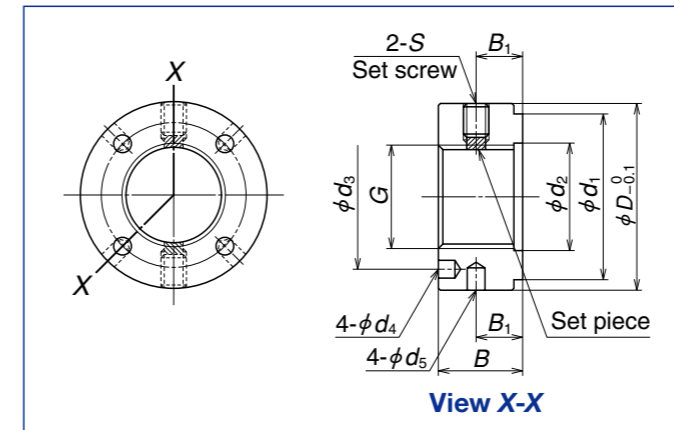
Ball screw support bearings must be installed



A Type shapes and dimensions



A Type locknuts



S Type shapes and dimensions



S Type locknuts

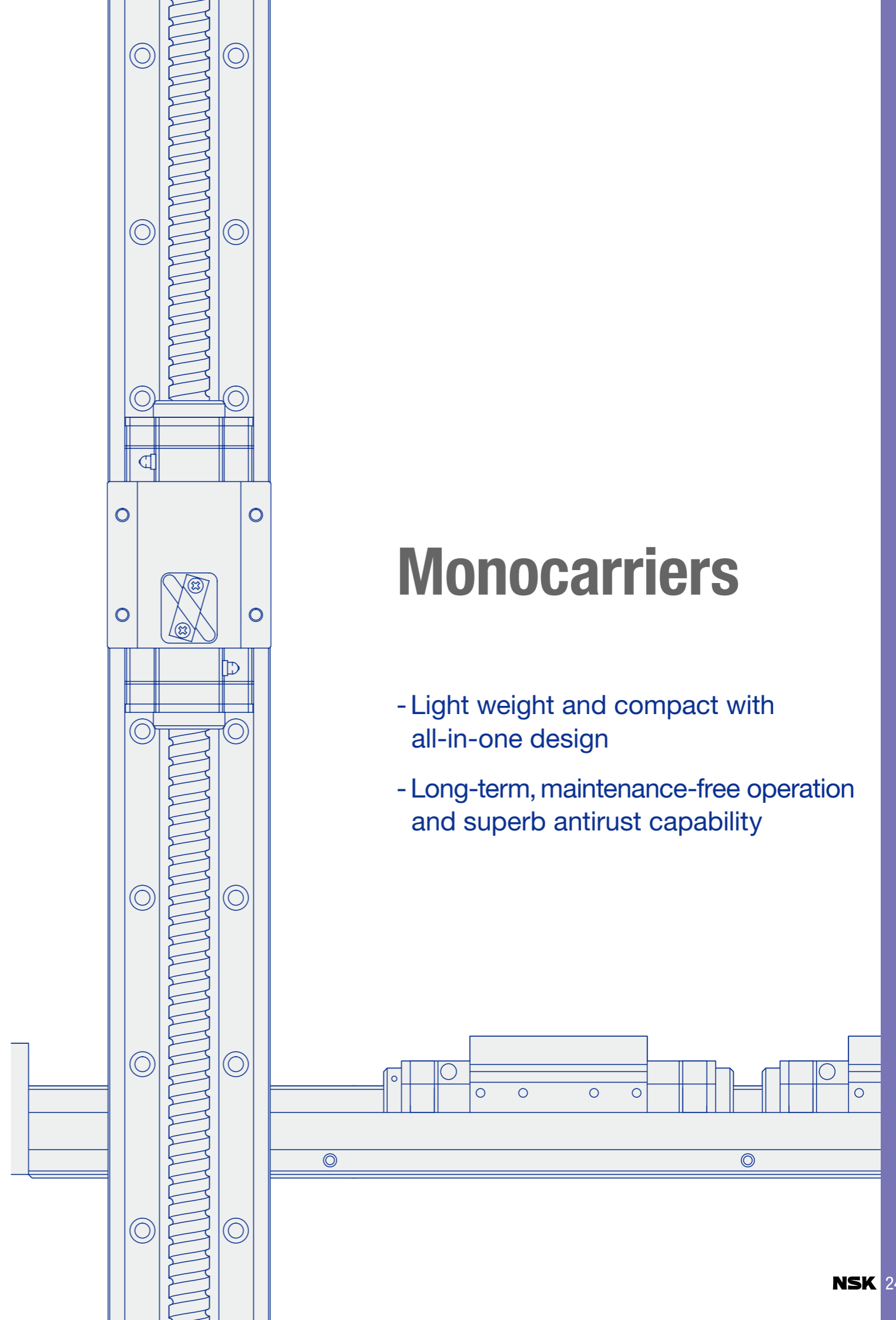
### A Type locknuts

Locknut part number	G	D	F	B	d	B <sub>1</sub>	S	Tightening torque (N·cm) (reference)	Set screw tightening torque (reference) [N·cm]
<b>WBK06L-01</b>	M6×0.75	14.5	12	5	10	2.75	M3, with brass set piece	190	69 (M3)
<b>WBK08L-01</b>	M8×1	17	14	6.5	13	4	M3, with brass set piece	230	69 (M3)
<b>WBK10L-01</b>	M10×1	20	17	8	16	5	M4, with brass set piece	280	147 (M4)
<b>WBK12L-01</b>	M12×1	22	19	8	17	5	M4, with brass set piece	630	147 (M4)
<b>WBK15L-01</b>	M15×1	25	22	10	21	6	M4, with brass set piece	790	147 (M4)
<b>WBK17L-01</b>	M17×1	29	24	13	24	8	M4, with brass set piece	910	147 (M4)
<b>WBK20L-01</b>	M20×1	35	30	13	26	8	M4, with brass set piece	1 670	147 (M4)
<b>WBK25L-01</b>	M25×1.5	42	36	16	34	10	M6, with brass set piece	2 060	490 (M6)

Note: Insert set piece (brass pad) and tighten securing set screw.

### S Type locknuts

Locknut part number	G	D <sub>0.1</sub>	B	d <sub>1</sub>	d <sub>2</sub>	d <sub>3</sub>	d <sub>4</sub>	d <sub>5</sub>	B <sub>1</sub>	S	Tightening torque (N·cm) (reference)	Set screw tightening torque (reference) [N·cm]
<b>WBK17L-31</b>	M17×1	37	18	30	18	27	4.3	4	10	M6	4 100	490 (M6)
<b>WBK20L-31</b>	M20×1	40	18	30	21	30	4.3	4	10	M6	4 500	490 (M6)
<b>WBK25L-31</b>	M25×1.5	45	20	40	26	35	4.3	4	11	M6	8 500	490 (M6)
<b>WBK30L-31</b>	M30×1.5	50	20	40	31	40	4.3	5	11	M6	10 100	490 (M6)
<b>WBK35L-31</b>	M35×1.5	55	22	50	36	45	4.3	5	12	M6	13 800	490 (M6)
<b>WBK40L-31</b>	M40×1.5	60	22	50	41	50	4.3	5	12	M6	15 500	490 (M6)



# Monocarriers

- Light weight and compact with all-in-one design
- Long-term, maintenance-free operation and superb antirust capability

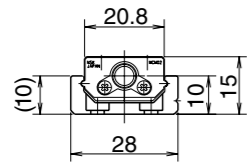
## Types of Monocarriers

	Light weight	Beam rigidity	Moment rigidity	Accuracy	Long stroke	Size variation
MCM Series	◎	○	○	◎	○	◎
MCH Series	○	◎	○	◎	◎	○

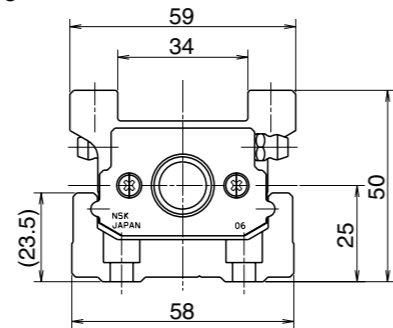
◎: Very good  
○: Good

### MCM Series Cross-sections

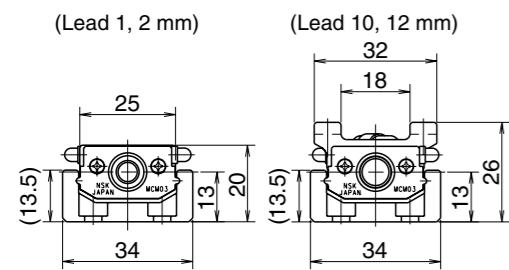
**MCM02**



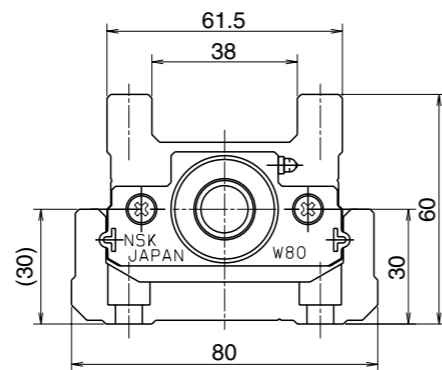
**MCM06**



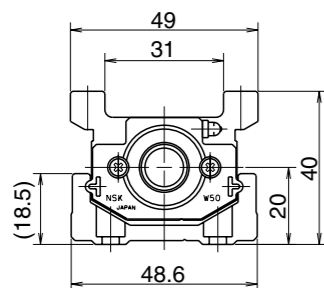
**MCM03**



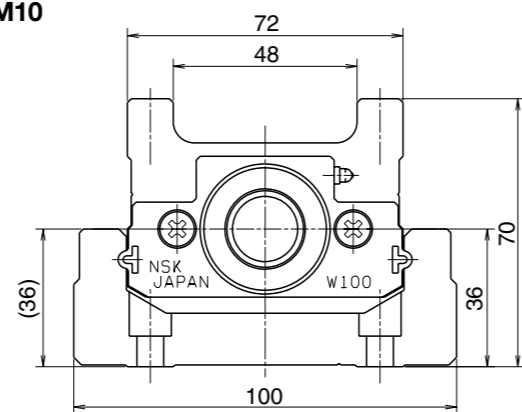
**MCM08**



**MCM05**

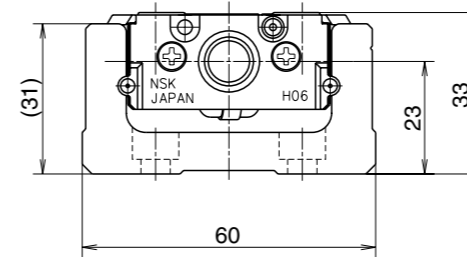


**MCM10**

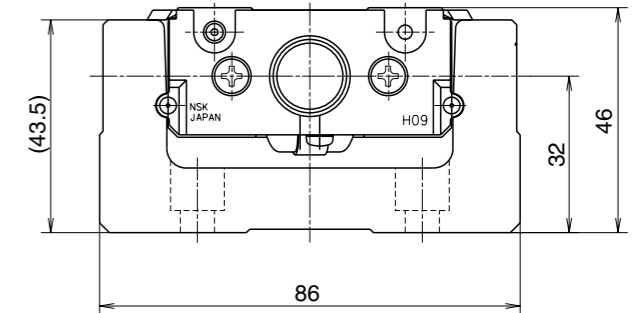


### MCH Series Cross-sections

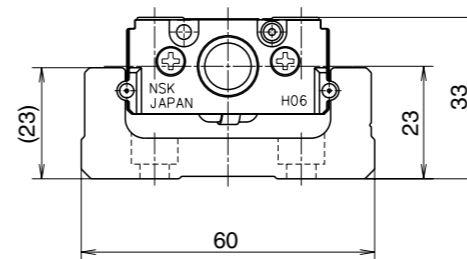
**MCH06**



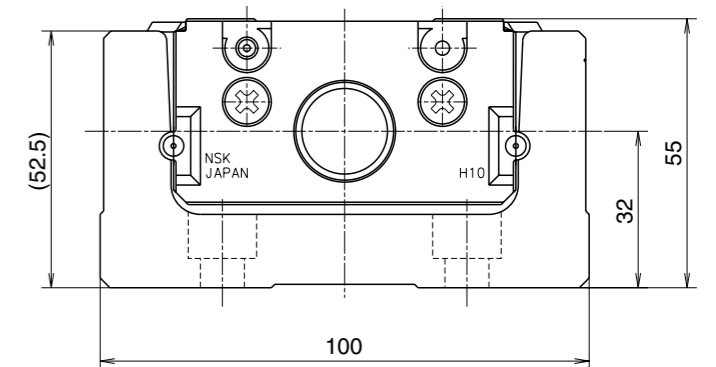
**MCH09**



**MCL06**



**MCH10**



## Part Number for MCM Series

**Body**

Example: **MC M 08 040 H 10 K 0 0**

Monocarrier	M type: MCM Series	Nominal size (rail width, unit: 10 mm)	Stroke (unit: 10 mm)	Accuracy grade (H: High grade, P: Precision grade)	NSK control number	Grease specification: O (standard AS2) Clean grease specification: B (LG2)	Slider specification K: Single slider D: Double slider	Ball screw lead (mm)
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**With Accessories**

Example: **MC E 08 040 H 10 K 0 0 K 0 0 0**

E: With MCM accessories	NSK control code	Sensor unit	Cover unit	Motor bracket
-------------------------	------------------	-------------	------------	---------------

Note: Accessories are available separately.

### Sensor unit (see page 263)

Part number code	Specification	Part number
0	N/A	—
1	Proximity switch (b-contact 3 pieces)	MC - SR** - 10
2	Proximity switch (a-contact 3 pieces)	MC - SR** - 11
3	Proximity switch (a-contact 1 piece, b-contact 2 pieces)	MC - SR** - 12
4	Photo sensor 3 pieces	MC - SR** - 13

\*\* : Part number  
Note: Sensor rail is not included in sensor unit. If you require the rail, please specify upon ordering. (See pages 263 to 264.)

### Cover unit (see pages 267 - 268)

Part number code	Specification	Part number
0	N/A	—
1	With top cover	MC - CV***** - 01 (02) *
2	Full cover	MC - CV***** - 00

\*\*\*\*\*: Part number and stroke number  
\*: Monocarrier -02 is only used for MCM03.  
Note: When a sensor unit is used, full cover unit cannot be used.

### Part number of motor bracket (see pages 269 - 283)

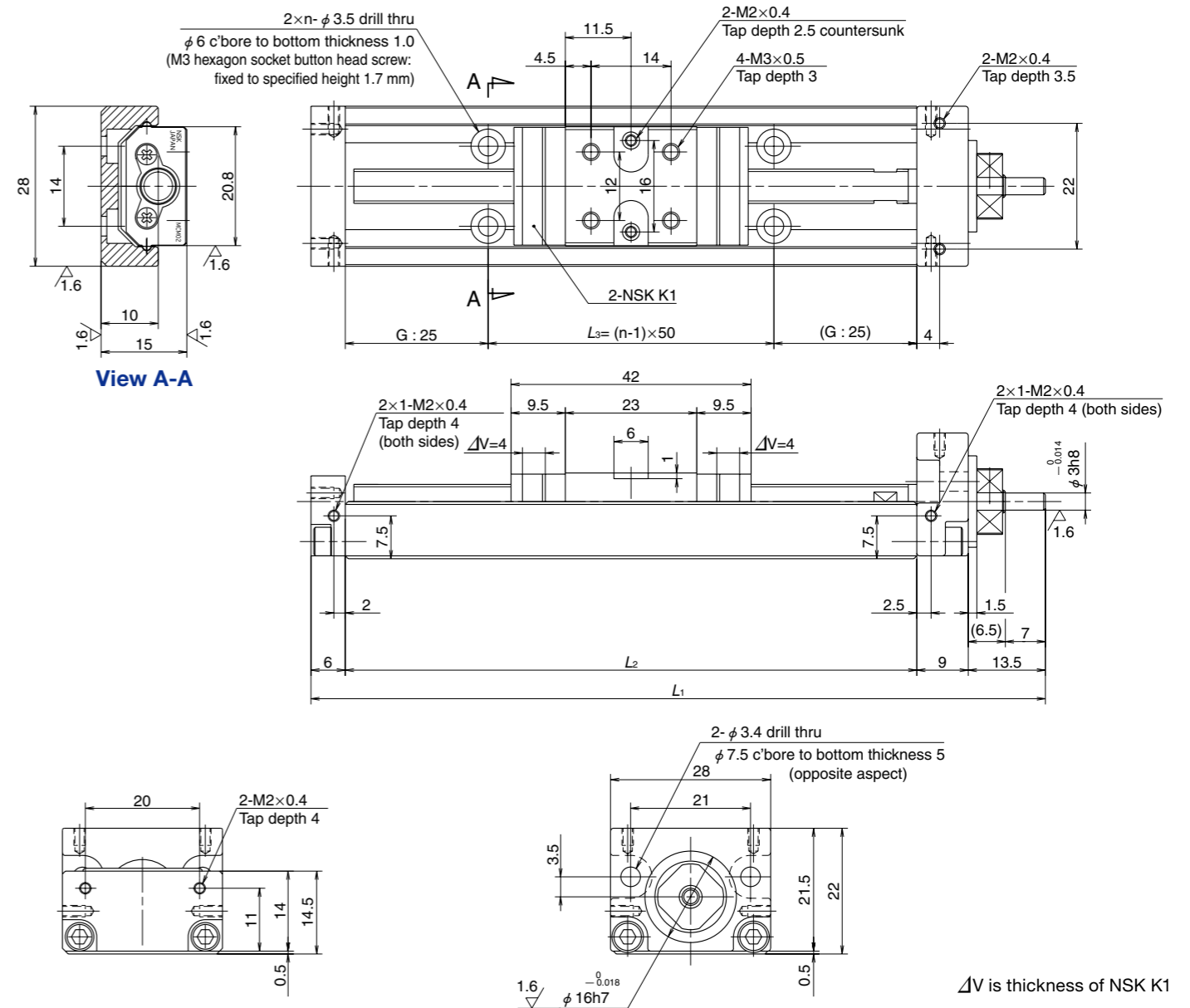
Part number code	Part number				
	MCM03	MCM05	MCM06	MCM08	MCM10
0	N/A	N/A	N/A	N/A	N/A
1	MC-BK03-146-00	MC-BK05-145-00	MC-BK06-145-00	MC-BK08-145-00	MC-BK10-170-00
2	MC-BK03-148-01	MC-BK05-146-00	MC-BK06-146-00	MC-BK08-146-00	MC-BK10-170-01
3	MC-BK03-231-00	MC-BK05-148-00	MC-BK06-148-00	MC-BK08-160-00	MC-BK10-190-00
4	—	MC-BK05-160-00	MC-BK06-160-00	MC-BK08-170-00	MC-BK10-270-00
5	—	MC-BK05-250-00	MC-BK06-170-00	MC-BK08-170-01	—
6	—	—	MC-BK06-170-01	MC-BK08-190-00	—
7	—	—	MC-BK06-250-00	MC-BK08-250-00	—
8	—	—	—	MC-BK08-270-00	—

N/A: Not applicable

## MCM Series Dimension Table

## MCM02

Accuracy grade: High grade (H)



### Dimensions of MCM02 (single slider)

Part number	Nominal stroke (mm)	Stroke limit (mm)	Ball screw lead (mm)	Body length (mm)			Mounting hole No. $n$	Inertia $\times 10^{-7}$ (kg·m <sup>2</sup> )	Mass (kg)	Maximum rotational speed (mm/s)
				$L_1$	$L_2$	$L_3$				
MCM02005H01K	50	58	1	128.5	100	50	2	0.93	0.26	50
MCM02005P01K										
MCM02005H02K										
MCM02005P02K	100	108	2	178.5	150	100	3	1.36	0.32	100
MCM02010H01K										
MCM02010P01K										
MCM02010H02K	150	158	1	228.5	200	150	4	1.81	0.39	50
MCM02010P02K										
MCM02015H01K										
MCM02015P01K	150	158	2	228.5	200	150	4	1.81	0.39	100
MCM02015H02K										
MCM02015P02K										

### Monocarrier dynamic torque specifications (N·cm)

Ball screw lead (mm)	High grade		Precision
	1	0.1 - 1.3	
2	0.1 - 1.3		0.2 - 1.6

- Frictional resistance of NSK K1 is included in dynamic torque in table.
- Grease is packed into ball screw, linear guide parts and support unit.
- Consult NSK for life estimates under large moment loads.
- Stroke limit = stroke + 4 [margin] × 2

► For basic load ratings, see page 303.

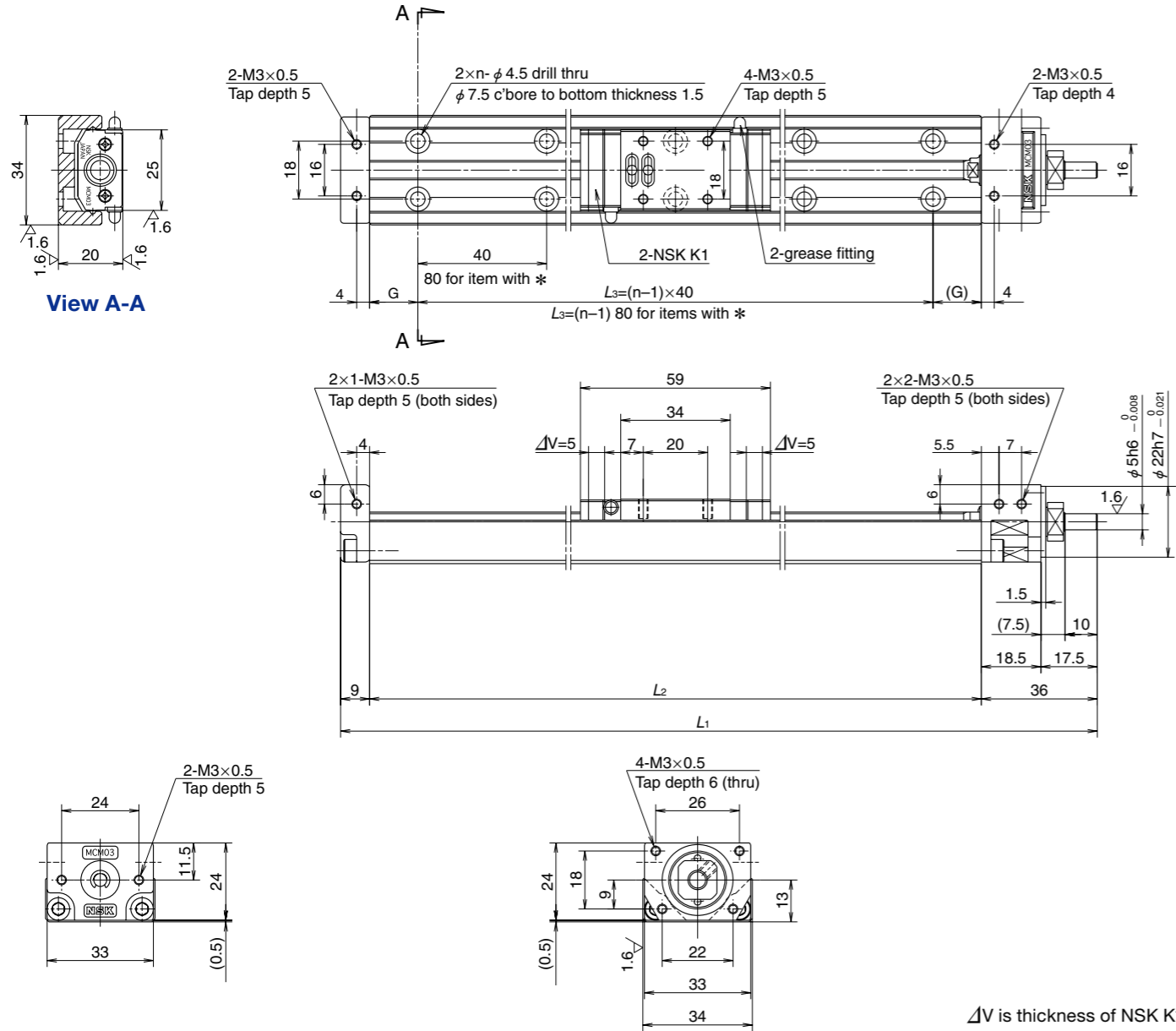


## MCM Series Dimension Tables

### MCM03

Ball screw lead 1 and 2

Accuracy grade: Precision (P)



Dimensions of MCM03 (single slider)

Part number	Nominal stroke (mm)	Stroke limit (mm) (K1 is not equipped)	Ball screw lead (mm)	Body length (mm)				Mounting hole No. $n$	Inertia $\times 10^{-5}$ (kg·m <sup>2</sup> )	Mass (kg)	Maximum rotational speed (mm/s)
				L <sub>1</sub>	L <sub>2</sub>	G	L <sub>3</sub>				
*MCM03005P01K00	50	56 (66)	1	160	115	17.5	80	2	0.015	0.6	50
*MCM03005P02K00			2								
MCM03010P01K00	100	131 (141)	1	235	190	15	160	5	0.021	0.7	50
MCM03010P02K00			2								
MCM03015P01K00	150	181 (191)	1	285	240	20	200	6	0.025	0.8	50
MCM03015P02K00			2								

Note: Bolt hole pitch L<sub>3</sub> on items marked with \* is 80 mm.

Monocarrier dynamic torque specifications (N·cm)

Ball screw lead (mm)	1	0.2 - 1.7
	2	

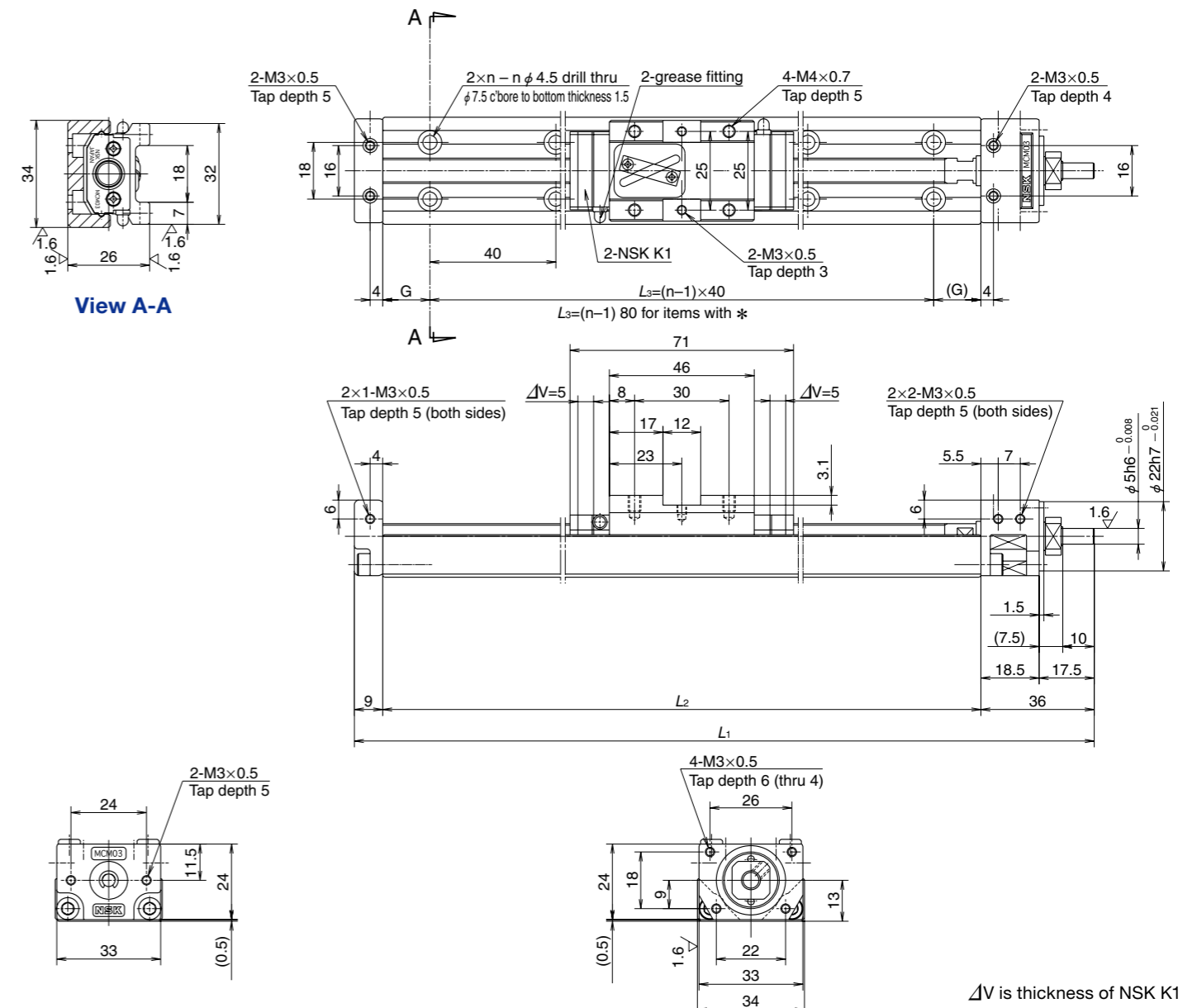
- Frictional resistance of NSK K1 is included in dynamic torque in table.
- Grease is packed into ball screw, linear guide parts and support unit.
- Consult NSK for life estimates under large moment loads.
- A spacer is required when using a cover unit, sensor unit or both together in ball screw lead of 1 and 2 mm. (See page 267)
- Stroke limit = stroke + (3 [margin] × 2)

► For basic load ratings, see page 303.

### MCM03

Ball screw lead 10 and 20

Accuracy grade: High grade (H)



Dimensions of MCM03 (single slider)

Part number	Nominal stroke (mm)	Stroke limit (mm) (K1 is not equipped)	Ball screw lead (mm)	Body length (mm)				Mounting hole No. $n$	Inertia $\times 10^{-5}$ (kg·m <sup>2</sup> )	Mass (kg)	Maximum rotational speed (mm/s)
				L <sub>1</sub>	L <sub>2</sub>	G	L <sub>3</sub>				
*MCM03010H10K00	50	69 (79)	10	185	140	30	80	2	0.080	0.6	
*MCM03010H12K00			12								
MCM03010H10K00	100	119 (129)	10	235	190	15	160	5	0.092	0.7	500
MCM03010H12K00			12								
MCM03015H10K00	150	169 (179)	10	285	240	20	200	6	0.105	0.8	500
MCM03015H12K00			12								
MCM03020H10K00	200	219 (229)	10	335	290	25	240	7	0.118	0.9	500
MCM03020H12K00			12								
MCM03025H10K00	250	269 (279)	10	385	340	30	280	8	0.131	1.0	500
MCM03025H12K00			12								

Note: Bolt hole pitch L<sub>3</sub> on items marked with \* is 80 mm.

Monocarrier dynamic torque specifications (N·cm)

Ball screw lead (mm)	10	0.3 - 3.0
	12	

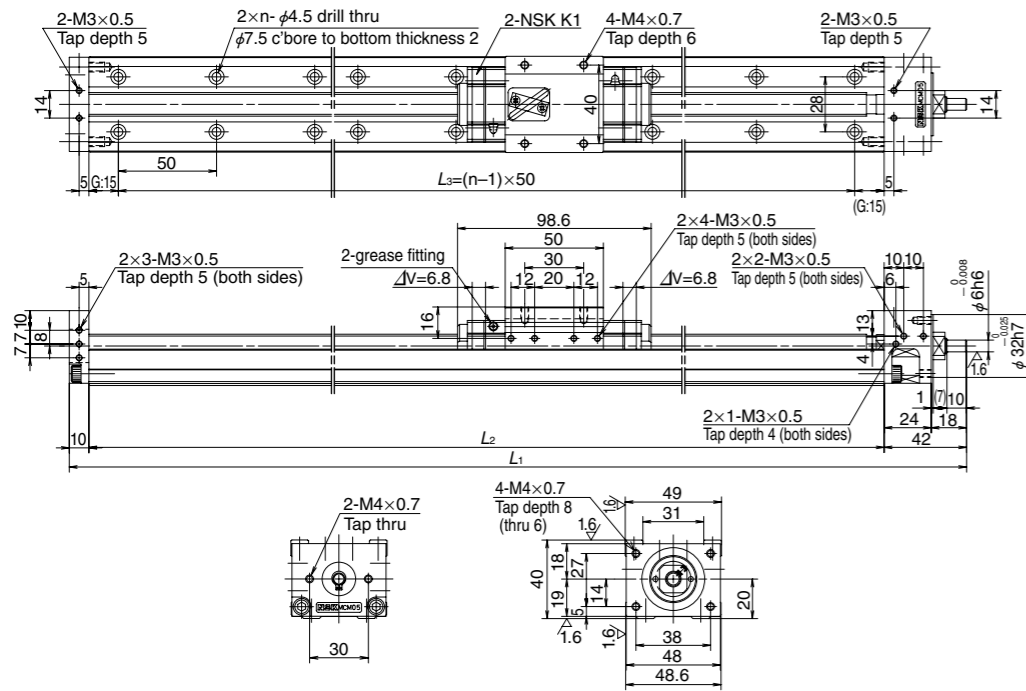
- Frictional resistance of NSK K1 is included in dynamic torque in table.
- Grease is packed into ball screw, linear guide parts and support unit.
- Consult NSK for life estimates under large moment loads.
- Stroke limit = stroke + (9.5 [margin] × 2)

► For basic load ratings, see page 303.

## MCM Series Dimension Tables

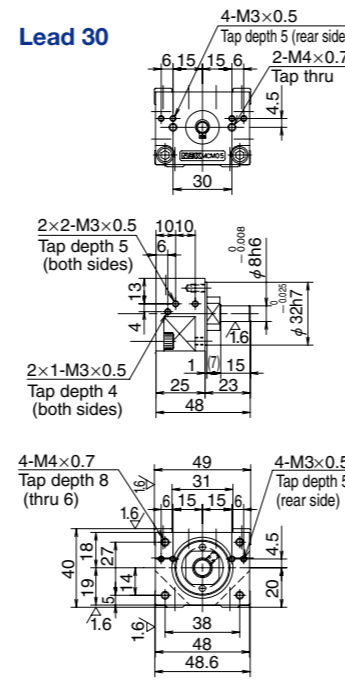
### MCM05

Lead 5, 10, 20



Accuracy grade: High grade (H)

Lead 30



$\Delta V$  is thickness of NSK K1

Dimensions of MCM05 (single slider)

Part number	Nominal stroke (mm)	Stroke limit (mm) (K1 is not equipped)	Ball screw lead (mm)	Body length (mm)			Mounting hole No. <i>n</i>	Inertia $\times 10^{-4}$ (kg·m <sup>2</sup> )	Mass (kg)	Maximum rotational speed (mm/s)
				<i>L</i> <sub>1</sub>	<i>L</i> <sub>2</sub>	<i>L</i> <sub>3</sub>				
MCM05005H05K00	50	80 (95)	5	232	180	150	4	0.025	1.4	250
MCM05005H10K00			10							500
MCM05005H20K00			20							1 000
MCM05010H05K00	100	130 (145)	5	282	230	200	5	0.031	1.6	250
MCM05010H10K00			10							500
MCM05010H20K00			20							1 000
MCM05015H05K00	150	180 (195)	5	332	280	250	6	0.036	1.8	250
MCM05015H10K00			10							500
MCM05015H20K00			20							1 000
MCM05020H05K00	200	230 (245)	5	382	330	300	7	0.042	2.0	250
MCM05020H10K00			10							500
MCM05020H20K00			20							1 000
MCM05025H05K00	250	280 (295)	5	432	380	350	8	0.051	2.2	250
MCM05025H10K00			10							500
MCM05025H20K00			20							1 000
MCM05030H05K00	300	330 (345)	5	482	430	400	9	0.053	2.3	250
MCM05030H10K00			10							500
MCM05030H20K00			20							1 000
MCM05030H30K00			30							2 500
MCM05040H05K00	400	430 (445)	5	582	530	500	11	0.064	2.4	250
MCM05040H10K00			10							500
MCM05040H20K00			20							1 000
MCM05040H30K00			30							2 500
MCM05050H05K00	500	530 (545)	5	682	630	600	13	0.074	2.7	250
MCM05050H10K00			10							500
MCM05050H20K00			20							1 000
MCM05050H30K00			30							2 200
MCM05060H05K00	600	630 (645)	5	782	730	700	15	0.076	3.1	250
MCM05060H10K00			10							500
MCM05060H20K00			20							1 000
MCM05060H30K00			30							2 500

Monocarrier dynamic torque specifications (N·cm)

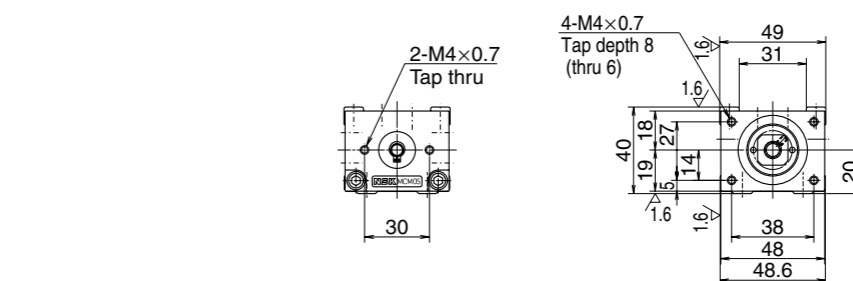
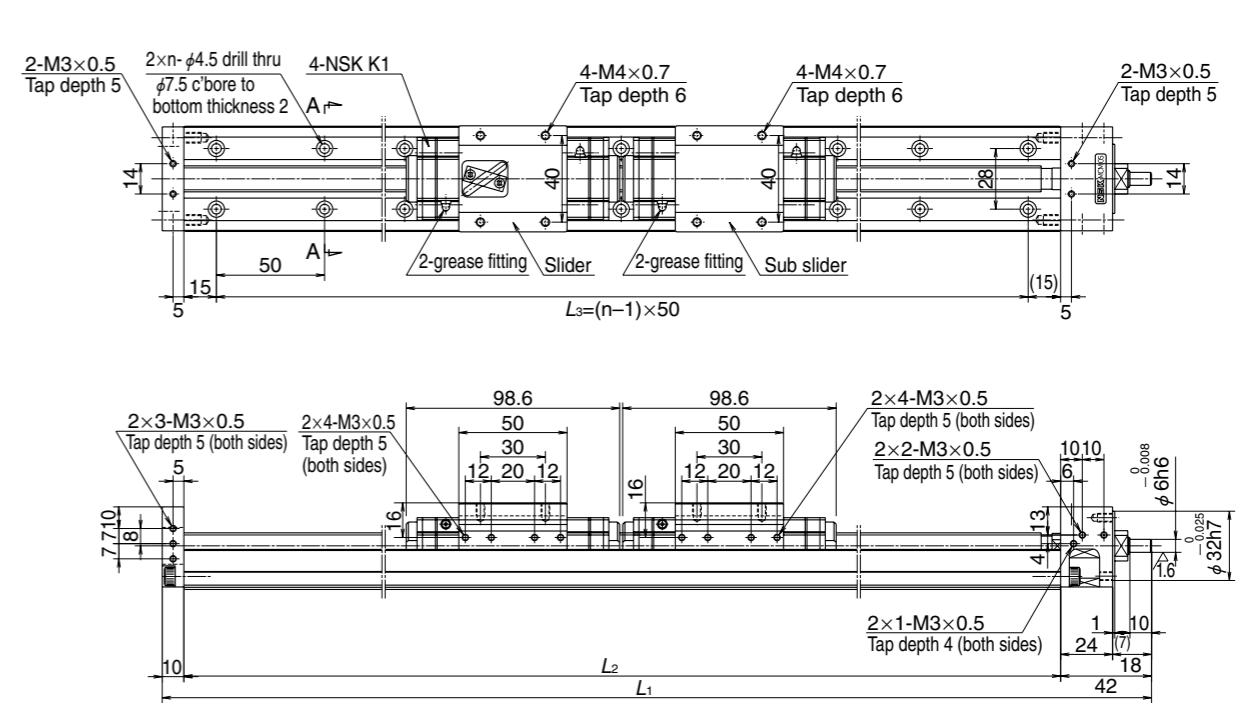
Ball screw lead (mm)	Torque (N·cm)	
	5	1.0 - 4.8
10	1.1 - 5.8	
20	1.6 - 7.9	
30	1.8 - 11.1	

- Frictional resistance of NSK K1 is included in dynamic torque in table.
- Grease is packed into ball screw, linear guide parts and support unit.
- Consult NSK for life estimates under large moment loads.
- Stroke limit = stroke + (15 [margin] × 2)

► For basic load ratings, see page 303.

### MCM05 (Double Slider)

Accuracy grade: High grade (H)



$\Delta V$  is thickness of NSK K1

Dimensions of MCM05 (double slider)

Part number	Nominal stroke (mm)	Stroke limit (mm) (K1 is not equipped)	Ball screw lead (mm)	Body length (mm)			Mounting hole No. <i>n</i>	Inertia $\times 10^{-4}$ (kg·m <sup>2</sup> )	Mass (kg)	Maximum rotational speed (mm/s)
				<i>L</i> <sub>1</sub>	<i>L</i> <sub>2</sub>	<i>L</i> <sub>3</sub>				
MCM05006H10D00	60	83 (110)	10	332	280	250	6	0.058	2.3	500
MCM05011H10D00	110	133 (160)	10	382	330	300	7	0.064	2.5	500
MCM05016H10D00	160	183 (210)	10	432	380	350	8	0.070	2.7	500
MCM05021H10D00	210	233 (260)	10	482	430	400	9	0.075	2.8	500
MCM05021H20D00			20							1 000
MCM05031H10D00	310	333 (360)	10	582	530	500	11	0.086	3.2	500
MCM05031H20D00			20							1 000
MCM05041H10D00	410	433 (460)	10	682	630	600	13	0.098	3.6	500
MCM05041H20D00			20							1 000
MCM05051H10D00	510	533 (560)	10	782	730	700	15	0.109	4.2	500
MCM05051H20D00			20							1 000

Monocarrier dynamic torque specifications (N·cm)

Ball screw lead (mm)	Torque (N·cm)	
	10	1.5 - 7.6
12	2.3 - 11.8	

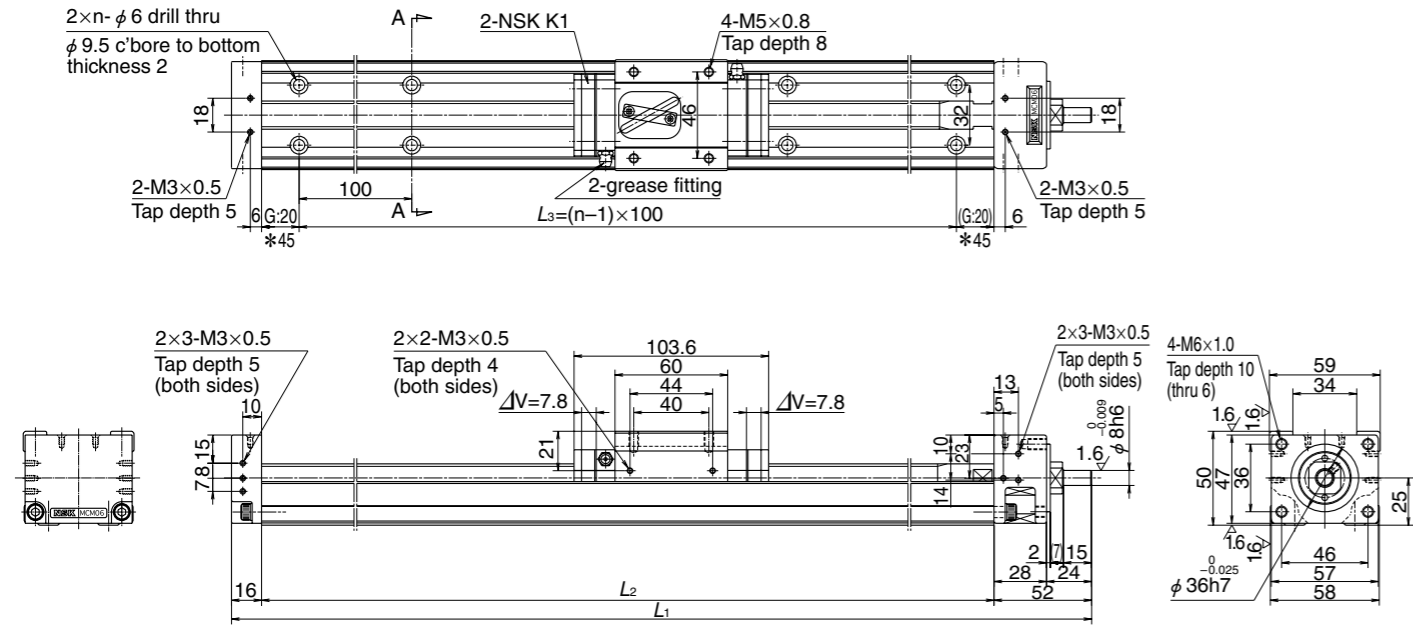
- Frictional resistance of NSK K1 is included in dynamic torque in table.
- Grease is packed into ball screw, linear guide parts and support unit.
- Consult NSK for life estimates under large moment loads.
- Stroke limit = stroke + (11.4 [margin] × 2)

► For basic load ratings, see page 303.

## MCM Series Dimension Tables

### MCM06

Accuracy grade: High grade (H)



$\Delta V$  is thickness of NSK K1

#### Dimensions of MCM06 (single slider)

Part number	Nominal stroke (mm)	Stroke limit (mm) (K1 is not equipped)	Ball screw lead (mm)	Body length (mm)			Mounting hole No. $n$	Inertia $\times 10^{-4}$ (kg·m <sup>2</sup> )	Mass (kg)	Maximum rotational speed (mm/s)
				$L_1$	$L_2$	$L_3$				
*MCM06005H05K00	50	85 (102)	5	258	190	100	2	0.083	2.7	250
*MCM06005H10K00			10					0.077		500
*MCM06005H20K00			20					0.122		1 000
MCM06010H05K00	100	135 (152)	5	308	240	200	3	0.103	3.0	250
MCM06010H10K00			10					0.092		500
MCM06010H20K00			20					0.137		1 000
*MCM06015H05K00	150	185 (202)	5	358	290	200	3	0.122	3.5	250
*MCM06015H10K00			10					0.106		500
*MCM06015H20K00			20					0.152		1 000
MCM06020H05K00	200	235 (252)	5	408	340	300	4	0.142	3.8	250
MCM06020H10K00			10					0.121		500
MCM06020H20K00			20					0.167		1 000
*MCM06025H05K00	250	285 (302)	5	458	390	300	4	0.161	4.2	250
*MCM06025H10K00			10					0.136		500
*MCM06025H20K00			20					0.181		1 000
MCM06030H05K00	300	335 (352)	5	508	440	400	5	0.180	4.5	250
MCM06030H10K00			10					0.150		500
MCM06030H20K00			20					0.196		1 000
MCM06040H05K00	400	435 (452)	5	608	540	500	6	0.219	5.2	250
MCM06040H10K00			10					0.180		500
MCM06040H20K00			20					0.225		1 000
MCM06050H05K00	500	535 (552)	5	708	640	600	7	0.258	6.0	250
MCM06050H10K00			10					0.209		500
MCM06050H20K00			20					0.255		1 000
MCM06060H05K00	600	635 (652)	5	808	740	700	8	0.297	6.7	250
MCM06060H10K00			10					0.239		500
MCM06060H20K00			20					0.284		1 000
MCM06070H05K00	700	735 (752)	5	908	840	800	9	0.335	7.4	250
MCM06070H10K00			10					0.268		490
MCM06070H20K00			20					0.314		980
MCM06080H05K00	800	835 (852)	5	1 008	940	900	10	0.374	8.1	250
MCM06080H10K00			10					0.298		390
MCM06080H20K00			20					0.343		770

Dimension G is 45 for items marked with \*.

#### Monocarrier dynamic torque specifications (N·cm)

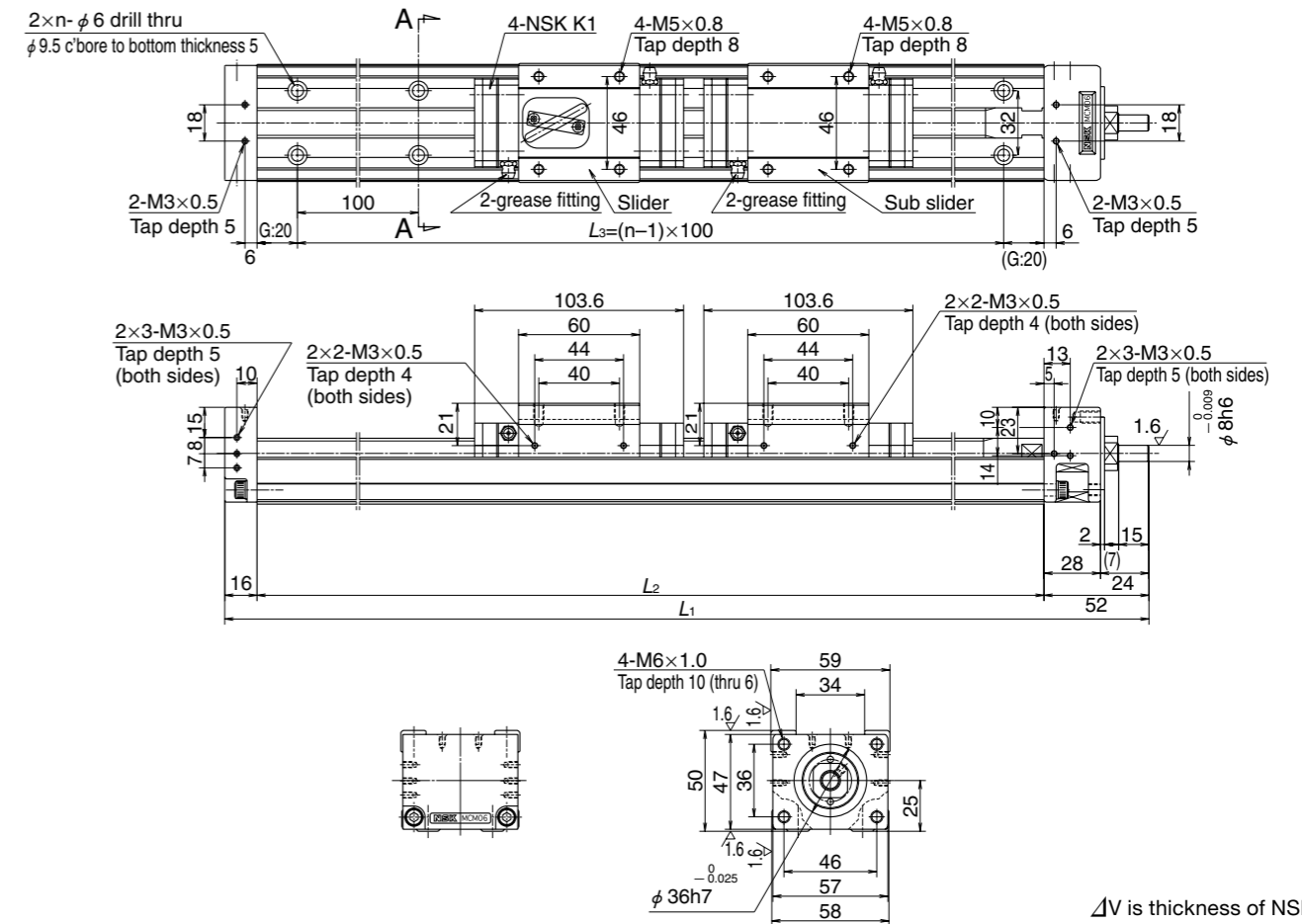
Ball screw lead (mm)	Torque (N·cm)	
	5	1.9 – 7.4
	10	2.2 – 8.6
20	2.8 – 11.0	

- Frictional resistance of NSK K1 is included in dynamic torque in table.
- Grease is packed into ball screw, linear guide parts and support unit.
- Consult NSK for life estimates under large moment loads.
- Stroke limit = stroke + (17.5 [margin] × 2)

► For basic load ratings, see page 303.

