



POWRÓT DO STRONY GŁÓWNEJ 

U.S. PATENTED

IKO

C-Sleeve Linear Roller Way
Super MX

See you again at
IKO Website
<http://www.ikont.co.jp/eg/>

*Maintenance free for
20,000 km or 5 years*

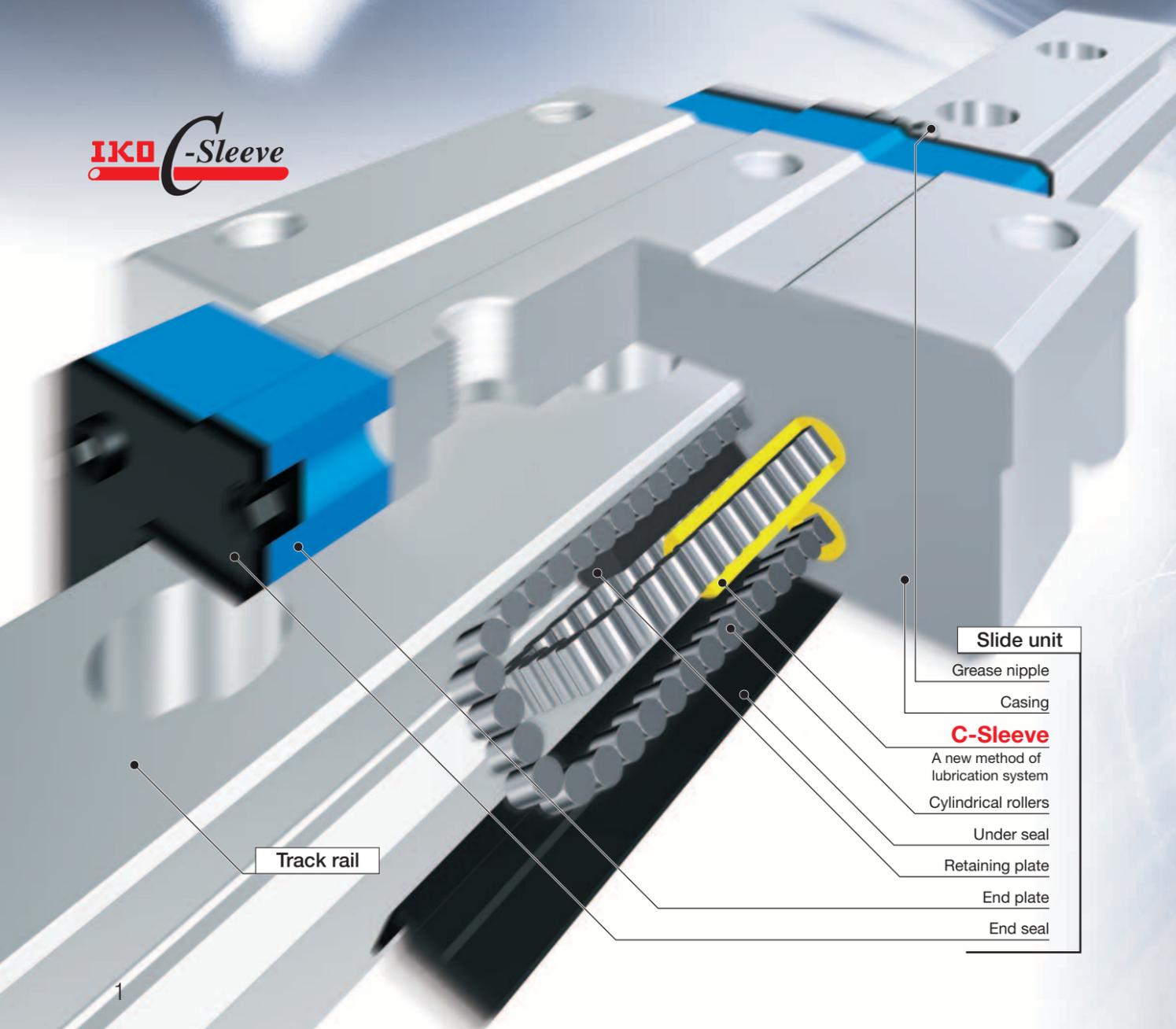
POWER & CARE

CAT-57141A

POWER & CARE

IKO

C-Sleeve Linear Roller Way Super MX



Slide unit

Grease nipple

Casing

C-Sleeve

A new method of lubrication system

Cylindrical rollers

Under seal

Retaining plate

End plate

End seal

Track rail

POWER

Roller Effect

Well-balanced structure with cylindrical rollers as rolling element brings you great load capacity, very high rigidity, superior running accuracy and excellent damping characteristics. C-Sleeve Linear Way Super MX is the best mechanical element for machine tool applications requiring high machining accuracy under high-speed cutting, heavy cutting with vibration and shocks, and precision grinding.

IKO C-Sleeve Linear Roller Way Super MX is a high performance roller type linear motion rolling guide, featuring high reliability, high rigidity, high accuracy and smooth motion which are required from machine tools, semiconductor manufacturing and liquid crystal manufacturing equipments. Cylindrical rollers are incorporated as rolling elements in four rows, arranged in parallel to each other. Owing to its small elastic deformation, stable operation is ensured even under heavy or fluctuating loads. This series is also suitable for applications with vibration and shocks.

With **IKO** original C-Sleeve technology, its performance makes us different from others, providing superior cost performance for you machines. Maintenance free for 20,000km or 5 years minimizes the amount of lubricant required and contributes to the global environment protection.

U.S. PATENT	
	No. 5,800,064
	No. 5,193,914
	No. 5,564,188
	No. 5,374,126
	No. 5,622,433
	No. 6,176,617
	No. 5,967,667
	No. 5,464,288

CARE

Maintenance free

Capillary system continuously supplies proper amount of lubrication oil to the cylindrical rollers keeping lubrication condition of the raceways well for long period of time allowing lubrication maintenance can be avoidable up to 20,000km or 5 years.

Interchangeable

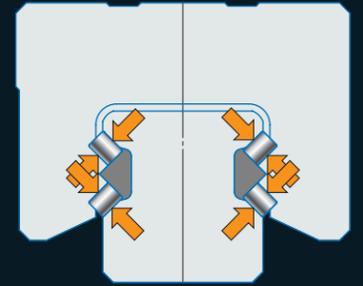
Interchangeable specification is available. Slide units and track rails can be supplied separately allowing them to be matched, replaced and added freely. This feature offers more freedom in designing machines, facilitating standardization and sudden changes of specifications.

POWER

High rigidity, high load capacity and high running accuracy

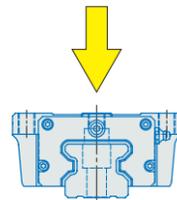
In **IKO** C-Sleeve Linear Roller Way Super MX, four rows of cylindrical rollers are incorporated in a highly rigid casing with good balance, and the cylindrical rollers in each row are arranged in parallel to each other. Owing to its small elastic deformation, stable operation is ensured even under heavy or fluctuating loads. Smooth and quiet motion, high reliability, high rigidity and high running accuracy are realized.

Parallel arranging of cylindrical rollers

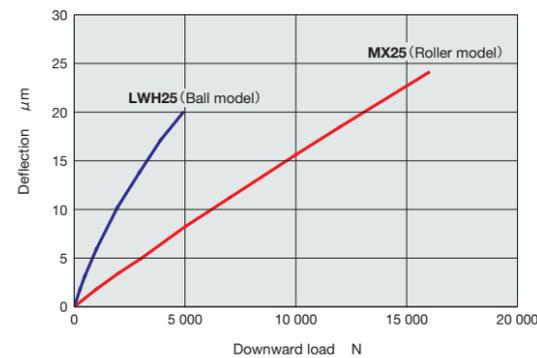


Super high rigidity

Rigidity of linear motion rolling guide has a large influence to the performance of machines or equipment in which they are assembled. Very high rigidity of C-Sleeve Linear Roller Way Super MX is achieved owing to the excellent elastic deformation characteristics of cylindrical rollers which give smaller elastic deformation under load as compared with steel balls. In addition, a large number of cylindrical rollers are incorporated in the slide unit.



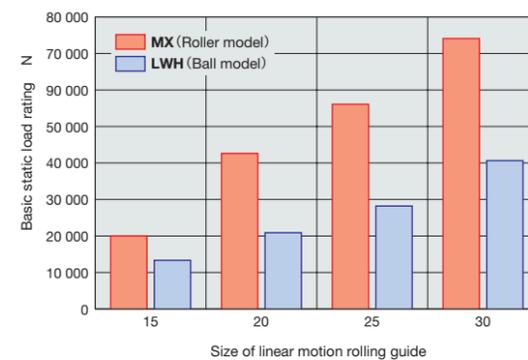
Elastic deformation characteristics of C-Sleeve Linear Roller Way Super MX



Super high load capacity

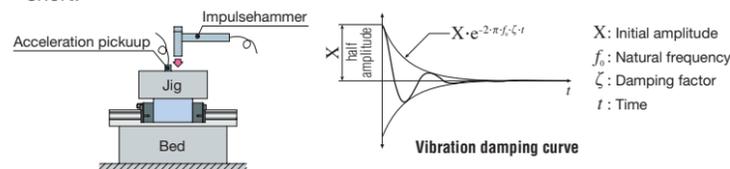
Cylindrical rollers give a larger contact area compared to steel balls, and higher load capacity is attainable. Incorporating a large number of cylindrical rollers, C-Sleeve Linear Roller Way Super MX has very high load ratings.

