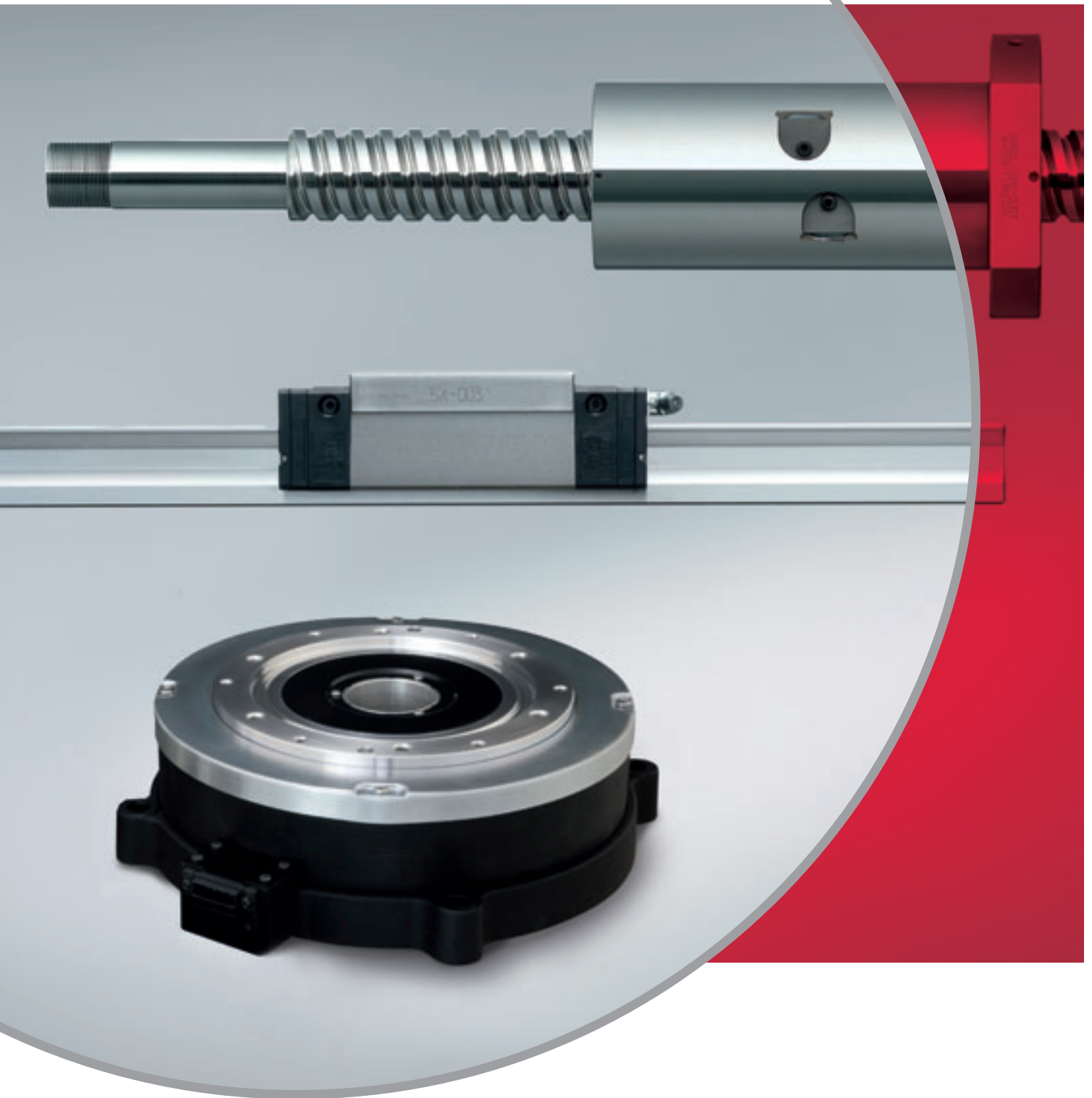
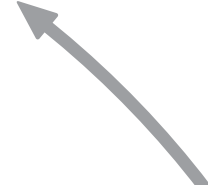


PRECISION MACHINE COMPONENTS
STANDARD ITEMS



Precision Machine Components

Linear guides | Ball Screws | Monocarrier | Megatorque Motors

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As one of the world's leading manufacturers of rolling bearings, linear technology components and steering systems, we can be found on almost every continent – with production facilities, sales offices and technology centres – because our customers appreciate short decision-making channels, prompt deliveries and local service.



The NSK company

NSK commenced operations as the first Japanese manufacturer of rolling bearings back in 1916. Ever since, we have been continuously expanding and improving not only our product portfolio but also our range of services for various industrial sectors. In this context, we develop technologies in the fields of rolling bearings, linear systems, components for the automotive industry and mechatronic systems. Our research and production facilities in Europe, Americas and Asia are linked together in a global technology

network. Here we concentrate not only on the development of new technologies, but also on the continuous optimisation of quality – at every process stage.

Among other things, our research activities include product design, simulation applications using a variety of analytical systems and the development of different steels and lubricants for rolling bearings.

Partnership based on trust – and trust based on quality

Total Quality by NSK: The synergies of our global network of NSK Technology Centres. Just one example of how we meet our requirements for high quality.

NSK is one of the leading companies with a long tradition in patent applications for machine parts. In our worldwide research centres, we not only concentrate on the development of new technologies, but also on the continual

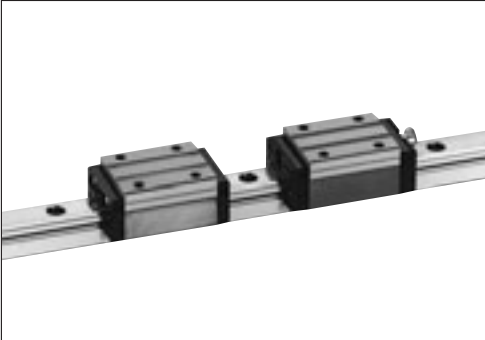
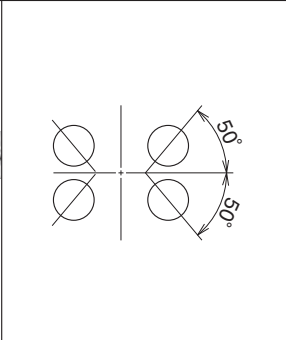
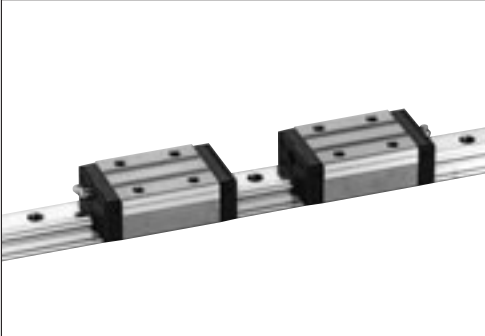
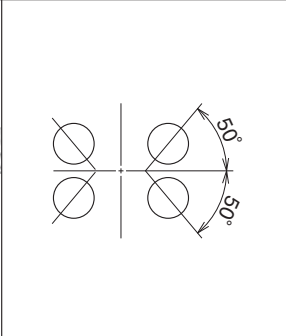

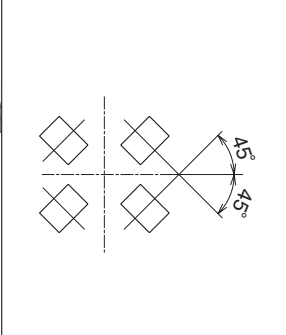
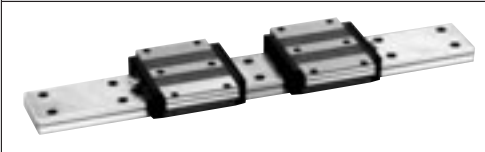
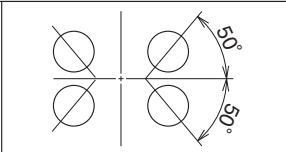
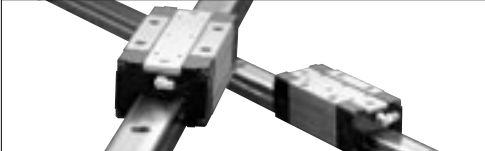
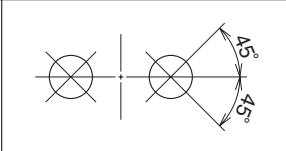

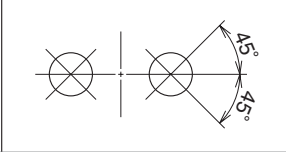

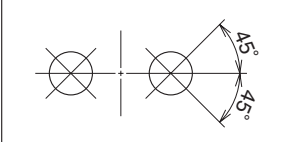
improvement of quality based on the integrated technology platform of tribology, material technology, analysis and mechatronics.

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Linear Guides

Types of Linear Guides

| Series | Features |
|--|--|
| <p>LH/SH Series</p>   | <p>LH Series</p> <ul style="list-style-type: none"> • NSK basic series • General versatility for heavy-duty applications • Large load carrying capacity against vertical direction Stainless steel is available (#15–30). <p>SH Series</p> <ul style="list-style-type: none"> • Silent and smooth featured LH incorporated with retainer piece |
| <p>LS/SS Series</p>   | <p>LS Series</p> <ul style="list-style-type: none"> • Compact designed NSK basic series • General versatility for fine application • Large load carrying capacity against vertical direction Stainless steel is available (#15–35). <p>SS Series</p> <ul style="list-style-type: none"> • Silent and smooth featured LS incorporated with retainer piece |
| <p>RA Series</p>   | <ul style="list-style-type: none"> • A roller guide with super high load capacity and rigidity • Super high accuracy and smooth motion • Highly dust proof and maintenance free |
| <p>LW Series</p>   | <ul style="list-style-type: none"> • Wide rail type linear guide • Ideal for use of single rail • Large load carrying capacity against vertical direction |
| <p>TS Series</p>   | <ul style="list-style-type: none"> • Low price linear guide best fit for transportation equipments • Long-term maintenance free by regularly equipped NSK K1 |
| <p>PU Series</p>   | <ul style="list-style-type: none"> • Lightweight designed miniature linear guide • Reduced noise and smooth motion • High corrosion resistance (stainless steel) |
| <p>PE Series</p>   | <ul style="list-style-type: none"> • Lightweight designed wide rail miniature linear guide • Ideal for use of single rail • Reduced noise and smooth motion • High corrosion resistance (stainless steel) |

| Ball slide model | | | | Size & Preload | | Dimension table |
|------------------|--------|--------|--------|----------------|---------------------------------|---------------------|
| AN, BN | AL, BL | AN, AL | BN, BL | Size | Preload | Page 11-14 19-24 |
| | | | | LH/SH15 | Slight preload ZZ | |
| EM, GM | | EM | GM | LH/SH20 | | |
| | | | | LH/SH25 | | |
| | | | | LH/SH30 | | |
| | | | | LH/SH35 | | |
| | | | | LH/SH45 | | |
| | | | | LH/SH55 | | |
| | | | | LH65 | | |
| AL, CL | | AL | CL | Size | Preload | Page 15-18 25-28 |
| | | | | LS/SS15 | Slight preload ZZ | |
| | | | | LS/SS20 | | |
| EM, JM | | EM | JM | LS/SS25 | | |
| | | | | LS/SS30 | | |
| | | | | LS/SS35 | | |
| AL, BL | AN, BN | AL, AN | BL, BN | Size | Preload | Page 29-34 |
| | | | | RA15 | Medium preload Z | |
| | | | | RA20 | | |
| | | | | RA25 | | |
| EM, GM | | EM | GM | RA30 | | |
| | | | | RA35 | | |
| | | | | RA45 | | |
| | | | | RA55 | | |
| | | | | RA65 | | |
| EL | | EL | | Size | Preload | Page 35-36 |
| | | | | LW17 | Slight preload ZZ | |
| | | | | LW21 | | |
| | | | | LW27 | | |
| | | | | LW35 | | |
| | | | | LW50 | | |
| AN | | AN | | Size | Preload | Page 37-38 |
| | | | | TS15 | Maximum clearance 60 μm S | |
| | | | | TS20 | | |
| | | | | TS25 | | |
| | | | | TS30 | | |
| | | | | TS35 | | |
| AL, TR, UR, BL | | AL, TR | BL, UR | Size | Preload | Page 39-40 |
| | | | | PU05 | Maximum clearance 3 μm ZT | |
| | | | | PU07 | | |
| | | | | PU09 | | |
| | | | | PU12 | | |
| | | | | PU15 | | |
| AR, TR, UR, BR | | AR, TR | BR, UR | Size | Preload | Page 41-42 |
| | | | | PE05 | Maximum clearance 3 μm ZT | |
| | | | | PE07 | | |
| | | | | PE09 | | |
| | | | | PE12 | | |
| | | | | 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 |

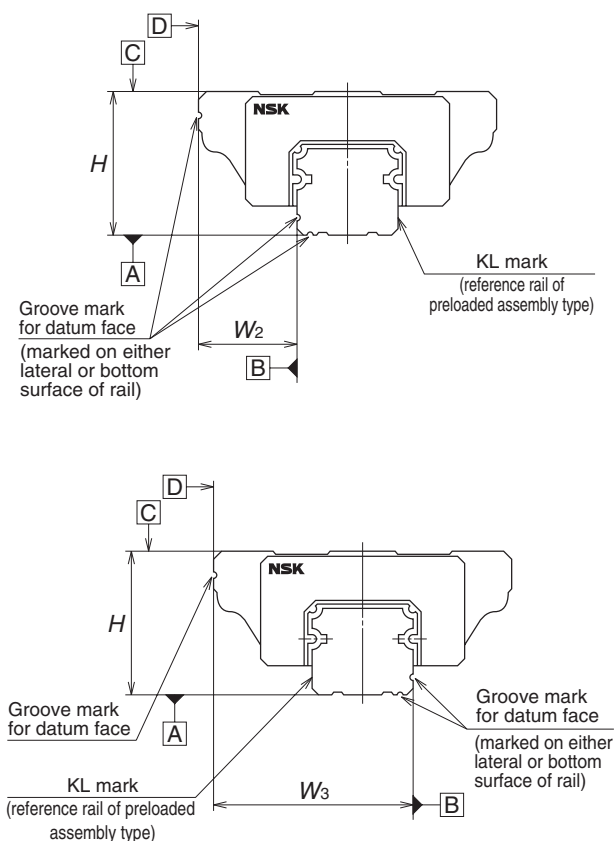


Fig. 1 Assembled accuracy (height and width)

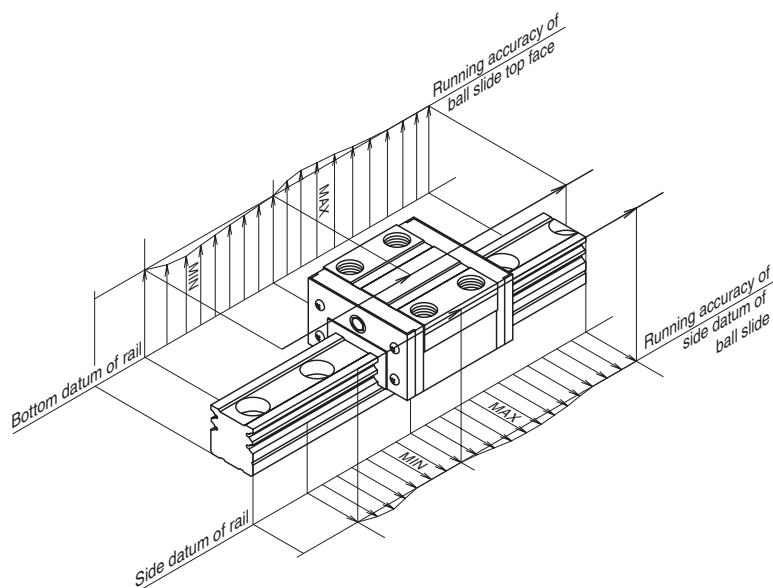


Fig. 2 Running parallelism of ball slide

Assembly dimension tolerance of random-matching type

 Unit: μm

| Series | LH/SH Series | | LS/SS Series | RA Series | LW Series | TS Series | PU/PE Series |
|--|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|-----------|--------------------------------------|
| | 15 – 35 | 45 – 65 | 15 – 35 | 15 – 65 | 17 – 50 | 15 – 35 | 05 – 15 |
| Mounting height H | ± 20 | ± 30 | ± 20 | ± 20 | ± 20 | ± 100 | ± 20 |
| 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 | ± 30 | ± 35 | ± 30 | ± 25 | ± 30 | – | ± 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: μm

| 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 |
| 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.

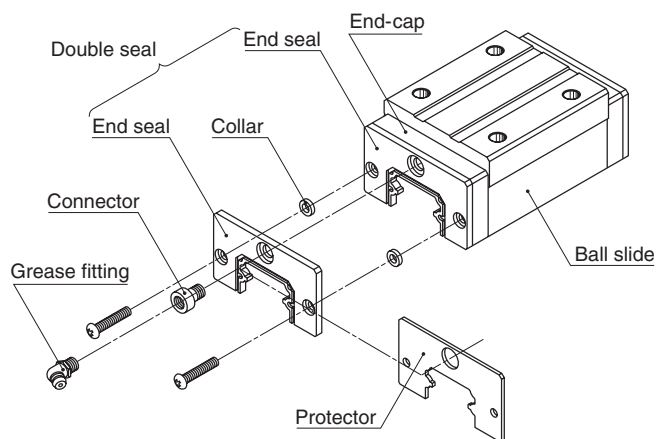


Fig. 3

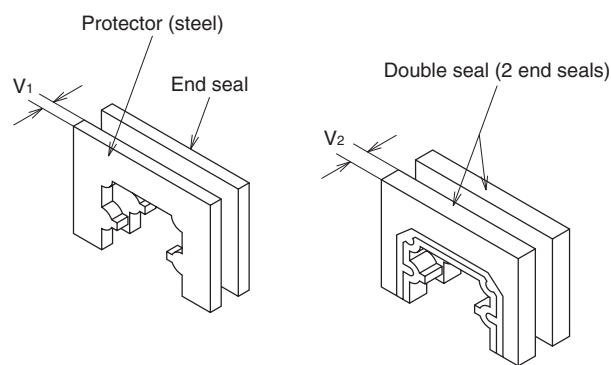


Fig. 4

Table 2 Double-seal set

Unit: mm

| Model No. | Part No. | | Increased thickness V_2 |
|-----------|-------------------|----------------|---------------------------|
| | 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 |

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

Table 3 Protector set

Unit: mm

| Model No. | Part No. | | Increased thickness V_1 |
|-----------|-------------------|----------------|---------------------------|
| | 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 |

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.

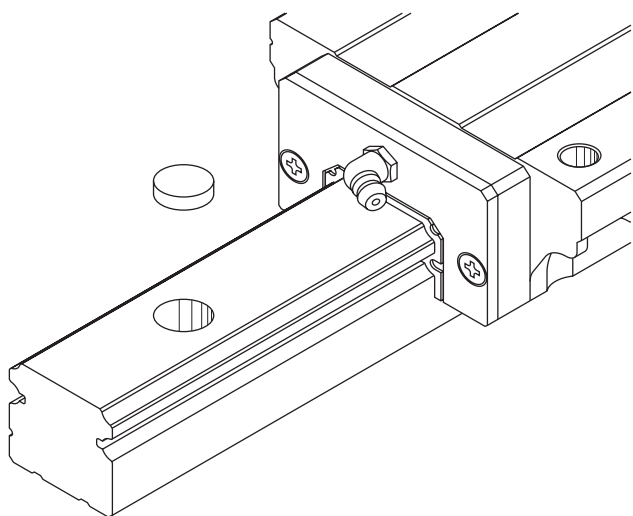


Fig. 5

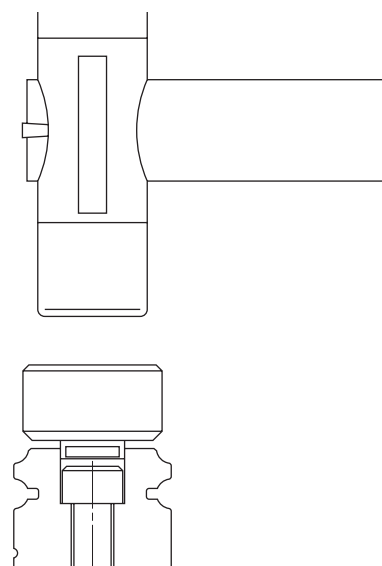


Fig. 6

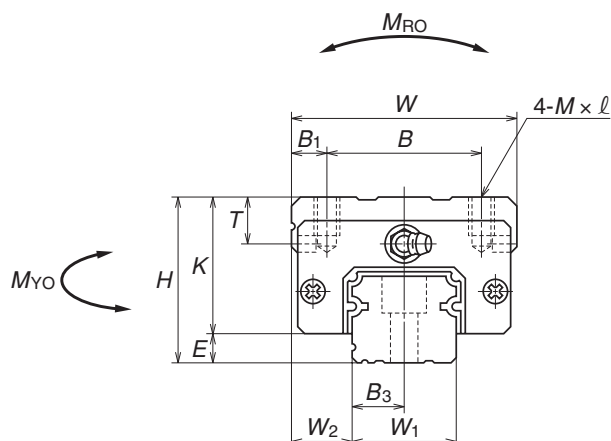
Table 4 Caps to cover rail bolt hole

| 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 |

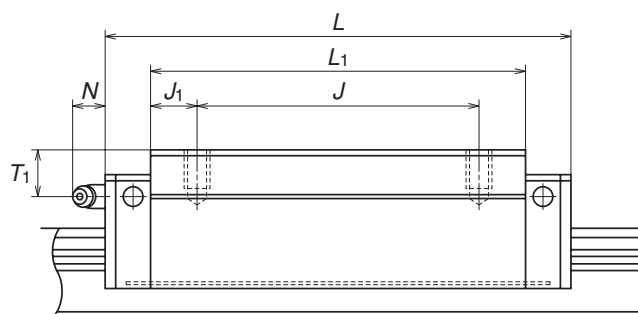
Linear Guides LH Series

Ball Slide Models: AL, AN, BL, BN

Front view of AL and AN, BL and BN types



Side view of BN type



| Model No. | Assembly | | | Ball slide | | | | | | | | | | | | |
|--------------------------------------|----------------------|----------|-----------------------|-------------------|--------------------|---------------|-----------|--|-----------------------|-----------------------|-----------------------|------------------------------|----------|--------------------|-----------------------|----------|
| | Height <i>H</i> | <i>E</i> | <i>W</i> ₂ | Width <i>W</i> | Length <i>L</i> | Mounting hole | | | <i>B</i> ₁ | <i>L</i> ₁ | <i>J</i> ₁ | <i>K</i> | <i>T</i> | Grease fitting | | |
| | | | | | | <i>B</i> | <i>J</i> | <i>M</i> × pitch × <i>l</i> | | | | | | Mounting hole size | <i>T</i> ₁ | <i>N</i> |
| LH15AN LH15BN | 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 |
| LH20AN LH20BN | 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 |
| LH25AL LH25AN LH25BL LH25BN | 36 40 36 40 | 7 | 12.5 | 48 | 79 107 | 35 | 35 50 | M6×1×6 M6×1×9 M6×1×6 M6×1×9 | 6.5 | 58 86 | 11.5 18 | 29 33 29 33 | 12 | M6×0.75 | 6 10 6 10 | 11 |
| LH30AL LH30AN LH30BL LH30BN | 42 45 42 45 | 9 | 16 | 60 | 85.6 124.6 | 40 | 40 60 | M8×1.25×8 M8×1.25×10 M8×1.25×8 M8×1.25×10 | 10 | 59 98 | 9.5 19 | 33 36 33 36 | 14 | M6×0.75 | 7 10 7 10 | 11 |
| LH35AL LH35AN LH35BL LH35BN | 48 55 48 55 | 9.5 | 18 | 70 | 109 143 | 50 | 50 72 | M8×1.25×8 M8×1.25×12 M8×1.25×8 M8×1.25×12 | 10 | 80 114 | 15 21 | 38.5 45.5 38.5 45.5 | 15 | M6×0.75 | 8 15 8 15 | 11 |
| LH45AN LH45BN | 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 |
| LH55AN LH55BN | 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 |
| LH65AN LH65BN | 90 | 16 | 31.5 | 126 | 193 253 | 76 | 70 120 | M16×2×20 | 25 | 147 207 | 38.5 43.5 | 74 | 23 | Rc1/8 | 19 | 13 |

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

Part number for ball slide only

Example:

LAH 25 AN S Z - K

Random-matching ball slide

Size

Shape/height

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

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

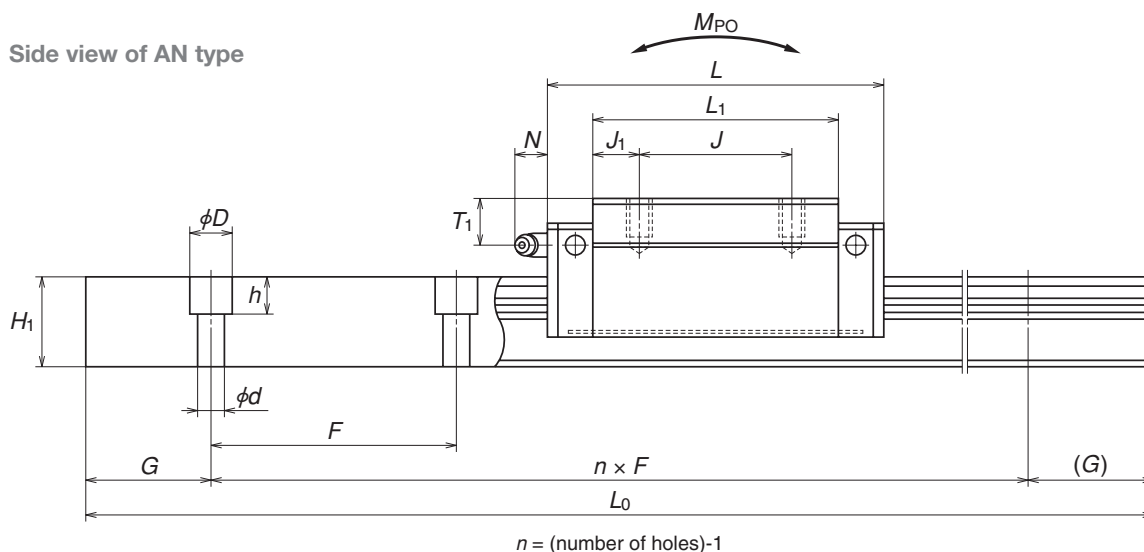
Butting rail specification
N: Non-butting L: Butting

Preload
Z: Slight preload (standard)

Accuracy: PC
(only PC grade is available)

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

Side view of AN type



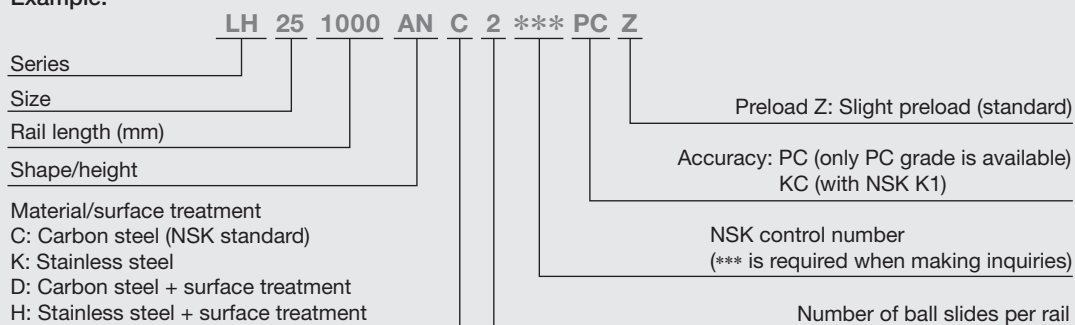
Unit: mm

| Rail | | | | | | | Basic load rating | | | | | Ball diameter | Weight | |
|-------|--------|-------|-----------------------|-------|------|---------------------------------|--------------------|--------------------|-------------------|-------------------|-------------------|---------------|------------------------------|-------------|
| Width | Height | Pitch | Mounting bolt hole | | | Max. length (Single rail) | Dynamic | Static | Static moment | | | D_w | Ball slide (kg) | Rail (kg/m) |
| W_1 | H_1 | F | $d \times D \times h$ | B_3 | G | L_{0max} () for stainless | C (N) | C_0 (N) | M_{R0} (N·m) | M_{P0} (N·m) | M_{Y0} (N·m) | | | |
| 15 | 15 | 60 | 4.5×7.5×5.3 | 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 |
| 20 | 18 | 60 | 6×9.5×8.5 | 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 |
| 23 | 22 | 60 | 7×11×9 | 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 |
| 28 | 26 | 80 | 9×14×12 | 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 |
| 34 | 29 | 80 | 9×14×12 | 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 |
| 45 | 38 | 105 | 14×20×17 | 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 |
| 53 | 44 | 120 | 16×23×20 | 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 |
| 63 | 53 | 150 | 18×26×22 | 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 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_{100} for a 100-km fatigue life, divide C by 1.26.

Part number for assembly (ball slide + rail)

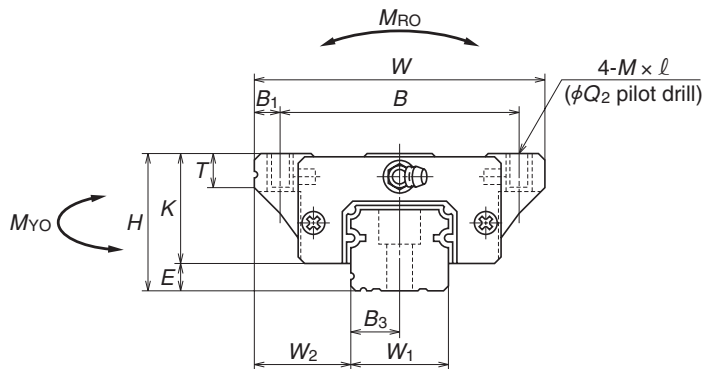
Example:



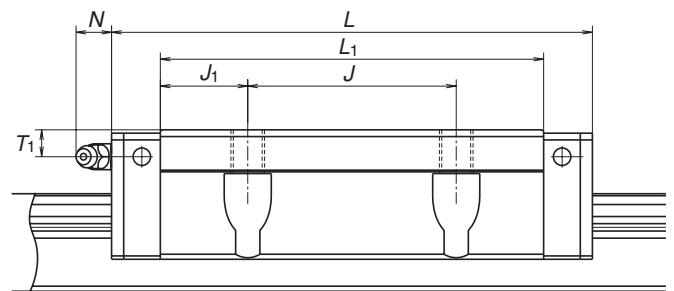
Linear Guides LH Series

Ball Slide Models: EM, GM

Front view of EM and GM types



Side view of GM type



| Model No. | Assembly | | | Ball slide | | | | | | | | | | | | | |
|--------------------------------|-------------|-----|----------------|------------|---------------|---------------|-----|-------------------------------------|----------------|----------------|----------------|----------------|------|------------|--------------------|----------------|-----|
| | Height H | E | W ₂ | Width W | Length L | Mounting hole | | | | B ₁ | L ₁ | J ₁ | K | T | Grease fitting | | |
| | | | | | | B | J | Q ₁ × l M × pitch × l | Q ₂ | | | | | | Mounting hole size | T ₁ | N |
| LH15EM LH15GM | 24 | 4.6 | 16 | 47 | 55 74 | 38 | 30 | M5×0.8×7 | 4.4 | 4.5 | 39 58 | 4.5 14 | 19.4 | 8 | φ3 | 4.5 | 3.3 |
| LH20EM LH20GM | 30 | 5 | 21.5 | 63 | 69.8 91.8 | 53 | 40 | M6×1×9.5 | 5.3 | 5 | 50 72 | 5 16 | 25 | 10 | M6×0.75 | 5 | 11 |
| LH25EM LH25GM | 36 | 7 | 23.5 | 70 | 79 107 | 57 | 45 | M8×1.25×10 (M8×1.25×11.5) | 6.8 | 6.5 | 58 86 | 6.5 20.5 | 29 | 11 (12) | M6×0.75 | 6 | 11 |
| LH30EM LH30GM | 42 | 9 | 31 | 90 | 98.6 124.6 | 72 | 52 | M10×1.5×12 (M10×1.5×14.5) | 8.6 | 9 | 72 98 | 10 23 | 33 | 11 (15) | M6×0.75 | 7 | 11 |
| LH35EM LH35GM | 48 | 9.5 | 33 | 100 | 109 143 | 82 | 62 | M10×1.5×13 | 8.6 | 9 | 80 114 | 9 26 | 38.5 | 12 | M6×0.75 | 8 | 11 |
| LH45EM LH45GM | 60 | 14 | 37.5 | 120 | 139 171 | 100 | 80 | M12×1.75×15 | 10.5 | 10 | 105 137 | 12.5 28.5 | 46 | 13 | Rc1/8 | 10 | 13 |
| LH55EM LH55GM | 70 | 15 | 43.5 | 140 | 163 201 | 116 | 95 | M14×2×18 | 12.5 | 12 | 126 164 | 15.5 34.5 | 55 | 15 | Rc1/8 | 11 | 13 |
| LH65EM LH65GM | 90 | 16 | 53.5 | 170 | 193 253 | 142 | 110 | M16×2×24 | 14.6 | 14 | 147 207 | 18.5 48.5 | 74 | 23 | Rc1/8 | 19 | 13 |

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.

Part number for ball slide only

Example:

LAH 25 EM S Z - K

Random-matching ball slide

Size

Shape/height

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

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

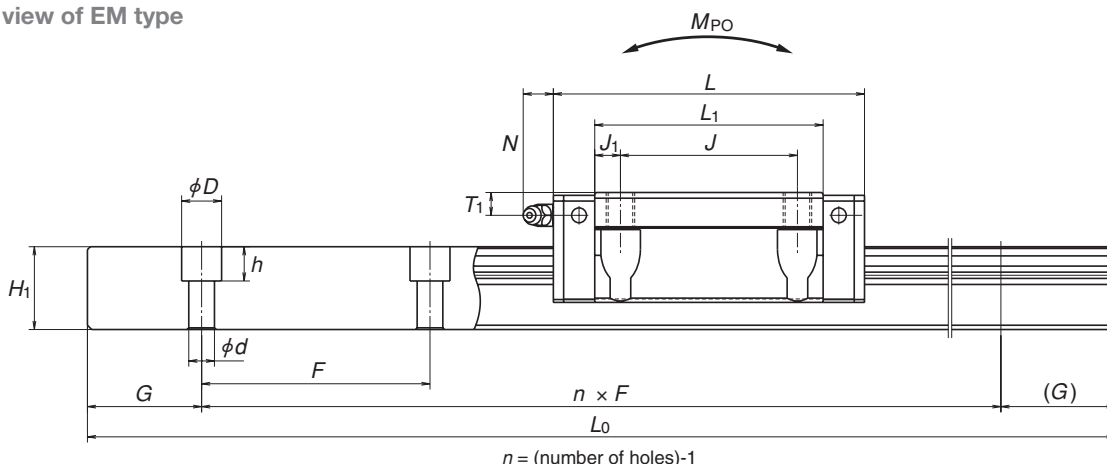
N: Non-butting L: Butting

Preload
Z: Slight preload (standard)

Accuracy: PC
(only PC grade is available)

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

Side view of EM type



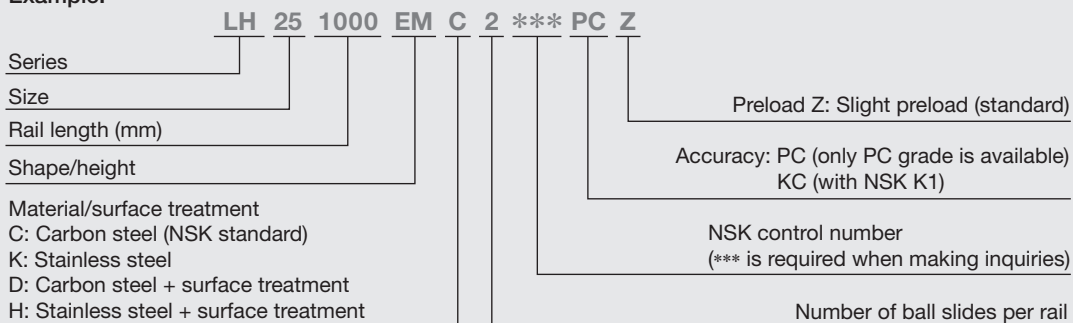
Unit: mm

| Rail | | | | | | | Basic load rating | | | | | Ball diameter | Weight | |
|-------|--------|-------|-----------------------|-------|------|--|--------------------|--------------------|----------------|-----------------|----------------|---------------|-----------------|-------------|
| Width | Height | Pitch | Mounting bolt hole | B_3 | G | Max. length (Single rail) L_{0max} () for stainless | Dynamic | Static | Static moment | | | D_w | Ball slide (kg) | Rail (kg/m) |
| W_1 | H_1 | F | $d \times D \times h$ | | | | C (N) | C_0 (N) | M_{R0} (N·m) | M_{P0} (N·m) | M_{Y0} (N·m) | | | |
| 15 | 15 | 60 | 4.5×7.5×5.3 | 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 |
| 20 | 18 | 60 | 6×9.5×8.5 | 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 |
| 23 | 22 | 60 | 7×11×9 | 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 |
| 28 | 26 | 80 | 9×14×12 | 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 |
| 34 | 29 | 80 | 9×14×12 | 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 |
| 45 | 38 | 105 | 14×20×17 | 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 |
| 53 | 44 | 120 | 16×23×20 | 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 |
| 63 | 53 | 150 | 18×26×22 | 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 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_{100} for a 100-km fatigue life, divide C by 1.26.

Part number for assembly (ball slide + rail)

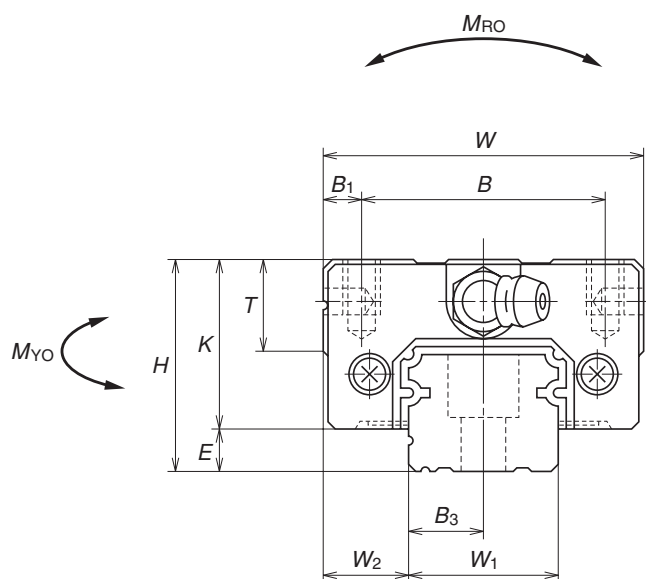
Example:



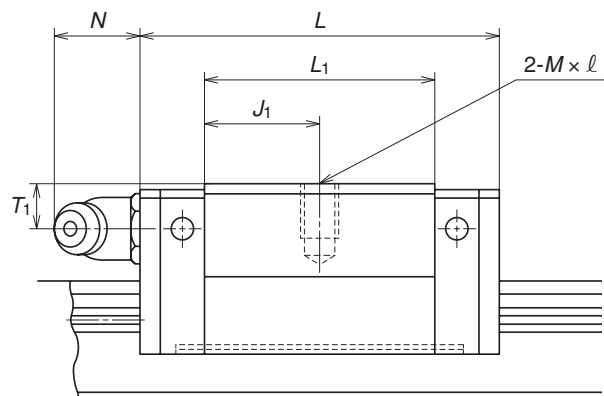
Linear Guides LS Series

Ball Slide Models: CL, AL

Front view of AL and CL types



Side view of CL type



| Model No. | Assembly | | | Ball slide | | | | | | | | | | | | |
|--------------------------------|--------------------|----------|-----------------------|-------------------|--------------------|---------------|----------|-----------------------------|-----------------------|-----------------------|-----------------------|----------|----------|--------------------|-----------------------|----------|
| | Height <i>H</i> | <i>E</i> | <i>W</i> ₂ | Width <i>W</i> | Length <i>L</i> | Mounting hole | | | <i>B</i> ₁ | <i>L</i> ₁ | <i>J</i> ₁ | <i>K</i> | <i>T</i> | Grease fitting | | |
| | | | | | | <i>B</i> | <i>J</i> | <i>M</i> × pitch × <i>ℓ</i> | | | | | | Mounting hole size | <i>T</i> ₁ | <i>N</i> |
| LS15CL LS15AL | 24 | 4.6 | 9.5 | 34 | 40.4 56.8 | 26 | — 26 | M4×0.7×6 | 4 | 23.6 40 | 11.8 7 | 19.4 | 10 | φ3 | 6 | 3 |
| LS20CL LS20AL | 28 | 6 | 11 | 42 | 47.2 65.2 | 32 | — 32 | M5×0.8×7 | 5 | 30 48 | 15 8 | 22 | 12 | M6×0.75 | 5.5 | 11 |
| LS25CL LS25AL | 33 | 7 | 12.5 | 48 | 59.6 81.6 | 35 | — 35 | M6×1×9 | 6.5 | 38 60 | 19 12.5 | 26 | 12 | M6×0.75 | 7 | 11 |
| LS30CL LS30AL | 42 | 9 | 16 | 60 | 67.4 96.4 | 40 | — 40 | M8×1.25×12 | 10 | 42 71 | 21 15.5 | 33 | 13 | M6×0.75 | 8 | 11 |
| LS35CL LS35AL | 48 | 10.5 | 18 | 70 | 77 108 | 50 | — 50 | M8×1.25×12 | 10 | 49 80 | 24.5 15 | 37.5 | 14 | M6×0.75 | 8.5 | 11 |

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

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

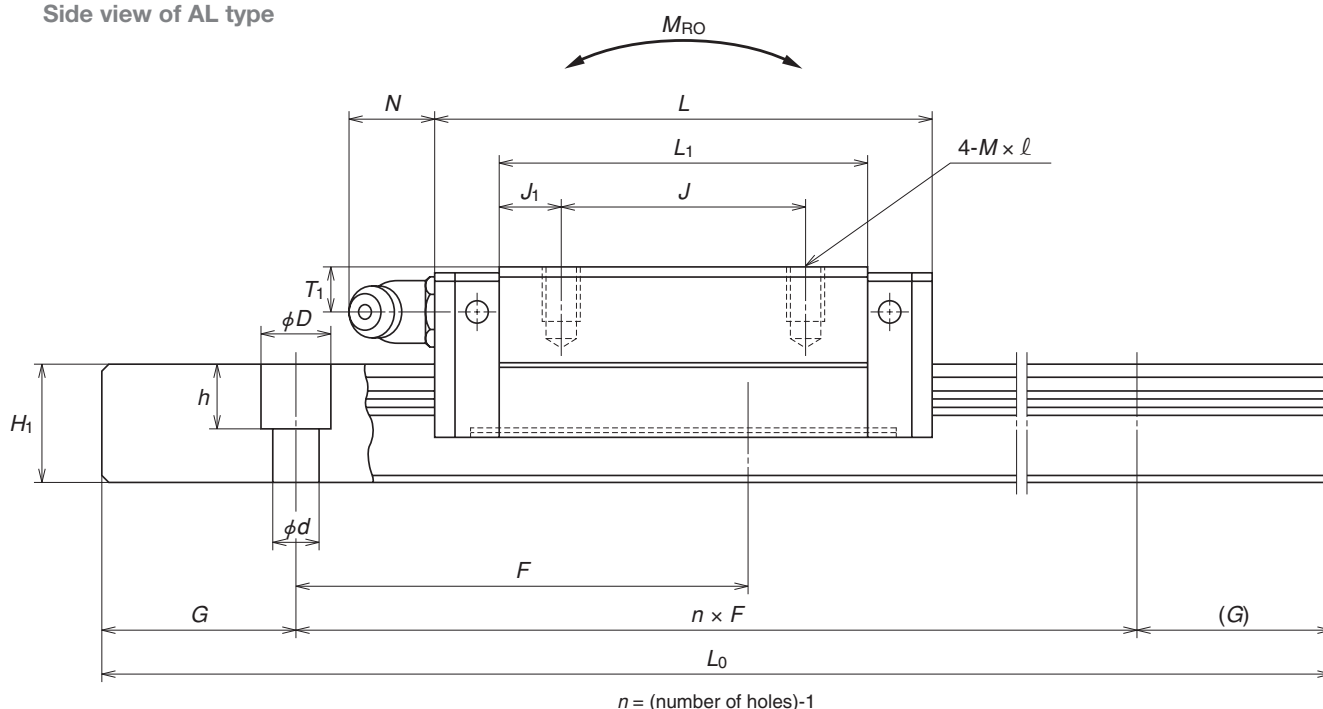
Preload
Z: Slight preload (standard)

Accuracy: PC (only PC grade is available)

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

Butting rail specification
N: Non-butting L: Butting

Side view of AL type



Unit: mm

| Rail | | | | | | | Basic load rating | | | | | Ball diameter | Weight | |
|-------|--------|-------|-----------------------|-------|----|--|-------------------|------------------|----------------|----------------|----------------|---------------|-----------------|-------------|
| Width | Height | Pitch | Mounting bolt hole | B_3 | G | Max. length (Single rail) L_{0max} () for stainless | Dynamic C (N) | Static C_0 (N) | Static moment | | | D_w | Ball slide (kg) | Rail (kg/m) |
| W_1 | H_1 | F | $d \times D \times h$ | | | | | | M_{RO} (N·m) | M_{P0} (N·m) | M_{V0} (N·m) | | | |
| 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 | 0.14 | 1.4 |
| | | | 8 350 | | | | 16 900 | 84.5 | 77 | 64.5 | | | | |
| 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 | 0.19 | 2.3 |
| | | | 11 700 | | | | 23 500 | 160 | 133 | 111 | | | | |
| 23 | 18 | 60 | 7×11×9 | 11.5 | 20 | 3 960 (3 500) | 12 700 | 20 800 | 164 | 91 | 76 | 3.968 | 0.34 | 3.1 |
| | | | 18 800 | | | | 36 500 | 286 | 258 | 217 | | | | |
| 28 | 23 | 80 | 7×11×9 | 14 | 20 | 4 000 (3 500) | 18 700 | 29 600 | 282 | 139 | 116 | 4.762 | 0.58 | 4.8 |
| | | | 28 800 | | | | 55 000 | 520 | 435 | 365 | | | | |
| 34 | 27.5 | 80 | 9×14×12 | 17 | 20 | 4 000 (3 500) | 26 000 | 40 000 | 465 | 220 | 185 | 5.556 | 0.86 | 7.0 |
| | | | 40 000 | | | | 74 500 | 865 | 695 | 580 | | | | |

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.

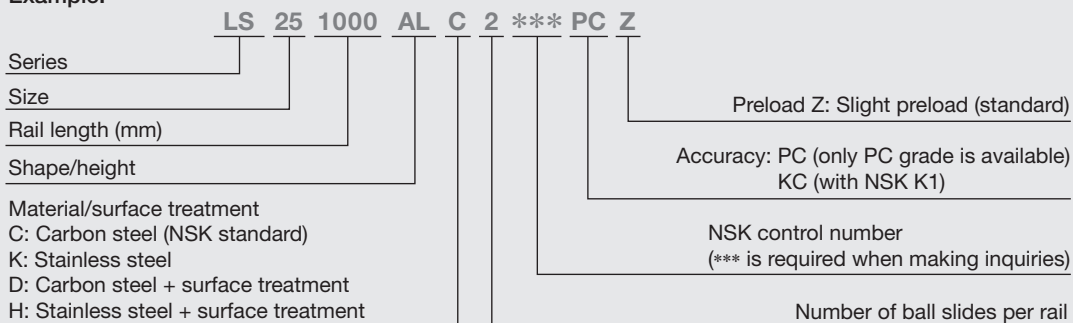
To convert C to C_{100} for a 100-km fatigue life, divide C by 1.26.

*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 assembly (ball slide + rail)

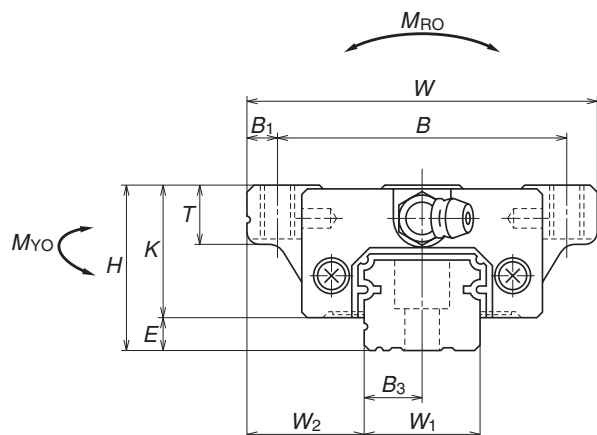
Example:



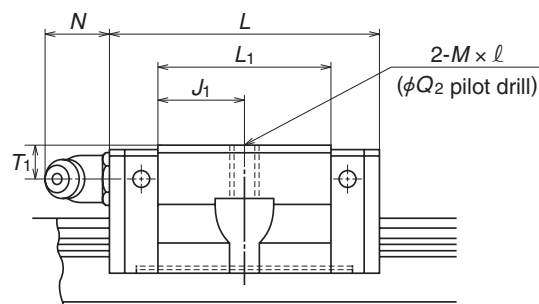
Linear Guides LS Series

Ball Slide Models: JM, EM

Front view of JM and EM types



Side view of JM type



| Model No. | Assembly | | | Ball slide | | | | | | | | | | | | | |
|--------------------------------|--------------------|----------|-----------------------|-------------------|--------------------|---------------|----------|----------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|----------|------------|--------------------|-----------------------|----------|
| | Height <i>H</i> | <i>E</i> | <i>W</i> ₂ | Width <i>W</i> | Length <i>L</i> | Mounting hole | | | | <i>B</i> ₁ | <i>L</i> ₁ | <i>J</i> ₁ | <i>K</i> | <i>T</i> | Grease fitting | | |
| | | | | | | <i>B</i> | <i>J</i> | <i>Q</i> ₁ × <i>ℓ</i> | <i>Q</i> ₂ | | | | | | Mounting hole size | <i>T</i> ₁ | <i>N</i> |
| LS15JM LS15EM | 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 | φ3 | 6 | 3 |
| LS20JM LS20EM | 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 |
| LS25JM LS25EM | 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 |
| LS30JM LS30EM | 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 |
| LS35JM LS35EM | 48 | 10.5 | 33 | 100 | 77 108 | 82 | — 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 |

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.

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

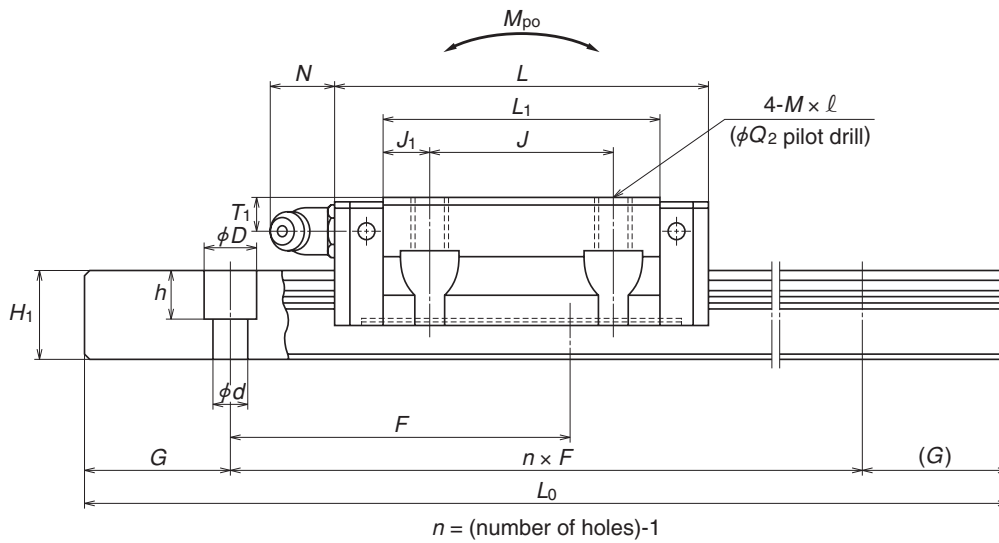
Preload
Z: Slight preload (standard)

Accuracy: PC (only PC grade is available)

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

Butting rail specification
N: Non-butting L: Butting

Side view of EM type



Unit: mm

| Rail | | | | | | | Basic load rating | | | | | Ball diameter | Weight | |
|-------|--------|-------|-----------------------|-------|----|--|-------------------|------------------|----------------|----------------|----------------|---------------|-----------------|-------------|
| Width | Height | Pitch | Mounting bolt hole | B_3 | G | Max. length (Single rail) L_{0max} () for stainless | Dynamic C (N) | Static C_0 (N) | Static moment | | | D_w | Ball slide (kg) | Rail (kg/m) |
| W_1 | H_1 | F | $d \times D \times h$ | | | | | | M_{R0} (N·m) | M_{P0} (N·m) | M_{V0} (N·m) | | | |
| 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 |
| | | | 8 350 | | | | 16 900 | 84.5 | 77 | 64.5 | | | | |
| 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 |
| | | | 11 700 | | | | 23 500 | 160 | 133 | 111 | | | | |
| 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 |
| | | | 18 800 | | | | 36 500 | 286 | 258 | 217 | | | | |
| 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 |
| | | | 28 800 | | | | 55 000 | 520 | 435 | 365 | | | | |
| 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 |
| | | | 40 000 | | | | 74 500 | 865 | 695 | 580 | | | | |

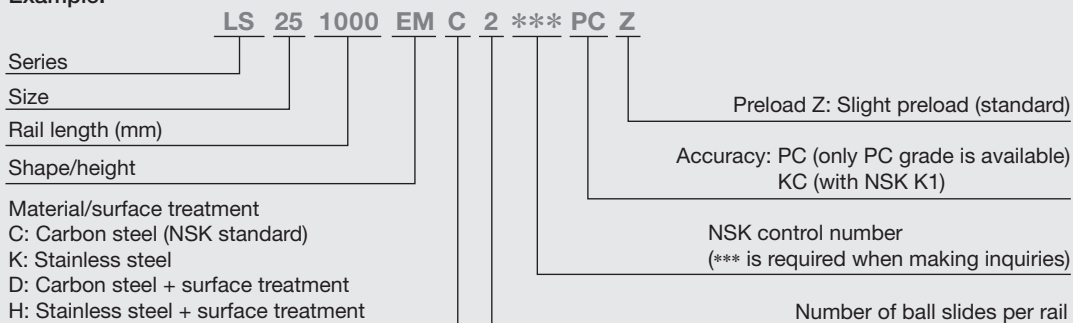
Note 3: Basic dynamic load rating C is a load that allows for a 50-km rating fatigue life and is a vertical and constant load on the ball slide mounting surface.

To convert C to C_{100} for a 100-km rating 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 assembly (ball slide + rail)

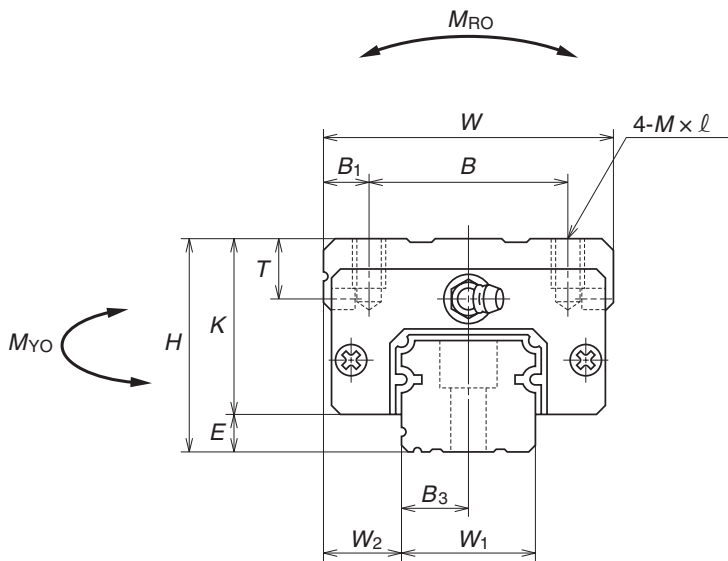
Example:



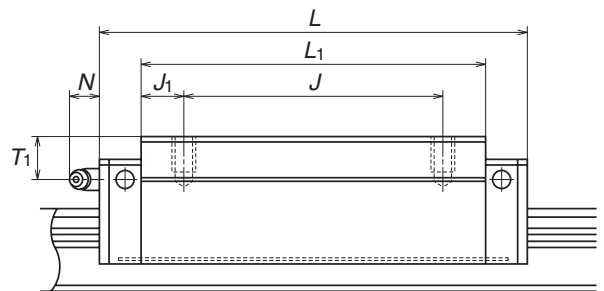
Linear Guides SH Series

Ball Slide Models: AN, BN

Front view of AN and BN types



Side view of BN type



| Model No. | Assembly | | | Ball slide | | | | | | | | | | | | |
|--------------------------------|--------------------|----------|-----------------------|-------------------|--------------------|---------------|----------|-----------------------------|-----------------------|-----------------------|-----------------------|----------|----------|--------------------|-----------------------|----------|
| | Height <i>H</i> | <i>E</i> | <i>W</i> ₂ | Width <i>W</i> | Length <i>L</i> | Mounting hole | | | <i>B</i> ₁ | <i>L</i> ₁ | <i>J</i> ₁ | <i>K</i> | <i>T</i> | Grease fitting | | |
| | | | | | | <i>B</i> | <i>J</i> | <i>M</i> × pitch × <i>l</i> | | | | | | Mounting hole size | <i>T</i> ₁ | <i>N</i> |
| 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 |
| 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 |
| 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 |
| 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 |
| 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 |
| 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 |
| 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 |

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

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)

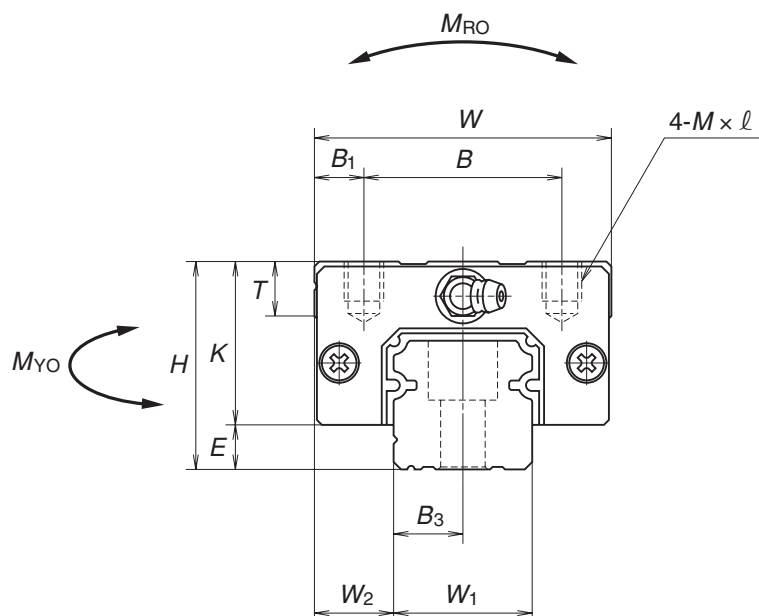
Accuracy: PC (only PC grade is available)

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

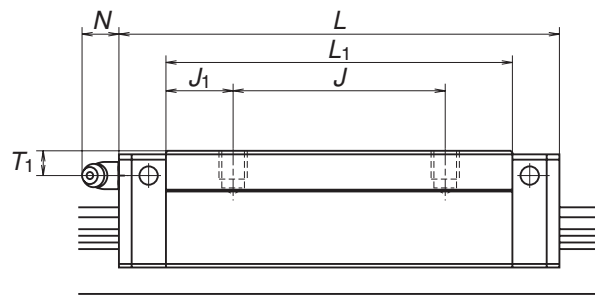
Linear Guides SH Series

Ball Slide Models: AL, BL

Front view of AL and BL types



Side view of BL type



| Model No. | Assembly | | | Ball slide | | | | | | | | | | | | |
|--------------------------------|---------------|-----|-------|--------------|---------------|---------------|----------|----------------------------------|-------|-----------|------------|------|-----|--------------------|-------|-----|
| | Height H | E | W_2 | Width W | Length L | Mounting hole | | | B_1 | L_1 | J_1 | K | T | Grease fitting | | |
| | | | | | | B | J | $M \times \text{pitch} \times l$ | | | | | | Mounting hole size | T_1 | N |
| SH25AL SH25BL | 36 | 7 | 12.5 | 48 | 79 107 | 35 | 35 50 | M6×1×6 | 6.5 | 58 86 | 11.5 18 | 29 | 12 | M6×0.75 | 6 | 11 |
| SH30AL SH30BL | 42 | 9 | 16 | 60 | 85.6 124.6 | 40 | 40 60 | M8×1.25×8 | 10 | 59 98 | 9.5 19 | 33 | 14 | M6×0.75 | 7 | 11 |
| SH35AL SH35BL | 48 | 9.5 | 18 | 70 | 109 143 | 50 | 50 72 | M8×1.25×8 | 10 | 80 114 | 15 21 | 38.5 | 15 | M6×0.75 | 8 | 11 |

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

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

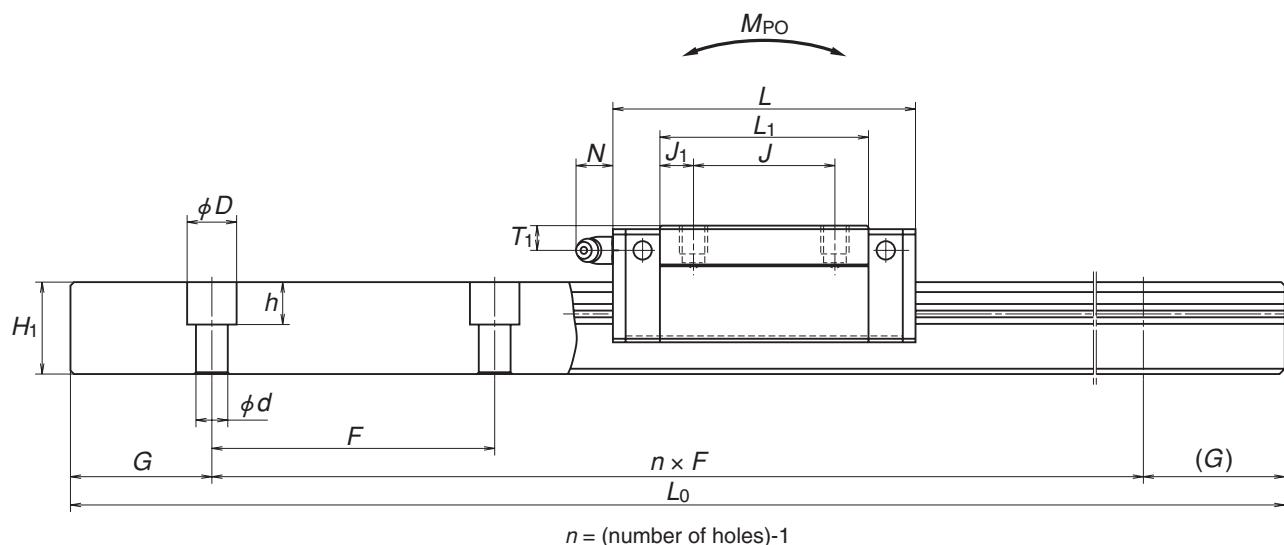
N: Non-butting L: Butting

Preload
Z: Slight preload (standard)

Accuracy: PC (only PC grade is available)

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

Side view of AL type



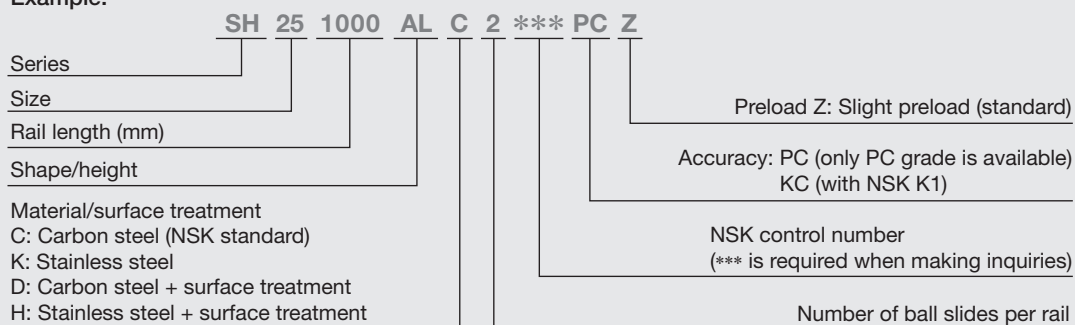
Unit: mm

| Rail | | | | | | | Basic load rating | | | | | Ball diameter | Weight | |
|-------|--------|-------|-----------------------|-------|----|---------------------------------|-------------------|-------------------|-------------------|-------------------|-------------------|---------------|-----------------|-------------|
| Width | Height | Pitch | Mounting bolt hole | | | Max. length (Single rail) | Dynamic | Static | Static moment | | | D_w | Ball slide (kg) | Rail (kg/m) |
| W_1 | H_1 | F | $d \times D \times h$ | B_3 | G | L_{0max} () for stainless | C (N) | C_0 (N) | M_{R0} (N·m) | M_{P0} (N·m) | M_{Y0} (N·m) | | | |
| 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 |
| 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 |
| 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 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_{100} for a 100-km fatigue life, divide C by 1.26.

Part number for assembly (ball slide + rail)

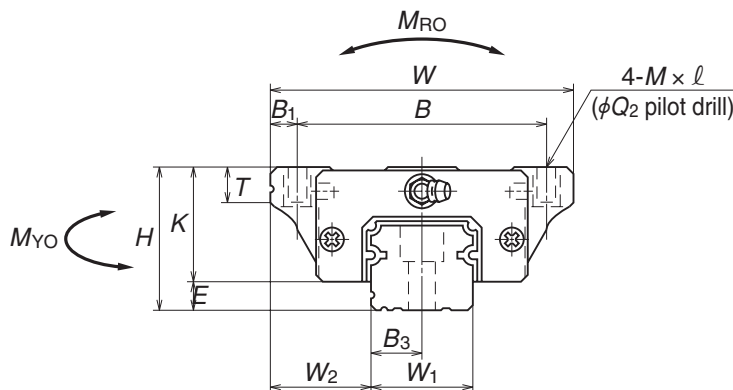
Example:



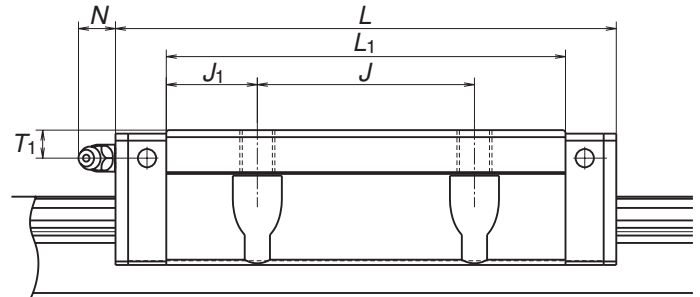
Linear Guides SH Series

Ball Slide Models: EM, GM

Front view of EM and GM types



Side view of GM type



| Model No. | Assembly | | | Ball slide | | | | | | | | | | | | | | |
|--------------------------------|-------------|-----|----------------|------------|---------------|---------------|----|-------------------------------------|----------------|----------------|----------------|----------------|----------------|------------|---------|--------------------|----------------|---|
| | Height H | E | W ₂ | Width W | Length L | Mounting hole | | | | Q ₂ | B ₁ | L ₁ | J ₁ | K | T | Grease fitting | | |
| | | | | | | B | J | Q ₁ × l M × pitch × l | φ ₂ | | | | | | | Mounting hole size | T ₁ | N |
| SH15EM SH15GM | 24 | 4.6 | 16 | 47 | 55 74 | 38 | 30 | M5×0.8×7 | 4.4 | 4.5 | 39 58 | 4.5 14 | 19.4 | 8 | φ3 | 4.5 | 3.3 | |
| SH20EM SH20GM | 30 | 5 | 21.5 | 63 | 69.8 91.8 | 53 | 40 | M6×1×9.5 | 5.3 | 5 | 50 72 | 5 16 | 25 | 10 | M6×0.75 | 5 | 11 | |
| SH25EM SH25GM | 36 | 7 | 23.5 | 70 | 79 107 | 57 | 45 | M8×1.25×10 (M8×1.25×11.5) | 6.8 | 6.5 | 58 86 | 6.5 20.5 | 29 | 11 (12) | M6×0.75 | 6 | 11 | |
| SH30EM SH30GM | 42 | 9 | 31 | 90 | 98.6 124.6 | 72 | 52 | M10×1.5×12 (M10×1.5×14.5) | 8.6 | 9 | 72 98 | 10 23 | 33 | 11 (15) | M6×0.75 | 7 | 11 | |
| SH35EM SH35GM | 48 | 9.5 | 33 | 100 | 109 143 | 82 | 62 | M10×1.5×13 | 8.6 | 9 | 80 114 | 9 26 | 38.5 | 12 | M6×0.75 | 8 | 11 | |
| SH45EM SH45GM | 60 | 14 | 37.5 | 120 | 139 171 | 100 | 80 | M12×1.75×15 | 10.5 | 10 | 105 137 | 12.5 28.5 | 46 | 13 | Rc1/8 | 10 | 13 | |
| SH55EM SH55GM | 70 | 15 | 43.5 | 140 | 163 201 | 116 | 95 | M14×2×18 | 12.5 | 12 | 126 164 | 15.5 34.5 | 55 | 15 | Rc1/8 | 11 | 13 | |

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.

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

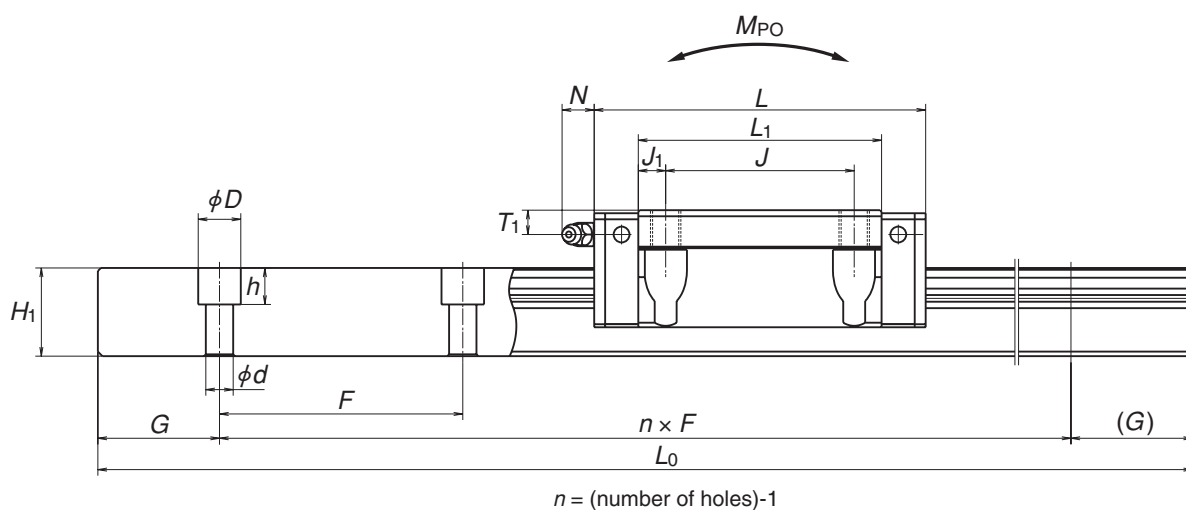
N: Non-butting L: Butting

Preload
Z: Slight preload (standard)

Accuracy: PC
(only PC grade is available)

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

Side view of EM type



Unit: mm

| Rail | | | | | | | Basic load rating | | | | | Ball diameter | Weight | |
|-------|--------|-------|-----------------------|-------|------|--|--------------------|--------------------|----------------|----------------|----------------|---------------|-----------------|-------------|
| Width | Height | Pitch | Mounting bolt hole | B_3 | G | Max. length (Single rail) L_{0max} () for stainless | Dynamic C (N) | Static C_0 (N) | Static moment | | | D_w | Ball slide (kg) | Rail (kg/m) |
| W_1 | H_1 | F | $d \times D \times h$ | | | | | | M_{R0} (N·m) | M_{P0} (N·m) | M_{Y0} (N·m) | | | |
| 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 | 0.17 0.25 | 1.6 |
| 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 | 0.45 0.65 | 2.6 |
| 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 | 0.63 0.93 | 3.6 |
| 28 | 26 | 80 | 9×14×12 | 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 |
| 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 | 1.7 2.4 | 7.2 |
| 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 |
| 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 | 5.0 6.5 | 16.9 |

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_{100} for a 100-km fatigue life, divide C by 1.26.

Part number for assembly (ball slide + rail)

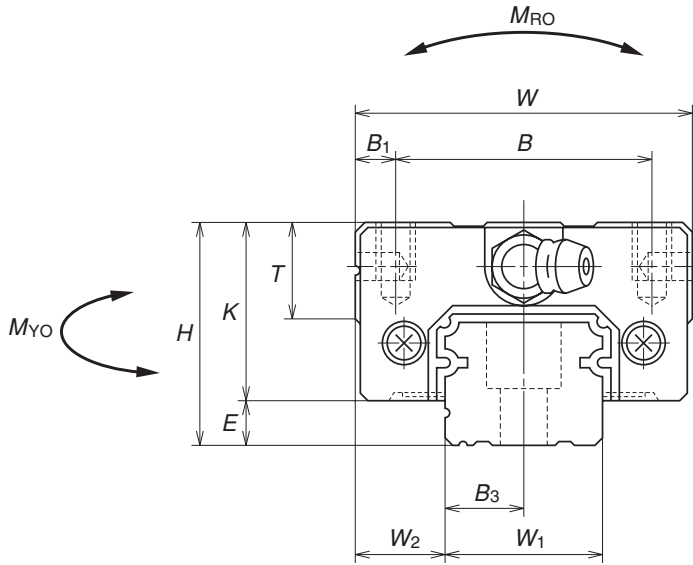
Example:

| | | | | | | | | | | | | | | | |
|--------|----|------|----|------------------|------|--------------|----|---|---|--------------------------------|---|----------|---|---------|--|
| Series | SH | Size | 25 | Rail length (mm) | 1000 | Shape/height | EM | Material/surface treatment | C | Number of ball slides per rail | 2 | Accuracy | PC | Preload | Z |
| | | | | | | | | C: Carbon steel (NSK standard) K: Stainless steel D: Carbon steel + surface treatment H: Stainless steel + surface treatment | | | | | Accuracy: PC (only PC grade is available) KC (with NSK K1) | | Preload Z: Slight preload (standard) |
| | | | | | | | | | | | | | | | NSK control number (***) is required when making inquiries |

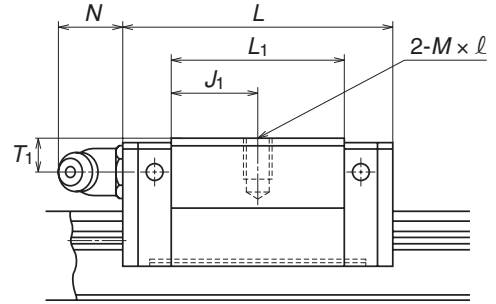
Linear Guides SS Series

Ball Slide Models: AL, CL

Front view of AL and CL types



Side view of CL type



| Model No. | Assembly | | | Ball slide | | | | | | | | | | | | |
|--------------------------------|--------------------|----------|-----------------------|-------------------|--------------------|---------------|----------|-----------------------------|-----------------------|-----------------------|-----------------------|----------|----------|--------------------|-----------------------|----------|
| | Height <i>H</i> | <i>E</i> | <i>W</i> ₂ | Width <i>W</i> | Length <i>L</i> | Mounting hole | | | <i>B</i> ₁ | <i>L</i> ₁ | <i>J</i> ₁ | <i>K</i> | <i>T</i> | Grease fitting | | |
| | | | | | | <i>B</i> | <i>J</i> | <i>M</i> × pitch × <i>l</i> | | | | | | Mounting hole size | <i>T</i> ₁ | <i>N</i> |
| SS15CL SS15AL | 24 | 4.6 | 9.5 | 34 | 40.4 56.8 | 26 | – 26 | M4×0.7×6 | 4 | 23.6 40 | 11.8 7 | 19.4 | 10 | φ3 | 6 | 3 |
| SS20CL SS20AL | 28 | 6 | 11 | 42 | 47.2 65.2 | 32 | – 32 | M5×0.8×7 | 5 | 30 48 | 15 8 | 22 | 12 | M6×0.75 | 5.5 | 11 |
| SS25CL SS25AL | 33 | 7 | 12.5 | 48 | 59.6 81.6 | 35 | – 35 | M6×1×9 | 6.5 | 38 60 | 19 12.5 | 26 | 12 | M6×0.75 | 7 | 11 |
| SS30CL SS30AL | 42 | 9 | 16 | 60 | 67.4 96.4 | 40 | – 40 | M8×1.25×12 | 10 | 42 71 | 21 15.5 | 33 | 13 | M6×0.75 | 8 | 11 |
| SS35CL SS35AL | 48 | 10.5 | 18 | 70 | 77 108 | 50 | – 50 | M8×1.25×12 | 10 | 49 80 | 24.5 15 | 37.5 | 14 | M6×0.75 | 8.5 | 11 |

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

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

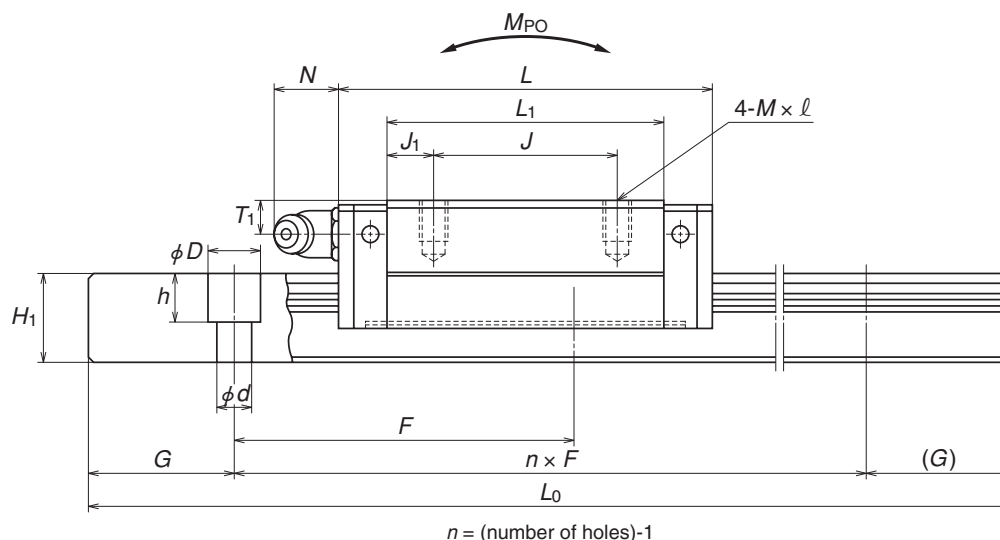
Preload
Z: Slight preload (standard)

Accuracy: PC (only PC grade is available)

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

Butting rail specification
N: Non-butting L: Butting

Side view of AL type



Unit: mm

| Rail | | | | | | | Basic load rating | | | | | Ball diameter | Weight | |
|-------|--------|-------|---------------------------|-------|----|---------------------------------|-------------------|------------------|-------------------|-------------------|-------------------|---------------|-----------------|-------------|
| Width | Height | Pitch | Mounting bolt hole | | | Max. length (Single rail) | Dynamic | Static | Static moment | | | D_w | Ball slide (kg) | Rail (kg/m) |
| W_1 | H_1 | F | $d \times D \times h$ | B_3 | G | L_{0max} () for stainless | C (N) | C_0 (N) | M_{R0} (N·m) | M_{P0} (N·m) | M_{Y0} (N·m) | | | |
| 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 | 0.14 0.2 | 1.4 |
| 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 | 0.19 0.28 | 2.3 |
| 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 | 0.34 0.51 | 3.1 |
| 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 | 0.58 0.85 | 4.8 |
| 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 | 0.86 1.3 | 7 |

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_{100} 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 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)

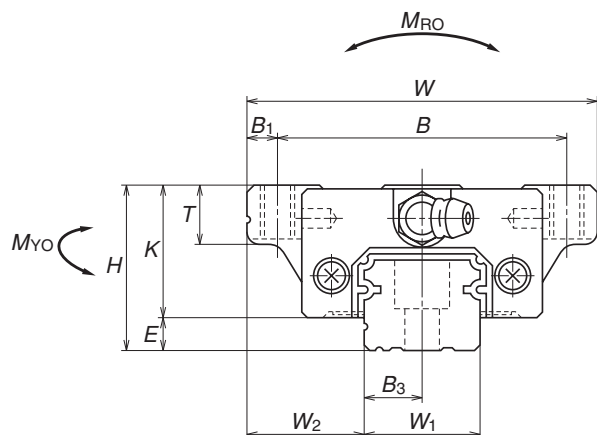
 NSK control number
(*** is required when making inquiries)

Number of ball slides per rail

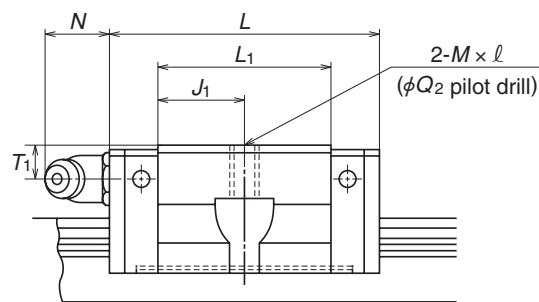
Linear Guides SS Series

Ball Slide Models: JM, EM

Front view of JM and EM types



Side view of JM type



| Model No. | Assembly | | | Ball slide | | | | | | | | | | | | | | |
|--------------------------------|--------------------|----------|-----------------------|-------------------|--------------------|---------------|----------|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|------------|----------|--------------------|-----------------------|----------|
| | Height <i>H</i> | <i>E</i> | <i>W</i> ₂ | Width <i>W</i> | Length <i>L</i> | Mounting hole | | | | <i>Q</i> ₂ | <i>B</i> ₁ | <i>L</i> ₁ | <i>J</i> ₁ | <i>K</i> | <i>T</i> | Grease fitting | | |
| | | | | | | <i>B</i> | <i>J</i> | <i>Q</i> ₁ × <i>l</i> <i>M</i> × pitch × <i>l</i> | <i>Q</i> ₂ | | | | | | | Mounting hole size | <i>T</i> ₁ | <i>N</i> |
| SS15JM SS15EM | 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 | φ3 | 6 | 3 | |
| SS20JM SS20EM | 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 | |
| SS25JM SS25EM | 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 | |
| SS30JM SS30EM | 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 | |
| SS35JM SS35EM | 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 | |

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.

Part number for ball slide only

Example:

SAS 25 EM 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

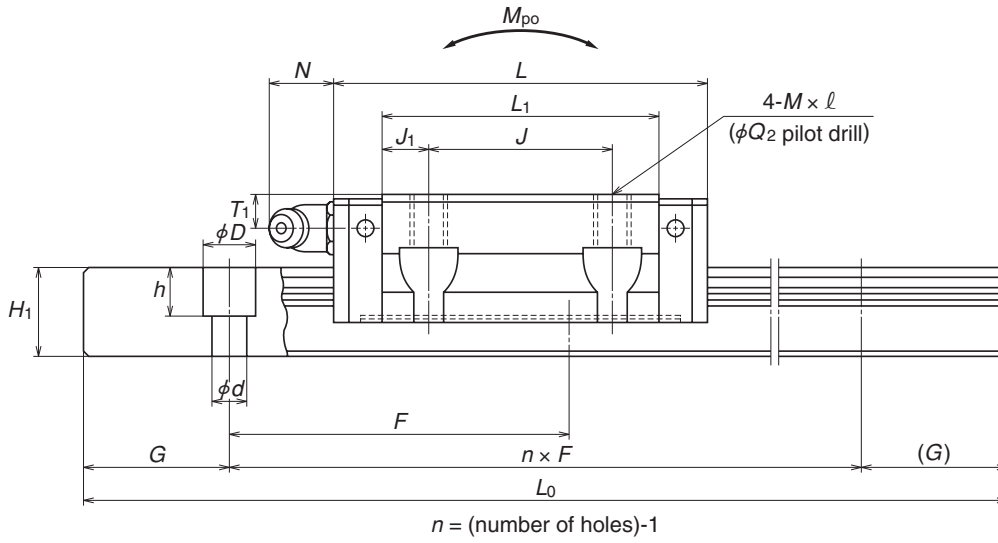
Preload
Z: Slight preload (standard)

Accuracy: PC (only PC grade is available)

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

Butting rail specification
N: Non-butting L: Butting

Side view of EM type



Unit: mm

| Rail | | | | | | | Basic load rating | | | | | Ball diameter | Weight | |
|-------|--------|-------|---------------------------|-------|----|------------------------------|-------------------|------------------|----------------|----------------|----------------|---------------|-----------------|-------------|
| Width | Height | Pitch | Mounting bolt hole | | | Max. length (Single rail) | Dynamic | Static | Static moment | | | D_w | Ball slide (kg) | Rail (kg/m) |
| W_1 | H_1 | F | $d \times D \times h$ | B_3 | G | L_{0max} () for stainless | C (N) | C_0 (N) | M_{R0} (N·m) | M_{P0} (N·m) | M_{Y0} (N·m) | | | |
| 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 |
| 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 |
| 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 |
| 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 |
| 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 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.

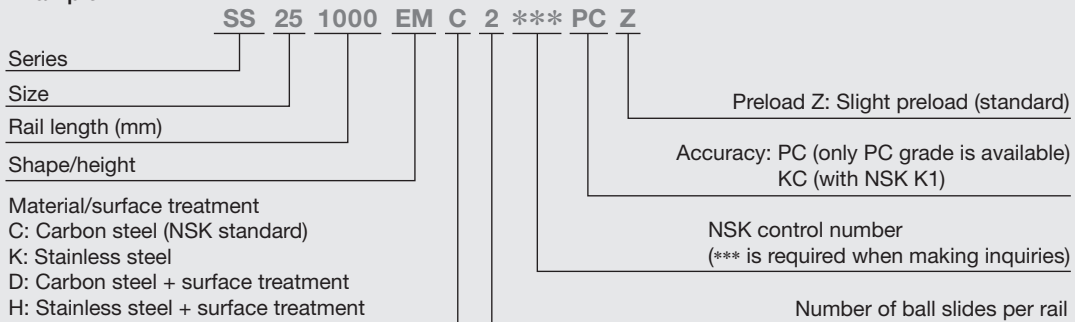
To convert C to C_{100} for a 100-km fatigue life, divide C by 1.26.

*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 assembly (ball slide + rail)

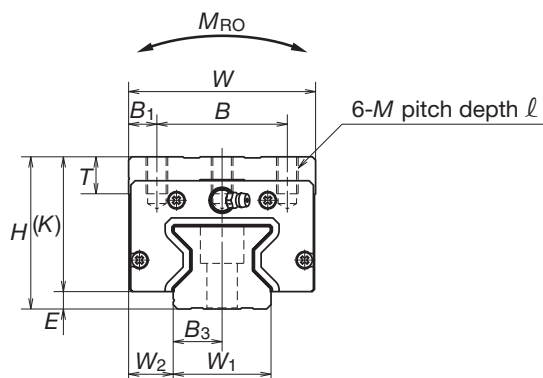
Example:



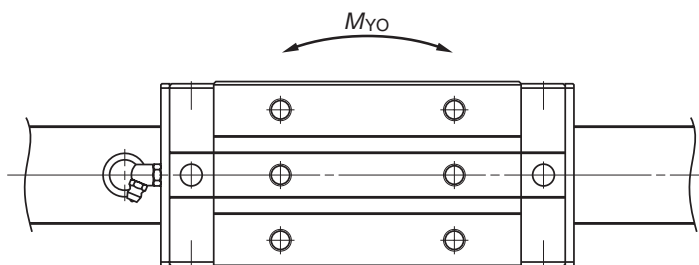
Linear Guides RA Series

Roller Slide Models: AN, BN

Front view of AN and BN types



Upper view of AN and BN types



| Model No. | Assembly | | | Roller slide | | | | | | | | | | | | |
|--------------------------------|--------------------|----------|-----------------------|-------------------|--------------------|---------------|-----------|-----------------------------|-----------------------|-----------------------|-----------------------|----------|----------|--------------------|-----------------------|----------|
| | Height <i>H</i> | <i>E</i> | <i>W</i> ₂ | Width <i>W</i> | Length <i>L</i> | Mounting hole | | | <i>B</i> ₁ | <i>L</i> ₁ | <i>J</i> ₁ | <i>K</i> | <i>T</i> | Grease fitting | | |
| | | | | | | <i>B</i> | <i>J</i> | <i>M</i> × pitch × <i>l</i> | | | | | | Mounting hole size | <i>T</i> ₁ | <i>N</i> |
| 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 |
| 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 |
| 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 |
| 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 |
| 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 |
| 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 |

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

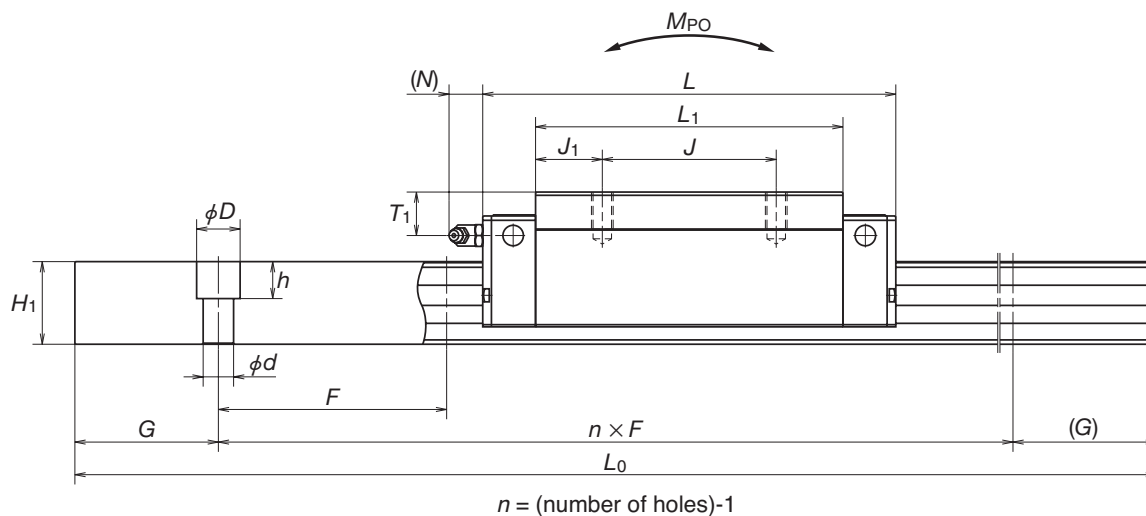
Preload
Z: Medium preload (standard)

Accuracy: P6 (only P6 grade is available)

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

Butting specification
N: Non-butting L: Butting

Side view of AN and BN types



Unit: mm

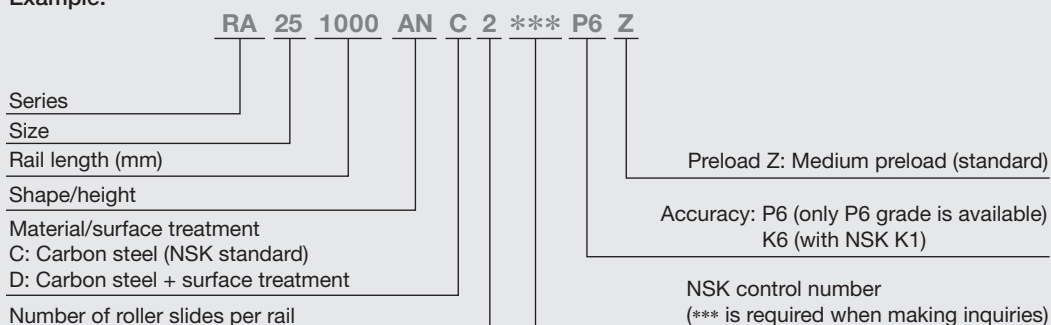
| Rail | | | | | | | Basic load rating | | | | | Weight | |
|-------|--------|-------|-----------------------|-------|------|-----------------------------|--------------------|--------------------|-------------------|-------------------|-------------------|--------------|--------|
| Width | Height | Pitch | Mounting bolt hole | | | Max. length | Dynamic | Static | Static moment | | | Roller slide | Rail |
| W_1 | H_1 | F | $d \times D \times h$ | B_3 | G | (Single rail) L_{0max} | C (N) | C_0 (N) | M_{R0} (N·m) | M_{P0} (N·m) | M_{Y0} (N·m) | (kg) | (kg/m) |
| 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 |
| 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 |
| 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 |
| 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 |
| 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 |
| 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: $C_{50km} = 1.23 \times C_{100km}$.

Part number for assembly (roller slide + rail)

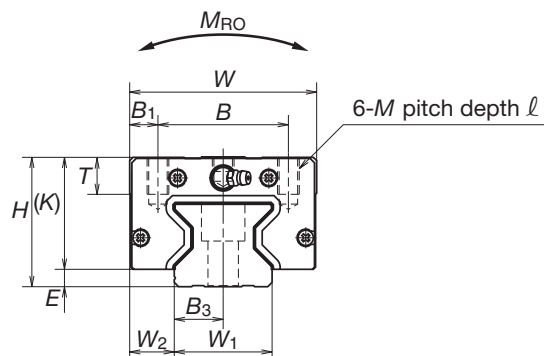
Example:



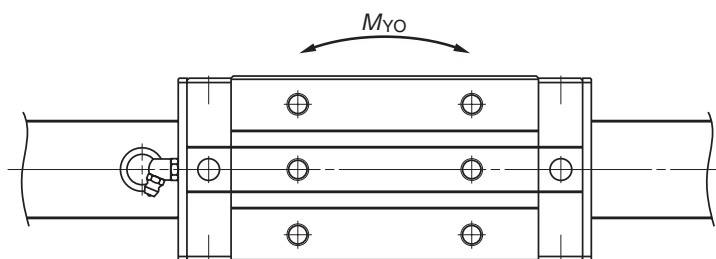
Linear Guides RA Series

Roller Slide Models: AL, BL

Front view of AL and BL types



Upper view of AL and BL types



| Model No. | Assembly | | | Roller slide | | | | | | | | | | | | |
|--------------------------------|----------|-----|-------|--------------|----------------|---------------|----------|----------------------------------|-------|----------------|----------------|------|-----|--------------------|-------|-----|
| | Height | | W_2 | Width W | Length L | Mounting hole | | | B_1 | L_1 | J_1 | K | T | Grease fitting | | |
| | H | E | | | | B | J | $M \times \text{pitch} \times l$ | | | | | | Mounting hole size | T_1 | N |
| 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 |
| 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 |
| 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 |
| 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 |
| 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 |

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

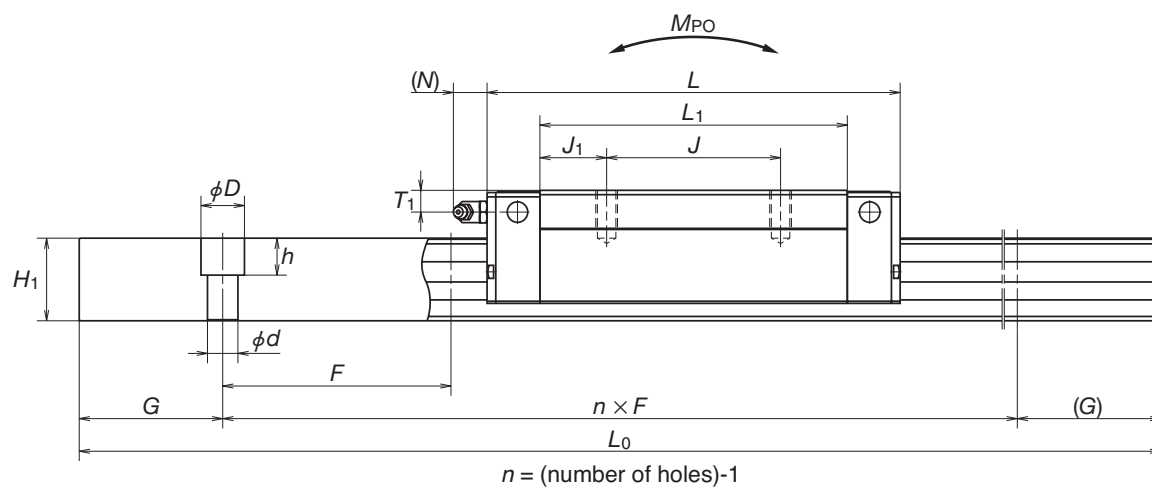
Preload
Z: Medium preload (standard)

Accuracy: P6 (only P6 grade is available)

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

Butting specification
N: Non-butting L: Butting

Side view of AL and BL types



Unit: mm

| Rail | | | | | | | Basic load rating | | | | | Weight | |
|-------|--------|-------|-----------------------|-------|------|---------------------------|--------------------|--------------------|------------------|-----------------|-----------------|--------------|--------|
| Width | Height | Pitch | Mounting bolt hole | | | Max. length (Single rail) | Dynamic | Static | Static moment | | | Roller slide | Rail |
| W_1 | H_1 | F | $d \times D \times h$ | B_3 | G | L_{0max} | C (N) | C_0 (N) | M_{R0} (N·m) | M_{P0} (N·m) | M_{Y0} (N·m) | (kg) | (kg/m) |
| 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 |
| 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 |
| 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 |
| 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 |
| 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: $C_{50km} = 1.23 \times C_{100km}$.

Part number for assembly (roller slide + rail)

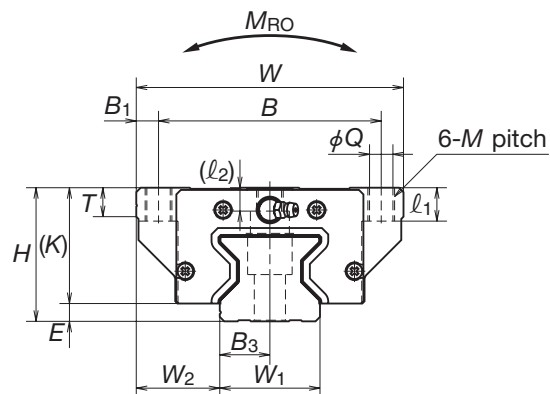
Example:

| | | | | | | | | | | |
|-------------------------------------|-----------|-----------|-------------|-----------|----------|----------|------------|-----------|----------|---|
| | 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) |

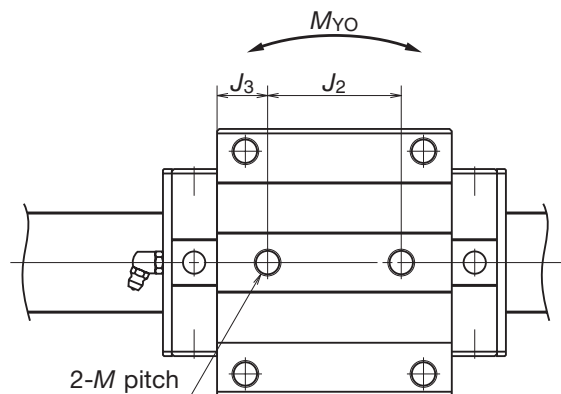
Linear Guides RA Series

Roller Slide Models: EM, GM

Front view of EM and GM types



Upper view of EM and GM types



| Model No. | Assembly | | | Roller slide | | | | | | | | | | | | | | Grease fitting | | |
|--------------------------------|----------|-----|----------------|--------------|----------------|---------------|-----|----------------|---|---|----------------|----------------|----------------|----------------|------|----|--------------------|----------------|----|--|
| | Height | E | W ₂ | Width W | Length L | Mounting hole | | | | | B ₁ | L ₁ | J ₁ | J ₃ | K | T | Mounting hole size | T ₁ | N | |
| | H | | | | | B | J | J ₂ | M × pitch × l ₁ (l ₂) | Q × l ₁ (l ₂) | | | | | | | | | | |
| RA25EM RA25GM | 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 | |
| RA30EM RA30GM | 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 | |
| RA35EM RA35GM | 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 | |
| RA45EM RA45GM | 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 | |
| RA55EM RA55GM | 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 | |
| RA65EM RA65GM | 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 | |

Part number for roller slide only

Example:

RAA 25 EM 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

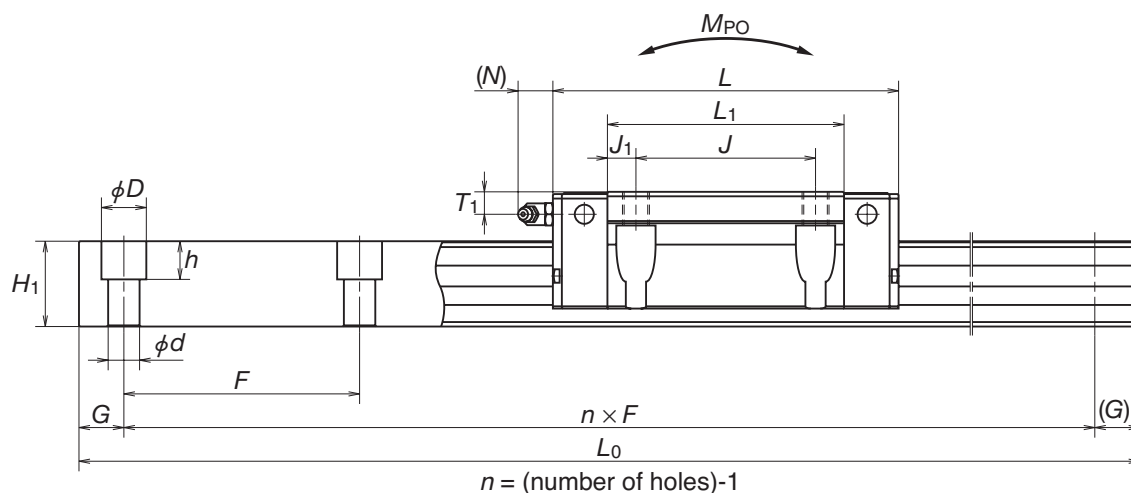
Preload
Z: Medium preload (standard)

Accuracy: P6
(only P6 grade is available)

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

Butting specification
N: Non-butting L: Butting

Side view of EM and GM types



Unit: mm

| Rail | | | | | | | Basic load rating | | | | | Weight | |
|-------|--------|-------|---|-------|------|--|-----------------------|------------------------|-------------------|-------------------|-------------------|----------------------|----------------|
| Width | Height | Pitch | Mounting bolt hole $d \times D \times h$ | B_3 | G | Max. length (Single rail) L_{0max} | Dynamic C (N) | Static C_0 (N) | Static moment | | | Roller slide (kg) | Rail (kg/m) |
| W_1 | H_1 | F | | | | | | | M_{R0} (N·m) | M_{P0} (N·m) | M_{Y0} (N·m) | | |
| 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 |
| 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 |
| 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 |
| 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 |
| 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 |
| 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: $C_{50km} = 1.23 \times C_{100km}$.

Part number for assembly (roller slide + rail)

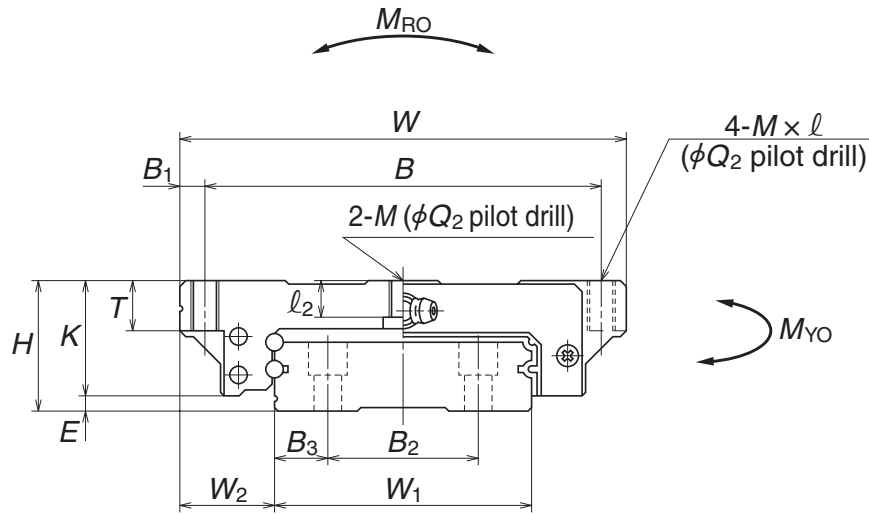
Example:

| | |
|-------------------------------------|---|
| RA 25 1000 EM C 2 *** P6 Z | |
| Series | RA |
| Size | 25 |
| Rail length (mm) | 1000 |
| Shape/height | EM |
| Material/surface treatment | C |
| C: Carbon steel (NSK standard) | |
| D: Carbon steel + surface treatment | |
| Number of roller slides per rail | 2 |
| | *** |
| | P6 |
| | Z |
| | Preload Z: Medium preload (standard) |
| | Accuracy: P6 (only P6 grade is available) K6 (with NSK K1) |
| | NSK control number (*** is required when making inquiries) |

Linear Guides LW Series

Ball Slide Model: EL

Front view of EL type



| Model No. | Assembly | | | Ball slide | | | | | | | | | | | | | | |
|---------------|----------|-----|----------------|------------|--------|---------------|----|------------|-----|---------------|----------------|----------------|----------------|----------------|----------------|----------------|-----|-----------|
| | Height | | | Width | Length | Mounting hole | | | | | | | | | | Grease fitting | | |
| | H | E | W ₂ | | | W | L | B | J | M × pitch × l | l ₂ | Q ₂ | B ₁ | L ₁ | J ₁ | K | T | Hole size |
| LW17EL | 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 |
| LW21EL | 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 |
| LW27EL | 27 | 4 | 19 | 80 | 74 | 70 | 40 | M6×1×10 | 6 | 5.3 | 5 | 56 | 8 | 23 | 10 | M6×0.75 | 6 | 11 |
| LW35EL | 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 |
| LW50EL | 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 |

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 C₁₀₀ 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

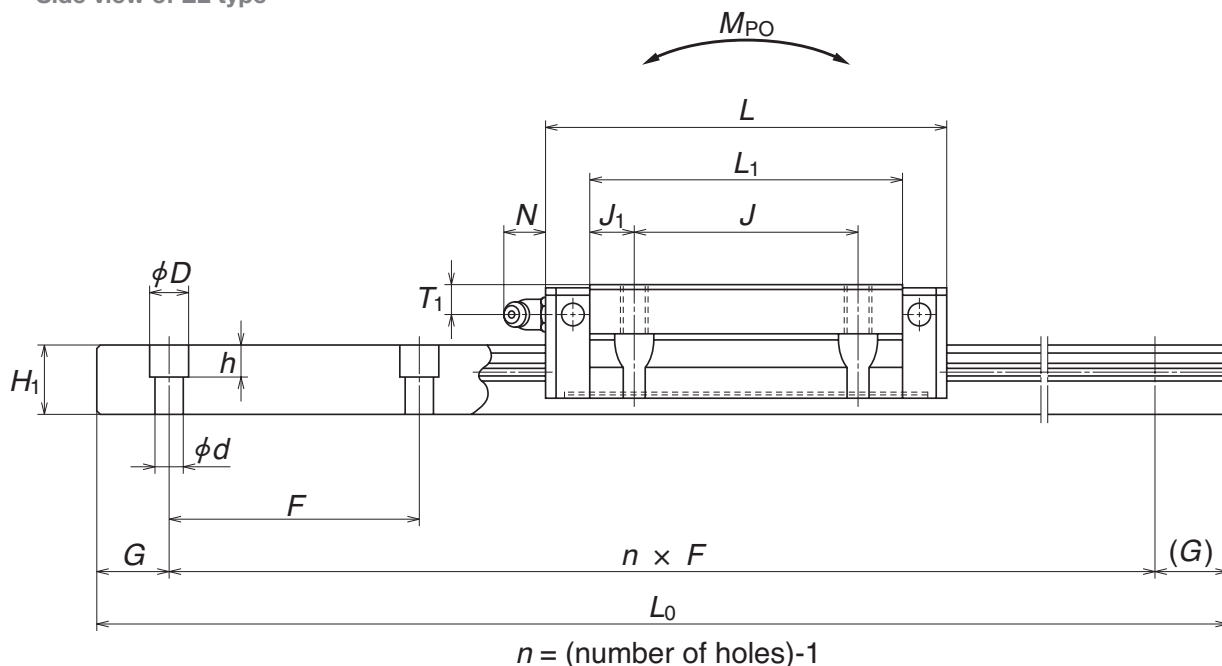
*Butting rail specification
N: Non-butting L: Butting

Preload
Z: Slight preload (standard)

Accuracy: PC
(only PC grade is available)

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

Side view of EL type

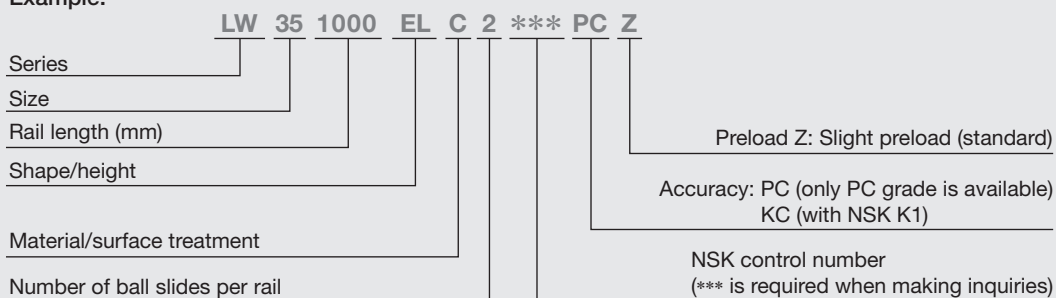


Unit: mm

| Rail | | | | | | | | Basic load rating | | | | | Ball diameter | Weight | |
|-------|--------|-------|-------|-----------------------|-------|--------------------|-------------|-------------------|---------|---------------|-------|----------|---------------|-----------------|-------------|
| Width | Height | | Pitch | Mounting bolt hole | | G | Max. length | Dynamic | Static | Static moment | | | D_w | Ball slide (kg) | Rail (kg/m) |
| W_1 | H_1 | B_2 | F | $d \times D \times h$ | B_3 | (recomm- ended) | L_{0max} | | | C | C_0 | M_{R0} | | | |
| 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 |
| 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 |
| 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 |
| 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 |
| 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 |

Part number for assembly (ball slide + rail)

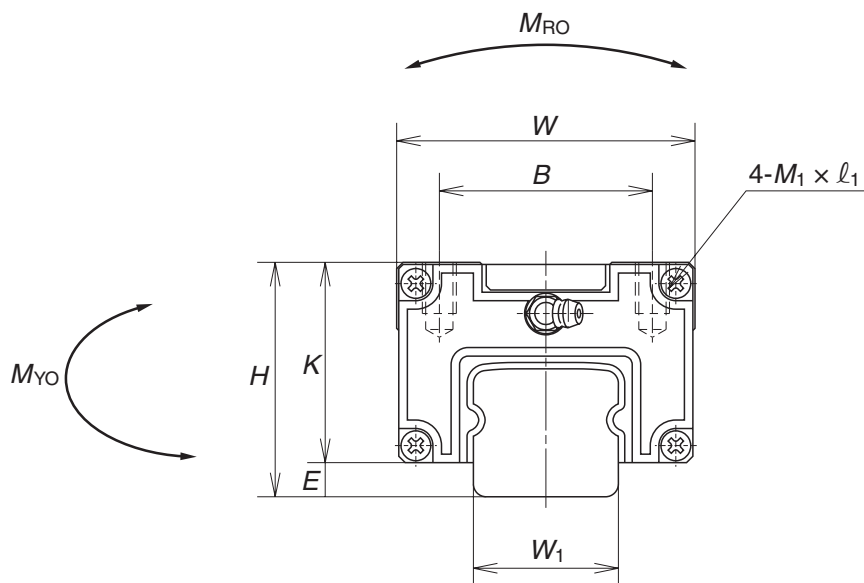
Example:



Linear Guides TS Series

Ball Slide Model: AN

Front view



| Model No. | Assembly | | Ball slide | | | | | | | | | | Width W_1 | Height H_1 | Pitch F |
|---------------|------------|-----|------------|--------|-------------|-----|--------------------------------------|-------|----------------|------------|-------|------|----------------|-----------------|--------------|
| | Height | | Width | Length | Tapped hole | | | | Grease fitting | | | | | | |
| | $H^{+0.1}$ | E | W | L | B | J | $M_1 \times \text{pitch} \times l_1$ | L_1 | K | Screw size | T_1 | N | | | |
| TS15AN | 28 | 3 | 34 | 72.2 | 26 | 26 | M4×0.7×6 | 39 | 25 | φ3 | 6.5 | (5) | 15 | 14 | 120 |
| TS20AN | 30 | 3 | 44 | 87 | 32 | 36 | M5×0.8×8 | 50 | 27 | M6 × 0.75 | 6.5 | (14) | 20 | 15 | 120 |
| TS25AN | 40 | 4 | 48 | 100 | 35 | 35 | M6×1×9 | 58 | 36 | M6 × 0.75 | 9.5 | (14) | 23 | 20 | 120 |
| TS30AN | 45 | 6.5 | 60 | 115 | 40 | 40 | M8×1.25×10 | 70 | 38.5 | M6 × 0.75 | 9.5 | (14) | 28 | 25 | 160 |
| TS35AN | 55 | 8 | 70 | 135.8 | 50 | 50 | M8×1.25×12 | 81.8 | 47 | M6 × 0.75 | 12 | (14) | 34 | 30 | 160 |

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.

Part number for ball slide only

Example:

TAS 30 AN - F

Random-matching ball slide

Size

Shape/height

Accessories

F: Fluoride low-temperature chrome plating + AS2 Grease
F50: Fluoride low-temperature chrome plating + LG2 Grease

Part number for rail only

Example:

T1S 30 2400 L P N * PL S**

Random-matching rail

Size

Rail length (mm)

Material/surface treatment

Butting rail code

N: Non-butting

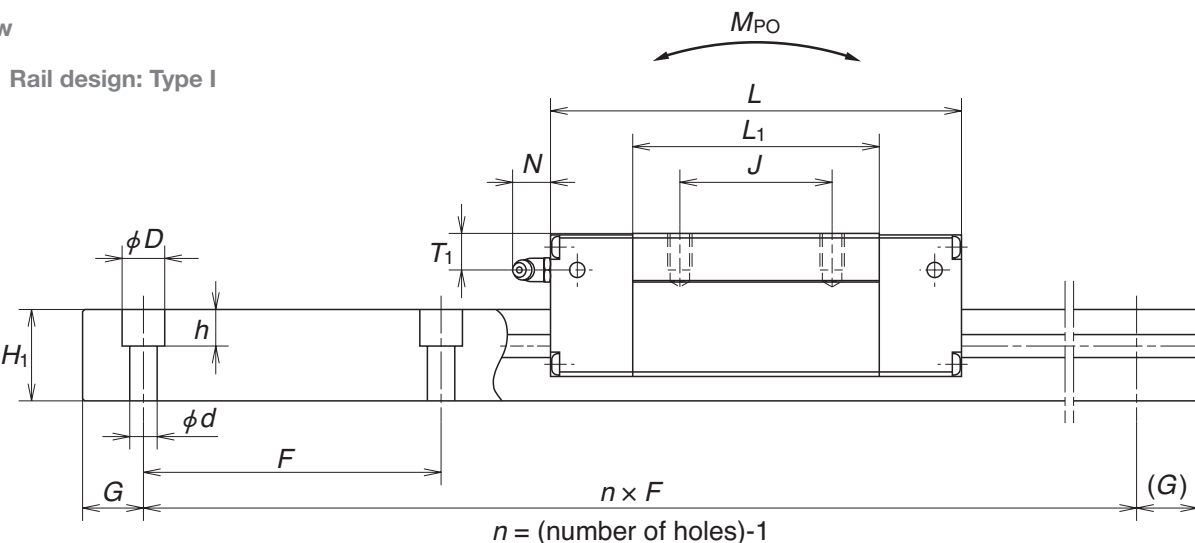
L: Butting

Preload
S: Clearance of 60 μm or less

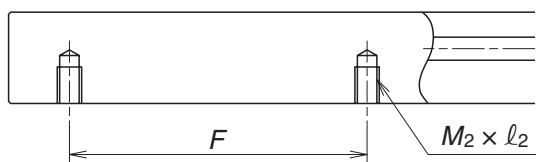
Accuracy grade
PL: Normal grade for transportation

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

Side view



Rail design: Type II (optional)



Unit: mm

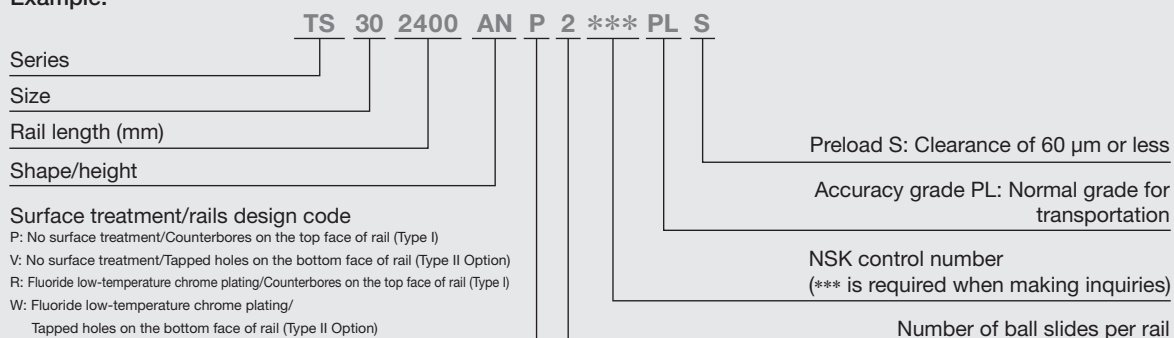
| Rail | | | | Basic load rating | | | | | | Ball diameter | Mass | |
|---------------------------------|---|-------------------------|--|-----------------------|------------------------|------------------------------|-------------------|-------------------|-------|-----------------------|----------------|--|
| Mounting hole | | G (recomm- ended) | Max. length (Single rail) L_{0max} | Dynamic C (N) | Static C_0 (N) | Allowable static moment load | | | D_w | Ball slide (kg) | Rail (kg/m) | |
| Type I $d \times D \times h$ | Type II $M_2 \times \text{pitch} \times l_2$ | | | | | M_{R0} (N·m) | M_{P0} (N·m) | M_{Y0} (N·m) | | | | |
| 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 | |
| 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 | |
| 7×11×9 | M6×1×9 | 20 | 4 000 | 21 800 | 26 000 | 320 | 217 | 217 | 5.556 | 0.47 | 3.4 | |
| 9×14×12 | M8×1.25×12 | 20 | 4 040* | 31 000 | 37 500 | 565 | 395 | 395 | 6.350 | 0.77 | 5.3 | |
| 9 ×14×12 | M8×1.25×12 | 20 | 4 040* | 46 500 | 53 000 | 970 | 635 | 635 | 7.937 | 1.3 | 7.7 | |

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_{100} 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 assembly (ball slide + rail)

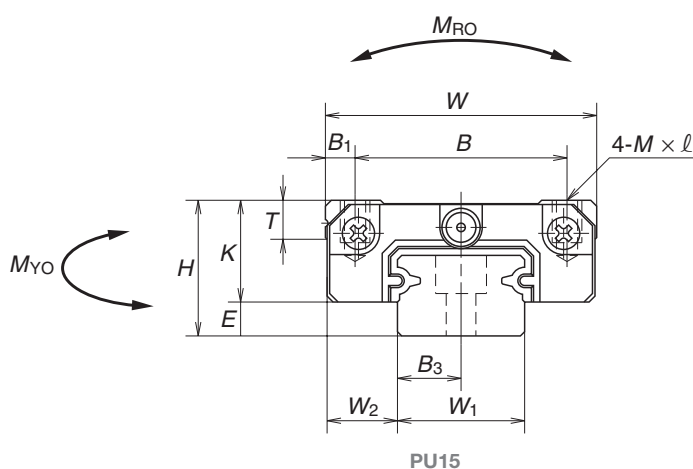
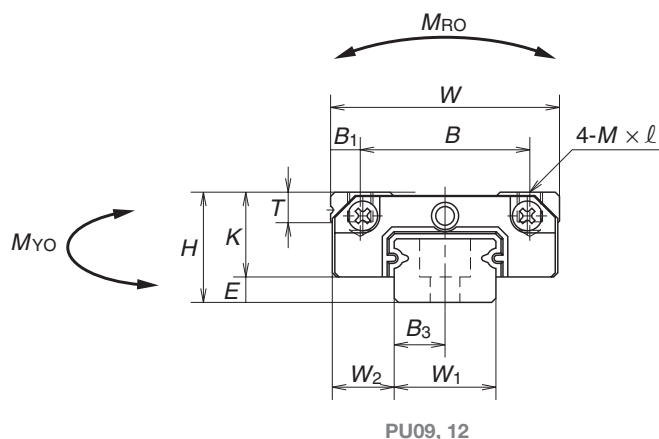
Example:



Linear Guides PU Series

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

Front view



| Model No. | Assembly | | | Ball slide | | | | | | | | | | | | |
|---------------|--------------------|----------|-----------------------|-------------------|--------------------|---------------|----------|-----------------------------|-----------------------|-----------------------|-----------------------|----------|----------|--------------------|-----------------------|----------|
| | Height <i>H</i> | <i>E</i> | <i>W</i> ₂ | Width <i>W</i> | Length <i>L</i> | Mounting hole | | | <i>B</i> ₁ | <i>L</i> ₁ | <i>J</i> ₁ | <i>K</i> | <i>T</i> | Grease fitting | | |
| | | | | | | <i>B</i> | <i>J</i> | <i>M</i> × pitch × <i>l</i> | | | | | | Mounting hole size | <i>T</i> ₁ | <i>N</i> |
| PU09TR | 10 | 2.2 | 5.5 | 20 | 30 | 15 | 10 | M3×0.5×3 | 2.5 | 19.6 | 4.8 | 7.8 | 2.6 | — | — | — |
| PU09UR | | | | | 41 | | 16 | | | 30.6 | 7.3 | | | | | |
| PU12TR | 13 | 3 | 7.5 | 27 | 35 | 20 | 15 | M3×0.5×3.5 | 3.5 | 20.4 | 2.7 | 10 | 3.4 | — | — | — |
| PU12UR | | | | | 48.7 | | 20 | | | 34.1 | 7.05 | | | | | |
| 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) |
| PU15BL | | | | | 61 | | 25 | | | 44.2 | 9.6 | | | | | |

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*₁₀₀ for a 100-km fatigue life, divide *C* by 1.26.

Part number for ball slide only

Example:

PAU 15 AL S - K

Random-matching ball slide

Accessories
K: With NSK K1

Size

Shape/height

S: Stainless steel

Part number for rail only

Example:

P1U 15 0470 R K N * PC T**

Random-matching rail

Size

Rail length (mm)

Shape (S: PU09-12, R: PU05-07-15)

Material/surface treatment

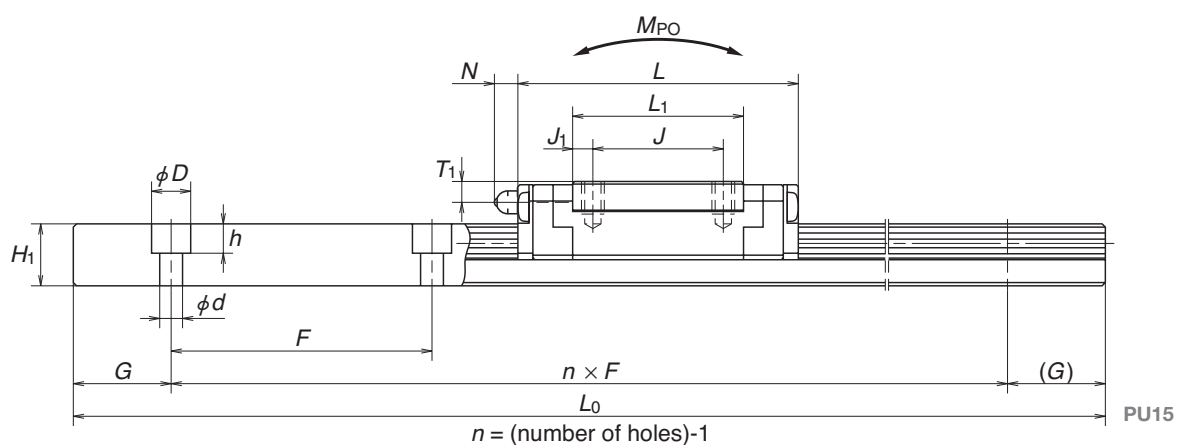
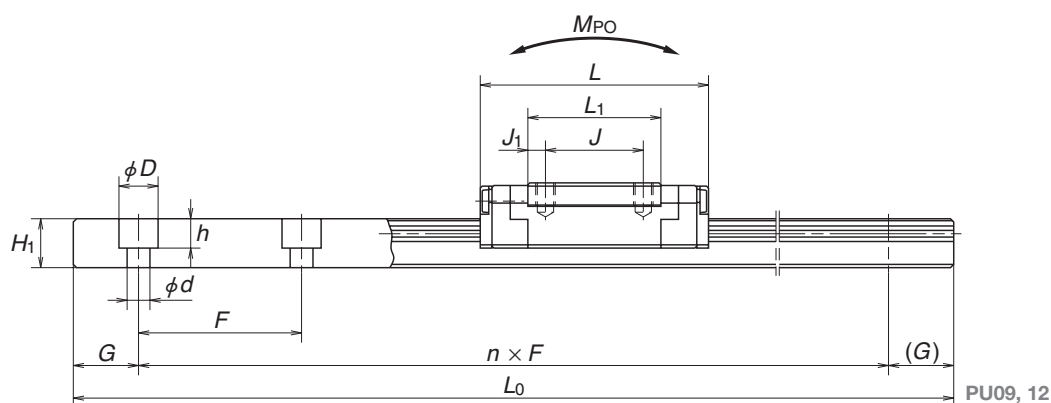
Preload
T: Fine clearance (standard)

Accuracy: PC
(only PC grade is available)

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

Butting rail specification
N: Non-butting L: Butting

Side view

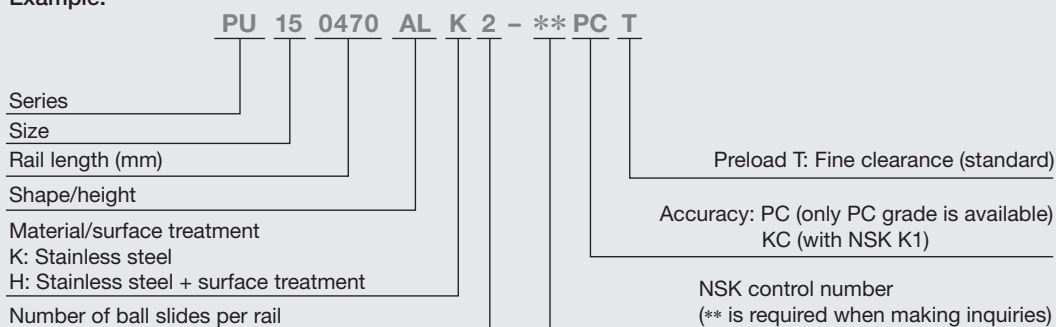


Unit: mm

| Rail | | | | | | | Basic load rating | | | | | Ball diameter | Weight | |
|-------|--------|-------|--|-------|-----|--------------------------------------|-------------------|------------------|----------------|----------------|----------------|---------------|----------------|-----------------|
| Width | Height | Pitch | Mounting bolt hole $d \times D \times h$ | B_3 | G | Max. length (Single rail) L_{0max} | Dynamic C (N) | Static C_0 (N) | Static moment | | | D_w | Ball slide (g) | Rail (g/100 mm) |
| W_1 | H_1 | F | | | | | | | M_{R0} (N·m) | M_{P0} (N·m) | M_{Y0} (N·m) | | | |
| 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 |
| | | | | | | | 2 100 | 3 500 | 16.4 | 15.6 | 15.6 | | 25 | |
| 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 |
| | | | | | | | 4 000 | 5 700 | 35 | 28.3 | 28.3 | | 53 | |
| 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 |
| | | | | | | | 8 100 | 11 300 | 54.5 | 69.5 | 69.5 | | 100 | |

Part number for assembly (ball slide + rail)

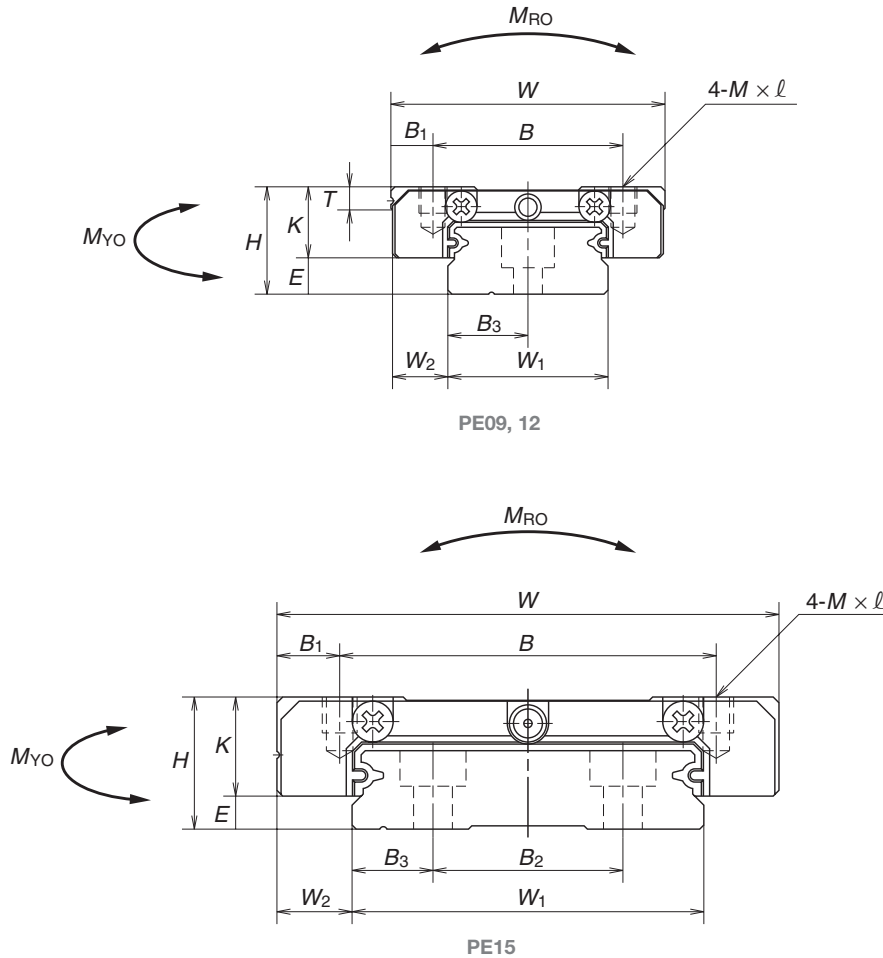
Example:



Linear Guides PE Series

Ball Slide Models: AR, TR, UR, BR

Front view



| Model No. | Assembly | | | Ball slide | | | | | | | | | | | | |
|-----------|--------------------|----------|-----------------------|-------------------|--------------------|---------------|----------|-----------------------------|-----------------------|-----------------------|-----------------------|----------|----------|--------------------|-----------------------|----------|
| | Height <i>H</i> | <i>E</i> | <i>W</i> ₂ | Width <i>W</i> | Length <i>L</i> | Mounting hole | | | <i>B</i> ₁ | <i>L</i> ₁ | <i>J</i> ₁ | <i>K</i> | <i>T</i> | Grease fitting | | |
| | | | | | | <i>B</i> | <i>J</i> | <i>M</i> × pitch × <i>l</i> | | | | | | Mounting hole size | <i>T</i> ₁ | <i>N</i> |
| PE09TR | 12 | 4 | 6 | 30 | 39.8 | 21 | 12 | M3×0.5×3 | 4.5 | 26.6 | 7.3 | 8 | 2.8 | — | — | — |
| PE09UR | | | | | 51.2 | 23 | 24 | | 3.5 | 38 | 7 | | | | | |
| PE12AR | 14 | 4 | 8 | 40 | 45 | 28 | 15 | M3×0.5×4 | 6 | 31 | 8 | 10 | 3.2 | — | — | — |
| PE12BR | | | | | 60 | | 28 | | | 28 | 46 | | | | | |
| PE15AR | 16 | 4 | 9 | 60 | 56.6 | 45 | 20 | M4×0.7×4.5 | 7.5 | 38.4 | 9.2 | 12 | 4.1 | φ3 | 3.2 | (3.3) |
| PE15BR | | | | | 76 | | 35 | | | 35 | 57.8 | | | | | |

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*₁₀₀ for a 100-km fatigue life, divide *C* by 1.26.

