

NSK Linear Guides™

NH/NS Models

With high durability, a full range of interchangeable slides and rails, and support for NSK K1-L™ lubrication units for maintenance-free operation, NH/NS models offer unmatched ease of use across applications.

Patented



With NSK's latest technologies, NH/NS models define the modern standard.

NH/NS model linear guides build upon proven LH/LS models with significantly improved durability. The user-friendly lineup features interchangeable rails/slides and support for NSK K1-L lubrication units for long-term, maintenance-free operation ideal for general purpose applications.

Features of NH and NS Models

1. Excellent durability

Super-long life twice that of conventional models

NH/NS models achieve a load rating 1.3x greater and a lifespan 2x longer than conventional LH/LS linear guides*1. This expands design options, allowing machines to have a longer life and for equipment downsizing.

*1: Based on representative values for the lineup.

Support for maintenance-free operation

Installing the optional NSK K1-L™ lubrication unit enables the linear guide to operate for a long period without maintenance. Proven in a wide range of fields, the K1-L unit helps to both save maintenance costs and protect the environment.

What is the NSK K1-L™ lubrication unit?

The NSK K1-L unit features a porous resin with abundant lubricating oil. Oil gradually seeps out from the resin to supply fresh lubricant to the linear guide over a long period.

2. A user-friendly standard

Interchangeable lineup

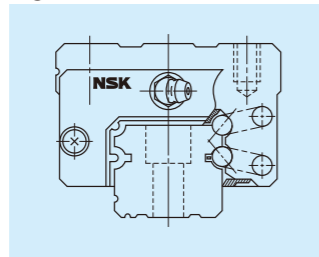
Rails and ball slides for the entire lineup can be freely matched to suit the application. Interchangeable rails and slides can be delivered quickly, all while maintaining proper accuracy and preload when combined.

Robust design that absorbs mounting errors

Thanks to a similar contact structure as DF arrangements of rolling bearings, the contact lines converge inward to reduce moment rigidity (Fig. 1).

This increases the capacity of the guides to compensate for errors in installation and makes it easy for users to mount the guides for best performance.

Fig. 1



Abundant options

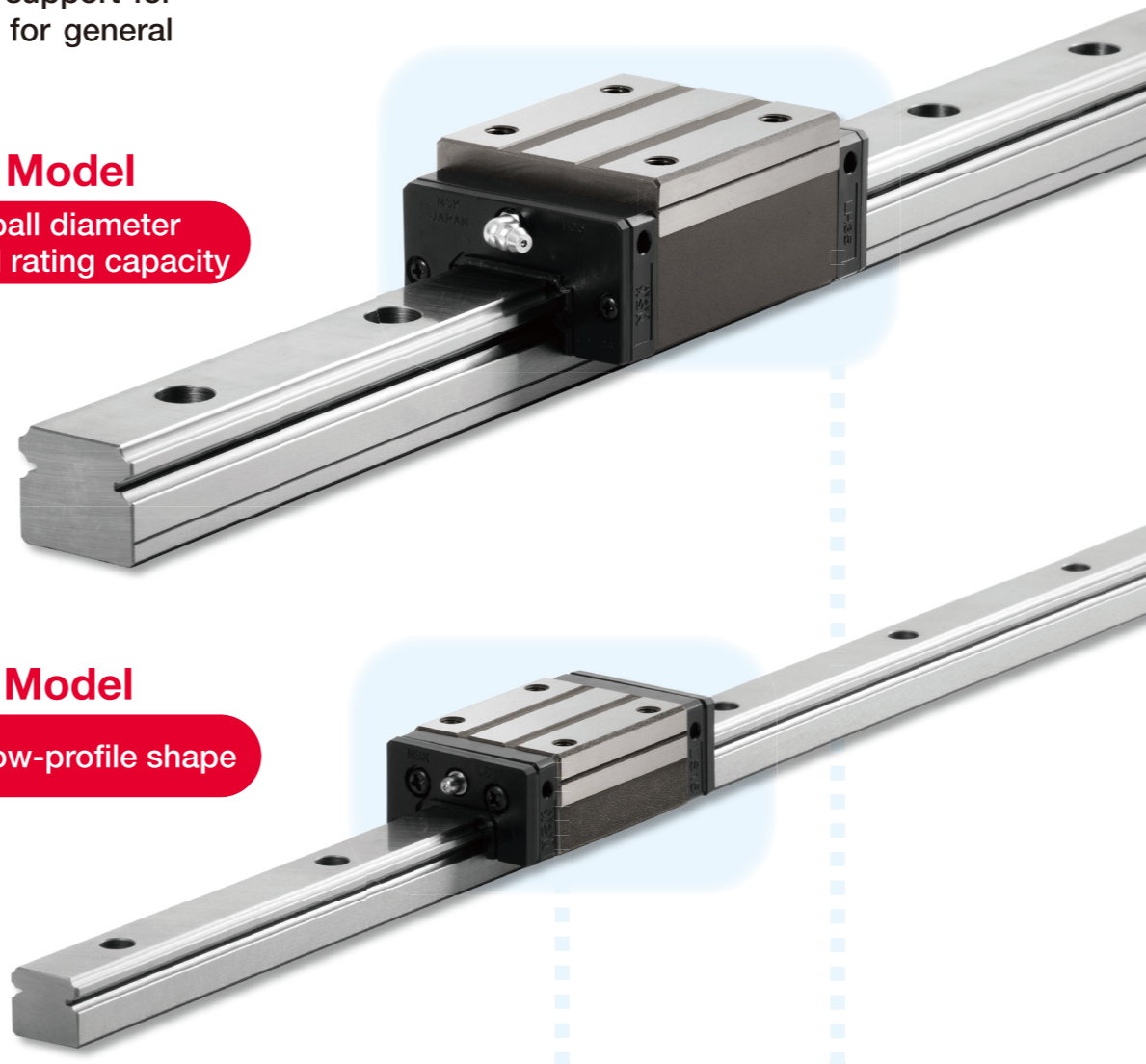
With various options available, including NSK K1-L lubrication units, double seals, protectors, specialized surface treatments, and more, we can offer the configuration best suited to your needs.

Mounting dimensions identical to LH/LS models

Mounting dimensions (assembled dimensions), such as height, width, mounting hole screw diameter/pitch, etc. are the same as those of LH/LS models. As such, NH and NS models can easily be used in existing machines without design changes.

NH Model
Larger ball diameter
Larger load rating capacity

NS Model
Compact, low-profile shape

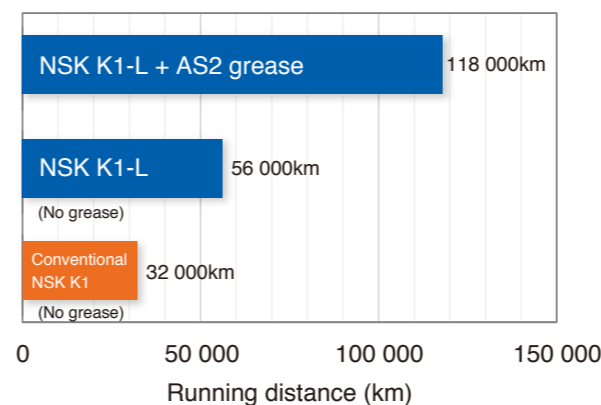
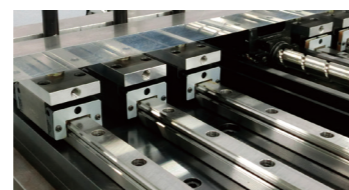


Realize extended maintenance-free operation with the optional NSK K1-L lubrication unit¹⁾

The NSK K1-L unit alone achieves a running distance over 50 000 km—nearly double that of the NSK K1. When used with an initial grease fill, the running distance soars to well over 100 000 km—all the while with no need for lubrication maintenance.²⁾

Endurance test

Model : NH25
Preload : Slight preload
Feed speed : 3.2 m/s
External load : None
Lubrication : Lubrication unit (two per slide)



Notes: 1) For details on NSK K1-L, please see the "NSK K1-L Lubrication Unit" catalog (CAT No. 3335).

2) Assuming a light load application in a normal environment. Lubrication performance is influenced significantly by the operating environment. There is no guarantee of values/performance in actual equipment.

Note that using a NSK K1-L unit alone (without grease or oil) is not possible in normal operation.

Standard linear guides produced through state-of-the-art technology

NH/NS models are based on LH/LS models, a lineup with an excellent track record across applications since their debut in 1989. As a standard lineup, NH/NS linear guides are the focal point for NSK's newest design and manufacturing technologies.

Reliable and proven LH/LS models

+

NSK's state-of-the-art design/manufacturing technologies

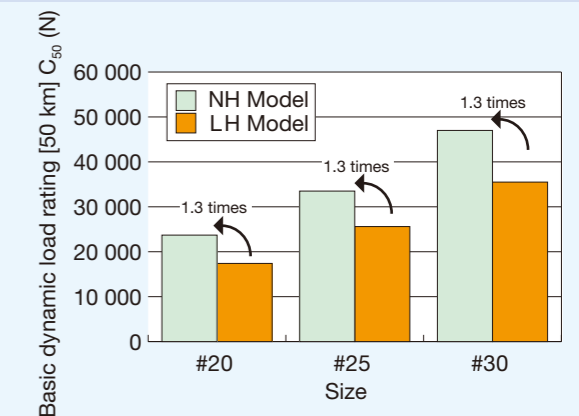
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New standard linear guides:
NH and NS models

Long-life ball groove geometry

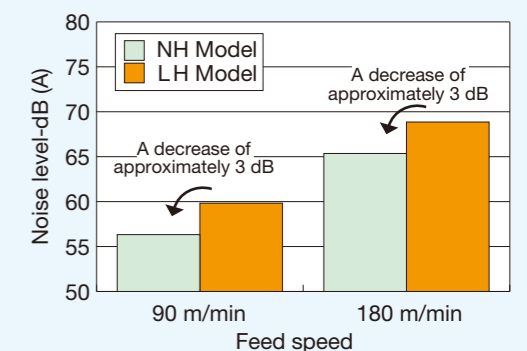
A ball groove geometry developed with NSK's exclusive tribology and analysis technologies optimizes the distribution of contact surface pressure, dramatically increasing rating life. Compared to LH/LS models, NH/NS models offer 1.3x the load rating capacity and double the life*1.

*1: Based on representative values for the lineup.



Low noise at high speeds

We achieved smoother ball circulation and reduced noise by refining the design of the ball circulation path, making NH/NS models well-suited to high-speed applications.



*Measurement results obtained from a size #25 linear guide alone.

Microphone position: 500 mm above the top of the specimen.

The noise level varies depending on the microphone position.

Specifications

1. Ball Slide Shape

- Two types of ball slides are available: A square type with tapped holes and a flanged type for mounting.
- A compact, low-profile square model is also available.
- Flanged types with mounting holes may be mounted from either the top or bottom. The holes consist of a tapped section used for fixing the ball slide from the top and a minor diameter section for bolt hole mounting from the bottom.
- Three ball slide lengths are available: standard/high load, long/super-high load, and short/medium load. The ball slide length you can use differs depending on the type. Please refer to the dimension tables for details.

Fig. 2 Ball slide shape

| Ball slide shape code | Shape/installation method | Type (Upper row: Rating; Lower row: Ball slide length) | | |
|-----------------------|---------------------------|--|----------------------|-------------------|
| | | High-load Standard | Super-high-load Long | Medium-load Short |
| AN BN | | AN | BN | |
| AL BL CL | | AL | BL | CL |
| EM GM JM | | EM | GM | JM |

2. Maximum Rail Length

- Table 1 shows the limitations of rail length (maximum length).
- Depending on the required accuracy grade, the available maximum rail length might be shorter than shown in Table 1.

Table 1 Length limitations of rails

| Model | Material | Size | Unit: mm | | | | | | | |
|-------|---------------------------|------|----------|-------|-------|-------|-------|-------|-------|-------|
| | | | 15 | 20 | 25 | 30 | 35 | 45 | 55 | 65 |
| NH | Special high carbon steel | | 2 980 | 3 960 | 3 960 | 4 000 | 4 000 | 3 990 | 3 960 | 3 900 |
| | Stainless steel | | 1 800 | 3 500 | 3 500 | 3 500 | | | | |
| NS | Special high carbon steel | | 2 920 | 3 960 | 3 960 | 4 000 | 4 000 | | | |
| | Stainless steel | | 1 800 | 3 500 | 3 500 | 3 500 | 3 500 | | | |

Note: Rails can be butted if user requirements exceed the rail length shown in the table. Please consult NSK for details.

3. Accuracy

- The preloaded assembly has five accuracy grades; Ultra precision P3, Super precision P4, High precision P5, Precision P6 and Normal PN grades, while the interchangeable type has High precision PH and Normal PC grades.