### MCM06 (Double Slider)

Accuracy grade: High grade (H)



$\Delta V$  is thickness of NSK K1

#### Dimensions of MCM06 (double slider)

Part number	Nominal stroke (mm)	Stroke limit (mm) (K1 is not equipped)	Ball screw lead (mm)	Body length (mm)			Mounting hole No. $n$	Inertia $\times 10^{-4}$ (kg·m <sup>2</sup> )	Mass (kg)	Maximum rotational speed (mm/s)
				$L_1$	$L_2$	$L_3$				
MCM06011H05D00	110	133 (164)	5	408	340	300	4	0.145	4.4	250
MCM06011H10D00			10					0.136		500
MCM06021H05D00	210	233 (264)	5	508	440	400	5	0.184	5.1	250
MCM06021H10D00			10					0.166		500
MCM06021H20D00			20					0.257		1 000
MCM06031H05D00	310	333 (364)	5	608	540	500	6	0.223	5.8	250
MCM06031H10D00			10					0.195		500
MCM06031H20D00			20					0.286		1 000
MCM06041H05D00	410	433 (464)	5	708	640	600	7	0.262	6.6	250
MCM06041H10D00			10					0.224		500
MCM06041H20D00			20					0.316		1 000
MCM06051H10D00	510	533 (564)	10	808	740	700	8	0.254	7.3	500
MCM06051H20D00			20					0.345		1 000
MCM06061H10D00	610	633 (664)	10	908	840	800	9	0.283	8.0	500
MCM06061H20D00			20					0.375		1 000
MCM06071H10D00	710	733 (764)	10	1 008	940	900	10	0.313	8.7	490
MCM06071H20D00			20					0.404		980

#### Monocarrier dynamic torque specifications (N·cm)

Ball screw lead (mm)	Torque (N·cm)	
	5	2.3 – 8.5
	10	2.7 – 10.9
20	4.0 – 15.9	

- Frictional resistance of NSK K1 is included in dynamic torque in table.
- Grease is packed into ball screw, linear guide parts and support unit.
- Consult NSK for life estimates under large moment loads.
- Stroke limit = stroke + (11.4 [margin] × 2)

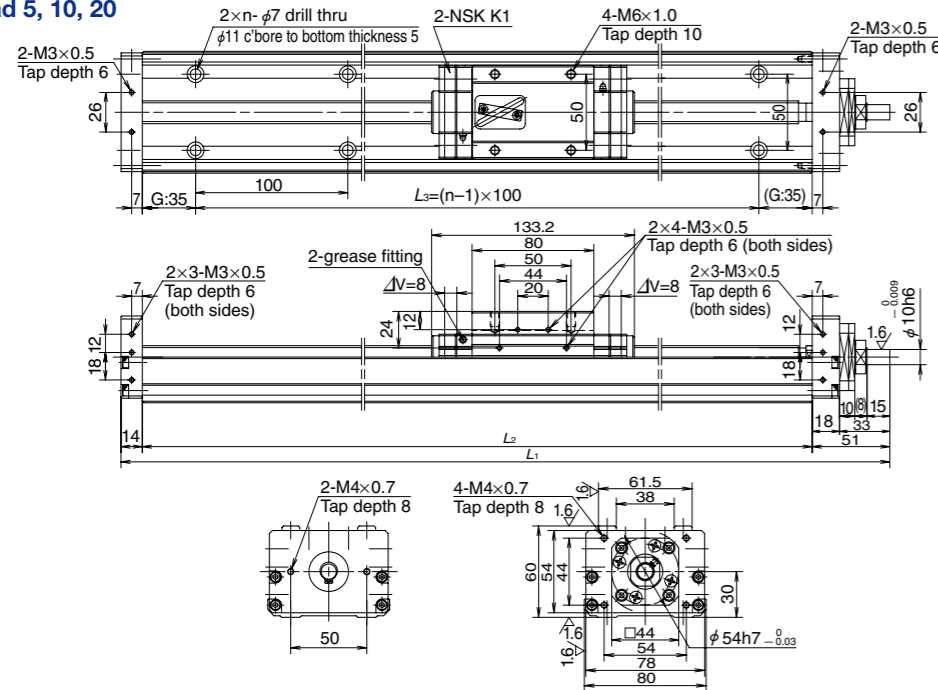
► For basic load ratings, see page 303.

## MCM Series Dimension Tables

## MCM08

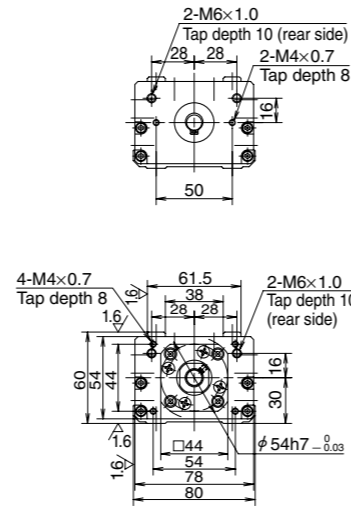
## MCM08 (Double Slider)

Lead 5, 10, 20



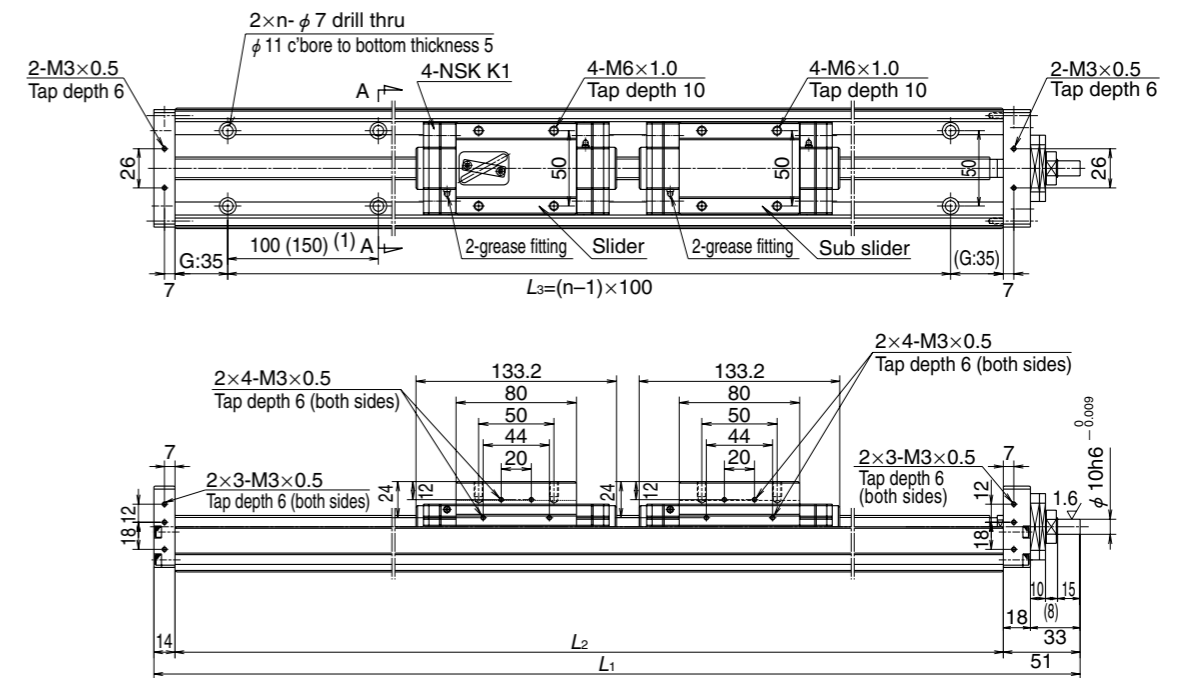
Accuracy grade: High grade (H)

Lead 30



ΔV is thickness of NSK K1

Accuracy grade: High grade (H)



### Dimensions of MCM08 (single slider)

Part number	Nominal stroke (mm)	Stroke limit (mm) (K1 is not equipped)	Ball screw lead (mm)	Body length (mm)			Mounting hole No. n	Inertia ×10 <sup>-4</sup> (kg·m <sup>2</sup> )	Mass (kg)	Maximum rotational speed (mm/s)
				L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>				
*MCM08005H05K00	50	85 (101)	5	285	220	100	2	0.101	4.1	250
*MCM08005H10K00			10							500
MCM08010H05K00	100	135 (151)	5	335	270	200	3	0.120	4.6	250
MCM08010H10K00			10							500
MCM08010H20K00			20							1 000
*MCM08015H05K00	150	185 (201)	5	385	320	200	3	0.139	5.1	250
*MCM08015H10K00			10							500
*MCM08015H20K00			20							1 000
MCM08020H05K00	200	235 (251)	5	435	370	300	4	0.159	5.5	250
MCM08020H10K00			10							500
MCM08020H20K00			20							1 000
*MCM08025H05K00	250	285 (301)	5	485	420	300	4	0.178	6.0	250
*MCM08025H10K00			10							500
*MCM08025H20K00			20							1 000
MCM08030H05K00	300	335 (351)	5	535	470	400	5	0.198	6.5	250
MCM08030H10K00			10							500
MCM08030H20K00			20							1 000
MCM08040H05K00	400	435 (451)	5	635	570	500	6	0.236	7.4	250
MCM08040H10K00			10							500
MCM08040H20K00			20							1 000
MCM08040H30K00			30							2 500
MCM08050H05K00	500	535 (551)	5	735	670	600	7	0.275	8.4	250
MCM08050H10K00			10							500
MCM08050H20K00			20							1 000
MCM08050H30K00			30							2 500
MCM08060H05K00	600	635 (651)	5	835	770	700	8	0.314	9.3	250
MCM08060H10K00			10							500
MCM08060H20K00			20							1 000
MCM08060H30K00			30							1 860
MCM08070H05K00	700	735 (751)	5	935	870	800	9	0.353	10.5	250
MCM08070H10K00			10							500
MCM08070H20K00			20							1 000
MCM08070H30K00			30							1 425
MCM08080H05K00	800	835 (851)	5	1 035	970	900	10	0.391	11.2	195
MCM08080H10K00			10							390
MCM08080H20K00			20							780

Dimension G is 60 for items marked with \*.

### Monocarrier dynamic torque specifications (N·cm)

Ball screw lead (mm)	5	1.0 - 5.9
10	2.0 - 7.8	
20	2.5 - 10.8	
30	2.8 - 12.0	

- Frictional resistance of NSK K1 is included in dynamic torque in table.
- Grease is packed into ball screw, linear guide parts and support unit.
- Consult NSK for life estimates under large moment loads.
- Stroke limit = stroke + (17.5 [margin] × 2)

► For basic load ratings, see page 303.

### Dimensions of MCM08 (double slider)

Part number	Nominal stroke (mm)	Stroke limit (mm) (K1 is not equipped)	Ball screw lead (mm)	Body length (mm)			Mounting hole No. n	Inertia ×10 <sup>-4</sup> (kg·m <sup>2</sup> )	Mass (kg)	Maximum rotational speed (mm/s)
				L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>				
*MCM08008H10D00	80	104 (136)	10	435	370	300	3	0.169	6.5	500
MCM08018H10D00	180	204 (236)	10	535	470	400	5	0.199	7.5	500
MCM08018H20D00			20							1 000
MCM08028H10D00	280	304 (336)	10	635	570	500	6	0.228	8.4	500
MCM08028H20D00			20							1 000
MCM08038H10D00	380	404 (436)	10	735	670	600	7	0.257	9.4	500
MCM08038H20D00			20							1 000
MCM08048H10D00	480	504 (536)	10	835	770	700	8	0.287	10.3	500
MCM08048H20D00			20							1 000
MCM08058H10D00	580	604 (636)	10	935	870	800	9	0.316	11.5	500
MCM08058H20D00			20							1 000
MCM08068H10D00	680	704 (736)	10	1 035	970	900	10	0.346	12.2	500
MCM08068H20D00			20							1 000

Dimension (1) is 150 mm for item marked with \*.

### Monocarrier dynamic torque specifications (N·cm)

Ball screw lead (mm)	10	2.5 - 10.8
20	4.0 - 17.2	

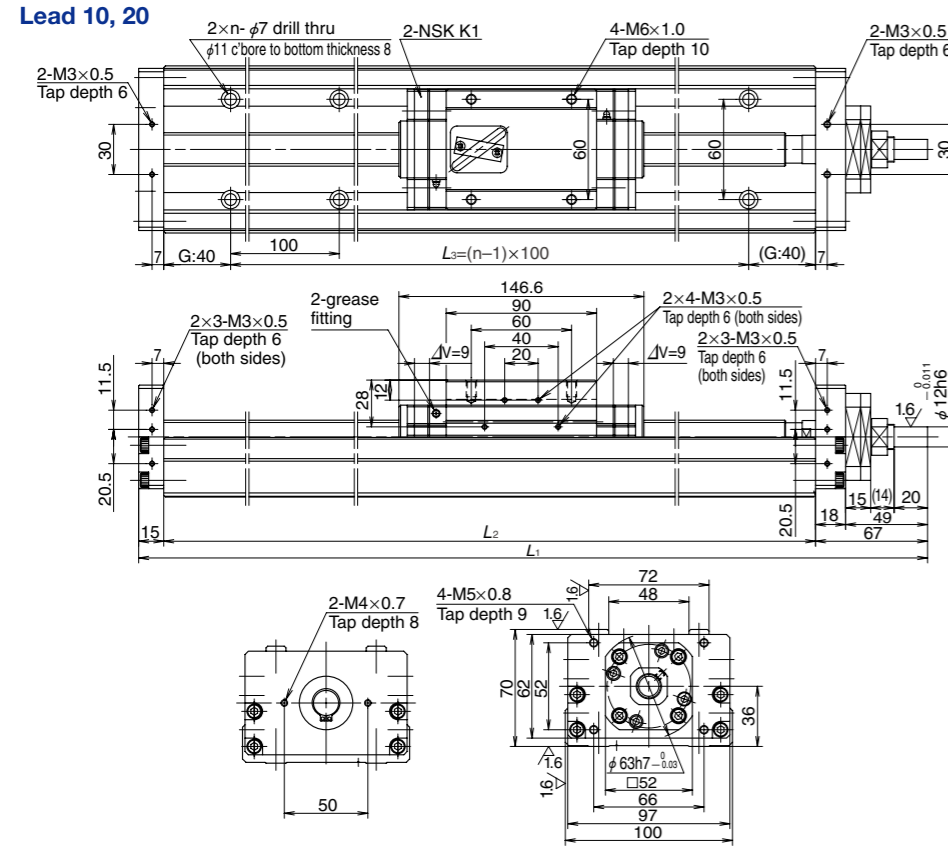
- Frictional resistance of NSK K1 is included in dynamic torque in table.
- Grease is packed into ball screw, linear guide parts and support unit.
- Consult NSK for life estimates under large moment loads.
- Stroke limit = stroke + (11.8 [margin] × 2)

► For basic load ratings, see page 303.

## MCM Series Dimension Tables

### MCM10

Accuracy grade: High grade (H)



Dimensions of MCM10 (single slider)

Part number	Nominal stroke (mm)	Stroke limit (mm) (K1 is not equipped)	Ball screw lead (mm)	Body length (mm)			Mounting hole No. $n$	Inertia $\times 10^{-4}$ (kg·m <sup>2</sup> )	Mass (kg)	Maximum rotational speed (mm/s)
				$L_1$	$L_2$	$L_3$				
MCM10010H10K00	100	130	10	362	280	200	3	0.332	7.8	500
MCM10010H20K00		(151)	20					0.446		1 000
◆ MCM10015H10K00	150	180	10	412	330	300	4	0.378	8.7	500
◆ MCM10015H20K00		(201)	20					0.492		1 000
MCM10020H10K00	200	230	10	462	380	300	4	0.425	9.5	500
MCM10020H20K00		(251)	20					0.539		1 000
◆ MCM10025H10K00	250	280	10	512	430	400	5	0.472	10.4	500
◆ MCM10025H20K00		(301)	20					0.586		1 000
MCM10030H10K00	300	330	10	562	480	400	5	0.519	11.2	500
MCM10030H20K00		(351)	20					0.633		1 000
MCM10040H10K00	400	430	10	662	580	500	6	0.612	13.0	500
MCM10040H20K00		(451)	20					0.726		1 000
MCM10050H10K00	500	530	10	762	680	600	7	0.706	14.6	500
MCM10050H20K00		(551)	20					0.820		1 000
MCM10050H30K00			30					1.010		2 500
MCM10060H10K00	600	630	10	862	780	700	8	0.800	16.3	500
MCM10060H20K00		(651)	20					0.914		1 000
MCM10060H30K00			30					1.104		2 500
MCM10070H10K00	700	730	10	962	880	800	9	0.893	18.0	500
MCM10070H20K00		(751)	20					1.007		1 000
MCM10070H30K00			30					1.197		1 920
MCM10080H10K00	800	830	10	1 062	980	900	10	0.893	19.7	500
MCM10080H20K00		(851)	20					1.007		1 000
MCM10080H30K00			30					1.197		1 510
MCM10090H10K00	900	930	10	1 162	1 080	1 000	11	1.081	21.4	440
MCM10090H20K00		(951)	20					1.195		880
* MCM10100H10K00	1 000	1 030	10	1 262	1 180	1 000	11	1.174	23.1	360
* MCM10100H20K00		(1 051)	20					1.288		720

Dimension G is 90 for items marked with \*.  
Dimension G is 15 for items marked with ◆.

Monocarrier dynamic torque specifications (N·cm)

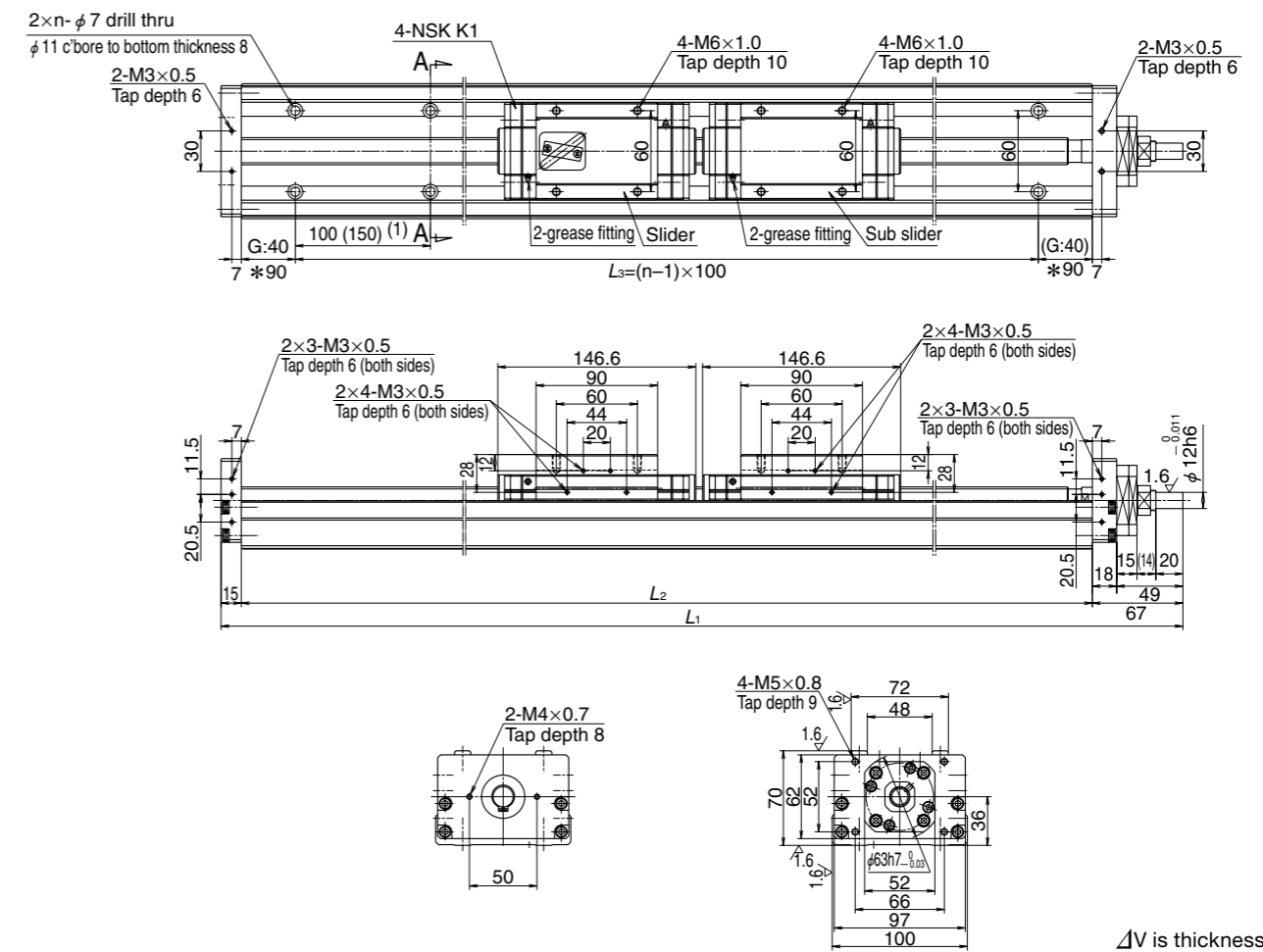
Ball screw lead (mm)	10	
	2.7	10.8
	3.1	12.7
	30	
	5.1	18.0

- Frictional resistance of NSK K1 is included in dynamic torque in table.
- Grease is packed into ball screw, linear guide parts and support unit.
- Consult NSK for life estimates under large moment loads.
- Stroke limit = stroke + (15 [margin] × 2)

► For basic load ratings, see page 303.

### MCM10 (Double Slider)

Accuracy grade: High grade (H)



Dimensions of MCM10 (double slider)

Part number	Nominal stroke (mm)	Stroke limit (mm) (K1 is not equipped)	Ball screw lead (mm)	Body length (mm)			Mounting hole No. $n$	Inertia $\times 10^{-4}$ (kg·m <sup>2</sup> )	Mass (kg)	Maximum rotational speed (mm/s)
				$L_1$	$L_2$	$L_3$				
● MCM10007H10D00	70	86(122)	10	462	380	300	3	0.463	11.0	500
MCM10017H10D00	170	186	10	562	480	400	5	0.557	12.7	500
MCM10017H20D00		(222)	20					0.785		1 000
MCM10027H10D00	270	286	10	662	580	500	6	0.650	13.4	500
MCM10027H20D00		(322)	20					0.878		1 000
MCM10037H10D00	370	386	10	762	680	600	7	0.744	15.1	500
MCM10037H20D00		(422)	20					0.972		1 000
MCM10047H10D00	470	486	10	862	780	700	8	0.838	17.8	500
MCM10047H20D00		(522)	20					1.066		1 000
MCM10057H10D00	570	586	10	962	880	800	9	0.931	19.5	500
MCM10057H20D00		(622)	20					1.159		1 000
MCM10067H10D00	670	686	10	1 062	980	900	10	1.025	21.2	500
MCM10067H20D00		(722)	20					1.253		1 000
* MCM10087H10D00	870	886	10	1 262	1 180	1 000	11	1.212	23.6	440
* MCM10087H20D00		(922)	20					1.440		880

Dimension G is 90 for items marked with \*.  
Dimension (1) is 150 mm for item marked with ●.

Monocarrier dynamic torque specifications (N·cm)

Ball screw lead (mm)	10	
	4.2	15.6
	5.0	19.6

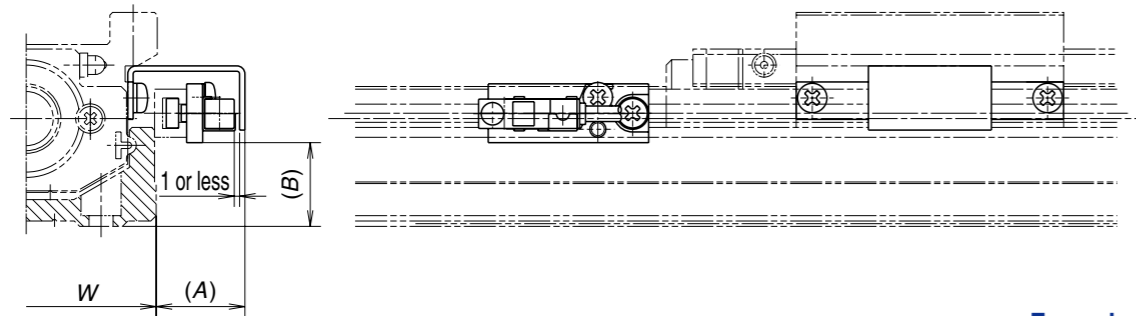
- Frictional resistance of NSK K1 is included in dynamic torque in table.
- Grease is packed into ball screw, linear guide parts and support unit.
- Consult NSK for life estimates under large moment loads.
- Stroke limit = stroke + (8.4 [margin] × 2)

► For basic load ratings, see page 303.

## Sensor Unit for MCM Series

## Accessories

### Proximity Switch



Example of assembly

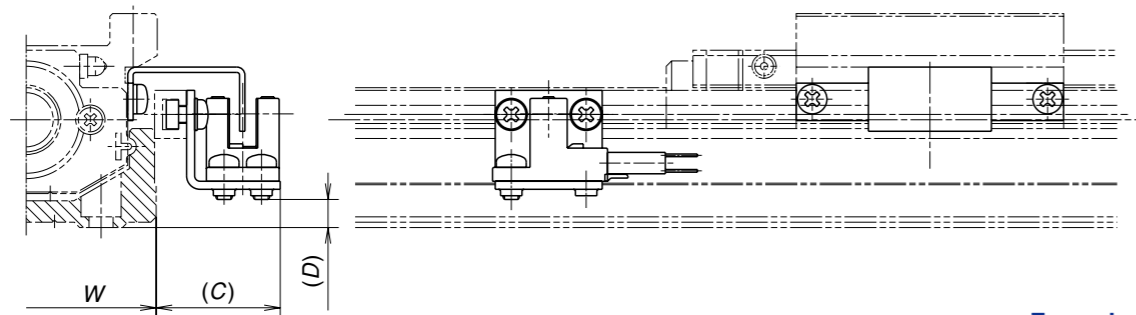
Type	Part number			Dimension A (mm)	Dimension B (mm)	Body width W (mm)
MCM02	MC-SR02-00	MC-SR02-01	MC-SR02-02	17	2	28
MCM03	MC-SR03-10	MC-SR03-11	MC-SR03-12	17	3	34
MCM05	MC-SR05-10	MC-SR05-11	MC-SR05-12	17	15	48.6
MCM06	MC-SR06-10	MC-SR06-11	MC-SR06-12	17	19	58
MCM08	MC-SR08-10	MC-SR08-11	MC-SR08-12	16	27	80
MCM10	MC-SR10-10	MC-SR10-11	MC-SR10-12	16	35	100
Quantity	Proximity switch (a-contact)	—	3	1	E2S-W13 (OMRON Corp.)	
	Proximity switch (b-contact)	3	—	2	E2S-W14 (OMRON Corp.)	

Note 1: See page 305 for proximity switch specifications.

Note 2: Sensor unit consists of sensors, sensor dog and sensor mounting parts.

Note 3: A spacer plate is required when using a cover unit or sensor unit for MCM03 with a lead of 1 or 2 mm. (see page 267)

### Photo Sensor



Example of assembly

Type	Part number	Dimension C (mm)	Dimension D (mm)	Body width W (mm)	Notes
MCM03	MC-SR03-13	24	0.5	34	EE-SX674 (OMRON Corp.) 3 sets (EE-1001 connector attachment)
MCM05	MC-SR05-13	24	5	48.6	
MCM06	MC-SR06-13	24	9	58	
MCM08	MC-SR08-13	23	17	80	
MCM10	MC-SR10-13	22	24	100	

Note 1: See page 306 for photo sensor specifications.

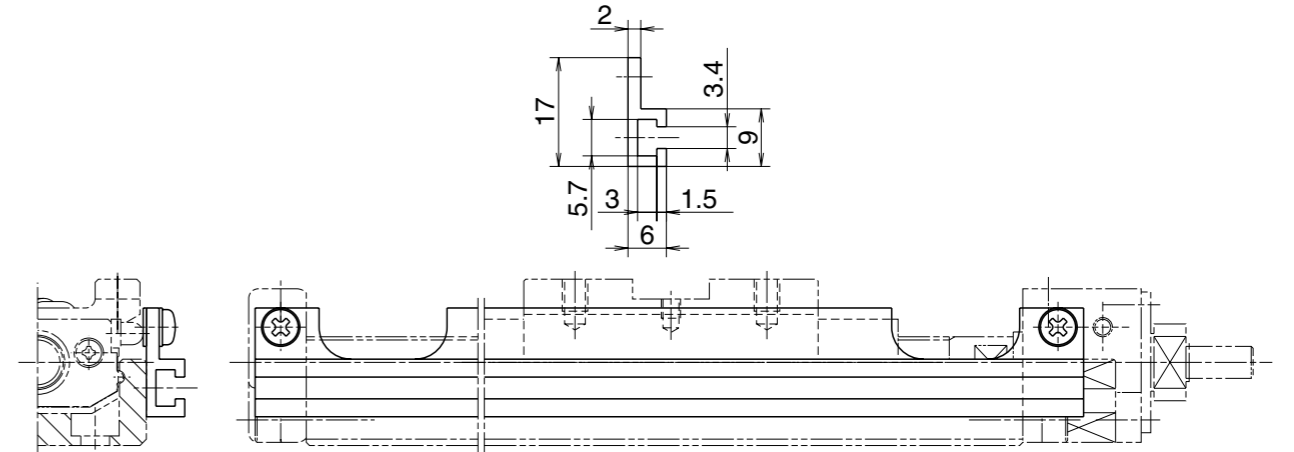
Note 2: Sensor unit consists of sensors, sensor dog and sensor mounting parts.

Note 3: A spacer plate is required when using a cover unit or sensor unit for MCM03 with lead of 1 or 2 mm. (see page 267)

## Sensor Rail

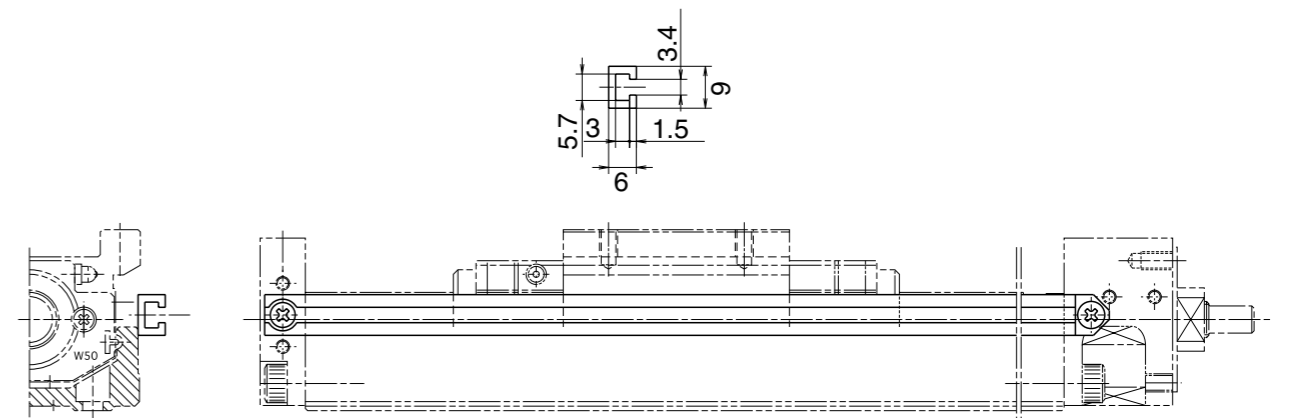
## Accessories

### Sensor Rail for MCM03: MC-SRL3- \* \* \* \*



Example of assembly

### Sensor Rail for MCM05: MC-SRL5- \* \* \* \*



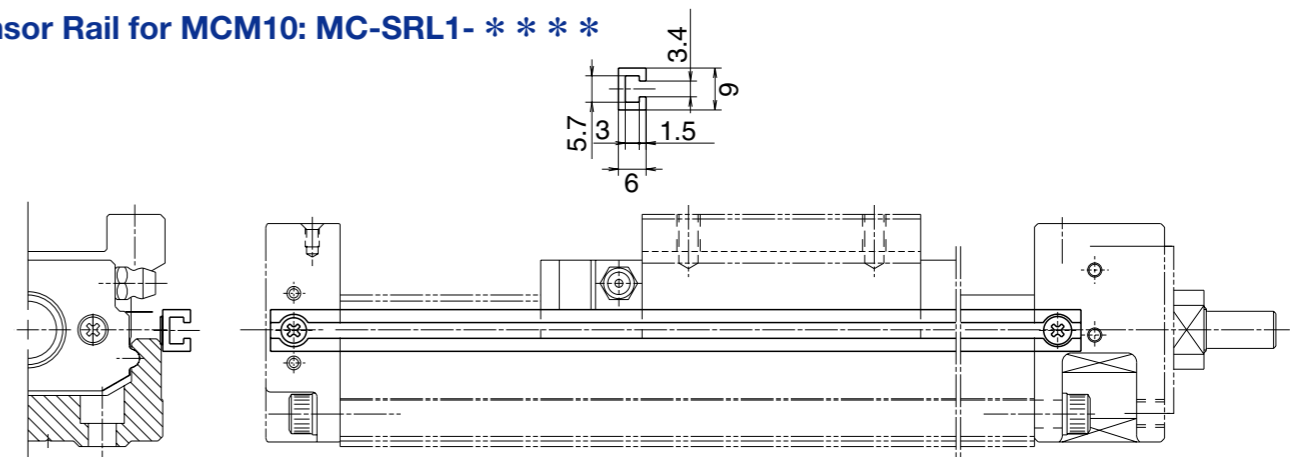
Example of assembly

### Sensor Rail for MCM02: MC-SRL2- \* \* \* \*

### Sensor Rail for MCM06: MC-SRL6- \* \* \* \*

### Sensor Rail for MCM08: MC-SRL8- \* \* \* \*

### Sensor Rail for MCM10: MC-SRL1- \* \* \* \*



Example of assembly

\* \* \* \* is same as rail dimension L<sub>2</sub>.

Please assemble the attached seat between the sensor rail and the support unit for MCM03, MCM05, MCM06, and MCM08.

### MCM Series and Sensor Rail Combination Table

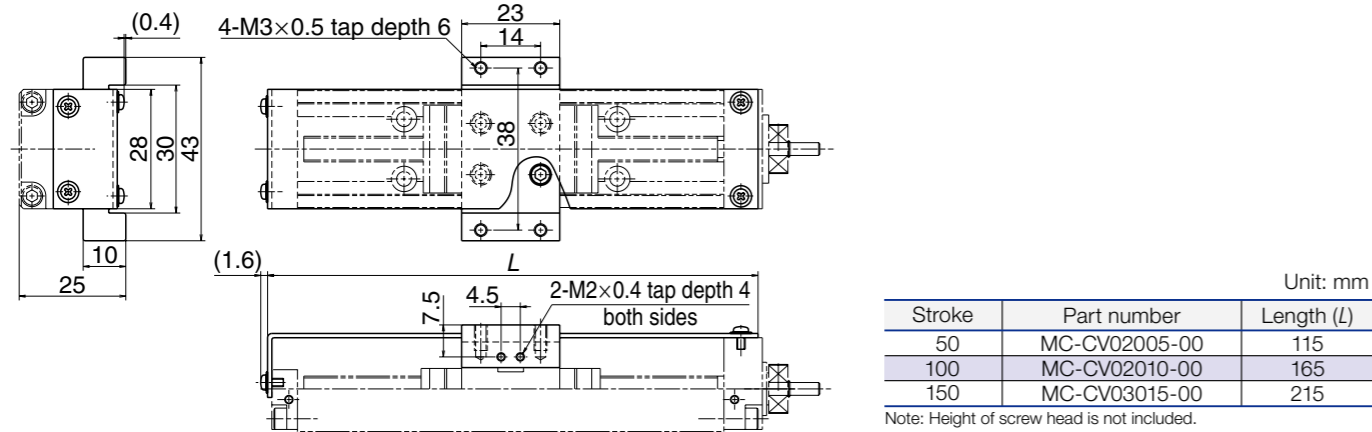
Nominal size	Body length $L_2$ (mm)	Part number	Sensor rail part number	
MCM02	100	MCM02005H01K MCM02005P01K MCM02005H02K MCM02005P02K	MC-SRL2-0100	
		MCM02010H01K MCM02010P01K MCM02010H02K MCM02010P02K		MC-SRL2-0150
		MCM02015H01K MCM02015P01K MCM02015H02K MCM02015P02K		
MCM03	115	MCM03005P01K00 MCM03005P02K00	MC-SRL3-0115	
	140	MCM03005H10K00 MCM03005H12K00	MC-SRL3-0140	
	190	MCM03010P01K00 MCM03010P02K00 MCM03010H10K00 MCM03010H12K00	MC-SRL3-0190	
		MCM03015P01K00 MCM03015P02K00 MCM03015H10K00 MCM03015H12K00		MC-SRL3-0240
	290	MCM03020H10K00 MCM03020H12K00	MC-SRL3-0290	
	340	MCM03025H10K00 MCM03025H12K00	MC-SRL3-0340	
MCM05	180	MCM05005H05K00 MCM05005H10K00	MC-SRL5-0180	
	230	MCM05010H05K00 MCM05010H10K00 MCM05010H20K00	MC-SRL5-0230	
		MCM05015H05K00 MCM05015H10K00 MCM05015H20K00 MCM05006H10D00		MC-SRL5-0280
	330	MCM05020H05K00 MCM05020H10K00 MCM05020H20K00 MCM05011H10D00	MC-SRL5-0330	
		MCM05025H05K00 MCM05025H10K00 MCM05025H20K00 MCM05016H10D00		MC-SRL5-0380
	430	MCM05030H05K00 MCM05030H10K00 MCM05030H20K00 MCM05030H30K00 MCM05021H10D00 MCM05021H20D00	MC-SRL5-0430	
		MCM05040H05K00 MCM05040H10K00 MCM05040H20K00 MCM05040H30K00 MCM05031H10D00 MCM05031H20D00		MC-SRL5-0530
		MCM05050H05K00 MCM05050H10K00 MCM05050H20K00 MCM05050H30K00 MCM05041H10D00 MCM05041H20D00		

Nominal size	Body length $L_2$ (mm)	Part number	Sensor rail part number
MCM05	730	MCM05060H05K00 MCM05060H10K00 MCM05060H20K00 MCM05060H30K00 MCM05051H10D00 MCM05051H20D00	MC-SRL5-0730
		MCM06005H05K00 MCM06005H10K00 MCM06005H20K00	
MCM06	190	MCM06010H05K00 MCM06010H10K00 MCM06010H20K00	MC-SRL6-0240
	240	MCM06015H05K00 MCM06015H10K00 MCM06015H20K00	MC-SRL6-0290
	290	MCM06020H05K00 MCM06020H10K00 MCM06020H20K00 MCM06011H05D00 MCM06011H10D00	MC-SRL6-0340
		MCM06025H05K00 MCM06025H10K00 MCM06025H20K00	
	390	MCM06030H05K00 MCM06030H10K00 MCM06030H20K00 MCM06021H05D00 MCM06021H10D00	MC-SRL6-0440
		MCM06035H05K00 MCM06035H10K00 MCM06035H20K00 MCM06022H05D00 MCM06022H10D00	
	440	MCM06040H05K00 MCM06040H10K00 MCM06040H20K00 MCM06031H05D00 MCM06031H10D00 MCM06031H20D00	MC-SRL6-0540
		MCM06045H05K00 MCM06045H10K00 MCM06045H20K00 MCM06032H05D00 MCM06032H10D00 MCM06032H20D00	
	540	MCM06050H05K00 MCM06050H10K00 MCM06050H20K00 MCM06041H05D00 MCM06041H10D00 MCM06041H20D00	MC-SRL6-0640
		MCM06055H05K00 MCM06055H10K00 MCM06055H20K00 MCM06042H05D00 MCM06042H10D00 MCM06042H20D00	
640	MCM06060H05K00 MCM06060H10K00 MCM06060H20K00 MCM06051H10D00 MCM06051H20D00	MC-SRL6-0740	
	MCM06065H05K00 MCM06065H10K00 MCM06065H20K00 MCM06052H10D00 MCM06052H20D00		MC-SRL6-0790
740	MCM06070H05K00 MCM06070H10K00 MCM06070H20K00 MCM06061H10D00 MCM06061H20D00	MC-SRL6-0840	
	MCM06075H05K00 MCM06075H10K00 MCM06075H20K00 MCM06062H10D00 MCM06062H20D00		MC-SRL6-0890
840	MCM06080H05K00 MCM06080H10K00 MCM06080H20K00 MCM06071H10D00 MCM06071H20D00	MC-SRL6-0940	
	MCM06085H05K00 MCM06085H10K00 MCM06085H20K00 MCM06072H10D00 MCM06072H20D00		MC-SRL6-0990

Nominal size	Body length $L_2$ (mm)	Part number	Sensor rail part number
MCM08	220	MCM08005H05K00 MCM08005H10K00	MC-SRL8-0220
		MCM08010H05K00 MCM08010H10K00 MCM08010H20K00	
	320	MCM08015H05K00 MCM08015H10K00 MCM08015H20K00	MC-SRL8-0320
		MCM08020H05K00 MCM08020H10K00 MCM08020H20K00 MCM08008H10D00	
	420	MCM08025H05K00 MCM08025H10K00 MCM08025H20K00	MC-SRL8-0420
		MCM08030H05K00 MCM08030H10K00 MCM08030H20K00 MCM08018H10D00 MCM08018H20D00	
	570	MCM08040H05K00 MCM08040H10K00 MCM08040H20K00 MCM08040H30K00 MCM08028H10D00 MCM08028H20D00	MC-SRL8-0570
		MCM08050H05K00 MCM08050H10K00 MCM08050H20K00 MCM08050H30K00 MCM08038H10D00 MCM08038H20D00	
	770	MCM08060H05K00 MCM08060H10K00 MCM08060H20K00 MCM08060H30K00 MCM08048H10D00 MCM08048H20D00	MC-SRL8-0770
		MCM08070H05K00 MCM08070H10K00 MCM08070H20K00 MCM08070H30K00 MCM08058H10D00 MCM08058H20D00	
970	MCM08080H05K00 MCM08080H10K00 MCM08080H20K00 MCM08080H30K00 MCM08068H10D00 MCM08068H20D00	MC-SRL8-0970	
	MCM10010H10K00 MCM10010H20K00		MC-SRL1-0280
MCM10	280	MCM10015H10K00 MCM10015H20K00	MC-SRL1-0330
	380	MCM10020H10K00 MCM10020H20K00 MCM10007H10K00	MC-SRL1-0380
	430	MCM10025H10K00 MCM10025H20K00	MC-SRL1-0430
	480	MCM10030H10K00 MCM10030H20K00 MCM10017H10K00 MCM10017H20K00	MC-SRL1-0480
		MCM10040H10K00 MCM10040H20K00 MCM10027H10K00 MCM10027H20K00	

Nominal size	Body length $L_2$ (mm)	Part number	Sensor rail part number	
MCM10	580	MCM10040H10K00 MCM10040H20K00 MCM10027H10K00 MCM10027H20K00	MC-SRL1-0580	
		MCM10050H10K00 MCM10050H20K00 MCM10050H30K00 MCM10037H10K00 MCM10037H20K00		MC-SRL1-0680
		MCM10060H10K00 MCM10060H20K00 MCM10060H30K00 MCM10047H10K00 MCM10047H20K00		
	880	MCM10070H10K00 MCM10070H20K00 MCM10070H30K00 MCM10057H10K00 MCM10057H20K00	MC-SRL1-0880	
		MCM10080H10K00 MCM10080H20K00 MCM10080H30K00 MCM10067H10K00 MCM10067H20K00		MC-SRL1-0980
	1 080	MCM10090H10K00 MCM10090H20K00	MC-SRL1-1080	
		MCM10100H10K00 MCM10100H20K00 MCM10087H10K00 MCM10087H20K00		MC-SRL1-1180

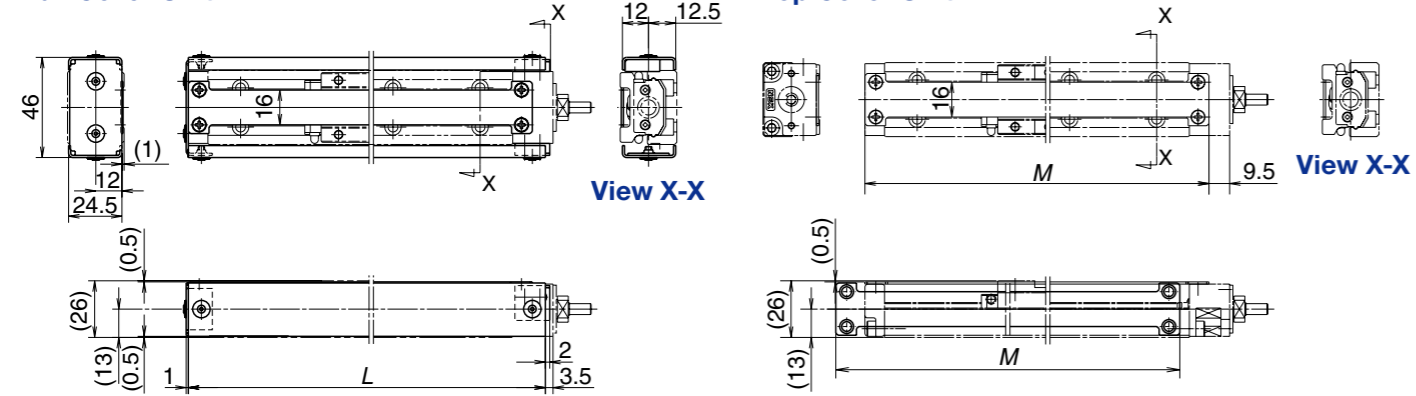
### Cover Unit for MCM02



### Cover Unit for MCM03

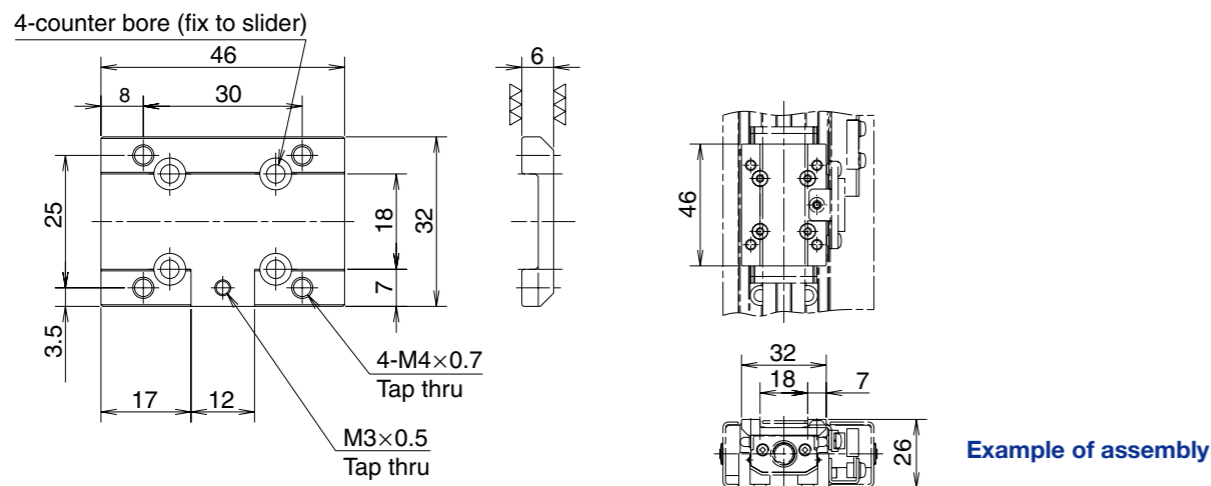
Note: Spacer (MC-SP03-00) is required for a main unit with ball screw lead of 1 or 2 mm.

#### Full Cover Unit



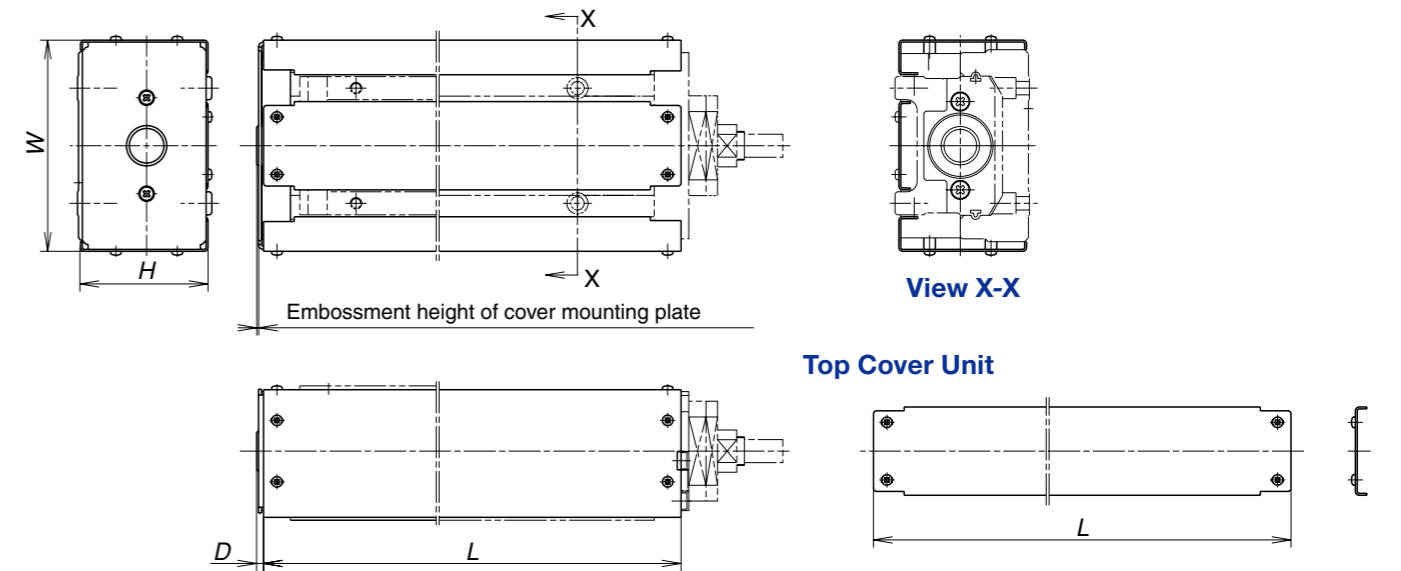
Note 1: Full-cover unit cannot be used when sensor unit is being used.  
Note 2: Height of screw head is not included.