Part number for ball slide only

Example:

PAE 15 AL S - K

Random-matching ball slide

Accessories
K: With NSK K1

Size

Shape/height

S: Stainless steel

Part number for rail only

Example:

P1E 15 0470 R K N * PC T**

Random-matching rail

Size

Rail length (mm)

Shape (S: PE05-07-09-12, R: PE15)

Material/surface treatment

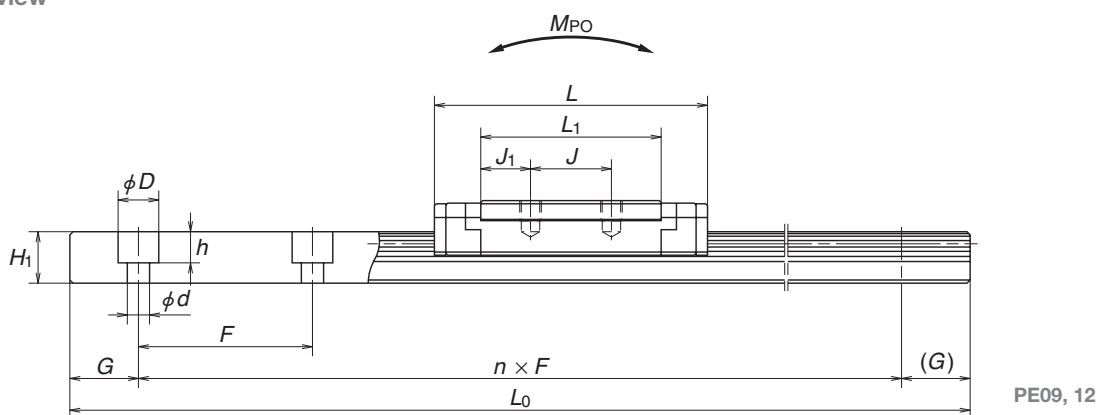
Preload
T: Fine clearance (standard)

Accuracy: PC
(only PC grade is available)

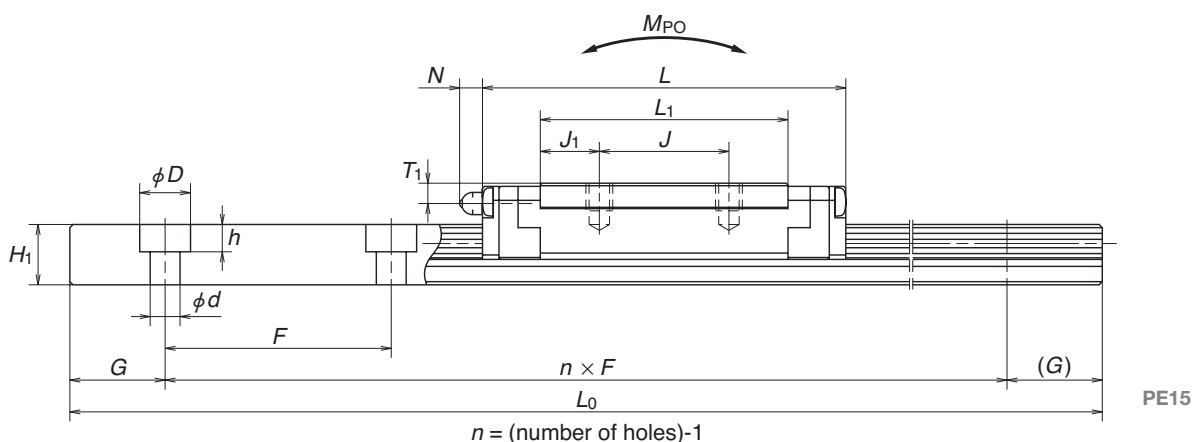
NSK control number
(*** is required when making inquiries)

Butting rail specification
N: Non-butting L: Butting

Side view



PE09, 12



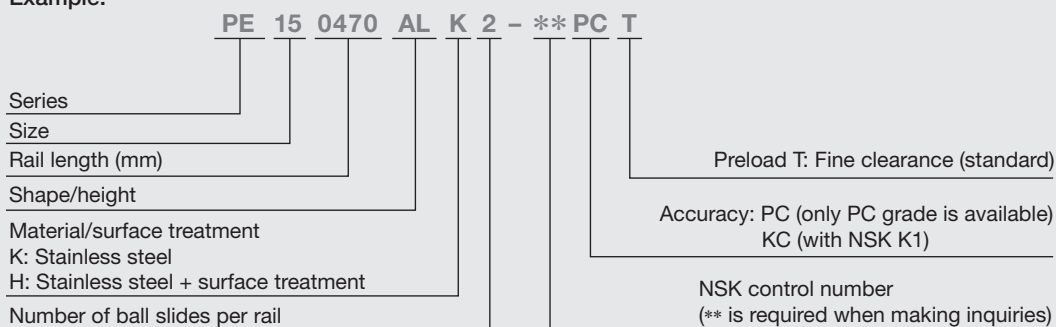
PE15

Unit: mm

| Rail | | | | | | | | Basic load rating | | | | | Ball diameter | Weight | |
|-------|--------|-------|-------|--|-------|----|--------------------------------------|-------------------|------------------|----------------|----------------|----------------|---------------|----------------|-----------------|
| Width | Height | | Pitch | Mounting bolt hole $d \times D \times h$ | | | Max. length (Single rail) L_{0max} | Dynamic C (N) | Static C_0 (N) | Static moment | | | D_w | Ball slide (g) | Rail (g/100 mm) |
| W_1 | H_1 | B_2 | F | $d \times D \times h$ | B_3 | G | L_{0max} | C | C_0 | M_{R0} (N·m) | M_{P0} (N·m) | M_{Y0} (N·m) | | | |
| 18 | 7.5 | — | 30 | 3.5×6×4.5 | 9 | 10 | 800 | 3 000 | 4 500 | 36.5 | 17.3 | 17.3 | 2 | 35 | 95 |
| | | | | | | | | 4 000 | 6 700 | 54.5 | 37.5 | 37.5 | | 50 | |
| 24 | 8.5 | — | 40 | 4.5×8×4.5 | 12 | 15 | 1 000 | 4 350 | 6 350 | 70.5 | 29.3 | 29.3 | 2.3812 | 66 | 140 |
| | | | | | | | | 5 800 | 9 550 | 106 | 63.5 | 63.5 | | 98 | |
| 42 | 9.5 | 23 | 40 | 4.5×8×4.5 | 9.5 | 15 | 1 200 | 7 600 | 10 400 | 207 | 59 | 59 | 3.175 | 140 | 275 |
| | | | | | | | | 10 300 | 16 000 | 320 | 135 | 135 | | 211 | |

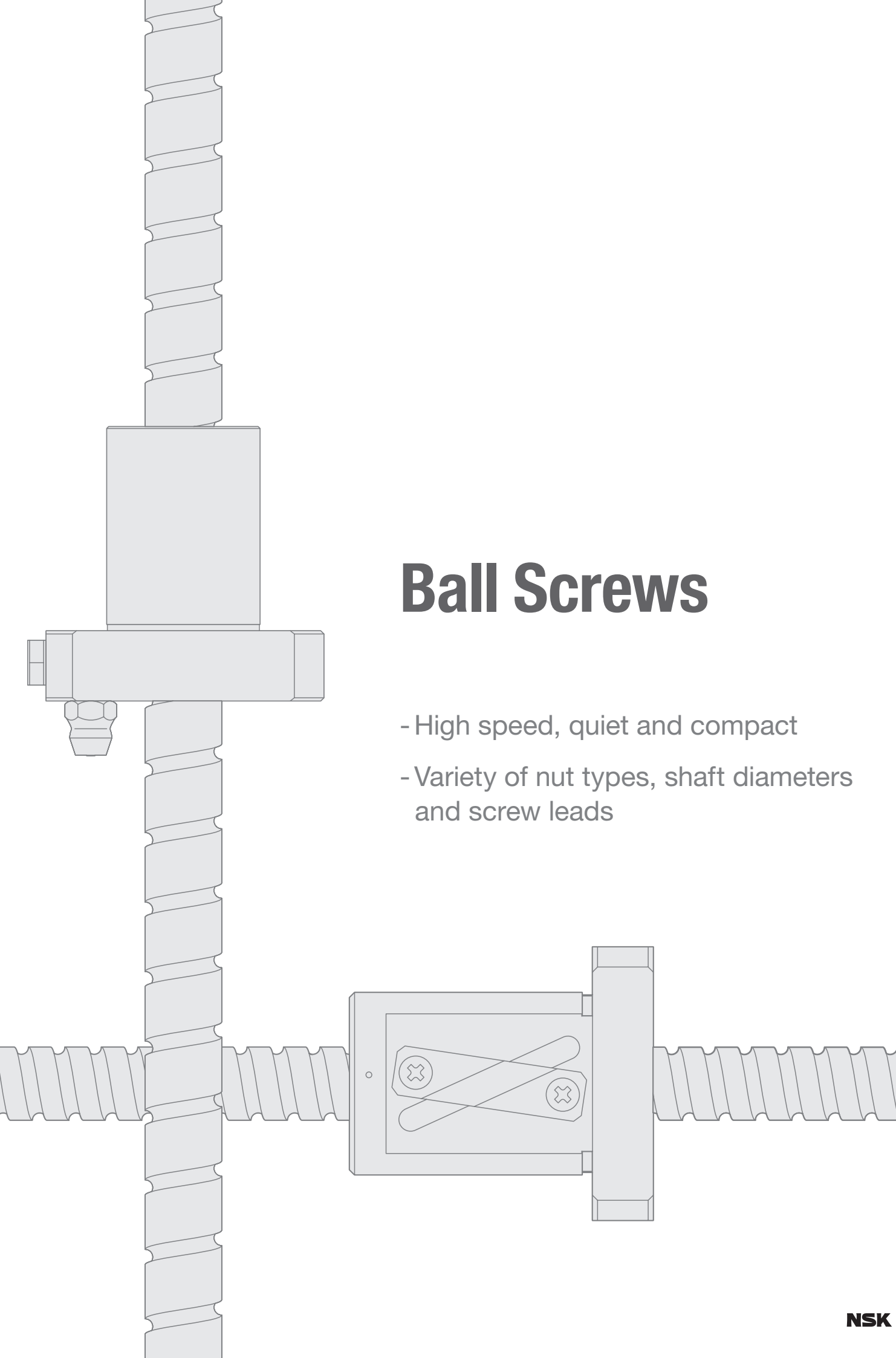
Part number for assembly (ball slide + rail)

Example:



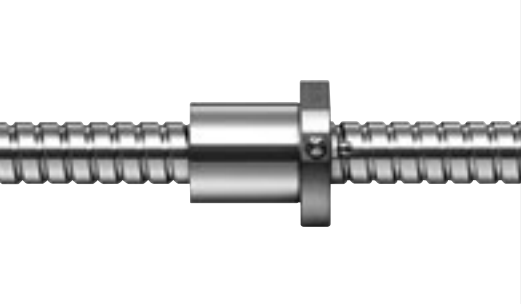
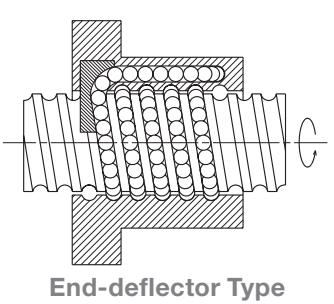
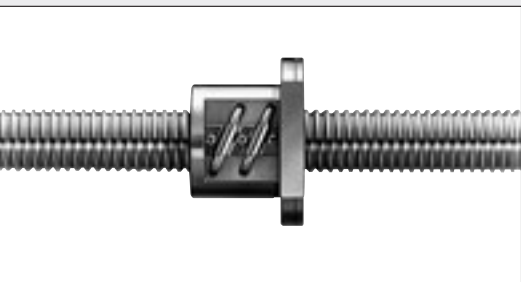
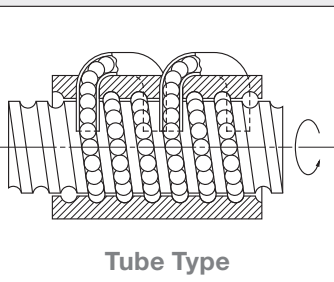
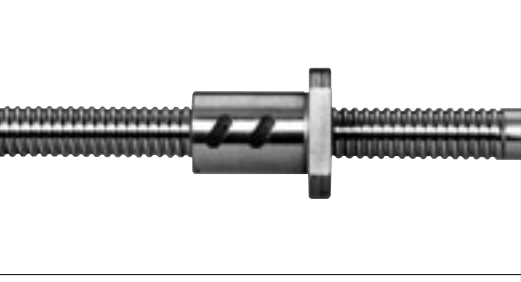
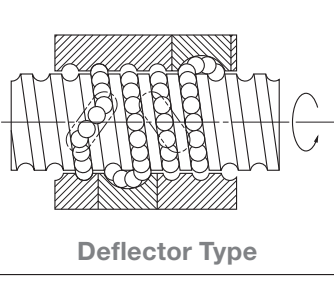
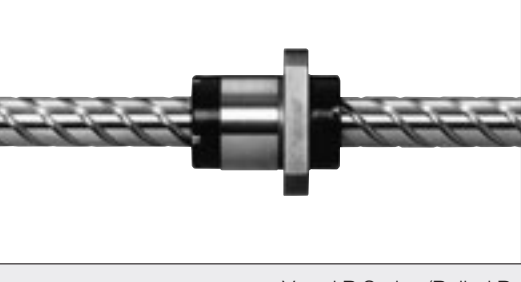
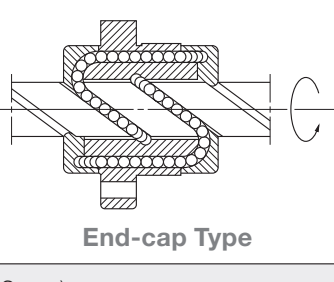
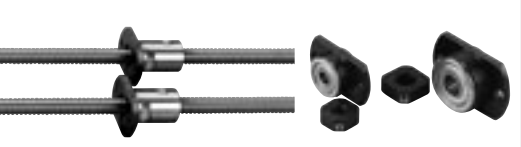
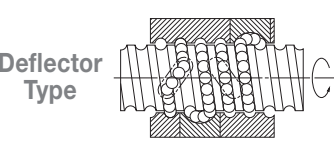






Ball Screws

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



Ball Screws

Types of Ball Screws

| Series | | Features |
|--|---|---|
| Compact FA Series | | |
|  |  End-deflector Type | <ul style="list-style-type: none"> • Easy-to-implement and ready-to-use ball screw with finished shaft-end • Quiet and compact, newly designed series 6 dB noise reduction, 10–30% smaller nut • High-speed operation of up to 5 000 min⁻¹ • New type of contact seal is equipped. • Low-profile designed support unit (bearing) is available. <p>PSS Series: Basic series FSS Series: Transportation series USS Series: High accuracy series</p> |
| A and S Series | | |
|  |  Tube Type | |
|  |  Deflector Type | <ul style="list-style-type: none"> • Easy-to-implement and ready-to-use ball screw with finished shaft-end • Variety of shaft diameter and lead combinations available <ul style="list-style-type: none"> • MA Series: Miniature automation series • FA Series: Factory automation series • KA Series: Stainless automation series • SS Series: Blank shaft-end series |
|  |  End-cap Type | |
| V and R Series (Rolled Ball Screw) | | |
|  |  Deflector Type | <p>RMA Series</p> <ul style="list-style-type: none"> • Precision rolled miniature ball screw series with finished shaft-end • Low-cost and compact design series • Easy-to-handle by providing compact support bearing unit |
|  |  RNFTL  RNFBFL  RNCT  RNFCFL  RNSTL | <ul style="list-style-type: none"> • General accuracy grade (Ct10) rolled ball screw series • Compatible with a variety of nut mounting styles • Low-cost and short delivery • Interchangeable screw shaft and ball nut |

| | Type | Specifications | | | | | Preload | Dimension table | |
|----------------|------------|----------------|----------------|--------------|-----------------------|---------------------|----------------------|-----------------|----------------|
| | | Accuracy grade | Nut system | Shaft dia. | Lead | Max. stroke | | | |
| | 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 | | | |
| | FSS | Ct7 | End-deflector | 12 | 10 | 800 | | Page 73 – 80 | |
| | | | | 15 | 10, 20 | 1 300 | | | |
| | | | | 20 | 10, 20 | 1 300 | | | |
| | | | | 25 | 10, 20, 25 | 1 250 | | | |
| | USS | C3 | End-deflector | 10 | 5 | 400 | | Page 81 – 86 | |
| 12 | | | | 5 | 500 | | | | |
| 15 | | | | 5 | 600 | | | | |
| | 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 | | | |
| | FA | C3 | Tube Type | 10 | 4 | 300 | | P-preload | Page 101 – 184 |
| | | | | 12 | 5, 10 | 450 | | | |
| | | C3, C5 | Tube/End-Cap | 14 | 5, 8 | 700 | | | |
| | | | | 15 | 10, 20 | 1 000 | | | |
| | | | | 16 | 5, 16, 32 | 1 200 | | | |
| C5 | Tube Type | 20 | 10, 20, 40 | 1 600 | | | | | |
| | | 25 | 20, 25, 50 | 2 000 | | | | | |
| KA | C3 | Deflector Type | 6 | 1 | 100 | P-preload | Page 145 – 168 | | |
| | | | 8 | 1, 2 | 150 | | | | |
| | | | 10 | 2, 4 | 300 | | | | |
| | C3, C5 | Deflector/Tube | 12 | 2, 5, 10 | 450 | | | | |
| | | | 15 | 10, 20 | 1 000 | | | | |
| | | | 20 | 20 | 1 000 | | | | |
| SS | C5 | Tube Type | 20 | 4, 5 | 944 | P-preload | Page 169 – 196 | | |
| | | | 25 | 4, 5, 6, 10 | 1 419 | | | | |
| | | Deflector Type | 25 | 5, 10 | 1 412 | Z-preload | | | |
| | | | 28 | 5, 6 | 1 114 | P-preload | | | |
| | | Tube Type | 32 | 5, 6, 8, 10 | 1 700 | P/Z/D-preload | | | |
| | | | 32 | 5, 10, | 1 680 | Z-preload | | | |
| | | Deflector Type | 36 | 10 | 1 897 | Z/D-preload | | | |
| | | | 40 | 5, 8, 10, 12 | 2 383 | | | | |
| | | Tube Type | 40 | 10 | 2 257 | Z-preload | | | |
| | | | 45 | 10 | 2 397 | | | | |
| Deflector Type | 50 | 10 | 2 497 | | | | | | |
| | 50 | 10 | 2 457 | | | | | | |
| 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 | | | | |
| | Shaft dia. | Lead | | | | | Clearance 0.1 – 0.25 | Page 209 – 224 | |
| | | 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 | – | | | | |

Ball Screws

Part Number for Ball Screws

Part number for Compact FA Series ball screw

Example: **PSS1520N1D-0561**

Compact FA Series:
PSS, FSS, USS

Screw shaft diameter (mm)

Screw shaft length L_3 (mm)

NSK control number

Lead (mm)

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**

Product code (ball screw)

Screw shaft diameter (mm)

Effective threaded length
(in units of 100 mm)

A Series: MA, FA, KA
S Series: MS, FS, SS

NSK control number

Lead (mm)

Axial play

Accuracy grade

Specification/Appearance

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**

V Series: RMA

Screw shaft length (mm)

Screw shaft diameter (mm)

Axial play

Lead (mm)

Accuracy grade

RMA: Miniature rolled ball screw

Part number for R Series rolled ball screw

Example for nut assembly: **RNFTL2510A5S**

Product code (nut assembly)

Seal code S: With seal
No code: Without seal

Nut model: FTL, FBL, STL, CT, FCL

Effective turns of balls (number of
turns of balls x number of circuits)

Screw shaft diameter (mm)

Internal design specification code

Lead (mm)

Example for screw shaft: **RS2510A20**

Product code (screw shaft)

Screw shaft length (x 100)

Screw shaft diameter (mm)

Internal design specification code

Lead (mm)

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

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

Ball Screws

Standard Ball Screw Series

Shaft Diameter and Lead Matrices

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

Standard ball screws: Shaft diameter and lead matrix

| Shaft dia. | | | | | | | | | |
|------------|-----------|-----------|------------|------------|------------|--|---------------|------------|--|
| | 1 | 1.5 | 2 | 2.5 | 4 | 5 | 6 | 8 | |
| 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) | | | |
| 12 | | | P 103 (MA) | P 105 (MA) | | P 55 (PSS) P 83 (USS) P 107 (FA) | | | |
| 14 | | | | | | P 111 (FA) | | P 113 (FA) | |
| 15 | | | | | | P 57 (PSS) P 85 (USS) | | | |
| 16 | | | P 119 (MA) | P 121 (MA) | | P123 (FA) | | | |
| 20 | | | | | P 169 (SS) | P 61 (PSS) P 169 (SS) | | | |
| 25 | | | | | P 171 (SS) | P 67 (PSS) P 171,173 (SS) | P 171 (SS) | | |
| 28 | | | | | | P175,177 (SS) | P175,177 (SS) | | |
| 30 | | | | | | | | | |
| 32 | | | | | | P 179,181,183 (SS) | P179,181 (SS) | P 181 (SS) | |
| 36 | | | | | | | | | |
| 40 | | | | | | P 185 (SS) | | P 189 (SS) | |
| 45 | | | | | | | | | |
| 50 | | | | | | | | | |

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 |

Unit: mm

| Lead | | | | | | | | | |
|--|---------------|------------|--|--|------------|------------|--------------------------|--------------------------|------------|
| 10 | 12 | 16 | 20 | 25 | 30 | 32 | 40 | 50 | 60 |
| | | | | | | | | | |
| | | | | | | | | | |
| P 53 (PSS) | | | | | | | | | |
| P 55 (PSS) P 109 (FA) P 73 (FSS) | | | P 55 (PSS) | | P 55 (PSS) | | | | |
| | | | | | | | | | |
| P 57 (PSS) P 75 (FSS) P 115 (FA) | | | P 59 (PSS) P 75 (FSS) P 117 (FA) | | P 59 (PSS) | | | | |
| | | P 125 (FA) | | | | P 127 (FA) | | | |
| 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) |
| 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) | |
| | | | | | | | | | |
| P 183,185,187 (SS) | | | | P 141 (FA) | | P 143 (FA) | | | |
| P185,187 (SS) | | | | | | | | | |
| P 189,191,193 (SS) | P189,191 (SS) | | | | | | | | |
| P 195 (SS) | | | | | | | | | |
| P193,195 (SS) | | | | | | | | | |

Ball Screws

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

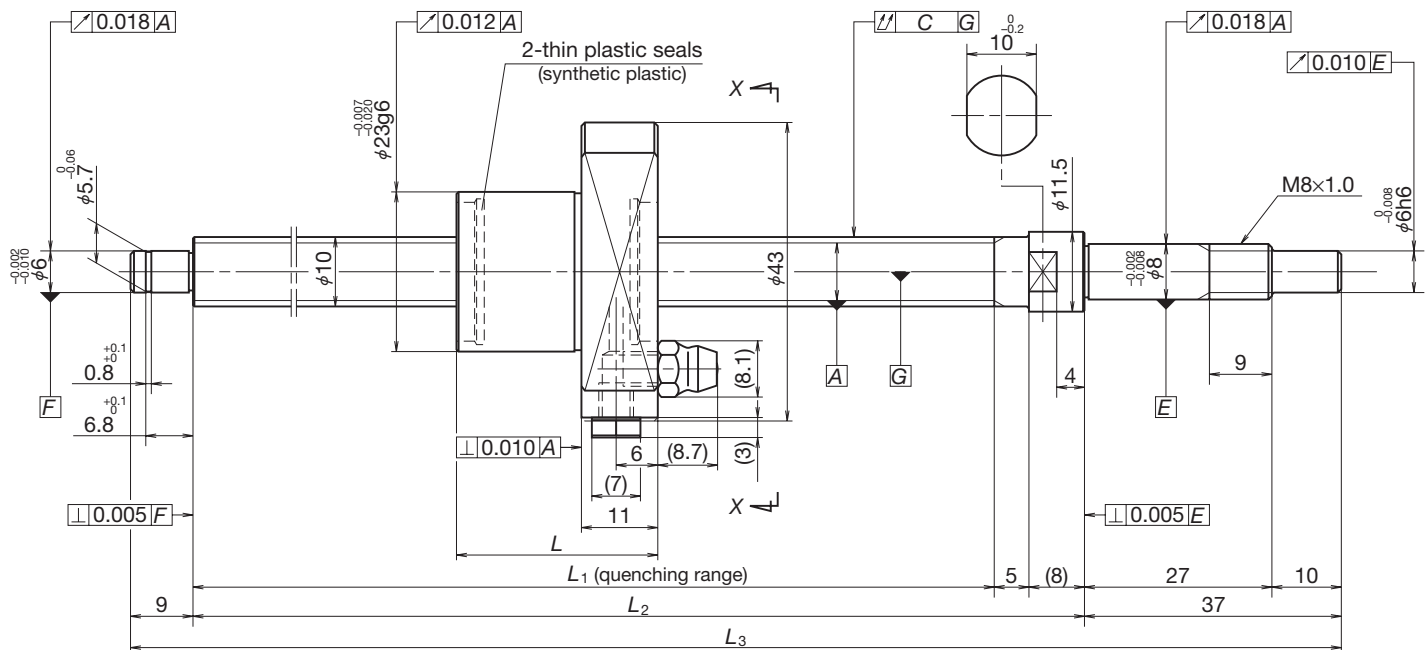
| Shaft dia. | | | | | | | | |
|------------|-----------|-------------------|-------------------|-------------------|-------------------|-------------------|---------------|--|
| | 3 | 4 | 5 | 6 | 8 | 10 | 12 | |
| 10 | P 209,217 | | | P 209,215 | | | | |
| 12 | | | | | P 209,215 | | P 213,221 | |
|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

Unit: mm

| Lead | | | | | | | |
|-----------|-----------|-----------|-----------|-----------|-------|-------|-------|
| 16 | 20 | 25 | 32 | 40 | 50 | 64 | 80 |
| | | | | | | | |
| | P 221 | | | | | | |
| P 213,221 | | | P 223 | | | | |
| | P 213,221 | | | P 223 | | | |
| | | P 213,221 | | | P 223 | | |
| | | | P 213,221 | | | P 223 | |
| | | | | P 213,221 | | | P 223 |
| P 211,217 | | | | | P 221 | | |

Ball Screws Compact FA Series

Compact FA Series PSS Type



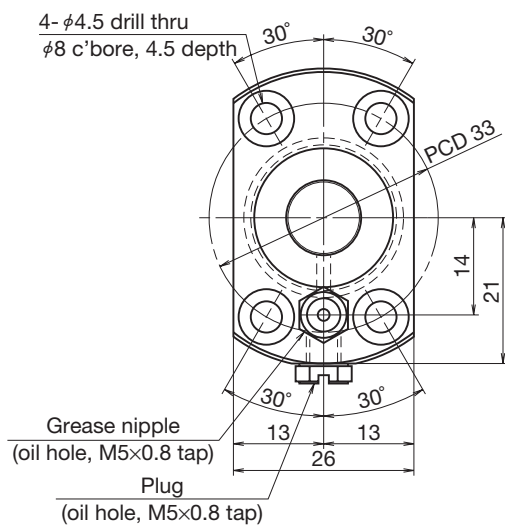
| Part number | Screw shaft diameter d | Lead l | Basic load ratings (N) | | Stroke | | Nut length L | Screw shaft length | | |
|-----------------------|--------------------------|----------|------------------------|-----------------|---------|----------------|----------------|--------------------|-------|-------|
| | | | Dynamic C_a | Static C_{0a} | Nominal | Max. $L_1 - L$ | | L_1 | L_a | L_3 |
| PSS1005N1D0171 | 10 | 5 | 2 930 | 4 790 | 50 | 83 | 29 | 112 | 125 | 171 |
| PSS1005N1D0221 | | | | | 100 | 133 | | 162 | 175 | 221 |
| PSS1005N1D0321 | | | | | 200 | 233 | | 262 | 275 | 321 |
| PSS1005N1D0421 | | | | | 300 | 333 | | 362 | 375 | 421 |
| PSS1005N1D0521 | | | | | 400 | 433 | | 462 | 475 | 521 |
| PSS1010N1D0221 | 10 | 10 | 1 970 | 3 010 | 100 | 130 | 32 | 162 | 175 | 221 |
| PSS1010N1D0321 | | | | | 200 | 230 | | 262 | 275 | 321 |
| PSS1010N1D0421 | | | | | 300 | 330 | | 362 | 375 | 421 |
| PSS1010N1D0521 | | | | | 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.

Screw Shaft $\phi 10$ Lead 5, 10

Unit: mm



View X-X

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) | ○ | |

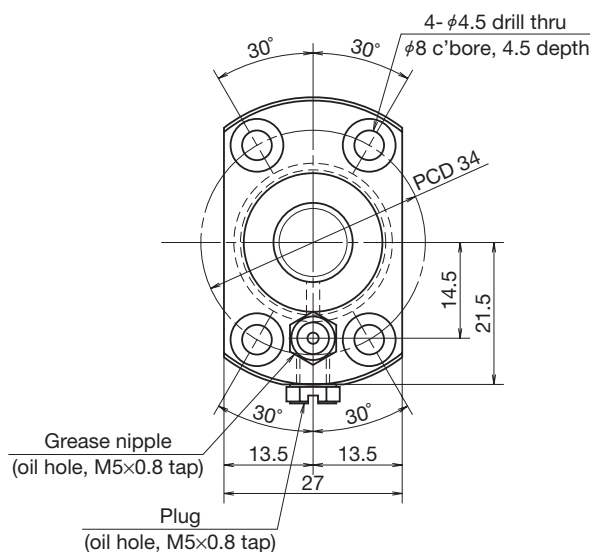
Unit: mm

| Lead accuracy | | | Shaft run-out C | Dynamic preload torque (N-cm) *1 | Mass (kg) | Limiting speeds (min ⁻¹) | Nut internal space (cm ³) | Standard volume of grease replenishing (cm ³) |
|------------------|-------------|-----------------|-------------------|----------------------------------|-----------|--------------------------------------|---------------------------------------|---|
| Target value T | Error e_p | Variation v_u | | | | Fixed - Support | | |
| 0 | 0.020 | 0.018 | 0.030 | 0.7 – 3.3 | 0.3 | 5 000 | 0.8 | 0.4 |
| | 0.020 | 0.018 | 0.045 | 0.7 – 3.3 | 0.3 | | | |
| | 0.023 | 0.018 | 0.060 | 0.6 – 4.3 | 0.3 | | | |
| | 0.025 | 0.020 | 0.070 | 0.6 – 4.3 | 0.4 | | | |
| | 0.027 | 0.020 | 0.085 | 0.4 – 4.9 | 0.5 | | | |
| 0 | 0.020 | 0.018 | 0.045 | 0.7 – 3.3 | 0.3 | 5 000 | 0.7 | 0.4 |
| | 0.023 | 0.018 | 0.060 | 0.6 – 4.3 | 0.4 | | | |
| | 0.025 | 0.020 | 0.070 | 0.6 – 4.3 | 0.4 | | | |
| | 0.027 | 0.020 | 0.085 | 0.4 – 4.9 | 0.5 | | | |

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

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

Unit: mm



View X-X

| 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 |
|--------------------------|------------|---------------------|
| WBK08-01B (square) | ○ | |
| WBK08S-01B (square) | | ○ |
| WBK08-11B (round) | ○ | |

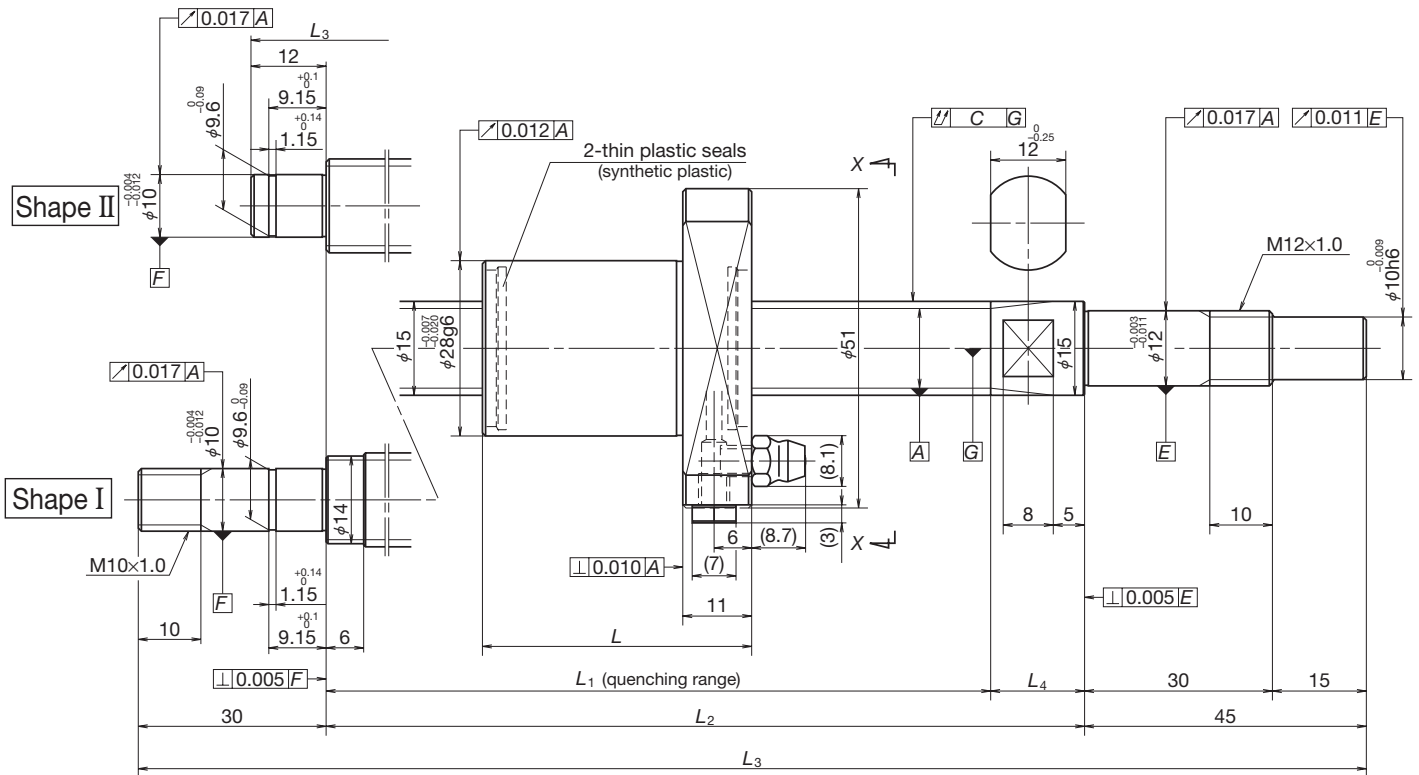
Unit: mm

| Lead accuracy | | | Shaft run-out C | Dynamic preload torque (N·cm) *1 | Mass (kg) | Limiting speeds (min ⁻¹) | Nut internal space (cm ³) | Standard volume of grease replenishing (cm ³) |
|------------------|-------------|-----------------|-------------------|----------------------------------|-----------|--------------------------------------|---------------------------------------|---|
| Target value T | Error e_p | Variation v_u | | | | Fixed - Support | | |
| 0 | 0.020 | 0.018 | 0.030 | 0.7 – 3.3 | 0.3 | 5 000 | 1.0 | 0.5 |
| | 0.020 | 0.018 | 0.045 | 0.7 – 3.3 | 0.3 | | | |
| | 0.023 | 0.018 | 0.060 | 0.6 – 4.3 | 0.4 | | | |
| | 0.025 | 0.020 | 0.070 | 0.6 – 4.3 | 0.5 | | | |
| | 0.027 | 0.020 | 0.085 | 0.6 – 4.3 | 0.6 | | | |
| | 0.030 | 0.023 | 0.085 | 0.4 – 4.9 | 0.7 | | | |
| 0 | 0.020 | 0.018 | 0.045 | 0.7 – 3.3 | 0.4 | 5 000 | 1.0 | 0.5 |
| | 0.023 | 0.018 | 0.060 | 0.6 – 4.3 | 0.5 | | | |
| | 0.025 | 0.020 | 0.070 | 0.6 – 4.3 | 0.5 | | | |
| | 0.027 | 0.020 | 0.085 | 0.6 – 4.3 | 0.6 | | | |
| | 0.030 | 0.023 | 0.085 | 0.4 – 4.9 | 0.7 | | | |
| 0 | 0.023 | 0.018 | 0.045 | 1.4 – 4.5 | 0.4 | 5 000 | 1.2 | 0.6 |
| | 0.023 | 0.018 | 0.060 | 0.9 – 4.9 | 0.5 | | | |
| | 0.027 | 0.020 | 0.070 | 0.9 – 4.9 | 0.6 | | | |
| | 0.030 | 0.023 | 0.085 | 0.6 – 5.9 | 0.7 | | | |
| | 0.030 | 0.023 | 0.110 | 0.6 – 5.9 | 0.8 | | | |
| 0 | 0.023 | 0.018 | 0.045 | 1.4 – 4.5 | 0.5 | 5 000 | 1.5 | 0.8 |
| | 0.023 | 0.018 | 0.060 | 0.9 – 4.9 | 0.6 | | | |
| | 0.027 | 0.020 | 0.070 | 0.9 – 4.9 | 0.7 | | | |
| | 0.030 | 0.023 | 0.085 | 0.6 – 5.9 | 0.7 | | | |
| | 0.030 | 0.023 | 0.110 | 0.6 – 5.9 | 0.8 | | | |

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

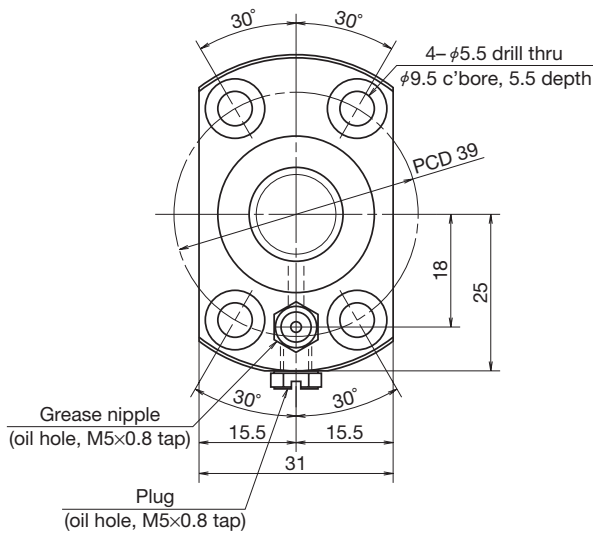


| Part number | Screw shaft diameter d | Lead l | Basic load ratings (N) | | Stroke | | Nut length L | Screw shaft length | | | |
|----------------|--------------------------|----------|------------------------|-----------------|---------|----------------|----------------|--------------------|-------|-------|-------|
| | | | Dynamic C_a | Static C_{0a} | Nominal | Max. $L_1 - L$ | | L_1 | L_2 | L_3 | L_4 |
| PSS1505N1D0211 | 15 | 5 | 5 460 | 10 200 | 50 | 109 | 30 | 139 | 154 | 211 | 15 |
| PSS1505N1D0261 | | | | | 100 | 159 | | 189 | 204 | 261 | |
| PSS1505N1D0361 | | | | | 200 | 259 | | 289 | 304 | 361 | |
| PSS1505N1D0461 | | | | | 300 | 359 | | 389 | 404 | 461 | |
| PSS1505N1D0561 | | | | | 400 | 459 | | 489 | 504 | 561 | |
| PSS1505N1D0661 | | | | | 500 | 559 | | 589 | 604 | 661 | |
| PSS1505N1D0761 | | | | | 600 | 659 | | 689 | 704 | 761 | |
| PSS1510N1D0261 | 15 | 10 | 5 460 | 10 200 | 100 | 146 | 43 | 189 | 204 | 261 | 15 |
| PSS1510N1D0361 | | | | | 200 | 246 | | 289 | 304 | 361 | |
| PSS1510N1D0461 | | | | | 300 | 346 | | 389 | 404 | 461 | |
| PSS1510N1D0561 | | | | | 400 | 446 | | 489 | 504 | 561 | |
| PSS1510N1D0661 | | | | | 500 | 546 | | 589 | 604 | 661 | |
| PSS1510N1D0761 | | | | | 600 | 646 | | 689 | 704 | 761 | |
| PSS1510N1D0879 | | | | | 700 | 746 | | 789 | 804 | 879 | |
| PSS1510N1D0979 | | | | | 800 | 846 | | 889 | 904 | 979 | |
| PSS1510N1D1179 | | | | | 1 000 | 1 046 | | 1 089 | 1 104 | 1 179 | |

*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.

Screw Shaft $\phi 15$ Lead 5, 10

Unit: mm



View X-X

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

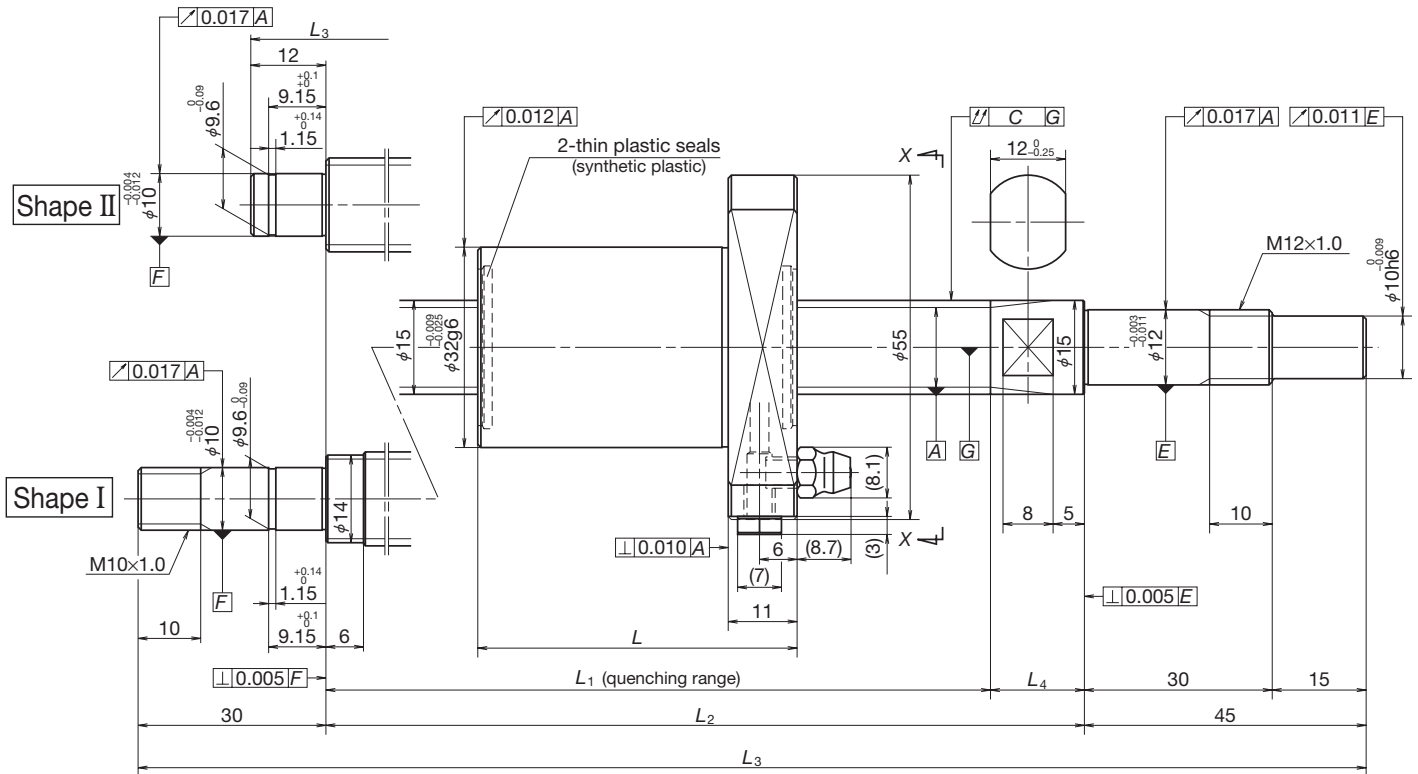
Unit: mm

| Left shaft end (opposite driven side) | Lead accuracy | | | Shaft run-out C | Dynamic preload torque (N·cm) *1 | Mass (kg) | Limiting speeds (min ⁻¹) | | Nut internal space (cm ³) | Standard volume of grease replenishing (cm ³) |
|--|------------------|-------------|-----------------|-------------------|----------------------------------|-----------|--------------------------------------|---------------|---------------------------------------|---|
| | Target value T | Error e_p | Variation v_U | | | | Fixed - Support | Fixed - Fixed | | |
| Shape II | 0 | 0.020 | 0.018 | 0.035 | 0.2 – 6.9 | 0.5 | 5 000 | – | 2.0 | 1.0 |
| | | 0.020 | 0.018 | 0.035 | 0.2 – 6.9 | 0.5 | | | | |
| | | 0.023 | 0.018 | 0.045 | 0.2 – 6.9 | 0.6 | | | | |
| | | 0.025 | 0.020 | 0.050 | 0.4 – 9.8 | 0.8 | | | | |
| | | 0.027 | 0.020 | 0.060 | 0.4 – 9.8 | 0.9 | | | | |
| | | 0.030 | 0.023 | 0.075 | 0.4 – 9.8 | 1.0 | | | | |
| | | 0.035 | 0.025 | 0.075 | 0.4 – 11.8 | 1.1 | 3 600 | | | |
| Shape II | 0 | 0.020 | 0.018 | 0.035 | 0.6 – 7.4 | 0.6 | 5 000 | – | 2.0 | 1.0 |
| | | 0.023 | 0.018 | 0.045 | 0.6 – 7.4 | 0.7 | | | | |
| | | 0.025 | 0.020 | 0.050 | 0.4 – 9.8 | 0.8 | | | | |
| | | 0.027 | 0.020 | 0.060 | 0.4 – 9.8 | 1.0 | | | | |
| | | 0.030 | 0.023 | 0.075 | 0.4 – 9.8 | 1.1 | | | | |
| | | 0.035 | 0.025 | 0.075 | 0.4 – 11.8 | 1.2 | | | | |
| | | 0.035 | 0.025 | 0.095 | 0.4 – 11.8 | 1.4 | 2 700 | 3 400 | | |
| Shape I | | 0.040 | 0.027 | 0.095 | 0.4 – 11.8 | 1.5 | 2 200 | 3 400 | | |
| | | 0.046 | 0.030 | 0.120 | 0.4 – 11.8 | 1.7 | 1 400 | 2 300 | | |

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



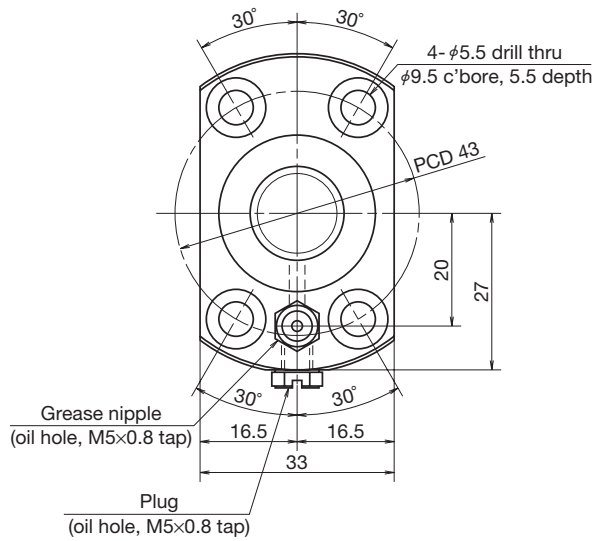
| Part number | Screw shaft diameter d | Lead l | Basic load ratings (N) | | Stroke | | Nut length L | Screw shaft length | | | |
|-----------------------|-----------------------------|-------------|------------------------|--------------------|---------|-------------------|-------------------|--------------------|-------|-------|-------|
| | | | Dynamic C_a | Static C_{0a} | Nominal | Max. $L_1 - L$ | | L_1 | L_2 | L_3 | L_4 |
| PSS1520N1D0261 | 15 | 20 | 5 070 | 8 730 | 100 | 135 | 51 | 186 | 204 | 261 | 18 |
| PSS1520N1D0361 | | | | | 200 | 235 | | 286 | 304 | 361 | |
| PSS1520N1D0461 | | | | | 300 | 335 | | 386 | 404 | 461 | |
| PSS1520N1D0561 | | | | | 400 | 435 | | 486 | 504 | 561 | |
| PSS1520N1D0661 | | | | | 500 | 535 | | 586 | 604 | 661 | |
| PSS1520N1D0761 | | | | | 600 | 635 | | 686 | 704 | 761 | |
| PSS1520N1D0879 | | | | | 700 | 735 | | 786 | 804 | 879 | |
| PSS1520N1D0979 | | | | | 800 | 835 | | 886 | 904 | 979 | |
| PSS1520N1D1179 | | | | | 1 000 | 1 035 | | 1 086 | 1 104 | 1 179 | |
| PSS1530N1D0311 | 15 | 30 | 5 070 | 8 730 | 100 | 159 | 71 | 230 | 254 | 311 | 24 |
| PSS1530N1D0411 | | | | | 200 | 259 | | 330 | 354 | 411 | |
| PSS1530N1D0511 | | | | | 300 | 359 | | 430 | 454 | 511 | |
| PSS1530N1D0611 | | | | | 400 | 459 | | 530 | 554 | 611 | |
| PSS1530N1D0711 | | | | | 500 | 559 | | 630 | 654 | 711 | |
| PSS1530N1D0811 | | | | | 600 | 659 | | 730 | 754 | 811 | |
| PSS1530N1D0929 | | | | | 700 | 759 | | 830 | 854 | 929 | |
| PSS1530N1D1029 | | | | | 800 | 859 | | 930 | 954 | 1 029 | |
| PSS1530N1D1229 | | | | | 1 000 | 1 059 | | 1 130 | 1 154 | 1 229 | |

*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.

Screw Shaft $\phi 15$ Lead 20, 30

Unit: mm



View X-X

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

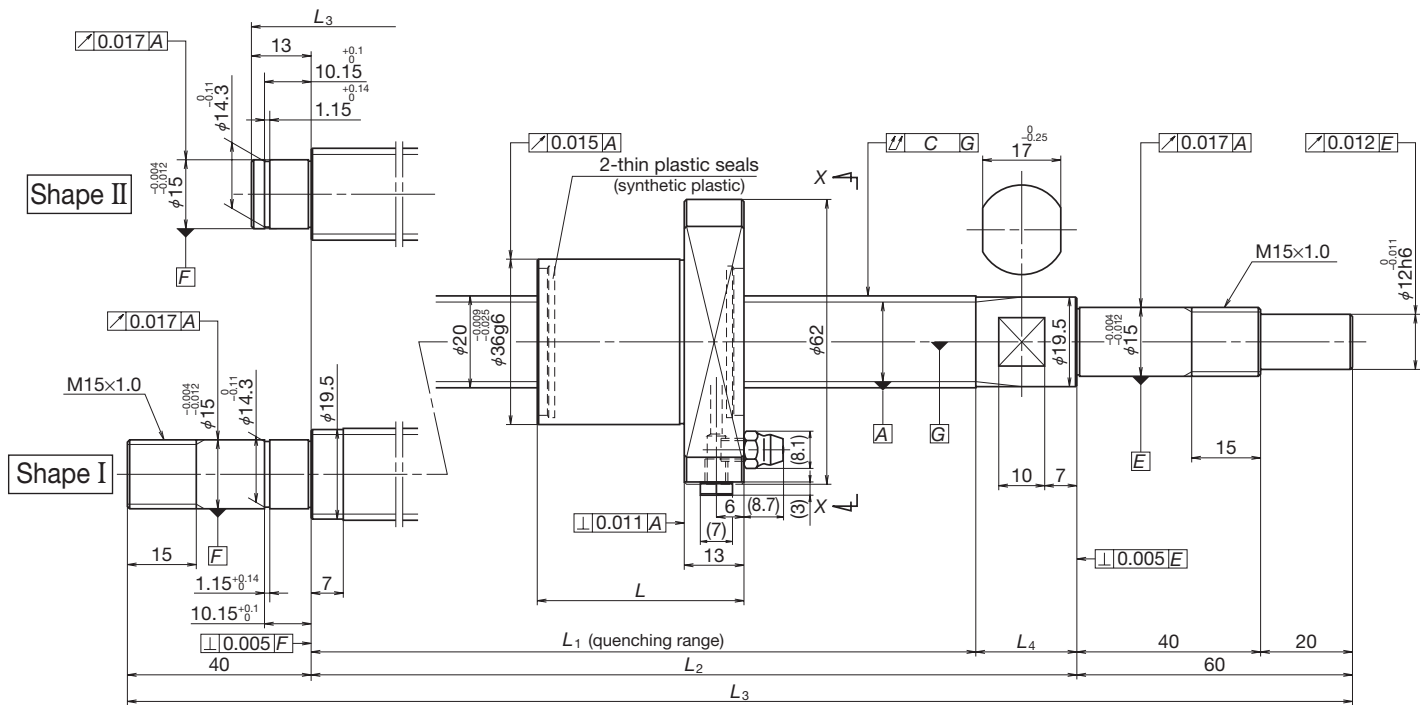
Unit: mm

| Left shaft end (opposite driven side) | Lead accuracy | | | Shaft run-out C | Dynamic preload torque (N·cm) *1 | Mass (kg) | Limiting speeds (min ⁻¹) | | Nut internal space (cm ³) | Standard volume of grease replenishing (cm ³) |
|--|------------------|-------------|-----------------|-------------------|----------------------------------|-----------|--------------------------------------|---------------|---------------------------------------|---|
| | Target value T | Error e_p | Variation v_U | | | | Fixed - Support | Fixed - Fixed | | |
| Shape II | 0 | 0.020 | 0.018 | 0.035 | 0.8 – 8.8 | 0.7 | 5 000 | – | 2.8 | 1.4 |
| | | 0.023 | 0.018 | 0.045 | 0.8 – 8.8 | 0.8 | | | | |
| | | 0.025 | 0.020 | 0.050 | 0.8 – 10.8 | 0.9 | | | | |
| | | 0.027 | 0.020 | 0.060 | 0.8 – 10.8 | 1.1 | | | | |
| | | 0.030 | 0.023 | 0.075 | 0.8 – 10.8 | 1.2 | 3 700 | | | |
| | | 0.035 | 0.025 | 0.075 | 0.8 – 13.8 | 1.3 | | | | |
| Shape I | 0 | 0.035 | 0.025 | 0.095 | 0.8 – 13.8 | 1.5 | 2 900 | 4 200 | | |
| | | 0.040 | 0.027 | 0.095 | 0.8 – 13.8 | 1.6 | 2 200 | 3 300 | | |
| | | 0.046 | 0.030 | 0.120 | 0.8 – 13.8 | 1.9 | 1 500 | 2 200 | | |
| Shape II | 0 | 0.023 | 0.018 | 0.035 | 1.2 – 9.3 | 0.8 | 5 000 | – | 3.4 | 1.7 |
| | | 0.025 | 0.020 | 0.050 | 0.8 – 10.8 | 1.0 | | | | |
| | | 0.027 | 0.020 | 0.060 | 0.8 – 10.8 | 1.1 | | | | |
| | | 0.030 | 0.023 | 0.060 | 0.8 – 10.8 | 1.2 | | | | |
| | | 0.030 | 0.023 | 0.075 | 0.8 – 13.8 | 1.4 | 4 500 | | | |
| | | 0.035 | 0.025 | 0.095 | 0.8 – 13.8 | 1.5 | 3 300 | | | |
| Shape I | 0 | 0.040 | 0.027 | 0.095 | 0.8 – 13.8 | 1.6 | 2 600 | 3 800 | | |
| | | 0.040 | 0.027 | 0.120 | 0.8 – 13.8 | 1.8 | 2 000 | 3 000 | | |
| | | 0.046 | 0.030 | 0.120 | 0.8 – 13.8 | 2.0 | 1 400 | 2 000 | | |

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



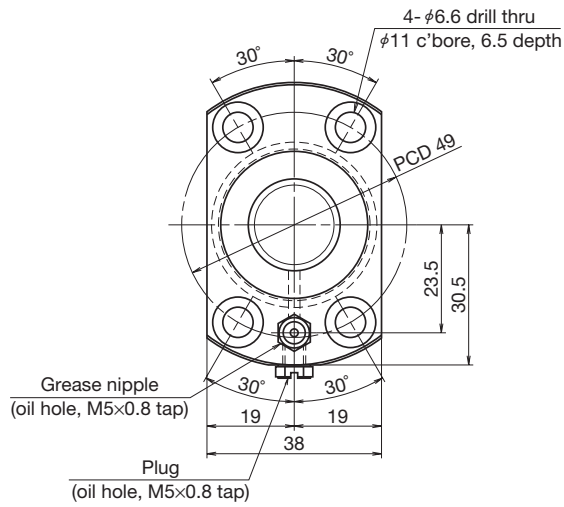
| Part number | Screw shaft diameter d | Lead l | Basic load ratings (N) | | Stroke | | Nut length L | Screw shaft length | | | |
|-----------------------|-----------------------------|-------------|------------------------|--------------------|---------|-------------------|-------------------|--------------------|-------|-------|-------|
| | | | Dynamic C_a | Static C_{0a} | Nominal | Max. $L_1 - L$ | | L_1 | L_2 | L_3 | L_4 |
| PSS2005N1D0323 | 20 | 5 | 8 790 | 18 500 | 150 | 197 | 31 | 228 | 250 | 323 | 22 |
| PSS2005N1D0373 | | | | | 200 | 247 | | 278 | 300 | 373 | |
| PSS2005N1D0473 | | | | | 300 | 347 | | 378 | 400 | 473 | |
| PSS2005N1D0573 | | | | | 400 | 447 | | 478 | 500 | 573 | |
| PSS2005N1D0673 | | | | | 500 | 547 | | 578 | 600 | 673 | |
| PSS2005N1D0773 | | | | | 600 | 647 | | 678 | 700 | 773 | |
| PSS2005N1D0873 | | | | | 700 | 747 | | 778 | 800 | 873 | |
| PSS2005N1D1000 | | | | | 800 | 847 | | 878 | 900 | 1 000 | |
| PSS2010N1D0387 | 20 | 10 | 8 790 | 18 500 | 200 | 247 | 45 | 292 | 314 | 387 | 22 |
| PSS2010N1D0487 | | | | | 300 | 347 | | 392 | 414 | 487 | |
| PSS2010N1D0587 | | | | | 400 | 447 | | 492 | 514 | 587 | |
| PSS2010N1D0687 | | | | | 500 | 547 | | 592 | 614 | 687 | |
| PSS2010N1D0787 | | | | | 600 | 647 | | 692 | 714 | 787 | |
| PSS2010N1D0887 | | | | | 700 | 747 | | 792 | 814 | 887 | |
| PSS2010N1D1014 | | | | | 800 | 847 | | 892 | 914 | 1 014 | |
| PSS2010N1D1214 | | | | | 1 000 | 1 047 | | 1 092 | 1 114 | 1 214 | |
| PSS2010N1D1414 | 1 200 | 1 247 | 1 292 | 1 314 | 1 414 | | | | | | |

*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.

Screw Shaft $\phi 20$ Lead 5, 10

Unit: mm



View X-X

| 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 | Fixed side | Simple support side |
|--------------------------|--------------------|---------------------|
| | WBK15-01B (square) | ○ |
| WBK15S-01B (square) | | ○ |
| WBK15-11 (round) | ○ | ○ |

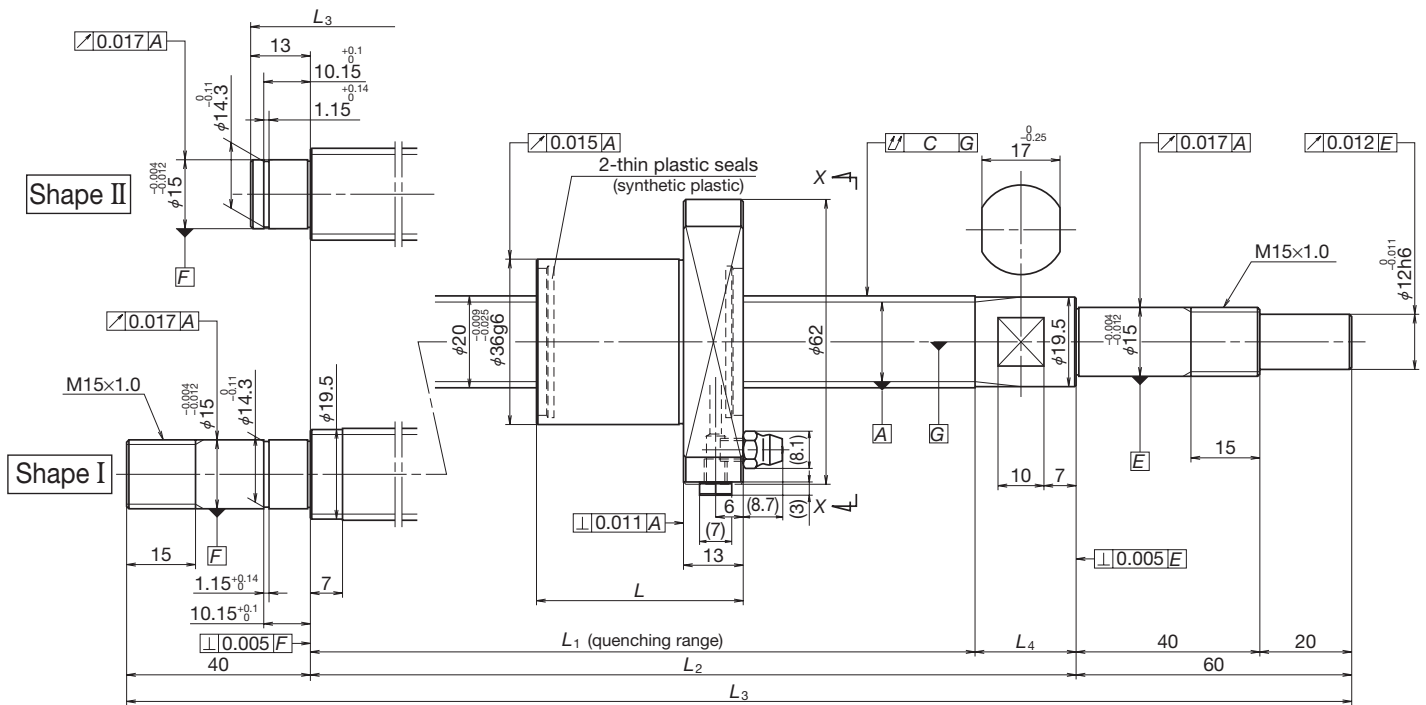
Unit: mm

| Left shaft end (opposite driven side) | Lead accuracy | | | Shaft run-out C | Dynamic preload torque (N·cm) *1 | Mass (kg) | Limiting speeds (min ⁻¹) | | Nut internal space (cm ³) | Standard volume of grease replenishing (cm ³) |
|--|------------------|-------------|-----------------|-------------------|----------------------------------|-----------|--------------------------------------|---------------|---------------------------------------|---|
| | Target value T | Error e_p | Variation v_U | | | | Fixed - Support | Fixed - Fixed | | |
| Shape II | 0 | 0.023 | 0.018 | 0.045 | 0.6 – 7.4 | 1.0 | 5 000 | – | 3.4 | 1.7 |
| | | 0.023 | 0.018 | 0.045 | 0.6 – 7.4 | 1.1 | | | | |
| | | 0.025 | 0.020 | 0.050 | 0.6 – 7.4 | 1.3 | | | | |
| | | 0.027 | 0.020 | 0.060 | 0.4 – 9.8 | 1.5 | | | | |
| | | 0.030 | 0.023 | 0.075 | 0.4 – 9.8 | 1.7 | | | | |
| | | 0.035 | 0.025 | 0.075 | 0.4 – 9.8 | 1.9 | | | | |
| Shape I | | 0.040 | 0.027 | 0.095 | 0.4 – 11.8 | 2.4 | 3 200 | 4 700 | | |
| Shape II | 0 | 0.023 | 0.018 | 0.045 | 1.2 – 9.3 | 1.2 | 5 000 | – | 3.2 | 1.6 |
| | | 0.025 | 0.020 | 0.050 | 1.2 – 9.3 | 1.4 | | | | |
| | | 0.027 | 0.020 | 0.060 | 0.8 – 10.8 | 1.7 | | | | |
| | | 0.030 | 0.023 | 0.075 | 0.8 – 10.8 | 1.9 | | | | |
| | | 0.035 | 0.025 | 0.075 | 0.8 – 10.8 | 2.1 | | | | |
| Shape I | | 0.040 | 0.027 | 0.120 | 0.8 – 13.8 | 2.6 | 3 100 | 4 600 | | |
| | | 0.046 | 0.030 | 0.120 | 0.8 – 13.8 | 3.1 | 2 100 | 3 100 | | |
| | | 0.054 | 0.035 | 0.160 | 0.8 – 13.8 | 3.6 | 1 500 | 2 200 | | |

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

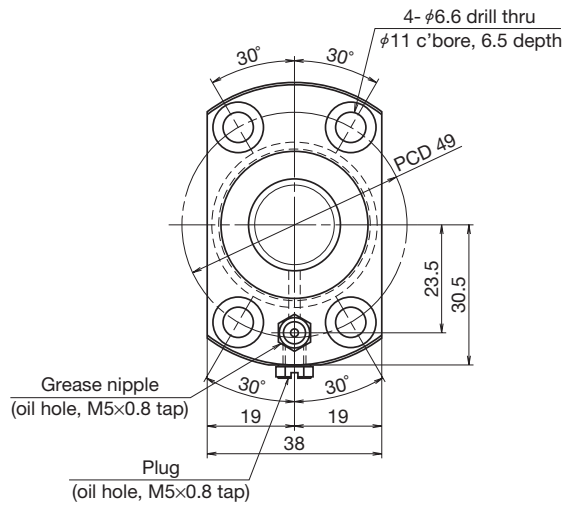


| Part number | Screw shaft diameter d | Lead l | Basic load ratings (N) | | Stroke | | Nut length L | Screw shaft length | | | |
|-----------------------|--------------------------|----------|------------------------|-----------------|---------|----------------|----------------|--------------------|-------|-------|-------|
| | | | Dynamic C_a | Static C_{0a} | Nominal | Max. $L_1 - L$ | | L_1 | L_2 | L_3 | L_4 |
| PSS2020N1D0508 | 20 | 20 | 5 900 | 11 700 | 300 | 359 | 54 | 413 | 435 | 508 | 22 |
| PSS2020N1D0608 | | | | | 400 | 459 | | 513 | 535 | 608 | |
| PSS2020N1D0708 | | | | | 500 | 559 | | 613 | 635 | 708 | |
| PSS2020N1D0808 | | | | | 600 | 659 | | 713 | 735 | 808 | |
| PSS2020N1D0908 | | | | | 700 | 759 | | 813 | 835 | 908 | |
| PSS2020N1D1035 | | | | | 800 | 859 | | 913 | 935 | 1 035 | |
| PSS2020N1D1235 | | | | | 1 000 | 1 059 | | 1 113 | 1 135 | 1 235 | |
| PSS2020N1D1435 | | | | | 1 200 | 1 259 | | 1 313 | 1 335 | 1 435 | |
| PSS2020N1D1835 | | | | | 1 600 | 1 659 | | 1 713 | 1 735 | 1 835 | |
| PSS2030N1D0408 | 20 | 30 | 5 900 | 11 700 | 200 | 234 | 74 | 308 | 335 | 408 | 27 |
| PSS2030N1D0508 | | | | | 300 | 334 | | 408 | 435 | 508 | |
| PSS2030N1D0608 | | | | | 400 | 434 | | 508 | 535 | 608 | |
| PSS2030N1D0708 | | | | | 500 | 534 | | 608 | 635 | 708 | |
| PSS2030N1D0808 | | | | | 600 | 634 | | 708 | 735 | 808 | |
| PSS2030N1D0908 | | | | | 700 | 734 | | 808 | 835 | 908 | |
| PSS2030N1D1035 | | | | | 800 | 834 | | 908 | 935 | 1 035 | |
| PSS2030N1D1235 | | | | | 1 000 | 1 034 | | 1 108 | 1 135 | 1 235 | |
| PSS2030N1D1435 | | | | | 1 200 | 1 234 | | 1 308 | 1 335 | 1 435 | |

*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.

Screw Shaft $\phi 20$ Lead 20, 30

Unit: mm



View X-X

| 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 | Fixed side | Simple support side |
|--------------------------|------------|---------------------|
| WBK15-01B (square) | ○ | ○ |
| WBK15S-01B (square) | | ○ |
| WBK15-11 (round) | ○ | ○ |

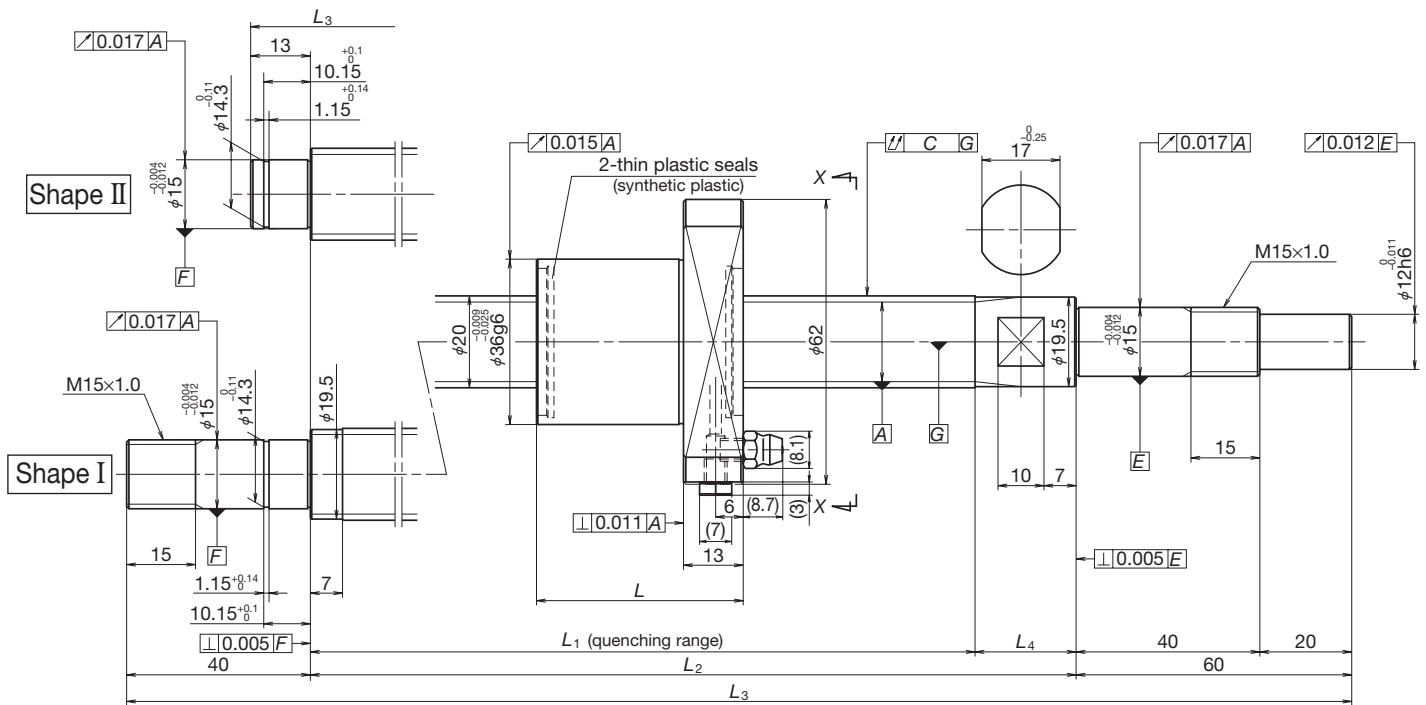
Unit: mm

| Left shaft end (opposite driven side) | Lead accuracy | | | Shaft run-out C | Dynamic preload torque (N·cm) *1 | Mass (kg) | Limiting speeds (min ⁻¹) | | Nut internal space (cm ³) | Standard volume of grease replenishing (cm ³) |
|--|------------------|-------------|-----------------|-------------------|----------------------------------|-----------|--------------------------------------|---------------|---------------------------------------|---|
| | Target value T | Error e_p | Variation v_U | | | | Fixed - Support | Fixed - Fixed | | |
| Shape II | 0 | 0.027 | 0.020 | 0.060 | 1.4 – 11.8 | 1.6 | 5 000 | - | 3.2 | 1.6 |
| | | 0.030 | 0.023 | 0.060 | 1.4 – 11.8 | 1.8 | | | | |
| | | 0.030 | 0.023 | 0.075 | 1.4 – 11.8 | 2.0 | | | | |
| | | 0.035 | 0.025 | 0.095 | 1.4 – 11.8 | 2.3 | | | | |
| | | 0.040 | 0.027 | 0.095 | 0.8 – 13.8 | 2.5 | 3 700 | | | |
| Shape I | 0 | 0.040 | 0.027 | 0.120 | 0.8 – 13.8 | 2.8 | 3 000 | 4 500 | 3.2 | 1.6 |
| | | 0.046 | 0.030 | 0.120 | 0.8 – 13.8 | 3.3 | 2 000 | 3 000 | | |
| | | 0.054 | 0.035 | 0.160 | 0.8 – 13.8 | 3.8 | 1 400 | 2 100 | | |
| | | 0.065 | 0.040 | 0.200 | 0.8 – 13.8 | 4.7 | 800 | 1 200 | | |
| Shape II | 0 | 0.023 | 0.018 | 0.050 | 1.6 – 9.8 | 1.4 | 5 000 | - | 4.6 | 2.3 |
| | | 0.027 | 0.020 | 0.060 | 1.4 – 11.8 | 1.7 | | | | |
| | | 0.030 | 0.023 | 0.060 | 1.4 – 11.8 | 1.9 | | | | |
| | | 0.030 | 0.023 | 0.075 | 1.4 – 11.8 | 2.1 | | | | |
| | | 0.035 | 0.025 | 0.095 | 1.4 – 11.8 | 2.4 | | | | |
| | | 0.040 | 0.027 | 0.095 | 0.8 – 13.8 | 2.6 | 3 900 | | | |
| Shape I | 0 | 0.040 | 0.027 | 0.120 | 0.8 – 13.8 | 2.9 | 3 100 | 4 600 | 4.6 | 2.3 |
| | | 0.046 | 0.030 | 0.120 | 0.8 – 13.8 | 3.4 | 2 100 | 3 000 | | |
| | | 0.054 | 0.035 | 0.160 | 0.8 – 13.8 | 3.9 | 1 500 | 2 200 | | |

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



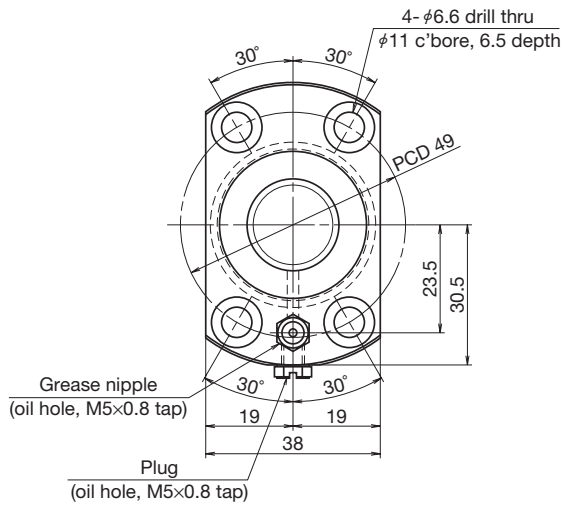
| Part number | Screw shaft diameter d | Lead l | Basic load ratings (N) | | Stroke | | Nut length L | Screw shaft length | | | |
|-----------------------|--------------------------|----------|------------------------|-----------------|---------|----------------|----------------|--------------------|-------|-------|-------|
| | | | Dynamic C_a | Static C_{0a} | Nominal | Max. $L_1 - L$ | | L_1 | L_2 | L_3 | L_4 |
| PSS2040N1D0658 | 20 | 40 | 5 900 | 11 700 | 400 | 461 | 92 | 553 | 585 | 658 | 32 |
| PSS2040N1D0758 | | | | | 500 | 561 | | 653 | 685 | 758 | |
| PSS2040N1D0858 | | | | | 600 | 661 | | 753 | 785 | 858 | |
| PSS2040N1D0958 | | | | | 700 | 761 | | 853 | 885 | 958 | |
| PSS2040N1D1085 | | | | | 800 | 861 | | 953 | 985 | 1 085 | |
| PSS2040N1D1285 | | | | | 1 000 | 1 061 | | 1 153 | 1 185 | 1 285 | |
| PSS2040N1D1485 | | | | | 1 200 | 1 261 | | 1 353 | 1 385 | 1 485 | |
| PSS2040N1D1885 | | | | | 1 600 | 1 661 | | 1 753 | 1 785 | 1 885 | |
| PSS2040N1D2285 | | | | | 2 000 | 2 061 | | 2 153 | 2 185 | 2 285 | |
| PSS2060N1D0708 | 20 | 60 | 5 900 | 11 700 | 400 | 464 | 129 | 593 | 635 | 708 | 42 |
| PSS2060N1D0808 | | | | | 500 | 564 | | 693 | 735 | 808 | |
| PSS2060N1D0908 | | | | | 600 | 664 | | 793 | 835 | 908 | |
| PSS2060N1D1008 | | | | | 700 | 764 | | 893 | 935 | 1 008 | |
| PSS2060N1D1135 | | | | | 800 | 864 | | 993 | 1 035 | 1 135 | |
| PSS2060N1D1335 | | | | | 1 000 | 1 064 | | 1 193 | 1 235 | 1 335 | |
| PSS2060N1D1535 | | | | | 1 200 | 1 264 | | 1 393 | 1 435 | 1 535 | |
| PSS2060N1D1935 | | | | | 1 600 | 1 664 | | 1 793 | 1 835 | 1 935 | |
| PSS2060N1D2335 | | | | | 2 000 | 2 064 | | 2 193 | 2 235 | 2 335 | |

*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.

Screw Shaft $\phi 20$ Lead 40, 60

Unit: mm



View X-X

| 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 | Fixed side | Simple support side |
|--------------------------|------------|---------------------|
| WBK15-01B (square) | ○ | ○ |
| WBK15S-01B (square) | | ○ |
| WBK15-11 (round) | ○ | ○ |

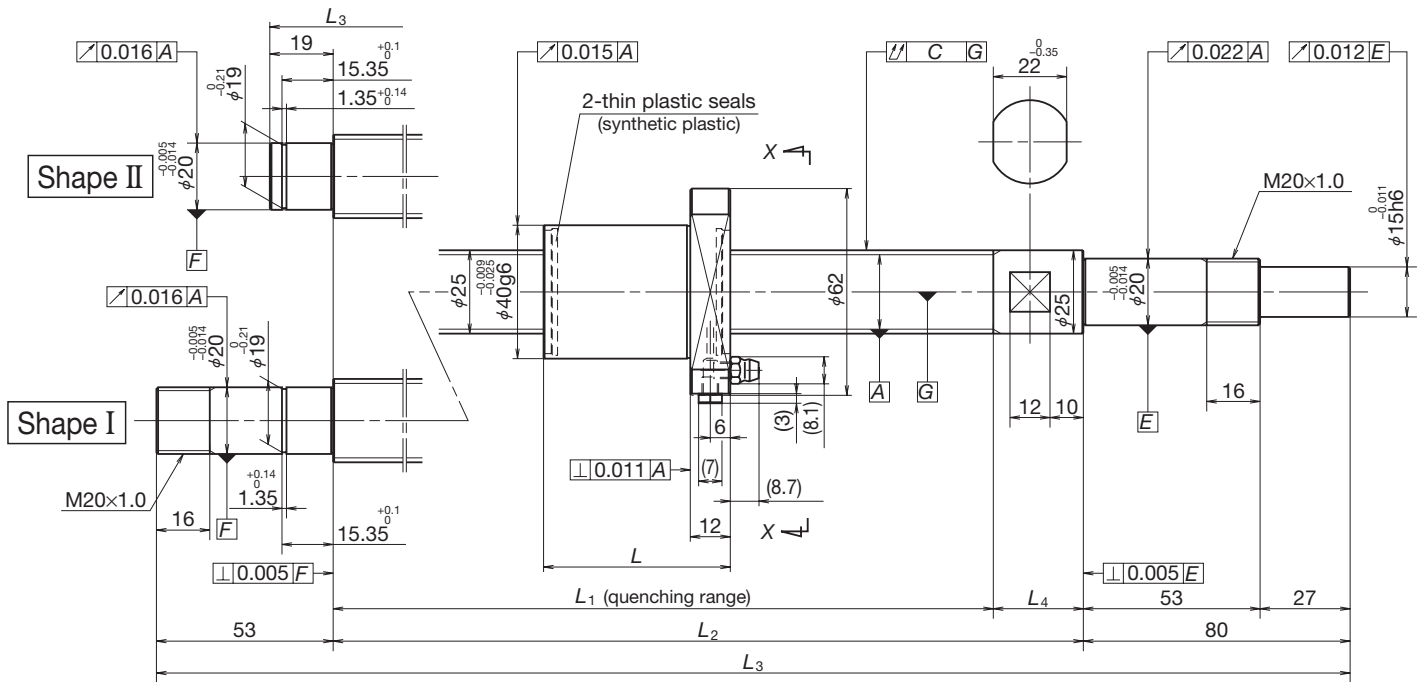
Unit: mm

| Left shaft end (opposite driven side) | Lead accuracy | | | Shaft run-out C | Dynamic preload torque (N·cm) *1 | Mass (kg) | Limiting speeds (min ⁻¹) | | Nut internal space (cm ³) | Standard volume of grease replenishing (cm ³) |
|--|------------------|-------------|-----------------|-------------------|----------------------------------|-----------|--------------------------------------|---------------|---------------------------------------|---|
| | Target value T | Error e_p | Variation v_U | | | | Fixed - Support | Fixed - Fixed | | |
| Shape II | 0 | 0.030 | 0.023 | 0.075 | 2.2 – 12.8 | 2.1 | 5 000 | - | 5.3 | 2.7 |
| | | 0.035 | 0.025 | 0.075 | 2.2 – 12.8 | 2.4 | | | | |
| | | 0.035 | 0.025 | 0.095 | 2.2 – 12.8 | 2.6 | | | | |
| | | 0.040 | 0.027 | 0.095 | 1.8 – 14.8 | 2.8 | 3 500 | | | |
| Shape I | | 0.040 | 0.027 | 0.120 | 1.8 – 14.8 | 3.1 | 2 800 | 4 200 | | |
| | | 0.046 | 0.030 | 0.160 | 1.8 – 14.8 | 3.6 | 1 900 | 2 800 | | |
| | | 0.054 | 0.035 | 0.160 | 1.8 – 14.8 | 4.1 | 1 400 | 2 000 | | |
| | | 0.065 | 0.040 | 0.200 | 1.8 – 14.8 | 5.1 | 800 | 1 200 | | |
| Shape II | 0 | 0.077 | 0.046 | 0.240 | 1.8 – 14.8 | 6.0 | 500 | 800 | | |
| | | 0.030 | 0.023 | 0.075 | 2.7 – 13.8 | 2.4 | 5 000 | - | 7.0 | 3.5 |
| | | 0.035 | 0.025 | 0.095 | 2.7 – 13.8 | 2.6 | | | | |
| | | 0.035 | 0.025 | 0.095 | 2.7 – 13.8 | 2.9 | 4 200 | | | |
| 0.040 | | 0.027 | 0.120 | 1.8 – 14.8 | 3.1 | 3 300 | | | | |
| Shape I | | 0.040 | 0.027 | 0.120 | 1.8 – 14.8 | 3.4 | 2 600 | 3 900 | | |
| | | 0.046 | 0.030 | 0.160 | 1.8 – 14.8 | 3.9 | 1 800 | 2 700 | | |
| | | 0.054 | 0.035 | 0.160 | 1.8 – 14.8 | 4.4 | 1 300 | 1 900 | | |
| | 0.065 | 0.040 | 0.200 | 1.8 – 14.8 | 5.4 | 800 | 1 100 | | | |
| Shape I | 0 | 0.077 | 0.046 | 0.240 | 1.8 – 14.8 | 6.3 | 500 | 700 | | |

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

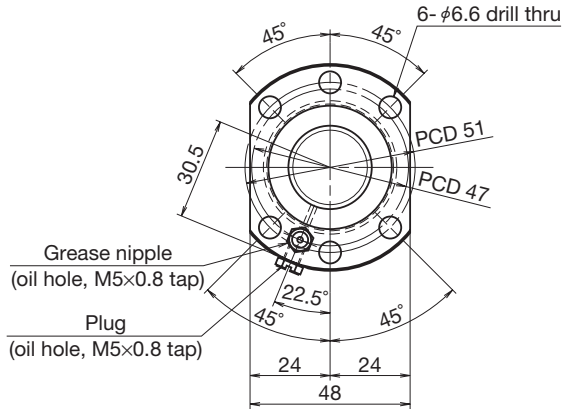


| Part number | Screw shaft diameter d | Lead l | Basic load ratings (N) | | Stroke | | Nut length L | Screw shaft length | | | |
|-----------------------|--------------------------|----------|------------------------|-----------------|---------|----------------|----------------|--------------------|-------|-------|-------|
| | | | Dynamic C_a | Static C_{0a} | Nominal | Max. $L_1 - L$ | | L_1 | L_2 | L_3 | L_4 |
| PSS2505N1D0349 | 25 | 5 | 9 760 | 23 600 | 150 | 191 | 32 | 223 | 250 | 349 | 27 |
| PSS2505N1D0399 | | | | | 200 | 241 | | 273 | 300 | 399 | |
| PSS2505N1D0499 | | | | | 300 | 341 | | 373 | 400 | 499 | |
| PSS2505N1D0599 | | | | | 400 | 441 | | 473 | 500 | 599 | |
| PSS2505N1D0699 | | | | | 500 | 541 | | 573 | 600 | 699 | |
| PSS2505N1D0899 | | | | | 700 | 741 | | 773 | 800 | 899 | |
| PSS2505N1D0999 | | | | | 800 | 841 | | 873 | 900 | 999 | |
| PSS2505N1D1233 | | | | | 1 000 | 1 041 | | 1 073 | 1 100 | 1 233 | |
| PSS2510N1D0549 | 25 | 10 | 12 800 | 32 300 | 300 | 367 | 56 | 423 | 450 | 549 | 27 |
| PSS2510N1D0649 | | | | | 400 | 467 | | 523 | 550 | 649 | |
| PSS2510N1D0749 | | | | | 500 | 567 | | 623 | 650 | 749 | |
| PSS2510N1D0849 | | | | | 600 | 667 | | 723 | 750 | 849 | |
| PSS2510N1D0949 | | | | | 700 | 767 | | 823 | 850 | 949 | |
| PSS2510N1D1049 | | | | | 800 | 867 | | 923 | 950 | 1 049 | |
| PSS2510N1D1283 | | | | | 1 000 | 1 067 | | 1 123 | 1 150 | 1 283 | |
| PSS2510N1D1883 | | | | | 1 600 | 1 667 | | 1 723 | 1 750 | 1 883 | |

*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.

Screw Shaft $\phi 25$ Lead 5, 10

Unit: mm



View X-X

| 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 | Fixed side | Simple support side |
|--------------------------|------------|---------------------|
| WBK20-01B (square) | ○ | ○ |
| WBK20S-01B (square) | | ○ |
| WBK20-11 (round) | ○ | ○ |

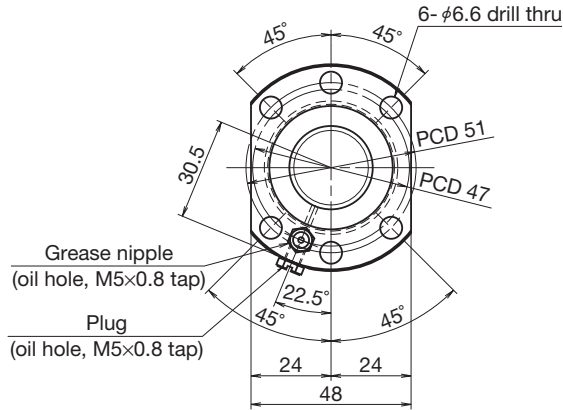
Unit: mm

| Left shaft end (opposite driven side) | Lead accuracy | | | Shaft run-out C | Dynamic preload torque (N·cm) *1 | Mass (kg) | Limiting speeds (min ⁻¹) | | Nut internal space (cm ³) | Standard volume of grease replenishing (cm ³) |
|--|---------------------|----------------|--------------------|----------------------|-------------------------------------|-----------|--------------------------------------|---------------|---------------------------------------|---|
| | Target value T | Error e_p | Variation v_U | | | | Fixed - Support | Fixed - Fixed | | |
| Shape II | 0 | 0.023 | 0.018 | 0.035 | 1.2 – 9.3 | 1.5 | 5 000 | - | 4.4 | 2.2 |
| | | 0.023 | 0.018 | 0.035 | 1.2 – 9.3 | 1.6 | | | | |
| | | 0.025 | 0.020 | 0.040 | 1.2 – 9.3 | 2.0 | | | | |
| | | 0.027 | 0.020 | 0.045 | 1.2 – 9.3 | 2.3 | | | | |
| | | 0.030 | 0.023 | 0.055 | 0.8 – 10.8 | 2.7 | | | | |
| | | 0.035 | 0.025 | 0.065 | 0.8 – 10.8 | 3.4 | | | | |
| | | 0.040 | 0.027 | 0.065 | 0.8 – 10.8 | 3.7 | 4 100 | | | |
| Shape I | | 0.046 | 0.030 | 0.080 | 0.8 – 13.8 | 4.5 | 2 700 | 4 000 | | |
| Shape II | 0 | 0.027 | 0.020 | 0.045 | 3.1 – 11.8 | 2.4 | 5 000 | - | 4.7 | 2.4 |
| | | 0.030 | 0.023 | 0.055 | 2.2 – 12.8 | 2.7 | | | | |
| | | 0.030 | 0.023 | 0.055 | 2.2 – 12.8 | 3.1 | | | | |
| | | 0.035 | 0.025 | 0.065 | 2.2 – 12.8 | 3.5 | | | | |
| | | 0.040 | 0.027 | 0.065 | 2.2 – 12.8 | 3.8 | | | | |
| Shape I | | 0.040 | 0.027 | 0.080 | 2.2 – 12.8 | 4.2 | 3 600 | | | |
| | | 0.046 | 0.030 | 0.100 | 1.8 – 14.8 | 5.0 | 2 500 | 3 700 | | |
| | | 0.065 | 0.040 | 0.130 | 1.8 – 14.8 | 7.2 | 1 000 | 1 600 | | |

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

Screw Shaft $\phi 25$ Lead 20, 25

Unit: mm



View X-X

| 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 | Fixed side | Simple support side |
|--------------------------|------------|---------------------|
| WBK20-01B (square) | ○ | ○ |
| WBK20S-01B (square) | | ○ |
| WBK20-11 (round) | ○ | ○ |

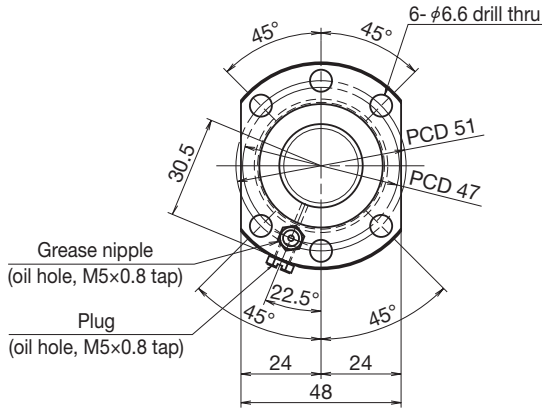
Unit: mm

| Left shaft end (opposite driven side) | Lead accuracy | | | Shaft run-out C | Dynamic preload torque (N·cm) *1 | Mass (kg) | Limiting speeds (min ⁻¹) | | Nut internal space (cm ³) | Standard volume of grease replenishing (cm ³) |
|--|---------------------|----------------|--------------------|----------------------|-------------------------------------|--------------|---|---------------|--|--|
| | Target value T | Error e_p | Variation v_U | | | | Fixed - Support | Fixed - Fixed | | |
| Shape II | 0 | 0.030 | 0.023 | 0.055 | 2.2 – 12.8 | 3.1 | 5 000 | - | 3.9 | 2.0 |
| | | 0.035 | 0.025 | 0.065 | 2.2 – 12.8 | 3.4 | | | | |
| | | 0.040 | 0.027 | 0.065 | 2.2 – 12.8 | 3.8 | | | | |
| | | 0.040 | 0.027 | 0.080 | 2.2 – 12.8 | 4.2 | | | | |
| Shape I | | 0.046 | 0.030 | 0.100 | 1.8 – 14.8 | 5.0 | 2 600 | 3 800 | | |
| | | 0.054 | 0.035 | 0.100 | 1.8 – 14.8 | 5.8 | 1 800 | 2 700 | | |
| | | 0.065 | 0.040 | 0.130 | 1.8 – 14.8 | 7.3 | 1 100 | 1 600 | | |
| | | 0.077 | 0.046 | 0.170 | 1.8 – 14.8 | 8.8 | 700 | 1 000 | | |
| Shape II | 0 | 0.035 | 0.025 | 0.055 | 2.7 – 13.8 | 3.3 | 5 000 | - | 4.3 | 2.2 |
| | | 0.035 | 0.025 | 0.065 | 2.7 – 13.8 | 3.7 | | | | |
| | | 0.040 | 0.027 | 0.065 | 2.7 – 13.8 | 4.1 | | | | |
| | | 0.040 | 0.027 | 0.080 | 2.7 – 13.8 | 4.4 | | | | |
| Shape I | | 0.046 | 0.030 | 0.100 | 1.8 – 14.8 | 5.3 | 2 300 | 3 500 | | |
| | | 0.054 | 0.035 | 0.100 | 1.8 – 14.8 | 6.0 | 1 700 | 2 600 | | |
| | | 0.065 | 0.040 | 0.130 | 1.8 – 14.8 | 7.5 | 1 000 | 1 500 | | |
| | | 0.077 | 0.046 | 0.170 | 1.8 – 14.8 | 9.1 | 700 | 1 000 | | |

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

Screw Shaft $\phi 25$ Lead 30, 50

Unit: mm



View X-X

| 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 | Fixed side | Simple support side |
|--------------------------|------------|---------------------|
| WBK20-01 (square) | ○ | ○ |
| WBK20S-01 (square) | | ○ |
| WBK20-11 (round) | ○ | ○ |

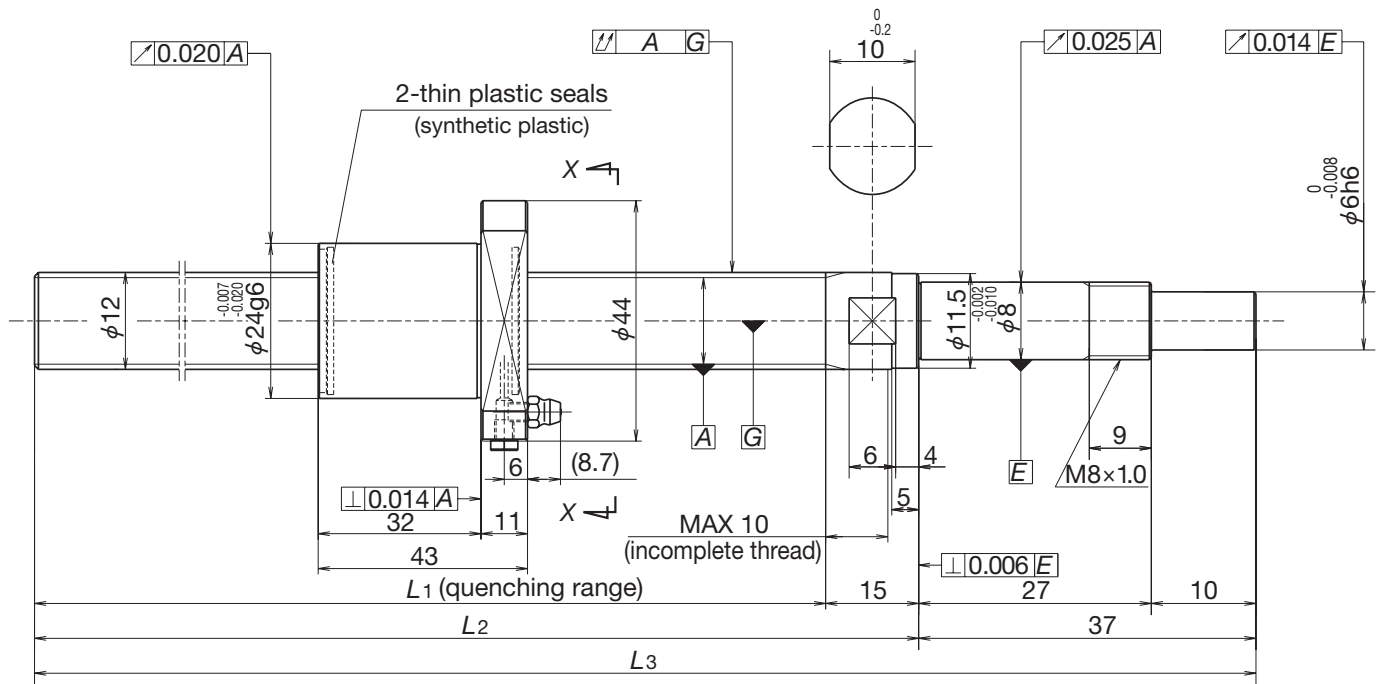
Unit: mm

| Left shaft end (opposite driven side) | Lead accuracy | | | Shaft run-out C | Dynamic preload torque (N·cm) *1 | Mass (kg) | Limiting speeds (min ⁻¹) | | Nut internal space (cm ³) | Standard volume of grease replenishing (cm ³) | |
|--|---------------------|----------------|--------------------|----------------------|-------------------------------------|--------------|---|---------------|--|--|-------|
| | Target value T | Error e_p | Variation v_U | | | | Fixed - Support | Fixed - Fixed | | | |
| Shape II | 0 | 0.035 | 0.025 | 0.055 | 2.7 – 13.8 | 3.4 | 5 000 | — | 5.5 | 2.8 | |
| | | 0.035 | 0.025 | 0.065 | 2.7 – 13.8 | 3.7 | | | | | |
| | | 0.040 | 0.027 | 0.065 | 2.7 – 13.8 | 4.1 | | | | | 4 300 |
| | | 0.040 | 0.027 | 0.080 | 2.7 – 13.8 | 4.5 | 3 400 | | | | |
| Shape I | 0 | 0.046 | 0.030 | 0.100 | 1.8 – 14.8 | 5.3 | 2 300 | 3 600 | 5.5 | 2.8 | |
| | | 0.054 | 0.035 | 0.100 | 1.8 – 14.8 | 6.1 | 1 700 | 2 600 | | | |
| | | 0.065 | 0.040 | 0.130 | 1.8 – 14.8 | 7.6 | 1 000 | 1 500 | | | |
| | | 0.077 | 0.046 | 0.170 | 1.8 – 14.8 | 9.1 | 700 | 1 000 | | | |
| Shape II | 0 | 0.035 | 0.025 | 0.065 | 5.4 – 17.6 | 3.8 | 5 000 | — | 7.7 | 3.9 | |
| | | 0.035 | 0.025 | 0.065 | 5.4 – 17.6 | 4.1 | | | | | 4 800 |
| | | 0.040 | 0.027 | 0.080 | 5.4 – 17.6 | 4.5 | | | | | 3 800 |
| | | 0.040 | 0.027 | 0.080 | 5.4 – 17.6 | 4.9 | 3 100 | | | | |
| Shape I | 0 | 0.046 | 0.030 | 0.100 | 4.1 – 19.6 | 5.8 | 2 200 | 3 400 | 7.7 | 3.9 | |
| | | 0.054 | 0.035 | 0.100 | 4.1 – 19.6 | 6.5 | 1 600 | 2 500 | | | |
| | | 0.065 | 0.040 | 0.130 | 4.1 – 19.6 | 8.0 | 900 | 1 500 | | | |
| | | 0.077 | 0.046 | 0.170 | 4.1 – 19.6 | 9.6 | 600 | 1 000 | | | |

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 for Conveyor FSS Type



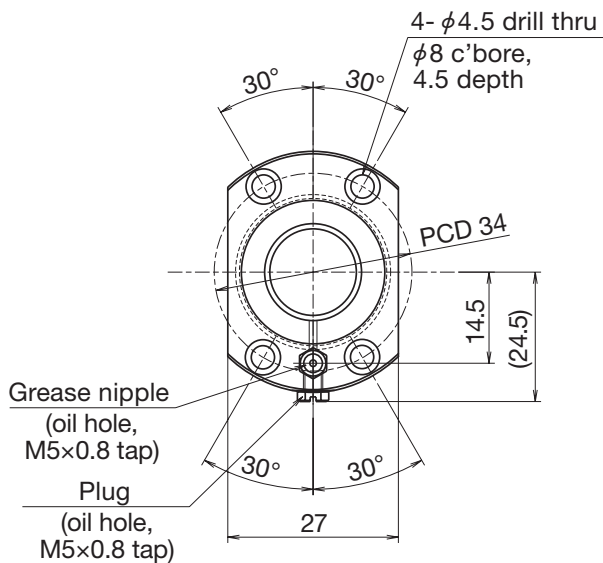
| Part number | Screw shaft diameter d | Lead l | Basic load ratings (N) | | Screw shaft length | | | |
|-----------------------|--------------------------|----------|------------------------|-----------------|--------------------|-------|-------|--|
| | | | Dynamic C_a | Static C_{0a} | L_1 | L_2 | L_3 | |
| FSS1210N1D0400 | 12 | 10 | 3 200 | 5 860 | 348 | 363 | 400 | |
| FSS1210N1D0600 | 12 | 10 | 3 200 | 5 860 | 548 | 563 | 600 | |
| FSS1210N1D0900 | 12 | 10 | 3 200 | 5 860 | 848 | 863 | 900 | |

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.

Screw Shaft $\phi 12$ Lead 10

Unit: mm



View X-X

| 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) | ○ | |

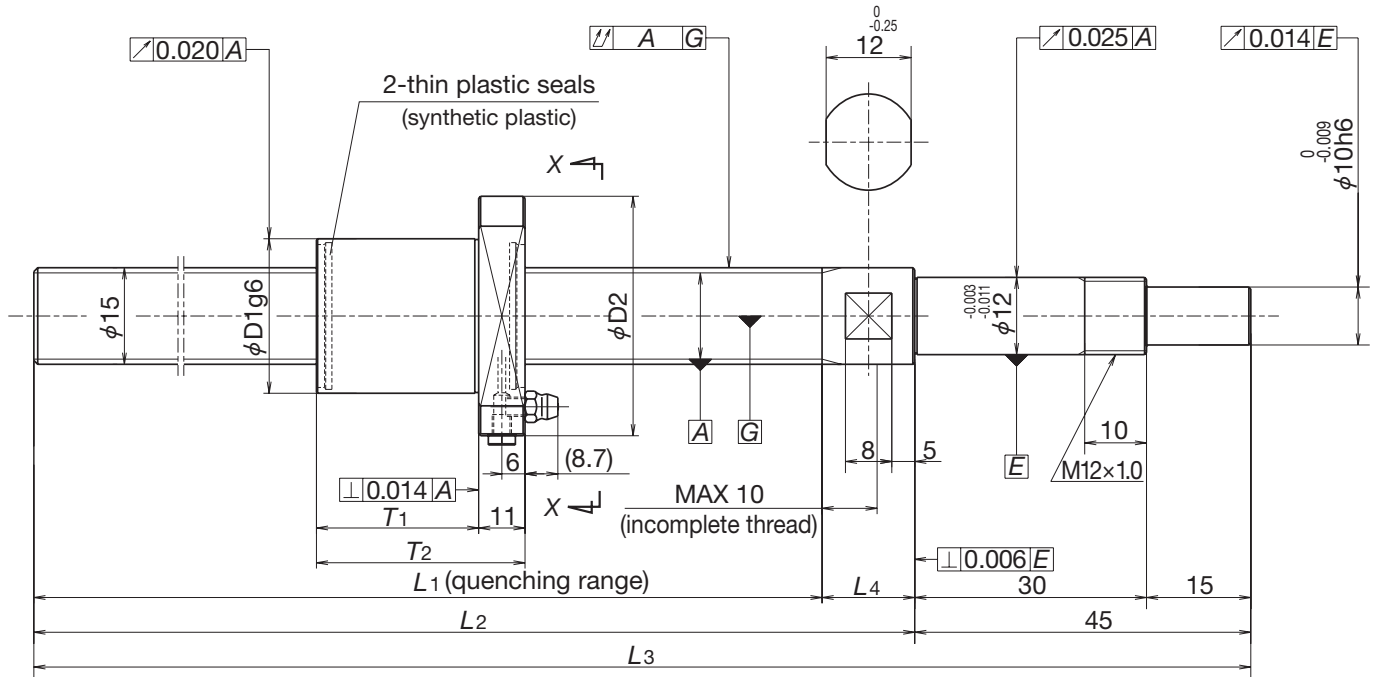
Unit: mm

| Lead accuracy | | | Shaft run-out A | Mass (kg) | Limiting speeds (min ⁻¹) | Nut internal space (cm ³) | Standard volume of grease replenishing (cm ³) |
|---------------------|---------------------|------------------------|----------------------|-----------|--------------------------------------|---------------------------------------|---|
| Target value T | Error θ_p | Variation v_{300} | | | Fixed - Support | | |
| 0 | 0.120 | 0.052 | 0.080 | 0.4 | 5 000 | 1.0 | 0.5 |
| 0 | 0.195 | 0.052 | 0.120 | 0.6 | 5 000 | 1.0 | 0.5 |
| 0 | 0.310 | 0.052 | 0.180 | 0.8 | 2 000 | 1.0 | 0.5 |

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



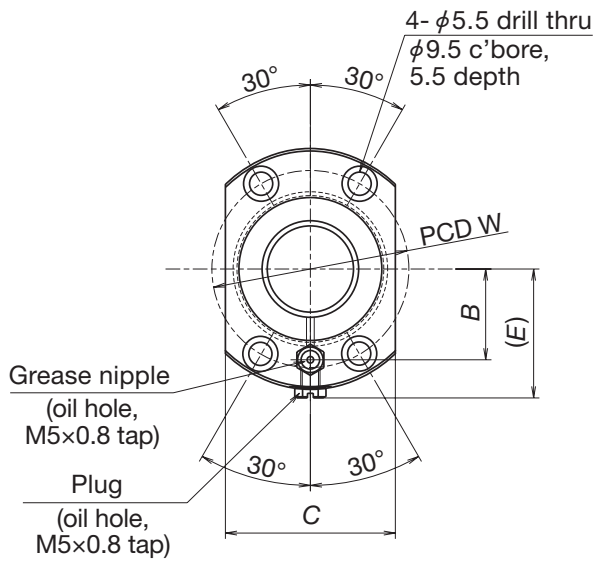
| Part number | Screw shaft diameter d | Lead l | Basic load ratings (N) | | Screw shaft length | | | | Nut dimensions | | | | | | | |
|-----------------------|--------------------------|----------|------------------------|-----------------|--------------------|-------|-------|-------|----------------|-------|-------|-------|-----|-----|-----|-----|
| | | | 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 |
| FSS1510N1D0500 | 15 | 10 | 5 460 | 10 200 | 440 | 455 | 500 | 15 | 32 | 43 | 28 | 51 | 39 | 18 | 31 | 28 |
| FSS1510N1D1000 | | | | | 940 | 955 | 1 000 | 15 | 32 | 43 | 28 | 51 | 39 | 18 | 31 | 28 |
| FSS1510N1D1450 | | | | | 1 390 | 1 405 | 1 450 | 15 | 32 | 43 | 28 | 51 | 39 | 18 | 31 | 28 |
| FSS1520N1D0500 | 15 | 20 | 5 070 | 8 730 | 437 | 455 | 500 | 18 | 40 | 51 | 32 | 55 | 43 | 20 | 33 | 30 |
| FSS1520N1D1000 | | | | | 937 | 955 | 1 000 | 18 | 40 | 51 | 32 | 55 | 43 | 20 | 33 | 30 |
| FSS1520N1D1450 | | | | | 1 387 | 1 405 | 1 450 | 18 | 40 | 51 | 32 | 55 | 43 | 20 | 33 | 30 |

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.

Screw Shaft $\phi 15$ Lead 10, 20

Unit: mm



View X-X

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 | Fixed side | Simple support side |
|--------------------------|------------|---------------------|
| WBK12-01B (square) | ○ | |
| WBK15SF-01B (square) | | ○ |
| WBK12-11 (round) | ○ | |

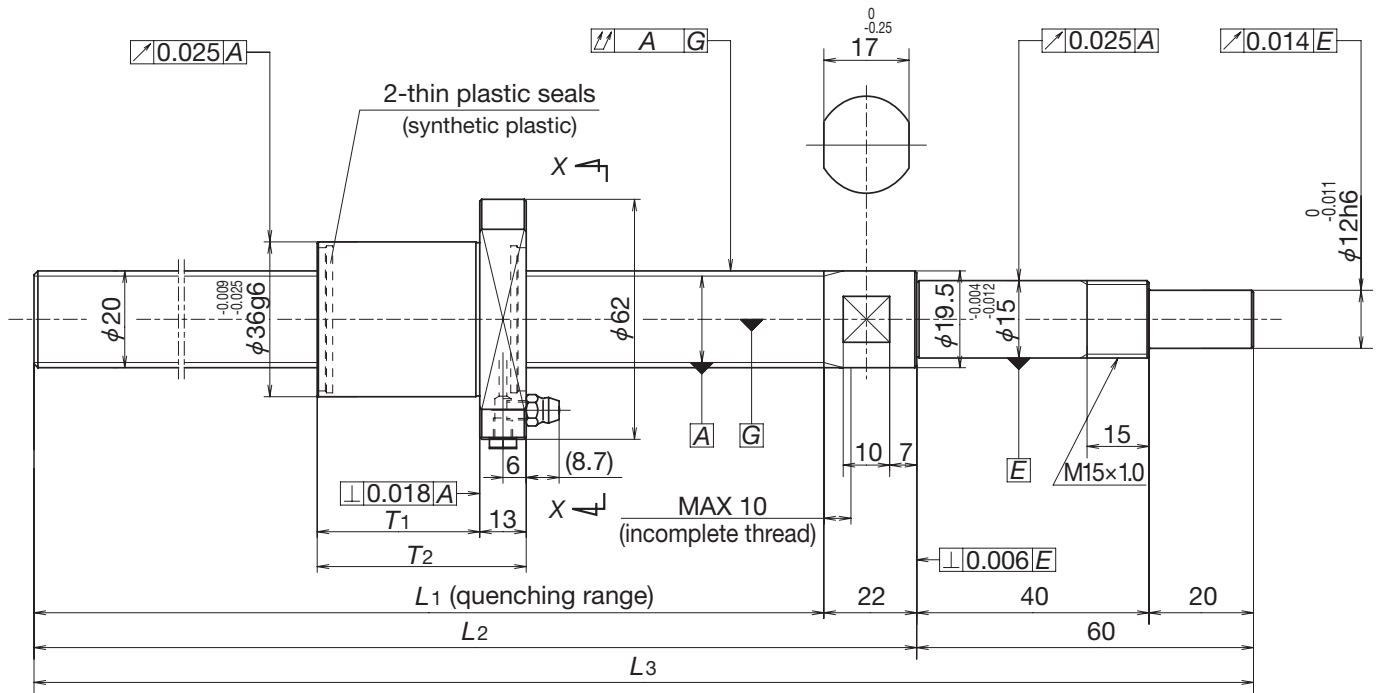
Unit: mm

| Lead accuracy | | | Shaft run-out A | Mass (kg) | Limiting speeds (min ⁻¹) | Nut internal space (cm ³) | Standard volume of grease replenishing (cm ³) |
|-------------------|---------------------|------------------------|--------------------|-----------|--------------------------------------|---------------------------------------|---|
| Target value T | Error θ_p | Variation v_{300} | | | Fixed - Support | | |
| 0 | 0.155 | 0.052 | 0.070 | 0.7 | 5 000 | 2.0 | 1.0 |
| | 0.310 | | 0.125 | 1.4 | 2 000 | | |
| | 0.490 | | 0.200 | 1.9 | 1 000 | | |
| 0 | 0.155 | 0.052 | 0.070 | 0.8 | 5 000 | 2.8 | 1.4 |
| | 0.310 | | 0.125 | 1.5 | 2 000 | | |
| | 0.490 | | 0.200 | 2.0 | 1 000 | | |

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



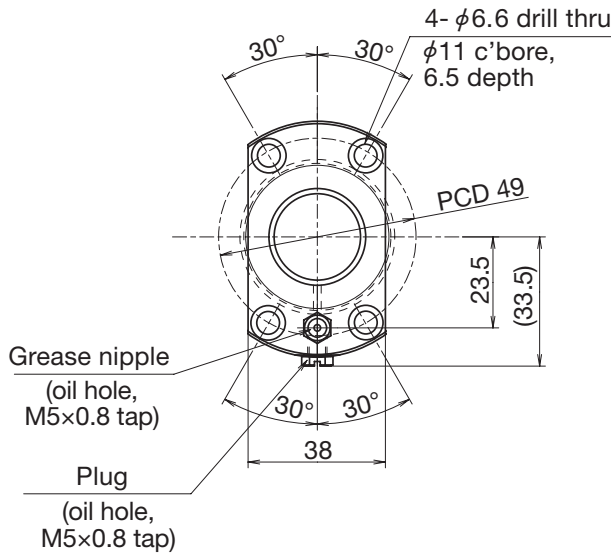
| Part number | Screw shaft diameter d | Lead l | Basic load ratings (N) | | Screw shaft length | | | Nut dimensions | |
|-----------------------|--------------------------|----------|------------------------|-----------------|--------------------|-------|-------|----------------|-------|
| | | | Dynamic C_a | Static C_{0a} | L_1 | L_2 | L_3 | T_1 | T_2 |
| FSS2010N1D0600 | 20 | 10 | 8 790 | 18 500 | 518 | 540 | 600 | 32 | 45 |
| FSS2010N1D1000 | | | | | 918 | 940 | 1 000 | | |
| FSS2010N1D1450 | | | | | 1 368 | 1 390 | 1 450 | | |
| FSS2020N1D0600 | 20 | 20 | 5 900 | 11 700 | 518 | 540 | 600 | 41 | 54 |
| FSS2020N1D1000 | | | | | 918 | 940 | 1 000 | | |
| FSS2020N1D1450 | | | | | 1 368 | 1 390 | 1 450 | | |

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.

Screw Shaft $\phi 20$ Lead 10, 20

Unit: mm



View X-X

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 | Fixed side | Simple support side |
|--------------------------|------------|---------------------|
| WBK15-01B (square) | ○ | |
| WBK20SF-01B (square) | | ○ |
| WBK15-11 (round) | ○ | |

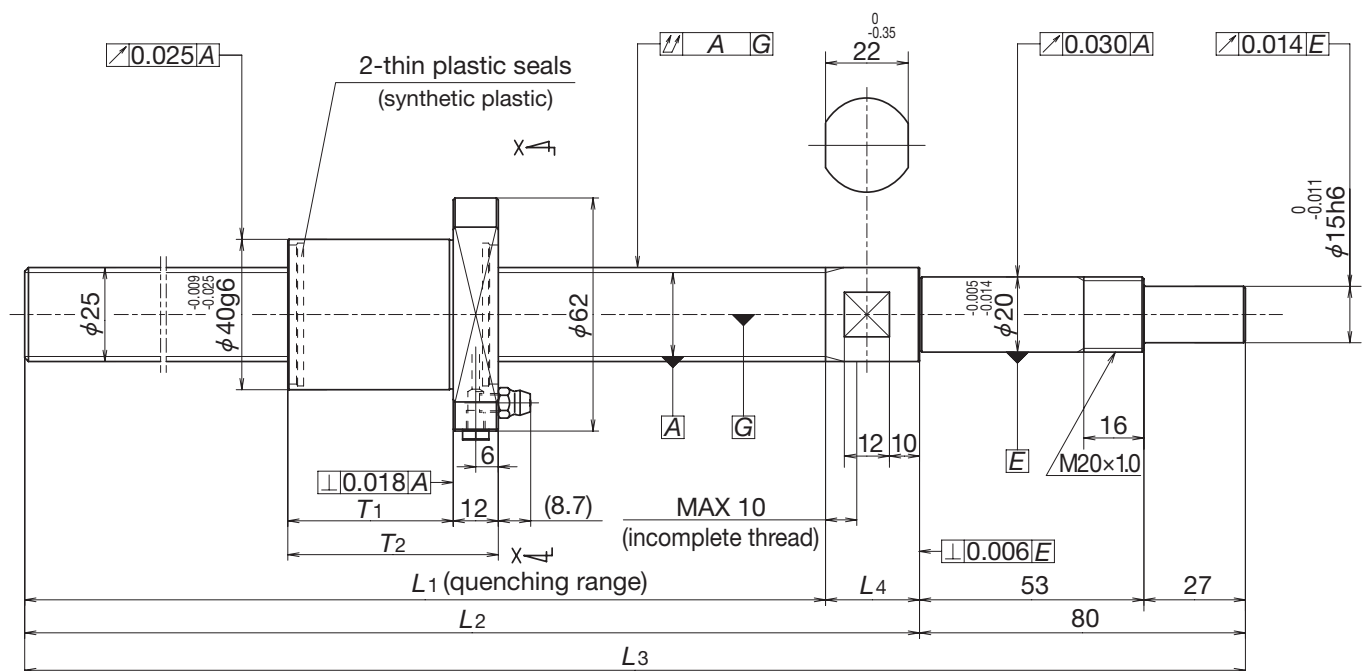
Unit: mm

| Lead accuracy | | | Shaft run-out A | Mass (kg) | Limiting speeds (min^{-1}) | Nut internal space (cm^3) | Standard volume of grease replenishing (cm^3) |
|---------------------|---------------------|------------------------|----------------------|--------------|--|---|---|
| Target value T | Error θ_p | Variation v_{300} | | | Fixed - Support | | |
| 0 | 0.195 | 0.052 | 0.085 | 1.4 | 5 000 | 3.2 | 1.6 |
| | 0.310 | | 0.125 | 2.4 | 3 000 | | |
| | 0.490 | | 0.200 | 3.4 | 1 500 | | |
| 0 | 0.195 | 0.052 | 0.085 | 1.5 | 5 000 | 3.2 | 1.6 |
| | 0.310 | | 0.125 | 2.5 | 3 000 | | |
| | 0.490 | | 0.200 | 3.5 | 1 500 | | |

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



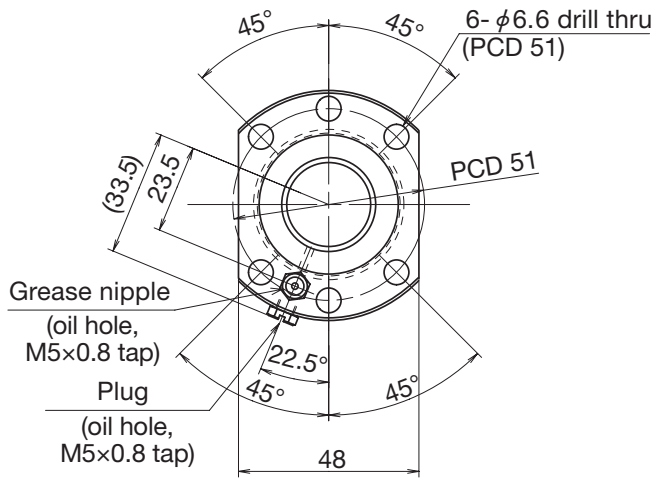
| Part number | Screw shaft diameter d | Lead l | Basic load ratings (N) | | Screw shaft length | | | | Nut dimensions | |
|-----------------------|-----------------------------|-------------|------------------------|--------------------|--------------------|-------|-------|-------|----------------|-------|
| | | | Dynamic C_a | Static C_{0a} | L_1 | L_2 | L_3 | L_4 | T_1 | T_2 |
| FSS2510N1D0600 | 25 | 10 | 12 800 | 32 300 | 493 | 520 | 600 | 27 | 44 | 56 |
| FSS2510N1D1000 | | | | | 893 | 920 | 1 000 | | | |
| FSS2510N1D1450 | | | | | 1 343 | 1 370 | 1 450 | | | |
| FSS2520N1D0600 | 25 | 20 | 6 560 | 14 600 | 494 | 520 | 600 | 26 | 42 | 54 |
| FSS2520N1D1000 | | | | | 894 | 920 | 1 000 | | | |
| FSS2520N1D1450 | | | | | 1 344 | 1 370 | 1 450 | | | |
| FSS2525N1D0600 | 25 | 25 | 6 560 | 14 600 | 490 | 520 | 600 | 30 | 51 | 63 |
| FSS2525N1D1000 | | | | | 890 | 920 | 1 000 | | | |
| FSS2525N1D1450 | | | | | 1 340 | 1 370 | 1 450 | | | |

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.

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

Unit: mm



View X-X

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 | Fixed side | Simple support side |
|--------------------------|------------|---------------------|
| WBK20-01 (square) | ○ | |
| WBK25SF-01 (square) | | ○ |
| WBK20-11 (round) | ○ | |

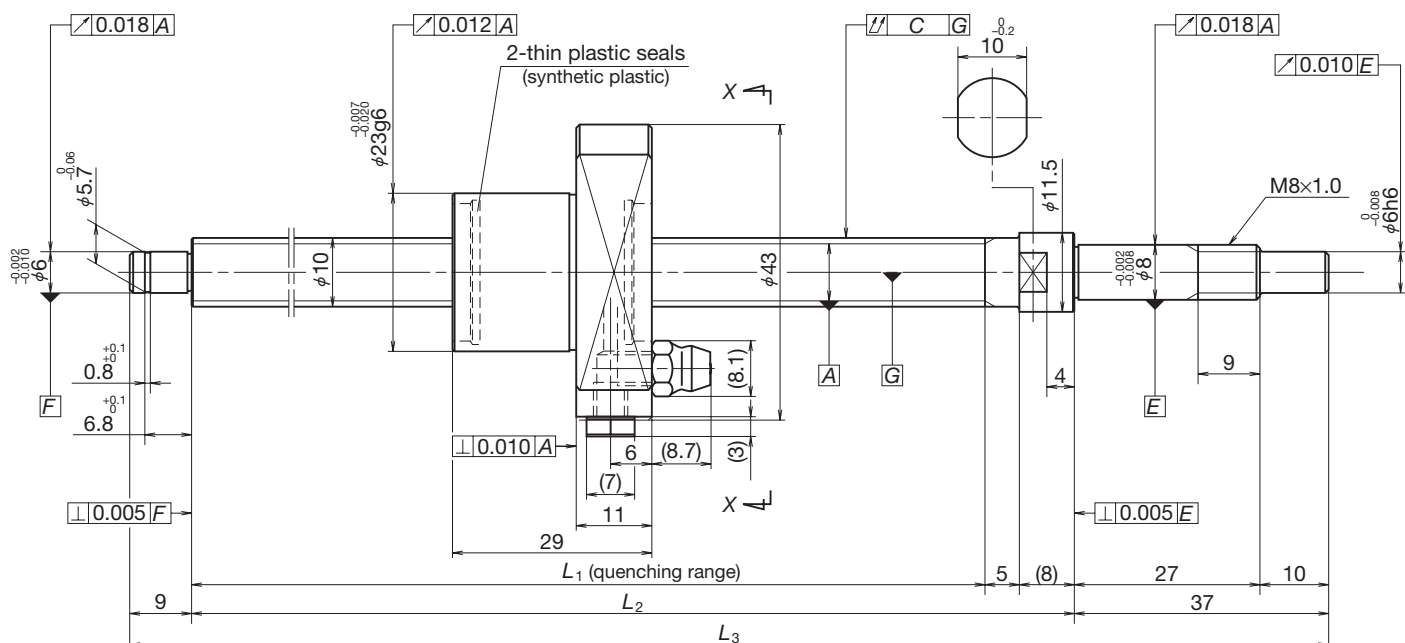
Unit: mm

| Lead accuracy | | | Shaft run-out A | Mass (kg) | Limiting speeds (min ⁻¹) | Nut internal space (cm ³) | Standard volume of grease replenishing (cm ³) |
|---------------------|---------------------|------------------------|----------------------|-----------|--------------------------------------|---------------------------------------|---|
| Target value T | Error θ_p | Variation v_{300} | | | Fixed - Support | | |
| 0 | 0.155 | 0.052 | 0.065 | 2.2 | 5 000 | 4.7 | 2.4 |
| | 0.310 | | 0.090 | 3.7 | 4 000 | | |
| | 0.490 | | 0.130 | 5.4 | 1 800 | | |
| 0 | 0.155 | 0.052 | 0.065 | 2.3 | 5 000 | 3.9 | 2.0 |
| | 0.310 | | 0.090 | 3.8 | 4 000 | | |
| | 0.490 | | 0.130 | 5.5 | 1 800 | | |
| 0 | 0.155 | 0.052 | 0.065 | 2.3 | 5 000 | 4.3 | 2.2 |
| | 0.310 | | 0.090 | 3.8 | 4 000 | | |
| | 0.490 | | 0.130 | 5.5 | 1 800 | | |

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 High Precision Series USS Type

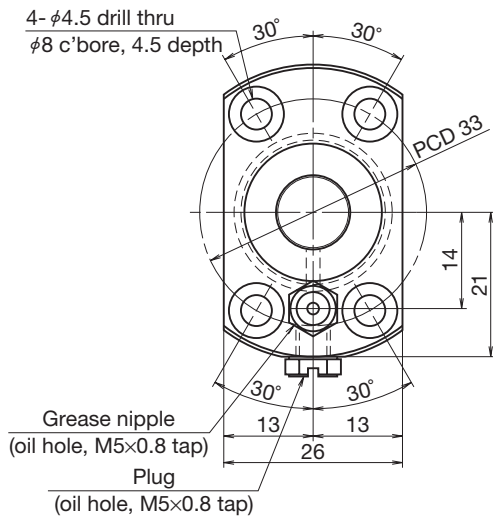


| Part number | Screw shaft diameter <i>d</i> | Lead <i>l</i> | Basic load ratings (N) | | Stroke | | Screw shaft length | | |
|-----------------------|----------------------------------|------------------|---------------------------------|---------------------------------|---------|----------------------------------|----------------------|----------------------|----------------------|
| | | | Dynamic <i>C_a</i> | Static <i>C_{0a}</i> | Nominal | Max. <i>L₁ - L</i> | <i>L₁</i> | <i>L₂</i> | <i>L₃</i> |
| USS1005N1D0221 | 10 | 5 | 2 930 | 4 790 | 100 | 133 | 162 | 175 | 221 |
| USS1005N1D0321 | 10 | 5 | 2 930 | 4 790 | 200 | 233 | 262 | 275 | 321 |
| USS1005N1D0521 | 10 | 5 | 2 930 | 4 790 | 400 | 433 | 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.

Screw Shaft $\phi 10$ Lead 5

Unit: mm



View X-X

| 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 | Fixed side | Simple support side |
|--------------------------|------------|---------------------|
| WBK08-01B (square) | ○ | |
| WBK08S-01B (square) | | ○ |
| WBK08-11B (round) | ○ | |

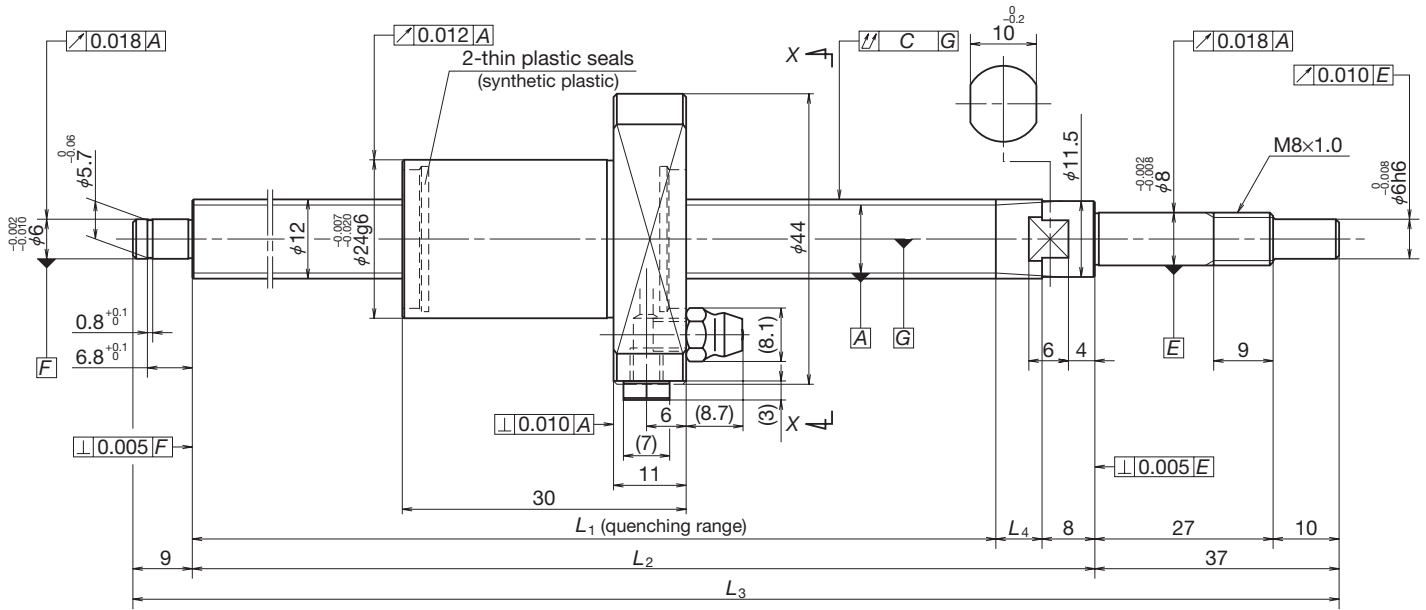
Unit: mm

| Lead accuracy | | | Shaft run-out C | Dynamic preload torque (N-cm) *1 | Mass (kg) | Limiting speeds (min ⁻¹) | Nut internal space (cm ³) | Standard volume of grease replenishing (cm ³) |
|------------------|-------------|-----------------|-------------------|----------------------------------|-----------|--------------------------------------|---------------------------------------|---|
| Target value T | Error e_p | Variation v_u | | | | Fixed - Support | | |
| 0 | 0.010 | 0.008 | 0.035 | 0.2 – 1.3 | 0.3 | 5 000 | 0.8 | 0.4 |
| 0 | 0.012 | 0.008 | 0.045 | 0.2 – 2.0 | 0.3 | 5 000 | 0.8 | 0.4 |
| 0 | 0.015 | 0.010 | 0.070 | 0.2 – 3.0 | 0.5 | 5 000 | 0.8 | 0.4 |

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



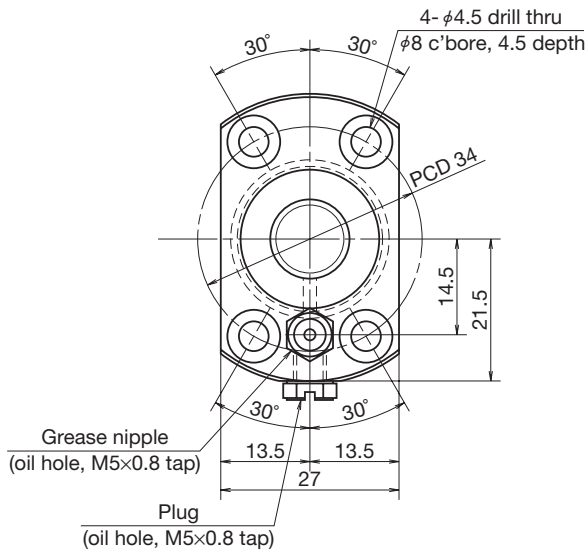
| Part number | Screw shaft diameter d | Lead l | Basic load ratings (N) | | Stroke | | Nut length L | Screw shaft length | | | |
|-----------------------|-----------------------------|-------------|------------------------|--------------------|---------|-------------------|-------------------|--------------------|-------|-------|-------|
| | | | Dynamic C_a | Static C_{0a} | Nominal | Max. $L_1 - L$ | | L_1 | L_2 | L_3 | L_4 |
| USS1205N1D0221 | 12 | 5 | 3 200 | 5 860 | 100 | 130 | 30 | 160 | 175 | 221 | 7 |
| USS1205N1D0321 | 12 | 5 | 3 200 | 5 860 | 200 | 230 | 30 | 260 | 275 | 321 | 7 |
| USS1205N1D0621 | 12 | 5 | 3 200 | 5 860 | 500 | 530 | 30 | 560 | 575 | 621 | 7 |

*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.

Screw Shaft $\phi 12$ Lead 5

Unit: mm



View X-X

| 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) | ○ | |

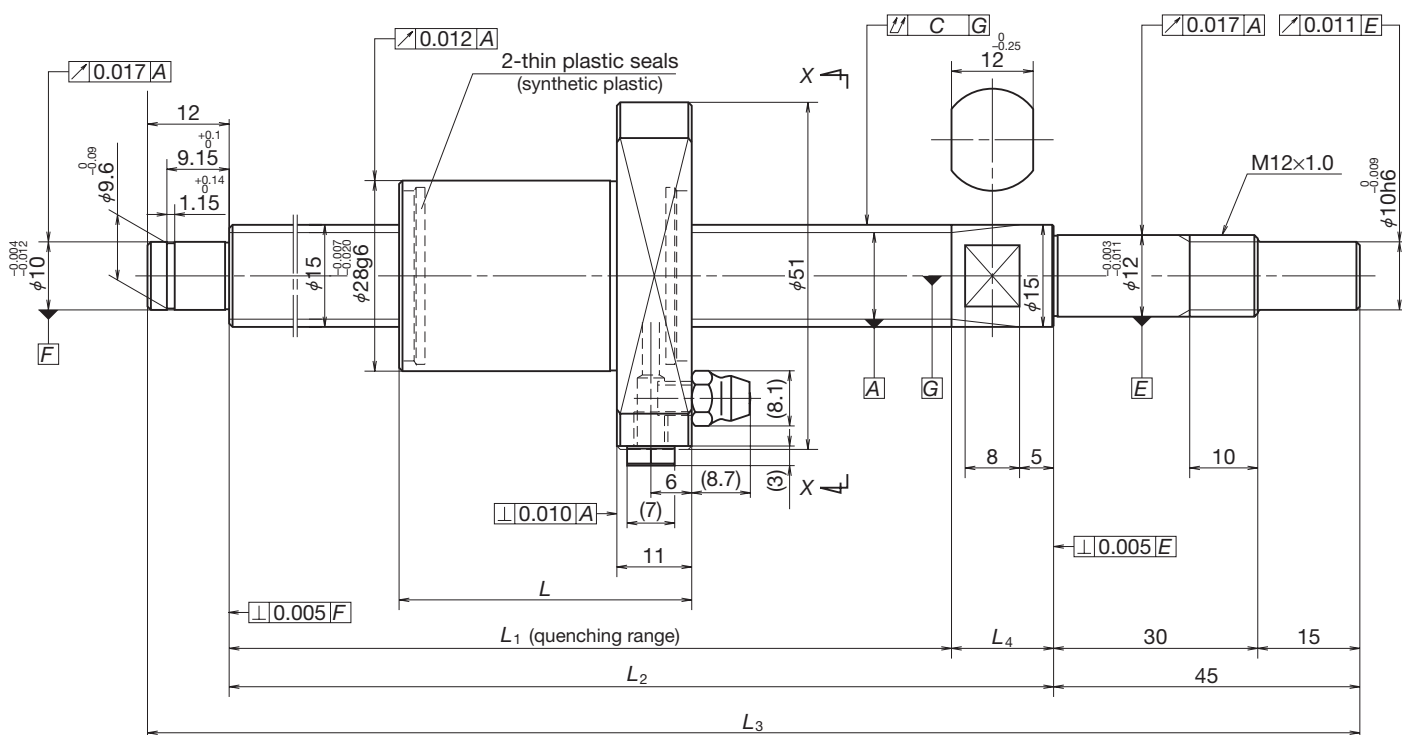
Unit: mm

| Lead accuracy | | | Shaft run-out C | Dynamic preload torque (N-cm) *1 | Mass (kg) | Limiting speeds (min ⁻¹) | Nut internal space (cm ³) | Standard volume of grease replenishing (cm ³) |
|------------------|-------------|-----------------|-------------------|----------------------------------|-----------|--------------------------------------|---------------------------------------|---|
| Target value T | Error e_p | Variation v_U | | | | Fixed - Support | | |
| 0 | 0.010 | 0.008 | 0.035 | 0.2 – 1.8 | 0.3 | 5 000 | 1.0 | 0.5 |
| 0 | 0.012 | 0.008 | 0.045 | 0.2 – 2.0 | 0.4 | 5 000 | 1.0 | 0.5 |
| 0 | 0.016 | 0.012 | 0.070 | 0.2 – 2.0 | 0.7 | 5 000 | 1.0 | 0.5 |

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

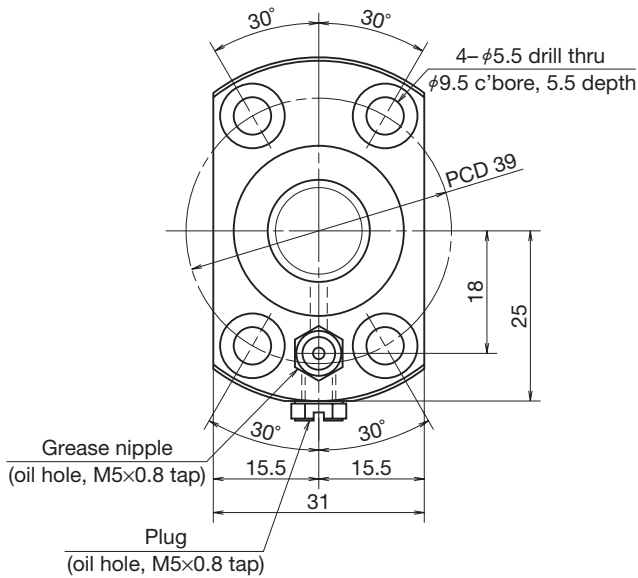


| Part number | Screw shaft diameter d | Lead l | Basic load ratings (N) | | Stroke | | Nut length L | Screw shaft length | | | |
|-----------------------|--------------------------|----------|------------------------|-----------------|---------|----------------|----------------|--------------------|-------|-------|-------|
| | | | Dynamic C_a | Static C_{0a} | Nominal | Max. $L_1 - L$ | | L_1 | L_2 | L_3 | L_4 |
| USS1505N1D0261 | 15 | 5 | 5 460 | 10 200 | 100 | 159 | 30 | 189 | 204 | 261 | 15 |
| USS1505N1D0361 | 15 | 5 | 5 460 | 10 200 | 200 | 259 | 30 | 289 | 304 | 361 | 15 |
| USS1505N1D0561 | 15 | 5 | 5 460 | 10 200 | 400 | 459 | 30 | 489 | 504 | 561 | 15 |
| USS1505N1D0761 | 15 | 5 | 5 460 | 10 200 | 600 | 659 | 30 | 689 | 704 | 761 | 15 |

*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.