Table 2 Tolerance of preloaded assembly

| Characteristics | Accuracy grade | Ultra precision P3 | Super precision P4 | High precision P5 | Precision grade P6 | Normal grade PN |
|---|----------------|--|--------------------|-------------------|--------------------|-----------------|
| | | Mounting height H Variation of H (All ball slides on a set of rails) | ±8 3 | ±10 5 | ±20 7 | ±40 15 |
| Mounting width W ₂ or W ₃ Variation of W ₂ or W ₃ (All ball slides on reference rail) | ±10 3 | ±15 7 | ±25 10 | ±50 20 | ±100 30 | |
| Running parallelism of surface C to surface A Running parallelism of surface D to surface B | | Refer to Fig. 3 and Table 4. | | | | |

Unit: μm

Table 3 Tolerance of interchangeable type

| Characteristics | Accuracy grade | High precision grade PH | | Normal grade PC | | |
|--|----------------|------------------------------|--------------------------------------|-----------------|--------------------------------------|------------|
| | | Model No. | NH15,20,25,30,35 NS15,20,25,30,35 | NH45,55,65 | NH15,20,25,30,35 NS15,20,25,30,35 | NH45,55,65 |
| Mounting height H | | | ±20 | ±30 | ±20 | ±30 |
| Variation of mounting height H | | | 15 | 20 | 15 | 20 |
| Mounting width W ₂ or W ₃ | | | ±30 | ±35 | ±30 | ±35 |
| Variation of mounting width W ₂ or W ₃ | | | 20 | 20 | 25 | 30 |
| Running parallelism of surface C to surface A Running parallelism of surface D to surface B | | Refer to Fig. 3 and Table 4. | | | | |

Unit: μm

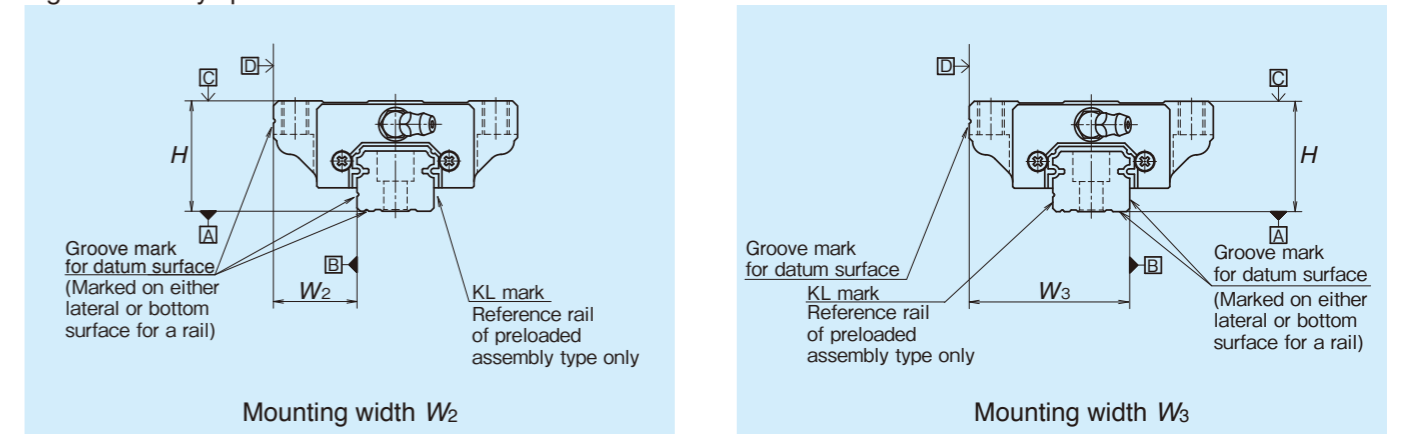
Note: Variation in interchangeable types refers to the variation among values taken at the same position on the same rail.

Table 4 Running parallelism of ball slide

| Rail length (mm) | Preloaded assembly | | | | | Interchangeable type | |
|-------------------|--------------------|--------------------|-------------------|--------------------|-----------------|----------------------|-----------------|
| | Ultra precision P3 | Super precision P4 | High precision P5 | Precision grade P6 | Normal grade PN | High precision PH | Normal grade PC |
| Over - 50 or less | 2 | 2 | 2 | 4 | 5 | 2 | 5 |
| 50 - 80 | 2 | 2 | 3 | 4 | 5 | 3 | 5 |
| 80 - 125 | 2 | 2 | 3 | 4 | 5 | 3 | 5 |
| 125 - 200 | 2 | 2 | 3.5 | 5 | 6 | 3.5 | 6 |
| 200 - 250 | 2 | 2.5 | 4.5 | 6 | 7.5 | 4.5 | 7.5 |
| 250 - 315 | 2 | 2.5 | 5 | 6.5 | 8.5 | 5 | 8.5 |
| 315 - 400 | 2 | 3 | 5.5 | 7 | 9.5 | 5.5 | 9.5 |
| 400 - 500 | 2 | 3 | 6 | 7.5 | 11 | 6 | 11 |
| 500 - 630 | 2 | 3.5 | 6.5 | 8.5 | 12 | 6.5 | 12 |
| 630 - 800 | 2 | 4 | 7 | 9.5 | 13 | 7 | 13 |
| 800 - 1 000 | 2.5 | 4.5 | 7.5 | 10 | 15 | 7.5 | 15 |
| 1 000 - 1 250 | 3 | 5 | 8.5 | 12 | 16 | 8.5 | 16 |
| 1 250 - 1 600 | 3.5 | 5.5 | 9.5 | 13 | 17 | 9.5 | 17 |
| 1 600 - 2 000 | 4 | 6.5 | 11 | 14 | 19 | 11 | 19 |
| 2 000 - 2 500 | 4.5 | 7.5 | 12 | 16 | 21 | 12 | 21 |
| 2 500 - 3 150 | 5.5 | 8.5 | 13 | 18 | 23 | 13 | 23 |
| 3 150 - 4 000 | 6 | 9.5 | 14 | 19 | 25 | 14 | 25 |

Unit: μm

Fig. 3 Accuracy specifications



4. Preload and Rigidity

- Slight preload Z1, Medium preload Z3, and Fine clearance Z0 are available for preloaded types, while interchangeable types offer Medium preload ZH, Slight preload ZZ, and Fine clearance ZT.
- Possible combinations of accuracy and preload grades are shown in Table 9.

Table 5 Preload and rigidity of preloaded assembly (1) NH Model

| Model No. | Preload (N) | | Rigidity (N/μm) | | | |
|-----------------|-------------------|-------------------|--------------------|-------------------|-------------------|-------------------|
| | | | Vertical direction | | Lateral direction | |
| | Slight preload Z1 | Medium preload Z3 | Slight preload Z1 | Medium preload Z3 | Slight preload Z1 | Medium preload Z3 |
| NH15 AN, EM | 78 | 490 | 137 | 226 | 98 | 186 |
| NH20 AN, EM | 147 | 835 | 186 | 335 | 137 | 245 |
| NH25 AL, AN, EM | 196 | 1 270 | 206 | 380 | 147 | 284 |
| NH30 AL, AN | 245 | 1 570 | 216 | 400 | 157 | 294 |
| NH30 EM | 294 | 1 770 | 265 | 480 | 186 | 355 |
| NH35 AL, AN, EM | 390 | 2 350 | 305 | 560 | 216 | 390 |
| NH45 AL, AN, EM | 635 | 3 900 | 400 | 745 | 284 | 540 |
| NH55 AL, AN, EM | 980 | 5 900 | 490 | 910 | 345 | 645 |
| NH65 AN, EM | 1 470 | 8 900 | 580 | 1 070 | 400 | 755 |
| NH15 BN, GM | 98 | 685 | 196 | 345 | 137 | 284 |
| NH20 BN, GM | 196 | 1 080 | 265 | 480 | 196 | 355 |
| NH25 BL, BN, GM | 245 | 1 570 | 294 | 560 | 216 | 400 |
| NH30 BL, BN, GM | 390 | 2 260 | 360 | 665 | 265 | 480 |
| NH35 BL, BN, GM | 490 | 2 940 | 430 | 795 | 305 | 570 |
| NH45 BL, BN, GM | 785 | 4 800 | 520 | 960 | 370 | 695 |
| NH55 BL, BN, GM | 1 180 | 7 050 | 635 | 1 170 | 440 | 835 |
| NH65 BN, GM | 1 860 | 11 300 | 805 | 1 480 | 550 | 1 040 |

Note: Clearance for Fine clearance Z0 is 0 to 3 μm. Therefore, preload is zero. However, Z0 of PN grade is 0 to 15 μm.

Table 7 Preload and rigidity of preloaded assembly (2) NS Model

| Model No. | Preload (N) | | Rigidity (N/μm) | | | |
|-------------|-------------------|-------------------|--------------------|-------------------|-------------------|-------------------|
| | | | Vertical direction | | Lateral direction | |
| | Slight preload Z1 | Medium preload Z3 | Slight preload Z1 | Medium preload Z3 | Slight preload Z1 | Medium preload Z3 |
| NS15 AL, EM | 69 | 390 | 127 | 226 | 88 | 167 |
| NS20 AL, EM | 88 | 540 | 147 | 284 | 108 | 206 |
| NS25 AL, EM | 147 | 880 | 206 | 370 | 147 | 275 |
| NS30 AL, EM | 245 | 1 370 | 255 | 460 | 186 | 345 |
| NS35 AL, EM | 345 | 1 960 | 305 | 550 | 216 | 400 |
| NS15 CL, JM | 49 | 294 | 78 | 147 | 59 | 108 |
| NS20 CL, JM | 69 | 390 | 108 | 186 | 78 | 137 |
| NS25 CL, JM | 98 | 635 | 127 | 235 | 88 | 177 |
| NS30 CL, JM | 147 | 980 | 147 | 275 | 108 | 206 |
| NS35 CL, JM | 245 | 1 370 | 186 | 335 | 137 | 245 |

Note: Clearance for Fine clearance Z0 is 0 to 3 μm. Therefore, preload is zero. However, Z0 of PN grade is 0 to 15 μm.

Table 9 Combinations of accuracy and preload

| | Accuracy grade | | | | | | |
|---|---|-----------------|----------------|-----------------|--------------|----------------|--------------|
| | Ultra precision | Super precision | High precision | Precision grade | Normal grade | High precision | Normal grade |
| | P3 | P4 | P5 | P6 | PN | PH | PC |
| Without NSK K1-L lubrication unit | P3 | P4 | P5 | P6 | PN | PH | PC |
| With NSK K1-L lubrication unit | L3 | L4 | L5 | L6 | LN | LH | LC |
| With NSK K1 for food and medical equipment | F3 | F4 | F5 | F6 | FN | FH | FC |
| Preload | Fine clearance Z0 | ○ | ○ | ○ | ○ | — | — |
| | Slight preload Z1 | ○ | ○ | ○ | ○ | — | — |
| | Medium preload Z3 | ○ | ○ | ○ | ○ | — | — |
| | Interchangeable type with fine clearance ZT | — | — | — | — | — | ○ |
| | Interchangeable type with slight preload ZZ | — | — | — | — | — | ○ |
| Interchangeable type with medium preload ZH | — | — | — | — | — | ○ | |

Table 6 Clearance and preload of interchangeable type (1) NH Model

| Model No. | Unit: μm | | |
|-----------|-------------------|-------------------|-------------------|
| | Fine clearance ZT | Slight preload ZZ | Medium preload ZH |
| NH15 | -4~15 | -4~0 | -3~-7 |
| NH20 | | -5~0 | -3~-8 |
| NH25 | | -5~0 | -4~-9 |
| NH30 | | -7~0 | -5~-12 |
| NH35 | -5~15 | -7~0 | -5~-12 |
| NH45 | | -7~0 | -7~-14 |
| NH55 | | -9~0 | -9~-18 |
| NH65 | | -9~0 | -10~-19 |

Note: Minus sign denotes a value is an amount of preload (elastic deformation of balls).

Table 8 Clearance and preload of interchangeable type (2) NS Model

| Model No. | Unit: μm | | |
|-----------|-------------------|-------------------|-------------------|
| | Fine clearance ZT | Slight preload ZZ | Medium preload ZH |
| NS15 | -4~15 | -4~0 | -3~-7 |
| NS20 | -4~15 | -4~0 | -3~-7 |
| NS25 | -5~15 | -5~0 | -4~-9 |
| NS30 | -5~15 | -5~0 | -4~-9 |
| NS35 | -5~15 | -6~0 | -4~-10 |

Note: Minus sign denotes a value of preload (elastic deformation of balls).

5. Basic Load Rating and Rating Life

The basic load rating used to express the load capacity of linear guides is determined by ISO standards (ISO 14728-1, 14728-2). Load ratings for NSK Linear Guides are based on these ISO standards.

The basic dynamic load rating refers to a non-fluctuating load that acts on the center of the ball slide from above so that the rated fatigue life is 100 km or 50 km. When the ball slide receives only load F in a vertical direction, the slide's rated fatigue life L can be calculated using the following equation where C₁₀₀ refers to the basic dynamic load rating for 100 km rated fatigue life and C₅₀ refers to the basic dynamic load rating for 50 km rated fatigue life.