### Spacer for MCM03 (accessory) MC-SP03-00 (for ball screw lead of 1 or 2 mm)



Example of assembly

### Cover Unit for MCM05, 06, 08, and 10



Part number	Stroke		Cover unit part number		Cover length			
	Single slider	Double slider	Top cover unit	Full cover unit*1	Length (L)	Height (H)	Width (W)	End part (D)
MCM05	50	—	MC-CV05005-01	MC-CV05005-00	200	38.5	65	2.6
	100	—	MC-CV05010-01	MC-CV05010-00	250			
	150	60	MC-CV05015-01	MC-CV05015-00	300			
	200	110	MC-CV05020-01	MC-CV05020-00	350			
	250	160	MC-CV05025-01	MC-CV05025-00	400			
	300	210	MC-CV05030-01	MC-CV05030-00	450			
	400	310	MC-CV05040-01	MC-CV05040-00	550			
	500	410	MC-CV05050-01	MC-CV05050-00	650			
MCM06	600	510	MC-CV05060-01	MC-CV05060-00	750	48.5	75	—**
	50	—	MC-CV06005-01	MC-CV06005-00	225			
	100	—	MC-CV06010-01	MC-CV06010-00	275			
	150	—	MC-CV06015-01	MC-CV06015-00	325			
	200	110	MC-CV06020-01	MC-CV06020-00	375			
	250	—	MC-CV06025-01	MC-CV06025-00	425			
	300	210	MC-CV06030-01	MC-CV06030-00	475			
	400	310	MC-CV06040-01	MC-CV06040-00	575			
MCM08	500	410	MC-CV06050-01	MC-CV06050-00	675	56.5	90	2.6
	600	510	MC-CV06060-01	MC-CV06060-00	775			
	700	610	MC-CV06070-01	MC-CV06070-00	875			
	800	710	MC-CV06080-01	MC-CV06080-00	975			
	50	—	MC-CV08005-01	MC-CV08005-00	248			
	100	—	MC-CV08010-01	MC-CV08010-00	298			
	150	—	MC-CV08015-01	MC-CV08015-00	348			
	200	80	MC-CV08020-01	MC-CV08020-00	398			
MCM10	250	—	MC-CV08025-01	MC-CV08025-00	448	66.5	110	3.6
	300	180	MC-CV08030-01	MC-CV08030-00	498			
	400	280	MC-CV08040-01	MC-CV08040-00	598			
	500	380	MC-CV08050-01	MC-CV08050-00	698			
	600	480	MC-CV08060-01	MC-CV08060-00	798			
	700	580	MC-CV08070-01	MC-CV08070-00	898			
	800	680	MC-CV08080-01	MC-CV08080-00	998			
	100	—	MC-CV10010-01	MC-CV10010-00	308			
150	—	MC-CV10015-01	MC-CV10015-00	358				
200	70	MC-CV10020-01	MC-CV10020-00	408				
250	—	MC-CV10025-01	MC-CV10025-00	458				
300	170	MC-CV10030-01	MC-CV10030-00	508				
400	270	MC-CV10040-01	MC-CV10040-00	608				
500	370	MC-CV10050-01	MC-CV10050-00	708				
600	470	MC-CV10060-01	MC-CV10060-00	808				
700	570	MC-CV10070-01	MC-CV10070-00	908				
800	670	MC-CV10080-01	MC-CV10080-00	1 008				
900	—	MC-CV10090-01	MC-CV10090-00	1 108				
1 000	870	MC-CV10100-01	MC-CV10100-00	1 208				

The dimensions of cover shown above do not include the head height of fixing machine screws. Add the head of machine screws of approximately 2.5 mm to the outer measurement of a cover unit. Set a margin for mechanical interference with surrounding components.

\*1 When using sensor unit, full-cover unit cannot be used.  
\*\* A cover mounting plate is not used for MCM06.

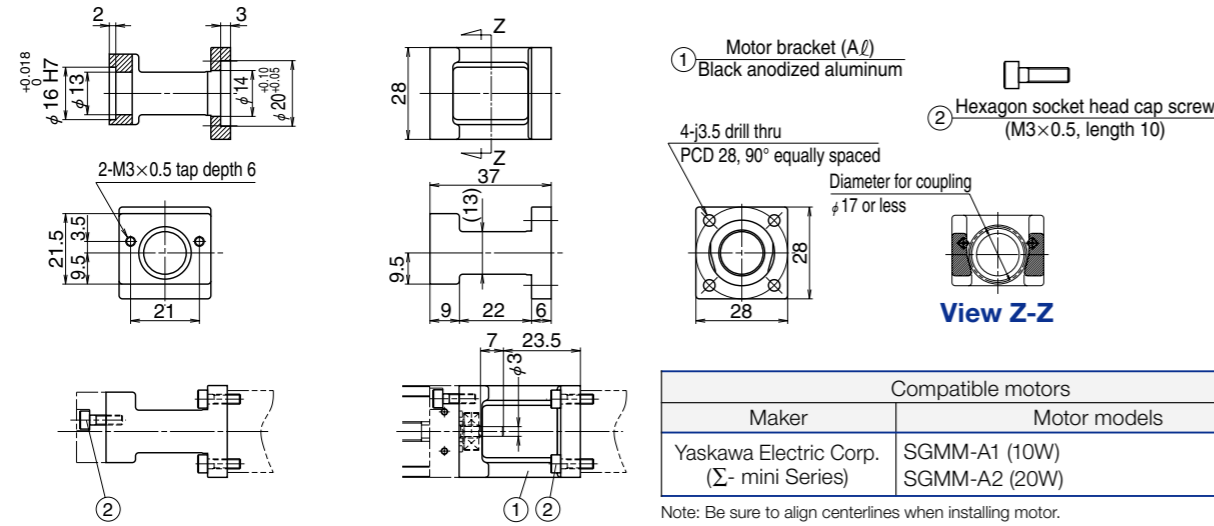


## Motor Bracket for MCM Series

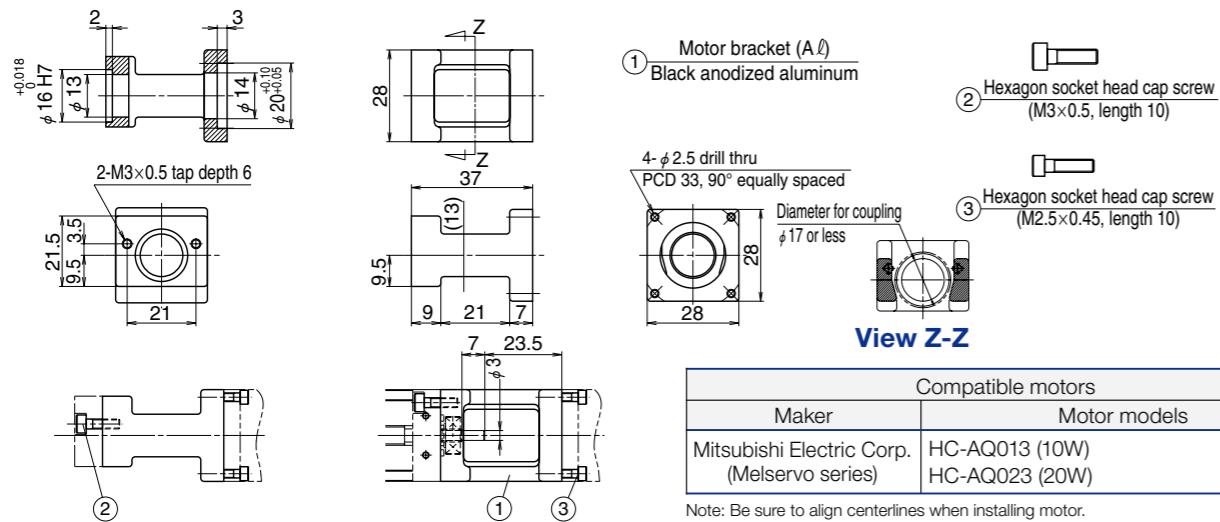
## Accessories

### Motor Bracket for MCM02

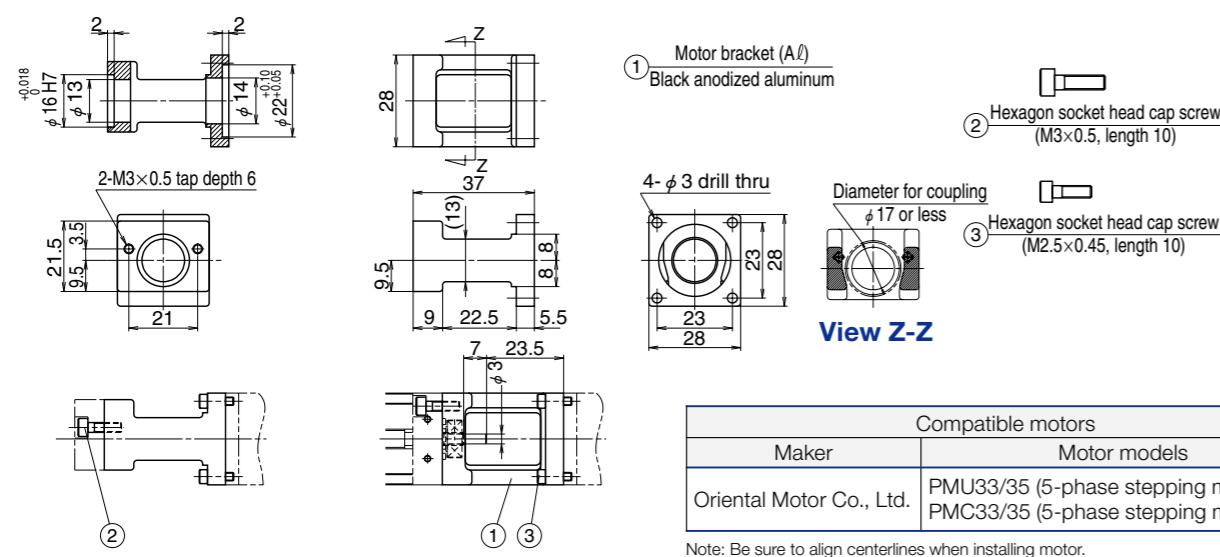
Part number  
**MC-BK02-128-00**



Part number  
**MC-BK02-133-00**

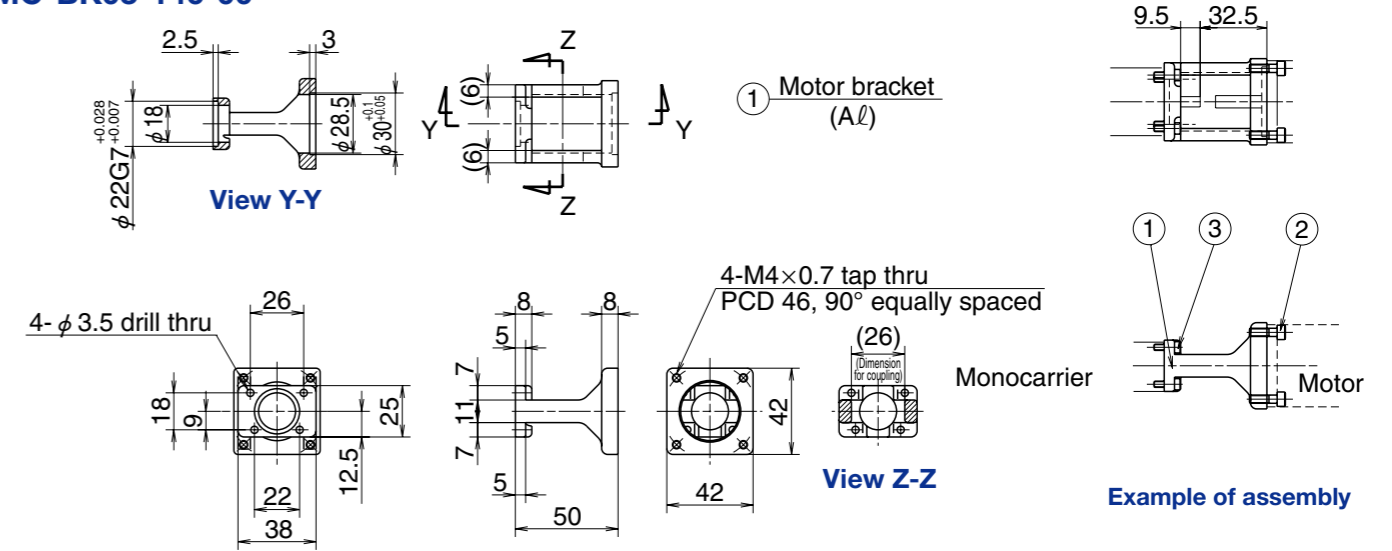


Part number  
**MC-BK02-223-00**



### Motor Bracket for MCM03

Part number  
**MC-BK03-146-00**

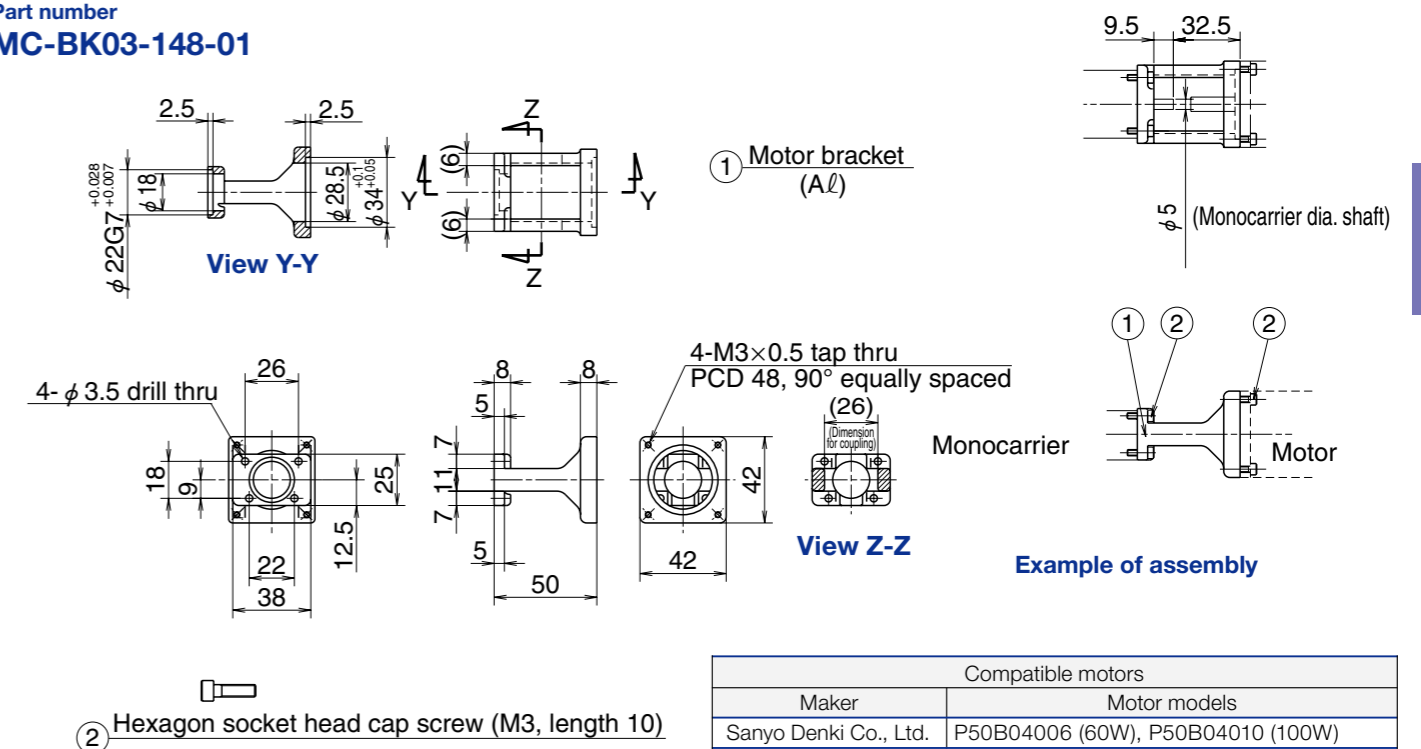


Compatible motors	
Maker	Motor models
Yaskawa Electric Corp.	SGMAH-A3 (30W), SGMAH-A5 (50W), SGMAS-A5A (50W), SGMAH-01 (100W), SGMAS-01A (100W)
Mitsubishi Electric Corp.	HF-KP053 (50W), HF-MP053 (50W), HC-KFS053 (50W), HC-MFS053 (50W), HF-KP13 (100W), HF-MP13 (100W), HC-KFS13 (100W), HC-MFS13 (100W)
OMRON Corp.	R88M-W03 (30W), R88M-W05 (50W), R88M-W10 (100W)
Sanyo Denki Co., Ltd.	P30B04003 (30W), P30B04005 (50W), P30B04010 (100W)

Note 1: Be sure to align centerlines when installing motor.  
Note 2: Be careful in the assembly orientation of bracket.  
Note 3: As the bracket is made by sand casting, the external dimensions are for reference only.

### Motor Bracket for MCM03

Part number  
**MC-BK03-148-01**



Compatible motors	
Maker	Motor models
Sanyo Denki Co., Ltd.	P50B04006 (60W), P50B04010 (100W)

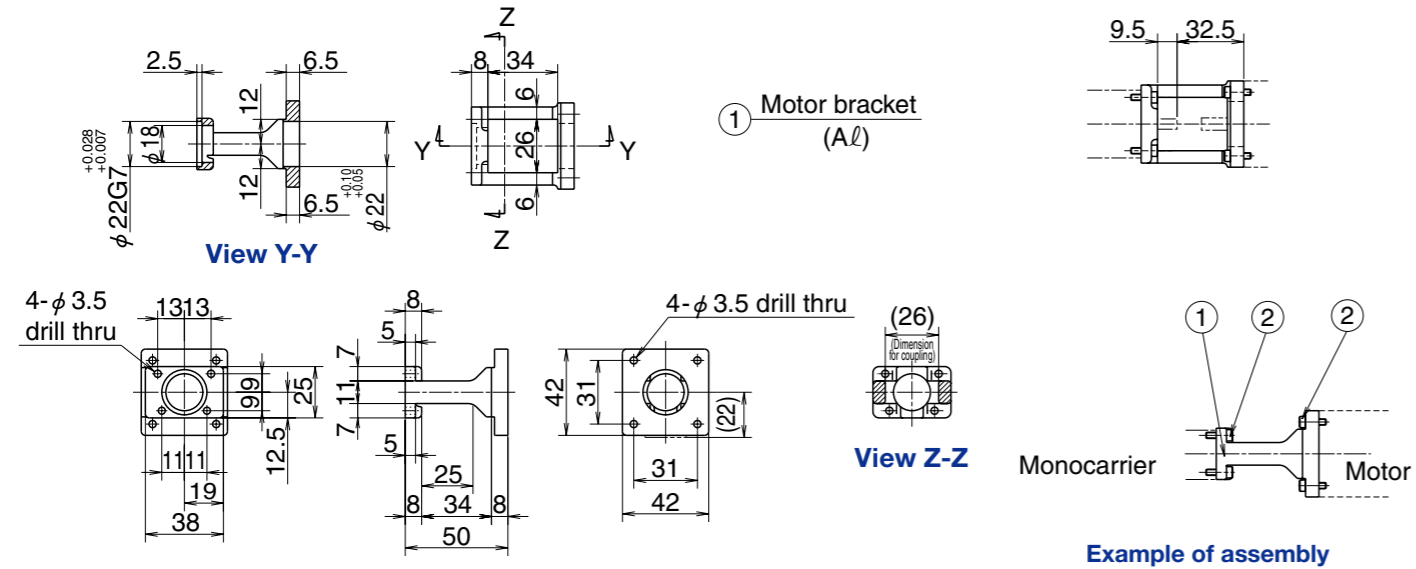
Note 1: Be sure to align centerlines when installing motor.  
Note 2: Be careful in the assembly orientation of bracket.  
Note 3: As the bracket is made by sand casting, the external dimensions are for reference only.

## Motor Bracket for MCM Series

## Accessories

### Motor Bracket for MCM03

Part number  
**MC-BK03-231-00**



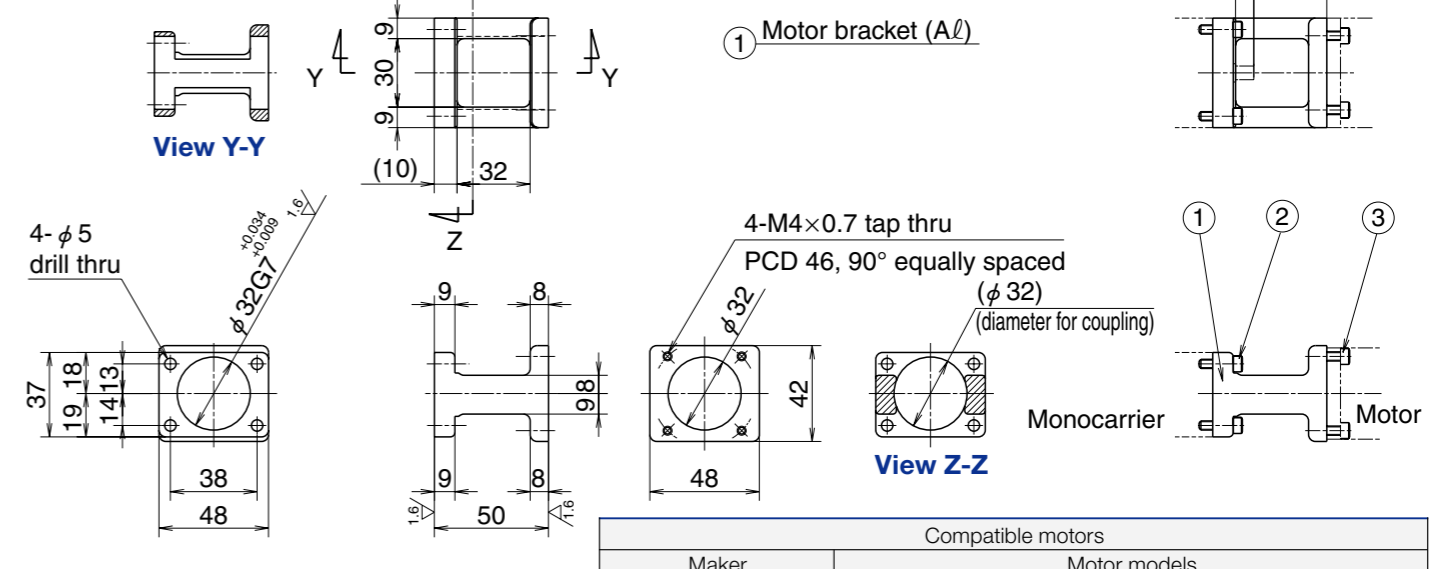
Compatible motors	
Maker	Motor models
Sanyo Denki Co., Ltd.	PBM423xxx, 103F55xx
Oriental Motor Co., Ltd.	AS46, ASC46, UPK54x, PK54x, CSK54x, CFK54x, UMK24x, CSK24x, PK24x

Note 1: Be sure to align centerlines when installing motor.  
Note 2: Be careful in the assembly orientation of bracket.  
Note 3: Because bracket is made by sand casting, external dimensions are for reference only.

## Accessories

### Motor Bracket for MCM05

Part number  
**MC-BK05-146-00**

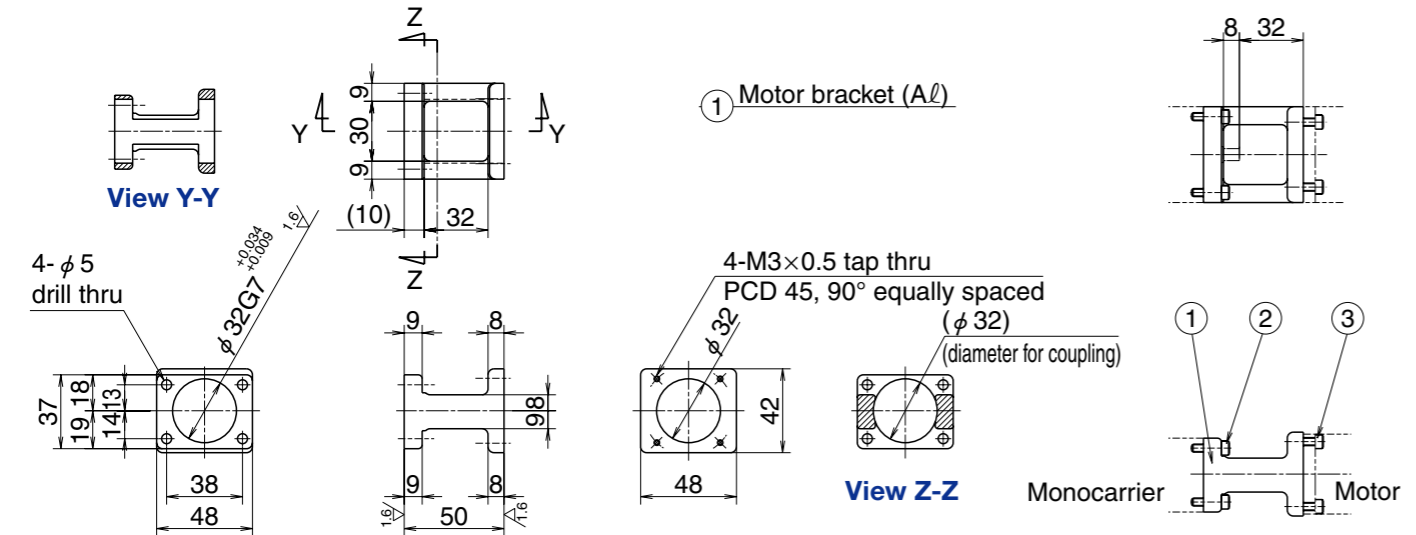


Compatible motors	
Maker	Motor models
Yaskawa Electric Corp.	SGMAH-A3 (30W), SGMAH-A5 (50W), SGMAS-A5A (50W), SGMAH-01 (100W), SGMAS-01A (100W)
Mitsubishi Electric Corp.	HF-KP053 (50W), HF-MP053 (50W), HC-KFS053 (50W), HC-MFS053 (50W), HF-KP13 (100W), HF-MP13 (100W), HC-KFS13 (100W), HC-MFS13 (100W)
OMRON Corp.	R88M-W03 (30W), R88M-W05 (50W), R88M-W10 (100W)
Sanyo Denki Co., Ltd.	P30B04003 (30W), P30B04005 (50W), P30B04010 (100W)

Note 1: Be sure to align centerlines when installing motor.  
Note 2: Be careful in the assembly orientation of bracket.  
Note 3: Because bracket is made by sand casting, external dimensions are for reference only.

### Motor Bracket for MCM05

Part number  
**MC-BK05-145-00**

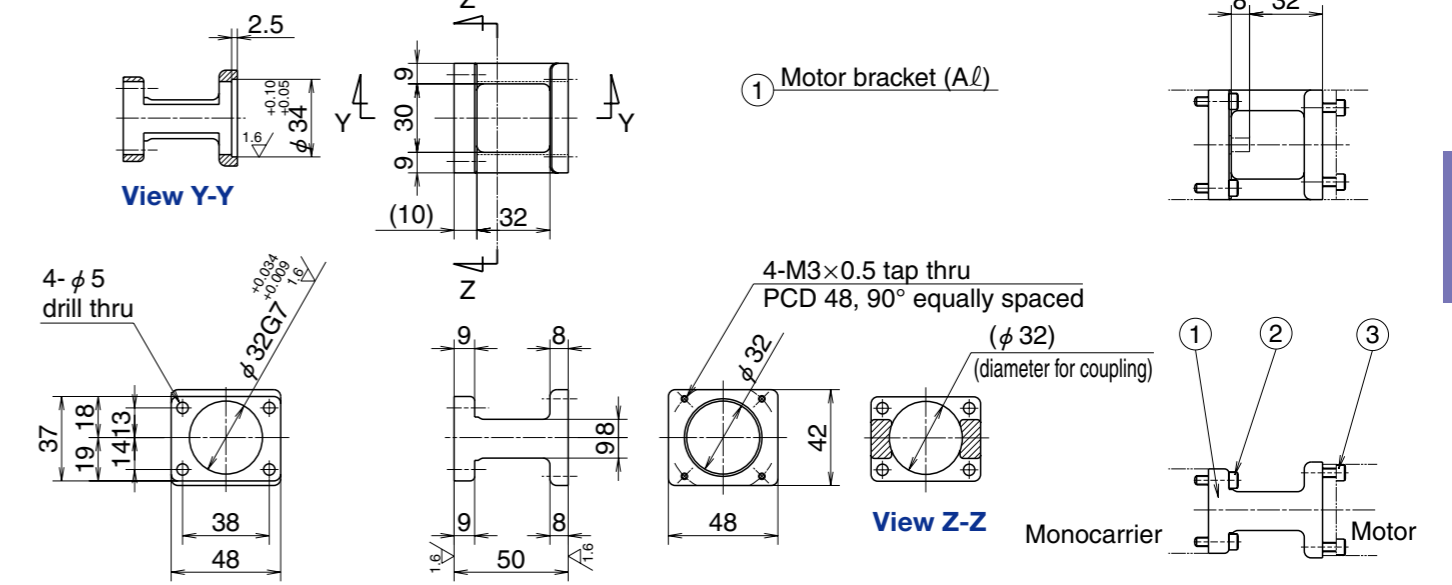


Compatible motors	
Maker	Motor models
Matsushita Electric Co., Ltd.	MSMD5A (50W), MSMD01 (100W)

Note 1: Be sure to align centerlines when installing motor.  
Note 2: Be careful in the assembly orientation of bracket.  
Note 3: Because bracket is made by sand casting, external dimensions are for reference only.

### Motor Bracket for MCM05

Part number  
**MC-BK05-148-00**



Compatible motors	
Maker	Motor models
Matsushita Electric Co., Ltd.	MAMA01 (100W)

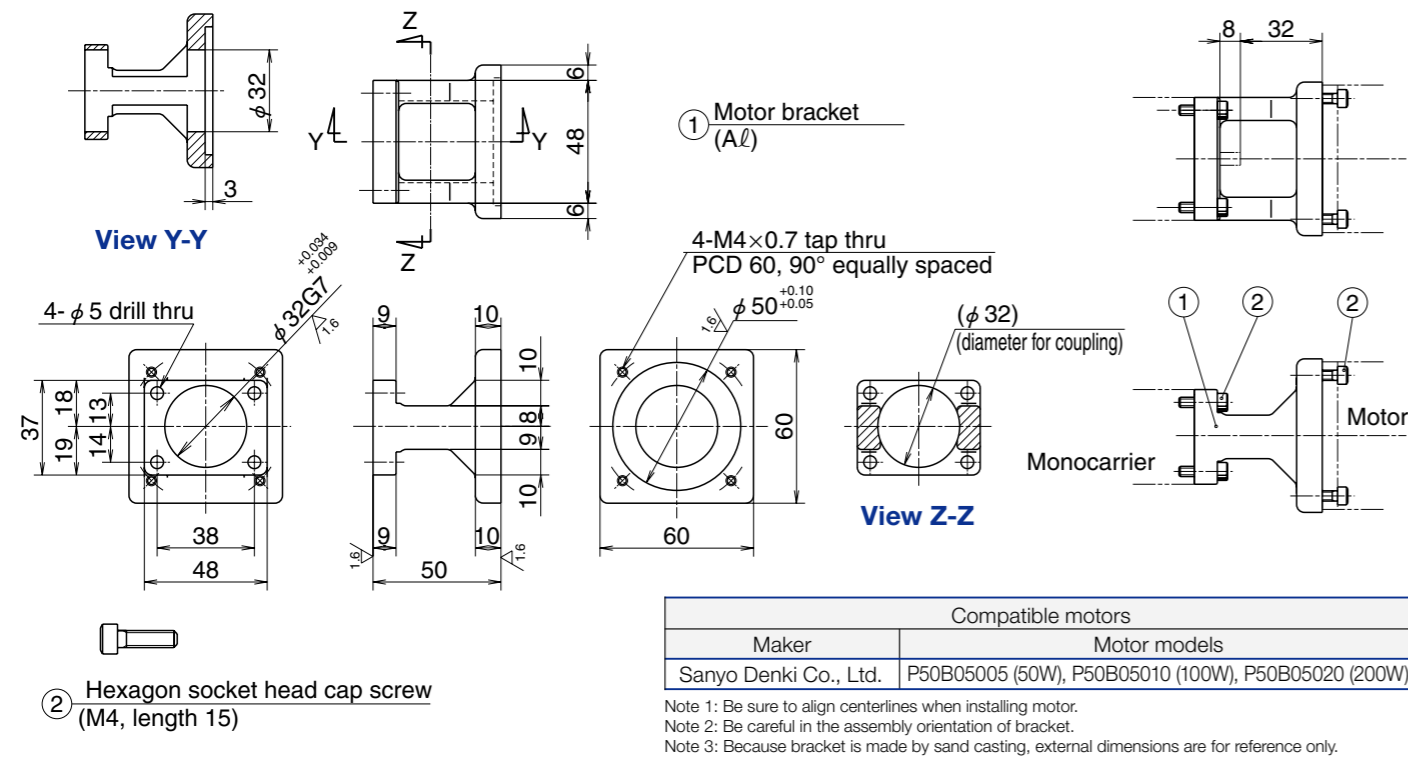
Note 1: Be sure to align centerlines when installing motor.  
Note 2: Be careful in the assembly orientation of bracket.  
Note 3: Because bracket is made by sand casting, external dimensions are for reference only.

## Motor Bracket for MCM Series

## Accessories

### Motor Bracket for MCM05

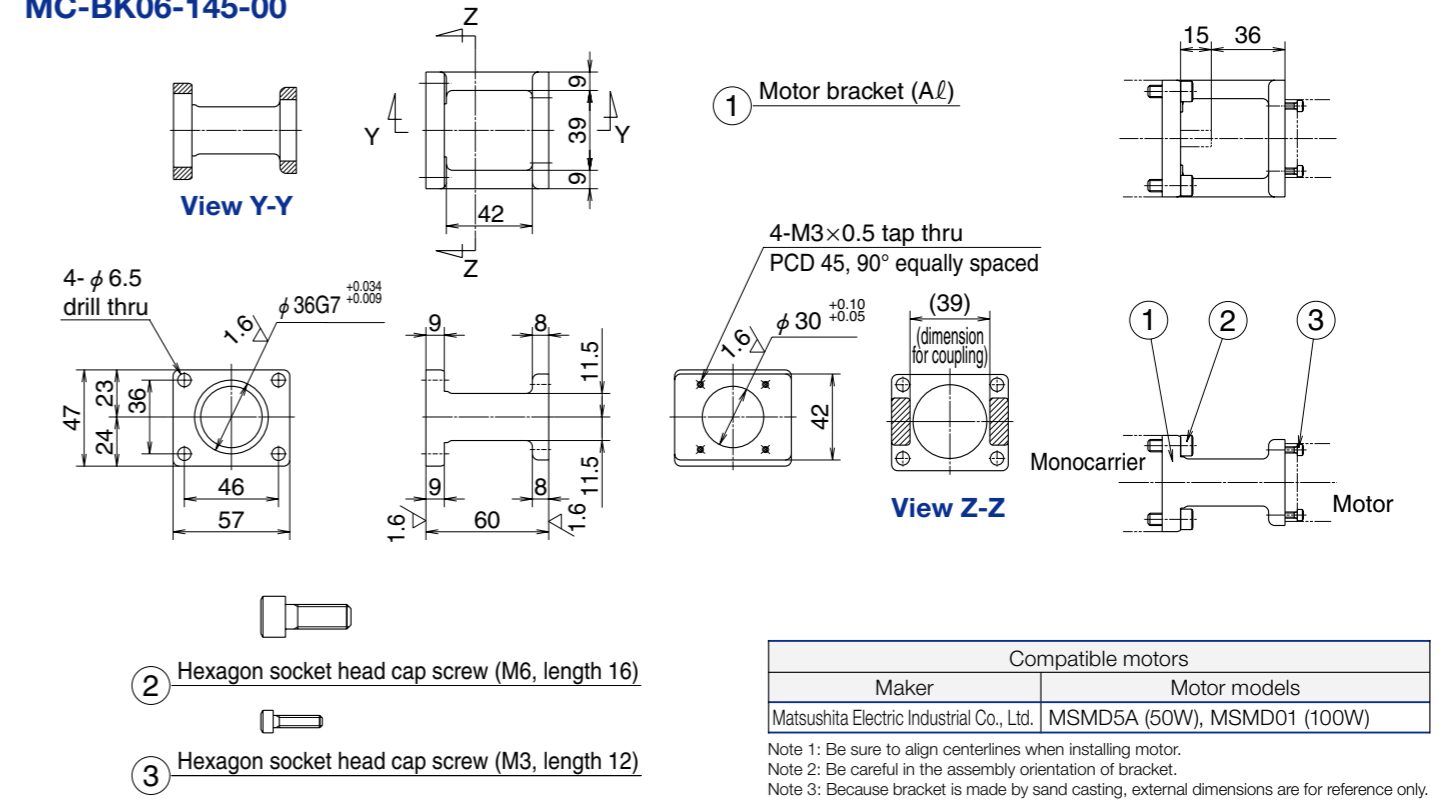
Part number  
MC-BK05-160-00



## Accessories

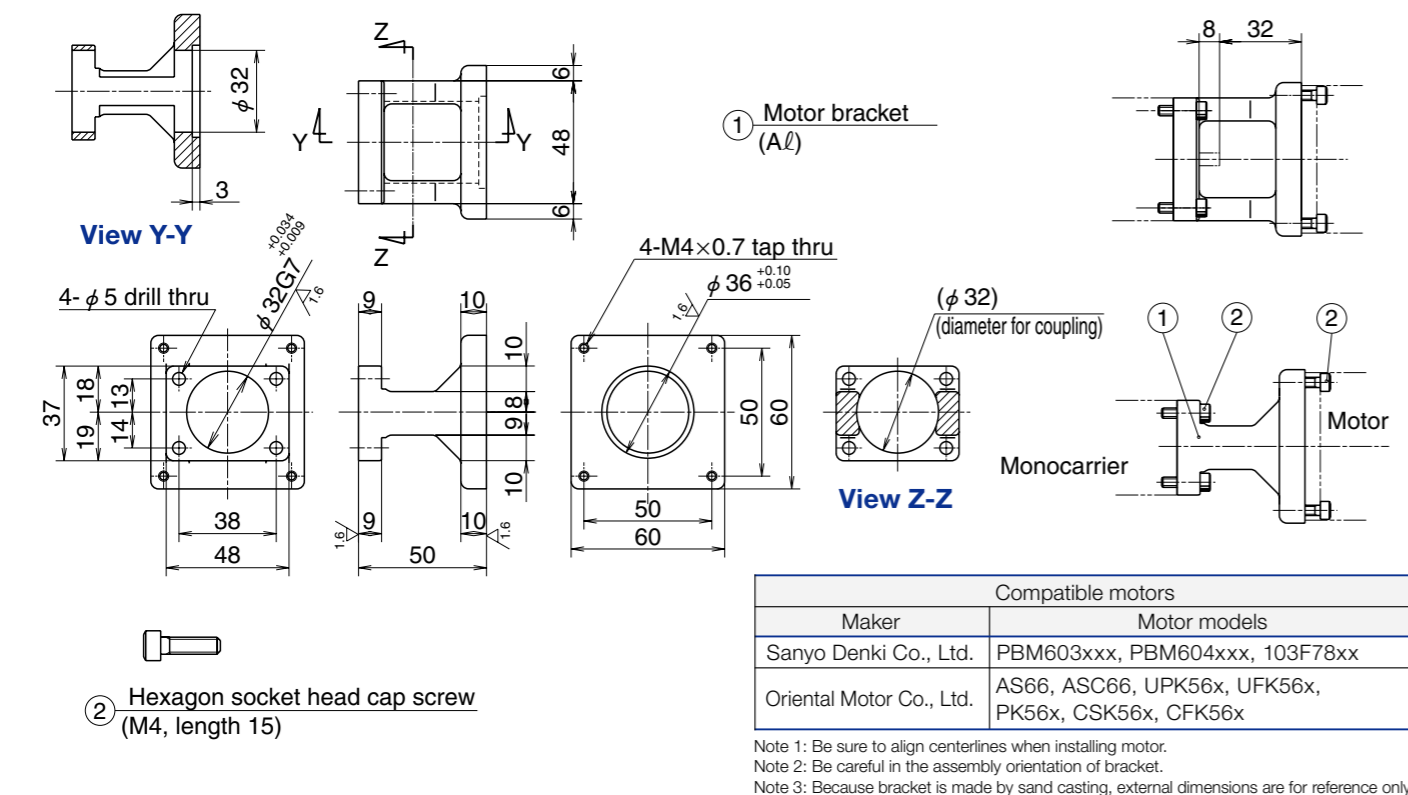
### Motor Bracket for MCM06

Part number  
MC-BK06-145-00



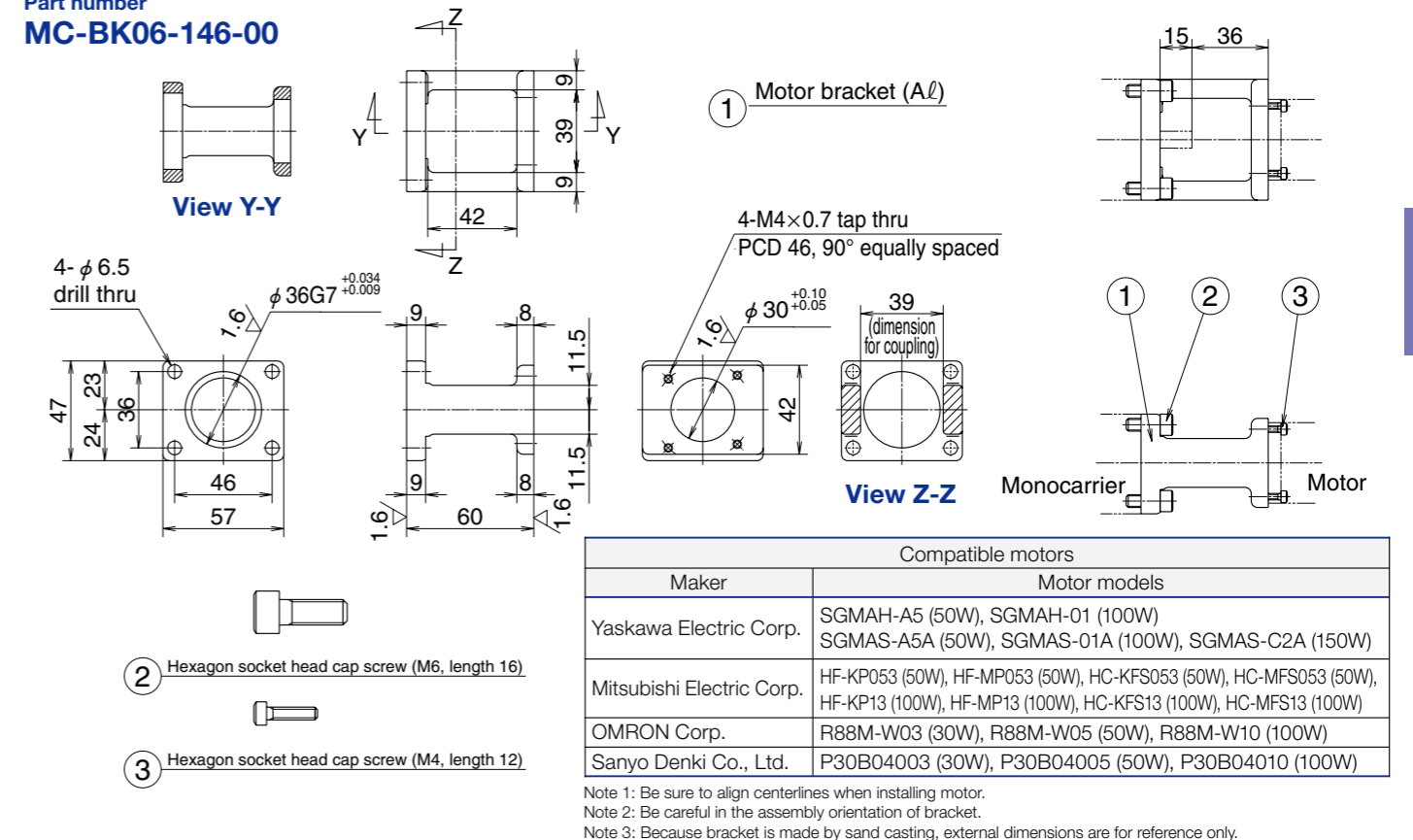
### Motor Bracket for MCM05

Part number  
MC-BK05-250-00



### Motor Bracket for MCM06

Part number  
MC-BK06-146-00

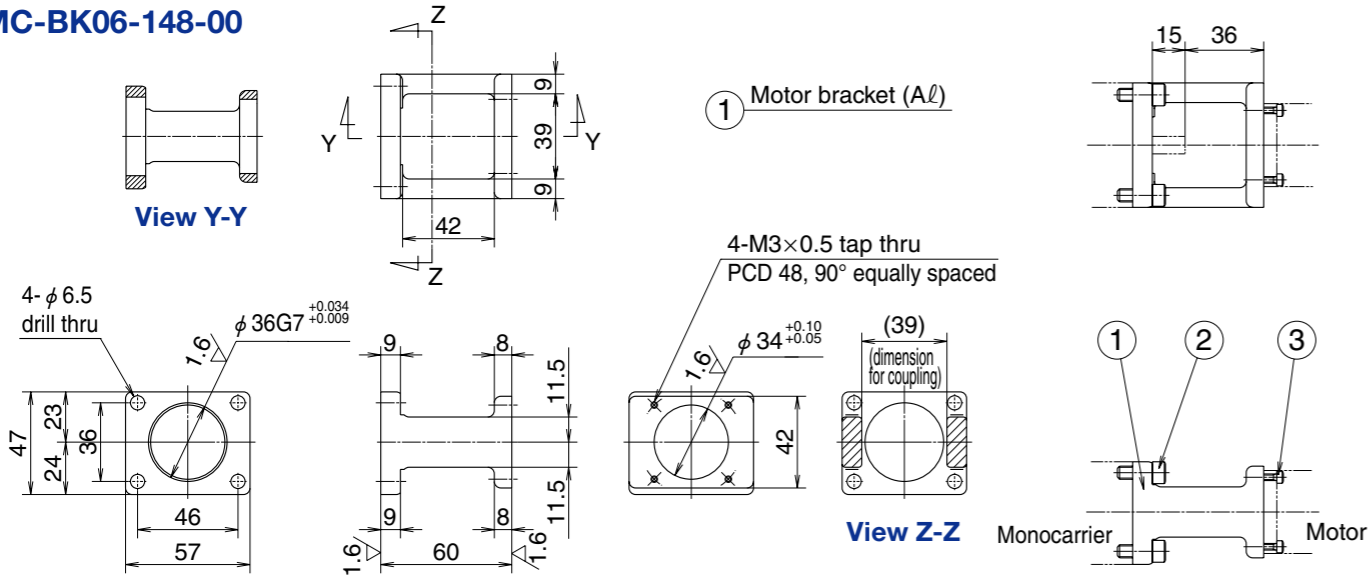


## Motor Bracket for MCM Series

## Accessories

### Motor Bracket for MCM06

Part number  
**MC-BK06-148-00**



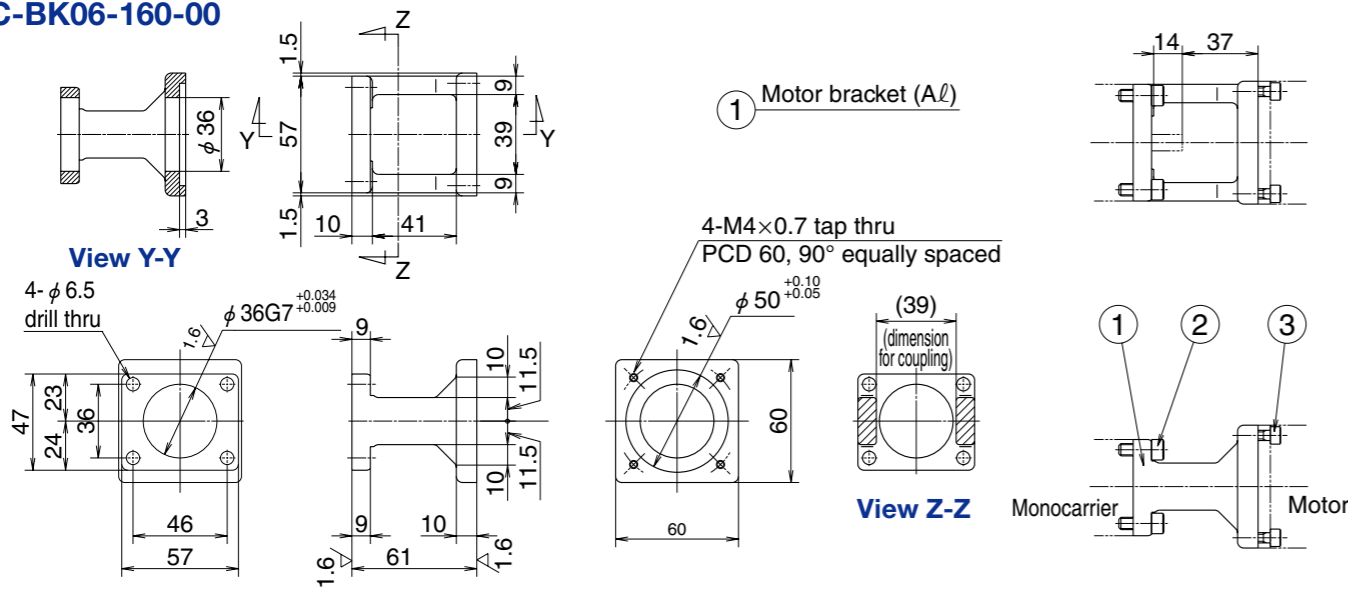
- ② Hexagon socket head cap screw (M6, length 16)
- ③ Hexagon socket head cap screw (M3, length 12)

Compatible motors	
Maker	Motor models
Matsushita Electric Co., Ltd.	MAMA01 (100W)
Sanyo Denki Co., Ltd.	P50B04006 (60W), P50B04010 (100W)

Note 1: Be sure to align centerlines when installing motor.  
Note 2: Be careful in the assembly orientation of bracket.  
Note 3: Because bracket is made by sand casting, external dimensions are for reference only.