Comparison of basic static load ratings

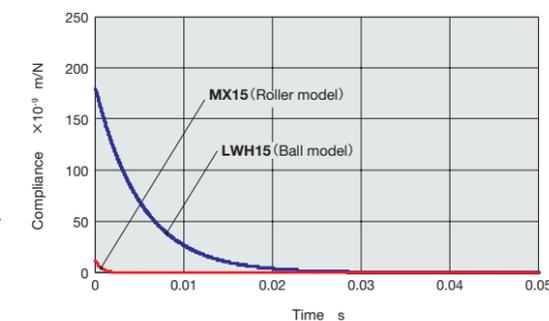


Excellent vibration damping characteristics

As compared with ball types in the same size, C-Sleeve Linear Roller Way Super MX has higher rigidity and gives much smaller deformation value under repeated fluctuating load. The natural frequency is high, and the vibration damping time can be very short.



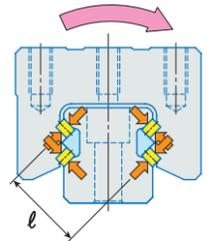
Vibration damping curve under downward excitation (half amplitude)



Excellent load balance and moment load capacity

Cylindrical rollers are arranged in a well-balanced form so that they can uniformly withstand loads in all directions. In addition, rows are arranged in such a way that the moment arm distance "l" between the loading points is wide under T₀ moment to give high moment load capacity.

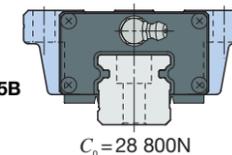
When T₀ moment is applied



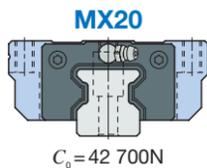
Downsizing

Due to the great load capacity of the roller type compared with the ball type, C-Sleeve Linear Roller Way Super MX series enables downsizing of the linear motion rolling guide with its abundant variations. It also enables downsizing of the machines or devices.

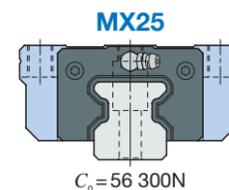
For example <Ball type> In case of LWH25B



Keeping the same or higher load capacity and downsizing the machine.



Keeping the same size and obtaining higher rigidity



Accurate positioning with excellent friction characteristics

A unique roller retaining method is adopted, in which the end faces of cylindrical rollers are guided accurately by the retaining plate, so the skewing of cylindrical rollers is prevented and smooth motion is achieved. As compared with the slide guides and ball type linear motion rolling guides, roller type has superior frictional characteristics and gives lower frictional resistance under preload. Good response to micro feeding and high positioning accuracy can thus be achieved.

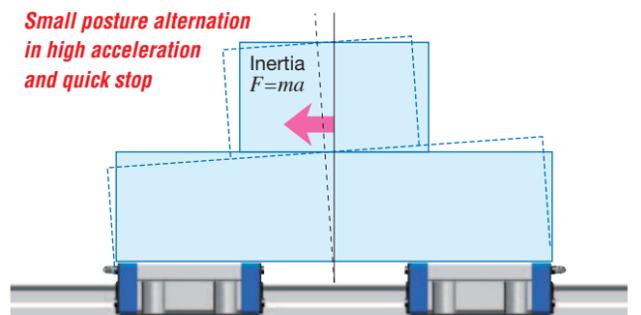
Accurate positioning with excellent friction characteristics

Smooth and quiet motion is achieved by adopting the optimum design based on the analysis of roller re-circulation behavior. Furthermore, as the number of load carrying cylindrical rollers is large, the minute fluctuating deflection during travel is minimized.

High tact

Quick positioning is possible by high rigidity and excellent vibration damping characteristics of roller type even with a large inertia caused by the latest high tact positioning devices.

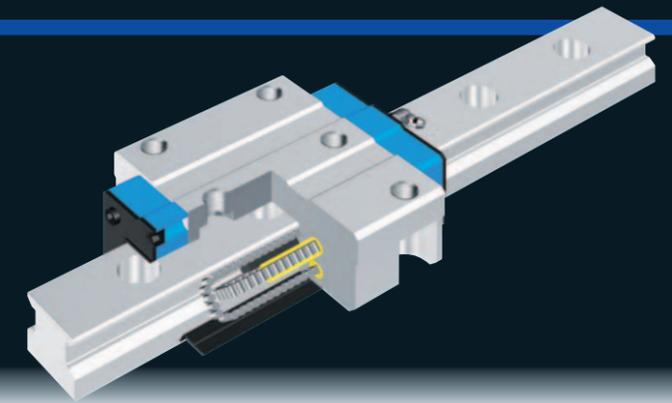
Small posture alteration in high acceleration and quick stop



CARE

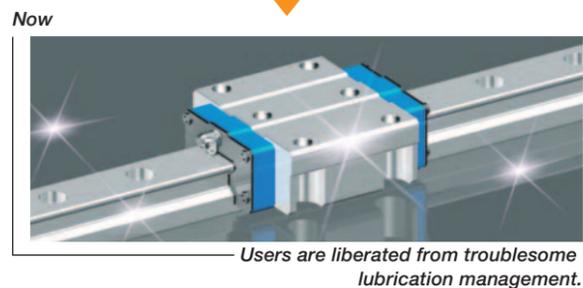
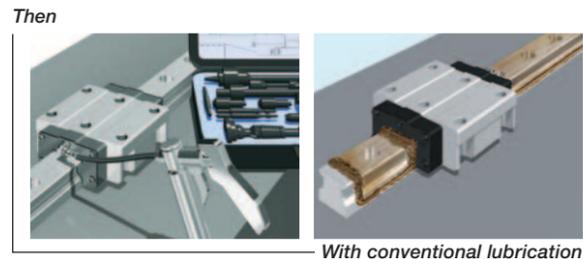
5 years or 20,000km of maintenance free

The Capillary system that **IKO** has developed is a new method of lubrication. The sleeve is formed by sintering a fine resin powder to act as a reservoir and the open pores are impregnated with a large amount of lubrication oil. The capillary action gives the correct amount of lubrication on the rolling elements to protect the raceways for long periods.



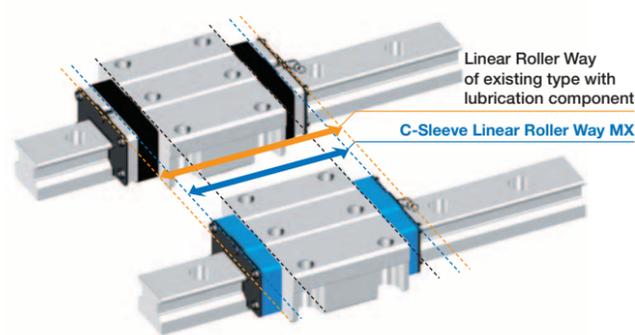
Maintenance free for saving-resources

Maintenance free has the ability to maintain lubrication for a long time, reducing the amount of labor required for troublesome lubrication maintenance. The capillary lubrication body continuously supplies lubricant for long period of time even after original grease inside is completely exhausted.



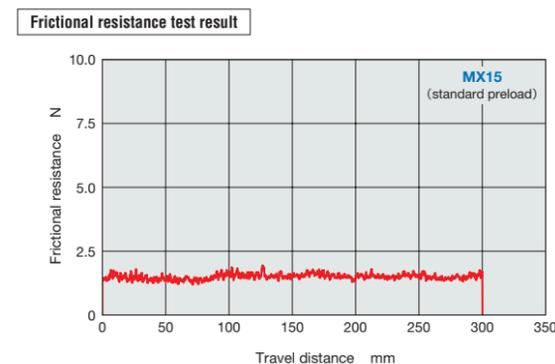
Compact design for miniaturization

Incorporating C-Sleeve, linear motion rolling guide provides a lightweight and compact size. C-Sleeve Linear Roller Way MX, having no external parts, can replace standard linear way without changing the external dimensions and it does not sacrifice the allowable stroke length.



Smooth and light operation

C-Sleeve is not in contact with the track rail. This permits smooth and light motion without increasing the rolling resistance. So the loss of power in driving devices can be minimized. Compatibility of quick response is superior and it contributes to the accuracy improvement and saving drive energy.



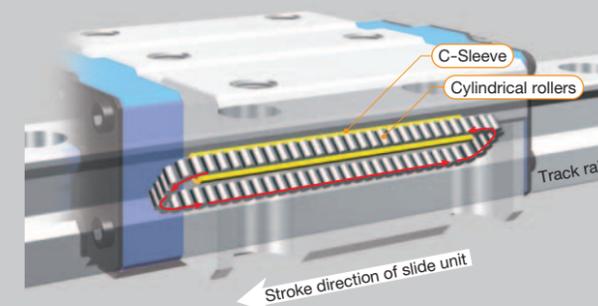
Ecology contributes to the global environment by conserving oil

To accomplish this, C-Sleeve applies only the minimal amount of lubricant requires for the proper lubrication to the rolling parts. Since the oil consumption is small, C-Sleeve is able to maintain proper lubrication even in long-term operation.