The basic static load rating refers to a static load that generates a contact stress of 4 200 MPa at the center of the contact area between the rolling element subjected to the maximum stress and the raceway surface. In this most heavily stressed contact area, the sum of the permanent deformation of the rolling element and that of the raceway is nearly 0.0001 times the rolling element's diameter.

Values for basic load ratings are listed in the dimension tables. In NH/NS models, the contact angle is set at 50 degrees, thus increasing load carrying capacity in the upward direction. Basic load ratings by direction are shown in Table 11.

- Please note that the equation used here for calculating life differs from that used for linear guides with rollers as the rolling elements.
- The load factor is expressed as f_w. Select the most suitable load factor from the values given in Table 10 according to potential vibration or impact loads on the machine onto which the linear guide will be mounted.

$$L = 100 \times \left(\frac{C_{100}}{f_w \cdot F} \right)^3 \text{ or } L = 50 \times \left(\frac{C_{50}}{f_w \cdot F} \right)^3 \text{ [km]}$$

Various loads may be applied to the linear guide (i.e., ball slide loads), including vertical, lateral, and moment loads. Sometimes, more than one type of load will be applied simultaneously or the volume and direction of the load may vary. Variable loads cannot be used for life calculations of linear guides as they are. Therefore, it is necessary to use an applied hypothetical constant load that would generate a fatigue life equivalent to the actual fatigue life. This is called the dynamic equivalent load. To calculate dynamic equivalent load, use the values provided in Table 12.

Table 12 Loads by linear guide arrangement

| Pattern | Arrangement of linear guide | Loads necessary to calculate dynamic equivalent load | | | | | Dynamic equivalent load |
|---------|-----------------------------|--|----------------------|-------------|----------|--------|---|
| | | Load | | Moment load | | | |
| | | Up/down (vertical) | Right/left (lateral) | Rolling | Pitching | Yawing | |
| 1 | | Fr | Fs | Mr | Mp | My | $F_r = F_r$ $F_{se} = F_s \cdot \tan \alpha$ $F_{re} = \varepsilon_r \cdot M_r$ $F_{pe} = \varepsilon_p \cdot M_p$ $F_{ye} = \varepsilon_y \cdot M_y$ |
| 2 | | Fr | Fs | Mr | | | |
| 3 | | Fr | Fs | | Mp | My | α : Contact angle (=50°) Dynamic equivalent coefficients ε_r : Rolling direction ε_p : Pitching direction ε_y : Yawing direction |
| 4 | | Fr | Fs | | | | |

Full dynamic equivalent load can be obtained using the proper coefficients. These formulas are determined by the relationship of load to volume.

After obtaining the dynamic equivalent coefficient in Table 9, the full dynamic equivalent load can be calculated using the appropriate equation below as determined by the magnitude of the load:

- When F_r is the largest load: $F_e = F_r + 0.5F_{se} + 0.5F_{re} + 0.5F_{pe} + 0.5F_{ye}$
- When F_{se} is the largest load: $F_e = 0.5F_r + F_{se} + 0.5F_{re} + 0.5F_{pe} + 0.5F_{ye}$
- When F_{re} is the largest load: $F_e = 0.5F_r + 0.5F_{se} + F_{re} + 0.5F_{pe} + 0.5F_{ye}$
- When F_{pe} is the largest load: $F_e = 0.5F_r + 0.5F_{se} + 0.5F_{re} + F_{pe} + 0.5F_{ye}$
- When F_{ye} is the largest load: $F_e = 0.5F_r + 0.5F_{se} + 0.5F_{re} + 0.5F_{pe} + F_{ye}$

The values for dynamic equivalent load in the formulas above should be absolute values that disregard load directions.

Table 10 Load factor f_w

| Impact/vibration | Load factor |
|---|-------------|
| No external impact/vibration | 1.0 to 1.5 |
| There is impact/vibration from outside. | 1.5 to 2.0 |
| There is significant impact/vibration. | 2.0 to 3.0 |

Table 11 Basic load rating by load direction

| Load rating | Direction | Downward | Upward | Lateral |
|---------------------------|-----------|----------------|--------------------|--------------------|
| Basic dynamic load rating | | C | C | 0.84C |
| Basic static load rating | | C ₀ | 0.78C ₀ | 0.65C ₀ |

Fig. 4 Load directions

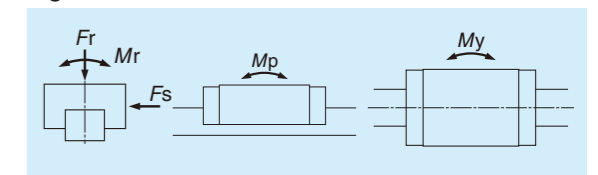


Table 13 Dynamic equivalent coefficients

| Model | Dynamic equivalent coefficients (1/m) | | |
|----------------|---------------------------------------|----------------|----------------|
| | ε _r | ε _p | ε _y |
| NH15AN, EM | 188 | 111 | 132 |
| NH15BN, GM | 188 | 72 | 86 |
| NH20AN, EM | 142 | 81 | 97 |
| NH20BN, GM | 142 | 57 | 68 |
| NH25AL, AN, EM | 123 | 68 | 81 |
| NH25BL, BN, GM | 123 | 51 | 61 |
| NH30AL, AN | 98 | 70 | 83 |
| NH30EM | 98 | 58 | 69 |
| NH30BL, BN, GM | 98 | 44 | 52 |
| NH35AL, AN, EM | 78 | 51 | 61 |
| NH35BL, BN, GM | 78 | 36 | 43 |
| NH45AL, AN, EM | 60 | 38 | 45 |
| NH45BL, BN, GM | 60 | 30 | 36 |
| NH55AL, AN, EM | 51 | 31 | 37 |
| NH55BL, BN, GM | 51 | 25 | 30 |
| NH65AN, EM | 43 | 27 | 32 |
| NH65BN, GM | 43 | 20 | 24 |
| NS15AL, EM | 177 | 116 | 138 |
| NS15CL, JM | 177 | 174 | 208 |
| NS20AL, EM | 127 | 94 | 112 |
| NS20CL, JM | 127 | 136 | 162 |
| NS25AL, EM | 111 | 70 | 83 |
| NS25CL, JM | 111 | 108 | 129 |
| NS30AL, EM | 94 | 63 | 75 |
| NS30CL, JM | 94 | 102 | 121 |
| NS35AL, EM | 76 | 54 | 64 |
| NS35CL, JM | 76 | 87 | 104 |

6. Dust-resistant parts and Lubrication accessories

(1) Standard specification

- Under normal applications, NH/NS models can be used without modification thanks to their dust resistance. These ball slides come standard with an end seal on both ends, and bottom seals underneath.
- Table 14 shows options available for higher dust resistance. Select the options that best suit your operation environment.

Table 14 Optional parts for dust resistance

| Name | Purpose |
|-------------|---|
| Double seal | Combines two end seals for enhanced seal effectiveness. |
| Protector | Protects the end seal from hot and hard contaminants. |
| Rail cap | Prevents foreign matter, such as swarf generated in cutting operation from clogging the rail-mounting holes. |
| Inner seal | Installed inside the slide to prevent foreign matter from entering and affecting the rolling contact surface. |
| Bellows | Covers the linear guide. |

Note: Inner seals can be selected for NH20-65. Not available for NS models.

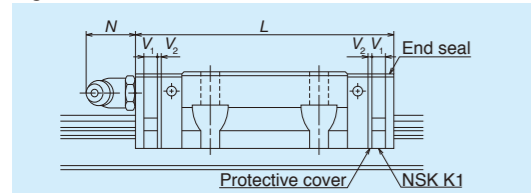
(2) Mounting position for lubrication accessories

- The standard position for grease fittings is at the end face of the ball slide. We can mount them on the side of the end cap as an option (Fig. 5).
- Please consult NSK for the installation of grease or tube fittings to the ball slide body or side of end cap.

(3) NSK K1-L lubrication unit/ NSK K1 for food processing/medical equipment

NSK K1/K1-L lubrication units are installed on the inner side of the end seal and contain a porous synthetic resin with abundant lubricating oil. The oil gradually seeps out from the resin to lubricate the linear guide over a long period. Table 15 shows dimensions when equipped to linear guides.

Fig. 7



7. Rust Prevention

(1) Stainless steel

For improved rust prevention, stainless steel is available for parts typically made of carbon steel in models NH15 to NS30 and NS15 to NS35. However, interchangeable types with high precision (PH) accuracy and medium preload (ZH) cannot use stainless steel.

(2) Surface treatment

NSK recommends low-temperature chrome plating or fluoride low-temperature chrome plating as the surface treatment. Please consult NSK regarding other surface treatments.

Table 16 Material/surface treatment code

| Code | Description |
|------|--|
| C | Special high carbon steel (NSK standard) |
| K | Stainless steel |
| D | Special high carbon steel with surface treatment |
| H | Stainless steel with surface treatment |
| Z | Other, special |

Fig. 5

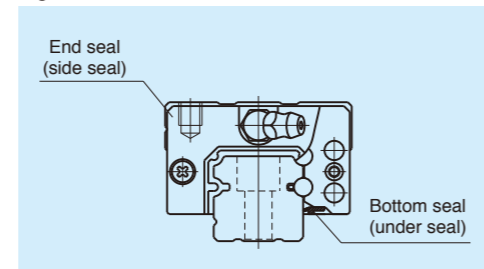


Fig. 6 Mounting position of lubrication accessories

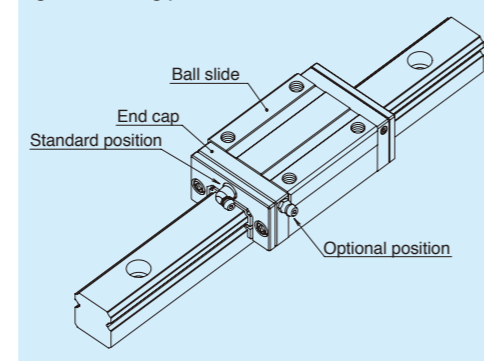


Table 15 Dimensions of linear guides equipped with NSK K1-L/NSK K1 for food processing/medical equipment

| Model No. | Standard ball slide length | Ball slide length with two NSK K1-L or NSK K1 for food processing/medical equipment L | NSK K1-L | | | Protrusion of grease fitting N | |
|-----------|----------------------------|---|--|--|--|--------------------------------|------|
| | | | Thickness of single NSK K1-L unit V ₁ | Thickness of single NSK K1 unit V ₂ | Thickness of protective cover V ₃ | | |
| NH15 | AN, EM | 55 | 65.6 | 5.3 | 4.5 | 0.8 | (5) |
| | BN, GM | 74 | 84.6 | | | | |
| NH20 | AN, EM | 69.8 | 80.4 | 5.3 | 4.5 | 0.8 | (14) |
| | BN, GM | 91.8 | 102.4 | | | | |
| NH25 | AL, AN, EM | 79 | 90.6 | 5.8 | 5 | 0.8 | (14) |
| | BL, BN, GM | 107 | 118.6 | | | | |
| NH30 | AL, AN | 85.6 | 97.6 | 6 | 5 | 1 | (14) |
| | BL, BN, GM | 124.6 | 136.6 | | | | |
| NH35 | AL, AN, EM | 109 | 122 | 6.5 | 5.5 | 1 | (14) |
| | BL, BN, GM | 143 | 156 | | | | |
| NH45 | AL, AN, EM | 139 | 154 | 7.5 | - | - | (15) |
| | BL, BN, GM | 171 | 186 | | | | |
| NH55 | AL, AN, EM | 163 | 178 | 7.5 | - | - | (15) |
| | BL, BN, GM | 201 | 216 | | | | |
| NH65 | AN, EM | 193 | 211 | 9 | - | - | (16) |
| | BN, GM | 253 | 271 | | | | |
| NS15 | AL, EM | 56.8 | 66.4 | 4.8 | 4 | 0.8 | (5) |
| | CL, JM | 40.4 | 50 | | | | |
| NS20 | AL, EM | 65.2 | 75.8 | 5.3 | 4.5 | 0.8 | (14) |
| | CL, JM | 47.2 | 57.8 | | | | |
| NS25 | AL, EM | 81.6 | 92.2 | 5.3 | 4.5 | 0.8 | (14) |
| | CL, JM | 59.6 | 70.2 | | | | |
| NS30 | AL, EM | 96.4 | 108.4 | 6 | 5 | 1 | (14) |
| | CL, JM | 67.4 | 79.4 | | | | |
| NS35 | AL, EM | 108 | 121 | 6.5 | 5.5 | 1 | (14) |
| | CL, JM | 77 | 90 | | | | |

Notes: 1) Slide length when equipped with NSK K1-L = (standard ball slide length) + (V₁ thickness of single NSK K1-L unit) x (number of K1-L units).
 2) NSK K1 lubrication units for food processing machinery/medical equipment are available for NH15 to NH35 and NS15 to NS35.
 When using these NSK K1 units, the slide length = (standard ball slide length) + (V₂ thickness of single NSK K1 unit x number of K1 units) + (V₃ thickness of protective cover x 2).