Screw Shaft $\phi 15$ Lead 5

Unit: mm



View X-X

| 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) | | ○ |

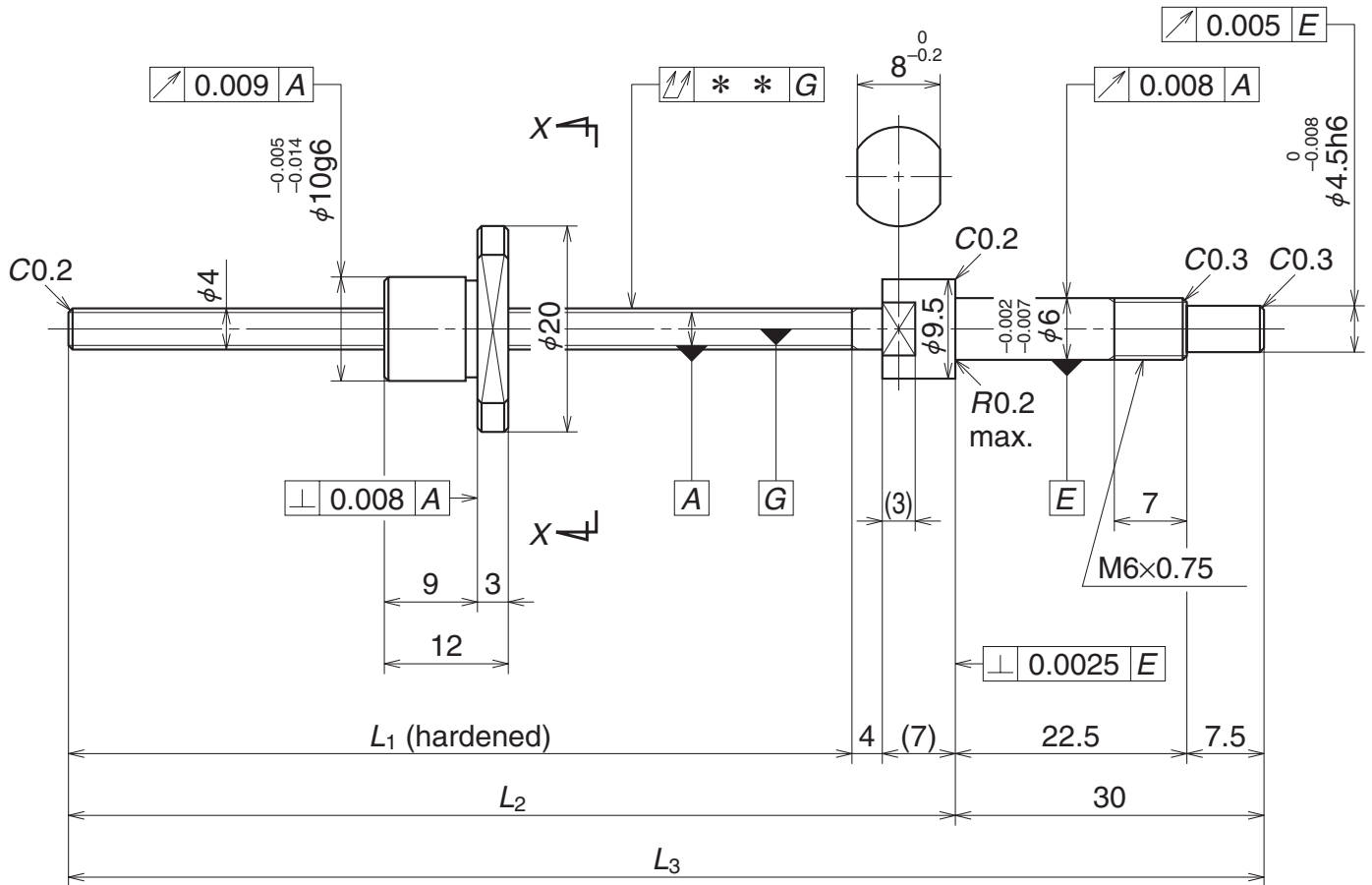
Unit: mm

| Lead accuracy | | | Shaft run-out C | Dynamic preload torque (N-cm) *1 | Mass (kg) | Limiting speeds (min ⁻¹) | Nut internal space (cm ³) | Standard volume of grease replenishing (cm ³) |
|------------------|-------------|-----------------|-------------------|----------------------------------|-----------|--------------------------------------|---------------------------------------|---|
| Target value T | Error e_p | Variation v_u | | | | Fixed - Support | | |
| 0 | 0.010 | 0.008 | 0.025 | 0.2 – 5.0 | 0.5 | 5 000 | 2.0 | 1.0 |
| 0 | 0.012 | 0.008 | 0.035 | 0.2 – 5.0 | 0.6 | 5 000 | 2.0 | 1.0 |
| 0 | 0.015 | 0.010 | 0.045 | 0.2 – 6.0 | 0.9 | 5 000 | 2.0 | 1.0 |
| 0 | 0.018 | 0.013 | 0.060 | 0.2 – 8.0 | 1.1 | 3 600 | 2.0 | 1.0 |

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

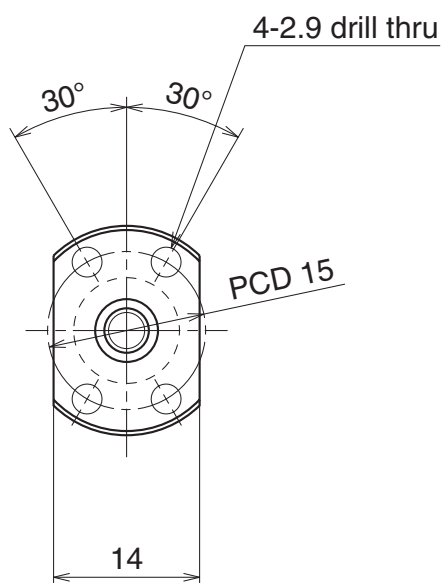


| Part number | Stroke | | Screw shaft length | | |
|-------------------------|---------|---------------------------------|--------------------|-------|--|
| | Nominal | Maximum (L_1 -Nut length) | L_1 | L_2 | |
| W0400MA-1PY-C3Z1 | 20 | 32 | 44 | 55 | |
| W0400MA-3PY-C3Z1 | 40 | 52 | 64 | 75 | |
| W0401MA-1PY-C3Z1 | 70 | 82 | 94 | 105 | |

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

Screw Shaft $\phi 4$ Lead 1

Unit: mm



View X-X

| 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) | |

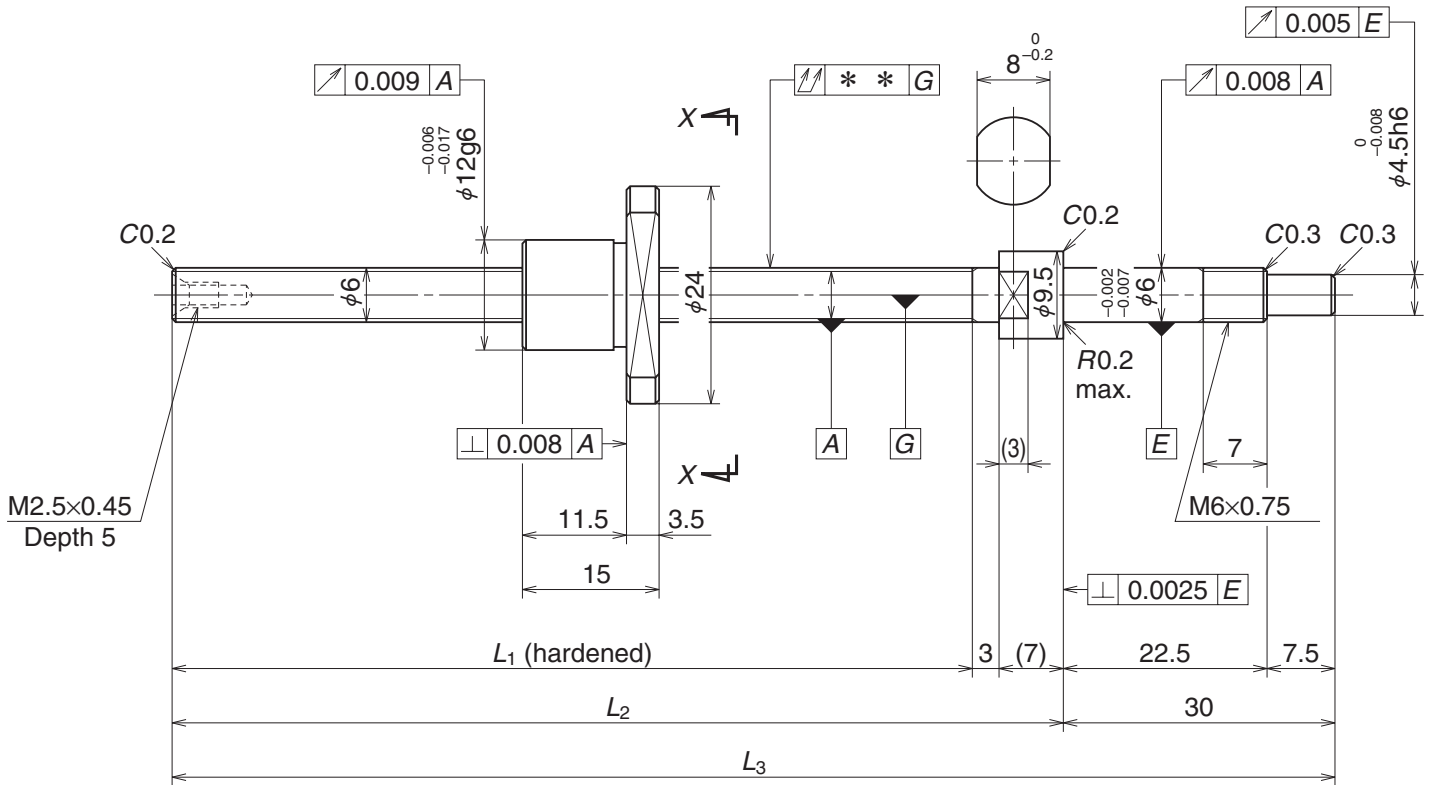
Ball Screws A Series

Unit: mm

| L_3 | Lead accuracy | | | Shaft run-out ** \updownarrow | Mass (kg) | Permissible rotational speed N (min ⁻¹) |
|-------|------------------|-------------|-----------------|------------------------------------|-----------|---|
| | Target value T | Error e_p | Variation v_U | | | Supporting condition |
| | | | | | | Fixed - Free |
| 85 | 0 | 0.008 | 0.008 | 0.015 | 0.024 | 3 000 |
| 105 | 0 | 0.008 | 0.008 | 0.020 | 0.026 | 3 000 |
| 135 | 0 | 0.008 | 0.008 | 0.025 | 0.028 | 3 000 |

Ball Screws A Series: Finished Shaft End

Nut Model: MPFD

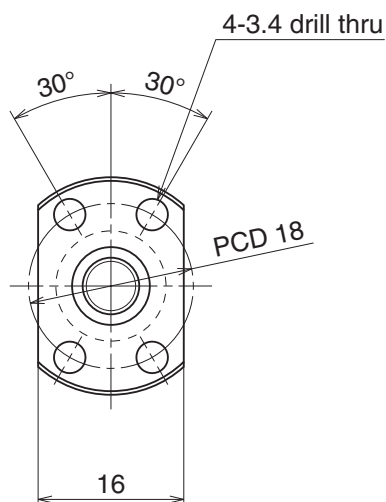


| Part number | Stroke | | Screw shaft length | | |
|-------------------------|---------|---------------------------------|--------------------|-------|--|
| | Nominal | Maximum (L_1 -Nut length) | L_1 | L_2 | |
| W0600MA-1PY-C3Z1 | 40 | 50 | 65 | 75 | |
| W0601MA-1PY-C3Z1 | 70 | 80 | 95 | 105 | |
| W0601MA-3PY-C3Z1 | 100 | 110 | 125 | 135 | |

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

Screw Shaft $\phi 6$ Lead 1

Unit: mm



View X-X

| Ball Screw Specifications | | |
|---------------------------------------|-----------------------|-----|
| Shaft dia. × Lead / Direction of turn | 6 × 1 / Right | |
| Preload / Ball recirculation | P-preload / Deflector | |
| Ball dia. / Ball circle dia. | 0.800 / 6.2 | |
| Effective turns of balls | 1 × 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) |

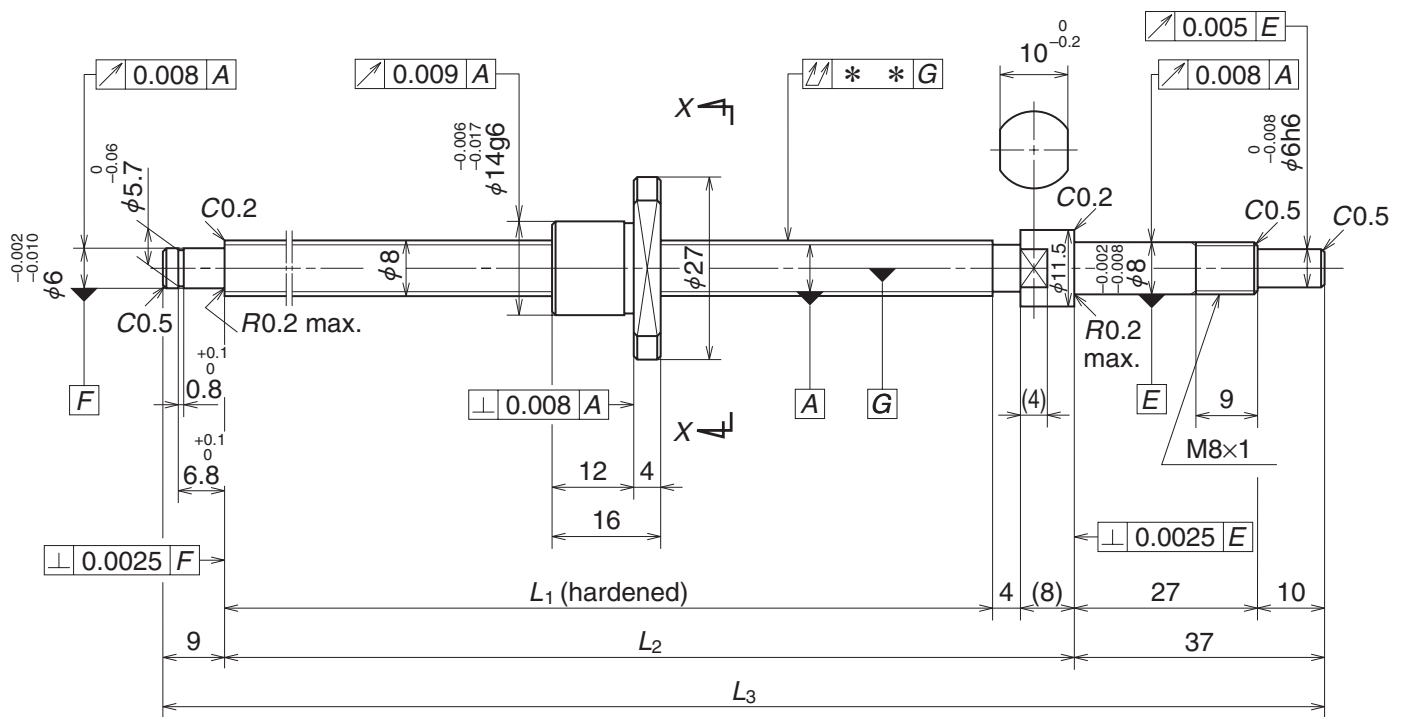
Ball Screws A Series

Unit: mm

| L_3 | Lead accuracy | | | Shaft run-out ** ↕ | Mass (kg) | Permissible rotational speed N (min ⁻¹) |
|-------|------------------|-------------|-----------------|-----------------------|-----------|---|
| | Target value T | Error e_p | Variation v_U | | | Supporting condition |
| | | | | | | Fixed - Free |
| 105 | 0 | 0.008 | 0.008 | 0.015 | 0.039 | 3 000 |
| 135 | 0 | 0.008 | 0.008 | 0.020 | 0.045 | 3 000 |
| 165 | 0 | 0.010 | 0.008 | 0.025 | 0.051 | 3 000 |

Ball Screws A Series: Finished Shaft End

Nut Model: MPFD

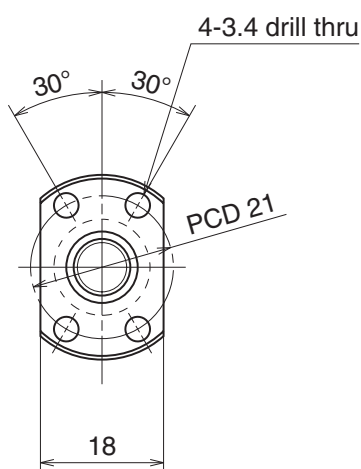


| Part number | Stroke | | Screw shaft length | | |
|-------------------------|---------|---------------------------------|--------------------|-------|--|
| | Nominal | Maximum (L_1 -Nut length) | L_1 | L_2 | |
| W0800MA-1PY-C3Z1 | 40 | 64 | 80 | 92 | |
| W0801MA-1PY-C3Z1 | 70 | 94 | 110 | 122 | |
| W0801MA-3PY-C3Z1 | 100 | 124 | 140 | 152 | |
| W0802MA-1PY-C3Z1 | 150 | 174 | 190 | 202 | |

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

Screw Shaft $\phi 8$ Lead 1

Unit: mm



View X-X

| Ball Screw Specifications | | |
|---------------------------------------|-----------------------|-------|
| Shaft dia. × Lead / Direction of turn | 8 × 1 / Right | |
| Preload / Ball recirculation | P-preload / Deflector | |
| Ball dia. / Ball circle dia. | 0.800 / 8.2 | |
| Effective turns of balls | 1 × 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 | |

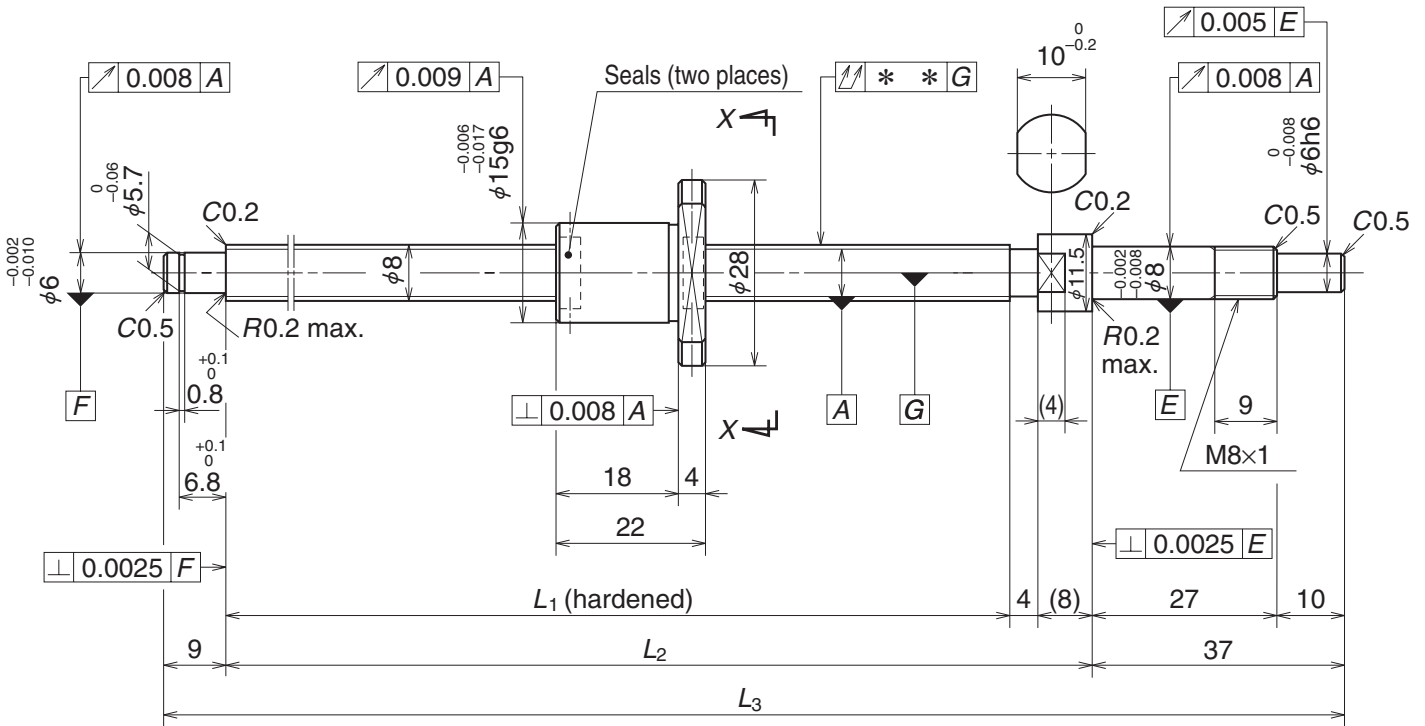
| Recommended Support Unit | Fixed side | Simple support side |
|--------------------------|------------|---------------------|
| WBK08-01A (square) | ○ | |
| WBK08S-01 (square) | | ○ |
| WBK08-11 (round) | ○ | |

Unit: mm

| L_3 | Lead accuracy | | | Shaft run-out ** ↕ | Mass (kg) | Permissible rotational speed N (min ⁻¹) |
|-------|------------------|-------------|-----------------|-----------------------|-----------|---|
| | Target value T | Error e_p | Variation v_U | | | Supporting condition |
| | | | | | | Fixed - Simple support |
| 138 | 0 | 0.008 | 0.008 | 0.025 | 0.073 | 3 000 |
| 168 | 0 | 0.010 | 0.008 | 0.030 | 0.084 | 3 000 |
| 198 | 0 | 0.010 | 0.008 | 0.030 | 0.095 | 3 000 |
| 248 | 0 | 0.010 | 0.008 | 0.035 | 0.11 | 3 000 |

Ball Screws A Series: Finished Shaft End

Nut Model: MPFD

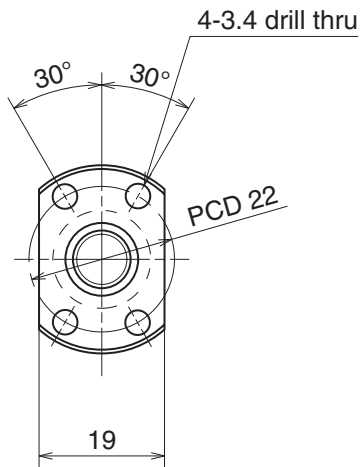


| Part number | Stroke | | Screw shaft length | | |
|---------------------------|---------|---------------------------------|--------------------|-------|--|
| | Nominal | Maximum (L_1 -Nut length) | L_1 | L_2 | |
| W0800MA-3PY-C3Z1.5 | 40 | 58 | 80 | 92 | |
| W0801MA-5PY-C3Z1.5 | 70 | 88 | 110 | 122 | |
| W0801MA-7PY-C3Z1.5 | 100 | 118 | 140 | 152 | |
| W0802MA-3PY-C3Z1.5 | 150 | 168 | 190 | 202 | |

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

Screw Shaft $\phi 8$ Lead 1.5

Unit: mm



View X-X

| Ball Screw Specifications | | |
|---------------------------------------|-----------------------|-------|
| Shaft dia. × Lead / Direction of turn | 8 × 1.5 / Right | |
| Preload / Ball recirculation | P-preload / Deflector | |
| Ball dia. / Ball circle dia. | 1.000 / 8.3 | |
| Effective turns of balls | 1 × 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 | |

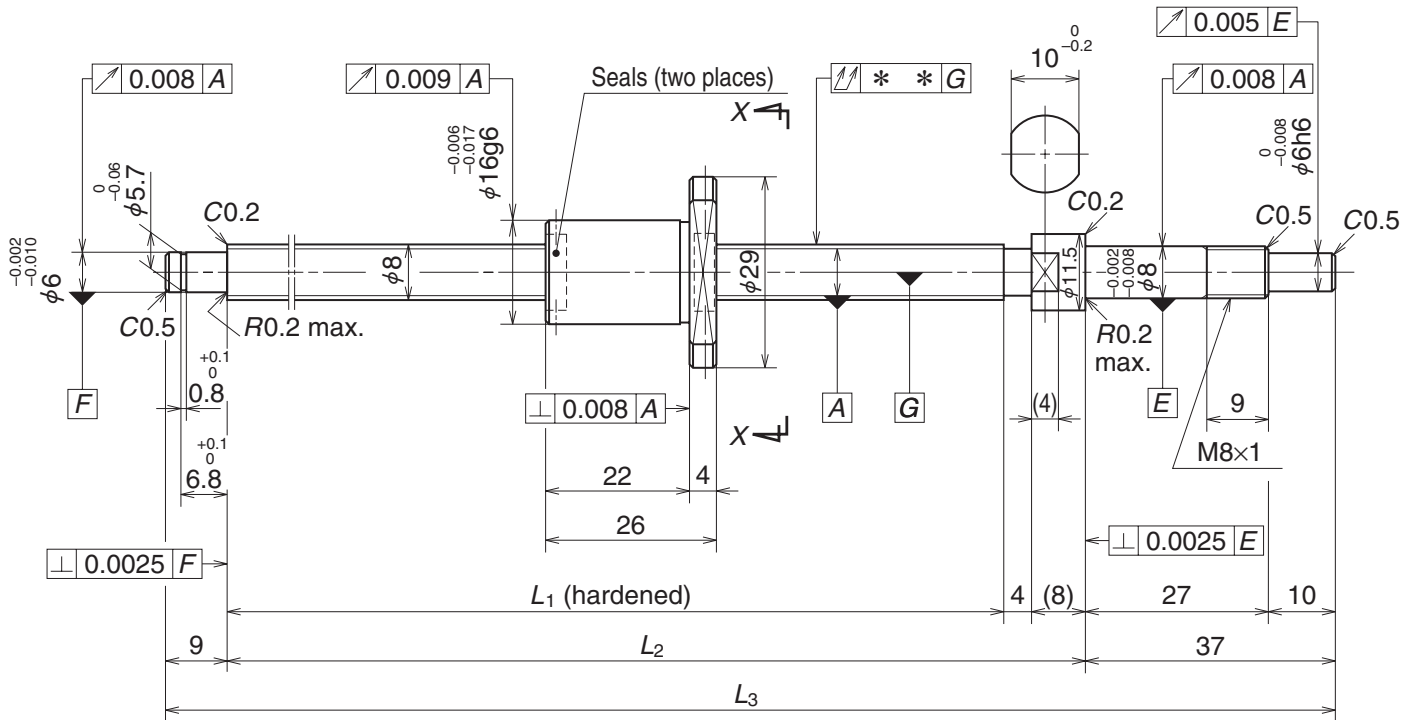
| Recommended Support Unit | Fixed side | Simple support side |
|--------------------------|------------|---------------------|
| WBK08-01A (square) | ○ | |
| WBK08S-01 (square) | | ○ |
| WBK08-11 (round) | ○ | |

Unit: mm

| L_3 | Lead accuracy | | | Shaft run-out ** ↕ | Mass (kg) | Permissible rotational speed N (min ⁻¹) |
|-------|------------------|-------------|-----------------|-----------------------|-----------|---|
| | Target value T | Error e_p | Variation v_U | | | Supporting condition |
| | | | | | | Fixed - Simple support |
| 138 | 0 | 0.008 | 0.008 | 0.025 | 0.082 | 3 000 |
| 168 | 0 | 0.010 | 0.008 | 0.030 | 0.093 | 3 000 |
| 198 | 0 | 0.010 | 0.008 | 0.030 | 0.10 | 3 000 |
| 248 | 0 | 0.010 | 0.008 | 0.035 | 0.12 | 3 000 |

Ball Screws A Series: Finished Shaft End

Nut Model: MPFD

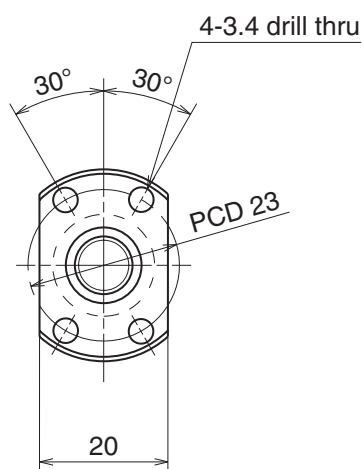


| Part number | Stroke | | Screw shaft length | | |
|--------------------------|---------|------------------------------|--------------------|-------|--|
| | Nominal | Maximum (L_1 -Nut length) | L_1 | L_2 | |
| W0800MA-5PY-C3Z2 | 40 | 54 | 80 | 92 | |
| W0801MA-9PY-C3Z2 | 70 | 84 | 110 | 122 | |
| W0801MA-11PY-C3Z2 | 100 | 114 | 140 | 152 | |
| W0802MA-5PY-C3Z2 | 150 | 164 | 190 | 202 | |

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

Screw Shaft $\phi 8$ Lead 2

Unit: mm



View X-X

| Ball Screw Specifications | | |
|---------------------------------------|-----------------------|-------|
| Shaft dia. × Lead / Direction of turn | 8 × 2 / Right | |
| Preload / Ball recirculation | P-preload / Deflector | |
| Ball dia. / Ball circle dia. | 1.200 / 8.3 | |
| Effective turns of balls | 1 × 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 | |

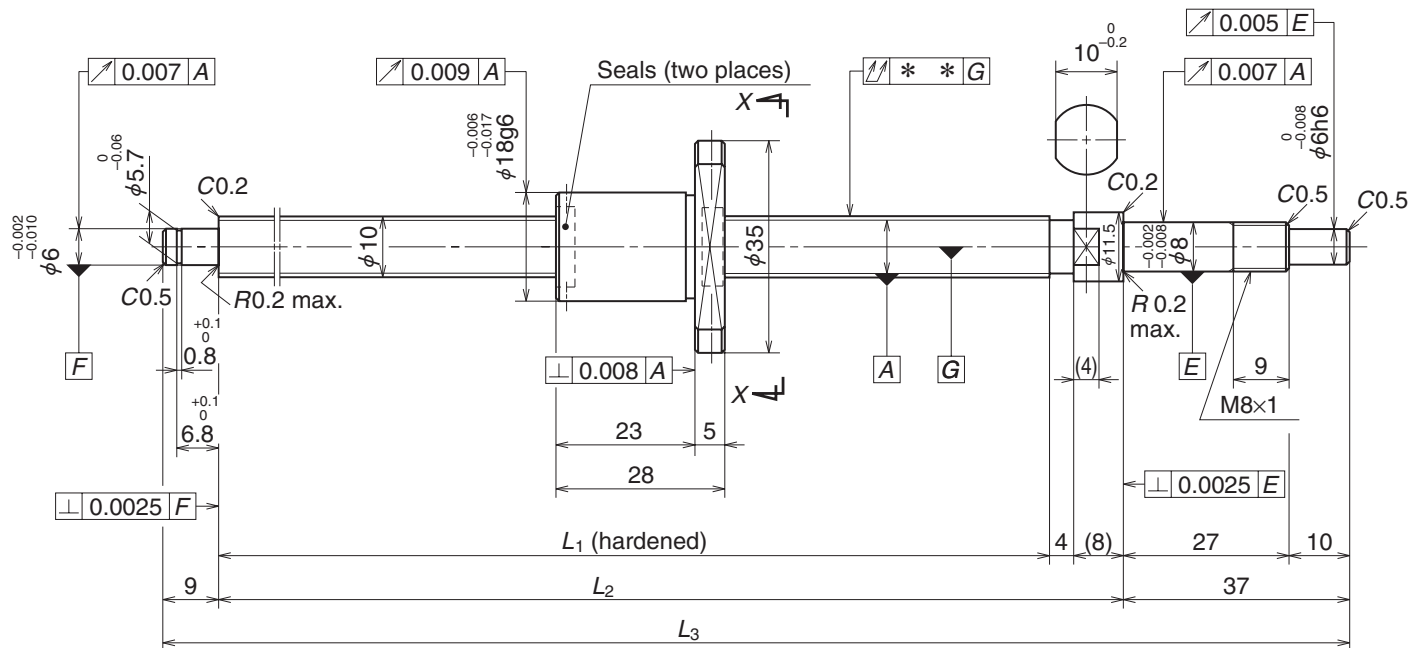
| Recommended Support Unit | Fixed side | Simple support side |
|--------------------------|------------|---------------------|
| WBK08-01A (square) | ○ | |
| WBK08S-01 (square) | | ○ |
| WBK08-11 (round) | ○ | |

Unit: mm

| L_3 | Lead accuracy | | | Shaft run-out ** ↕ | Mass (kg) | Permissible rotational speed N (min ⁻¹) |
|-------|------------------|-------------|-----------------|-----------------------|-----------|---|
| | Target value T | Error e_p | Variation v_U | | | Supporting condition |
| | | | | | | Fixed - Simple support |
| 138 | 0 | 0.008 | 0.008 | 0.025 | 0.09 | 3 000 |
| 168 | 0 | 0.010 | 0.008 | 0.030 | 0.10 | 3 000 |
| 198 | 0 | 0.010 | 0.008 | 0.030 | 0.11 | 3 000 |
| 248 | 0 | 0.010 | 0.008 | 0.035 | 0.13 | 3 000 |

Ball Screws A Series: Finished Shaft End

Nut Model: MPFD

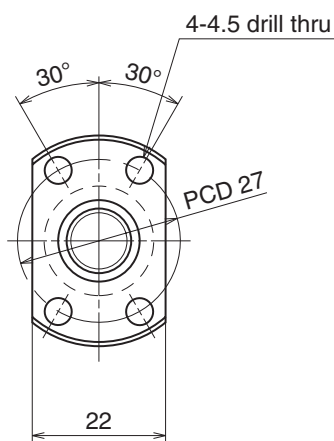


| Part number | Stroke | | Screw shaft length | | |
|-------------------------|---------|---------------------------------|--------------------|-------|--|
| | Nominal | Maximum (L_1 -Nut length) | L_1 | L_2 | |
| W1001MA-1PY-C3Z2 | 50 | 72 | 100 | 112 | |
| W1001MA-3PY-C3Z2 | 100 | 122 | 150 | 162 | |
| W1002MA-1PY-C3Z2 | 150 | 172 | 200 | 212 | |
| W1002MA-3PY-C3Z2 | 200 | 222 | 250 | 262 | |

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

Screw Shaft $\phi 10$ Lead 2

Unit: mm



View X-X

Ball Screw Specifications

| | | |
|---------------------------------------|-----------------|-----------------------|
| Shaft dia. × Lead / Direction of turn | | 10 × 2 / Right |
| Preload / Ball recirculation | | P-preload / Deflector |
| Ball dia. / Ball circle dia. | | 1.200 / 10.3 |
| Effective turns of balls | | 1 × 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 |

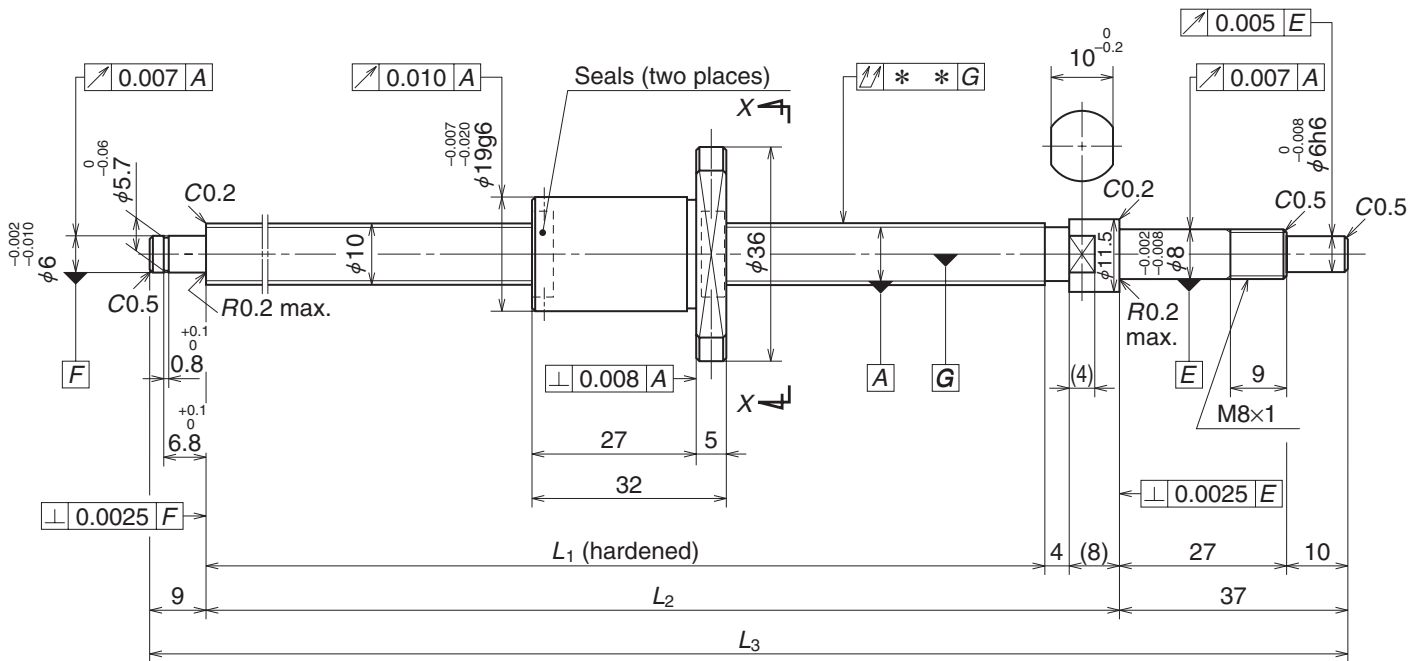
| Recommended Support Unit | Fixed side | Simple support side |
|--------------------------|------------|---------------------|
| WBK08-01A (square) | ○ | |
| WBK08S-01 (square) | | ○ |
| WBK08-11 (round) | ○ | |

Unit: mm

| L_3 | Lead accuracy | | | Shaft run-out ** ↕ | Mass (kg) | Permissible rotational speed N (min ⁻¹) |
|-------|------------------|-------------|-----------------|-----------------------|-----------|---|
| | Target value T | Error e_p | Variation v_U | | | Supporting condition |
| | | | | | | Fixed - Simple support |
| 158 | 0 | 0.008 | 0.008 | 0.020 | 0.13 | 3 000 |
| 208 | 0 | 0.010 | 0.008 | 0.030 | 0.16 | 3 000 |
| 258 | 0 | 0.010 | 0.008 | 0.030 | 0.19 | 3 000 |
| 308 | 0 | 0.012 | 0.008 | 0.030 | 0.22 | 3 000 |

Ball Screws A Series: Finished Shaft End

Nut Model: MPFD

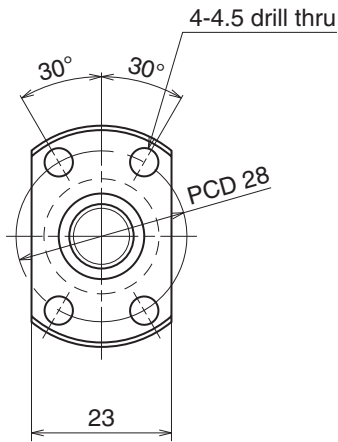


| Part number | Stroke | | Screw shaft length | | |
|---------------------------|---------|---------------------------------|--------------------|-------|--|
| | Nominal | Maximum (L_1 -Nut length) | L_1 | L_2 | |
| W1001MA-5PY-C3Z2.5 | 50 | 68 | 100 | 112 | |
| W1001MA-7PY-C3Z2.5 | 100 | 118 | 150 | 162 | |
| W1002MA-5PY-C3Z2.5 | 150 | 168 | 200 | 212 | |
| W1002MA-7PY-C3Z2.5 | 200 | 218 | 250 | 262 | |

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

Screw Shaft $\phi 10$ Lead 2.5

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) | ○ | |

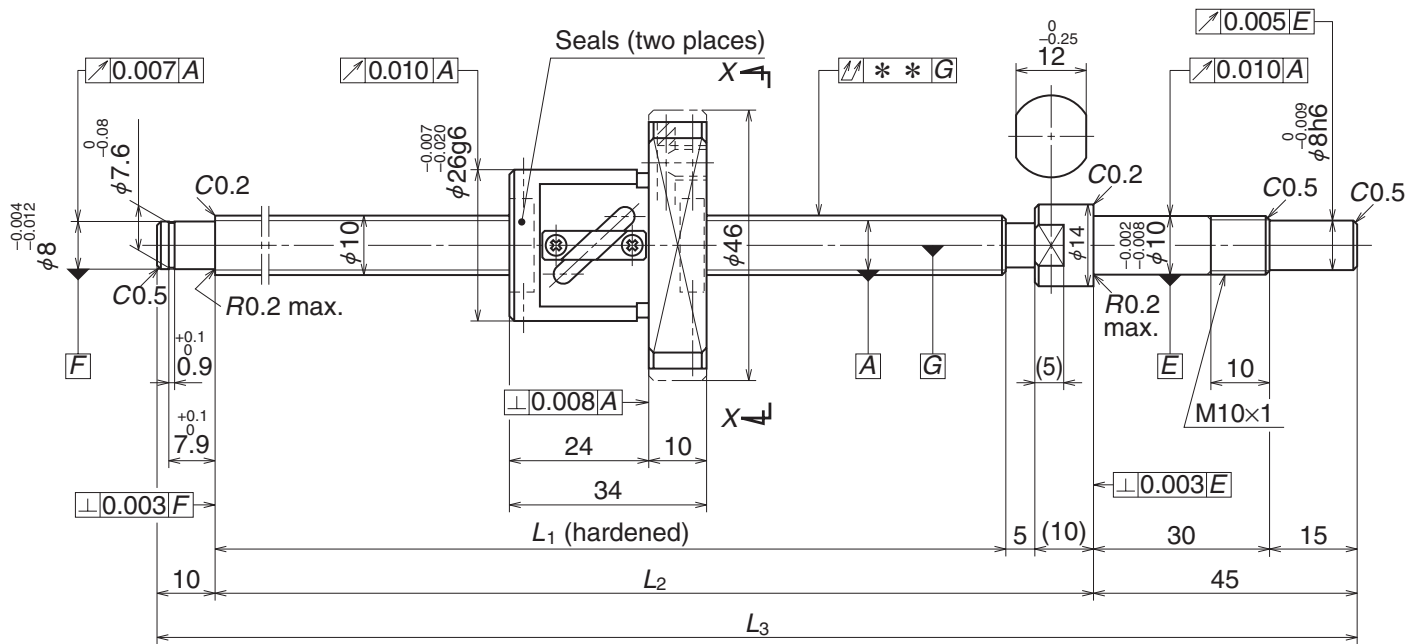
Ball Screws A Series

Unit: mm

| L_3 | Lead accuracy | | | Shaft run-out ** ↕ | Mass (kg) | Permissible rotational speed N (min ⁻¹) |
|-------|------------------|-------------|-----------------|-----------------------|-----------|---|
| | Target value T | Error e_p | Variation v_U | | | Supporting condition |
| | | | | | | Fixed - Simple support |
| 158 | 0 | 0.008 | 0.008 | 0.020 | 0.14 | 3 000 |
| 208 | 0 | 0.010 | 0.008 | 0.030 | 0.17 | 3 000 |
| 258 | 0 | 0.010 | 0.008 | 0.030 | 0.20 | 3 000 |
| 308 | 0 | 0.012 | 0.008 | 0.030 | 0.23 | 3 000 |

Ball Screws A Series: Finished Shaft End

Nut Model: PFT

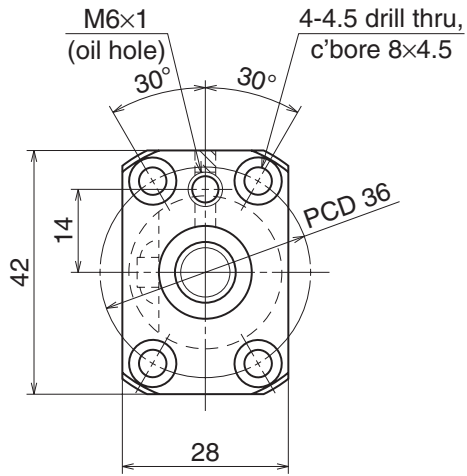


| Part number | Stroke | | Screw shaft length | | |
|------------------------|---------|---------------------------------|--------------------|-------|--|
| | Nominal | Maximum (L_1 -Nut length) | L_1 | L_2 | |
| W1001FA-1P-C3Z4 | 50 | 76 | 110 | 125 | |
| W1001FA-3P-C3Z4 | 100 | 126 | 160 | 175 | |
| W1002FA-1P-C3Z4 | 150 | 176 | 210 | 225 | |
| W1002FA-3P-C3Z4 | 200 | 226 | 260 | 275 | |
| W1003FA-1P-C3Z4 | 250 | 276 | 310 | 325 | |
| W1003FA-3P-C3Z4 | 300 | 326 | 360 | 375 | |

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

Screw Shaft $\phi 10$ Lead 4

Unit: mm



View X-X

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 ³) | | 0.8 |

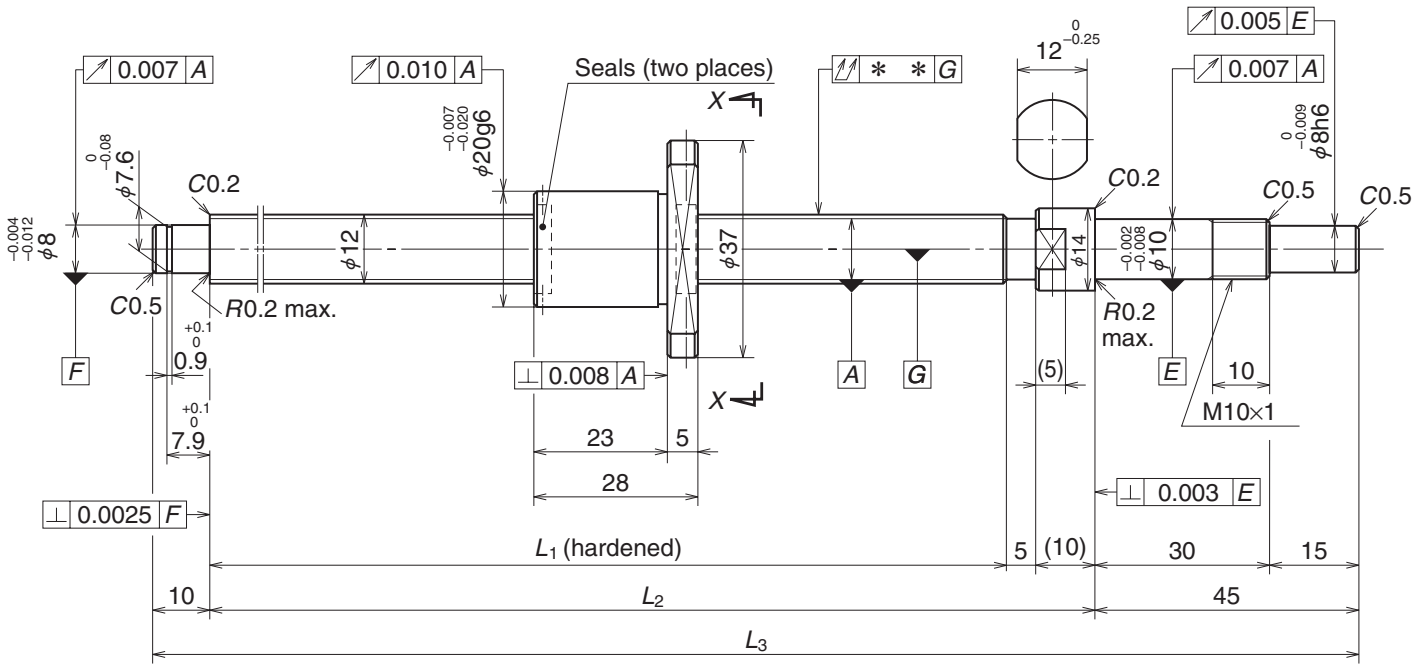
| Recommended Support Unit | Fixed side | Simple support side |
|--------------------------|------------|---------------------|
| WBK10-01A (square) | ○ | |
| WBK10S-01 (square) | | ○ |
| WBK10-11 (round) | ○ | |

Unit: mm

| L_3 | Lead accuracy | | | Shaft run-out ** ↕ | Mass (kg) | Permissible rotational speed N (min ⁻¹) |
|-------|------------------|-------------|-----------------|-----------------------|-----------|---|
| | Target value T | Error e_p | Variation v_U | | | Supporting condition |
| | | | | | | Fixed - Simple support |
| 180 | 0 | 0.010 | 0.008 | 0.020 | 0.26 | 3 000 |
| 230 | 0 | 0.010 | 0.008 | 0.030 | 0.28 | 3 000 |
| 280 | 0 | 0.012 | 0.008 | 0.030 | 0.31 | 3 000 |
| 330 | 0 | 0.012 | 0.008 | 0.040 | 0.34 | 3 000 |
| 380 | 0 | 0.012 | 0.008 | 0.040 | 0.37 | 3 000 |
| 430 | 0 | 0.013 | 0.010 | 0.050 | 0.39 | 3 000 |

Ball Screws A Series: Finished Shaft End

Nut Model: MPFD

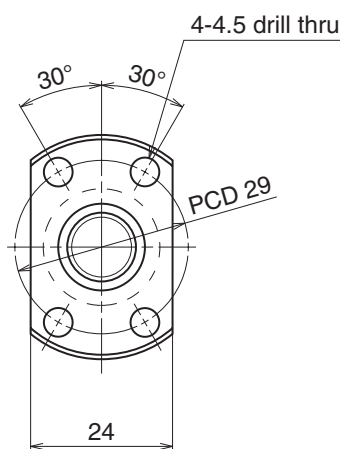


| Part number | Stroke | | Screw shaft length | | |
|-------------------------|---------|---------------------------------|--------------------|-------|--|
| | Nominal | Maximum (L_1 -Nut length) | L_1 | L_2 | |
| W1201MA-1PY-C3Z2 | 50 | 82 | 110 | 125 | |
| W1201MA-3PY-C3Z2 | 100 | 132 | 160 | 175 | |
| W1202MA-1PY-C3Z2 | 150 | 182 | 210 | 225 | |
| W1202MA-3PY-C3Z2 | 200 | 232 | 260 | 275 | |
| W1203MA-1PY-C3Z2 | 250 | 282 | 310 | 325 | |

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

Screw Shaft $\phi 12$ Lead 2

Unit: mm



View X-X

| 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 | |

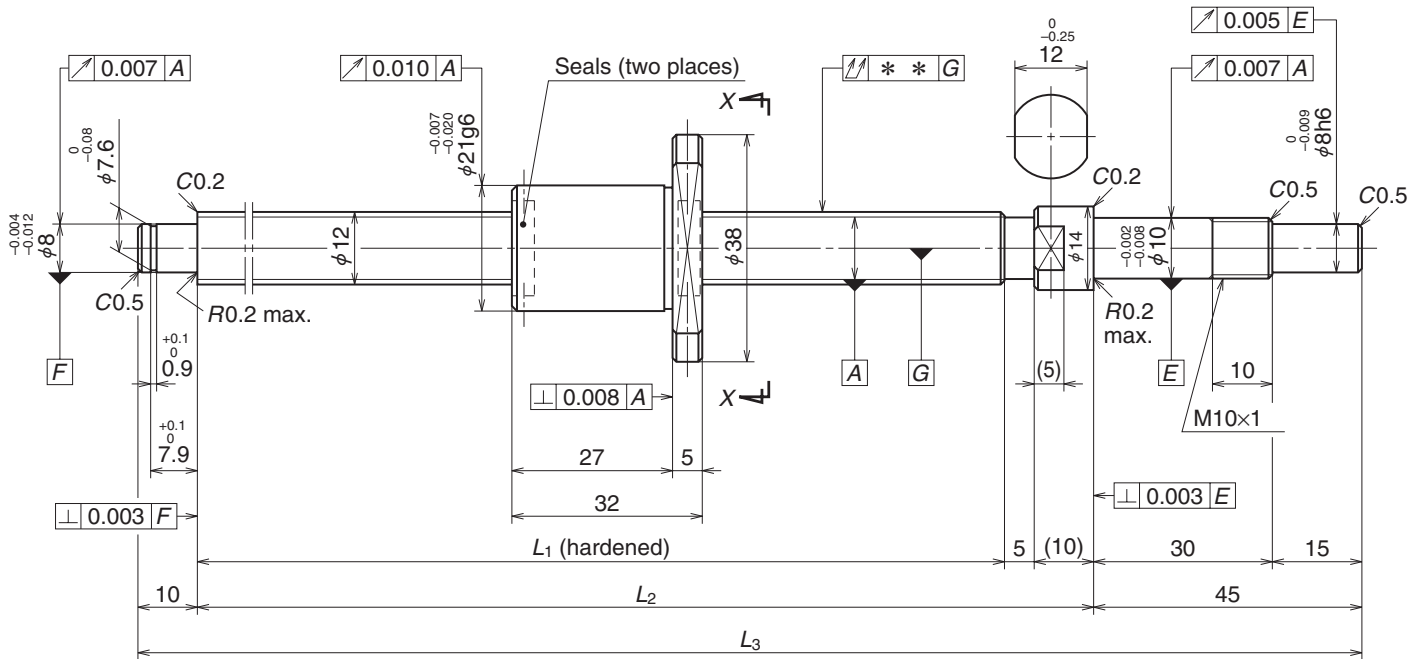
| Recommended Support Unit | Fixed side | Simple support side |
|--------------------------|------------|---------------------|
| WBK10-01A (square) | ○ | |
| WBK10S-01 (square) | | ○ |
| WBK10-11 (round) | ○ | |

Unit: mm

| L_3 | Lead accuracy | | | Shaft run-out ** ↕ | Mass (kg) | Permissible rotational speed N (min ⁻¹) |
|-------|------------------|-------------|-----------------|-----------------------|-----------|---|
| | Target value T | Error e_p | Variation v_U | | | Supporting condition |
| | | | | | | Fixed - Simple support |
| 180 | 0 | 0.010 | 0.008 | 0.020 | 0.20 | 3 000 |
| 230 | 0 | 0.010 | 0.008 | 0.030 | 0.24 | 3 000 |
| 280 | 0 | 0.012 | 0.008 | 0.030 | 0.28 | 3 000 |
| 330 | 0 | 0.012 | 0.008 | 0.040 | 0.32 | 3 000 |
| 380 | 0 | 0.012 | 0.008 | 0.040 | 0.36 | 3 000 |

Ball Screws A Series: Finished Shaft End

Nut Model: MPFD

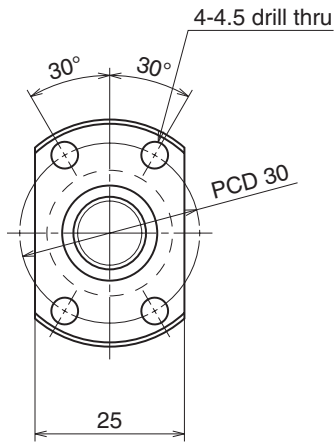


| Part number | Stroke | | Screw shaft length | | |
|---------------------------|---------|---|--------------------|----------------|--|
| | Nominal | Maximum (L ₁ -Nut length) | L ₁ | L ₂ | |
| W1201MA-5PY-C3Z2.5 | 50 | 78 | 110 | 125 | |
| W1201MA-7PY-C3Z2.5 | 100 | 128 | 160 | 175 | |
| W1202MA-5PY-C3Z2.5 | 150 | 178 | 210 | 225 | |
| W1202MA-7PY-C3Z2.5 | 200 | 228 | 260 | 275 | |
| W1203MA-3PY-C3Z2.5 | 250 | 278 | 310 | 325 | |

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

Screw Shaft $\phi 12$ Lead 2.5

Unit: mm



View X-X

| 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) | ○ | |

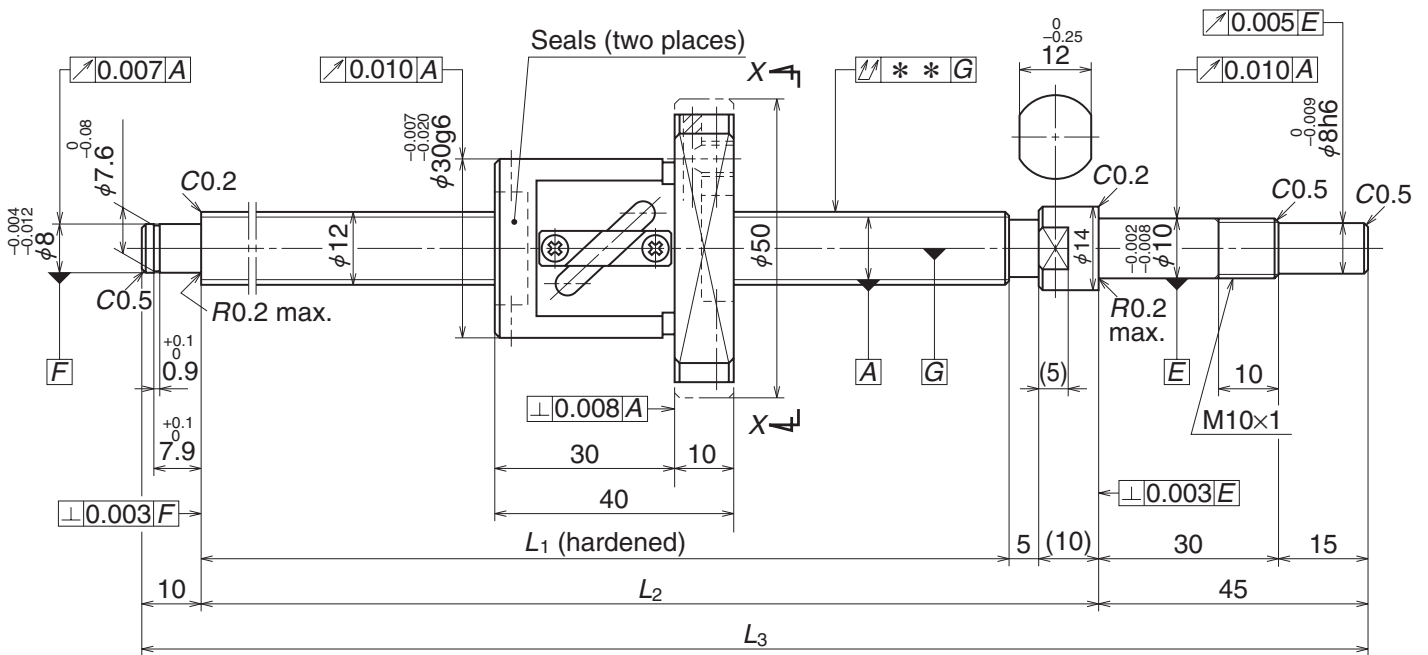
Ball Screws A Series

Unit: mm

| L_3 | Lead accuracy | | | Shaft run-out ** ↕ | Mass (kg) | Permissible rotational speed N (min ⁻¹) |
|-------|------------------|-------------|-----------------|-----------------------|-----------|---|
| | Target value T | Error e_p | Variation v_U | | | Supporting condition |
| | | | | | | Fixed - Simple support |
| 180 | 0 | 0.010 | 0.008 | 0.020 | 0.21 | 3 000 |
| 230 | 0 | 0.010 | 0.008 | 0.030 | 0.25 | 3 000 |
| 280 | 0 | 0.012 | 0.008 | 0.030 | 0.29 | 3 000 |
| 330 | 0 | 0.012 | 0.008 | 0.040 | 0.33 | 3 000 |
| 380 | 0 | 0.012 | 0.008 | 0.040 | 0.37 | 3 000 |

Ball Screws A Series: Finished Shaft End

Nut Model: PFT

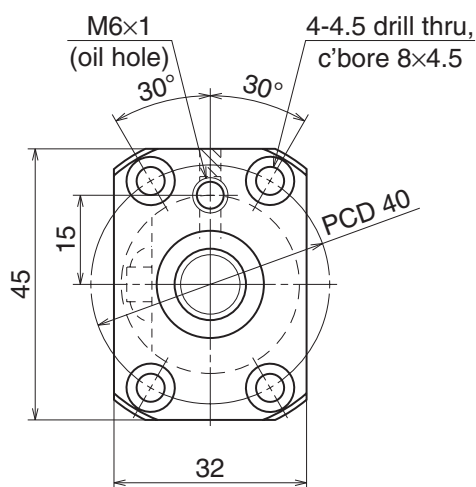


| Part number | Stroke | | Screw shaft length | | |
|------------------------|---------|---------------------------------|--------------------|-------|--|
| | Nominal | Maximum (L_1 -Nut length) | L_1 | L_2 | |
| W1201FA-1P-C3Z5 | 50 | 70 | 110 | 125 | |
| W1201FA-3P-C3Z5 | 100 | 120 | 160 | 175 | |
| W1202FA-1P-C3Z5 | 150 | 170 | 210 | 225 | |
| W1202FA-3P-C3Z5 | 200 | 220 | 260 | 275 | |
| W1203FA-1P-C3Z5 | 250 | 270 | 310 | 325 | |
| W1204FA-1P-C3Z5 | 350 | 370 | 410 | 425 | |
| W1205FA-1P-C3Z5 | 450 | 470 | 510 | 525 | |

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

Screw Shaft $\phi 12$ Lead 5

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 ³) | | 1.2 |

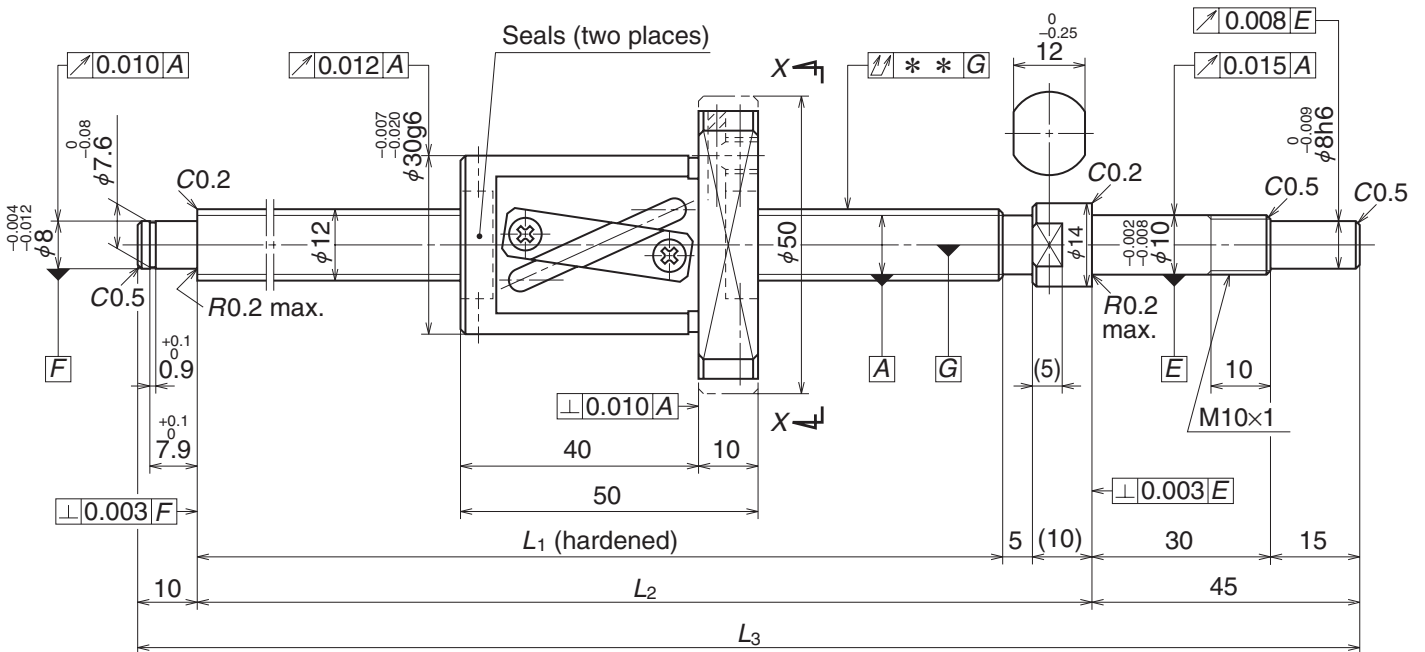
| Recommended Support Unit | Fixed side | Simple support side |
|--------------------------|--------------------|---------------------|
| | WBK10-01A (square) | ○ |
| WBK10S-01 (square) | | ○ |
| WBK10-11 (round) | ○ | |

Unit: mm

| L_3 | Lead accuracy | | | Shaft run-out ** ↕ | Mass (kg) | Permissible rotational speed N (min ⁻¹) |
|-------|------------------|-------------|-----------------|-----------------------|-----------|---|
| | Target value T | Error e_p | Variation v_U | | | Supporting condition |
| | | | | | | Fixed - Simple support |
| 180 | 0 | 0.010 | 0.008 | 0.020 | 0.35 | 3 000 |
| 230 | 0 | 0.010 | 0.008 | 0.030 | 0.38 | 3 000 |
| 280 | 0 | 0.012 | 0.008 | 0.030 | 0.42 | 3 000 |
| 330 | 0 | 0.012 | 0.008 | 0.040 | 0.46 | 3 000 |
| 380 | 0 | 0.012 | 0.008 | 0.040 | 0.50 | 3 000 |
| 480 | 0 | 0.015 | 0.010 | 0.050 | 0.58 | 3 000 |
| 580 | 0 | 0.016 | 0.012 | 0.065 | 0.66 | 3 000 |

Ball Screws A Series: Finished Shaft End

Nut Model: LPFT

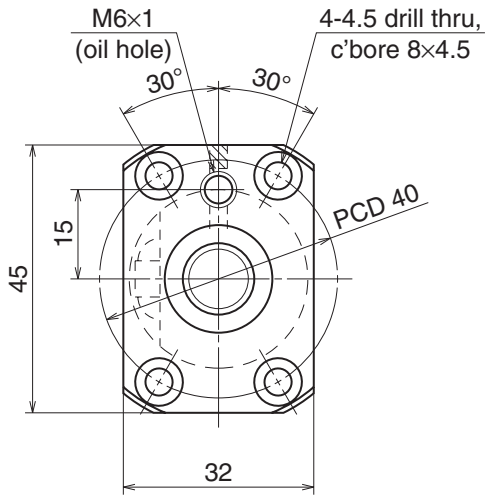


| Part number | Stroke | | Screw shaft length | | |
|-------------------------|---------|---------------------------------|--------------------|-------|--|
| | Nominal | Maximum (L_1 -Nut length) | L_1 | L_2 | |
| W1201FA-5P-C5Z10 | 100 | 110 | 160 | 175 | |
| W1202FA-5P-C5Z10 | 150 | 160 | 210 | 225 | |
| W1203FA-3P-C5Z10 | 250 | 260 | 310 | 325 | |
| W1204FA-3P-C5Z10 | 350 | 360 | 410 | 425 | |
| W1205FA-3P-C5Z10 | 450 | 460 | 510 | 525 | |

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

Screw Shaft $\phi 12$ Lead 10

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 ³) | 1.4 | |

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

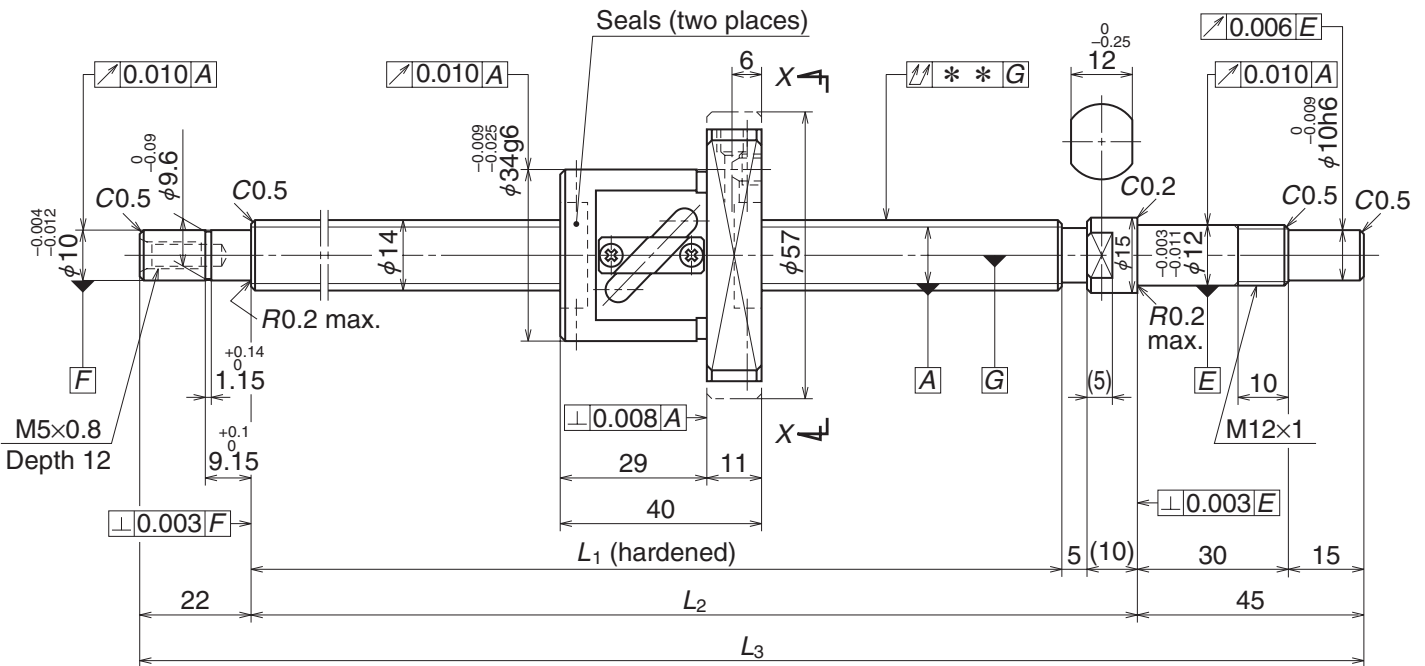
Ball Screws A Series

Unit: mm

| L_3 | Lead accuracy | | | Shaft run-out ** ↕ | Mass (kg) | Permissible rotational speed N (min ⁻¹) |
|-------|------------------|-------------|-----------------|-----------------------|-----------|---|
| | Target value T | Error e_p | Variation v_U | | | Supporting condition |
| | | | | | | Fixed - Simple support |
| 230 | 0 | 0.020 | 0.018 | 0.035 | 0.43 | 3 000 |
| 280 | 0 | 0.023 | 0.018 | 0.035 | 0.47 | 3 000 |
| 380 | 0 | 0.023 | 0.018 | 0.050 | 0.56 | 3 000 |
| 480 | 0 | 0.027 | 0.020 | 0.060 | 0.64 | 3 000 |
| 580 | 0 | 0.030 | 0.023 | 0.075 | 0.72 | 3 000 |

Ball Screws A Series: Finished Shaft End

Nut Model: PFT

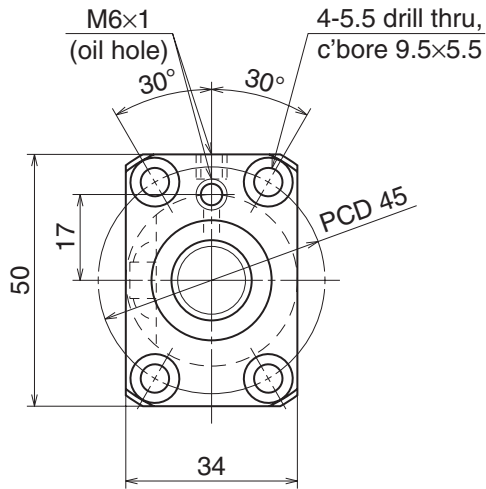


| Part number | Stroke | | Screw shaft length | | |
|------------------------|---------|---------------------------------|--------------------|-------|--|
| | Nominal | Maximum (L_1 -Nut length) | L_1 | L_2 | |
| W1401FA-1P-C3Z5 | 100 | 149 | 189 | 204 | |
| W1402FA-1P-C3Z5 | 150 | 199 | 239 | 254 | |
| W1403FA-1P-C3Z5 | 250 | 299 | 339 | 354 | |
| W1404FA-1P-C3Z5 | 350 | 399 | 439 | 454 | |
| W1405FA-1P-C3Z5 | 450 | 499 | 539 | 554 | |
| W1406FA-1P-C3Z5 | 600 | 649 | 689 | 704 | |

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

Screw Shaft $\phi 14$ Lead 5

Unit: mm



View X-X

| 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 ³) | 2.2 | |

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

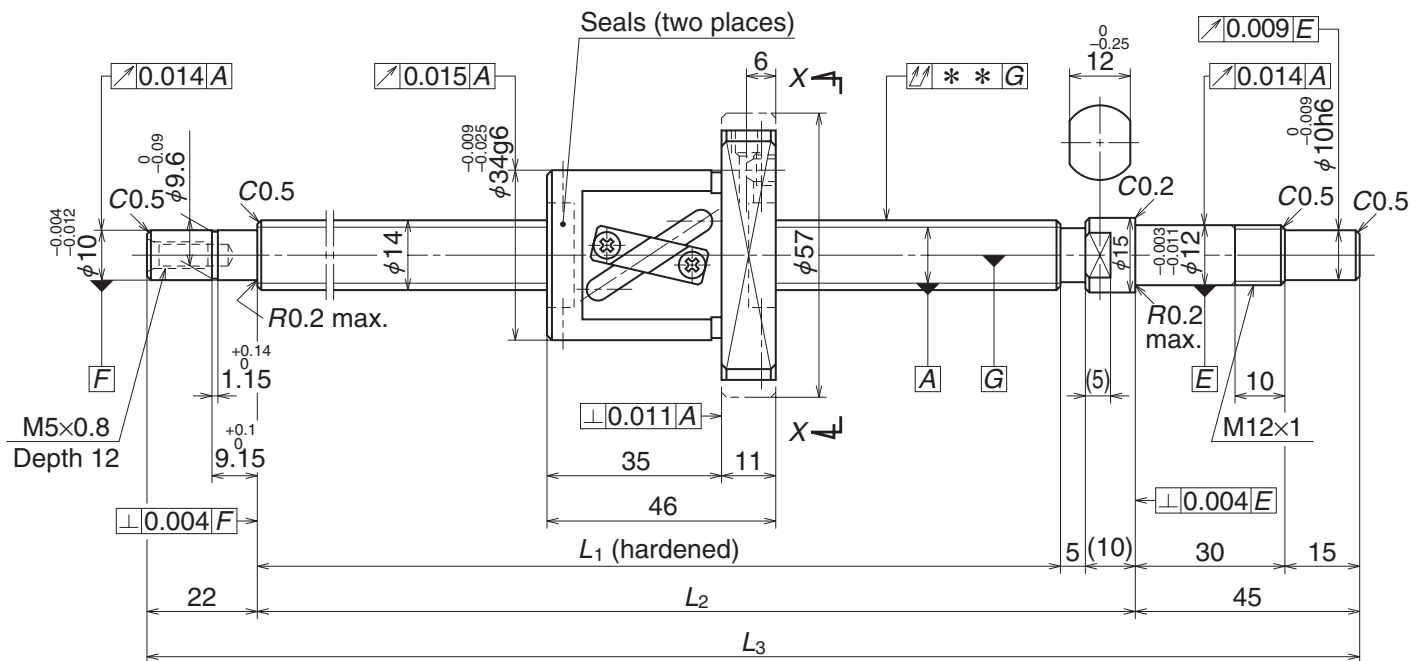
Ball Screws A Series

Unit: mm

| L_3 | Lead accuracy | | | Shaft run-out ** ↕ | Mass (kg) | Permissible rotational speed N (min ⁻¹) | |
|-------|------------------|-------------|-----------------|-----------------------|-----------|---|---------------|
| | Target value T | Error e_p | Variation v_U | | | Supporting condition | |
| | | | | | | Fixed - Simple support | Fixed - Fixed |
| 271 | 0 | 0.010 | 0.008 | 0.020 | 0.52 | 3 000 | 3 000 |
| 321 | 0 | 0.012 | 0.008 | 0.030 | 0.57 | 3 000 | 3 000 |
| 421 | 0 | 0.013 | 0.010 | 0.035 | 0.67 | 3 000 | 3 000 |
| 521 | 0 | 0.015 | 0.010 | 0.045 | 0.77 | 3 000 | 3 000 |
| 621 | 0 | 0.016 | 0.012 | 0.045 | 0.87 | 3 000 | 3 000 |
| 771 | 0 | 0.018 | 0.013 | 0.055 | 1.0 | 3 000 | 3 000 |

Ball Screws A Series: Finished Shaft End

Nut Model: LPFT

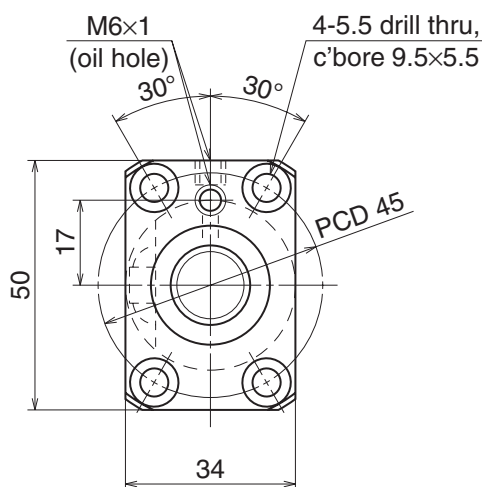


| Part number | Stroke | | Screw shaft length | | |
|------------------------|---------|---------------------------------|--------------------|-------|--|
| | Nominal | Maximum (L_1 -Nut length) | L_1 | L_2 | |
| W1401FA-3P-C5Z8 | 100 | 143 | 189 | 204 | |
| W1402FA-3P-C5Z8 | 150 | 193 | 239 | 254 | |
| W1402FA-5P-C5Z8 | 200 | 243 | 289 | 304 | |
| W1403FA-3P-C5Z8 | 250 | 293 | 339 | 354 | |
| W1403FA-5P-C5Z8 | 300 | 343 | 389 | 404 | |
| W1404FA-3P-C5Z8 | 350 | 393 | 439 | 454 | |
| W1404FA-5P-C5Z8 | 400 | 443 | 489 | 504 | |
| W1405FA-3P-C5Z8 | 450 | 493 | 539 | 554 | |
| W1405FA-5P-C5Z8 | 500 | 543 | 589 | 604 | |
| W1406FA-3P-C5Z8 | 550 | 593 | 639 | 654 | |
| W1406FA-5P-C5Z8 | 600 | 643 | 689 | 704 | |
| W1407FA-1P-C5Z8 | 700 | 743 | 789 | 804 | |

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

Screw Shaft $\phi 14$ Lead 8

Unit: mm



View X-X

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 ³) | | 2.1 |

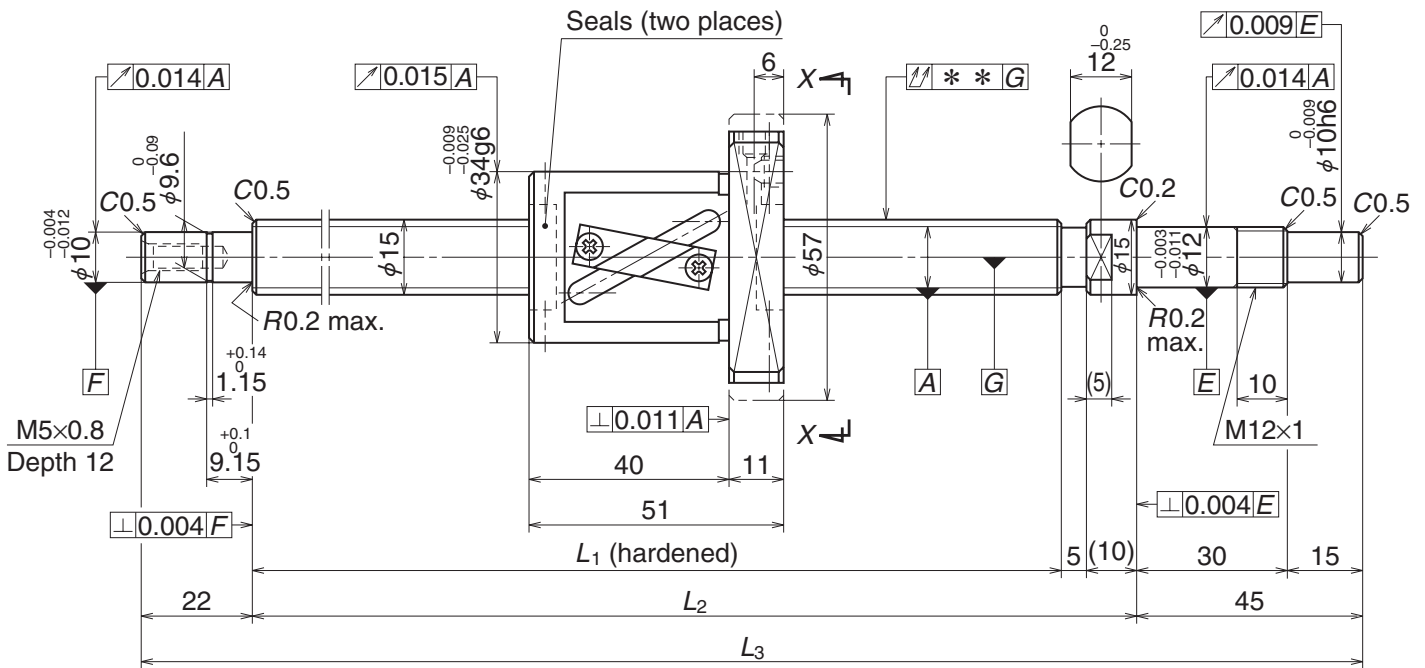
| Recommended Support Unit | Fixed side | Simple support side |
|--------------------------|------------|---------------------|
| WBK12-01A (square) | ○ | |
| WBK12S-01 (square) | | ○ |
| WBK12-11 (round) | ○ | |

Unit: mm

| L_3 | Lead accuracy | | | Shaft run-out ** ↕ | Mass (kg) | Permissible rotational speed N (min ⁻¹) | |
|-------|------------------|-------------|-----------------|-----------------------|-----------|---|---------------|
| | Target value T | Error e_p | Variation v_U | | | Supporting condition | |
| | | | | | | Fixed - Simple support | Fixed - Fixed |
| 271 | 0 | 0.020 | 0.018 | 0.025 | 0.56 | 3 000 | 3 000 |
| 321 | 0 | 0.023 | 0.018 | 0.035 | 0.61 | 3 000 | 3 000 |
| 371 | 0 | 0.023 | 0.018 | 0.035 | 0.67 | 3 000 | 3 000 |
| 421 | 0 | 0.025 | 0.020 | 0.040 | 0.72 | 3 000 | 3 000 |
| 471 | 0 | 0.025 | 0.020 | 0.040 | 0.78 | 3 000 | 3 000 |
| 521 | 0 | 0.027 | 0.020 | 0.050 | 0.83 | 3 000 | 3 000 |
| 571 | 0 | 0.027 | 0.020 | 0.050 | 0.88 | 3 000 | 3 000 |
| 621 | 0 | 0.030 | 0.023 | 0.050 | 0.94 | 3 000 | 3 000 |
| 671 | 0 | 0.030 | 0.023 | 0.065 | 0.99 | 3 000 | 3 000 |
| 721 | 0 | 0.035 | 0.025 | 0.065 | 1.0 | 3 000 | 3 000 |
| 771 | 0 | 0.035 | 0.025 | 0.065 | 1.1 | 3 000 | 3 000 |
| 871 | 0 | 0.035 | 0.025 | 0.085 | 1.2 | 2 800 | 3 000 |

Ball Screws A Series: Finished Shaft End

Nut Model: LPFT

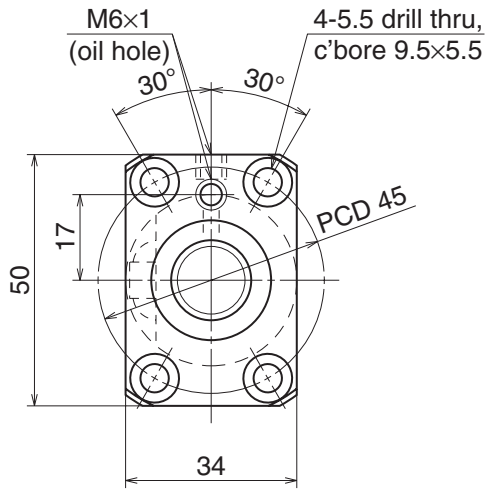


| Part number | Stroke | | Screw shaft length | | |
|-------------------------|---------|---------------------------------|--------------------|-------|--|
| | Nominal | Maximum (L_1 -Nut length) | L_1 | L_2 | |
| W1501FA-1P-C5Z10 | 100 | 138 | 189 | 204 | |
| W1502FA-1P-C5Z10 | 150 | 188 | 239 | 254 | |
| W1502FA-3P-C5Z10 | 200 | 238 | 289 | 304 | |
| W1503FA-1P-C5Z10 | 250 | 288 | 339 | 354 | |
| W1503FA-3P-C5Z10 | 300 | 338 | 389 | 404 | |
| W1504FA-1P-C5Z10 | 350 | 388 | 439 | 454 | |
| W1504FA-3P-C5Z10 | 400 | 438 | 489 | 504 | |
| W1505FA-1P-C5Z10 | 450 | 488 | 539 | 554 | |
| W1505FA-3P-C5Z10 | 500 | 538 | 589 | 604 | |
| W1506FA-1P-C5Z10 | 550 | 588 | 639 | 654 | |
| W1506FA-3P-C5Z10 | 600 | 638 | 689 | 704 | |
| W1507FA-1P-C5Z10 | 700 | 738 | 789 | 804 | |
| W1508FA-1P-C5Z10 | 800 | 838 | 889 | 904 | |
| W1510FA-1P-C5Z10 | 1 000 | 1 038 | 1 089 | 1 104 | |

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

Screw Shaft $\phi 15$ Lead 10

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 | 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 ³) | 2.3 | |

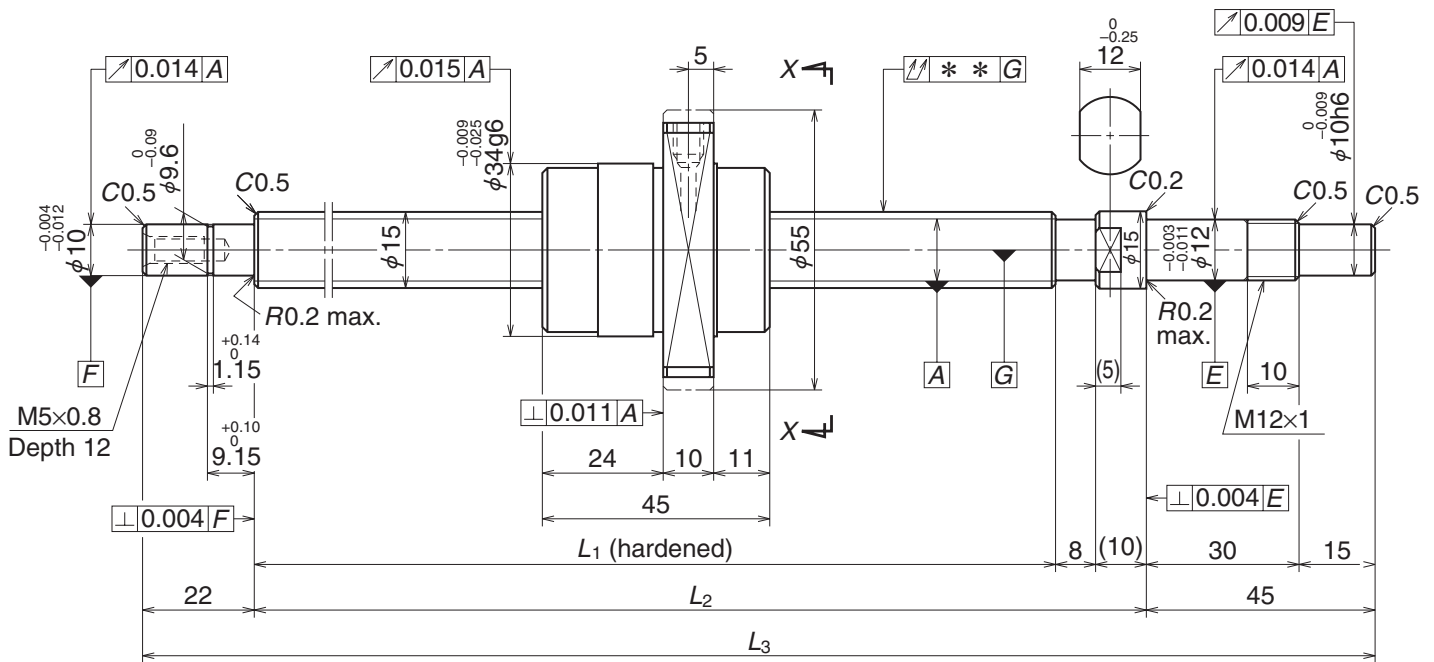
| Recommended Support Unit | Fixed side | Simple support side |
|--------------------------|------------|---------------------|
| WBK12-01A (square) | ○ | |
| WBK12S-01 (square) | | ○ |
| WBK12-11 (round) | ○ | |

Unit: mm

| L_3 | Lead accuracy | | | Shaft run-out ** ↕ | Mass (kg) | Permissible rotational speed N (min ⁻¹) | |
|-------|------------------|-------------|-----------------|-----------------------|-----------|---|---------------|
| | Target value T | Error e_p | Variation v_U | | | Supporting condition | |
| | | | | | | Fixed - Simple support | Fixed - Fixed |
| 271 | 0 | 0.020 | 0.018 | 0.025 | 0.61 | 3 000 | 3 000 |
| 321 | 0 | 0.023 | 0.018 | 0.035 | 0.67 | 3 000 | 3 000 |
| 371 | 0 | 0.023 | 0.018 | 0.035 | 0.74 | 3 000 | 3 000 |
| 421 | 0 | 0.025 | 0.020 | 0.040 | 0.80 | 3 000 | 3 000 |
| 471 | 0 | 0.025 | 0.020 | 0.040 | 0.86 | 3 000 | 3 000 |
| 521 | 0 | 0.027 | 0.020 | 0.050 | 0.93 | 3 000 | 3 000 |
| 571 | 0 | 0.027 | 0.020 | 0.050 | 1.0 | 3 000 | 3 000 |
| 621 | 0 | 0.030 | 0.023 | 0.050 | 1.1 | 3 000 | 3 000 |
| 671 | 0 | 0.030 | 0.023 | 0.065 | 1.1 | 3 000 | 3 000 |
| 721 | 0 | 0.035 | 0.025 | 0.065 | 1.2 | 3 000 | 3 000 |
| 771 | 0 | 0.035 | 0.025 | 0.065 | 1.2 | 3 000 | 3 000 |
| 871 | 0 | 0.035 | 0.025 | 0.085 | 1.4 | 3 000 | 3 000 |
| 971 | 0 | 0.040 | 0.027 | 0.085 | 1.5 | 2 400 | 3 000 |
| 1 171 | 0 | 0.046 | 0.030 | 0.110 | 1.8 | 1 590 | 2 250 |

Ball Screws A Series: Finished Shaft End

Nut Model: UPFC

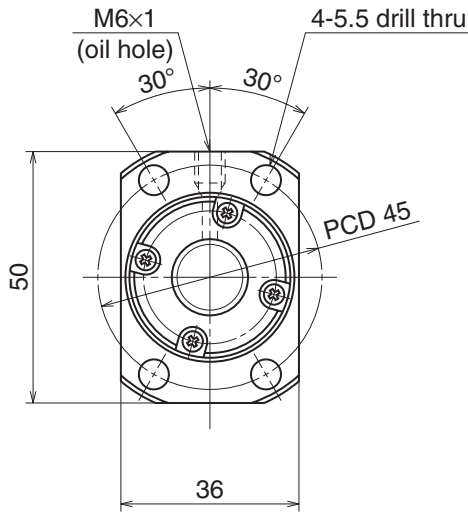


| Part number | Stroke | | Screw shaft length | | |
|--------------------------|---------|---------------------------------|--------------------|-------|--|
| | Nominal | Maximum (L_1 -Nut length) | L_1 | L_2 | |
| W1501FA-3PG-C5Z20 | 100 | 141 | 186 | 204 | |
| W1502FA-5PG-C5Z20 | 150 | 191 | 236 | 254 | |
| W1502FA-7PG-C5Z20 | 200 | 241 | 286 | 304 | |
| W1503FA-5PG-C5Z20 | 250 | 291 | 336 | 354 | |
| W1503FA-7PG-C5Z20 | 300 | 341 | 386 | 404 | |
| W1504FA-5PG-C5Z20 | 350 | 391 | 436 | 454 | |
| W1504FA-7PG-C5Z20 | 400 | 441 | 486 | 504 | |
| W1505FA-5PG-C5Z20 | 450 | 491 | 536 | 554 | |
| W1505FA-7PG-C5Z20 | 500 | 541 | 586 | 604 | |
| W1506FA-5PG-C5Z20 | 550 | 591 | 636 | 654 | |
| W1506FA-7PG-C5Z20 | 600 | 641 | 686 | 704 | |
| W1507FA-3PG-C5Z20 | 700 | 741 | 786 | 804 | |
| W1508FA-3PG-C5Z20 | 800 | 841 | 886 | 904 | |
| W1510FA-3PG-C5Z20 | 1 000 | 1 041 | 1 086 | 1 104 | |

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

Screw Shaft $\phi 15$ Lead 20

Unit: mm



View X-X

| 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 ³) | 1.9 | |

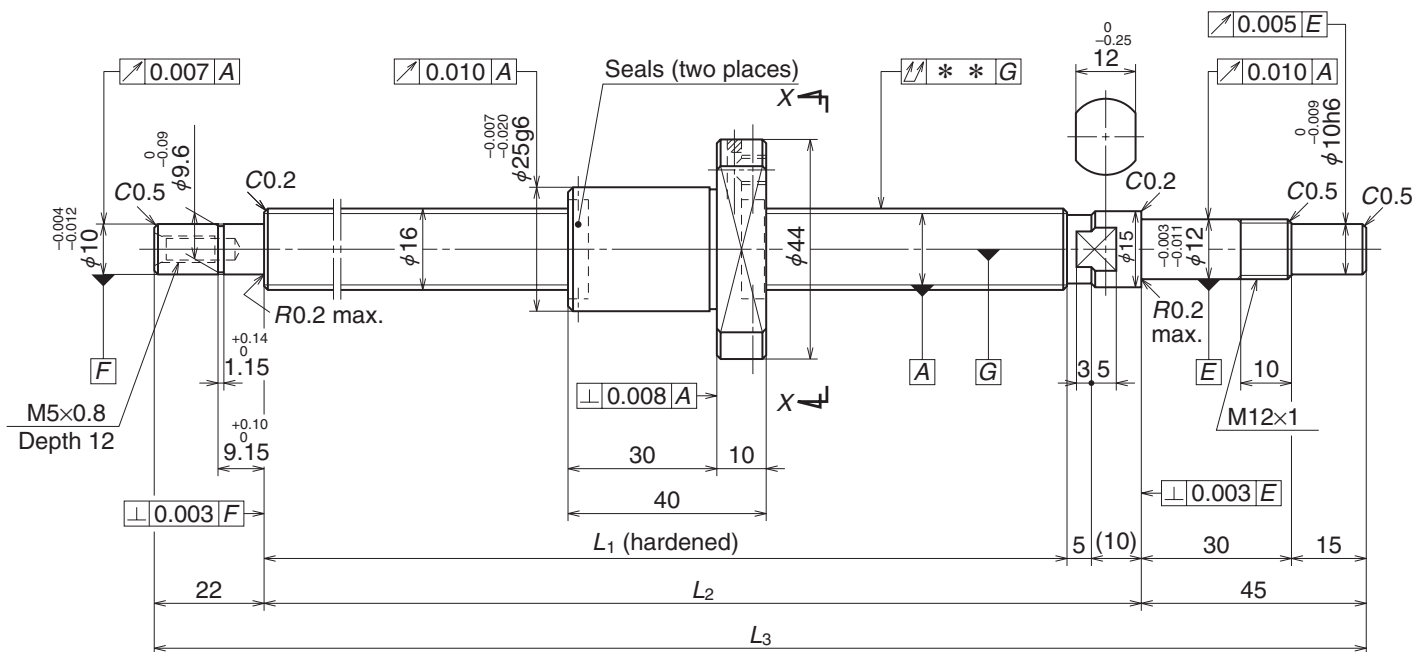
| Recommended Support Unit | Fixed side | Simple support side |
|--------------------------|------------|---------------------|
| WBK12-01A (square) | ○ | |
| WBK12S-01 (square) | | ○ |
| WBK12-11 (round) | ○ | |

Unit: mm

| L_3 | Lead accuracy | | | Shaft run-out ** ↕ | Mass (kg) | Permissible rotational speed N (min ⁻¹) | |
|-------|------------------|-------------|-----------------|-----------------------|-----------|---|---------------|
| | Target value T | Error e_p | Variation v_U | | | Supporting condition | |
| | | | | | | Fixed - Simple support | Fixed - Fixed |
| 271 | 0 | 0.020 | 0.018 | 0.025 | 0.61 | 3 000 | 3 000 |
| 321 | 0 | 0.023 | 0.018 | 0.035 | 0.68 | 3 000 | 3 000 |
| 371 | 0 | 0.023 | 0.018 | 0.035 | 0.75 | 3 000 | 3 000 |
| 421 | 0 | 0.025 | 0.020 | 0.040 | 0.81 | 3 000 | 3 000 |
| 471 | 0 | 0.025 | 0.020 | 0.040 | 0.88 | 3 000 | 3 000 |
| 521 | 0 | 0.027 | 0.020 | 0.050 | 0.95 | 3 000 | 3 000 |
| 571 | 0 | 0.027 | 0.020 | 0.050 | 1.0 | 3 000 | 3 000 |
| 621 | 0 | 0.030 | 0.023 | 0.050 | 1.1 | 3 000 | 3 000 |
| 671 | 0 | 0.030 | 0.023 | 0.065 | 1.1 | 3 000 | 3 000 |
| 721 | 0 | 0.035 | 0.025 | 0.065 | 1.2 | 3 000 | 3 000 |
| 771 | 0 | 0.035 | 0.025 | 0.065 | 1.3 | 3 000 | 3 000 |
| 871 | 0 | 0.035 | 0.025 | 0.085 | 1.4 | 3 000 | 3 000 |
| 971 | 0 | 0.040 | 0.027 | 0.085 | 1.5 | 2 400 | 3 000 |
| 1 171 | 0 | 0.046 | 0.030 | 0.110 | 1.8 | 1 590 | 2 240 |

Ball Screws A Series: Finished Shaft End

Nut Model: MPFD

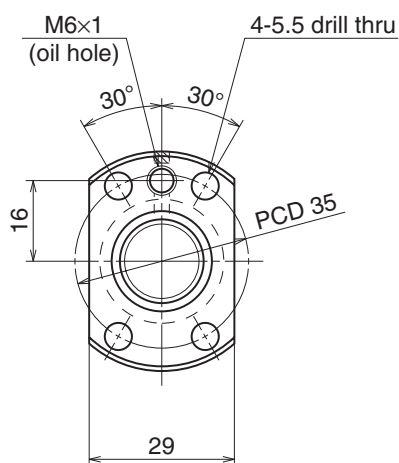


| Part number | Stroke | | Screw shaft length | | |
|-------------------------|---------|---------------------------------|--------------------|-------|--|
| | Nominal | Maximum (L_1 -Nut length) | L_1 | L_2 | |
| W1601MA-1PY-C3Z2 | 50 | 99 | 139 | 154 | |
| W1601MA-3PY-C3Z2 | 100 | 149 | 189 | 204 | |
| W1602MA-1PY-C3Z2 | 150 | 199 | 239 | 254 | |
| W1602MA-3PY-C3Z2 | 200 | 249 | 289 | 304 | |
| W1603MA-1PY-C3Z2 | 300 | 349 | 389 | 404 | |

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

Screw Shaft $\phi 16$ Lead 2

Unit: mm



View X-X

| Ball Screw Specifications | | |
|---|-----------------------|-------|
| Shaft dia. × Lead / Direction of turn | 16 × 2 / Right | |
| Preload / Ball recirculation | P-preload / Deflector | |
| Ball dia. / Ball circle dia. | 1.588 / 16.4 | |
| Effective turns of balls | 1 × 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 ³) | 1.6 | |

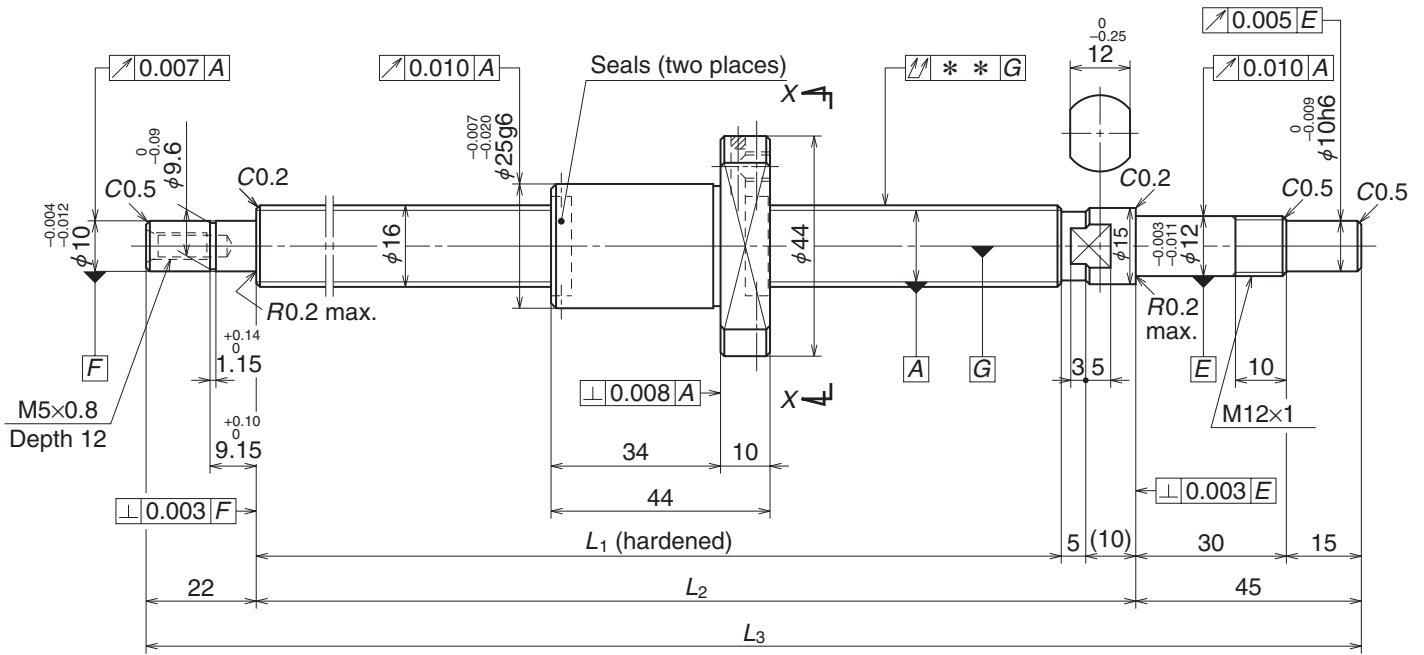
| Recommended Support Unit | Fixed side | Simple support side |
|--------------------------|------------|---------------------|
| WBK12-01A (square) | ○ | |
| WBK12S-01 (square) | | ○ |
| WBK12-11 (round) | ○ | |

Unit: mm

| L_3 | Lead accuracy | | | Shaft run-out ** ↕ | Mass (kg) | Permissible rotational speed N (min ⁻¹) | |
|-------|------------------|-------------|-----------------|-----------------------|-----------|---|---------------|
| | Target value T | Error e_p | Variation v_U | | | Supporting condition | |
| | | | | | | Fixed - Simple support | Fixed - Fixed |
| 221 | 0 | 0.010 | 0.008 | 0.020 | 0.41 | 3 000 | 3 000 |
| 271 | 0 | 0.010 | 0.008 | 0.020 | 0.48 | 3 000 | 3 000 |
| 321 | 0 | 0.012 | 0.008 | 0.030 | 0.55 | 3 000 | 3 000 |
| 371 | 0 | 0.012 | 0.008 | 0.030 | 0.62 | 3 000 | 3 000 |
| 471 | 0 | 0.013 | 0.010 | 0.035 | 0.77 | 3 000 | 3 000 |

Ball Screws A Series: Finished Shaft End

Nut Model: MPFD

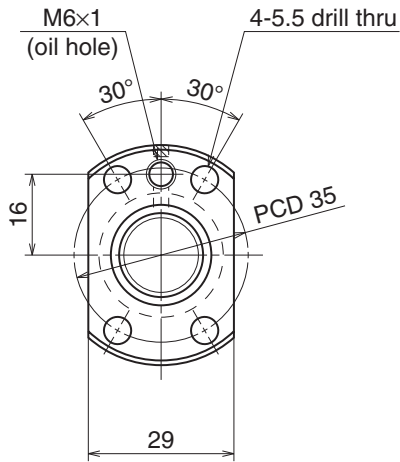


| Part number | Stroke | | Screw shaft length | | |
|---------------------------|---------|------------------------------|--------------------|-------|--|
| | Nominal | Maximum (L_1 -Nut length) | L_1 | L_2 | |
| W1601MA-5PY-C3Z2.5 | 50 | 95 | 139 | 154 | |
| W1601MA-7PY-C3Z2.5 | 100 | 145 | 189 | 204 | |
| W1602MA-5PY-C3Z2.5 | 150 | 195 | 239 | 254 | |
| W1602MA-7PY-C3Z2.5 | 200 | 245 | 289 | 304 | |
| W1603MA-3PY-C3Z2.5 | 300 | 345 | 389 | 404 | |

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

Screw Shaft $\phi 16$ Lead 2.5

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 ³) | 1.6 | |

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

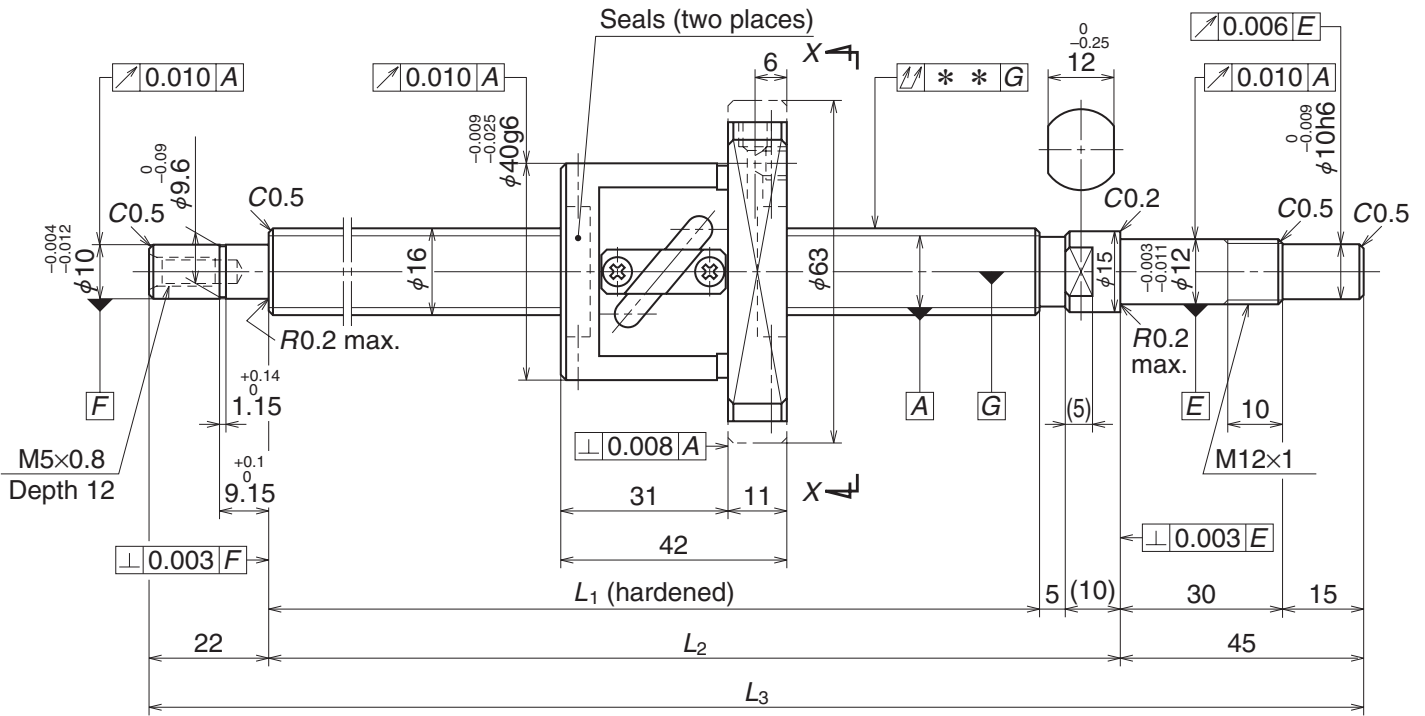
Ball Screws A Series

Unit: mm

| L_3 | Lead accuracy | | | Shaft run-out ** ↕ | Mass (kg) | Permissible rotational speed N (min ⁻¹) | |
|-------|------------------|-------------|-----------------|-----------------------|-----------|---|---------------|
| | Target value T | Error e_p | Variation v_U | | | Supporting condition | |
| | | | | | | Fixed - Simple support | Fixed - Fixed |
| 221 | 0 | 0.010 | 0.008 | 0.020 | 0.42 | 3 000 | 3 000 |
| 271 | 0 | 0.010 | 0.008 | 0.020 | 0.49 | 3 000 | 3 000 |
| 321 | 0 | 0.012 | 0.008 | 0.030 | 0.57 | 3 000 | 3 000 |
| 371 | 0 | 0.012 | 0.008 | 0.030 | 0.64 | 3 000 | 3 000 |
| 471 | 0 | 0.013 | 0.010 | 0.035 | 0.79 | 3 000 | 3 000 |

Ball Screws A Series: Finished Shaft End

Nut Model: PFT

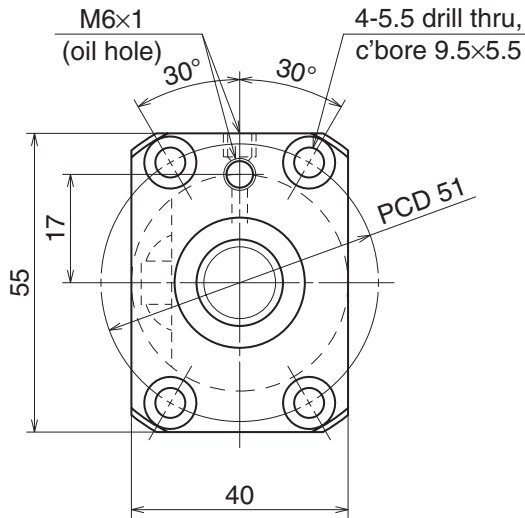


| Part number | Stroke | | Screw shaft length | | |
|------------------------|---------|---------------------------------|--------------------|-------|--|
| | Nominal | Maximum (L_1 -Nut length) | L_1 | L_2 | |
| W1601FA-1P-C3Z5 | 100 | 147 | 189 | 204 | |
| W1602FA-1P-C3Z5 | 200 | 247 | 289 | 304 | |
| W1603FA-1P-C3Z5 | 300 | 347 | 389 | 404 | |
| W1604FA-1P-C3Z5 | 400 | 447 | 489 | 504 | |
| W1606FA-1P-C3Z5 | 600 | 647 | 689 | 704 | |
| W1608FA-1P-C3Z5 | 800 | 847 | 889 | 904 | |

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

Screw Shaft $\phi 16$ Lead 5

Unit: mm



View X-X

| Ball Screw Specifications | | |
|---|-------------------------|-------|
| Shaft dia. × Lead / Direction of turn | 16 × 5 / Right | |
| Preload / Ball recirculation | P-preload / Return tube | |
| Ball dia. / Ball circle dia. | 3.175 / 16.5 | |
| Effective turns of balls | 2.5 × 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 ³) | 2.6 | |

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

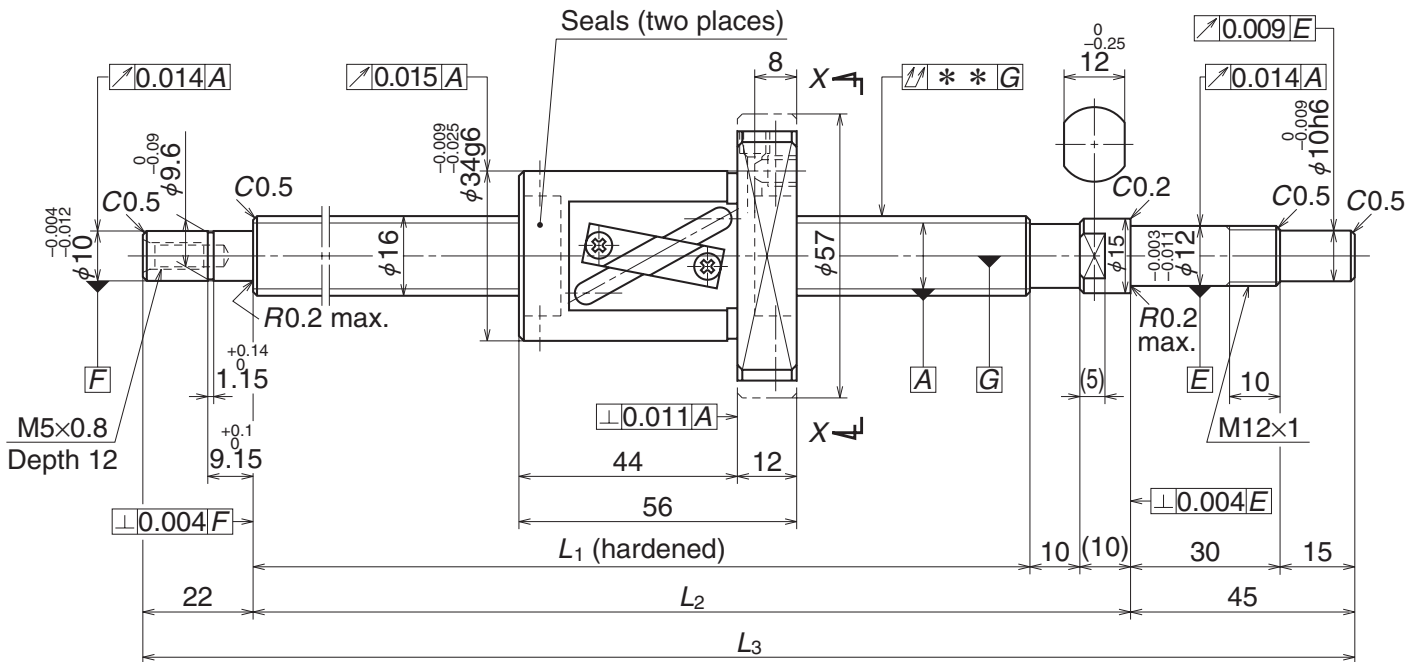
Ball Screws A Series

Unit: mm

| L_3 | Lead accuracy | | | Shaft run-out ** ↕ | Mass (kg) | Permissible rotational speed N (min ⁻¹) | |
|-------|------------------|-------------|-----------------|-----------------------|-----------|---|---------------|
| | Target value T | Error e_p | Variation v_U | | | Supporting condition | |
| | | | | | | Fixed - Simple support | Fixed - Fixed |
| 271 | 0 | 0.010 | 0.008 | 0.020 | 0.70 | 3 000 | 3 000 |
| 371 | 0 | 0.012 | 0.008 | 0.030 | 0.83 | 3 000 | 3 000 |
| 471 | 0 | 0.013 | 0.010 | 0.035 | 0.97 | 3 000 | 3 000 |
| 571 | 0 | 0.015 | 0.010 | 0.045 | 1.1 | 3 000 | 3 000 |
| 771 | 0 | 0.018 | 0.013 | 0.055 | 1.4 | 3 000 | 3 000 |
| 971 | 0 | 0.021 | 0.015 | 0.075 | 1.6 | 2 570 | 3 000 |

Ball Screws A Series: Finished Shaft End

Nut Model: LPFT

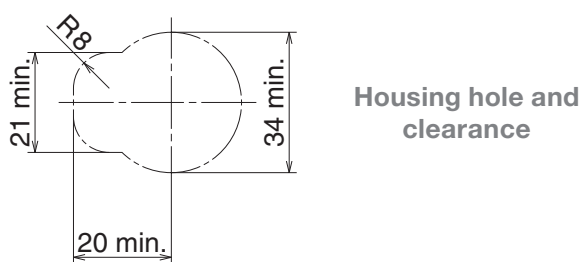
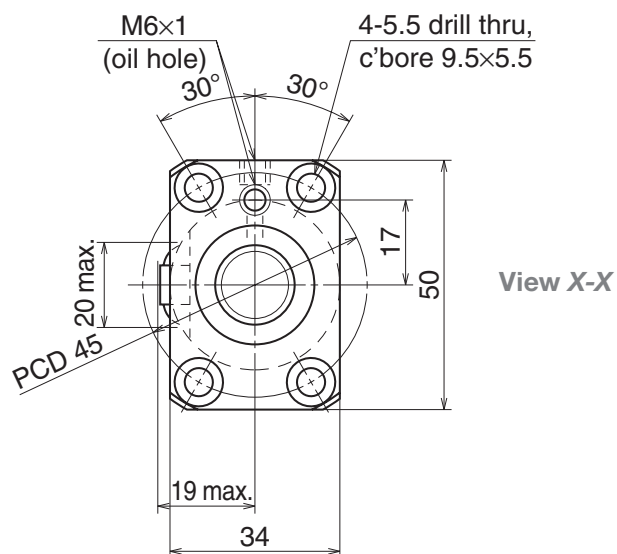


| Part number | Stroke | | Screw shaft length | | |
|-------------------------|---------|---|--------------------|----------------|--|
| | Nominal | Maximum (L ₁ -Nut length) | L ₁ | L ₂ | |
| W1601FA-3P-C5Z16 | 100 | 128 | 184 | 204 | |
| W1602FA-3P-C5Z16 | 150 | 178 | 234 | 254 | |
| W1602FA-5P-C5Z16 | 200 | 228 | 284 | 304 | |
| W1603FA-3P-C5Z16 | 250 | 278 | 334 | 354 | |
| W1603FA-5P-C5Z16 | 300 | 328 | 384 | 404 | |
| W1604FA-3P-C5Z16 | 350 | 378 | 434 | 454 | |
| W1604FA-5P-C5Z16 | 400 | 428 | 484 | 504 | |
| W1605FA-1P-C5Z16 | 450 | 478 | 534 | 554 | |
| W1605FA-3P-C5Z16 | 500 | 528 | 584 | 604 | |
| W1606FA-3P-C5Z16 | 550 | 578 | 634 | 654 | |
| W1606FA-5P-C5Z16 | 600 | 628 | 684 | 704 | |
| W1607FA-1P-C5Z16 | 700 | 728 | 784 | 804 | |
| W1608FA-3P-C5Z16 | 800 | 828 | 884 | 904 | |
| W1610FA-1P-C5Z16 | 1 000 | 1 028 | 1 084 | 1 104 | |

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

Screw Shaft $\phi 16$ Lead 16

Unit: mm



| 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 ³) | 2.1 | |

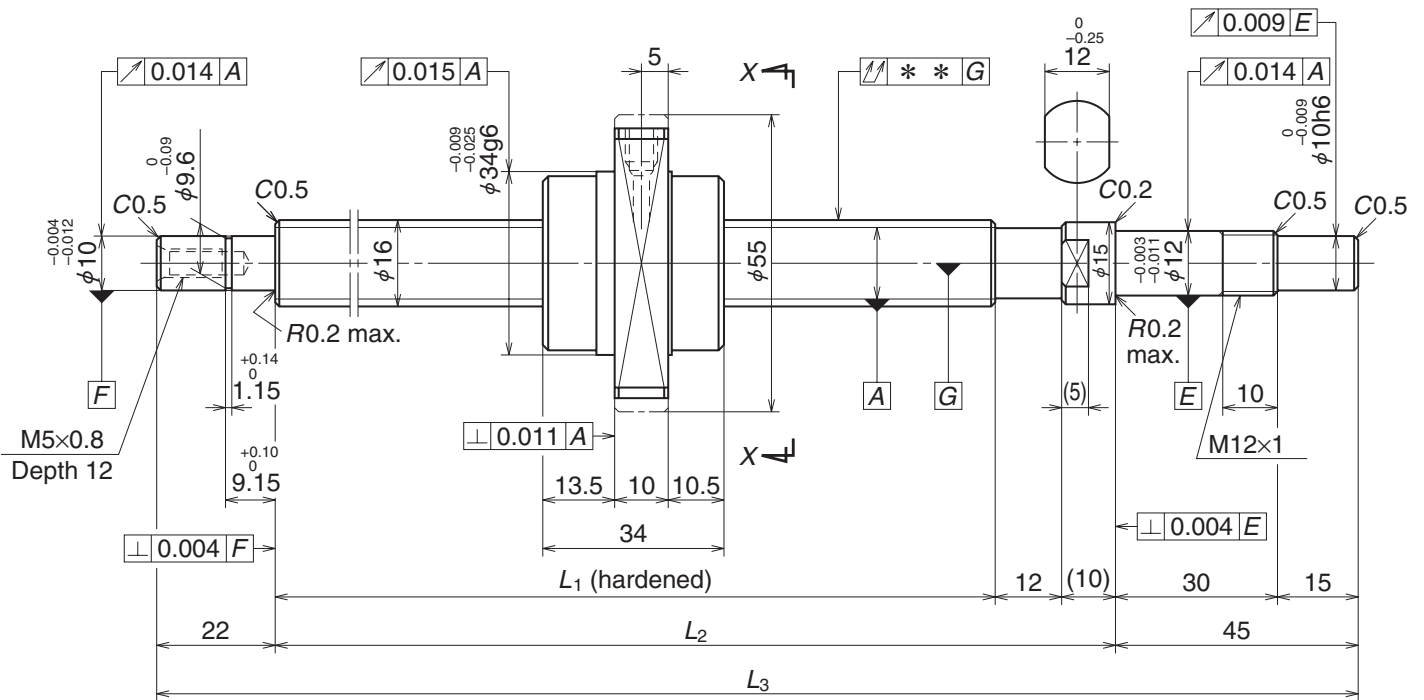
| Recommended Support Unit | Fixed side | Simple support side |
|--------------------------|------------|---------------------|
| WBK12-01A (square) | ○ | |
| WBK12S-01 (square) | | ○ |
| WBK12-11 (round) | ○ | |

Unit: mm

| L_3 | Lead accuracy | | | Shaft run-out ** | Mass (kg) | Permissible rotational speed N (min ⁻¹) | |
|-------|------------------|-------------|-----------------|------------------|-----------|---|---------------|
| | Target value T | Error e_p | Variation v_U | | | Supporting condition | |
| | | | | | | Fixed - Simple support | Fixed - Fixed |
| 271 | 0 | 0.020 | 0.018 | 0.025 | 0.69 | 3 000 | 3 000 |
| 321 | 0 | 0.023 | 0.018 | 0.035 | 0.77 | 3 000 | 3 000 |
| 371 | 0 | 0.023 | 0.018 | 0.035 | 0.84 | 3 000 | 3 000 |
| 421 | 0 | 0.025 | 0.020 | 0.040 | 0.92 | 3 000 | 3 000 |
| 471 | 0 | 0.025 | 0.020 | 0.040 | 0.99 | 3 000 | 3 000 |
| 521 | 0 | 0.027 | 0.020 | 0.050 | 1.1 | 3 000 | 3 000 |
| 571 | 0 | 0.027 | 0.020 | 0.050 | 1.1 | 3 000 | 3 000 |
| 621 | 0 | 0.030 | 0.023 | 0.050 | 1.2 | 3 000 | 3 000 |
| 671 | 0 | 0.030 | 0.023 | 0.065 | 1.3 | 3 000 | 3 000 |
| 721 | 0 | 0.035 | 0.025 | 0.065 | 1.4 | 3 000 | 3 000 |
| 771 | 0 | 0.035 | 0.025 | 0.065 | 1.4 | 3 000 | 3 000 |
| 871 | 0 | 0.035 | 0.025 | 0.085 | 1.6 | 3 000 | 3 000 |
| 971 | 0 | 0.040 | 0.027 | 0.085 | 1.7 | 2 690 | 3 000 |
| 1 171 | 0 | 0.046 | 0.030 | 0.110 | 2.0 | 1 770 | 2 480 |

Ball Screws A Series: Finished Shaft End

Nut Model: UPFC

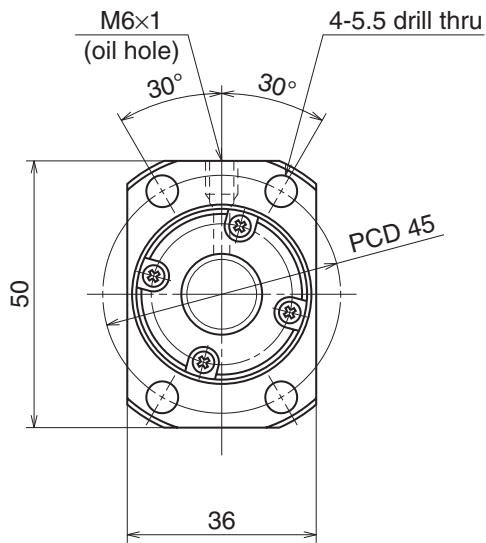


| Part number | Stroke | | Screw shaft length | | |
|---------------------------|---------|---------------------------------|--------------------|-------|--|
| | Nominal | Maximum (L_1 -Nut length) | L_1 | L_2 | |
| W1603FA-7PGX-C5Z32 | 300 | 348 | 382 | 404 | |
| W1605FA-5PGX-C5Z32 | 500 | 548 | 582 | 604 | |
| W1608FA-5PGX-C5Z32 | 800 | 848 | 882 | 904 | |
| W1612FA-1PGX-C5Z32 | 1 200 | 1 248 | 1 282 | 1 304 | |

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.