Lubricant supply mechanism of C-sleeve system

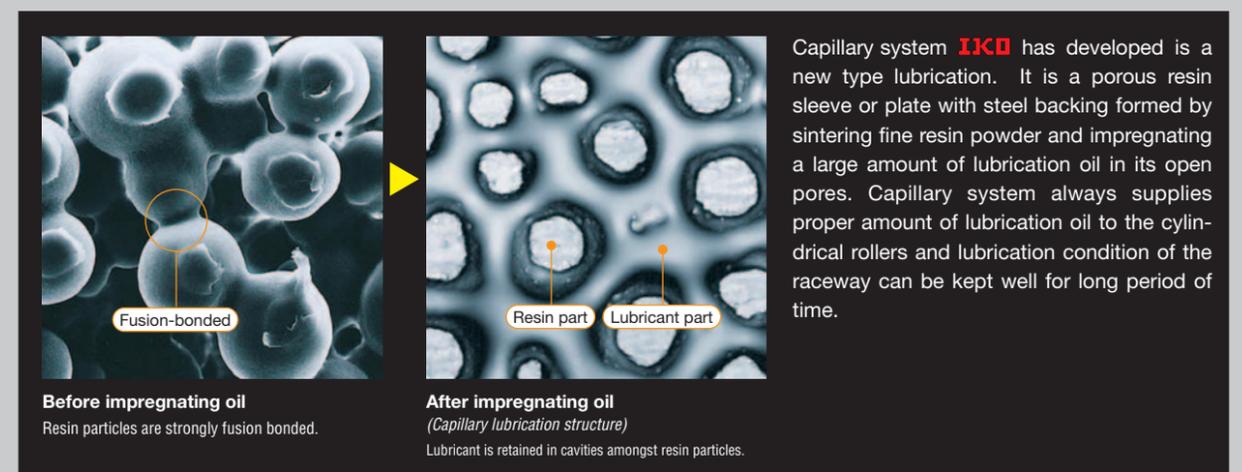
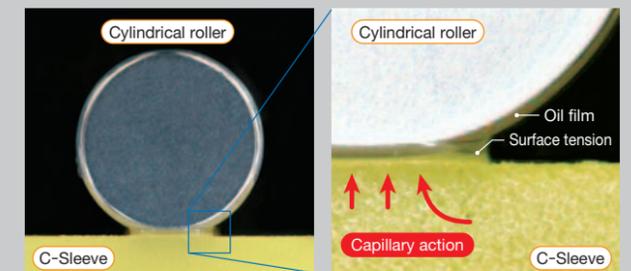
The circulation of the cylindrical rollers distributes lubricant.

Lubricant is supplied directly to the cylindrical rollers. As the cylindrical rollers circulate, the lubricant is distributed to the loading area along the track rail. This results in adequate lubrication being properly maintained in the loading area for a long time.



Lubricant is deposited directly to the surface of the cylindrical rollers.

The surface of C-Sleeve is always covered with the lubricant. Lubricant is continuously supplied to the surface of cylindrical rollers by surface tension in the contact of C-Sleeve surface and cylindrical rollers. New oil permeates automatically from the core of C-Sleeve to the internal surface that comes in contact with cylindrical rollers.



Capillary system **IKO** has developed is a new type lubrication. It is a porous resin sleeve or plate with steel backing formed by sintering fine resin powder and impregnating a large amount of lubrication oil in its open pores. Capillary system always supplies proper amount of lubrication oil to the cylindrical rollers and lubrication condition of the raceway can be kept well for long period of time.

CARE

Interchangeable specification

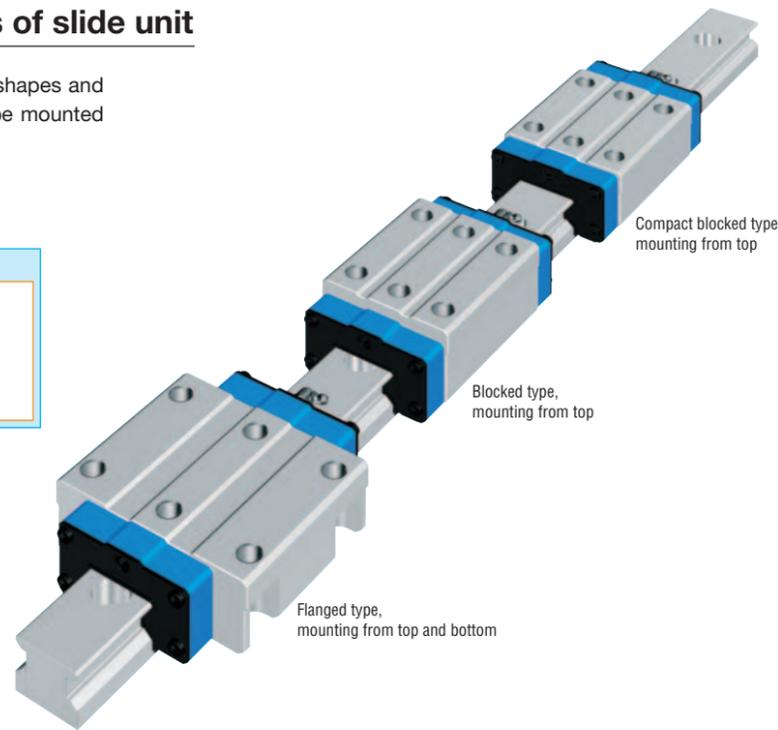
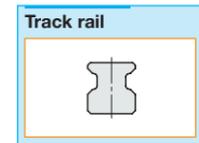
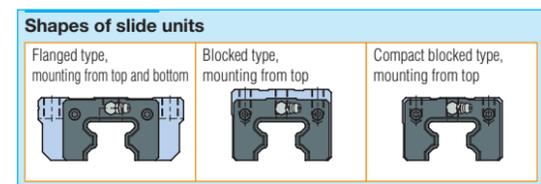
The interchangeable specification is produced by **IKO** original precision manufacturing technology and the dimensional accuracy of both slide unit and track rail is strictly controlled to achieve the interchangeability of higher standard.

- Requirements of ;**
- Extending machine life and increase rigidity
 - Improving machining accuracy
 - Replace only the slide unit
 - Increase the number of slide unit
 - Replace the track rail
 - Extend the length of track rail
 - Stock only slide unit for back up

- Interchangeable specification realizes ;**
- Quick design change.
 - Giving higher accuracy and changing preload.
 - Slide unit and track rail can be supplied and handled individually.
 - Slide unit in any shape with any accuracy or preload can be matched to a track rail.
 - Slide unit and track rail can be stocked separately, which contributes to minimize inventory.

Interchangeability among types of slide unit

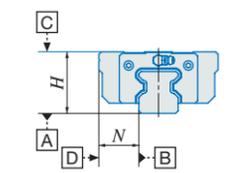
Various types of slide units with different sectional shapes and lengths are prepared. All of these slide units can be mounted on the same track rails freely as required.



Interchangeability in accuracy

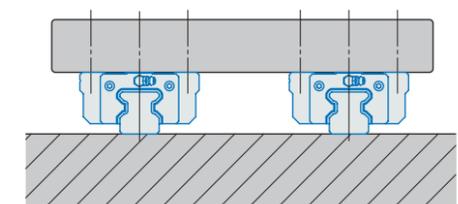
Two accuracy classes, High and Precision class are prepared and can be used for the application requiring high running accuracy. Furthermore, the height variation among multiple sets is also controlled with high level of accuracy, ensuring that these products can be used for parallel track rail arrangement.

- Two accuracy grades are available.**
- Dimension H and N
 - Dimensional variation of H and N among in the one set
 - Parallelism in the operation of $\square C$ surface to $\square A$ surface
 - Parallelism in the operation of $\square D$ surface to $\square B$ surface



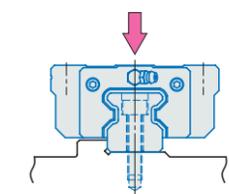
Suitable for using in parallel.

- Dimensional variation of H dimension for multiple assembled sets

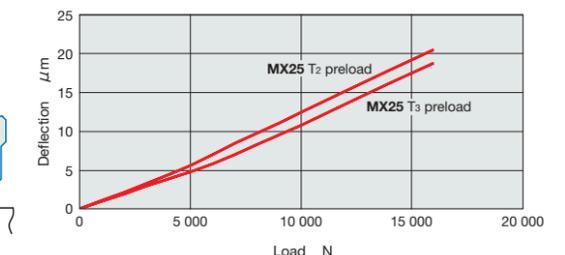


Interchangeability in preload

High accuracy dimensional control owing to a simple structure has made it possible to realize the interchangeability in preloaded slide units. In the interchangeable specification products, several preload types are prepared so that these products can be used for the application requires higher rigidity.