### Motor Bracket for MCM06

Part number  
**MC-BK06-160-00**



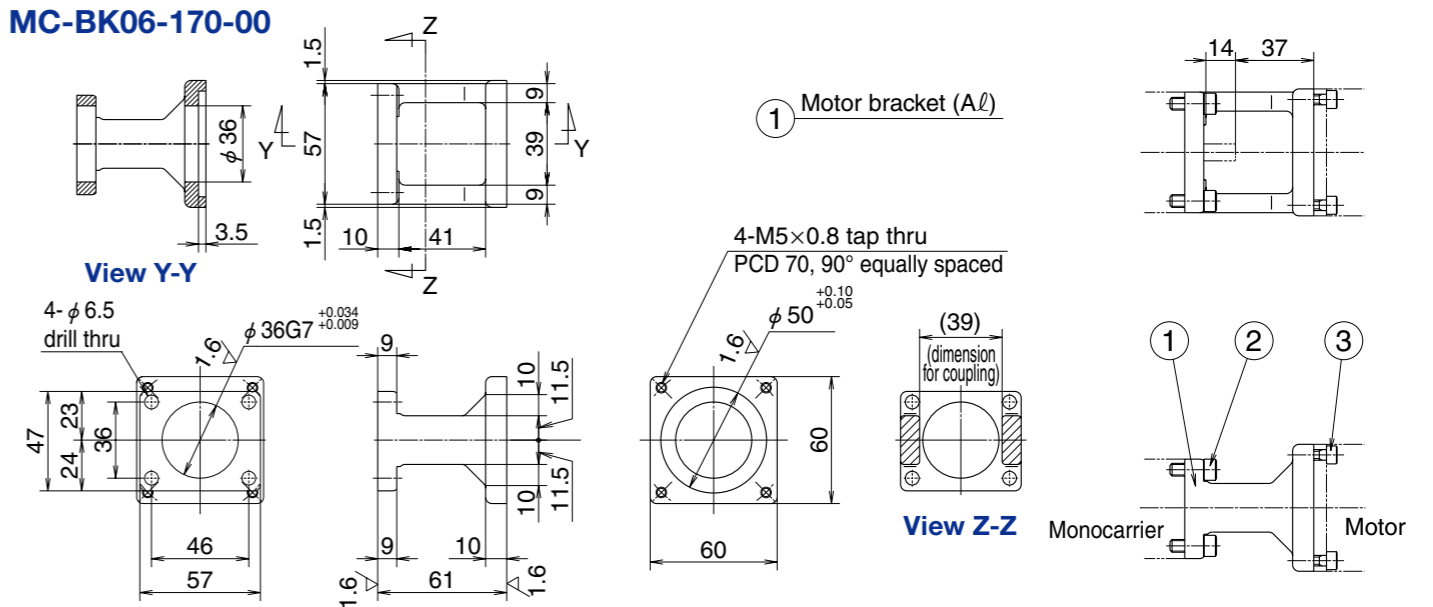
- ② Hexagon socket head cap screw (M6, length 16)
- ③ Hexagon socket head cap screw (M4, length 14)

Compatible motors	
Maker	Motor models
Sanyo Denki Co., Ltd.	P50B05005 (50W), P50B05010 (100W), P50B05020 (200W)

Note 1: Be sure to align centerlines when installing motor.  
Note 2: Be careful in the assembly orientation of bracket.  
Note 3: Because bracket is made by sand casting, external dimensions are for reference only.

### Motor Bracket for MCM06

Part number  
**MC-BK06-170-00**



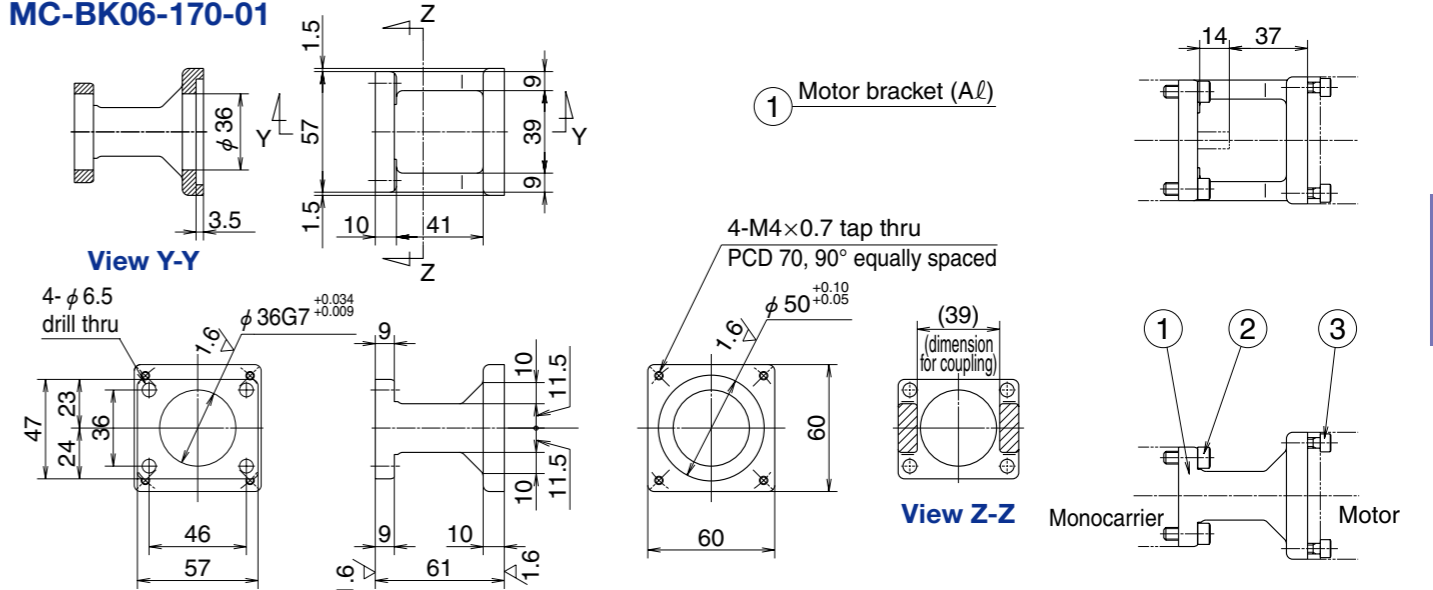
- ② Hexagon socket head cap screw (M6, length 16)
- ③ Hexagon socket head cap screw (M5, length 14)

Compatible motors	
Maker	Motor models
Yaskawa Electric Corp.	SGMAH-02 (200W), SGMAS-02A (200W), SGMAS-04 (400W), SGMAS-04A (400W)
Mitsubishi Electric Corp.	HF-KP23 (200W), HF-MP23 (200W), HF-KP43 (400W), HF-MP43 (400W)
OMRON Corp.	R88M-W20 (200W), R88M-W40 (400W)
Sanyo Denki Co., Ltd.	P30B06020 (200W), P30B06040 (400W)

Note 1: Be sure to align centerlines when installing motor.  
Note 2: Be careful in the assembly orientation of bracket.  
Note 3: Because bracket is made by sand casting, external dimensions are for reference only.

### Motor Bracket for MCM06

Part number  
**MC-BK06-170-01**



- ② Hexagon socket head cap screw (M6, length 16)
- ③ Hexagon socket head cap screw (M4, length 14)

Compatible motors	
Maker	Motor models
Matsushita Electric Industrial Co., Ltd.	MSMD02 (200W), MAMA02 (200W), MSMD04 (400W), MAMA04 (400W)

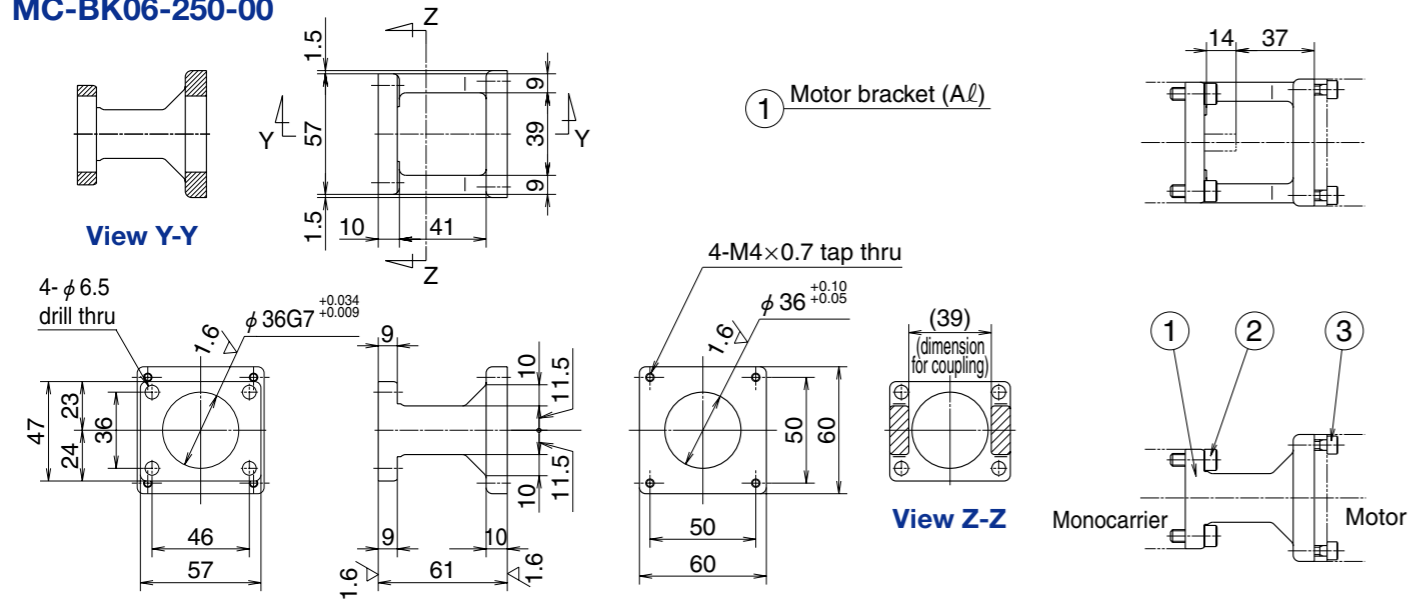
Note 1: Be sure to align centerlines when installing motor.  
Note 2: Be careful in the assembly orientation of bracket.  
Note 3: Because bracket is made by sand casting, external dimensions are for reference only.

## Motor Bracket for MCM Series

## Accessories

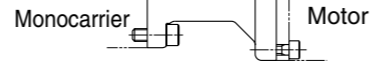
### Motor Bracket for MCM06

Part number  
**MC-BK06-250-00**



① Motor bracket (Al)

View Z-Z



Compatible motors	
Maker	Motor models
Sanyo Denki Co., Ltd.	PBM603xxx, PBM604xxx, 103F78xx
Oriental Motor Co., Ltd.	AS66, ASC66, UPK56x, PK56x, CSK56x, CFK56x, UFK56x

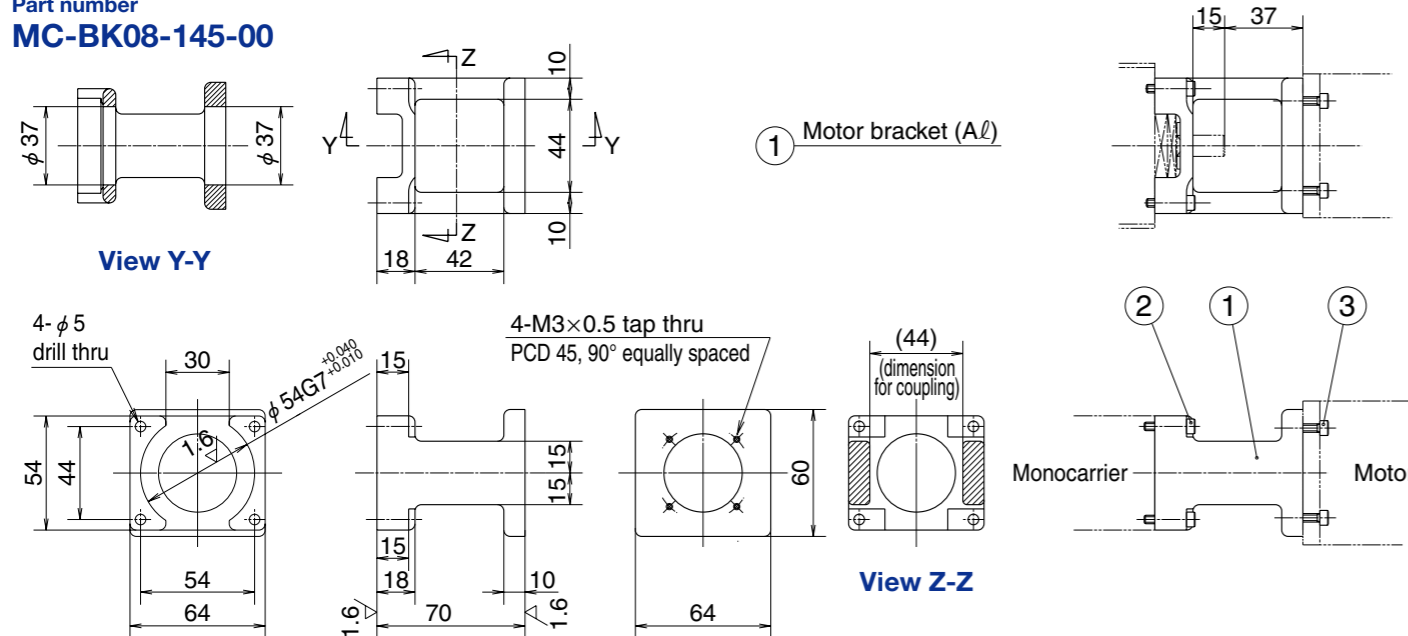
Note 1: Be sure to align centerlines when installing motor.  
Note 2: Be careful in the assembly orientation of bracket.  
Note 3: Because bracket is made by sand casting, external dimensions are for reference only.

② Hexagon socket head cap screw (M6, length 16)

③ Hexagon socket head cap screw (M4, length 24)

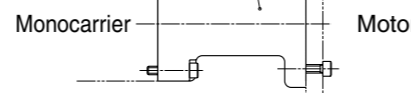
### Motor Bracket for MCM08

Part number  
**MC-BK08-145-00**



① Motor bracket (Al)

View Z-Z



Compatible motors	
Maker	Motor models
Matsushita Electric Industrial Co., Ltd.	MSMD01 (100W)

Note 1: Be sure to align centerlines when installing motor.  
Note 2: Be careful in the assembly orientation of bracket.  
Note 3: Because bracket is made by sand casting, external dimensions are for reference only.

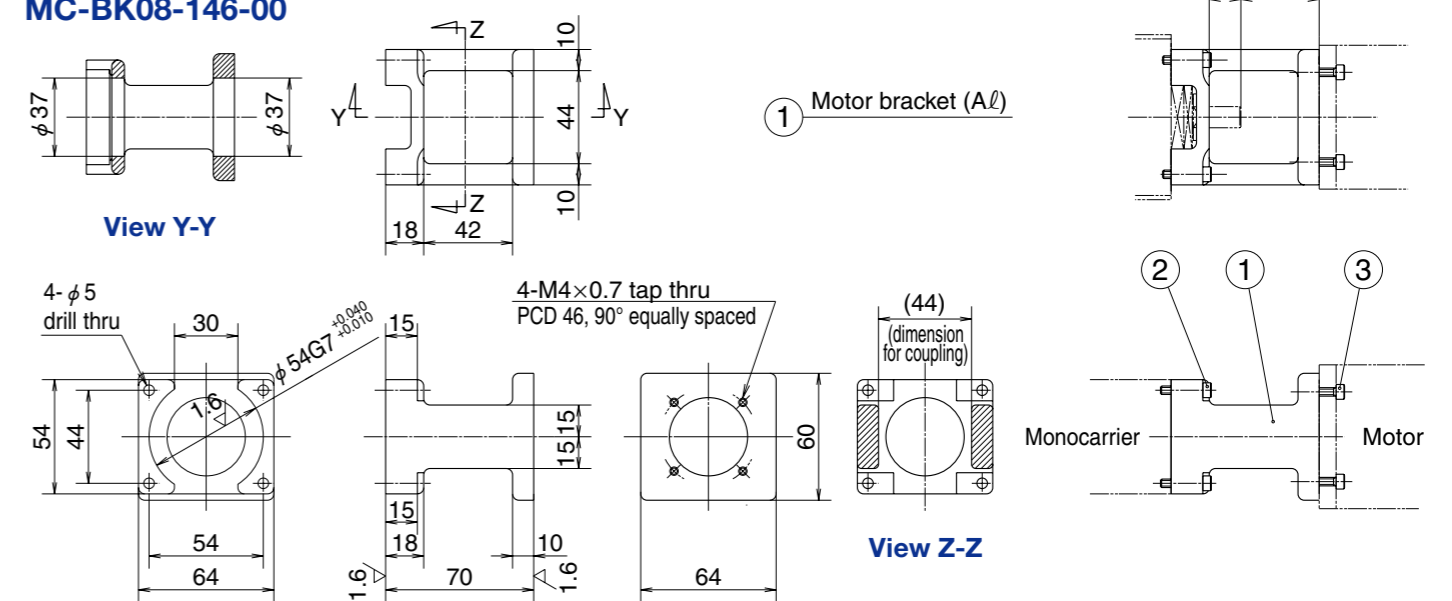
② Hexagon socket head cap screw (M4, length 20)

③ Hexagon socket head cap screw (M3, length 12)

## Accessories

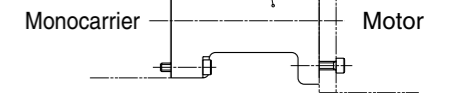
### Motor Bracket for MCM08

Part number  
**MC-BK08-146-00**



① Motor bracket (Al)

View Z-Z



Compatible motors	
Maker	Motor models
Yaskawa Electric Corp.	SGMAH-01 (100W), SGMAS-01A (100W), SGMAS-C2A (150W)
Mitsubishi Electric Corp.	HF-KP13 (100W), HF-MP13 (100W), HC-KFS13 (100W), HC-MFS13 (100W)
Sanyo Denki Co., Ltd.	P30B04003 (30W), P30B04005 (50W), P30B04010 (100W)

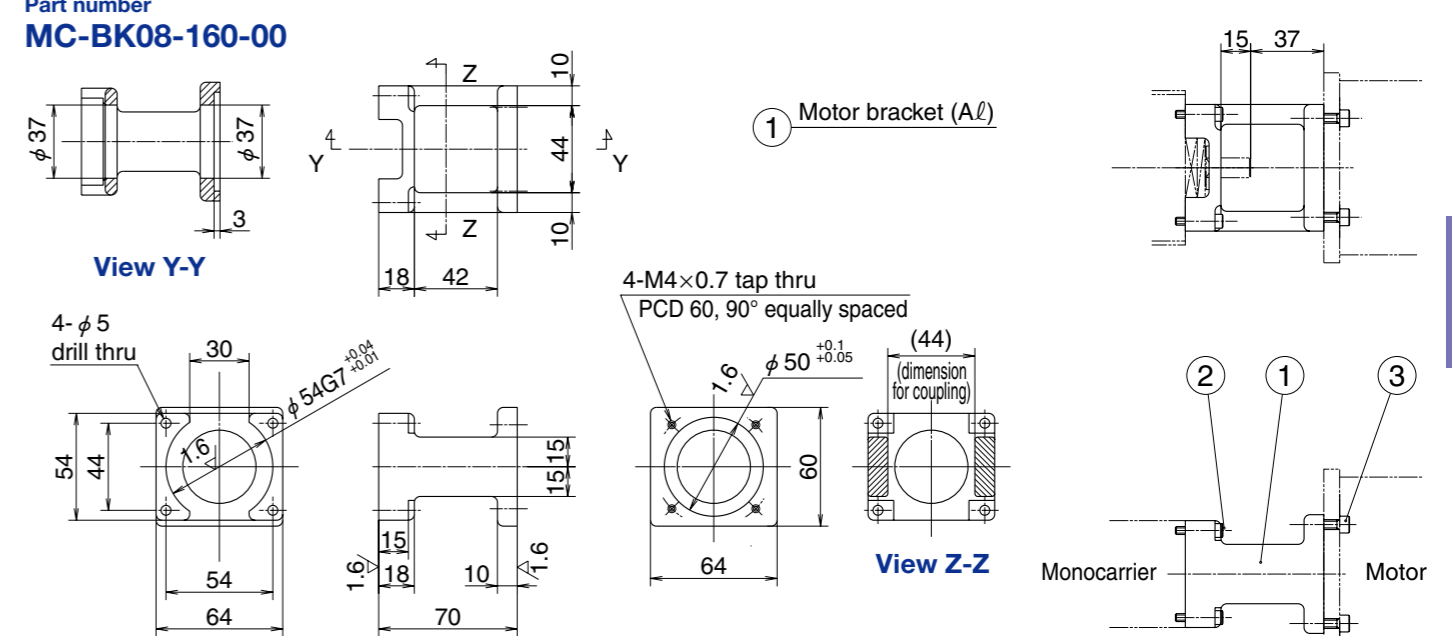
Note 1: Be sure to align centerlines when installing motor.  
Note 2: Be careful in the assembly orientation of bracket.  
Note 3: Because bracket is made by sand casting, external dimensions are for reference only.

② Hexagon socket head cap screw (M4, length 20)

③ Hexagon socket head cap screw (M4, length 14)

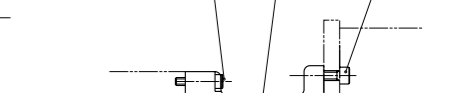
### Motor Bracket for MCM08

Part number  
**MC-BK08-160-00**



① Motor bracket (Al)

View Z-Z



Compatible motors	
Maker	Motor models
Sanyo Denki Co., Ltd.	P50B05005 (50W), P50B05010 (100W), P50B05020 (200W)

Note 1: Be sure to align centerlines when installing motor.  
Note 2: Be careful in the assembly orientation of bracket.  
Note 3: Because bracket is made by sand casting, external dimensions are for reference only.

② Hexagon socket head cap screw (M4, length 20)

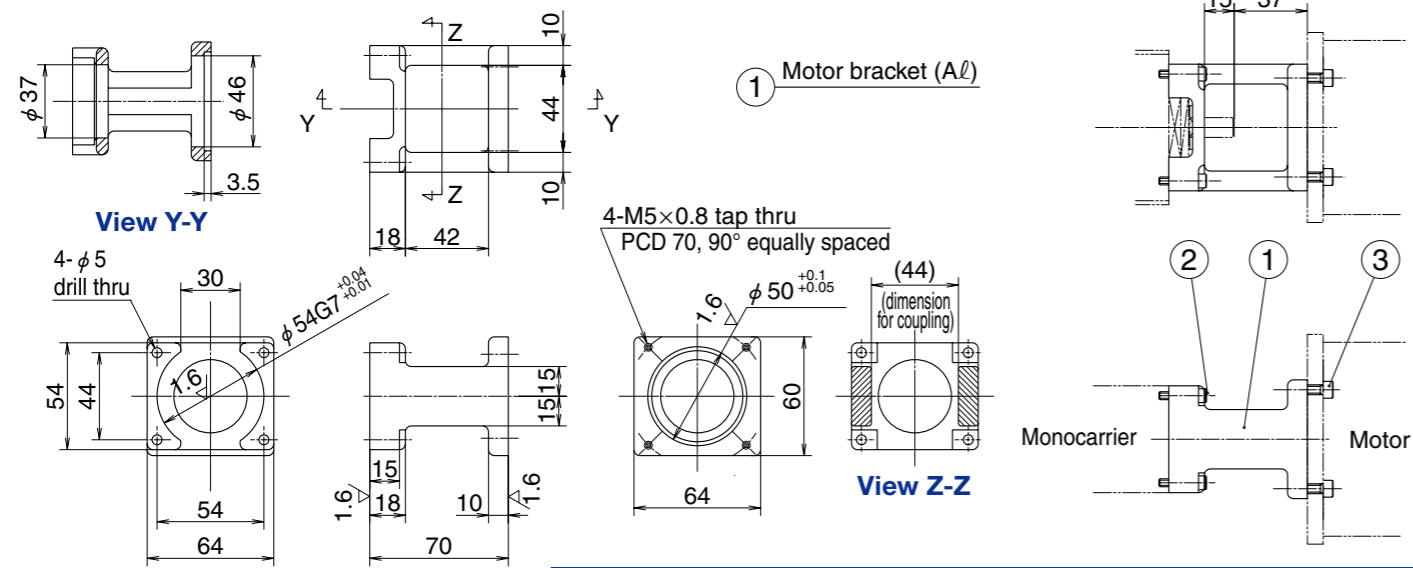
③ Hexagon socket head cap screw (M4, length 14)

## Motor Bracket for MCM Series

## Accessories

### Motor Bracket for MCM08

Part number  
**MC-BK08-170-00**



- ② Hexagon socket head cap screw (M4, length 20)
- ③ Hexagon socket head cap screw (M5, length 14)

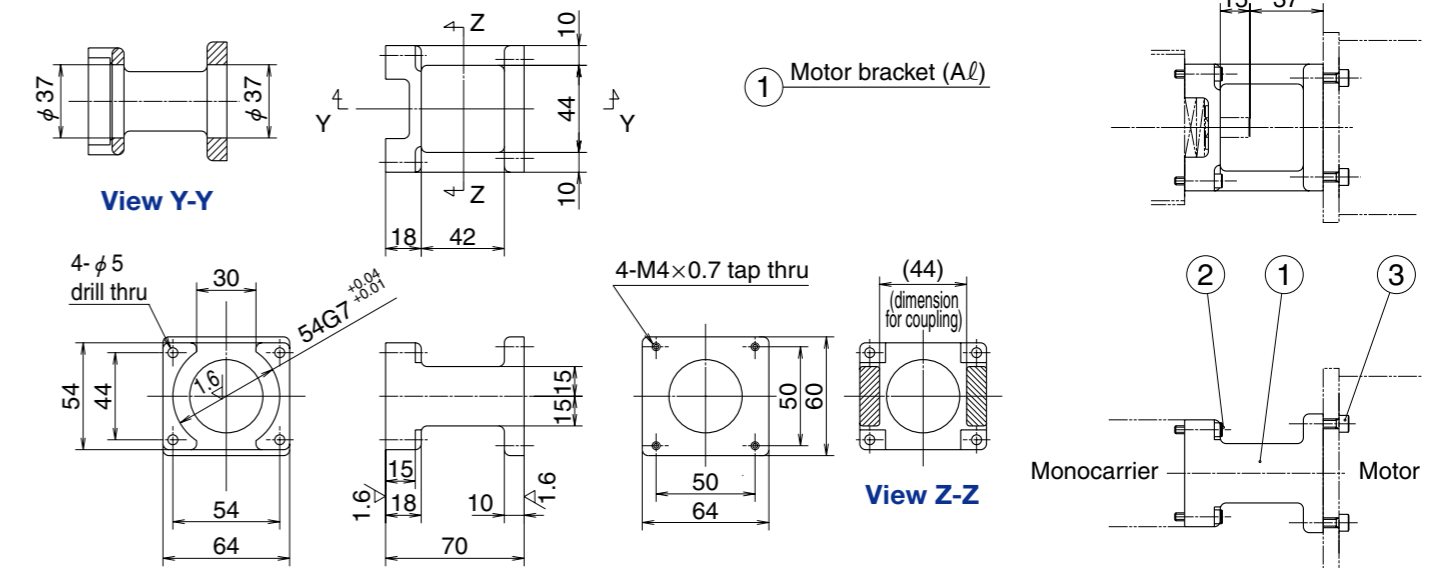
Compatible motors	
Maker	Motor models
Yaskawa Electric Corp.	SGMAH-02 (200W), SGMAS-02A (200W), SGMAH-04 (400W), SGMAS-04A (400W)
Mitsubishi Electric Corp.	HF-KP23 (200W), HF-MP23 (200W), HF-KP43 (400W), HF-MP43 (400W)
OMRON Corp.	R88M-W20 (200W), R88M-W40 (400W)
Sanyo Denki Co., Ltd.	P30B06020 (200W), P30B06040 (400W)

Note 1: Be sure to align centerlines when installing motor.  
Note 2: Be careful in the assembly orientation of bracket.  
Note 3: Because bracket is made by sand casting, external dimensions are for reference only.

## Accessories

### Motor Bracket for MCM08

Part number  
**MC-BK08-250-00**



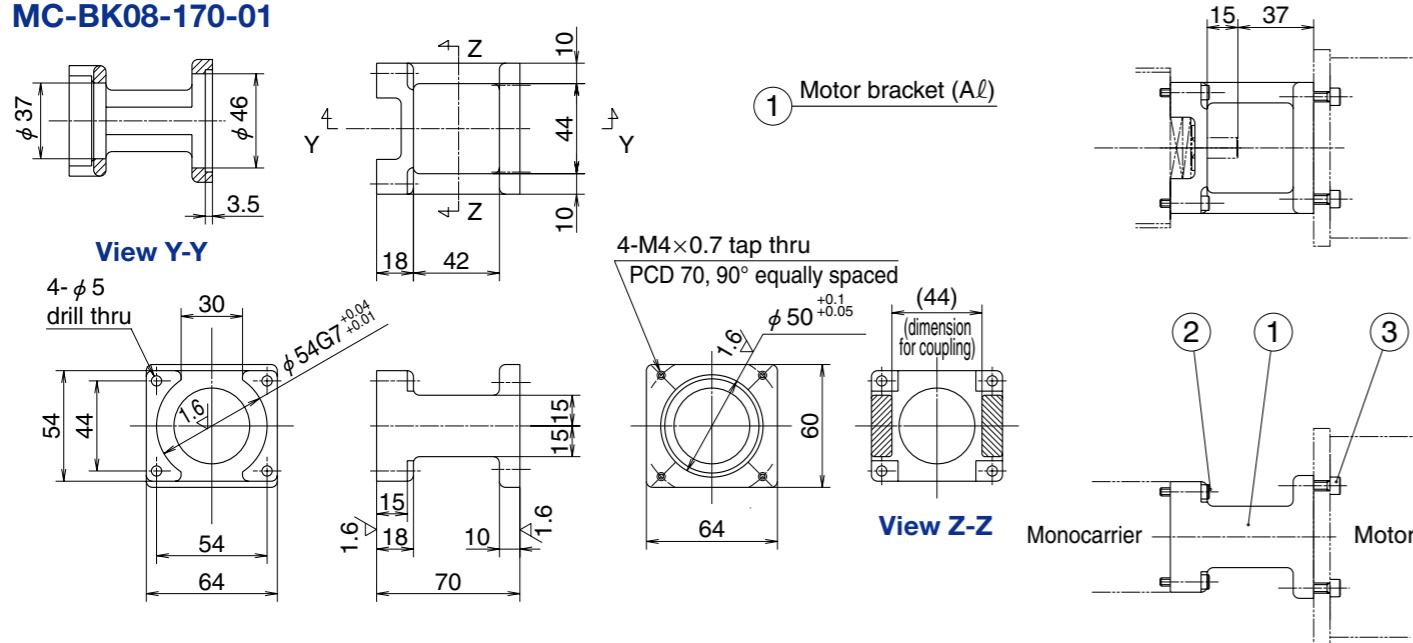
- ② Hexagon socket head cap screw (M4, length 20)
- ③ Hexagon socket head cap screw (M4, length 14)

Compatible motors	
Maker	Motor models
Sanyo Denki Co., Ltd.	PBM603xxx, PBM604xxx, 103F78xx
Oriental Motor Co., Ltd.	AS66, ASC66, UPK56xx, PK56xx, CSK56x, CFK56x, UFK56x

Note 1: Be sure to align centerlines when installing motor.  
Note 2: Be careful in the assembly orientation of bracket.  
Note 3: Because bracket is made by sand casting, external dimensions are for reference only.

### Motor Bracket for MCM08

Part number  
**MC-BK08-170-01**



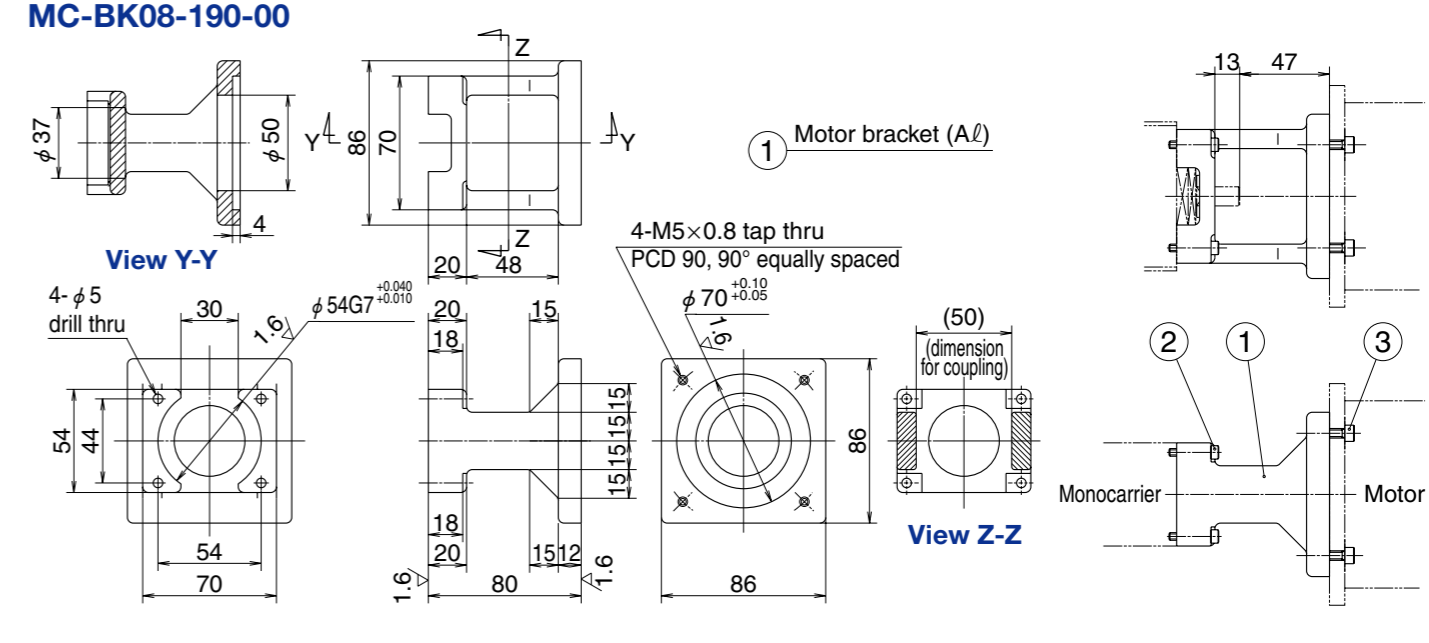
- ② Hexagon socket head cap screw (M4, length 20)
- ③ Hexagon socket head cap screw (M4, length 14)

Compatible motors	
Maker	Motor models
Matsushita Electric Industrial Co., Ltd.	MSMD02 (200W), MAMA02 (200W), MSMD04 (400W), MAMA04 (400W)

Note 1: Be sure to align centerlines when installing motor.  
Note 2: Be careful in the assembly orientation of bracket.  
Note 3: Because bracket is made by sand casting, external dimensions are for reference only.

### Motor Bracket for MCM08

Part number  
**MC-BK08-190-00**



- ② Hexagon socket head cap screw (M4, length 22)
- ③ Hexagon socket head cap screw (M5, length 16)

Compatible motors	
Maker	Motor models
Sanyo Denki Co., Ltd.	P50B07020 (200W), P50B07030 (300W), P50B07040 (400W)

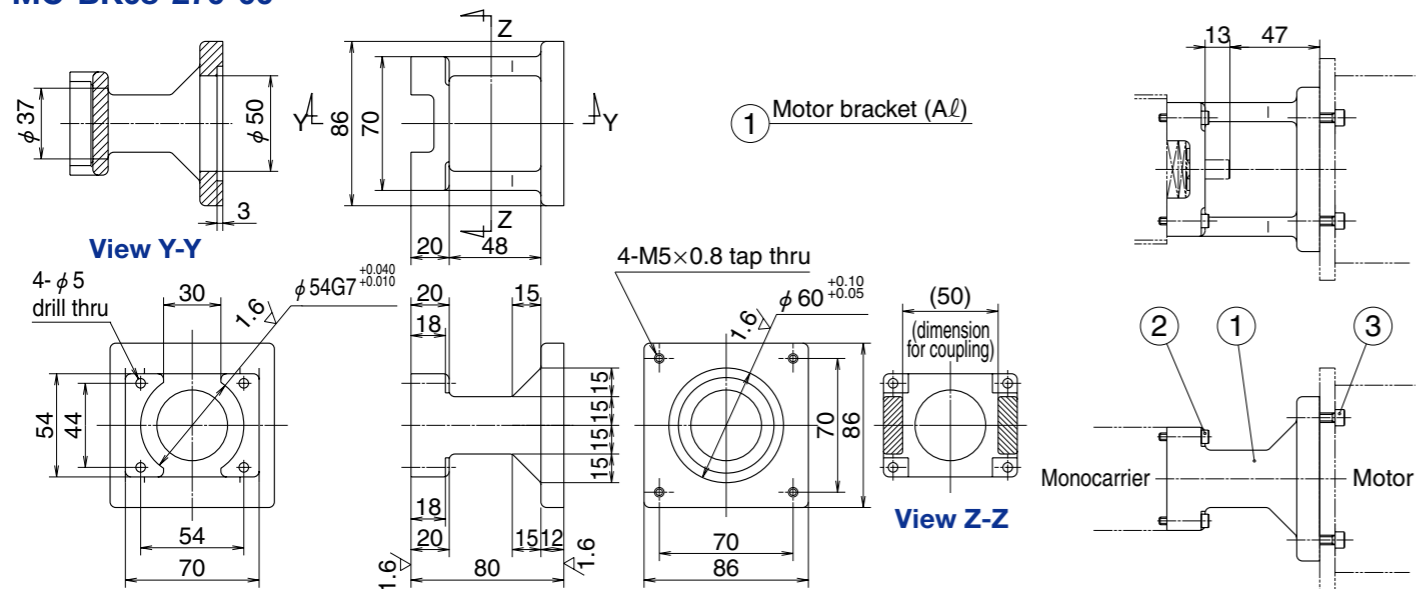
Note 1: Be sure to align centerlines when installing motor.  
Note 2: Be careful in the assembly orientation of bracket.  
Note 3: Because bracket is made by sand casting, external dimensions are for reference only.

## Motor Bracket for MCM Series

## Accessories

### Motor Bracket for MCM08

Part number  
**MC-BK08-270-00**



② Hexagon socket head cap screw (M4, length 22)

③ Hexagon socket head cap screw (M5, length 16)

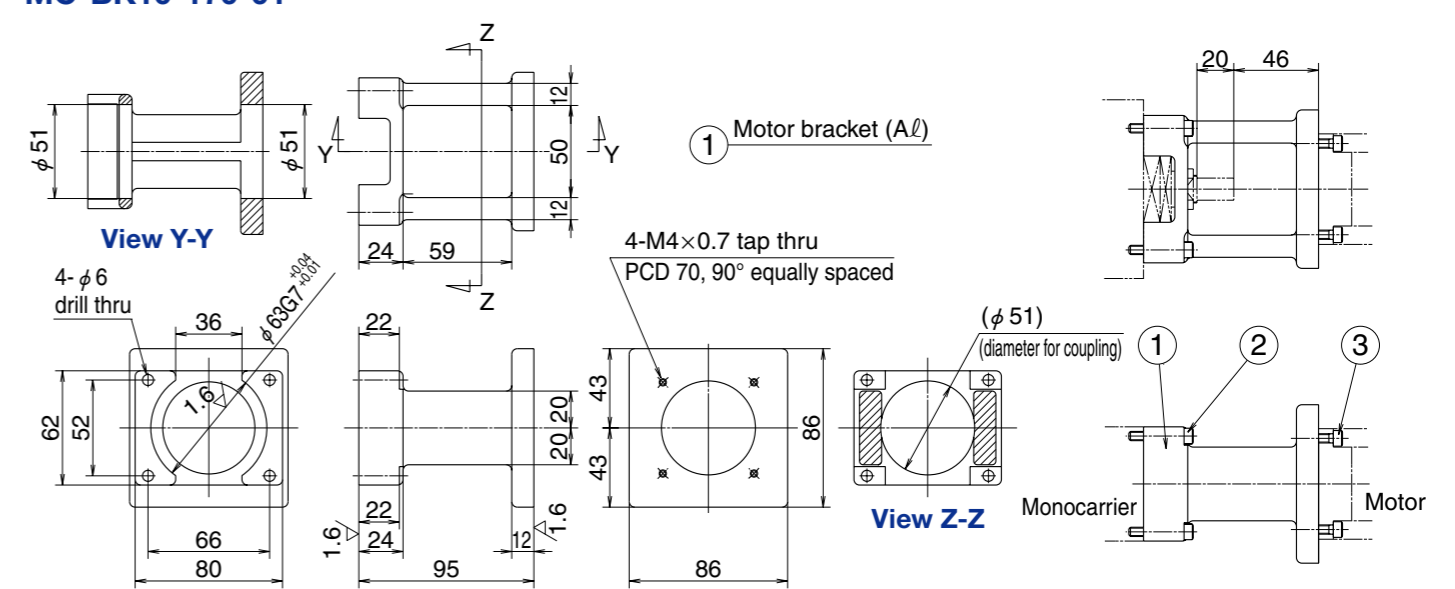
Compatible motors	
Maker	Motor models
Oriental Motor Co., Ltd.	AS98, UPK59x, PK59x, CSK59x, CFK59x, UFK59x
Sanyo Denki Co., Ltd.	103F85xx

Note 1: Be sure to align centerlines when installing motor.  
Note 2: Be careful in the assembly orientation of bracket.  
Note 3: Because bracket is made by sand casting, external dimensions are for reference only.

## Accessories

### Motor Bracket for MCM10

Part number  
**MC-BK10-170-01**



② Hexagon socket head cap screw (M5, length 30)

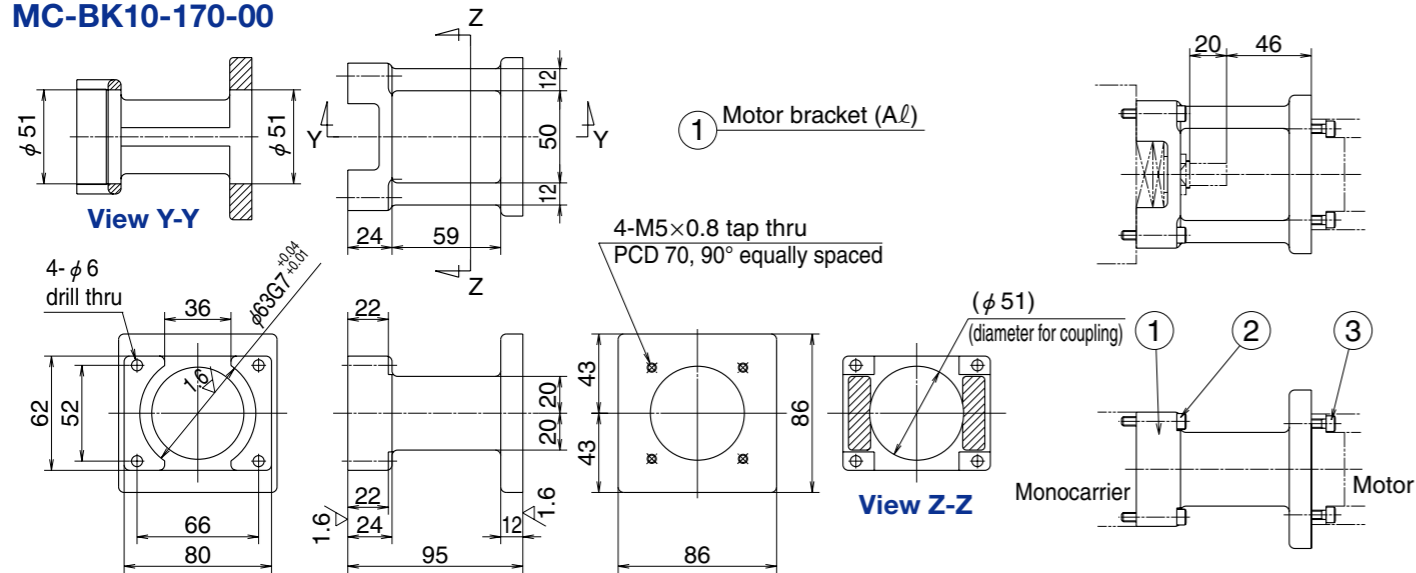
③ Hexagon socket head cap screw (M4, length 16)

Compatible motors	
Maker	Motor models
Matsushita Electric Industrial Co., Ltd.	MSMD02 (200W), MAMA02 (200W), MSMD04 (400W), MAMA04 (400W)

Note 1: Be sure to align centerlines when installing motor.  
Note 2: Be careful in the assembly orientation of bracket.  
Note 3: Because bracket is made by sand casting, external dimensions are for reference only.

### Motor Bracket for MCM10

Part number  
**MC-BK10-170-00**



② Hexagon socket head cap screw (M5, length 30)

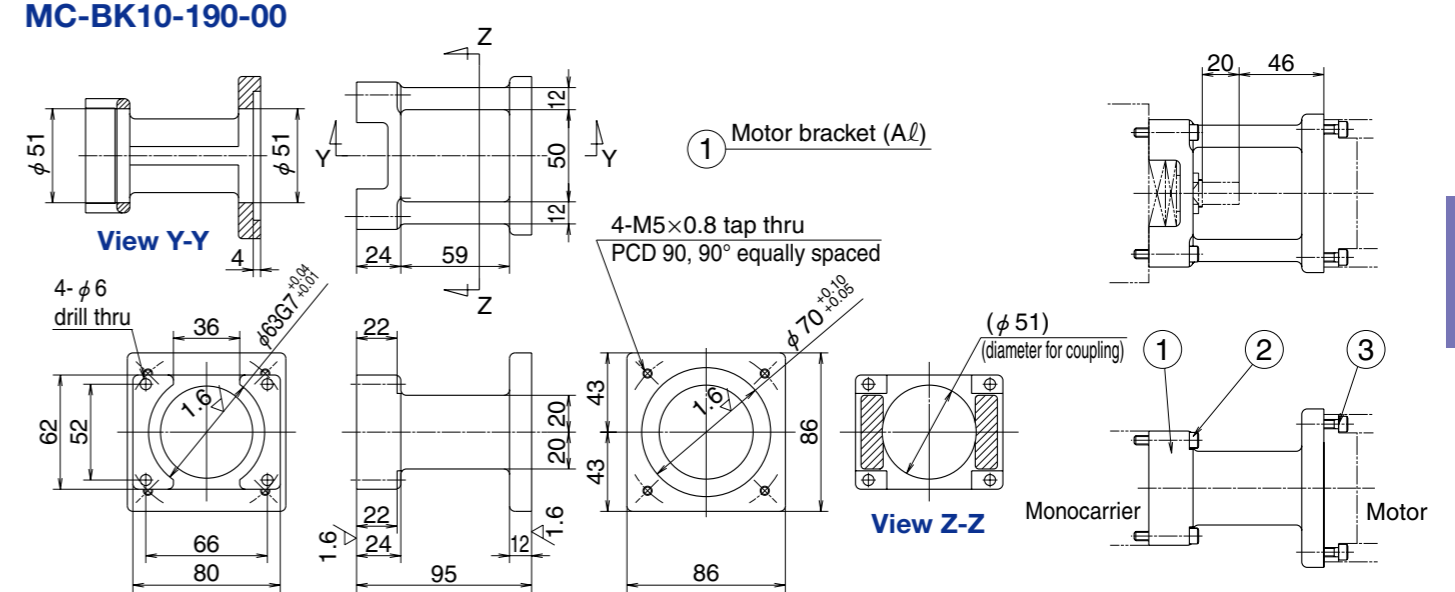
③ Hexagon socket head cap screw (M5, length 16)

Compatible motors	
Maker	Motor models
Yaskawa Electric Corp.	SGMAH-02 (200W), SGMAS-02A (200W), SGMAS-04 (400W), SGMAS-04A (400W)
Mitsubishi Electric Corp.	HF-KP23 (200W), HF-MP23 (200W), HF-KP43 (400W), HF-MP43 (400W)
OMRON Corp.	R88M-W20 (200W), R88M-W40 (400W)
Sanyo Denki Co., Ltd.	P30B06020 (200W), P30B06040 (400W)

Note 1: Be sure to align centerlines when installing motor.  
Note 2: Be careful in the assembly orientation of bracket.  
Note 3: Because bracket is made by sand casting, external dimensions are for reference only.

### Motor Bracket for MCM10

Part number  
**MC-BK10-190-00**



② Hexagon socket head cap screw (M5, length 30)

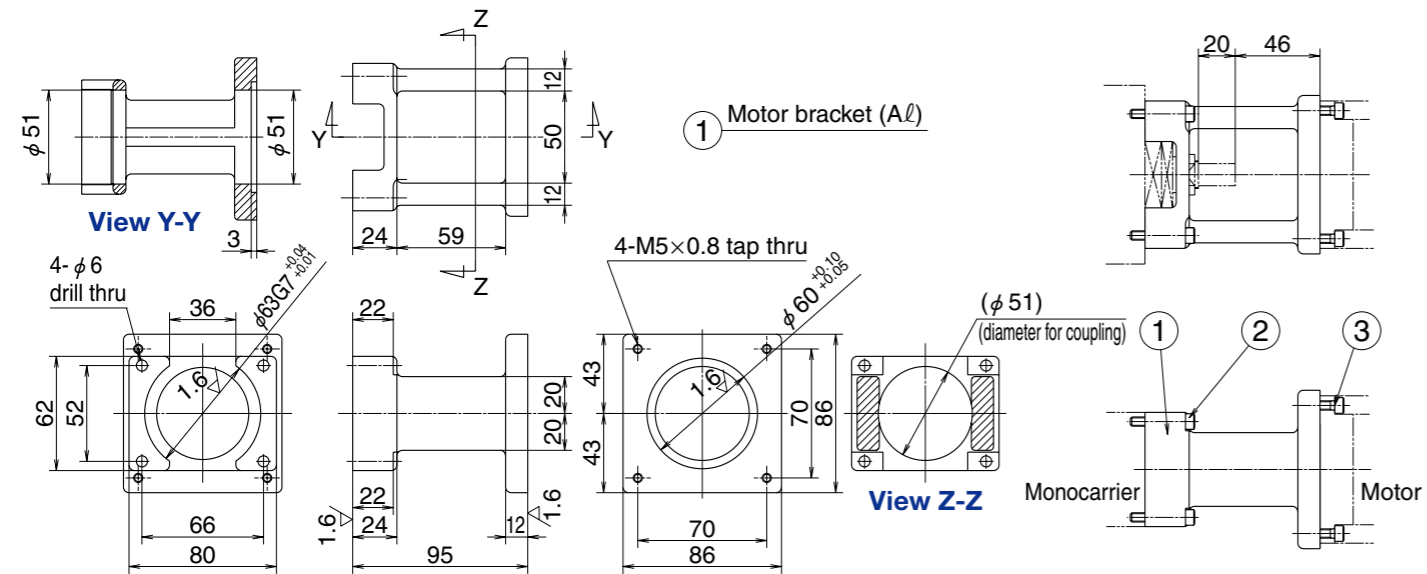
③ Hexagon socket head cap screw (M5, length 16)

Compatible motors	
Maker	Motor models
Matsushita Electric Industrial Co., Ltd.	MSMD08 (750W), MAMA08 (750W)
Sanyo Denki Co., Ltd.	P50B07020 (200W), P50B07030 (300W), P50B07040 (400W)

Note 1: Be sure to align centerlines when installing motor.  
Note 2: Be careful in the assembly orientation of bracket.  
Note 3: Because bracket is made by sand casting, external dimensions are for reference only.