Screw Shaft $\phi 16$ Lead 32

Unit: mm



View X-X

| Ball Screw Specifications | | |
|---|---------------------|-------|
| Shaft dia. × Lead / Direction of turn | 16 × 32 / Right | |
| Preload / Ball recirculation | P-preload / End cap | |
| Ball dia. / Ball circle dia. | 3.175 / 16.75 | |
| Effective turns of balls | 0.7 × 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 ³) | 2.0 | |

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

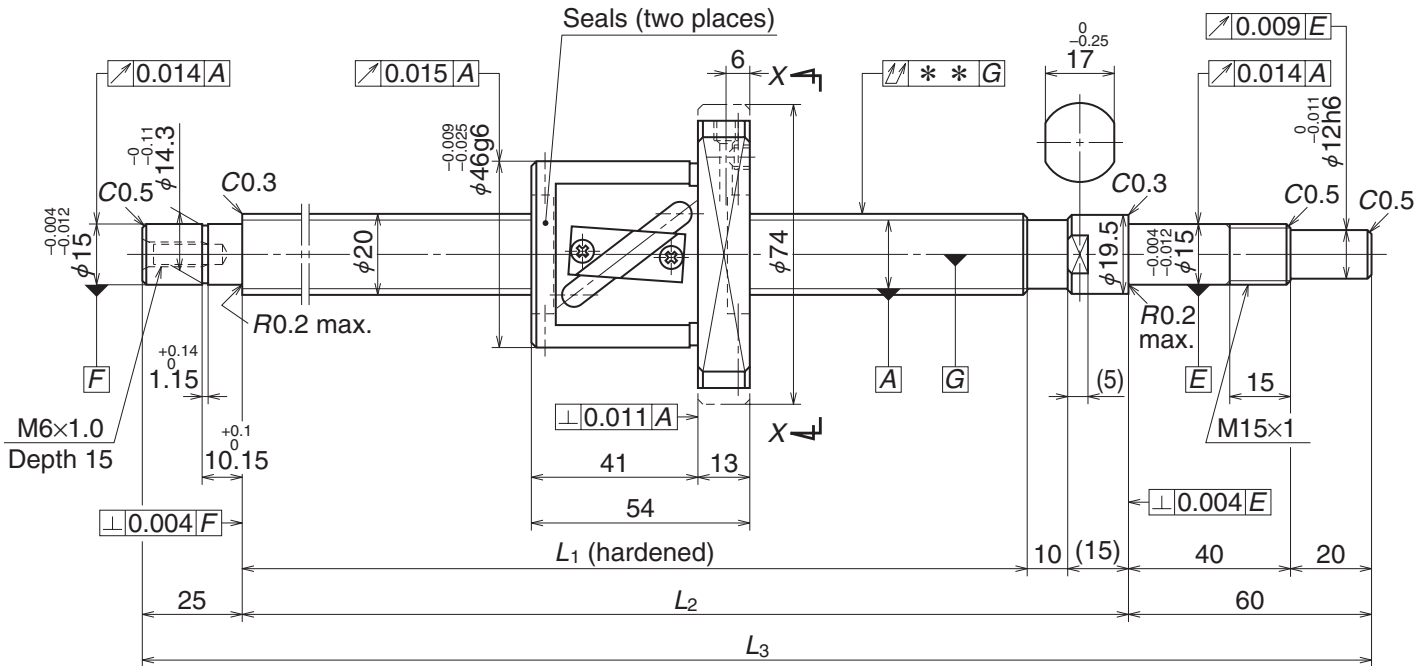
Ball Screws A Series

Unit: mm

| L_3 | Lead accuracy | | | Shaft run-out ** ↕ | Mass (kg) | Permissible rotational speed N (min ⁻¹) | |
|-------|------------------|-------------|-----------------|-----------------------|-----------|---|---------------|
| | Target value T | Error e_p | Variation v_U | | | Supporting condition | |
| | | | | | | Fixed - Simple support | Fixed - Fixed |
| 471 | 0 | 0.025 | 0.020 | 0.040 | 0.90 | 3 000 | 3 000 |
| 671 | 0 | 0.030 | 0.023 | 0.065 | 1.2 | 3 000 | 3 000 |
| 971 | 0 | 0.040 | 0.027 | 0.085 | 1.7 | 2 630 | 3 000 |
| 1 371 | 0 | 0.054 | 0.035 | 0.150 | 2.3 | 1 240 | 1 740 |

Ball Screws A Series: Finished Shaft End

Nut Model: LPFT

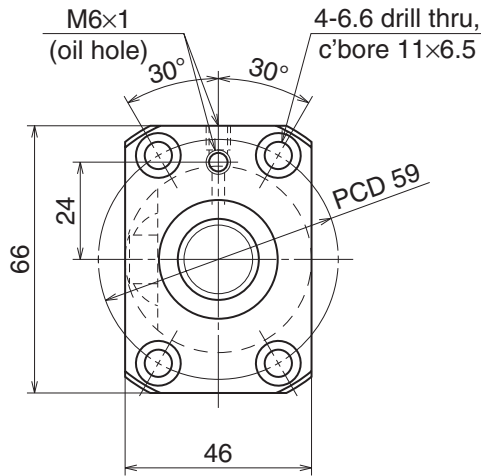


| Part number | Stroke | | Screw shaft length | | |
|-------------------------|---------|---|--------------------|----------------|--|
| | Nominal | Maximum (L ₁ -Nut length) | L ₁ | L ₂ | |
| W2002FA-1P-C5Z10 | 200 | 235 | 289 | 314 | |
| W2003FA-1P-C5Z10 | 300 | 335 | 389 | 414 | |
| W2004FA-1P-C5Z10 | 400 | 435 | 489 | 514 | |
| W2005FA-1P-C5Z10 | 500 | 535 | 589 | 614 | |
| W2006FA-1P-C5Z10 | 600 | 635 | 689 | 714 | |
| W2007FA-1P-C5Z10 | 700 | 735 | 789 | 814 | |
| W2008FA-1P-C5Z10 | 800 | 835 | 889 | 914 | |
| W2009FA-1P-C5Z10 | 900 | 935 | 989 | 1 014 | |
| W2010FA-1P-C5Z10 | 1 000 | 1 035 | 1 089 | 1 114 | |
| W2011FA-1P-C5Z10 | 1 100 | 1 135 | 1 189 | 1 214 | |
| W2012FA-1P-C5Z10 | 1 200 | 1 235 | 1 289 | 1 314 | |

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

Screw Shaft $\phi 20$ Lead 10

Unit: mm



View X-X

| 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 ³) | 4.7 | |

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

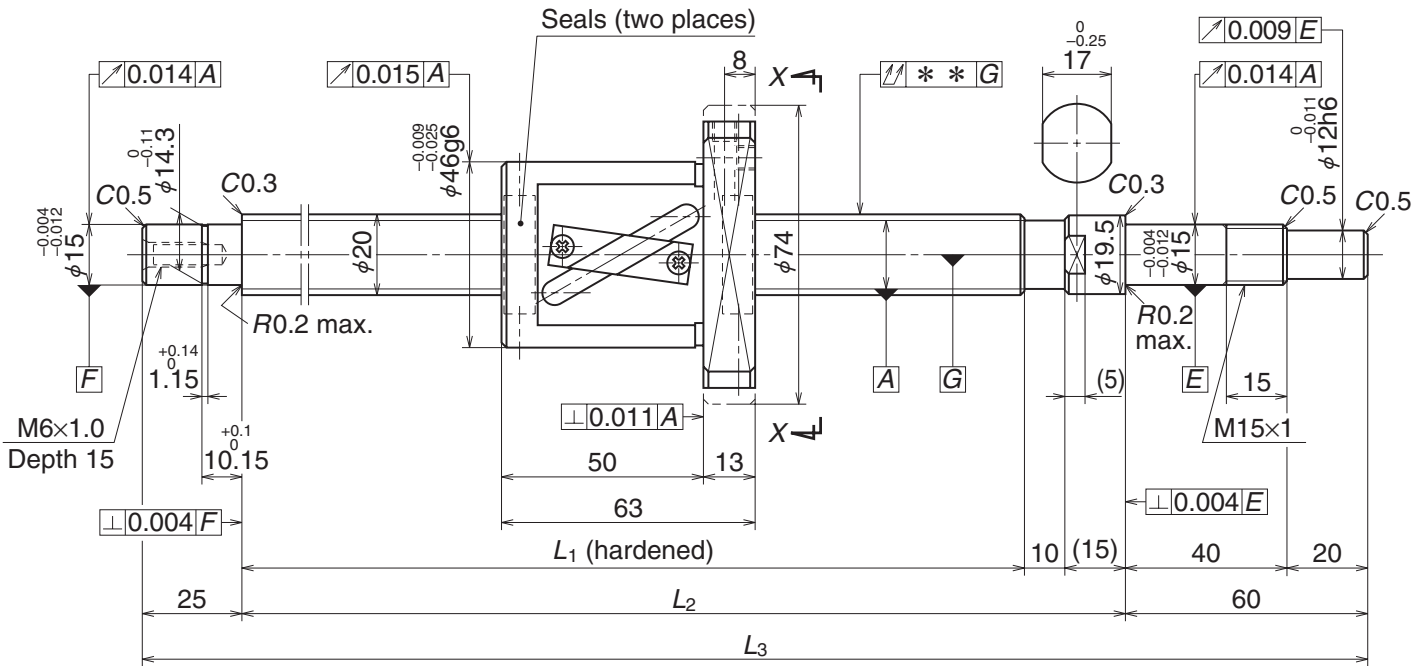
Ball Screws A Series

Unit: mm

| L_3 | Lead accuracy | | | Shaft run-out ** ↕ | Mass (kg) | Permissible rotational speed N (min ⁻¹) | |
|-------|------------------|-------------|-----------------|-----------------------|-----------|---|---------------|
| | Target value T | Error e_p | Variation v_U | | | Supporting condition | |
| | | | | | | Fixed - Simple support | Fixed - Fixed |
| 399 | 0 | 0.023 | 0.018 | 0.035 | 1.4 | 3 000 | 3 000 |
| 499 | 0 | 0.025 | 0.020 | 0.040 | 1.6 | 3 000 | 3 000 |
| 599 | 0 | 0.027 | 0.020 | 0.050 | 1.9 | 3 000 | 3 000 |
| 699 | 0 | 0.030 | 0.023 | 0.065 | 2.1 | 3 000 | 3 000 |
| 799 | 0 | 0.035 | 0.025 | 0.065 | 2.3 | 3 000 | 3 000 |
| 899 | 0 | 0.035 | 0.025 | 0.085 | 2.5 | 3 000 | 3 000 |
| 999 | 0 | 0.040 | 0.027 | 0.085 | 2.8 | 3 000 | 3 000 |
| 1 099 | 0 | 0.040 | 0.027 | 0.110 | 3.0 | 2 680 | 3 000 |
| 1 199 | 0 | 0.046 | 0.030 | 0.110 | 3.2 | 2 210 | 3 000 |
| 1 299 | 0 | 0.046 | 0.030 | 0.150 | 3.4 | 1 840 | 2 570 |
| 1 399 | 0 | 0.054 | 0.035 | 0.150 | 3.7 | 1 570 | 2 190 |

Ball Screws A Series: Finished Shaft End

Nut Model: LPFT

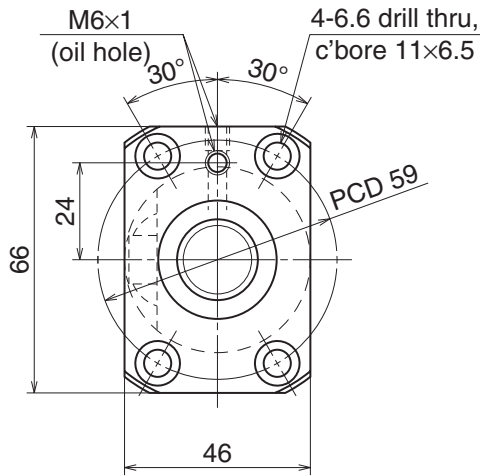


| Part number | Stroke | | Screw shaft length | | |
|-------------------------|---------|---------------------------------|--------------------|-------|--|
| | Nominal | Maximum (L_1 -Nut length) | L_1 | L_2 | |
| W2003FA-3P-C5Z20 | 200 | 247 | 310 | 335 | |
| W2004FA-3P-C5Z20 | 300 | 347 | 410 | 435 | |
| W2005FA-3P-C5Z20 | 400 | 447 | 510 | 535 | |
| W2006FA-3P-C5Z20 | 500 | 547 | 610 | 635 | |
| W2007FA-3P-C5Z20 | 600 | 647 | 710 | 735 | |
| W2008FA-3P-C5Z20 | 700 | 747 | 810 | 835 | |
| W2009FA-3P-C5Z20 | 800 | 847 | 910 | 935 | |
| W2010FA-3P-C5Z20 | 900 | 947 | 1 010 | 1 035 | |
| W2011FA-3P-C5Z20 | 1 000 | 1 047 | 1 110 | 1 135 | |
| W2012FA-3P-C5Z20 | 1 100 | 1 147 | 1 210 | 1 235 | |
| W2015FA-1P-C5Z20 | 1 400 | 1 447 | 1 510 | 1 535 | |

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

Screw Shaft $\phi 20$ Lead 20

Unit: mm



View X-X

Ball Screw Specifications

| | | |
|---|-----------------|-------------------------|
| Shaft dia. × Lead / Direction of turn | | 20 × 20 / Right |
| Preload / Ball recirculation | | P-preload / Return tube |
| Ball dia. / Ball circle dia. | | 3.969 / 21 |
| Effective turns of balls | | 1.5 × 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 ³) | | 4.2 |

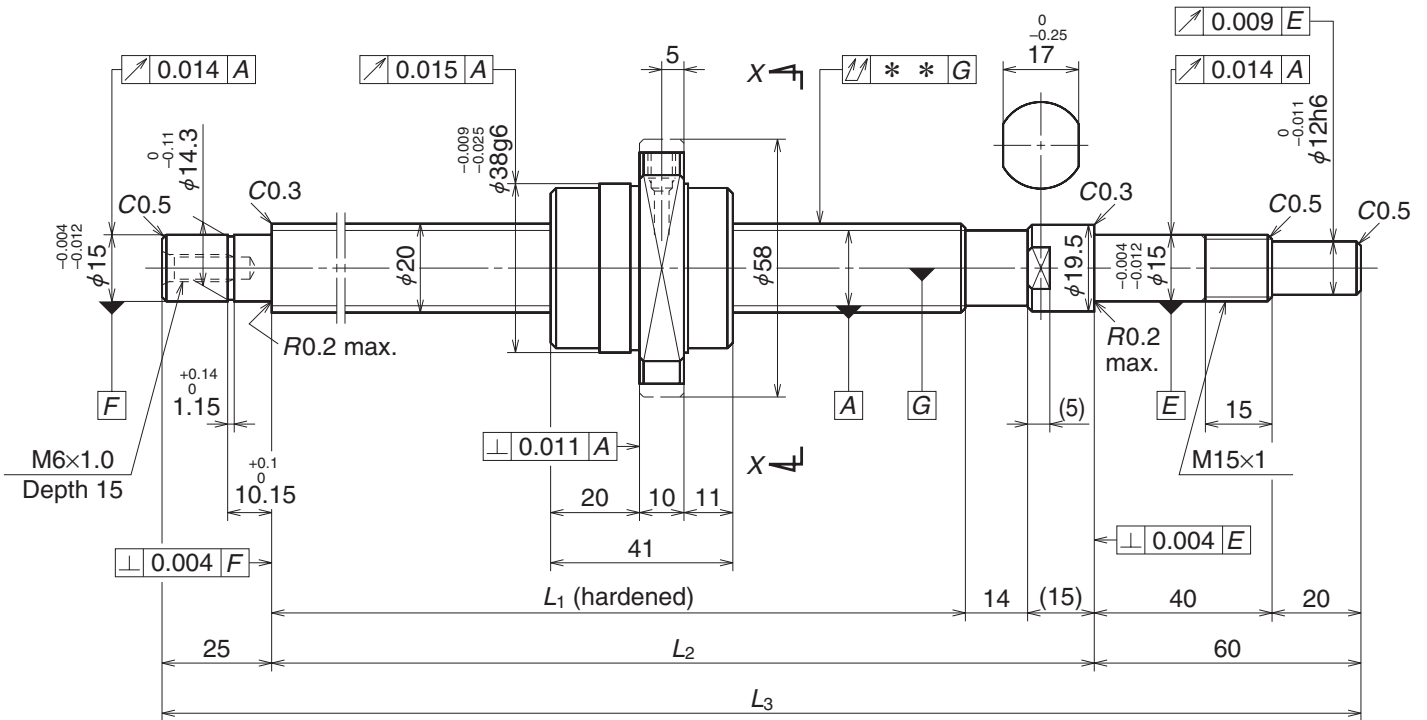
| Recommended Support Unit | Fixed side | Simple support side |
|--------------------------|--------------------|---------------------|
| | WBK15-01A (square) | ○ |
| WBK15S-01 (square) | | ○ |
| WBK15-11 (round) | ○ | |

Unit: mm

| L_3 | Lead accuracy | | | Shaft run-out ** ↕ | Mass (kg) | Permissible rotational speed N (min ⁻¹) | |
|-------|------------------|-------------|-----------------|-----------------------|-----------|---|---------------|
| | Target value T | Error e_p | Variation v_U | | | Supporting condition | |
| | | | | | | Fixed - Simple support | Fixed - Fixed |
| 420 | 0 | 0.023 | 0.018 | 0.040 | 1.6 | 3 000 | 3 000 |
| 520 | 0 | 0.027 | 0.020 | 0.050 | 1.8 | 3 000 | 3 000 |
| 620 | 0 | 0.030 | 0.023 | 0.050 | 2.0 | 3 000 | 3 000 |
| 720 | 0 | 0.030 | 0.023 | 0.065 | 2.3 | 3 000 | 3 000 |
| 820 | 0 | 0.035 | 0.025 | 0.085 | 2.5 | 3 000 | 3 000 |
| 920 | 0 | 0.040 | 0.027 | 0.085 | 2.7 | 3 000 | 3 000 |
| 1 020 | 0 | 0.040 | 0.027 | 0.110 | 3.0 | 3 000 | 3 000 |
| 1 120 | 0 | 0.046 | 0.030 | 0.110 | 3.2 | 2 590 | 3 000 |
| 1 220 | 0 | 0.046 | 0.030 | 0.110 | 3.4 | 2 140 | 2 970 |
| 1 320 | 0 | 0.046 | 0.030 | 0.150 | 3.7 | 1 790 | 2 500 |
| 1 620 | 0 | 0.054 | 0.035 | 0.180 | 4.4 | 1 140 | 1 610 |

Ball Screws A Series: Finished Shaft End

Nut Model: UPFC

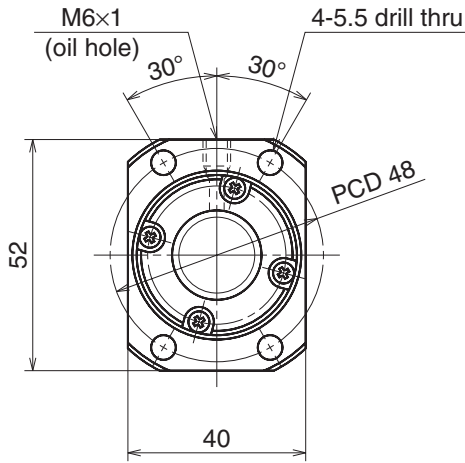


| Part number | Stroke | | Screw shaft length | | |
|---------------------------|---------|---|--------------------|----------------|--|
| | Nominal | Maximum (L ₁ -Nut length) | L ₁ | L ₂ | |
| W2005FA-5PGX-C5Z40 | 400 | 465 | 506 | 535 | |
| W2007FA-5PGX-C5Z40 | 600 | 665 | 706 | 735 | |
| W2009FA-5PGX-C5Z40 | 800 | 865 | 906 | 935 | |
| W2011FA-5PGX-C5Z40 | 1 000 | 1 065 | 1 106 | 1 135 | |
| W2013FA-1PGX-C5Z40 | 1 200 | 1 265 | 1 306 | 1 335 | |
| W2017FA-1PGX-C5Z40 | 1 600 | 1 665 | 1 706 | 1 735 | |

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.

Screw Shaft $\phi 20$ Lead 40

Unit: mm



View X-X

| Ball Screw Specifications | | |
|---|---------------------|-------|
| Shaft dia. × Lead / Direction of turn | 20 × 40 / Right | |
| Preload / Ball recirculation | P-preload / End cap | |
| Ball dia. / Ball circle dia. | 3.175 / 20.75 | |
| Effective turns of balls | 0.7 × 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 ³) | 2.8 | |

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

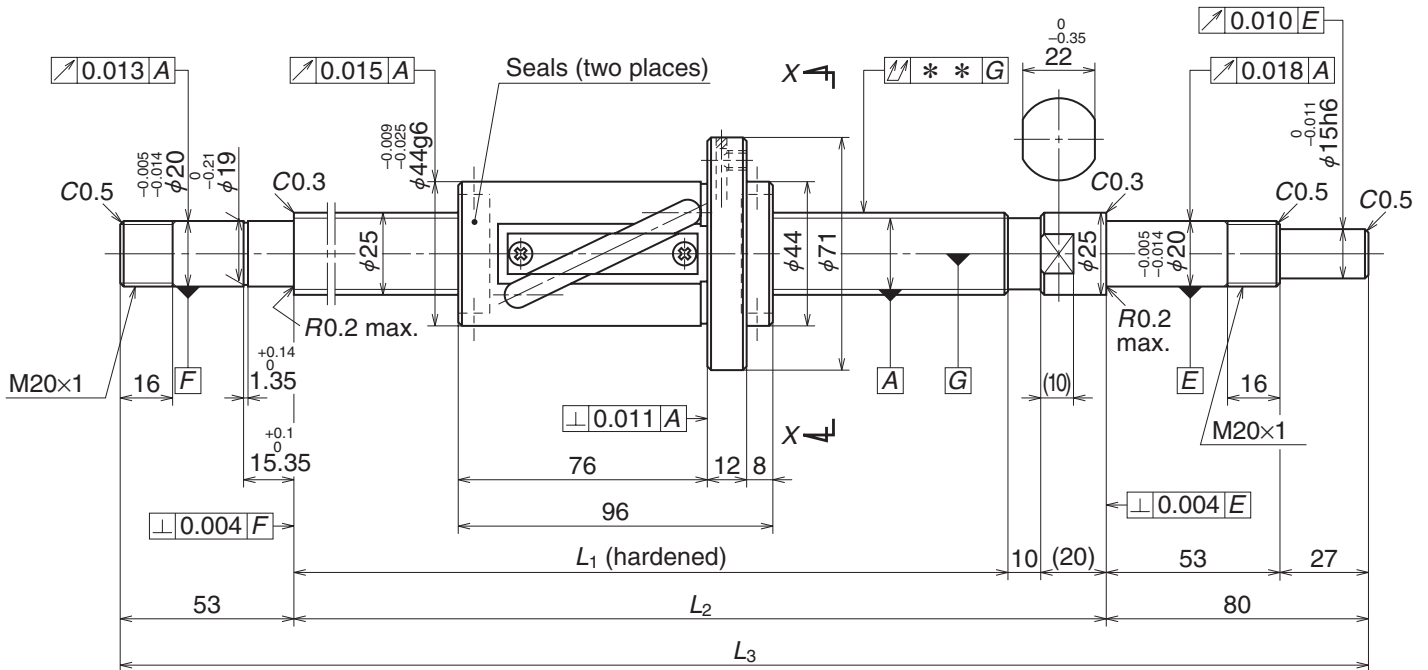
Ball Screws A Series

Unit: mm

| L_3 | Lead accuracy | | | Shaft run-out ** ↕ | Mass (kg) | Permissible rotational speed N (min ⁻¹) | |
|-------|------------------|-------------|-----------------|-----------------------|-----------|---|---------------|
| | Target value T | Error e_p | Variation v_U | | | Supporting condition | |
| | | | | | | Fixed - Simple support | Fixed - Fixed |
| 620 | 0 | 0.030 | 0.023 | 0.050 | 1.7 | 3 000 | 3 000 |
| 820 | 0 | 0.035 | 0.025 | 0.085 | 2.2 | 3 000 | 3 000 |
| 1 020 | 0 | 0.040 | 0.027 | 0.110 | 2.7 | 3 000 | 3 000 |
| 1 220 | 0 | 0.046 | 0.030 | 0.110 | 3.1 | 2 170 | 3 000 |
| 1 420 | 0 | 0.054 | 0.035 | 0.150 | 3.6 | 1 550 | 2 160 |
| 1 820 | 0 | 0.065 | 0.040 | 0.230 | 4.6 | 910 | 1 270 |

Ball Screws A Series: Finished Shaft End

Nut Model: LPFT

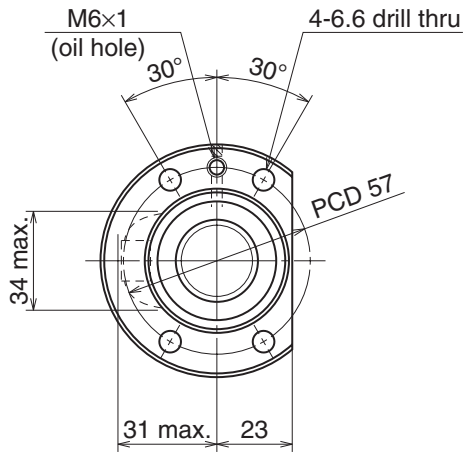


| Part number | Stroke | | Screw shaft length | | |
|-------------------------|---------|---------------------------------|--------------------|-------|--|
| | Nominal | Maximum (L_1 -Nut length) | L_1 | L_2 | |
| W2507FA-1P-C5Z20 | 600 | 654 | 750 | 780 | |
| W2509FA-1P-C5Z20 | 800 | 854 | 950 | 980 | |
| W2511FA-1P-C5Z20 | 1 000 | 1 054 | 1 150 | 1 180 | |
| W2513FA-1P-C5Z20 | 1 200 | 1 254 | 1 350 | 1 380 | |
| W2515FA-1P-C5Z20 | 1 400 | 1 454 | 1 550 | 1 580 | |
| W2517FA-1P-C5Z20 | 1 600 | 1 654 | 1 750 | 1 780 | |
| W2521FA-1P-C5Z20 | 2 000 | 2 054 | 2 150 | 2 180 | |

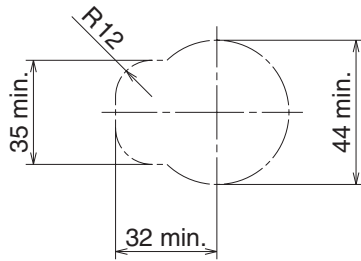
Note: NSK grease LR3 is recommended. Amount for replenishing should be about 50% of nut internal space capacity.

Screw Shaft $\phi 25$ Lead 20

Unit: mm



View X-X



Housing hole and clearance

| Ball Screw Specifications | | |
|---|-------------------------|--------|
| Shaft dia. × Lead / Direction of turn | 25 × 20 / Right | |
| Preload / Ball recirculation | P-preload / Return tube | |
| Ball dia. / Ball circle dia. | 4.762 / 26.25 | |
| Effective turns of balls | 2.5 × 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 ³) | 12 | |

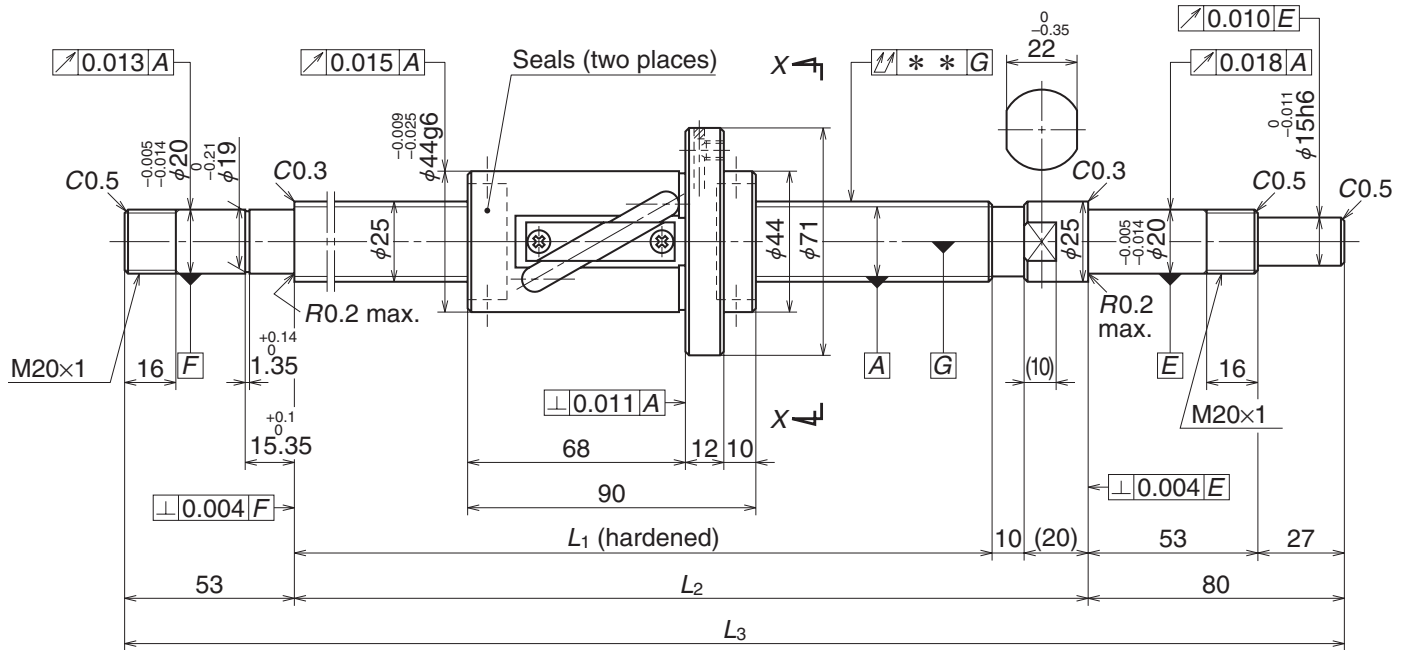
| Recommended Support Unit | Fixed side | Simple support side |
|--------------------------|------------|---------------------|
| WBK20-01 (square) | ○ | ○ |
| WBK20S-01 (square) | | ○ |
| WBK20-11 (round) | ○ | ○ |

Unit: mm

| L_3 | Lead accuracy | | | Shaft run-out ** ↕ | Mass (kg) | Permissible rotational speed N (min ⁻¹) | |
|-------|------------------|-------------|-----------------|-----------------------|-----------|---|---------------|
| | Target value T | Error e_p | Variation v_U | | | Supporting condition | |
| | | | | | | Fixed - Simple support | Fixed - Fixed |
| 913 | 0 | 0.035 | 0.025 | 0.055 | 4.0 | 2 800 | 2 800 |
| 1 113 | 0 | 0.040 | 0.027 | 0.070 | 4.7 | 2 800 | 2 800 |
| 1 313 | 0 | 0.046 | 0.030 | 0.090 | 5.4 | 2 560 | 2 800 |
| 1 513 | 0 | 0.054 | 0.035 | 0.090 | 6.2 | 1 840 | 2 550 |
| 1 713 | 0 | 0.054 | 0.035 | 0.120 | 6.9 | 1 390 | 1 940 |
| 1 913 | 0 | 0.065 | 0.040 | 0.120 | 7.6 | 1 080 | 1 520 |
| 2 313 | 0 | 0.077 | 0.046 | 0.160 | 9.1 | 710 | 1 000 |

Ball Screws A Series: Finished Shaft End

Nut Model: LPFT

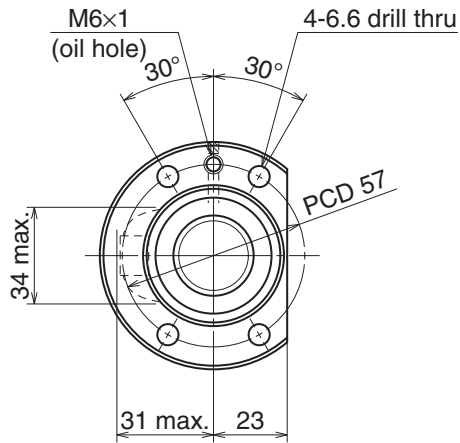


| Part number | Stroke | | Screw shaft length | | |
|-------------------------|---------|---------------------------------|--------------------|-------|--|
| | Nominal | Maximum (L_1 -Nut length) | L_1 | L_2 | |
| W2507FA-3P-C5Z25 | 600 | 660 | 750 | 780 | |
| W2509FA-3P-C5Z25 | 800 | 860 | 950 | 980 | |
| W2511FA-3P-C5Z25 | 1 000 | 1 060 | 1 150 | 1 180 | |
| W2513FA-3P-C5Z25 | 1 200 | 1 260 | 1 350 | 1 380 | |
| W2515FA-3P-C5Z25 | 1 400 | 1 460 | 1 550 | 1 580 | |
| W2517FA-3P-C5Z25 | 1 600 | 1 660 | 1 750 | 1 780 | |
| W2521FA-3P-C5Z25 | 2 000 | 2 060 | 2 150 | 2 180 | |

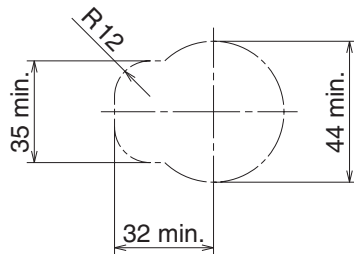
Note: NSK grease LR3 is recommended. Amount for replenishing should be about 50% of nut internal space capacity.

Screw Shaft $\phi 25$ Lead 25

Unit: mm



View X-X



Housing hole and clearance

| Ball Screw Specifications | | |
|---|-------------------------|--------|
| Shaft dia. × Lead / Direction of turn | 25 × 25 / Right | |
| Preload / Ball recirculation | P-preload / Return tube | |
| Ball dia. / Ball circle dia. | 4.762 / 26.25 | |
| Effective turns of balls | 1.5 × 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 ³) | 7.5 | |

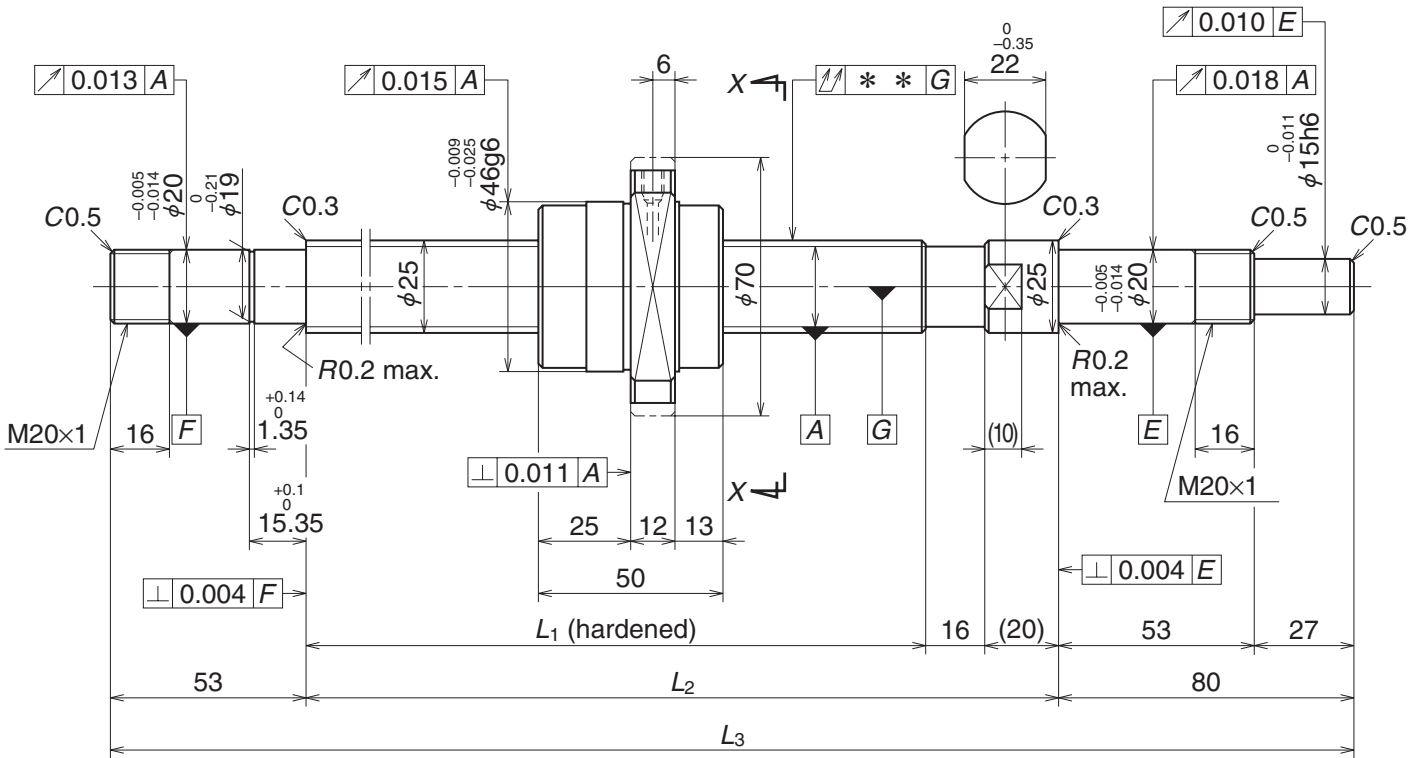
| Recommended Support Unit | Fixed side | Simple support side |
|--------------------------|------------|---------------------|
| WBK20-01 (square) | ○ | ○ |
| WBK20S-01 (square) | | ○ |
| WBK20-11 (round) | ○ | ○ |

Unit: mm

| L_3 | Lead accuracy | | | Shaft run-out ** ↕ | Mass (kg) | Permissible rotational speed N (min ⁻¹) | |
|-------|------------------|-------------|-----------------|-----------------------|-----------|---|---------------|
| | Target value T | Error e_p | Variation v_U | | | Supporting condition | |
| | | | | | | Fixed - Simple support | Fixed - Fixed |
| 913 | 0 | 0.035 | 0.025 | 0.055 | 4.0 | 2 800 | 2 800 |
| 1 113 | 0 | 0.040 | 0.027 | 0.070 | 4.7 | 2 800 | 2 800 |
| 1 313 | 0 | 0.046 | 0.030 | 0.090 | 5.4 | 2 540 | 2 800 |
| 1 513 | 0 | 0.054 | 0.035 | 0.090 | 6.2 | 1 830 | 2 540 |
| 1 713 | 0 | 0.054 | 0.035 | 0.120 | 7.0 | 1 380 | 1 930 |
| 1 913 | 0 | 0.065 | 0.040 | 0.120 | 7.7 | 1 080 | 1 510 |
| 2 313 | 0 | 0.077 | 0.046 | 0.160 | 9.1 | 710 | 1 000 |

Ball Screws A Series: Finished Shaft End

Nut Model: UPFC

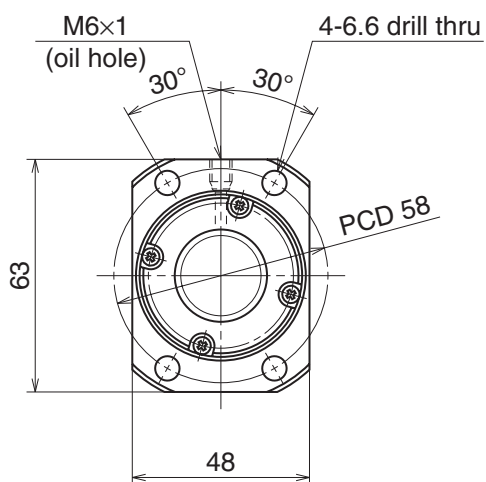


| Part number | Stroke | | Screw shaft length | | |
|---------------------------|---------|---------------------------------|--------------------|-------|--|
| | Nominal | Maximum (L_1 -Nut length) | L_1 | L_2 | |
| W2508FA-1PGX-C5Z50 | 700 | 794 | 844 | 880 | |
| W2511FA-5PGX-C5Z50 | 1 000 | 1 094 | 1 144 | 1 180 | |
| W2516FA-1PGX-C5Z50 | 1 500 | 1 594 | 1 644 | 1 680 | |
| W2521FA-5PGX-C5Z50 | 2 000 | 2 094 | 2 144 | 2 180 | |

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.

Screw Shaft $\phi 25$ Lead 50

Unit: mm



View X-X

| 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 ³) | 4.2 | |

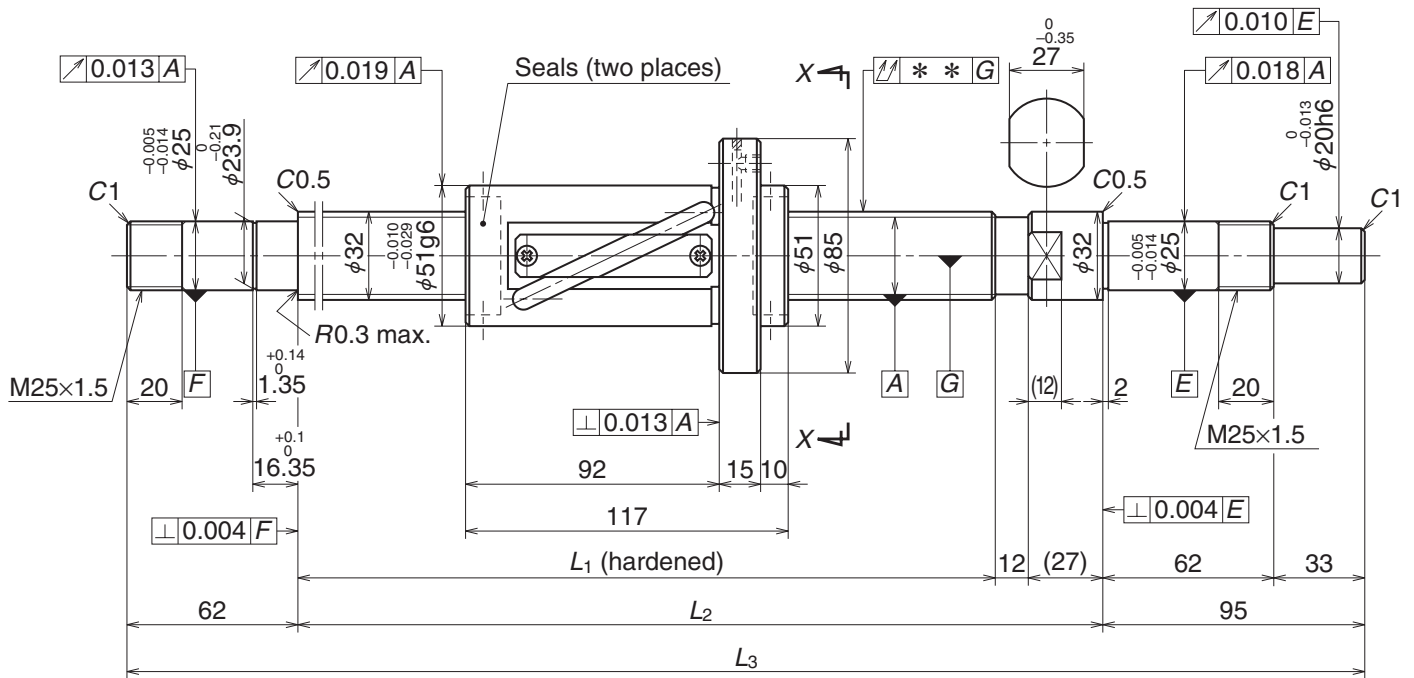
| Recommended Support Unit | Fixed side | Simple support side |
|--------------------------|------------|---------------------|
| WBK20-01 (square) | ○ | ○ |
| WBK20S-01 (square) | | ○ |
| WBK20-11 (round) | ○ | ○ |

Unit: mm

| L_3 | Lead accuracy | | | Shaft run-out ** ↕ | Mass (kg) | Permissible rotational speed N (min ⁻¹) | |
|-------|------------------|-------------|-----------------|-----------------------|-----------|---|---------------|
| | Target value T | Error e_p | Variation v_U | | | Supporting condition | |
| | | | | | | Fixed - Simple support | Fixed - Fixed |
| 1013 | 0 | 0.040 | 0.027 | 0.070 | 4.1 | 2 800 | 2 800 |
| 1 313 | 0 | 0.046 | 0.030 | 0.090 | 5.3 | 2 550 | 2 800 |
| 1 813 | 0 | 0.065 | 0.040 | 0.120 | 7.2 | 1 230 | 1 710 |
| 2 313 | 0 | 0.077 | 0.046 | 0.160 | 9.1 | 720 | 1 010 |

Ball Screws A Series: Finished Shaft End

Nut Model: LPFT

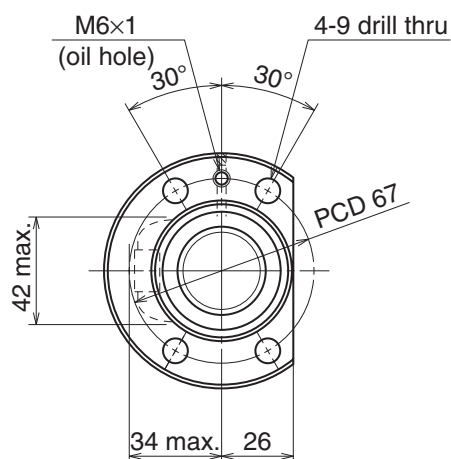


| Part number | Stroke | | Screw shaft length | | |
|-------------------------|---------|------------------------------|--------------------|-------|--|
| | Nominal | Maximum (L_1 -Nut length) | L_1 | L_2 | |
| W3211FA-1P-C5Z25 | 1 000 | 1 063 | 1 180 | 1 219 | |
| W3216FA-1P-C5Z25 | 1 500 | 1 563 | 1 680 | 1 719 | |
| W3221FA-1P-C5Z25 | 2 000 | 2 063 | 2 180 | 2 219 | |
| W3227FA-1P-C5Z25 | 2 600 | 2 663 | 2 780 | 2 819 | |

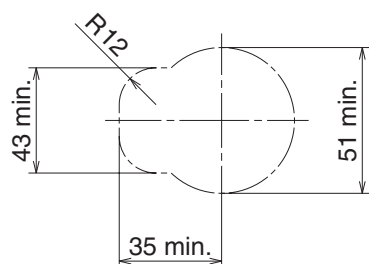
Note: NSK grease LR3 is recommended. Amount for replenishing should be about 50% of nut internal space capacity.

Screw Shaft $\phi 32$ Lead 25

Unit: mm



View X-X



Housing hole and clearance

| Ball Screw Specifications | | |
|---|-------------------------|--------|
| Shaft dia. × Lead / Direction of turn | 32 × 25 / Right | |
| Preload / Ball recirculation | P-preload / Return tube | |
| Ball dia. / Ball circle dia. | 4.762 / 33.25 | |
| Effective turns of balls | 2.5 × 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 ³) | 17.5 | |

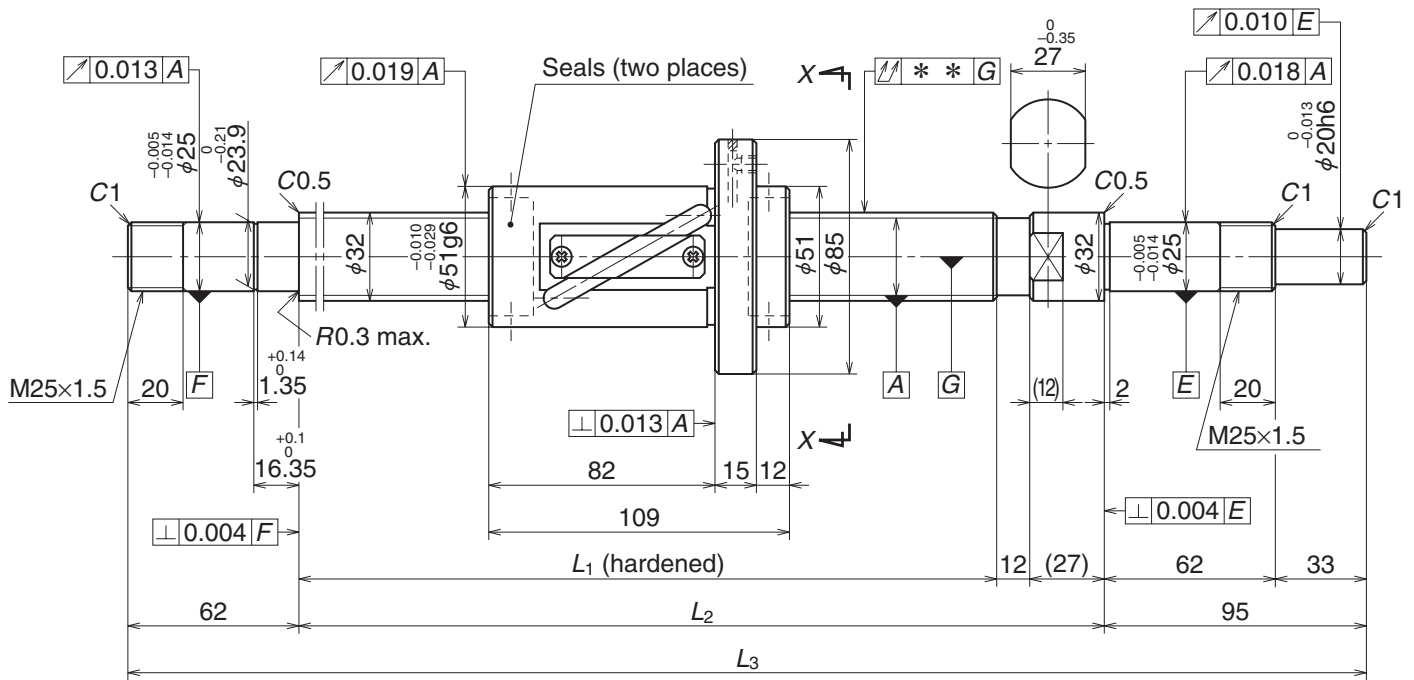
| Recommended Support Unit | Fixed side | Simple support side |
|--------------------------|------------|---------------------|
| WBK25-01W (square) | ○ | ○ |
| WBK25S-01W (square) | | ○ |
| WBK25-11 (round) | ○ | ○ |

Unit: mm

| L_3 | Lead accuracy | | | Shaft run-out ** | Mass (kg) | Permissible rotational speed N (min ⁻¹) | |
|-------|------------------|-------------|-----------------|------------------|-----------|---|---------------|
| | Target value T | Error e_p | Variation v_U | | | Supporting condition | |
| | | | | | | Fixed - Simple support | Fixed - Fixed |
| 1 376 | 0 | 0.046 | 0.030 | 0.090 | 9.3 | 2 180 | 2 180 |
| 1 876 | 0 | 0.065 | 0.040 | 0.120 | 12.3 | 1 580 | 2 180 |
| 2 376 | 0 | 0.077 | 0.046 | 0.160 | 15.4 | 930 | 1 300 |
| 2 976 | 0 | 0.093 | 0.054 | 0.200 | 19.1 | 560 | 800 |

Ball Screws A Series: Finished Shaft End

Nut Model: LPFT

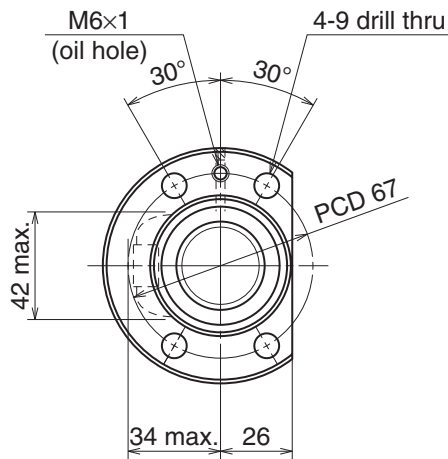


| Part number | Stroke | | Screw shaft length | | |
|-------------------------|---------|---|--------------------|----------------|--|
| | Nominal | Maximum (L ₁ -Nut length) | L ₁ | L ₂ | |
| W3211FA-3P-C5Z32 | 1 000 | 1 071 | 1 180 | 1 219 | |
| W3216FA-3P-C5Z32 | 1 500 | 1 571 | 1 680 | 1 719 | |
| W3221FA-3P-C5Z32 | 2 000 | 2 071 | 2 180 | 2 219 | |
| W3227FA-3P-C5Z32 | 2 600 | 2 671 | 2 780 | 2 819 | |

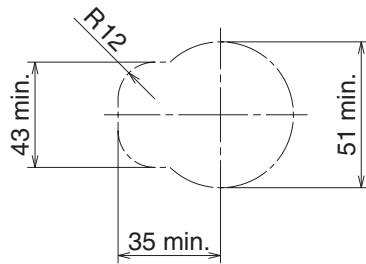
Note: NSK grease LR3 is recommended. Amount for replenishing should be about 50% of nut internal space capacity.

Screw Shaft $\phi 32$ Lead 32

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 ³) | 14 | |

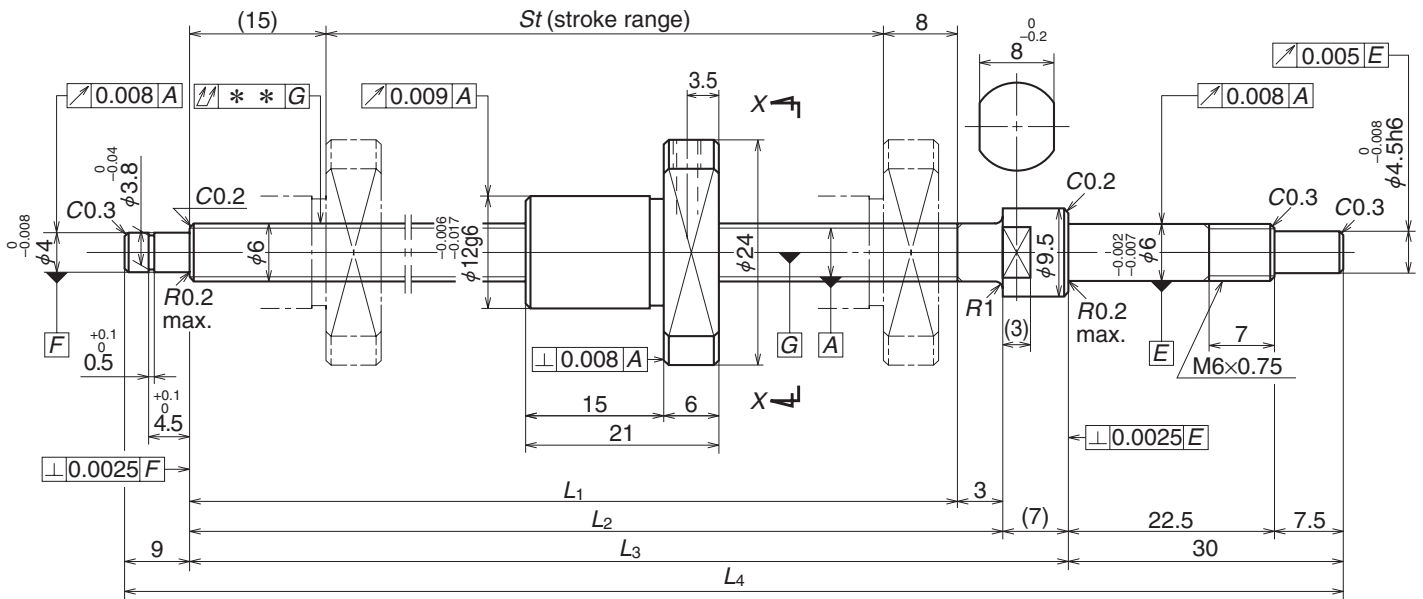
| Recommended Support Unit | Fixed side | Simple support side |
|--------------------------|------------|---------------------|
| WBK25-01W (square) | ○ | ○ |
| WBK25S-01W (square) | | ○ |
| WBK25-11 (round) | ○ | ○ |

Unit: mm

| L_3 | Lead accuracy | | | Shaft run-out ** | Mass (kg) | Permissible rotational speed N (min ⁻¹) | |
|-------|------------------|-------------|-----------------|------------------|-----------|---|---------------|
| | Target value T | Error e_p | Variation v_U | | | Supporting condition | |
| | | | | | | Fixed - Simple support | Fixed - Fixed |
| 1 376 | 0 | 0.046 | 0.030 | 0.090 | 9.3 | 2 180 | 2 180 |
| 1 876 | 0 | 0.065 | 0.040 | 0.120 | 12.3 | 1 570 | 2 180 |
| 2 376 | 0 | 0.077 | 0.046 | 0.160 | 15.4 | 920 | 1 290 |
| 2 976 | 0 | 0.093 | 0.054 | 0.200 | 19.1 | 560 | 790 |

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

Nut Model: MPFD



| Part number | Stroke | | Screw shaft length | | | |
|-------------------------|---------|---------|--------------------|-------|-------|--|
| | Nominal | Maximum | L_1 | L_2 | L_3 | |
| W0601KA-3PY-C3Z1 | 100 | 102 | 125 | 128 | 135 | |

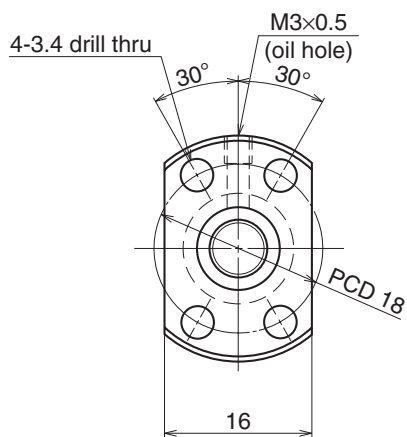
Note 1: Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.

Note 2: NSK Clean Grease LG2 is recommended. Apply to screw shaft surface when replenishing.

Note 3: Nut does not have seal.

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 | 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 | |

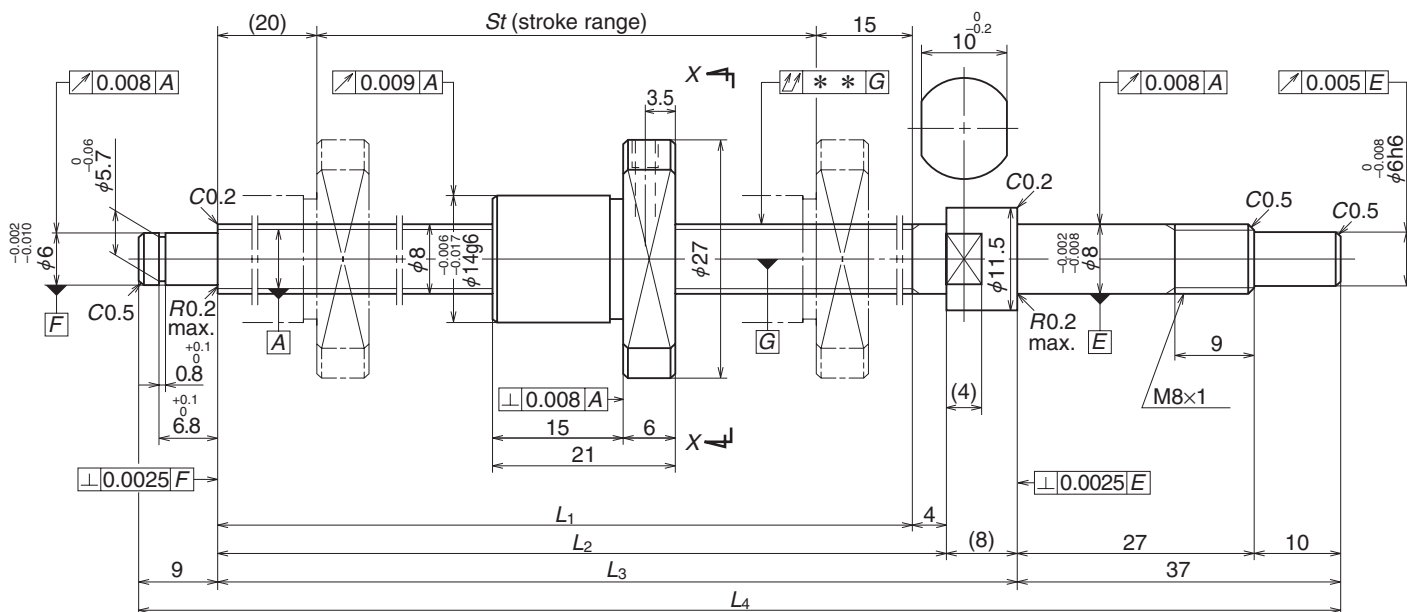
Ball Screws KA Series

Unit: mm

| L_4 | Lead accuracy | | | Shaft run-out ** ↕ | Mass (kg) | Permissible rotational speed N (min ⁻¹) |
|-------|------------------|-------------|-----------------|-----------------------|-----------|---|
| | Target value T | Error e_p | Variation v_U | | | Supporting condition |
| | | | | | | Fixed - Simple support |
| 174 | 0 | 0.010 | 0.008 | 0.025 | 0.06 | 3 000 |

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

Nut Model: MPFD



| Part number | Stroke | | Screw shaft length | | | |
|-------------------------|---------|---------|--------------------|-------|-------|--|
| | Nominal | Maximum | L_1 | L_2 | L_3 | |
| W0802KA-1PY-C3Z1 | 150 | 155 | 190 | 194 | 202 | |

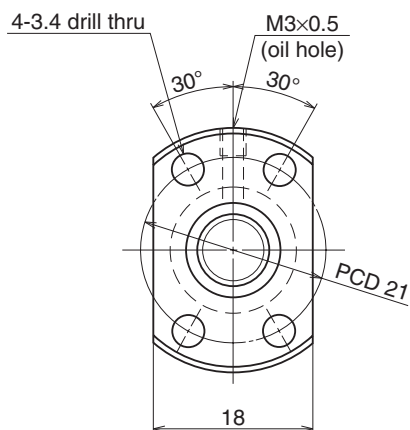
Note 1: Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.

Note 2: NSK Clean Grease LG2 is recommended. Apply to screw shaft surface when replenishing.

Note 3: Nut does not have seal.

Screw Shaft $\phi 8$ Lead 1

Unit: mm



View X-X

| 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 | |

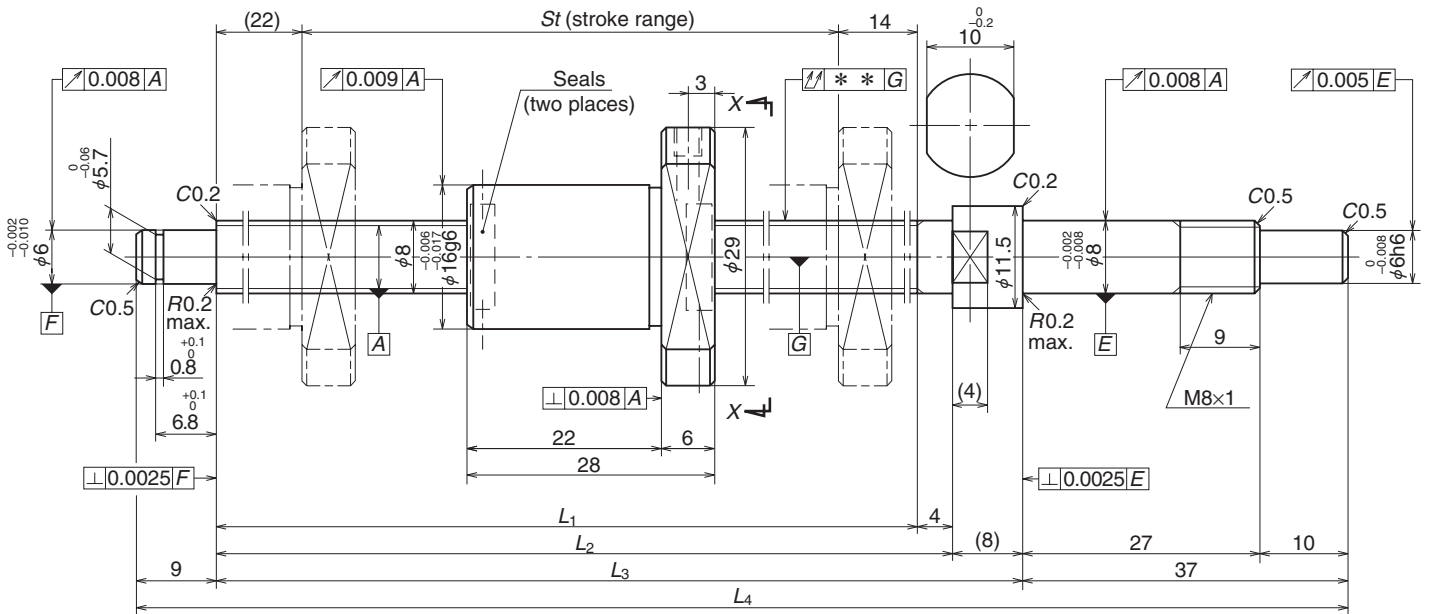
| Recommended Support Unit For Clean Environment Use | Fixed side | Simple support side |
|--|------------|---------------------|
| WBK08-01C (square) | ○ | |
| WBK08S-01C (square) | | ○ |
| WBK08-11C (round) | ○ | |

Unit: mm

| L_4 | Lead accuracy | | | Shaft run-out ** ↕ | Mass (kg) | Permissible rotational speed N (min ⁻¹) |
|-------|------------------|-------------|-----------------|-----------------------|-----------|---|
| | Target value T | Error e_p | Variation v_U | | | Supporting condition |
| | | | | | | Fixed - Simple support |
| 248 | 0 | 0.010 | 0.008 | 0.035 | 0.12 | 3 000 |

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

Nut Model: MPFD

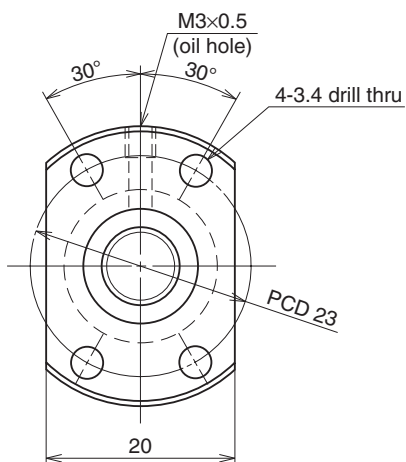


| Part number | Stroke | | Screw shaft length | | | |
|-------------------------|---------|---------|--------------------|----------------|----------------|--|
| | Nominal | Maximum | L ₁ | L ₂ | L ₃ | |
| W0802KA-5PY-C3Z2 | 150 | 154 | 190 | 194 | 202 | |

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.

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 | |

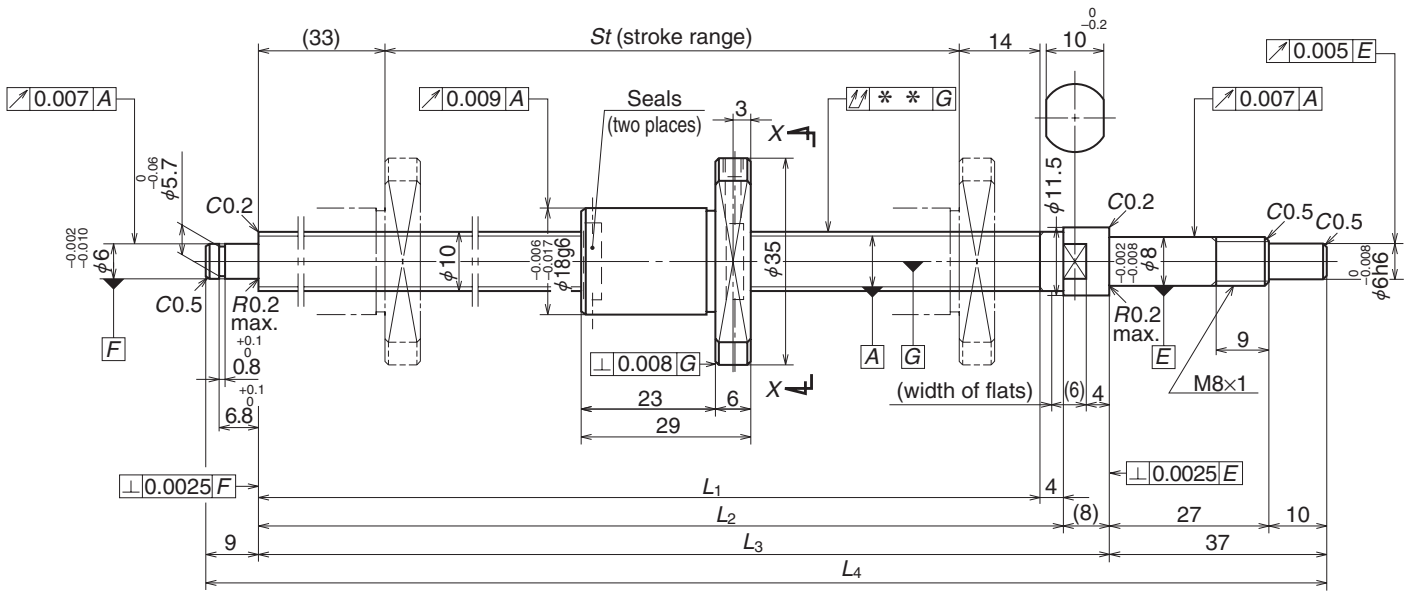
| Recommended Support Unit For Clean Environment Use | Fixed side | Simple support side |
|--|------------|---------------------|
| WBK08-01C (square) | ○ | |
| WBK08S-01C (square) | | ○ |
| WBK08-11C (round) | ○ | |

Unit: mm

| L_4 | Lead accuracy | | | Shaft run-out ** ↕ | Mass (kg) | Permissible rotational speed N (min ⁻¹) |
|-------|------------------|-------------|-----------------|-----------------------|-----------|---|
| | Target value T | Error e_p | Variation v_U | | | Supporting condition |
| | | | | | | Fixed - Simple support |
| 248 | 0 | 0.010 | 0.008 | 0.035 | 0.13 | 3 000 |

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

Nut Model: MPFD

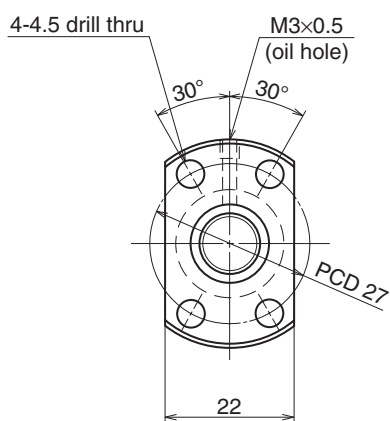


| Part number | Stroke | | Screw shaft length | | | |
|-------------------------|---------|---------|--------------------|-------|-------|--|
| | Nominal | Maximum | L_1 | L_2 | L_3 | |
| W1002KA-3PY-C3Z2 | 200 | 203 | 250 | 254 | 262 | |

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.

Screw Shaft $\phi 10$ Lead 2

Unit: mm



View X-X

| 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 | |

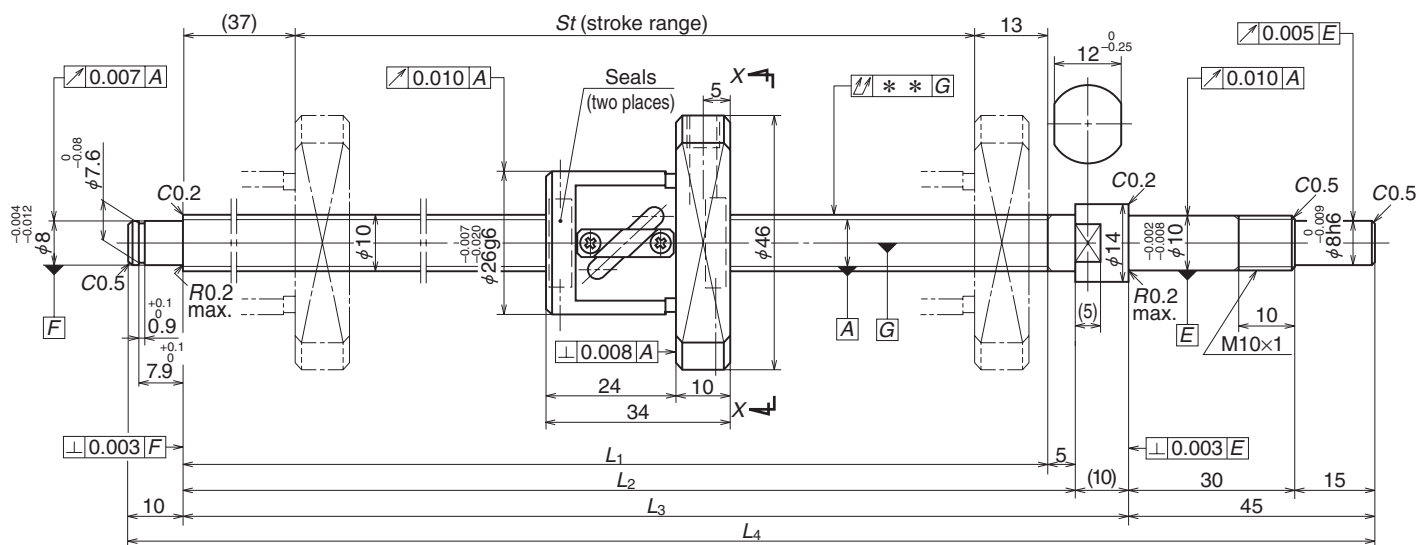
| Recommended Support Unit For Clean Environment Use | Fixed side | Simple support side |
|--|------------|---------------------|
| WBK10-01C (square) | ○ | |
| WBK10S-01C (square) | | ○ |
| WBK10-11C (round) | ○ | |

Unit: mm

| L_4 | Lead accuracy | | | Shaft run-out ** ↕ | Mass (kg) | Permissible rotational speed N (min ⁻¹) |
|-------|------------------|-------------|-----------------|-----------------------|-----------|---|
| | Target value T | Error e_p | Variation v_U | | | Supporting condition |
| | | | | | | Fixed - Simple support |
| 308 | 0 | 0.012 | 0.008 | 0.030 | 0.22 | 3 000 |

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

Nut Model: PFT

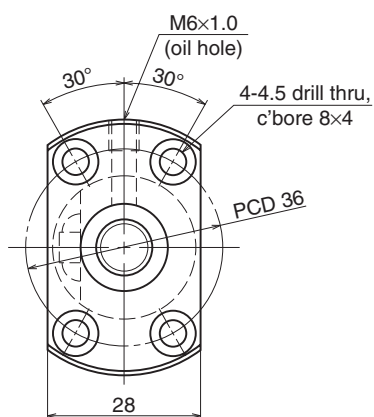


| Part number | Stroke | | Screw shaft length | | | |
|------------------------|---------|---------|--------------------|----------------|----------------|--|
| | Nominal | Maximum | L ₁ | L ₂ | L ₃ | |
| W1001KA-3P-C3Z4 | 100 | 110 | 160 | 165 | 175 | |
| W1003KA-3P-C3Z4 | 300 | 310 | 360 | 365 | 375 | |

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.

Screw Shaft $\phi 10$ Lead 4

Unit: mm



View X-X

| 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 ³) | 0.8 | |

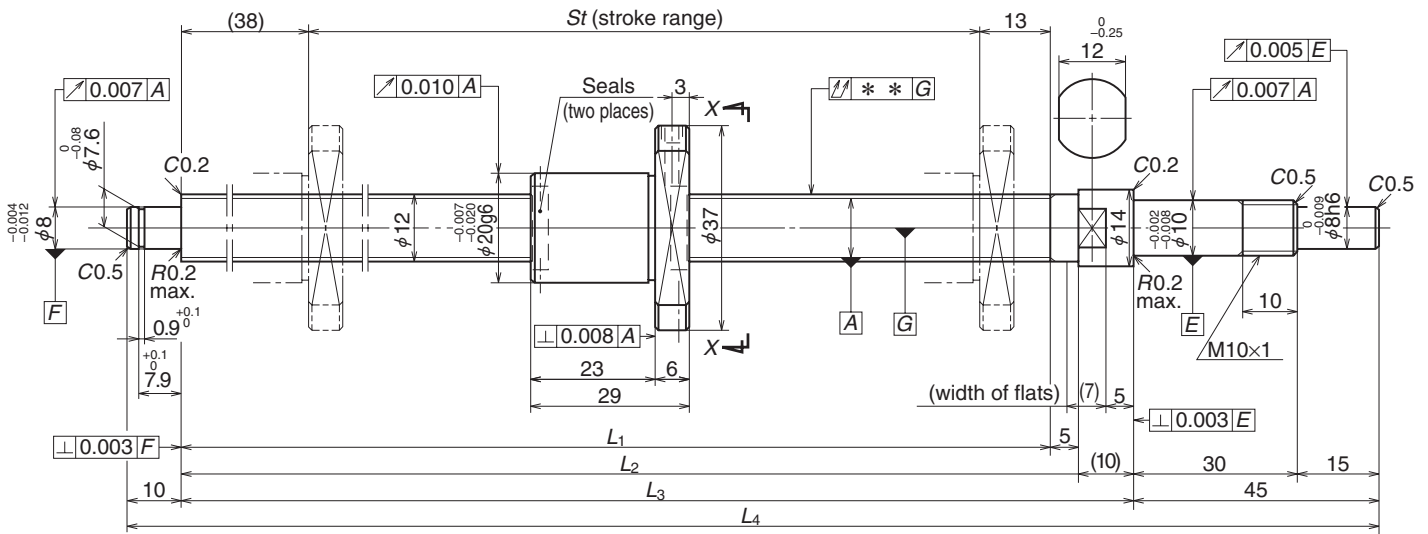
| Recommended Support Unit For Clean Environment Use | Fixed side | Simple support side |
|--|------------|---------------------|
| WBK10-01C (square) | ○ | |
| WBK10S-01C (square) | | ○ |
| WBK10-11C (round) | ○ | |

Unit: mm

| L_4 | Lead accuracy | | | Shaft run-out ** ↕ | Mass (kg) | Permissible rotational speed N (min ⁻¹) |
|-------|------------------|-------------|-----------------|-----------------------|-----------|---|
| | Target value T | Error e_p | Variation v_U | | | Supporting condition |
| | | | | | | Fixed - Simple support |
| 230 | 0 | 0.010 | 0.008 | 0.030 | 0.29 | 3 000 |
| 430 | 0 | 0.013 | 0.008 | 0.050 | 0.39 | 3 000 |

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

Nut Model: MPFD

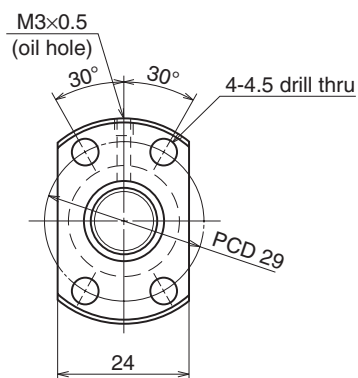


| Part number | Stroke | | Screw shaft length | | | |
|-------------------------|---------|---------|--------------------|-------|-------|--|
| | Nominal | Maximum | L_1 | L_2 | L_3 | |
| W1201KA-3PY-C3Z2 | 100 | 109 | 160 | 165 | 175 | |
| W1203KA-1PY-C3Z2 | 250 | 259 | 310 | 315 | 325 | |

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.

Screw Shaft $\phi 12$ Lead 2

Unit: mm



View X-X

| 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 | |

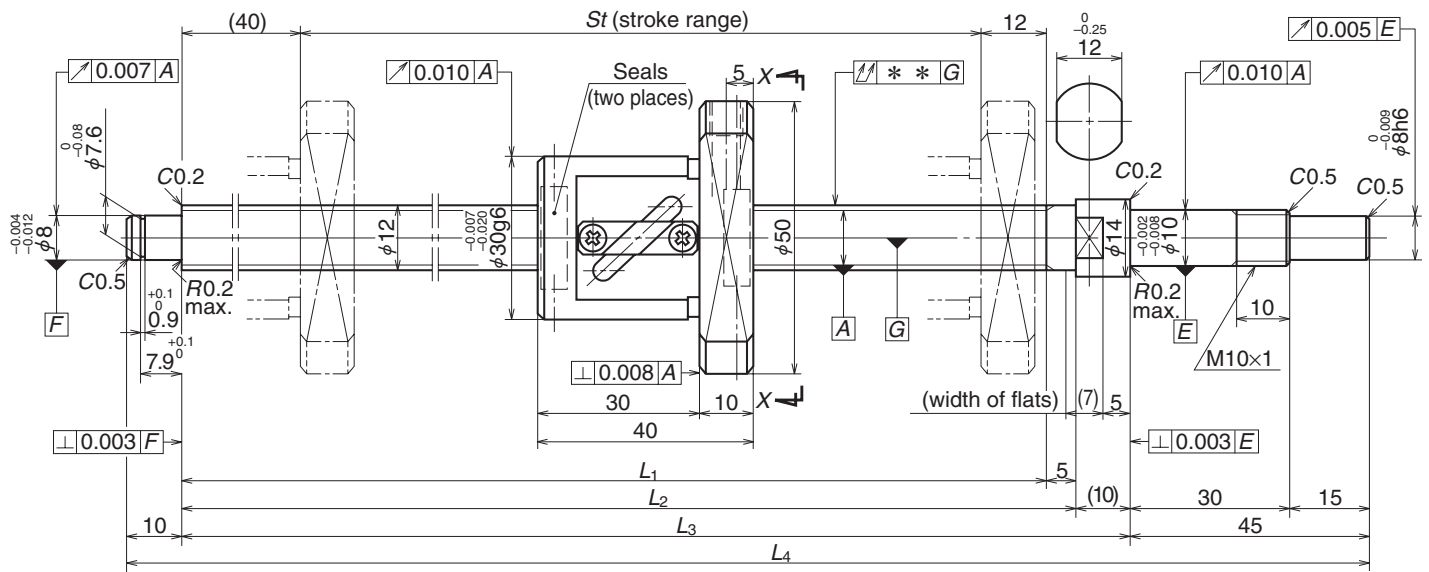
| Recommended Support Unit For Clean Environment Use | Fixed side | Simple support side |
|--|------------|---------------------|
| WBK10-01C (square) | ○ | |
| WBK10S-01C (square) | | ○ |
| WBK10-11C (round) | ○ | |

Unit: mm

| L_4 | Lead accuracy | | | Shaft run-out ** ↕ | Mass (kg) | Permissible rotational speed N (min ⁻¹) |
|-------|------------------|-------------|-----------------|-----------------------|-----------|---|
| | Target value T | Error e_p | Variation v_U | | | Supporting condition |
| | | | | | | Fixed - Simple support |
| 230 | 0 | 0.010 | 0.008 | 0.030 | 0.24 | 3 000 |
| 380 | 0 | 0.012 | 0.008 | 0.040 | 0.36 | 3 000 |

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

Nut Model: PFT



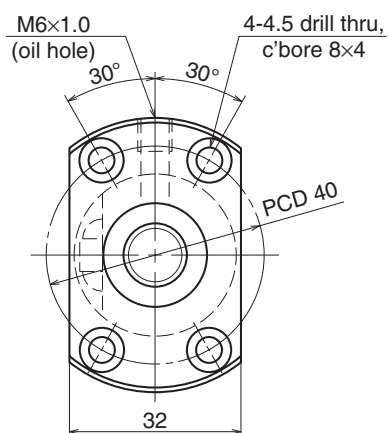
| Part number | Stroke | | Screw shaft length | | | |
|------------------------|---------|---------|--------------------|-------|-------|--|
| | Nominal | Maximum | L_1 | L_2 | L_3 | |
| W1202KA-3P-C3Z5 | 200 | 208 | 260 | 265 | 275 | |
| W1205KA-1P-C3Z5 | 450 | 458 | 510 | 515 | 525 | |

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.

Screw Shaft $\phi 12$ Lead 5

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 | 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 ³) | | 1.2 |

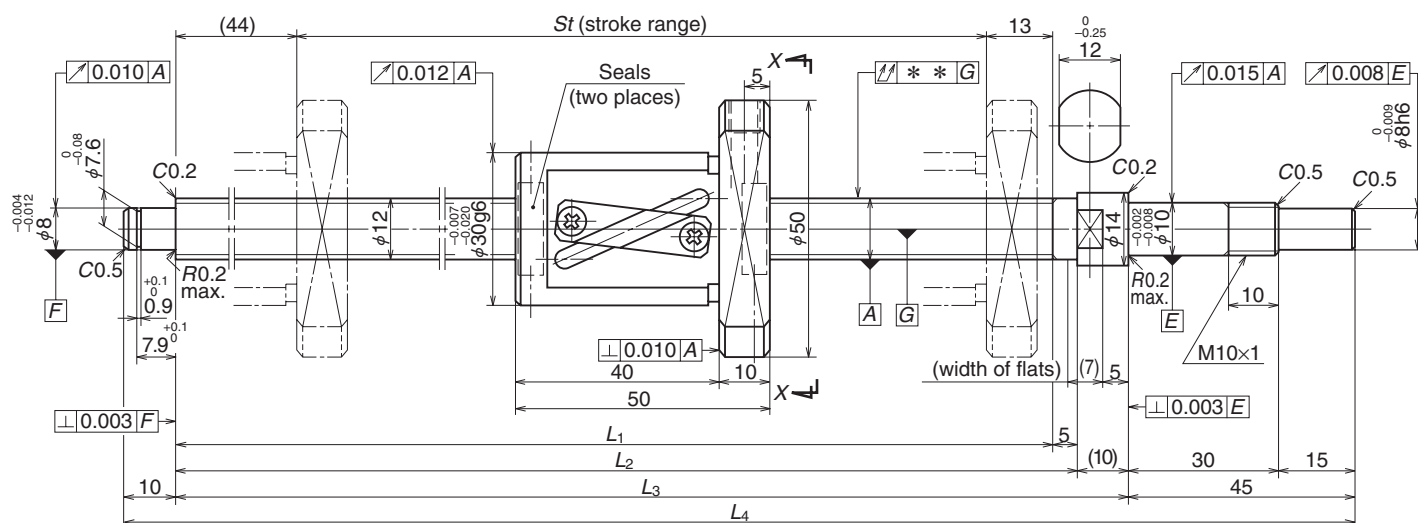
| Recommended Support Unit For Clean Environment Use | Fixed side | Simple support side |
|--|--------------------|---------------------|
| | WBK10-01C (square) | ○ |
| WBK10S-01C (square) | | ○ |
| WBK10-11C (round) | ○ | |

Unit: mm

| L_4 | Lead accuracy | | | Shaft run-out ** ↕ | Mass (kg) | Permissible rotational speed N (min ⁻¹) |
|-------|------------------|-------------|-----------------|-----------------------|-----------|---|
| | Target value T | Error e_p | Variation v_U | | | Supporting condition |
| | | | | | | Fixed - Simple support |
| 330 | 0 | 0.012 | 0.008 | 0.040 | 0.47 | 3 000 |
| 580 | 0 | 0.016 | 0.012 | 0.065 | 0.66 | 3 000 |

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

Nut Model: LPFT



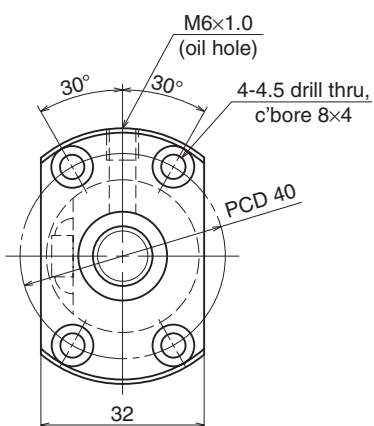
| Part number | Stroke | | Screw shaft length | | | |
|-------------------------|---------|---------|--------------------|-------|-------|--|
| | Nominal | Maximum | L_1 | L_2 | L_3 | |
| W1203KA-3P-C5Z10 | 250 | 253 | 310 | 315 | 325 | |
| W1205KA-3P-C5Z10 | 450 | 453 | 510 | 515 | 525 | |

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.

Screw Shaft $\phi 12$ Lead 10

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 | 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 ³) | 1.4 | |

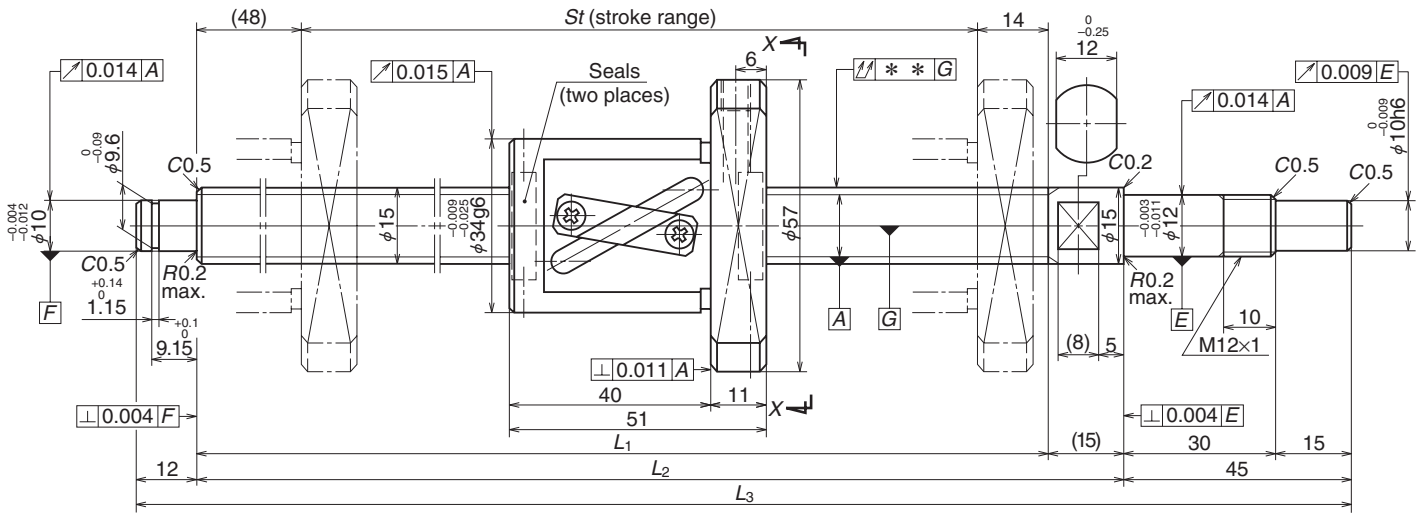
| Recommended Support Unit For Clean Environment Use | Fixed side | Simple support side |
|--|------------|---------------------|
| WBK10-01C (square) | ○ | |
| WBK10S-01C (square) | | ○ |
| WBK10-11C (round) | ○ | |

Unit: mm

| L_4 | Lead accuracy | | | Shaft run-out ** ↕ | Mass (kg) | Permissible rotational speed N (min ⁻¹) |
|-------|------------------|-------------|-----------------|-----------------------|-----------|---|
| | Target value T | Error e_p | Variation v_U | | | Supporting condition |
| | | | | | | Fixed - Simple support |
| 380 | 0 | 0.023 | 0.018 | 0.050 | 0.56 | 3 000 |
| 580 | 0 | 0.030 | 0.023 | 0.075 | 0.72 | 3 000 |

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

Nut Model: LPFT



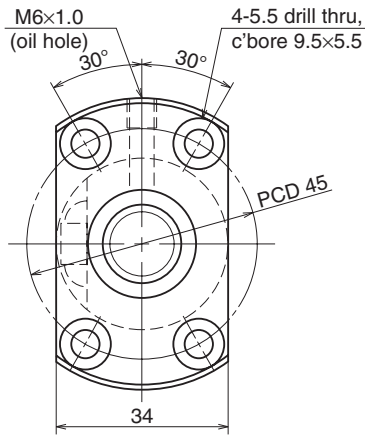
| Part number | Stroke | | Screw shaft length | | |
|-------------------------|---------|---------|--------------------|----------------|--|
| | Nominal | Maximum | L ₁ | L ₂ | |
| W1504KA-3P-C5Z10 | 400 | 427 | 489 | 504 | |
| W1506KA-3P-C5Z10 | 600 | 627 | 689 | 704 | |
| W1510KA-1P-C5Z10 | 1 000 | 1 027 | 1 089 | 1 104 | |

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.

Screw Shaft $\phi 15$ Lead 10

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 ³) | 2.3 | |

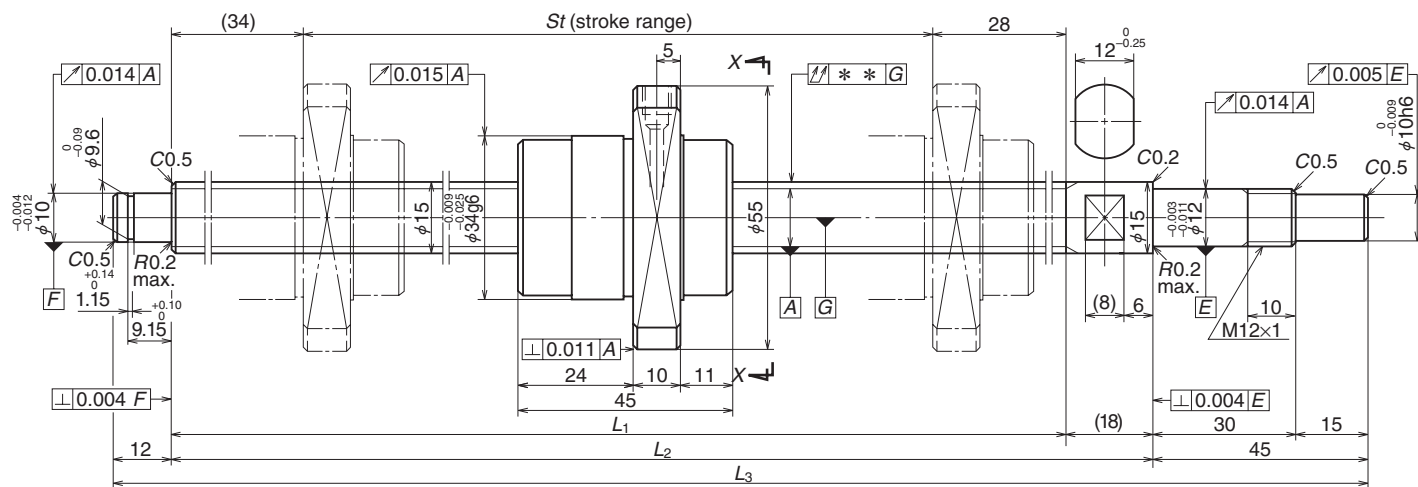
| Recommended Support Unit For Clean Environment Use | Fixed side | Simple support side |
|--|--------------------|---------------------|
| | WBK12-01C (square) | ○ |
| WBK12S-01C (square) | | ○ |
| WBK12-11C (round) | ○ | |

Unit: mm

| L_3 | Lead accuracy | | | Shaft run-out ** ↕ | Mass (kg) | Permissible rotational speed N (min ⁻¹) |
|-------|------------------|-------------|-----------------|-----------------------|-----------|---|
| | Target value T | Error e_p | Variation v_U | | | Supporting condition |
| | | | | | | Fixed - Simple support |
| 561 | 0 | 0.027 | 0.020 | 0.050 | 0.99 | 3 000 |
| 761 | 0 | 0.035 | 0.025 | 0.065 | 1.2 | 3 000 |
| 1 161 | 0 | 0.046 | 0.030 | 0.110 | 1.7 | 1 610 |

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

Nut Model: UPFC



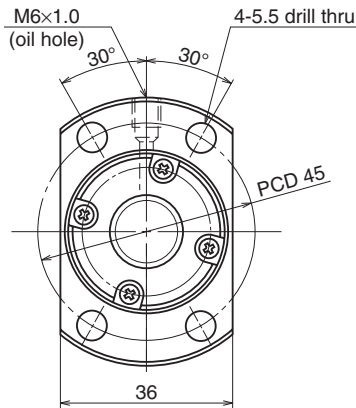
| Part number | Stroke | | Screw shaft length | | |
|--------------------------|---------|---------|--------------------|-------|--|
| | Nominal | Maximum | L_1 | L_2 | |
| W1504KA-7PG-C5Z20 | 400 | 424 | 486 | 504 | |
| W1506KA-7PG-C5Z20 | 600 | 624 | 686 | 704 | |
| W1510KA-3PG-C5Z20 | 1 000 | 1 024 | 1 086 | 1 104 | |

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.

Screw Shaft $\phi 15$ Lead 20

Unit: mm



View X-X

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 ³) | | 1.9 |

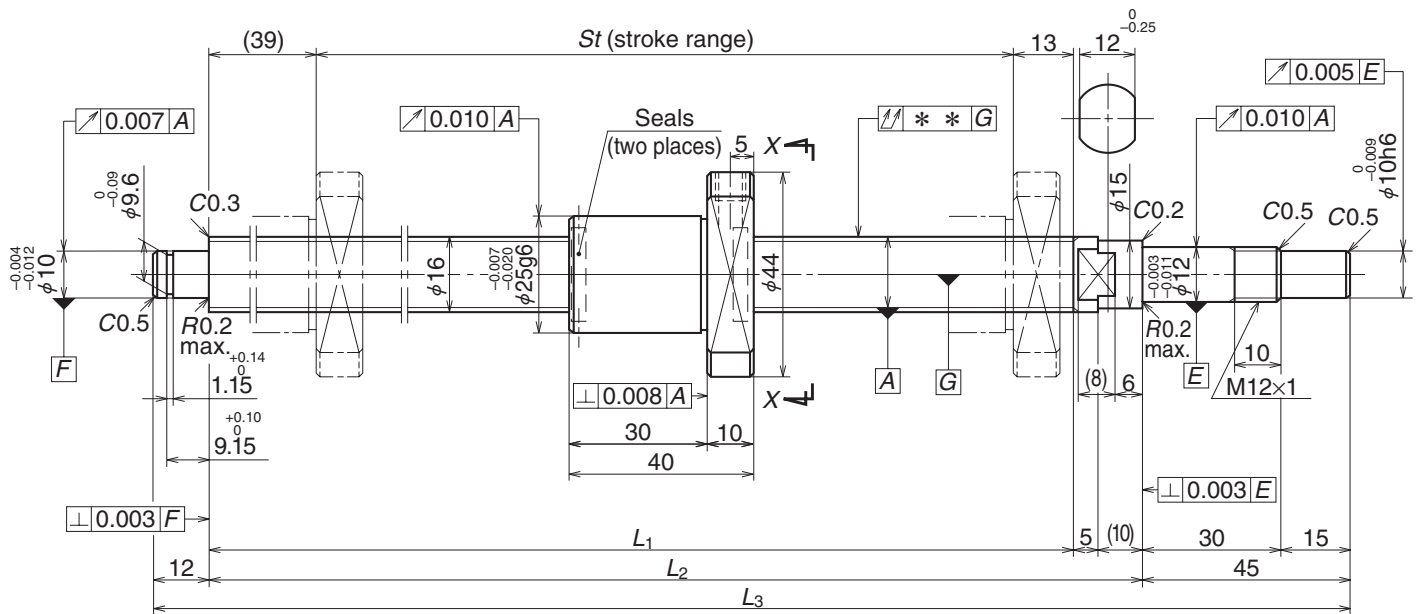
| Recommended Support Unit For Clean Environment Use | Fixed side | Simple support side |
|--|--------------------|---------------------|
| | WBK12-01C (square) | ○ |
| WBK12S-01C (square) | | ○ |
| WBK12-11C (round) | ○ | |

Unit: mm

| L_3 | Lead accuracy | | | Shaft run-out ** ↕ | Mass (kg) | Permissible rotational speed N (min ⁻¹) |
|-------|------------------|-------------|-----------------|-----------------------|-----------|---|
| | Target value T | Error e_p | Variation v_U | | | Supporting condition |
| | | | | | | Fixed - Simple support |
| 561 | 0 | 0.027 | 0.020 | 0.050 | 1.0 | 3 000 |
| 761 | 0 | 0.035 | 0.025 | 0.065 | 1.3 | 3 000 |
| 1 161 | 0 | 0.046 | 0.030 | 0.110 | 1.8 | 1 610 |

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

Nut Model: MPFD



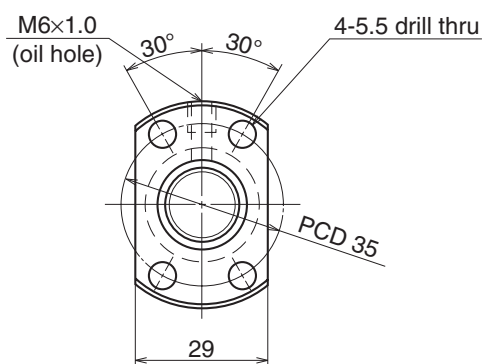
| Part number | Stroke | | Screw shaft length | | |
|-------------------------|---------|---------|--------------------|-------|--|
| | Nominal | Maximum | L_1 | L_2 | |
| W1601KA-3PY-C3Z2 | 100 | 137 | 189 | 204 | |
| W1603KA-1PY-C3Z2 | 300 | 337 | 389 | 404 | |

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.

Screw Shaft $\phi 16$ Lead 2

Unit: mm



View X-X

| 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 ³) | 1.6 | |

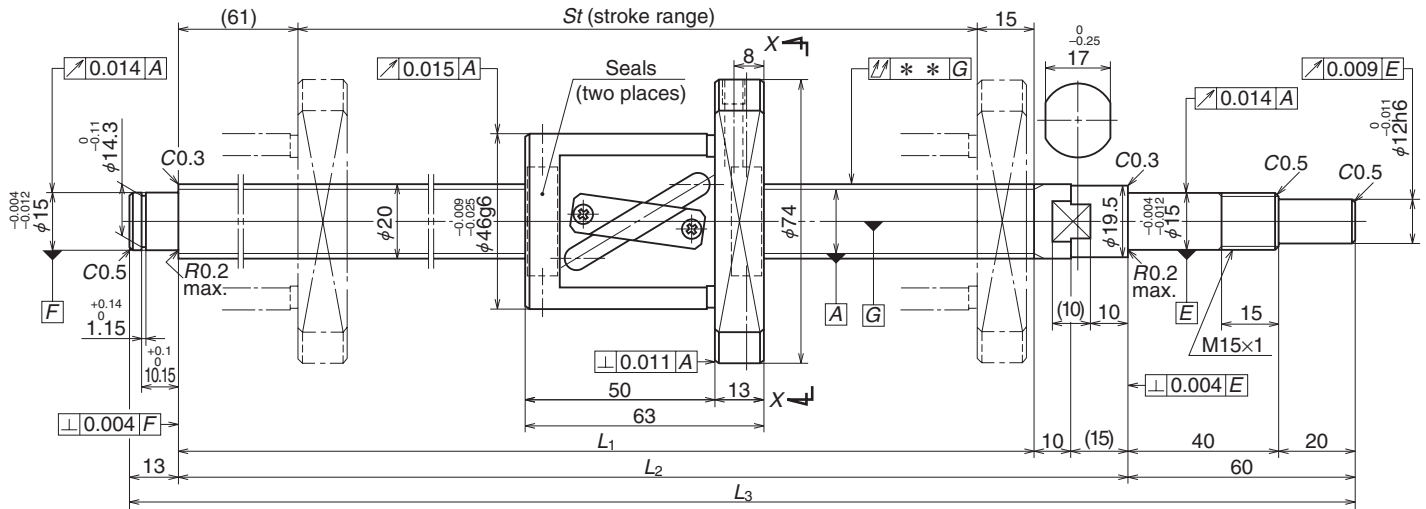
| Recommended Support Unit For Clean Environment Use | Fixed side | Simple support side |
|--|--------------------|---------------------|
| | WBK12-01C (square) | ○ |
| WBK12S-01C (square) | | ○ |
| WBK12-11C (round) | ○ | |

Unit: mm

| L_3 | Lead accuracy | | | Shaft run-out ** ↕ | Mass (kg) | Permissible rotational speed N (min ⁻¹) |
|-------|------------------|-------------|-----------------|-----------------------|-----------|---|
| | Target value T | Error e_p | Variation v_U | | | Supporting condition |
| | | | | | | Fixed - Simple support |
| 261 | 0 | 0.010 | 0.008 | 0.020 | 0.46 | 3 000 |
| 461 | 0 | 0.013 | 0.010 | 0.035 | 0.75 | 3 000 |

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

Nut Model: LPFT

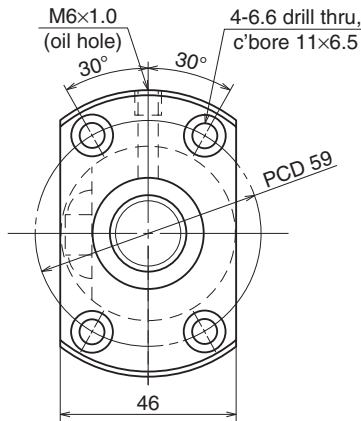


| Part number | Stroke | | Screw shaft length | | |
|-------------------------|---------|---------|--------------------|-------|--|
| | Nominal | Maximum | L_1 | L_2 | |
| W2005KA-3P-C5Z20 | 400 | 434 | 510 | 535 | |
| W2007KA-3P-C5Z20 | 600 | 634 | 710 | 735 | |
| W2011KA-3P-C5Z20 | 1 000 | 1 034 | 1 110 | 1 135 | |

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.

Screw Shaft $\phi 20$ Lead 20

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 ³) | 4.2 | |

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

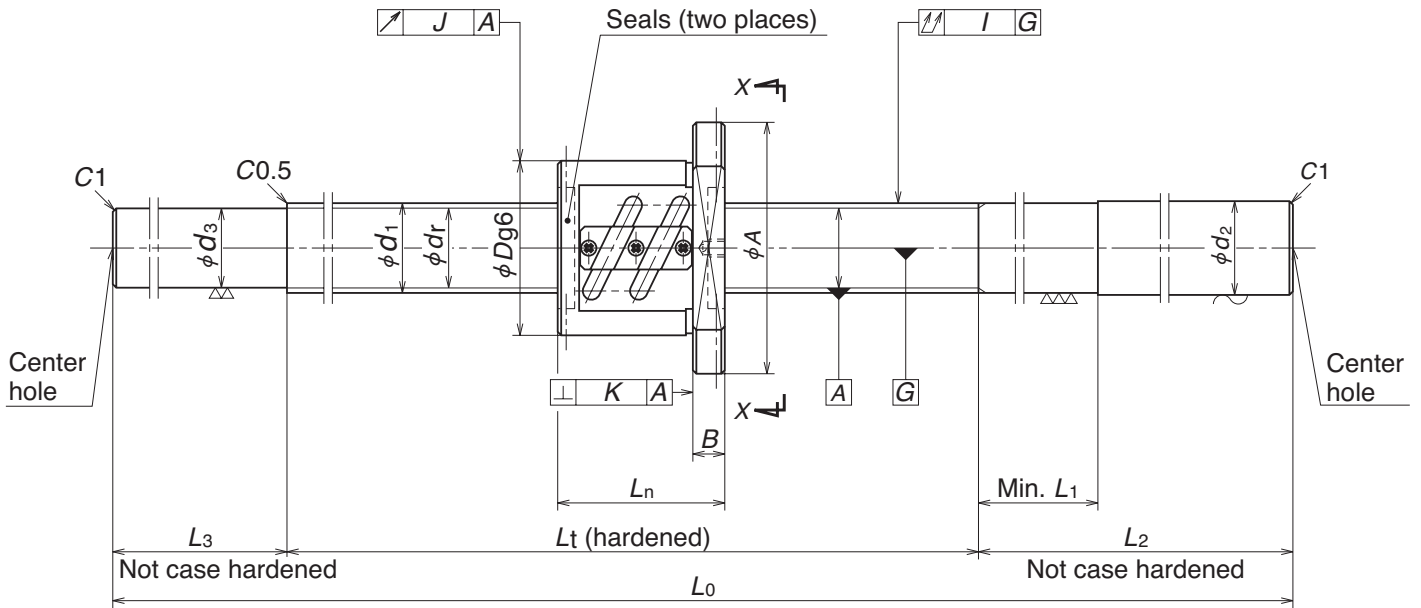
Ball Screws KA Series

Unit: mm

| L_3 | Lead accuracy | | | Shaft run-out ** ↕ | Mass (kg) | Permissible rotational speed N (min ⁻¹) |
|-------|------------------|-------------|-----------------|-----------------------|-----------|---|
| | Target value T | Error e_p | Variation v_U | | | Supporting condition |
| | | | | | | Fixed - Simple support |
| 608 | 0 | 0.030 | 0.023 | 0.050 | 2.0 | 3 000 |
| 808 | 0 | 0.035 | 0.025 | 0.085 | 2.5 | 3 000 |
| 1 208 | 0 | 0.046 | 0.030 | 0.110 | 3.4 | 2 160 |

Ball Screws S Series: Blank Shaft End

Nut Model: PFT



Nut type code: PFT

| Part number | Stroke max. $L_t - L_n$ | Screw shaft dia. d_1 | Lead l | Nut dimensions | | | | | | | | | |
|------------------------|----------------------------|---------------------------|-------------|---------------------|--------|-----|-----|-------------------------|-----------|-----|-----|-----|-----------------|
| | | | | Outside dia. D | Flange | | | Overall length L_n | Bolt hole | | | | Oil hole Q |
| | | | | | A | G | B | | W | X | Y | Z | |
| W2003SS-1P-C5Z4 | 251 | 20 | 4 | 40 | 63 | 24 | 11 | 49 | 51 | 5.5 | 9.5 | 5.5 | M6x1 |
| W2005SS-1P-C5Z4 | 451 | | | | | | | | | | | | |
| W2008SS-1P-C5Z4 | 751 | | | | | | | | | | | | |
| W2003SS-2P-C5Z5 | 244 | 20 | 5 | 44 | 67 | 26 | 11 | 56 | 55 | 5.5 | 9.5 | 5.5 | M6x1 |
| W2005SS-2P-C5Z5 | 444 | | | | | | | | | | | | |
| W2007SS-1P-C5Z5 | 644 | | | | | | | | | | | | |
| W2010SS-1P-C5Z5 | 944 | | | | | | | | | | | | |

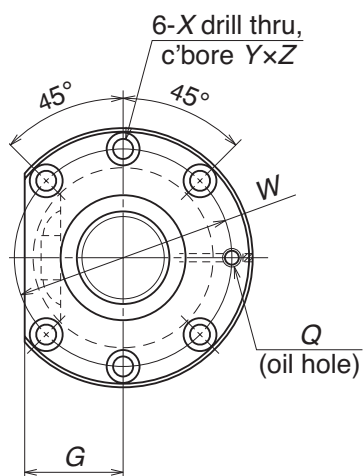
Note 1: Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.

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.

Screw Shaft $\phi 20$ Lead 4, 5

Unit: mm



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 |
| Static C_{0a} | 9 410 | 17 100 |
| Axial play | 0 | |
| Preload (N) | 290 | 490 |
| Dynamic friction torque (N·cm) | 3.9 | 7.8 |
| Internal spatial volume of nut (cm ³) | 2.7 | 4.3 |

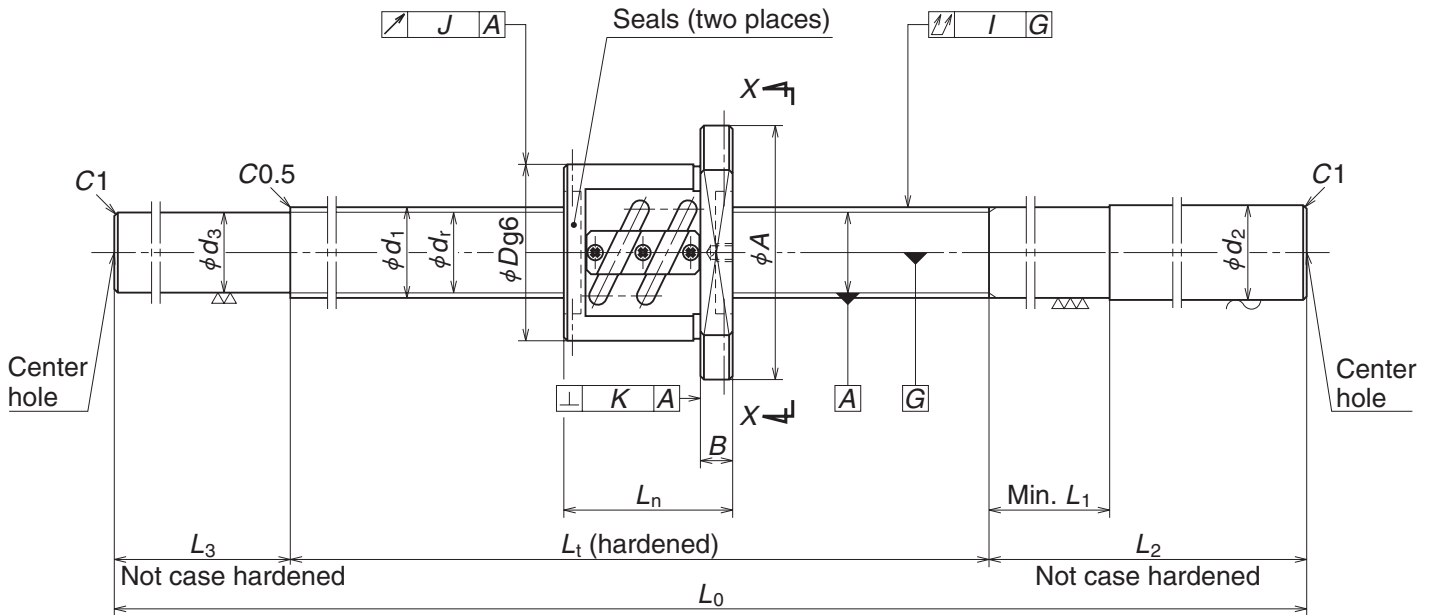
| Recommended Support Unit | Fixed side | Simple support side |
|--------------------------|------------|---------------------|
| WBK15-01A (square) | ○ | |
| WBK15S-01 (square) | | ○ |
| WBK15-11 (round) | ○ | |

Unit: mm

| Screw shaft dimensions | | | | | | | Lead accuracy | | | Run-out | | | Mass (kg) | Permissible rotational speed N (min ⁻¹) |
|------------------------|------------------|-------|-------|-----------------|-------|----------------------|------------------|------------------|-----------------|------------------------|---------------------------|-----------------------------|-----------|---|
| Threaded length L_t | Shaft end, right | | | Shaft end, left | | Overall length L_0 | Target value T | Error θ_p | Variation v_U | Shaft straightness I | Nut O.D. eccentricity J | Flange perpendicularity K | | |
| | d_2 | L_1 | L_2 | d_3 | L_3 | | | | | | | | | |
| 300 | 20.2 | 40 | 150 | 17.8 | — | 450 | -0.007 | 0.023 | 0.018 | 0.055 | 0.015 | 0.011 | 1.5 | 3 000 |
| 500 | | | 150 | | 50 | 700 | -0.012 | 0.027 | 0.020 | 0.085 | | | 2.0 | |
| 800 | | | 200 | | 100 | 1 100 | -0.019 | 0.035 | 0.025 | 0.140 | | | 2.9 | |
| 300 | 20.2 | 40 | 150 | 17.2 | — | 450 | -0.007 | 0.023 | 0.018 | 0.055 | 0.015 | 0.011 | 1.6 | 3 000 |
| 500 | | | 150 | | 50 | 700 | -0.012 | 0.027 | 0.020 | 0.085 | | | 2.2 | |
| 700 | | | 200 | | 100 | 1 000 | -0.017 | 0.035 | 0.025 | 0.110 | | | 2.8 | |
| 1 000 | | | 200 | | 100 | 1 300 | -0.024 | 0.040 | 0.027 | 0.180 | | | 3.5 | |

Ball Screws S Series: Blank Shaft End

Nut Model: PFT



Nut type code: PFT

| Part number | Stroke max. $L_t - L_n$ | Screw shaft dia. d_1 | Lead l | Nut dimensions | | | | | | | | | |
|------------------------|----------------------------|---------------------------|-------------|----------------|--------|-----|-----|----------------|-----------|-----|-----|-----|----------|
| | | | | Outside dia. | Flange | | | Overall length | Bolt hole | | | | Oil hole |
| | | | | D | A | G | B | L_n | W | X | Y | Z | Q |
| W2503SS-1P-C5Z4 | 252 | 25 | 4 | 46 | 69 | 26 | 11 | 48 | 57 | 5.5 | 9.5 | 5.5 | M6×1 |
| W2506SS-1P-C5Z4 | 552 | | | | | | | | | | | | |
| W2510SS-1P-C5Z4 | 952 | | | | | | | | | | | | |
| W2503SS-2P-C5Z5 | 245 | 25 | 5 | 50 | 73 | 28 | 11 | 55 | 61 | 5.5 | 9.5 | 5.5 | M6×1 |
| W2505SS-1P-C5Z5 | 445 | | | | | | | | | | | | |
| W2508SS-1P-C5Z5 | 745 | | | | | | | | | | | | |
| W2512SS-1P-C5Z5 | 1 145 | | | | | | | | | | | | |
| W2504SS-1P-C5Z6 | 338 | 25 | 6 | 53 | 76 | 29 | 11 | 62 | 64 | 5.5 | 9.5 | 5.5 | M6×1 |
| W2508SS-2P-C5Z6 | 738 | | | | | | | | | | | | |
| W2512SS-2P-C5Z6 | 1 138 | | | | | | | | | | | | |

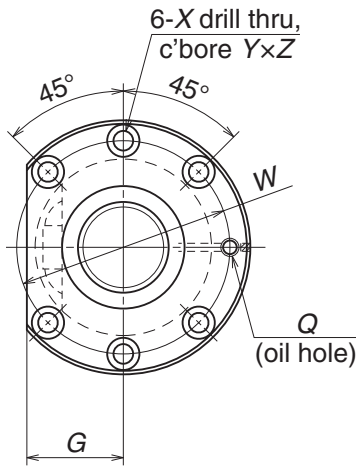
Note 1: Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.

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.

Screw Shaft $\phi 25$ Lead 4, 5, 6

Unit: mm



View X-X

| Ball Screw Specifications | | | | |
|---|-------------------------|----------------|----------------|--------|
| Shaft dia. × Lead / Direction of turn | 25 × 4 / Right | 25 × 5 / Right | 25 × 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 × 2 | | | |
| Accuracy grade / Preload | C5 / Z | | | |
| Basic load rating (N) | Dynamic C_a | 6 020 | 10 400 | 14 100 |
| | Static C_{0a} | 13 600 | 21 900 | 26 800 |
| 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 ³) | 3.2 | 5.2 | 7.0 | |

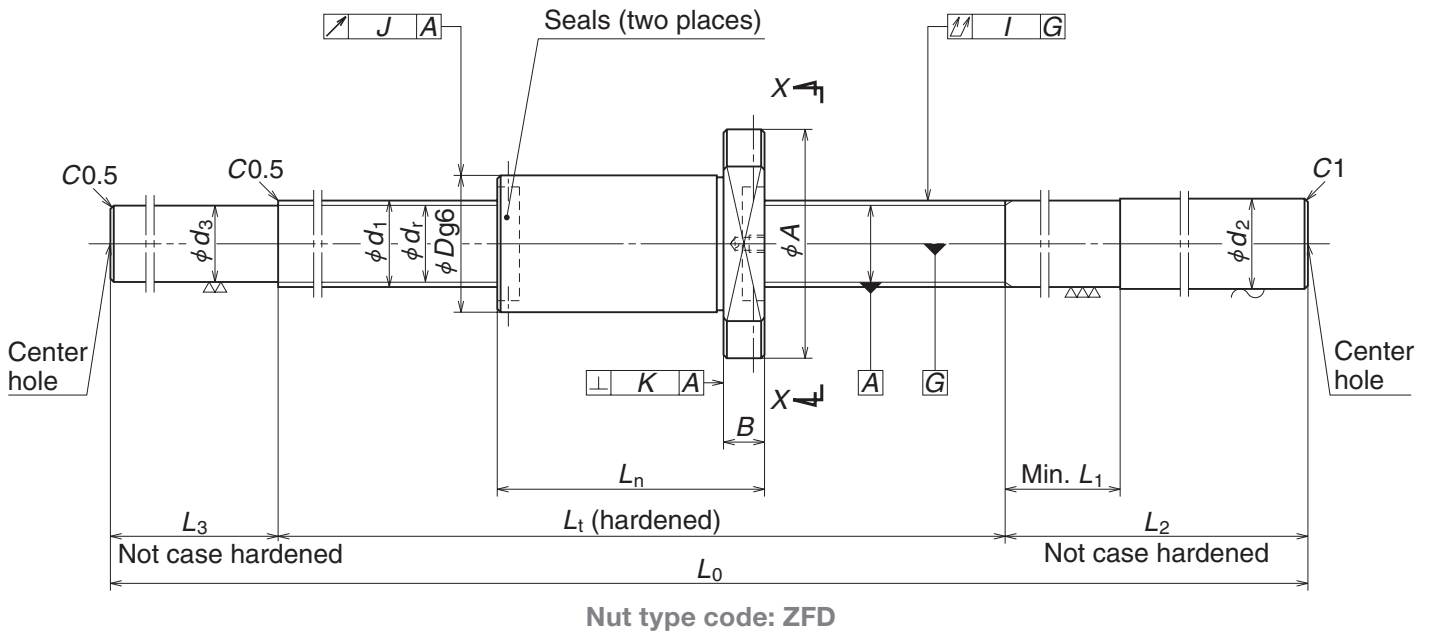
| Recommended Support Unit | Fixed side | Simple support side |
|--------------------------|------------|---------------------|
| WBK20-01 (square) | ○ | ○ |
| WBK20S-01 (square) | | ○ |
| WBK20-11 (round) | ○ | ○ |

Unit: mm

| Screw shaft dimensions | | | | | | Lead accuracy | | | Run-out | | | Mass (kg) | Permissible rotational speed N (min ⁻¹) | |
|------------------------|------------------|-------|-------|-----------------|-------|----------------------|------------------|--------------------|-------------------|------------------------|---------------------------|-----------|---|-----------------------------|
| Threaded length L_t | Shaft end, right | | | Shaft end, left | | Overall length L_0 | Target value T | Error ϵ_p | Variation ν_U | Shaft straightness I | Nut O.D. eccentricity J | | | Flange perpendicularity K |
| | d_2 | L_1 | L_2 | d_3 | L_3 | | | | | | | | | |
| 300 | 25.2 | 40 | 150 | 22.8 | — | 450 | -0.007 | 0.023 | 0.018 | 0.040 | 0.015 | 0.011 | 2.2 | 2 800 |
| 600 | | | 200 | | 100 | 900 | -0.014 | 0.030 | 0.023 | 0.075 | | | 3.8 | |
| 1 000 | | | 200 | | 100 | 1 300 | -0.024 | 0.040 | 0.027 | 0.120 | | | 5.2 | |
| 300 | 25.2 | 40 | 200 | 22.2 | — | 500 | -0.007 | 0.023 | 0.018 | 0.040 | 0.015 | 0.011 | 2.5 | 2 800 |
| 500 | | | 200 | | 50 | 750 | -0.012 | 0.027 | 0.020 | 0.060 | | | 3.4 | |
| 800 | | | 250 | | 100 | 1 150 | -0.019 | 0.035 | 0.025 | 0.090 | | | 4.8 | |
| 1 200 | | | 300 | | 100 | 1 600 | -0.029 | 0.046 | 0.030 | 0.120 | | | 6.3 | |
| 400 | 25.2 | 40 | 200 | 21.4 | — | 600 | -0.010 | 0.025 | 0.020 | 0.050 | 0.019 | 0.013 | 3.0 | 2 800 |
| 800 | | | 250 | | 100 | 1 150 | -0.019 | 0.035 | 0.025 | 0.090 | | | 4.8 | |
| 1 200 | | | 300 | | 100 | 1 600 | -0.029 | 0.046 | 0.030 | 0.120 | | | 6.3 | |

Ball Screws S Series: Blank Shaft End

Nut Model: ZFD



| Part number | Stroke max. L_1-L_n | Screw shaft dia. d_1 | Lead l | Nut dimensions | | | | | | | | | |
|--------------------------|--------------------------|---------------------------|-------------|----------------|--------|-----|-----|----------------|-----------|-----|-----|-----|----------|
| | | | | Outside dia. | Flange | | | Overall length | Bolt hole | | | | Oil hole |
| | | | | D | A | G | B | L_n | W | X | Y | Z | Q |
| W2502SS-1ZY-C5Z5 | 184 | 25 | 5 | 40 | 63 | 24 | 11 | 66 | 51 | 5.5 | 9.5 | 5.5 | M6×1 |
| W2504SS-3ZY-C5Z5 | 334 | | | | | | | | | | | | |
| W2506SS-2ZY-C5Z5 | 534 | | | | | | | | | | | | |
| W2509SS-1ZY-C5Z5 | 834 | | | | | | | | | | | | |
| W2512SS-3ZY-C5Z5 | 1 134 | | | | | | | | | | | | |
| W2504SS-4ZY-C5Z10 | 312 | 25 | 10 | 42 | 69 | 26 | 15 | 88 | 55 | 6.6 | 11 | 6.5 | M6×1 |
| W2506SS-3ZY-C5Z10 | 512 | | | | | | | | | | | | |
| W2508SS-3ZY-C5Z10 | 712 | | | | | | | | | | | | |
| W2511SS-1ZY-C5Z10 | 1 012 | | | | | | | | | | | | |
| W2515SS-2ZY-C5Z10 | 1 412 | | | | | | | | | | | | |

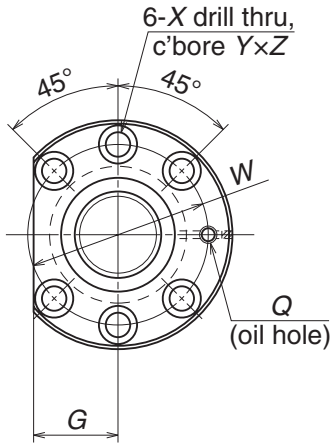
Note 1: Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.

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.

Screw Shaft $\phi 25$ Lead 5, 10

Unit: mm



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 |
| Static C_{0a} | 22 900 | 21 400 |
| Axial play | 0 | |
| Preload (N) | 740 | 880 |
| Dynamic friction torque (N·cm) | 13.8 | 21.5 |
| Internal spatial volume of nut (cm ³) | 5.4 | 9.0 |

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

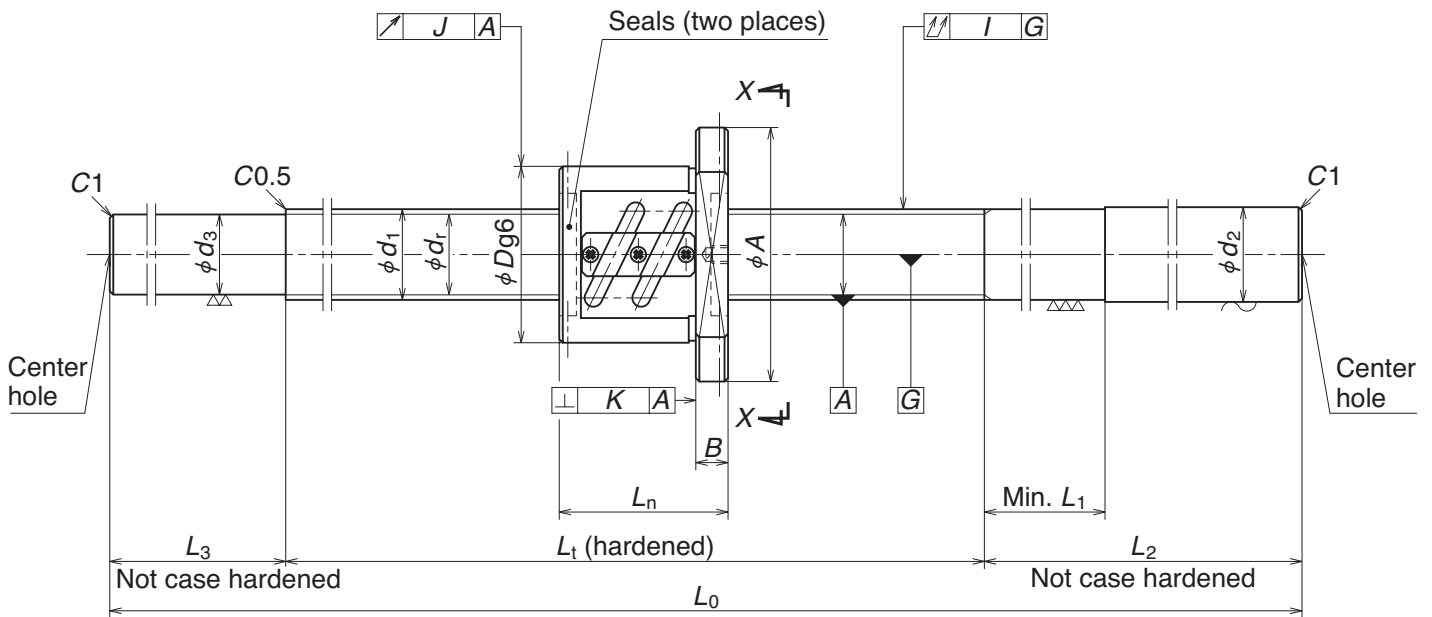
Ball Screws S Series

Unit: mm

| Screw shaft dimensions | | | | | | | Lead accuracy | | | Run-out | | | Mass (kg) | Permissible rotational speed N (min ⁻¹) |
|------------------------|------------------|-------|-------|-----------------|-------|----------------------|------------------|-------------|-----------------|------------------------|---------------------------|-----------------------------|-----------|---|
| 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 | | |
| | d_2 | L_1 | L_2 | d_3 | L_3 | | | | | | | | | |
| 250 | 25.2 | 40 | 200 | 22.4 | — | 450 | -0.005 | 0.023 | 0.018 | 0.040 | 0.015 | 0.011 | 2.1 | 2 800 |
| 400 | | | 200 | | 50 | 650 | -0.009 | 0.025 | 0.020 | 0.060 | | | 2.8 | |
| 600 | | | 250 | | 100 | 950 | -0.013 | 0.030 | 0.023 | 0.075 | | | 3.9 | |
| 900 | | | 250 | | 100 | 1 250 | -0.021 | 0.040 | 0.027 | 0.090 | | | 4.9 | |
| 1 200 | | | 300 | | 100 | 1 600 | -0.028 | 0.046 | 0.030 | 0.120 | | | 6.2 | |
| 400 | 25.2 | 60 | 200 | 21.3 | 50 | 650 | -0.008 | 0.025 | 0.020 | 0.060 | 0.015 | 0.011 | 3.0 | 2 800 |
| 600 | | | 250 | | 100 | 950 | -0.012 | 0.030 | 0.023 | 0.075 | | | 4.1 | |
| 800 | | | 250 | | 100 | 1 150 | -0.017 | 0.035 | 0.025 | 0.090 | | | 4.8 | |
| 1 100 | | | 300 | | 100 | 1 500 | -0.024 | 0.046 | 0.030 | 0.120 | | | 6.0 | |
| 1 200 | | | 300 | | 100 | 1 900 | -0.034 | 0.054 | 0.035 | 0.150 | | | 7.4 | |

Ball Screws S Series: Blank Shaft End

Nut Model: PFT



Nut type code: PFT

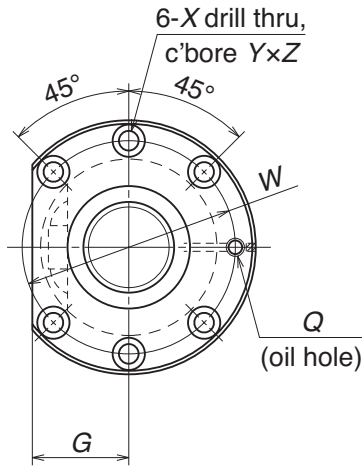
| Part number | Stroke max. $L_t - L_n$ | Screw shaft dia. d_1 | Lead l | Nut dimensions | | | | | | | | | |
|-------------------------|----------------------------|---------------------------|-------------|---------------------|--------|-----|-----|-------------------------|-----------|-----|-----|-----|-----------------|
| | | | | Outside dia. D | Flange | | | Overall length L_n | Bolt hole | | | | Oil hole Q |
| | | | | | A | G | B | | W | X | Y | Z | |
| W2504SS-2P-C5Z10 | 319 | 25 | 10 | 58 | 85 | 32 | 15 | 81 | 71 | 6.6 | 11 | 6.5 | M6x1 |
| W2507SS-1P-C5Z10 | 619 | | | | | | | | | | | | |
| W2510SS-2P-C5Z10 | 919 | | | | | | | | | | | | |
| W2515SS-1P-C5Z10 | 1 419 | | | | | | | | | | | | |
| W2804SS-1P-C5Z5 | 344 | 28 | 5 | 55 | 85 | 31 | 12 | 56 | 69 | 6.6 | 11 | 6.5 | M6x1 |
| W2806SS-1P-C5Z5 | 544 | | | | | | | | | | | | |
| W2808SS-1P-C5Z5 | 744 | | | | | | | | | | | | |
| W2812SS-1P-C5Z5 | 1 144 | | | | | | | | | | | | |
| W2804SS-3P-C5Z6 | 337 | 28 | 6 | 55 | 85 | 31 | 12 | 63 | 69 | 6.6 | 11 | 6.5 | M6x1 |
| W2806SS-3P-C5Z6 | 537 | | | | | | | | | | | | |
| W2808SS-3P-C5Z6 | 737 | | | | | | | | | | | | |
| W2812SS-3P-C5Z6 | 1 137 | | | | | | | | | | | | |

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.

Screw Shaft $\phi 25$ Lead 10
Screw Shaft $\phi 28$ Lead 5, 6

Unit: mm



View X-X

| Ball Screw Specifications | | | |
|---|-------------------------|----------------|----------------|
| Shaft dia. × Lead / Direction of turn | 25 × 10 / Right | 28 × 5 / Right | 28 × 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 × 2 | 2.5 × 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 ³) | 9.7 | 6.1 | |

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

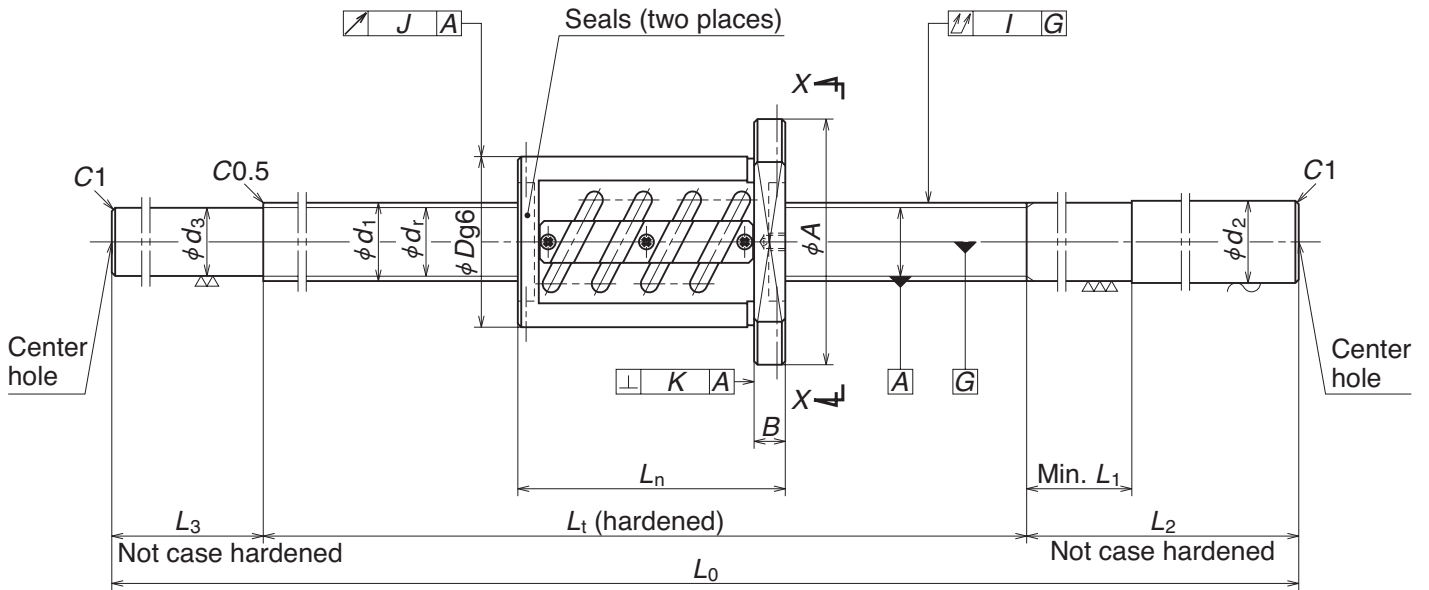
Ball Screws S Series

Unit: mm

| Screw shaft dimensions | | | | | | | Lead accuracy | | | Run-out | | | Mass (kg) | Permissible rotational speed N (min ⁻¹) |
|------------------------|------------------|-------|-------|-----------------|-------|-------|------------------|--------------------|-------------------|------------------------|---------------------------|-----------------------------|-----------|---|
| Threaded length L_t | Shaft end, right | | | Shaft end, left | | | Target value T | Error ϵ_p | Variation ν_U | Shaft straightness I | Nut O.D. eccentricity J | Flange perpendicularity K | | |
| | d_2 | L_1 | L_2 | d_3 | L_3 | L_0 | | | | | | | | |
| 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 |
| 700 | | | 250 | | 100 | 1 050 | -0.017 | 0.035 | 0.025 | 0.090 | | | 5.1 | |
| 1 000 | | | 250 | | 100 | 1 350 | -0.024 | 0.040 | 0.027 | 0.120 | | | 6.1 | |
| 1 500 | | | 300 | | 100 | 1 900 | -0.036 | 0.054 | 0.035 | 0.150 | | | 8.0 | |
| 400 | 28.2 | 40 | 200 | 25.2 | — | 600 | -0.010 | 0.025 | 0.020 | 0.050 | 0.019 | 0.013 | 3.7 | 2 500 |
| 600 | | | 250 | | 100 | 950 | -0.014 | 0.030 | 0.023 | 0.075 | | | 5.2 | |
| 800 | | | 250 | | 100 | 1 150 | -0.019 | 0.035 | 0.025 | 0.090 | | | 6.1 | |
| 1 200 | | | 300 | | 100 | 1 600 | -0.029 | 0.046 | 0.030 | 0.120 | | | 8.1 | |
| 400 | 28.2 | 40 | 200 | 25.2 | — | 600 | -0.010 | 0.025 | 0.020 | 0.050 | 0.019 | 0.013 | 3.8 | 2 500 |
| 600 | | | 250 | | 100 | 950 | -0.014 | 0.030 | 0.023 | 0.075 | | | 5.3 | |
| 800 | | | 250 | | 100 | 1 150 | -0.019 | 0.035 | 0.025 | 0.090 | | | 6.2 | |
| 1 200 | | | 300 | | 100 | 1 600 | -0.029 | 0.046 | 0.030 | 0.120 | | | 8.2 | |

Ball Screws S Series: Blank Shaft End

Nut Model: ZFT



Nut type code: ZFT

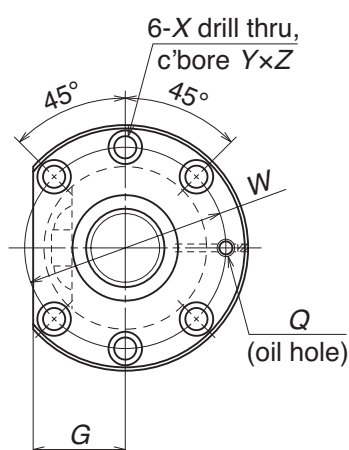
| Part number | Stroke max. L_1-L_n | Screw shaft dia. d_1 | Lead l | Nut dimensions | | | | | | | | | |
|------------------------|--------------------------|---------------------------|-------------|----------------|--------|-----|-----|----------------|-----------|-----|-----|-----|----------|
| | | | | Outside dia. | Flange | | | Overall length | Bolt hole | | | | Oil hole |
| | | | | D | A | G | B | L_n | W | X | Y | Z | Q |
| W2804SS-2Z-C5Z5 | 314 | 28 | 5 | 55 | 85 | 31 | 12 | 86 | 69 | 6.6 | 11 | 6.5 | M6x1 |
| W2806SS-2Z-C5Z5 | 514 | | | | | | | | | | | | |
| W2808SS-2Z-C5Z5 | 714 | | | | | | | | | | | | |
| W2812SS-2Z-C5Z5 | 1 114 | | | | | | | | | | | | |
| W2804SS-4Z-C5Z6 | 301 | 28 | 6 | 55 | 85 | 31 | 12 | 99 | 69 | 6.6 | 11 | 6.5 | M6x1 |
| W2806SS-4Z-C5Z6 | 501 | | | | | | | | | | | | |
| W2808SS-4Z-C5Z6 | 701 | | | | | | | | | | | | |
| W2812SS-4Z-C5Z6 | 1 101 | | | | | | | | | | | | |

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.

Screw Shaft $\phi 28$ Lead 5, 6

Unit: mm



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 ³) | 9.2 | 9.5 |

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

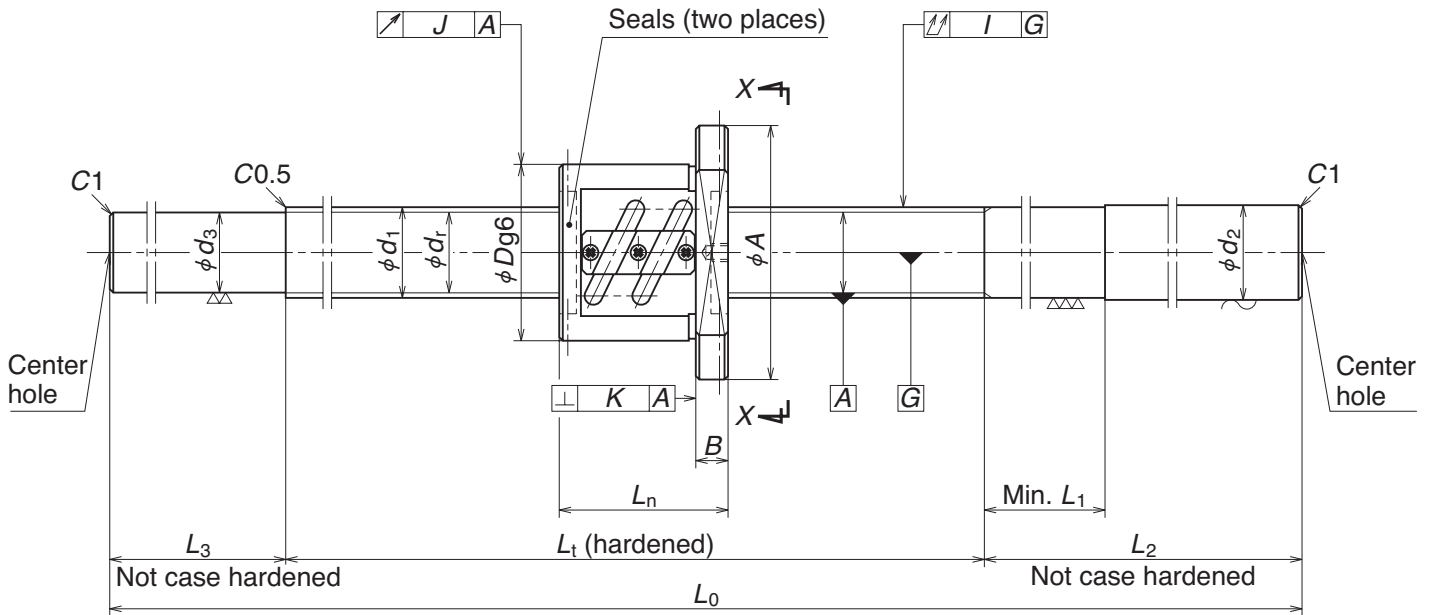
Ball Screws S Series

Unit: mm

| Screw shaft dimensions | | | | | | Lead accuracy | | | Run-out | | | Mass (kg) | Permissible rotational speed N (min ⁻¹) | |
|------------------------|------------------|-------|-------|-----------------|-------|----------------------|------------------|-------------|-----------------|------------------------|---------------------------|-----------|---|-----------------------------|
| 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 |
| | d_2 | L_1 | L_2 | d_3 | L_3 | | | | | | | | | |
| 400 | 28.2 | 40 | 200 | 25.2 | — | 600 | -0.010 | 0.025 | 0.020 | 0.050 | 0.019 | 0.013 | 4.7 | 2 500 |
| 600 | | | 250 | | 100 | 950 | -0.014 | 0.030 | 0.023 | 0.075 | | | 5.5 | |
| 800 | | | 250 | | 100 | 1 150 | -0.019 | 0.035 | 0.025 | 0.090 | | | 6.4 | |
| 1 200 | | | 300 | | 100 | 1 600 | -0.029 | 0.046 | 0.030 | 0.120 | | | 8.4 | |
| 400 | 28.2 | 40 | 200 | 25.2 | — | 600 | -0.010 | 0.025 | 0.020 | 0.050 | 0.019 | 0.013 | 4.2 | 2 500 |
| 600 | | | 250 | | 100 | 950 | -0.014 | 0.030 | 0.023 | 0.075 | | | 5.7 | |
| 800 | | | 250 | | 100 | 1 150 | -0.019 | 0.035 | 0.025 | 0.090 | | | 6.6 | |
| 1 200 | | | 300 | | 100 | 1 600 | -0.029 | 0.046 | 0.030 | 0.120 | | | 8.6 | |

Ball Screws S Series: Blank Shaft End

Nut Model: PFT



Nut type code: PFT

| Part number | Stroke max. $L_t - L_n$ | Screw shaft dia. d_1 | Lead l | Nut dimensions | | | | | | | | | |
|------------------------|----------------------------|---------------------------|-------------|----------------|--------|-----|-----|----------------|-----------|-----|-----|-----|----------|
| | | | | Outside dia. | Flange | | | Overall length | Bolt hole | | | | Oil hole |
| | | | | D | A | G | B | L_n | W | X | Y | Z | Q |
| W3204SS-1P-C5Z5 | 344 | 32 | 5 | 58 | 85 | 32 | 12 | 56 | 71 | 6.6 | 11 | 6.5 | M6×1 |
| W3206SS-1P-C5Z5 | 544 | | | | | | | | | | | | |
| W3208SS-1P-C5Z5 | 744 | | | | | | | | | | | | |
| W3212SS-1P-C5Z5 | 1 144 | | | | | | | | | | | | |
| W3215SS-1P-C5Z5 | 1 444 | | | | | | | | | | | | |
| W3206SS-3P-C5Z6 | 537 | 32 | 6 | 62 | 89 | 34 | 12 | 63 | 75 | 6.6 | 11 | 6.5 | M6×1 |
| W3210SS-1P-C5Z6 | 937 | | | | | | | | | | | | |
| W3215SS-3P-C5Z6 | 1 437 | | | | | | | | | | | | |

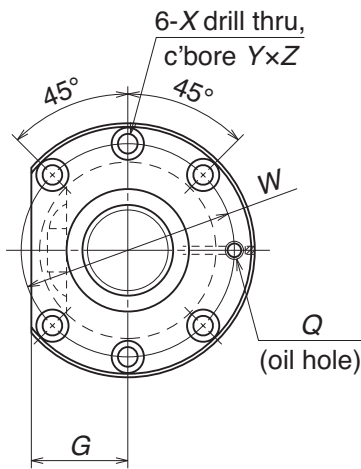
Note 1: Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.