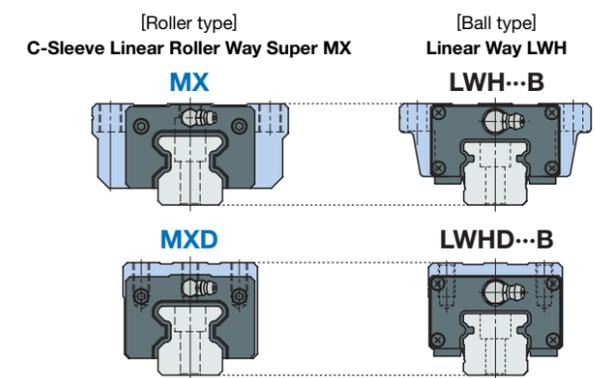


Slide unit with higher preload symbol offers greater rigidity.



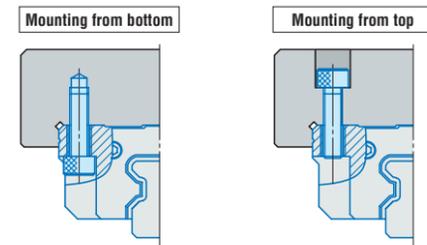
Dimensional interchangeability to the ball type

The mounting dimensions are the same as those of ball type Linear Way H. So this guide can replace the ball type without any change in mounting dimensions in the existing machines or equipment.



Flanged, blocked and compact blocked types are available

Flanged slide unit can be mounted from either direction top or bottom.



Various optional parts

C-Sleeve Linear Roller Way Super MX has 17 kinds of optional parts and they can be indicated by supplemental codes in the identification number.

Coding example

MX 15 C2 R240 T1 P S2 /V

Supplemental code

Identification number

The specification of C-Sleeve Linear Roller Way Super MX is identified by the identification number, which consists of a model code, a size, a part code, a preload symbol, a classification symbol, interchangeable code and optional supplemental codes.

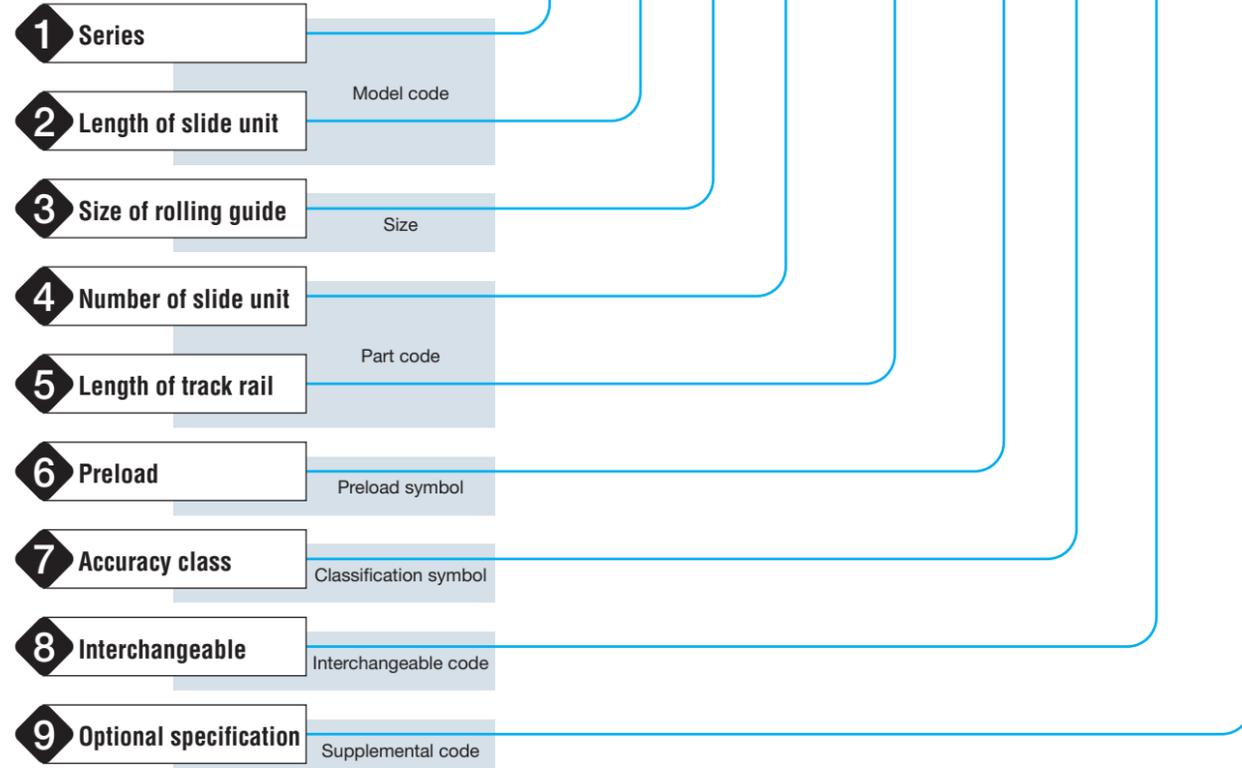
Example of identification number

Interchangeable specification

Slide unit only	<u>MX</u>	<u>G</u>	<u>15</u>	<u>C1</u>		<u>T₁</u>	<u>P</u>	<u>S2</u>	<u>/Z</u>
Track rail only ⁽¹⁾	<u>LRX</u>		<u>15</u>		<u>R240</u>		<u>P</u>	<u>S2</u>	<u>/F</u>
Set product	<u>MX</u>	<u>G</u>	<u>15</u>	<u>C2</u>	<u>R240</u>	<u>T₁</u>	<u>P</u>	<u>S2</u>	<u>/FZ</u>

Non-interchangeable specification

Set product	<u>MX</u>	<u>G</u>	<u>15</u>	<u>C2</u>	<u>R240</u>	<u>T₁</u>	<u>P</u>		<u>/FZ</u>
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Note (1): In case ordering track rail only, model code should be changed as shown below.
 MX / MXD / MXS → LRX (Ex: LRX15R240HS2)

1 Series

Flange type, mounting from top and bottom : **MX**⁽¹⁾

Block type, mounting from top : **MXD**

Compact block type, mounting from top : **MXS**

Note (1): Size 20 (MX20, MXD20 and MXS20) can be mounted from top only. For mounting from bottom, MXH can be used, which have the same dimensions as those of above models.

2 Length of slide unit

Standard	: No symbol
High rigidity long	: G

3 Size of rolling guide

15, 20, 25, 30	For available types and size are shown in Table 1 below.
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Table 1 Type and size of C-sleeve Linear Roller Way Super MX

Size	Mode code		Blocked shape, mounting from top		Compact blocked shape, mounting from top	
	Flanged shape, mounting from top and bottom		Standard MXD	High rigidity long MXDG	Standard MXS	High rigidity long MXSG
15	☆	☆	☆	☆	☆	☆
20	☆ ⁽¹⁾	☆ ⁽¹⁾	☆	☆	☆	☆
25	☆	☆	☆	☆	☆	☆
30	☆	☆	☆	☆	☆	☆

Note (1): MX20 and MXG20 can be mounted from top side only. Remark: ☆ marks are also applicable for interchangeable specification. For mounting from bottom, MXH20 and MXHG20 can be used.

4 Number of slide unit and track rail

Set product (with track rail)	: C○	For an assembled set, indicates the number of slide units assembled on one track rail. For an interchangeable slide unit only, "C1" can be indicated.
Slide unit only (Interchangeable series)	: C1 (Ex: MX15C1HS2)	

5 Length of track rail

Set product (with slide unit)	: R○	Indicate the length of track rail in mm. For standard and maximum lengths, see "Track rail length" in Table 18 on page 22.
Track rail only (Interchangeable series)	: No symbol (Ex: LRX15R220H2)	

6 Preload

Standard	: No symbol	Specify this items for an assembled set or an interchangeable single slide unit. For details of preload amount and applicable sizes are shown in Table 3 on page 11.
Light preload	: T ₁	
Medium preload	: T ₂	
Heavy preload	: T ₃	

7 Accuracy code

High class	: H	Super precision class (SP) and Ultra precision class (UP) are applicable to Non-interchangeable products only. In the interchangeable specification, please combine the same accuracy codes on both slide unit and track rail. For details of accuracy, see Table 2 on page 11.
Precision class	: P	
Super precision class	: SP	
Ultra precision class	: UP	

8 Interchangeable specification

Interchangeable	: S2	In C-sleeve Linear Roller Way, slide unit and track rail can be supplied separately by indicating interchangeable code S2.
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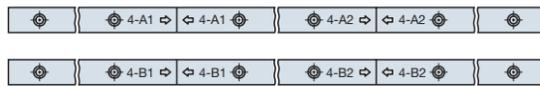
9 Optional specifications

/A, /D, /E, /F, /GE, /HP, /I, /JO, /LO, /LFO, /MA, /MN, /N, /T, /VO, /WO, /ZO	Applicable special specifications are shown in Table 5 on page 12. When a combination of several special specifications is required, arrange their supplemental codes in alphabetical order. For detail of special specifications, see page 13 to 17.
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Optional special specification for the use under special environment

Butt jointing track rails

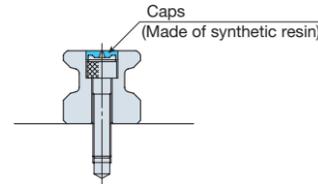
/A



When the required length of non-interchangeable track rail exceeds the maximum length shown in Table 18, two or more track rails can be used by butt jointing them in the direction of linear motion. For the length and the number of butt jointing track rails, please consult IKO.