8. Installation

(1) Permissible values of mounting error

Improper mounting results in harmful effects such as shortened operating life, deterioration of motion accuracy, and friction variation. Permissible mounting error is shown in Tables 17 and 18, with representative errors shown in Figs. 8 and 9.

Fig. 8

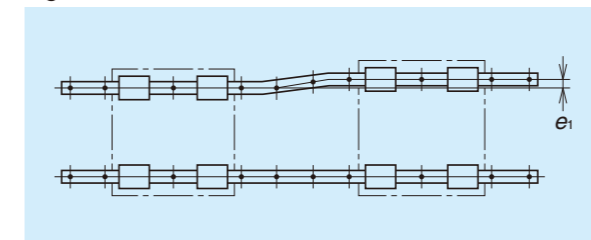


Fig. 9

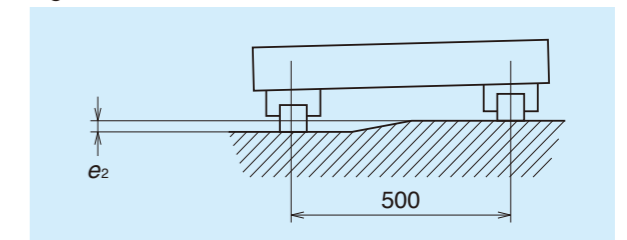


Table 17

| Value | Preload | Model No. | | | | | | | |
|--|----------------|-------------|------|------|------|------|------|------|------|
| | | NH15 | NH20 | NH25 | NH30 | NH35 | NH45 | NH55 | NH65 |
| Permissible values for parallelism error of two rails e ₁ | Z0, ZT | 22 | 30 | 40 | 45 | 55 | 65 | 80 | 110 |
| | Z1, ZZ | 18 | 20 | 25 | 30 | 35 | 45 | 55 | 70 |
| | Z3, ZH | 13 | 15 | 20 | 25 | 30 | 40 | 45 | 60 |
| Permissible values for height error of two rails e ₂ | Z0, ZT | 375μm/500mm | | | | | | | |
| | Z1, ZZ, Z3, ZH | 330μm/500mm | | | | | | | |

Unit: μm

Table 18

| Value | Preload | Model No. | | | | |
|--|----------------|-------------|------|------|------|------|
| | | NS15 | NS20 | NS25 | NS30 | NS35 |
| Permissible values for parallelism error of two rails e ₁ | Z0, ZT | 20 | 22 | 30 | 35 | 40 |
| | Z1, ZZ | 15 | 17 | 20 | 25 | 30 |
| | Z3, ZH | 12 | 15 | 15 | 20 | 25 |
| Permissible values for height error of two rails e ₂ | Z0, ZT | 375μm/500mm | | | | |
| | Z1, ZZ, Z3, ZH | 330μm/500mm | | | | |

Unit: μm

(2) Shoulder height and corner radius of the mounting surface

When horizontally fixing a rail or ball slide by pushing it onto the shoulder (the risen portion of the mounting surface) of the bed or table, refer to the shoulder height and corner radius specified in Figs. 10 and 11 and Table 19.

Shoulder height of the mounting surface and corner radius r

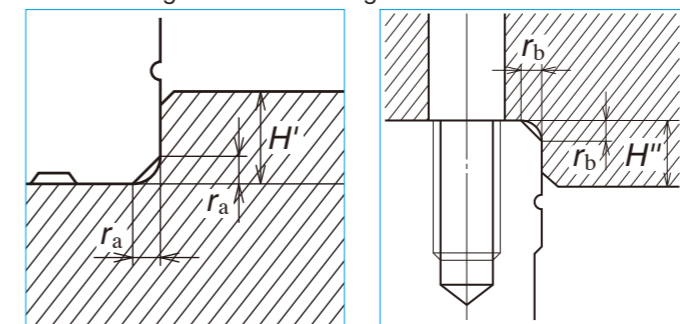


Fig. 10 Shoulder for the rail datum surface

Fig. 11 Shoulder for the ball slide datum surface

Table 19

| Model No. | Corner radius (maximum) | | Shoulder height | |
|-----------|-------------------------|-----|-----------------|-----|
| | ra | rb | H' | H'' |
| NH15 | 0.5 | 0.5 | 4 | 4 |
| NH20 | 0.5 | 0.5 | 4.5 | 5 |
| NH25 | 0.5 | 0.5 | 5 | 5 |
| NH30 | 0.5 | 0.5 | 6 | 6 |
| NH35 | 0.5 | 0.5 | 6 | 6 |
| NH45 | 0.7 | 0.7 | 8 | 8 |
| NH55 | 0.7 | 0.7 | 10 | 10 |
| NH65 | 1 | 1 | 11 | 11 |
| NS15 | 0.5 | 0.5 | 4 | 4 |
| NS20 | 0.5 | 0.5 | 4.5 | 5 |
| NS25 | 0.5 | 0.5 | 5 | 5 |
| NS30 | 0.5 | 0.5 | 6 | 6 |
| NS35 | 0.5 | 0.5 | 6 | 6 |

Unit: mm

9. Maximum allowable speed

Table 20 shows the standard maximum allowable speed for 10 000 km operation under normal conditions. However, the maximum allowable speed can be affected by the accuracy of the installation, operating temperature, external load, etc. If operation will exceed the permissible distance and speed, please contact NSK.

Table 20 Maximum allowable speed

| Model | Size | Unit: m/min | | | | | | | |
|-------|------|-------------|----|-----|----|----|-----|----|-----|
| | | 15 | 20 | 25 | 30 | 35 | 45 | 55 | 65 |
| NH | | | | 300 | | | 200 | | 150 |
| NS | | | | 300 | | | | | |

10. Handling Precautions

- Bumping or hitting the slide may cause damage.
- Operating temperature should be less than 80°C. If this temperature is exceeded, the plastic parts may be damaged.
- If using NSK K1-L, the maximum operating temperature is 50°C (momentary maximum temperature: 80°C). Do not expose the NSK K1-L lubrication unit to organic solvents that remove oil such as hexane and do not leave it in contact with white kerosene or rust preventive oils that contain white kerosene.
- Note the following regarding interchangeable slides:
 - Interchangeable slides are delivered on a provisional rail (an assembly tool).
 - Always use a provisional rail when transferring interchangeable slides onto/from a rail.
 - Do not remove the slide from the provisional rail except when transferring to a rail.

11. Dimensions

NH-AN (High-load/standard, square type)

NH-BN (Super-high-load/long, square type)

(1) Reference number for preloaded assembly

| | |
|--|---|
| NH 30 1200 ANC 2 -** P5 3 | |
| Model | Preload code (refer to Table 9 on page 5) 0 : Z0, 1 : Z1, 3 : Z3, T : ZT, Z : ZZ, H : ZH |
| Size | Accuracy code (refer to Table 9 on page 5) |
| Rail length (mm) | Design serial number Added to the reference number |
| Ball slide shape code (refer to Fig. 2 on page 3) | Number of ball slides per rail |
| Material/surface treatment code (refer to Table 16 on page 7) C: Special high carbon steel (NSK standard); K: Stainless steel | |

(2) Reference number for interchangeable type

| | |
|---|---|
| NAH 30 ANSZ -L | |
| Interchangeable ball slide model code NAH: NH model interchangeable ball slide | Option code -L: Equipped with NSK K1-L -F: Fluoride low temperature chrome plating + AS2 grease -F50: Fluoride low temperature chrome plating + LG2 grease |
| Size | Preload code No code: Fine clearance, Z: Slight preload, H: Medium preload |
| Ball slide shape code (refer to Fig. 2 on page 3) | Material code No code: Special high carbon steel (NSK standard), S: Stainless steel |

| | |
|---|---|
| N1H 30 1200 LCN -** PC Z | |
| Interchangeable rail model code N1H: NH model interchangeable rail | Preload code T: Fine clearance, Z: Slight preload (common rail for slight or medium preload) (refer to Table 9 on page 5) |
| Size | Accuracy code PH: High precision grade interchangeable type PC: Normal grade interchangeable type |
| Rail length (mm) | Design serial number Added to the reference number |
| Rail shape code: L L: Standard | Butting rail specification* N: Non-butting; L: Butting specification |
| Material/surface treatment code (refer to Table 16 on page 7) | *Please consult with NSK for butting rail specification. |

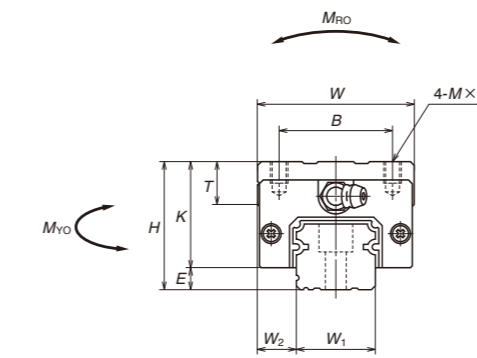
The Click!Speedy™ NSK Linear Guide Quick Delivery System uses a different numbering system. For details, please refer to the Click!Speedy general catalog CAT. No. E3191.

| Model No. | Assembly | | | Ball slide | | | | | | | | | | Width W ₁ | Height H ₁ | |
|------------------|-------------|-----|----------------|------------|---------------|---------------|-----------|-------------|----------------|------|----|-----------|----------------|-------------------------|--------------------------|----|
| | Height H | E | W ₂ | Width W | Length L | Mounting hole | | | Grease fitting | | | | | | | |
| | | | | | | B | J | M×Pitch×ℓ | L ₁ | K | T | Hole size | T ₁ | | | N |
| NH15AN NH15BN | 28 | 4.6 | 9.5 | 34 | 55 74 | 26 | 26 | M4×0.7×6 | 39 58 | 23.4 | 8 | φ3 | 8.5 | 3.3 | 15 | 15 |
| NH20AN NH20BN | 30 | 5 | 12 | 44 | 69.8 91.8 | 32 | 36 50 | M5×0.8×6 | 50 72 | 25 | 12 | M6×0.75 | 5 | 11 | 20 | 18 |
| NH25AN NH25BN | 40 | 7 | 12.5 | 48 | 79 107 | 35 | 35 50 | M6×1×9 | 58 86 | 33 | 12 | M6×0.75 | 10 | 11 | 23 | 22 |
| NH30AN NH30BN | 45 | 9 | 16 | 60 | 85.6 124.6 | 40 | 40 60 | M8×1.25×10 | 59 98 | 36 | 14 | M6×0.75 | 10 | 11 | 28 | 26 |
| NH35AN NH35BN | 55 | 9.5 | 18 | 70 | 109 143 | 50 | 50 72 | M8×1.25×12 | 80 114 | 45.5 | 15 | M6×0.75 | 15 | 11 | 34 | 29 |
| NH45AN NH45BN | 70 | 14 | 20.5 | 86 | 139 171 | 60 | 60 80 | M10×1.5×17 | 105 137 | 56 | 17 | Rc1/8 | 20 | 13 | 45 | 38 |
| NH55AN NH55BN | 80 | 15 | 23.5 | 100 | 163 201 | 75 | 75 95 | M12×1.75×18 | 126 164 | 65 | 18 | Rc1/8 | 21 | 13 | 53 | 44 |
| NH65AN NH65BN | 90 | 16 | 31.5 | 126 | 193 253 | 76 | 70 120 | M16×2×20 | 147 207 | 74 | 23 | Rc1/8 | 19 | 13 | 63 | 53 |

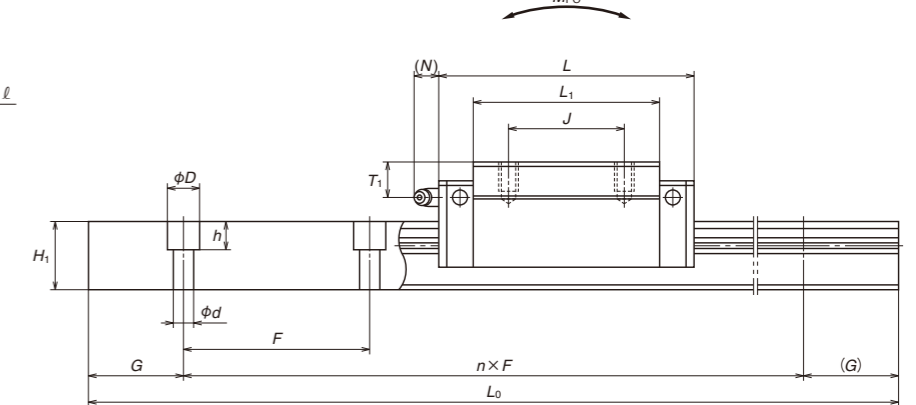
Notes: 1) The external appearance of stainless steel ball slides differs slightly from of carbon steel ball slides.

Assembly (Preloaded assembly or assembled interchangeable slide/rail.)