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.

Screw Shaft $\phi 32$ Lead 5, 6

Unit: mm



View X-X

| Ball Screw Specifications | | | |
|---|-------------------------|----------------|--------|
| Shaft dia. × Lead / Direction of turn | 32 × 5 / Right | 32 × 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 × 2 | | |
| Accuracy grade / Preload | C5 / Z | | |
| Basic load rating (N) | Dynamic C_a | 11 600 | 15 500 |
| | Static C_{0a} | 28 000 | 34 700 |
| Axial play | 0 | | |
| Preload (N) | 590 | 780 | |
| Dynamic friction torque (N·cm) | 10.8 | 15.6 | |
| Internal spatial volume of nut (cm ³) | 6.9 | 9.4 | |

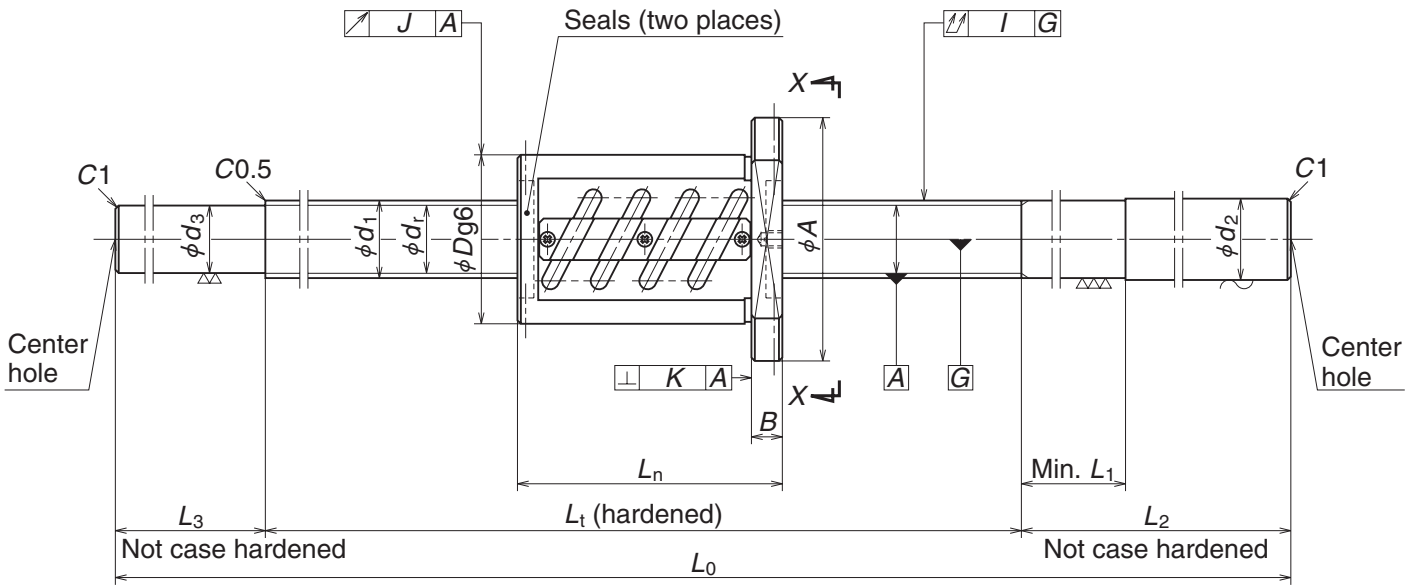
| Recommended Support Unit | Fixed side | Simple support side |
|--------------------------|------------|---------------------|
| WBK25-01W (square) | ○ | ○ |
| WBK25S-01W (square) | | ○ |
| WBK25-11 (round) | ○ | ○ |

Unit: mm

| Screw shaft dimensions | | | | | | | Lead accuracy | | | Run-out | | | Mass (kg) | Permissible rotational speed N (min ⁻¹) |
|------------------------|------------------|-------|-------|-----------------|-------|----------------------|------------------|--------------------|-------------------|------------------------|---------------------------|-----------------------------|-----------|---|
| Threaded length L_t | Shaft end, right | | | Shaft end, left | | Overall length L_0 | Target value T | Error ϵ_p | Variation ν_U | Shaft straightness I | Nut O.D. eccentricity J | Flange perpendicularity K | | |
| | d_2 | L_1 | L_2 | d_3 | L_3 | | | | | | | | | |
| 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 |
| 600 | | | 250 | | 100 | 950 | -0.014 | 0.030 | 0.023 | 0.075 | | | 6.5 | |
| 800 | | | 250 | | 100 | 1 150 | -0.019 | 0.035 | 0.025 | 0.090 | | | 7.7 | |
| 1 200 | | | 300 | | 100 | 1 600 | -0.029 | 0.046 | 0.030 | 0.120 | | | 10.3 | |
| 1 500 | | | 300 | | 100 | 1 900 | -0.036 | 0.054 | 0.035 | 0.150 | | | 12.1 | |
| 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 |
| 1 000 | | | 300 | | | 1 400 | -0.024 | 0.040 | 0.027 | 0.120 | | | 9.2 | |
| 1 500 | | | 300 | | | 1 900 | -0.036 | 0.054 | 0.035 | 0.150 | | | 12.1 | |

Ball Screws S Series: Blank Shaft End

Nut Model: ZFT



Nut type code: ZFT

| Part number | Stroke max. L_1-L_n | Screw shaft dia. d_1 | Lead l | Nut dimensions | | | | | | | | | |
|------------------------|--------------------------|---------------------------|-------------|----------------|--------|-----|-----|----------------|-----------|-----|-----|-----|----------|
| | | | | Outside dia. | Flange | | | Overall length | Bolt hole | | | | Oil hole |
| | | | | D | A | G | B | L_n | W | X | Y | Z | Q |
| W3204SS-2Z-C5Z5 | 314 | 32 | 5 | 58 | 85 | 32 | 12 | 86 | 71 | 6.6 | 11 | 6.5 | M6×1 |
| W3206SS-2Z-C5Z5 | 514 | | | | | | | | | | | | |
| W3208SS-2Z-C5Z5 | 714 | | | | | | | | | | | | |
| W3212SS-2Z-C5Z5 | 1 114 | | | | | | | | | | | | |
| W3215SS-2Z-C5Z5 | 1 414 | | | | | | | | | | | | |
| W3206SS-4Z-C5Z6 | 501 | 32 | 6 | 62 | 89 | 34 | 12 | 99 | 75 | 6.6 | 11 | 6.5 | M6×1 |
| W3210SS-2Z-C5Z6 | 901 | | | | | | | | | | | | |
| W3215SS-4Z-C5Z6 | 1 401 | | | | | | | | | | | | |
| W3206SS-5Z-C5Z8 | 518 | 32 | 8 | 66 | 100 | 38 | 15 | 82 | 82 | 9 | 14 | 8.5 | M6×1 |
| W3210SS-3Z-C5Z8 | 918 | | | | | | | | | | | | |
| W3215SS-5Z-C5Z8 | 1 418 | | | | | | | | | | | | |

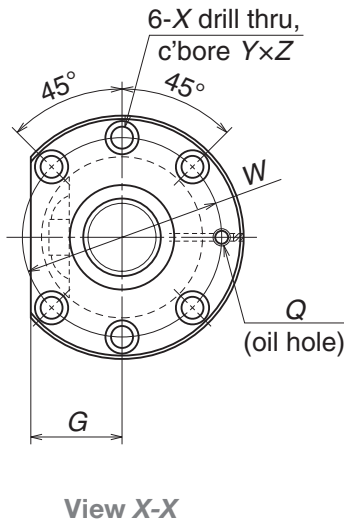
Note 1: Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.

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.

Screw Shaft $\phi 32$ Lead 5, 6, 8

Unit: mm



| Ball Screw Specifications | | | | |
|---|-------------------------|----------------|----------------|--------|
| Shaft dia. x Lead / Direction of turn | 32 x 5 / Right | 32 x 6 / Right | 32 x 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 x 2 | | 2.5 x 1 | |
| Accuracy grade / Preload | C5 / Z | | | |
| Basic load rating (N) | Dynamic C_a | 18 500 | 24 700 | 17 500 |
| | Static C_{0a} | 56 100 | 69 400 | 41 000 |
| 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 ³) | 10 | 15 | 7.9 | |

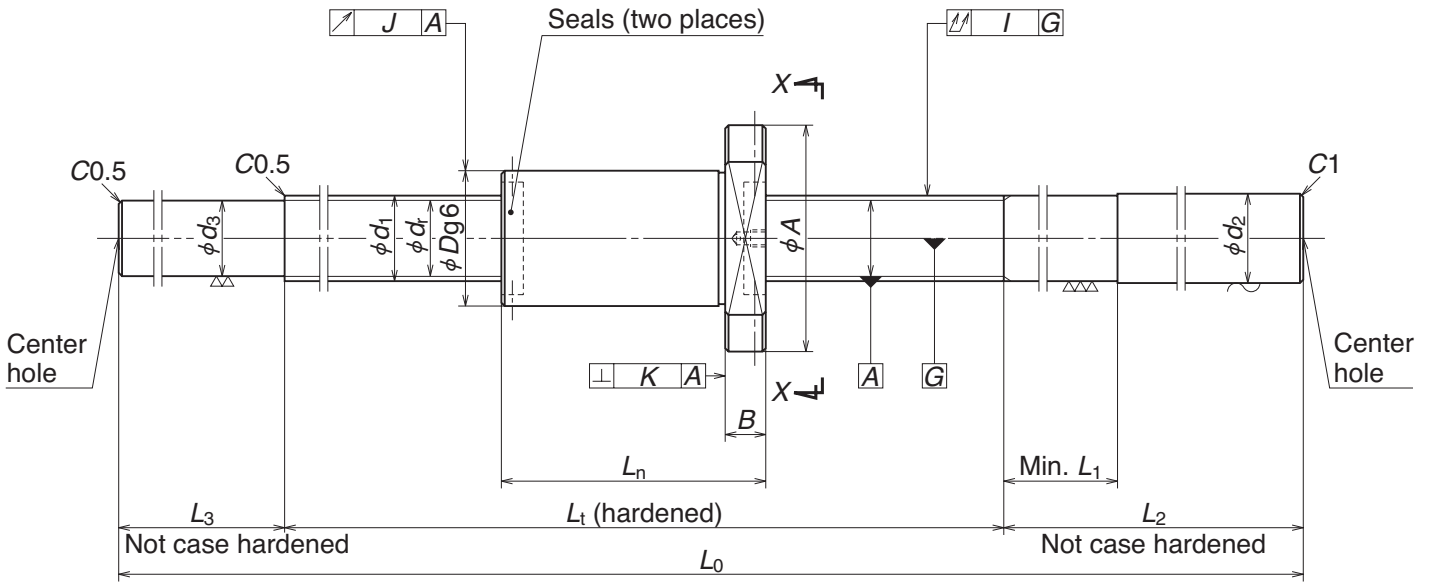
| Recommended Support Unit | Fixed side | Simple support side |
|--------------------------|--------------------|---------------------|
| | WBK25-01W (square) | ○ |
| WBK25S-01W (square) | | ○ |
| WBK25-11 (round) | ○ | ○ |

Unit: mm

| Screw shaft dimensions | | | | | | Lead accuracy | | | Run-out | | | Mass (kg) | Permissible rotational speed N (min ⁻¹) | |
|------------------------|------------------|-------|-----------------|-------|----------------------|------------------|-------------|-----------------|------------------------|---------------------------|-----------------------------|-----------|---|-------|
| Threaded length | 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 | | | |
| L_1 | d_2 | L_1 | L_2 | d_3 | | | | | | | | L_3 | | |
| 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 |
| 600 | | | 250 | | 100 | 950 | -0.014 | 0.030 | 0.023 | 0.075 | | | 6.9 | |
| 800 | | | 250 | | 100 | 1 150 | -0.019 | 0.035 | 0.025 | 0.090 | | | 8.0 | |
| 1 200 | | | 300 | | 100 | 1 600 | -0.029 | 0.046 | 0.030 | 0.120 | | | 10.1 | |
| 1 500 | | | 300 | | 100 | 1 900 | -0.036 | 0.054 | 0.035 | 0.150 | | | 12.4 | |
| 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 |
| 1 000 | | | 300 | | | 1 400 | -0.024 | 0.040 | 0.027 | 0.120 | | | 9.7 | |
| 1 500 | | | 300 | | | 1 900 | -0.036 | 0.054 | 0.035 | 0.150 | | | 12.6 | |
| 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 |
| 1 000 | | | 300 | | | 1 400 | -0.024 | 0.040 | 0.027 | 0.120 | | | 9.8 | |
| 1 500 | | | 300 | | | 1 900 | -0.036 | 0.054 | 0.035 | 0.150 | | | 12.6 | |

Ball Screws S Series: Blank Shaft End

Nut Model: ZFD



Nut type code: ZFD

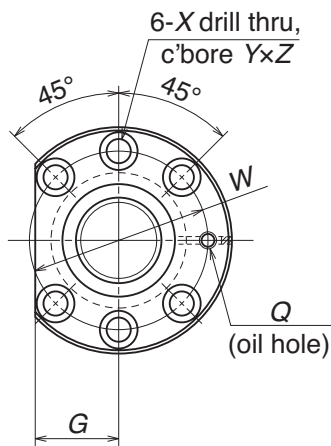
| Part number | Stroke max. $L_t - L_n$ | Screw shaft dia. d_1 | Lead l | Nut dimensions | | | | | | | | | |
|--------------------------|----------------------------|---------------------------|-------------|---------------------|--------|-----|-----|-------------------------|-----------|-----|-----|-----|-----------------|
| | | | | Outside dia. D | Flange | | | Overall length L_n | Bolt hole | | | | Oil hole Q |
| | | | | | A | G | B | | W | X | Y | Z | |
| W3204SS-3ZY-C5Z5 | 323 | 32 | 5 | 48 | 75 | 29 | 12 | 77 | 61 | 6.6 | 11 | 6.5 | M6×1 |
| W3206SS-6ZY-C5Z5 | 523 | | | | | | | | | | | | |
| W3209SS-1ZY-C5Z5 | 823 | | | | | | | | | | | | |
| W3212SS-3ZY-C5Z5 | 1 123 | | | | | | | | | | | | |
| W3216SS-1ZY-C5Z5 | 1 523 | | | | | | | | | | | | |
| W3205SS-3ZY-C5Z10 | 380 | 32 | 10 | 54 | 88 | 34 | 15 | 120 | 70 | 9 | 14 | 8.5 | M6×1 |
| W3207SS-3ZY-C5Z10 | 580 | | | | | | | | | | | | |
| W3210SS-6ZY-C5Z10 | 880 | | | | | | | | | | | | |
| W3214SS-3ZY-C5Z10 | 1 280 | | | | | | | | | | | | |
| W3218SS-3ZY-C5Z10 | 1 680 | | | | | | | | | | | | |

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.

Screw Shaft $\phi 32$ Lead 5, 10

Unit: mm



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 | 25 900 |
| | Static C_{0a} | 40 700 | 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 ³) | 22 | 23 | |

| Recommended Support Unit | |
|--------------------------|--|
| WBK25DF-31 (round) | |

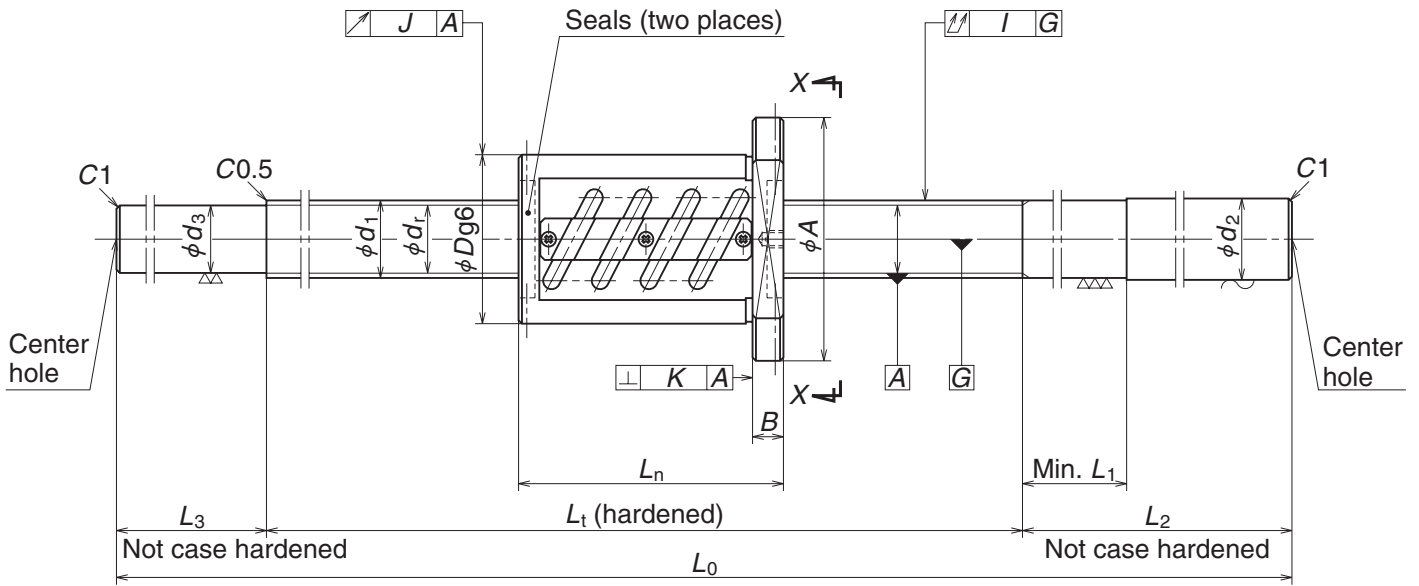
Ball Screws S Series

Unit: mm

| Screw shaft dimensions | | | | | | | Lead accuracy | | | Run-out | | | Mass (kg) | Permissible rotational speed N (min ⁻¹) |
|------------------------|------------------|-------|-------|-----------------|-------|----------------------|---------------|-------|-----------|--------------------|-----------------------|-------------------------|-----------|---|
| Threaded length | Shaft end, right | | | Shaft end, left | | | Target value | Error | Variation | Shaft straightness | Nut O.D. eccentricity | Flange perpendicularity | | |
| L_t | d_2 | L_1 | L_2 | d_3 | L_3 | Overall length L_0 | T | e_p | v_U | I | J | K | | |
| 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 |
| 600 | | | 250 | | 100 | 950 | -0.013 | 0.030 | 0.023 | 0.075 | | | 6.4 | |
| 900 | | | 250 | | 100 | 1 250 | -0.021 | 0.040 | 0.027 | 0.090 | | | 8.1 | |
| 1 200 | | | 300 | | 100 | 1 600 | -0.028 | 0.046 | 0.030 | 0.120 | | | 10.2 | |
| 1 600 | | | 300 | | 100 | 2 000 | -0.037 | 0.054 | 0.035 | 0.150 | | | 12.6 | |
| 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 |
| 700 | | | 250 | | 100 | 1 050 | -0.015 | 0.035 | 0.025 | 0.090 | | | 7.3 | |
| 1 000 | | | 300 | | 100 | 1 400 | -0.022 | 0.040 | 0.027 | 0.120 | | | 9.3 | |
| 1 400 | | | 350 | | 120 | 1 870 | -0.032 | 0.054 | 0.035 | 0.150 | | | 11.9 | |
| 1 800 | | | 350 | | 120 | 2 270 | -0.041 | 0.065 | 0.040 | 0.200 | | | 14.1 | |

Ball Screws S Series: Blank Shaft End

Nut Model: ZFT



Nut type code: ZFT

| Part number | Stroke max. $L_t - L_n$ | Screw shaft dia. d_1 | Lead l | Nut dimensions | | | | | | | | | |
|-------------------------|----------------------------|---------------------------|-------------|---------------------|--------|-----|-----|-------------------------|-----------|-----|------|-----|-----------------|
| | | | | Outside dia. D | Flange | | | Overall length L_n | Bolt hole | | | | Oil hole Q |
| | | | | | A | G | B | | W | X | Y | Z | |
| W3205SS-1Z-C5Z10 | 400 | 32 | 10 | 74 | 108 | 41 | 15 | 100 | 90 | 9 | 11 | 8.5 | M6×1 |
| W3207SS-1Z-C5Z10 | 600 | | | | | | | | | | | | |
| W3210SS-4Z-C5Z10 | 900 | | | | | | | | | | | | |
| W3214SS-1Z-C5Z10 | 1 300 | | | | | | | | | | | | |
| W3218SS-1Z-C5Z10 | 1 700 | | | | | | | | | | | | |
| W3607SS-1Z-C5Z10 | 597 | 36 | 10 | 75 | 120 | 45 | 18 | 103 | 98 | 11 | 17.5 | 11 | M6×1 |
| W3612SS-1Z-C5Z10 | 1 097 | | | | | | | | | | | | |
| W3620SS-1Z-C5Z10 | 1 897 | | | | | | | | | | | | |
| W4006SS-1Z-C5Z5 | 511 | 40 | 5 | 67 | 101 | 39 | 15 | 89 | 83 | 9 | 14 | 8.5 | Rc1/8 |
| W4010SS-1Z-C5Z5 | 911 | | | | | | | | | | | | |
| W4016SS-1Z-C5Z5 | 1 511 | | | | | | | | | | | | |

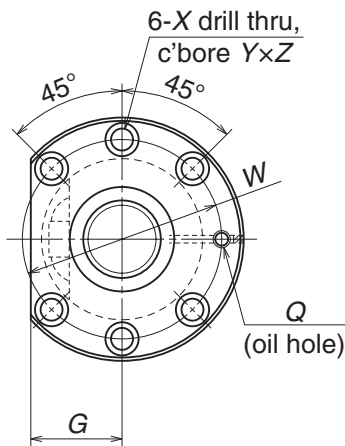
Note 1: Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.

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.

Screw Shaft $\phi 32, 36$ Lead 10
Screw Shaft $\phi 40$ Lead 5

Unit: mm



View X-X

| 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 ³) | 22 | 27 | 14 |

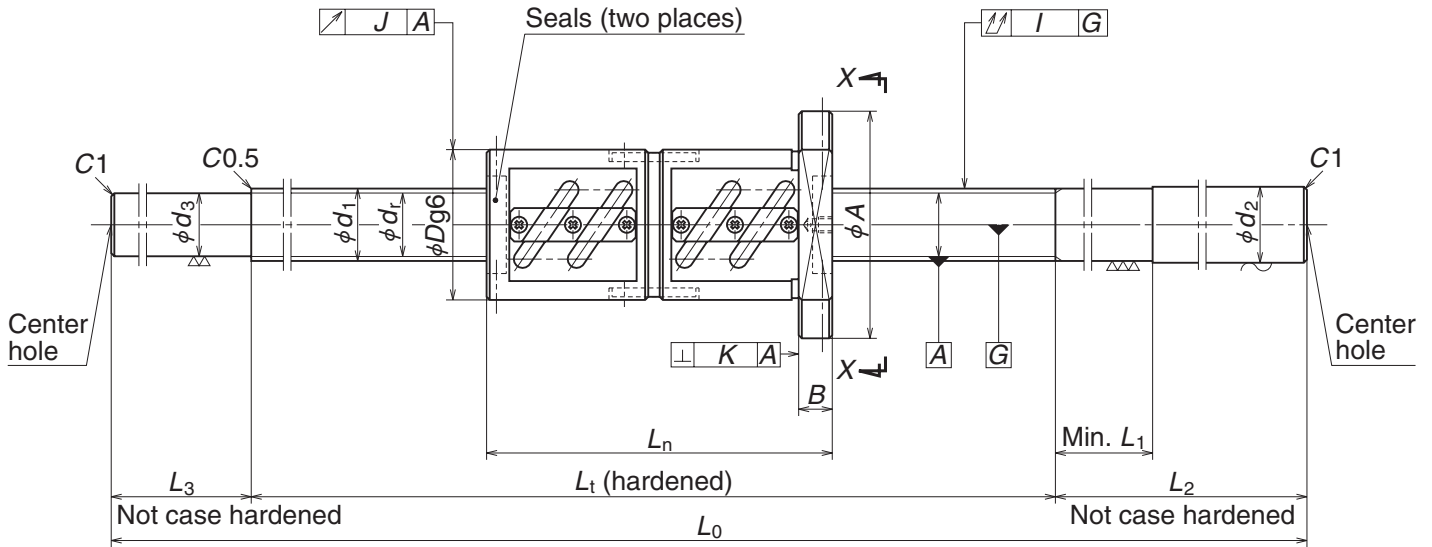
| Recommended Support Unit | | Fixed side | Simple support side |
|--------------------------|--------------------|------------|---------------------|
| Screw shaft dia. 32 | WBK25DF-31 (round) | ○ | ○ |
| Screw shaft dia. 36 | WBK30DF-31 (round) | ○ | |
| | WBK25DF-31 (round) | | ○ |
| Screw shaft dia.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

Unit: mm

| Screw shaft dimensions | | | | | | | Lead accuracy | | | Run-out | | | Mass (kg) | Permissible rotational speed N (min ⁻¹) |
|------------------------|------------------|-------|-------|-----------------|-------|----------------------|------------------|--------------------|-------------------|------------------------|---------------------------|-----------------------------|-----------|---|
| Threaded length | Shaft end, right | | | Shaft end, left | | Overall length L_0 | Target value T | Error ϵ_p | Variation ν_U | Shaft straightness I | Nut O.D. eccentricity J | Flange perpendicularity K | | |
| L_t | d_2 | L_1 | L_2 | d_3 | L_3 | | | | | | | | | |
| 500 | 32.3 | 60 | 250 | 26.2 | 100 | 850 | -0.012 | 0.027 | 0.020 | 0.075 | 0.019 | 0.013 | 7.5 | 2 180 |
| 700 | | | 250 | | 100 | 1 050 | -0.017 | 0.035 | 0.025 | 0.090 | | | 8.5 | |
| 1 000 | | | 300 | | 100 | 1 400 | -0.024 | 0.040 | 0.027 | 0.120 | | | 10.5 | |
| 1 400 | | | 350 | | 120 | 1 870 | -0.034 | 0.054 | 0.035 | 0.150 | | | 13.1 | |
| 1 800 | | | 350 | | 120 | 2 270 | -0.043 | 0.065 | 0.040 | 0.200 | | | 15.2 | |
| 700 | 36.3 | 60 | 300 | 30.4 | 100 | 1 100 | -0.017 | 0.035 | 0.025 | 0.065 | 0.019 | 0.013 | 10.9 | 1 940 |
| 1 200 | | | 350 | | 120 | 1 670 | -0.029 | 0.046 | 0.030 | 0.100 | | | 14.9 | |
| 2 000 | | | 350 | | 120 | 2 470 | -0.048 | 0.065 | 0.040 | 0.130 | | | 20.4 | |
| 600 | 40.3 | 50 | 300 | 37.2 | 100 | 1 000 | -0.014 | 0.030 | 0.023 | 0.050 | 0.019 | 0.013 | 11.1 | 1 750 |
| 1 000 | | | 300 | | | 1 400 | -0.024 | 0.040 | 0.027 | 0.080 | | | 14.8 | |
| 1 600 | | | 350 | | | 2 050 | -0.038 | 0.054 | 0.035 | 0.130 | | | 20.8 | |

Ball Screws S Series: Blank Shaft End

Nut Model: DFT



Nut type code: DFT

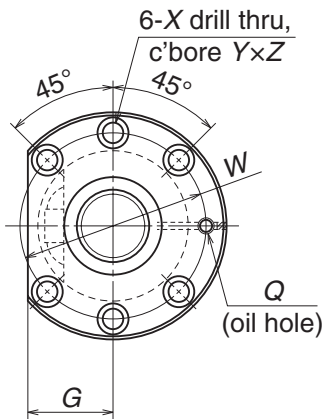
| Part number | Stroke max. L_1-L_n | Screw shaft dia. d_1 | Lead l | Nut dimensions | | | | | | | | | |
|-------------------------|--------------------------|---------------------------|-------------|----------------|--------|-----|-----|----------------|-----------|-----|------|-----|----------|
| | | | | Outside dia. | Flange | | | Overall length | Bolt hole | | | | Oil hole |
| | | | | D | A | G | B | L_n | W | X | Y | Z | Q |
| W3205SS-2D-C5Z10 | 310 | 32 | 10 | 74 | 108 | 41 | 15 | 190 | 90 | 9 | 14 | 8.5 | M6×1 |
| W3207SS-2D-C5Z10 | 510 | | | | | | | | | | | | |
| W3210SS-5D-C5Z10 | 810 | | | | | | | | | | | | |
| W3214SS-2D-C5Z10 | 1 210 | | | | | | | | | | | | |
| W3218SS-2D-C5Z10 | 1 610 | | | | | | | | | | | | |
| W3607SS-2D-C5Z10 | 507 | 36 | 10 | 75 | 120 | 45 | 18 | 193 | 98 | 11 | 17.5 | 11 | M6×1 |
| W3612SS-2D-C5Z10 | 1 007 | | | | | | | | | | | | |
| W3620SS-2D-C5Z10 | 1 807 | | | | | | | | | | | | |

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.

Screw Shaft $\phi 32, 36$ Lead 10

Unit: mm



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 |
| Static C_{0a} | 49 300 | 123 000 |
| Axial play | 0 | |
| Preload (N) | 3 240 | 3 430 |
| Internal spatial volume of nut (cm ³) | 57 | 67 |

| 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) | | ○ |

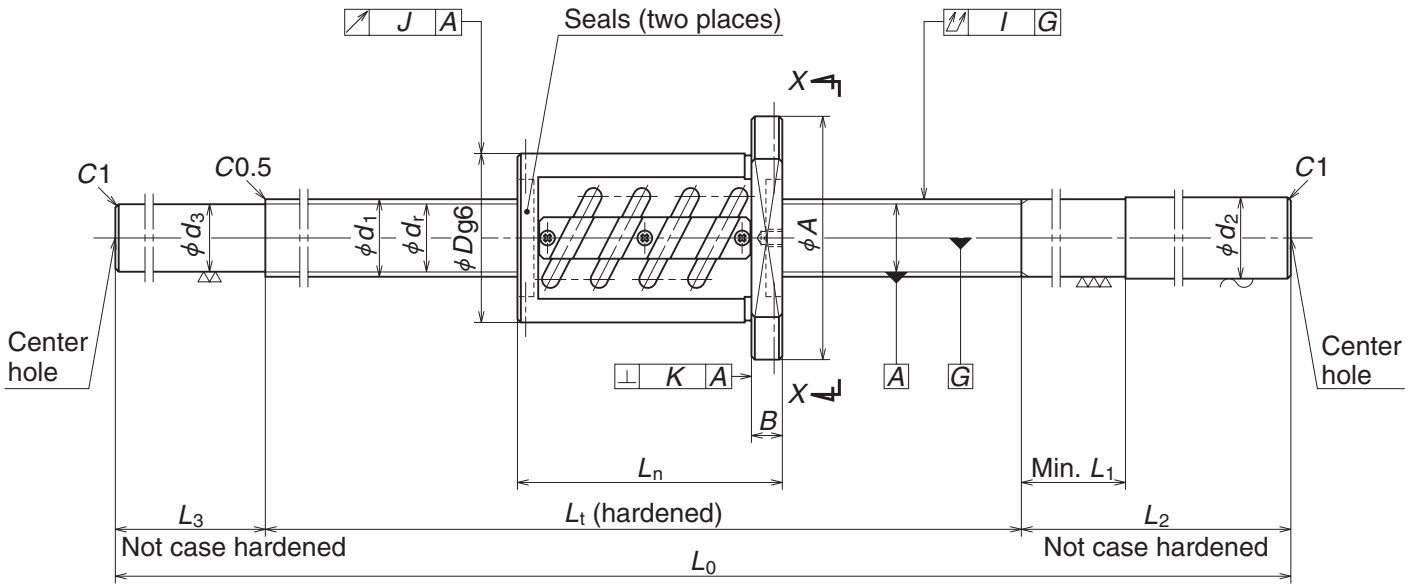
Ball Screws S Series

Unit: mm

| Screw shaft dimensions | | | | | | | Lead accuracy | | | Run-out | | | Mass (kg) | Permissible rotational speed N (min ⁻¹) |
|------------------------|------------------|-------|-------|-----------------|-------|----------------------|------------------|--------------------|-------------------|------------------------|---------------------------|-----------------------------|-----------|---|
| Threaded length | Shaft end, right | | | Shaft end, left | | Overall length L_0 | Target value T | Error ϵ_p | Variation ν_U | Shaft straightness I | Nut O.D. eccentricity J | Flange perpendicularity K | | |
| L_1 | d_2 | L_1 | L_2 | d_3 | L_3 | | | | | | | | | |
| 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 |
| 700 | | | 250 | | 100 | 1 050 | -0.017 | 0.035 | 0.025 | 0.090 | | | 10.6 | |
| 1 000 | | | 300 | | 100 | 1 400 | -0.024 | 0.040 | 0.027 | 0.120 | | | 12.5 | |
| 1 400 | | | 350 | | 120 | 1 870 | -0.034 | 0.054 | 0.035 | 0.150 | | | 15.1 | |
| 1 800 | | | 350 | | 120 | 2 270 | -0.043 | 0.065 | 0.040 | 0.200 | | | 17.2 | |
| 700 | 36.3 | 60 | 300 | 30.4 | 100 | 1 100 | -0.017 | 0.035 | 0.025 | 0.065 | 0.019 | 0.013 | 12.8 | 1 940 |
| 1 200 | | | 350 | | 120 | 1 670 | -0.029 | 0.046 | 0.030 | 0.100 | | | 16.8 | |
| 2 000 | | | 350 | | 120 | 2 470 | -0.048 | 0.065 | 0.040 | 0.130 | | | 22.3 | |

Ball Screws S Series: Blank Shaft End

Nut Model: ZFT



Nut type code: ZFT

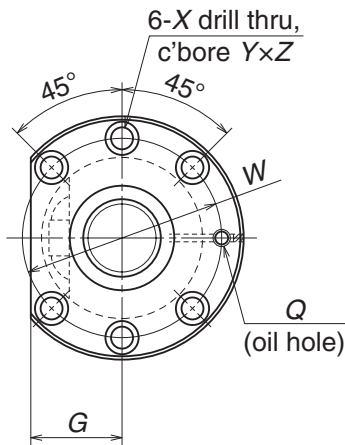
| Part number | Stroke max. L_1-L_n | Screw shaft dia. d_1 | Lead l | Nut dimensions | | | | | | | | | |
|-------------------------|--------------------------|---------------------------|-------------|---------------------|--------|-----|-----|-------------------------|-----------|-----|------|-----|-----------------|
| | | | | Outside dia. D | Flange | | | Overall length L_n | Bolt hole | | | | Oil hole Q |
| | | | | | A | G | B | | W | X | Y | Z | |
| W4007SS-1Z-C5Z8 | 570 | 40 | 8 | 74 | 108 | 41 | 15 | 130 | 90 | 9 | 14 | 8.5 | Rc1/8 |
| W4012SS-1Z-C5Z8 | 1 070 | | | | | | | | | | | | |
| W4018SS-1Z-C5Z8 | 1 670 | | | | | | | | | | | | |
| W4007SS-2Z-C5Z10 | 597 | 40 | 10 | 82 | 124 | 47 | 18 | 103 | 102 | 11 | 17.5 | 11 | Rc1/8 |
| W4010SS-2Z-C5Z10 | 897 | | | | | | | | | | | | |
| W4014SS-1Z-C5Z10 | 1 297 | | | | | | | | | | | | |
| W4018SS-2Z-C5Z10 | 1 697 | | | | | | | | | | | | |
| W4024SS-1Z-C5Z10 | 2 297 | | | | | | | | | | | | |
| W4010SS-4Z-C5Z12 | 883 | 40 | 12 | 86 | 128 | 48 | 18 | 117 | 106 | 11 | 17.5 | 11 | Rc1/8 |
| W4016SS-2Z-C5Z12 | 1 483 | | | | | | | | | | | | |
| W4025SS-1Z-C5Z12 | 2 383 | | | | | | | | | | | | |

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.

Screw Shaft $\phi 40$ Lead 8, 10, 12

Unit: mm



View X-X

| 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 ³) | 27 | 30 | 35 | |

| Recommended Support Unit | |
|--------------------------|--|
| WBK30DF-31 (round) | |

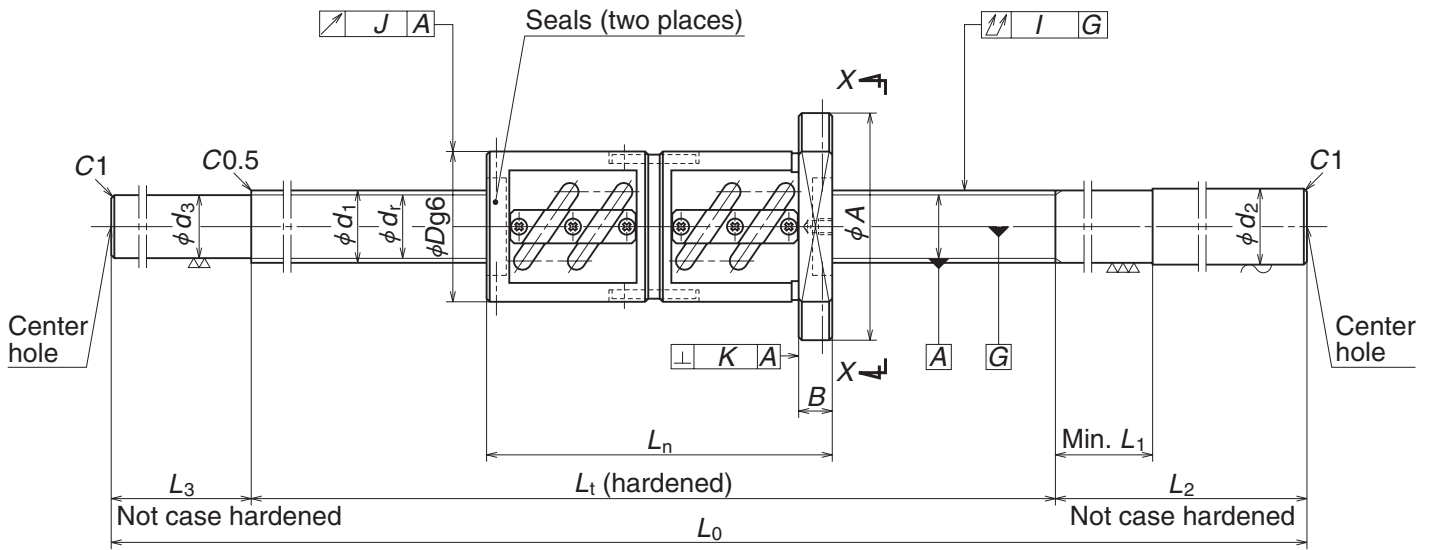
Ball Screws S Series

Unit: mm

| Screw shaft dimensions | | | | | | | Lead accuracy | | | Run-out | | | Mass (kg) | Permissible rotational speed N (min ⁻¹) |
|------------------------|------------------|-------|-------|-----------------|-------|----------------------|------------------|-------------|-------------------|------------------------|---------------------------|-----------------------------|-----------|---|
| Threaded length | Shaft end, right | | | Shaft end, left | | | Target value T | Error e_p | Variation ν_U | Shaft straightness I | Nut O.D. eccentricity J | Flange perpendicularity K | | |
| L_1 | d_2 | L_1 | L_2 | d_3 | L_3 | Overall length L_0 | | | | | | | | |
| 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 |
| 1 200 | | | 350 | | 100 | 1 650 | -0.029 | 0.046 | 0.030 | 0.100 | | | 18.0 | |
| 1 800 | | | 350 | | 120 | 2 270 | -0.043 | 0.065 | 0.040 | 0.130 | | | 23.5 | |
| 700 | 40.3 | 60 | 300 | 34.4 | 100 | 1 100 | -0.017 | 0.035 | 0.025 | 0.065 | 0.025 | 0.015 | 13.3 | 1 750 |
| 1 000 | | | 300 | | 100 | 1 400 | -0.024 | 0.040 | 0.027 | 0.080 | | | 15.9 | |
| 1 400 | | | 350 | | 120 | 1 870 | -0.034 | 0.054 | 0.035 | 0.100 | | | 20.0 | |
| 1 800 | | | 350 | | 120 | 2 270 | -0.043 | 0.065 | 0.040 | 0.130 | | | 23.4 | |
| 2 400 | | | 400 | | 150 | 2 950 | -0.058 | 0.077 | 0.046 | 0.170 | | | 29.4 | |
| 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 |
| 1 600 | | | 350 | | 150 | 2 100 | -0.038 | 0.054 | 0.035 | 0.130 | | | 22.9 | |
| 2 500 | | | 400 | | 150 | 3 050 | -0.060 | 0.077 | 0.046 | 0.170 | | | 31.1 | |

Ball Screws S Series: Blank Shaft End

Nut Model: DFT



Nut type code: DFT

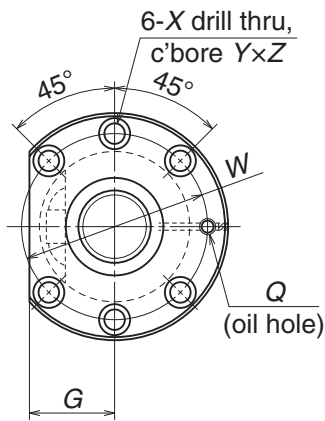
| Part number | Stroke max. L_1-L_n | Screw shaft dia. d_1 | Lead l | Nut dimensions | | | | | | | | | |
|-------------------------|--------------------------|---------------------------|-------------|----------------|--------|-----|-----|----------------|-----------|-----|------|-----|----------|
| | | | | Outside dia. | Flange | | | Overall length | Bolt hole | | | | Oil hole |
| | | | | D | A | G | B | L_n | W | X | Y | Z | Q |
| W4007SS-3D-C5Z10 | 507 | 40 | 10 | 82 | 124 | 47 | 18 | 193 | 102 | 11 | 17.5 | 11 | Rc1/8 |
| W4010SS-3D-C5Z10 | 807 | | | | | | | | | | | | |
| W4014SS-2D-C5Z10 | 1 207 | | | | | | | | | | | | |
| W4018SS-3D-C5Z10 | 1 607 | | | | | | | | | | | | |
| W4024SS-2D-C5Z10 | 2 207 | | | | | | | | | | | | |
| W4010SS-5D-C5Z12 | 775 | 40 | 12 | 86 | 128 | 48 | 18 | 225 | 106 | 11 | 17.5 | 11 | Rc1/8 |
| W4016SS-3D-C5Z12 | 1 375 | | | | | | | | | | | | |
| W4025SS-2D-C5Z12 | 2 275 | | | | | | | | | | | | |

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.

Screw Shaft $\phi 40$ Lead 10, 12

Unit: mm



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 |
| Static C_{0a} | 137 000 | 155 000 |
| Axial play | 0 | |
| Preload (N) | 3 630 | 4 310 |
| Dynamic friction torque (N·cm) | 108 | 138 |
| Internal spatial volume of nut (cm ³) | 740 | 93 |

| Recommended Support Unit | |
|--------------------------|--|
| WBK30DF-31 (round) | |

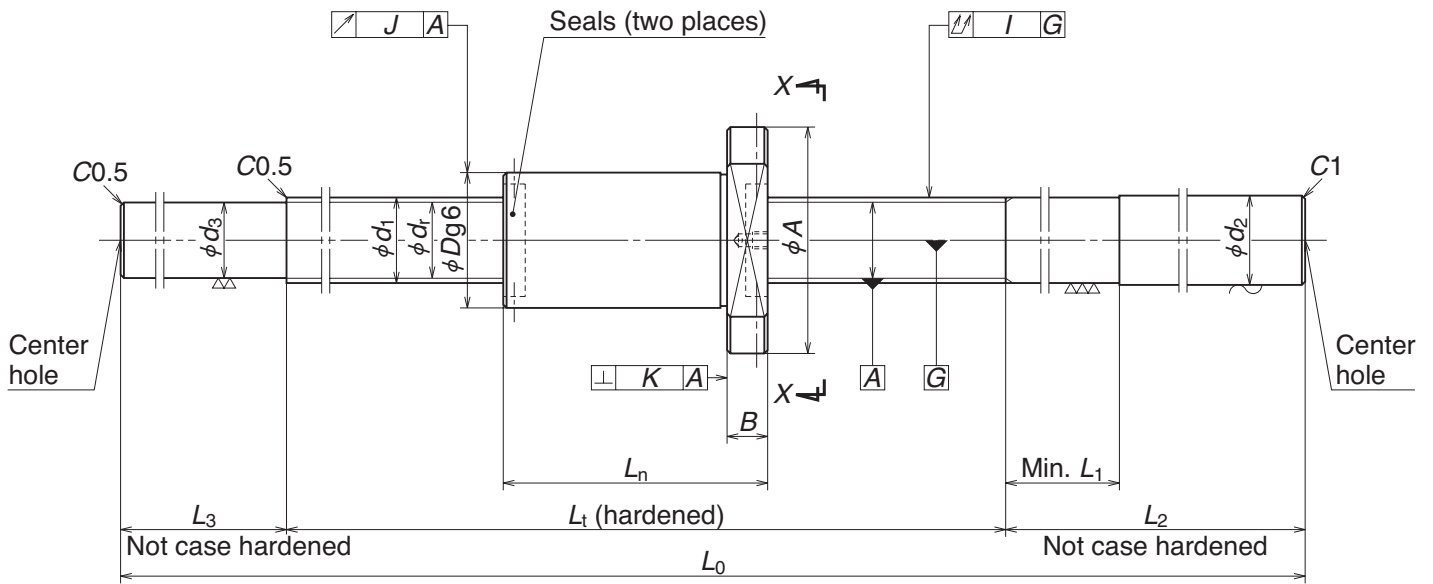
Ball Screws S Series

Unit: mm

| Screw shaft dimensions | | | | | | | Lead accuracy | | | Run-out | | | Mass (kg) | Permissible rotational speed N (min ⁻¹) |
|------------------------|------------------|-------|-------|-----------------|-------|----------------------|------------------|-------------|-----------------|------------------------|---------------------------|-----------------------------|-----------|---|
| 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 | | |
| | d_2 | L_1 | L_2 | d_3 | L_3 | | | | | | | | | |
| 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 |
| 1 000 | | | 300 | | 100 | 1 400 | -0.024 | 0.040 | 0.027 | 0.080 | | | 18.1 | |
| 1 400 | | | 350 | | 120 | 1 870 | -0.034 | 0.054 | 0.035 | 0.100 | | | 22.2 | |
| 1 800 | | | 350 | | 120 | 2 270 | -0.043 | 0.065 | 0.040 | 0.130 | | | 25.6 | |
| 2 400 | | | 400 | | 150 | 2 950 | -0.058 | 0.077 | 0.046 | 0.170 | | | 31.6 | |
| 1 000 | 40.3 | 70 | 300 | 34.1 | 100 | 1 400 | -0.024 | 0.040 | 0.027 | 0.080 | 0.025 | 0.015 | 19.7 | 1 750 |
| 1 600 | | | 350 | | 150 | 2 100 | -0.038 | 0.054 | 0.035 | 0.130 | | | 25.8 | |
| 2 500 | | | 400 | | 150 | 3 050 | -0.060 | 0.077 | 0.046 | 0.170 | | | 34.0 | |

Ball Screws S Series: Blank Shaft End

Nut Model: ZFD



Nut type code: ZFD

| Part number | Stroke max. L_1-L_n | Screw shaft dia. d_1 | Lead l | Nut dimensions | | | | | | | | | |
|--------------------------|--------------------------|---------------------------|-------------|----------------|--------|-----|-----|----------------|-----------|-----|------|-----|----------|
| | | | | Outside dia. | Flange | | | Overall length | Bolt hole | | | | Oil hole |
| | | | | D | A | G | B | L_n | W | X | Y | Z | Q |
| W4007SS-4ZY-C5Z10 | 557 | 40 | 10 | 62 | 104 | 40 | 18 | 143 | 82 | 11 | 17.5 | 11 | Rc1/8 |
| W4010SS-6ZY-C5Z10 | 857 | | | | | | | | | | | | |
| W4014SS-3ZY-C5Z10 | 1 257 | | | | | | | | | | | | |
| W4018SS-4ZY-C5Z10 | 1 657 | | | | | | | | | | | | |
| W4024SS-3ZY-C5Z10 | 2 257 | | | | | | | | | | | | |
| W5007SS-1ZY-C5Z10 | 557 | 50 | 10 | 72 | 114 | 44 | 18 | 143 | 92 | 11 | 17.5 | 11 | Rc1/8 |
| W5010SS-3ZY-C5Z10 | 857 | | | | | | | | | | | | |
| W5015SS-3ZY-C5Z10 | 1 357 | | | | | | | | | | | | |
| W5020SS-3ZY-C5Z10 | 1 857 | | | | | | | | | | | | |
| W5026SS-3ZY-C5Z10 | 2 457 | | | | | | | | | | | | |

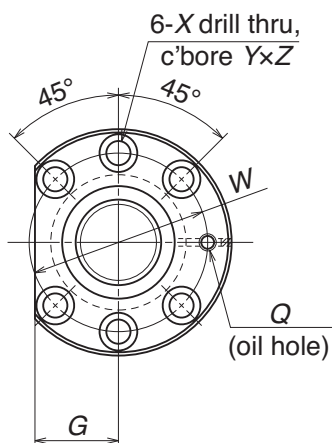
Note 1: Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.

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.

Screw Shaft $\phi 40, 50$ Lead 10

Unit: mm



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 |
| Static C_{0a} | 43 600 | 122 000 |
| Axial play | 0 | |
| Preload (N) | 2 840 | 3 240 |
| Dynamic friction torque (N·cm) | 83 | 108 |
| Internal spatial volume of nut (cm ³) | 32 | 39 |

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

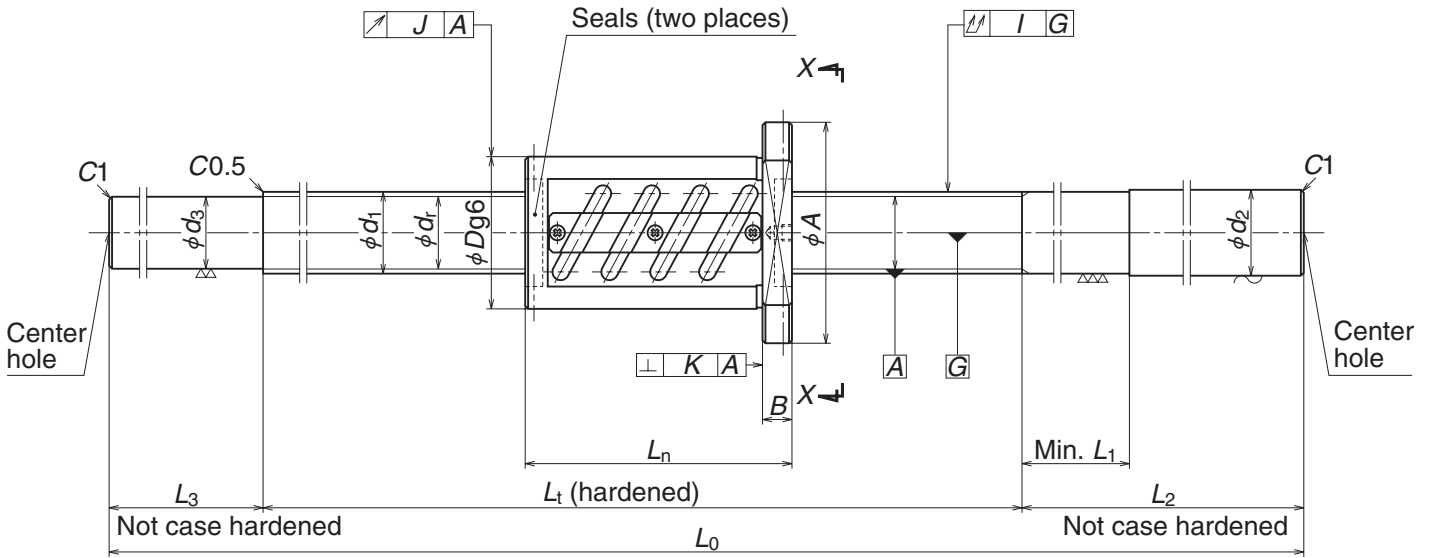
Ball Screws S Series

Unit: mm

| Screw shaft dimensions | | | | | | | Lead accuracy | | | Run-out | | | Mass (kg) | Permissible rotational speed N (min ⁻¹) |
|------------------------|------------------|-------|-------|-----------------|-------|----------------------|------------------|--------------------|-------------------|------------------------|---------------------------|-----------------------------|-----------|---|
| Threaded length | Shaft end, right | | | Shaft end, left | | Overall length L_0 | Target value T | Error ϵ_p | Variation ν_U | Shaft straightness I | Nut O.D. eccentricity J | Flange perpendicularity K | | |
| L_1 | d_2 | L_1 | L_2 | d_3 | L_3 | | | | | | | | | |
| 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 |
| 1 000 | | | 300 | | 100 | 1 400 | -0.022 | 0.040 | 0.027 | 0.080 | | | 14.7 | |
| 1 400 | | | 350 | | 120 | 1 870 | -0.032 | 0.054 | 0.035 | 0.100 | | | 18.9 | |
| 1 800 | | | 350 | | 120 | 2 270 | -0.041 | 0.065 | 0.040 | 0.170 | | | 22.5 | |
| 2 400 | | | 400 | | 150 | 2 950 | -0.056 | 0.077 | 0.046 | 0.170 | | | 28.5 | |
| 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 |
| 1 000 | | | 300 | | 100 | 1 400 | -0.022 | 0.040 | 0.027 | 0.080 | | | 22.5 | |
| 1 500 | | | 400 | | 150 | 2 050 | -0.034 | 0.054 | 0.035 | 0.130 | | | 31.8 | |
| 2 000 | | | 400 | | 150 | 2 550 | -0.046 | 0.065 | 0.040 | 0.170 | | | 38.9 | |
| 2 600 | | | 500 | | 200 | 3 300 | -0.060 | 0.093 | 0.054 | 0.220 | | | 49.5 | |

Ball Screws S Series: Blank Shaft End

Nut Model: ZFT



Nut type code: ZFT

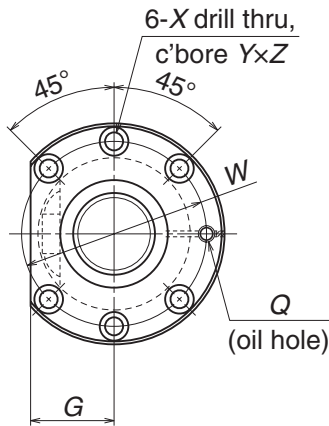
| Part number | Stroke max. L_1-L_n | Screw shaft dia. d_1 | Lead l | Nut dimensions | | | | | | | | | |
|-------------------------|--------------------------|---------------------------|-------------|---------------------|--------|-----|-----|-------------------------|-----------|-----|------|-----|-----------------|
| | | | | Outside dia. D | Flange | | | Overall length L_n | Bolt hole | | | | Oil hole Q |
| | | | | | A | G | B | | W | X | Y | Z | |
| W4510SS-1Z-C5Z10 | 897 | 45 | 10 | 88 | 132 | 50 | 18 | 103 | 110 | 11 | 17.5 | 11 | Rc1/8 |
| W4516SS-1Z-C5Z10 | 1 497 | | | | | | | | | | | | |
| W4525SS-1Z-C5Z10 | 2 397 | | | | | | | | | | | | |
| W5010SS-1Z-C5Z10 | 897 | 50 | 10 | 93 | 135 | 51 | 18 | 103 | 113 | 11 | 17.5 | 11 | Rc1/8 |
| W5015SS-1Z-C5Z10 | 1 397 | | | | | | | | | | | | |
| W5020SS-1Z-C5Z10 | 1 897 | | | | | | | | | | | | |
| W5026SS-1Z-C5Z10 | 2 497 | | | | | | | | | | | | |
| W5010SS-2Z-C5Z10 | 867 | 50 | 10 | 93 | 135 | 51 | 18 | 163 | 113 | 11 | 17.5 | 11 | Rc1/8 |
| W5015SS-2Z-C5Z10 | 1 337 | | | | | | | | | | | | |
| W5020SS-2Z-C5Z10 | 1 837 | | | | | | | | | | | | |
| W5026SS-2Z-C5Z10 | 2 437 | | | | | | | | | | | | |

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.

Screw Shaft $\phi 45, 50$ Lead 10

Unit: mm



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 ³) | 34 | 37 | 59 | |

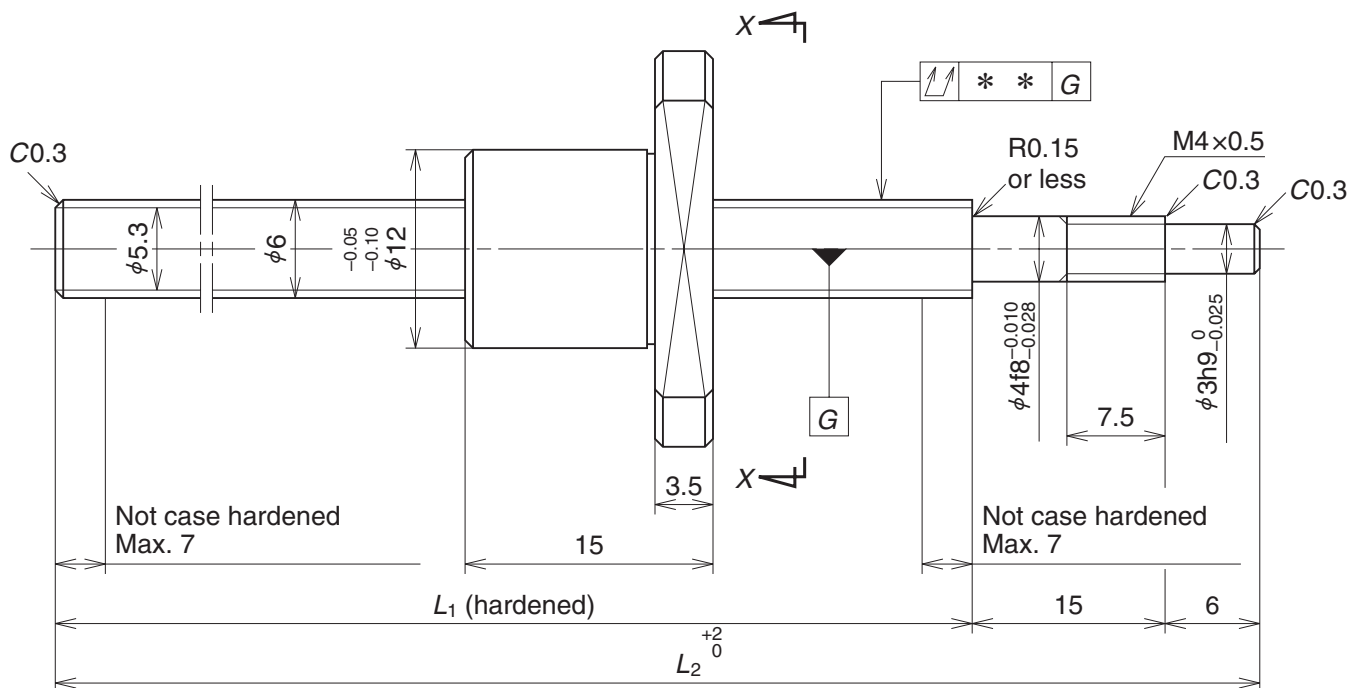
| Recommended Support Unit | |
|--------------------------|---------------------|
| Screw shaft dia. 45 | WBK35DFD-31 (round) |
| Screw shaft dia. 50 | WBK40DFD-31 (round) |

Unit: mm

| Screw shaft dimensions | | | | | | | Lead accuracy | | | Run-out | | | Mass (kg) | Permissible rotational speed N (min ⁻¹) |
|------------------------|------------------|-------|-------|-----------------|-------|----------------------|------------------|-------------|-----------------|------------------------|---------------------------|-----------------------------|-----------|---|
| Threaded length | Shaft end, right | | | Shaft end, left | | | Target value T | Error e_p | Variation v_U | Shaft straightness I | Nut O.D. eccentricity J | Flange perpendicularity K | | |
| L_t | d_2 | L_1 | L_2 | d_3 | L_3 | Overall length L_0 | | | | | | | | |
| 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 |
| 1 600 | | | 400 | | 150 | 2 150 | -0.038 | 0.054 | 0.035 | 0.130 | | | 28.1 | |
| 2 500 | | | 450 | | 150 | 3 100 | -0.060 | 0.077 | 0.046 | 0.170 | | | 38.8 | |
| 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 |
| 1 500 | | | 400 | | 150 | 2 050 | -0.036 | 0.054 | 0.035 | 0.130 | | | 32.9 | |
| 2 000 | | | 400 | | 150 | 2 550 | -0.048 | 0.065 | 0.040 | 0.170 | | | 39.8 | |
| 2 600 | | | 450 | | 150 | 3 200 | -0.062 | 0.093 | 0.054 | 0.220 | | | 48.9 | |
| 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 |
| 1 500 | | | 400 | | 150 | 2 050 | -0.036 | 0.054 | 0.035 | 0.130 | | | 34.6 | |
| 2 000 | | | 400 | | 150 | 2 550 | -0.048 | 0.065 | 0.040 | 0.170 | | | 41.5 | |
| 2 600 | | | 450 | | 150 | 3 200 | -0.062 | 0.093 | 0.054 | 0.220 | | | 50.7 | |

Ball Screws V Series: Finished Shaft End

Precision Rolled Miniature: RMA



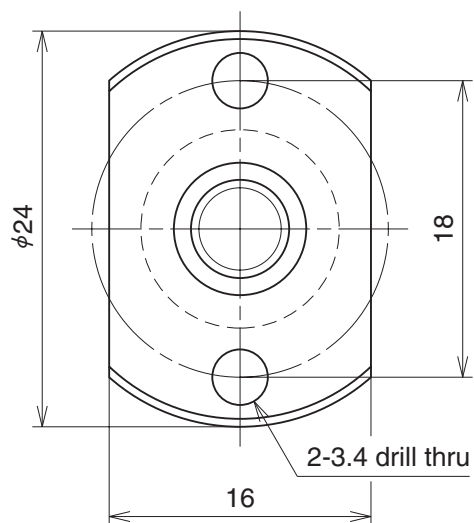
| Part number | Stroke | | Screw shaft length | | |
|-----------------------|---------|---------------------------------|--------------------|-------|--|
| | Nominal | Maximum (L_1 -Nut length) | L_1 | L_2 | |
| RMA0601C7S-160 | 100 | 124 | 139 | 160 | |
| RMA0601C7S-260 | 200 | 224 | 239 | 260 | |

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.

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 | |
| 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 | |

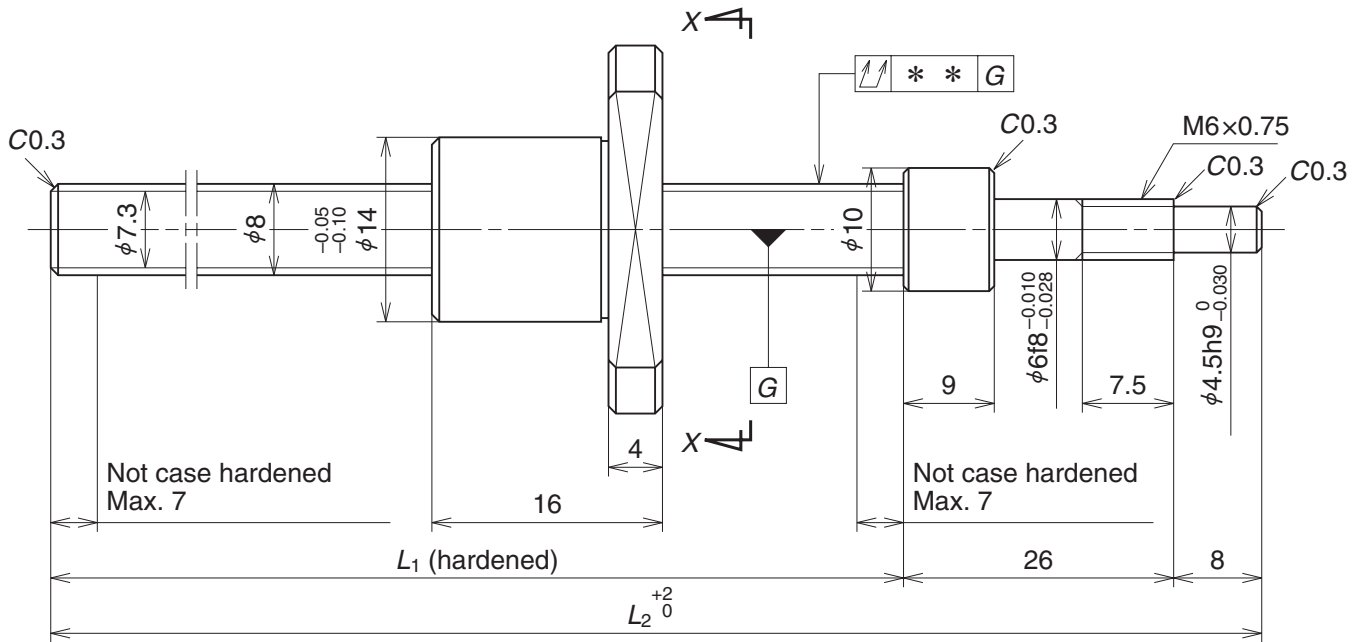
| Recommended Support Unit |
|-------------------------------|
| WBK04R-11 (round, fixed side) |

Unit: mm

| Lead accuracy | | | Shaft run-out** \uparrow | Mass (kg) | Permissible rotational speed N (min^{-1}) |
|------------------|-------------|---------------------|-------------------------------|-----------|--|
| Target value T | Error e_p | Variation v_{300} | | | |
| 0 | 0.052 | 0.052 | 0.060 | 0.045 | 3 000 |
| 0 | 0.085 | 0.052 | 0.090 | 0.065 | 3 000 |

Ball Screws V Series: Finished Shaft End

Precision Rolled Miniature: RMA



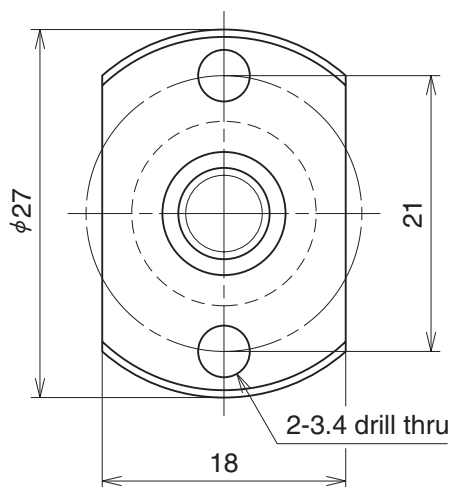
| Part number | Stroke | | Screw shaft length | | |
|-----------------------|---------|---------------------------------|--------------------|-------|--|
| | Nominal | Maximum (L_1 -Nut length) | L_1 | L_2 | |
| RMA0801C7S-180 | 100 | 130 | 146 | 180 | |
| RMA0801C7S-280 | 200 | 230 | 246 | 280 | |

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.

Screw Shaft $\phi 8$ Lead 1

Unit: mm



View X-X

| 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 |

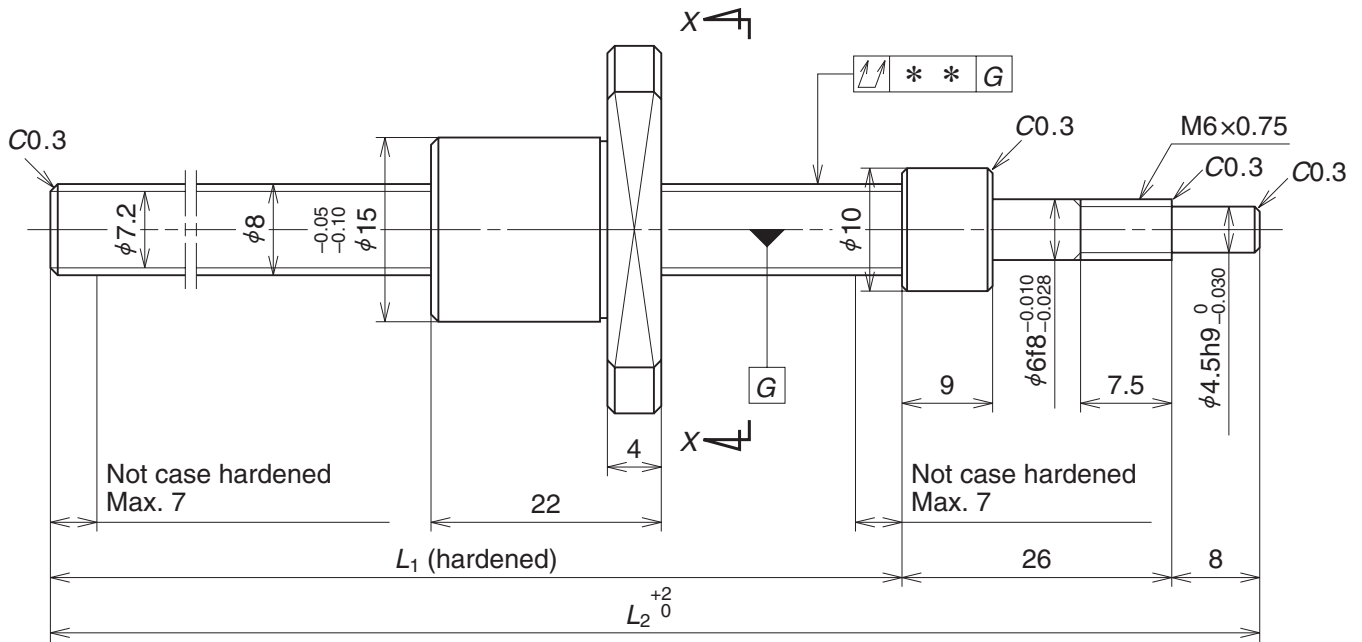
| Recommended Support Unit | |
|-------------------------------|--|
| WBK06R-11 (round, fixed side) | |

Unit: mm

| Lead accuracy | | | Shaft run-out** | Mass (kg) | Permissible rotational speed N (min ⁻¹) |
|------------------|-------------|---------------------|-----------------|-----------|---|
| Target value T | Error e_p | Variation v_{300} | | | |
| 0 | 0.052 | 0.052 | 0.060 | 0.085 | 3 000 |
| 0 | 0.085 | 0.052 | 0.090 | 0.12 | 3 000 |

Ball Screws V Series: Finished Shaft End

Precision Rolled Miniature: RMA



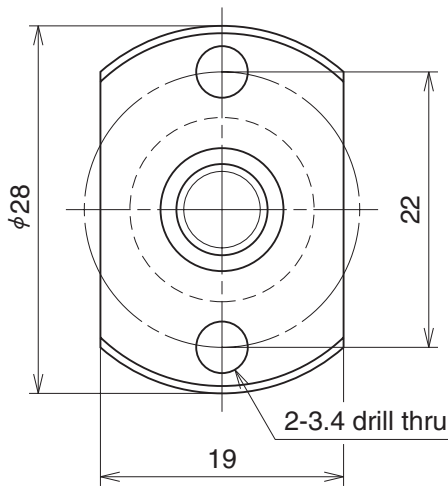
| Part number | Stroke | | Screw shaft length | | |
|-------------------------|---------|---------------------------------|--------------------|-------|--|
| | Nominal | Maximum (L_1 -Nut length) | L_1 | L_2 | |
| RMA0801.5C7S-180 | 100 | 124 | 146 | 180 | |
| RMA0801.5C7S-280 | 200 | 224 | 246 | 280 | |

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.

Screw Shaft $\phi 8$ Lead 1.5

Unit: mm



View X-X

| 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 |

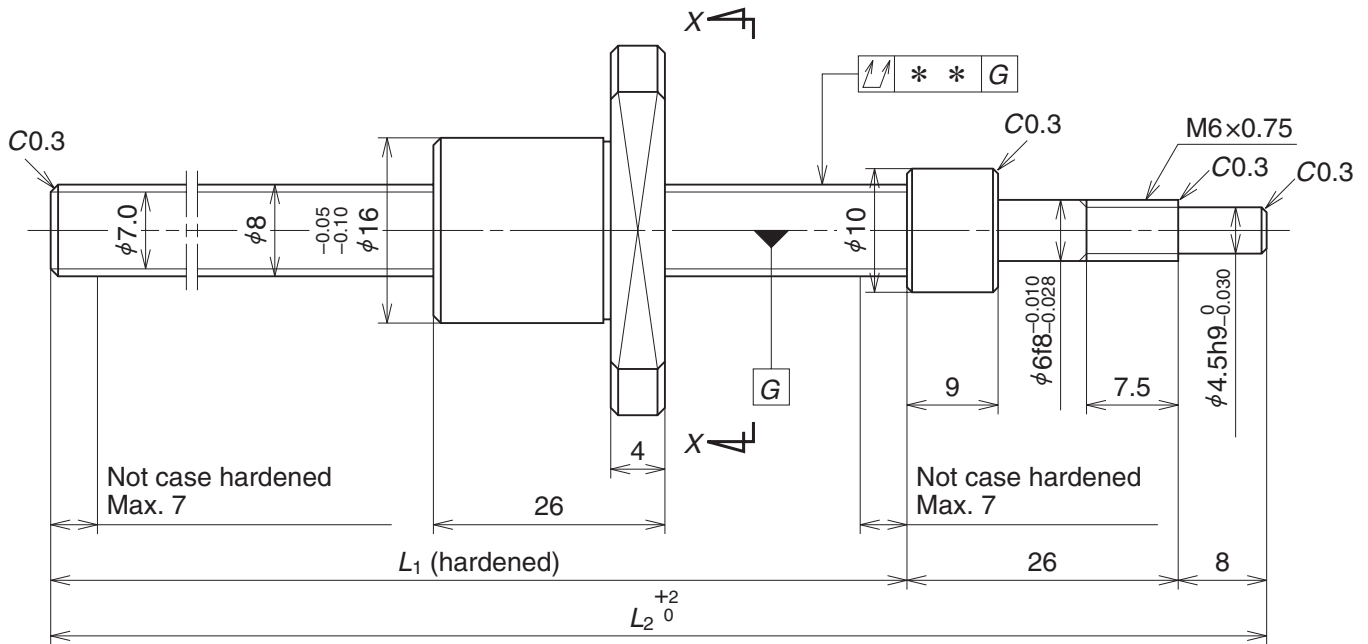
| Recommended Support Unit | |
|-------------------------------|--|
| WBK06R-11 (round, fixed side) | |

Unit: mm

| Lead accuracy | | | Shaft run-out** \uparrow | Mass (kg) | Permissible rotational speed N (min^{-1}) |
|---------------------|----------------|------------------------|-------------------------------|-----------|---|
| Target value T | Error e_p | Variation v_{300} | | | |
| 0 | 0.052 | 0.052 | 0.060 | 0.093 | 3 000 |
| 0 | 0.085 | 0.052 | 0.090 | 0.13 | 3 000 |

Ball Screws V Series: Finished Shaft End

Precision Rolled Miniature: RMA



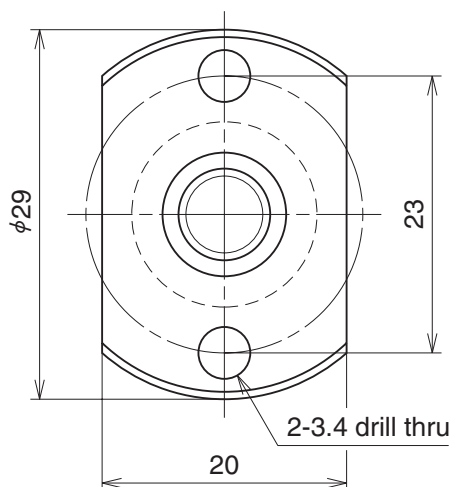
| Part number | Stroke | | Screw shaft length | | |
|-----------------------|---------|---------------------------------|--------------------|-------|--|
| | Nominal | Maximum (L_1 -Nut length) | L_1 | L_2 | |
| RMA0802C7S-180 | 100 | 120 | 146 | 180 | |
| RMA0802C7S-280 | 200 | 220 | 246 | 280 | |

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.

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 |
| 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 |

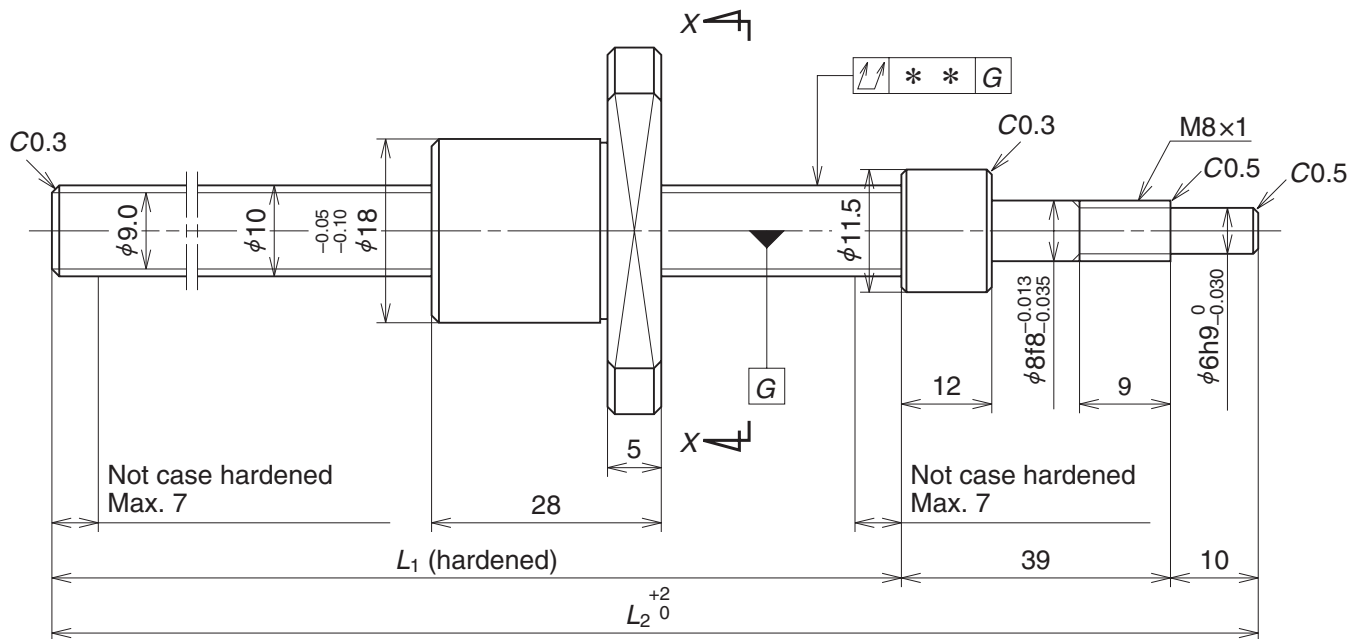
| Recommended Support Unit | |
|-------------------------------|--|
| WBK06R-11 (round, fixed side) | |

Unit: mm

| Lead accuracy | | | Shaft run-out** $\uparrow\downarrow$ | Mass (kg) | Permissible rotational speed N (min ⁻¹) |
|---------------------|----------------|------------------------|---|-----------|--|
| Target value T | Error e_p | Variation v_{300} | | | |
| 0 | 0.052 | 0.052 | 0.060 | 0.10 | 3 000 |
| 0 | 0.085 | 0.052 | 0.090 | 0.14 | 3 000 |

Ball Screws V Series: Finished Shaft End

Precision Rolled Miniature: RMA



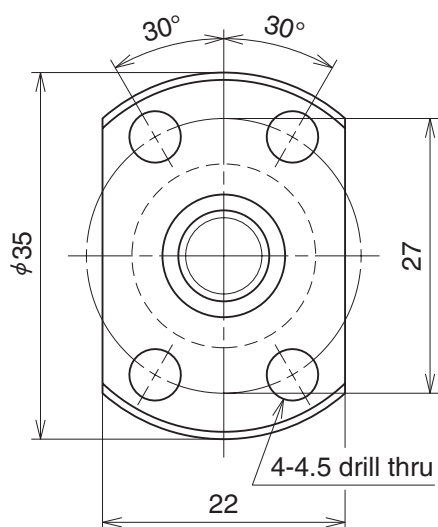
| Part number | Stroke | | Screw shaft length | | |
|-----------------------|---------|---------------------------------|--------------------|-------|--|
| | Nominal | Maximum (L_1 -Nut length) | L_1 | L_2 | |
| RMA1002C7S-250 | 150 | 173 | 201 | 250 | |
| RMA1002C7S-350 | 250 | 273 | 301 | 350 | |

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.

Screw Shaft $\phi 10$ Lead 2

Unit: mm



View X-X

| 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 | |

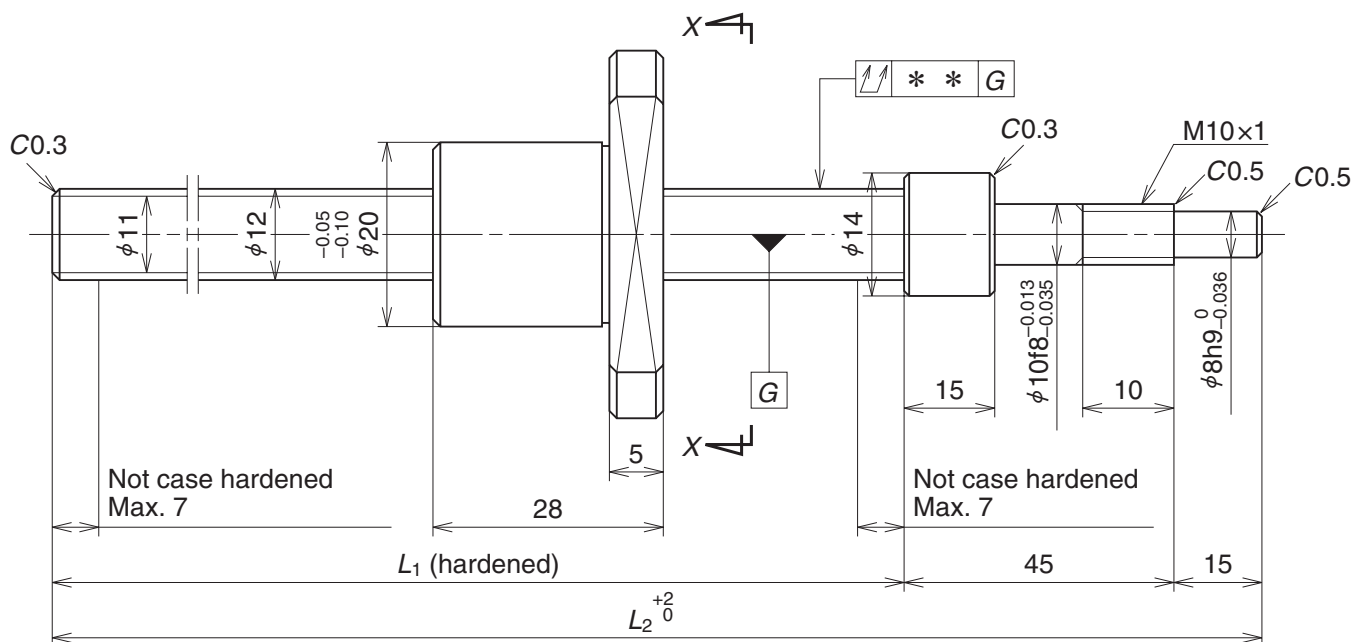
| Recommended Support Unit |
|--------------------------------|
| WBK08-01A (square, fixed side) |
| WBK08-11 (round, fixed side) |

Unit: mm

| Lead accuracy | | | Shaft run-out** \uparrow | Mass (kg) | Permissible rotational speed N (min^{-1}) |
|------------------|-------------|---------------------|-------------------------------|-----------|--|
| Target value T | Error e_p | Variation v_{300} | | | |
| 0 | 0.085 | 0.052 | 0.070 | 0.19 | 3 000 |
| 0 | 0.085 | 0.052 | 0.100 | 0.25 | 3 000 |

Ball Screws V Series: Finished Shaft End

Precision Rolled Miniature: RMA



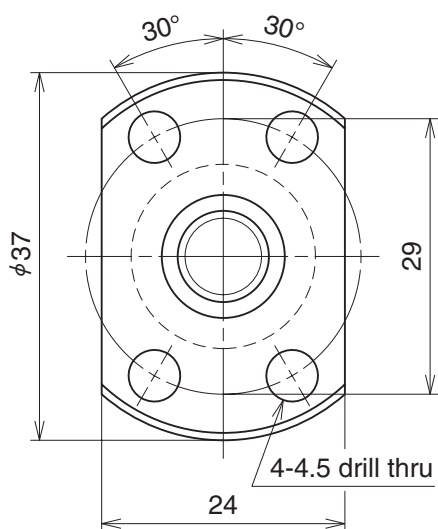
| Part number | Stroke | | Screw shaft length | | |
|-----------------------|---------|---------------------------------|--------------------|-------|--|
| | Nominal | Maximum (L_1 -Nut length) | L_1 | L_2 | |
| RMA1202C7S-250 | 150 | 162 | 190 | 250 | |
| RMA1202C7S-350 | 250 | 262 | 290 | 350 | |

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.

Screw Shaft $\phi 12$ Lead 2

Unit: mm



View X-X

Ball Screw Specifications

| | | |
|---------------------------------------|-----------------|----------------|
| Shaft dia. × Lead / Direction of turn | | 12 × 2 / Right |
| Ball recirculation | | Deflector |
| Ball dia. / Ball circle dia. | | 1.200 / 12.3 |
| Root dia. | | 10.9 |
| Effective turns of balls | | 1 × 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) |

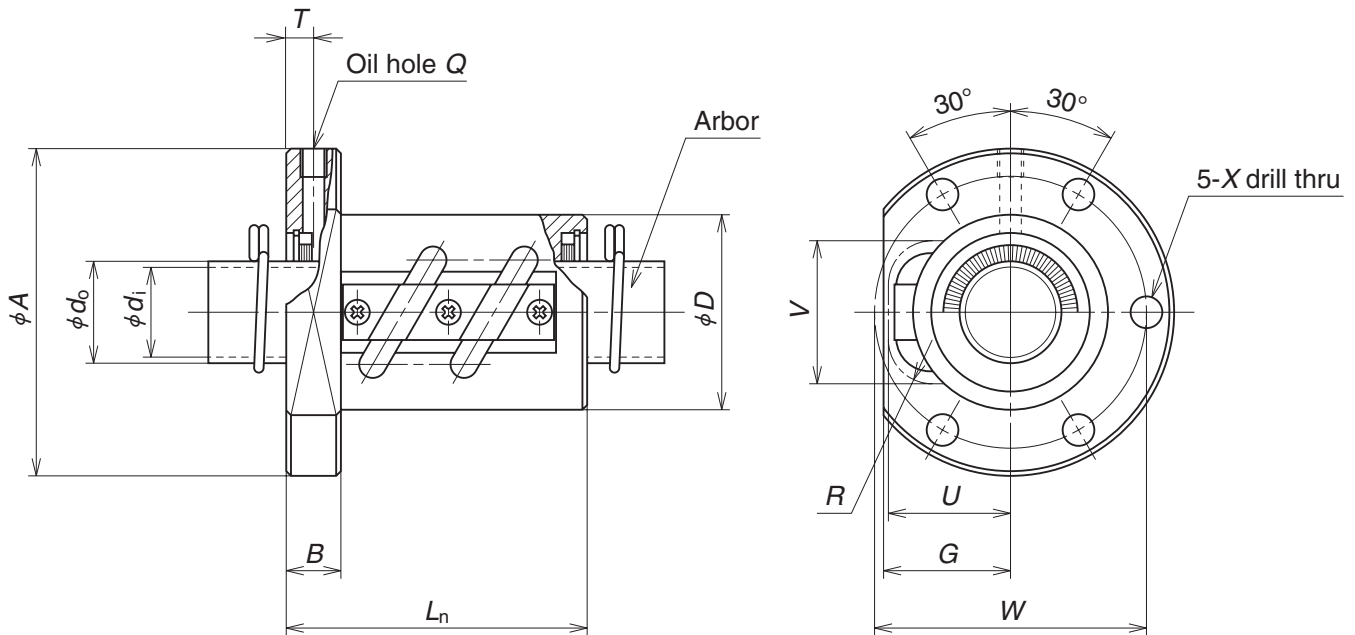
Unit: mm

| Lead accuracy | | | Shaft run-out** ↕ | Mass (kg) | Permissible rotational speed N (min ⁻¹) |
|---------------------|----------------|------------------------|----------------------|-----------|--|
| Target value T | Error e_p | Variation v_{300} | | | |
| 0 | 0.060 | 0.052 | 0.070 | 0.26 | 3 000 |
| 0 | 0.085 | 0.052 | 0.100 | 0.34 | 3 000 |

Ball Screws R Series: Rolled Ball Screws

Nut Model: RNFTL

Tube type: Flanged nut



| Part number | Shaft dia. d | Lead l | Ball dia. D_w | Ball circle dia. d_m | Root dia. d_r | Effective turns of balls Turns × Circuits | Basic load rating (N) | | Axial play max. | Ball nut dimensions | | | |
|------------------------|-------------------|-------------|--------------------|---------------------------|--------------------|--|-----------------------|--------------------|-----------------|---------------------|-----|--------|-----|
| | | | | | | | Dynamic C_a | Static C_{oa} | | Outside dia. | | Flange | |
| | | | | | | | | | | D | A | G | B |
| RNFTL 1003A3.5 | 10 | 3 | 2.381 | 10.65 | 8.1 | 3.5×1 | 3 780 | 6 730 | 0.10 | 20 | 40 | 15 | 6 |
| RNFTL 1006A2.5S | 10 | 6 | 2.381 | 10.65 | 8.1 | 2.5×1 | 2 830 | 4 810 | 0.10 | 20 | 40 | 15 | 6 |
| RNFTL 1208A2.5S | 12 | 8 | 2.778 | 12.65 | 9.6 | 2.5×1 | 3 730 | 6 560 | 0.10 | 25 | 45 | 19 | 8 |
| RNFTL 1404A3.5S | 14 | 4 | 2.778 | 14.5 | 11.5 | 3.5×1 | 5 370 | 10 800 | 0.10 | 25 | 50 | 19 | 10 |
| RNFTL 1405A2.5 | 14 | 5 | 3.175 | 14.5 | 11.0 | 2.5×1 | 5 260 | 9 720 | 0.10 | 30 | 50 | 22 | 10 |
| RNFTL 1610A2.5 | 16 | 10 | 3.175 | 16.75 | 13.3 | 2.5×1 | 5 660 | 11 500 | 0.10 | 30 | 53 | 23 | 10 |
| RNFTL 1610A2.5S | | | | | | | | | | | | | |
| RNFTL 1808A3.5 | 18 | 8 | 4.762 | 18.5 | 13.6 | 3.5×1 | 13 200 | 25 800 | 0.15 | 34 | 63 | 27 | 12 |
| RNFTL 1808A3.5S | | | | | | | | | | | | | |
| RNFTL 2005A2.5 | 20 | 5 | 3.175 | 20.5 | 17.0 | 2.5×1 | 6 360 | 14 200 | 0.10 | 40 | 60 | 28 | 10 |
| RNFTL 2005A2.5S | | | | | | | | | | | | | |
| RNFTL 2010A2.5 | 20 | 10 | 4.762 | 21.25 | 16.2 | 2.5×1 | 10 900 | 21 800 | 0.15 | 40 | 67 | 30 | 12 |
| RNFTL 2010A2.5S | | | | | | | | | | | | | |
| RNFTL 2505A5 | 25 | 5 | 3.175 | 25.5 | 22.0 | 2.5×2 | 12 800 | 36 300 | 0.10 | 42 | 71 | 28 | 12 |
| RNFTL 2505A5S | | | | | | | | | | | | | |
| RNFTL 2510A2.5 | 25 | 10 | 6.35 | 26 | 19.0 | 2.5×1 | 17 500 | 35 200 | 0.20 | 44 | 80 | 34 | 15 |
| RNFTL 2510A2.5S | | | | | | | | | | | | | |
| RNFTL 2510A5 | | | | | | 80 | 34 | 15 | | | | | |
| RNFTL 2510A5S | | | | | | | | | | | | | |

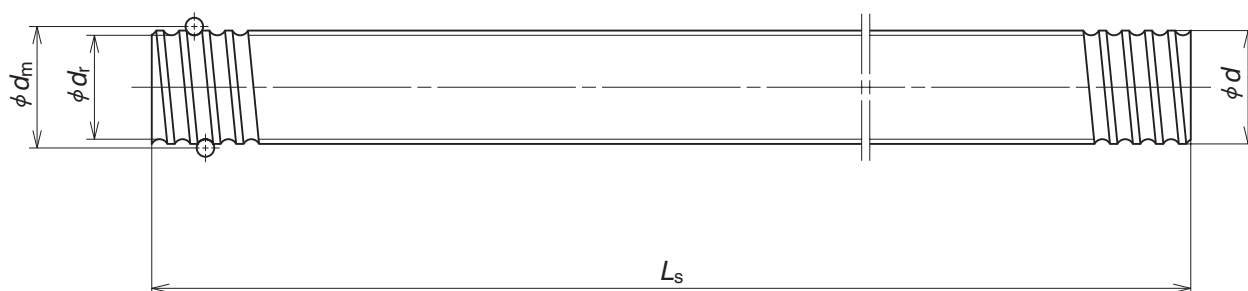
Note 1: Protruding portion of tube does not interfere with ball nut housing if its dimensions corresponding to U and V are large enough.

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.



Unit: mm

| Ball nut dimensions | | | | | | | | Nut mass (kg) | Arbor | | Screw shaft | | | Shaft mass/m (kg) | Internal spatial volume of nut (cm ³) | Standard volume of grease replenishing (cm ³) | |
|---------------------|-----------|-----|----------|-----|-----------------|------|-----|---------------|--------------|-------|-----------------|-------|--------------------|-------------------|---|---|-----|
| Length | Bolt hole | | Oil hole | | Projecting tube | | | | Outside dia. | Bore | Standard length | | Screw shaft number | | | | |
| L_n | W | X | Q | T | U | V | R | d_o | d_i | L_s | | | | | | | |
| 34 | 30 | 4.5 | M3×0.5 | 3.0 | 15 | 15 | 7 | 0.092 | 8.1 | 6.1 | 400 | 800 | RS1003A** | 0.50 | | | |
| 36 | 30 | 4.5 | M3×0.5 | 3.5 | 15 | 15 | 5 | 0.095 | 8.1 | 6.1 | 400 | 800 | RS1006A** | 0.56 | 1.1 | 0.6 | |
| 46 | 35 | 4.5 | M3×0.5 | 5.5 | 19 | 18 | 7 | 0.18 | 9.6 | 7.6 | 400 | 800 | RS1208A** | 0.74 | 1.8 | 0.9 | |
| 43 | 40 | 4.5 | M6×1 | 5.0 | 19 | 20 | 7 | 0.20 | 11.5 | 9.5 | 500 | 1 000 | RS1404A** | 1.02 | 2.0 | 1.0 | |
| 45 | 40 | 4.5 | M6×1 | 5.0 | 22 | 21 | 8 | 0.26 | 11.0 | 9.0 | 500 | 1 000 | RS1405A** | 1.00 | 2.4 | 1.2 | |
| 54 | 41 | 5.5 | M6×1 | 5.5 | 23 | 22.5 | 8 | 0.28 | 13.3 | 11.3 | 500 | 1 000 | 1 500 | RS1610A** | 1.37 | 2.7 | 1.4 |
| 58 | 49 | 6.6 | M6×1 | 6.0 | 27 | 27 | 8 | 0.43 | 13.6 | 11.6 | 500 | 1 000 | 1 500 | RS1808A** | 1.60 | 5.2 | 2.6 |
| 46 | 50 | 4.5 | M6×1 | 5.0 | 28 | 27 | 10 | 0.42 | 17.0 | 14.6 | 500 | 1 000 | 2 000 | RS2005A** | 2.17 | 3.5 | 1.8 |
| 59 | 53 | 6.6 | M6×1 | 6.0 | 30 | 29 | 12 | 0.55 | 16.2 | 13.8 | 500 | 1 000 | 2 000 | RS2010A** | 2.18 | 7.1 | 3.6 |
| 66 | 57 | 6.6 | M6×1 | 6.0 | 28 | 31 | 10 | 0.62 | 22.0 | 19.6 | 1 000 | 2 000 | 2 500 | RS2505A** | 3.47 | 6.5 | 3.3 |
| 62 | 62 | 9 | M6×1 | 7.5 | 34 | 37 | 17 | 0.75 | 19.0 | 16.6 | 1 000 | 2 000 | 2 500 | RS2510A** | 3.13 | 13 | 6.5 |
| 92 | 62 | 9 | M6×1 | 7.5 | 34 | 37 | 17 | | | | | | | | | 18 | 9.0 |

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

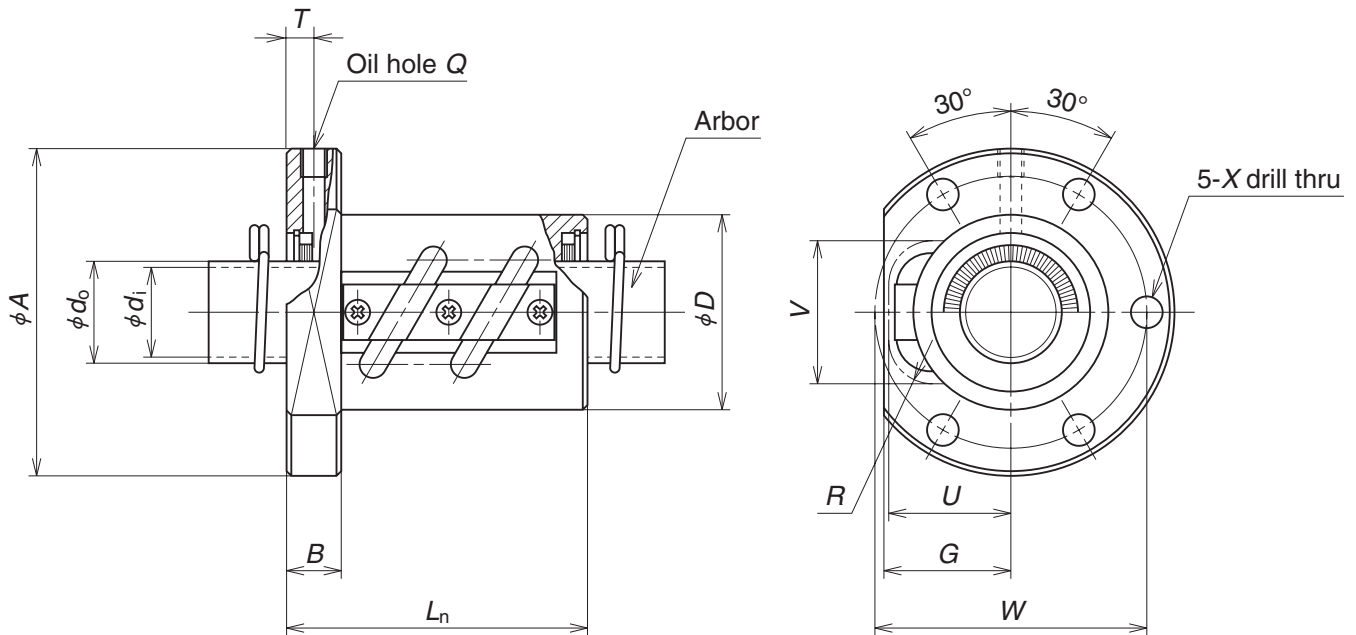
Note 5: Value obtained by dividing standard screw length by 100 mm will be entered at end of the part number where marked with **.

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.

Ball Screws R Series: Rolled Ball Screws

Nut Model: RNFTL

Tube type: Flanged nut



| Part number | Shaft dia. d | Lead l | Ball dia. D_w | Ball circle dia. d_m | Root dia. d_r | Effective turns of balls Turns \times Circuits | Basic load rating (N) | | Axial play max. | Ball nut dimensions | | | |
|------------------------|-------------------|-------------|--------------------|---------------------------|--------------------|---|-----------------------|--------------------|-----------------|---------------------|-----|--------|-----|
| | | | | | | | Dynamic C_a | Static C_{0a} | | Outside dia. | | Flange | |
| | | | | | | | | | | D | A | G | B |
| RNFTL 2806A2.5 | 28 | 6 | 3.175 | 28.5 | 25.0 | 2.5×1 | 7 430 | 20 300 | 0.10 | 50 | 79 | 33 | 15 |
| RNFTL 2806A2.5S | | | | | | | | | | | | | |
| RNFTL 2806A5 | | | | | | | | | | | | | |
| RNFTL 2806A5S | | | | | | | | | | | | | |
| RNFTL 3210A5 | 32 | 10 | 6.35 | 33.75 | 27.0 | 2.5×2 | 35 700 | 92 200 | 0.20 | 55 | 97 | 39 | 18 |
| RNFTL 3210A5S | | | | | | | | | | | | | |
| RNFTL 3610A2.5 | 36 | 10 | 6.35 | 37 | 30.0 | 2.5×1 | 21 000 | 51 000 | 0.20 | 60 | 102 | 42 | 18 |
| RNFTL 3610A2.5S | | | | | | | | | | | | | |
| RNFTL 3610A5 | | | | | | 2.5×2 | 38 100 | 102 000 | | 60 | 102 | 42 | 18 |
| RNFTL 3610A5S | | | | | | | | | | | | | |
| RNFTL 4010A7 | 40 | 10 | 6.35 | 41.75 | 35.0 | 3.5×2 | 53 500 | 164 000 | 0.20 | 65 | 114 | 44 | 20 |
| RNFTL 4010A7S | | | | | | | | | | | | | |
| RNFTL 4512A5 | 45 | 12 | 7.144 | 46.5 | 39.0 | 2.5×2 | 49 600 | 147 000 | 0.23 | 70 | 130 | 47 | 22 |
| RNFTL 4512A5S | | | | | | | | | | | | | |
| RNFTL 5010A7 | 50 | 10 | 6.35 | 51.75 | 45.0 | 3.5×2 | 59 500 | 205 000 | 0.20 | 80 | 140 | 52 | 22 |
| RNFTL 5010A7S | | | | | | | | | | | | | |
| RNFTL 5016A5 | 50 | 16 | 9.525 | 52 | 42.0 | 2.5×2 | 99 900 | 293 000 | 0.23 | 85 | 163 | 57 | 28 |
| RNFTL 5016A5S | | | | | | | | | | | | | |

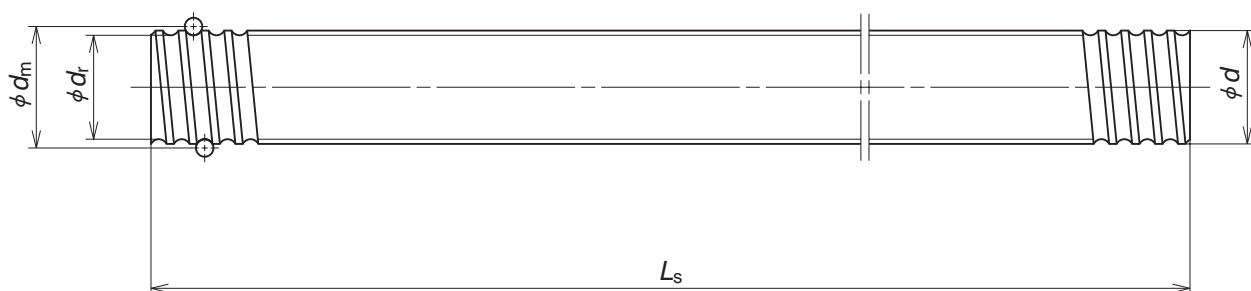
Note 1: Protruding portion of tube does not interfere with ball nut housing if its dimensions corresponding to U and V are large enough.

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

Seal is a brush-seal.



Unit: mm

| Ball nut dimensions | | | | | | | | Nut mass (kg) | Arbor | | Screw shaft | | | Shaft mass/m (kg) | Internal spatial volume of nut (cm ³) | Standard volume of grease replenishing (cm ³) | |
|---------------------|-----------|-----|----------|------|-----------------|-----|-----|---------------|--------------|-------|-----------------|-------|--------------------|-------------------|---|---|-----|
| Length | Bolt hole | | Oil hole | | Projecting tube | | | | Outside dia. | Bore | Standard length | | Screw shaft number | | | | |
| L_n | W | X | Q | T | U | V | R | d_o | d_i | L_s | | | | | | | |
| 55 | 65 | 6.6 | M6×1 | 7.5 | 33 | 34 | 10 | 0.85 | 25.0 | 22.6 | 1 000 | 2 000 | 2 500 | RS2806A** | 4.47 | 5.9 | 3.0 |
| 79 | 65 | 6.6 | M6×1 | 7.5 | 33 | 34 | 10 | | | | | | | | | 1.07 | 8.4 |
| 97 | 75 | 11 | M6×1 | 9.0 | 39 | 42 | 17 | 1.55 | 27.0 | 24.6 | 1 000 | 2 000 | 3 000 | RS3210A** | 5.53 | 29 | 15 |
| 68 | 80 | 11 | M6×1 | 9.0 | 42 | 46 | 17 | 1.47 | 30.0 | 27.6 | 1 000 | 2 000 | 3 000 | RS3610A** | 6.91 | 21 | 11 |
| 98 | 80 | 11 | M6×1 | 9.0 | 42 | 46 | 17 | | | | | | | | | 1.80 | 33 |
| 120 | 90 | 14 | M6×1 | 10.0 | 44 | 50 | 20 | 2.49 | 35.0 | 31.8 | 2 000 | 3 000 | 4 000 | RS4010** | 8.87 | 42 | 21 |
| 116 | 100 | 18 | M6×1 | 11.0 | 47 | 55 | 20 | 3.07 | 39.0 | 35.8 | 2 000 | 3 000 | 4 000 | RS4512** | 11.16 | 49 | 25 |
| 122 | 110 | 18 | M6×1 | 11.0 | 52 | 59 | 20 | 4.06 | 45.0 | 41.8 | 2 000 | 3 000 | 4 000 | RS5010** | 14.15 | 53 | 27 |
| 146 | 125 | 22 | M6×1 | 14.0 | 57 | 63 | 25 | 6.42 | 42.0 | 38.8 | 2 000 | 3 000 | 4 000 | RS5016** | 13.48 | 94 | 47 |

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

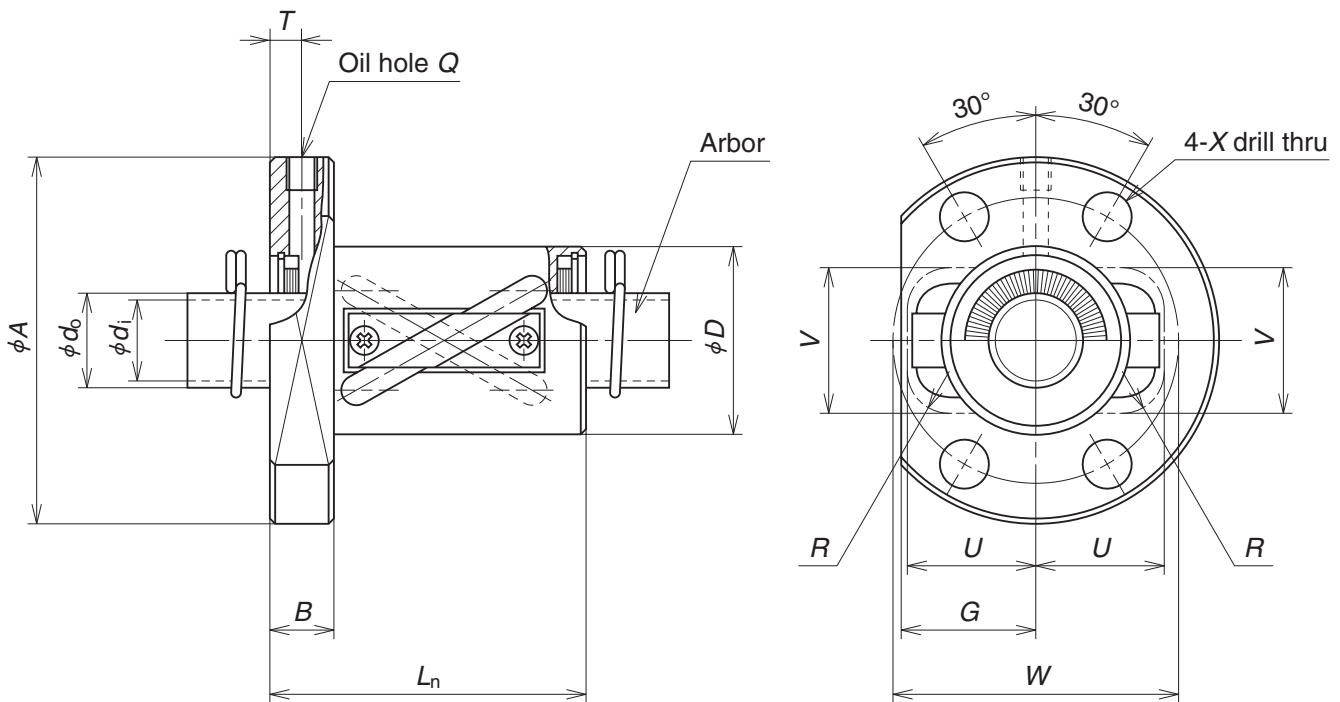
Note 5: Value obtained by dividing standard screw length by 100 mm will be entered at end of the part number where marked with **.

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.

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_w</i> | Ball circle dia. <i>d_m</i> | Root dia. <i>d_r</i> | Effective turns of balls Turns × Circuits | Basic load rating (N) | | Axial play max. | Ball nut dimensions | | | |
|----------------------|------------------------|------------------|-----------------------------------|--|-----------------------------------|--|---------------------------------|---------------------------------|-----------------|---------------------|----------|----------|----------|
| | | | | | | | Dynamic <i>C_a</i> | Static <i>C_{0a}</i> | | Outside dia. | | Flange | |
| | | | | | | | | | | <i>D</i> | <i>A</i> | <i>G</i> | <i>B</i> |
| RNFTL 1212A3 | 12 | 12 | 2.381 | 12.65 | 10.1 | 1.5×2 | 3 360 | 6 270 | 0.10 | 24 | 44 | 17 | 8 |
| RNFTL 1616A3 | 16 | 16 | 2.778 | 16.65 | 13.6 | 1.5×2 | 4 880 | 9 650 | 0.10 | 30 | 55 | 22 | 10 |
| RNFTL 1616A3S | | | | | | | | | | | | | |
| RNFTL 2020A3 | 20 | 20 | 3.175 | 20.75 | 17.3 | 1.5×2 | 7 010 | 15 400 | 0.10 | 35 | 68 | 25 | 12 |
| RNFTL 2020A3S | | | | | | | | | | | | | |
| RNFTL 2525A3 | 25 | 25 | 3.969 | 26 | 22.0 | 1.5×2 | 10 500 | 24 100 | 0.12 | 45 | 80 | 31 | 12 |
| RNFTL 2525A3S | | | | | | | | | | | | | |
| RNFTL 3232A3 | 32 | 32 | 4.762 | 33.25 | 28.0 | 1.5×2 | 15 300 | 37 100 | 0.15 | 55 | 100 | 37 | 15 |
| RNFTL 3232A3S | | | | | | | | | | | | | |
| RNFTL 4040A3 | 40 | 40 | 6.35 | 41.75 | 35.0 | 1.5×2 | 24 400 | 61 600 | 0.20 | 70 | 120 | 46 | 18 |
| RNFTL 4040A3S | | | | | | | | | | | | | |

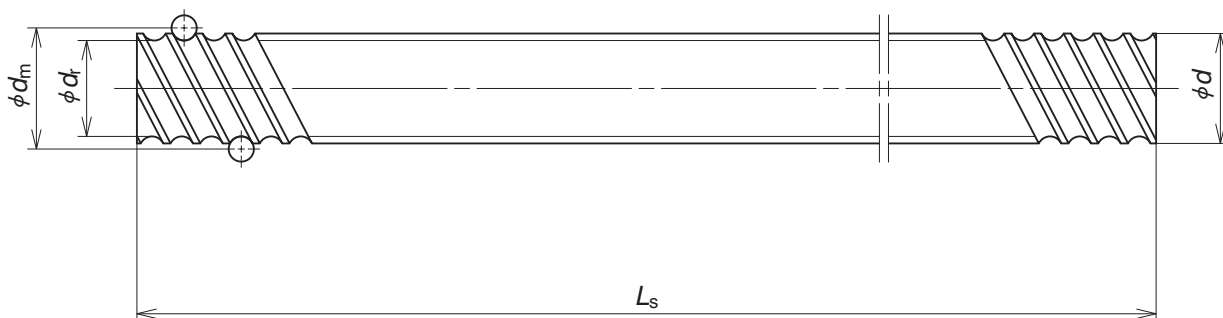
Note 1: Protruding portion of tube does not interfere with ball nut housing if its dimensions corresponding to U and V are large enough.

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.



Unit: mm

| Ball nut dimensions | | | | | | | | Nut mass (kg) | Arbor | | Screw shaft | | | Shaft mass/m (kg) | Internal spatial volume of nut (cm ³) | Standard volume of grease replenishing (cm ³) | |
|---------------------|-----------|-----|----------|-----|-----------------|-----|-----|---------------|--------------|-------|-----------------|-------|-------|-------------------|---|---|--------------------|
| Length | Bolt hole | | Oil hole | | Projecting tube | | | | Outside dia. | Bore | Standard length | | | | | | Screw shaft number |
| | L_n | W | X | Q | T | U | V | | R | d_o | d_i | L_s | | | | | |
| 44 | 34 | 4.5 | M3×0.5 | 4.0 | 17 | 16 | 5 | 0.16 | 10.1 | 8.1 | 400 | 800 | | RS1212A** | 0.74 | 1.7 | 0.9 |
| 50 | 43 | 6.6 | M6×1 | 5.0 | 22 | 22 | 7 | 0.29 | 13.6 | 11.6 | 500 | 1 000 | 1 500 | RS1616A** | 1.37 | 2.8 | 1.4 |
| 59 | 52 | 9 | M6×1 | 6.0 | 25 | 27 | 8 | 0.49 | 17.3 | 14.9 | 500 | 1 000 | 2 000 | RS2020A** | 2.19 | 4.9 | 2.5 |
| 69 | 63 | 9 | M6×1 | 6.0 | 31 | 32 | 10 | 0.80 | 22.0 | 19.6 | 1 000 | 2 000 | 2 500 | RS2525A** | 3.43 | 9.1 | 4.6 |
| 84 | 80 | 11 | M6×1 | 7.5 | 37 | 40 | 12 | 1.46 | 28.0 | 25.6 | 1 000 | 2 000 | 3 000 | RS3232A** | 5.71 | 19 | 9.5 |
| 103 | 95 | 14 | M6×1 | 9.0 | 46 | 49 | 15 | 2.69 | 35.0 | 31.8 | 2 000 | 3 000 | 4 000 | RS4040A** | 8.82 | 39 | 20 |

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

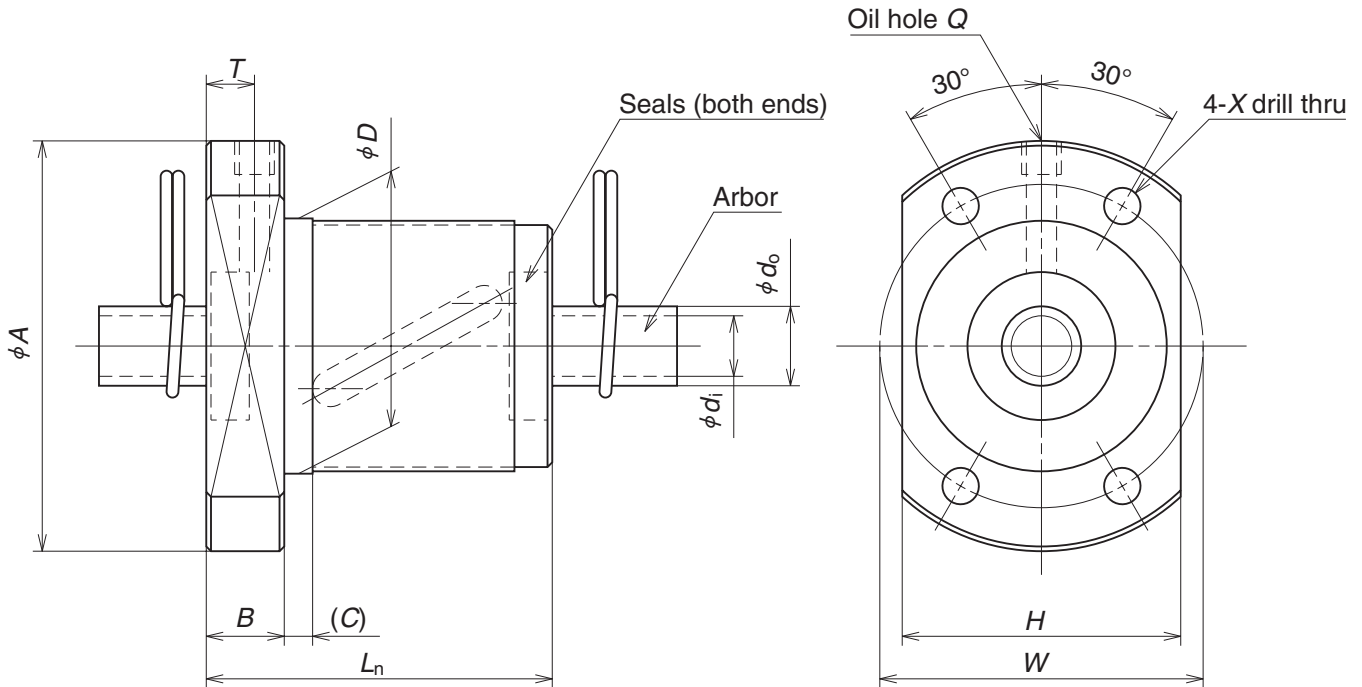
Note 5: Value obtained by dividing standard screw length by 100 mm will be entered at end of the part number where marked with **.

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.

Ball Screws R Series: Rolled Ball Screws

Nut Model: RNFBL

Return tube type, embedded; tube, flanged

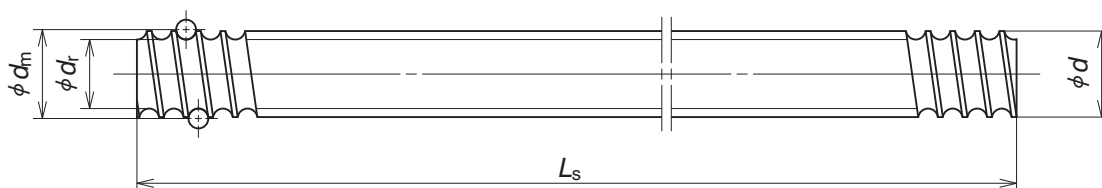


| Part number | Shaft dia. <i>d</i> | Lead <i>l</i> | Ball dia. <i>D_w</i> | Ball circle dia. <i>d_m</i> | Root dia. <i>d_r</i> | Effective turns of balls Turns × Circuits | Basic load rating (N) | | Axial play max. | Ball nut dimensions | | | |
|------------------------|------------------------|------------------|-----------------------------------|--|-----------------------------------|--|---------------------------------|---------------------------------|-----------------|--------------------------|----------|----------|----|
| | | | | | | | Dynamic <i>C_a</i> | Static <i>C_{0a}</i> | | Outside dia. <i>D</i> | Flange | | |
| | | | | | | <i>A</i> | | | | | <i>H</i> | <i>B</i> | |
| RNFBL 1006A2.5S | 10 | 6 | 2.381 | 10.65 | 8.1 | 2.5×1 | 2 830 | 4 810 | 0.10 | 26 | 42 | 29 | 8 |
| RNFBL 1208A2.5S | 12 | 8 | 2.778 | 12.65 | 9.6 | 2.5×1 | 3 730 | 6 560 | 0.10 | 29 | 45 | 32 | 8 |
| RNFBL 1404A3.5S | 14 | 4 | 2.778 | 14.5 | 11.5 | 3.5×1 | 5 370 | 10 800 | 0.10 | 31 | 50 | 37 | 10 |
| RNFBL 1405A2.5S | 14 | 5 | 3.175 | 14.5 | 11.0 | 2.5×1 | 5 260 | 9 720 | 0.10 | 32 | 50 | 38 | 10 |
| RNFBL 1808A3.5S | 18 | 8 | 4.762 | 18.5 | 13.6 | 3.5×1 | 13 200 | 25 800 | 0.15 | 50 | 80 | 60 | 12 |
| RNFBL 2005A2.5S | 20 | 5 | 3.175 | 20.5 | 17.0 | 2.5×1 | 6 360 | 14 200 | 0.10 | 40 | 60 | 46 | 10 |
| RNFBL 2010A2.5S | 20 | 10 | 4.762 | 21.25 | 16.2 | 2.5×1 | 10 900 | 21 800 | 0.15 | 52 | 82 | 64 | 12 |
| RNFBL 2505A2.5S | 25 | 5 | 3.175 | 25.5 | 22.0 | 2.5×1 | 7 070 | 18 200 | 0.10 | 43 | 67 | 50 | 10 |
| RNFBL 2505A5S | | | | | | 2.5×2 | 12 800 | 36 300 | | | | | |
| RNFBL 2510A2.5S | 25 | 10 | 6.35 | 26 | 19.0 | 2.5×1 | 17 500 | 35 200 | 0.20 | 60 | 96 | 72 | 15 |
| RNFBL 2510A5S | | | | | | 2.5×2 | 31 800 | 70 300 | | | | | |
| RNFBL 2806A2.5S | 28 | 6 | 3.175 | 28.5 | 25.0 | 2.5×1 | 7 430 | 20 300 | 0.10 | 50 | 80 | 60 | 12 |
| RNFBL 2806A5S | | | | | | 2.5×2 | 13 500 | 40 600 | | | | | |
| RNFBL 3210A2.5S | 32 | 10 | 6.35 | 33.75 | 27.0 | 2.5×1 | 19 700 | 46 100 | 0.20 | 67 | 103 | 78 | 15 |
| RNFBL 3210A5S | | | | | | 2.5×2 | 35 700 | 92 200 | | | | | |
| RNFBL 3610A2.5S | 36 | 10 | 6.35 | 37 | 30.0 | 2.5×1 | 21 000 | 51 000 | 0.20 | 70 | 110 | 82 | 17 |
| RNFBL 3610A5S | | | | | | 2.5×2 | 31 800 | 102 000 | | | | | |
| RNFBL 4010A5S | 40 | 10 | 6.35 | 41.75 | 35.0 | 2.5×2 | 40 100 | 116 000 | 0.20 | 76 | 116 | 88 | 17 |

Note 1: Actual screw shaft length may be slightly longer than nominal length L_s 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 **.



Unit: mm

| Ball nut dimensions | | | | | | Nut mass (kg) | Arbor | | Screw shaft | | | Shaft mass/m (kg) | Internal spatial volume of nut (cm ³) | Standard volume of grease replenishing (cm ³) | |
|---------------------|-----------|----|----------|--------|--------------|----------------|----------------|-----------------|-------------|--------------------|-------|-------------------|---|---|-----|
| Length | Bolt hole | | Oil hole | | Outside dia. | | Bore | Standard length | | Screw shaft number | | | | | |
| Overall length | (C) | W | X | Q | T | d _o | d _i | L _s | | | | | | | |
| L _n | | | | | | | | | | | | | | | |
| 36 | 3 | 34 | 4.5 | M3×0.5 | 5.0 | 0.16 | 8.1 | 6.1 | 400 | 800 | | RS1006A** | 0.56 | 1.1 | 0.6 |
| 44 | 3 | 37 | 4.5 | M3×0.5 | 5.5 | 0.21 | 9.6 | 7.6 | 400 | 800 | | RS1208A** | 0.81 | 1.6 | 0.8 |
| 40 | 4 | 40 | 4.5 | M6×1 | 5.0 | 0.25 | 11.5 | 9.5 | 500 | 1 000 | | RS1404A** | 1.02 | 2.4 | 1.2 |
| 40 | 4 | 40 | 4.5 | M6×1 | 5.0 | 0.26 | 11.0 | 9.0 | 500 | 1 000 | | RS1405A** | 1.00 | 1.9 | 1.0 |
| 61 | 4 | 65 | 6.6 | M6×1 | 6.0 | 1.00 | 13.6 | 11.6 | 500 | 1 000 | 1 500 | RS1808A** | 1.60 | 5.8 | 2.9 |
| 40 | 4 | 50 | 4.5 | M6×1 | 5.0 | 0.37 | 17.0 | 14.6 | 500 | 1 000 | 2 000 | RS2005A** | 2.17 | 2.8 | 1.4 |
| 61 | 5 | 67 | 6.6 | M6×1 | 6.0 | 1.05 | 16.2 | 13.8 | 500 | 1 000 | 2 000 | RS2010A** | 2.18 | 7.6 | 3.8 |
| 40 | 4 | 55 | 5.5 | M6×1 | 5.0 | 0.40 | 22.0 | 19.6 | 1 000 | 2 000 | 2 500 | RS2505A** | 3.47 | 3.5 | 1.8 |
| 55 | | | | | | 0.50 | | | | | | | | 4.7 | 2.4 |
| 66 | 5 | 78 | 9.0 | M6×1 | 7.5 | 1.52 | 19.0 | 16.6 | 1 000 | 2 000 | 2 500 | RS2510A** | 3.13 | 14 | 7.0 |
| 96 | | | | | | 1.99 | | | | | | | | 19 | 9.5 |
| 47 | 5 | 65 | 6.6 | M6×1 | 6.0 | 0.70 | 25.0 | 22.6 | 1 000 | 2 000 | 2 500 | RS2806A** | 4.47 | 4.5 | 2.3 |
| 65 | | | | | | 0.87 | | | | | | | | 7.6 | 3.8 |
| 67 | 5 | 85 | 9.0 | M6×1 | 7.5 | 1.72 | 27.0 | 24.6 | 1 000 | 2 000 | 3 000 | RS3210A** | 5.53 | 20 | 10 |
| 97 | | | | | | 2.25 | | | | | | | | 28 | 14 |
| 69 | 5 | 90 | 11.0 | M6×1 | 8.5 | 1.97 | 30.0 | 27.6 | 1 000 | 2 000 | 3 000 | RS3610A** | 6.91 | 21 | 11 |
| 99 | | | | | | 2.53 | | | | | | | | 29 | 15 |
| 99 | 5 | 96 | 11.0 | M6×1 | 8.5 | 2.86 | 35.0 | 31.8 | 2 000 | 3 000 | 4 000 | RS4010A** | 8.87 | 36 | 18 |

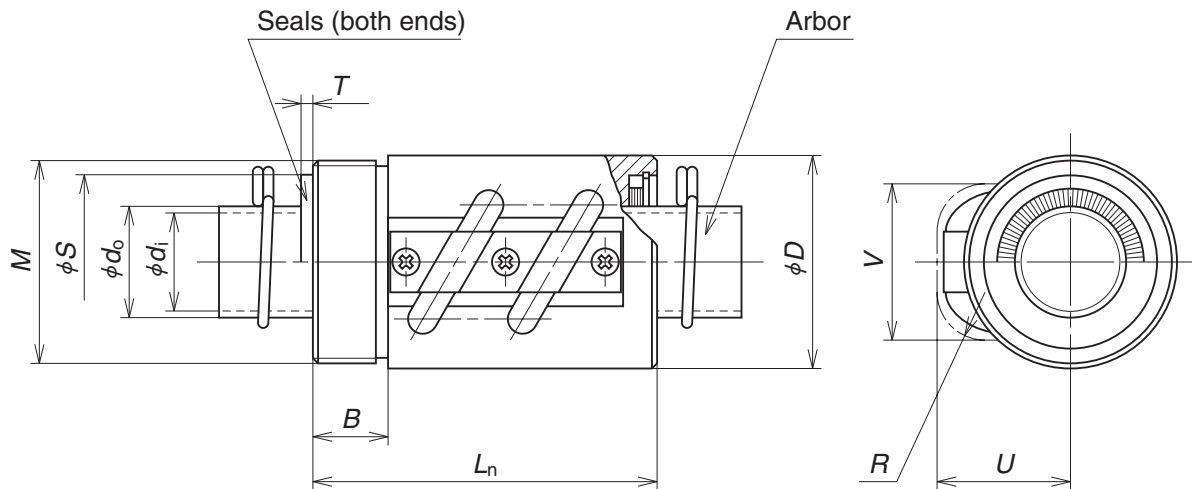
Note 4: Seal for those with shaft diameter of 14 mm or less is made of synthetic resin. Seal for those of 16 mm or more is a brush-seal.

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.

Ball Screws R Series: Rolled Ball Screws

Nut Model: RNCT

Return tube type, nut with V-thread



| Part number | Shaft dia. <i>d</i> | Lead <i>l</i> | Ball dia. <i>D_w</i> | Ball circle dia. <i>d_m</i> | Root dia. <i>d_r</i> | Effective turns of balls Turns × Circuits | Basic load rating (N) | | Axial play max. | Ball nut dimensions | | |
|-----------------------|------------------------|------------------|-----------------------------------|--|-----------------------------------|--|---------------------------------|---------------------------------|-----------------|--------------------------|----------|----------|
| | | | | | | | Dynamic <i>C_a</i> | Static <i>C_{0a}</i> | | Outside dia. <i>D</i> | Flange | |
| | | | | | | | | | | | <i>M</i> | <i>B</i> |
| RNCT 1003A3.5 | 10 | 3 | 2.381 | 10.65 | 8.1 | 3.5×1 | 3 780 | 6 730 | 0.10 | 20 | M18×1 | 10 |
| RNCT 1404A3.5S | 14 | 4 | 2.778 | 14.5 | 11.5 | 3.5×1 | 5 370 | 10 800 | 0.10 | 25 | M24×1 | 10 |
| RNCT 1405A2.5S | 14 | 5 | 3.175 | 14.5 | 11.0 | 2.5×1 | 5 260 | 9 720 | 0.10 | 30 | M26×1.5 | 10 |
| RNCT 1808A3.5 | 18 | 8 | 4.762 | 18.5 | 13.6 | 3.5×1 | 13 200 | 25 800 | 0.15 | 34 | M32×1.5 | 12 |
| RNCT 1808A3.5S | | | | | | | | | | | | |
| RNCT 2005A2.5 | 20 | 5 | 3.175 | 20.5 | 17.0 | 2.5×1 | 6 360 | 14 200 | 1.10 | 40 | M36×1.5 | 12 |
| RNCT 2005A2.5S | | | | | | | | | | | | |
| RNCT 2505A5 | 25 | 5 | 3.175 | 25.5 | 22.0 | 2.5×2 | 12 800 | 36 300 | 0.10 | 42 | M40×1.5 | 15 |
| RNCT 2505A5S | | | | | | | | | | | | |
| RNCT 2510A5 | 25 | 10 | 6.35 | 26 | 19.0 | 2.5×2 | 31 800 | 70 300 | 0.20 | 44 | M42×1.5 | 15 |
| RNCT 2510A5S | | | | | | | | | | | | |
| RNCT 2806A5 | 28 | 6 | 3.175 | 28.5 | 25.0 | 2.5×2 | 13 500 | 40 600 | 0.10 | 50 | M45×1.5 | 15 |
| RNCT 2806A5S | | | | | | | | | | | | |
| RNCT 3210A5 | 32 | 10 | 6.35 | 33.75 | 27.0 | 2.5×2 | 35 700 | 92 200 | 0.20 | 55 | M50×1.5 | 18 |
| RNCT 3210A5S | | | | | | | | | | | | |
| RNCT 3610A5 | 36 | 10 | 6.35 | 37 | 30.0 | 2.5×2 | 38 100 | 102 000 | 0.20 | 60 | M55×2 | 18 |
| RNCT 3610A5S | | | | | | | | | | | | |
| RNCT 4010A7 | 40 | 10 | 6.35 | 41.75 | 35.0 | 3.5×2 | 53 500 | 164 000 | 0.20 | 65 | M60×2 | 25 |
| RNCT 4010A7S | | | | | | | | | | | | |
| RNCT 4512A5 | 45 | 12 | 7.144 | 46.5 | 39.0 | 2.5×2 | 46 900 | 147 000 | 0.23 | 70 | M65×2 | 30 |
| RNCT 4512A5S | | | | | | | | | | | | |
| RNCT 5010A7 | 50 | 10 | 6.35 | 51.75 | 45.0 | 3.5×2 | 59 500 | 205 000 | 0.20 | 80 | M75×2 | 40 |
| RNCT 5010A7S | | | | | | | | | | | | |
| RNCT 5016A5 | 50 | 16 | 9.525 | 52 | 42.0 | 2.5×2 | 99 900 | 293 000 | 0.23 | 85 | M80×2 | 40 |
| RNCT 5016A5S | | | | | | | | | | | | |

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.

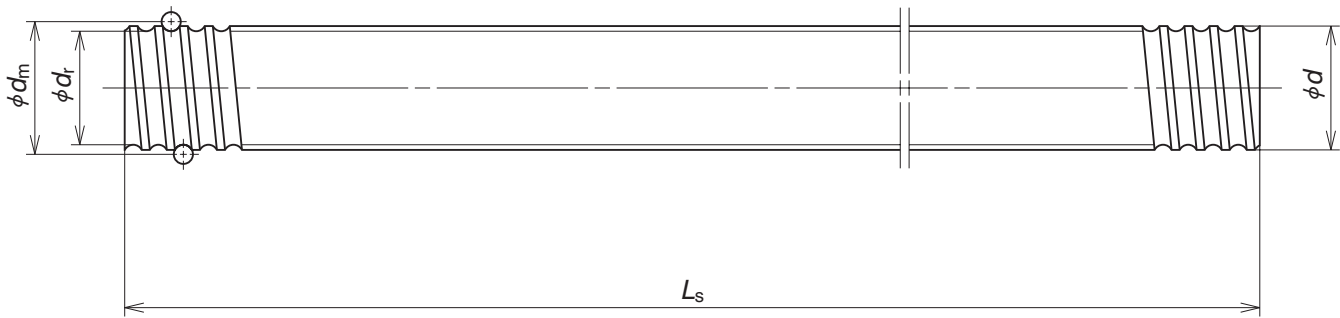
Note 3: Seal cannot be installed in V-thread side but may be installed in opposite side.