Caps for rail mounting holes

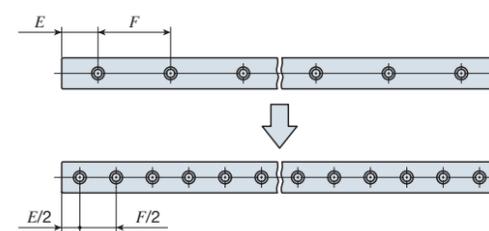
/F



Specify to have customized caps for track rail mounting holes appended. These caps cover the track rail mounting holes to improve the sealing performance in the linear motion direction. Aluminum caps are also available. Consult IKO for further information.

Half pitch of track rail mounting holes

/HP

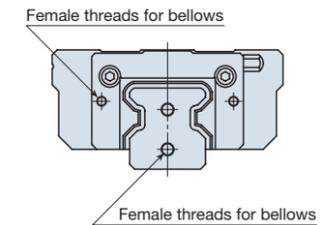


The pitch of the track rail mounting holes can be 1/2 of the dimension F of standard rail. Track rail mounting bolts are appended in the same number as that of mounting holes.

With female threads for bellow attachment

(for an assembled set)

/J /JJ /JR /JS /JJS

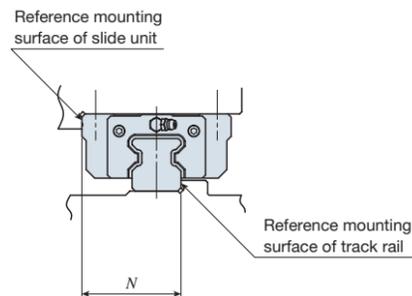


For an assembled set of interchangeable or non-interchangeable specification, female threads for mounting bellows are provided on the slide unit and the track rail. For details of related dimensions, see Table 8.

- ① /J Female threads are provided on both ends of the track rail, and on the slide unit ends which are the closest to the track rail ends. (In case only one slide unit is assembled, female threads are provided on both ends.)
- ② /JJ Female threads are provided on both ends of the track rail, and on all ends of all slide units. (Applicable when the number of slide units to be two or more. In case only one slide unit is assembled, indicate "/J".)
- ③ /JR Female threads are provided on both ends of the track rail.
- ④ /JS Female threads are provided on the slide unit ends which are the closest to the track rail ends. (In case only one slide unit is assembled, female threads are provided on both ends.)
- ⑤ /JJS Female threads are provided on all ends of all slide units. (Applicable when the number of slide units to be two or more. In case only one slide unit is assembled, indicate "/JS".)

Opposite reference surfaces arrangement

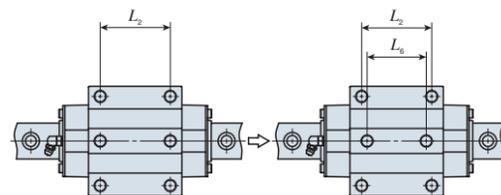
/D



The reference mounting surface of track rail is made opposite to the standard side. The accuracy of dimension N including parallelism in operation is the same to that of standard specification.

Changed pitch of slide unit middle mounting holes

/GE



The pitch length between the two middle mounting holes of slide unit is changed. For the dimension, see Table 7.

Table 7 Pitch of slide unit middle mounting holes (Supplemental code /GE)

Model number	L_2	L_6
MX(G) 15	30	26
MX(G) 20 ⁽¹⁾	40	35
MX(G) 25	45	40
MX(G) 30	52	44

unit : mm

Note (1) : Also applicable to MXH(G)20

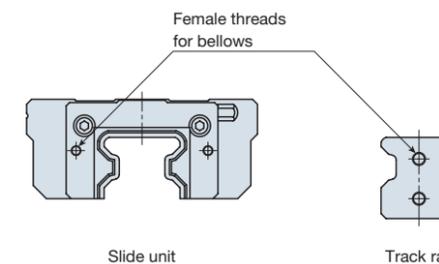
With inspection sheet

/I

The inspection sheet recording dimensions H and N (See Accuracy), dimensional variations of H and N and parallelism in operation of the slide unit is attached to each set.

With female threads for bellows

/J /JR /JL

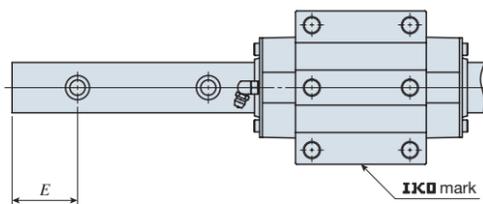


Female threads for mounting bellows are provided on the interchangeable slide unit or the interchangeable track rail. For details of related dimensions, see Table 8.

- ① /J Female threads are provided at both ends of the slide unit or the track rail.
- ② /JR Female threads are provided at the right end of the slide unit in sight of IKO mark.
- ③ /JL Female threads are provided at the left end of the slide unit in sight of IKO mark.

Specified track rail mounting hole positions

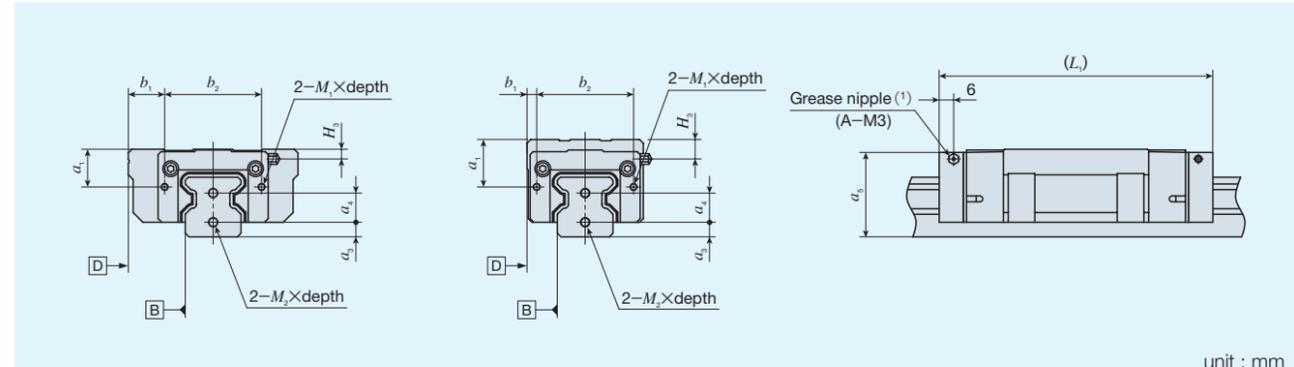
/E



The position of the first mounting hole from left end of the track rail (dimension E) can be specified. When ordering, add the dimension (in mm) after "/E". Dimension E can be specified in a limited range. Consult IKO for further information.

Optional special specification for the use under special environment

Table 8 Female threads for bellows (Supplemental code /J, /JJ)



Model number	Slide unit					Track rail			
	a_1	b_1	b_2	$M_1 \times \text{depth}$	L_1	H_3	a_3	a_4	$M_2 \times \text{depth}$
MX 15	10.5	10.5	26	M3×6	83	1	4	8	M3×6
MXG 15					99				
MXD 15	14.5	4			83	5			
MXDG 15					99				
MXS 15	10.5	4			83	1			
MXSG 15					99				
MX 20 MXH 20	12	13.5	36	M3×6	101	2	5	10	M4×8
MXG 20 MXHG 20					121				
MXD 20	16	4			101	6			
MXDG 20					121				
MXS 20	12	4			101	2			
MXSG 20					121				
MX 25	15.5	15	40	M3×6	113	4	6	12	M4×8
MXG 25					128				
MXD 25	19.5	4			113	8			
MXDG 25					128				
MXS 25	15.5	4			113	4			
MXSG 25					128				
MX 30	18.5	20	50	M3×6	128	4.8	7	14	M4×8
MXG 30					149				
MXD 30	21.5	5			128	7.8			
MXDG 30					149				
MXS 30	19.5	5			128	4.8			
MXSG 30					149				

Note (1): The specification and mounting position of grease nipple are different from those of the standard product.
 Remark: For grease nipple specification, see Table 13 on page 19.
 For the size 15 and 20 of flange type and compact block type, the dimension a_3 is higher than the H dimension.
 For details, consult for future information.

Black chrome surface treatment
/LC /LR /LCR

A black permeable chrome film is formed to improve corrosion resistance.

- ① /LC Treatment is applied to the casing.
- ② /LR Treatment is applied to the track rail.
- ③ /LCR Treatment is applied to the casing and the track rail.

Fluorine black chrome surface treatment
/LFC /LFR /LFCR

After forming a black permeable chrome film, the surface is coated with fluorine resin for further improvement in corrosion resistance. This treatment is also effective in preventing the adhesion of foreign substances on the surface.