### Motor Bracket for MCM10

Part number  
**MC-BK10-270-00**



- 2 Hexagon socket head cap screw (M5, length 30)
- 3 Hexagon socket head cap screw (M5, length 18)

Compatible motors	
Maker	Motor models
Sanyo Denki Co., Ltd.	103F85xx
Oriental Motor Co., Ltd.	AS98, UPK59x, PK59x, CSK59x, CFK59x, UFK59x

Note 1: Be sure to align centerlines when installing motor.  
 Note 2: Be careful in the assembly orientation of bracket.  
 Note 3: Because bracket is made by sand casting, external dimensions are for reference only.



## Part Number for MCH Series

**Body**

Example: **MC H 06 040 H 10 K (B0)**

Monocarrier

H Type: MCH Series  
L Type: MCH Series low-profile rail (only for 06 size)

Nominal size (rail width, unit: 10 mm)

Stroke (unit: 10 mm)

Accuracy grade (H: High grade)

\*1

Special specification  
Grease specification: B (LG2)  
Slider specification K: Single slider  
D: Double slider

Ball screw lead (mm)

\*1 These two code fields are added when non-standard grease is used. Coding of MCH Monocarrier with standard grease has 12 characters, as shown above.

**With Accessories**

Example: **MC S 06 040 H 10 K 0 0 K 0 0 0**

S: With MCH accessories  
R: With MCL accessories

NSK control code  
Sensor unit  
Cover unit  
Motor bracket

Note: Accessories are available separately.

### Sensor unit (see page 293)

Part number code	Specification	Part number
0	N/A	—
1	Proximity switch (b-contact 3 peices)	MC-SRH**-10
2	Proximity switch (a-contact 3 peices)	MC-SRH**-11
3	Proximity switch (a-contact 1 peice, b-contact 2 pieces)	MC-SRH**-12
4	Photo sensor 3 pieces	MC-SRH**-13

\*\* : Part number  
Note: Sensor rail is not included in sensor unit. If you require the rail, please specify upon ordering. (see pages 293 to 294)

### Cover unit (see pages 295 – 297)

Part number code	Specification	Part number
0	N/A	—
1	For single slider	MC-HV*****-00
	For double slider	MC-HV*****D00

\*\*\*\*\*: Part number and stroke number

### Motor bracket (see pages 299 – 301)

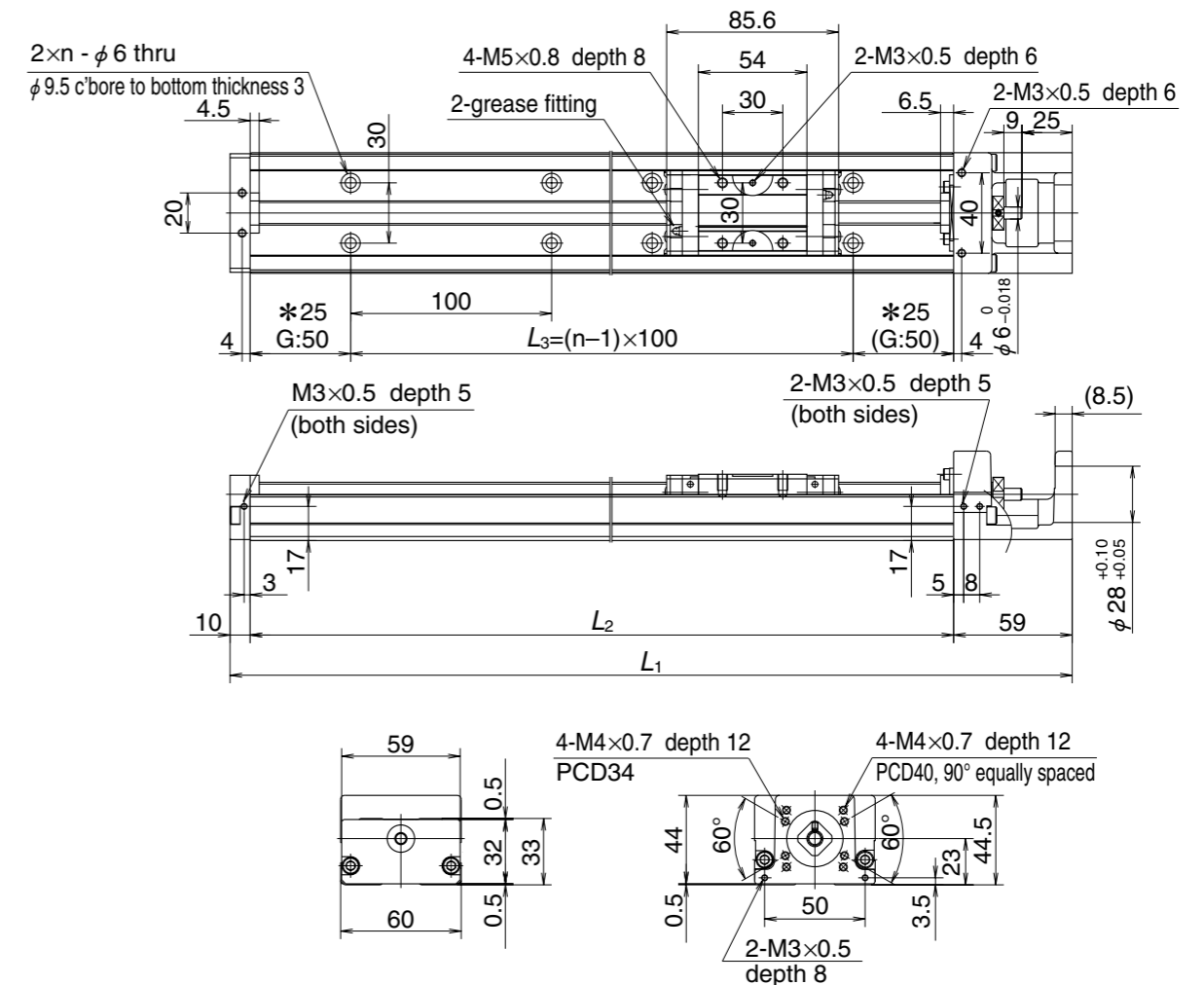
Part number code	Type		
	MCH06 (MCL06)	MCH09	MCH10
0	N/A	N/A	N/A
1	MC-BKH06-145-00	MC-BKH09-145-00	MC-BKH10-170-00
2	MC-BKH06-146-00	MC-BKH09-146-00	MC-BKH10-170-01
3	MC-BKH06-231-00	MC-BKH09-170-00	MC-BKH10-190-00
4	MC-BKH06-250-00	MC-BKH09-170-01	MC-BKH10-190-01
5	—	MC-BKH09-231-00	MC-BKH10-250-00
6	—	MC-BKH09-250-00	MC-BKH10-270-00

N/A: Not applicable

## MCH Series Dimension Table

MCL06

Accuracy grade: High grade (H)



- Rail of MCL 06 is made lighter than that of MCH 06 by lowering rail height. Weight ratio between MCH 06 and MCL 06 is 5 to 4.
- Double slider specification is also available for MCL 06.
- Combinations of stroke and ball screw lead of MCL 06 are same as those of MCH 06.

### Dimensions of MCL06 (single slider)

Part number	Nominal stroke (mm)	Stroke limit (mm) (K1 is not equipped)	Ball screw lead (mm)	Body length (mm)				Inertia $\times 10^{-6}$ (kg-m <sup>2</sup> )	Mass (kg)	Maximum rotational speed (mm/s)
				L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	n			
*MCL06005H05K	50	53	5	219	150	100	2	2.38	1.0	250
*MCL06005H10K		(65)	10					3.45		500
MCL06010H05K	100	103	5	269	200	100	2	3.17	1.3	250
MCL06010H10K		(115)	10					4.12		500
MCL06020H05K	200	203	5	369	300	200	3	4.51	1.9	250
MCL06020H10K		(215)	10					5.46		500
MCL06030H10K	300	303	10	469	400	300	4	6.80	2.6	500
MCL06030H20K		(315)	20					10.6		1 000
MCL06040H10K	400	403	10	569	500	400	5	8.13	3.2	500
MCL06040H20K		(415)	20					11.9		1 000
MCL06050H10K	500	503	10	669	600	500	6	9.47	3.9	500
MCL06050H20K		(515)	20					13.3		1 000

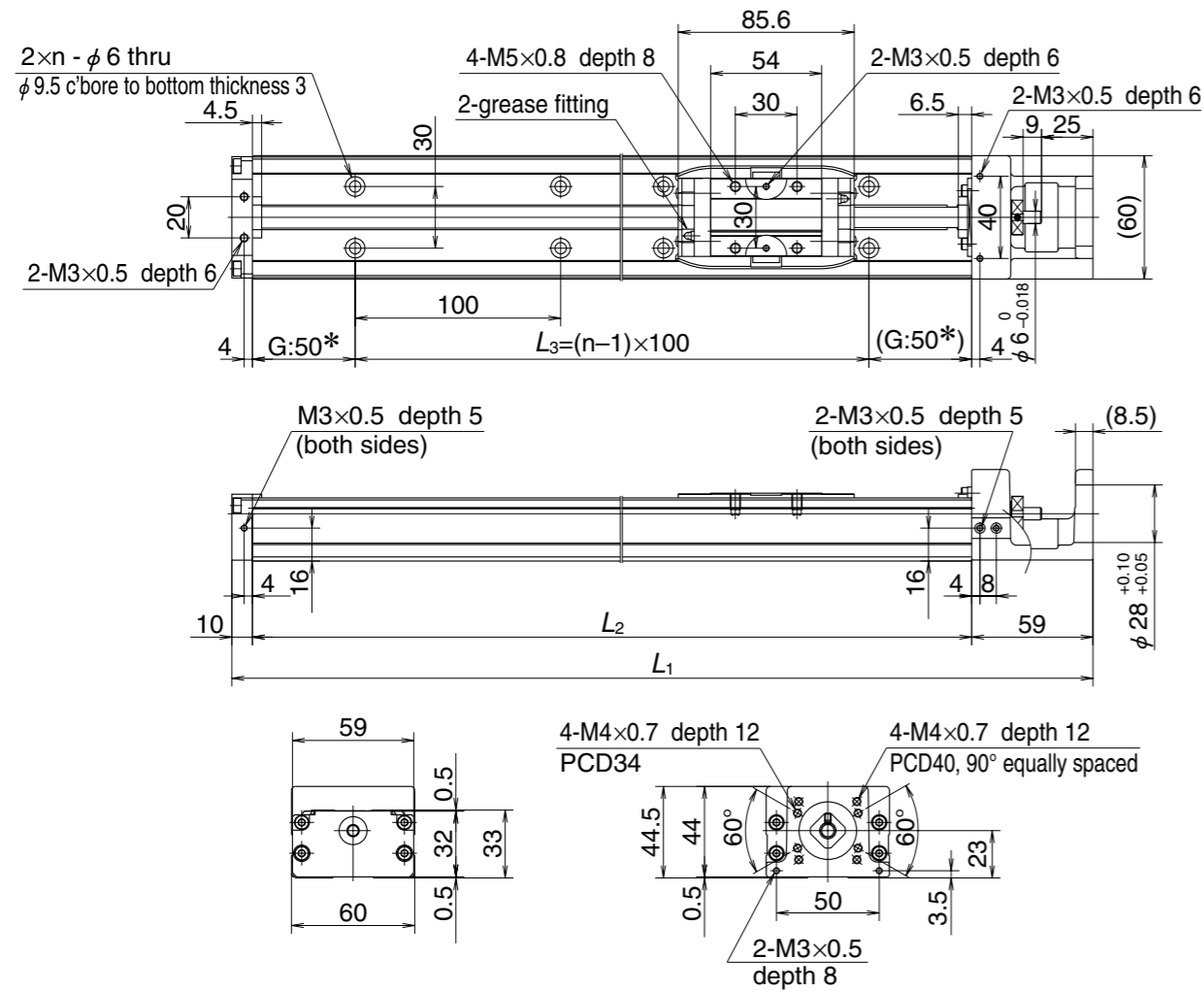
Dimension of G is 25 instead of 50 for items marked with \*.

### Monocarrier dynamic torque specifications (N-cm)

Ball screw lead (mm)	Dynamic torque (N-cm)	
	5	1.0 – 4.8
	10	1.1 – 5.8
20	1.6 – 7.9	

1. Frictional resistance of NSK K1 is included in dynamic torque in table.
2. Grease is packed into ball screw, linear guide parts and support unit.
3. Consult NSK for life estimates under large moment loads.

► For basic load ratings, see page 304.



Dimensions of MCH06 (single slider)

Part number	Nominal stroke (mm)	Stroke limit (mm) (K1 is not equipped)	Ball screw lead (mm)	Body length (mm)				Inertia $\times 10^{-6}$ (kg·m <sup>2</sup> )	Mass (kg)	Maximum rotational speed (mm/s)
				L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	n			
*MCH06005H05K	50	53 (65)	5	219	150	100	2	2.38	1.8	250
*MCH06005H10K			10					3.45		500
*MCH06005H20K			20					7.25		1 000
MCH06010H05K	100	103 (115)	5	269	200	100	2	3.17	2.2	250
MCH06010H10K			10					4.12		500
MCH06010H20K			20					7.92		1 000
MCH06020H05K	200	203 (215)	5	369	300	200	3	4.51	3.0	250
MCH06020H10K			10					5.46		500
MCH06020H20K			20					9.26		1 000
MCH06030H05K	300	303 (315)	5	469	400	300	4	5.85	3.7	250
MCH06030H10K			10					6.80		500
MCH06030H20K			20					10.6		1 000
MCH06040H05K	400	403 (415)	5	569	500	400	5	7.18	4.5	250
MCH06040H10K			10					8.13		500
MCH06040H20K			20					11.9		1 000
MCH06050H05K	500	503 (515)	5	669	600	500	6	8.52	5.2	250
MCH06050H10K			10					9.47		500
MCH06050H20K			20					13.3		1 000

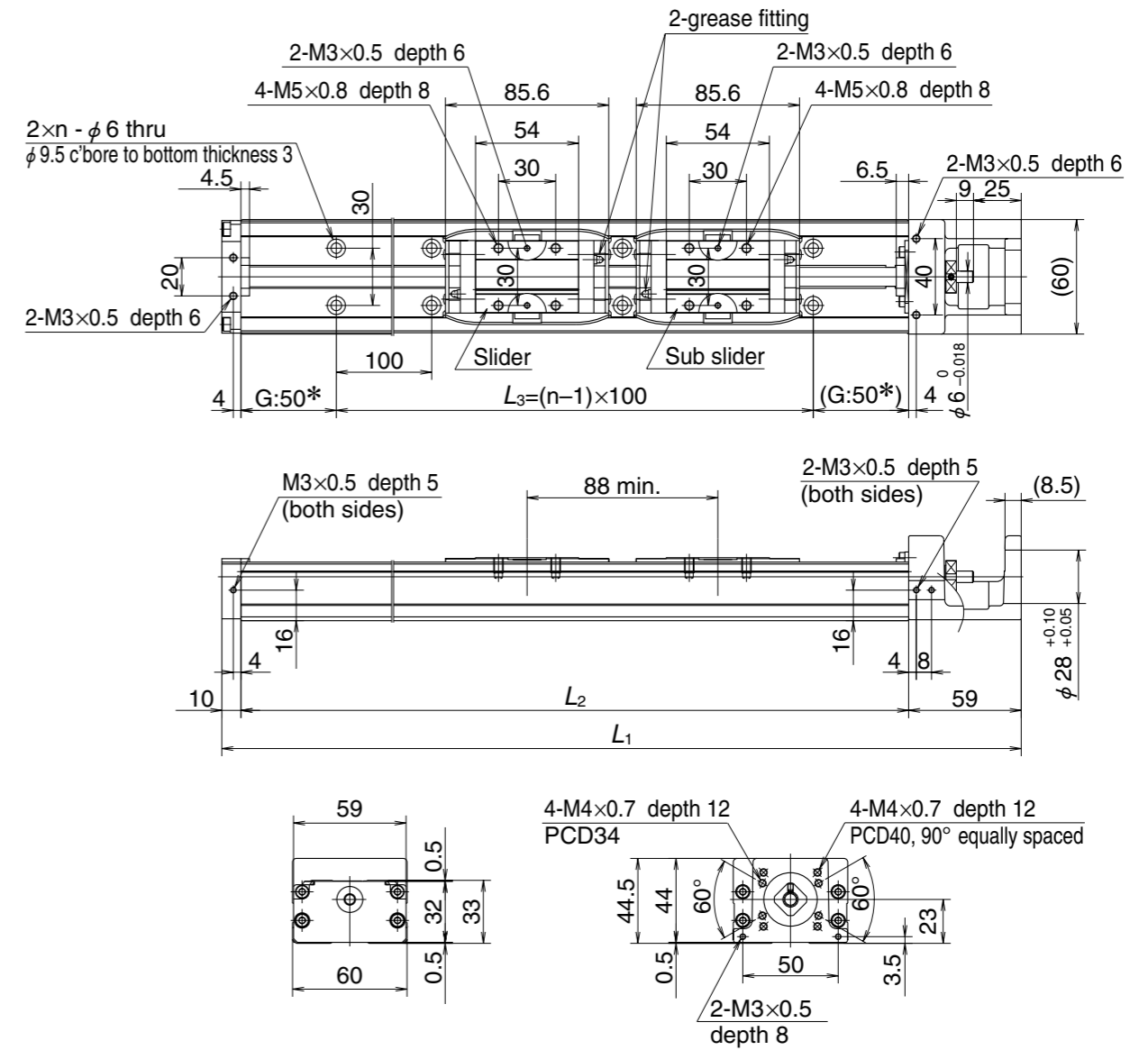
Dimension of G is 25 instead of 50 for items marked with \*.

Monocarrier dynamic torque specifications (N·cm)

Ball screw lead (mm)	Dynamic torque (N·cm)	
	5	1.0 – 4.8
	10	1.1 – 5.8
20	1.6 – 7.9	

- Frictional resistance of NSK K1 is included in dynamic torque in table.
- Grease is packed into ball screw, linear guide parts and support unit.
- Consult NSK for life estimates under large moment loads.

► For basic load ratings, see page 304.



Dimensions of MCH06 (double slider)

Part number	Nominal stroke (mm)	Stroke limit (mm) (K1 is not equipped)	Ball screw lead (mm)	Body length (mm)				Inertia $\times 10^{-6}$ (kg·m <sup>2</sup> )	Mass (kg)	Maximum rotational speed (mm/s)
				L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	n			
MCH06010H05D	100	115 (139)	5	369	300	200	3	4.82	3.5	250
MCH06010H10D			10					6.72		500
MCH06020H05D	200	215 (239)	5	469	400	300	4	8.06	4.2	250
MCH06020H10D			10					15.7		500
MCH06030H05D	300	315 (339)	5	569	500	400	5	9.40	5.0	250
MCH06030H10D			10					17.0		500
MCH06040H10D	400	415 (439)	10	669	600	500	6	10.7	5.7	500
MCH06040H20D			20					18.3		1 000

Monocarrier dynamic torque specifications (N·cm)

Ball screw lead (mm)	Dynamic torque (N·cm)	
	5	1.2 – 5.2
	10	1.5 – 9.6
20	2.3 – 11.8	

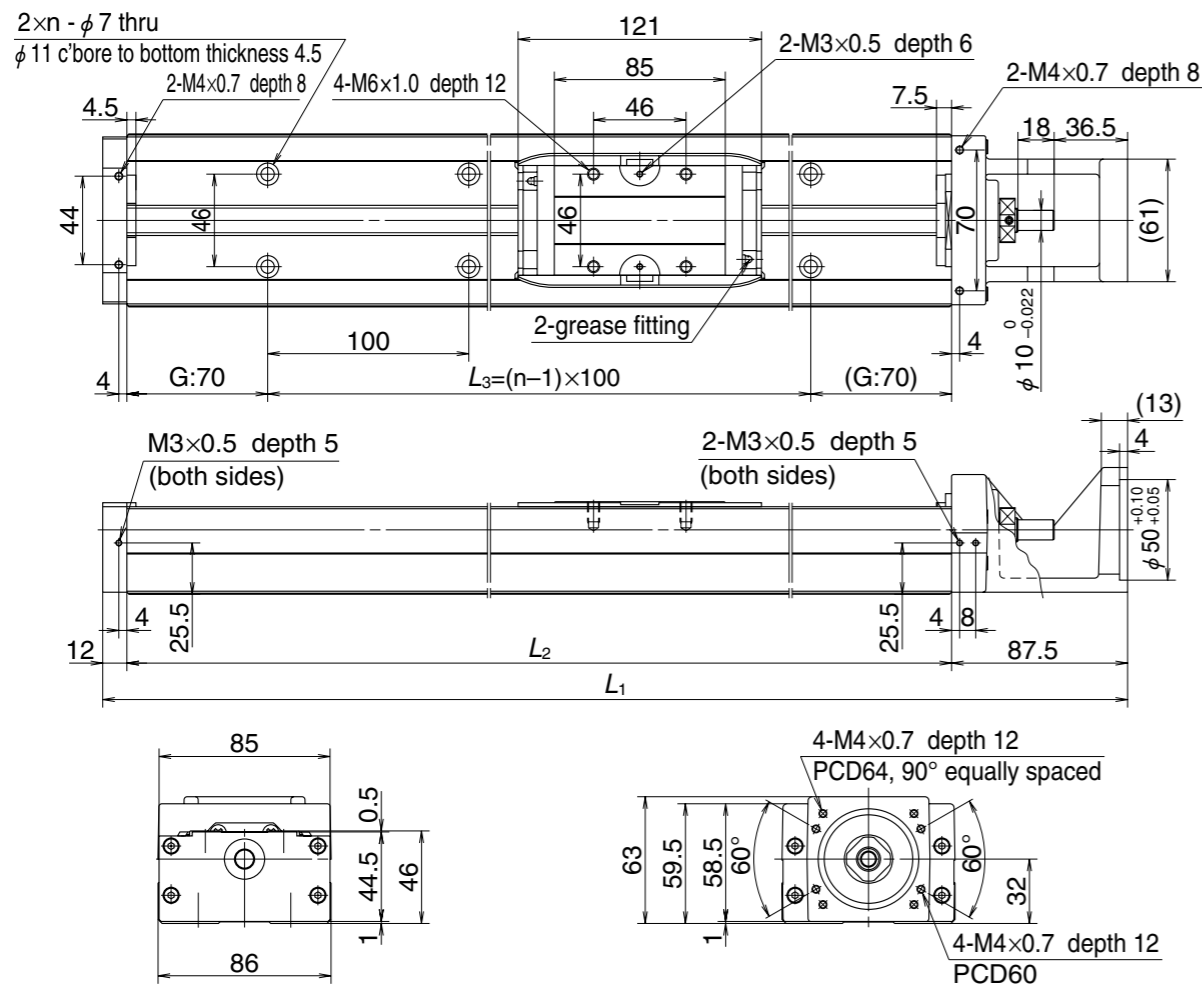
- Frictional resistance of NSK K1 is included in dynamic torque in table.
- Grease is packed into ball screw, linear guide parts and support unit.
- Consult NSK for life estimates under large moment loads.

► For basic load ratings, see page 304.

## MCH Series Dimension Tables

### MCH09

Accuracy grade: High grade (H)



Dimensions of MCH09 (single slider)

Part number	Nominal stroke (mm)	Stroke limit (mm) (K1 is not equipped)	Ball screw lead (mm)	Body length (mm)				Inertia $\times 10^{-6}$ (kg·m <sup>2</sup> )	Mass (kg)	Maximum rotational speed (mm/s)
				L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	n			
MCH09010H05K	100	107 (121)	5	339.5	240	100	2	9.2	5.0	250
MCH09010H10K			10					10.7		500
MCH09010H20K			20					16.8		1 000
MCH09020H05K	200	207 (221)	5	439.5	340	200	3	12.4	6.5	250
MCH09020H10K			10					13.9		500
MCH09020H20K			20					20.0		1 000
MCH09030H05K	300	307 (321)	5	539.5	440	300	4	15.6	8.1	250
MCH09030H10K			10					17.1		500
MCH09030H20K			20					23.2		1 000
MCH09040H05K	400	407 (421)	5	639.5	540	400	5	18.8	9.7	250
MCH09040H10K			10					20.3		500
MCH09040H20K			20					26.4		1 000
MCH09050H05K	500	507 (521)	5	739.5	640	500	6	22.0	11	250
MCH09050H10K			10					23.5		500
MCH09050H20K			20					29.6		1 000
MCH09060H05K	600	607 (621)	5	839.5	740	600	7	25.2	13	250
MCH09060H10K			10					26.7		500
MCH09060H20K			20					32.8		1 000
MCH09070H05K	700	707 (721)	5	939.5	840	700	8	28.4	14.5	250
MCH09070H10K			10					30.0		500
MCH09070H20K			20					36.0		1 000
MCH09080H05K	800	807 (821)	5	1 039.5	940	800	9	31.6	16	210
MCH09080H10K			10					33.2		410
MCH09080H20K			20					39.2		830

Monocarrier dynamic torque specifications (N·cm)

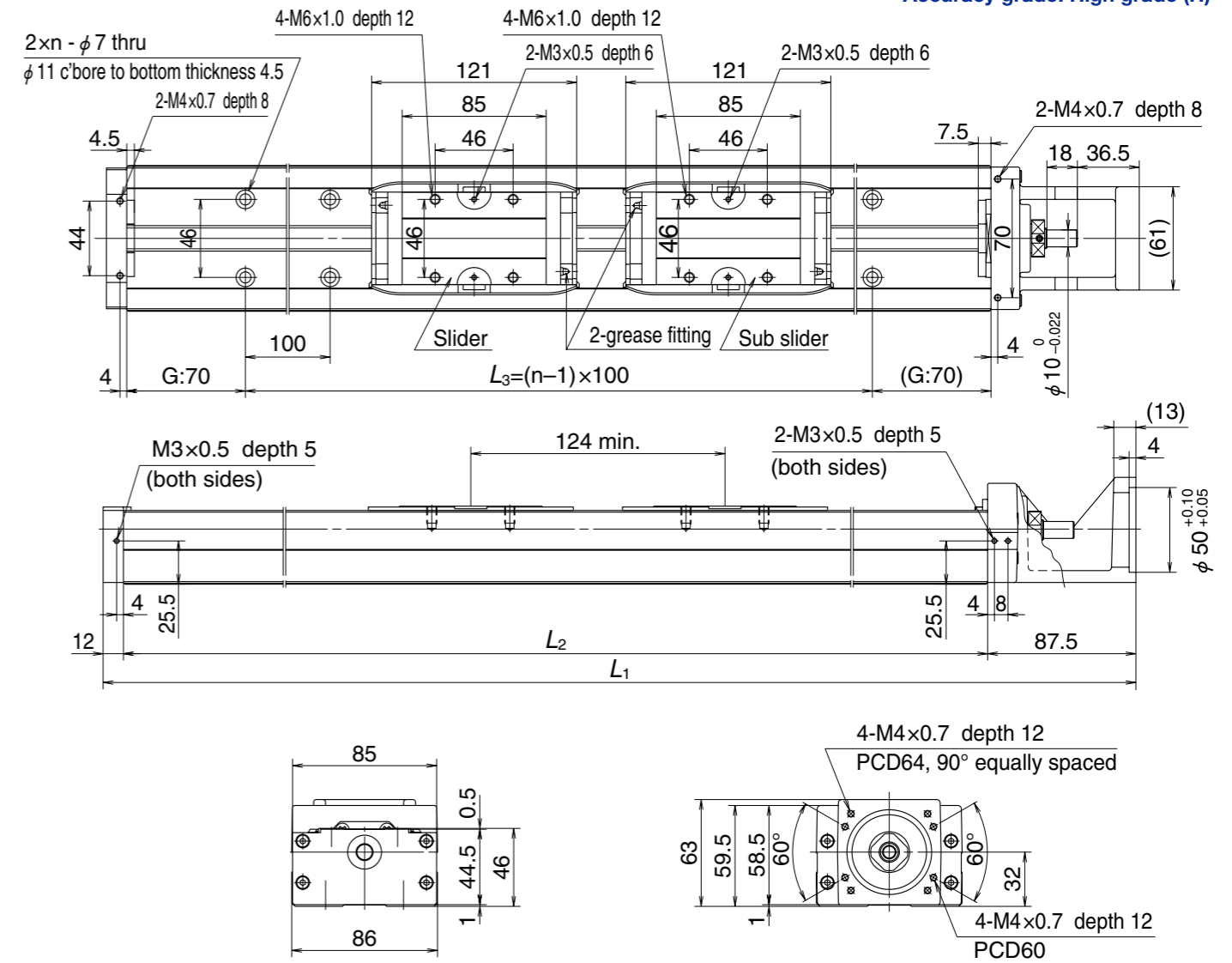
Ball screw lead (mm)	5		1.0 - 5.9	
	10		2.0 - 7.8	
	20		2.0 - 10.8	

- Frictional resistance of NSK K1 is included in dynamic torque in table.
- Grease is packed into ball screw, linear guide parts and support unit.
- Consult NSK for life estimates under large moment loads.

► For basic load ratings, see page 304.

### MCH09 (Double Slider)

Accuracy grade: High grade (H)



Dimensions of MCH09 (double slider)

Part number	Nominal stroke (mm)	Stroke limit (mm) (K1 is not equipped)	Ball screw lead (mm)	Body length (mm)				Inertia $\times 10^{-6}$ (kg·m <sup>2</sup> )	Mass (kg)	Maximum rotational speed (mm/s)
				L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	n			
MCH09015H05D	150	183 (211)	5	539.5	440	300	4	16.1	8.9	250
MCH09015H10D			10					19.2		500
MCH09025H05D	250	283 (311)	5	639.5	540	400	5	19.3	11	250
MCH09025H10D			10					22.4		500
MCH09035H05D	350	383 (411)	5	739.5	640	500	6	22.5	12	250
MCH09035H10D			10					25.6		500
MCH09045H10D	450	483 (511)	10	839.5	740	600	7	28.8	14	500
MCH09045H20D			20					40.9		1 000
MCH09065H10D	650	683 (711)	10	1 039.5	940	800	9	35.2	17	500
MCH09065H20D			20					47.3		1 000

Monocarrier dynamic torque specifications (N·cm)

Ball screw lead (mm)	5		1.5 - 7.0	
	10		2.5 - 10.8	
	20		4.0 - 17.2	

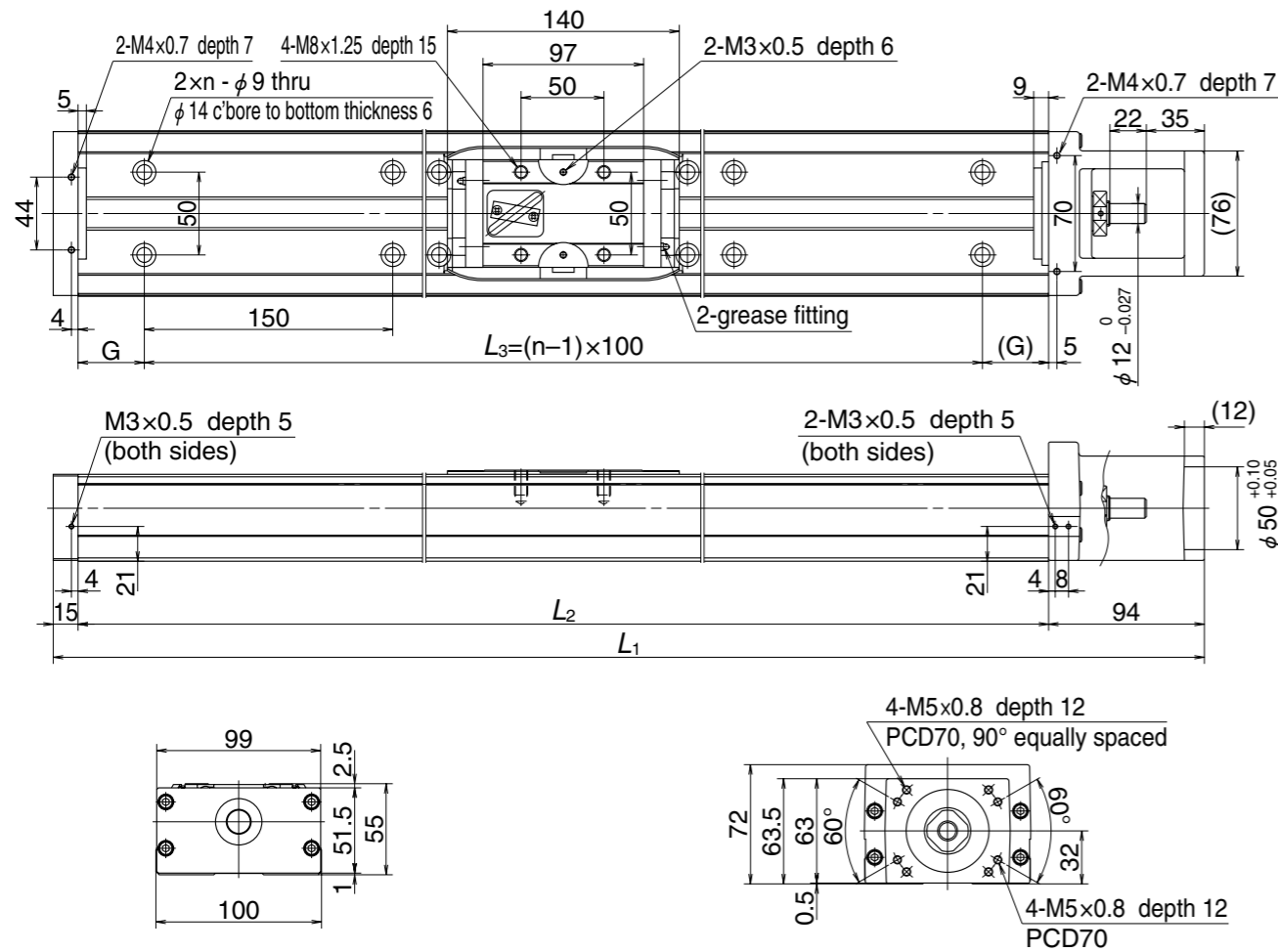
- Frictional resistance of NSK K1 is included in dynamic torque in table.
- Grease is packed into ball screw, linear guide parts and support unit.
- Consult NSK for life estimates under large moment loads.

► For basic load ratings, see page 304.

## MCH Series Dimension Tables

### MCH10

Accuracy grade: High grade (H)



Dimensions of MCH10 (single slider)

Part number	Nominal stroke (mm)	Stroke limit (mm) (K1 is not equipped)	Ball screw lead (mm)	Body length (mm)					Inertia $\times 10^{-6}$ (kg·m <sup>2</sup> )	Mass (kg)	Maximum rotational speed (mm/s)
				L <sub>1</sub>	L <sub>2</sub>	G	L <sub>3</sub>	n			
MCH10010H10K	100	126	10	389	280	65	150	2	33.2	7.3	500
MCH10010H20K		(142)	20						41.1		1 000
MCH10020H10K	200	226	10	489	380	40	300	3	43.4	9.5	500
MCH10020H20K		(242)	20						51.3		1 000
MCH10030H10K	300	326	10	589	480	15	450	4	53.7	12	500
MCH10030H20K		(342)	20						61.6		1 000
MCH10040H10K	400	426	10	689	580	65	450	4	62.4	14	500
MCH10040H20K		(442)	20						71.8		1 000
MCH10050H10K	500	526	10	789	680	40	600	5	74.7	16	500
MCH10050H20K		(542)	20						82.3		1 000
MCH10060H10K	600	626	10	889	780	15	750	6	84.9	19	500
MCH10060H20K		(642)	20						92.5		1 000
MCH10070H10K	700	726	10	989	880	65	750	6	95.1	21	500
MCH10070H20K		(742)	20						103		1 000
MCH10080H10K	800	826	10	1 089	980	40	900	7	105	23	500
MCH10080H20K		(842)	20						113		1 000
MCH10090H10K	900	926	10	1 189	1 080	15	1 050	8	116	25	440
MCH10090H20K		(942)	20						123		870
MCH10100H10K	1 000	1 026	10	1 289	1 180	65	1 050	8	126	27	360
MCH10100H20K		(1 042)	20						133		720
MCH10110H10K	1 100	1 126	10	1 389	1 280	40	1 200	9	136	29	300
MCH10110H20K		(1 142)	20						143		600
MCH10120H10K	1 200	1 226	10	1 489	1 380	15	1 350	10	146	32	250
MCH10120H20K		(1 242)	20						154		510

Monocarrier dynamic torque specifications (N·cm)

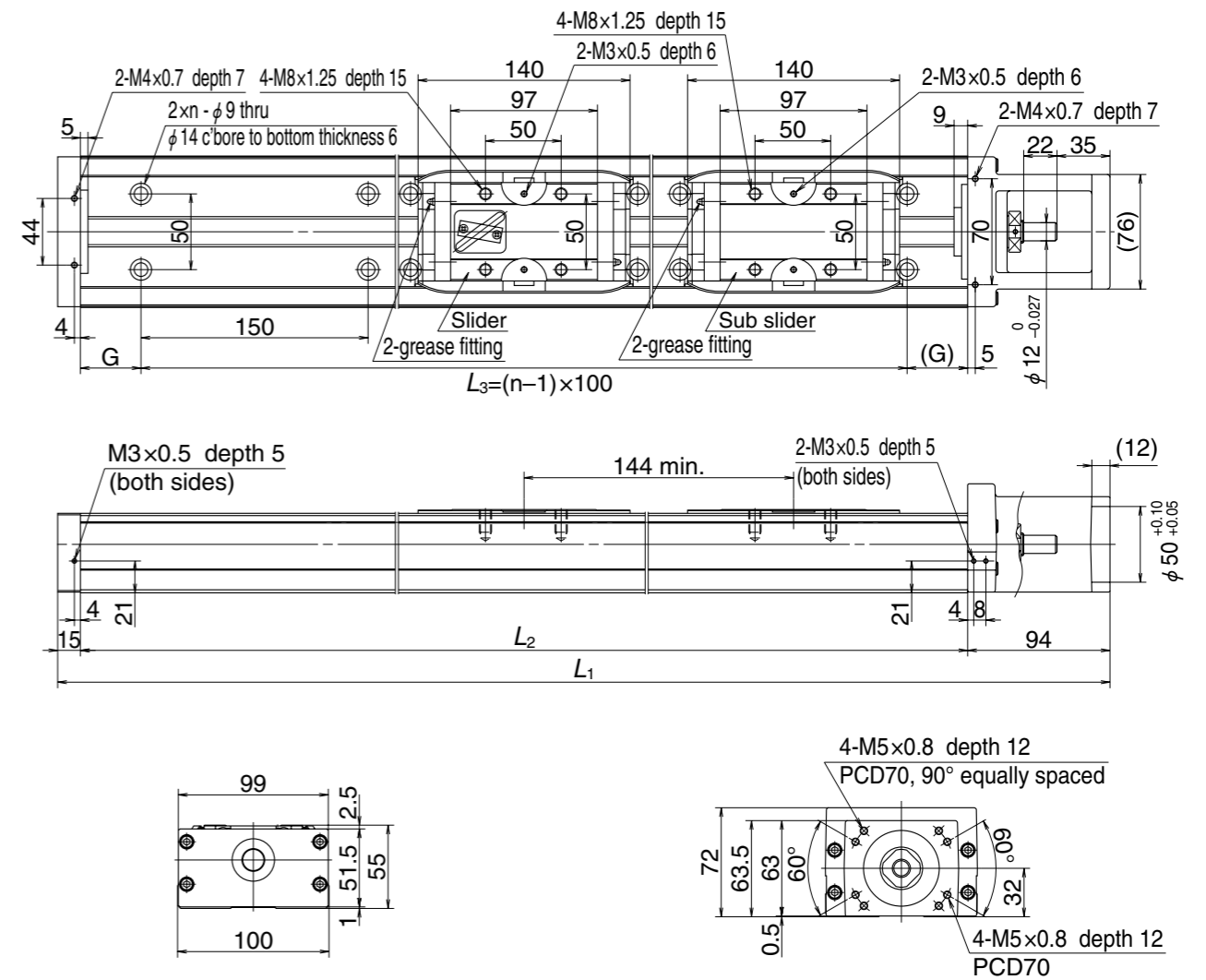
Ball screw lead (mm)	10	2.7 – 10.8
	20	3.1 – 12.7

- Frictional resistance of NSK K1 is included in dynamic torque in table.
- Grease is packed into ball screw, linear guide parts and support unit.
- Consult NSK for life estimates under large moment loads.

► For basic load ratings, see page 304.

### MCH10 (Double Slider)

Accuracy grade: High grade (H)



Dimensions of MCH10 (double slider)

Part number	Nominal stroke (mm)	Stroke limit (mm) (K1 is not equipped)	Ball screw lead (mm)	Body length (mm)					Inertia $\times 10^{-6}$ (kg·m <sup>2</sup> )	Mass (kg)	Maximum rotational speed (mm/s)
				L <sub>1</sub>	L <sub>2</sub>	G	L <sub>3</sub>	n			
MCH10025H10D	250	282	10	689	580	65	450	4	67.1	15	500
MCH10025H20D		(314)	20						82.4		1 000
MCH10035H10D	350	382	10	789	680	40	600	5	77.3	17	500
MCH10035H20D		(414)	20						92.5		1 000
MCH10045H10D	450	482	10	889	780	15	750	6	87.5	20	500
MCH10045H20D		(514)	20						103		1 000
MCH10055H10D	550	582	10	989	880	65	750	6	97.7	22	500
MCH10055H20D		(614)	20						113		1 000
MCH10065H10D	650	682	10	1 089	980	40	900	7	108	24	500
MCH10065H20D		(714)	20						123		1 000
MCH10075H20D	750	782 (814)	20	1 189	1 080	15	1 050	8	133	26	1 000
MCH10085H20D	850	882 (914)	20	1 289	1 180	65	1 050	8	143	28	950
MCH10095H20D	950	982 (1 014)	20	1 389	1 280	40	1 200	9	154	30	780
MCH10105H20D	1 050	1 082 (1 114)	20	1 489	1 380	15	1 350	10	164	33	650

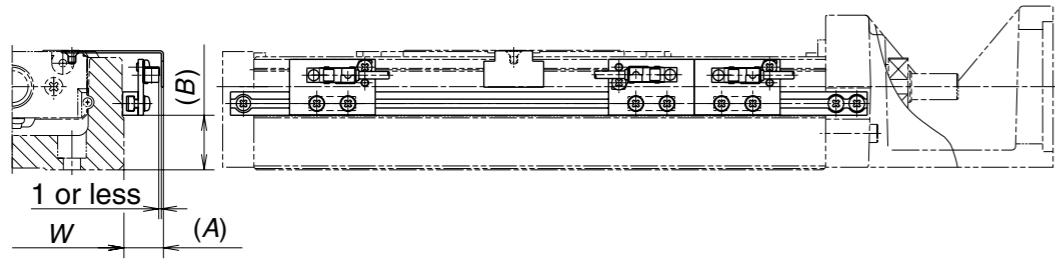
Monocarrier dynamic torque specifications (N·cm)

Ball screw lead (mm)	10	4.2 – 15.6
	20	5.0 – 19.6

- Frictional resistance of NSK K1 is included in dynamic torque in table.
- Grease is packed into ball screw, linear guide parts and support unit.
- Consult NSK for life estimates under large moment loads.

► For basic load ratings, see page 304.

### Proximity Switch



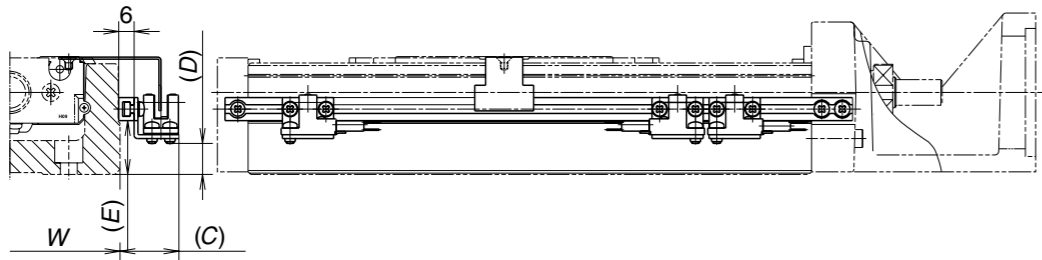
Example of assembly

Type	Part number			Dimension A (mm)	Dimension B (mm)	Body width W (mm)
MCH06	MC-SRH06-10	MC-SRH06-11	MC-SRH06-12	17	10	60
MCH09	MC-SRH09-10	MC-SRH09-11	MC-SRH09-12	16	21	86
MCH10	MC-SRH10-10	MC-SRH10-11	MC-SRH10-12	16	16	100
Quantity	Proximity switch (a-contact)	3	1	E2S-W13 (OMRON Corp.)		
	Proximity switch (b-contact)	3	2	E2S-W14 (OMRON Corp.)		

Note 1: See page 305 for proximity switch specifications.

Note 2: Sensor unit consists of sensors, sensor dog and sensor mounting parts.

### Photo Sensor



Example of assembly

Type	Part number	Dimension C (mm)	Dimension D (mm)	Body width E (mm)	Body width W (mm)	Notes
MCH06	MC-SRH06-13	24	2	11	60	EE-SX674 (OMRON Corp.) 3 sets (EE-1001 connector attachment)
MCH09	MC-SRH09-13	23	12	21	86	
MCH10	MC-SRH10-13	23	29	16	100	

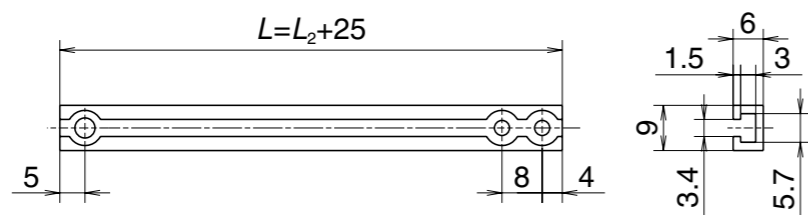
Note 1: See page 306 for photo sensor specifications.

Note 2: Sensor unit consists of sensors, sensor dog and sensor mounting parts.

### Sensor Rail

Part number: MC-SRL- \* \* \* \*

\* \* \* \* is same as rail dimension  $L_2$ .