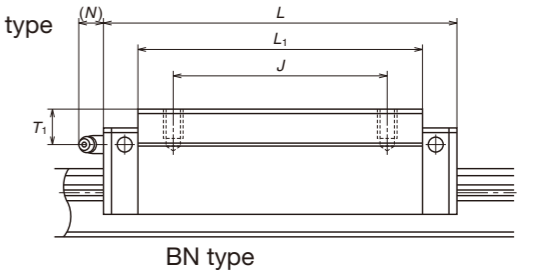
Front view of AN and BN types



Side view of AN type

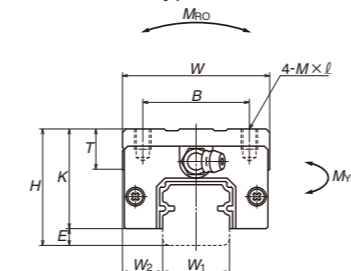


Side view of BN type

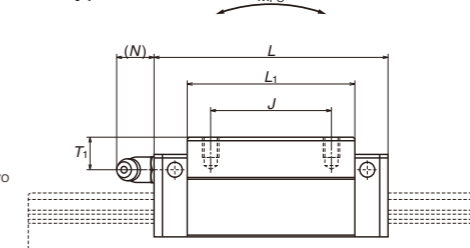


Ball slide of interchangeable type

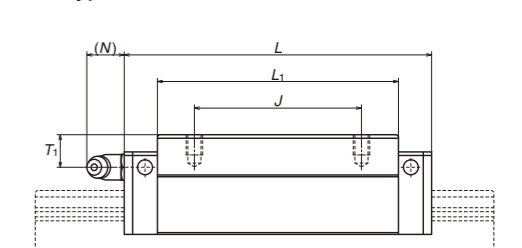
AN and BN types



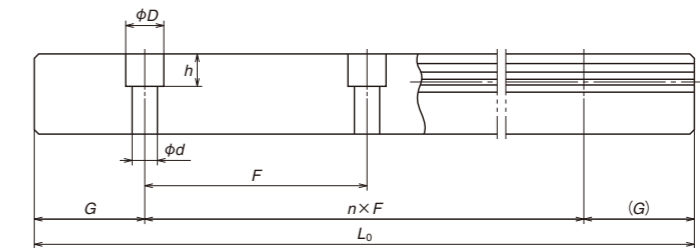
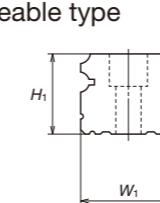
AN type



BN type



Rail of interchangeable type



Unit: mm

| Pitch F | Rail | | Basic load rating | | | | | | | | Weight | | |
|------------|-----------------------------|------|---|-------------------------------|---------------------------------|------------------------------|-----------------|---------------------|------------------|-----------------|------------------|-----------------|-------------|
| | Mounting bolt hole d×D×h | G | Max. length L _{0max} (l for stainless) | 2) Dynamic | | Static C ₀ (N) | M _{RO} | Static moment (N·m) | | | | Ball slide (kg) | Rail (kg/m) |
| | | | | [50km] C ₅₀ (N) | [100km] C ₁₀₀ (N) | | | M _{PO} | | M _{YO} | | | |
| 60 | 4.5×7.5×5.3 | 20 | 2 980 (1 800) | 14 200 18 100 | 11 300 14 400 | 20 700 32 000 | 108 166 | 94.5 216 | 575 1 150 | 79.5 181 | 480 965 | 0.18 0.26 | 1.6 |
| 60 | 6×9.5×8.5 | 20 | 3 960 (3 500) | 23 700 30 000 | 18 800 24 000 | 32 500 50 500 | 219 340 | 185 420 | 1 140 2 230 | 155 355 | 955 1 870 | 0.33 0.48 | 2.6 |
| 60 | 7×11×9 | 20 | 3 960 (3 500) | 33 500 45 500 | 26 800 36 500 | 46 000 71 000 | 360 555 | 320 725 | 1 840 3 700 | 267 610 | 1 540 3 100 | 0.55 0.82 | 3.6 |
| 80 | 9×14×12 | 20 | 4 000 (3 500) | 41 000 61 000 | 32 500 48 500 | 51 500 91 500 | 490 870 | 350 1 030 | 2 290 5 600 | 292 865 | 1 920 4 700 | 0.77 1.3 | 5.2 |
| 80 | 9×14×12 | 20 | 4 000 | 62 500 81 000 | 49 500 64 500 | 80 500 117 000 | 950 1 380 | 755 1 530 | 4 500 8 350 | 630 1 280 | 3 800 7 000 | 1.5 2.1 | 7.2 |
| 105 | 14×20×17 | 22.5 | 3 990 | 107 000 131 000 | 84 500 104 000 | 140 000 187 000 | 2 140 2 860 | 1 740 3 000 | 9 750 15 600 | 1 460 2 520 | 8 150 13 100 | 3.0 3.9 | 12.3 |
| 120 | 16×23×20 | 30 | 3 960 | 158 000 193 000 | 125 000 153 000 | 198 000 264 000 | 3 600 4 850 | 3 000 5 150 | 16 300 26 300 | 2 510 4 350 | 13 700 22 100 | 4.7 6.1 | 16.9 |
| 150 | 18×26×22 | 35 | 3 900 | 239 000 310 000 | 190 000 246 000 | 281 000 410 000 | 6 150 8 950 | 4 950 10 100 | 27 900 51 500 | 4 150 8 450 | 23 400 43 500 | 7.7 10.8 | 24.3 |

2) The basic load ratings comply with ISO standards. (ISO14728-1 and ISO14728-2)

C₅₀: basic dynamic load rating for 50 km rated fatigue life, C₁₀₀: basic dynamic load rating for 100 km rated fatigue life

NH-AL (High-load/standard, square type)
 NH-BL (Super-high-load/long, square type)

(1) Reference number for preloaded assembly

| | | | | | | | | | | | | | | | |
|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| NH 30 1200 AL C 2 -** P5 3 | | | | | | | | | | | | | | | |
| Model | | | | | | | | | | | | Preload code (refer to Table 9 on page 5) | | | |
| Size | | | | | | | | | | | | Accuracy code (refer to Table 9 on page 5) | | | |
| Rail length (mm) | | | | | | | | | | | | Design serial number | | | |
| Ball slide shape code (refer to Fig. 2 on page 3) | | | | | | | | | | | | Added to the reference number | | | |
| Material/surface treatment code (refer to Table 16 on page 7) | | | | | | | | | | | | Number of ball slides per rail | | | |
| C: Special high carbon steel (NSK standard); K: Stainless steel | | | | | | | | | | | | | | | |

(2) Reference number for interchangeable type

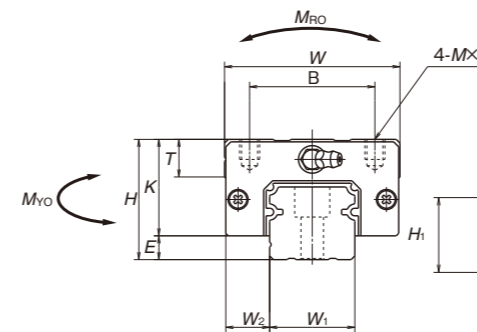
| | | | | | | | | | | | | | | | |
|---|--|--|--|--|--|--|--|--|--|--|---|--|--|--|--|
| NAH 30 AL SZ -L | | | | | | | | | | | | | | | |
| Ball slide | | | | | | | | | | | | Option code | | | |
| Interchangeable ball slide model code | | | | | | | | | | | | -L: Equipped with NSK K1-L | | | |
| NAH: NH model interchangeable ball slide | | | | | | | | | | | | -F: Fluoride low temperature chrome plating + AS2 grease | | | |
| Size | | | | | | | | | | | | -F50: Fluoride low temperature chrome plating + LG2 grease | | | |
| Ball slide shape code (refer to Fig. 2 on page 3) | | | | | | | | | | | | Preload code | | | |
| | | | | | | | | | | | No code: Fine clearance, Z: Slight preload, H: Medium preload | | | | |
| | | | | | | | | | | | Material code | | | | |
| | | | | | | | | | | | No code: Special high carbon steel (NSK standard), S: Stainless steel | | | | |

| | | | | | | | | | | | | | | | |
|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| N1H 30 1200 LCN -** PC Z | | | | | | | | | | | | | | | |
| Rail | | | | | | | | | | | | Preload code | | | |
| Interchangeable rail model code | | | | | | | | | | | | T: Fine clearance, Z: Slight preload (common rail for slight or medium preload) (refer to Table 9 on page 5) | | | |
| N1H: NH model interchangeable rail | | | | | | | | | | | | Accuracy code | | | |
| Size | | | | | | | | | | | | PH: High precision grade interchangeable type | | | |
| Rail length (mm) | | | | | | | | | | | | PC: Normal grade interchangeable type | | | |
| Rail shape code: L | | | | | | | | | | | | Design serial number | | | |
| L: Standard | | | | | | | | | | | | Added to the reference number | | | |
| Material/surface treatment code (refer to Table 16 on page 7) | | | | | | | | | | | | Butting rail specification* | | | |
| | | | | | | | | | | | N: Non-butting; L: Butting specification | | | | |
| *Please consult with NSK for butting rail specification. | | | | | | | | | | | | | | | |

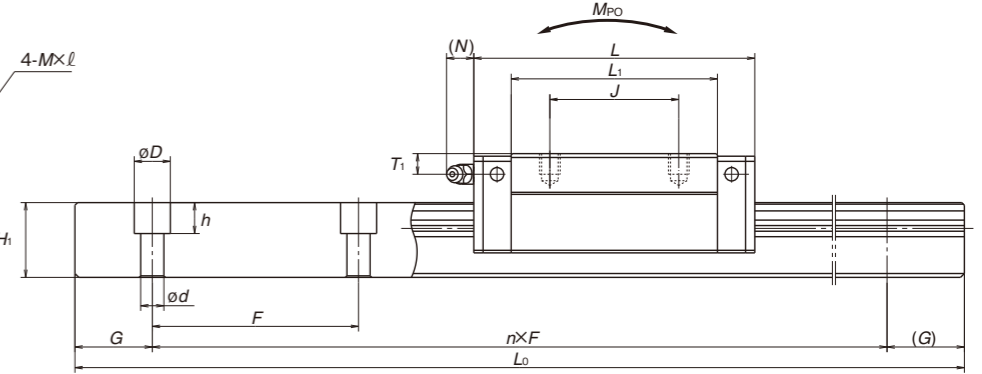
The Click!Speedy™ NSK Linear Guide Quick Delivery System uses a different numbering system. For details, please refer to the Click!Speedy general catalog CAT. No. E3191.

Assembly (Preloaded assembly or assembled interchangeable slide/rail.)

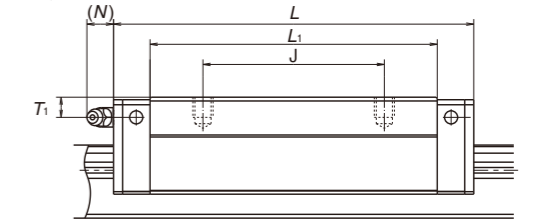
Front view of AL and BL types



Side view of AL type

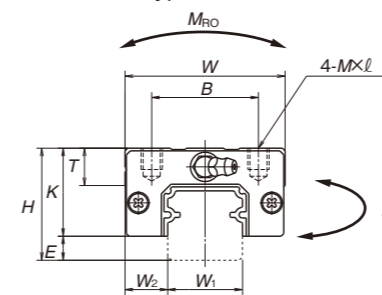


Side view of BL type

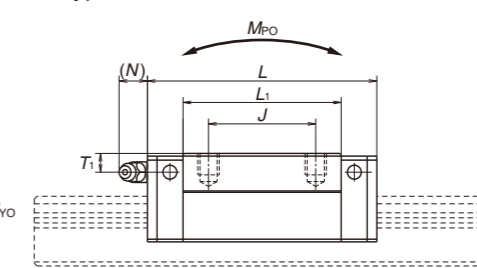


Ball slide of interchangeable type

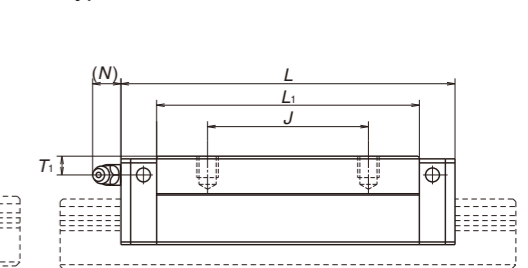
AL and BL types



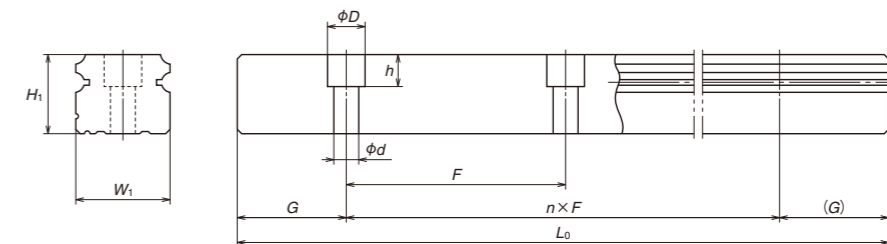
AL type



BL type



Rail of interchangeable type



| Model No. | Assembly | | | Ball slide | | | | | | | | Grease fitting | | | Width W ₁ | Height H ₁ |
|------------------|-------------|-----|----------------|------------|---------------|---------------|----------|-------------|----------------|------|----|----------------|----------------|----|-------------------------|--------------------------|
| | Height H | E | W ₂ | Width W | Length L | Mounting hole | | | L ₁ | K | T | Hole size | T ₁ | N | | |
| | | | | | | B | J | M×Pitch×ℓ | | | | | | | | |
| NH25AL NH25BL | 36 | 7 | 12.5 | 48 | 79 107 | 35 | 35 50 | M6×1×6 | 58 86 | 29 | 12 | M6×0.75 | 6 | 11 | 23 | 22 |
| NH30AL NH30BL | 42 | 9 | 16 | 60 | 85.6 124.6 | 40 | 40 60 | M8×1.25×8 | 59 98 | 33 | 14 | M6×0.75 | 7 | 11 | 28 | 26 |
| NH35AL NH35BL | 48 | 9.5 | 18 | 70 | 109 143 | 50 | 50 72 | M8×1.25×8 | 80 114 | 38.5 | 15 | M6×0.75 | 8 | 11 | 34 | 29 |
| NH45AL NH45BL | 60 | 14 | 20.5 | 86 | 139 171 | 60 | 60 80 | M10×1.5×10 | 105 137 | 46 | 17 | Rc1/8 | 10 | 13 | 45 | 38 |
| NH55AL NH55BL | 70 | 15 | 23.5 | 100 | 163 201 | 75 | 75 95 | M12×1.75×13 | 126 164 | 55 | 15 | Rc1/8 | 11 | 13 | 53 | 44 |