- ① /LFC Treatment is applied to the casing.
- ② /LFR Treatment is applied to the track rail.
- ③ /LFCR Treatment is applied to the casing and the track rail.

With track rail mounting bolts
/MA

Track rail mounting bolts are not appended for the assembled set products (both interchangeable and non-interchangeable specifications). /MA designates to append the bolts according to the number of mounting holes. For size of bolts, please refer dimension tables.

Without track rail mounting bolts
/MN

Track rail mounting bolts are not appended by /MN and it is applicable to interchangeable track rail only.

No end seal
/N

End rubber seals at both ends of slide unit are replaced by steel end pressure plates (not in contact with the track rail) to reduce frictional resistance. The under seals are not assembled in this case and this is not effective for dust protection.

Butt-jointing interchangeable track rail
(for interchangeable specification)
/T

A special interchangeable track rail of which both ends are finished for butt jointing in the direction of linear motion is provided. Use the track rails having the same interchangeable code for butt jointing. For the butt jointing for non-interchangeable specification, indicate "butt-jointing track rail "/A".

With double end seals
(for interchangeable single slide unit)
/V /VR /VL

Double rubber end seals are provided on the interchangeable slide unit for more effective dust protection. For the total length of the slide unit with double end seals, see the Table 9.

- ① /V Double end seals are provided at both ends of the slide unit.
- ② /VR Double end seals are provided at the right end of the slide unit in sight of mark.
- ③ /VL Double end seals are provided at the left end of the slide unit in sight of mark.

With double end seals
(for assembled set only)
/V /VV

Double end seals are provided on the slide unit of assembled set of interchangeable specification or non-interchangeable (set) specification for more effective dust protection. For the total length of the slide unit with double end seals, see the Table 9.

- ① /V Double end seals are provided at the ends of slide units which are the closest to the ends of the track rail. (In case only one slide unit is assembled, double end seals are provided at both ends.)
- ② /VV Double end seals are provided at all ends of all slide units. (Applicable when the number of slide units to be two or more. In case only one slide unit is assembled, indicate "/V".)

Table 9 Slide unit with double end seals (Supplemental code /V)

Model number	L_1 (1)	L_2 (1)
MX 15	74	76
MXG 15	90	92
MX 20	93	103
MXG 20	113	123
MX 25	107	116
MXG 25	122	131
MX 30	121	134
MXG 30	142	155

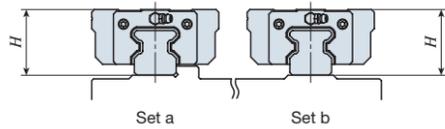
Note (1): The values for the slide unit with double end seals at both ends.
 Remark: The table shows representative model numbers only and is also applicable to all models in the same size.

1N=0.102kgf=0.2248lbs.
 1mm=0.03937inch

Optional special specification for the use under special environment

Matched sets to be used as an assembled group

/W



For two or more assembly sets of C-Sleeve Linear Roller Way Super MX used on the same plane, the dimensional variation of H of Linear Way is kept within the specified range. The dimensional variation of dimension H in matched sets is the same as that of a single set. Indicate the number of sets after "/W".

With scrapers

(for interchangeable single slide unit)

/Z /ZR /ZL

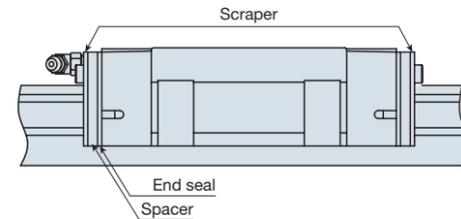
Metal scrapers are provided on the slide unit of interchangeable specification. The scraper (non-contact type) is used to effectively remove large particles of dust or foreign matters adhering to the track rail. For the total length of the slide unit with scrapers, see Table 10.

- ① /Z Scrapers are provided at both ends of the slide unit.
- ② /ZR A scraper is provided at the right end of the slide unit in sight of  mark.
- ③ /ZL A scraper is provided at the left end of the slide unit in sight of  mark.

With scrapers

(for assembled set)

/Z /ZZ

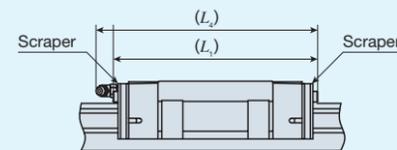


Metal scrapers are provided on the slide units of assembled set of interchangeable specification or non-interchangeable (set) specification.

The scraper (non-contact type) is used to effectively remove large particles of dust or foreign matters adhering to the track rail. For the total length of the slide unit with scrapers, see Table 10.

- ① /Z Scrapers are provided at the ends of slide units which are the closest to the ends of the track rail. (In case only one slide unit is assembled, scrapers are provided at both ends.)
- ② /ZZ Scrapers are provided at all ends of all slide units. (Applicable when the number of slide units to be two or more. In case only one slide unit is assembled, indicate "/Z".)

Table 10 Slide unit with scrapers (Supplemental code /Z)



unit : mm

Model number	L_1 (1)	L_2 (1)
MX 15	76	77
MXG 15	92	93
MX 20	95	104
MXG 20	115	124
MX 25	109	117
MXG 25	124	132
MX 30	124	135
MXG 30	145	156

Note (1): The values are the slide unit lengths with scrapers at both ends.
Remark: The table shows representative model numbers and is also applicable to all models in the same size of MX series.

Load Rating and Life

Basic dynamic load rating C

Conforming to ISO/FDIS 14728-1

The basic dynamic load rating is defined as a constant load both in direction and magnitude under which a group of identical C-Sleeve Linear Roller Way Super MX is individually operated and 90% of those in the group can travel 50×10^3 m free from material damage due to rolling contact fatigue.

Basic static load rating C_0

Conforming to ISO/FDIS 14728-2

The basic static load rating is defined as a static load that gives a prescribed constant contact stress at the center of the contact area between rolling elements and raceways receiving the maximum load. Generally, the basic static load rating is used in combination with the static safety factor.

The static load ratings of C-Sleeve Linear Roller Way Super MX are designated for equal load capacity in downward load, upward load and lateral load.

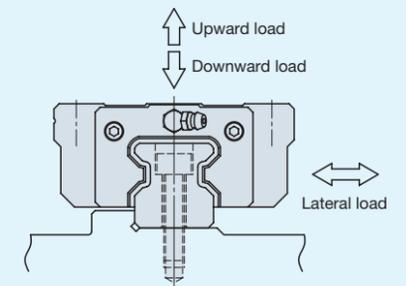


Fig. 2 Load direction

Static moment rating T_0, T_x, T_y

The static moment rating is defined as a static moment load (See Fig. 3) that gives a prescribed constant contact stress at the center of the contact area between rolling elements and raceways receiving the maximum load.

The static moment rating is used in combination with the static safety factor to give the limiting load for normal rolling motion. Generally, the basic static moment rating is used in combination with the static safety factor.

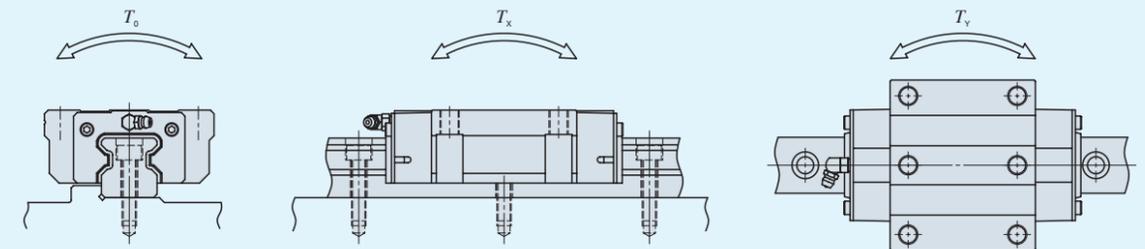


Fig. 3 Directions of static moment rating

Load Rating and Life

Life

The rating life of C-Sleeve Linear Roller Way Super MX series is obtained from the following calculation formula.

$$L = 50 \left(\frac{C}{P} \right)^{10/3} \dots \dots \dots (1)$$

where, L : Rating life, 10^3 m
 C : Basic dynamic load rating, N
 P : Equivalent load, N

If the stroke length and the number or strokes per minute are known, the life in hours must be corrected by the following formula.

$$L_h = \frac{10^6 L}{2Sn_1 \times 60} \dots \dots \dots (2)$$

where, L_h : Rating life in hours, hours
 S : Stroke length, mm
 n_1 : Number of strokes per minute, cpm

Static safety factor

The static safety factor f_s of C-Sleeve Linear Roller Way Super MX series is given in the following formula, and general values of this factor are shown in Table 11.

$$f_s = \frac{C_0}{P_0} \dots \dots \dots (3)$$

where, f_s : Static safety factor
 C_0 : Basic static load rating, N
 P_0 : Static load, N

Table 11 Static safety factor

Operating conditions	f_s
Operation with vibration and/or shocks	4 ~ 6
High operating performance	3 ~ 5
Normal operation	2.5 ~ 3

Load factor

Actual loads applied to the linear motion rolling guide sometimes exceed the theoretically calculated load due to vibration and shocks caused by machine operation. The actual life is calculated considering the load factor.