### Body of MCH Series and Sensor Rail Combination Table

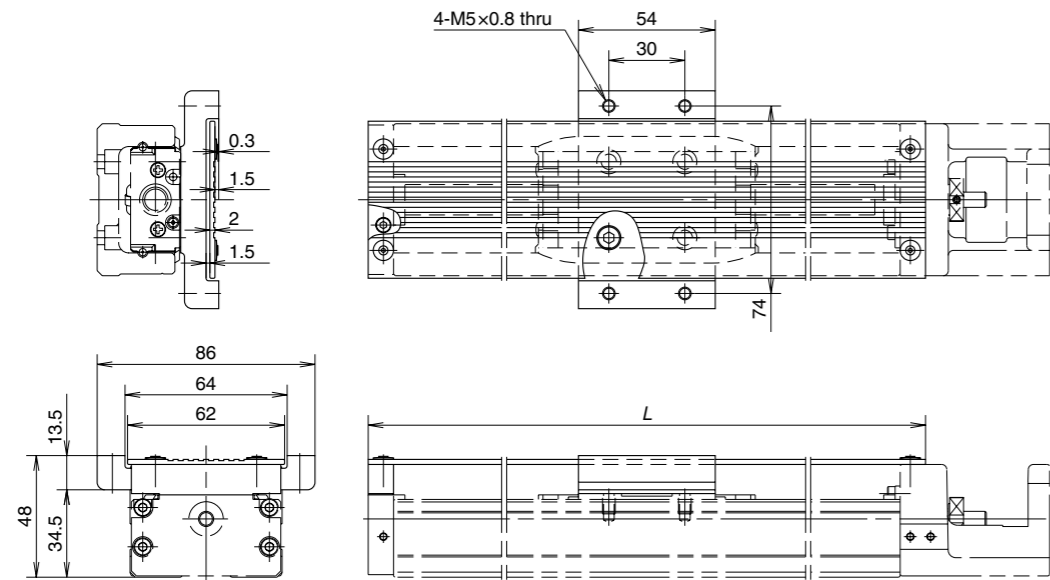
Nominal size	Body length $L_2$ (mm)	Part number	Sensor rail part number
MCH06	150	MCH06005H05K MCH06005H10K	MC-SRL-0150
	200	MCH06010H05K MCH06010H10K	MC-SRL-0200
	300	MCH06020H05K MCH06020H10K MCH06010H05D MCH06010H10D	MC-SRL-0300
	400	MCH06030H10K MCH06030H20K MCH06020H05D MCH06020H10D	MC-SRL-0400
	500	MCH06040H10K MCH06040H20K MCH06030H05D MCH06030H10D	MC-SRL-0500
	600	MCH06050H10K MCH06050H20K MCH06040H10D MCH06040H20D	MC-SRL-0600
MCL06	150	MCL06005H05K MCL06005H10K	MC-SRL-0150
	200	MCL06010H05K MCL06010H10K	MC-SRL-0200
	300	MCL06020H05K MCL06020H10K	MC-SRL-0300
	400	MCL06030H10K MCL06030H20K	MC-SRL-0400
	500	MCL06040H10K MCL06040H20K	MC-SRL-0500
	600	MCL06050H10K MCL06050H20K	MC-SRL-0600
MCH09	340	MCH09020H05K MCH09020H10K	MC-SRL-0340
	440	MCH09030H05K MCH09030H10K MCH09015H05D MCH09015H10D	MC-SRL-0440
	540	MCH09040H05K MCH09040H10K MCH09025H05D MCH09025H10D	MC-SRL-0540
	640	MCH09050H10K MCH09050H20K MCH09035H05D MCH09035H10D	MC-SRL-0640
	740	MCH09060H10K MCH09060H20K MCH09045H10D MCH09045H20D	MC-SRL-0740
	940	MCH09080H10K MCH09080H20K MCH09065H10D MCH09065H20D	MC-SRL-0940

Nominal size	Body length $L_2$ (mm)	Part number	Sensor rail part number
MCH10	580	MCH10040H10K MCH10025H10D	MC-SRL-0580
	680	MCH10050H10K MCH10050H20K MCH10035H10D MCH10035H20D	MC-SRL-0680
	780	MCH10060H10K MCH10060H20K MCH10045H10D MCH10045H20D	MC-SRL-0780
	880	MCH10070H10K MCH10070H20K MCH10055H10D MCH10055H20D	MC-SRL-0880
	980	MCH10080H10K MCH10080H20K MCH10065H10D MCH10065H20D	MC-SRL-0980
	1 080	MCH10090H20K MCH10075H20D	MC-SRL-1080
	1 180	MCH10100H20K MCH10085H20D	MC-SRL-1180
	1 280	MCH10110H20K MCH10095H20D	MC-SRL-1280
	1 380	MCH10120H20K MCH10105H20D	MC-SRL-1380

## Cover Unit for MCH Series

## Accessories

### Cover Unit for MCH06 Cover Unit for MCL06

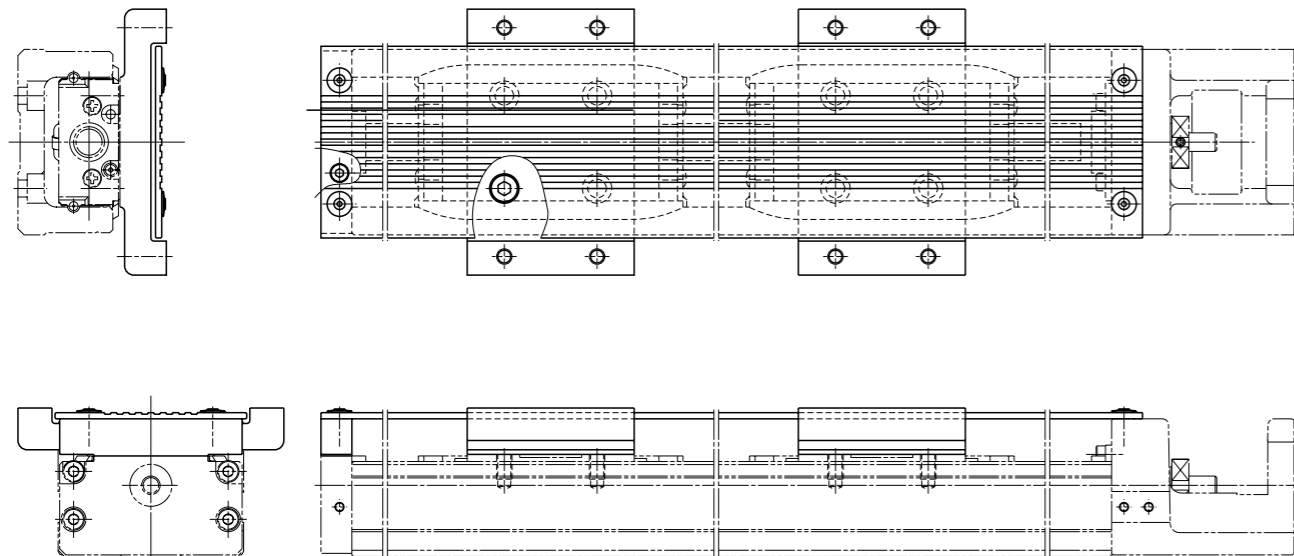


Unit: mm

Single slider		Double slider		Top cover length L
Stroke	Part number	Stroke	Part number	
50	MC-HV06005-00	-	-	170
100	MC-HV06010-00	-	-	220
200	MC-HV06020-00	100	MC-HV06010D00	320
300	MC-HV06030-00	200	MC-HV06020D00	420
400	MC-HV06040-00	300	MC-HV06030D00	520
500	MC-HV06050-00	400	MC-HV06040D00	620

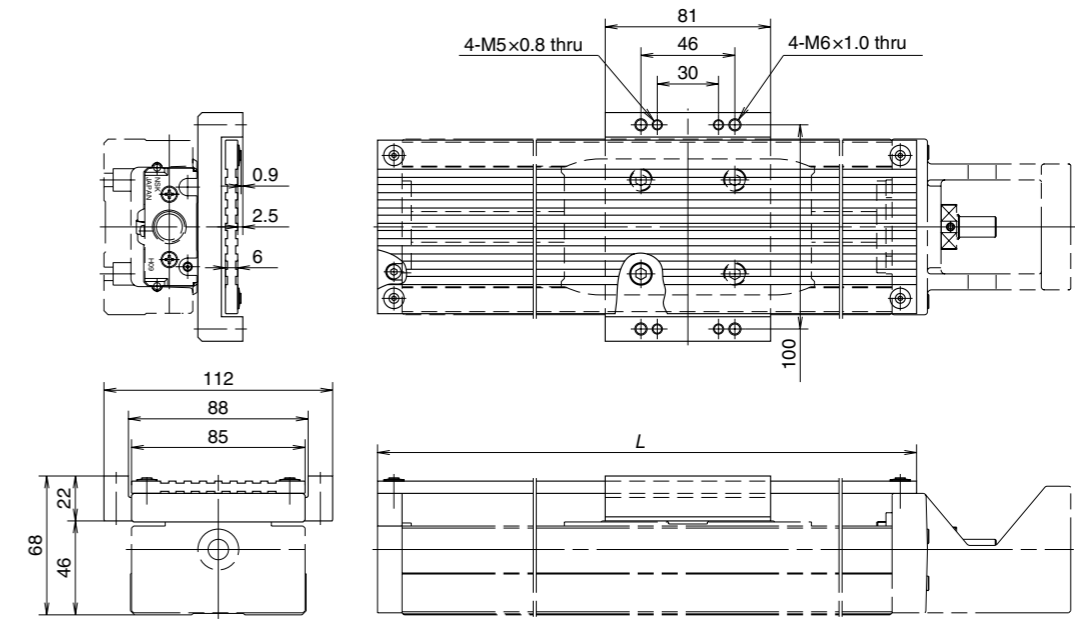
### Cover Unit for Double Sliders (reference drawing)

Two spacers are attached for double slider.



### Cover Unit for MCH09

## Accessories

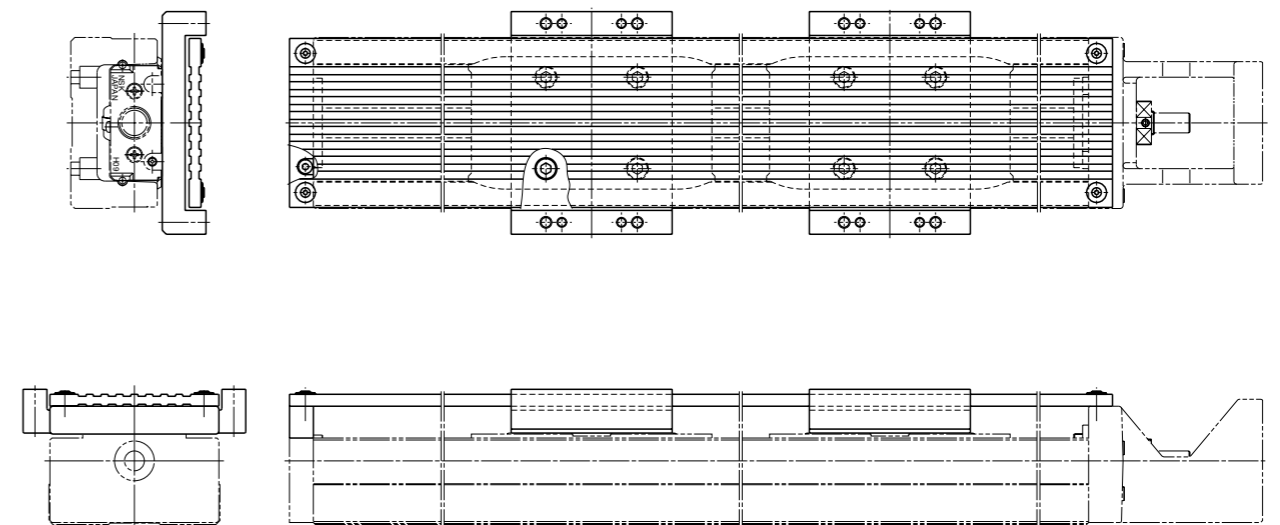


Unit: mm

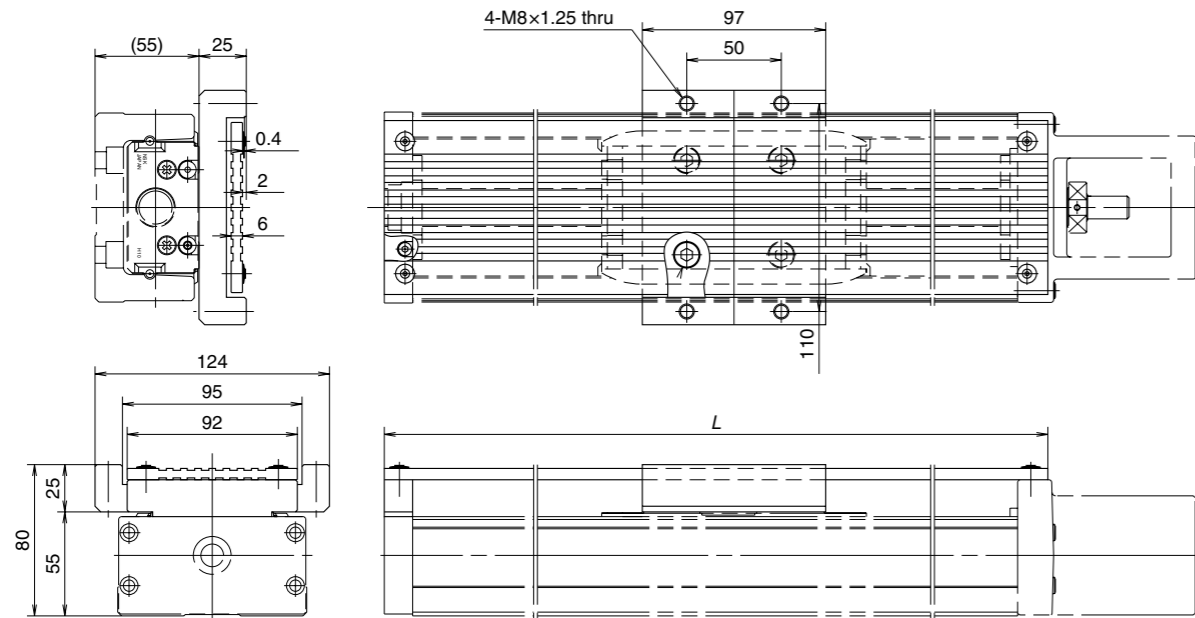
Single slider		Double slider		Top cover length L
Stroke	Part number	Stroke	Part number	
100	MC-HV09010-00	-	-	264
200	MC-HV09020-00	-	-	364
300	MC-HV09030-00	150	MC-HV09015D00	464
400	MC-HV09040-00	250	MC-HV09025D00	564
500	MC-HV09050-00	350	MC-HV09035D00	664
600	MC-HV09060-00	450	MC-HV09045D00	764
700	MC-HV09070-00	-	-	864
800	MC-HV09080-00	650	MC-HV09065D00	964

### Cover Unit for Double Sliders (reference drawing)

Two spacers are attached for double slider.



### Cover Unit for MCH10

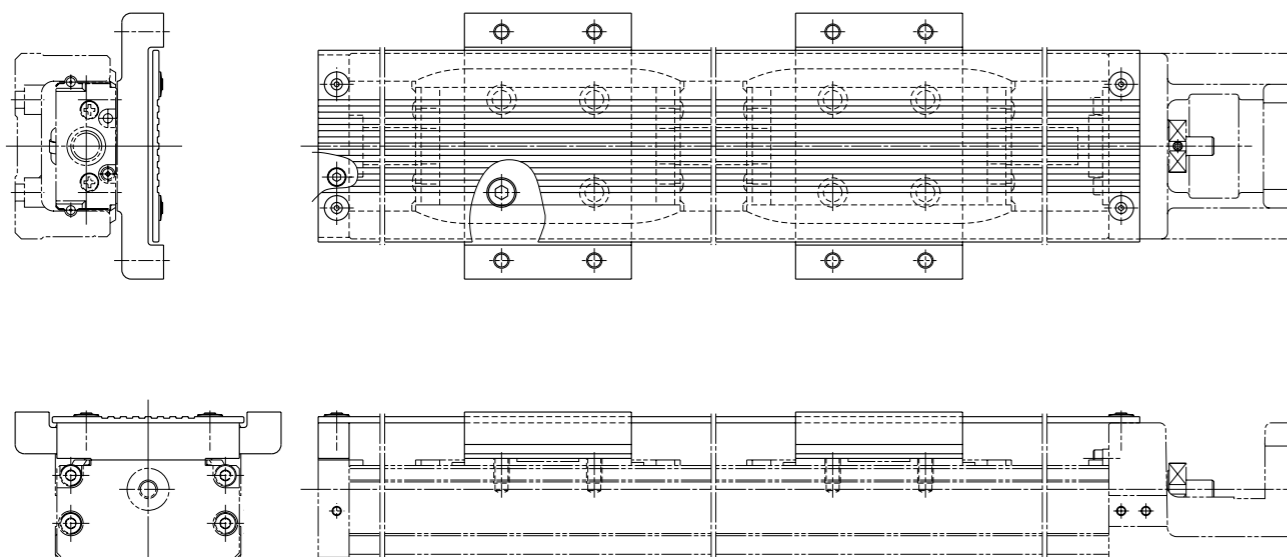


Unit: mm

Single slider		Double slider		Top cover length <i>L</i>
Stroke	Part number	Stroke	Part number	
100	MC-HV10010-00	-	-	310
200	MC-HV10020-00	-	-	410
300	MC-HV10030-00	-	-	510
400	MC-HV10040-00	250	MC-HV10025D00	610
500	MC-HV10050-00	350	MC-HV10035D00	710
600	MC-HV10060-00	450	MC-HV10045D00	810
700	MC-HV10070-00	550	MC-HV10055D00	910
800	MC-HV10080-00	650	MC-HV10065D00	1 010
900	MC-HV10090-00	750	MC-HV10075D00	1 110
1 000	MC-HV10100-00	850	MC-HV10085D00	1 210
1 100	MC-HV10110-00	950	MC-HV10095D00	1 310
1 200	MC-HV10120-00	1 050	MC-HV10105D00	1 410

### Cover Unit for Double Sliders (reference drawing)

Two spacers are attached for double slider.

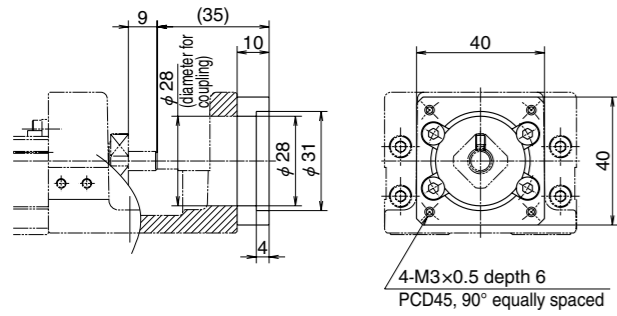


## Intermediate Plate for MCH Series Motors

- Ask NSK about motors not listed in compatible motor list.
- In case of indirect motor mount, please consult with NSK.

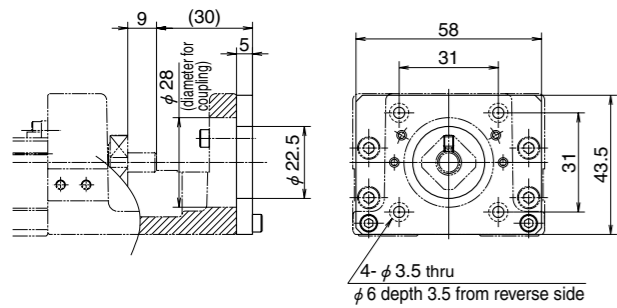
## Motor Bracket for MCH06 and MCL06

Part number  
**MC-BKH06-145-00**



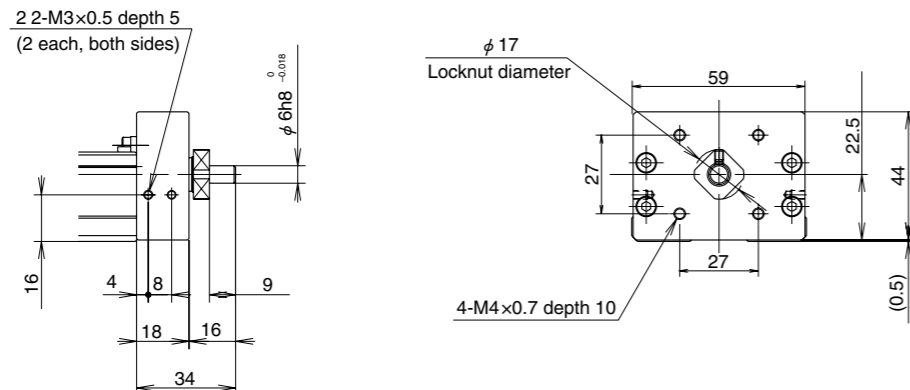
Compatible motors	
Maker	Motor models
Matsushita Electric Industrial Co., Ltd.	MSMD5A (50W), MSMD01 (100W)

Part number  
**MC-BKH06-231-00**



Compatible motors	
Maker	Motor models
Oriental Motor Co., Ltd.	AS46, ASC46, UPK54x, PK54x, CSK54x, CFK54x, UMK24x, CSK24x, PK24x
Sanyo Denki Co., Ltd.	PBM423xxx, 103F55xx

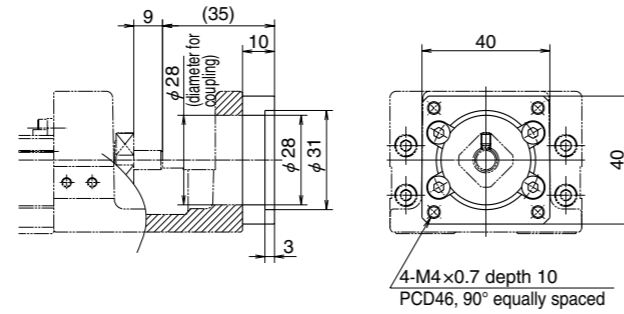
## Diameter of Ball Screw Shaft-end to Install Pulley for Indirect Motor Mount of MCH06



## Accessories

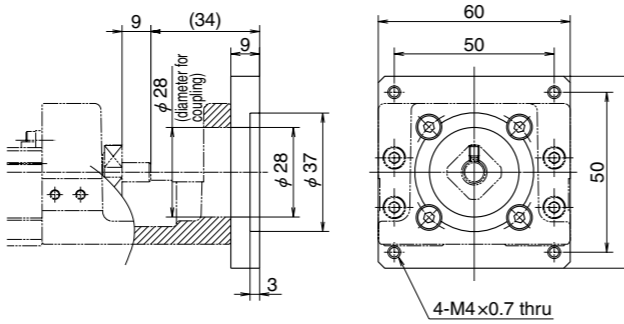
- Be sure to align center lines when installing motor.

Part number  
**MC-BKH06-146-00**



Compatible motors	
Maker	Motor models
Yaskawa Electric Corp.	SGMAH-A3 (30W), SGMAH-A5 (50W), SGMAS-A5A (50W), SGMAH-01 (100W), SGMAS-01A (100W)
Mitsubishi Electric Corp.	HF-KP053 (50W), HF-MP053 (50W), HC-KFS053 (50W), HC-MFS053 (50W), HF-KP13 (100W), HF-MP13 (100W), HC-KFS13 (100W), HC-MFS13 (100W)
OMRON Corp.	R88M-W03 (30W), R88M-W05 (50W), R88M-W10 (100W)
Sanyo Denki Co., Ltd.	P30B04xxx P Series

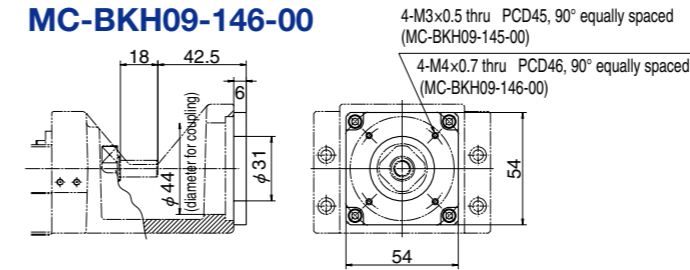
Part number  
**MC-BKH06-250-00**



Compatible motors	
Maker	Motor models
Oriental Motor Co., Ltd.	AS66, ASC66, UPK56x, UFK56x, PK56x, CSK56x, CFK56x
OMRON Corp.	MUMS02 (200W), MUMS04 (400W)
Sanyo Denki Co., Ltd.	PBM603xx, PBM604xx, 103F78xx

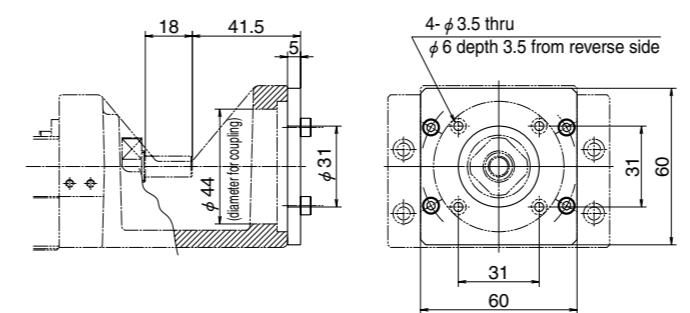
## Motor Bracket for MCH09

Part number  
**MC-BKH09-145-00**  
**MC-BKH09-146-00**



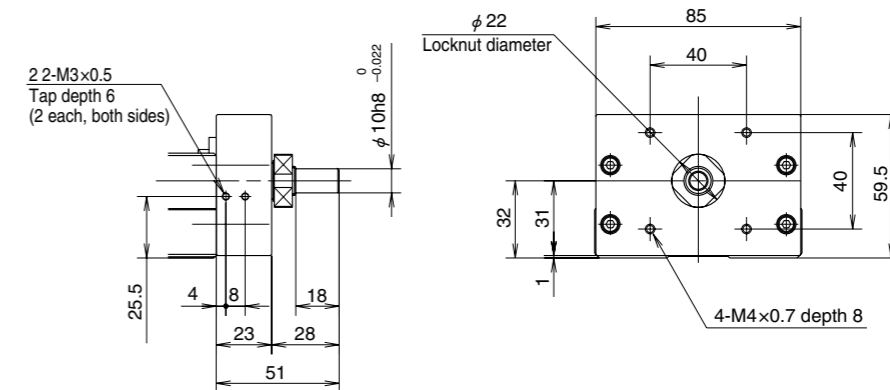
Part number	Compatible motors	
	Maker	Motor models
MC-BKH09-145-00	Matsushita Electric Industrial Co., Ltd.	MSMD5A (50W), MSMD01 (100W)
MC-BKH09-146-00	Yaskawa Electric Corp.	SGMAH-A5 (50W), SGMAS-A5A (50W), SGMAH-01 (100W), SGMAS-01A (100W)
	Mitsubishi Electric Corp.	HF-KP053 (50W), HF-MP05 (50W), HC-KFS053 (50W), HC-MFS053 (50W), HF-KP13 (100W), HF-MP13 (100W), HC-KFS13 (100W), HC-MFS13 (100W)
MC-BKH09-146-00	OMRON Corp.	R88M-W05 (50W), R88M-W10 (100W)
	Sanyo Denki Co., Ltd.	P30B04xxx P Series

Part number  
**MC-BKH09-231-00**

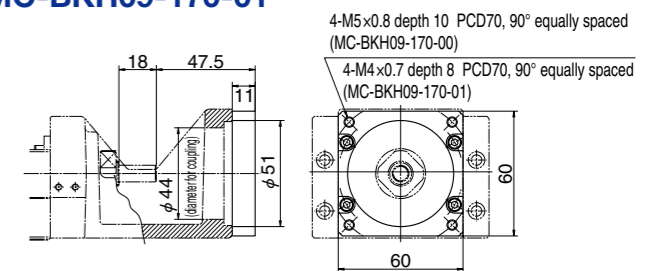


Compatible motors	
Maker	Motor models
Sanyo Denki Co., Ltd.	PBM423xxx, 103F55xx
Oriental Motor Co., Ltd.	AS46, ASC46, UPK54x, PK54x, CSK54x, CFK54x, UMK24x, CSK24x, PK24x

## Diameter of Ball Screw Shaft-end to Install Pulley for Indirect Motor Mount of MCH09

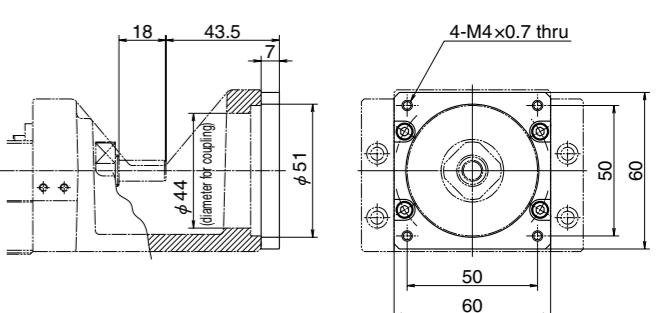


Part number  
**MC-BKH09-170-00**  
**MC-BKH09-170-01**



Part number	Compatible motors	
	Maker	Motor models
MC-BKH09-170-00	Yaskawa Electric Corp.	SGMAH-02 (200W), SGMAS-02A (200W), SGMAH-04 (400W), SGMAS-04A (400W)
	Mitsubishi Electric Corp.	HF-KP23 (200W), HF-MP23 (200W), HF-KP43 (400W), HF-MP43 (400W)
	OMRON Corp.	R88M-W20 (200W), R88M-W40 (400W)
MC-BKH09-170-01	Sanyo Denki Co., Ltd.	P30B06xxx P Series
	Matsushita Electric Industrial Co., Ltd.	MSMD02 (200W), MSMA02 (200W), MSMA04 (400W), MSMD04 (400W)

Part number  
**MC-BKH09-250-00**

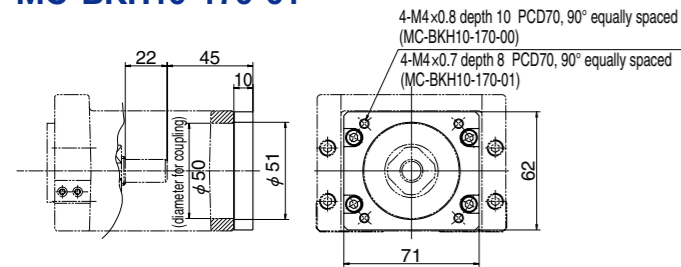


Compatible motors	
Maker	Motor models
Sanyo Denki Co., Ltd.	PBM603xx, PBM604xx, 103F78xx
Oriental Motor Co., Ltd.	AS66, ASC66, UPK56x, UFK56x, PK56x, CSK56x, CFK56x



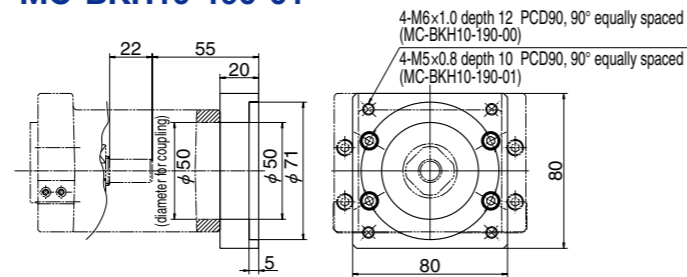
### Motor Bracket for MCH10

Part number  
**MC-BKH10-170-00**  
**MC-BKH10-170-01**



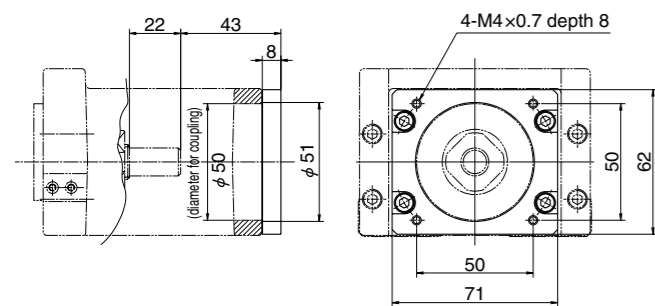
Part number	Compatible motors	
	Maker	Motor models
MC-BKH10-170-00	Yaskawa Electric Corp.	SGMAH-02 (200W), SGMAS-02A (200W), SGMAH-04 (400W), SGMAS-04A (400W)
	Mitsubishi Electric Corp.	HF-KP23 (200W), HF-MP23 (200W), HF-KP43 (400W), HF-MP43 (400W)
	OMRON Corp.	R88M-W20 (200W), R88M-W40 (400W)
	Sanyo Denki Co., Ltd.	P30B06xxx P Series
MC-BKH10-170-01	Matsushita Electric Industrial Co., Ltd.	MSMD02 (200W), MSMA02 (200W), MSMD04 (400W), MSMA04 (400W)

Part number  
**MC-BKH10-190-00**  
**MC-BKH10-190-01**



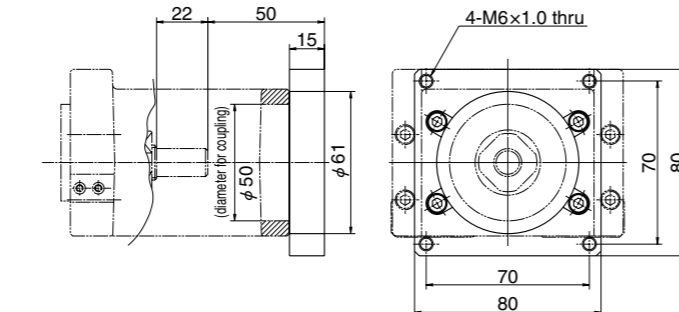
Part number	Compatible motors	
	Maker	Motor models
MC-BKH10-190-00	Mitsubishi Electric Corp.	HC-KFS73 (750W), HC-MFS73 (750W), HF-KP73 (750W), HF-MP73 (750W)
MC-BKH10-190-01	Sanyo Denki Co., Ltd.	P50B07xxx P Series

Part number  
**MC-BKH10-250-00**



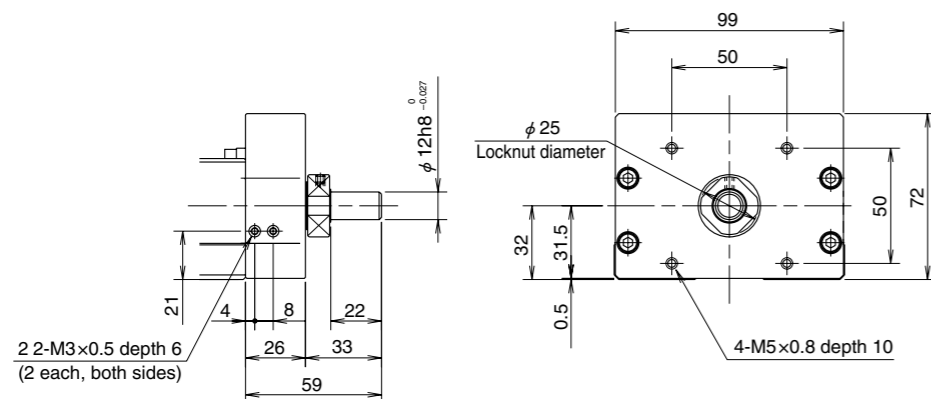
Compatible motors	
Maker	Motor models
Sanyo Denki Co., Ltd.	PBM603xx, PBM604xx, 103F78xx
Oriental Motor Co., Ltd.	AS66, ASC66, UPK56x, PK56x, CSK56x, CFK56x, UMK56x, UFK56x

Part number  
**MC-BKH10-270-00**



Compatible motors	
Maker	Motor models
Oriental Motor Co., Ltd.	AS98, ASC98, UPK59x, PK59x, CSK59x, CFK59x, UMK59x, UFK59x

### Diameter of Ball Screw Shaft-End to Install Pulley for Indirect Motor Mount of MCH10



## Basic Load Rating

## MCM Series

### Basic Load Rating

Nominal size	Lead $l$ (mm)	Shaft dia. $d$ (mm)	Basic dynamic load rating (N)				Basic static load rating (N)		Support unit limit load (N)
			Ball screw $C_a$	Linear guide $C$	Support unit $C_a$	Rated running distance $L_a$ (km)	Ball screw $C_{0a}$	Linear guide $C_0$	
MCM02	1	$\phi 6$	340 (high grade) 405 (precision)	4 910	615	1	555 (high grade) 615 (precision)	2 120	490
	2		340 (high grade) 405 (precision)	3 900		2	555 (high grade) 615 (precision)		
MCM03	1	$\phi 6$	735	10 900	2 670	1	1 230	4 900	1 040
	2		735	8 650		2			
	10	$\phi 8$	1 230	6 250		10			
	12		1 230	5 880		12			
MCM05	5	$\phi 12$	3 760	15 600	4 400	5	6 310	10 900	1 450
	10		2 260	12 400		10	3 780		
	20		2 260	9 850		20	3 780		
	30		3 260	8 600		30	5 400		
MCM06	5	$\phi 16$	7 310	25 200	6 550	5	13 500	17 000	2 730
	10	$\phi 15$	7 060	20 000		10	12 700		
	20		4 560	15 900		20	7 750		
MCM08	5	$\phi 16$	7 310	30 800	7 100	5	13 500	22 800	3 040
	10	$\phi 15$	7 060	24 400		10	12 700		
	20		4 560	19 400		20	7 750		
	30		5 070	16 930		30	8 730		
MCM10	10		$\phi 20$	10 900	33 500	7 600	10	21 700	29 400
	20	7 060		26 600	20		12 700		
	30	11 700		23 200	30		22 700		

Note 1: Basic dynamic and static load ratings indicate values for one slider.

Note 2: Basic dynamic load rating of linear guide is load of perpendicular direction to the axis that allows 90% of a group of same Monocarriers to operate "Rated running distance" in table, which is equivalent to 1 million revolutions of ball screw and support unit under the same conditions without causing flaking by rolling contact fatigue.

Note 3: Basic dynamic load rating of ball screw is load in the axial direction that allows 90% of ball screws of a group of same Monocarriers to rotate 1 million revolutions under the same conditions without causing flaking by rolling contact fatigue.

Note 4: Basic dynamic load rating of support unit is constant load in the axial direction that allows 90% of support units of same group of Monocarriers to rotate 1 million revolutions under the same conditions without causing flaking by rolling contact fatigue.

Note 5: Basic static load rating is load that results in combined permanent deformations at contact points of balls and ball grooves of respective parts at a diameter of 0.01%.

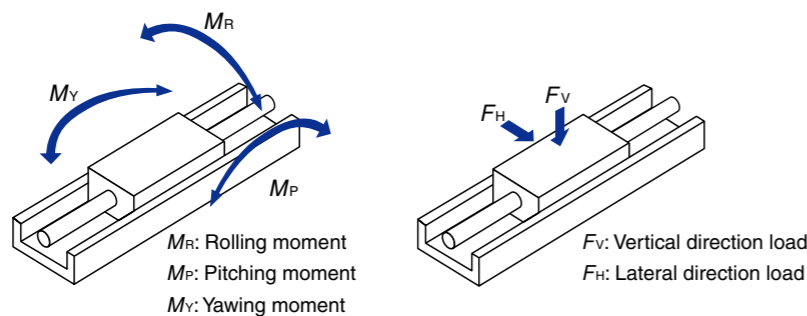
### Basic Static Moment Load of Linear Guide

Nominal size	Lead (mm)	Slider	Basic static moment (N · m)		
			Rolling $M_{R0}$	Pitching $M_{P0}$	Yawing $M_{Y0}$
MCM02	1, 2	Single	24	8	8
MCM03	1, 2	Single	68	28	28
	10, 12		92	51	51
MCM05	5, 10, 20, 30	Single	229	89	89
	5, 10, 20	Double	455	765	765
MCM06	5, 10, 20	Single	415	174	174
		Double	825	1 220	1 220
MCM08	5, 10, 20, 30	Single	770	300	300
	5, 10, 20	Double	1 540	2 050	2 050
MCM10	10, 20, 30	Single	1 170	425	425
	10, 20	Double	2 340	2 940	2 940

Note 1: Basic static moment of double slider is value when two sliders equipped with NSK K1 are butted against each other.

Note 2: Basic static moment is value when rolling contact pressure of balls exceeds 4 000 N/mm<sup>2</sup>.

Note 3: If extremely heavy load is required, please consult NSK for estimation of fatigue life.



## Basic Load Rating

## MCH Series

### Basic Load Rating

Nominal size	Lead $l$ (mm)	Shaft dia. $d$ (mm)	Basic dynamic load rating (N)				Basic static load rating (N)		Support unit limit load (N)
			Ball screw $C_a$	Linear guide $C$	Support unit $C_a$	Rated running distance $L_a$ (km)	Ball screw $C_{0a}$	Linear guide $C_0$	
MCH06 (MCL06)	5	$\phi 12$	3 000 (high grade) 3 760 (precision)	22 800	4 400	5	5 410 (high grade) 6 310 (precision)	16 300	1 450
	10		1 930 (high grade) 2 260 (precision)	18 100		10	3 160 (high grade) 3 780 (precision)		
	20		1 930 (high grade) 2 260 (precision)	14 400		20	3 160 (high grade) 3 780 (precision)		
MCH09	5	$\phi 15$	6 820 (high grade) 7 100 (precision)	40 600	7 100	5	13 200 (high grade) 13 000 (precision)	30 500	3 040
	10		5 110 (high grade) 7 060 (precision)	32 200		10	9 290 (high grade) 12 700 (precision)		
	20		3 290 (high grade) 4 560 (precision)	25 500		20	5 620 (high grade) 7 750 (precision)		
MCH10	10	$\phi 20$	8 230 (high grade) 10 900 (precision)	44 600	7 600	10	17 100 (high grade) 21 700 (precision)	42 000	3 380
	20		5 300 (high grade) 7 060 (precision)	35 400		20	10 300 (high grade) 12 700 (precision)		

Note 1: Basic dynamic and static load ratings indicate values for one slider.

Note 2: Basic dynamic load rating of linear guide is load of perpendicular direction to the axis that allows 90% of a group of same Monocarriers to operate "Rated running distance" in table, which is equivalent to 1 million revolutions of ball screw and support unit under the same conditions without causing flaking by rolling contact fatigue.

Note 3: Basic dynamic load rating of ball screw is load in the axial direction that allows 90% of ball screws of a group of same Monocarriers to rotate 1 million revolutions under the same conditions without causing flaking by rolling contact fatigue.

Note 4: Basic dynamic load rating of support unit is constant load in the axial direction that allows 90% of support units of same group of Monocarriers to rotate 1 million revolutions under the same conditions without causing flaking by rolling contact fatigue.

Note 5: Basic static load rating is load that results in combined permanent deformations at contact points of balls and ball grooves of respective parts at a diameter of 0.01%.

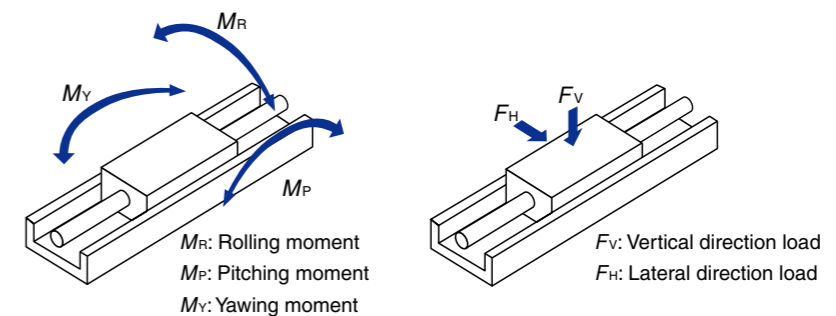
### Basic Static Moment Load of Linear Guide

Nominal size	Slider	Basic static moment (N·m)		
		Rolling $M_{R0}$	Pitching $M_{P0}$	Yawing $M_{Y0}$
MCH06 (MCL06)	Single	335	133	133
	Double	770	730	730
MCH09	Single	890	385	385
	Double	1 780	2 070	2 070
MCH10	Single	1 460	610	610
	Double	2 920	3 430	3 430

Note 1: Basic static moment of double slider is value when two sliders equipped with NSK K1 are butted against each other.

Note 2: Basic static moment is value when rolling contact pressure of balls exceeds 4 000 N/mm<sup>2</sup>.

Note 3: If extremely heavy load is required, please consult NSK for estimation of fatigue life.



## Sensor Specifications

### Proximity Switch

Item	E2S-W13 type	E2S-W14 type
Setting surface	Front face	
Sensing distance	1.6 mm ±15%	
Setting distance	0 to 1.2 mm	
Differential travel	10% max. of sensing distance	
Detectable object type	Ferrous metal	
Standard sensing object	Iron, 12 × 12 × 1 mm	
Response frequency	1 kHz min.	
Power supply voltage (operating voltage range)	12 to 24 VDC; ripple (p-p), 10% max. (10 to 30 VDC)	
Current consumption	13 mA max. at 24 VDC with no load	
Control output (switching capacity)	NPN open collector output, 50 mA max. (30 VDC max.)	
Control output (residual voltage)	1.0 V max. with a load current of 50 mA and a cable length of 1 m	
Indicator	Operation indicator (orange)	
Operating status (with sensing object approaching)	NO (a-contact)	NC (b-contact)
Wire lead length	1 000 mm	

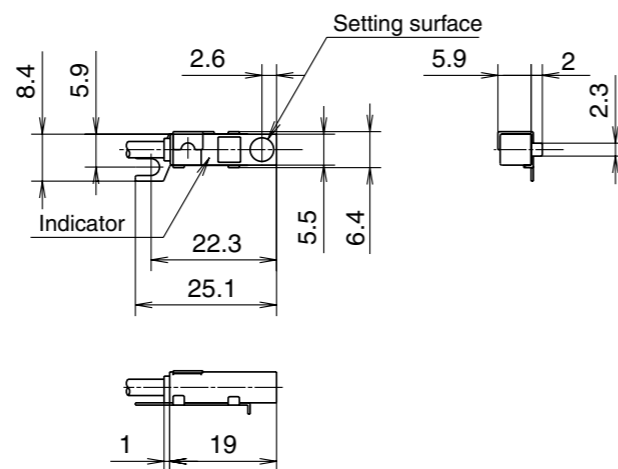
Use of OMRON E2S-W13, E2S-W14  
 Note 1: Do not make a wrong connection.  
 Note 2: Please contact NSK for PNP output type.

Movement mode	Output type	Type	Time chart	Output circuit
NO	NPN	E2S-W13 type		<p>*(Maximum load current: 50 mA)</p>
		E2S-W14 type		
NC	NPN	E2S-W14 type		<p>*(Maximum load current: 50 mA)</p>

E2S-W13 (a-contact)

E2S-W14 (b-contact)

The external appearances are the same.



### Photo Sensor

Item	EE-SX674 type
Slot width	5 mm
Standard reference object	Opaque, 2 × 0.8 mm
Differential distance	0.025 mm
Light source	GaAs infrared LED with peak wavelength of 940 nm
Indicator (without detecting object)	ON GaP red LED (peak emission wavelength, 690 nm)
Supply voltage	5 to 24 VDC ±10%; ripple (p-p), 10% max.
Current consumption	35 mA max.
Control output	NPN open collector output models, 5 to 24 VDC, 100 mA load current
Response frequency	1 kHz max. (3 kHz typ.)
Ambient illumination	Fluorescent light, 1 000 lx max.
Ambient temperature	-25°C to 55°C (-13°F to 131°F) (for operating); -30°C to 80°C (-22°F to 176°F) (for storing)
Ambient humidity	5 to 85% (RH) (for operating); 5 to 95% (RH) (for storing)
Connecting method	EE-1001/1006 Connectors, soldering terminals

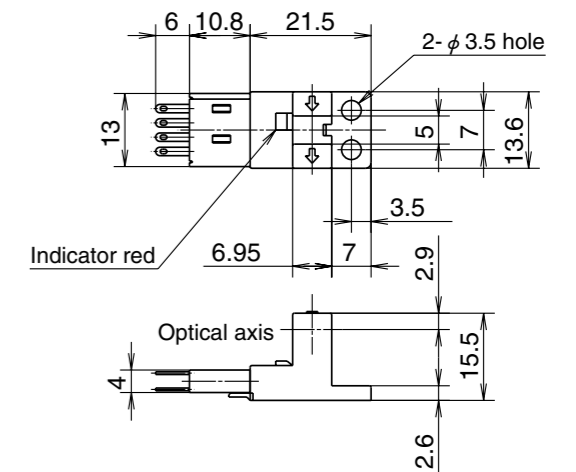
Use of OMRON EE-SX674  
 Note 1: Do not make a wrong connection.  
 Note 2: Please contact NSK for PNP output type.

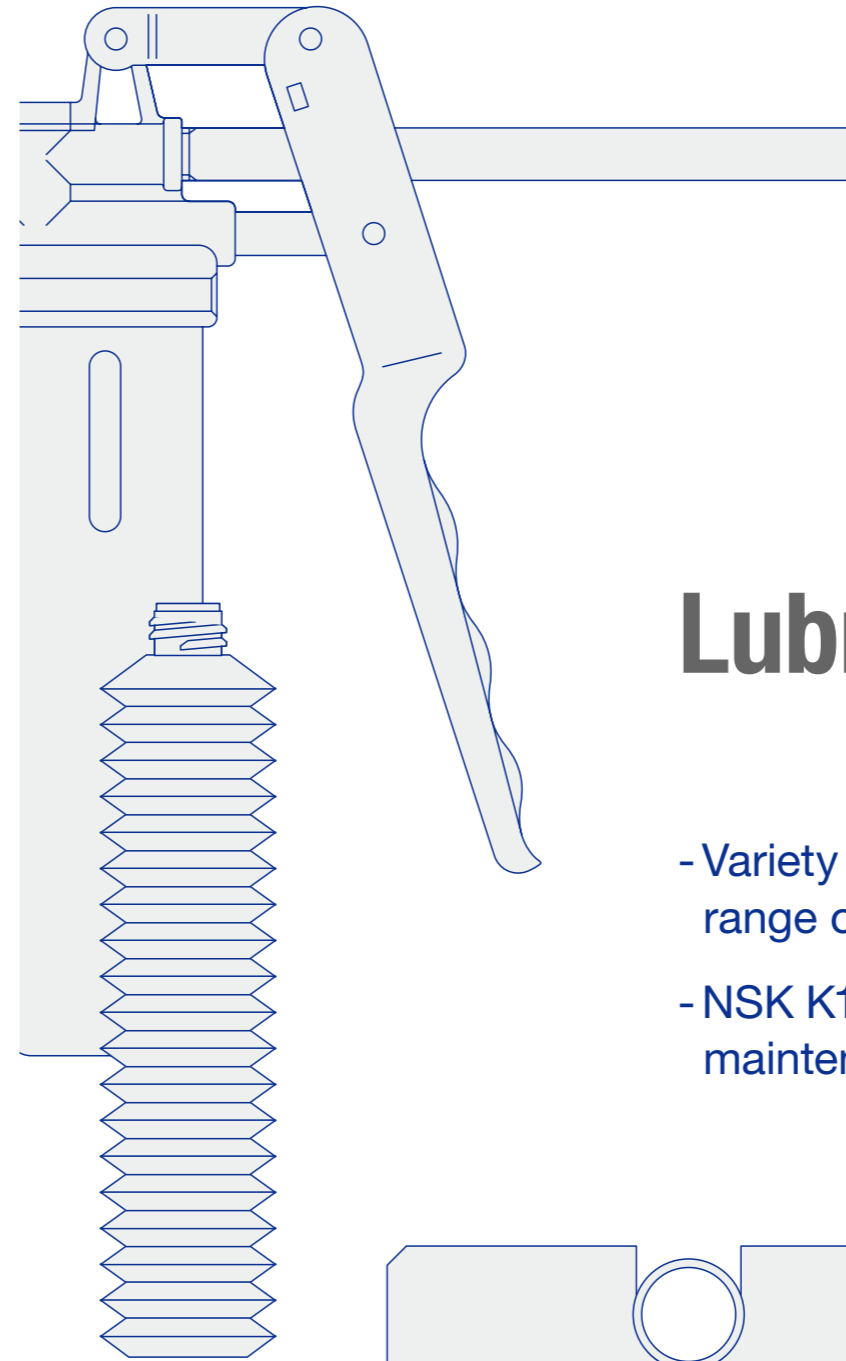
Type	Movement mode	Time chart	Connection terminal	Output circuit
EE-SX674 type	Light-ON		When terminals L and ⊕ are short circuited	<p>DC 5 to 24 V                  Less than 100 mA</p>
	Dark-ON		When terminals L and ⊕ are open circuited	

EE-SX674 (Sensor)

EE-1001 (Connector)

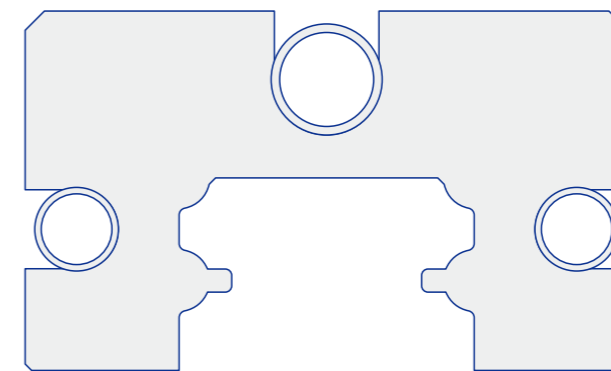
A connector is mounted to the sensor in the right figure.





## Lubrication

- Variety of greases for wide range of applications
- NSK K1 lubrication unit for long-term, maintenance-free operation



## NSK Grease Unit



Grease in bellows tube

Supply grease to linear guides and ball screws by manual type hand grease pump. Install grease in bellows tube pump. Several types of grease (80 g) are available.

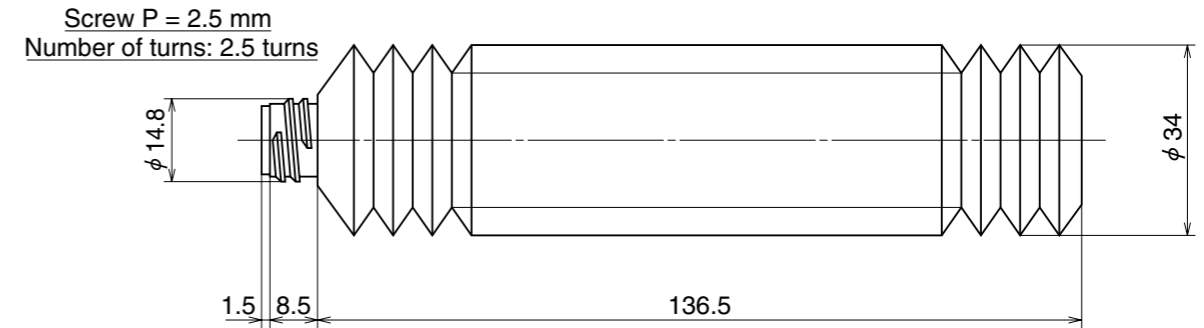


### 1. Composition of NSK Grease Unit

Components and grease types are shown below.