Notes: 1) The external appearance of stainless steel ball slides differs slightly from of carbon steel ball slides.

| Pitch F | Rail | | G (reference) | Max. length L _{0max} (for stainless) | Basic load rating | | | | | | | | Weight | |
|------------|--------------------------------|---------------------|------------------|---|---------------------|----------------------|----------------|-----------------|---------------------|----------------|------------------|--------------|-----------------------|----------------|
| | Mounting bolt hole d×D×h | C ₅₀ (N) | | | 2) Dynamic | | Static | | Static moment (N·m) | | | | Ball slide (kg) | Rail (kg/m) |
| | | | | | [50km] | [100km] | C ₀ | M _{RO} | M _{PO} | | M _{VO} | | | |
| | | | | | C ₅₀ (N) | C ₁₀₀ (N) | (N) | (One slide) | (Two slides) | (One slide) | (Two slides) | | | |
| 60 | 7×11×9 | 20 | 3 960 (3 500) | 33 500 45 500 | 26 800 36 500 | 46 000 71 000 | 360 555 | 320 725 | 1 840 3 700 | 267 610 | 1 540 3 100 | 0.46 0.69 | 3.6 | |
| 80 | 9×14×12 | 20 | 4 000 (3 500) | 41 000 61 000 | 32 500 48 500 | 51 500 91 500 | 490 870 | 350 1 030 | 2 290 5 600 | 292 865 | 1 920 4 700 | 0.69 1.16 | 5.2 | |
| 80 | 9×14×12 | 20 | 4 000 | 62 500 81 000 | 49 500 64 500 | 80 500 117 000 | 950 1 380 | 755 1 530 | 4 500 8 350 | 630 1 280 | 3 800 7 000 | 1.2 1.7 | 7.2 | |
| 105 | 14×20×17 | 22.5 | 3 990 | 107 000 131 000 | 84 500 104 000 | 140 000 187 000 | 2 140 2 860 | 1 740 3 000 | 9 750 15 600 | 1 460 2 520 | 8 150 13 100 | 2.2 2.9 | 12.3 | |
| 120 | 16×23×20 | 30 | 3 960 | 158 000 193 000 | 125 000 153 000 | 198 000 264 000 | 3 600 4 850 | 3 000 5 150 | 16 300 26 300 | 2 510 4 350 | 13 700 22 100 | 3.7 4.7 | 16.9 | |

2) The basic load ratings comply with ISO standards. (ISO14728-1 and ISO14728-2)
 C₅₀: basic dynamic load rating for 50 km rated fatigue life, C₁₀₀: basic dynamic load rating for 100 km rated fatigue life

Unit: mm

NH-EM (High-load/standard, square type)

NH-GM (Super-high-load/long, square type)

(1) Reference number for preloaded assembly

NH 30 1200EMC 2 - P5 3**

| | | |
|--|--------------------------|---|
| Model | NH 30 1200EMC 2 -** P5 3 | Preload code (refer to Table 9 on page 5) 0 : Z0, 1 : Z1, 3 : Z3, T : ZT, Z : ZZ, H : ZH |
| Size | 30 | Accuracy code (refer to Table 9 on page 5) |
| Rail length (mm) | 1200 | Design serial number Added to the reference number |
| Ball slide shape code (refer to Fig. 2 on page 3) | EM | Number of ball slides per rail |
| Material/surface treatment code (refer to Table 16 on page 7) C: Special high carbon steel (NSK standard); K: Stainless steel | 2 -** | |

(2) Reference number for interchangeable type

NAH 30 EMSZ -L

| | | |
|---|----------------|--|
| Ball slide | NAH 30 EMSZ -L | Option code |
| Interchangeable ball slide model code NAH: NH model interchangeable ball slide | NAH 30 EMSZ -L | -L: Equipped with NSK K1-L -F: Fluoride low temperature chrome plating + AS2 grease -F50: Fluoride low temperature chrome plating + LG2 grease |
| Size | 30 | Preload code No code: Fine clearance, Z: Slight preload, H: Medium preload |
| Ball slide shape code (refer to Fig. 2 on page 3) | EM | Material code No code: Special high carbon steel (NSK standard), S: Stainless steel |

N1H 30 1200 LCN - PC Z**

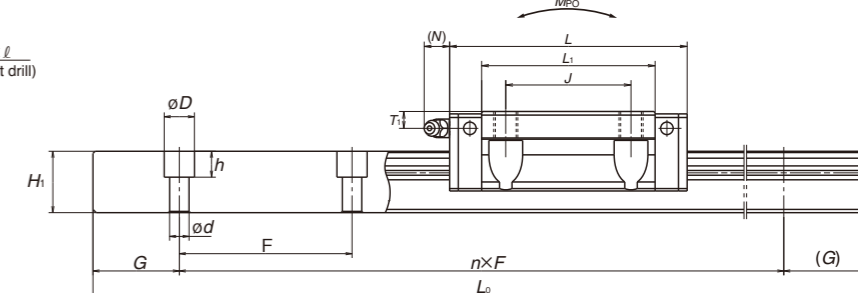
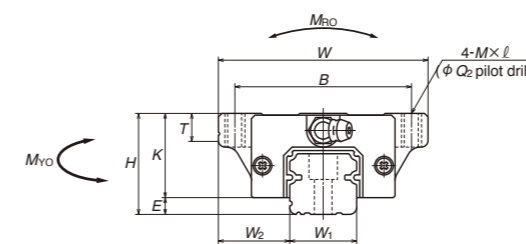
| | | |
|---|--------------------------|---|
| Rail | N1H 30 1200 LCN -** PC Z | Preload code |
| Interchangeable rail model code N1H: NH model interchangeable rail | N1H 30 1200 LCN -** PC Z | T: Fine clearance, Z: Slight preload (common rail for slight or medium preload) (refer to Table 9 on page 5) |
| Size | 30 | Accuracy code PH: High precision grade interchangeable type PC: Normal grade interchangeable type |
| Rail length (mm) | 1200 | Design serial number Added to the reference number |
| Rail shape code: L L: Standard | LCN -** PC Z | Butting rail specification* N: Non-butting; L: Butting specification |
| Material/surface treatment code (refer to Table 16 on page 7) | | *Please consult with NSK for butting rail specification. |

The Click!Speedy™ NSK Linear Guide Quick Delivery System uses a different numbering system. For details, please refer to the Click!Speedy general catalog CAT. No. E3191.

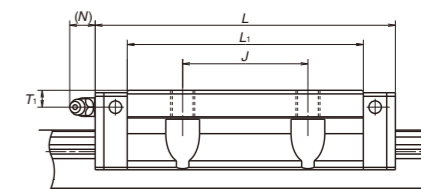
Assembly (Preloaded assembly or assembled interchangeable slide/rail.)

Front view of EM and GM types

Side view of EM type



Side view of GM type

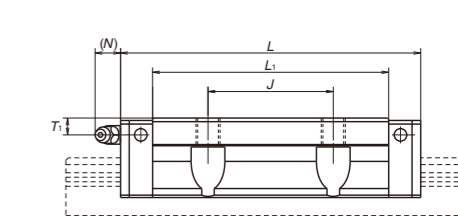
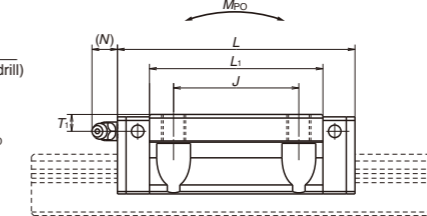
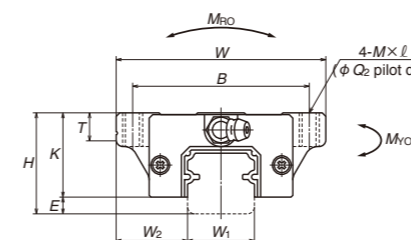


Ball slide of interchangeable type

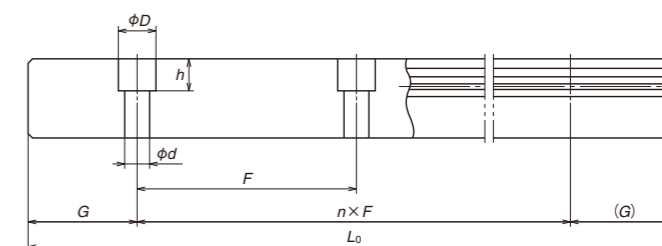
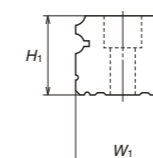
EM and GM types

EM type

GM type



Rail of interchangeable type



| Model No. | Assembly | | | Ball slide | | | | | | | | | | | Width | Height | |
|------------------|----------|-------|--------|---------------|---------------|-----------|----------------|------------------------------|------|----------------|-----------|----------------|---------|--------|-------|--------|----|
| | Height | Width | Length | Mounting hole | | | | | | Grease fitting | | | Width | Height | | | |
| | | | | B | J | M×Pitch×ℓ | Q ₂ | L ₁ | K | T | Hole size | T ₁ | | | | | N |
| NH15EM NH15GM | 24 | 4.6 | 16 | 47 | 55 74 | 38 | 30 | M5×0.8×7 | 4.4 | 39 58 | 19.4 | 8 | φ3 | 4.5 | 3.3 | 15 | 15 |
| NH20EM NH20GM | 30 | 5 | 21.5 | 63 | 69.8 91.8 | 53 | 40 | M6×1×9.5 | 5.3 | 50 72 | 25 | 10 | M6×0.75 | 5 | 11 | 20 | 18 |
| NH25EM NH25GM | 36 | 7 | 23.5 | 70 | 79 107 | 57 | 45 | M8×1.25×10 (M8×1.25×11.5) | 6.8 | 58 86 | 29 | 11 (12) | M6×0.75 | 6 | 11 | 23 | 22 |
| NH30EM NH30GM | 42 | 9 | 31 | 90 | 98.6 124.6 | 72 | 52 | M10×1.5×12 (M10×1.5×14.5) | 8.6 | 72 98 | 33 | 11 (15) | M6×0.75 | 7 | 11 | 28 | 26 |
| NH35EM NH35GM | 48 | 9.5 | 33 | 100 | 109 143 | 82 | 62 | M10×1.5×13 | 8.6 | 80 114 | 38.5 | 12 | M6×0.75 | 8 | 11 | 34 | 29 |
| NH45EM NH45GM | 60 | 14 | 37.5 | 120 | 139 171 | 100 | 80 | M12×1.75×15 | 10.5 | 105 137 | 46 | 13 | Rc1/8 | 10 | 13 | 45 | 38 |
| NH55EM NH55GM | 70 | 15 | 43.5 | 140 | 163 201 | 116 | 95 | M14×2×18 | 12.5 | 126 164 | 55 | 15 | Rc1/8 | 11 | 13 | 53 | 44 |
| NH65EM NH65GM | 90 | 16 | 53.5 | 170 | 193 253 | 142 | 110 | M16×2×24 | 14.6 | 147 207 | 74 | 23 | Rc1/8 | 19 | 13 | 63 | 53 |

Notes: 1) Parenthesized dimensions are for items made of stainless steel.
2) The external appearance of stainless steel ball slides differs slightly from of carbon steel ball slides.