Table 12 Load factor

Condition	f_w
Smooth operation free from vibration and/or shocks	1 ~ 1.2
Normal operation	1.2 ~ 1.5
Operation with shock loads	1.5 ~ 3

Lubrication and dust protection

High quality lithium-soap base grease containing extreme pressure additive (ALVANIA EP grease 2 -Shell-) is pre-packed in C-Sleeve Linear Roller Way Super MX. Additionally, C-Sleeve (Capillary sleeve) a component part is placed in the cylindrical roller recirculation path, thereby extending the re-lubrication (greasing) interval time and maintenance work for a long period.

C-Sleeve Linear Roller Way Super MX is provided with an oil hole and with grease nipple shown in Table 13. Supply nozzles matching the size of grease nipple are available. For these parts for lubrication, consult IKO for further information.

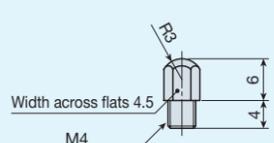
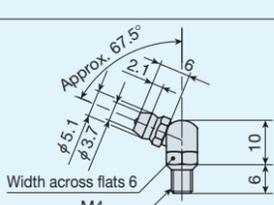
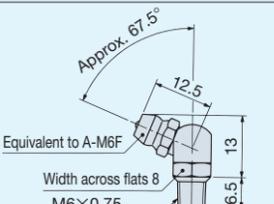
C-Sleeve Linear Roller Way Super MX is dust protected with special rubber seals. But, if large amount of fine contaminants are present, or if large particles of foreign matter such as dust or chips may fall on the track rail, it is recommended to provide protective covers such as bellows for the entire linear motion mechanism. Bellows to match the dimensions of C-Sleeve Linear Way are optionally available. They are easy to mount and highly effective for dust protection. If required, consult IKO.

Grease nipple

Grease nipples shown in Table 13 are assembled to each slide unit of C-Sleeve Linear Roller Way Super MX.

Table 13 Grease nipple

unit : mm

Model number	Grease nipple	
	Code	Shape and dimension
MX 15	A-M4	
		Width across flats 4.5 M4
MX 20 MX 25	B-M4	
		Width across flats 6 M4
MX 30	B-M6	
		Equivalent to A-M6F Width across flats 8 M6x0.75

Remark : The table shows representative model number and is also applicable to all models in the same size.

Precautions for use

1 Mounting surface, reference mounting surface, and general mounting structure

To mount C-Sleeve Linear Roller Way Super MX, correctly fit the reference mounting surfaces B and D of the slide unit and track rail to the reference mounting surfaces of the table and the bed, and then fix them tightly. (See Fig. 4)

The reference mounting surfaces B and D and the mounting surfaces A and C of C-Sleeve Linear Way are accurately finished by grinding. Stable and high accuracy linear motion can be obtained by finishing the mating mounting surfaces of machines or equipment with high accuracy and correctly mounting the guide on these surfaces.

The slide unit reference mounting surface is always the side surface opposite to the IKO mark. The track rail reference mounting surface is identified by locating the IKO mark on the top surface of the track rail. The track rail reference mounting surface is the side surface above the IKO mark (in the direction of the arrow). (See Fig. 5)

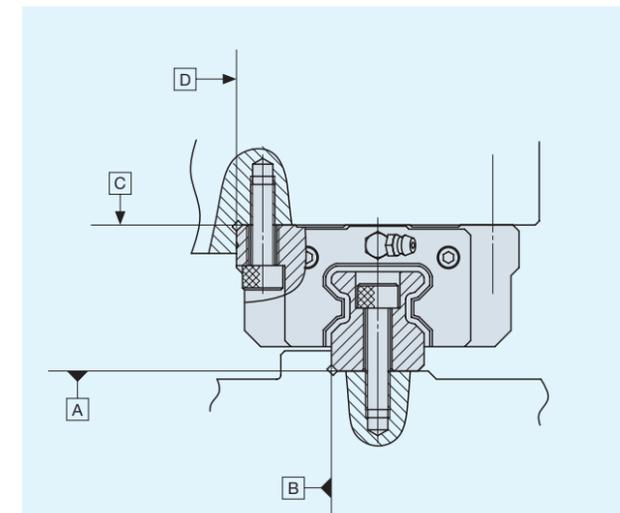


Fig. 4 Reference mounting surfaces and general mounting structure

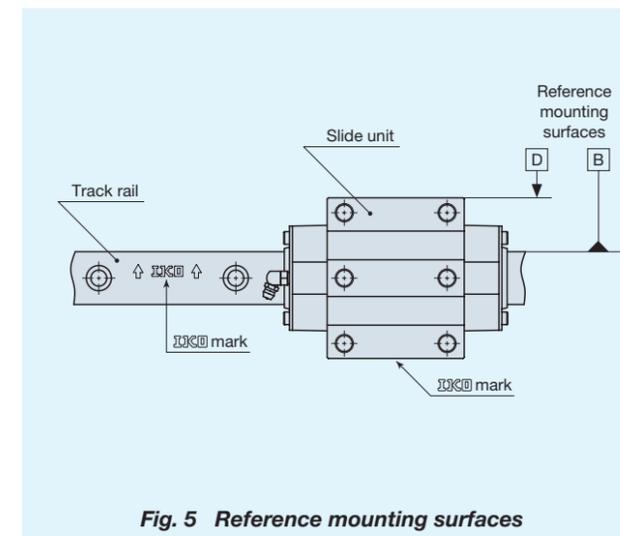


Fig. 5 Reference mounting surfaces

2 Mounting of the slide unit

The slide unit is provided with one or two mounting thread holes in the middle of width (See Fig. 6) so that an applied load can be received with good load balance. When designing machines or equipment, ensure that these middle-mounting holes of the slide unit can be securely tightened to obtain maximum performance of the guide. It is recommended to secure the screwing depths shown in Table 14 for the slide unit of compact block type.

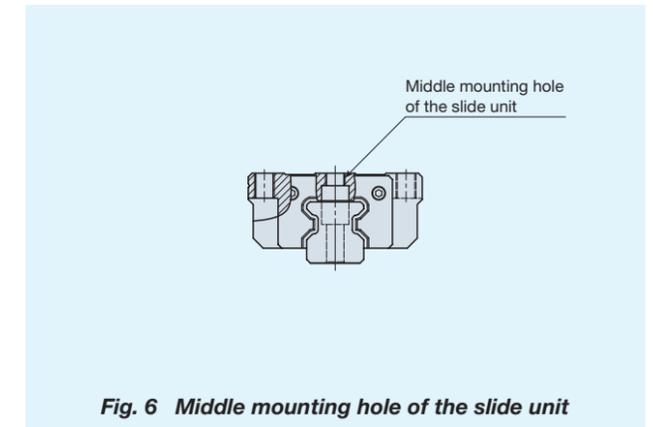


Fig. 6 Middle mounting hole of the slide unit

Table 14 Screwing depth of slide unit mounting holes for compact block type unit : mm

Model number	Recommended minimum depth
MXS(G) 15	4.5
MXS(G) 20	5.5
MXS(G) 25	7
MXS(G) 30	9

Precautions for use

③ Corner radius and shoulder height of reference mounting surfaces

It is recommended to make a relieved fillet at the corner of the mating reference mounting surfaces as shown in Fig. 7. Otherwise, corner radius R is recommended shown in Table 15. Table 15 shows recommended shoulder heights and radius of the reference mounting surfaces.

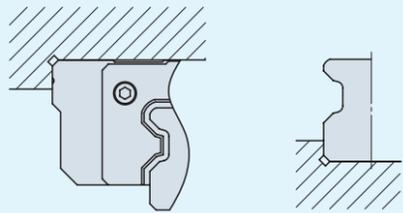
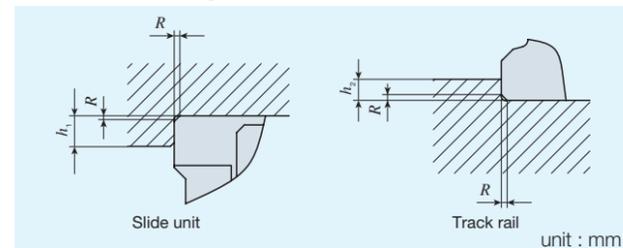


Fig. 7 Relieved radius shape of reference mounting surface

Table 15 Shoulder height and radius of the reference mounting surfaces



Model number	Slide unit Shoulder height h_1	Track rail Shoulder height h_2	Relieved radius R (max.)
MX 15	4	3	0.5
MX 20	5	4	0.5
MX 25	6	5	1
MX 30	8	5.5	1

Remark : The table shows representative model numbers but is applicable to all models of the same size.

④ Multiple slide units mounted in close distance

When using multiple slide units in close distance to each other, actual load may be greater than the calculated load depending on the mounting accuracy of the slide units on the mounting surfaces and the reference mounting surfaces of the machine. It is suggested in such cases to assume a greater load than the calculated load.

⑤ Operating temperature

The C-Sleeve Linear Roller Way Super MX must be operated below 80°C (maximum).