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.



Unit: mm

| Ball nut dimensions | | | | Nut mass (kg) | Seal dimensions | | Arbor | | Screw shaft | | | Shaft mass/m (kg) | Internal spatial volume of nut (cm ³) | Standard volume of grease replenishing (cm ³) | |
|---------------------|-----|-----------------|-----|---------------|-----------------|-----------|--------------|------|-----------------|-------|--------------------|-------------------|---|---|-------|
| Length | | Projecting tube | | | Diameter | Thickness | Outside dia. | Bore | Standard length | | Screw shaft number | | | | |
| L_n | U | V | R | | | | | | S | T | | | | | d_0 |
| 38 | 15 | 15 | 7 | 0.049 | | | 8.1 | 6.1 | 400 | 800 | | RS1003A** | 0.50 | | |
| 43 | 19 | 20 | 7 | 0.083 | | | 11.5 | 9.5 | 500 | 1 000 | | RS1404A** | 1.02 | 2.7 | 1.4 |
| 45 | 22 | 21 | 8 | 0.15 | | | 11.0 | 9.0 | 500 | 1 000 | | RS1405A** | 1.00 | 3.1 | 1.6 |
| 58 | 27 | 27 | 8 | 0.21 | 28.5 | 2.5 | 13.6 | 11.6 | 500 | 1 000 | 1 500 | RS1808A** | 1.66 | 6.6 | 3.3 |
| 48 | 28 | 27 | 10 | 0.28 | 29.5 | 2.5 | 17.0 | 14.6 | 500 | 1 000 | 2 000 | RS2005A** | 2.17 | 4.8 | 2.4 |
| 69 | 28 | 31 | 10 | 0.38 | 34.5 | 2.5 | 22.0 | 19.6 | 1 000 | 2 000 | 2 500 | RS2505A** | 3.47 | 8.4 | 4.2 |
| 92 | 34 | 37 | 17 | 0.49 | 38.5 | 2.5 | 19.0 | 16.6 | 1 000 | 2 000 | 2 500 | RS2510A** | 3.13 | 21 | 1 |
| 79 | 33 | 34 | 10 | 0.68 | 37.5 | 2.5 | 25.0 | 22.6 | 1 000 | 2 000 | 2 500 | RS2806A** | 4.47 | 9.7 | 4.9 |
| 97 | 39 | 42 | 17 | 0.79 | 45.5 | 2.5 | 27.0 | 24.6 | 1 000 | 2 000 | 3 000 | RS3210A** | 5.53 | 32 | 16 |
| 98 | 42 | 46 | 17 | 0.97 | 50.5 | 3.0 | 30.0 | 27.6 | 1 000 | 2 000 | 3 000 | RS3610A** | 6.91 | 32 | 16 |
| 125 | 44 | 50 | 20 | 1.37 | 54.5 | 3.0 | 35.0 | 31.8 | 2 000 | 3 000 | 4 000 | RS4010A** | 8.87 | 51 | 26 |
| 124 | 47 | 55 | 20 | 1.42 | 60.5 | 3.0 | 39.0 | 35.8 | 2 000 | 3 000 | 4 000 | RS4512A** | 11.16 | 60 | 30 |
| 140 | 52 | 59 | 20 | 2.41 | 64.5 | 3.0 | 45.0 | 41.8 | 2 000 | 3 000 | 4 000 | RS5010A** | 14.15 | 76 | 38 |
| 158 | 57 | 63 | 25 | 3.14 | 68.5 | 3.0 | 42.0 | 38.8 | 2 000 | 3 000 | 4 000 | RS5016A** | 13.48 | 114 | 57 |

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

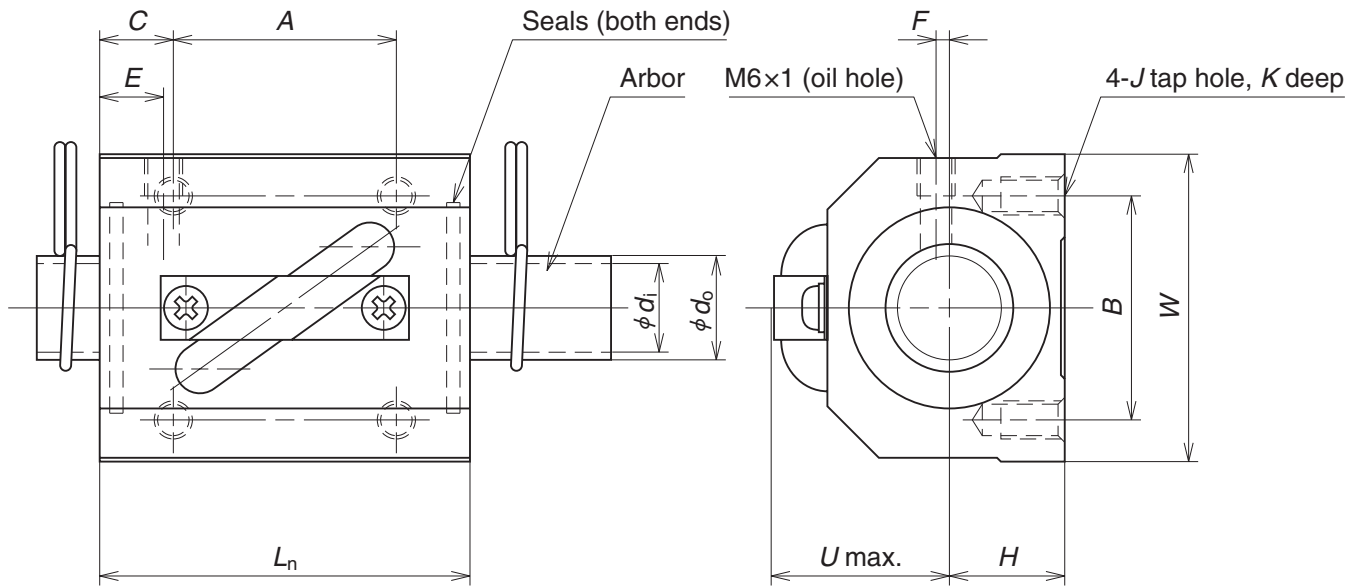
Note 5: Value obtained by dividing standard screw length by 100 mm will be entered at end of the part number where marked with **.

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.

Ball Screws R Series: Rolled Ball Screws

Nut Model: RNSTL

Return tube type, square nut

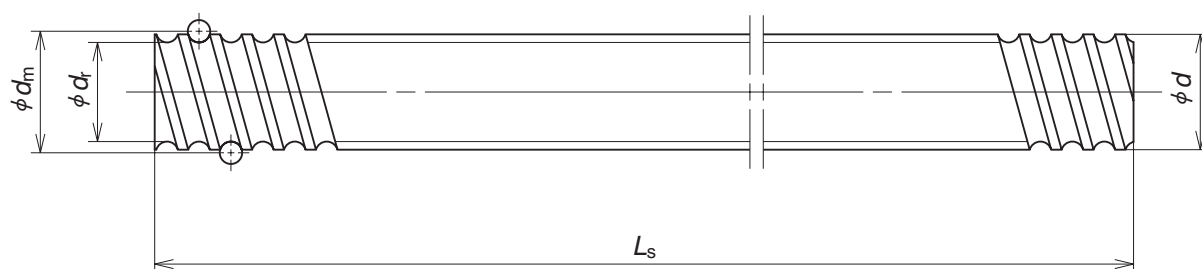


| Part number | Shaft dia. d | Lead l | Ball dia. D_w | Ball circle dia. d_m | Root dia. d_r | Effective turns of balls Turns × Circuits | Basic load rating (N) | | Axial play max. | Ball nut dimensions | | |
|------------------------|-------------------|-------------|--------------------|---------------------------|--------------------|--|-----------------------|--------------------|-----------------|---------------------|--------------|----------------------|
| | | | | | | | Dynamic C_a | Static C_{0a} | | Length L_n | Width W | Center height H |
| | | | | | | | | | | | | |
| RNSTL 1404A3.5S | 14 | 4 | 2.778 | 14.5 | 11.5 | 3.5×1 | 5 370 | 10 800 | 0.10 | 38 | 34 | 13 |
| RNSTL 1405A2.5S | 14 | 5 | 3.175 | 14.5 | 11.0 | 2.5×1 | 5 260 | 9 720 | 0.10 | 38 | 34 | 13 |
| RNSTL 1808A3.5S | 18 | 8 | 4.762 | 18.5 | 13.6 | 3.5×1 | 13 200 | 25 800 | 0.15 | 56 | 48 | 17 |
| RNSTL 2005A2.5S | 20 | 5 | 3.175 | 20.5 | 17.0 | 2.5×1 | 6 360 | 14 200 | 0.10 | 38 | 48 | 17 |
| RNSTL 2010A2.5S | 20 | 10 | 4.762 | 21.25 | 16.2 | 2.5×1 | 10 900 | 21 800 | 0.15 | 58 | 48 | 18 |
| RNSTL 2505A2.5S | 25 | 5 | 3.175 | 25.5 | 22.0 | 2.5×1 | 7 070 | 18 200 | 0.10 | 35 | 60 | 20 |
| RNSTL 2510A5S | 25 | 10 | 6.35 | 26 | 19.0 | 2.5×2 | 31 800 | 70 300 | 0.20 | 94 | 60 | 23 |
| RNSTL 2806A2.5S | 28 | 6 | 3.175 | 28.5 | 25.0 | 2.5×1 | 7 430 | 20 300 | 0.10 | 42 | 60 | 22 |
| RNSTL 2806A5S | | | | | | 2.5×2 | 13 500 | 40 600 | | 67 | 60 | 22 |
| RNSTL 3210A2.5S | 32 | 10 | 6.35 | 33.75 | 27.0 | 2.5×1 | 19 700 | 46 100 | 0.20 | 64 | 70 | 26 |
| RNSTL 3210A5S | | | | | | 2.5×2 | 35 700 | 92 200 | | 94 | 70 | 26 |
| RNSTL 3610A2.5S | 36 | 10 | 6.35 | 37 | 30.0 | 2.5×1 | 21 000 | 51 000 | 0.20 | 64 | 86 | 29 |
| RNSTL 3610A5S | | | | | | 2.5×2 | 38 100 | 102 000 | | 96 | 86 | 29 |
| RNSTL 4512A5S | 45 | 12 | 7.144 | 46.5 | 39.0 | 2.5×2 | 49 600 | 147 000 | 0.23 | 115 | 100 | 36 |

Note 1: Actual screw shaft length may be slightly longer than nominal length L_n 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 **.



Unit: mm

| Ball nut dimensions | | | | | | | | Nut mass (kg) | Arbor | | Screw shaft | | | Shaft mass/m (kg) | Internal spatial volume of nut (cm ³) | Standard volume of grease replenishing (cm ³) | |
|---------------------|----|------|-----|----------|----|---|----|---------------|--------------|-------|-----------------|-------|--------------------|-------------------|---|---|-----|
| Bolt hole | | | | Oil hole | | | | | Outside dia. | Bore | Standard length | | Screw shaft number | | | | |
| A | B | C | J | K | E | F | U | d_0 | d_i | L_s | | | | | | | |
| 22 | 26 | 8 | M4 | 7 | 7 | 3 | 20 | 0.20 | 11.5 | 9.5 | 500 | 1 000 | RS1404A** | 1.02 | 1.6 | 0.8 | |
| 22 | 26 | 8 | M4 | 7 | 7 | 3 | 21 | 0.20 | 11.0 | 9.0 | 500 | 1 000 | RS1405A** | 1.00 | 1.8 | 0.9 | |
| 35 | 35 | 10.5 | M6 | 10 | 8 | 3 | 26 | 0.31 | 13.6 | 11.6 | 500 | 1 000 | 1 500 | RS1808A** | 1.60 | 3.4 | 1.7 |
| 22 | 35 | 8 | M6 | 9 | 6 | 2 | 27 | 0.24 | 17.0 | 14.6 | 500 | 1 000 | 2 000 | RS2005A** | 2.17 | 2.5 | 1.3 |
| 35 | 35 | 11.5 | M6 | 10 | 10 | 2 | 28 | 0.35 | 16.2 | 13.8 | 500 | 1 000 | 2 000 | RS2010A** | 2.18 | 6.3 | 3.2 |
| 22 | 40 | 6.5 | M8 | 10 | 6 | 0 | 27 | 0.31 | 22.0 | 19.6 | 1 000 | 2 000 | 2 500 | RS2505A** | 3.47 | 2.6 | 1.3 |
| 60 | 40 | 17 | M8 | 12 | 10 | 0 | 32 | 1.32 | 19.0 | 16.6 | 1 000 | 2 000 | 2 500 | RS2510A** | 3.13 | 18 | 9.0 |
| 18 | 40 | 12 | M8 | 12 | 8 | 0 | 32 | 0.65 | 25.0 | 22.6 | 1 000 | 2 000 | 2 500 | RS2806A** | 4.47 | 3.5 | 1.8 |
| 40 | 40 | 13.5 | | | | | | 1.04 | | | | | | | | 7.0 | 3.5 |
| 45 | 50 | 9.5 | M8 | 12 | 10 | 0 | 38 | 1.12 | 27.0 | 24.6 | 1 000 | 2 000 | 3 000 | RS3210A** | 5.53 | 18 | 9.0 |
| 60 | 50 | 17 | | | | | | 1.75 | | | | | | | | 27 | 14 |
| 45 | 60 | 9.5 | M10 | 16 | 11 | 0 | 41 | 1.76 | 30.0 | 27.6 | 1 000 | 2 000 | 3 000 | RS3610A** | 6.91 | 18 | 9.0 |
| 60 | 60 | 18 | | | | | | 2.64 | | | | | | | | 27 | 14 |
| 75 | 75 | 20 | M12 | 20 | 13 | 0 | 46 | 1.22 | 39.0 | 35.8 | 2 000 | 3 000 | 4 000 | RS4512A** | 11.16 | 47 | 24 |

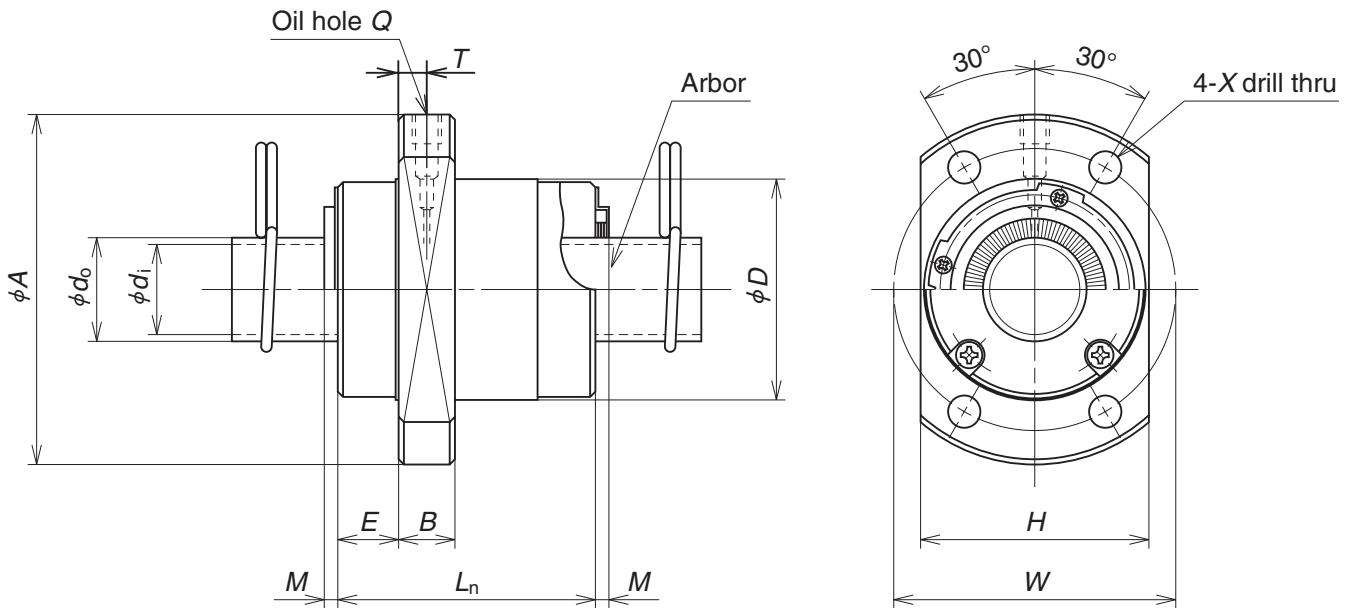
Note 4: Seal for those with shaft diameter of 14 mm or less is made of synthetic resin. Seal for those of 18 mm or more is a brush-seal.

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

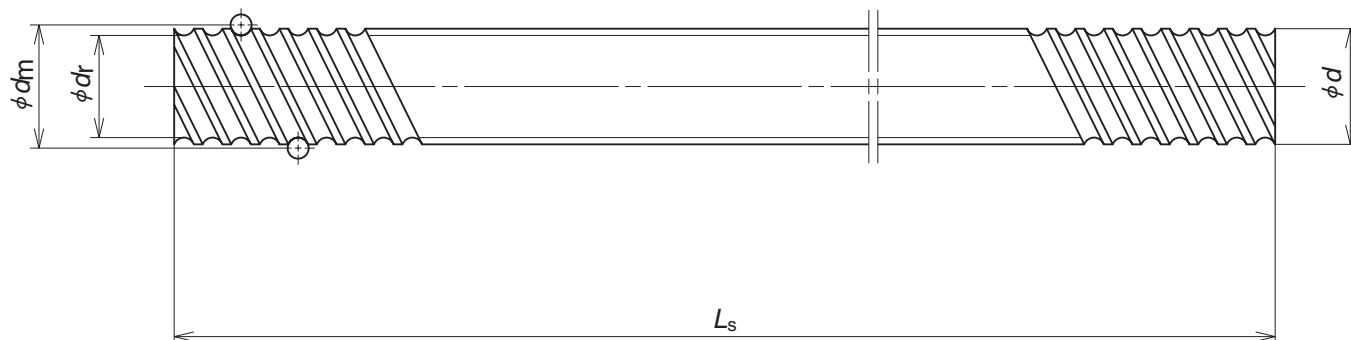


| Part number | Shaft dia. <i>d</i> | Lead <i>l</i> | Ball dia. <i>D_w</i> | Ball circle dia. <i>d_m</i> | Root dia. <i>d_r</i> | Effective turns of balls | | Basic load rating (N) | | Axial play max. | Ball nut dimensions | | | |
|----------------------|------------------------|------------------|-----------------------------------|--|-----------------------------------|--------------------------|------------------------------|------------------------------|--------------|-----------------|---------------------|----------|----------|--|
| | | | | | | Turns × Circuits | Dynamic <i>C_a</i> | Static <i>C_{0a}</i> | Outside dia. | | Flange | | | |
| | | | | | | | | | <i>D</i> | | <i>A</i> | <i>H</i> | <i>B</i> | |
| RNFCL 1212A3 | 12 | 12 | 2.381 | 12.65 | 10.1 | 1.7×2 | 3 740 | 6 640 | 0.10 | 26 | 44 | 28 | 6 | |
| RNFCL 1212A6 | | | | | | 1.7×4 | 6 780 | 13 300 | | | | | | |
| RNFCL 1520A3 | 15 | 20 | 3.175 | 15.5 | 12.2 | 1.7×2 | 6 730 | 12 300 | 0.10 | 33 | 51 | 35 | 10 | |
| RNFCL 1520A3S | | | | | | 1.7×4 | 9 860 | 20 800 | | | | | | |
| RNFCL 1616A3 | 16 | 16 | 2.778 | 16.65 | 13.5 | 1.7×2 | 5 430 | 10 400 | 0.10 | 32 | 53 | 34 | 10 | |
| RNFCL 1616A3S | | | | | | 1.7×4 | 9 860 | 20 800 | | | | | | |
| RNFCL 1616A6 | | | | | | 1.7×2 | 7 810 | 16 500 | | | | | | |
| RNFCL 1616A6S | | | | | | 1.7×4 | 14 200 | 33 000 | | | | | | |
| RNFCL 2020A3 | 20 | 20 | 3.175 | 20.75 | 17.3 | 1.7×2 | 7 810 | 16 500 | 0.10 | 39 | 62 | 41 | 10 | |
| RNFCL 2020A3S | | | | | | 1.7×4 | 14 200 | 33 000 | | | | | | |
| RNFCL 2020A6 | | | | | | 1.7×2 | 11 700 | 25 800 | | | | | | |
| RNFCL 2020A6S | | | | | | 1.7×4 | 21 200 | 51 500 | | | | | | |
| RNFCL 2525A3 | 25 | 25 | 3.969 | 26 | 22.0 | 1.7×2 | 11 700 | 25 800 | 0.12 | 47 | 74 | 49 | 12 | |
| RNFCL 2525A3S | | | | | | 1.7×4 | 21 200 | 51 500 | | | | | | |
| RNFCL 2525A6 | | | | | | 1.7×2 | 17 100 | 40 500 | | | | | | |
| RNFCL 2525A6S | | | | | | 1.7×4 | 31 000 | 81 000 | | | | | | |
| RNFCL 3232A3 | 32 | 32 | 4.762 | 33.25 | 28.0 | 1.7×2 | 17 100 | 40 500 | 0.15 | 58 | 92 | 60 | 12 | |
| RNFCL 3232A3S | | | | | | 1.7×4 | 31 000 | 81 000 | | | | | | |
| RNFCL 3232A6 | | | | | | 1.7×2 | 27 200 | 67 900 | | | | | | |
| RNFCL 3232A6S | | | | | | 1.7×4 | 49 300 | 136 000 | | | | | | |
| RNFCL 4040A3 | 40 | 40 | 6.35 | 41.75 | 35.0 | 1.7×2 | 27 200 | 67 900 | 0.20 | 73 | 114 | 75 | 15 | |
| RNFCL 4040A3S | | | | | | 1.7×4 | 49 300 | 136 000 | | | | | | |
| RNFCL 4040A6 | | | | | | 1.7×2 | 40 600 | 106 000 | | | | | | |
| RNFCL 4040A6S | | | | | | 1.7×4 | 73 700 | 212 000 | | | | | | |
| RNFCL 5050A3 | 50 | 50 | 7.938 | 52.25 | 44.0 | 1.7×2 | 40 600 | 106 000 | 0.25 | 90 | 135 | 92 | 20 | |
| RNFCL 5050A3S | | | | | | 1.7×4 | 73 700 | 212 000 | | | | | | |
| RNFCL 5050A6 | | | | | | 1.7×2 | 40 600 | 106 000 | | | | | | |
| RNFCL 5050A6S | | | | | | 1.7×4 | 73 700 | 212 000 | | | | | | |

Note 1: Actual screw shaft length may be slightly longer than nominal length *L_s* 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 **.



Unit: mm

| Ball nut dimensions | | | | | | | Nut mass (kg) | Arbor | | Screw shaft | | | Screw shaft number | Shaft mass/m (kg) | Internal spatial volume of nut (cm ³) | Standard volume of grease replenishing (cm ³) |
|---------------------|----------------------|----------|-----------|----------|----------|----------|---------------|----------------------|----------------------|----------------------|-------|-------|--------------------|-------------------|---|---|
| Length | | | Bolt hole | | Oil hole | | | Outside dia. | Bore | Standard length | | | | | | |
| <i>E</i> | <i>L_n</i> | <i>M</i> | <i>W</i> | <i>X</i> | <i>Q</i> | <i>T</i> | | <i>d₀</i> | <i>d_i</i> | <i>L_s</i> | | | | | | |
| 9 | 30 | — | 35 | 4.5 | M3×0.5 | 3.0 | 0.12 | 10.1 | 8.1 | 400 | 800 | | RS1212A** | 0.74 | | |
| 11 | 45 | — | 42 | 4.5 | M6×1 | 5.0 | 0.28 | 12.2 | 10.2 | 500 | 1 000 | 1 500 | RS1520A** | 1.15 | 3.3 | 1.7 |
| | | 3 | | | | | | | | | | | | | | |
| 10 | 38 | — | 42 | 4.5 | M6×1 | 5.0 | 0.23 | 13.5 | 11.5 | 500 | 1 000 | 1 500 | RS1616A** | 1.37 | 2.6 | 1.3 |
| | | 3 | | | | | | | | | | | | | 2.6 | 1.3 |
| | | — | | | | | | | | | | | | | | |
| | | 3 | | | | | | | | | | | | | | |
| 11.5 | 46 | — | 50 | 5.5 | M6×1 | 5.0 | 0.37 | 17.3 | 14.9 | 500 | 1 000 | 2 000 | RS2020A** | 2.19 | 4.4 | 2.2 |
| | | 3 | | | | | | | | | | | | | 4.9 | 2.5 |
| | | — | | | | | | | | | | | | | | |
| 13 | 55 | 3 | 60 | 6.6 | M6×1 | 6.0 | 0.62 | 22.0 | 19.6 | 1 000 | 2 000 | 2 500 | RS2525A** | 3.43 | 8.2 | 4.1 |
| | | — | | | | | | | | | | | | | 8.9 | 4.5 |
| | | 3 | | | | | | | | | | | | | | |
| | | 3 | | | | | | | | | | | | | | |
| 16 | 70 | — | 74 | 9 | M6×1 | 5.5 | 1.10 | 28.0 | 25.6 | 1 000 | 2 000 | 3 000 | RS3232A** | 5.71 | 16 | 8.0 |
| | | 3 | | | | | | | | | | | | | 17 | 8.5 |
| | | — | | | | | | | | | | | | | | |
| | | 3 | | | | | | | | | | | | | | |
| 19.5 | 85 | — | 93 | 11 | M6×1 | 6.5 | 2.09 | 35.0 | 31.8 | 2 000 | 3 000 | 4 000 | RS4040A** | 8.82 | 32 | 16 |
| | | 3.5 | | | | | | | | | | | | | 33 | 17 |
| | | — | | | | | | | | | | | | | | |
| 21.5 | 107 | 3.5 | 112 | 14 | M6×1 | 7.0 | 3.90 | 44.0 | 40.8 | 2 000 | 3 000 | 4 000 | RS5050A** | 13.81 | 64 | 32 |
| | | — | | | | | | | | | | | | | 68 | 34 |
| | | 3.5 | | | | | | | | | | | | | | |
| | | 3.5 | | | | | | | | | | | | | | |

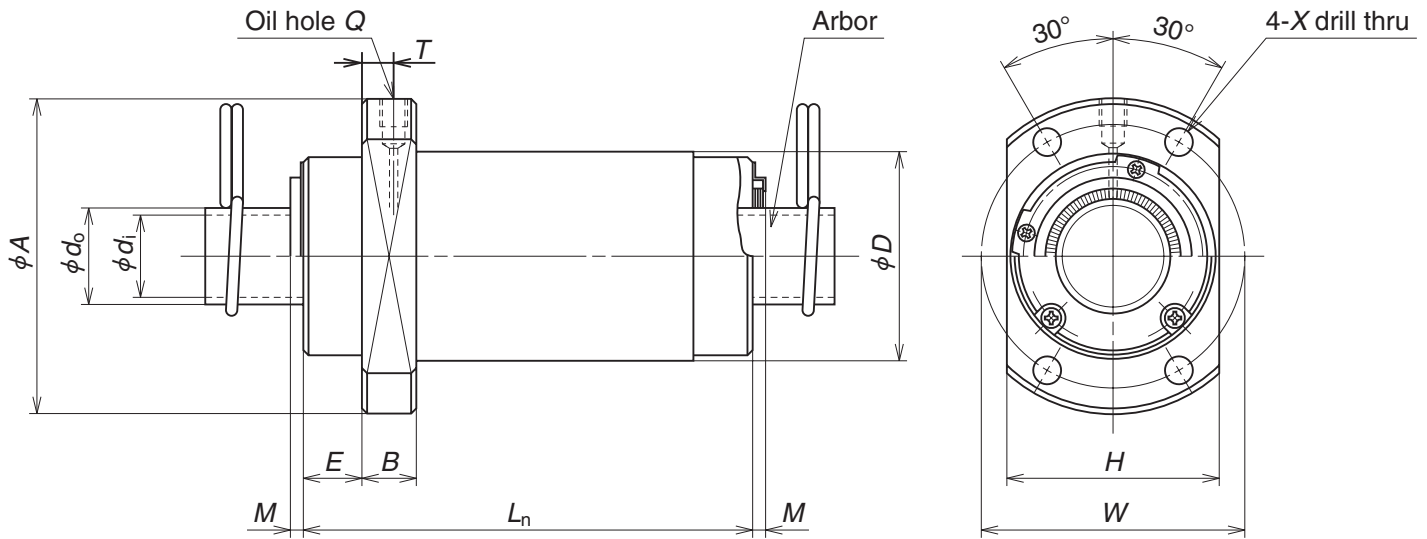
Note 4: Length of nut becomes longer (2 x M) for those with seal; seal is a brush-seal.

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

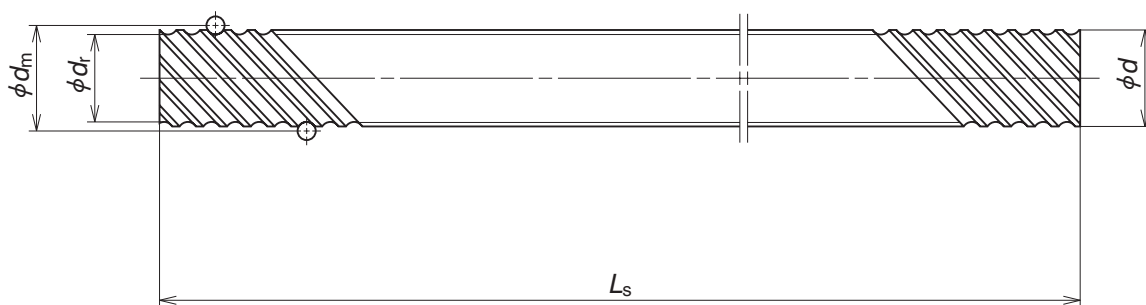


| Part number | Shaft dia. <i>d</i> | Lead <i>l</i> | Ball dia. <i>D_w</i> | Ball circle dia. <i>d_m</i> | Root dia. <i>d_r</i> | Effective turns of balls Turns × Circuits | Basic load rating (N) | | Axial play max. | Ball nut dimensions | | | |
|----------------------|------------------------|------------------|-----------------------------------|--|-----------------------------------|--|---------------------------------|---------------------------------|-----------------|---------------------|----------|----------|----------|
| | | | | | | | Dynamic <i>C_a</i> | Static <i>C_{oa}</i> | | Outside dia. | | Flange | |
| | | | | | | | | | | <i>D</i> | <i>A</i> | <i>H</i> | <i>B</i> |
| RNFCL 1632A2 | 16 | 32 | 2.778 | 16.65 | 13.5 | 0.7×4 | 4 600 | 8 460 | 0.10 | 32 | 50 | 34 | 10 |
| RNFCL 1632A2S | | | | | | | | | | | | | |
| RNFCL 1632A3 | | | | | | | | | | | | | |
| RNFCL 1632A3S | | | | | | | | | | | | | |
| RNFCL 1632A6 | | | | | | | | | | | | | |
| RNFCL 1632A6S | | | | | | | | | | | | | |
| RNFCL 2040A2 | 20 | 40 | 3.175 | 20.75 | 17.3 | 0.7×4 | 6 610 | 13 600 | 0.10 | 38 | 58 | 40 | 10 |
| RNFCL 2040A2S | | | | | | | | | | | | | |
| RNFCL 2040A3 | | | | | | | | | | | | | |
| RNFCL 2040A3S | | | | | | | | | | | | | |
| RNFCL 2040A6 | | | | | | | | | | | | | |
| RNFCL 2040A6S | | | | | | | | | | | | | |
| RNFCL 2550A2 | 25 | 50 | 3.969 | 26 | 22.0 | 0.7×4 | 9 870 | 21 200 | 0.12 | 46 | 70 | 48 | 12 |
| RNFCL 2550A2S | | | | | | | | | | | | | |
| RNFCL 2550A3 | | | | | | | | | | | | | |
| RNFCL 2550A3S | | | | | | | | | | | | | |
| RNFCL 2550A6 | | | | | | | | | | | | | |
| RNFCL 2550A6S | | | | | | | | | | | | | |
| RNFCL 3264A3 | 32 | 64 | 4.762 | 33.25 | 28.0 | 1.7×2 | 17 100 | 40 500 | 0.15 | 58 | 92 | 60 | 12 |
| RNFCL 3264A3S | | | | | | | | | | | | | |
| RNFCL 3264A6 | | | | | | | | | | | | | |
| RNFCL 3264A6S | | | | | | | | | | | | | |
| RNFCL 4080A3 | 40 | 80 | 6.35 | 41.75 | 35.0 | 1.7×2 | 27 200 | 67 900 | 0.20 | 73 | 114 | 75 | 15 |
| RNFCL 4080A3S | | | | | | | | | | | | | |
| RNFCL 4080A6 | | | | | | | | | | | | | |
| RNFCL 4080A6S | | | | | | | | | | | | | |

Note 1: Actual screw shaft length may be slightly longer than nominal length L_n 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 **.



Unit: mm

| Ball nut dimensions | | | | | | | Nut mass (kg) | Arbor | | Screw shaft | | | | Shaft mass/m (kg) | Internal spatial volume of nut (cm ³) | Standard volume of grease replenishing (cm ³) | |
|---------------------|----------------------|----------|-----------|----------|----------|----------|---------------|----------------------|----------------------|----------------------|-------|-------|--------------------|-------------------|---|---|-----|
| Length | | | Bolt hole | | Oil hole | | | Outside dia. | Bore | Standard length | | | Screw shaft number | | | | |
| <i>E</i> | <i>L_n</i> | <i>M</i> | <i>W</i> | <i>X</i> | <i>Q</i> | <i>T</i> | | <i>d_o</i> | <i>d_i</i> | <i>L_s</i> | | | | | | | |
| 10 | 34 | — | 41 | 4.5 | M6×1 | 5.5 | 0.21 | 13.5 | 11.5 | 500 | 1 000 | 1 500 | RS1632A** | 1.34 | 2.4 | 1.2 | |
| | 66 | — | | | | | 0.33 | | | | | | | | 3.9 | 2.0 | |
| | 66 | — | | | | | 0.33 | | | | | | | | 4.1 | 2.1 | |
| 11 | 41 | — | 48 | 5.5 | M6×1 | 5.5 | 0.31 | 17.3 | 14.9 | 500 | 1 000 | 1 500 | 2 000 | RS2040A** | 2.15 | 4.1 | 2.1 |
| | 81 | — | | | | | 0.53 | | | | | | | | | 6.3 | 3.2 |
| | 81 | — | | | | | 0.53 | | | | | | | | | 7.0 | 3.5 |
| 13 | 50 | — | 58 | 6.6 | M6×1 | 7.0 | 0.53 | 22.0 | 19.6 | 1 000 | 2 000 | 2 500 | RS2550A** | 3.37 | 8.4 | 4.2 | |
| | 100 | — | | | | | 0.91 | | | | | | | | 14 | 7.0 | |
| | 100 | — | | | | | 0.91 | | | | | | | | 15 | 7.5 | |
| 15.5 | 126 | — | 74 | 9 | M6×1 | 7.5 | 1.76 | 28.0 | 25.6 | 1 000 | 2 000 | 3 000 | 4 000 | RS3264A** | 5.63 | 24 | 12 |
| | — | 3 | | | | | | | | | | | | | | 26 | 13 |
| | — | 3 | | | | | | | | | | | | | | | |
| 19 | 158 | — | 93 | 11 | M6×1 | 10 | 3.44 | 35.0 | 31.8 | 2 000 | 3 000 | 4 000 | 5 000 | RS4080A** | 8.69 | 52 | 26 |
| | — | 3.5 | | | | | | | | | | | | | | 55 | 28 |
| | — | 3.5 | | | | | | | | | | | | | | | |

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

$$L = 10^6 \times \left(\frac{C_a}{f_w \cdot F_m} \right)^3 \text{ (rev)}$$

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 (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

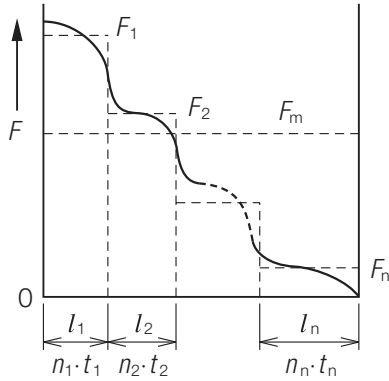


Fig. 1 Stepwise load change

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

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

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

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

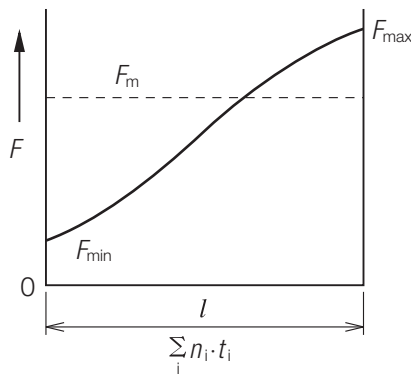


Fig. 2 Linear load change

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

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

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

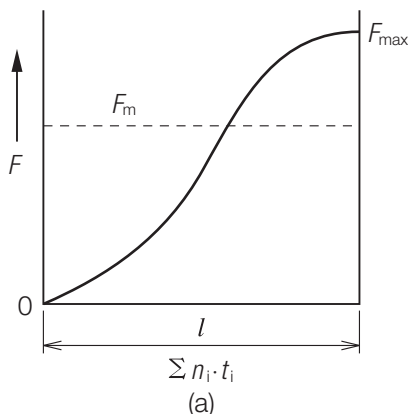


Fig. 3 Load that changes in sinusoidal pattern

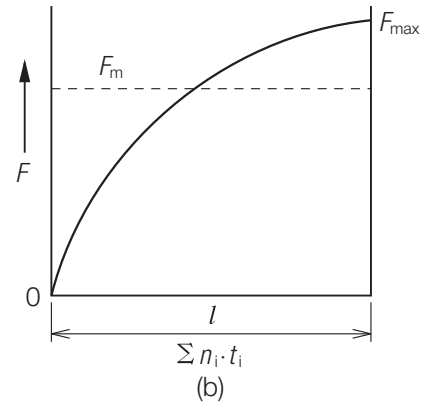


Fig. 4 Load that changes in sinusoidal pattern

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.

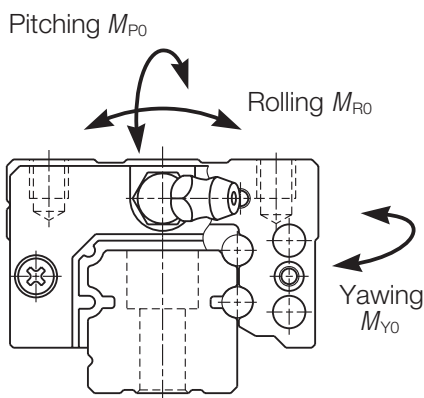
“ M_0 ,” which is the limit of static moment load in such use, is shown in the “Dimension Table for Linear Guide” as well as the same definition of basic static load rating. There are three M_0 defined by three different moment directions. M_{R0} is the limit of static moment load of rolling direction, 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 |
| LH, LS, SH, SS, LW | | C | C | $0.84C$ | C_0 | $0.78C_0$ | $0.65C_0$ |
| RA, TS, PU, PE | | C | C | C | C_0 | C_0 | C_0 |



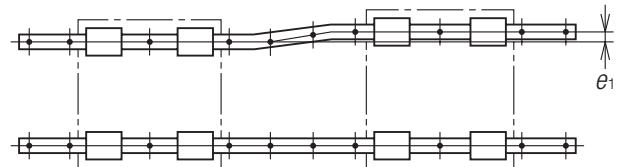
Moment load directions

8. Effect of mounting error

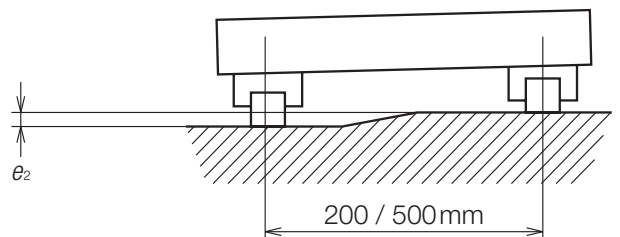
- Excessive mounting error significantly reduces the life of the Linear Guide and Ball Screw. Therefore, NSK recommends the following permissible values of mounting error.

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: μm

| 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 μm / 500mm | | | | | | | | |

Permissible values of parallelism for LS and SS Series

Unit: μm

| 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 μm / 500 mm | | | | |

Permissible values of parallelism for RA Series

Unit: μm

| Value | Model number | | | | | | | |
|---|----------------------------|------|------|------|------|------|------|------|
| | RA15 | RA20 | RA25 | RA30 | RA35 | RA45 | RA55 | RA65 |
| Permissible values of parallelism in two rails e_1 | 5 | 7 | 9 | 11 | 13 | 17 | 19 | 30 |
| Permissible values of parallelism (height) in two rails e_2 | 150 μm / 500 mm | | | | | | | |

Permissible values of parallelism for PU and PE Series

Unit: μm

| 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 μm / 200 mm | | | | | 50 μm / 200 mm | | | | |

Permissible values of parallelism for LW Series

Unit: μm

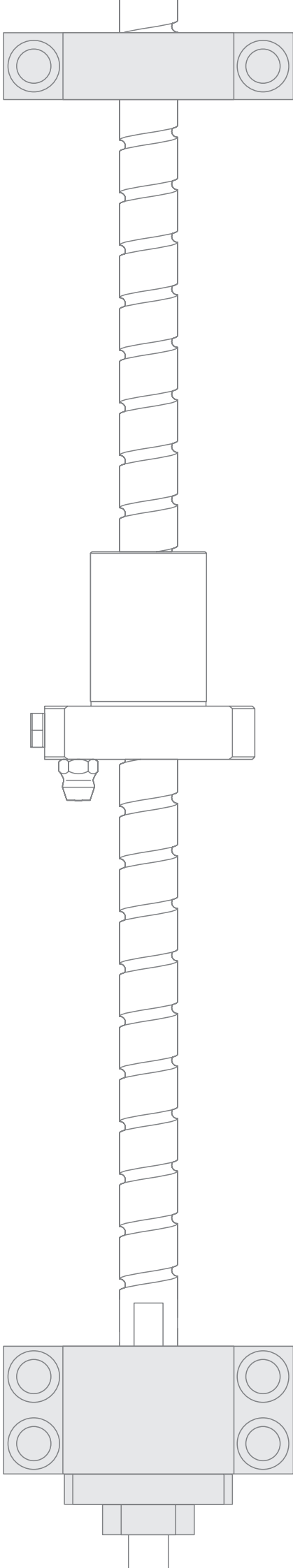
| Value | Preload | Model number | | | | |
|---|---------|---------------------------|------|------|------|------|
| | | LW17 | LW21 | LW27 | LW35 | LW50 |
| Permissible values of parallelism in two rails e_1 | ZZ | 9 | 9 | 13 | 23 | 34 |
| Permissible values of parallelism (height) in two rails e_2 | ZZ | 45 μm / 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.

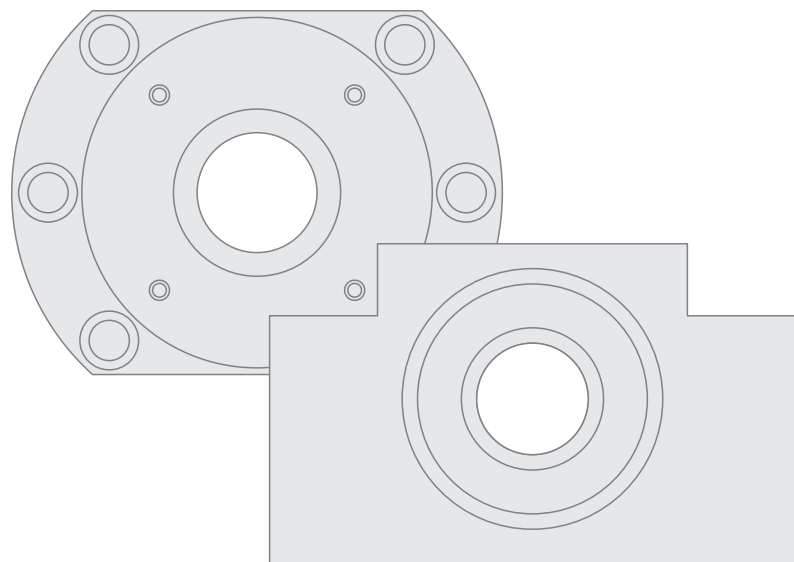
In general, the following values are recommended as control values of permissible mounting error.

| | |
|-----------------------------------|---------------------------|
| Misalignment in inclination | 1 / 2 000 or under |
| Eccentricity | 20 μm or under |



Support Units




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



Support Units

Types of Support Units

Support unit categories

| Application | Shape | Support side | Bearing in use | Bearing bore Bearing seat diameter | Page |
|-----------------------------|--|---------------------|------------------------------|--|-------|
| Small equipment, light load | 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*  | | Deep groove ball bearing | $\phi 12, \phi 15$ (exclusive for VFA type) | 237 - |

Part number for Support Unit

For light load

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

| | |
|---|--|
| Support Unit: WBK | No code or A: For general use B: For compact FA C: For clean environment use |
| 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) | 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 | Bearing combination DF: Face to face duplex combination DFD: Face to face triplex combination DFF: Face to face quadruplex combination |
| Size (internal bore of bearing) | |

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

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.

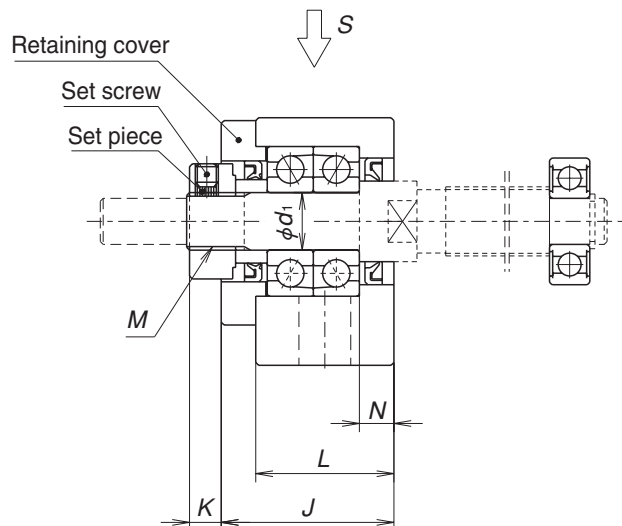
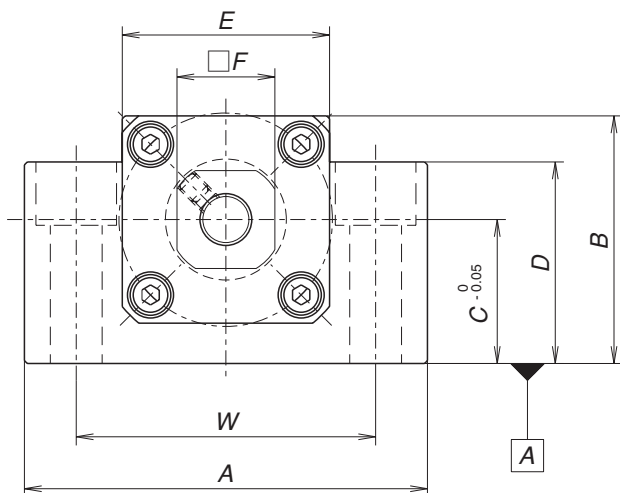
A deep-groove ball bearing with a shield on both sides is used on the simple support side.

2) Locknut is provided

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

Support Units

Support Units for Light Load and Small Equipment



Fixed support side support unit (square type)

| Part number | Use | d_1 | A | B | C | D | E | F | L | J | K |
|-------------------|-------------------|-------|-----|----|------|----|----|----|------|------|-----|
| WBK06-01A* | General | 6 | 42 | 25 | 13 | 20 | 18 | 12 | 20 | 20 | 5.5 |
| WBK08-01A* | General | 8 | 52 | 32 | 17 | 26 | 25 | 14 | 23 | 23 | 7 |
| WBK08-01B | Low-profile type | | 62 | 31 | 15.5 | 31 | — | | 21.5 | 25.5 | 4.5 |
| WBK08-01C* | Clean environment | | 52 | 32 | 17 | 26 | 25 | | 23 | 23 | 7 |
| WBK10-01A | General | 10 | 70 | 43 | 25 | 35 | 36 | 17 | 24 | 30 | 5.5 |
| WBK10-01B | Low-profile type | | | 38 | 20 | 38 | — | | | | |
| WBK10-01C | Clean environment | | | 43 | 25 | 35 | 36 | | | | |
| WBK12-01A | General | 12 | 70 | 43 | 25 | 35 | 36 | 19 | 24 | 30 | 5.5 |
| WBK12-01B | Low-profile type | | | 38 | 20 | 38 | — | | | | |
| WBK12-01C | Clean environment | | | 43 | 25 | 35 | 36 | | | | |
| WBK15-01A | General | 15 | 80 | 50 | 30 | 40 | 41 | 22 | 25 | 31 | 12 |
| WBK15-01B | Low-profile type | | | 42 | 22 | 42 | — | | | | |
| WBK15-01C | Clean environment | | | 50 | 30 | 40 | 41 | | | | |
| WBK17-01A | General | 17 | 86 | 64 | 39 | 55 | 50 | 24 | 35 | 44 | 7 |
| WBK20-01 | General | 20 | 95 | 58 | 30 | 45 | 56 | 30 | 42 | 52 | 10 |
| WBK25-01W | General | 25 | 105 | 68 | 35 | 25 | 66 | 36 | 48 | 61 | 13 |

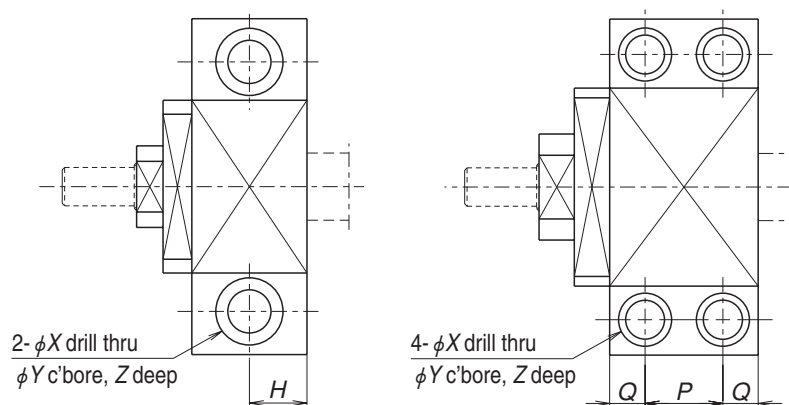
*For retaining cover side of WBK06-01A, WBK08-01A, and WBK08-01C there are no seals.

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 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) |

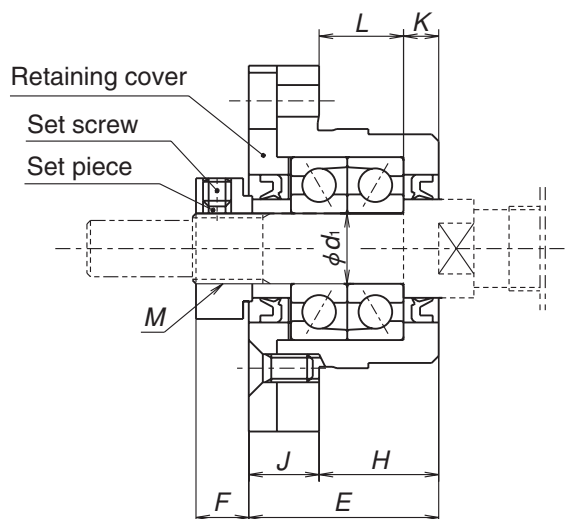
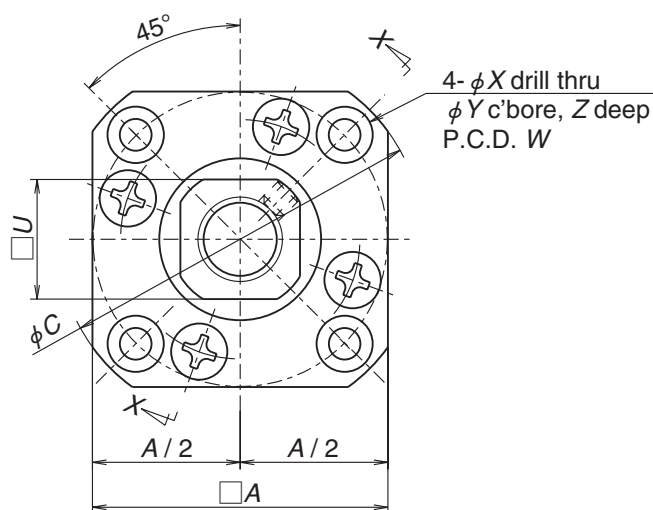
Units: mm

| N | Counterbore dimensions | | | | | | | Mass (kg) | Locknut screw M | Attached bearing for support side |
|-----|------------------------|----|----|----|-----|-----|----|-----------|-----------------|-----------------------------------|
| | H | P | Q | W | X | Y | Z | | | |
| 3.5 | 10 | — | — | 30 | 5.5 | 9.5 | 11 | 0.15 | M6×0.75 | — |
| 4 | 11.5 | — | — | 38 | 6.6 | 11 | 12 | 0.25 | M8×1 | 606ZZ |
| 3.5 | 11 | | | 46 | 9 | 14 | 18 | 0.3 | | 606ZZ |
| 4 | 11.5 | | | 38 | 6.6 | 11 | 12 | 0.25 | | 606VV |
| 6 | 12 | — | — | 52 | 9 | 14 | 11 | 0.5 | M10×1 | 608ZZ |
| | | | | | | | 19 | 0.45 | | 608ZZ |
| | | | | | | | 11 | 0.5 | | 608VV |
| 6 | 12 | — | — | 52 | 9 | 14 | 11 | 0.5 | M12×1 | 6000ZZ |
| | | | | | | | 19 | 0.4 | | 6000ZZ |
| | | | | | | | 11 | 0.5 | | 6000VV |
| 5 | 12.5 | — | — | 60 | 11 | 17 | 15 | 0.7 | M15×1 | 6002ZZ |
| | | | | | | | 23 | 0.6 | | 6002ZZ |
| | | | | | | | 15 | 0.7 | | 6002VV |
| 7 | — | 19 | 8 | 68 | 9 | 14 | 11 | 1.3 | M17×1 | 6203ZZ |
| 10 | — | 22 | 10 | 75 | 11 | 17 | 15 | 1.4 | M20×1 | 6204ZZ |
| 14 | — | 30 | 9 | 85 | 11 | — | — | 1.9 | M25×1.5 | 6205ZZ |

Support Units

Support Units

Support Units for Light Load and Small Equipment



View X-X (example 1)

Fixed support side support unit (round type)

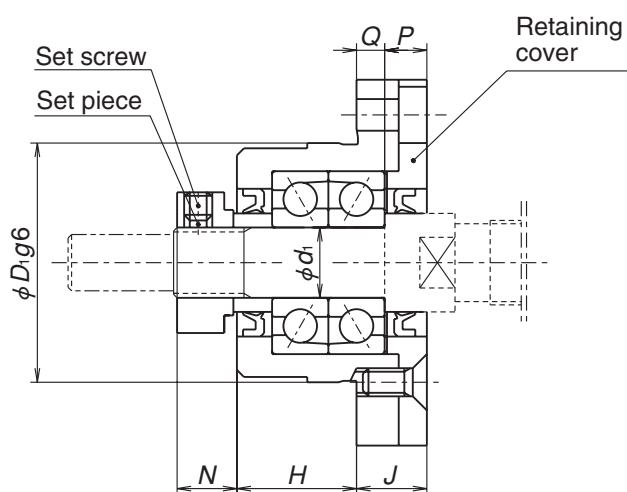
| Part number | Use | d_1 | A | C | D_1 | E | H | L | K | F | N |
|-------------------|-------------------|-------|----|----|-------|------|------|-----|-----|-----|-----|
| WBK06-11* | General | 6 | 28 | 35 | 22 | 20 | 13 | 9.5 | 3.5 | 5.5 | 6.5 |
| WBK08-11* | General | 8 | 35 | 43 | 28 | 23 | 14 | 10 | 4 | 7 | 8 |
| WBK08-11B | Low-profile type | | 42 | 52 | 34 | 25.5 | 15.5 | 12 | 3.5 | 4.5 | 7 |
| WBK08-11C* | Clean environment | | 35 | 43 | 28 | 23 | 14 | 10 | 4 | 7 | 8 |
| WBK10-11 | General | 10 | 42 | 52 | 34 | 27 | 17 | 12 | 5 | 7.5 | 8.5 |
| WBK10-11C | Clean environment | | 42 | 52 | 34 | 27 | 17 | 12 | 5 | 7.5 | 8.5 |
| WBK12-11 | General | 12 | 44 | 54 | 36 | 27 | 17 | 12 | 5 | 7.5 | 8.5 |
| WBK12-11C | Clean environment | | 44 | 54 | 36 | 27 | 17 | 12 | 5 | 7.5 | 8.5 |
| WBK15-11 | General | 15 | 52 | 63 | 40 | 32 | 17 | 11 | 6 | 12 | 14 |
| WBK15-11C | Clean environment | | 52 | 63 | 40 | 32 | 17 | 11 | 6 | 12 | 14 |
| WBK20-11 | General | 20 | 68 | 85 | 57 | 52 | 30 | 20 | 10 | 10 | 14 |
| WBK25-11 | General | 25 | 79 | 98 | 63 | 57 | 30 | 20 | 10 | 13 | 20 |

*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.



| 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) |

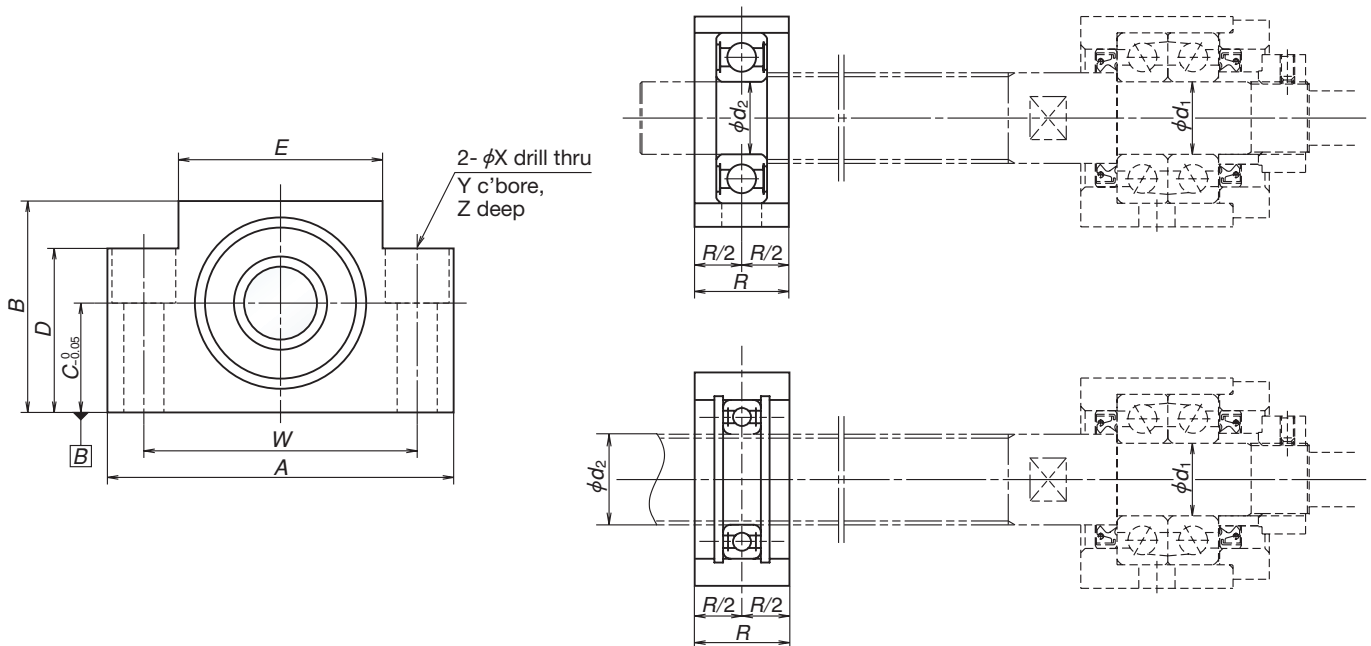
View X-X (example 2)

Units: mm

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

Support Units

Support Units for Light Load and Small Equipment



Simple support side support unit (square type)

Unit: mm

| Part number | Use | d_2 | 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

| Fixed support side support unit | | | | | | Simple support side support unit | | |
|---------------------------------|-------------------|----------------------------------|----------------|------------------|--------------------------------|----------------------------------|------------------|--|
| Part number | Use | Axial direction | | | Maximum starting torque (N·cm) | Part number | Bearing part No. | Radial direction Basic dynamic load rating C (N) |
| | | Basic dynamic load rating Ca (N) | Load limit (N) | Stiffness (N/μm) | | | | |
| 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 |

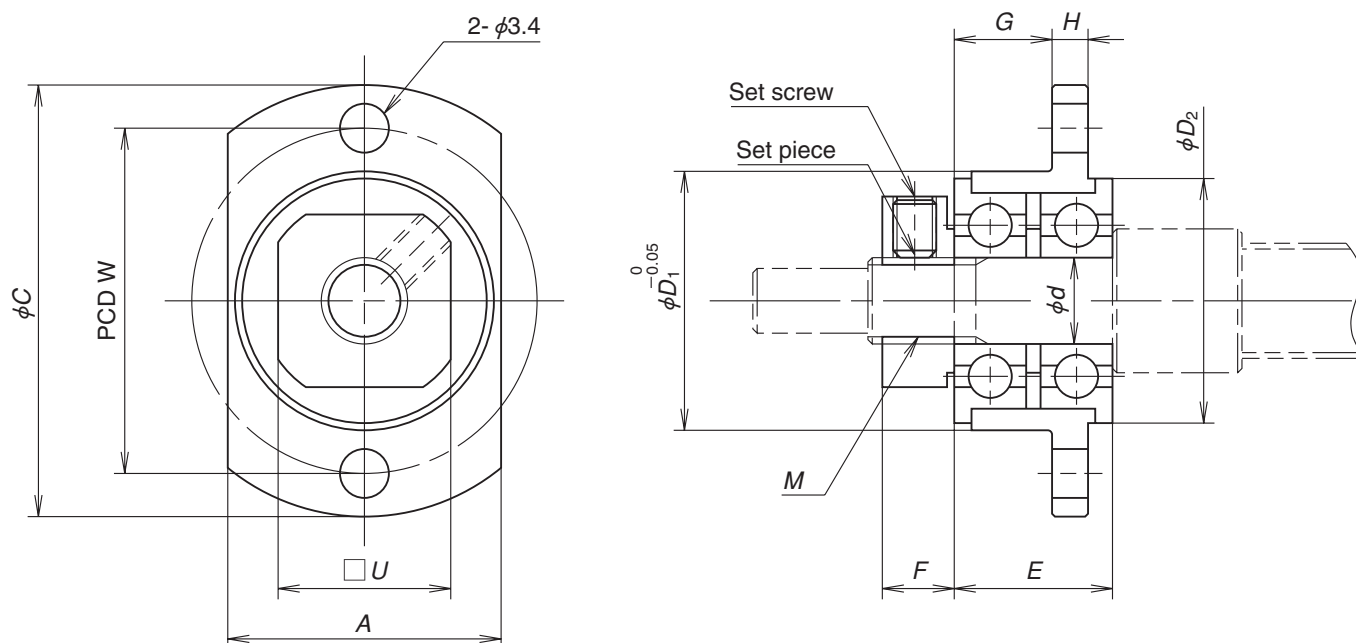
* Simple support side support unit for Compact FA Series for Conveyers (FSS type). Unit supports outer screw shafts.

Support Units

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 ₁ | D ₂ | E | F | G | H | W | U | M |
|------------------|----|----|---|----------------|----------------|----|---|-----|-----|----|----|---------|
| WBK04R-11 | 14 | 25 | 4 | 13 | 12.5 | 9 | 5 | 5 | 2.5 | 19 | 10 | M4×0.5 |
| WBK06R-11 | 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] |
|------------------|-----------------------|--|--|
| WBK04R-11 | RMA0601 | 100 | 38 (M2.5) |
| | RMA0801 | | |
| WBK06R-11 | RMA0801.5 | 190 | 69 (M3) |
| | RMA0802 | | |

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

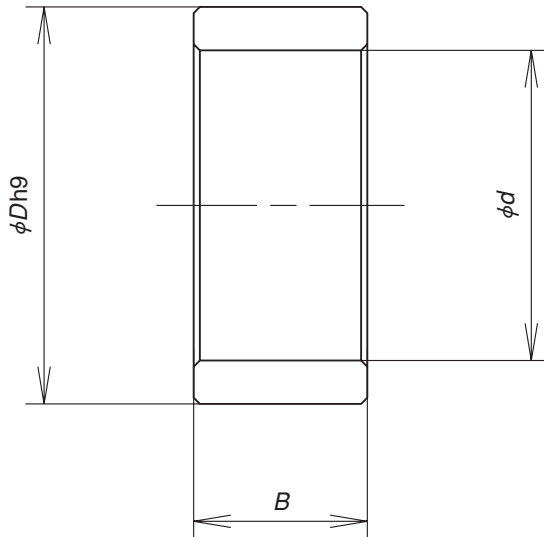
Note 2: Support kit is on provisional shaft (bolt) during shipping.

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

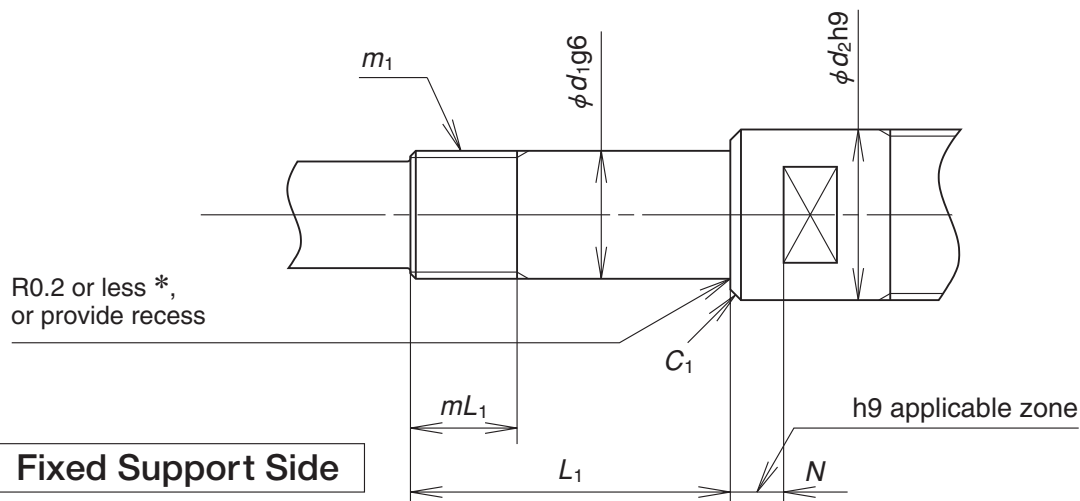
| Part number | Internal diameter d | Outside diameter D | Width B | Applicable support unit |
|---------------|--------------------------|-------------------------|--------------|-------------------------|
| WBK06K | 6 | 9.5 | 5.0 | WBK06-**-** |
| WBK08K | 8 | 11.5 | 5.5 | WBK08-**-** |
| WBK10K |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

Support Units for Light Load and Small Equipment

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

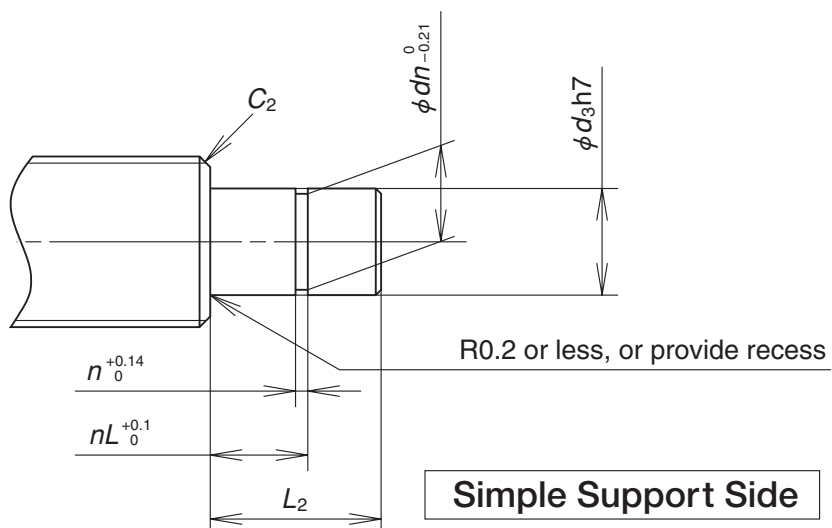
transportation, add the width of the spacer (B from table of spacer dimensions on page 240) to L_1 below.



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 |
| WBK06-*** | 6 | 22.5 | M6×0.75 | 7 | 9.5 | 3.5 | 0.2 |
| WBK08-*** | 8 | 27 | M8×1 | 9 | 11.5 | 4 | 0.2 |
| WBK10-*** | 10 | 30 | M10×1 | 10 | 14 | 6 | 0.2 |
| WBK12-*** | 12 | 30 | M12×1 | 10 | 15 | 6 | 0.2 |
| WBK15-*** | 15 | 40 | M15×1 | 15 | 19.5 | 5 | 0.3 |
| WBK17-*** | 17 | 46 | M17×1 | 17 | 24 | 7 | 0.3 |
| WBK20-*** | 20 | 53 | M20×1 | 16 | 25 | 10 | 0.3 |
| WBK25-*** | 25 | 62 | M25×1.5 | 20 | 32 | 14 | 0.5 |
| WBK04R-11 | 4 | 15 | M4×0.5 | 7.5 | — | — | 0.3 |
| WBK06R-11 | 6 | 17 | M6×0.75 | 7.5 | — | — | 0.3 |

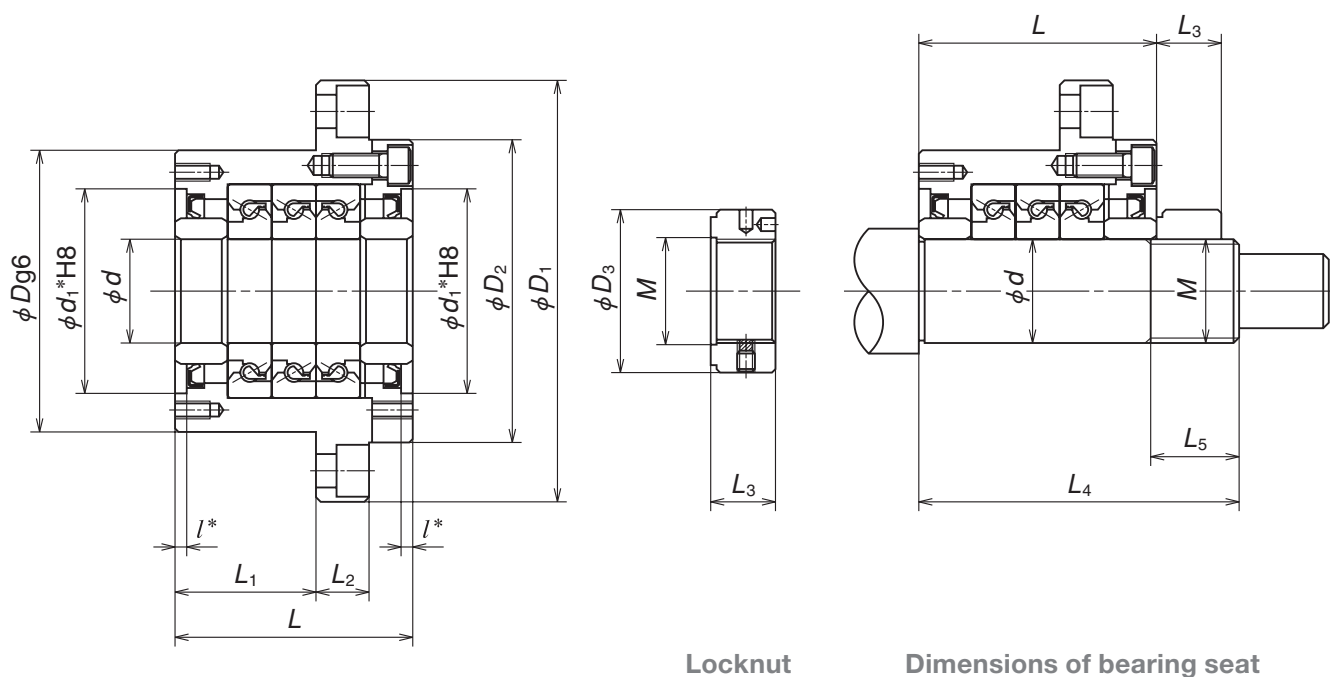


Units: mm

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

Support Units

Support Unit (For Heavy Load / Machine Tools)



Locknut

Dimensions of bearing seat

| Support unit number | Support unit | | | | | | | | | | | | | | | | |
|---------------------|--------------|-----|-------|-------|-----|-------|-------|-----|-----|-----|------|-----|---------|-------|-------|-------|-------|
| | d | D | D_1 | D_2 | L | L_1 | L_2 | A | W | X | Y | Z | d_1^* | l^* | V^* | P^* | Q^* |
| WBK 17DF-31 | 17 | 70 | 106 | 72 | 60 | 32 | 15 | 80 | 88 | 9 | 14 | 8.5 | 45 | 3 | 58 | M5 | 10 |
| WBK 20DF-31 | 20 | 70 | 106 | 72 | 60 | 32 | 15 | 80 | 88 | 9 | 14 | 8.5 | 45 | 3 | 58 | M5 | 10 |
| WBK 25DF-31 | 25 | 85 | 130 | 90 | 66 | 33 | 18 | 100 | 110 | 11 | 17.5 | 11 | 57 | 4 | 70 | M6 | 12 |
| WBK 25DFD-31 | | | | | 81 | 48 | | | | | | | | | | | |
| WBK 30DF-31 | 30 | 85 | 130 | 90 | 66 | 33 | 18 | 100 | 110 | 11 | 17.5 | 11 | 57 | 4 | 70 | M6 | 12 |
| WBK 30DFD-31 | | | | | 81 | 48 | | | | | | | | | | | |
| WBK 35DF-31 | 35 | 95 | 142 | 102 | 66 | 33 | 18 | 106 | 121 | 11 | 17.5 | 11 | 69 | 4 | 80 | M6 | 12 |
| WBK 35DFD-31 | | | | | 81 | 48 | | | | | | | | | | | |
| WBK 35DFF-31 | | | | | 96 | 48 | | | | | | | | | | | |
| WBK 40DF-31 | 40 | 95 | 142 | 102 | 66 | 33 | 18 | 106 | 121 | 11 | 17.5 | 11 | 69 | 4 | 80 | M6 | 12 |
| WBK 40DFD-31 | | | | | 81 | 48 | | | | | | | | | | | |
| WBK 40DFF-31 | | | | | 96 | 48 | | | | | | | | | | | |

Note 1: Rigidity

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

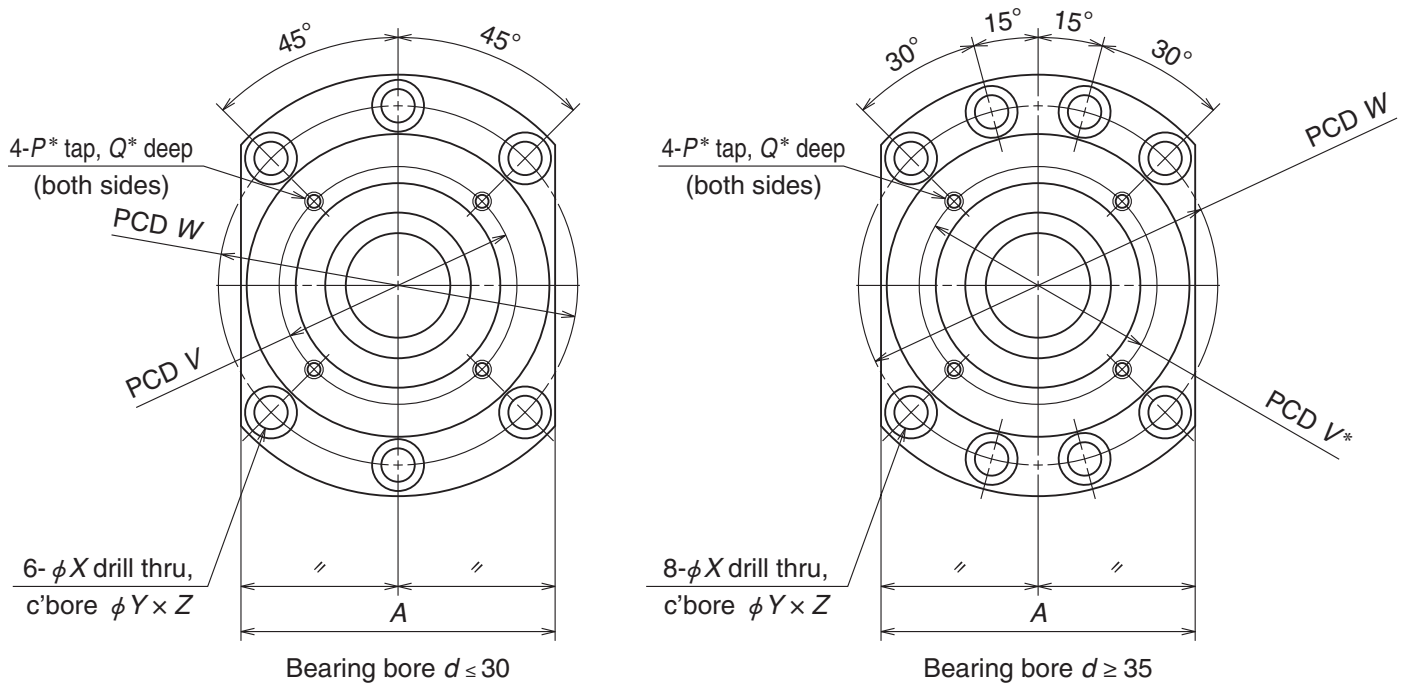
Note 2: Starting torque

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.



Unit: mm

| Basic dynamic load rating C_a (N) | Permissible axial load (N) | Preload (N) | Axial rigidity (N/ μ m) | Maximum starting torque (N·cm) | Locknut | | | Mass (kg) | Bearing seat for unit | | |
|--|----------------------------|-------------|-----------------------------|--------------------------------|---------|-------|-------|-----------|-----------------------|-------|-------|
| | | | | | M | D_3 | L_3 | | d | L_4 | L_5 |
| 21 900 | 26 600 | 2 150 | 750 | 19 | M17×1 | 37 | 18 | 1.9 | 17 | 81 | 23 |
| 21 900 | 26 600 | 2 150 | 750 | 19 | M20×1 | 40 | 18 | 1.9 | 20 | 81 | 23 |
| 28 500 | 40 500 | 3 150 | 1 000 | 29 | M25×1.5 | 45 | 20 | 3.1 | 25 | 89 | 26 |
| 46 500 | 81 500 | 4 300 | 1 470 | 39 | | | | 3.4 | | 104 | |
| 29 200 | 43 000 | 3 350 | 1 030 | 30 | M30×1.5 | 50 | 20 | 3.0 | 30 | 89 | 26 |
| 47 500 | 86 000 | 4 500 | 1 520 | 40 | | | | 3.3 | | 104 | |
| 31 000 | 50 000 | 3 800 | 1 180 | 34 | M35×1.5 | 55 | 22 | 3.4 | 35 | 92 | 30 |
| 50 500 | 100 000 | 5 200 | 1 710 | 45 | | | | 4.3 | | 107 | |
| 50 500 | 100 000 | 7 650 | 2 350 | 59 | | | | 5.0 | | 122 | |
| 31 500 | 52 000 | 3 900 | 1 230 | 36 | M40×1.5 | 60 | 22 | 3.6 | 40 | 92 | 30 |
| 51 500 | 104 000 | 5 300 | 1 810 | 47 | | | | 4.2 | | 107 | |
| 51 500 | 104 000 | 7 850 | 2 400 | 61 | | | | 4.7 | | 122 | |

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

Support Units

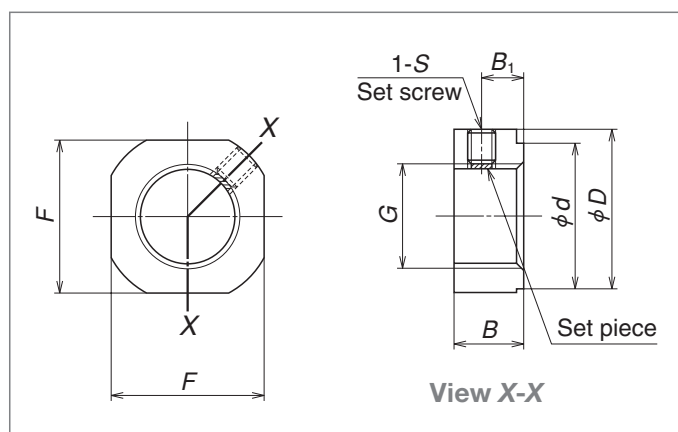
Locknut, Grease unit, and Travel Stopper

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

Locknuts

Ball screw support bearings must be installed

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



A Type shapes and dimensions



A Type locknuts

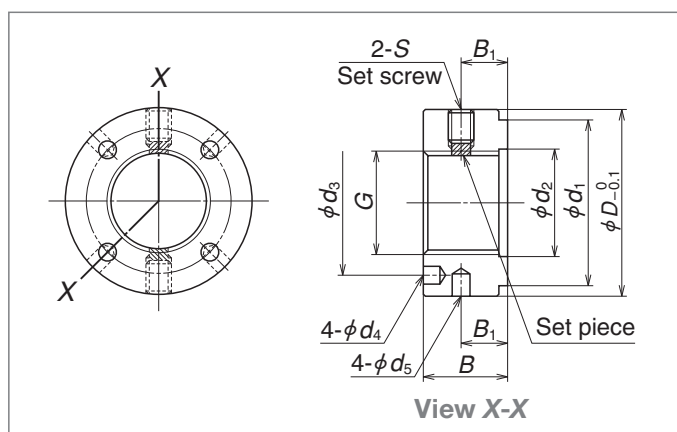
A Type locknuts

| Locknut part number | G | D | F | B | d |
|---------------------|---------|------|-----|-----|-----|
| WBK06L-01 | M6×0.75 | 14.5 | 12 | 5 | 10 |
| WBK08L-01 | M8×1 | 17 | 14 | 6.5 | 13 |
| WBK10L-01 | M10×1 | 20 | 17 | 8 | 16 |
| WBK12L-01 | M12×1 | 22 | 19 | 8 | 17 |
| WBK15L-01 | M15×1 | 25 | 22 | 10 | 21 |
| WBK17L-01 | M17×1 | 29 | 24 | 13 | 24 |
| WBK20L-01 | M20×1 | 35 | 30 | 13 | 26 |
| WBK25L-01 | M25×1.5 | 42 | 36 | 16 | 34 |

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

S Type locknuts

| Locknut part number | G | $D_{0.1}$ | B | d_1 | d_2 | d_3 |
|---------------------|---------|-----------|-----|-------|-------|-------|
| WBK17L-31 | M17×1 | 37 | 18 | 30 | 18 | 27 |
| WBK20L-31 | M20×1 | 40 | 18 | 30 | 21 | 30 |
| WBK25L-31 | M25×1.5 | 45 | 20 | 40 | 26 | 35 |
| WBK30L-31 | M30×1.5 | 50 | 20 | 40 | 31 | 40 |
| WBK35L-31 | M35×1.5 | 55 | 22 | 50 | 36 | 45 |
| WBK40L-31 | M40×1.5 | 60 | 22 | 50 | 41 | 50 |



S Type shapes and dimensions



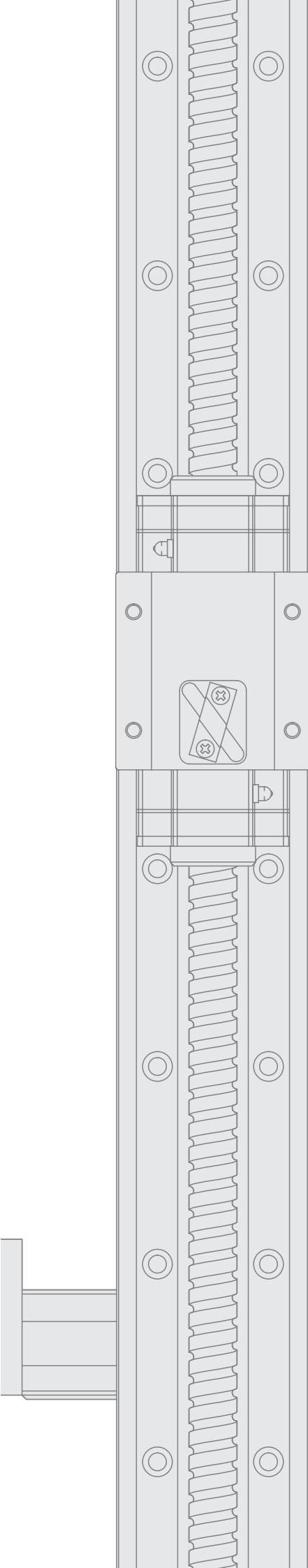
S Type locknuts

Unit: mm

| B_1 | S | Tightening torque (N-cm) (reference) | Set screw tightening torque (reference) [N-cm] |
|-------|--------------------------|--------------------------------------|--|
| 2.75 | M3, with brass set piece | 190 | 69 (M3) |
| 4 | M3, with brass set piece | 230 | 69 (M3) |
| 5 | M4, with brass set piece | 280 | 147 (M4) |
| 5 | M4, with brass set piece | 630 | 147 (M4) |
| 6 | M4, with brass set piece | 790 | 147 (M4) |
| 8 | M4, with brass set piece | 910 | 147 (M4) |
| 8 | M4, with brass set piece | 1 670 | 147 (M4) |
| 10 | M6, with brass set piece | 2 060 | 490 (M6) |

Unit: mm

| d_4 | d_5 | B_1 | S | Tightening torque (N-cm) (reference) | Set screw tightening torque (reference) [N-cm] |
|-------|-------|-------|----|--------------------------------------|--|
| 4.3 | 4 | 10 | M6 | 4 100 | 490 (M6) |
| 4.3 | 4 | 10 | M6 | 4 500 | 490 (M6) |
| 4.3 | 4 | 11 | M6 | 8 500 | 490 (M6) |
| 4.3 | 5 | 11 | M6 | 10 100 | 490 (M6) |
| 4.3 | 5 | 12 | M6 | 13 800 | 490 (M6) |
| 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



Monocarriers

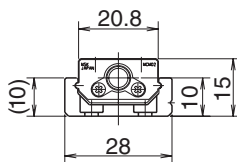
Types of Monocarriers

| | Light weight | Beam rigidity | Moment rigidity |
|------------|--------------|---------------|-----------------|
| MCM Series | ◎ | ○ | ○ |
| MCH Series | ○ | ◎ | ○ |

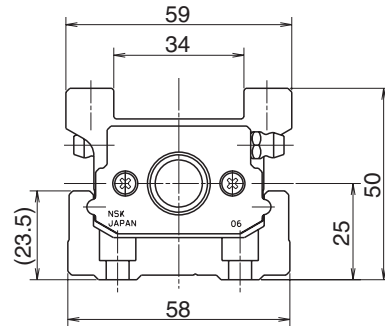
◎: Very good
○: Good

MCM Series Cross-sections

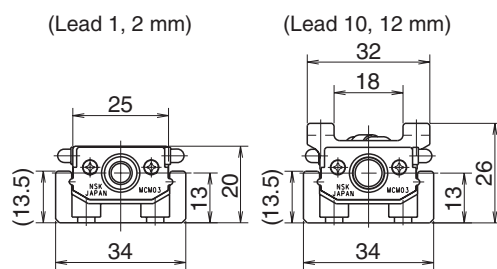
MCM02



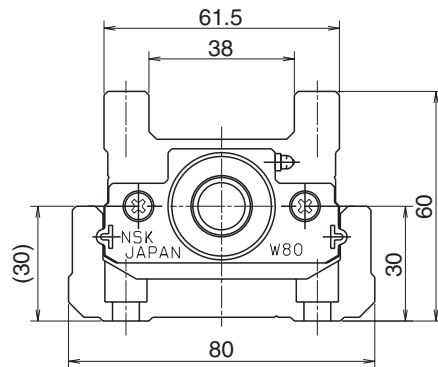
MCM06



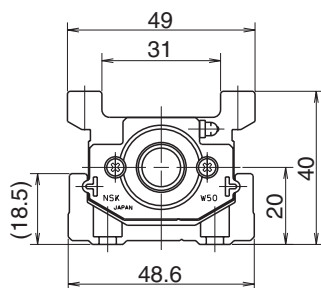
MCM03



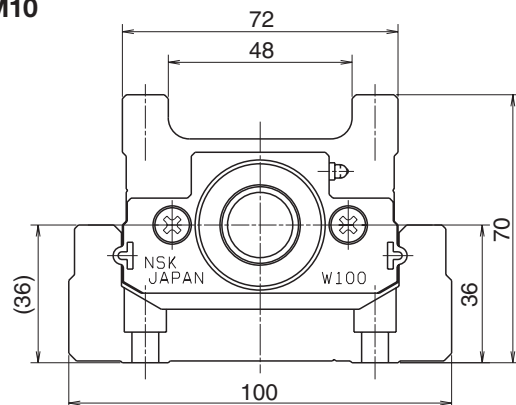
MCM08



MCM05



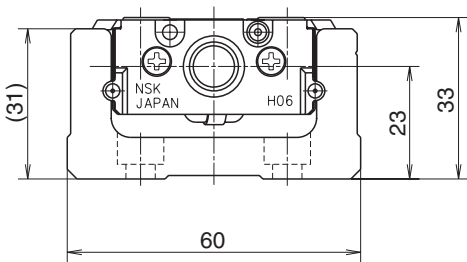
MCM10



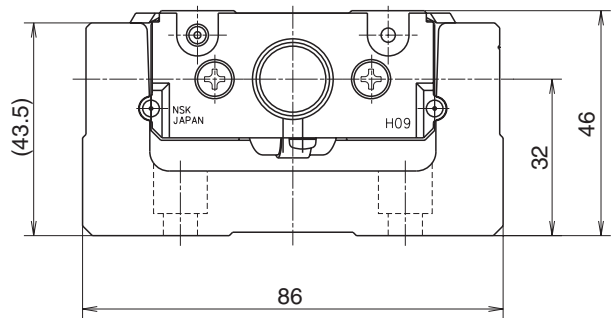
| | Accuracy | Long stroke | Size variation |
|--|----------|-------------|----------------|
| | ◎ | ○ | ◎ |
| | ◎ | ◎ | ○ |

MCH Series Cross-sections

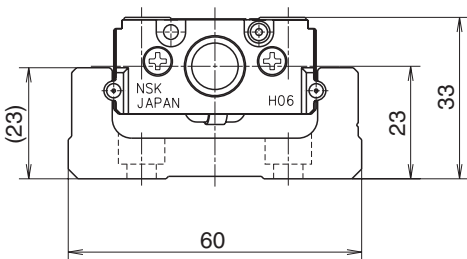
MCH06



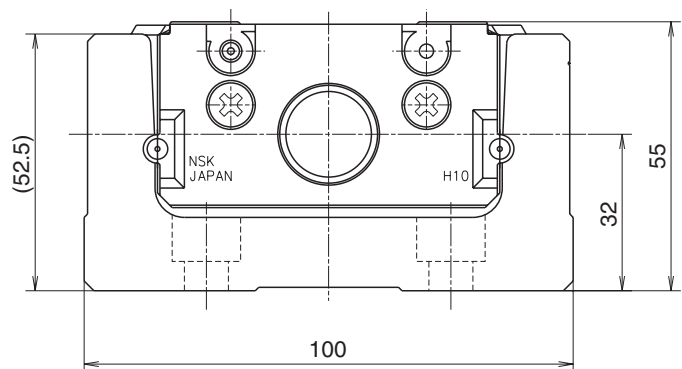
MCH09



MCL06



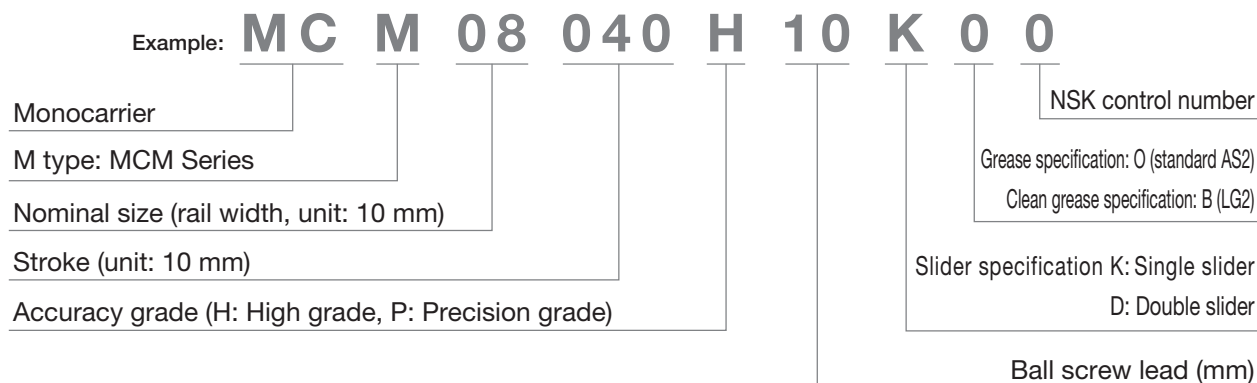
MCH10



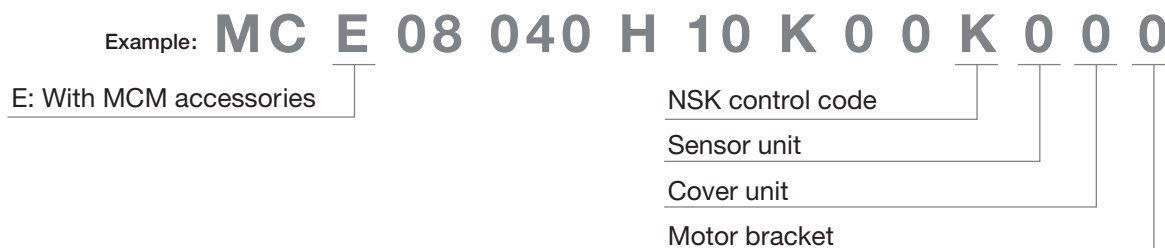
Monocarriers MCM Series

Part Number for MCM Series

Body



With Accessories



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

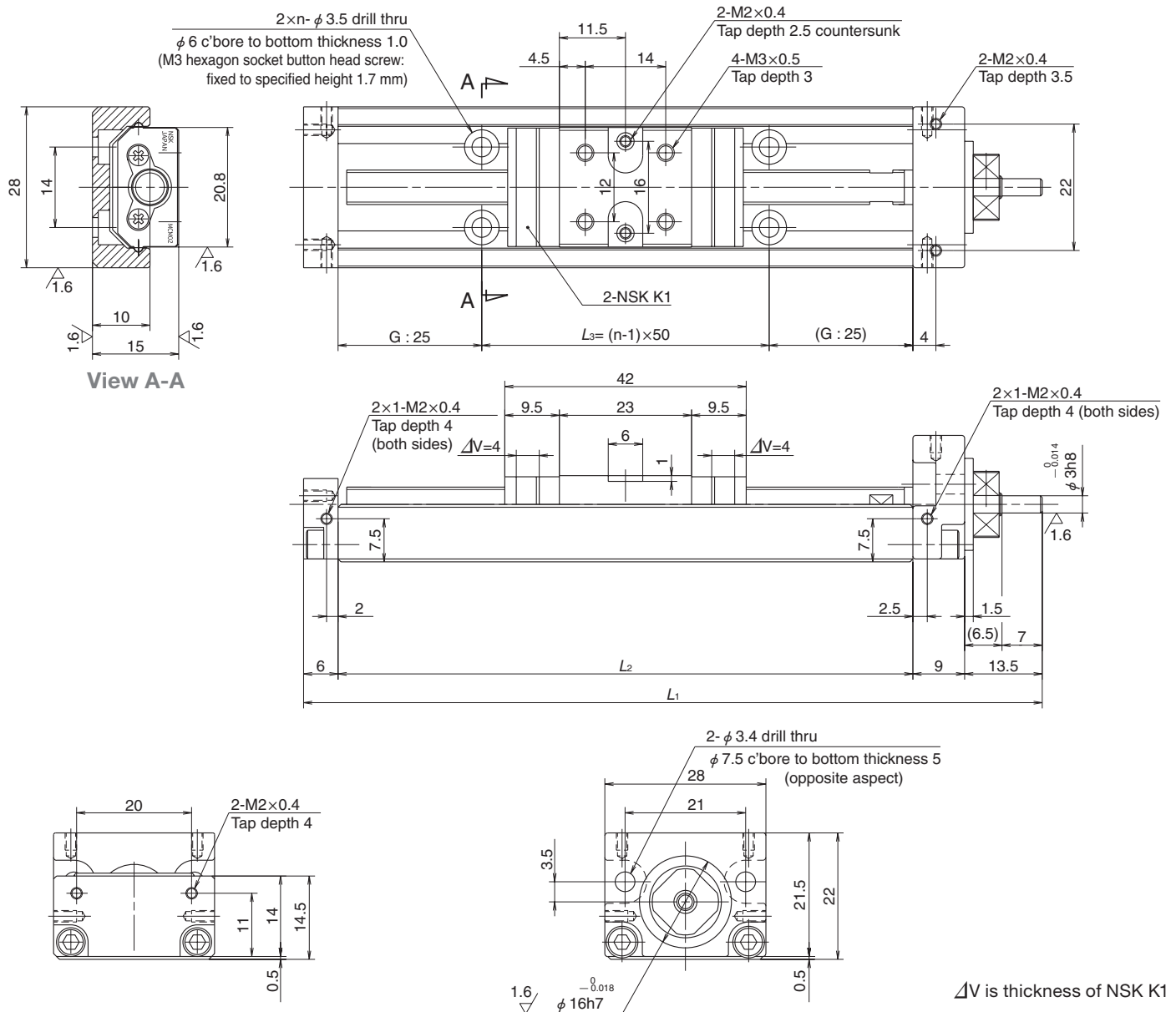
*: Monocarrier -02 is only used for MCM03.

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



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 ²) | 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 | | | | | | | | | | 100 |
| MCM02005H02K | | | | | | | | | | 100 |
| MCM02005P02K | 100 | 108 | 2 | 178.5 | 150 | 100 | 3 | 1.36 | 0.32 | 50 |
| MCM02010H01K | | | | | | | | | | 100 |
| MCM02010P01K | | | | | | | | | | 100 |
| MCM02010H02K | | | | | | | | | | 100 |
| MCM02010P02K | 150 | 158 | 1 | 228.5 | 200 | 150 | 4 | 1.81 | 0.39 | 50 |
| MCM02015H01K | | | | | | | | | | 50 |
| MCM02015P01K | | | | | | | | | | 50 |
| MCM02015H02K | | | | | | | | | | 50 |
| MCM02015P02K | | | | | | | | | | 50 |

Monocarrier dynamic torque specifications (N·cm)

| Ball screw lead (mm) | High grade | Precision |
|----------------------|------------|-----------|
| | 1 | 0.1 - 1.3 |
| 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 + (4 [margin] \times 2)

► For basic load ratings, see page 303.

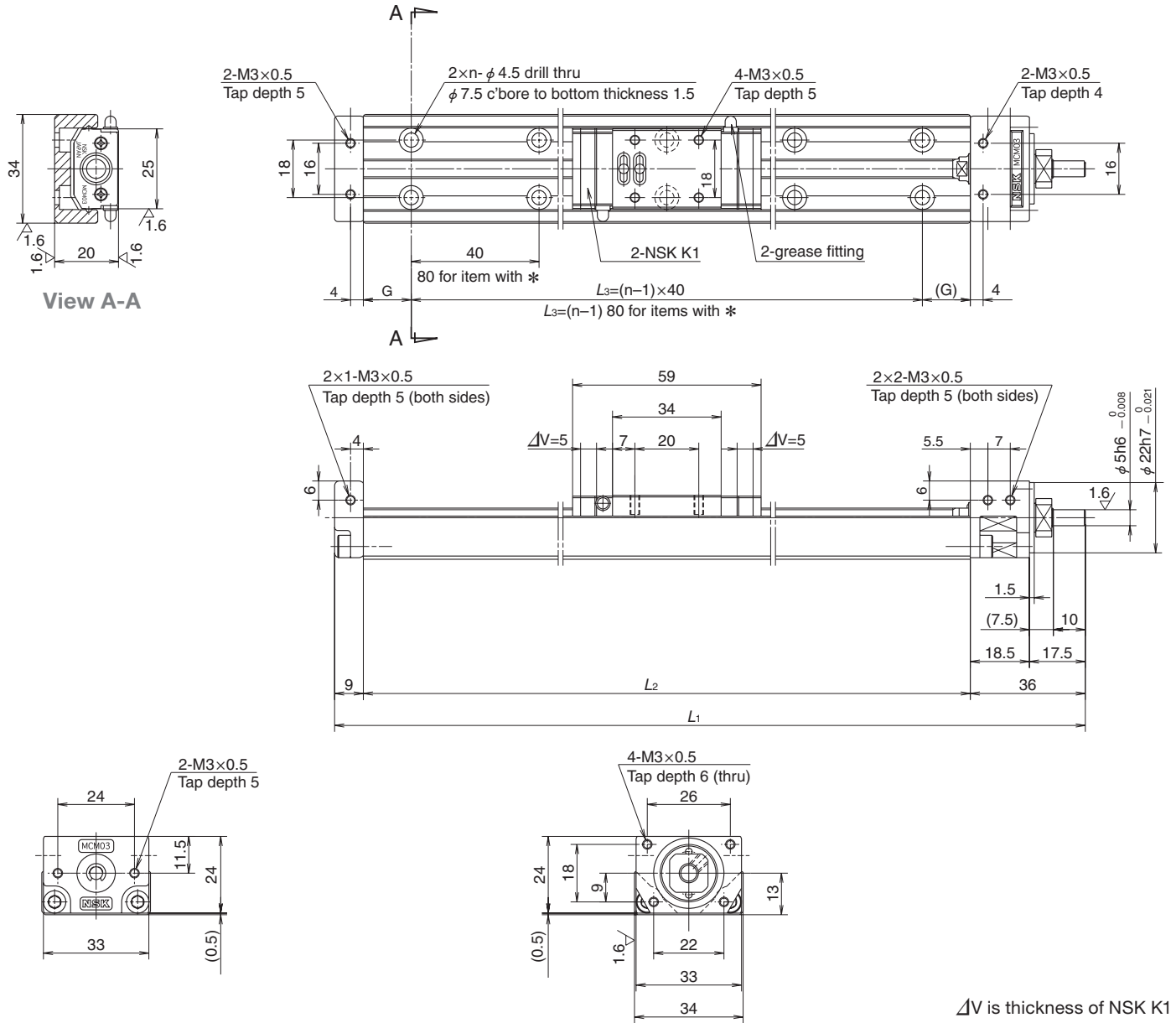
Monocarriers MCM Series

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. <i>n</i> | Inertia $\times 10^{-5}$ (kg·m ²) | Mass (kg) | Maximum rotational speed (mm/s) |
|------------------|---------------------|---|----------------------|-----------------------|-----------------------|----------|-----------------------|-------------------------------|--|-----------|---------------------------------|
| | | | | <i>L</i> ₁ | <i>L</i> ₂ | <i>G</i> | <i>L</i> ₃ | | | | |
| * MCM03005P01K00 | 50 | 56 (66) | 1 | 160 | 115 | 17.5 | 80 | 2 | 0.015 | 0.6 | 50 |
| * MCM03005P02K00 | | | 2 | | | | | | | | 100 |
| MCM03010P01K00 | 100 | 131 (141) | 1 | 235 | 190 | 15 | 160 | 5 | 0.021 | 0.7 | 50 |
| MCM03010P02K00 | | | 2 | | | | | | | | 100 |
| MCM03015P01K00 | 150 | 181 (191) | 1 | 285 | 240 | 20 | 200 | 6 | 0.025 | 0.8 | 50 |
| MCM03015P02K00 | | | 2 | | | | | | | | 100 |

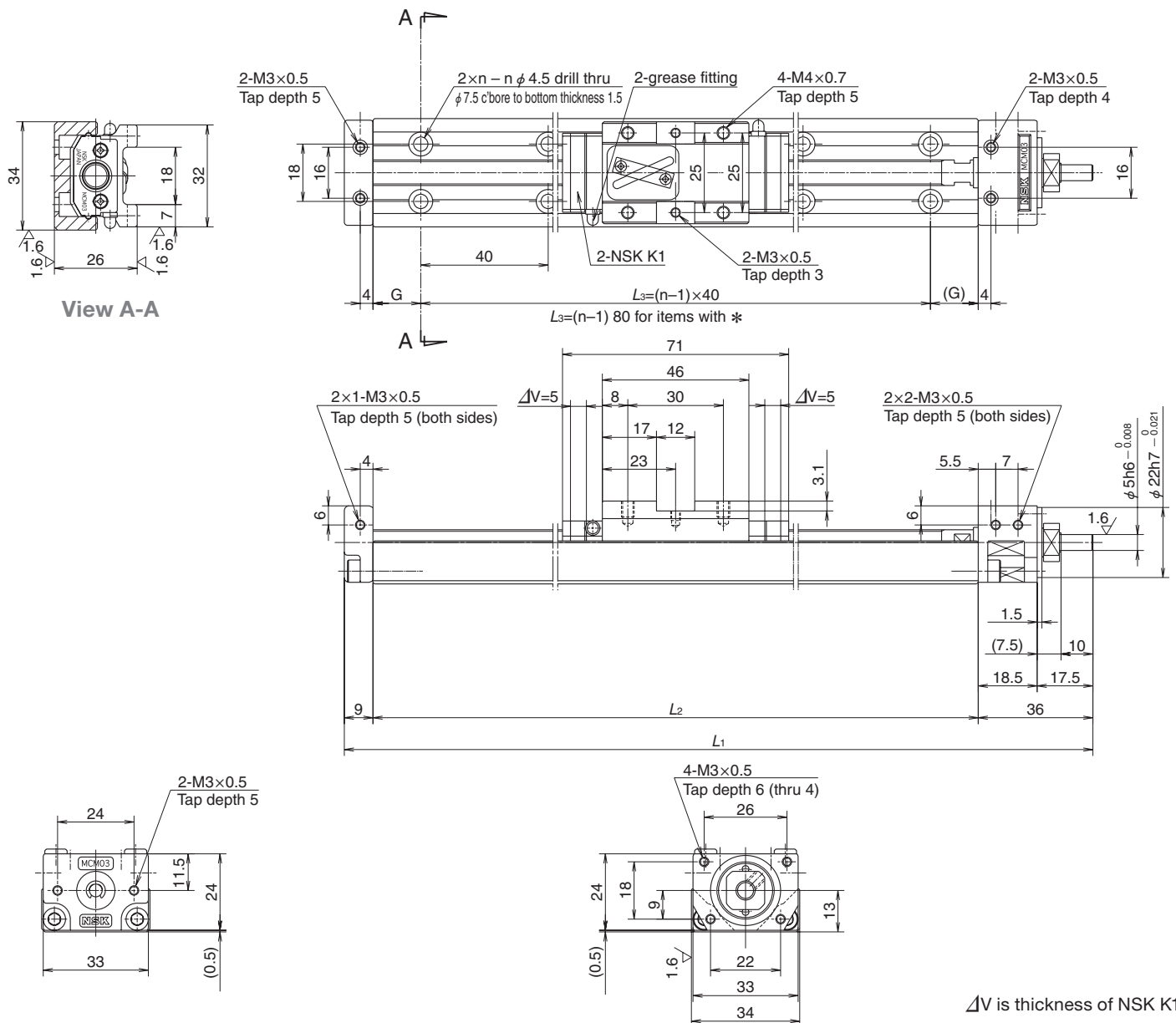
Note: Bolt hole pitch *L*₃ on items marked with * is 80 mm.

Monocrider 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.



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 ²) | Mass (kg) | Maximum rotational speed (mm/s) |
|------------------|---------------------|--|----------------------|------------------|-------|----|-------|-----------------------|---|-----------|---------------------------------|
| | | | | L_1 | L_2 | G | L_3 | | | | |
| * MCM03010H10K00 | 50 | 69 | 10 | 185 | 140 | 30 | 80 | 2 | 0.080 | 0.6 | |
| * MCM03010H12K00 | | (79) | 12 | | | | | | | | |
| MCM03010H10K00 | 100 | 119 | 10 | 235 | 190 | 15 | 160 | 5 | 0.092 | 0.7 | |
| MCM03010H12K00 | | (129) | 12 | | | | | | | | |
| MCM03015H10K00 | 150 | 169 | 10 | 285 | 240 | 20 | 200 | 6 | 0.105 | 0.8 | |
| MCM03015H12K00 | | (179) | 12 | | | | | | | | |
| MCM03020H10K00 | 200 | 219 | 10 | 335 | 290 | 25 | 240 | 7 | 0.118 | 0.9 | |
| MCM03020H12K00 | | (229) | 12 | | | | | | | | |
| MCM03025H10K00 | 250 | 269 | 10 | 385 | 340 | 30 | 280 | 8 | 0.131 | 1.0 | |
| MCM03025H12K00 | | (279) | 12 | | | | | | | | |

Note: Bolt hole pitch L_3 on items marked with * is 80 mm.

Monocarrier dynamic torque specifications (N·cm)

| | | |
|----------------------|----|-----------|
| Ball screw lead (mm) | 10 | 0.3 - 3.0 |
| | 12 | |

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.
4. Stroke limit = stroke + (9.5 [margin] \times 2)

► For basic load ratings, see page 303.

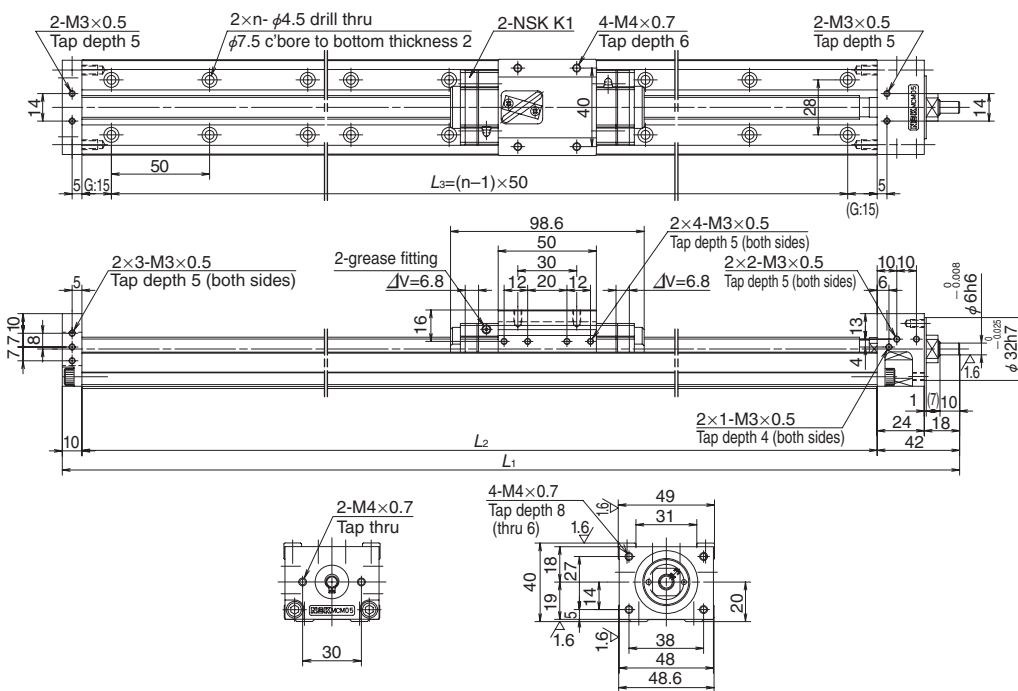
Monocarriers MCM Series

MCM Series Dimension Tables

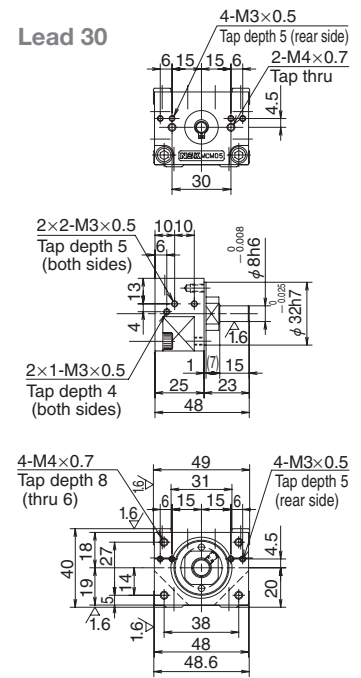
MCM05

Lead 5, 10, 20

Accuracy grade: High grade (H)



Lead 30



Dimensions of MCM05 (single slider)

ΔV is thickness of NSK K1

| 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 ²) | Mass (kg) | Maximum rotational speed (mm/s) |
|----------------|---------------------|---|----------------------|------------------|-------|-------|--------------------------|--|-----------|---------------------------------|
| | | | | L_1 | L_2 | L_3 | | | | |
| MCM05005H05K00 | 50 | 80 (95) | 5 | 232 | 180 | 150 | 4 | 0.025 | 1.4 | 250 |
| MCM05005H10K00 | | | 10 | | | | | | | |
| MCM05005H20K00 | | | 20 | | | | | | | |
| MCM05010H05K00 | 100 | 130 (145) | 5 | 282 | 230 | 200 | 5 | 0.031 | 1.6 | 250 |
| MCM05010H10K00 | | | 10 | | | | | | | |
| MCM05010H20K00 | | | 20 | | | | | | | |
| MCM05015H05K00 | 150 | 180 (195) | 5 | 332 | 280 | 250 | 6 | 0.036 | 1.8 | 250 |
| MCM05015H10K00 | | | 10 | | | | | | | |
| MCM05015H20K00 | | | 20 | | | | | | | |
| MCM05020H05K00 | 200 | 230 (245) | 5 | 382 | 330 | 300 | 7 | 0.042 | 2.0 | 250 |
| MCM05020H10K00 | | | 10 | | | | | | | |
| MCM05020H20K00 | | | 20 | | | | | | | |
| MCM05025H05K00 | 250 | 280 (295) | 5 | 432 | 380 | 350 | 8 | 0.047 | 2.2 | 250 |
| MCM05025H10K00 | | | 10 | | | | | | | |
| MCM05025H20K00 | | | 20 | | | | | | | |
| MCM05030H05K00 | 300 | 330 (345) | 5 | 482 | 430 | 400 | 9 | 0.053 | 2.3 | 250 |
| MCM05030H10K00 | | | 10 | | | | | | | |
| MCM05030H20K00 | | | 20 | 487 | 30 | 0.063 | 2.4 | 500 | | |
| MCM05030H30K00 | | | 30 | | | | | | | |
| MCM05040H05K00 | 400 | 430 (445) | 5 | 582 | 530 | 500 | 11 | 0.064 | 2.7 | 250 |
| MCM05040H10K00 | | | 10 | | | | | | | |
| MCM05040H20K00 | | | 20 | 587 | 30 | 0.074 | 2.8 | 500 | | |
| MCM05040H30K00 | | | 30 | | | | | | | |
| MCM05050H05K00 | 500 | 530 (545) | 5 | 682 | 630 | 600 | 13 | 0.076 | 3.1 | 250 |
| MCM05050H10K00 | | | 10 | | | | | | | |
| MCM05050H20K00 | | | 20 | 687 | 30 | 0.085 | 3.2 | 500 | | |
| MCM05050H30K00 | | | 30 | | | | | | | |
| MCM05060H05K00 | 600 | 630 (645) | 5 | 782 | 730 | 700 | 15 | 0.087 | 3.5 | 250 |
| MCM05060H10K00 | | | 10 | | | | | | | |
| MCM05060H20K00 | | | 20 | 787 | 30 | 0.096 | 3.6 | 500 | | |
| MCM05060H30K00 | | | 30 | | | | | | | |

Monocarrier dynamic torque specifications (N·cm)

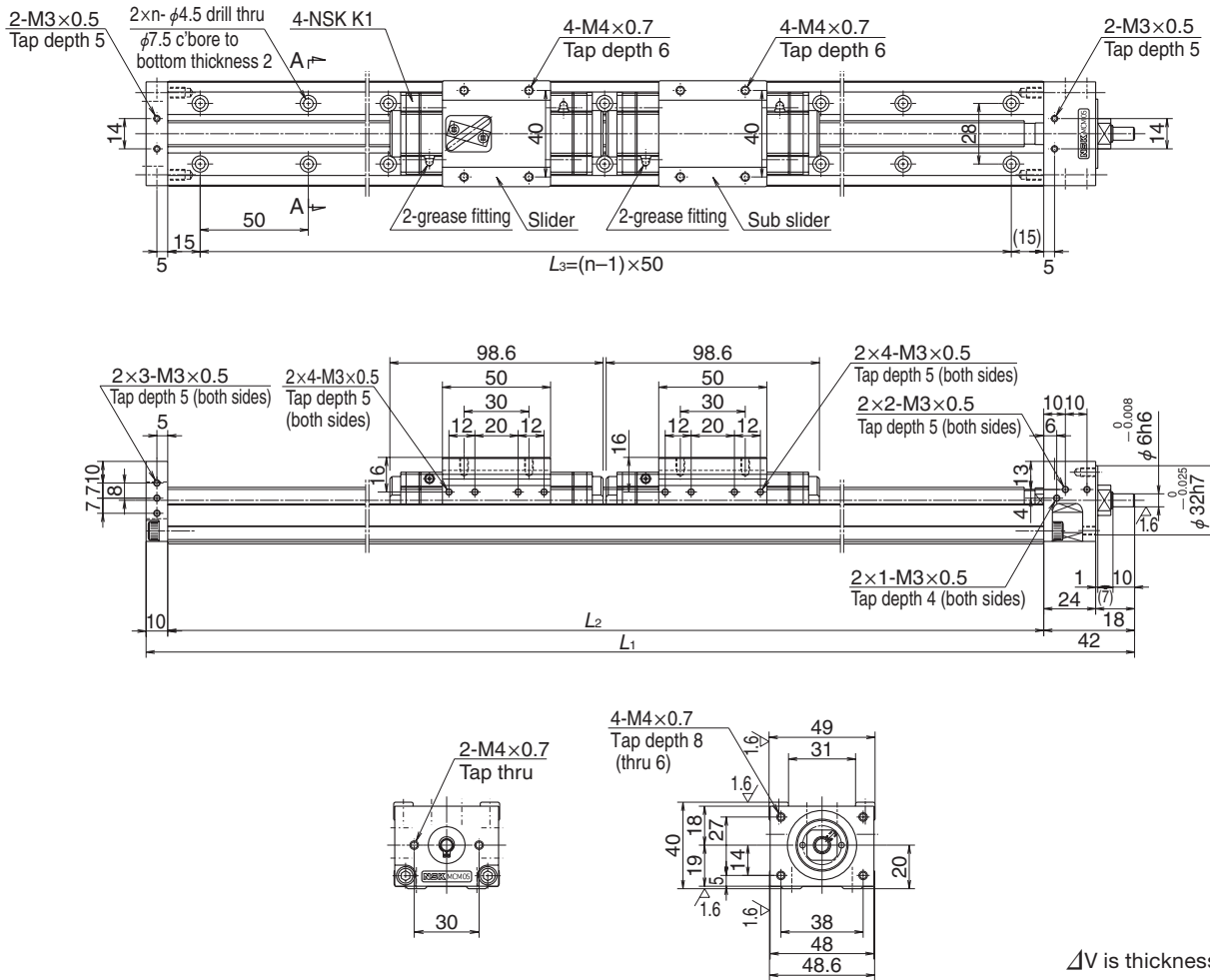
| Ball screw lead (mm) | 5 | 1.0 - 4.8 |
|----------------------|----|------------|
| | 10 | 1.1 - 5.8 |
| | 20 | 1.6 - 7.9 |
| | 30 | 1.8 - 11.1 |

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.
4. Stroke limit = stroke + (15 [margin] × 2)

► For basic load ratings, see page 303.

MCM05 (Double Slider)

Accuracy grade: High grade (H)



ΔV 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. n | Inertia $\times 10^{-4}$ (kg·m ²) | Mass (kg) | Maximum rotational speed (mm/s) |
|----------------|---------------------|---|----------------------|------------------|-------|-------|-----------------------|---|-----------|---------------------------------|
| | | | | L_1 | L_2 | L_3 | | | | |
| 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 | | | | | | | |
| MCM05031H10D00 | 310 | 333 (360) | 10 | 582 | 530 | 500 | 11 | 0.086 | 3.2 | 500 |
| MCM05031H20D00 | | | 20 | | | | | | | |
| MCM05041H10D00 | 410 | 433 (460) | 10 | 682 | 630 | 600 | 13 | 0.098 | 3.6 | 500 |
| MCM05041H20D00 | | | 20 | | | | | | | |
| MCM05051H10D00 | 510 | 533 (560) | 10 | 782 | 730 | 700 | 15 | 0.109 | 4.2 | 500 |
| MCM05051H20D00 | | | 20 | | | | | | | |

Monocarrier dynamic torque specifications (N·cm)

| Ball screw lead (mm) | Dynamic 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)

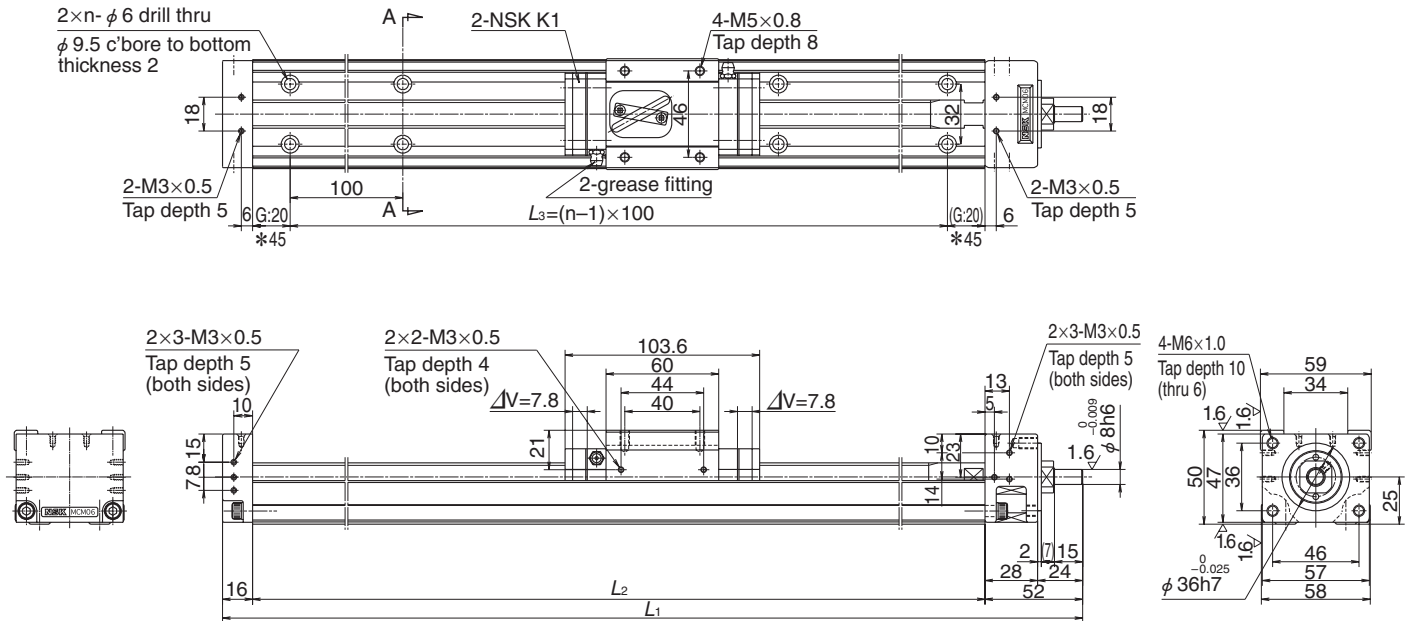
► For basic load ratings, see page 303.

Monocarriers MCM Series

MCM Series Dimension Tables

MCM06

Accuracy grade: High grade (H)



ΔV 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. <i>n</i> | Inertia $\times 10^{-4}$ (kg·m ²) | Mass (kg) | Maximum rotational speed (mm/s) |
|------------------|---------------------|---|----------------------|-----------------------|-----------------------|-----------------------|-------------------------------|--|-----------|---------------------------------|
| | | | | <i>L</i> ₁ | <i>L</i> ₂ | <i>L</i> 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 *.

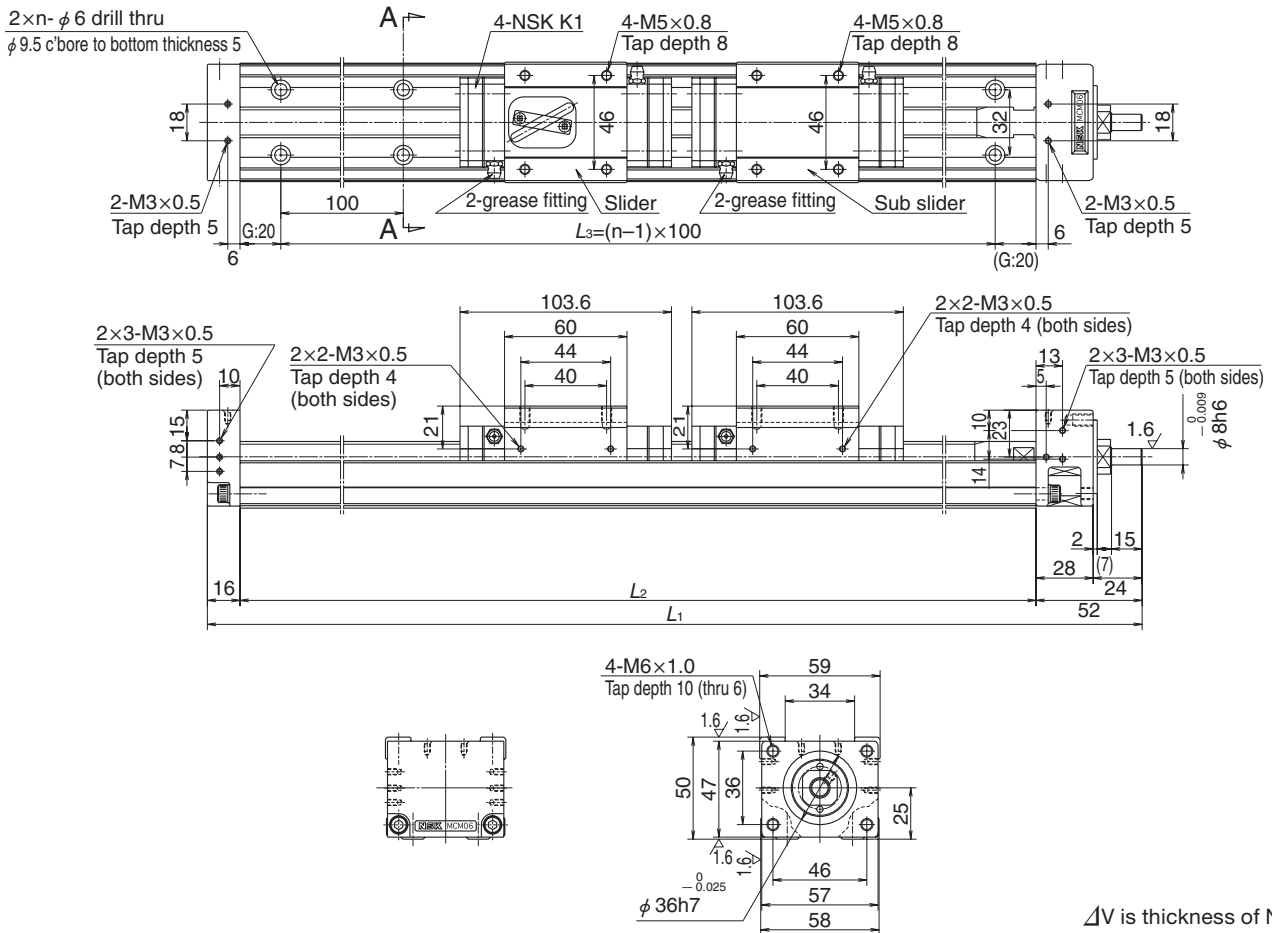
| Monocarrier dynamic torque specifications (N·cm) | | |
|--|----|------------|
| Ball screw lead (mm) | 5 | 1.9 - 7.4 |
| | 10 | 2.2 - 8.6 |
| | 20 | 2.8 - 11.0 |

- 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)



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 ²) | 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 | | | | | | | 500 |
| MCM06021H05D00 | 210 | 233 (264) | 5 | 508 | 440 | 400 | 5 | 0.184 | 5.1 | 250 |
| MCM06021H10D00 | | | 10 | | | | | | | 500 |
| MCM06021H20D00 | | | 20 | | | | | | | 1 000 |
| MCM06031H05D00 | 310 | 333 (364) | 5 | 608 | 540 | 500 | 6 | 0.223 | 5.8 | 250 |
| MCM06031H10D00 | | | 10 | | | | | | | 500 |
| MCM06031H20D00 | | | 20 | | | | | | | 1 000 |
| MCM06041H05D00 | 410 | 433 (464) | 5 | 708 | 640 | 600 | 7 | 0.262 | 6.6 | 250 |
| MCM06041H10D00 | | | 10 | | | | | | | 500 |
| MCM06041H20D00 | | | 20 | | | | | | | 1 000 |
| MCM06051H10D00 | 510 | 533 (564) | 10 | 808 | 740 | 700 | 8 | 0.254 | 7.3 | 500 |
| MCM06051H20D00 | | | 20 | | | | | | | 1 000 |
| MCM06061H10D00 | 610 | 633 (664) | 10 | 908 | 840 | 800 | 9 | 0.283 | 8.0 | 500 |
| MCM06061H20D00 | | | 20 | | | | | | | 1 000 |
| MCM06071H10D00 | 710 | 733 (764) | 10 | 1 008 | 940 | 900 | 10 | 0.313 | 8.7 | 490 |
| MCM06071H20D00 | | | 20 | | | | | | | 980 |

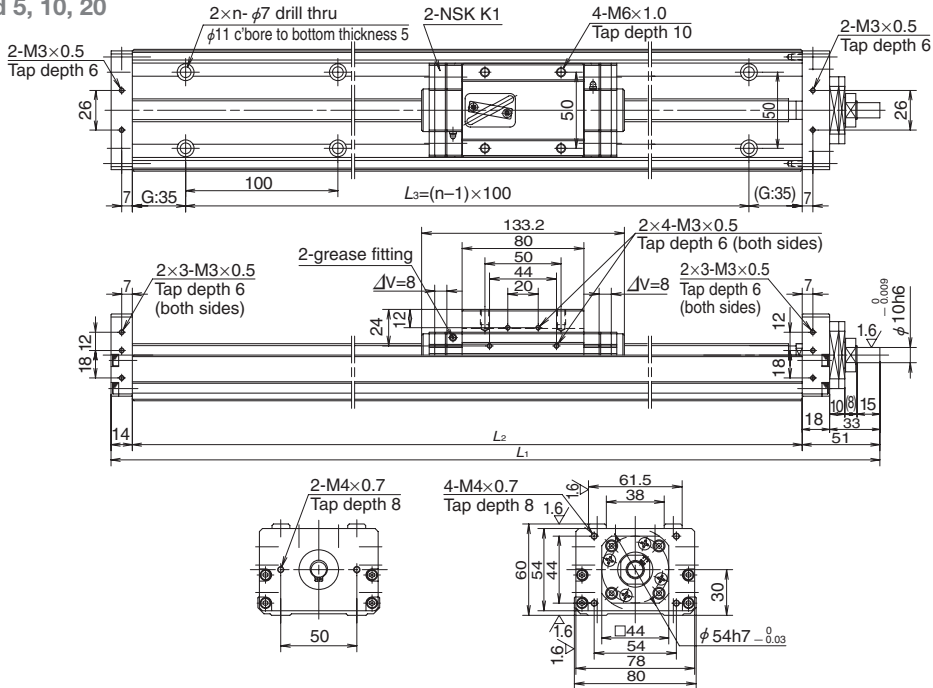
Monocarrier dynamic torque specifications (N·cm)

| Ball screw lead (mm) | 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)

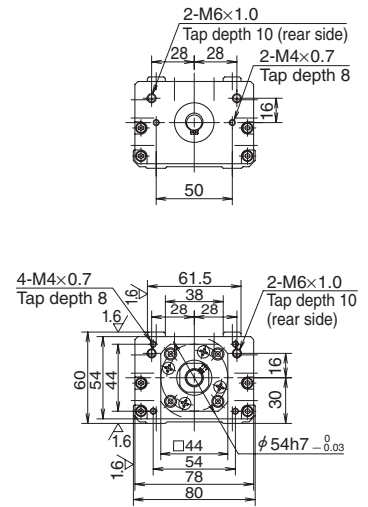
► For basic load ratings, see page 303.

Lead 5, 10, 20



Accuracy grade: High grade (H)

Lead 30



ΔV is thickness of NSK K1

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. <i>n</i> | Inertia $\times 10^{-4}$ (kg·m ²) | Mass (kg) | Maximum rotational speed (mm/s) |
|------------------|---------------------|---|----------------------|-----------------------|-----------------------|-----------------------|-------------------------------|--|-----------|---------------------------------|
| | | | | <i>L</i> ₁ | <i>L</i> ₂ | <i>L</i> ₃ | | | | |
| * 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 | | | 5 | | | | | | | 250 |
| * MCM08015H10K00 | 150 | 185 (201) | 10 | 385 | 320 | 200 | 3 | 0.139 | 5.1 | 500 |
| * MCM08015H20K00 | | | 20 | | | | | | | 1 000 |
| MCM08020H05K00 | | | 5 | | | | | | | 250 |
| MCM08020H10K00 | 200 | 235 (251) | 10 | 435 | 370 | 300 | 4 | 0.159 | 5.5 | 500 |
| MCM08020H20K00 | | | 20 | | | | | | | 1 000 |
| * MCM08025H05K00 | | | 5 | | | | | | | 250 |
| * MCM08025H10K00 | 250 | 285 (301) | 10 | 485 | 420 | 300 | 4 | 0.178 | 6.0 | 500 |
| * MCM08025H20K00 | | | 20 | | | | | | | 1 000 |
| MCM08030H05K00 | | | 5 | | | | | | | 250 |
| MCM08030H10K00 | 300 | 335 (351) | 10 | 535 | 470 | 400 | 5 | 0.198 | 6.5 | 500 |
| MCM08030H20K00 | | | 20 | | | | | | | 1 000 |
| MCM08040H05K00 | | | 5 | | | | | | | 250 |
| MCM08040H10K00 | 400 | 435 (451) | 10 | 635 | 570 | 500 | 6 | 0.236 | 7.4 | 500 |
| MCM08040H20K00 | | | 20 | | | | | | | 1 000 |
| MCM08040H30K00 | | | 30 | | | | | | | 2 500 |
| MCM08050H05K00 | 500 | 535 (551) | 5 | 735 | 670 | 600 | 7 | 0.203 | 8.4 | 250 |
| MCM08050H10K00 | | | 10 | | | | | | | 500 |
| MCM08050H20K00 | | | 20 | | | | | | | 1 000 |
| MCM08050H30K00 | | | 30 | | | | | | | 2 500 |
| MCM08060H05K00 | 600 | 635 (651) | 5 | 835 | 770 | 700 | 8 | 0.232 | 9.3 | 250 |
| MCM08060H10K00 | | | 10 | | | | | | | 500 |
| MCM08060H20K00 | | | 20 | | | | | | | 1 000 |
| MCM08060H30K00 | | | 30 | | | | | | | 1 860 |
| MCM08070H05K00 | 700 | 735 (751) | 5 | 935 | 870 | 800 | 9 | 0.464 | 10.5 | 250 |
| MCM08070H10K00 | | | 10 | | | | | | | 500 |
| MCM08070H20K00 | | | 20 | | | | | | | 1 000 |
| MCM08070H30K00 | | | 30 | | | | | | | 1 425 |
| MCM08080H05K00 | 800 | 835 (851) | 5 | 1 035 | 970 | 900 | 10 | 0.291 | 11.2 | 195 |
| MCM08080H10K00 | | | 10 | | | | | | | 390 |
| MCM08080H20K00 | | | 20 | | | | | | | 780 |

Dimension G is 60 for items marked with *.