| Pitch | Mounting bolt hole d×D×h | G | Max. length L _{0max} (1 for stainless) | 2) Dynamic | | Static C ₀ (N) | Basic load rating | | | | Weight | | |
|-------|-----------------------------|------|---|-------------------------------|---------------------------------|------------------------------|-------------------|---------------------|------------------|-----------------|------------------|--------------|------|
| | | | | [50km] C ₅₀ (N) | [100km] C ₁₀₀ (N) | | M _{RO} | Static moment (N·m) | | Ball slide (kg) | Rail (kg/m) | | |
| | | | | M _{PO} | M _{YO} | | | (One slide) | (Two slides) | | | | |
| 60 | 4.5×7.5×5.3 | 20 | 2 980 (1 800) | 14 200 18 100 | 11 300 14 400 | 20 700 32 000 | 108 166 | 94.5 216 | 575 1 150 | 79.5 181 | 480 965 | 0.17 0.25 | 1.6 |
| 60 | 6×9.5×8.5 | 20 | 3 960 (3 500) | 23 700 30 000 | 18 800 24 000 | 32 500 50 500 | 219 340 | 185 420 | 1 140 2 230 | 155 355 | 955 1 870 | 0.45 0.65 | 2.6 |
| 60 | 7×11×9 | 20 | 3 960 (3 500) | 33 500 45 500 | 26 800 36 500 | 46 000 71 000 | 360 555 | 320 725 | 1 840 3 700 | 267 610 | 1 540 3 100 | 0.63 0.93 | 3.6 |
| 80 | 9×14×12 | 20 | 4 000 (3 500) | 47 000 61 000 | 37 500 48 500 | 63 000 91 500 | 600 870 | 505 1 030 | 3 150 5 600 | 425 865 | 2 650 4 700 | 1.2 1.6 | 5.2 |
| 80 | 9×14×12 | 20 | 4 000 | 62 500 81 000 | 49 500 64 500 | 80 500 117 000 | 950 1 380 | 755 1 530 | 4 500 8 350 | 630 1 280 | 3 800 7 000 | 1.7 2.4 | 7.2 |
| 105 | 14×20×17 | 22.5 | 3 990 | 107 000 131 000 | 84 500 104 000 | 140 000 187 000 | 2 140 2 860 | 1 740 3 000 | 9 750 15 600 | 1 460 2 520 | 8 150 13 100 | 3 3.9 | 12.3 |
| 120 | 16×23×20 | 30 | 3 960 | 158 000 193 000 | 125 000 153 000 | 198 000 264 000 | 3 600 4 850 | 3 000 5 150 | 16 300 26 300 | 2 510 4 350 | 13 700 22 100 | 5 6.5 | 16.9 |
| 150 | 18×26×22 | 35 | 3 900 | 239 000 310 000 | 190 000 246 000 | 281 000 410 000 | 6 150 8 950 | 4 950 10 100 | 27 900 51 500 | 4 150 8 450 | 23 400 43 500 | 10 14.1 | 24.3 |

3) The basic load ratings comply with ISO standards. (ISO14728-1 and ISO14728-2)
C₅₀: basic dynamic load rating for 50 km rated fatigue life, C₁₀₀: basic dynamic load rating for 100 km rated fatigue life

Unit: mm

NS-CL (High-load/standard, square type)
NS-AL (Super-high-load/long, square type)

(1) Reference number for preloaded assembly

| | | | | | | | | | | | | | | | |
|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| NS 30 1200 AL C 2 -** P5 3 | | | | | | | | | | | | | | | |
| Model | | | | | | | | | | | Preload code (refer to Table 9 on page 5) | | | | |
| Size | | | | | | | | | | | Accuracy code (refer to Table 9 on page 5) | | | | |
| Rail length (mm) | | | | | | | | | | | Design serial number | | | | |
| Ball slide shape code (refer to Fig. 2 on page 3) | | | | | | | | | | | Added to the reference number | | | | |
| Material/surface treatment code (refer to Table 16 on page 7) | | | | | | | | | | | Number of ball slides per rail | | | | |
| C: Special high carbon steel (NSK standard); K: Stainless steel | | | | | | | | | | | | | | | |

(2) Reference number for interchangeable type

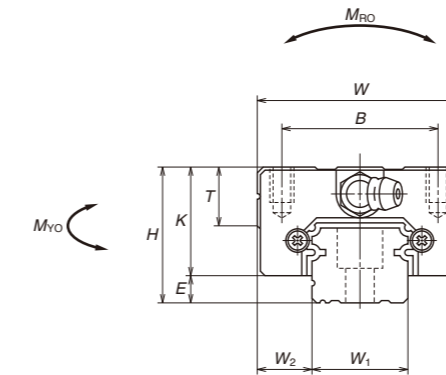
| | | | | | | | | | | | | | | | |
|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| NAS 30 AL SZ -L | | | | | | | | | | | | | | | |
| Ball slide | | | | | | | | | | | Option code | | | | |
| Interchangeable ball slide model code | | | | | | | | | | | -L: Equipped with NSK K1-L | | | | |
| Size | | | | | | | | | | | -F: Fluoride low temperature chrome plating + AS2 grease | | | | |
| Ball slide shape code (refer to Fig. 2 on page 3) | | | | | | | | | | | -F50: Fluoride low temperature chrome plating + LG2 grease | | | | |
| No code: Fine clearance, Z: Slight preload, H: Medium preload | | | | | | | | | | | | | | | |
| Material code | | | | | | | | | | | | | | | |
| No code: Special high carbon steel (NSK standard), S: Stainless steel | | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | |
|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| N1S 30 1200 LCN -** PC Z | | | | | | | | | | | | | | | |
| Rail | | | | | | | | | | | Preload code | | | | |
| Interchangeable rail model code | | | | | | | | | | | T: Fine clearance, Z: Slight preload (common rail for slight or medium preload) (refer to Table 9 on page 5) | | | | |
| Size | | | | | | | | | | | Accuracy code | | | | |
| Rail length (mm) | | | | | | | | | | | PH: High precision grade interchangeable type | | | | |
| Rail shape code: L | | | | | | | | | | | PC: Normal grade interchangeable type | | | | |
| Material/surface treatment code (refer to Table 16 on page 7) | | | | | | | | | | | Design serial number | | | | |
| Added to the reference number | | | | | | | | | | | | | | | |
| Butting rail specification* | | | | | | | | | | | | | | | |
| N: Non-butting; L: Butting specification | | | | | | | | | | | | | | | |
| *Please consult with NSK for butting rail specification. | | | | | | | | | | | | | | | |

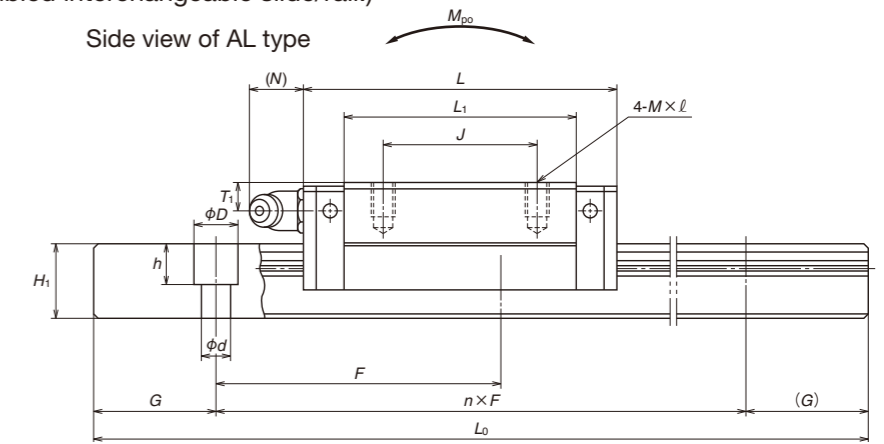
The Click!Speedy™ NSK Linear Guide Quick Delivery System uses a different numbering system. For details, please refer to the Click!Speedy general catalog CAT. No. E3191.

Assembly (Preloaded assembly or assembled interchangeable slide/rail.)

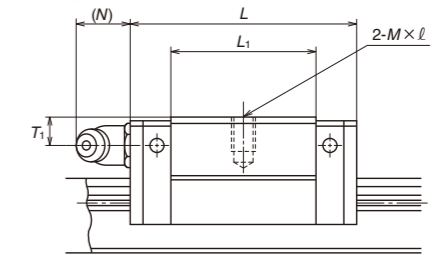
Front view of AL and CL types



Side view of AL type

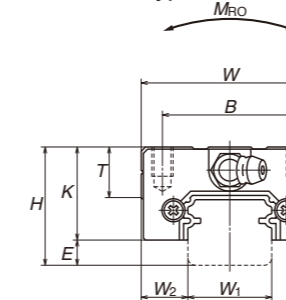


Side view of CL type

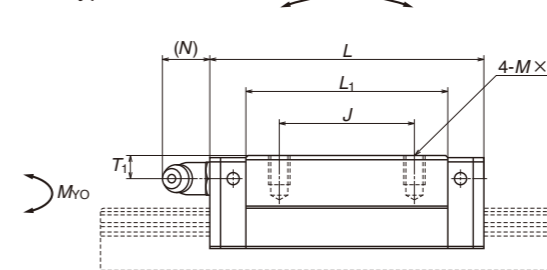


Ball slide of interchangeable type

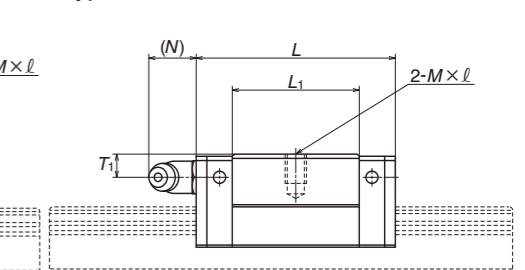
AL and CL types



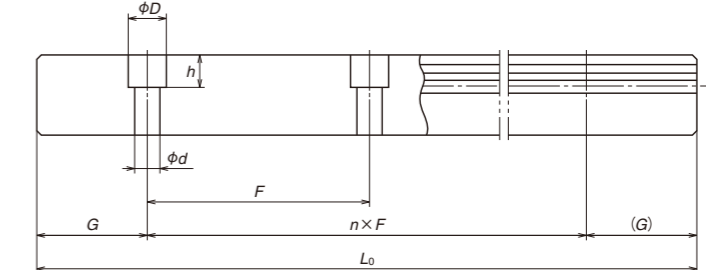
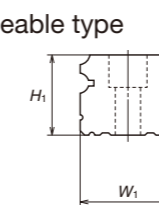
AL type



CL type



Rail of interchangeable type



| Model No. | Assembly | | | Ball slide | | | | | | | | Grease fitting | | | Width | Height | | |
|------------------|----------|-------|--------|---------------|--------------|----|---------|----------------|------------|------|-----------|----------------|-----|----|-------|--------|----|----|
| | Height | Width | Length | Mounting hole | | | | L1 | K | T | Hole size | | T1 | N | | | W1 | H1 |
| | | | | E | W2 | W | L | | | | B | J | | | | | | |
| NS15CL NS15AL | 24 | 4.6 | 9.5 | 34 | 40.4 56.8 | 26 | — 26 | M4 x 0.7 x 6 | 23.6 40 | 19.4 | 10 | phi 3 | 6 | 3 | 15 | 12.5 | | |
| NS20CL NS20AL | 28 | 6 | 11 | 42 | 47.2 65.2 | 32 | — 32 | M5 x 0.8 x 7 | 30 48 | 22 | 12 | M6 x 0.75 | 5.5 | 11 | 20 | 15.5 | | |
| NS25CL NS25AL | 33 | 7 | 12.5 | 48 | 59.6 81.6 | 35 | — 35 | M6 x 1 x 9 | 38 60 | 26 | 12 | M6 x 0.75 | 7 | 11 | 23 | 18 | | |
| NS30CL NS30AL | 42 | 9 | 16 | 60 | 67.4 96.4 | 40 | — 40 | M8 x 1.25 x 12 | 42 71 | 33 | 13 | M6 x 0.75 | 8 | 11 | 28 | 23 | | |
| NS35CL NS35AL | 48 | 10.5 | 18 | 70 | 77 108 | 50 | — 50 | M8 x 1.25 x 12 | 49 80 | 37.5 | 14 | M6 x 0.75 | 8.5 | 11 | 34 | 27.5 | | |

Notes: 1) The external appearance of stainless steel ball slides differs slightly from of carbon steel ball slides.
2) The basic load ratings comply with ISO standards. (ISO14728-1 and ISO14728-2)
C50: basic dynamic load rating for 50 km rated fatigue life, C100: basic dynamic load rating for 100 km rated fatigue life

| Pitch | Rail | | | Basic load rating | | | | | | | Weight | | |
|-------|-----------------------------------|----|---|-------------------|------------------|------------------|---------------------|-------------|----------------|--------------|-----------------|--------------|-----|
| | Mounting bolt hole d x D x h | G | Max. length L0max (1 for stainless) | 2) Dynamic | | Static | Static moment (N·m) | | | | Ball slide (kg) | Rail (kg/m) | |
| | | | | [50km] | [100km] | | MRO | MPO | | MKO | | | |
| | | | | C50(N) | C100(N) | CO | | (One slide) | (Two slides) | | (One slide) | (Two slides) | |
| 60 | *4.5 x 7.5 x 5.3 3.5 x 6 x 4.5 | 20 | 2 920 (1 800) | 7 250 11 200 | 5 750 8 850 | 9 100 16 900 | 45.5 84.5 | 24.5 77 | 196 470 | 20.5 64.5 | 165 395 | 0.14 0.20 | 1.4 |
| 60 | 6 x 9.5 x 8.5 | 20 | 3 960 (3 500) | 10 600 15 600 | 8 400 12 400 | 13 400 23 500 | 91.5 160 | 46.5 133 | 330 755 | 39 111 | 279 630 | 0.19 0.28 | 2.3 |
| 60 | 7 x 11 x 9 | 20 | 3 960 (3 500) | 17 700 26 100 | 14 000 20 700 | 20 800 36 500 | 164 286 | 91 258 | 655 1 470 | 76 217 | 550 1 230 | 0.34 0.51 | 3.1 |
| 80 | 7 x 11 x 9 | 20 | 4 000 (3 500) | 24 700 38 000 | 19 600 30 000 | 29 600 55 000 | 282 520 | 139 435 | 1 080 2 650 | 116 365 | 905 2 220 | 0.58 0.85 | 4.8 |
| 80 | 9 x 14 x 12 | 20 | 4 000 (3 500) | 34 500 52 500 | 27 300 42 000 | 40 000 74 500 | 465 865 | 220 695 | 1 670 4 000 | 185 580 | 1 400 3 350 | 0.86 1.3 | 7.0 |

*1) For NS15, M4 (4.5 x 7.5 x 5.3) rail mounting bolt holes are standard. Please contact NSK to request M3 holes (3.5 x 6 x 4.5).