NSK Grease Unit	Name	(tube type)	Part number
NSK Grease (80 g in bellows tube)	NSK Grease AS2	(Brown)	NSK GRS AS2
	NSK Grease PS2	(Orange)	NSK GRS PS2
	NSK Grease LR3	(Green)	NSK GRS LR3
	NSK Grease LG2	(Blue)	NSK GRS LG2
	NSK Grease LGU	(Yellow)	NSK GRS LGU
	NSK Grease NF2	(Gray)	NSK GRS NF2
NSK Hand Grease Pump Unit			NSK HGP
NSK Hand Grease Pump (Straight nozzle NSK HGP NZ1 – One nozzle is provided with hand pump.)			
Grease nozzle (used with hand grease pump)			
	NSK straight nozzle		NSK HGP NZ1
	NSK chuck nozzle		NSK HGP NZ2
	NSK drive fitting nozzle		NSK HGP NZ3
	NSK point nozzle		NSK HGP NZ4
	NSK flexible nozzle		NSK HGP NZ5
	NSK flexible extension pipe		NSK HGP NZ6
	NSK straight extension pipe		NSK HGP NZ7
	NSK MCH exclusive fitting nozzle		NSK HGP NZ8

### 2. NSK Greases (80 g in bellows tube)



Bellows tube

### 3. NSK Manual Grease Pump Unit

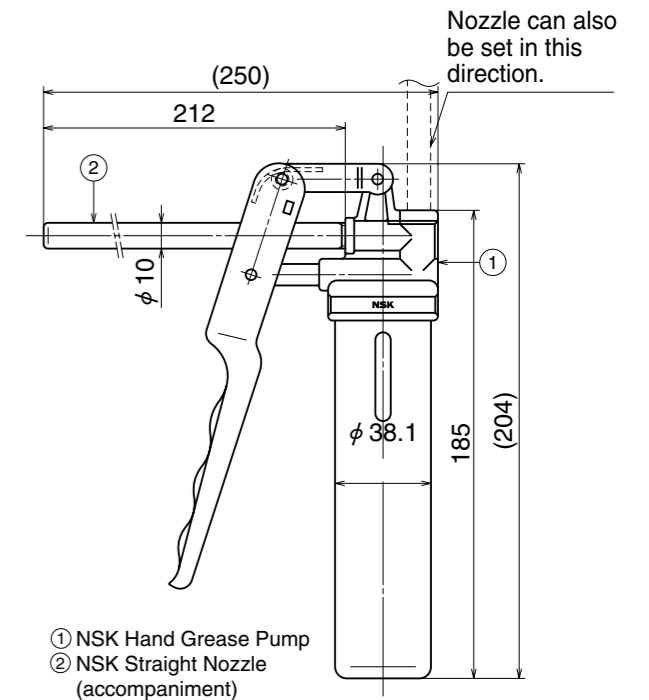
#### 1) NSK Hand Grease Pump Unit Part number: NSK HGP

##### (1) Features

- Light-weight ..... Can be operated by one hand, yet there is no worry of making a mistake.
- Inserting by high pressure ... Insert at 15 Mpa.
- No leaking ..... Does not leak when held upside down.
- Easy to change grease ..... Simply attach grease in bellows tube.
- Remaining grease ..... Can be confirmed through slit on tube.
- Several nozzles ..... Five types of nozzles to choose from.

##### (2) Specifications

- Spout volume ..... 0.33cc / shot
- Grease tube outer diameter ... φ 38.1
- Accessories ..... Several nozzles for unique application can be attached.



① NSK Hand Grease Pump  
② NSK Straight Nozzle (accompaniment)

NSK Hand grease pump with NSK straight nozzle

► For lubrication, see page 313.

## NSK Grease Unit

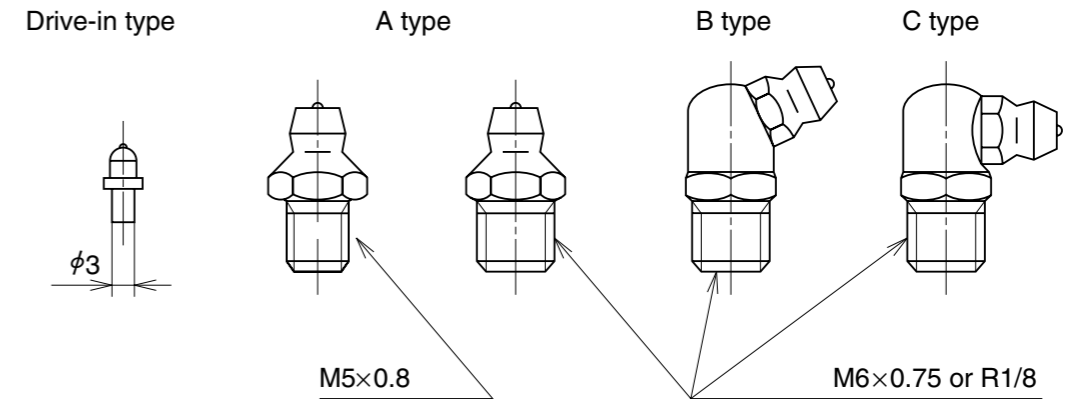
### 2) Nozzles

#### Nozzles that can be attached to NSK Hand Grease Pump

Name	Part number	Applicable grease fitting	Dimensions
NSK straight nozzle	NSK HGP NZ1	A, B, C	
NSK chuck nozzle	NSK HGP NZ2	A, B, C	
NSK fitting nozzle	NSK HGP NZ3	Drive-in type	
NSK point nozzle	NSK HGP NZ4	For non-grease fitting	
NSK flexible nozzle	NSK HGP NZ5	A, B, C	
NSK flexible extension pipe	NSK HGP NZ6	N / A	
NSK straight extension pipe	NSK HGP NZ7	N / A	
NSK MCH exclusive fitting nozzle	NSK HGP NZ8	Drive-in type	

\* N/A: Not applicable

#### Grease fittings



#### Grease fittings used for Linear Guides

Linear guide	Size	Tap hole for grease fitting	Standard grease fitting	Straight nozzle NZ1	Chuck nozzles (two) NZ2	Drive-in nipple nozzle NZ3	Point nozzle NZ4	Flexible nozzle NZ5
LH / SH Series	15	φ3	Drive-in type			○		
	20, 25, 30, 35	M6x0.75	B type	○	○*1			○
	45, 55	Rc1/8	B type	○	○			○
LS / SS Series	15	φ3	Drive-in type			○		
	20, 25, 30, 35	M6x0.75	B type	○	○*1			○
	45, 55, 65	Rc1/8	B type	○	○			○
RA Series	15, 20	φ3	Drive-in type			○		
	25, 30, 35	M6x0.75	B type	○	○*1			○
	45, 55, 65	Rc1/8	B type	○	○			○
LW Series	17	φ3	Drive-in type			○		
	21, 27, 35	M6x0.75	B type	○	○*1			○
	50	Rc1/8	B type	○	○			○
TS Series	15	φ3	Drive-in type			○		
	20, 25, 30, 35	M6x0.75	B type	○	○*1			○
PU Series	05, 07, 09, 12	—	—				○*2	
	15	φ3	Drive-in type			○		
PE Series	05, 07, 09, 12	—	—				○*2	
	15	φ3	Drive-in type			○		

\*1 If using a chuck nozzle, avoid interference with plate and rail.

\*2 PU and PE Series: Apply grease directly to ball groove, etc. using point nozzle.

#### Grease fittings used for Ball Screws

Ball screw	Model number	Tap hole for grease fitting	Standard grease fitting	Straight nozzle NZ1	Chuck nozzles (two) NZ2	Drive-in nipple nozzle NZ3	Point nozzle NZ4	Flexible nozzle NZ5
Compact FA	PSS FSS USS	M5x0.8	A type	○	○			○

#### Grease fittings used for Monocarrier

Monocarrier	Size	Tap hole for grease fitting	Standard grease fitting	Straight nozzle NZ1	Chuck nozzles (two) NZ2	Drive-in nipple nozzle NZ3	Flexible nozzle NZ5	MCH exclusive fitting nozzle NZ8
MCM series	02	—	—					
	03, 05, 08, 10	φ3	Drive-in type			○		○
	06	M6x0.75	A type	○	○		○	
MCH series	06, 09, 10	φ3	Drive-in type					○

## NSK Grease Unit

Lubricating method – grease – for Ball Screw, Linear Guide and Monocarrier.

Use a grease lubrication most suitable to condition requirements and purpose to optimize functions of Ball Screw, Linear Guide and Monocarrier.

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

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

The following are lubrication methods using grease.

### Grease Lubrication

Grease lubrication is widely used because it does not require a special oil supply system or piping.

Grease lubricants made by NSK are:

- Various types of grease in bellows tubes that can be instantly attached to a grease pump;
- NSK Grease Unit that consists of a hand grease pump and various nozzles. These are compact and easy to use.

### NSK Grease Lubricants

The following table shows the marketed general grease widely used for Linear Guide, Ball Screw and Monocarrier for specific uses, conditions and purposes.

#### Grease lubricant for linear guide and ball screw

Type	Thickener	Base oil	Base oil kinematic viscosity mm <sup>2</sup> /s (40°C)	Range of use temperature (°C)	Purpose
AS2	Lithium type	Mineral oil	130	-10 – 110	For general use at high load.
PS2	Lithium type	Synthetic oil + mineral oil	15	-50 – 110	For low-temperature and high frequency operations.
LR3	Lithium type	Synthetic oil	30	-30 – 130	For high speed, medium load.
LG2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	30	-20 – 70	For clean environments.
LGU	Diurea	Synthetic hydrocarbon oil	100	-30 – 120	For clean environments.
NF2	Urea composite type	Synthetic oil + mineral oil	27	-40 – 100	For fretting resistance.

### How to Replenish Grease

Use grease fitting if exclusive grease supply component is not used. Supply required amount through grease fitting by a grease gun (pump).

Wipe off old grease and accumulated dust before supplying new grease. If grease fitting is not used, apply grease directly to the rail or to the ball groove of the screw shaft. Remove the seal if possible, and move a ball slide or ball nut a few strokes so the grease permeates into the ball slide and inside the nut. A hand grease pump, an exclusive and easy lubrication device for Linear Guide, Ball Screw and Monocarrier, is available at NSK.

### Volume of Grease to be Replenished

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

- When there is an exclusive grease supply system and the volume from the spout can be controlled, the criterion is:

All at once, replenish the amount that fills about 50% of the internal space of the ball slide or the internal space of the ball nut. This method eliminates waste of grease and is efficient.

The following tables show internal spaces of ball slide, ball nut and monocarrier slider for reference.

- When replenishing using a grease gun:

Use a grease gun and fill the inside of the ball slide, ball nut and monocarrier slider with grease. Supply grease until it comes out from the ball slide, ball nut or monocarrier slider area. Move ball slide, ball nut or monocarrier slider by hand while filling them with grease so the grease permeates all areas. Do not operate the machine immediately after replenishing. Always try the system a few times to spread the grease throughout the system and to remove excess grease. Trial operations are necessary because the resistance to sliding force and screw torque greatly increases immediately after replenishment (full-pack state) and may cause problems. The agitating resistance of grease is accountable for this phenomenon. Wipe off excess grease that accumulates at end of rail and screw shaft after trial runs so the grease does not move to other areas.

## NSK Grease Unit

### Linear Guide

#### Inside space of ball slide of linear guide

##### LH, LS Series

Unit: cm<sup>3</sup>

Model No.	Series	LH		LS	
		High load type	Ultra-high load type	Medium load type	High load type
15		3	4	2	3
20		6	8	3	4
25		9	13	5	8
30		13	20	8	12
35		22	30	12	19
45		47	59	—	—
55		80	100	—	—
65		139	186	—	—
85		—	336	—	—

##### SH, SS Series

Unit: cm<sup>3</sup>

Model No.	Series	SH		SS	
		High load type	Ultra-high load type	Medium load type	High load type
15		2	3	1.5	2
20		5	7	3	4
25		9	12	5	7
30		11	17	7	11
35		20	27	11	17
45		42	53	—	—
55		73	93	—	—

##### RA Series

Unit: cm<sup>3</sup>

Model No.	Series	RA	
		High load type	Ultra-high load type
25		3	3.5
30		5	6
35		6	8
45		10	13
55		15	20
65		33	42

##### LW Series

Unit: cm<sup>3</sup>

Model No.	Series	LW
17		3
21		3
27		7
35		24
50		52

##### TS Series

Unit: cm<sup>3</sup>

Model No.	Series	TS
15		2
20		3
25		6
30		9
35		15

##### PU, PE Series

Unit: cm<sup>3</sup>

Model No.	Series	PU		PE	
		Standard type	High load type	Standard type	High load type
09		0.2	0.3	0.4	0.5
12		0.3	0.4	0.5	0.7
15		0.8	1.1	1.2	1.6

### Ball Screw

#### Inside space of ball nut

The inside space of the ball nut is shown in the dimension table for each series, and instructions on the method of grease replenishment are given below.

### Monocarrier

#### Inside space of slider

MCM model number	Lead (mm)	Inside space of slider (cm <sup>3</sup> )
MCM03	1	1
	2	1
	10	2
	12	2
MCM05	5	4
	10	4
	20	2
	30	2
MCM06	5	8
	10	7
	20	6
MCM08	5	12
	10	10
	20	9
	30	4
MCM10	10	19
	20	17
	30	9

MCH model number	Lead (mm)	Inside space of slider (cm <sup>3</sup> )
MCH06	5	3
	10	3
	20	3
MCH09	5	6
	10	6
	20	6
MCH10	10	11
	20	10

### Intervals of Checks and Replenishment

Although the grease is of high quality, it gradually deteriorates and its lubrication function diminishes. Also, the grease in the ball slide and ball nut is gradually removed by stroke movement. In some environments, the grease becomes dirty, and foreign objects may enter. Grease should be replenished depending on frequency of use. The following is a guide of grease replenishment intervals for Linear Guide and Ball screw.

#### Intervals of checks and replenishments for grease lubrication

Intervals of checks	Items to check	Intervals of replenishment
3–6 months	Dirt, foreign matter such as cutting chips	Usually once per year. Every 3 000 km for material handling system that travels more than 3 000 km per year. Replenish if checking results warrant it necessary.

Note 1: As a general rule, do not mix greases of different brands. Grease structure may be destroyed if greases of different thickeners are mixed. Even when greases have the same thickener, different additives in them may have an adverse effect on each other.

Note 2: Grease viscosity varies by temperature. Viscosity is particular high in winter due to low temperatures. Pay attention to increases in Linear Guide and Monocarrier sliding resistance and Ball Screw and Monocarrier torque in such conditions.



## NSK K1 Lubrication Unit



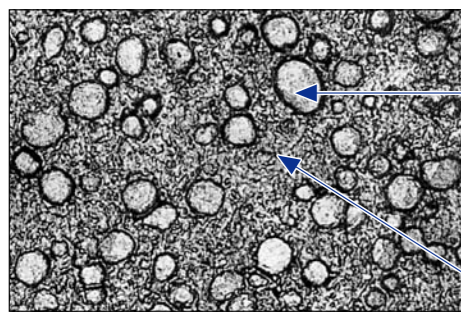
NSK K1 lowers machine operating costs and reduces impact on the environment.

### What is “long-term, maintenance-free operation”?

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

### What is the NSK K1 Lubrication Unit?

NSK K1 is a lubrication device that combines oil and resin in a single unit. The porous resin in the unit contains a large amount of lubrication oil. Positioned close to the rail, NSK K1 constantly supplies fresh oil, which seeps from the resin, lubricating the rail surface.



Enlarged surface of NSK K1 Lubrication Unit

#### Polyolefin

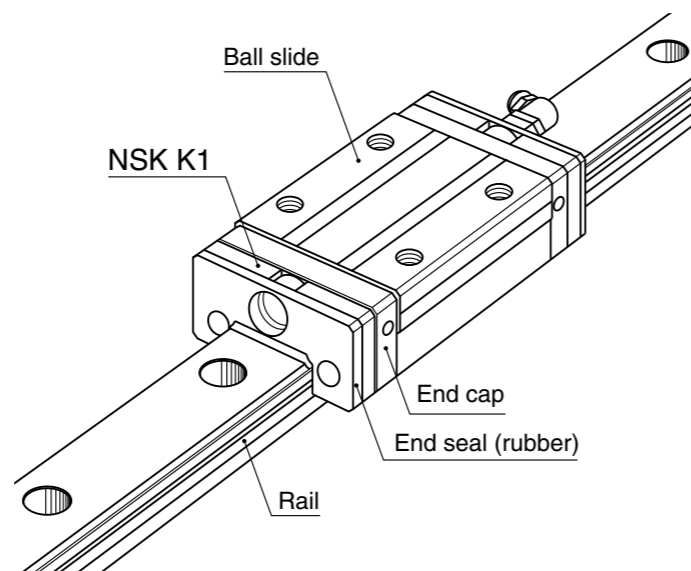
Unlike vinyl chloride products, polyolefin does not produce dioxin. Polyolefin is also being increasingly used at supermarkets for food wrapping.

#### Lubrication oil

This mineral oil-based oil has a viscosity of 100 cSt.

### Remarkable sealing capacity with new material: NSK K1 Lubrication Unit

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



## 1. Features

Compact and efficient lubrication unit.

### 1) Long-term maintenance is not required

Used with grease, the lubrication function lasts for a long time. Ideal for systems/environments in which replenishing is difficult.

For automotive component processing lines, etc.

### 2) Does not pollute the environment

A very small volume of grease combined with NSK K1 can provide sufficient lubrication. NSK K1 is suitable for clean environment applications.

Food processing, medical equipment, liquid crystal displays, semiconductor manufacturing equipment, etc.

### 3) Good for applications where lubricant is washed away

Used with grease, machine life is prolonged even when the machine is washed entirely using water or in environments where the machine is exposed to rain or wind.

Food processing equipment, housing, construction machines, etc.

### 4) Maintains efficiency in dusty environments

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

Woodworking machines, etc.

Note: Stainless steel linear guides and ball screws should be considered for use in corrosive environments or other environments where rusting is a potential problem.

## 2. Precautions for handling

To maintain high functionality of the NSK K1 Seal, observe the following precautions.

### 1) Temperature range in use

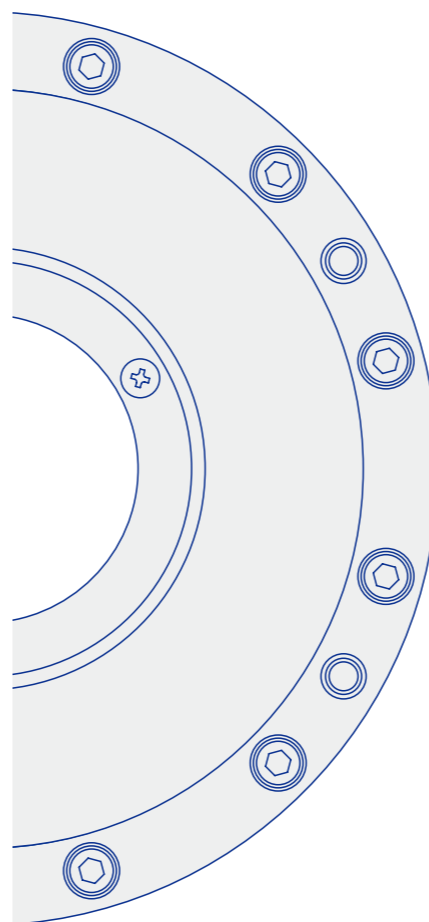
Maximum temperature in use: 50°C

Momentary maximum temperature in use: 80°C

### 2) Chemicals that should not come into contact with seal

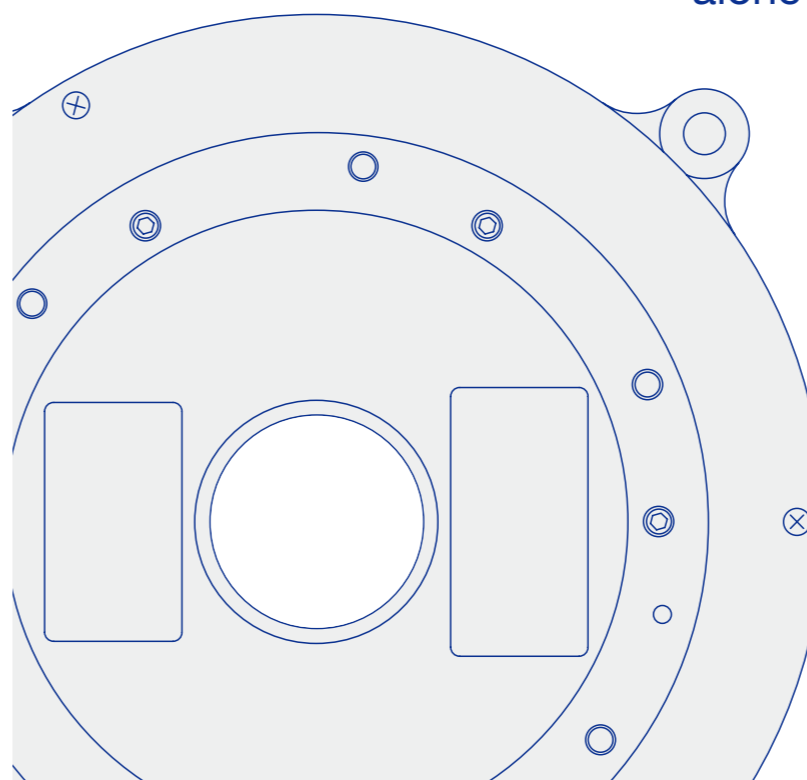
Do not leave NSK K1 in organic solvent, white kerosene such as hexane, thinner that removes oil, or rust preventive oil that contains white kerosene.

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



# Megatorque Motors

- High torque, high resolution and compact direct drive motors
- Intelligent drive with positioning controller function enabling stand-alone operation



# Megatorque Motors

## Direct-drive motors with advanced features only available from NSK

With advanced features, including high torque, high resolution, maximum rotational speed of 10 [s<sup>-1</sup>] (PS Series), high rigidity, and compactness, the Megatorque Motor complies with CE mark, UL standards, and the EU RoHS Directive. These innovative direct-drive motors are extremely accurate, light-weight, and boost the productivity of various devices.

Resolution of position sensor **2.62 million [counts/rev]**  
 PS Series Maximum rotational speed **10 [s<sup>-1</sup>]** (varies by motor model)

### High resolution

The Megatorque Motor's absolute position sensor is capable of a high resolution of 2 621 440 [counts/rev] and repeatability of ±2 [arc seconds]. It requires no homing operations and facilitates the development of highly accurate devices.

» Resolution of position sensor **2 621 440 [counts/rev]**

### Shortened positioning time

A new servo algorithm shortens settling time to less than one-fifth of conventional NSK motors. Shortened positioning time boosts the productivity of various devices.

» Settling time less than 1/5

### High torque

The optimal magnetic field design gives it more than twice as much force density as conventional NSK motors. A maximum of 50% increase in motor torque increases productivity during high acceleration/deceleration drives.

» Force density more than twice as much

### Compact motor

NSK's advanced design technology has produced two unique motor series: the low profile PN Series (height of PN2: 35 [mm]) and the light and compact PS Series (external diameter of PS1: φ100 [mm]).

» Height 35 [mm] (PN2)    » Outer diameter φ100 [mm] (PS1)

### High accuracy and interchangeability

Interchangeable Motors and Driver Units can be freely combined. Increased positioning accuracy of 90 [arc seconds] and interchangeability improve ease of use.

» Absolute positioning accuracy **90 [arc seconds]**

### Intelligent

The EDC Driver Unit's positioning controller function is provided as a standard feature. In addition, an electronic gear function is built in for setting the pulse train position command. The EDC Megaterm software is used to collect, edit, and monitor data.

» Positioning controller function as a standard specification

### Full consideration for people and the environment

Compliance with international safety standards (UL Standards, CE mark) assures worldwide applicability. The Megatorque Motor is environment friendly and complies with the EU RoHS Directive.

» Compliance with **UL Standards, CE mark, EU RoHS Directive**

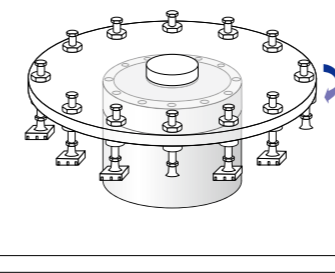


## Comparison of major features

PS Series	PN Series
Outer rotor	Inner rotor
Small diameter	Low profile
Fixed from the bottom	Fixed from the top
High rotational speed	High rigidity
Small installation space	Low motor height
Compact, clean, high accuracy, hollow structure, maintenance free	
For high-speed positioning of medium/light loads	For positioning of large loads
<p>(1) Outer rotor                      (2) Small diameter                      (3) Fixed from the bottom</p>	<p>(1) Inner rotor                      (2) Low profile                      (3) Fixed from the top</p>

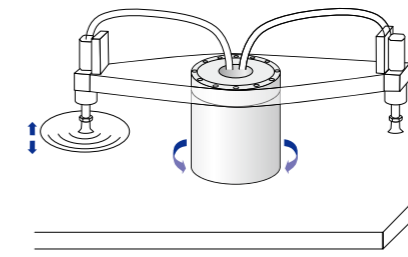
## PS and PN Series in a variety of applications and installations

Application 1: **PS Series**  
 Inspection conveyor for electronic parts



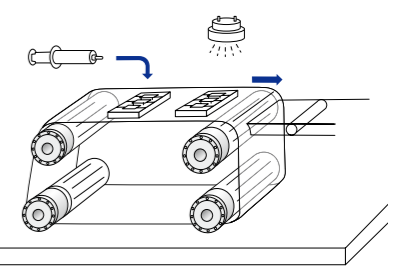
- High speed and high accuracy
- Compact • Clean
- Hollow structure (convenient for wiring/tubing)

Application 2: **PS Series**  
 Conveyor for DVD/CD



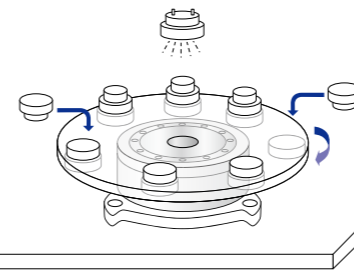
- High speed and high accuracy
- Clean • Maintenance free
- Hollow structure (convenient for wiring/tubing)

Application 3: **PS Series**  
 Inspection conveyor for medical devices



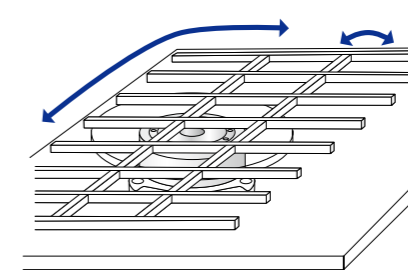
- Compact • Clean • Maintenance free

Application 4: **PN Series**  
 Automatic part assembly



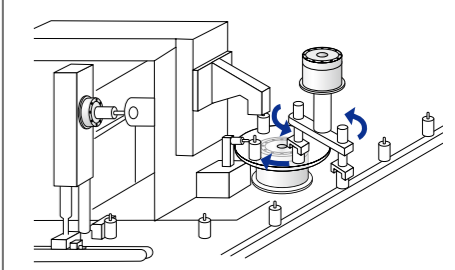
- High speed and high accuracy • Compact
- Advanced functions (unequal partitioned positioning and short-cut positioning)

Application 5: **PN Series**  
 Turn table and alignment for flat panels



- Compact • Maintenance free
- Advanced functions (fine positioning)
- High torque

Application 6: **PN Series + PS Series**  
 Manufacturing line for electric parts



- High-speed • Compact • Maintenance free

## Types of Megatorque Motors

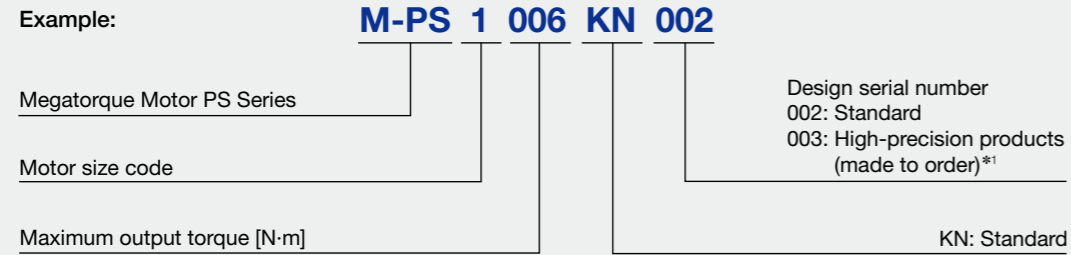
### PS Series (Outer Rotor Type)

Series	PS Series			
Model	PS1 Model Motor		PS3 Model Motor	
Motor outer diameter [mm]	φ 100		φ 150	
Motor hollow diameter [mm]	φ 35		φ 56	
Maximum rotational speed [s <sup>-1</sup> ]	10	10	8	5
Resolution of position sensor [counts/rev]	2 621 440			
Absolute positioning accuracy [arc sec]	90 (interchangeable, ambient temperature: 25 ± 5 [°C])			
Driver unit model (Dimensions: W × D × H [mm])	EDC Driver Unit  70 × 140 × 190		EDC Driver Unit  90 × 140 × 190	
Reference page	Page 325 – 328			
Features	Shortened positioning time Compact motor Interchangeable, highly accurate absolute position sensor Compact driver unit			

### PN Series (Inner Rotor Type)

Series	PN Series		
Model	PN2 Model Motor	PN3 Model Motor	PN4 Model Motor
Motor outer diameter [mm]	φ 170	φ 210	φ 280
Motor hollow diameter [mm]	φ 36	φ 56	φ 50
Maximum rotational speed [s <sup>-1</sup> ]	2	3	3
Resolution of position sensor [counts/rev]	2 621 440		
Absolute positioning accuracy [arc sec]	90 (interchangeable, ambient temperature: 25 ± 5 [°C])		
Driver unit model (Dimensions: W × D × H [mm])	EDC Driver Unit  70 × 140 × 190	EDC Driver Unit  90 × 140 × 190	
Reference page	Page 329 – 330		
Features	Shortened positioning time Low profile and high rigidity motor Interchangeable, highly accurate absolute position sensor Compact driver unit		

### Part number for PS1 Model Motor



### PS1 Model Motor specifications

Functional item	Part number	M-PS1006KN002	M-PS1012KN002	M-PS1018KN002
Motor outer diameter [mm]		φ 100		
Maximum output torque [N·m]		6	12	18
Rated output torque [N·m]		2	4	6
Motor height [mm]		85	110	135
Motor hollow diameter [mm]		φ 35		
Maximum rotational speed [s <sup>-1</sup> ]		10		
Rated rotational speed [s <sup>-1</sup> ]		5		
Resolution of position sensor [counts/rev]		2 621 440		
Absolute positioning accuracy [arc sec]* <sup>1</sup>		90 (interchangeable type, ambient temperature: 25 ± 5 [°C])		
Repeatability [arc sec]		±2		
Allowable axial load [N]		1 000 (under no radial load)		
Allowable radial load [N]		820 (under no axial load)		
Allowable moment load [N·m]		28		
Rotor's moment of inertia [kg·m <sup>2</sup> ]		0.0024	0.0031	0.0038
Recommended load's moment of inertia [kg·m <sup>2</sup> ]		0.015–0.24	0.03–0.31	0.03–0.38
Mass [kg]		2.4	3.5	4.5
Environmental conditions		Ambient temperature 0–40 [°C]; humidity: 20–80%; use indoors, free from dust, condensation and corrosive gas. IP30 equivalent.		

Note: Please consult with NSK in case of a simultaneous application of axial load, radial load and moment load to a motor.

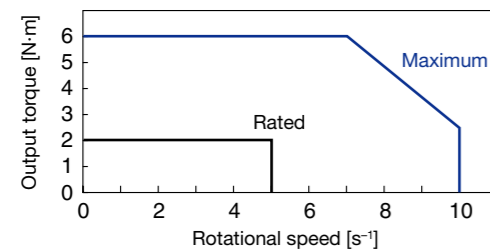
For an oscillating operation less than 45 [°], turn the motor 90 [°] or more at least once a day.

\*<sup>1</sup> Absolute positioning accuracy of high-precision products (made to order) is 30 [arc sec] (interchangeable type, ambient temperature of 25 ± 5 [°C]).

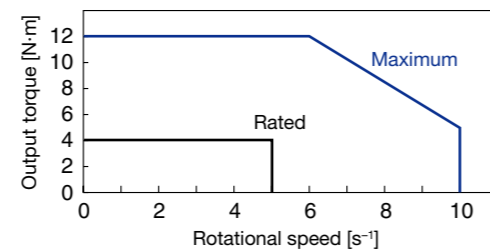
Cable length is up to 8 [m].

### Rotational speed and output torque characteristics

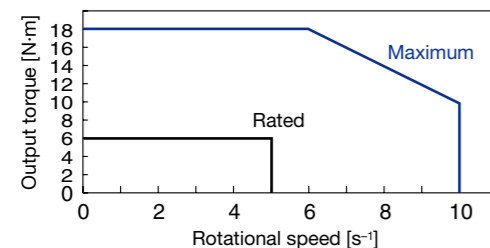
PS1006 Motor



PS1012 Motor

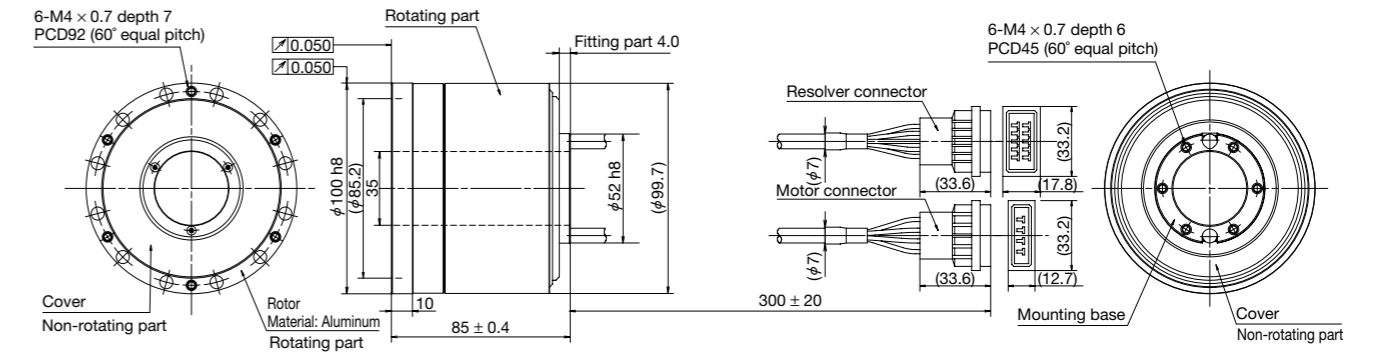


PS1018 Motor

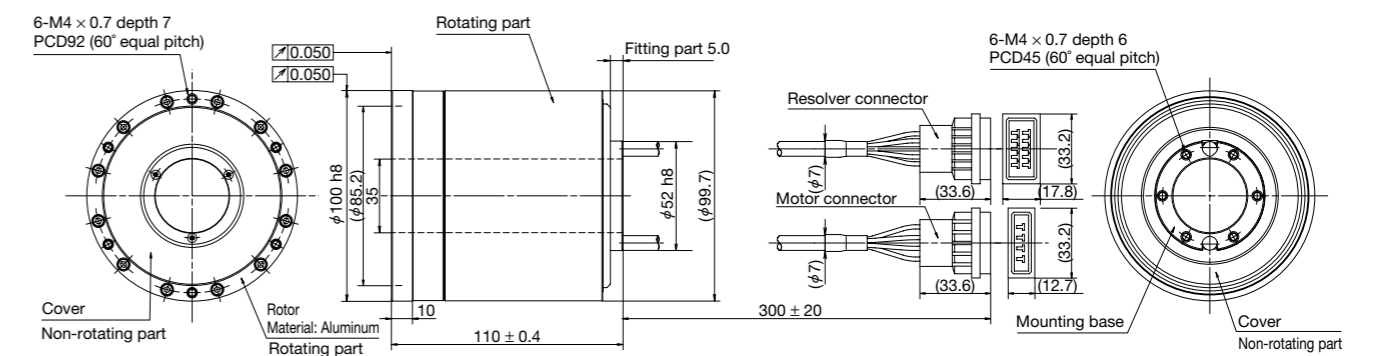


### Dimensions of PS1 Model

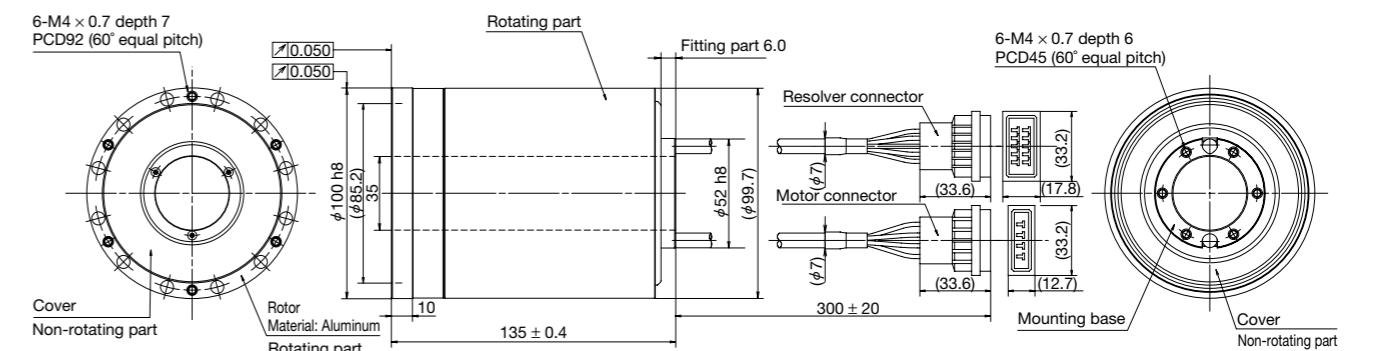
M-PS1006KN002



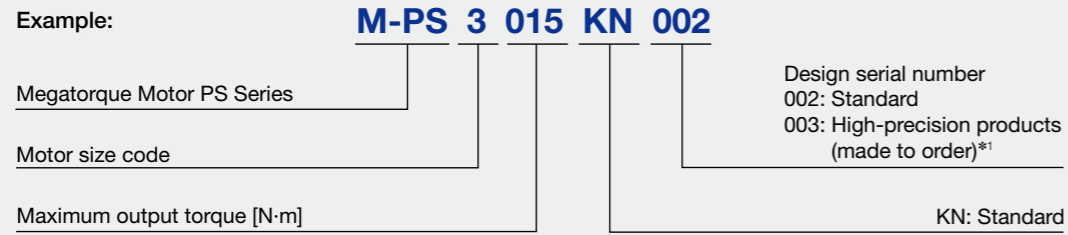
M-PS1012KN002



M-PS1018KN002



### Part number for PS3 Model Motor



### PS3 Model Motor specifications

Functional item	Part number	M-PS3015KN002	M-PS3030KN002	M-PS3060KN002	M-PS3090KN002
Motor outer diameter [mm]		φ150			
Maximum output torque [N·m]		15	30	60	90
Rated output torque [N·m]		5	10	20	30
Motor height [mm]		85	102	136	170
Motor hollow diameter [mm]		φ56			
Maximum rotational speed [s <sup>-1</sup> ]		10		8	5
Rated rotational speed [s <sup>-1</sup> ]		5		1	1
Resolution of position sensor [counts/rev]		2 621 440			
Absolute positioning accuracy [arc sec]*1		90 (interchangeable type, ambient temperature: 25 ± 5 [°C])			
Repeatability [arc sec]		±2			
Allowable axial load [N]		2 000 (under no radial load)			
Allowable radial load [N]		1 700 (under no axial load)			
Allowable moment load [N·m]		42			
Rotor's moment of inertia [kg·m <sup>2</sup> ]		0.011	0.014	0.019	0.024
Recommended load's moment of inertia [kg·m <sup>2</sup> ]		0-1.1	0-1.4	0.12-1.9	0.12-2.4
Mass [kg]		5.5	6.9	11.0	13.8
Environmental conditions		Ambient temperature 0-40 [°C]; humidity: 20-80%; use indoors, free from dust, condensation and corrosive gas. IP30 equivalent.			

Note: Please consult with NSK in case of a simultaneous application of axial load, radial load and moment load to a motor.

For an oscillating operation less than 45 [°], turn the motor 90 [°] or more at least once a day.

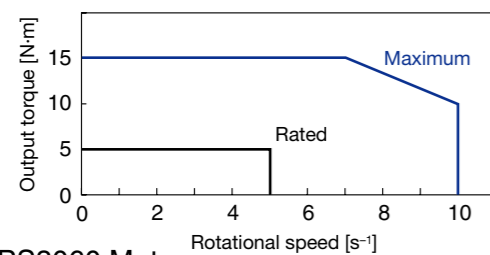
Do not apply excessive load and/or impact to the motor when inserting the dowel pin.

\*1 Absolute positioning accuracy of high-precision products (made to order) is 30 [arc sec] (interchangeable type, ambient temperature of 25 ± 5 [°C]).

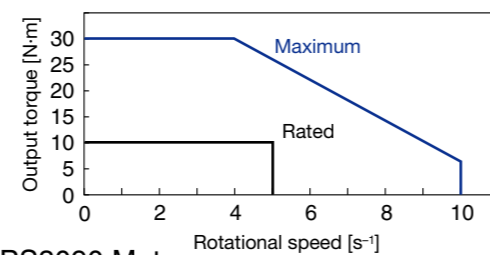
Cable length is up to 8 [m].

### Rotational speed and output torque characteristics

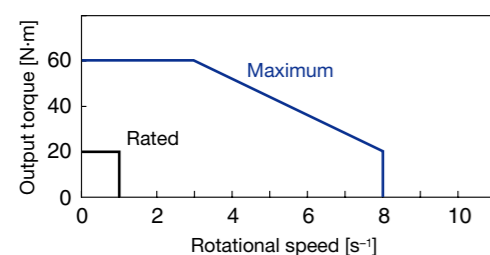
PS3015 Motor



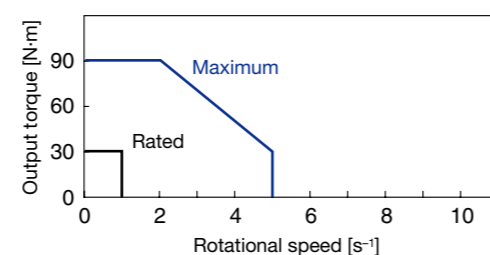
PS3030 Motor



PS3060 Motor

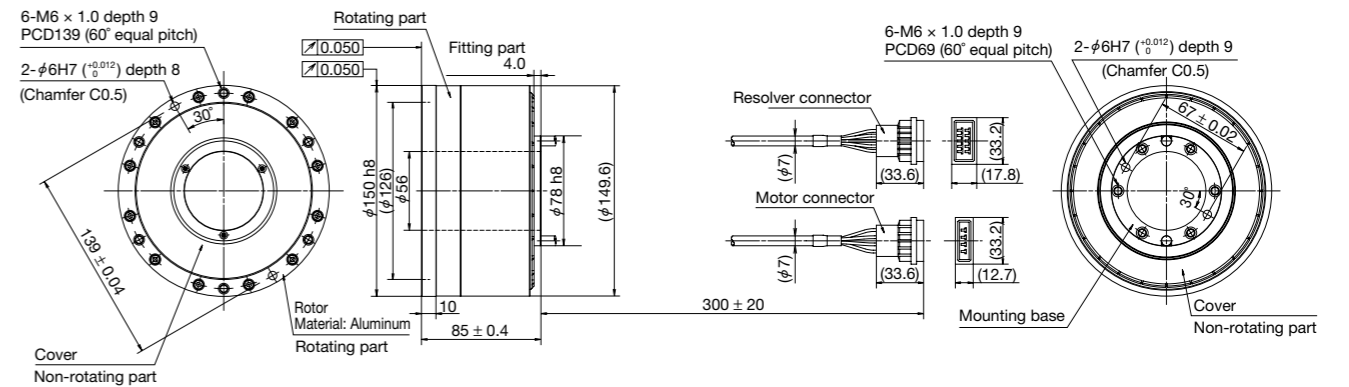


PS3090 Motor

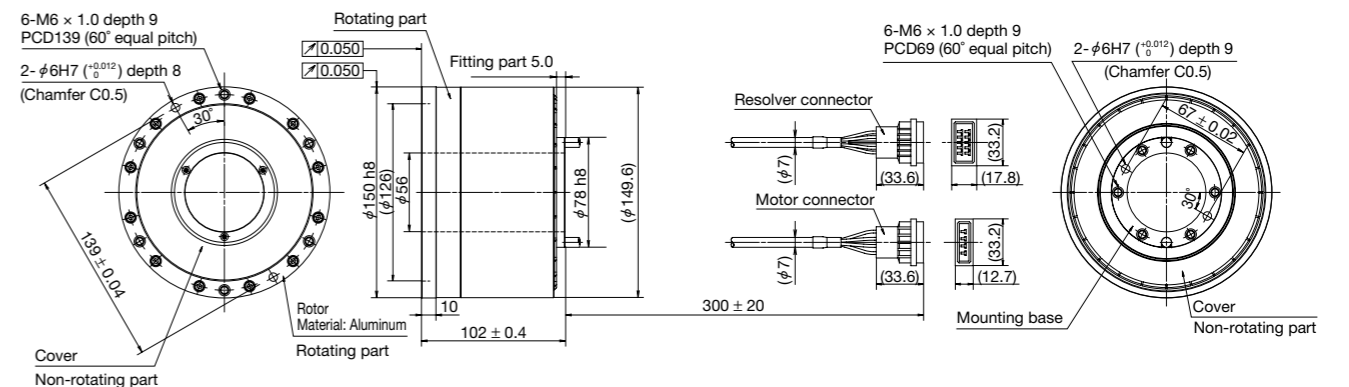


### Dimensions of PS3 Model

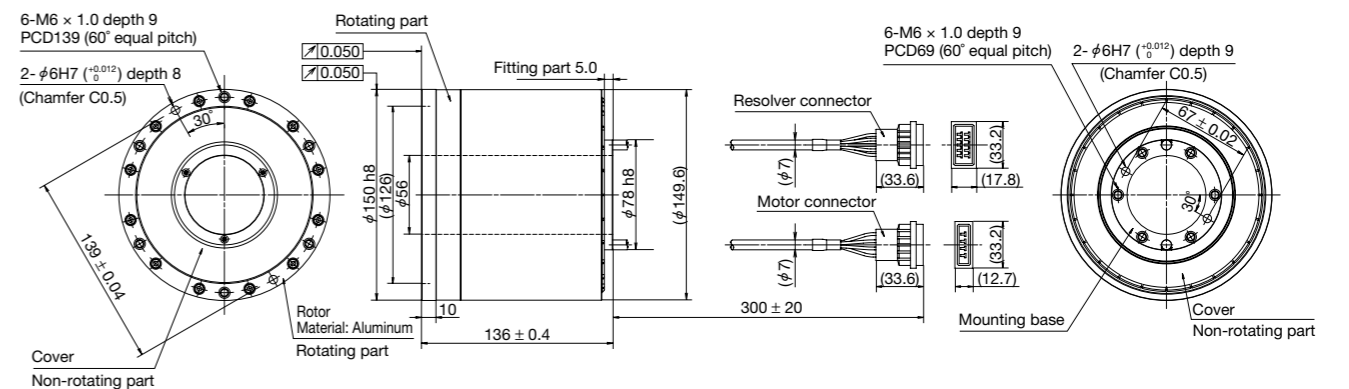
#### M-PS3015KN002



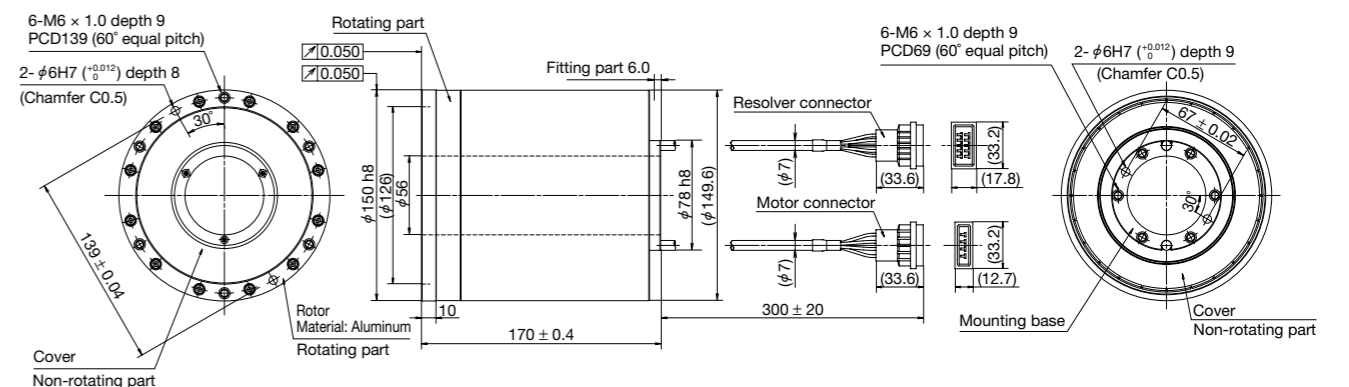
#### M-PS3030KN002



#### M-PS3060KN002



#### M-PS3090KN002



### Part number for PN Model Motor

Example:

**M-PN 3 045 KN 001**

Megatorque Motor PN Series

Motor size code

Maximum output torque [N·m]

Design serial number  
201: Standard (PN2)  
003: Standard (PN3/PN4)

KN: Standard

### PN Model Motor specifications

Functional item	Part number	M-PN2012KN201 (Note 2)	M-PN3045KN001	M-PN4135KN001	M-PN4180KN001
Motor outer diameter [mm]		$\phi$ 170	$\phi$ 210	$\phi$ 280	
Maximum output torque [N·m]		12	45	135	180
Rated output torque [N·m]		2	15	45	60
Motor height [mm]		35	85	95	112
Motor hollow diameter [mm]		36	56	50	
Maximum rotational speed [ $s^{-1}$ ]		2	3		
Rated rotational speed [ $s^{-1}$ ]		1			
Resolution of position sensor [counts/rev]		2 621 440			
Absolute positioning accuracy [arc sec]		90 (interchangeable type, ambient temperature: 25 $\pm$ 5 [ $^{\circ}C$ ])			
Repeatability [arc sec]		$\pm$ 2			
Allowable axial load [N]*1		1 000	4 500	9 500	
Allowable radial load [N]*2		300	4 500	9 500	
Allowable moment load [N·m]		20	80	160	200
Rotor's moment of inertia [kg·m $^2$ ]		0.0024	0.011	0.057	0.065
Recommended load's moment of inertia [kg·m $^2$ ]		0.02–0.24	0.11–0.77	0.57–3.99	0.65–4.55
Mass [kg]		3.7	13	26	31
Environmental conditions		Ambient temperature 0–40 [ $^{\circ}C$ ]; humidity: 20–80%; use indoors, free from dust, condensation and corrosive gas. IP30 equivalent.			

Note 1: Please consult with NSK in case of a simultaneous application of axial load, radial load and moment load to a motor.