Monocarrier dynamic torque specifications (N·cm)

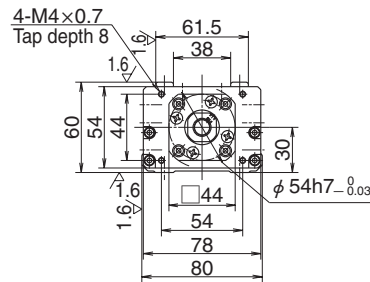
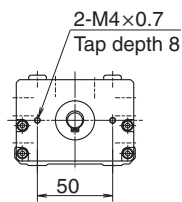
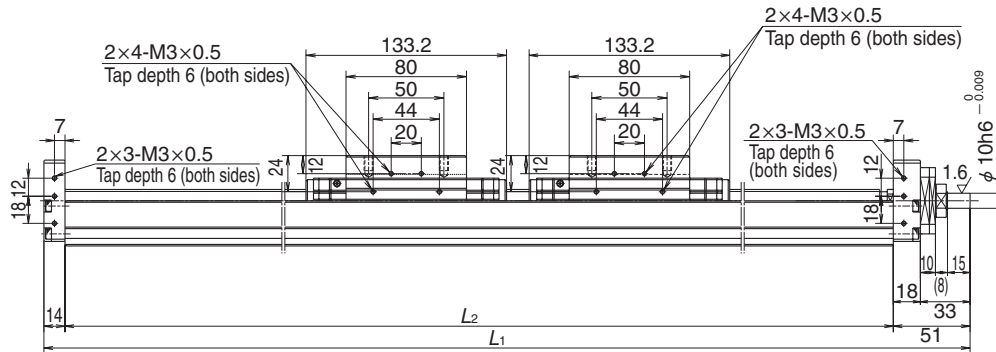
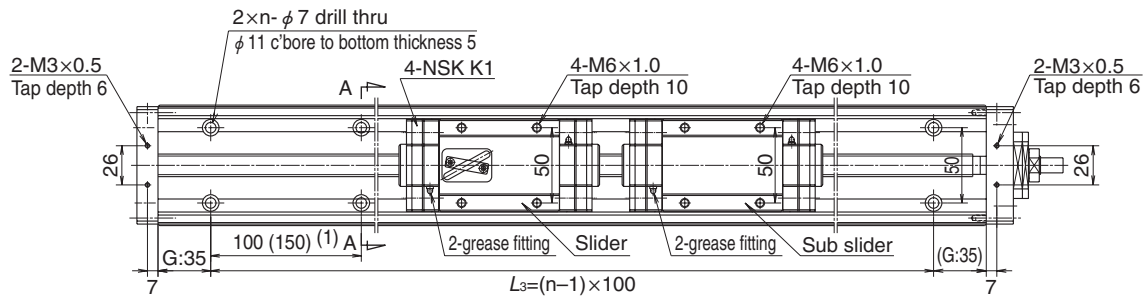
| Ball screw lead (mm) | 5 | 1.0 – 5.9 |
|----------------------|----|------------|
| | 10 | 2.0 – 7.8 |
| | 20 | 2.5 – 10.8 |
| | 30 | 2.8 – 12.0 |

- 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.

MCM08 (Double Slider)

Accuracy grade: High grade (H)



ΔV is thickness of NSK K1

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 $\times 10^{-4}$ (kg·m ²) | Mass (kg) | Maximum rotational speed (mm/s) |
|-----------------|---------------------|---|----------------------|------------------|-------|-------|--------------------------|--|-----------|---------------------------------|
| | | | | L_1 | L_2 | L_3 | | | | |
| *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 | 0.351 | | | | | 1 000 | | |
| MCM08028H10D00 | 280 | 304 (336) | 10 | 635 | 570 | 500 | 6 | 0.228 | 8.4 | 500 |
| MCM08028H20D00 | | 20 | 0.380 | | | | | 1 000 | | |
| MCM08038H10D00 | 380 | 404 (436) | 10 | 135 | 670 | 600 | 7 | 0.257 | 9.4 | 500 |
| MCM08038H20D00 | | 20 | 0.409 | | | | | 1 000 | | |
| MCM08048H10D00 | 480 | 504 (536) | 10 | 835 | 770 | 700 | 8 | 0.287 | 10.3 | 500 |
| MCM08048H20D00 | | 20 | 0.439 | | | | | 1 000 | | |
| MCM08058H10D00 | 580 | 604 (636) | 10 | 935 | 870 | 800 | 9 | 0.316 | 11.5 | 500 |
| MCM08058H20D00 | | 20 | 0.468 | | | | | 1 000 | | |
| MCM08068H10D00 | 680 | 704 (736) | 10 | 1 035 | 970 | 900 | 10 | 0.346 | 12.2 | 500 |
| MCM08068H20D00 | | 20 | 0.498 | | | | | 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)

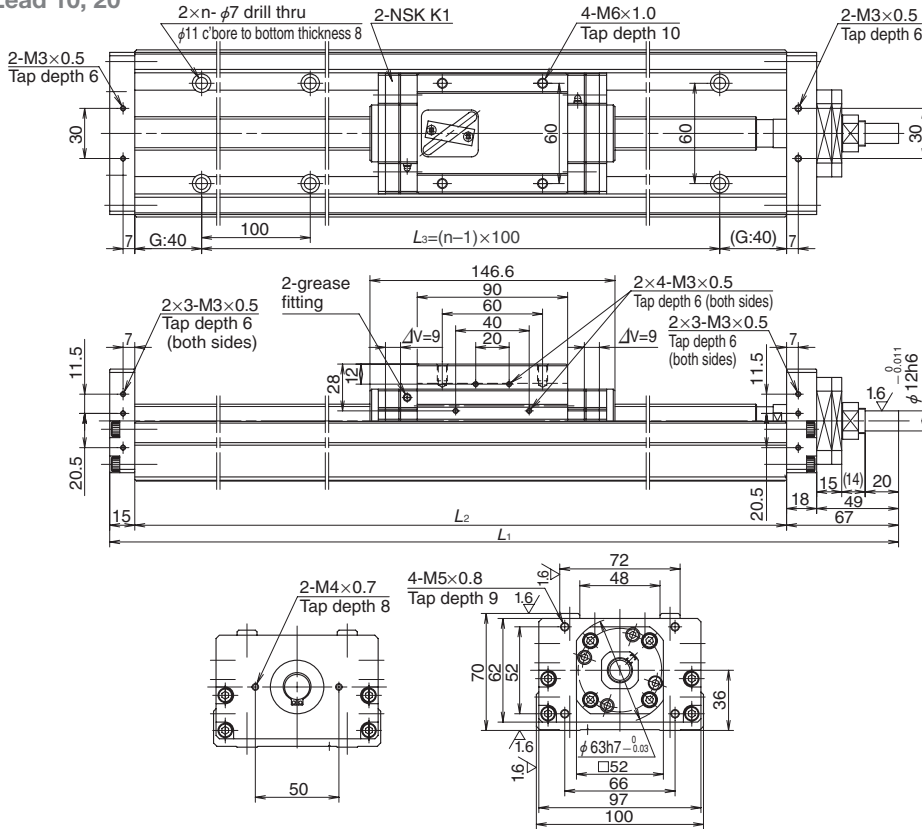
► For basic load ratings, see page 303.

MCM Series Dimension Tables

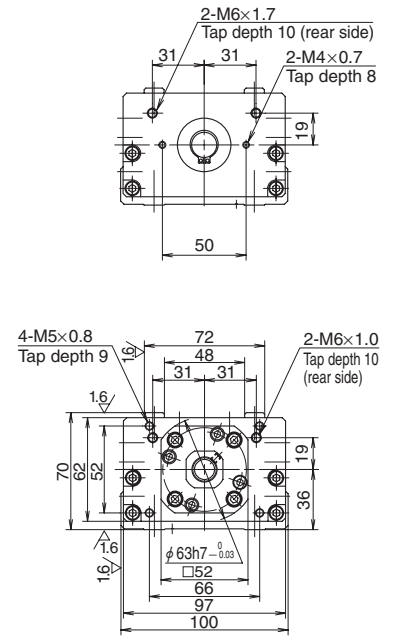
MCM10

Accuracy grade: High grade (H)

Lead 10, 20



Lead 30



ΔV is thickness of NSK K1

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. <i>n</i> | Inertia $\times 10^{-4}$ (kg·m ²) | Mass (kg) | Maximum rotational speed (mm/s) |
|-------------------------|---------------------|---|----------------------|-----------------------|-----------------------|-----------------------|-------------------------------|--|-----------|---------------------------------|
| | | | | <i>L</i> ₁ | <i>L</i> ₂ | <i>L</i> ₃ | | | | |
| MCM10010H10K00 | 100 | 130 (151) | 10 | 362 | 280 | 200 | 3 | 0.332 | 7.8 | 500 |
| MCM10010H20K00 | | | 20 | | | | | | | 1 000 |
| ◆ MCM10015H10K00 | 150 | 180 (201) | 10 | 412 | 330 | 300 | 4 | 0.378 | 8.7 | 500 |
| ◆ MCM10015H20K00 | | | 20 | | | | | | | 1 000 |
| MCM10020H10K00 | 200 | 230 (251) | 10 | 462 | 380 | 300 | 4 | 0.425 | 9.5 | 500 |
| MCM10020H20K00 | | | 20 | | | | | | | 1 000 |
| ◆ MCM10025H10K00 | 250 | 280 (301) | 10 | 512 | 430 | 400 | 5 | 0.472 | 10.4 | 500 |
| ◆ MCM10025H20K00 | | | 20 | | | | | | | 1 000 |
| MCM10030H10K00 | 300 | 330 (351) | 10 | 562 | 480 | 400 | 5 | 0.519 | 11.2 | 500 |
| MCM10030H20K00 | | | 20 | | | | | | | 1 000 |
| MCM10040H10K00 | 400 | 430 (451) | 10 | 662 | 580 | 500 | 6 | 0.612 | 13.0 | 500 |
| MCM10040H20K00 | | | 20 | | | | | | | 1 000 |
| MCM10050H10K00 | 500 | 530 (551) | 10 | 762 | 680 | 600 | 7 | 0.706 | 14.6 | 500 |
| MCM10050H20K00 | | | 20 | | | | | | | 1 000 |
| MCM10050H30K00 | | | 30 | | | | | | | 2 500 |
| MCM10060H10K00 | 600 | 630 (651) | 10 | 862 | 780 | 700 | 8 | 0.800 | 16.3 | 500 |
| MCM10060H20K00 | | | 20 | | | | | | | 1 000 |
| MCM10060H30K00 | | | 30 | | | | | | | 2 500 |
| MCM10070H10K00 | 700 | 730 (751) | 10 | 962 | 880 | 800 | 9 | 0.893 | 18.0 | 500 |
| MCM10070H20K00 | | | 20 | | | | | | | 1 000 |
| MCM10070H30K00 | | | 30 | | | | | | | 1 920 |
| MCM10080H10K00 | 800 | 830 (851) | 10 | 1 062 | 980 | 900 | 10 | 0.893 | 19.7 | 500 |
| MCM10080H20K00 | | | 20 | | | | | | | 1 000 |
| MCM10080H30K00 | | | 30 | | | | | | | 1 510 |
| MCM10090H10K00 | 900 | 930 (951) | 10 | 1 162 | 1 080 | 1 000 | 11 | 1.081 | 21.4 | 440 |
| MCM10090H20K00 | | | 20 | | | | | | | 880 |
| *MCM10100H10K00 | 1 000 | 1 030 (1 051) | 10 | 1 262 | 1 180 | 1 000 | 11 | 1.174 | 23.1 | 360 |
| *MCM10100H20K00 | | | 20 | | | | | | | 720 |

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

Monocarrier dynamic torque specifications (N·cm)

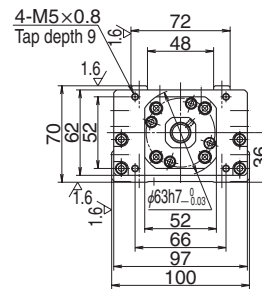
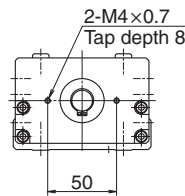
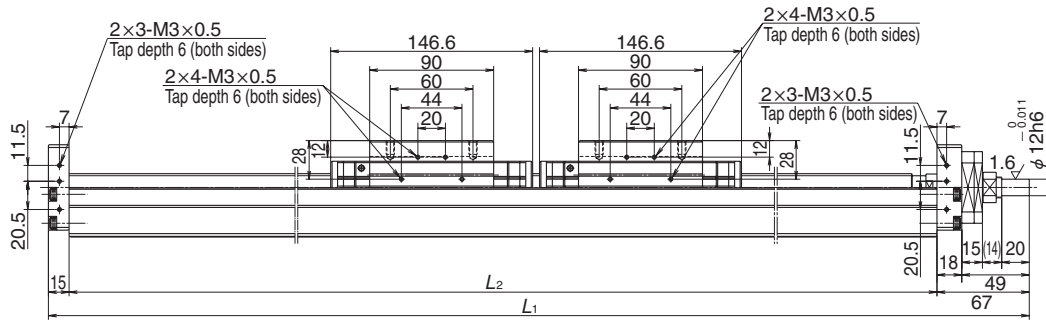
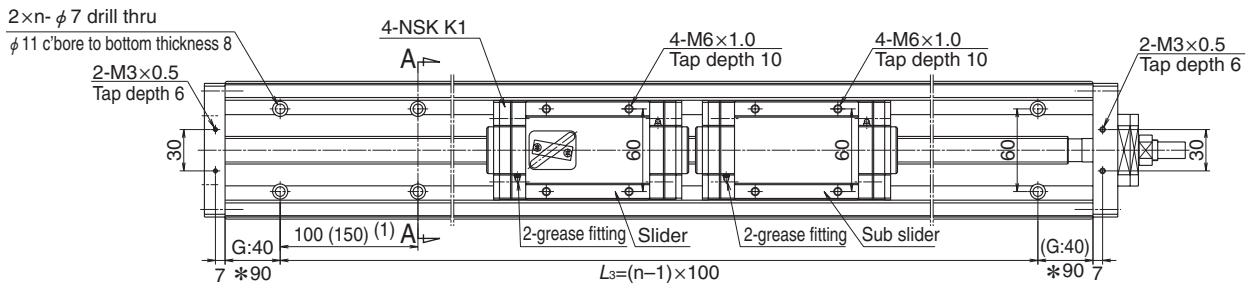
| Ball screw lead (mm) | 10 | 2.7 - 10.8 |
|----------------------|----|------------|
| | 20 | 3.1 - 12.7 |
| | 30 | 5.1 - 18.0 |

- 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)



ΔV is thickness of NSK K1

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 ²) | 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 ●.

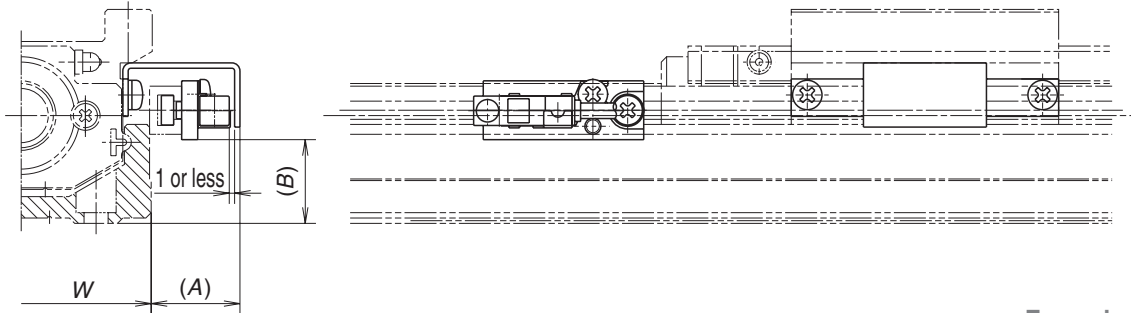
Monocarrier dynamic torque specifications (N·cm)

| Ball screw lead (mm) | 10 | 4.2 – 15.6 |
|----------------------|----|------------|
| | 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.
- Stroke limit = stroke + (8.4 [margin] × 2)

► For basic load ratings, see page 303.

Proximity Switch



Example of assembly

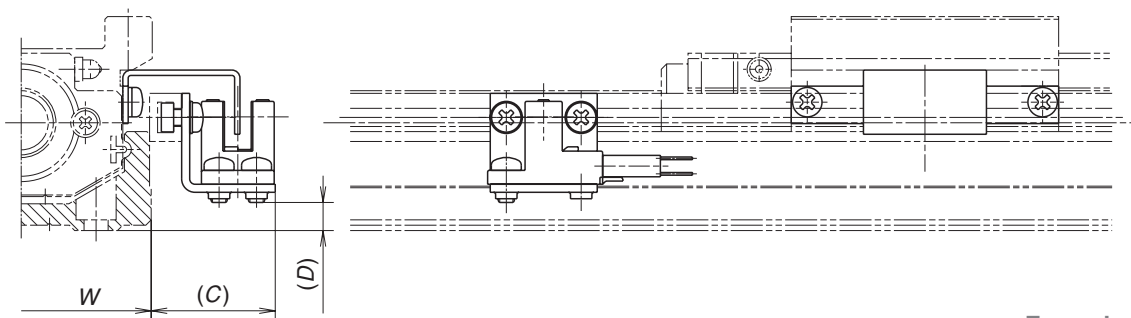
| Type | Part number | | | Dimension A (mm) | Dimension B (mm) | Body width W (mm) |
|----------|------------------------------|------------|------------|------------------|-----------------------|-------------------|
| MCM02 | MC-SR02-00 | MC-SR02-01 | MC-SR02-02 | 17 | 2 | 28 |
| MCM03 | MC-SR03-10 | 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

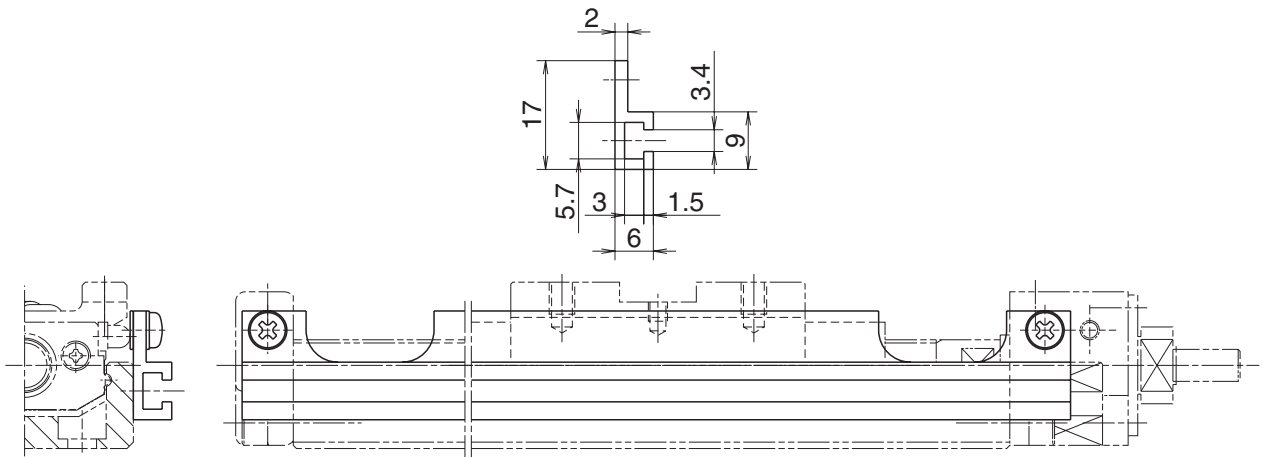
| Type | Part number | Dimension C (mm) | Dimension D (mm) | Body width W (mm) | Notes |
|-------|-------------|------------------|------------------|-------------------|--|
| MCM03 | MC-SR03-13 | 24 | 0.5 | 34 | EE-SX674 (OMRON Corp.) 3 sets (EE-1001 connector attachment) |
| MCM05 | MC-SR05-13 | 24 | 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.

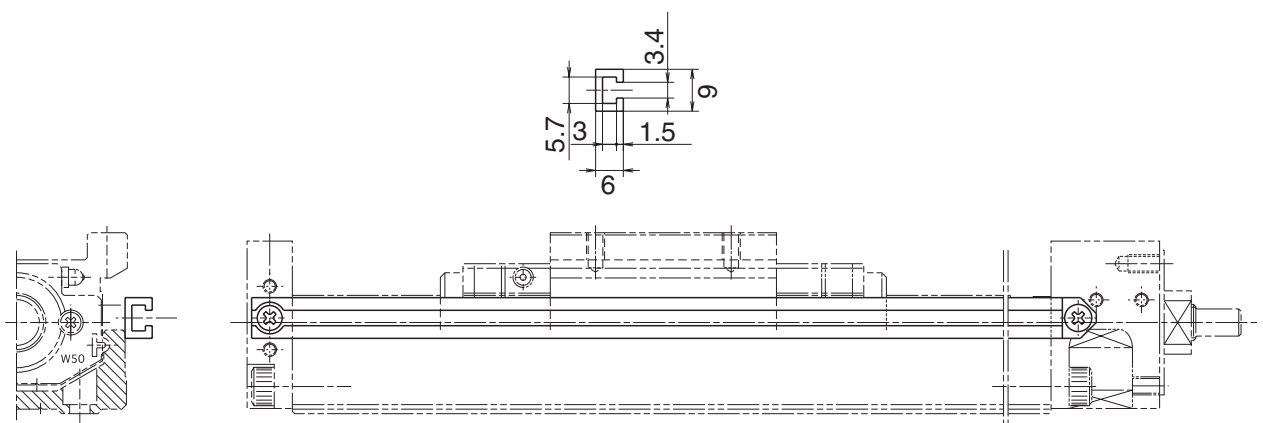
Note 3: A spacer plate is required when using a cover unit or sensor unit for MCM03 with lead of 1 or 2 mm. (see page 267)

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



Example of assembly

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



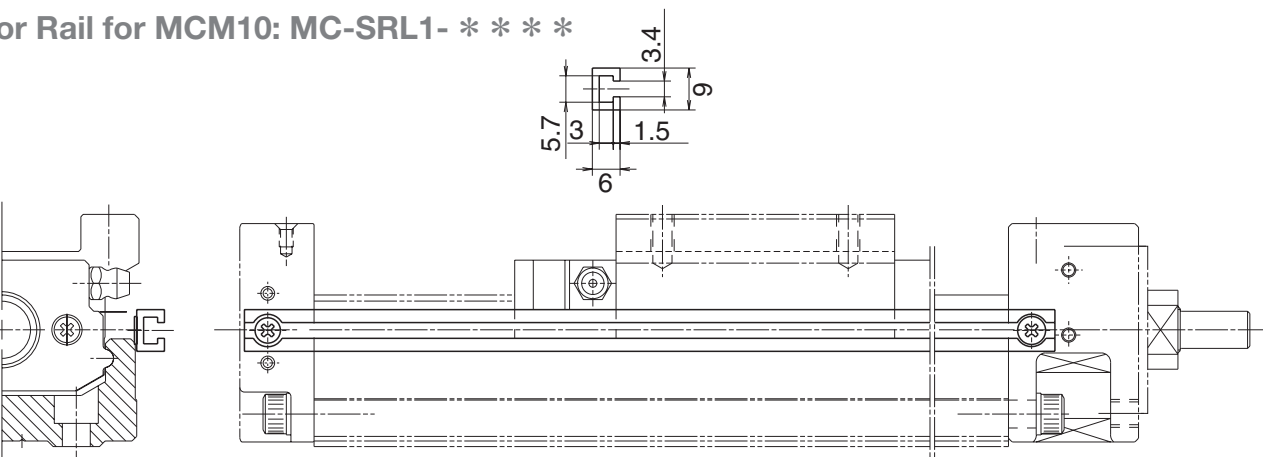
Example of assembly

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_2 .

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

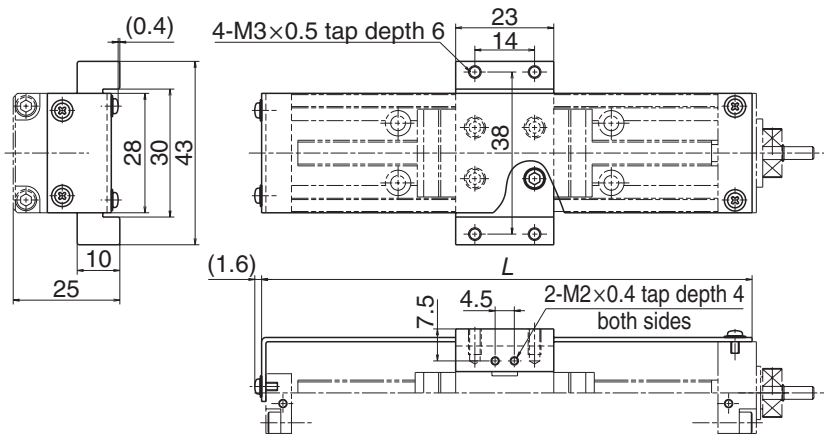
| Nominal size | Body length L_2 (mm) | Part number | Sensor rail part number |
|--------------|------------------------|----------------|-------------------------|
| MCM02 | 100 | MCM02005H01K | MC-SRL2-0100 |
| | | MCM02005P01K | |
| | | MCM02005H02K | |
| | | MCM02005P02K | |
| | 150 | MCM02010H01K | MC-SRL2-0150 |
| | | MCM02010P01K | |
| MCM02010H02K | | | |
| 200 | MCM02010P02K | MC-SRL2-0200 | |
| | MCM02015H01K | | |
| | MCM02015P01K | | |
| MCM03 | 115 | MCM02015H02K | MC-SRL2-0200 |
| | | MCM02015P02K | |
| | 140 | MCM03005P01K00 | MC-SRL3-0115 |
| | | MCM03005P02K00 | |
| | 190 | MCM03005H10K00 | MC-SRL3-0140 |
| | | MCM03005H12K00 | |
| | 240 | MCM03010P01K00 | MC-SRL3-0190 |
| | | MCM03010P02K00 | |
| | | MCM03010H10K00 | |
| | | MCM03010H12K00 | |
| 290 | MCM03015P01K00 | MC-SRL3-0240 | |
| | MCM03015P02K00 | | |
| | MCM03015H10K00 | | |
| | MCM03015H12K00 | | |
| 340 | MCM03020H10K00 | MC-SRL3-0290 | |
| | MCM03020H12K00 | | |
| MCM05 | 180 | MCM03025H10K00 | MC-SRL3-0340 |
| | | MCM03025H12K00 | |
| | 230 | MCM05005H05K00 | MC-SRL5-0180 |
| | | MCM05005H10K00 | |
| | 280 | MCM05010H05K00 | MC-SRL5-0230 |
| | | MCM05010H10K00 | |
| | 330 | MCM05010H20K00 | MC-SRL5-0280 |
| | | MCM05015H05K00 | |
| | 380 | MCM05015H10K00 | MC-SRL5-0330 |
| | | MCM05015H20K00 | |
| 430 | MCM05020H05K00 | MC-SRL5-0380 | |
| | MCM05020H10K00 | | |
| 480 | MCM05020H20K00 | MC-SRL5-0430 | |
| | MCM05011H10D00 | | |
| 530 | MCM05016H10D00 | MC-SRL5-0480 | |
| | MCM05030H05K00 | | |
| 580 | MCM05030H10K00 | MC-SRL5-0530 | |
| | MCM05030H20K00 | | |
| 630 | MCM05030H30K00 | MC-SRL5-0580 | |
| | MCM05021H10D00 | | |
| 680 | MCM05021H20D00 | MC-SRL5-0630 | |
| | MCM05040H05K00 | | |
| 730 | MCM05040H10K00 | MC-SRL5-0680 | |
| | MCM05040H20K00 | | |
| 780 | MCM05040H30K00 | MC-SRL5-0730 | |
| | MCM05031H10D00 | | |
| 830 | MCM05031H20D00 | MC-SRL5-0780 | |
| | MCM05050H05K00 | | |
| 880 | MCM05050H10K00 | MC-SRL5-0830 | |
| | MCM05050H20K00 | | |
| 930 | MCM05050H30K00 | MC-SRL5-0880 | |
| | MCM05041H10D00 | | |
| 980 | MCM05041H20D00 | MC-SRL5-0930 | |
| | MCM05050H05K00 | | |

| Nominal size | Body length L_2 (mm) | Part number | Sensor rail part number |
|--------------|------------------------|----------------|-------------------------|
| MCM05 | 730 | MCM05060H05K00 | MC-SRL5-0730 |
| | | MCM05060H10K00 | |
| | | MCM05060H20K00 | |
| | | MCM05060H30K00 | |
| | | MCM05051H10D00 | |
| MCM06 | 190 | MCM05051H20D00 | MC-SRL5-0730 |
| | | MCM06005H05K00 | |
| | 240 | MCM06005H10K00 | MC-SRL6-0190 |
| | | MCM06005H20K00 | |
| | 290 | MCM06010H05K00 | MC-SRL6-0240 |
| | | MCM06010H10K00 | |
| | 340 | MCM06010H20K00 | MC-SRL6-0290 |
| | | MCM06015H05K00 | |
| | 390 | MCM06015H10K00 | MC-SRL6-0340 |
| | | MCM06015H20K00 | |
| 440 | MCM06020H05K00 | MC-SRL6-0390 | |
| | MCM06020H10K00 | | |
| 490 | MCM06020H20K00 | MC-SRL6-0440 | |
| | MCM06011H05D00 | | |
| 540 | MCM06011H10D00 | MC-SRL6-0490 | |
| | MCM06025H05K00 | | |
| 590 | MCM06025H10K00 | MC-SRL6-0540 | |
| | MCM06025H20K00 | | |
| 640 | MCM06030H05K00 | MC-SRL6-0590 | |
| | MCM06030H10K00 | | |
| 690 | MCM06030H20K00 | MC-SRL6-0640 | |
| | MCM06021H05D00 | | |
| 740 | MCM06021H10D00 | MC-SRL6-0690 | |
| | MCM06021H20D00 | | |
| 790 | MCM06040H05K00 | MC-SRL6-0740 | |
| | MCM06040H10K00 | | |
| 840 | MCM06040H20K00 | MC-SRL6-0790 | |
| | MCM06031H05D00 | | |
| 890 | MCM06031H10D00 | MC-SRL6-0840 | |
| | MCM06031H20D00 | | |
| 940 | MCM06050H05K00 | MC-SRL6-0890 | |
| | MCM06050H10K00 | | |
| 990 | MCM06050H20K00 | MC-SRL6-0940 | |
| | MCM06041H05D00 | | |
| 1040 | MCM06041H10D00 | MC-SRL6-0990 | |
| | MCM06041H20D00 | | |

| Nominal size | Body length L_2 (mm) | Part number | Sensor rail part number |
|----------------|---------------------------|----------------|-------------------------|
| MCM08 | 220 | MCM08005H05K00 | MC-SRL8-0220 |
| | | MCM08005H10K00 | |
| | 270 | MCM08010H05K00 | MC-SRL8-0270 |
| | | MCM08010H10K00 | |
| | | MCM08010H20K00 | |
| | 320 | MCM08015H05K00 | MC-SRL8-0320 |
| | | MCM08015H10K00 | |
| | | MCM08015H20K00 | |
| | 370 | MCM08020H05K00 | MC-SRL8-0370 |
| | | MCM08020H10K00 | |
| MCM08020H20K00 | | | |
| 420 | MCM08025H05K00 | MC-SRL8-0420 | |
| | MCM08025H10K00 | | |
| | MCM08025H20K00 | | |
| 470 | MCM08030H05K00 | MC-SRL8-0470 | |
| | MCM08030H10K00 | | |
| | MCM08030H20K00 | | |
| | MCM08018H10D00 | | |
| 570 | MCM08038H20D00 | MC-SRL8-0570 | |
| | MCM08040H05K00 | | |
| | MCM08040H10K00 | | |
| | MCM08040H20K00 | | |
| 670 | MCM08040H30K00 | MC-SRL8-0670 | |
| | MCM08028H10D00 | | |
| | MCM08028H20D00 | | |
| | MCM08050H05K00 | | |
| 770 | MCM08050H10K00 | MC-SRL8-0770 | |
| | MCM08050H20K00 | | |
| | MCM08050H30K00 | | |
| | MCM08038H10D00 | | |
| 870 | MCM08038H20D00 | MC-SRL8-0870 | |
| | MCM08060H05K00 | | |
| | MCM08060H10K00 | | |
| | MCM08060H20K00 | | |
| 970 | MCM08060H30K00 | MC-SRL8-0970 | |
| | MCM08048H10D00 | | |
| | MCM08048H20D00 | | |
| | MCM08070H05K00 | | |
| 280 | MCM08070H10K00 | MC-SRL1-0280 | |
| | MCM08070H20K00 | | |
| | MCM08070H30K00 | | |
| | MCM08058H10D00 | | |
| 330 | MCM08058H20D00 | MC-SRL1-0330 | |
| | MCM08080H05K00 | | |
| | MCM08080H10K00 | | |
| | MCM08080H20K00 | | |
| 380 | MCM08080H30K00 | MC-SRL1-0380 | |
| | MCM08068H10D00 | | |
| | MCM08068H20D00 | | |
| | MCM10010H10K00 | | |
| 430 | MCM10010H20K00 | MC-SRL1-0430 | |
| | MCM10015H10K00 | | |
| | MCM10015H20K00 | | |
| | MCM10020H10K00 | | |
| 480 | MCM10020H20K00 | MC-SRL1-0480 | |
| | MCM10007H10K00 | | |
| | MCM10025H10K00 | | |
| | MCM10025H20K00 | | |
| MCM10 | MCM10030H10K00 | MC-SRL1-0480 | |
| | MCM10030H20K00 | | |
| | MCM10017H10K00 | | |
| | MCM10017H20K00 | | |

| Nominal size | Body length L_2 (mm) | Part number | Sensor rail part number |
|----------------|---------------------------|----------------|-------------------------|
| MCM10 | 580 | MCM10040H10K00 | MC-SRL1-0580 |
| | | MCM10040H20K00 | |
| | | MCM10027H10K00 | |
| | | MCM10027H20K00 | |
| | 680 | MCM10050H10K00 | MC-SRL1-0680 |
| | | MCM10050H20K00 | |
| | | MCM10050H30K00 | |
| | | MCM10037H10K00 | |
| | 780 | MCM10037H20K00 | MC-SRL1-0780 |
| | | MCM10060H10K00 | |
| MCM10060H20K00 | | | |
| MCM10060H30K00 | | | |
| 880 | MCM10047H10K00 | MC-SRL1-0880 | |
| | MCM10047H20K00 | | |
| | MCM10070H10K00 | | |
| | MCM10070H20K00 | | |
| 980 | MCM10070H30K00 | MC-SRL1-0980 | |
| | MCM10057H10K00 | | |
| | MCM10057H20K00 | | |
| | MCM10080H10K00 | | |
| 1 080 | MCM10080H20K00 | MC-SRL1-1080 | |
| | MCM10080H30K00 | | |
| | MCM10067H10K00 | | |
| | MCM10067H20K00 | | |
| 1 180 | MCM10090H10K00 | MC-SRL1-1180 | |
| | MCM10090H20K00 | | |
| | MCM10100H10K00 | | |
| | MCM10100H20K00 | | |
| MCM10 | MCM10087H10K00 | MC-SRL1-1180 | |
| | MCM10087H20K00 | | |

Cover Unit for MCM02



Unit: mm

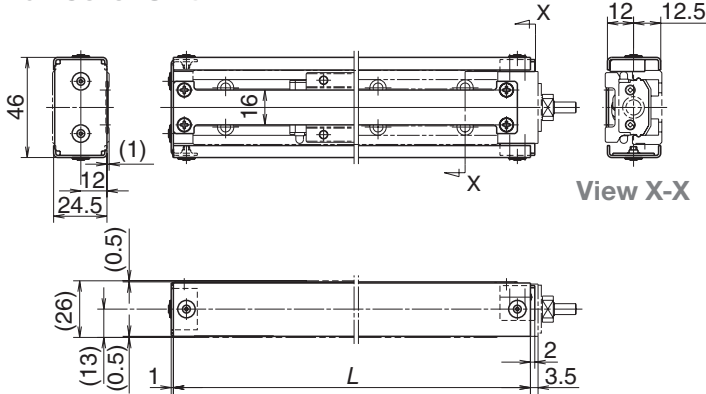
| Stroke | Part number | Length (L) |
|--------|---------------|------------|
| 50 | MC-CV02005-00 | 115 |
| 100 | MC-CV02010-00 | 165 |
| 150 | MC-CV03015-00 | 215 |

Note: Height of screw head is not included.

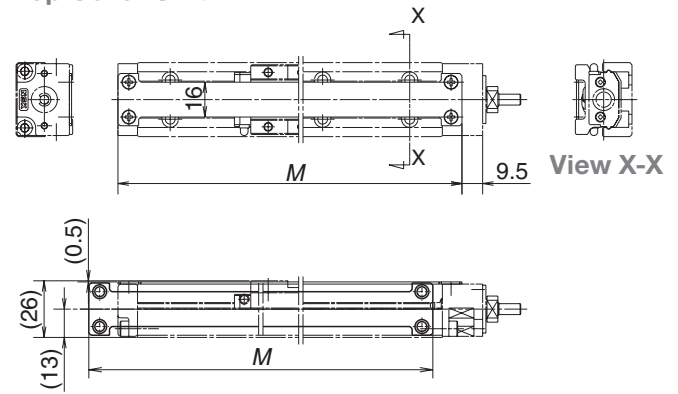
Cover Unit for MCM03

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

Full Cover Unit



Top Cover Unit



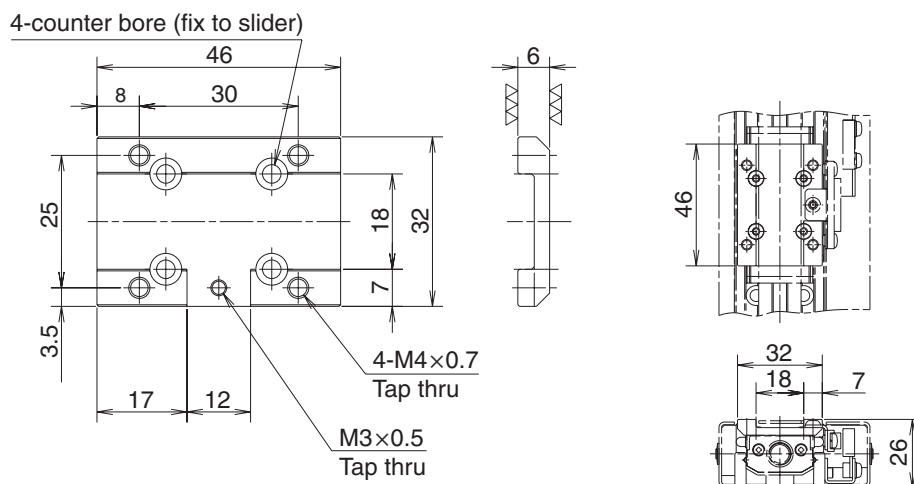
Unit: mm

| Stroke | Part number | | Cover length | |
|------------------|----------------|-----------------|--------------|------------|
| | Top cover unit | Full cover unit | Length (L) | Length (M) |
| 50 (lead 1, 2) | MC-CV03005-02 | *MC-CV03005-01 | 139 | 133 |
| 50 (lead 10, 12) | MC-CV03005-02A | *MC-CV03005-01A | 164 | 158 |
| 100 | MC-CV03010-02 | *MC-CV03010-01 | 214 | 208 |
| 150 | MC-CV03015-02 | *MC-CV03015-01 | 264 | 258 |
| 200 | MC-CV03020-02 | *MC-CV03020-01 | 314 | 308 |
| 250 | MC-CV03025-02 | *MC-CV03025-01 | 364 | 358 |

Note 1: Full-cover unit cannot be used when sensor unit is being used.

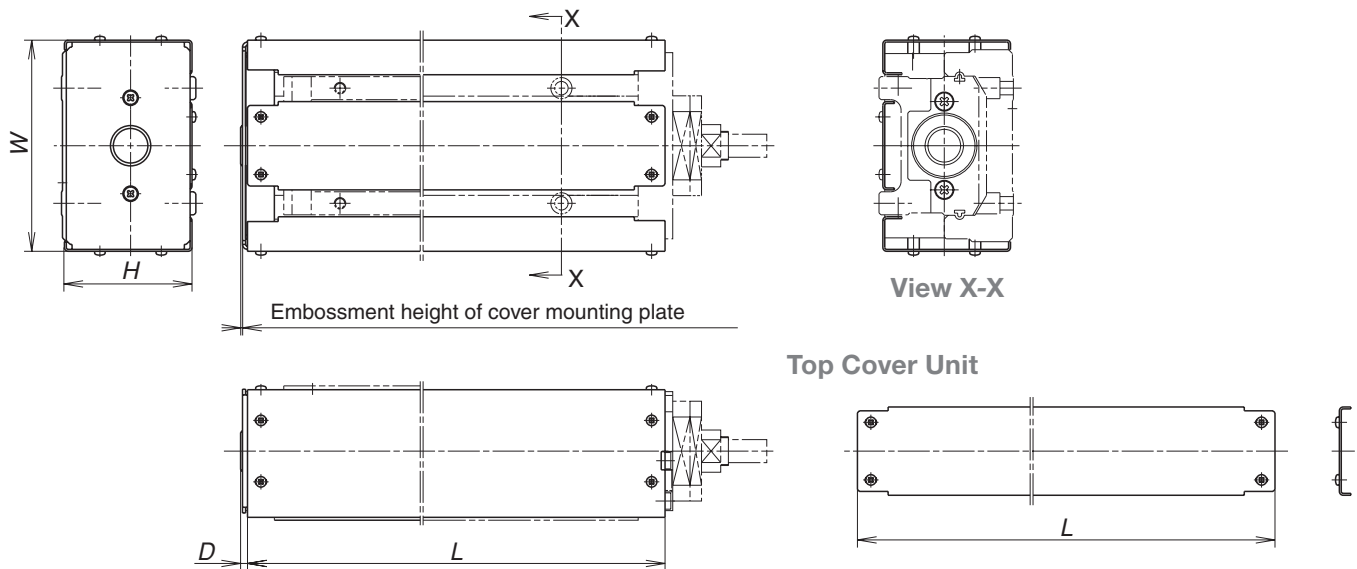
Note 2: Height of screw head is not included.

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



Unit: mm

| 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 | | | |
| | 500 | 410 | MC-CV06050-01 | MC-CV06050-00 | 675 | | | |
| | 600 | 510 | MC-CV06060-01 | MC-CV06060-00 | 775 | | | |
| MCM08 | 700 | 610 | MC-CV06070-01 | MC-CV06070-00 | 875 | 56.5 | 90 | 2.6 |
| | 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 | | | |
| | 250 | — | MC-CV08025-01 | MC-CV08025-00 | 448 | | | |
| | 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 | | | |
| MCM10 | 600 | 480 | MC-CV08060-01 | MC-CV08060-00 | 798 | 66.5 | 110 | 3.6 |
| | 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.

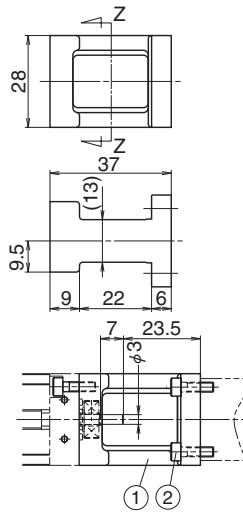
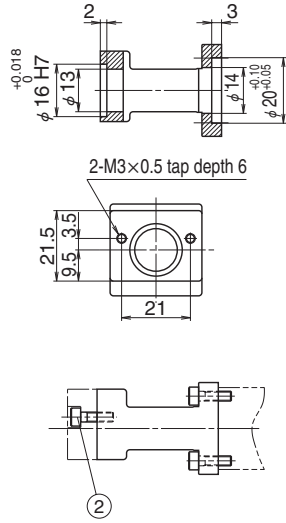
*1 When using sensor unit, full-cover unit cannot be used.

** A cover mounting plate is not used for MCM06.

Motor Bracket for MCM02

Part number

MC-BK02-128-00



① Motor bracket (A ℓ)
Black anodized aluminum

4- ϕ 3.5 drill thru
PCD 28, 90° equally spaced



Diameter for coupling
 ϕ 17 or less

View Z-Z

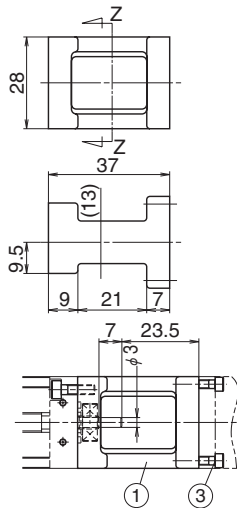
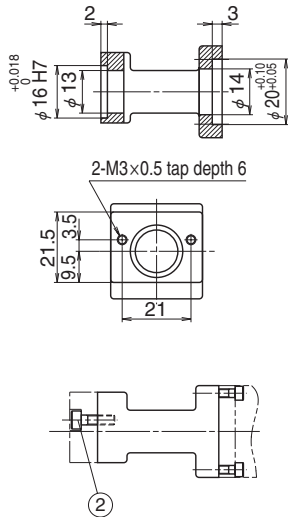
② Hexagon socket head cap screw
(M3x0.5, length 10)

| Compatible motors | |
|---|--------------------------------|
| Maker | Motor models |
| Yaskawa Electric Corp. (Σ - mini Series) | SGMM-A1 (10W) SGMM-A2 (20W) |

Note: Be sure to align centerlines when installing motor.

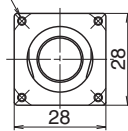
Part number

MC-BK02-133-00



① Motor bracket (A ℓ)
Black anodized aluminum

4- ϕ 2.5 drill thru
PCD 33, 90° equally spaced



Diameter for coupling
 ϕ 17 or less

View Z-Z

② Hexagon socket head cap screw
(M3x0.5, length 10)

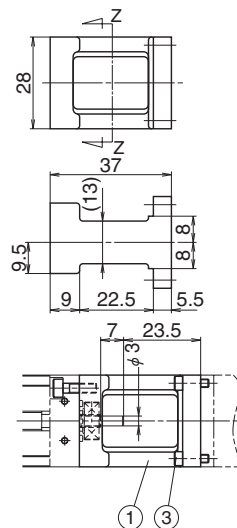
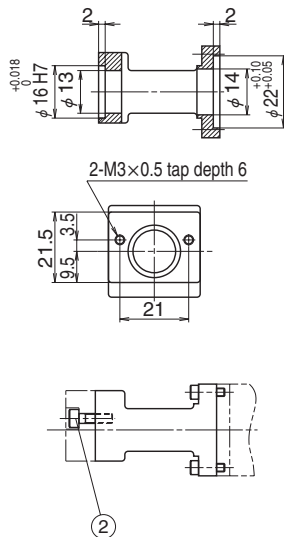
③ Hexagon socket head cap screw
(M2.5x0.45, length 10)

| Compatible motors | |
|--|----------------------------------|
| Maker | Motor models |
| Mitsubishi Electric Corp. (Melservo series) | HC-AQ013 (10W) HC-AQ023 (20W) |

Note: Be sure to align centerlines when installing motor.

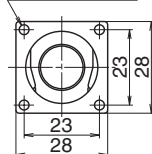
Part number

MC-BK02-223-00



① Motor bracket (A ℓ)
Black anodized aluminum

4- ϕ 3 drill thru



Diameter for coupling
 ϕ 17 or less

View Z-Z

② Hexagon socket head cap screw
(M3x0.5, length 10)

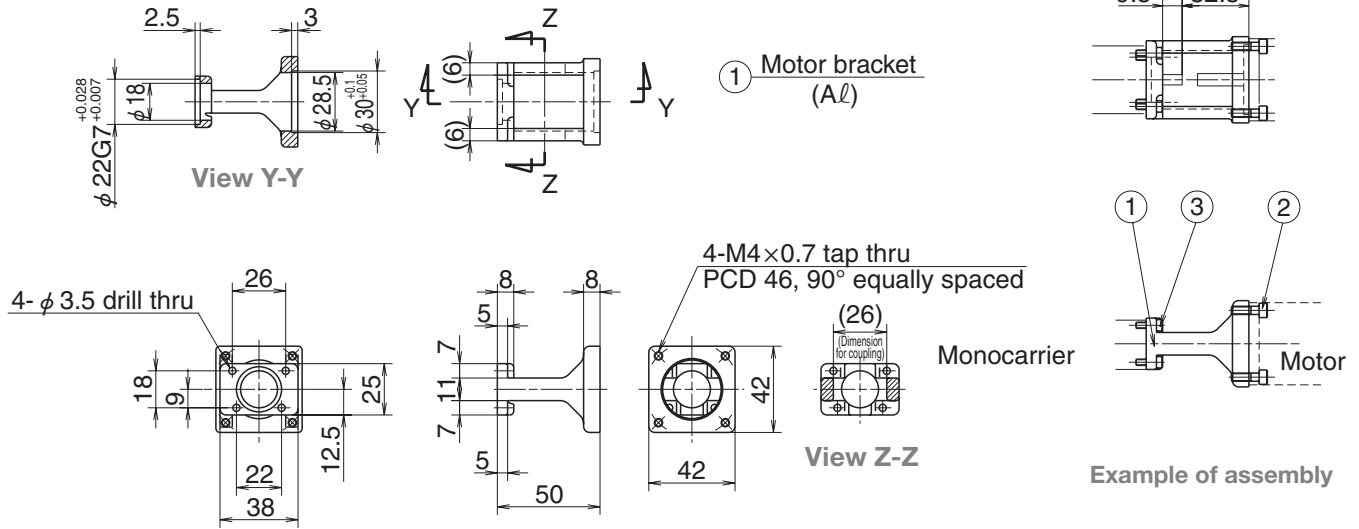
③ Hexagon socket head cap screw
(M2.5x0.45, length 10)

| Compatible motors | |
|--------------------------|--|
| Maker | Motor models |
| Oriental Motor Co., Ltd. | PMU33/35 (5-phase stepping motor) PMC33/35 (5-phase stepping motor) |

Note: Be sure to align centerlines when installing motor.

Motor Bracket for MCM03

Part number
MC-BK03-146-00



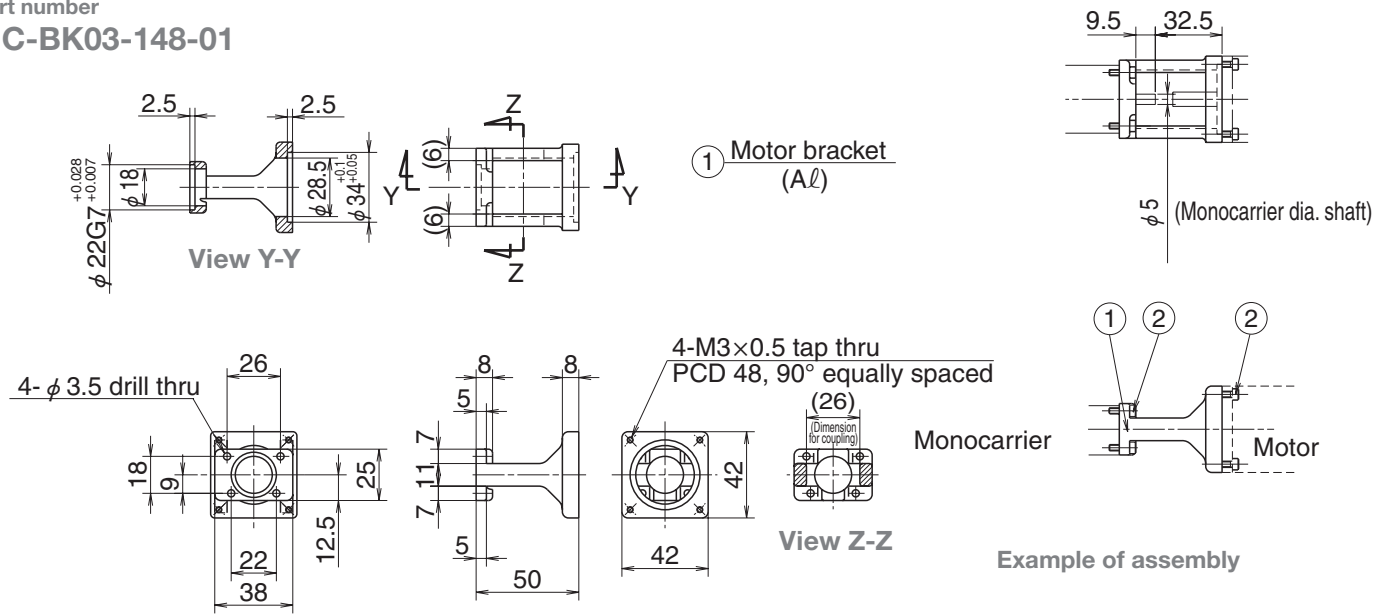
- ② Hexagon socket head cap screw (M4, length 12)
- ③ Hexagon socket head cap screw (M3, length 10)

| 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



- ② Hexagon socket head cap screw (M3, length 10)

| 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.

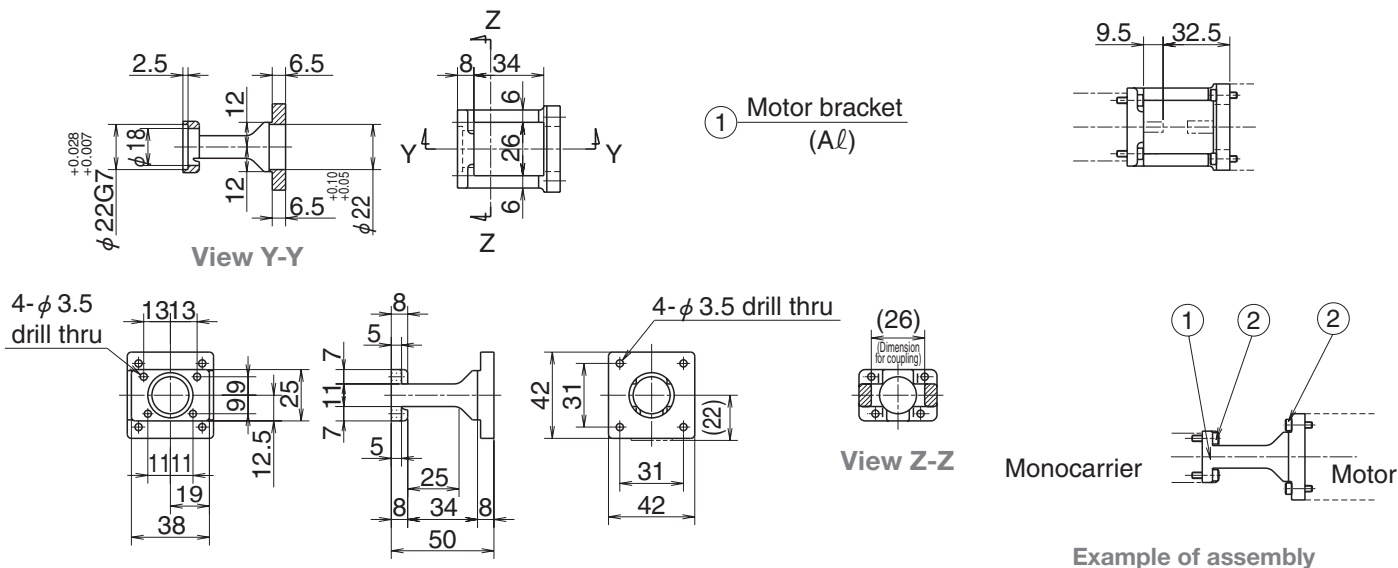
Motor Bracket for MCM Series

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.

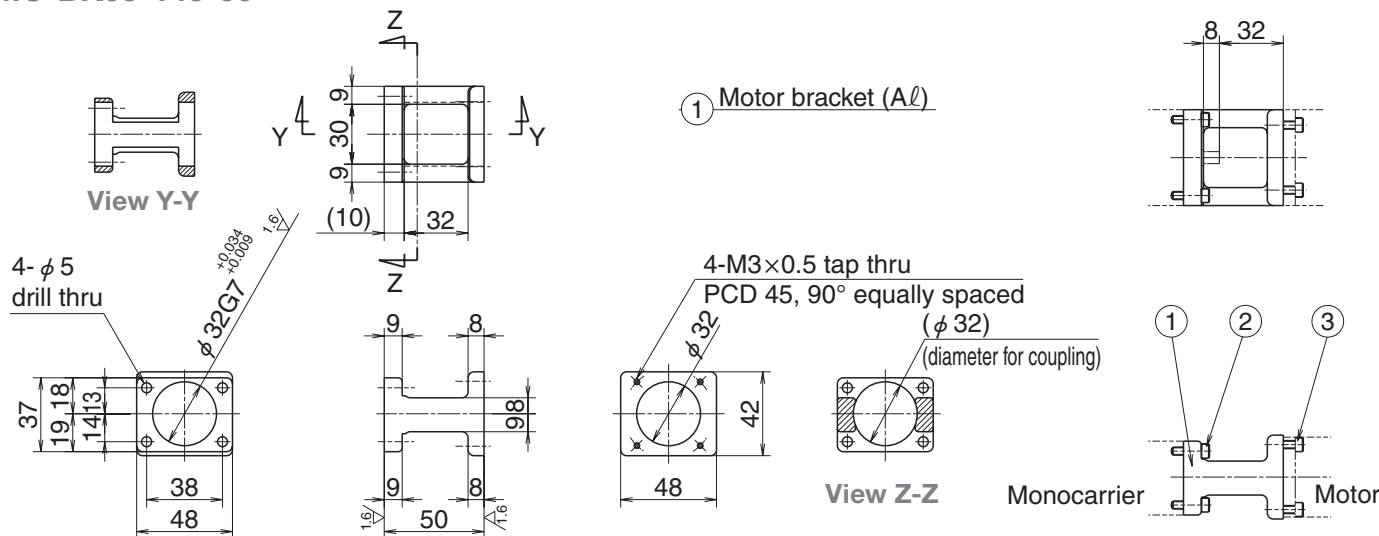
Note 2: Be careful in the assembly orientation of bracket.

Note 3: Because bracket is made by sand casting, external dimensions are for reference only.

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-BK05-146-00

① Motor bracket (Aℓ)

View Y-Y

View Z-Z

4-φ5 drill thru

4-M4×0.7 tap thru
PCD 46, 90° equally spaced
(φ 32)
(diameter for coupling)

Monocarrier Motor

② Hexagon socket head cap screw (M4, length 15)

③ Hexagon socket head cap screw (M4, length 12)

| 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-BK05-148-00

① Motor bracket (Aℓ)

View Y-Y

View Z-Z

4-φ5 drill thru

4-M3×0.5 tap thru
PCD 48, 90° equally spaced
(φ 32)
(diameter for coupling)

Monocarrier Motor

② Hexagon socket head cap screw (M4, length 15)

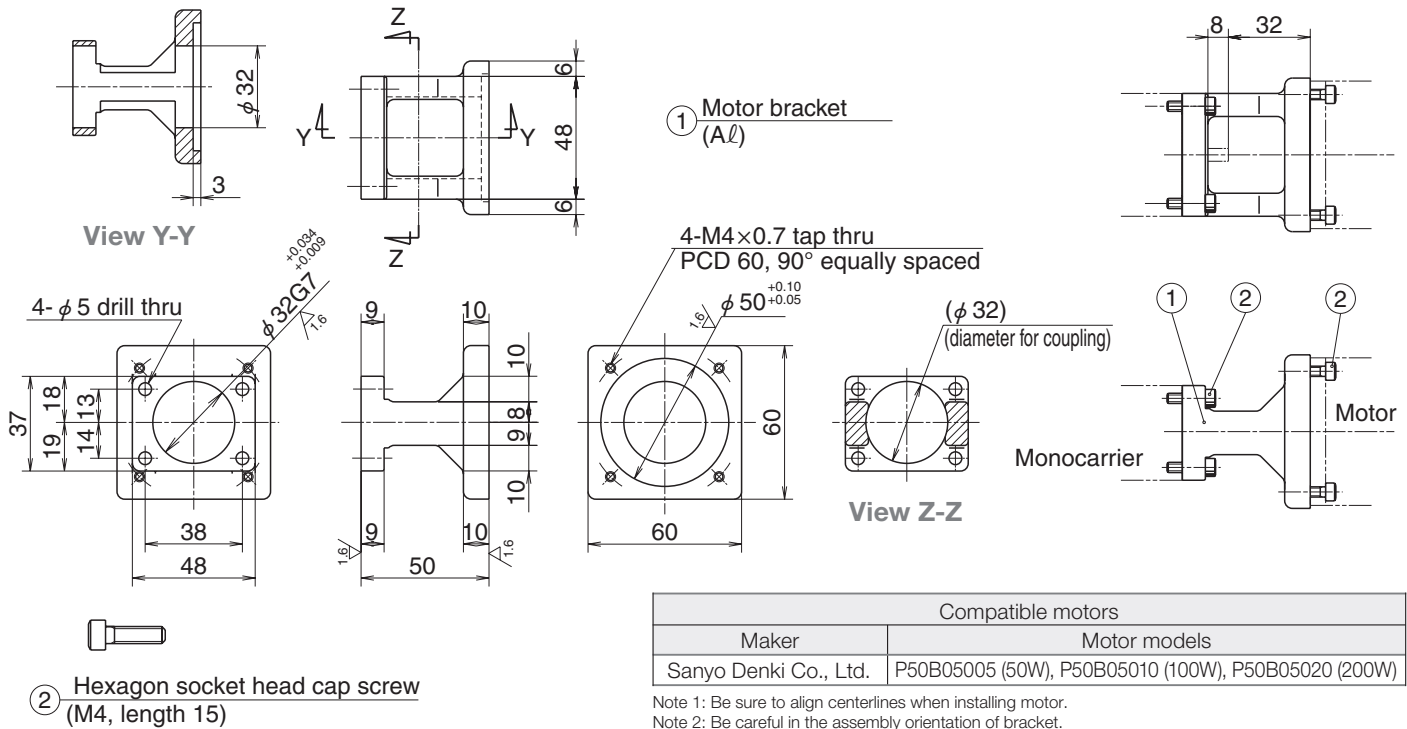
③ Hexagon socket head cap screw (M3, length 12)

| 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 MCM05

Part number
MC-BK05-160-00



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

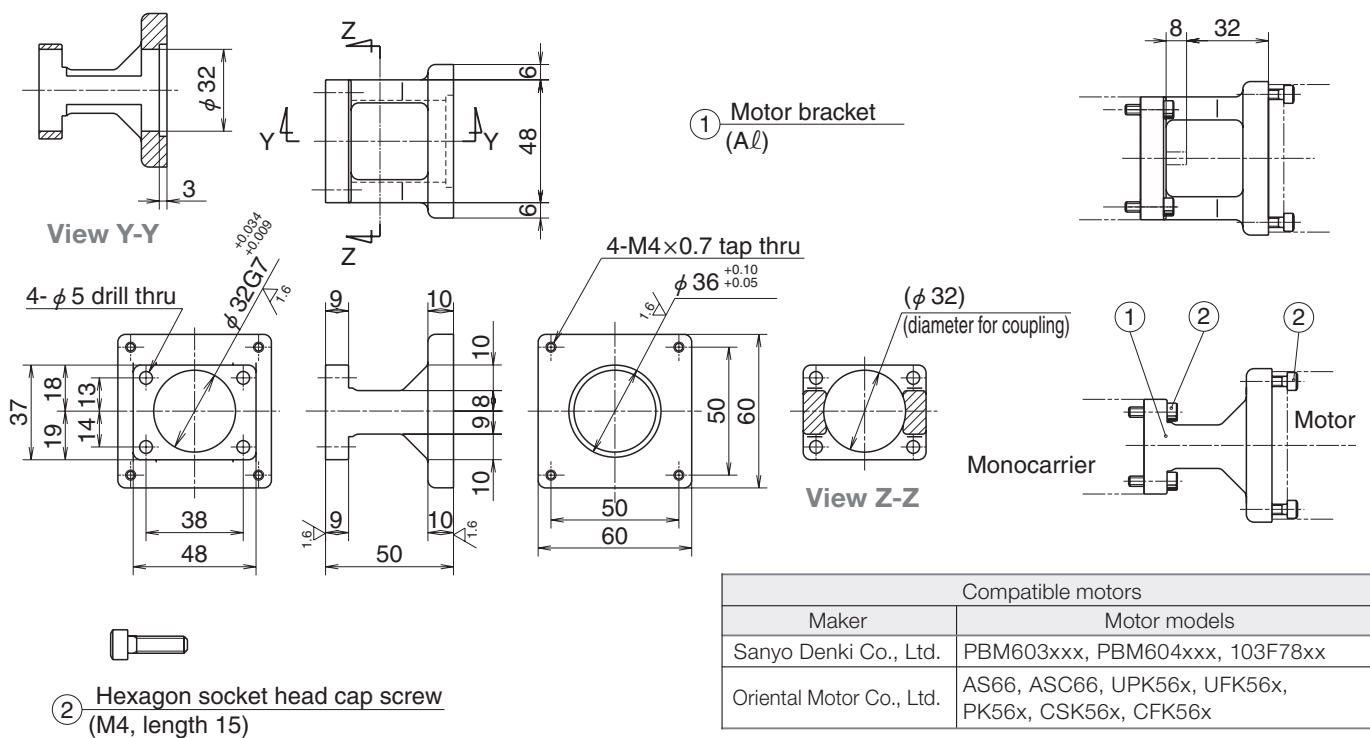
Note 1: Be sure to align centerlines when installing motor.

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 MCM05

Part number
MC-BK05-250-00



| Compatible motors | |
|--------------------------|--|
| Maker | Motor models |
| Sanyo Denki Co., Ltd. | PBM603xxx, PBM604xxx, 103F78xx |
| Oriental Motor Co., Ltd. | AS66, ASC66, UPK56x, UFK56x, PK56x, CSK56x, CFK56x |

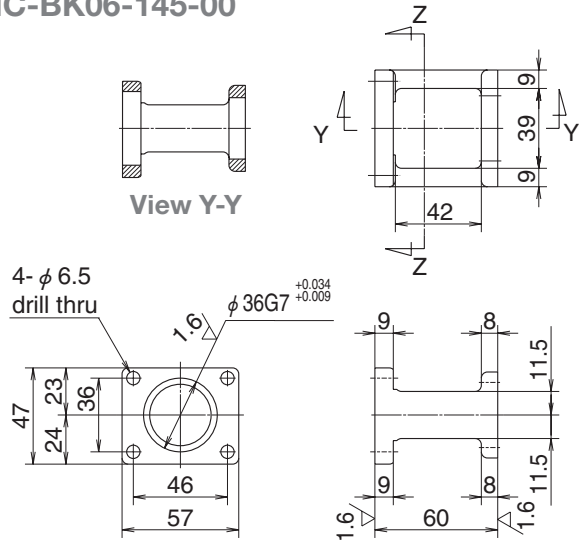
Note 1: Be sure to align centerlines when installing motor.

Note 2: Be careful in the assembly orientation of bracket.

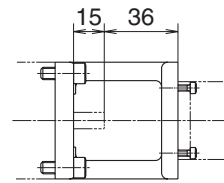
Note 3: Because bracket is made by sand casting, external dimensions are for reference only.

Motor Bracket for MCM06

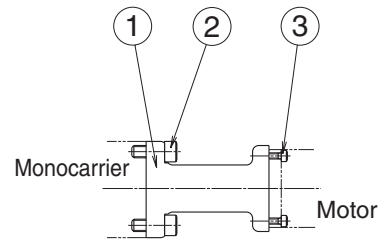
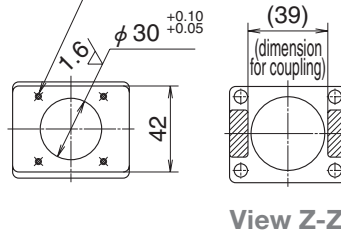
Part number
MC-BK06-145-00



① Motor bracket (AL)



4-M3×0.5 tap thru
PCD 45, 90° equally spaced



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 Industrial Co., Ltd. | MSMD5A (50W), MSMD01 (100W) |

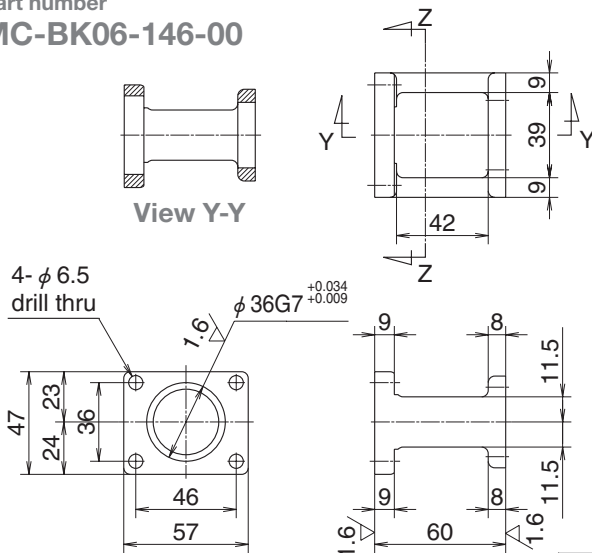
Note 1: Be sure to align centerlines when installing motor.

Note 2: Be careful in the assembly orientation of bracket.

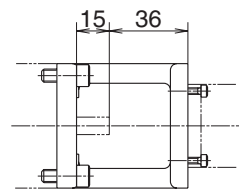
Note 3: Because bracket is made by sand casting, external dimensions are for reference only.

Motor Bracket for MCM06

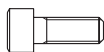
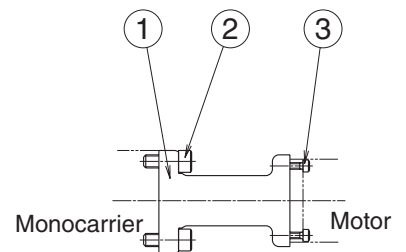
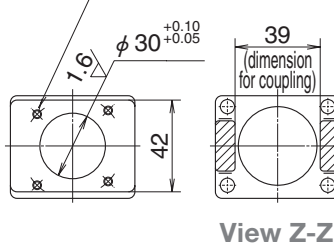
Part number
MC-BK06-146-00



① Motor bracket (AL)



4-M4×0.7 tap thru
PCD 46, 90° equally spaced



② Hexagon socket head cap screw (M6, length 16)



③ Hexagon socket head cap screw (M4, length 12)

| Compatible motors | |
|---------------------------|---|
| Maker | Motor models |
| Yaskawa Electric Corp. | SGMAH-A5 (50W), SGMAH-01 (100W) SGMAS-A5A (50W), SGMAS-01A (100W), SGMAS-C2A (150W) |
| 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) |

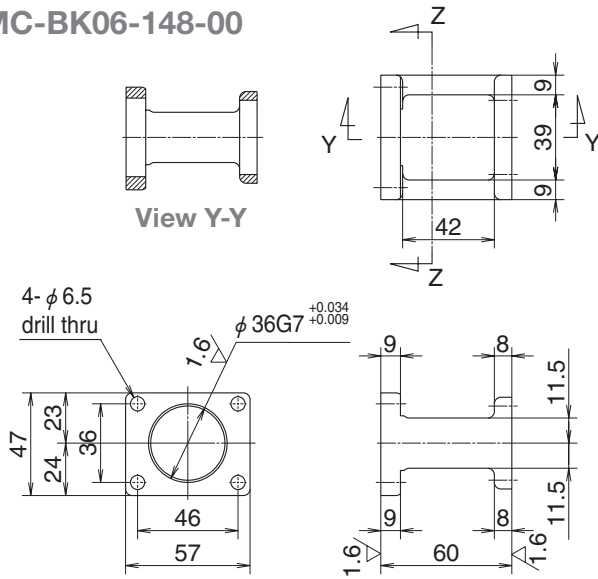
Note 1: Be sure to align centerlines when installing motor.

Note 2: Be careful in the assembly orientation of bracket.

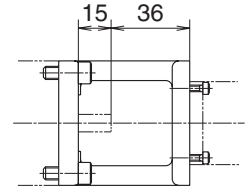
Note 3: Because bracket is made by sand casting, external dimensions are for reference only.

Motor Bracket for MCM06

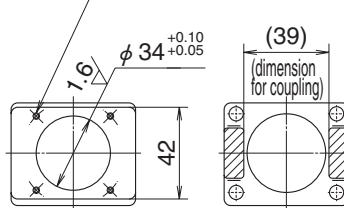
Part number
MC-BK06-148-00



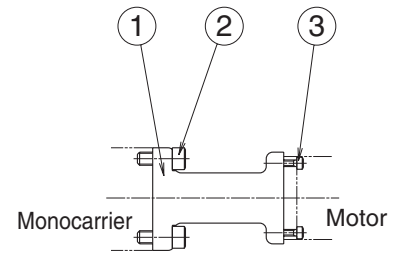
① Motor bracket (Al)



4-M3×0.5 tap thru
PCD 48, 90° equally spaced



View Z-Z



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) |

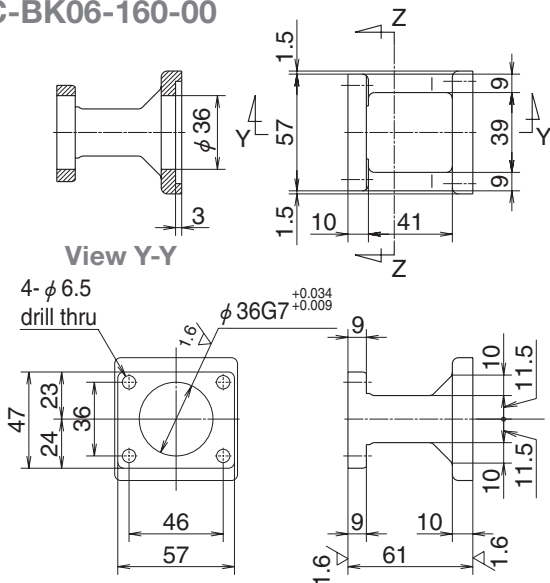
Note 1: Be sure to align centerlines when installing motor.

Note 2: Be careful in the assembly orientation of bracket.

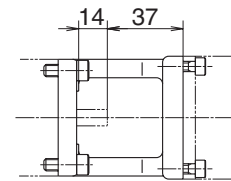
Note 3: Because bracket is made by sand casting, external dimensions are for reference only.

Motor Bracket for MCM06

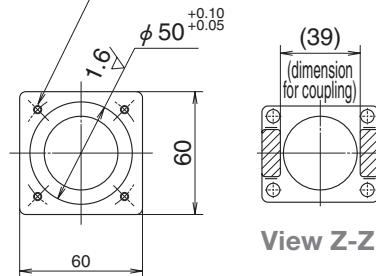
Part number
MC-BK06-160-00



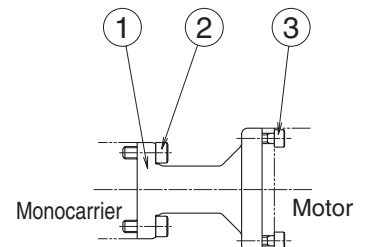
① Motor bracket (Al)



4-M4×0.7 tap thru
PCD 60, 90° equally spaced



View Z-Z



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) |

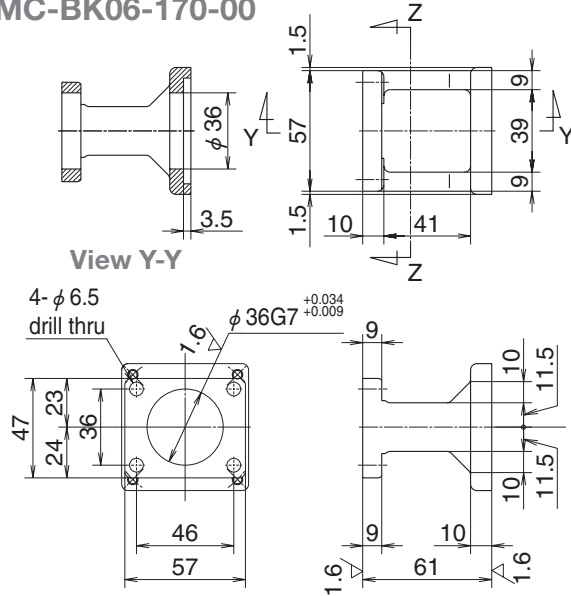
Note 1: Be sure to align centerlines when installing motor.

Note 2: Be careful in the assembly orientation of bracket.

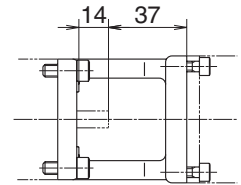
Note 3: Because bracket is made by sand casting, external dimensions are for reference only.

Motor Bracket for MCM06

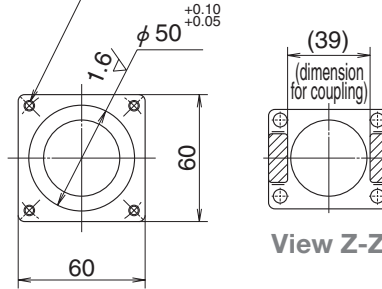
Part number
MC-BK06-170-00



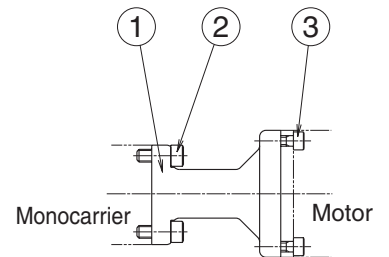
① Motor bracket (AL)



4-M5×0.8 tap thru
PCD 70, 90° equally spaced



View Z-Z



② Hexagon socket head cap screw (M6, length 16)



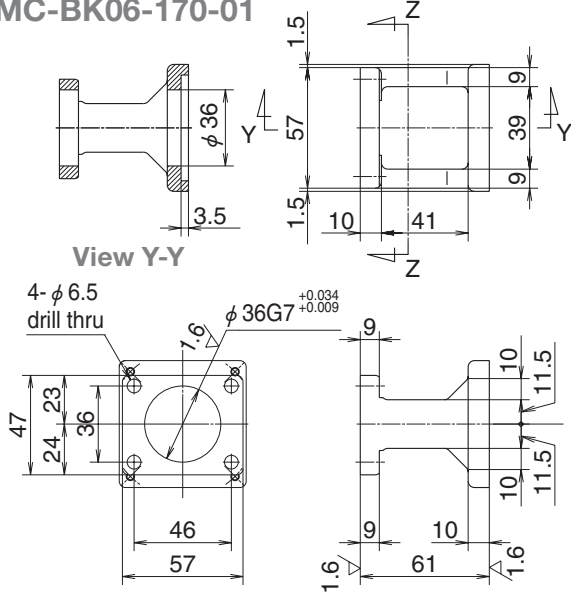
③ Hexagon socket head cap screw (M5, length 14)

| Compatible motors | |
|---------------------------|--|
| Maker | Motor models |
| Yaskawa Electric Corp. | SGMAH-02 (200W), SGMAS-02A (200W), 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) |

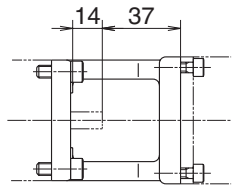
Note 1: Be sure to align centerlines when installing motor.
 Note 2: Be careful in the assembly orientation of bracket.
 Note 3: Because bracket is made by sand casting, external dimensions are for reference only.

Motor Bracket for MCM06

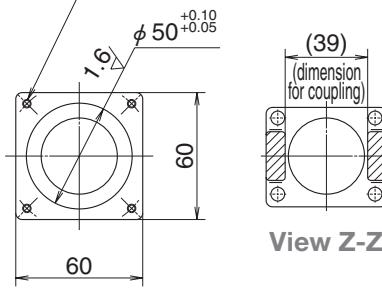
Part number
MC-BK06-170-01



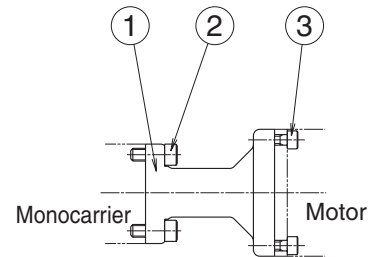
① Motor bracket (AL)



4-M4×0.7 tap thru
PCD 70, 90° equally spaced



View Z-Z



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.

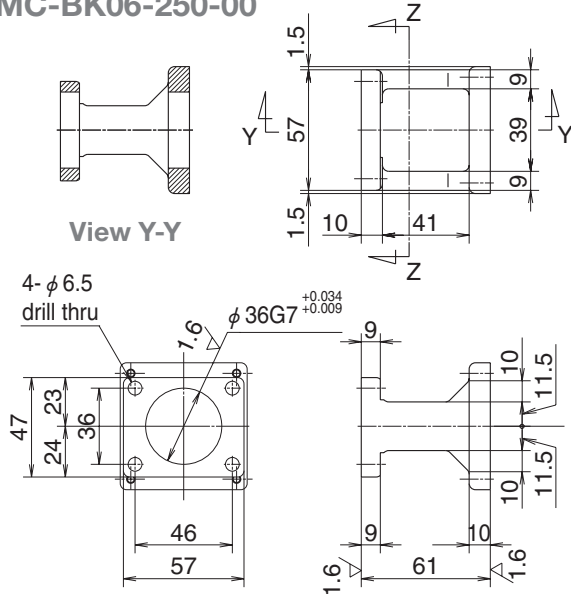
Motor Bracket for MCM Series

Accessories

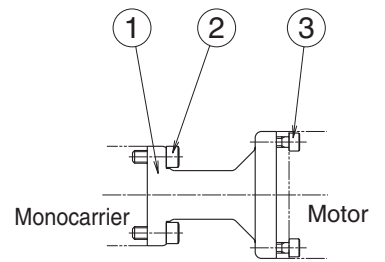
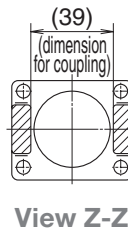
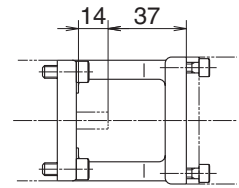
Motor Bracket for MCM06

Part number

MC-BK06-250-00



① Motor bracket (AL)



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

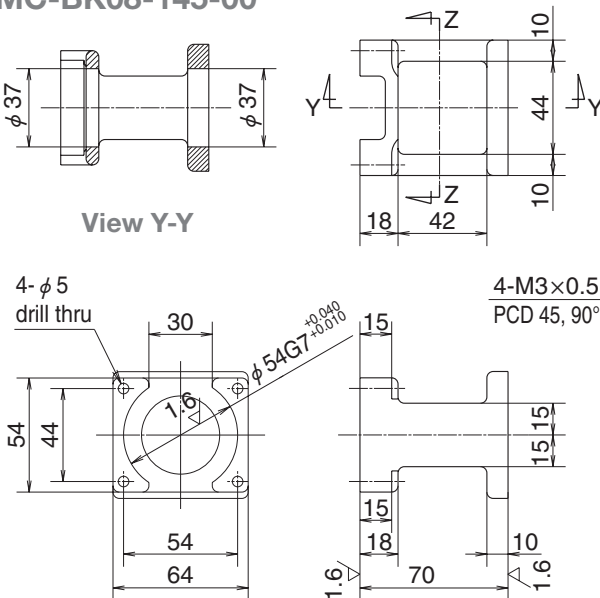
| Compatible motors | |
|--------------------------|--|
| Maker | Motor models |
| Sanyo Denki Co., Ltd. | PBM603xxx, PBM604xxx, 103F78xx |
| Oriental Motor Co., Ltd. | AS66, ASC66, UPK56x, PK56x, CSK56x, CFK56x, UFK56x |

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.

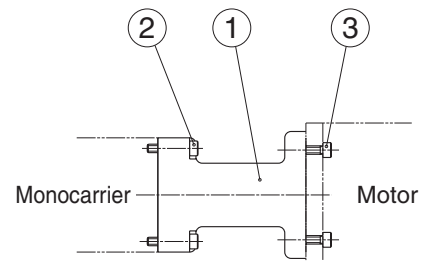
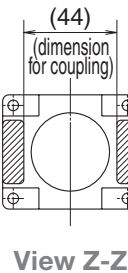
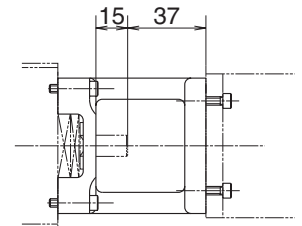
Motor Bracket for MCM08

Part number

MC-BK08-145-00



① Motor bracket (AL)



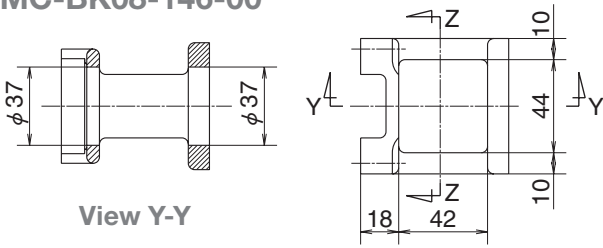
- ② Hexagon socket head cap screw (M4, length 20)
- ③ Hexagon socket head cap screw (M3, length 12)

| Compatible motors | |
|--|---------------|
| Maker | Motor models |
| Matsushita Electric Industrial Co., Ltd. | MSMD01 (100W) |

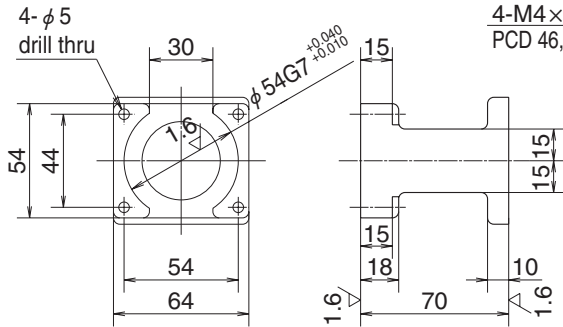
Note 1: Be sure to align centerlines when installing motor.
 Note 2: Be careful in the assembly orientation of bracket.
 Note 3: Because bracket is made by sand casting, external dimensions are for reference only.

Motor Bracket for MCM08

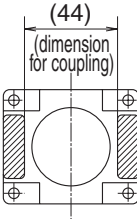
Part number
MC-BK08-146-00



View Y-Y

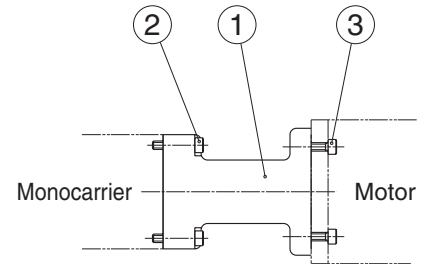
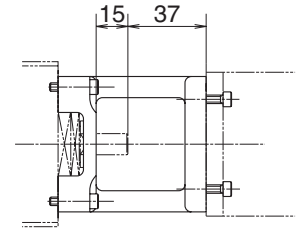


4-M4×0.7 tap thru
PCD 46, 90° equally spaced



View Z-Z

① Motor bracket (AL)



Monocarrier

Motor

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) |

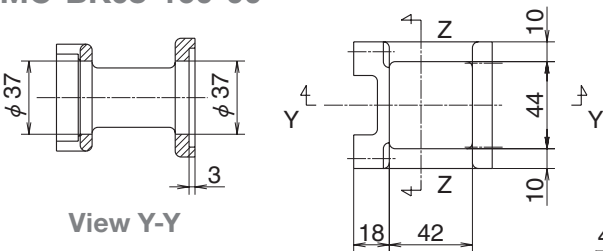
Note 1: Be sure to align centerlines when installing motor.
 Note 2: Be careful in the assembly orientation of bracket.
 Note 3: Because bracket is made by sand casting, external dimensions are for reference only.

② Hexagon socket head cap screw (M4, length 20)

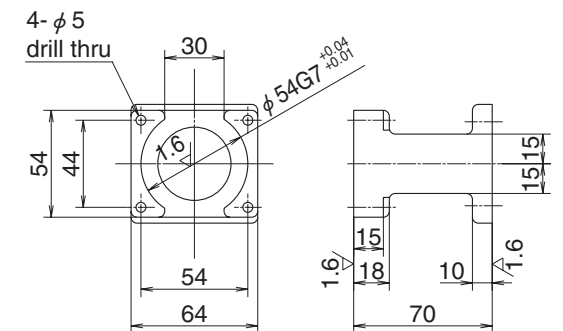
③ Hexagon socket head cap screw (M4, length 14)

Motor Bracket for MCM08

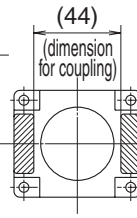
Part number
MC-BK08-160-00



View Y-Y

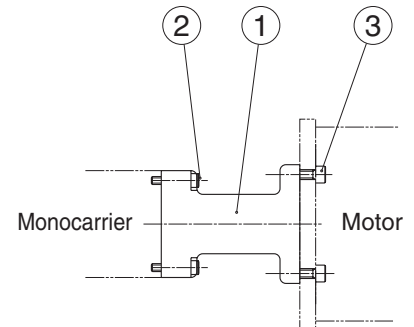
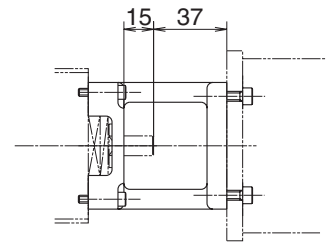


4-M4×0.7 tap thru
PCD 60, 90° equally spaced



View Z-Z

① Motor bracket (AL)



Monocarrier

Motor

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)

Monocarriers MCM Series

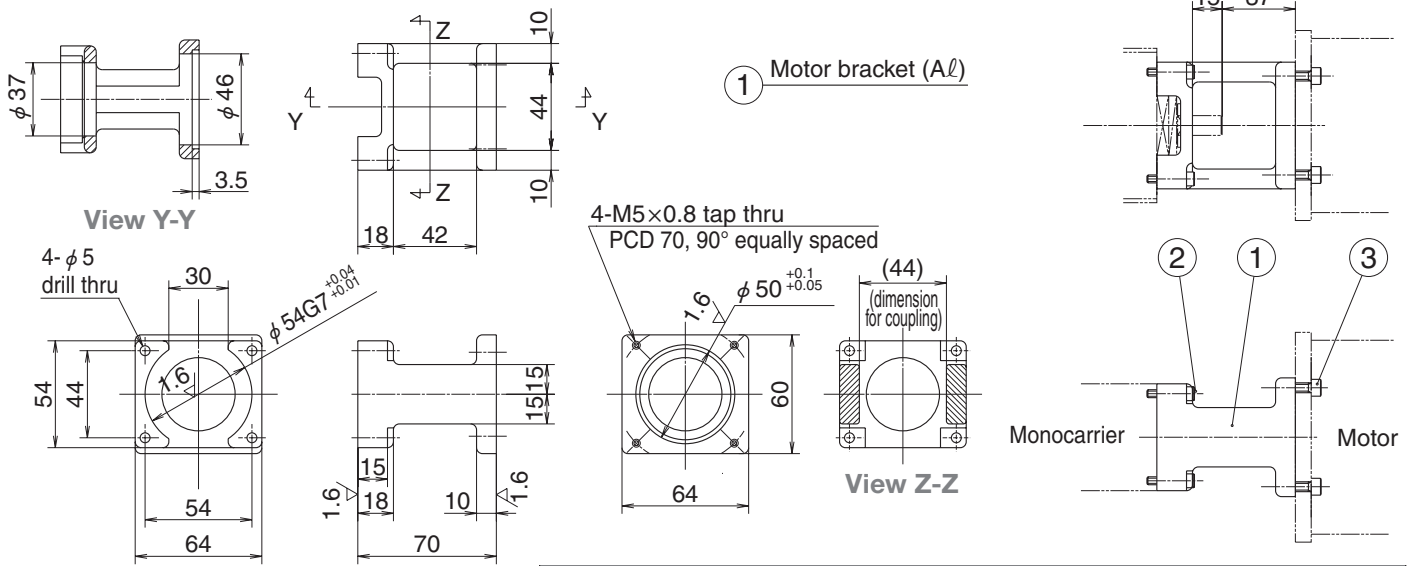
Motor Bracket for MCM Series

Accessories

Motor Bracket for MCM08

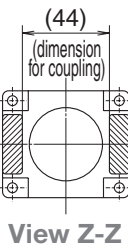
Part number

MC-BK08-170-00



① Motor bracket (Al)

4-M5×0.8 tap thru
PCD 70, 90° equally spaced



View Z-Z

Monocarrier Motor

| 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.

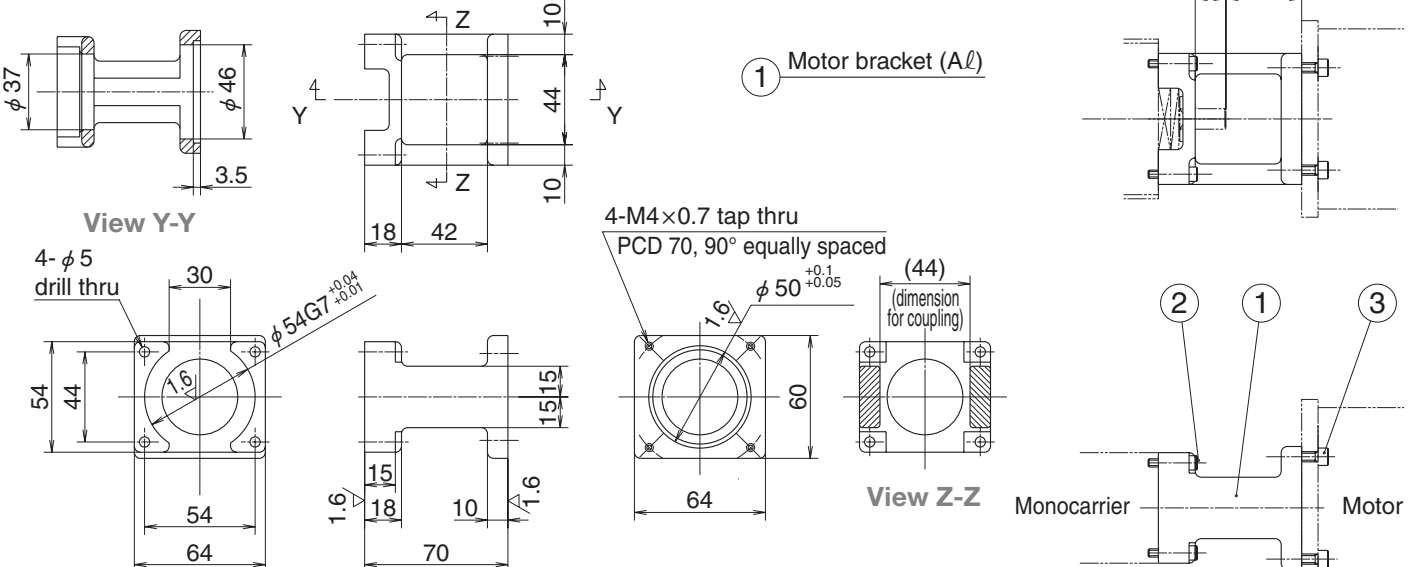
② Hexagon socket head cap screw (M4, length 20)

③ Hexagon socket head cap screw (M5, length 14)

Motor Bracket for MCM08

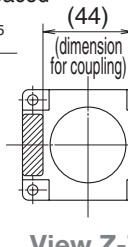
Part number

MC-BK08-170-01



① Motor bracket (Al)

4-M4×0.7 tap thru
PCD 70, 90° equally spaced



View Z-Z

Monocarrier Motor

| Compatible motors | |
|--|--|
| Maker | Motor models |
| Matsushita Electric Industrial Co., Ltd. | MSMD02 (200W), MAMA02 (200W), MSMD04 (400W), MAMA04 (400W) |

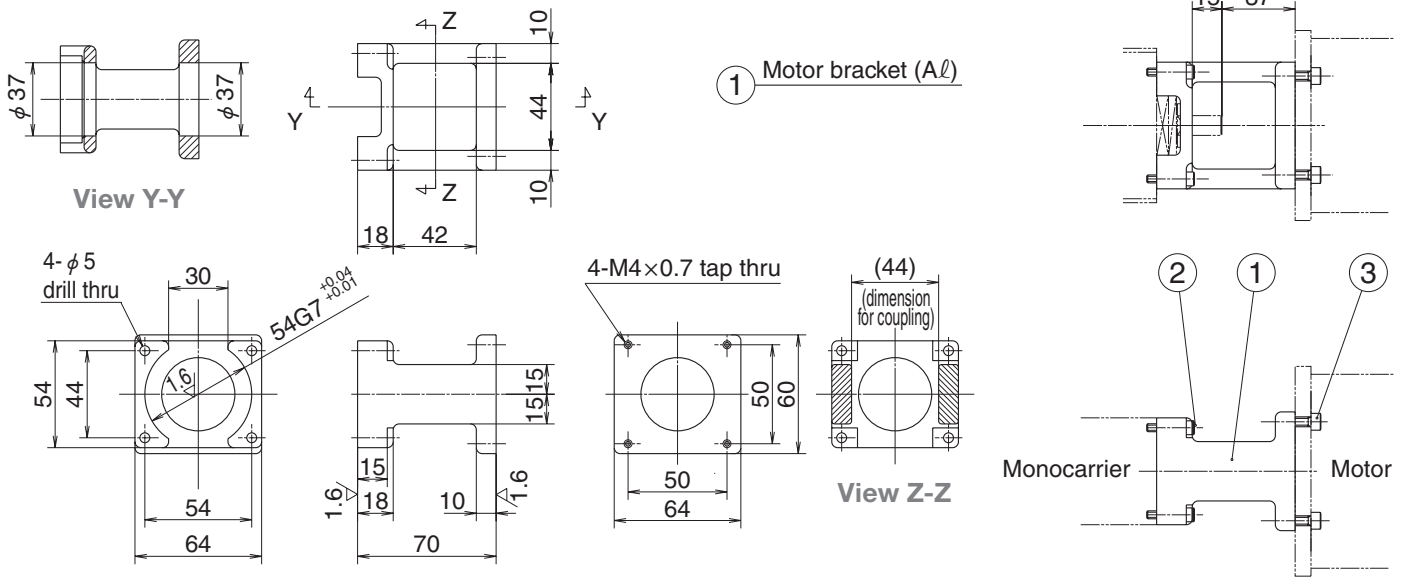
Note 1: Be sure to align centerlines when installing motor.
 Note 2: Be careful in the assembly orientation of bracket.
 Note 3: Because bracket is made by sand casting, external dimensions are for reference only.

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-BK08-250-00



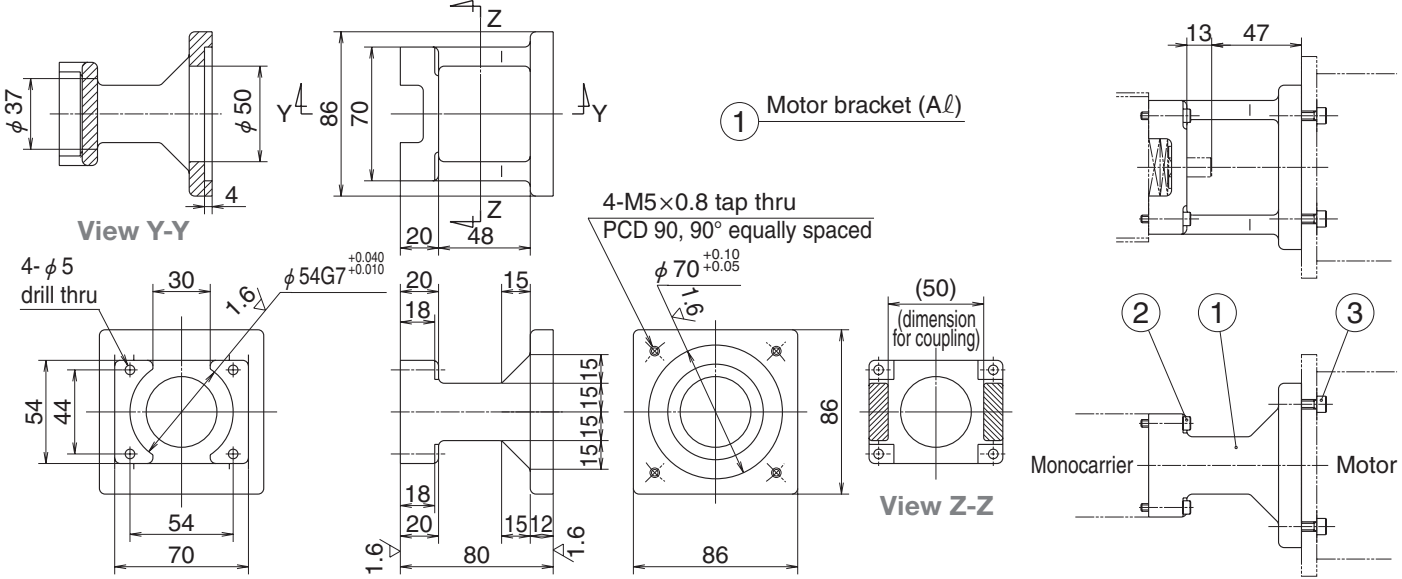
- ② Hexagon socket head cap screw (M4, length 20)
- ③ Hexagon socket head cap screw (M4, length 14)

| 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-BK08-190-00



- 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) |

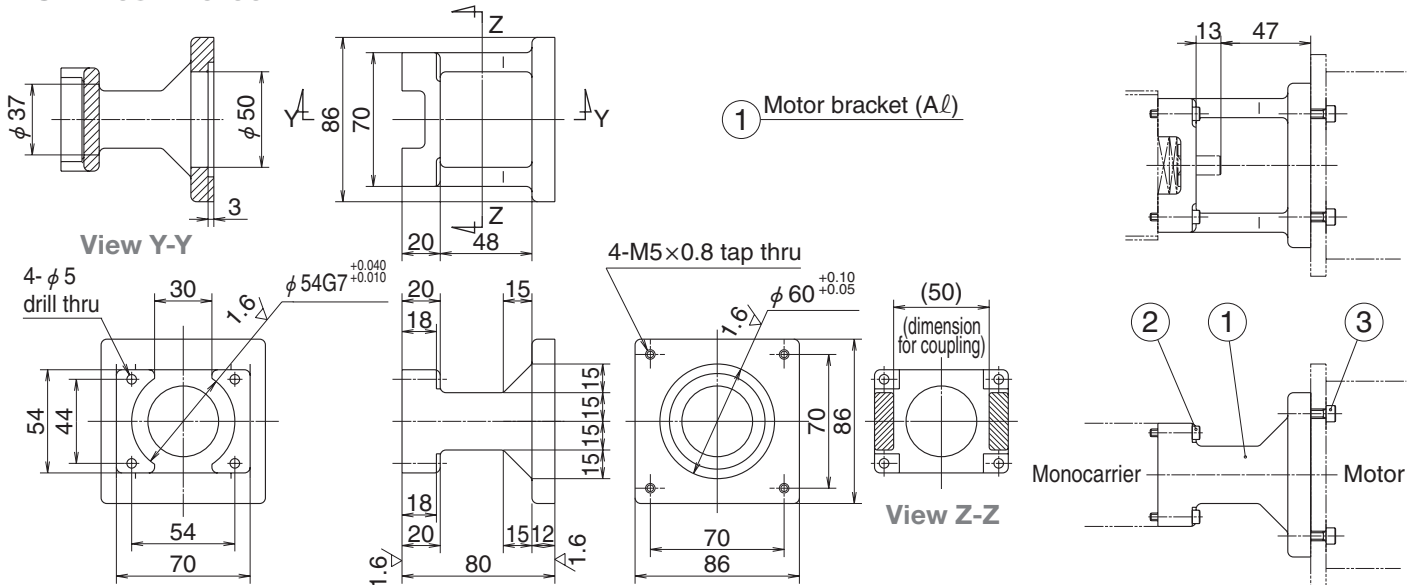
Note 1: Be sure to align centerlines when installing motor.
 Note 2: Be careful in the assembly orientation of bracket.
 Note 3: Because bracket is made by sand casting, external dimensions are for reference only.



Monocarriers MCM Series

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)

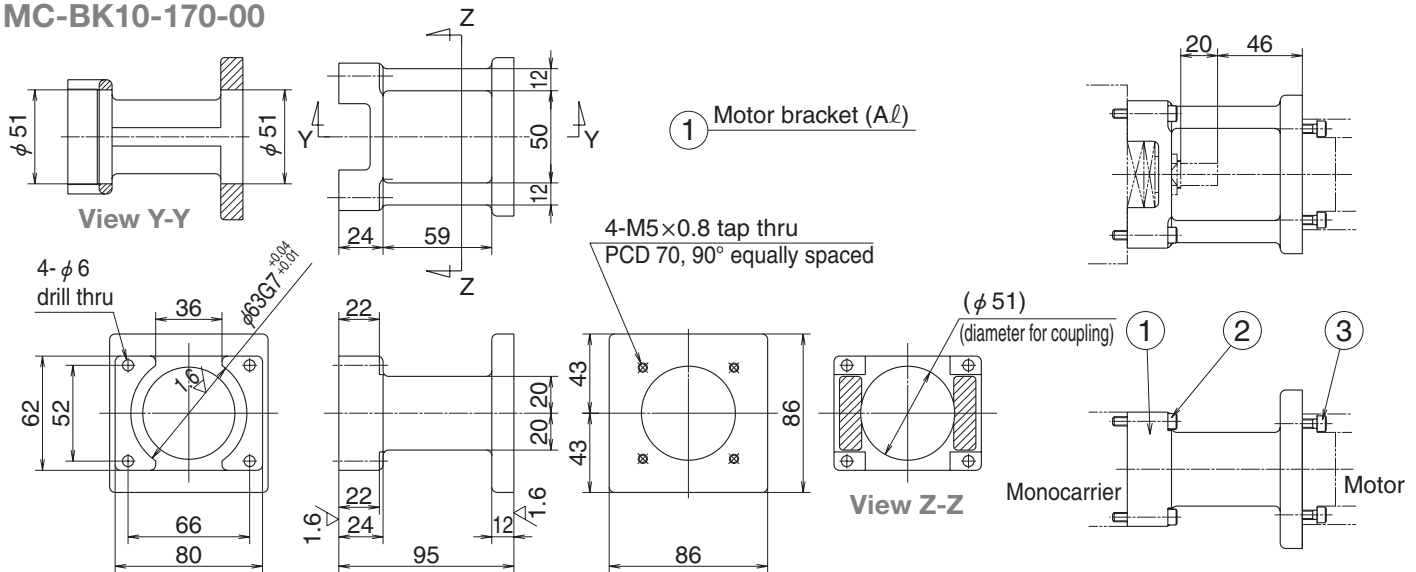
| Compatible motors | |
|--------------------------|---|
| Maker | Motor models |
| Oriental Motor Co., Ltd. | AS98, UPK59x, PK59x, CSK59x, CFK59x, UFK59x |
| Sanyo Denki Co., Ltd. | 103F85xx |



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.

Motor Bracket for MCM10

Part number

MC-BK10-170-00



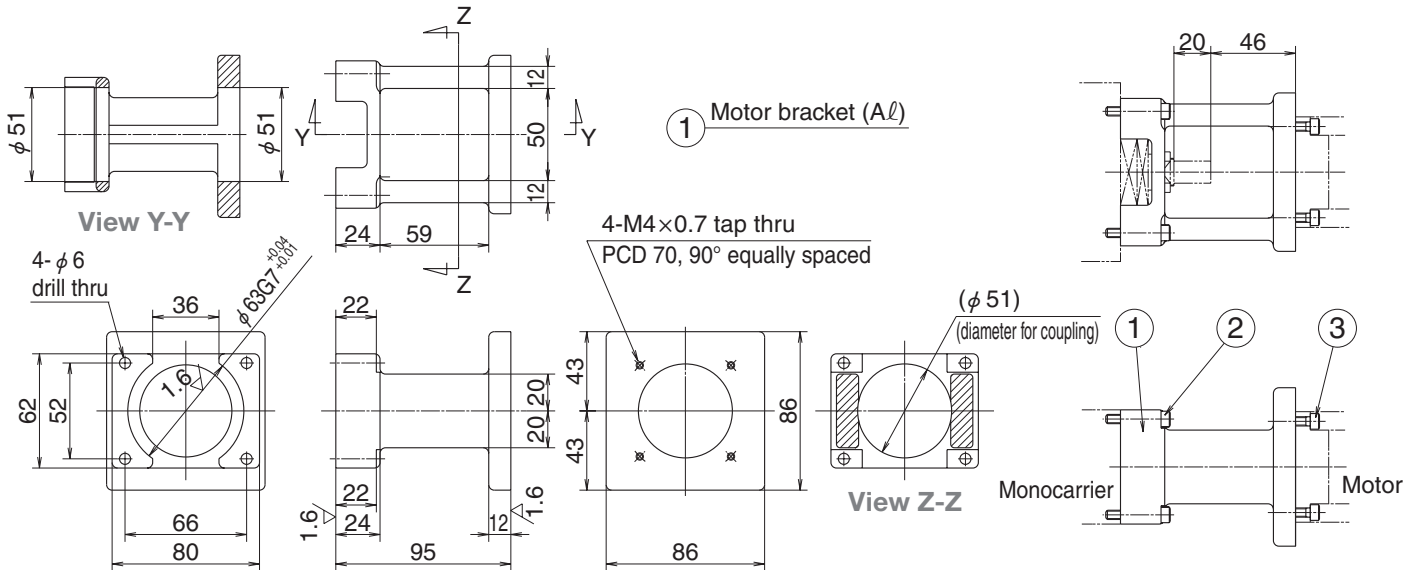
-  ② Hexagon socket head cap screw (M5, length 30)
-  ③ Hexagon socket head cap screw (M5, length 16)

| Compatible motors | |
|---------------------------|--|
| Maker | Motor models |
| Yaskawa Electric Corp. | SGMAH-02 (200W), SGMAS-02A (200W), 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.

Motor Bracket for MCM10

Part number
MC-BK10-170-01



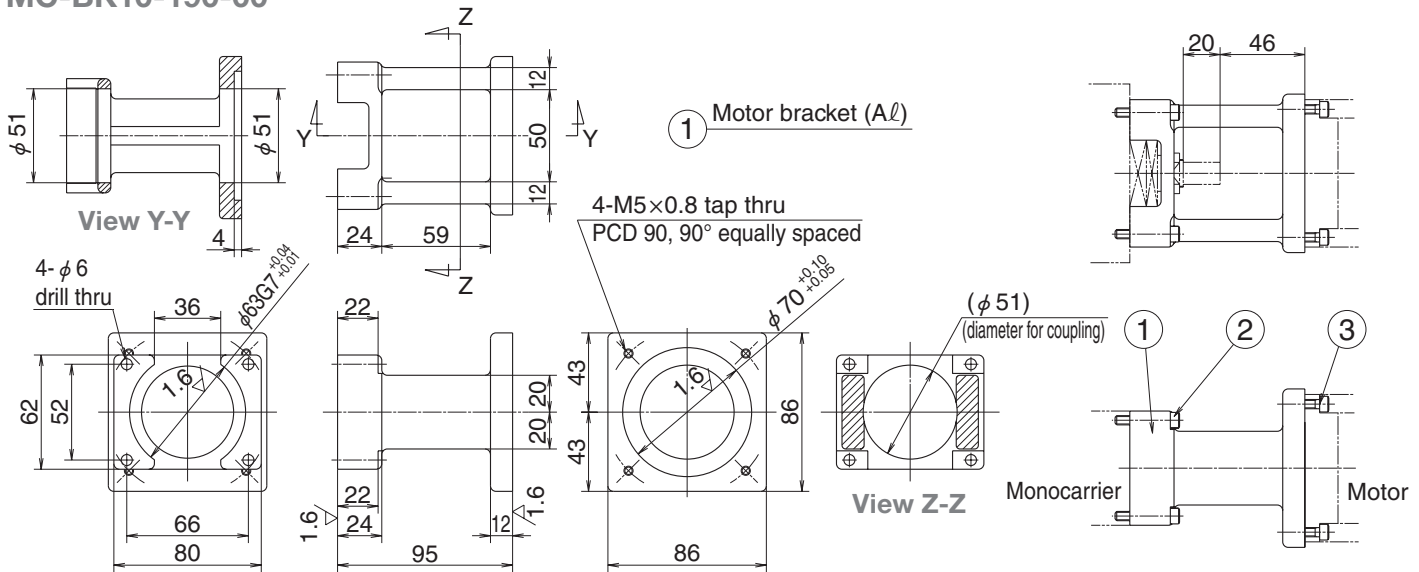
- ② Hexagon socket head cap screw (M5, length 30)
- ③ Hexagon socket head cap screw (M4, length 16)

| 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-BK10-190-00



- ② Hexagon socket head cap screw (M5, length 30)
- ③ Hexagon socket head cap screw (M5, length 16)

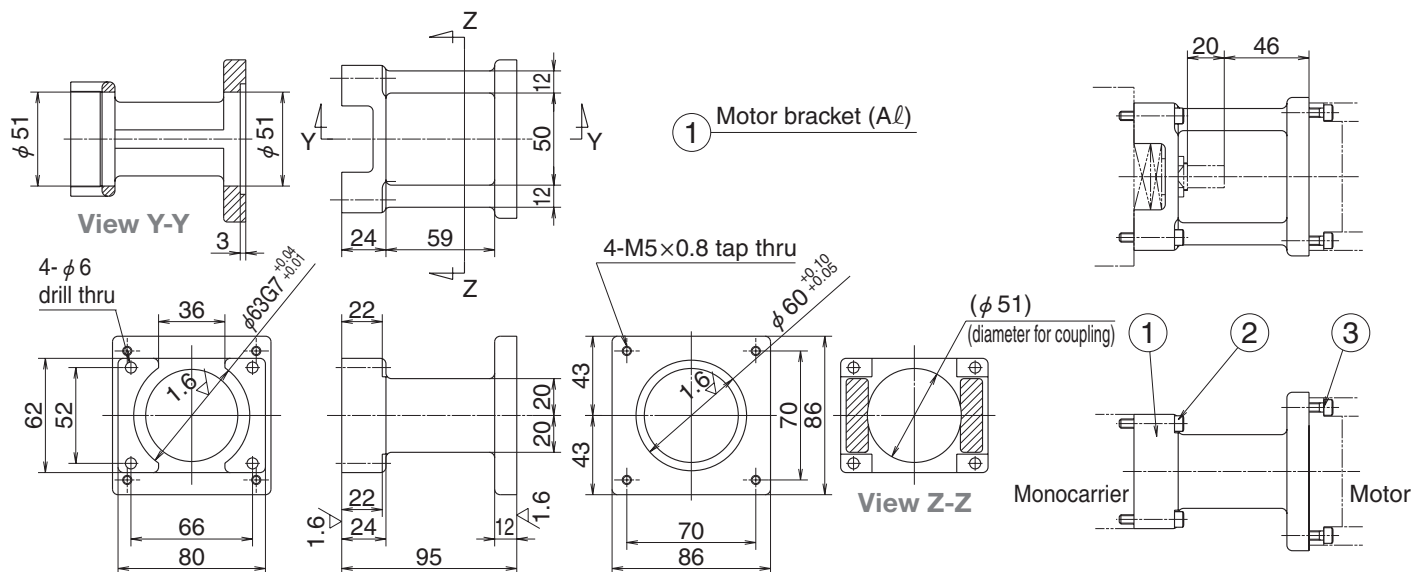
| Compatible motors | |
|--|--|
| Maker | Motor models |
| Matsushita Electric Industrial Co., Ltd. | MSMD08 (750W), MAMA08 (750W) |
| Sanyo Denki Co., Ltd. | P50B07020 (200W), P50B07030 (300W), P50B07040 (400W) |

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.

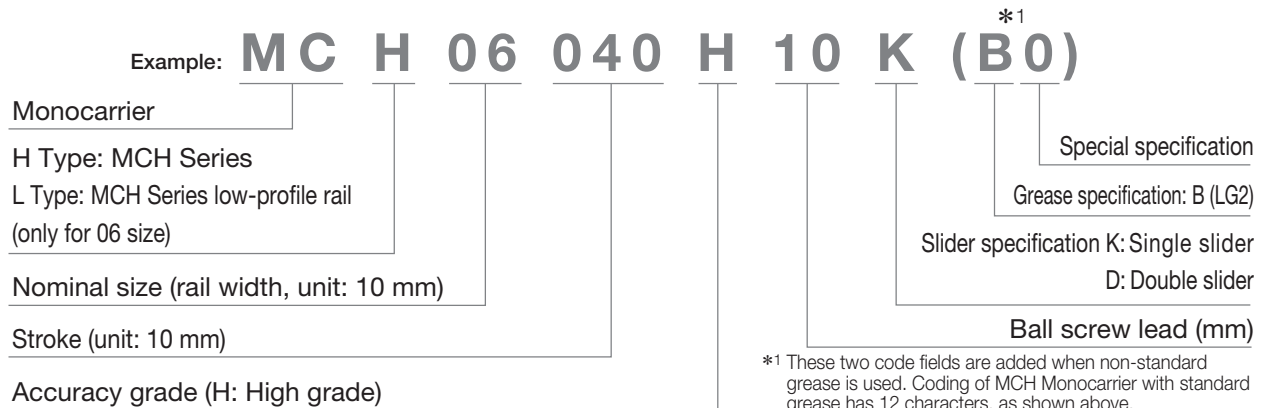
Note 2: Be careful in the assembly orientation of bracket.

Note 3: Because bracket is made by sand casting, external dimensions are for reference only.

Monocarriers MCH Series

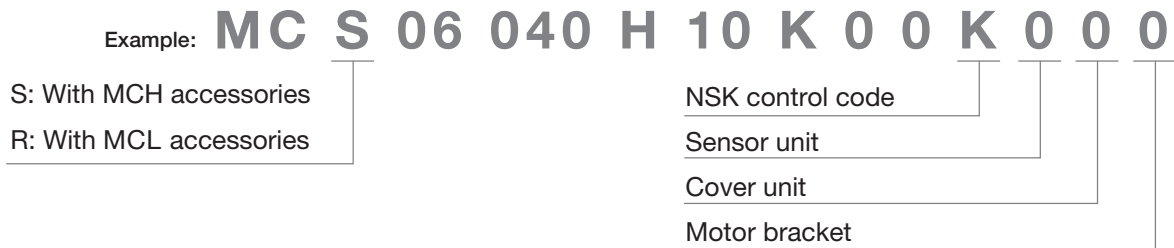
Part Number for MCH Series

Body



*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



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 peices) | MC—SRH**—12 |
| 4 | Photo sensor 3 peices | 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)

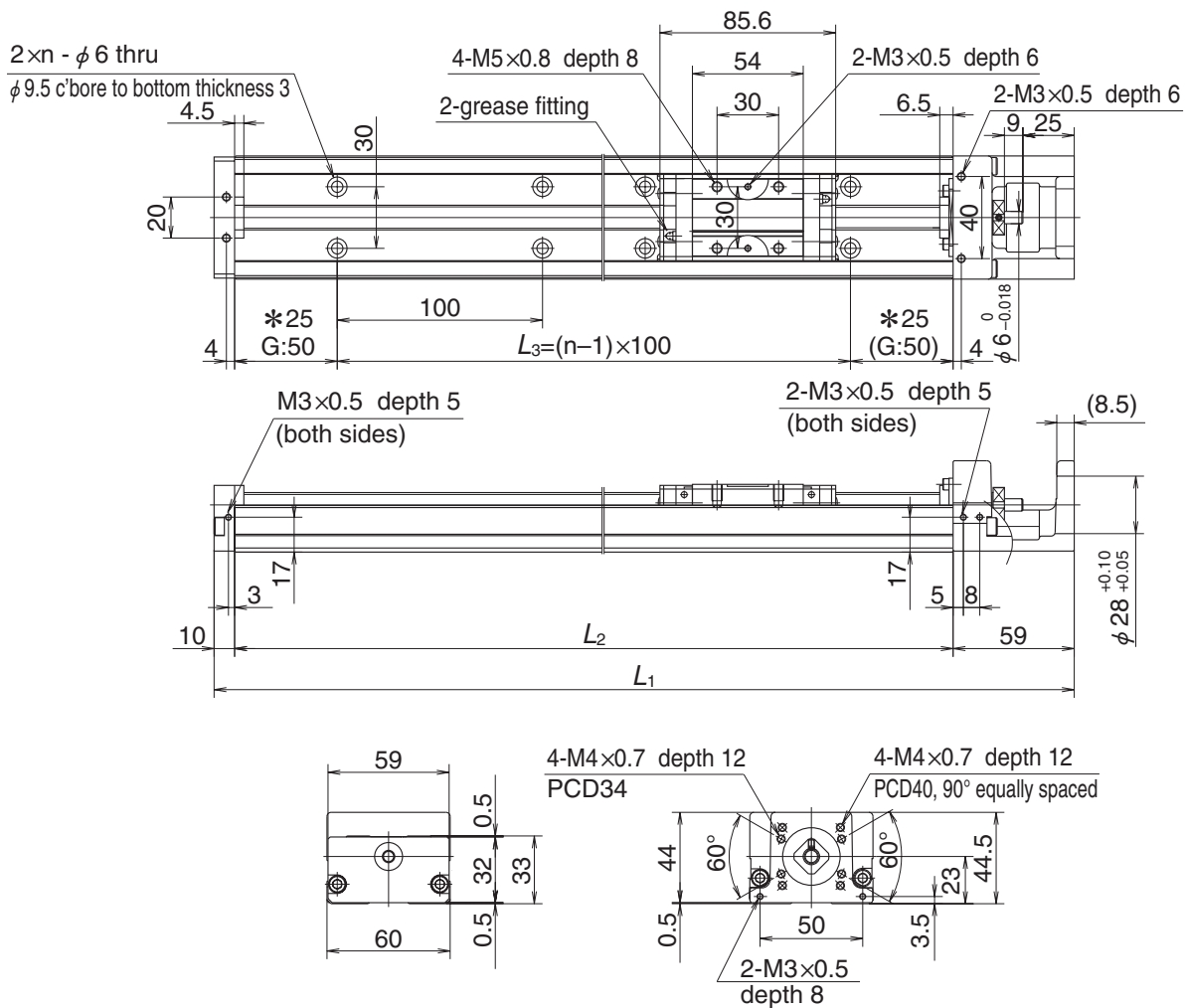
| Part number code | Specification | Part number |
|------------------|-------------------|---------------|
| 0 | N/A | — |
| 1 | For single slider | MC—HV*****—00 |
| | For double slider | MC—HV*****D00 |

*****: 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



- 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)

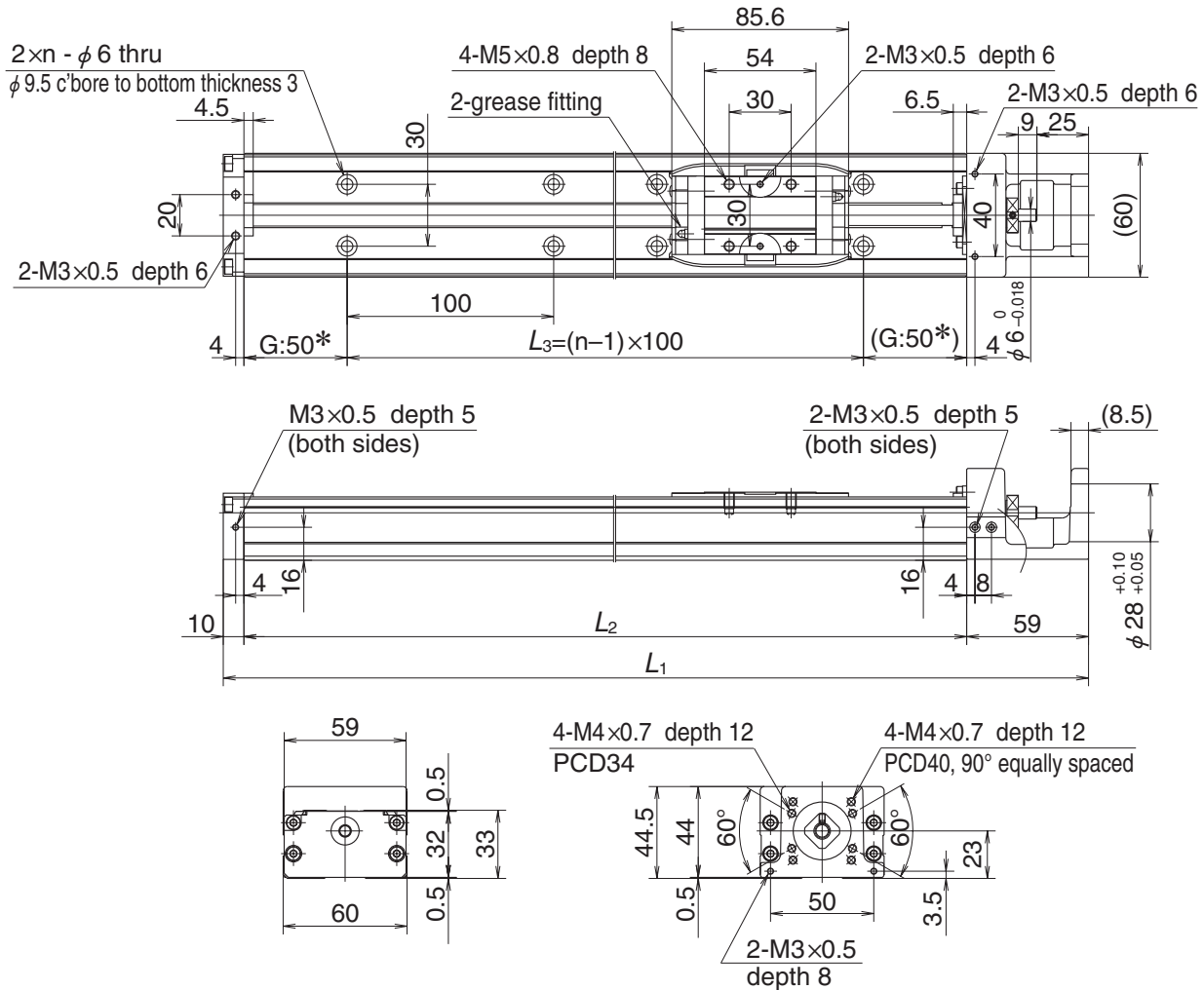
| Part number | Nominal stroke (mm) | Stroke limit (mm) (K1 is not equipped) | Ball screw lead (mm) | Body length (mm) | | | | Inertia ×10 ⁻⁶ (kg·m ²) | Mass (kg) | Maximum rotational speed (mm/s) |
|---------------|---------------------|---|----------------------|------------------|----------------|----------------|---|--|-----------|---------------------------------|
| | | | | L ₁ | L ₂ | L ₃ | n | | | |
| *MCL06005H05K | 50 | 53 (65) | 5 | 219 | 150 | 100 | 2 | 2.38 | 1.0 | 250 |
| *MCL06005H10K | | | 10 | | | | | | | 500 |
| MCL06010H05K | 100 | 103 (115) | 5 | 269 | 200 | 100 | 2 | 3.17 | 1.3 | 250 |
| MCL06010H10K | | | 10 | | | | | | | 500 |
| MCL06020H05K | 200 | 203 (215) | 5 | 369 | 300 | 200 | 3 | 4.51 | 1.9 | 250 |
| MCL06020H10K | | | 10 | | | | | | | 500 |
| MCL06030H10K | 300 | 303 (315) | 10 | 469 | 400 | 300 | 4 | 6.80 | 2.6 | 500 |
| MCL06030H20K | | | 20 | | | | | | | 1 000 |
| MCL06040H10K | 400 | 403 (415) | 10 | 569 | 500 | 400 | 5 | 8.13 | 3.2 | 500 |
| MCL06040H20K | | | 20 | | | | | | | 1 000 |
| MCL06050H10K | 500 | 503 (515) | 10 | 669 | 600 | 500 | 6 | 9.47 | 3.9 | 500 |
| MCL06050H20K | | | 20 | | | | | | | 1 000 |

Dimension of G is 25 instead of 50 for items marked with *.

| Monocarrier dynamic torque specifications (N·cm) | | |
|--|----|-----------|
| Ball screw lead (mm) | 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 ²) | Mass (kg) | Maximum rotational speed (mm/s) | | |
|---------------|---------------------|---|----------------------|------------------|-------|-------|-----|---|-----------|---------------------------------|------|-------|
| | | | | L_1 | L_2 | L_3 | 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 *.

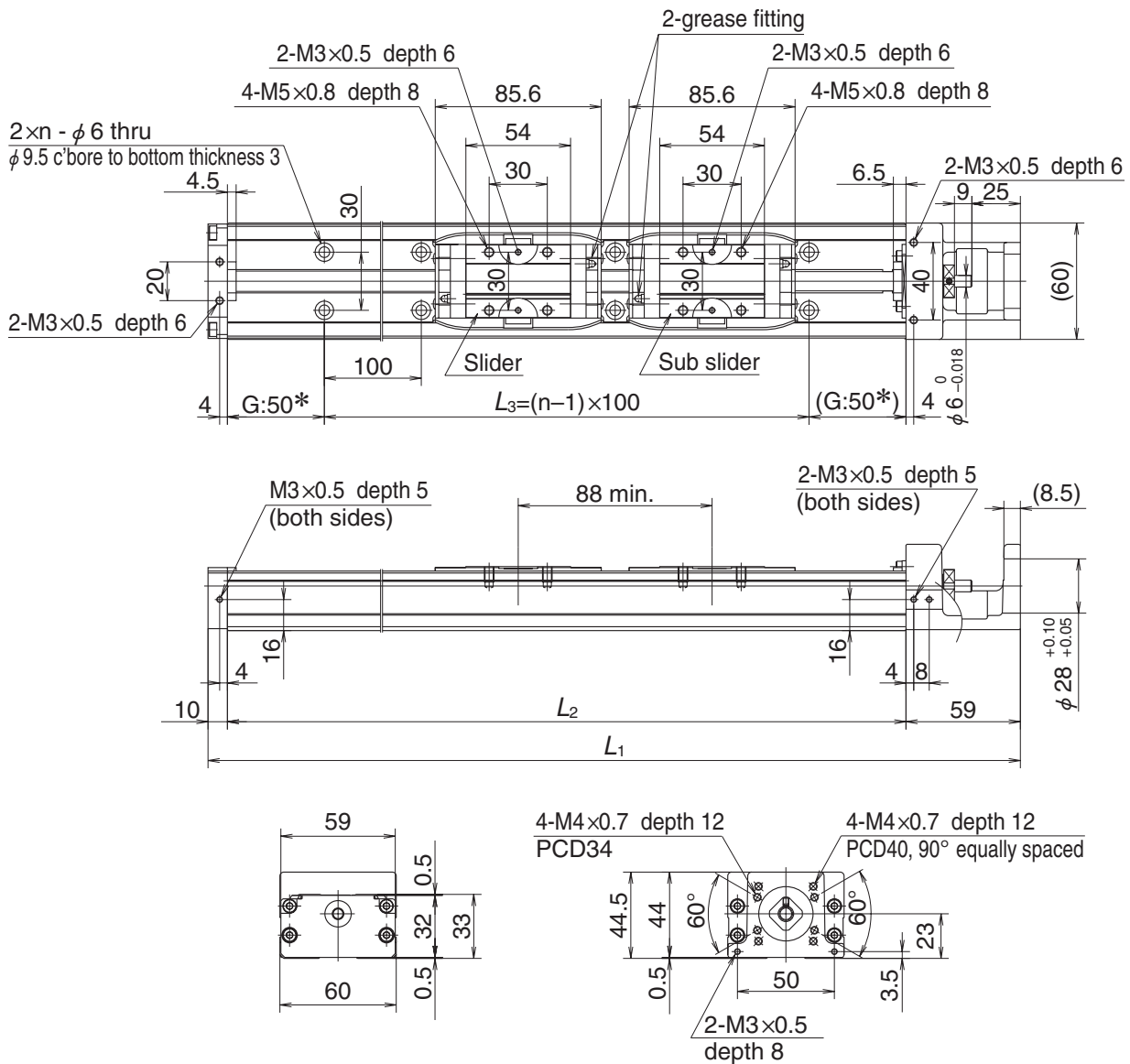
| Monocarrier dynamic torque specifications (N·cm) | | |
|--|----|-----------|
| Ball screw lead (mm) | 5 | 1.0 – 4.8 |
| | 10 | 1.1 – 5.8 |
| | 20 | 1.6 – 7.9 |

- 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.

MCH06 (Double Slider)

Accuracy grade: High grade (H)



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 ×10 ⁻⁶ (kg·m ²) | Mass (kg) | Maximum rotational speed (mm/s) |
|--------------|---------------------|---|----------------------|------------------|----------------|----------------|---|--|-----------|---------------------------------|
| | | | | L ₁ | L ₂ | L ₃ | n | | | |
| MCH06010H05D | 100 | 115 | 5 | 369 | 300 | 200 | 3 | 4.82 | 3.5 | 250 |
| MCH06010H10D | | (139) | 10 | | | | | 6.72 | | 500 |
| MCH06020H05D | 200 | 215 | 5 | 469 | 400 | 300 | 4 | 8.06 | 4.2 | 250 |
| MCH06020H10D | | (239) | 10 | | | | | 15.7 | | 500 |
| MCH06030H05D | 300 | 315 | 5 | 569 | 500 | 400 | 5 | 9.40 | 5.0 | 250 |
| MCH06030H10D | | (339) | 10 | | | | | 17.0 | | 500 |
| MCH06040H10D | 400 | 415 | 10 | 669 | 600 | 500 | 6 | 10.7 | 5.7 | 500 |
| MCH06040H20D | | (439) | 20 | | | | | 18.3 | | 1 000 |

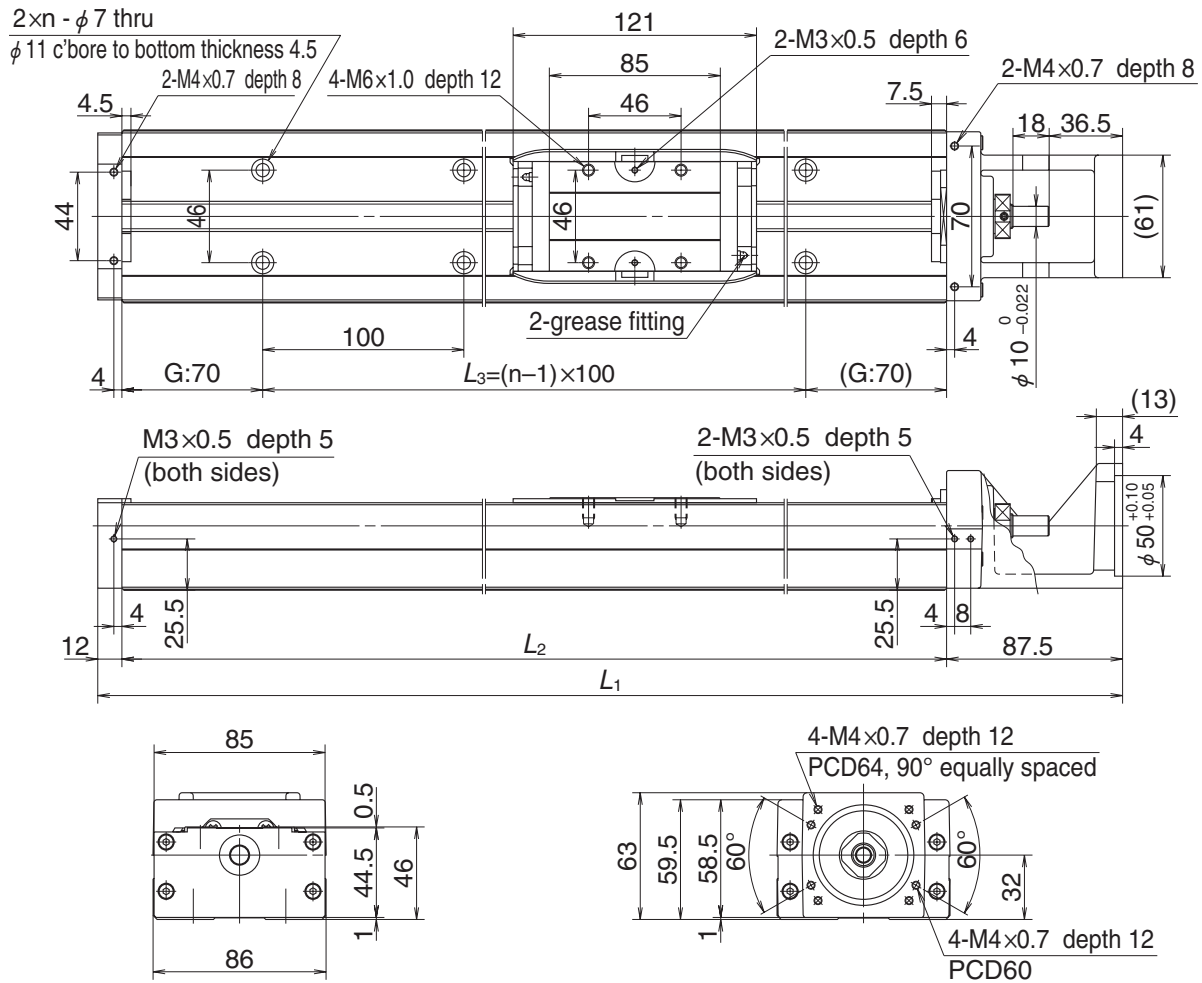
Monocarrier dynamic torque specifications (N·cm)

| Ball screw lead (mm) | 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.