Unit: mm

NS-JM (High-load/standard, square type)
NS-EM (Super-high-load/long, square type)

(1) Reference number for preloaded assembly

| | |
|--|---|
| NS 30 1200 EMC 2 -** P5 3 | |
| Model | Preload code (refer to Table 9 on page 5) 0 : Z0, 1 : Z1, 3 : Z3, T : ZT, Z : ZZ, H : ZH |
| Size | Accuracy code (refer to Table 9 on page 5) |
| Rail length (mm) | Design serial number Added to the reference number |
| Ball slide shape code (refer to Fig. 2 on page 3) | Number of ball slides per rail |
| Material/surface treatment code (refer to Table 16 on page 7) C: Special high carbon steel (NSK standard); K: Stainless steel | |

(2) Reference number for interchangeable type

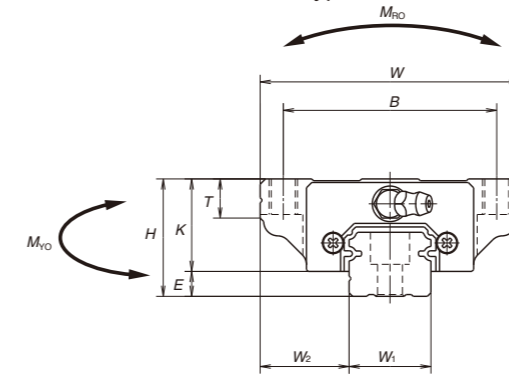
| | |
|---|---|
| NAS 30 EMSZ -L | |
| Interchangeable ball slide model code NAS: NS model interchangeable ball slide | Option code -L: Equipped with NSK K1-L -F: Fluoride low temperature chrome plating + AS2 grease -F50: Fluoride low temperature chrome plating + LG2 grease |
| Size | Preload code No code: Fine clearance, Z: Slight preload, H: Medium preload |
| Ball slide shape code (refer to Fig. 2 on page 3) | Material code No code: Special high carbon steel (NSK standard), S: Stainless steel |

| | |
|---|---|
| N1S 30 1200 LCN -** PC Z | |
| Interchangeable rail model code N1S: NS model interchangeable rail | Preload code T: Fine clearance, Z: Slight preload (common rail for slight or medium preload) (refer to Table 9 on page 5) |
| Size | Accuracy code PH: High precision grade interchangeable type PC: Normal grade interchangeable type |
| Rail length (mm) | Design serial number Added to the reference number |
| Rail shape code: L L: Standard | Butting rail specification* N: Non-butting; L: Butting specification |
| Material/surface treatment code (refer to Table 16 on page 7) | *Please consult with NSK for butting rail specification. |

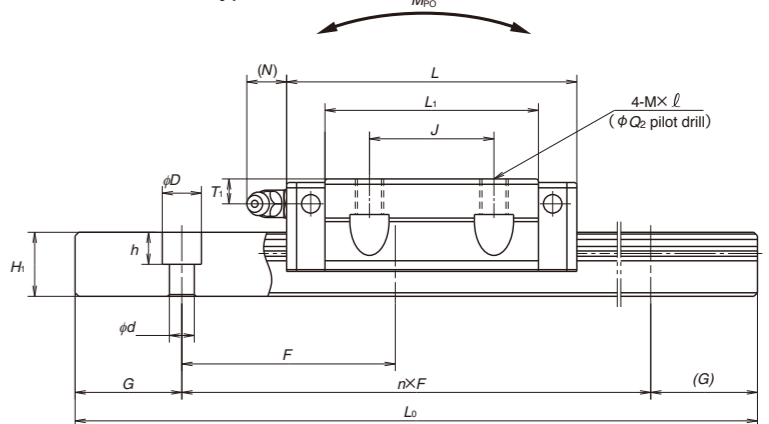
The Click!Speedy™ NSK Linear Guide Quick Delivery System uses a different numbering system. For details, please refer to the Click!Speedy general catalog CAT. No. E3191.

Assembly (Preloaded assembly or assembled interchangeable slide/rail.)

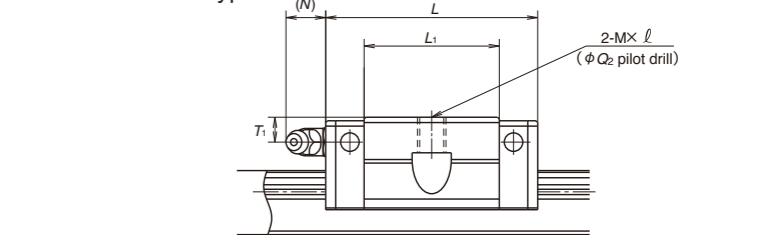
Front view of EM and JM types



Side view of EM type

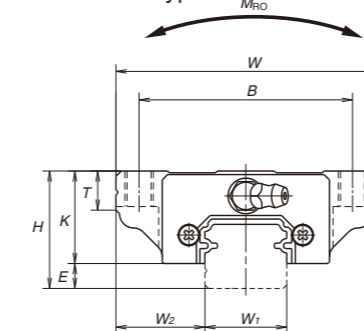


Side view of JM type

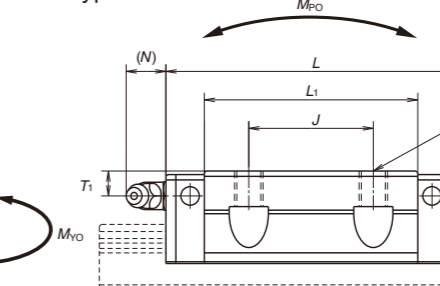


Ball side of interchangeable type

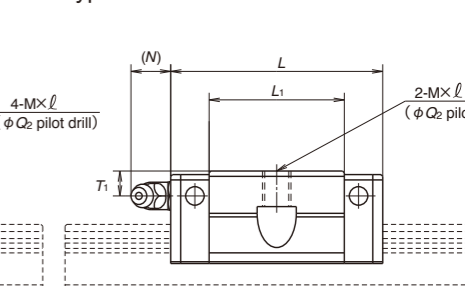
EM and JM types



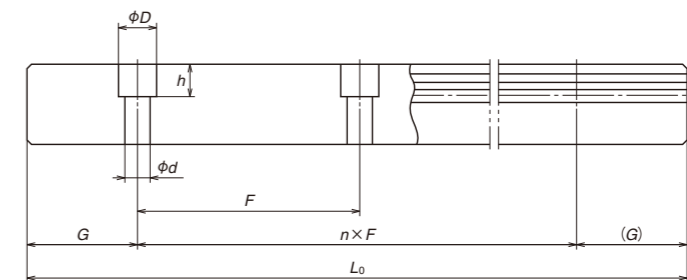
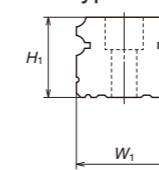
EM type



JM type



Rail of interchangeable type



| Model No. | Assembly | | | Ball slide | | | | | | | | | | Width | Height | | |
|------------------|----------|--------|-------|---------------|--------------|----------------|---|------------------------------|----------------|------------|-----------|------------|---------|-------|--------|----------------|----------------|
| | Height | Length | Width | Mounting hole | | | | | Grease fitting | | | Width | Height | | | | |
| | | | | H | E | W ₂ | W | L | B | J | M×Pitch×ℓ | | | | | Q ₂ | L ₁ |
| NS15JM NS15EM | 24 | 4.6 | 18.5 | 52 | 40.4 56.8 | 41 | — | M5×0.8×7 | 4.4 | 23.6 40 | 19.4 | 8 | φ3 | 6 | 3 | 15 | 12.5 |
| NS20JM NS20EM | 28 | 6 | 19.5 | 59 | 47.2 65.2 | 49 | — | M6×1×9 (M6×1×9.5) | 5.3 | 30 48 | 22 | 10 | M6×0.75 | 5.5 | 11 | 20 | 15.5 |
| NS25JM NS25EM | 33 | 7 | 25 | 73 | 59.6 81.6 | 60 | — | M8×1.25×10 (M8×1.25×11.5) | 6.8 | 38 60 | 26 | 11 (12) | M6×0.75 | 7 | 11 | 23 | 18 |
| NS30JM NS30EM | 42 | 9 | 31 | 90 | 67.4 96.4 | 72 | — | M10×1.5×12 (M10×1.5×14.5) | 8.6 | 42 71 | 33 | 11 (15) | M6×0.75 | 8 | 11 | 28 | 23 |
| NS35JM NS35EM | 48 | 10.5 | 33 | 100 | 77 108 | 82 | — | M10×1.5×13 (M10×1.5×14.5) | 8.6 | 49 80 | 37.5 | 12 (15) | M6×0.75 | 8.5 | 11 | 34 | 27.5 |

Notes: 1) The external appearance of stainless steel ball slides differs slightly from of carbon steel ball slides.
2) Parenthesized dimensions are for items made of stainless steel.

| Rail | | Basic load rating | | | | | | | | | | Weight | |
|------------|--------------------------------|-------------------|---|-------------------------------|---------------------------------|---------------------------------|-----------------|---------------------|----------------|-----------------|----------------|-----------------------|----------------|
| Pitch F | Mounting bolt hole d×D×h | G (reference) | Max. length L _{0max} (l for stainless) | Dynamic | | Static C ₀ (N) | M _{RO} | Static moment (N·m) | | | | Ball slide (kg) | Rail (kg/m) |
| | | | | [50km] C ₅₀ (N) | [100km] C ₁₀₀ (N) | | | M _{PO} | | M _{KO} | | | |
| | | | | | | | | (One slide) | (Two slides) | (One slide) | (Two slides) | | |
| 60 | *4.5×7.5×5.3 3.5×6×4.5 | 20 | 2 920 (1 800) | 7 250 11 200 | 5 750 8 850 | 9 100 16 900 | 45.5 84.5 | 24.5 77 | 196 470 | 20.5 64.5 | 165 395 | 0.17 0.26 | 1.4 |
| 60 | 6×9.5×8.5 | 20 | 3 960 (3 500) | 10 600 15 600 | 8 400 12 400 | 13 400 23 500 | 91.5 160 | 46.5 133 | 330 755 | 39 111 | 279 630 | 0.24 0.35 | 2.3 |
| 60 | 7×11×9 | 20 | 3 960 (3 500) | 17 700 26 100 | 14 000 20 700 | 20 800 36 500 | 164 286 | 91 258 | 655 1 470 | 76 217 | 550 1 230 | 0.44 0.66 | 3.1 |
| 80 | 7×11×9 | 20 | 4 000 (3 500) | 24 700 38 000 | 19 600 30 000 | 29 600 55 000 | 282 520 | 139 435 | 1 080 2 650 | 116 365 | 905 2 220 | 0.76 1.2 | 4.8 |
| 80 | 9×14×12 | 20 | 4 000 (3 500) | 34 500 52 500 | 27 300 42 000 | 40 000 74 500 | 465 865 | 220 695 | 1 670 4 000 | 185 580 | 1 400 3 350 | 1.2 1.7 | 7 |

3) The basic load ratings comply with ISO standards. (ISO14728-1 and ISO14728-2)
C₅₀: basic dynamic load rated for 50 km rating fatigue life, C₁₀₀: basic dynamic load rating for 100 km rated fatigue life.
*) For NS15, M4 (4.5 × 7.5 × 5.3) rail mounting bolt holes are standard.
Please contact NSK to request M3 holes (3.5 × 6 × 4.5).

Unit: mm

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< As of July 2022 >

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www.nsk.com

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