\*1 Under no radial load

\*2 Under no axial load

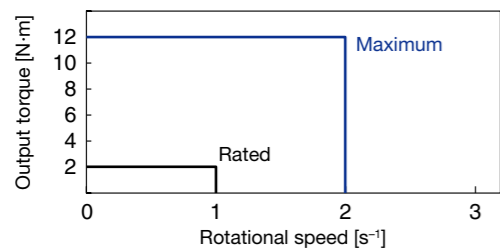
For an oscillating operation less than 45 [ $^{\circ}$ ], turn the motor 90 [ $^{\circ}$ ] or more at least once a day.

Do not apply excessive load and/or impact to the motor when inserting the dowel pin.

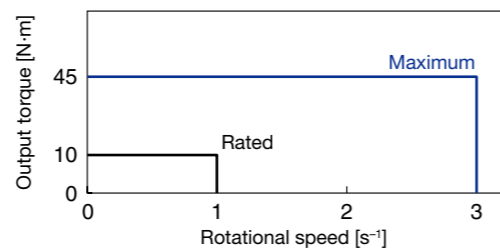
Note 2: Cable length for PN2012 is up to 8 [m].

### Rotational speed and output torque characteristics

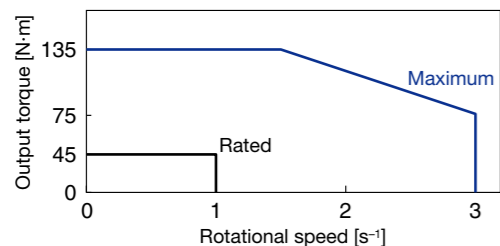
PN2012 Motor



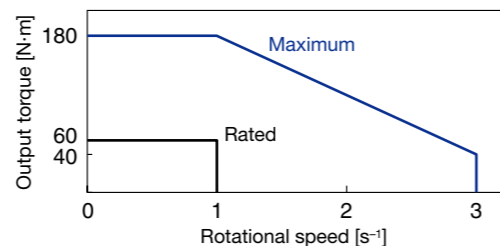
PN3045 Motor



PN4135 Motor

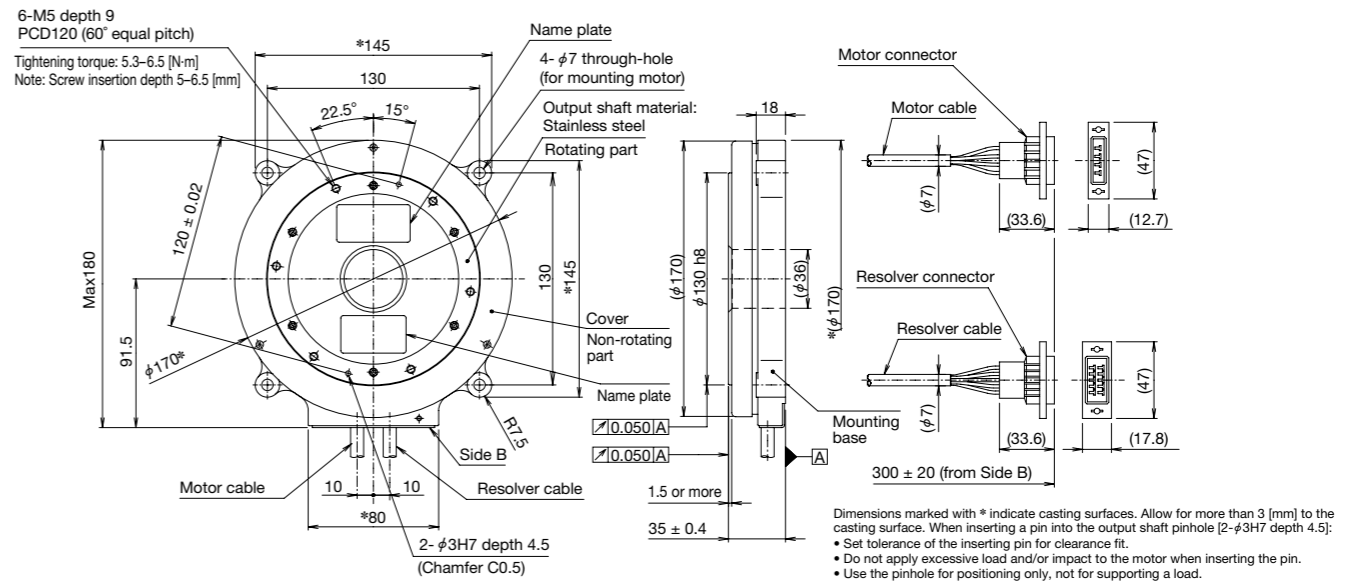


PN4180 Motor

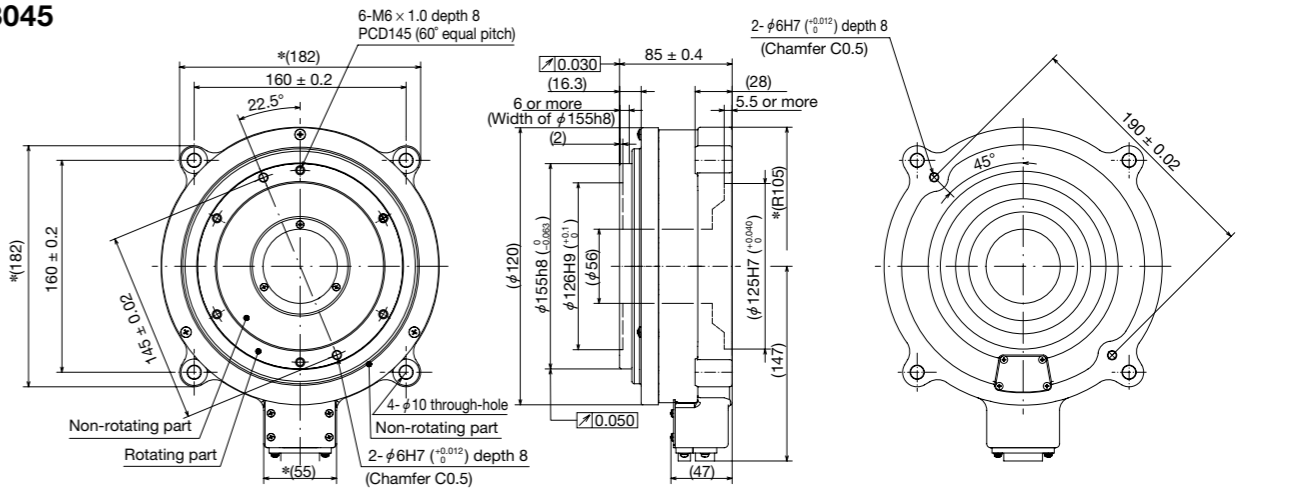


### Dimensions of PN Model

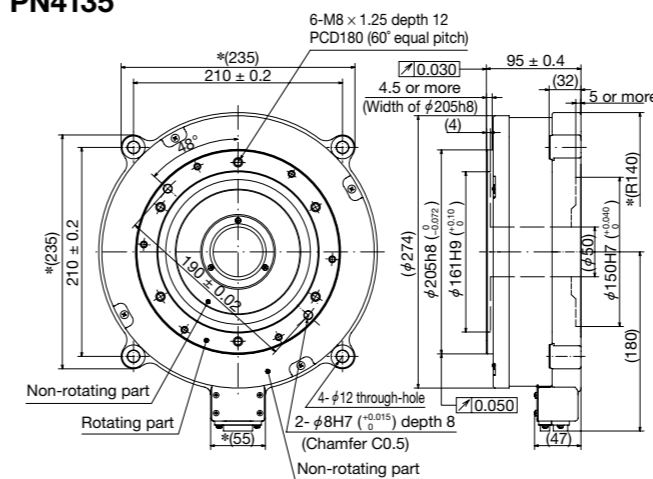
PN2012



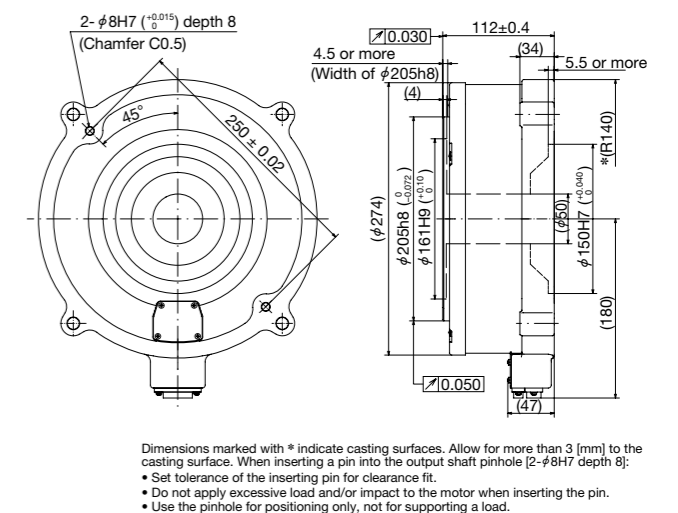
PN3045



PN4135



PN4180



## EDC Driver Unit

### Features of EDC Driver Unit

- **Adopts new servo algorithm (achieves settling time of 1 [ms])**

The EDC Driver Unit adopts an original disturbance observer control and preview-based feed-forward control, which significantly reduces the positioning time, especially the settling time (approaching time).

- **Positioning controller function**

Positioning operation can be controlled without complicated communication or higher order controller.

- **Compact Driver Unit**

Combined with special electric components and advanced integration technology, the Driver Unit body is 65% smaller than conventional NSK units.

- **Variety of control I/Os**

All control inputs required for positioning are available, including an encoder output, servo control and program control; no additional sensor is required to monitor the status.

### Components and Functions of EDC Driver Unit

#### Rear mounting hole

Mounting bracket available as accessory for front mounting.

#### Independent inputs of main power and control power

Separate power lines assure system safety.

#### Motor cable connector

Clamping type connector shortens work time and prevents mis-wiring.



#### 7-segment LED indicators

Driver Unit status can be confirmed at a glance.

#### Analog monitor output terminal

Speed, positioning error, torque, motor current, etc. can be monitored by analog voltage. Effectively used for set up tuning or for monitoring operating status.

#### RS-232C communication connector

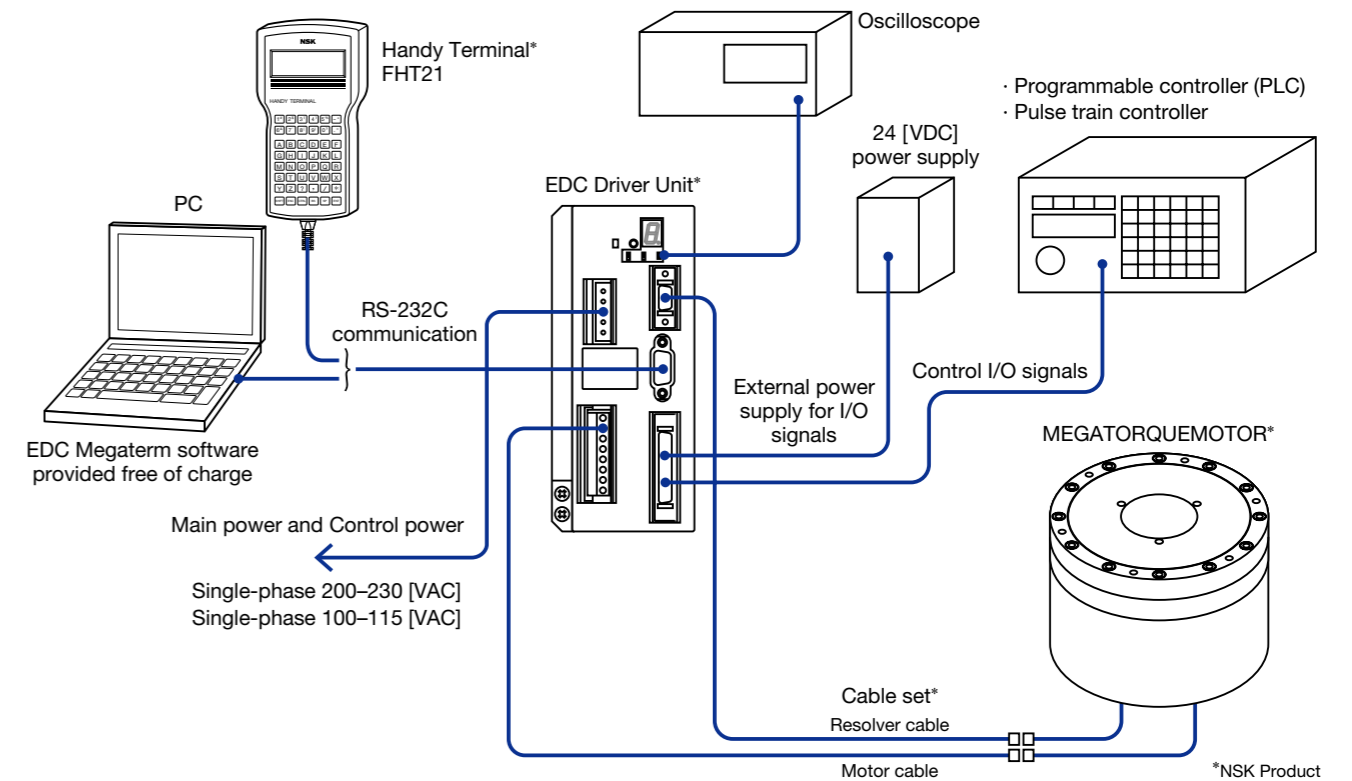
Connect the handy terminal to set parameters. Use the EDC Megatorm software to communicate with a PC.

#### Control signal I/O connector

A variety of signals are available, including servo on, in-position, emergency stop, area signal, override, various alarm outputs,  $\phi A/\phi B/\phi Z$ , etc.

### System Configuration and EDC Driver Unit Control Technology

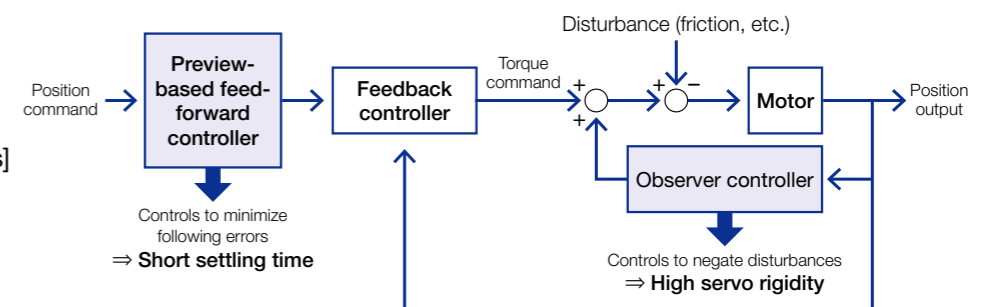
#### System Configuration



### Control Technology and High-speed Positioning Example

- **Control block diagram**

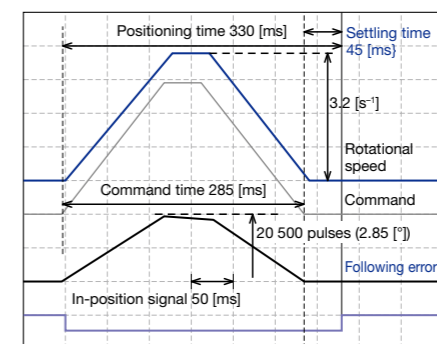
Adopts new servo algorithm  
Settling time: Less than 1 [ms]



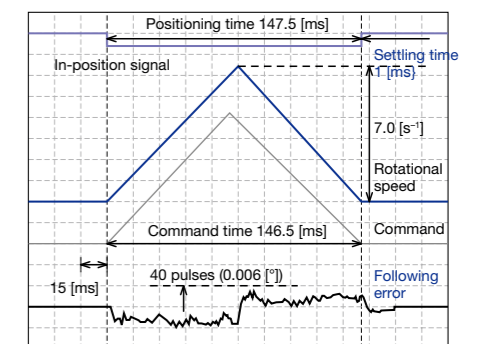
- **Comparison of 180 [°] positioning**

Positioning time =  
Command time + Settling time

#### Conventional NSK motor (JS2014)



#### PS1012



Settling time	⇒	S45 [ms]	⇒	1 [ms]
Following error	⇒	20 500 pulses	⇒	40 pulses
Positioning time	⇒	330 [ms]	⇒	147.5 [ms]



## EDC Driver Unit

### Part Number for EDC Driver Unit

#### Part number for EDC Driver Unit for PS Series Motor

Example: **M-EDC PS1006 A B 5 02 -01**

EDC Driver Unit  
 Motor model  
 Main power voltage A: 200–230 [VAC] (single-phase)  
 C: 100–115 [VAC] (single-phase)  
 Specification of position sensor  
 B: Incorporates absolute position sensor  
 Function 5: Standard  
 C: CC-Link (made to order)

No code: No accessories included  
 -01: Connectors, mounting brackets, and user's manual (Japanese version)  
 -02: Connectors, mounting brackets, and user's manual (English version)

Design serial number  
 02: Standard  
 03: High-precision products (made to order)

#### Part number for EDC Driver Unit for PN2 Motor

Example: **M-EDC PN2012 A B 5 02 -01**

EDC Driver Unit  
 Motor model  
 Main power voltage A: 200–230 [VAC] (single-phase)  
 C: 100–115 [VAC] (single-phase)  
 Specification of position sensor  
 B: Incorporates absolute position sensor  
 Function 5: Standard  
 C: CC-Link (made to order)

No code: No accessories included  
 -01: Connectors, mounting brackets, and user's manual (Japanese version)  
 -02: Connectors, mounting brackets, and user's manual (English version)

Design serial number  
 02: Standard  
 03: High-precision products (made to order)

#### Part number for EDC Driver Unit for PN3 and PN4 Motors

Example: **M-EDC PN3045 A B 5 02 -01**

EDC Driver Unit  
 Motor model  
 Main power voltage A: 200–230 [VAC] (single-phase)  
 C: 100–115 [VAC] (single-phase) (PN3 type only)  
 Specification of position sensor  
 B: Incorporates absolute position sensor  
 Function 5: Standard  
 C: CC-Link (made to order)

No code: No accessories included  
 -01: Connectors, mounting brackets, and user's manual (Japanese version)  
 -02: Connectors, mounting brackets, and user's manual (English version)

Design serial number  
 02: Standard  
 03: High-precision products (made to order)

Accessories vary depending on the function.

#### Standard accessories

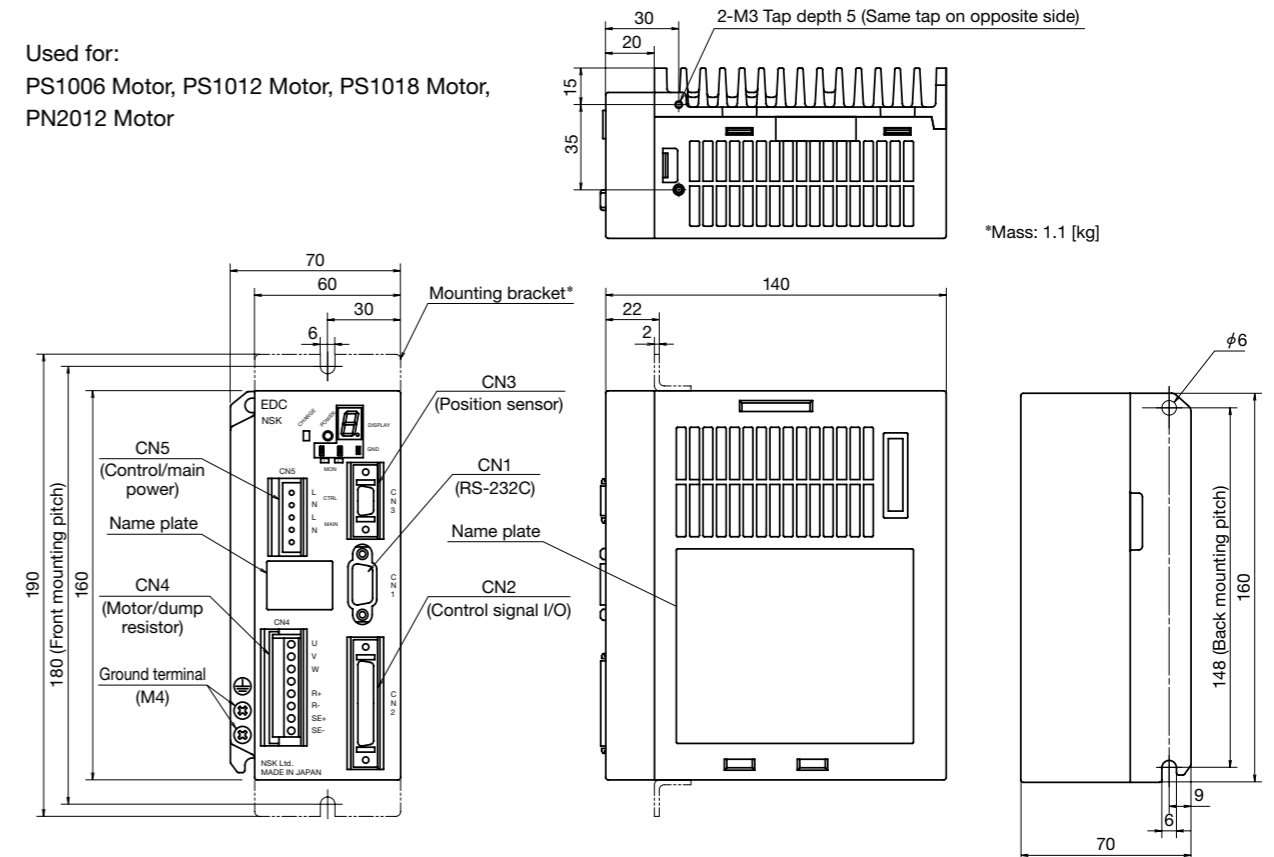
- (1) CN2 connector (user side)  
 Connector: 54306-5019 (Molex), or equivalent      Connector shell: 54331-0501 (Molex), or equivalent
- (2) CN5 connector (user side)  
 Connector: 231-305/026-000 (WAGO), or equivalent      Wiring lever: 231-131 (WAGO), or equivalent
- (3) Mounting bracket
- (4) User's Manual (English version)

#### Accessories for EDC Driver Unit (CC-Link Function)

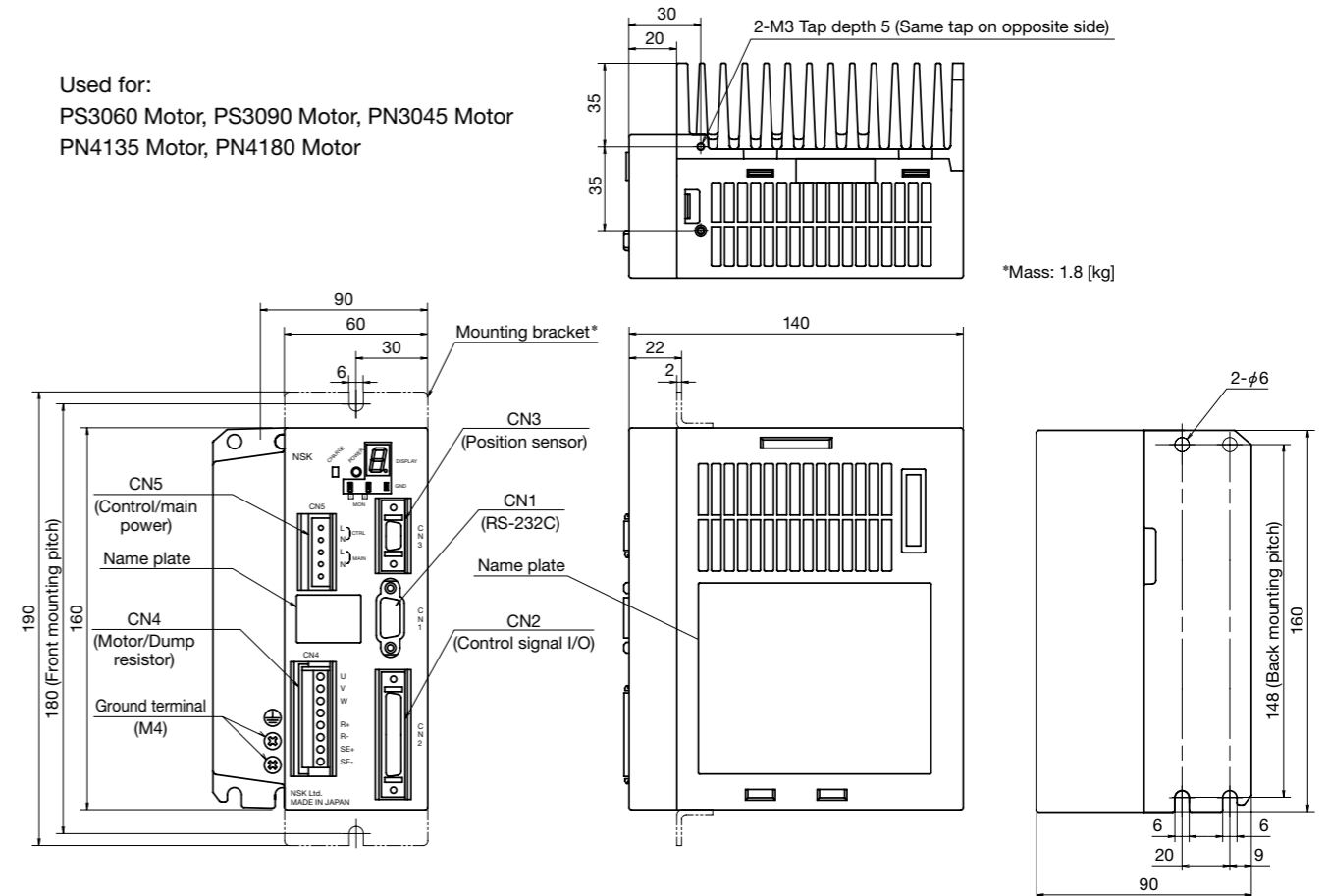
- (1) CN2 connector (user side)  
 Connector: DHF-PDA10-3-A01 (DDK)
- (2) CN5 connector (user side)  
 Connector: 231-305/026-000 (WAGO)  
 Wiring lever: 231-131 (WAGO)
- (3) CN6 connector (user side)  
 Connector: MSTB, 5/5-STF-5, 08AU  
 (Phoenix contact)
- (4) Mounting bracket
- (5) User's manual (English version)
- (6) User's manual for CC-Link (English version)

### Dimensions of EDC Driver Unit (Function)

Used for:  
 PS1006 Motor, PS1012 Motor, PS1018 Motor,  
 PN2012 Motor



Used for:  
 PS3060 Motor, PS3090 Motor, PN3045 Motor  
 PN4135 Motor, PN4180 Motor



## EDC Driver Unit

### General Specifications of EDC Driver Unit

Item	Motor model	PS1006	PS1012	PS1018	PS3015	PS3030	PS3060	PS3090	PN2012	PN3045	PN4135	PN4180	
Input power	Rated capacity [VA]	300	400	500	500	800	400	600	100	500	900	1100	
	Maximum capacity [VA]	1 000	1 500	2 000	2 300	2 900	5 000	5 500	2 100	4400	5 000	5 100	
	Control power source	Single phase 100–115 [VAC], single phase 200–230 [VAC]								Single phase 200–230 [VAC]			
	Main power source	Voltage fluctuation range less than ±10%								Voltage fluctuation range ±10%			
Resolution of position sensor [counts/rev]		2 621 440											
Positioning operation mode		Program operation (up to 256 Program channels: Position commands and parameter settings are programmable), Pulse train command, RS-232C serial communication command, Jogging, Home Return											
Input signal	Pulse train command	Photocoupler input, maximum frequency: 1MHz Input format: CW/CCW, Pulse and direction or $\phi A/\phi B$ Resolution changer for universal multiplication is available (1 000–5 242 880 [counts/rev])											
	Control input	Photocoupler input ( $\pm$ common), 17 input ports (Input voltage: 24 [VDC]) Emergency stop, Alarm clear, Over travel limit (+ direction), Over travel limit (– direction), Servo on, Program operation start, Stop, Internal program channel switching 0–7 bit, Jog, Jog direction, (Hold, Velocity, Integration OFF, Home Return start, and Home position limit)											
Output signal	Position feedback signal	Signal format: $\phi A/\phi B/\phi Z$ line driver. Universal resolution setting to $\phi A/\phi B$ is available. Resolution of $\phi A/\phi B$ : Shipping set: 20 480 [counts/rev] (Quadrupled: 81 920) Maximum: 1 310 720 [counts/rev] (Quadrupled: 5 242 880) *As the maximum frequency is 781K [Hz], the resolution setting limits the maximum velocity.											
	Control output	Photocoupler output ( $\pm$ common), 8 outputs (Max. switching capacity: 24 [VDC] / 50 [mA]) Driver Unit ready, Warning, Over travel limit detection ( $\pm$ direction), Servo state, Busy, In-position, Target proximity A (Target proximity B), Zone A/B/C, Travel limit $\pm$ , Normal, Position error under/over, Velocity under/over, Torque command under/over, Thermal loading under/over, Home return complete, Home position defined											
Alarms		RAM error, ROM error, System error, Interface error, ADC error, Emergency stop, CPU error, Position sensor error, Absolute position error, Motor cable disconnect, Excessive velocity, Resolver excitation amplifier alarm, Commutation error, Overheat, Main AC Line over voltage, Excess current, Control AC line under voltage, Power module alarm, Excess position error, Program error, Automatic tuning error, Position command/feedback error, Software thermal error, Main AC Line under voltage, Travel limit over, Field bus warning, Home position undefined, Field bus error											
Monitors		Analog monitor x 2, (universal range and offset setting), RS-232C monitor											
Communication		RS-232C serial communication (asynchronous, 9 600 [bps])											
Others		Automatic tuning Function set to Input/Output ports available Temporal parameter setting by program is available Individual acceleration/deceleration setting Acceleration profiling											
Option		Field path (CC-Link)											
Environmental conditions	Operating/Storing temperatures	0 to 50 [°C] for operating / –20 to +70 [°C] for storing											
	Operating/Storing humidity	90% or less [no condensation]											
	Vibration resistance	4.9 [m/s <sup>2</sup> ]											
Internal functions	Regenerative energy absorption	Dump resistor											
	Dynamic brake	Functions at power off, servo off and in the occurrence of an alarm											
Compatible safety regulation	UL	UL508C											
	CE	LVD	EN50178										
		EMC	EMI: EN55011, EMS: EN61000-6-2										
Connector	RS-232C	CN1	D-sub 9 pins										
	Control signal I/O	CN2	Standard specification: Half pitch connector 50 pins CC-Link specification: Half pitch connector 10 pins										
	Position sensor	CN3	Half-pitch connector 14 pins										
	Motor	CN4	Plastic connector (UL and CE compatible)										
	Dump resistor												
	Main/control power source	CN5	Plastic connector (UL and CE compatible)										
	CC-Link (option)	CN6	Connector MSTB2, 5/5-STF-5, 08 AU (Phoenix contact)										

## Cable Set

### Part number for cable set

Example:

**M-C 004 SCP 03**

Cable set for Megatorque Motor

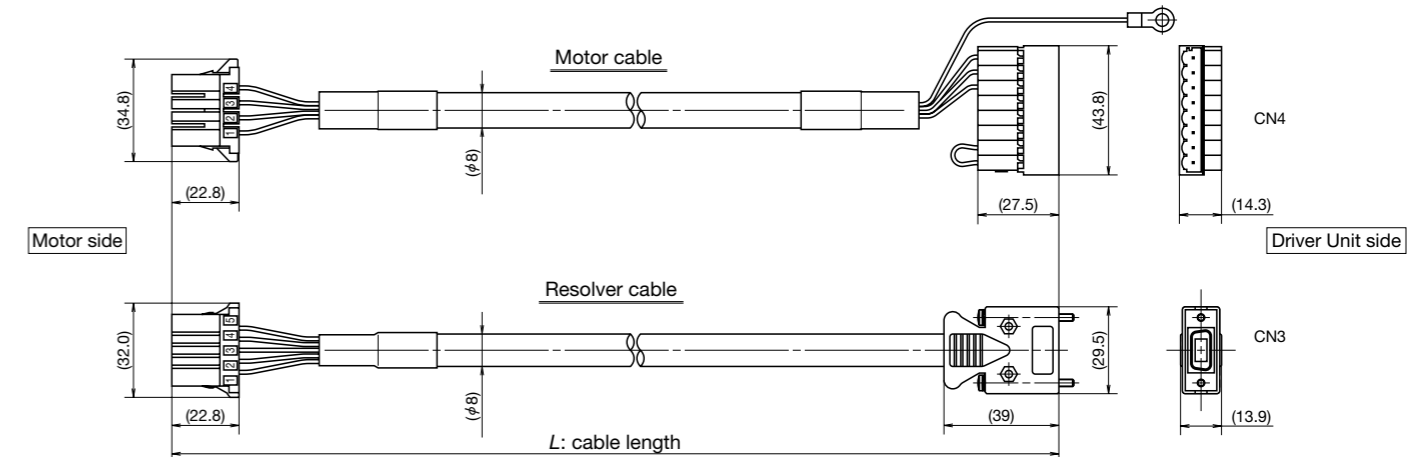
03: Fixed use type  
13: Flexible type

Cable length  
Example: 004: 4m

SCP: Cable set for EDC Driver Unit

Refer to "Motor and EDC Driver Unit Combinations" for correct length.  
Cable length can be up to 8[m] for combinations with PN2012 and high-precision products in PS series.

### Dimension of Cable Set



### Cable bend radius (for both motor cable and resolver cable)

	Bend radius at fixed side	Bend radius at moving side
Fixed use type	R43 or more	—
Flexible type	R40 or more	R80 or more

## Accessories

### Handy Terminal

#### Part number for Handy Terminal

Example:

**M-FHT 21**

Handy Terminal

Design number



Handy Terminal FHT21 is an easy-to-handle RS-232C communication terminal for inputting parameters and programs to the EDC Driver Unit.

- LCD screen: 20 letters × 4 lines, no external power source required, cable length: 3 [m]

Conventional models M-FHT01 and M-FHT11 are also supported by the EDC Driver Unit.

## Accessories

Item	Part number	Contents
Connector	M-E014DCFS1-001	CN2 connector (user side) for standard function
	M-E014DCFS1-006	CN2 connector (user side) for CC-Link function
	M-E014DCFS1-002	CN5 connector (user side)
	M-E014DCFS1-003	CN6 connector (user side)
	M-E011DCCN1-001	Cable with CN2 connector for CC-Link function
Mounting bracket	M-E050DCKA1-001	Driver Unit mounting brackets
	M-E099DC0C2-155	User's manual (Japanese version)
Manual	M-E099DC0C2-158	User's manual (English version)
	M-E099DC0C2-156	CC-Link option instruction manual (Japanese version)
	M-E099DC0C2-157	CC-Link option instruction manual (English version)
Dump resistor	M-E014DCFR1-100	Dump resistor
	M-E014DCFR1-101	Dump resistor (large capacity)
Accessory set	M-E014DCFS1-004	Set of M-E014DCFS1-001, M-E014DCFS1-002, and M-E050DCKA1-001

## Motor and EDC Driver Unit Combinations

### PS Series and EDC Driver Unit combinations

Motor outer diameter	Motor part number	EDC driver unit part number (** indicates accessories specification)	Power voltage	Cable part number	Main specifications
φ100	M-PS1006KN002	M-EDC-PS1006AB502-**	AC200-AC230	M-C0**SCP03 (Fixed use type) M-C0**SCP13 (Flexible type) ** indicates cable length 01: 1 [m] 02: 2 [m] 03: 3 [m] 04: 4 [m] 05: 5 [m] 06: 6 [m] 08: 8 [m] 10: 10 [m] 15: 15 [m] 20: 20 [m] 30: 30 [m]	256 program channels Pulse train input (photocoupler)
		M-EDC-PS1006CB502-**	AC100-AC115		
	M-PS1012KN002	M-EDC-PS1012AB502-**	AC200-AC230		
		M-EDC-PS1012CB502-**	AC100-AC115		
	M-PS1018KN002	M-EDC-PS1018AB502-**	AC200-AC230		
		M-EDC-PS1018CB502-**	AC100-AC115		
φ150	M-PS3015KN002	M-EDC-PS3015AB502-**	AC200-AC230		
		M-EDC-PS3015CB502-**	AC100-AC115		
	M-PS3030KN002	M-EDC-PS3030AB502-**	AC200-AC230		
		M-EDC-PS3030CB502-**	AC100-AC115		
	M-PS3060KN002	M-EDC-PS3060AB502-**	AC200-AC230		
		M-EDC-PS3060CB502-**	AC100-AC115		
	M-PS3090KN002	M-EDC-PS3090AB502-**	AC200-AC230		
		M-EDC-PS3090CB502-**	AC100-AC115		

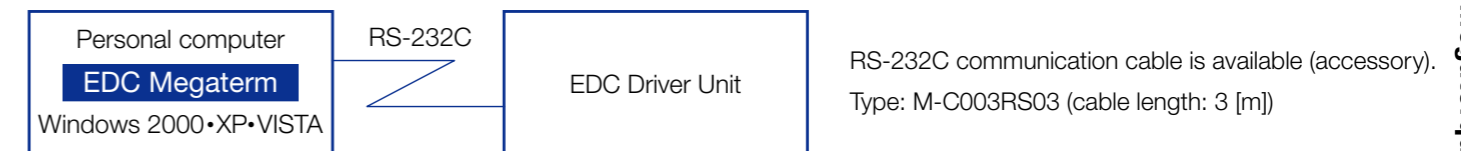
### PN Series and EDC Driver Unit combinations

Motor outer diameter	Motor part number	EDC driver unit part number (** indicates accessories specification)	Power voltage	Cable part number	Main specifications
φ170	M-PN2012KN201	M-EDC-PN2012AB502-**	AC200-AC230	Refer to the above table. (Note that maximum cable length for PN2012 is 8 [m].)	256 program channels Pulse train input (photocoupler)
		M-EDC-PN2012CB502-**	AC100-AC115		
φ210	M-PN3045KN001	M-EDC-PN3045ABC502-**	AC200-AC230		
		M-EDC-PN3045CB502-**	AC100-AC115		
φ280	M-PN4135KN001	M-EDC-PN4135AB502-**	AC200-AC230		
	M-PN4180KN001	M-EDC-PN4180AB502-**	AC200-AC230		

## “EDC Megaterm” Application Software

Once installed on your computer, this software enables the editing, preparation and control of EDC Driver Unit programs and parameters. It also facilitates the allocation and monitoring of control input/output. And its oscilloscope function allows for easy confirmation of motor operation.

EDC Megaterm can be downloaded for free from the NSK website.



### Functions

1. Oscilloscope function
2. Allocation and monitoring of control input/output
3. Parameter editing
4. Channel editing
5. Others:
  - Upload/download parameter and channel data
  - Terminal









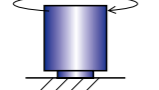
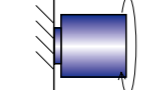
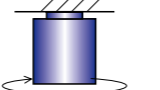





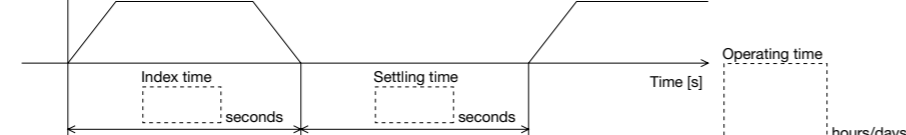


## Form for Requesting Megatorque Motor Selection

NSK will assist in selecting the optimal Megatorque Motor.







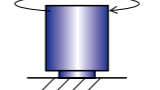
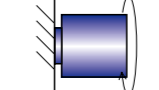
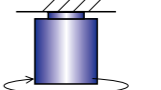

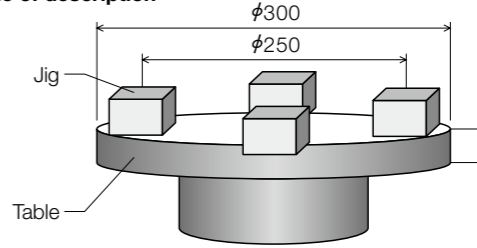




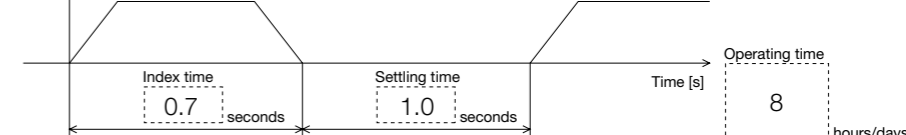


Please fill in the necessary items on the below form and send it by fax to the local NSK office.

Items marked with  represent the minimum information required for selection. Please provide as much detail as possible.

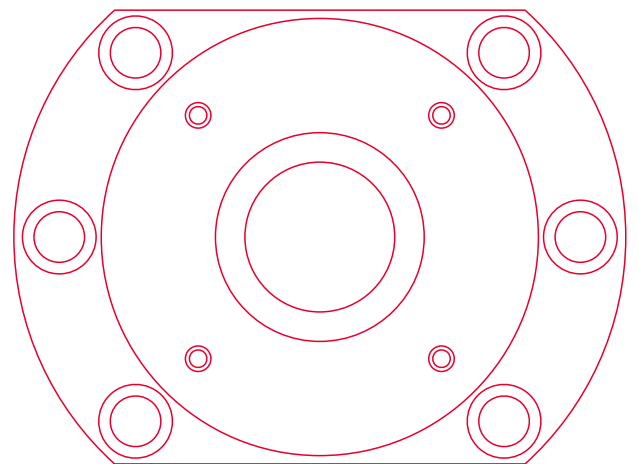
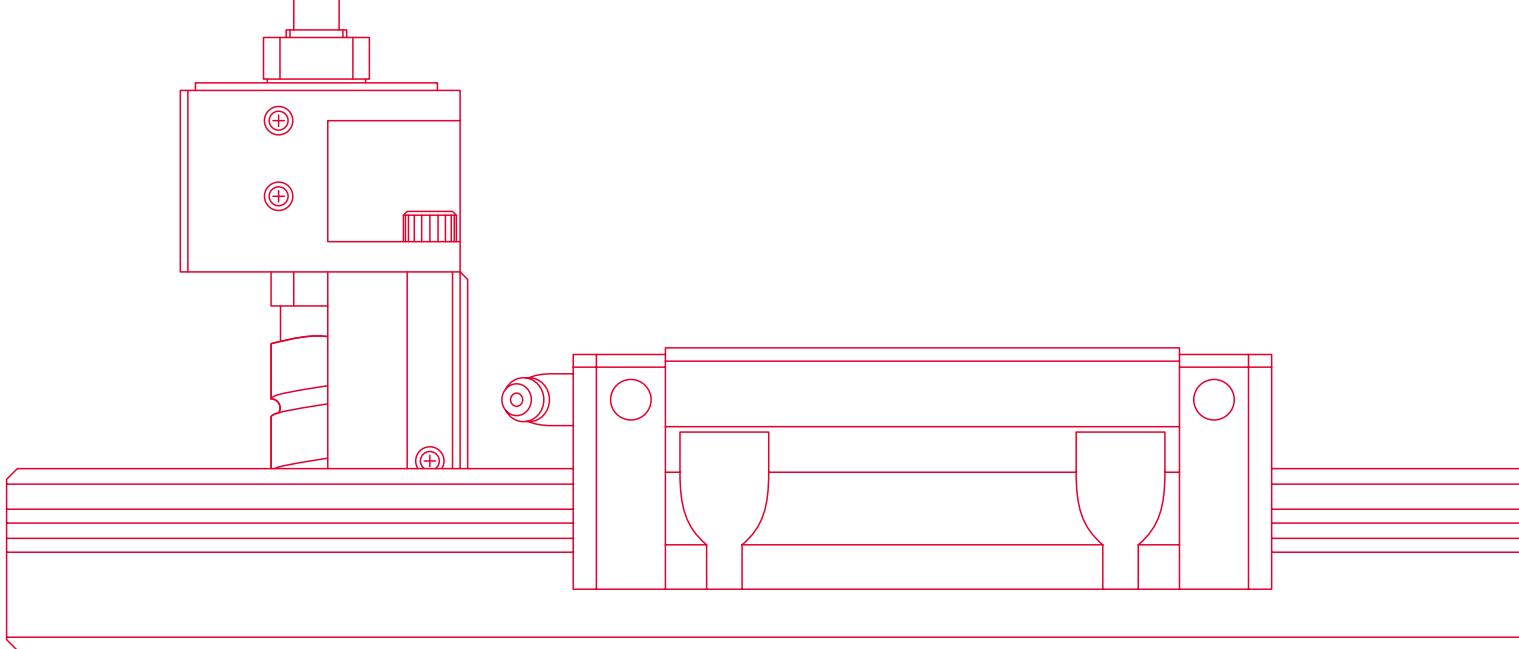
To be completed  
by customer

To _____, in charge of Precision Machinery & Parts, NSK		Date (DD/MM/YYYY): / /		
 Company Name: _____		 Section: _____		
 Name: _____		 Contact: _____ TEL _____ FAX _____		
 Application and equipment used (specify with as much detail as possible)				
 Motor installation position (check in <input type="checkbox"/> )	<input type="checkbox"/> Upright position  Output shaft in a vertical direction	<input type="checkbox"/> Horizontal position  Output shaft in a horizontal direction	<input type="checkbox"/> Upside-down position  Output shaft in a downward direction	<input type="checkbox"/> Others
 Load conditions (1) Geometry, dimensions, thickness, material (or mass) of table (2) Dimensions, mass, quantity of loads/ jigs (3) PCD (distance between the jigs/ works) (example of description)	Schematic drawing (an attached illustration showing outside dimensions is acceptable) • Please provide information on outside dimensions, dimensions from the center, material, etc.			
 External force (pressure/impact load, sliding friction, etc.)	Attachment: <input type="checkbox"/> Yes <input type="checkbox"/> No N <input type="checkbox"/> None <input type="checkbox"/> Always <input type="checkbox"/> At settling <input type="checkbox"/> During rotating <input type="checkbox"/> Some impact <input type="checkbox"/> Rotational direction <input type="checkbox"/> Sliding friction			
*Specify position, direction, etc. in the schematic drawing.				
<b>Motor size requested</b>				
<b>Positioning command system</b> <input type="checkbox"/> Internal program system <input type="checkbox"/> Pulse train input operation <input type="checkbox"/> RS-232C operation <input type="checkbox"/> CC-Link				
 Positioning angle / Number of points Settle at _____ °, Number of points: _____				
 Repeatability (±) ± _____ seconds (± _____ mm at _____ mm from the motor center)				
 Cycle pattern (desired positioning time) *Specify settling time.	Rotational speed [s <sup>-1</sup> ]  Index time _____ seconds Settling time _____ seconds Operating time _____ hours/days			
 Input power voltage <input type="checkbox"/> AC100-115V <input type="checkbox"/> AC200-230V <input type="checkbox"/> Others ( _____ V)				
<b>Environmental conditions</b> Operating environment <input type="checkbox"/> General environment (equivalent to IP30) <input type="checkbox"/> Oil, water and chemical <input type="checkbox"/> Oil, water and chemical <input type="checkbox"/> Chips and dust <input type="checkbox"/> Clean Operating temperature <input type="checkbox"/> 0°C to 40°C <input type="checkbox"/> Below 0°C <input type="checkbox"/> Above 40°C <input type="checkbox"/> Other ( _____ °C) Contact NSK for details.				
 Cable specification and length <input type="checkbox"/> Fixed cable <input type="checkbox"/> Movable cable Length: _____ m (standard: 2, 4, 8 m) Select "Movable" when cable is repeatedly bent anywhere along the wiring route.				
<b>Other request items</b>				

Example of  
completed form

To Mr. XXX XXX, in charge of Precision Machinery & Parts, NSK		Date (DD/MM/YYYY): 12 / 01 / 2010		
 Company Name: YYY Corporation		 Section: Engineering Dept., Engineering Section #1		
 Name: YYY YYY		 Contact: _____ TEL 03-1234-5678-8 FAX 03-1234-5678		
 Application and equipment used (specify with as much detail as possible)	Semiconductor inspection machine			
 Motor installation position (check in <input type="checkbox"/> )	<input checked="" type="checkbox"/> Upright position  Output shaft in a vertical direction	<input type="checkbox"/> Horizontal position  Output shaft in a horizontal direction	<input type="checkbox"/> Upside-down position  Output shaft in a downward direction	<input type="checkbox"/> Others
 Load conditions (1) Geometry, dimensions, thickness, material (or mass) of table (2) Dimensions, mass, quantity of loads/ jigs (3) PCD (distance between the jigs/ works) (example of description)	Schematic drawing (an attached illustration showing outside dimensions is acceptable) • Please provide information on outside dimensions, dimensions from the center, material, etc. <b>Example of description</b>  Jig Table φ300 φ250 20 mm Material: Aluminum • Jig: Mass of 5 kg x 4 PCD: 250 mm • External force: None			
 External force (pressure/impact load, sliding friction, etc.)	Attachment: <input type="checkbox"/> Yes <input type="checkbox"/> No 10 N <input checked="" type="checkbox"/> None <input type="checkbox"/> Always <input type="checkbox"/> At settling <input type="checkbox"/> During rotating <input type="checkbox"/> Some impact <input type="checkbox"/> Rotational direction <input type="checkbox"/> Sliding friction			
Force is applied downward to a single point at 125 mm in radius from the center. *Specify position, direction, etc. in the schematic drawing.				
<b>Motor size requested</b> M-PS3060				
<b>Positioning command system</b> <input checked="" type="checkbox"/> Internal program system <input type="checkbox"/> Pulse train input operation <input type="checkbox"/> RS-232C operation <input type="checkbox"/> CC-Link				
 Positioning angle / Number of points Settle at 90 °, Number of points: 4				
 Repeatability (±) ± 20.6 seconds (± 0.01 mm at 100 mm from the motor center)				
 Cycle pattern (desired positioning time) *Specify settling time.	Rotational speed [s <sup>-1</sup> ]  Index time 0.7 seconds Settling time 1.0 seconds Operating time 8 hours/days			
 Input power voltage <input type="checkbox"/> AC100-115V <input checked="" type="checkbox"/> AC200-230V <input type="checkbox"/> Others ( _____ V)				
<b>Environmental conditions</b> Operating environment <input checked="" type="checkbox"/> General environment (equivalent to IP30) <input type="checkbox"/> Oil, water and chemical <input type="checkbox"/> Oil, water and chemical <input type="checkbox"/> Chips and dust <input type="checkbox"/> Clean Operating temperature <input checked="" type="checkbox"/> 0°C to 40°C <input type="checkbox"/> Below 0°C <input type="checkbox"/> Above 40°C <input type="checkbox"/> Other ( _____ °C) Contact NSK for details.				
 Cable specification and length <input type="checkbox"/> Fixed cable <input checked="" type="checkbox"/> Movable cable Length: 4 m (standard: 2, 4, 8 m) Select "Movable" when cable is repeatedly bent anywhere along the wiring route.				
<b>Other request items</b> Please reply by January 12, 2010. (example)				





NSK used environmentally friendly paper and printing methods for this publication.

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