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 ²) | Mass (kg) | Maximum rotational speed (mm/s) |
|--------------|---------------------|---|----------------------|------------------|-------|-------|-----|---|-----------|---------------------------------|
| | | | | L_1 | L_2 | L_3 | 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)

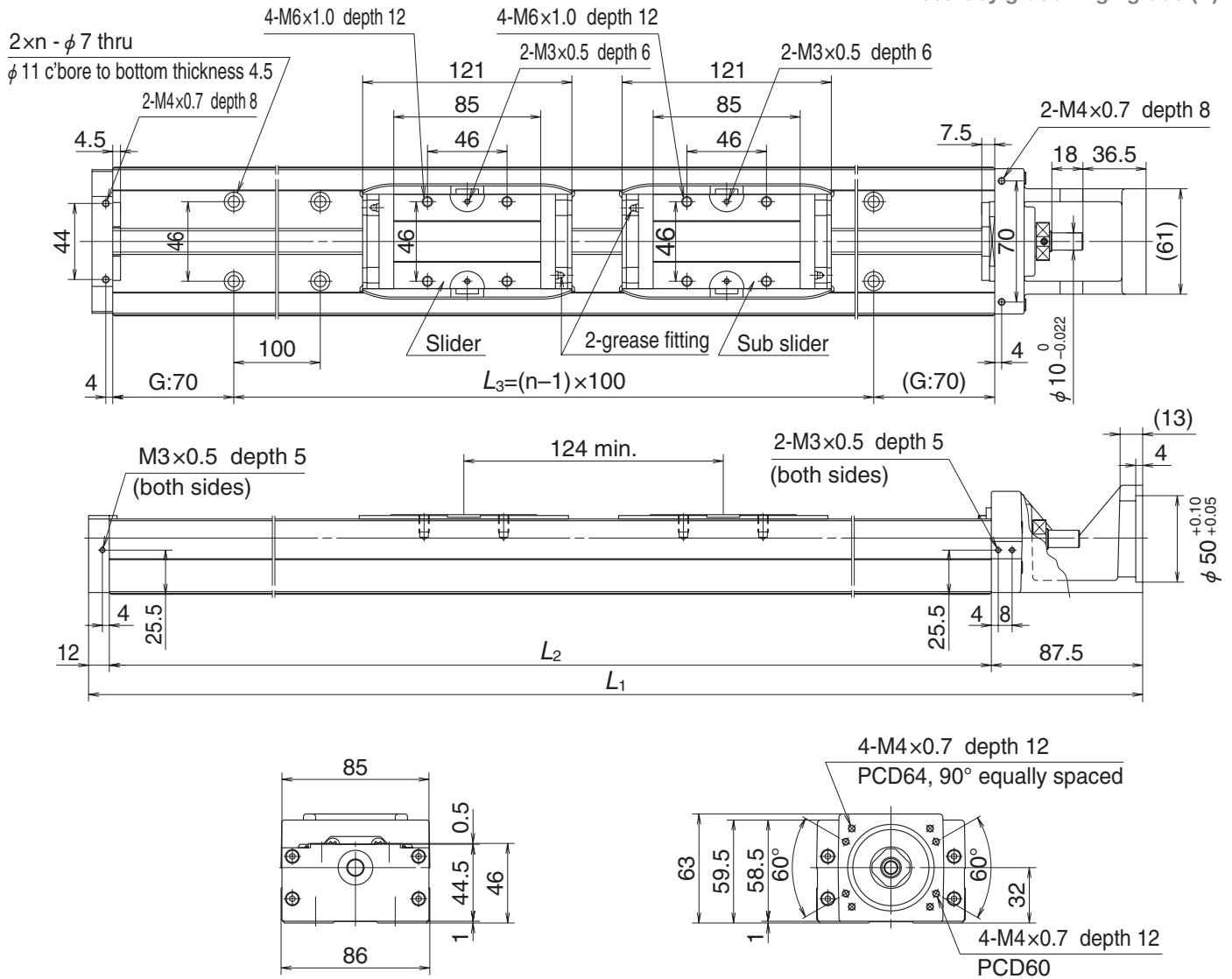
| Ball screw lead (mm) | Dynamic torque (N·cm) | |
|----------------------|-----------------------|-----------|
| | 5 | 1.0 – 5.9 |
| | 10 | 2.0 – 7.8 |
| 20 | 2.0 – 10.8 | |

- 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 ²) | Mass (kg) | Maximum rotational speed (mm/s) |
|---------------------|---------------------|---|----------------------|------------------|----------------|----------------|---|---|-----------|---------------------------------|
| | | | | L ₁ | L ₂ | L ₃ | n | | | |
| MCH09015H05D | 150 | 183 (211) | 5 | 539.5 | 440 | 300 | 4 | 16.1 | 8.9 | 250 |
| MCH09015H10D | | | 10 | | | | | | | |
| MCH09025H05D | 250 | 283 (311) | 5 | 639.5 | 540 | 400 | 5 | 19.3 | 11 | 250 |
| MCH09025H10D | | | 10 | | | | | | | |
| MCH09035H05D | 350 | 383 (411) | 5 | 739.5 | 640 | 500 | 6 | 22.5 | 12 | 250 |
| MCH09035H10D | | | 10 | | | | | | | |
| MCH09045H10D | 450 | 483 (511) | 10 | 839.5 | 740 | 600 | 7 | 28.8 | 14 | 500 |
| MCH09045H20D | | | 20 | | | | | | | |
| MCH09065H10D | 650 | 683 (711) | 10 | 1 039.5 | 940 | 800 | 9 | 35.2 | 17 | 500 |
| MCH09065H20D | | | 20 | | | | | | | |

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.

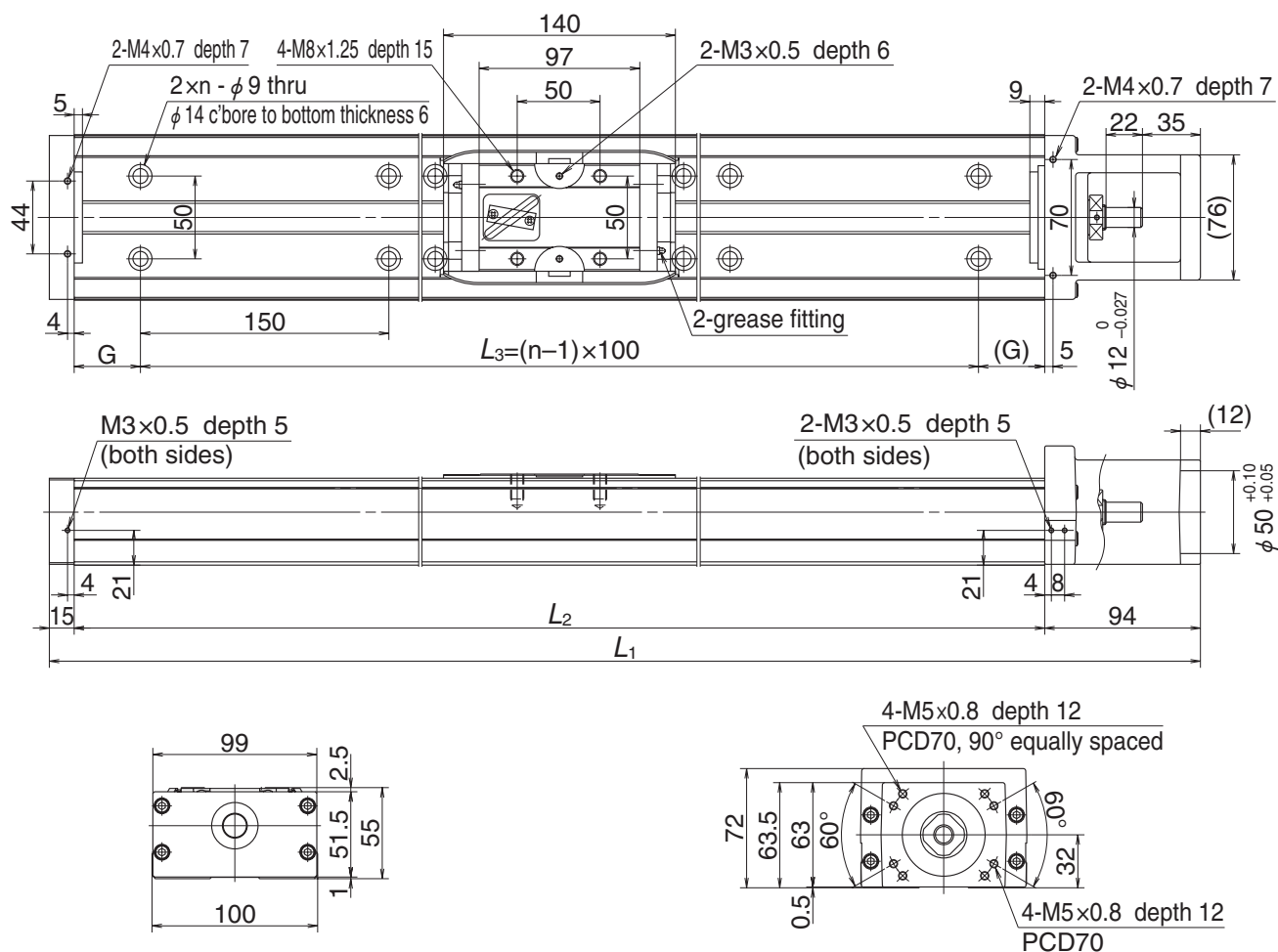
► For basic load ratings, see page 304.

Monocarriers MCH Series

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 ²) | Mass (kg) | Maximum rotational speed (mm/s) |
|--------------|---------------------|---|----------------------|------------------|-------|-----|-------|-----|---|-----------|---------------------------------|
| | | | | L_1 | L_2 | G | L_3 | n | | | |
| MCH10010H10K | 100 | 126 (142) | 10 | 389 | 280 | 65 | 150 | 2 | 33.2 | 7.3 | 500 |
| MCH10010H20K | | | 20 | | | | | | | | |
| MCH10020H10K | 200 | 226 (242) | 10 | 489 | 380 | 40 | 300 | 3 | 43.4 | 9.5 | 500 |
| MCH10020H20K | | | 20 | | | | | | | | |
| MCH10030H10K | 300 | 326 (342) | 10 | 589 | 480 | 15 | 450 | 4 | 53.7 | 12 | 500 |
| MCH10030H20K | | | 20 | | | | | | | | |
| MCH10040H10K | 400 | 426 (442) | 10 | 689 | 580 | 65 | 450 | 4 | 62.4 | 14 | 500 |
| MCH10040H20K | | | 20 | | | | | | | | |
| MCH10050H10K | 500 | 526 (542) | 10 | 789 | 680 | 40 | 600 | 5 | 74.7 | 16 | 500 |
| MCH10050H20K | | | 20 | | | | | | | | |
| MCH10060H10K | 600 | 626 (642) | 10 | 889 | 780 | 15 | 750 | 6 | 84.9 | 19 | 500 |
| MCH10060H20K | | | 20 | | | | | | | | |
| MCH10070H10K | 700 | 726 (742) | 10 | 989 | 880 | 65 | 750 | 6 | 95.1 | 21 | 500 |
| MCH10070H20K | | | 20 | | | | | | | | |
| MCH10080H10K | 800 | 826 (842) | 10 | 1 089 | 980 | 40 | 900 | 7 | 105 | 23 | 500 |
| MCH10080H20K | | | 20 | | | | | | | | |
| MCH10090H10K | 900 | 926 (942) | 10 | 1 189 | 1 080 | 15 | 1 050 | 8 | 116 | 25 | 440 |
| MCH10090H20K | | | 20 | | | | | | | | |
| MCH10100H10K | 1 000 | 1 026 (1 042) | 10 | 1 289 | 1 180 | 65 | 1 050 | 8 | 126 | 27 | 360 |
| MCH10100H20K | | | 20 | | | | | | | | |
| MCH10110H10K | 1 100 | 1 126 (1 142) | 10 | 1 389 | 1 280 | 40 | 1 200 | 9 | 136 | 29 | 300 |
| MCH10110H20K | | | 20 | | | | | | | | |
| MCH10120H10K | 1 200 | 1 226 (1 242) | 10 | 1 489 | 1 380 | 15 | 1 350 | 10 | 146 | 32 | 250 |
| MCH10120H20K | | | 20 | | | | | | | | |

Monocrider dynamic torque specifications (N·cm)

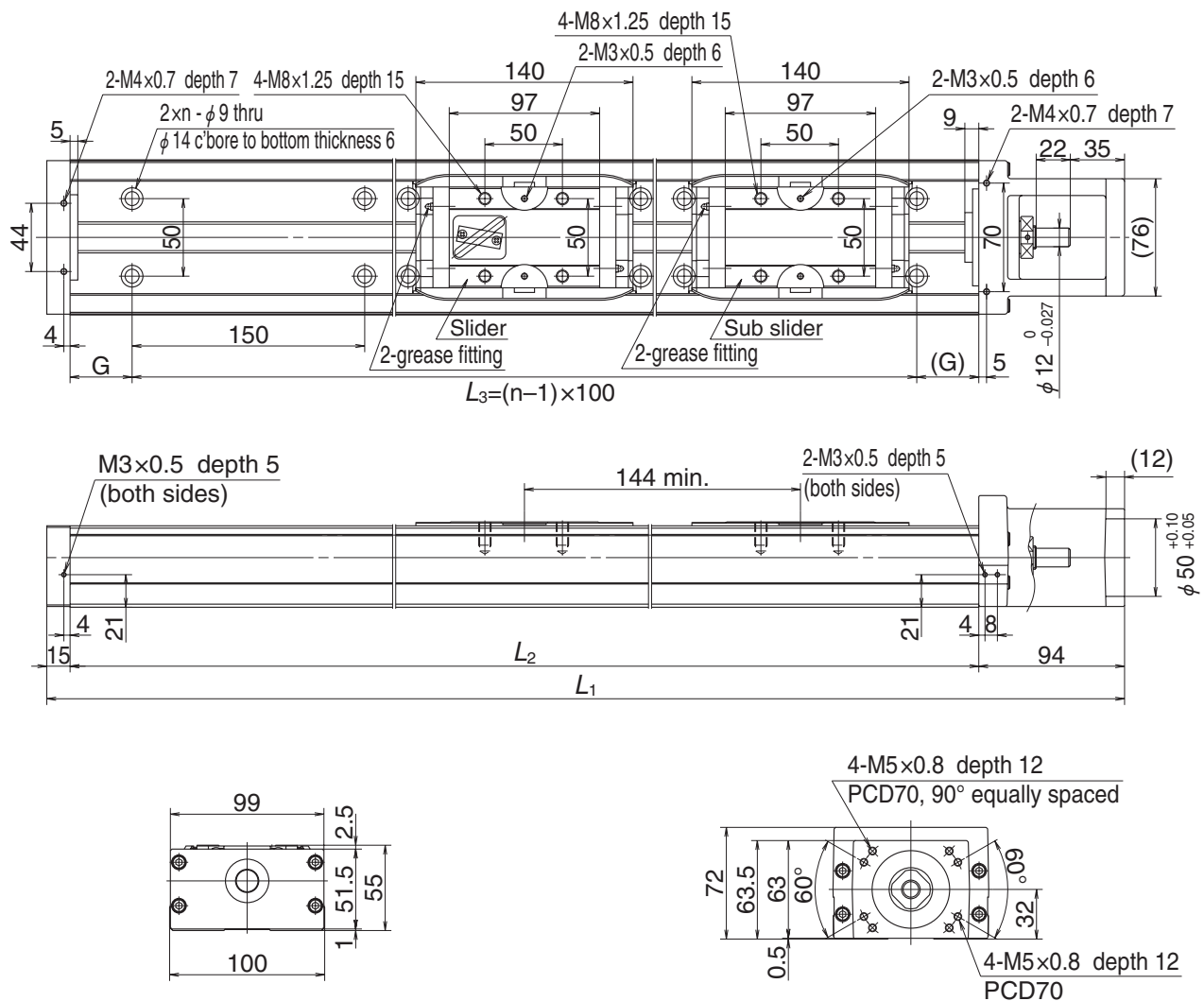
| Ball screw lead (mm) | 10 | 2.7 – 10.8 |
|----------------------|----|------------|
| | 20 | 3.1 – 12.7 |

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.

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 ²) | Mass (kg) | Maximum rotational speed (mm/s) |
|---------------------|---------------------|--|----------------------|------------------|-------|-----|-------|-----|---|-----------|---------------------------------|
| | | | | L_1 | L_2 | G | L_3 | 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 |

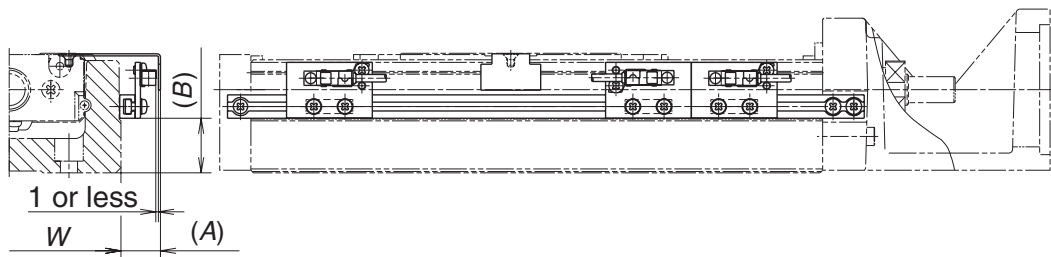
Monocarrier dynamic torque specifications (N·cm)

| Ball screw lead (mm) | 10 | 4.2 – 15.6 |
|----------------------|----|------------|
| | 20 | 5.0 – 19.6 |

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.

Proximity Switch



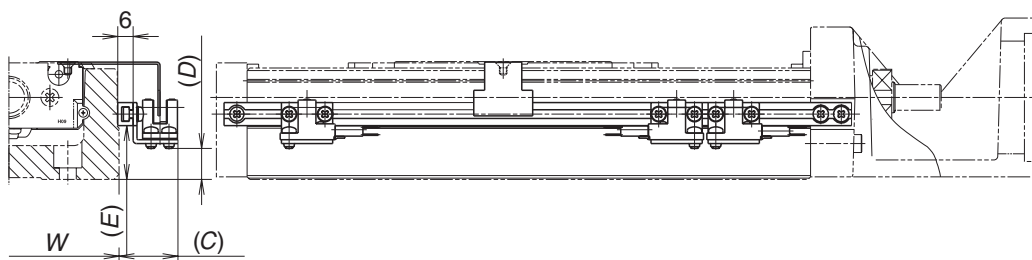
Example of assembly

| 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 | |

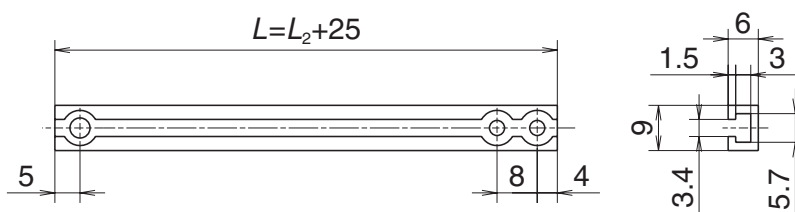
Note 1: See page 306 for photo sensor specifications.

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 .



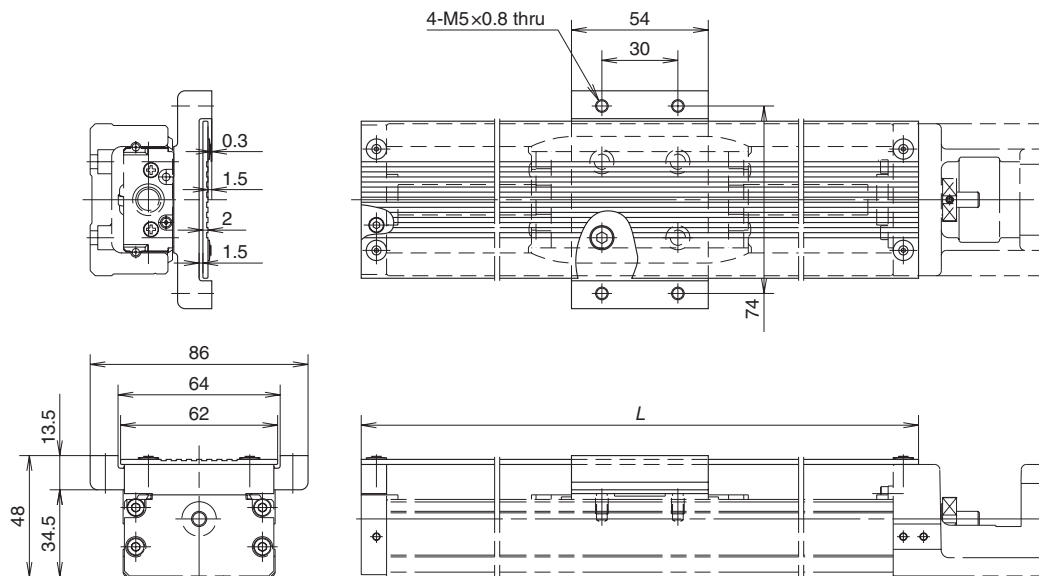
Body of MCH Series and Sensor Rail Combination Table

| 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 |
| 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 MCH06

Cover Unit for MCL06

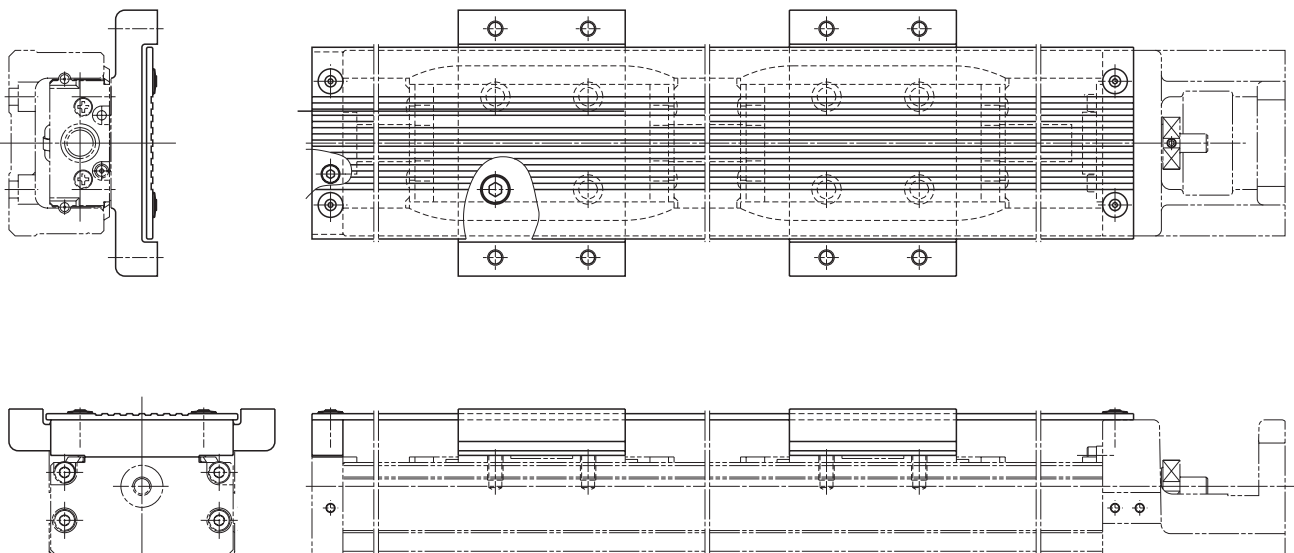


Unit: mm

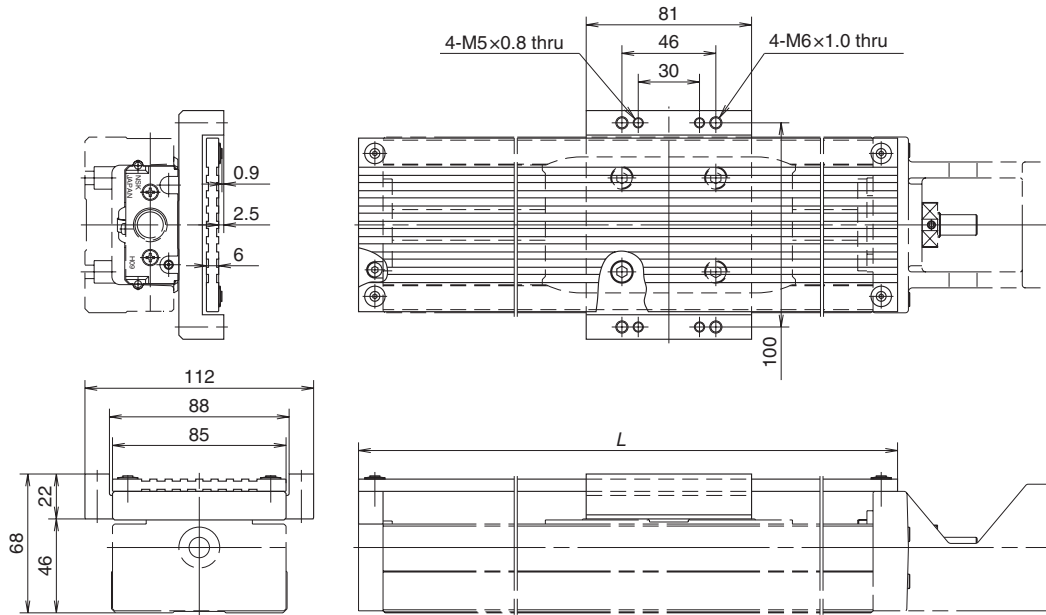
| Single slider | | Double slider | | Top cover length <i>L</i> |
|---------------|---------------|---------------|---------------|------------------------------|
| Stroke | Part number | Stroke | Part number | |
| 50 | MC-HV06005-00 | – | – | 170 |
| 100 | MC-HV06010-00 | – | – | 220 |
| 200 | MC-HV06020-00 | 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

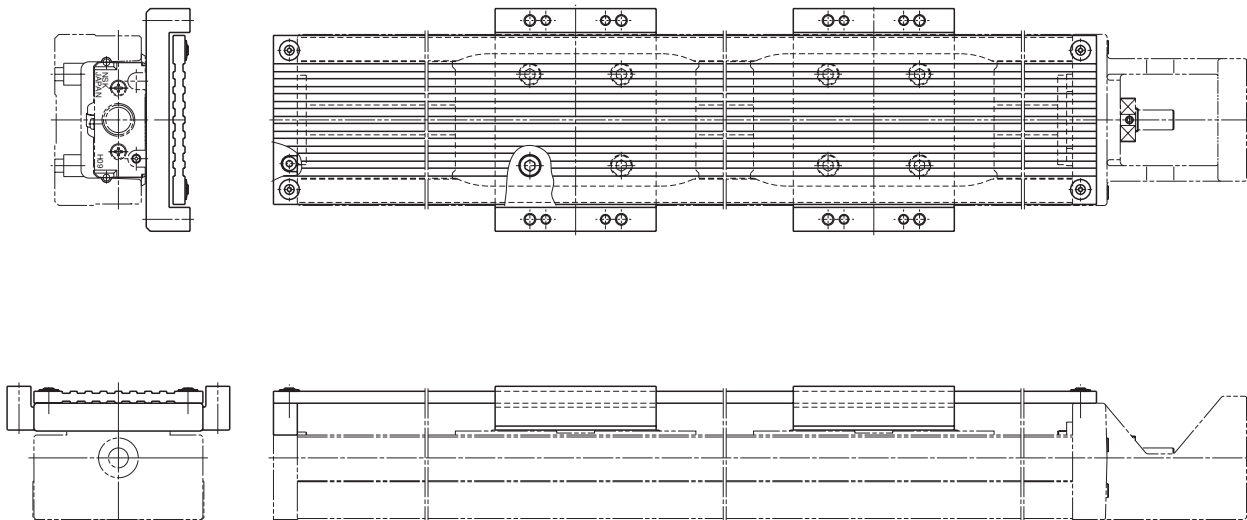


Unit: mm

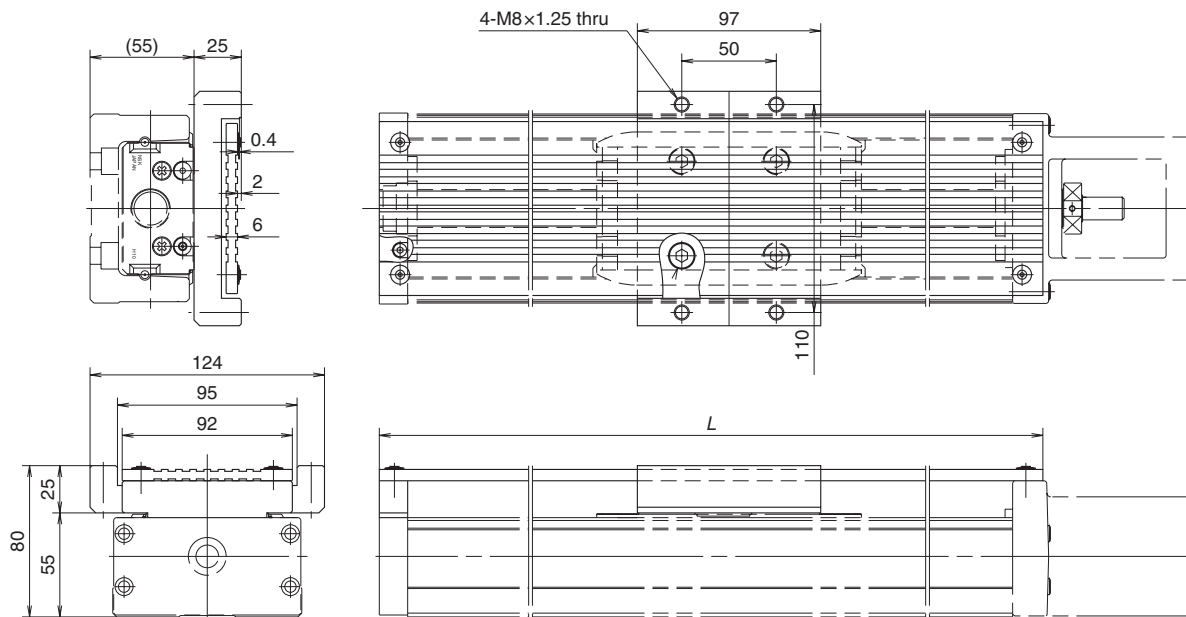
| Single slider | | Double slider | | Top cover length <i>L</i> |
|---------------|---------------|---------------|---------------|------------------------------|
| Stroke | Part number | Stroke | Part number | |
| 100 | MC-HV09010-00 | – | – | 264 |
| 200 | MC-HV09020-00 | – | – | 364 |
| 300 | MC-HV09030-00 | 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

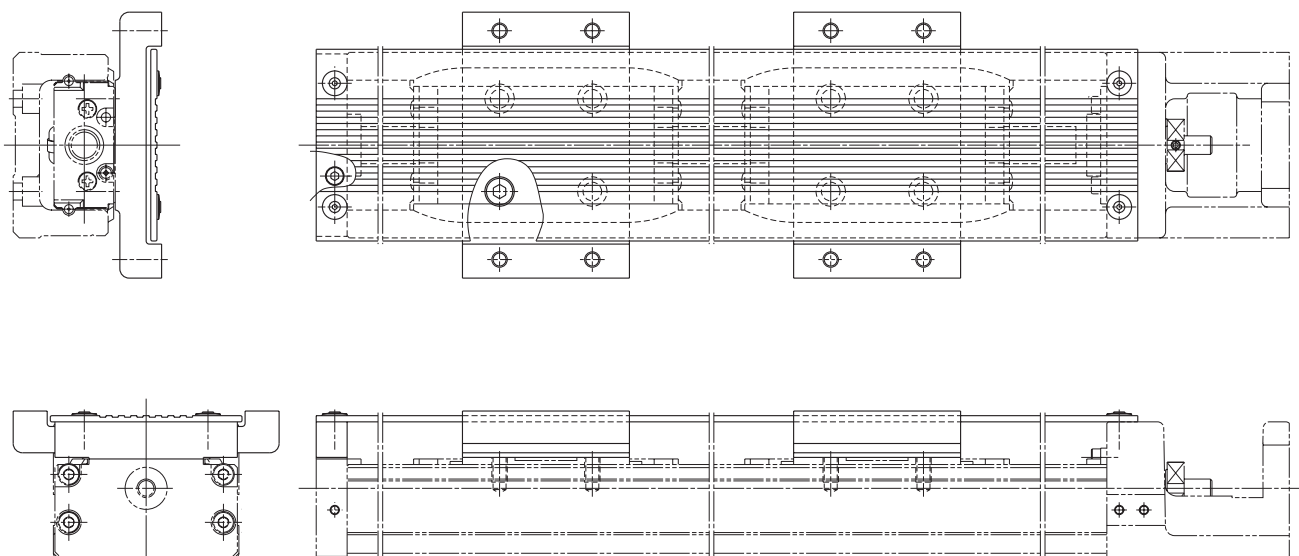


Unit: mm

| 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.



Monocarriers MCH Series

Intermediate Plate for MCH Series Motors

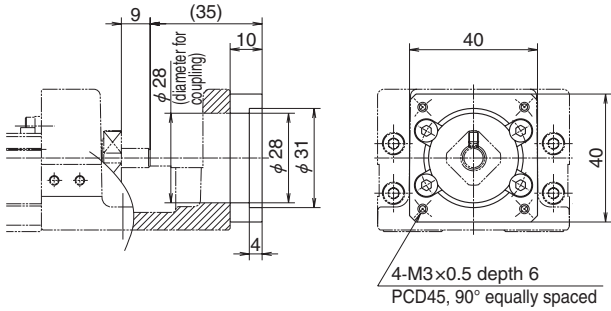
Accessories

- Ask NSK about motors not listed in compatible motor list.
- In case of indirect motor mount, please consult with NSK.

- Be sure to align center lines when installing motor.

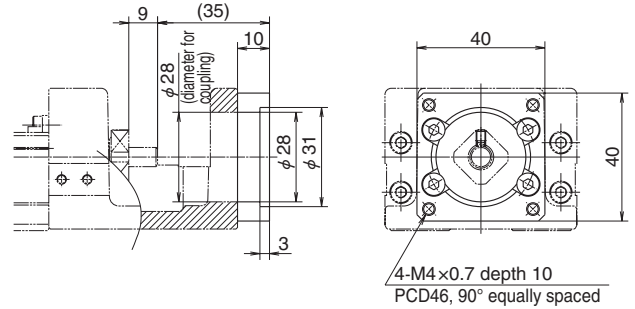
Motor Bracket for MCH06 and MCL06

Part number
MC-BKH06-145-00



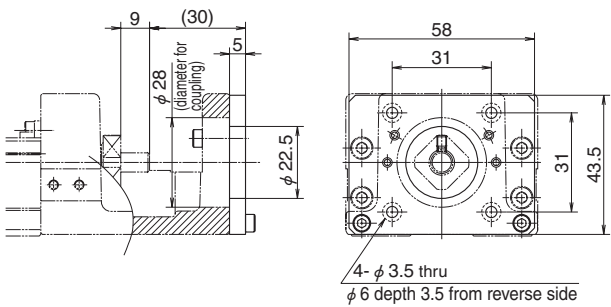
| Compatible motors | |
|--|-----------------------------|
| Maker | Motor models |
| Matsushita Electric Industrial Co., Ltd. | MSMD5A (50W), MSMD01 (100W) |

Part number
MC-BKH06-146-00



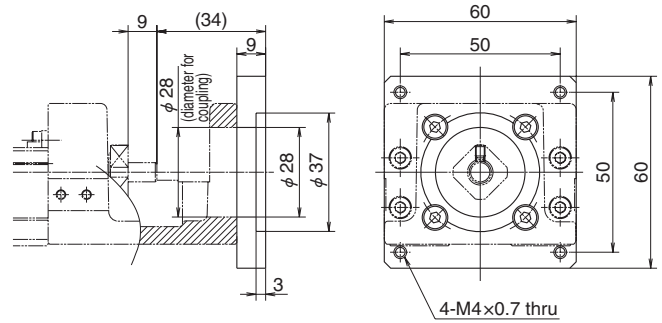
| Compatible motors | |
|---------------------------|--|
| Maker | Motor models |
| Yaskawa Electric Corp. | SGMAH-A3 (30W), SGMAH-A5 (50W), SGMAS-A5A (50W), SGMAH-01 (100W), SGMAS-01A (100W) |
| Mitsubishi Electric Corp. | HF-KP053 (50W), HF-MP053 (50W), HC-KFS053 (50W), HC-MFS053 (50W), HF-KP13 (100W), 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-BKH06-231-00



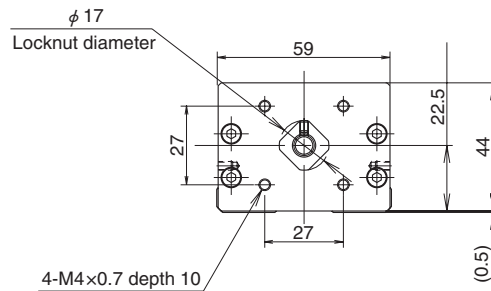
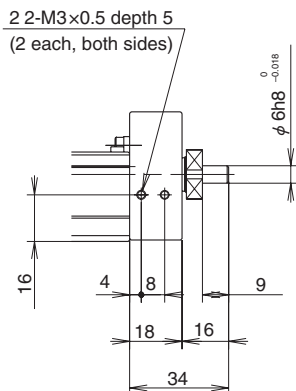
| Compatible motors | |
|--------------------------|---|
| Maker | Motor models |
| Oriental Motor Co., Ltd. | AS46, ASC46, UPK54x, PK54x, CSK54x, CFK54x, UMK24x, CSK24x, PK24x |
| Sanyo Denki Co., Ltd. | PBM423xxx, 103F55xx |

Part number
MC-BKH06-250-00



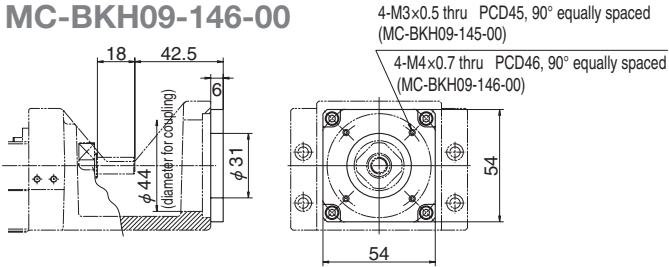
| Compatible motors | |
|--------------------------|--|
| Maker | Motor models |
| Oriental Motor Co., Ltd. | AS66, ASC66, UPK56x, UFK56x, PK56x, CSK56x, CFK56x |
| OMRON Corp. | MUMS02 (200W), MUMS04 (400W) |
| Sanyo Denki Co., Ltd. | PBM603xx, PBM604xx, 103F78xx |

Diameter of Ball Screw Shaft-end to Install Pulley for Indirect Motor Mount of MCH06



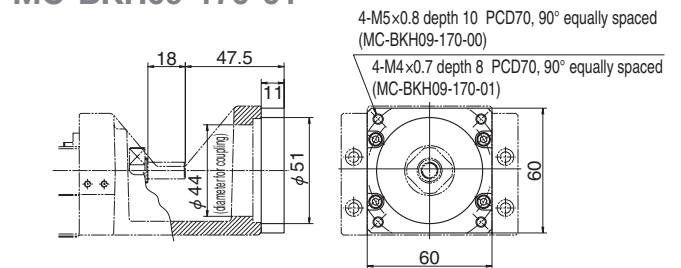
Motor Bracket for MCH09

Part number
MC-BKH09-145-00
MC-BKH09-146-00



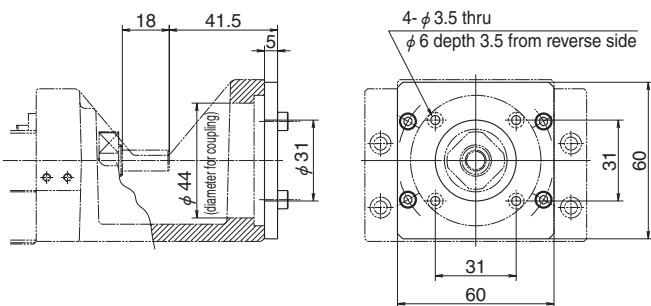
| Part number | Compatible motors | |
|-----------------|--|---|
| | Maker | Motor models |
| MC-BKH09-145-00 | Matsushita Electric Industrial Co., Ltd. | MSMD5A (50W), MSMD01 (100W) |
| MC-BKH09-146-00 | Yaskawa Electric Corp. | SGMAH-A5 (50W), SGMAS-A5A (50W), SGMAH-01 (100W), SGMAS-01A (100W) |
| | 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) |
| | OMRON Corp. | R88M-W05 (50W), R88M-W10 (100W) |
| | Sanyo Denki Co., Ltd. | P30B04xxx P Series |

Part number
MC-BKH09-170-00
MC-BKH09-170-01



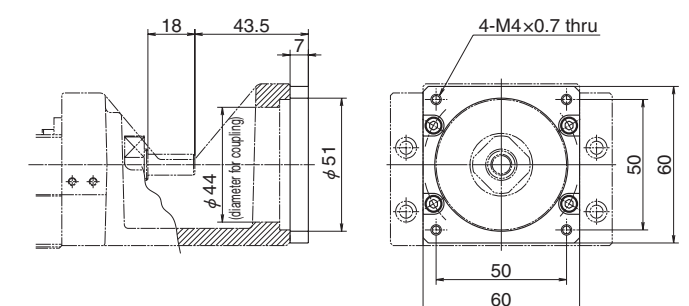
| Part number | Compatible motors | |
|-----------------|--|--|
| | Maker | Motor models |
| MC-BKH09-170-00 | Yaskawa Electric Corp. | SGMAH-02 (200W), SGMAS-02A (200W), SGMAH-04 (400W), SGMAS-04A (400W) |
| | Mitsubishi Electric Corp. | HF-KP23 (200W), HF-MP23 (200W), HF-KP43 (400W), HF-MP43 (400W) |
| | OMRON Corp. | R88M-W20 (200W), R88M-W40 (400W) |
| | Sanyo Denki Co., Ltd. | P30B06xxx P Series |
| MC-BKH09-170-01 | Matsushita Electric Industrial Co., Ltd. | MSMD02 (200W), MSMA02 (200W), MSMA04 (400W), MSMD04 (400W) |

Part number
MC-BKH09-231-00



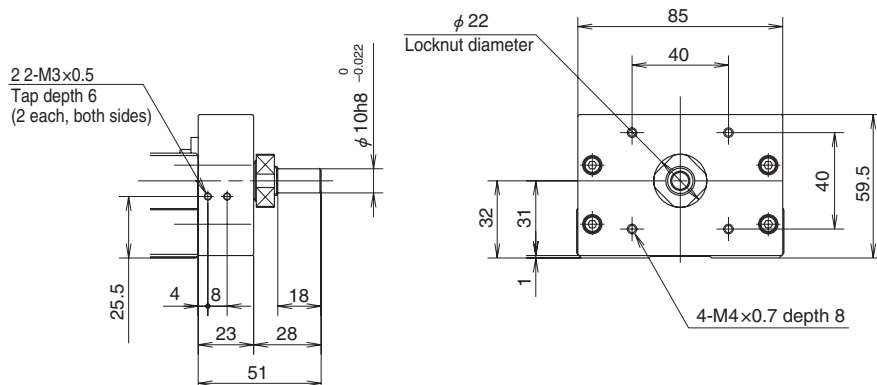
| Compatible motors | |
|--------------------------|---|
| Maker | Motor models |
| Sanyo Denki Co., Ltd. | PBM423xxx, 103F55xx |
| Oriental Motor Co., Ltd. | AS46, ASC46, UPK54x, PK54x, CSK54x, CFK54x, UMK24x, CSK24x, PK24x |

Part number
MC-BKH09-250-00



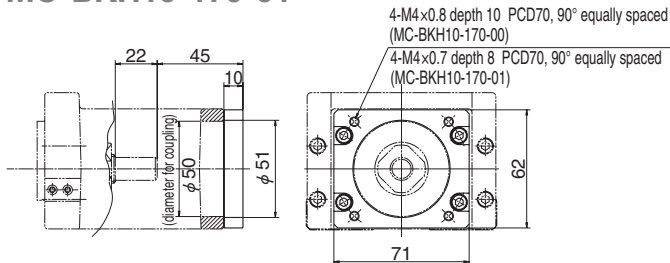
| Compatible motors | |
|--------------------------|--|
| Maker | Motor models |
| Sanyo Denki Co., Ltd. | PBM603xx, PBM604xx, 103F78xx |
| Oriental Motor Co., Ltd. | AS66, ASC66, UPK56x, UFK56x, PK56x, CSK56x, CFK56x |

Diameter of Ball Screw Shaft-end to Install Pulley for Indirect Motor Mount of MCH09



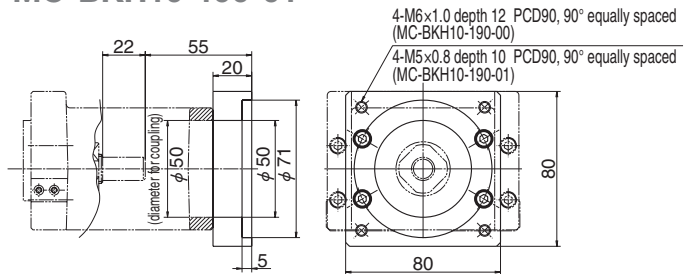
Motor Bracket for MCH10

Part number
MC-BKH10-170-00
MC-BKH10-170-01



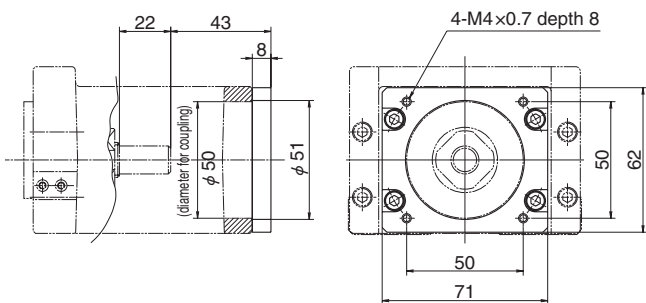
| Part number | Compatible motors | |
|-----------------|--|--|
| | Maker | Motor models |
| MC-BKH10-170-00 | Yaskawa Electric Corp. | SGMAH-02 (200W), SGMAS-02A (200W), SGMAS-04 (400W), SGMAS-04A (400W) |
| | Mitsubishi Electric Corp. | HF-KP23 (200W), HF-MP23 (200W), HF-KP43 (400W), HF-MP43 (400W) |
| | OMRON Corp. | R88M-W20 (200W), R88M-W40 (400W) |
| | Sanyo Denki Co., Ltd. | 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



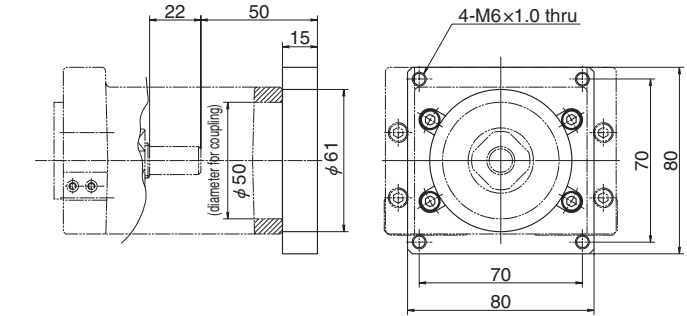
| Part number | Compatible motors | |
|-----------------|---------------------------|--|
| | Maker | Motor models |
| MC-BKH10-190-00 | Mitsubishi Electric Corp. | HC-KFS73 (750W), HC-MFS73 (750W), HF-KP73 (750W), HF-MP73 (750W) |
| MC-BKH10-190-01 | Sanyo Denki Co., Ltd. | P50B07xxx P Series |

Part number
MC-BKH10-250-00



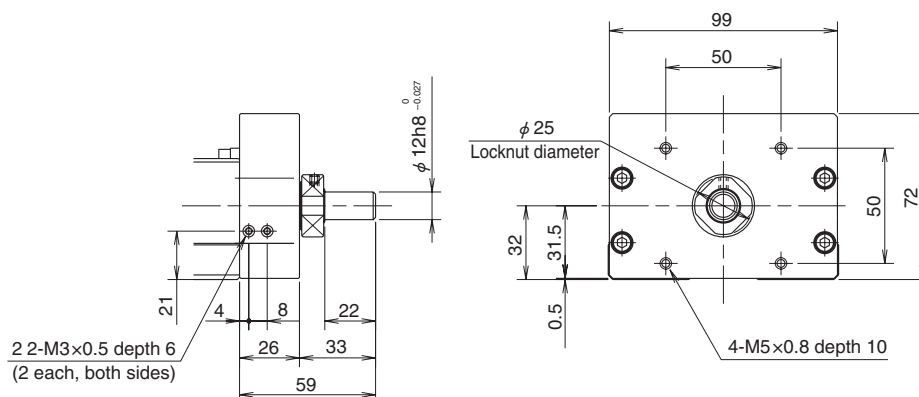
| Compatible motors | |
|--------------------------|--|
| Maker | Motor models |
| Sanyo Denki Co., Ltd. | PBM603xx, PBM604xx, 103F78xx |
| Oriental Motor Co., Ltd. | AS66, ASC66, UPK56x, PK56x, CSK56x, CFK56x, UMK56x, UFK56x |

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

| 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 | 1 690 | | | 6 620 |
| | 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 | 6 550 | 30 | 5 400 | | | 2 730 |
| 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 | $\phi 15$ | 7 310 | 30 800 | 7 100 | 5 | 13 500 | 22 800 | 3 040 | |
| | 10 | | 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 | 3 380 | |
| | 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%.

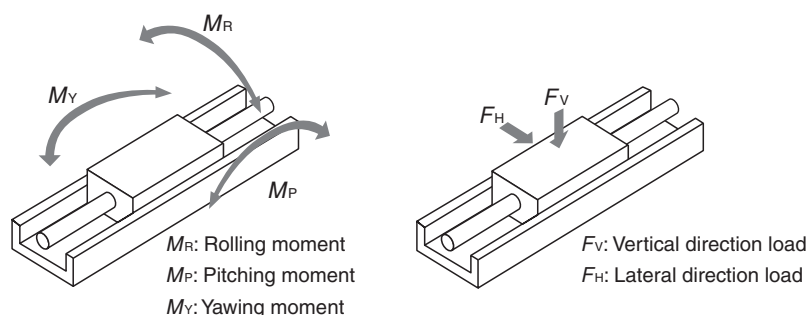
Basic Static Moment Load of Linear Guide

| 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/mm².

Note 3: If extremely heavy load is required, please consult NSK for estimation of fatigue life.



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%.

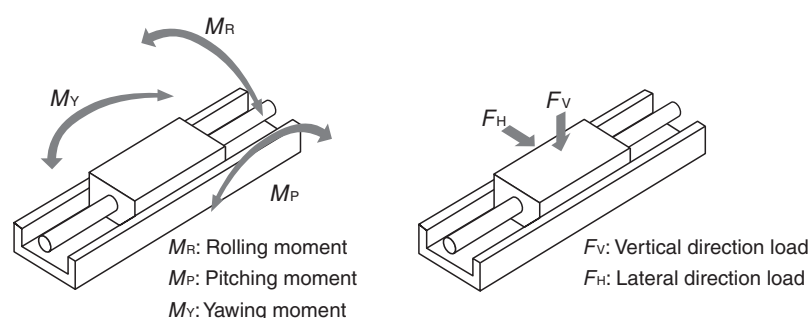
Basic Static Moment Load of Linear Guide

| Nominal size | Slider | Basic static moment (N·m) | | |
|---------------|--------|---------------------------|-------------------|-------------------|
| | | Rolling M_{R0} | Pitching M_{P0} | Pitching M_{V0} |
| 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/mm².

Note 3: If extremely heavy load is required, please consult NSK for estimation of fatigue life.



Monocarriers

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>Target object: Yes (ON), No (OFF)</p> <p>Output transistor (load): ON, OFF</p> <p>Output transistor (orange): ON, OFF</p> | <p>* (Maximum load current: 50 mA)</p> |
| NC | | E2S-W14 type | <p>Target object: Yes (ON), No (OFF)</p> <p>Output transistor (load): ON, OFF</p> <p>Output transistor (orange): ON, OFF</p> | |

E2S-W13 (a-contact)

E2S-W14 (b-contact)

The external appearances are the same.

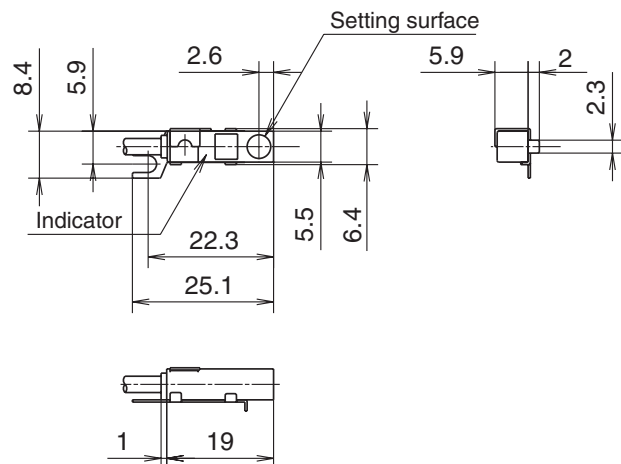


Photo Sensor

| | |
|--------------------------------------|--|
| 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 ℓ × 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

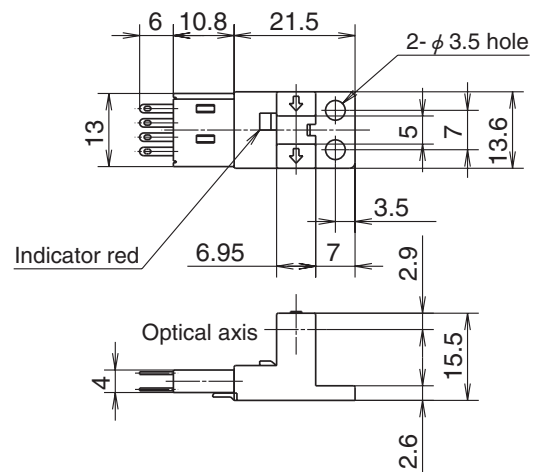
Note 1: Do not make a wrong connection.

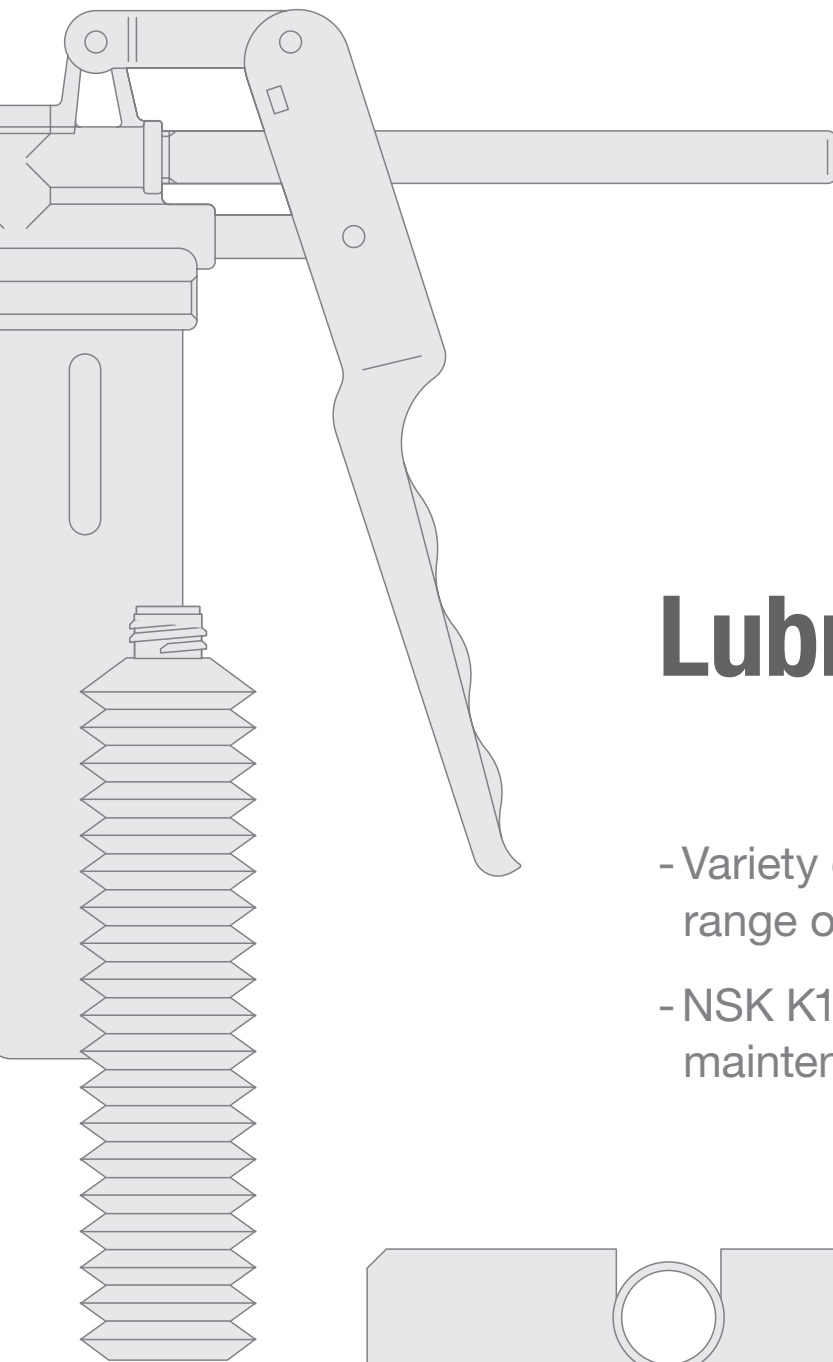
Note 2: Please contact NSK for PNP output type.

| Type | Movement mode | Time chart | Connection terminal | Output circuit |
|---------------|---------------|------------|--|----------------|
| EE-SX674 type | Light-ON | | When terminals L and ⊕ are short circuited | |
| | Dark-ON | | When terminals L and ⊕ are open circuited | |

EE-SX674 (Sensor)
EE-1001 (Connector)

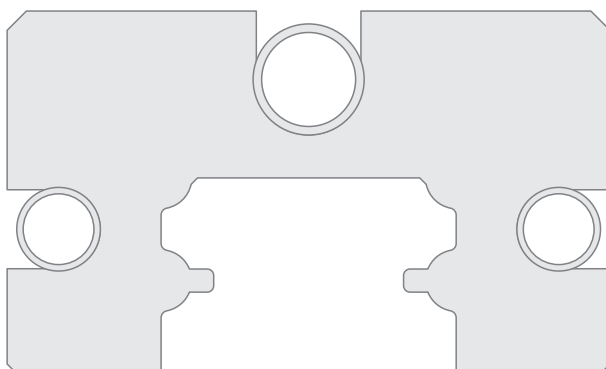
A connector is mounted to the sensor in the right figure.





Lubrication

- Variety of greases for wide range of applications
- NSK K1 lubrication unit for long-term, maintenance-free operation



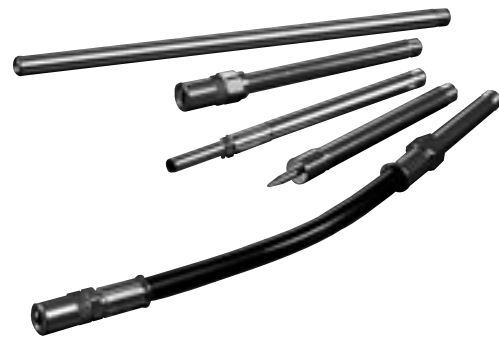
NSK Grease Unit



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.

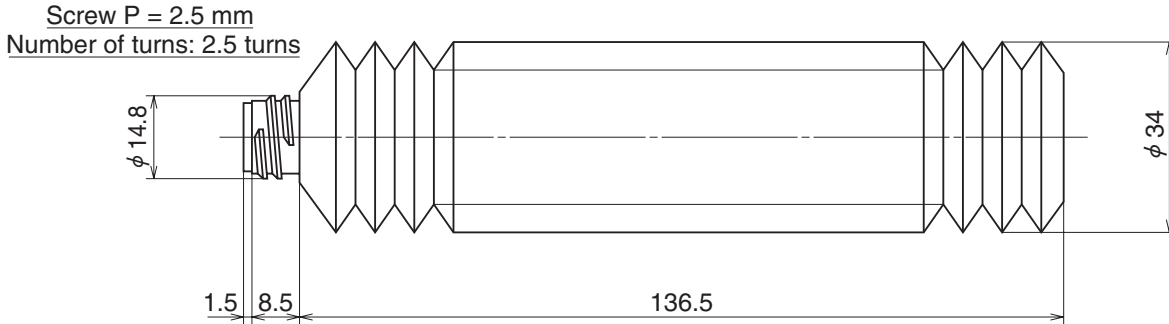


1. Composition of NSK Grease Unit

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 Hand Grease Pump | | NSK HGP |
| | (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

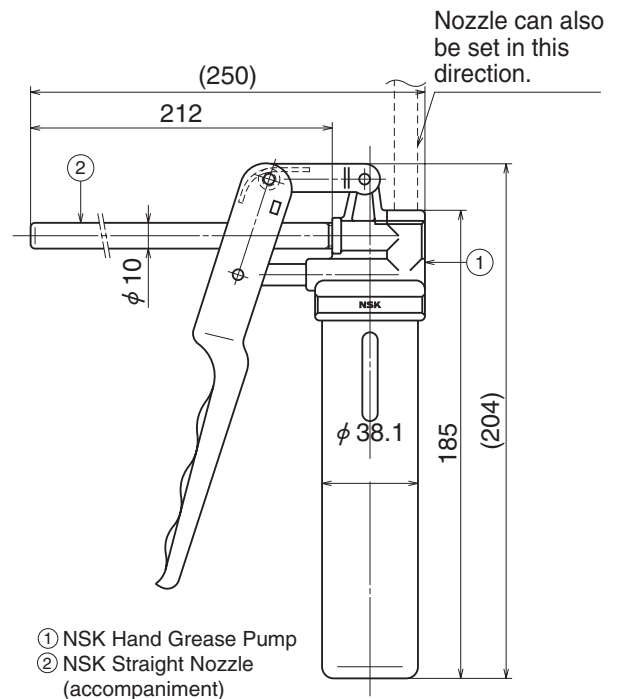
1) NSK Hand Grease Pump Unit Part number: NSK HGP

(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

NSK Grease Unit

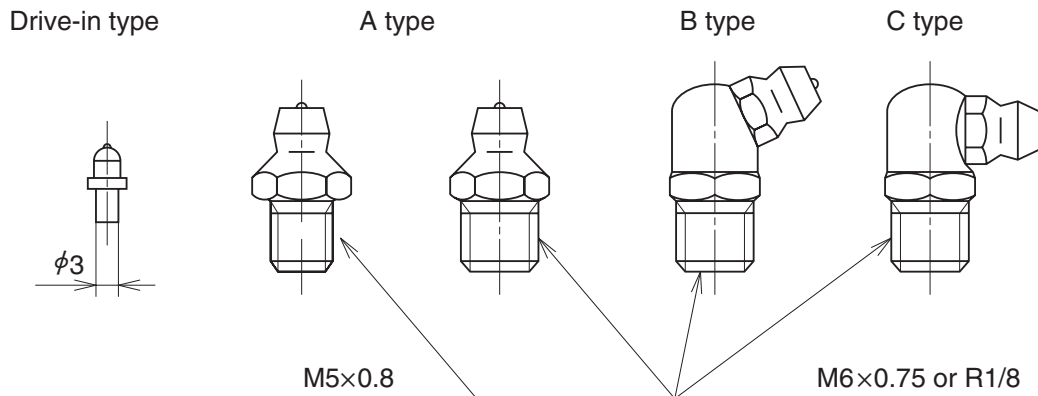
2) Nozzles

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 | $\phi 3$ | Drive-in type | | | ○ | | |
| | 20, 25, 30, 35 | M6x0.75 | B type | ○ | ○*1 | | | ○ |
| | 45, 55 | Rc1/8 | B type | ○ | ○ | | | ○ |
| LS / SS Series | 15 | $\phi 3$ | Drive-in type | | | ○ | | |
| | 20, 25, 30, 35 | M6x0.75 | B type | ○ | ○*1 | | | ○ |
| | 45, 55, 65 | Rc1/8 | B type | ○ | ○ | | | ○ |
| RA Series | 15, 20 | $\phi 3$ | Drive-in type | | | ○ | | |
| | 25, 30, 35 | M6x0.75 | B type | ○ | ○*1 | | | ○ |
| | 45, 55, 65 | Rc1/8 | B type | ○ | ○ | | | ○ |
| LW Series | 17 | $\phi 3$ | Drive-in type | | | ○ | | |
| | 21, 27, 35 | M6x0.75 | B type | ○ | ○*1 | | | ○ |
| | 50 | Rc1/8 | B type | ○ | ○ | | | ○ |
| TS Series | 15 | $\phi 3$ | Drive-in type | | | ○ | | |
| | 20, 25, 30, 35 | M6x0.75 | B type | ○ | ○*1 | | | ○ |
| PU Series | 05, 07, 09, 12 | — | — | | | | ○*2 | |
| | 15 | $\phi 3$ | Drive-in type | | | ○ | | |
| PE Series | 05, 07, 09, 12 | — | — | | | | ○*2 | |
| | 15 | $\phi 3$ | 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 | $\phi 3$ | Drive-in type | | | ○ | | ○ |
| | 06 | M6x0.75 | A type | ○ | ○ | | ○ | |
| MCH series | 06, 09, 10 | $\phi 3$ | 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 ² /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: cm³

| 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: cm³

| 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: cm³

| 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: cm³

| Model No. | Series | LW |
|-----------|--------|----|
| 17 | | 3 |
| 21 | | 3 |
| 27 | | 7 |
| 35 | | 24 |
| 50 | | 52 |

TS Series

Unit: cm³

| Model No. | Series | TS |
|-----------|--------|----|
| 15 | | 2 |
| 20 | | 3 |
| 25 | | 6 |
| 30 | | 9 |
| 35 | | 15 |

PU, PE Series

Unit: cm³

| 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 ³) |
|------------------|-----------|--|
| 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 ³) |
|------------------|-----------|--|
| 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



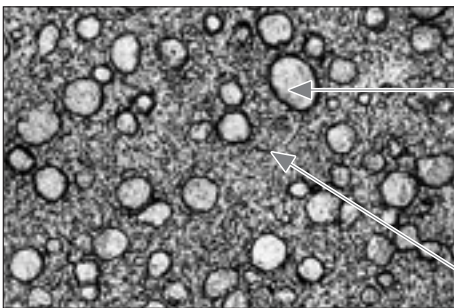
NSK K1 lowers machine operating costs and reduces impact on the environment.

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

100µm

Polyolefin

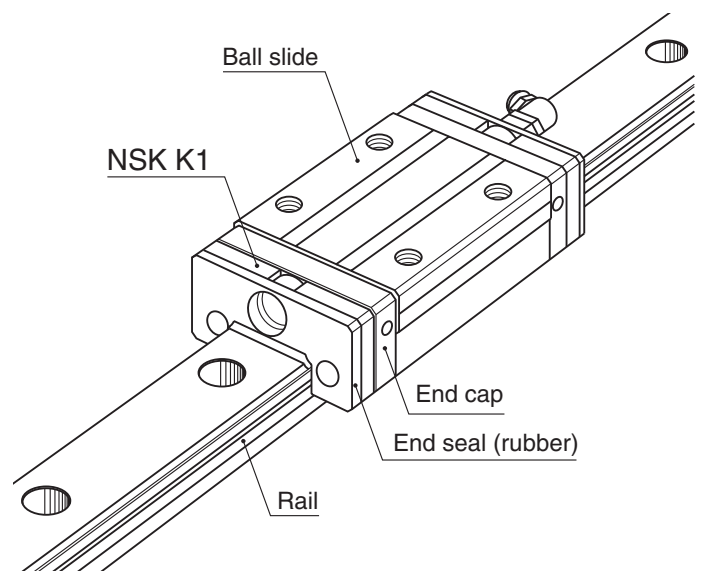
Unlike vinyl chloride products, polyolefin does not produce dioxin. Polyolefin is also being increasingly used at supermarkets for food wrapping.

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.

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.

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.

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

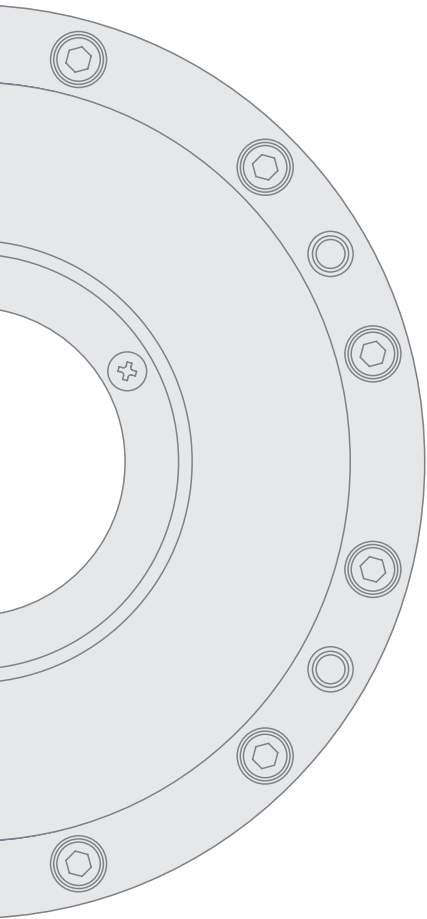
Maximum temperature in use: 50°C

Momentary maximum temperature in use: 80°C

2) Chemicals that should not come into contact with seal

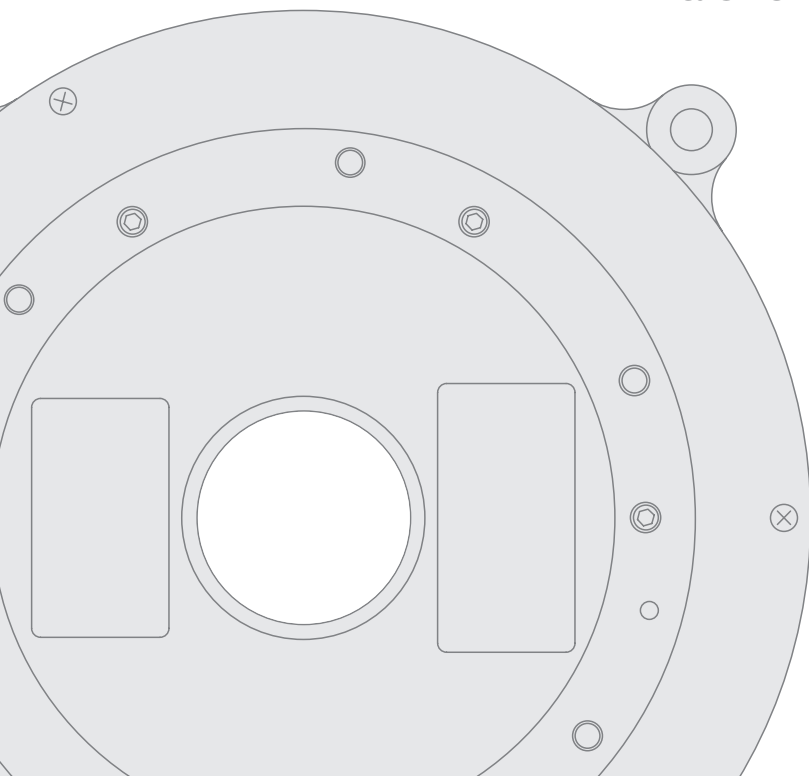
Do not leave NSK K1 in organic solvent, white kerosene such as hexane, thinner that removes oil, or rust preventive oil that contains white kerosene.

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



Direct-drive motors with advanced features only available from NSK

With advanced features, including high torque, high resolution, maximum rotational speed of 10 [s⁻¹] (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⁻¹]** (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: ϕ 100 [mm]).

» **Height 35 [mm] (PN2)** » **Outer diameter ϕ 100 [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

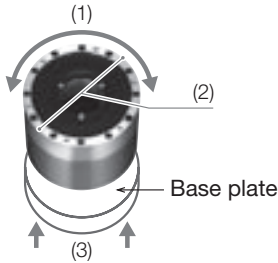
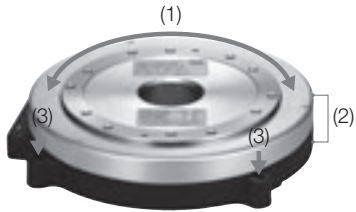
Compliance with international safety standards (UL Standards, CE mark) assures worldwide applicability.

The Megatorque Motor is environment friendly and complies with the EU RoHS Directive.

» **Compliance with UL Standards, CE mark, EU RoHS Directive**

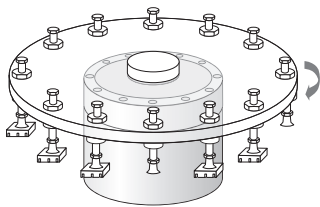


Comparison of major features

| 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>  |

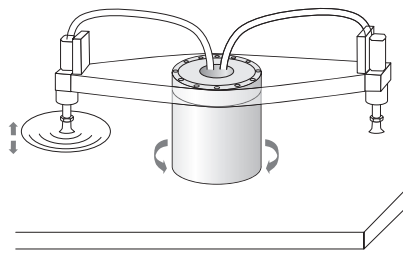
PS and PN Series in a variety of applications and installations

Application 1: PS Series
Inspection conveyor for electronic parts



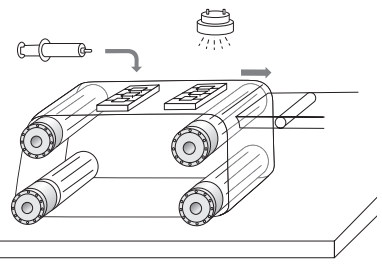
- High speed and high accuracy
- Compact • Clean
- Hollow structure (convenient for wiring/tubing)

Application 2: PS Series
Conveyor for DVD/CD



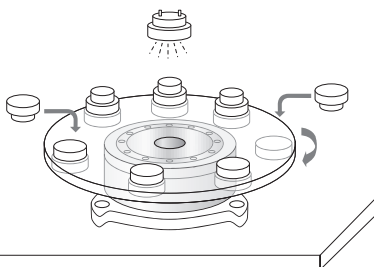
- High speed and high accuracy
- Clean • Maintenance free
- Hollow structure (convenient for wiring/tubing)

Application 3: PS Series
Inspection conveyor for medical devices



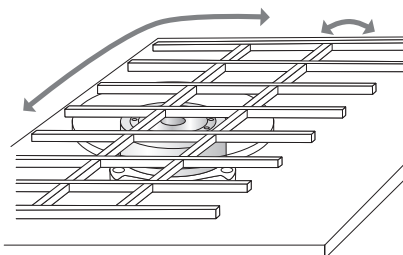
- Compact • Clean • Maintenance free

Application 4: PN Series
Automatic part assembly



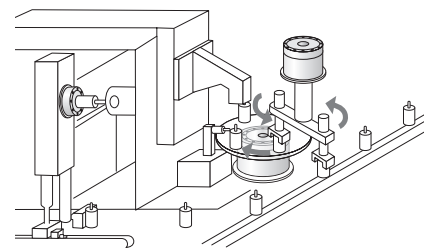
- High speed and high accuracy • Compact
- Advanced functions (unequal partitioned positioning and short-cut positioning)

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

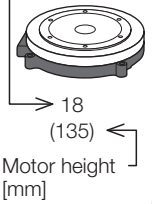
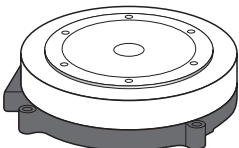
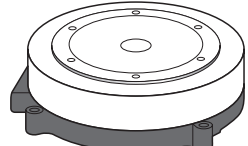
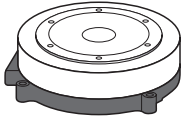
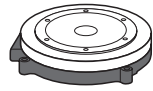


Megatorque Motors

Types of Megatorque Motors

PS Series (Outer Rotor Type)

| Series | PS Series | | | |
|---|---|--|---------------------------------------|--------|
| Model | PS1 Model Motor | | PS3 Model Motor | |
| <p>Maximum output torque [N·m]</p> <p>Motor height [mm]</p> | | | | |
| Motor outer diameter [mm] | ϕ 100 | | ϕ 150 | |
| Motor hollow diameter [mm] | ϕ 35 | | ϕ 56 | |
| Maximum rotational speed [s ⁻¹] | 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 |
| Maximum output torque [N·m]  Motor height [mm] | 200 [N·m] | | |  135 (95) |
| | 100 [N·m] | | |  180 (112) |
| | 50 [N·m] | |  45 (85) | |
| | 30 [N·m] |  12 (35) | | |
| | 10 [N·m] | | | |
| Motor outer diameter [mm] | ϕ 170 | ϕ 210 | ϕ 280 | |
| Motor hollow diameter [mm] | ϕ 36 | ϕ 56 | ϕ 50 | |
| Maximum rotational speed [s ⁻¹] | 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  | EDC Driver Unit  | | |
| | 70 × 140 × 190 | 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 | | | |

Megatorque Motors

Motor Specifications PS Series Motor

Part number for PS1 Model Motor

Example:

M-PS 1 006 KN 002

Megatorque Motor PS Series

Motor size code

Maximum output torque [N·m]

Design serial number
002: Standard
003: High-precision products
(made to order)*¹

KN: Standard

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 ⁻¹] | | 10 | | |
| Rated rotational speed [s ⁻¹] | | 5 | | |
| 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] | | 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 ²] | | 0.0024 | 0.0031 | 0.0038 |
| Recommended load's moment of inertia [kg·m ²] | | 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.

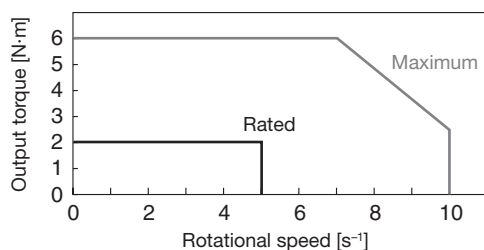
For an oscillating operation less than 45 [°], turn the motor 90 [°] or more at least once a day.

*¹ Absolute positioning accuracy of high-precision products (made to order) is 30 [arc sec] (interchangeable type, ambient temperature of 25 ± 5 [°C]).

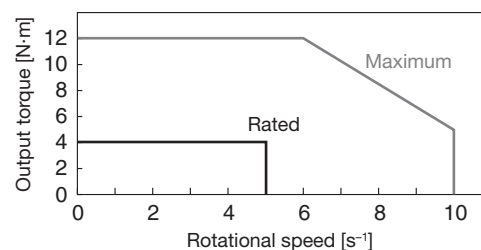
Cable length is up to 8 [m].

Rotational speed and output torque characteristics

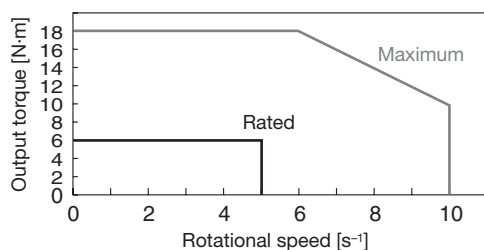
PS1006 Motor



PS1012 Motor

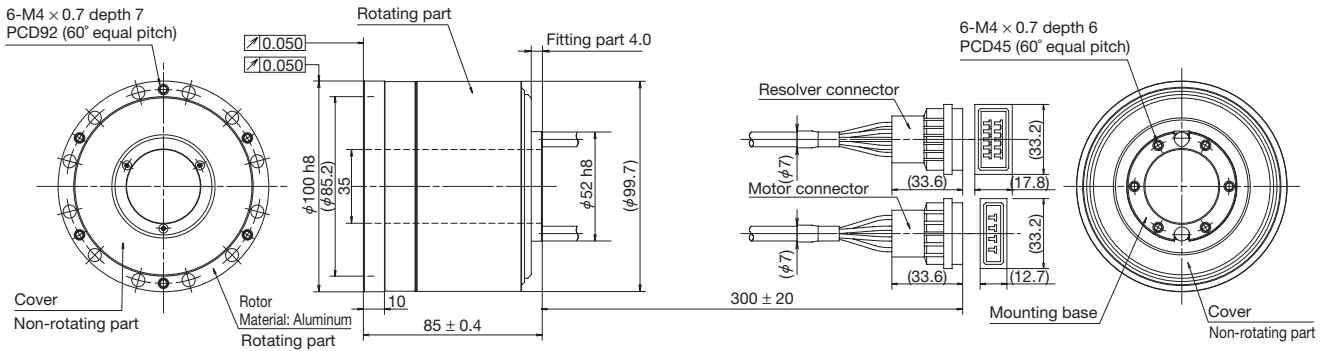


PS1018 Motor

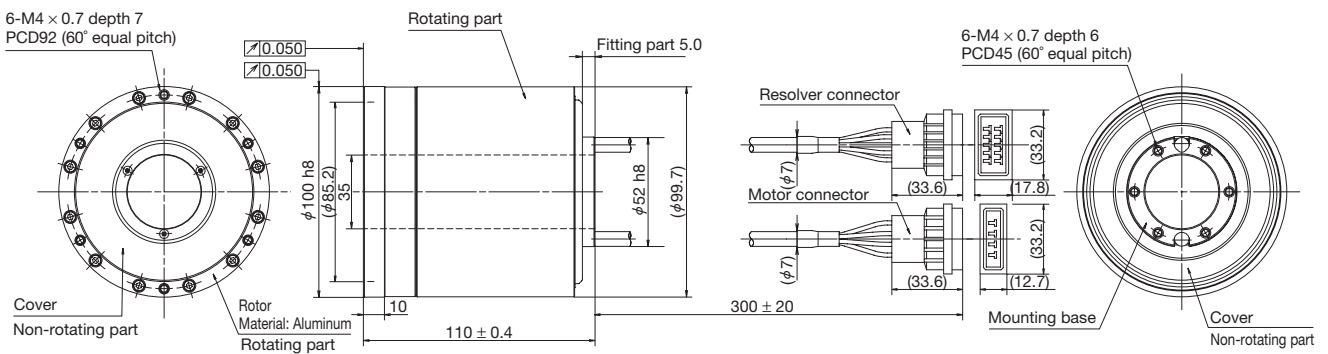


Dimensions of PS1 Model

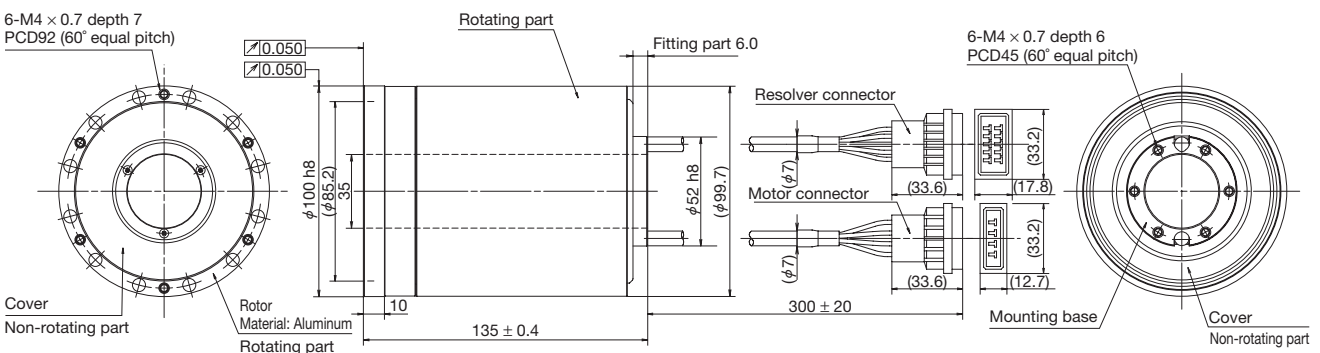
M-PS1006KN002



M-PS1012KN002



M-PS1018KN002



Megatorque Motors

Motor Specifications PS Series Motor

Part number for PS3 Model Motor

Example:

M-PS 3 015 KN 002

Megatorque Motor PS Series

Motor size code

Maximum output torque [N·m]

Design serial number
002: Standard
003: High-precision products
(made to order)*¹

KN: Standard

PS3 Model Motor specifications

| Functional item | Part number | M-PS3015KN002 | M-PS3030KN002 | M-PS3060KN002 | M-PS3090KN002 |
|---|-------------|--|---------------|---------------|---------------|
| Motor outer diameter [mm] | | ϕ 150 | | | |
| 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] | | ϕ 56 | | | |
| Maximum rotational speed [s ⁻¹] | | 10 | | 8 | 5 |
| Rated rotational speed [s ⁻¹] | | 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 ²] | | 0.011 | 0.014 | 0.019 | 0.024 |
| Recommended load's moment of inertia [kg·m ²] | | 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.

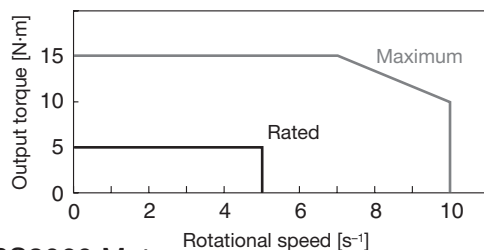
Do not apply excessive load and/or impact to the motor when inserting the dowel pin.

*¹ Absolute positioning accuracy of high-precision products (made to order) is 30 [arc sec] (interchangeable type, ambient temperature of 25 ± 5 [°C]).

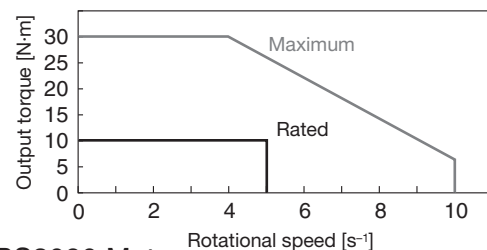
Cable length is up to 8 [m].

Rotational speed and output torque characteristics

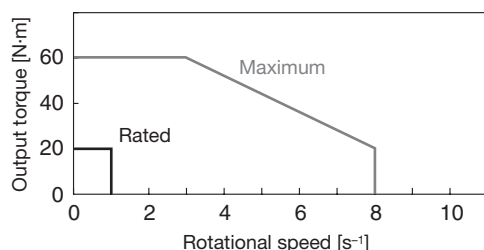
PS3015 Motor



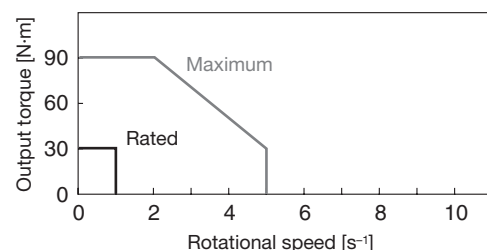
PS3030 Motor



PS3060 Motor

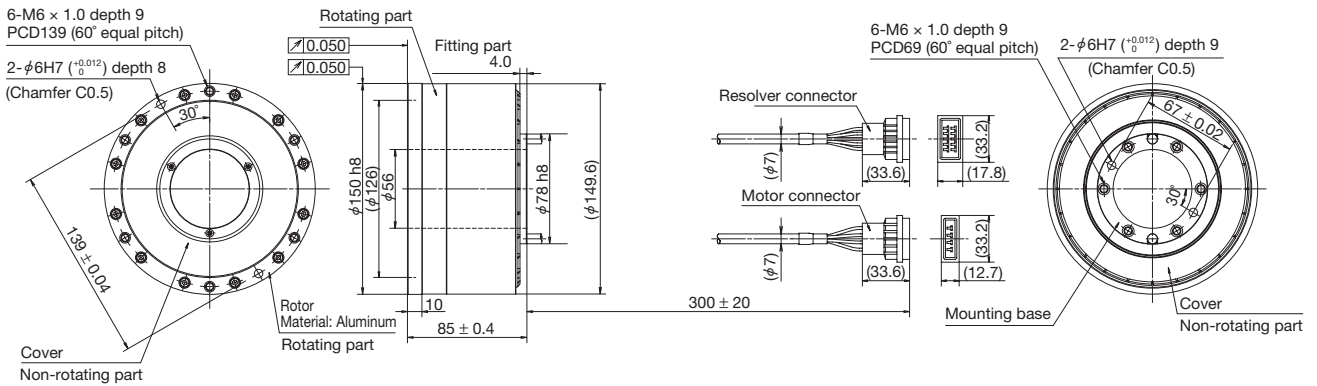


PS3090 Motor

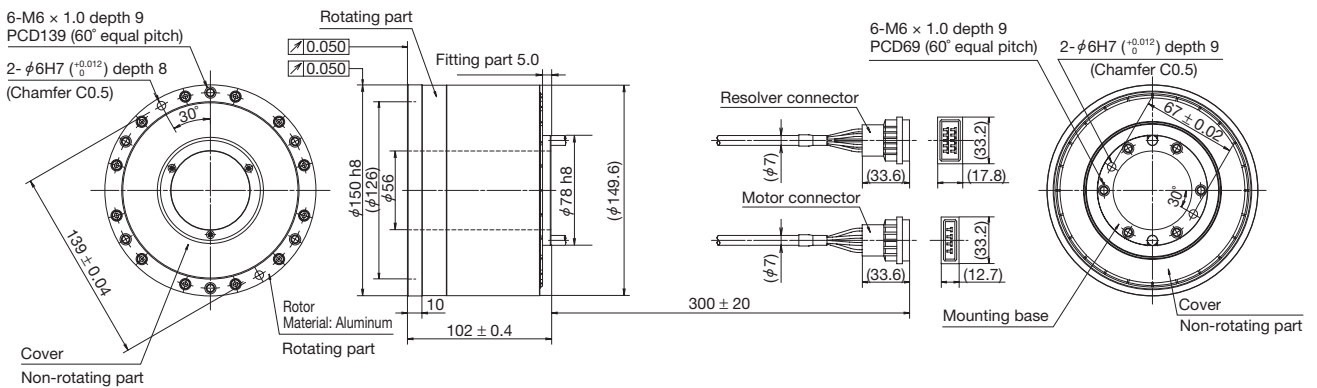


Dimensions of PS3 Model

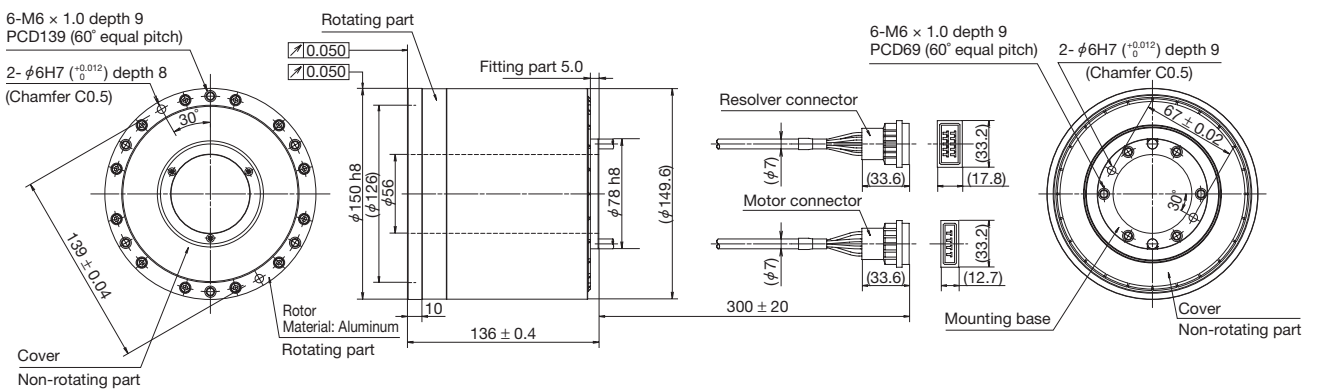
M-PS3015KN002



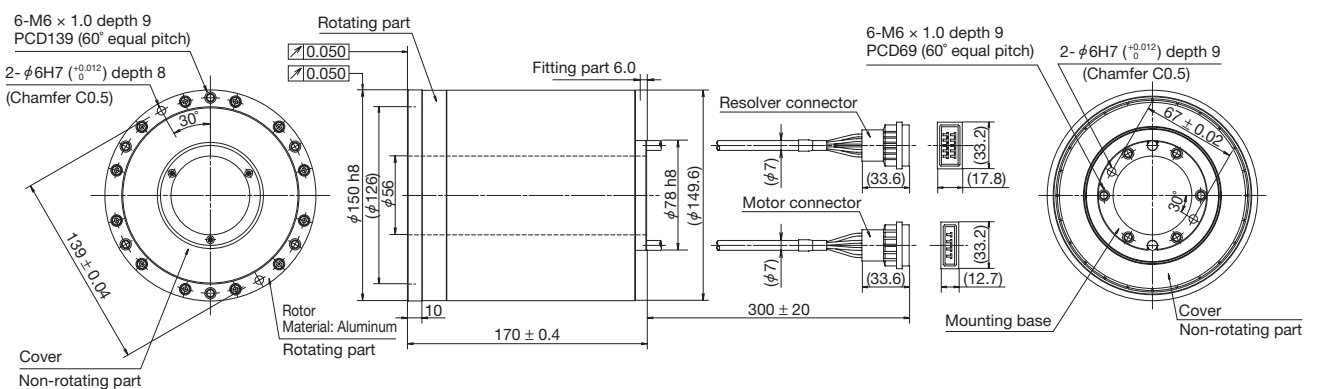
M-PS3030KN002



M-PS3060KN002



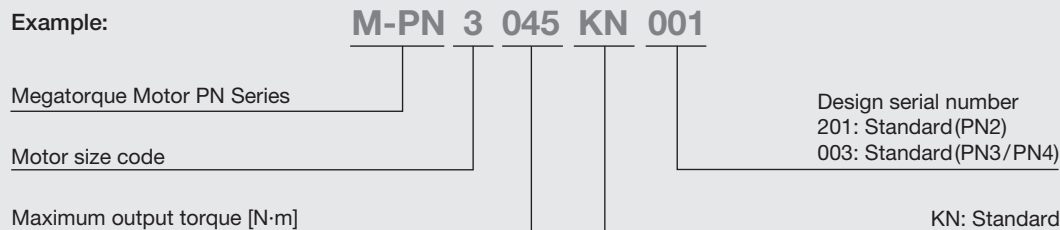
M-PS3090KN002



Megatorque Motors

Motor Specifications PN Series Motor

Part number for PN Model Motor



PN Model Motor specifications

| Functional item | Part number | M-PN2012KN201 <small>(Note 2)</small> | M-PN3045KN001 | M-PN4135KN001 | M-PN4180KN001 |
|---|-------------|--|---------------|---------------|---------------|
| Motor outer diameter [mm] | | φ 170 | φ 210 | φ 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 ± 5 [°C]) | | | |
| Repeatability [arc sec] | | ±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 [°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

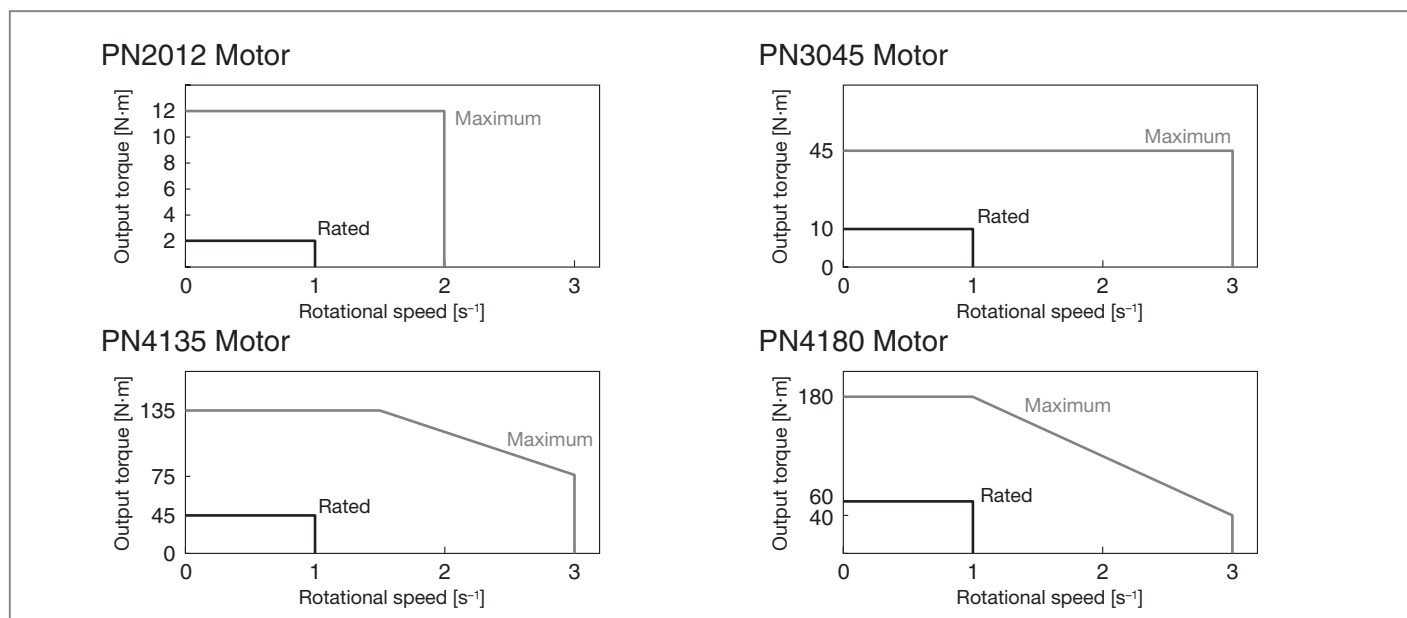
*2 Under no axial load

For an oscillating operation less than 45 [°], 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.

Note 2: Cable length for PN2012 is up to 8 [m].

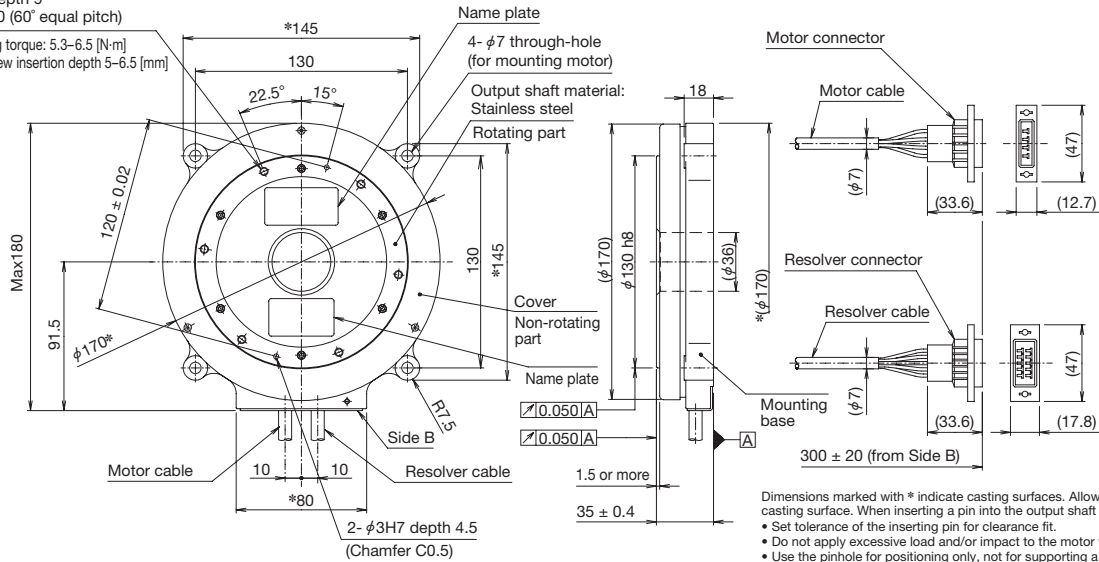
Rotational speed and output torque characteristics



Dimensions of PN Model

PN2012

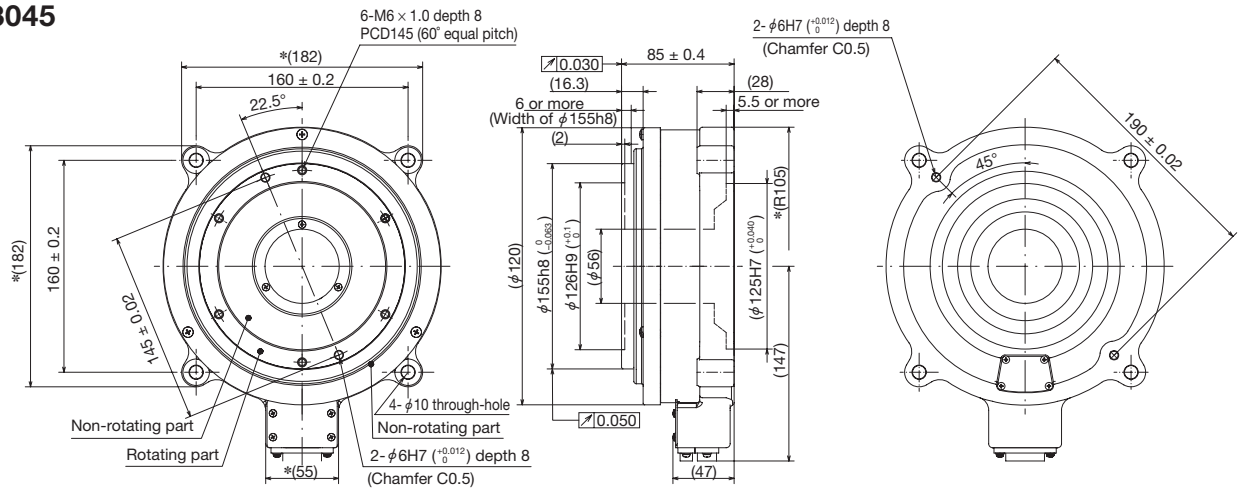
6-M5 depth 9
PCD120 (60° equal pitch)
Tightening torque: 5.3-6.5 [N·m]
Note: Screw insertion depth 5-6.5 [mm]



Dimensions marked with * indicate casting surfaces. Allow for more than 3 [mm] to the casting surface. When inserting a pin into the output shaft pinhole [2-φ3H7 depth 4.5]:

- Set tolerance of the inserting pin for clearance fit.
- Do not apply excessive load and/or impact to the motor when inserting the pin.
- Use the pinhole for positioning only, not for supporting a load.

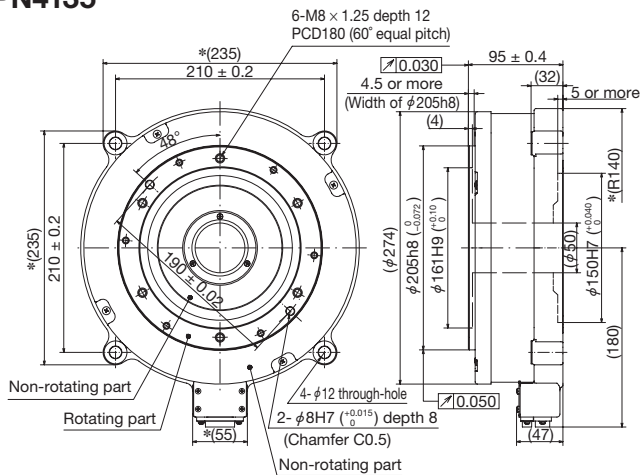
PN3045



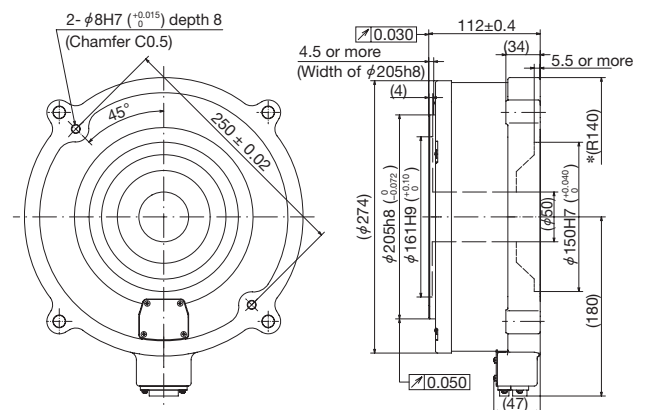
Dimensions marked with * indicate casting surfaces. Allow for more than 3 [mm] to the casting surface. When inserting a pin into the output shaft pinhole [2-φ6H7 depth 8]:

- Set tolerance of the inserting pin for clearance fit.
- Do not apply excessive load and/or impact to the motor when inserting the pin.
- Use the pinhole for positioning only, not for supporting a load.

PN4135



PN4180



Dimensions marked with * indicate casting surfaces. Allow for more than 3 [mm] to the casting surface. When inserting a pin into the output shaft pinhole [2-φ8H7 depth 8]:

- Set tolerance of the inserting pin for clearance fit.
- Do not apply excessive load and/or impact to the motor when inserting the pin.
- Use the pinhole for positioning only, not for supporting a load.

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

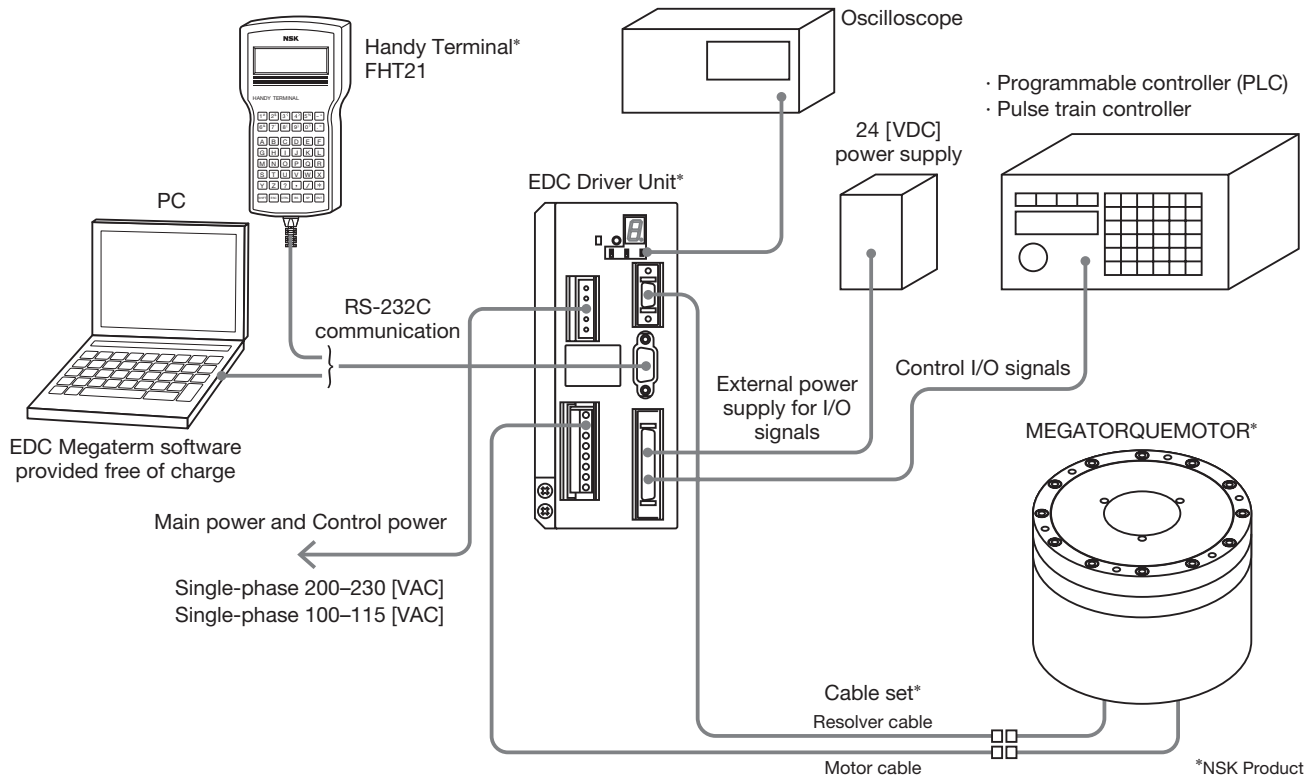
Connect the handy terminal to set parameters. Use the EDC Megaterm software to communicate with a PC.

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

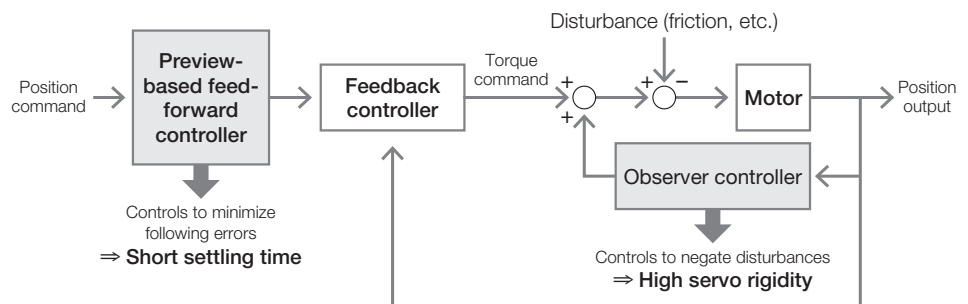
System Configuration



Control Technology and High-speed Positioning Example

Control block diagram

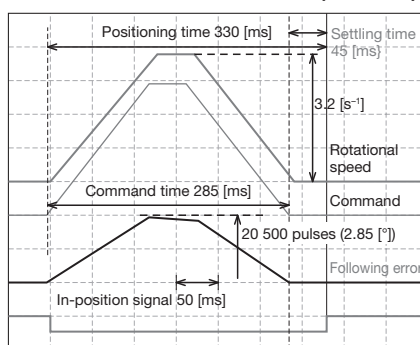
Adopts new servo algorithm
 Settling time: Less than 1 [ms]



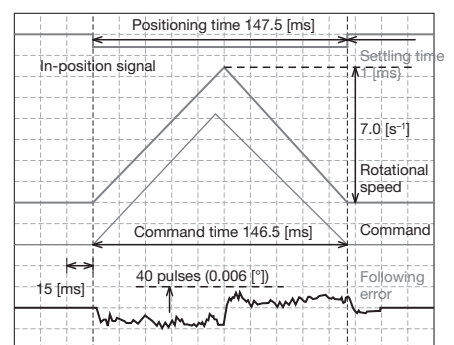
Comparison of 180 [°] positioning

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) | Design serial number 02: Standard 03: High-precision products (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) | |

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) | Design serial number 02: Standard 03: High-precision products (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) | |

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) | Design serial number 02: Standard 03: High-precision products (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) | |

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)

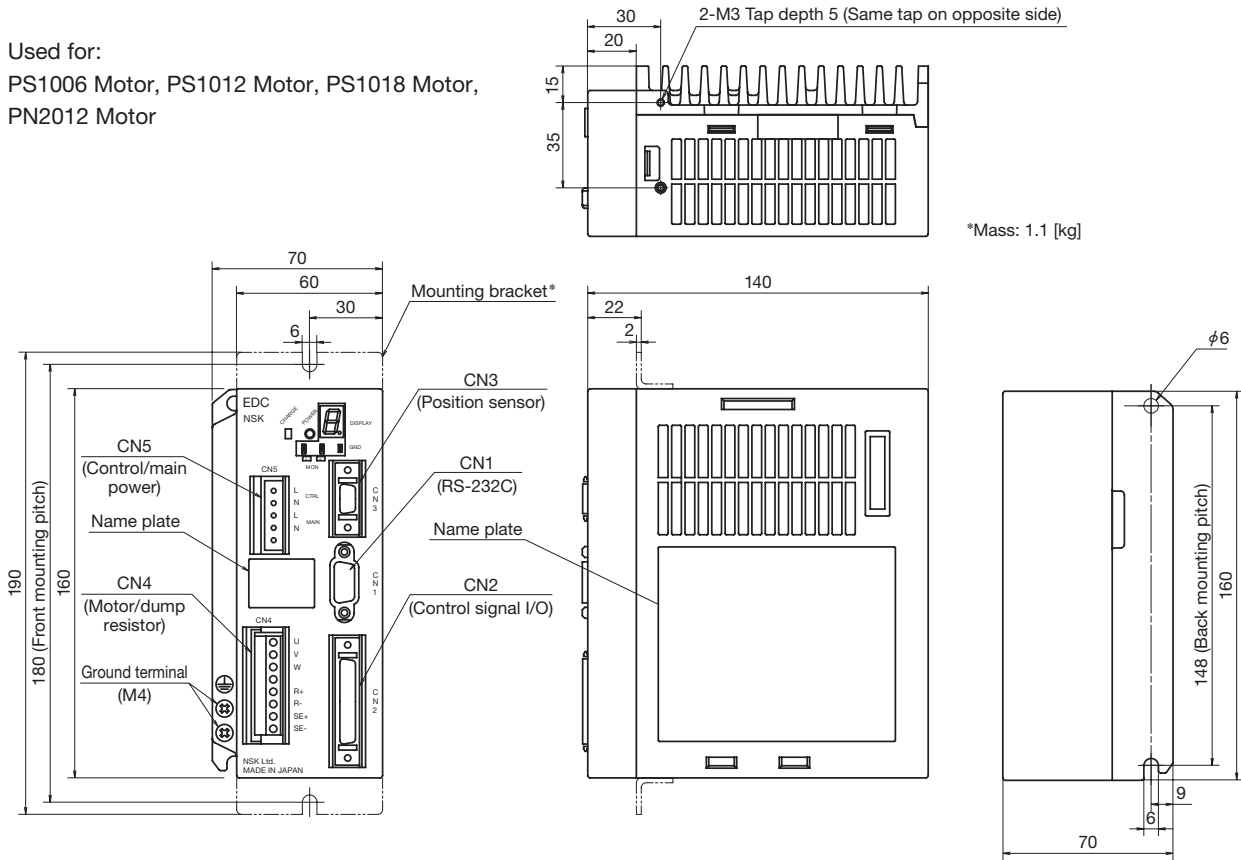
Accessories for EDC Driver Unit (CC-Link Function)

- (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:

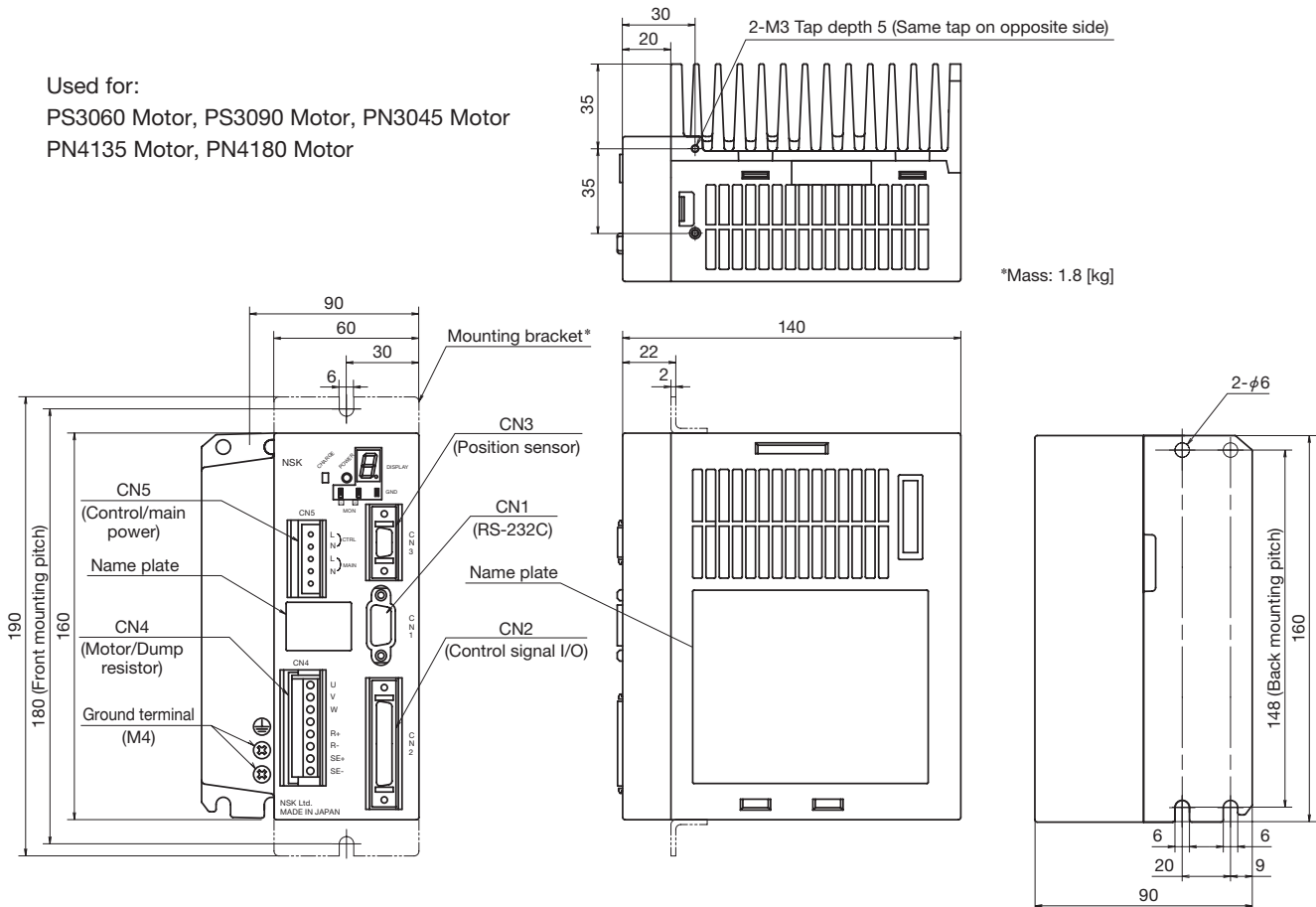
PS1006 Motor, PS1012 Motor, PS1018 Motor,
PN2012 Motor



*Mass: 1.1 [kg]

Used for:

PS3060 Motor, PS3090 Motor, PN3045 Motor
PN4135 Motor, PN4180 Motor



*Mass: 1.8 [kg]

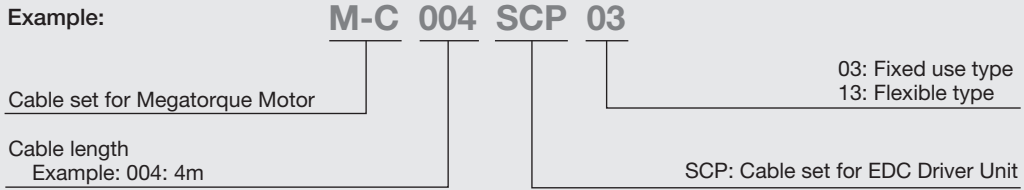
EDC Driver Unit

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 $\pm 10\%$ | | | | | | | Voltage fluctuation range $\pm 10\%$ | | | | |
| 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 ²] | | | | | | | | | | | |
| 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) | | | | | | | | | | | |

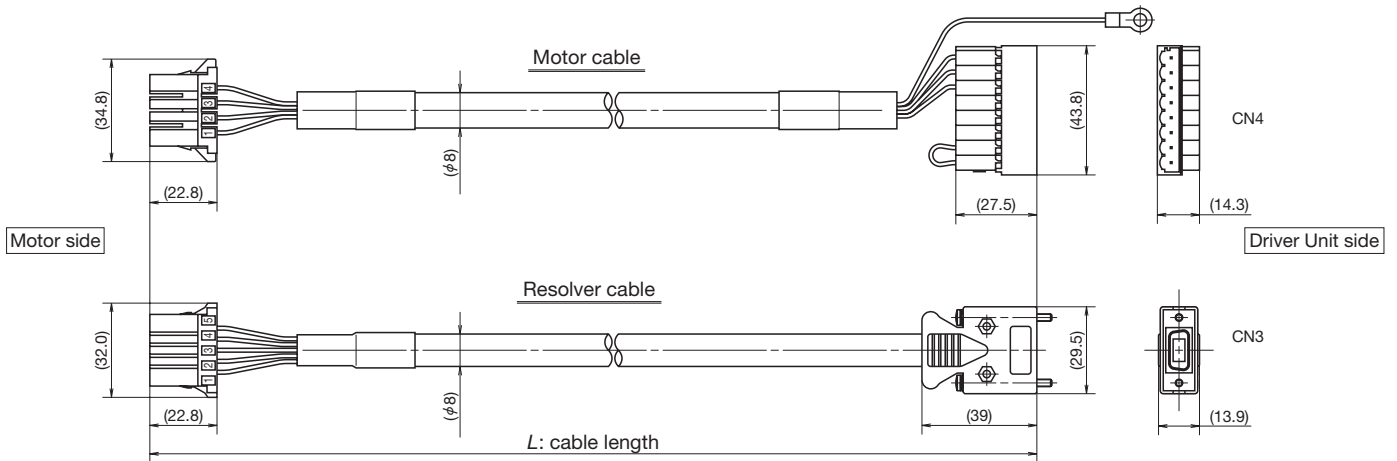
Cable Set

Part number for cable set



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 |
| Manual | M-E099DC0C2-155 | User's manual (Japanese version) |
| | 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) | 256 program channels Pulse train input (photocoupler) |
| | | M-EDC-PS1006CB502-* | AC100-AC115 | | |
| | M-PS1012KN002 | M-EDC-PS1012AB502-* | AC200-AC230 | M-C0**SCP13 (Flexible type) | |
| | | M-EDC-PS1012CB502-* | AC100-AC115 | | |
| | M-PS1018KN002 | M-EDC-PS1018AB502-* | AC200-AC230 | ** indicates cable length | |
| | | M-EDC-PS1018CB502-* | AC100-AC115 | | |
| φ150 | M-PS3015KN002 | M-EDC-PS3015AB502-* | AC200-AC230 | 01: 1 [m] | |
| | | M-EDC-PS3015CB502-* | AC100-AC115 | 02: 2 [m] | |
| | M-PS3030KN002 | M-EDC-PS3030AB502-* | AC200-AC230 | 03: 3 [m] | |
| | | M-EDC-PS3030CB502-* | AC100-AC115 | 04: 4 [m] | |
| | M-PS3060KN002 | M-EDC-PS3060AB502-* | AC200-AC230 | 05: 5 [m] | |
| | | M-EDC-PS3060CB502-* | AC100-AC115 | 06: 6 [m] | |
| | M-PS3090KN002 | M-EDC-PS3090AB502-* | AC200-AC230 | 08: 8 [m] | |
| | | M-EDC-PS3090CB502-* | AC100-AC115 | 10: 10 [m] 15: 15 [m] 20: 20 [m] 30: 30 [m] | |

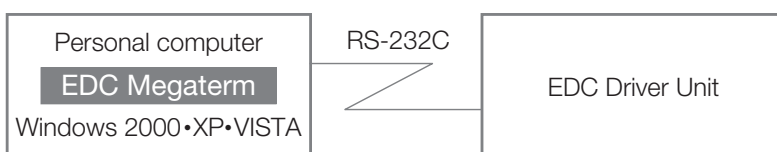
PN Series and EDC Driver Unit combinations

| 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.



RS-232C communication cable is available (accessory).
Type: M-C003RS03 (cable length: 3 [m])

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



Megatorque Motors

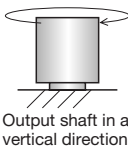
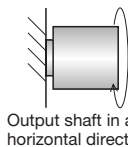
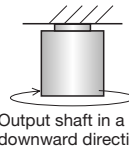
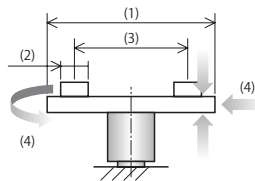
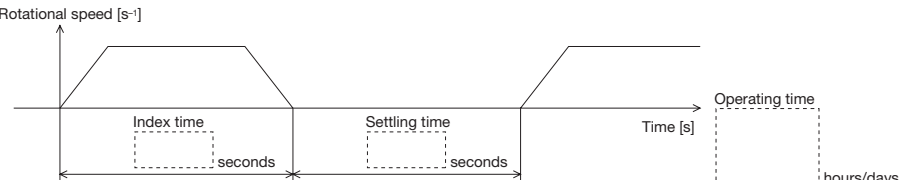
Form for Requesting Megatorque Motor Selection

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 \odot 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): ____ / ____ / ____ | | | |
| \odot Company Name: _____ | \odot Section: _____ | | | |
| \odot Name: _____ | \odot Contact: _____ TEL _____ FAX _____ | | | |
| \odot Application and equipment used (specify with as much detail as possible) | | | | |
| \odot 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 |
| \odot 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. <div style="border: 2px solid red; padding: 5px; text-align: center; color: red; font-weight: bold;"> Please download separate PDF file to complete the form with the computer </div> | | | Attachment: <input type="checkbox"/> Yes <input type="checkbox"/> No |
| (4) External force (pressure/impact load, sliding friction, etc.) | _____ 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. | | | |
| \odot Motor size requested | | | | |
| \odot Positioning command system | <input type="checkbox"/> Internal program system <input type="checkbox"/> Pulse train input operation <input type="checkbox"/> RS-232C operation <input type="checkbox"/> CC-Link | | | |
| \odot Positioning angle / Number of points | Settle at _____ °, Number of points: _____ | | | |
| \odot Repeatability (\pm) | \pm _____ seconds (\pm _____ mm at _____ mm from the motor center) | | | |
| \odot Cycle pattern (desired positioning time) *Specify settling time. |  | | | |
| \odot Input power voltage | <input type="checkbox"/> AC100-115V <input type="checkbox"/> AC200-230V <input type="checkbox"/> Others (_____ V) | | | |
| \odot Environmental conditions | 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. | | | |
| \odot 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. | | | |
| \odot Other request items | | | | |

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

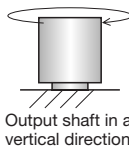
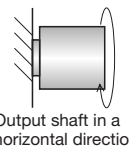
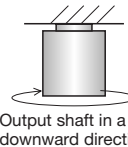
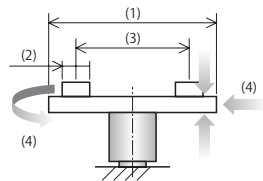
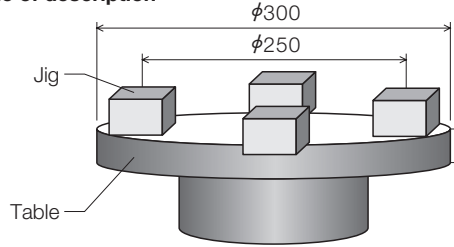
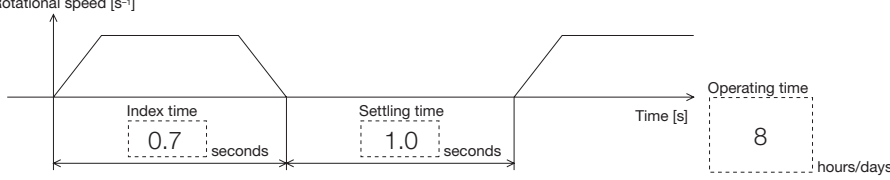
Section: Engineering Dept., Engineering Section #1

Name: YYY YYY

Contact:

TEL 03-1234-5678-8

FAX 03-1234-5678

| | | | |
|---|---|--|--|
| <p>Application and equipment used (specify with as much detail as possible)</p> | <p>Semiconductor inspection machine</p> | | |
| <p>Motor installation position (check in <input type="checkbox"/>)</p> | <p><input checked="" type="checkbox"/> Upright position  Output shaft in a vertical direction</p> | <p><input type="checkbox"/> Horizontal position  Output shaft in a horizontal direction</p> | <p><input type="checkbox"/> Upside-down position  Output shaft in a downward direction</p> <p><input type="checkbox"/> Others</p> |
| <p>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)</p>  | <p>Schematic drawing (an attached illustration showing outside dimensions is acceptable) • Please provide information on outside dimensions, dimensions from the center, material, etc. Example of description</p>  <p>Attachment: <input type="checkbox"/> Yes <input type="checkbox"/> No</p> | | |
| <p>(4) External force (pressure/impact load, sliding friction, etc.)</p> | <p>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</p> <p>Force is applied downward to a single point at 125 mm in radius from the center. *Specify position, direction, etc. in the schematic drawing.</p> | | |
| <p>Motor size requested</p> | <p>M-PS3060</p> | | |
| <p>Positioning command system</p> | <p><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</p> | | |
| <p>Positioning angle / Number of points</p> | <p>Settle at 90°, Number of points: 4</p> | | |
| <p>Repeatability (±)</p> | <p>± 20.6 seconds (± 0.01 mm at 100 mm from the motor center)</p> | | |
| <p>Cycle pattern (desired positioning time) *Specify settling time.</p> | <p>Rotational speed [s⁻¹]</p>  | | |
| <p>Input power voltage</p> | <p><input type="checkbox"/> AC100-115V <input checked="" type="checkbox"/> AC200-230V <input type="checkbox"/> Others (V)</p> | | |
| <p>Environmental conditions</p> | <p>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.</p> | | |
| <p>Cable specification and length</p> | <p><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.</p> | | |
| <p>Other request items</p> | <p>Please reply by January 12, 2010. (example)</p> | | |

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BRISBANE 1/69 Selhurst Street, Coopers Plains, Queensland 4108, Australia
P: 07-3347-2600 F: 07-3345-5376 C: 61
PERTH Unit 1, 71 Tacoma Circuit, Canning Vale, Western Australia 6155, Australia
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HONG KONG Suite 814, World Commerce Centre, Harbour City, T.S.T, KLN, Hong Kong, China
P: 02739-9933 F: 02739-9323 C: 852
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P: 0755-25904886 F: 0755-25904883 C: 86

KUNSHAN NSK CO., LTD.

OFFICE/PLANT 258 South Huang Pu Jiang Rd., Kunshan Economic & Technical Development
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OFFICE/PLANT No. 34 Zhenxing Road, Zhangjiagang Economic Development Zone, Zhangjiagang City,
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CHENGDU Room1117, Lippo Tower, No.62 North Kehua Road, Chengdu, Sichuan, China (610041)
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SHENYANG Room 3805-3806, Tower A, Royal Wanxin International Mansion, No.390 Qingnian
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China (130061)
P: 0431-8898-8682 F: 0431-8898-8670 C: 86

TIAN JIN Room 06, 09F The Exchange Tower 2, No. 189 NanJing Road, Heping District,
Tianjin, China (300050)
P: 022-8319-5030 F: 022-8319-5033 C: 86

NANJING A1 22F, Golden Eagle International Plaza, No.89 Hanzhong Road, Nanjing,
Jiangsu, China (210029)
P:025-8472-6671 F:025-8472-6687 C:86

CHONGQING Room 2306, Unit B, No.137, Keyuan 2nd Road, Jiulongpo District, Chongqing,
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NSK-WANDA ELECTRIC POWER ASSISTED STEERING SYSTEMS CO.,LTD.

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P:0571-8231-4818 F:0571-8248-6656 C:86

SHENYANG NSK PRECISION CO., LTD.

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Shenyang, Liaoning, China (110141)
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India:

RANE NSK STEERING SYSTEMS LTD.

CHENNAI 14, Rajagopalan Salai, Vallancherry, Guduvancherry, Tamil Nadu-603 202, India
P:044-474-06017 F:044-274-66001 C:91

BAWAL Plot No.28A, Sector 6, HSIIDC Growth Centre Bawal, District Rewari, Haryana
-123 501, India
P:01284-264281 F:01284-264280 C:91

NSK INDIA SALES CO.PVT.LTD.

CHENNAI New No.7, Old No.5, Boat Club Road, Chennai-600 028, India
P:044-2433-1161 F:044-2433-1160 C:91

GURGAON 107, Park Centra, Sector-30, Opposite 32nd Milestone, NH-8, Gurgaon,
Haryana-122 001, India
P:0124-4104-530 F:0124-4104-532 C:91

KOLKATA 502, Trinity Towers, 83, Topsis Road, Kolkata-700 046, India
P:033-4001-2062 F:0333-4001-2064 C:91

MUMBAI 321, A Wing, Ahura Centre, 82, Mahakali Caves Road, Andheri East, Mumbai
-400 093, India
P:022-2838-7787 F:022-2838-5191 C:91

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Kancheepuram District, Tamil Nadu-602 105, India
P:044-2714-3000 F:044-2714-3099 C:91

Indonesia:

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17520, Indonesia
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PT. NSK INDONESIA www.id.nsk.com

JAKARTA Summitmas II, 6th Floor, Jl. Jend Sudirman Kav. 61-62, Jakarta 12190, Indonesia
P: 021-252-3458 F: 021-252-3223 C: 62

PT. NSK-WARNER INDONESIA

BEKASI MM2100 Industrial Town, Cikarang Barat, Bekasi 17520, Indonesia
P: 021-8998-3216 F: 021-8998-3218 C: 62

Korea:

NSK KOREA CO., LTD. www.kr.nsk.com

SEOUL Posco Center (West Wing) 9F, 892, Daechi-4Dong, Kangnam-Ku, Seoul, 135-777, Korea
P: 02-3287-0300 F: 02-3287-0345 C: 82

CHANGWON 60, Seongsan-Dong, Changwon, Kyungsangnam-Do, 641-315, Korea
P: 055-287-6001 F: 055-285-9982 C: 82

Malaysia:

NSK BEARINGS (MALAYSIA) SDN. BHD. www.my.nsk.com

HEAD OFFICE No. 2, Jalan Pemaju, U1/15, Seksyen U1, Hicom Glenmarie Industrial Park,
40150 Shah Alam, Selangor, Malaysia
P: 03-7803-8859 F: 03-7806-5982 C: 60

PRAI No.36, Jalan kikik, Taman Inderawasih, 13600 Prai, Penang, Malaysia
P: 04-3902275 F: 04-3991830 C: 60

JOHOR BAHRU 88 Jalan Ros Merah 2/17, Taman Johor Jaya, 81100 Johor Bahru, Johor, Malaysia
P: 07-3546290 F: 07-3546291 C: 60

KOTA KINABALU No. 8 Lot 3B, Block C, Lorong Waja 2, Taman Waja, Jalan Pintas, Kepayan Ridge,
88300 Kota Kinabalu, Sabah, Malaysia
P: 088-413798 F: 088-413798 C: 60

IPOH Gr. Floor, 89 Jalan Bendahara, 31650 Ipoh, Perak, Malaysia
P: 05-2555000 F: 05-2553373 C: 60

NSK MICRO PRECISION (M) SDN. BHD. www.my.nsk.com

MALAYSIA PLANT No.43 Jalan Taming Dua,Taman Taming Jaya 43300 Balakong, Selangor Darul Ehsan,
Malaysia
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