⑥ Cleaning

Do not wash C-Sleeve Linear Roller Way Super MX with organic solvent and/or white kerosene, which have the ability of removing fat, nor leave them in contact with the above agents.

Mounting

① When assembling two or more sets of C-Sleeve Linear Roller Way Super MX

• Interchangeable specification

In case of an interchangeable specification product, assemble a slide unit and a track rail with the same interchangeable code "S2".

• Non-interchangeable specification

Use an assembly of slide unit and track rail as delivered without changing the combination.

• Matched sets to be used as an assembled group

Special specification products of matched sets (by supplemental code "/W") are delivered as a group in which dimensional variations are specially controlled. Mount them without mixing with the sets of another group.

② Assembling a slide unit and a track rail

When assembling C-Sleeve Linear Roller Way Super MX, correctly fit the groove of the slide unit mounted on a steel ball holder to the groove of the track rail, and then move the slide unit gently from the dummy rail to the track rail in parallel direction.

Cylindrical rollers are retained, so the slide unit can be separated freely from the track rail. However, the slide unit can be assembled on the track rail much easier by using provided dummy rail.

Dummy rail is appended as an accessory to the interchangeable slide unit. Dummy rail is also appended to non-interchangeable specification product. Please use it when disassembling/assembling the slid unit.

③ Accuracy of mating mounting surfaces

A load greater than the calculated load may act on C-Sleeve Linear Roller Way Super MX, depending on the accuracy of mating mounting surfaces and assembling accuracy. This will eventually give an adverse effect on the service life of C-Sleeve Linear Roller Way Super MX. Therefore, the accuracy must be carefully examined.

The accuracy of mating mounting surfaces for track rail and slide unit and the assembling accuracy must be determined considering the operating conditions, required running accuracy and rigidity, etc. Also, the mounting structure must be examined to ensure accuracy and performance for the reliable use of a linear motion rolling guide. When multiple sets are mounted, the parallelism between the two mounting surfaces of machines must be prepared, in general, as shown in Table 16.

Table 16 Parallelism between two mounting surfaces

Class	unit : μm			
	High (H)	Precision (P)	Super precision (SP)	Ultra precision (UP)
Parallelism	30	20	10	6

④ Cleaning the mounting surfaces

When mounting C-Sleeve Linear Roller Way Super MX, firstly clean all the mounting and reference mounting surfaces. (See Fig. 8)

Remove burrs and blemishes from the reference mounting surfaces and mounting surfaces of the machine using an oil-stone, etc., and then wipe the surfaces with clean cloth.

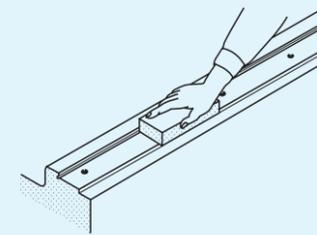


Fig. 8 Cleaning the mounting surfaces

⑤ Tightening torque of mounting bolts

The standard torque values for C-Sleeve Linear Roller Way Super MX mounting bolts are shown in Table 17. When machines or equipment are subjected to serve vibration, shock, large fluctuating load, or moment load, the bolts should be tightened with a torque 1.2 to 1.5 times higher than the standard torque values shown. When the mating member material is cast iron or aluminum, tightening torque should be lowered in accordance with strength characteristics of the material.

Table 17 Tightening torque of mounting bolts

Bolt size	Tightening torque N·m Carbon steel bolt (Strength division 12.9)
M 4×0.7	4.0
M 5×0.8	7.9
M 6×1	13.3
M 8×1.25	32.0
M10×1.5	62.7

Remark : In tightening torque for slide unit center mounting holes on flange type (MX), 70% to 80% values of Table 17 is recommended.

Track rail lengths

Standard and maximum lengths of track rails are shown in Table 18. Track rail in any length are also available. Simply indicate the necessary length of track rail in millimeter (mm) in the identification number.

In non-interchangeable specification, for track rail longer than the maximum length shown in Table 18, butt-jointing track rails are available upon request. In this case, indicate supplemental code "/A" in the identification number.

E dimensions at both ends are the same unless otherwise specified. To change these dimensions, specify the specified rail mounting hole positions (supplemental code "/E") of special specification.

Table 18 Standard and maximum lengths of track rails

Item	Model number	unit : mm			
		MX 15	MX 20	MX 25	MX 30
Standard length $L(n)$		180 (3)	240 (4)	240 (4)	480 (6)
		240 (4)	480 (8)	480 (8)	640 (8)
		360 (6)	660 (11)	660 (11)	800 (10)
		480 (8)	840 (14)	840 (14)	1 040 (13)
		660 (11)	1 020 (17)	1 020 (17)	1 200 (15)
Mounting hole pitch F		60	60	60	80
	E	30	30	30	40
Reference dimension $E^{(1)}$	Over (incl.)	7	8	9	10
	Under	37	38	39	50
Maximum length (2)		1 500 (1 980)	1 980 (3 000)	3 000	2 960 (4 000)

Note (1) : Not applicable to the track rail with female threads for bellows (Supplemental code /J)

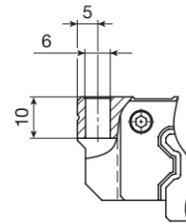
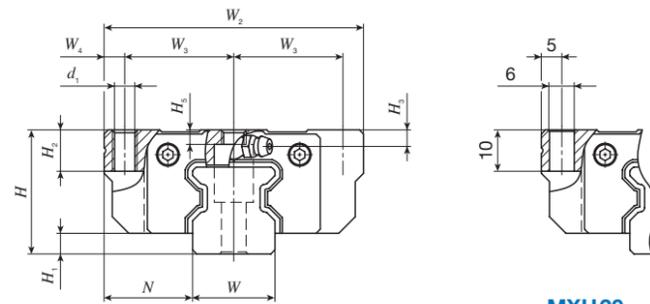
(2) : The track rails can be manufactured up to the maximum length shown in parentheses. If required, please consult  for further information.

Remark : The table shows representative model numbers and is also applicable to all models in the same size.

IKO C-Sleeve Linear Roller Way Super MX

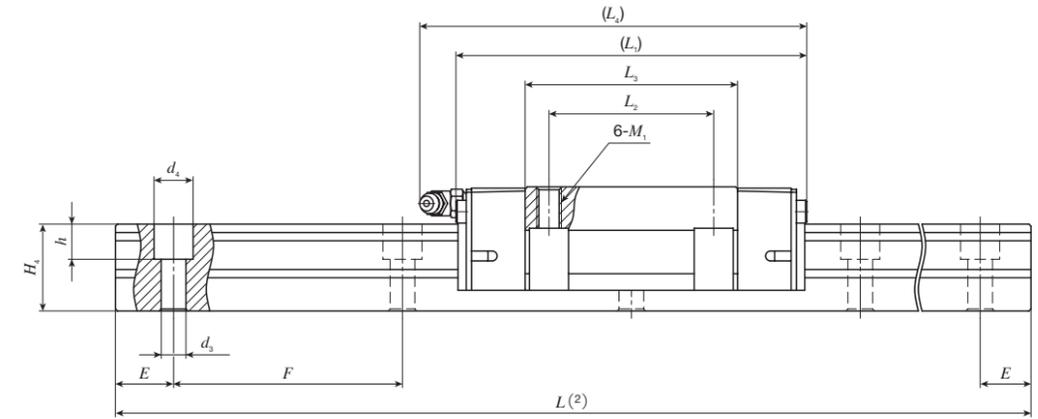
Flange type,
mounting from top and bottom

Standard : MX
High rigidity long : MXG



MXH20
MXHG20

Model mounted from bottom only ⁽¹⁾



Model number	Interchangeable	Mass (Reference)		Dimension of assembly mm			Dimension of slide unit mm										Dimension of track rail mm						Recommended ⁽³⁾ mounting bolt for track rail mm Bolt size × length	Basic ⁽⁴⁾ dynamic load rating C N	Basic ⁽⁴⁾ static load rating C ₀ N	Static moment rating ⁽⁴⁾			Model number			
		Slide unit kg	Track rail ⁽²⁾ kg/m	H	H ₁	N	W ₂	W ₃	W ₄	L ₁	L ₂	L ₃	L ₄	d ₁	M ₁	H ₂	H ₃	H ₅	W	H ₄	d ₃	d ₄				h	E	F		T ₀ N·m	T _x N·m	T _y N·m
MX 15	☆	0.20	1.65	24	4	16	47	19	4.5	68	30	40	71	4.4	M 5	7	3.5	3	15	16.5	4.5	8	6	30	60	M4×16	11 500	20 000	188	136 942	136 942	MX 15
MXG 15	☆	0.28		84	56	87	20 000	263	262 1 590	262 1 590	MXG 15																					
MX 20 ⁽¹⁾	☆	0.44	2.73	30	5	21.5	63	26.5	5	86	40	51.6	94	-	M 6	10	4	3.5	20	21	6	9.5	8.5	30	60	M5×20	23 400	42 700	550	379 2 520	379 2 520	MX 20 ⁽¹⁾
MXG 20 ⁽¹⁾	☆	0.61		106	71.6	114	58 900	760	713 4 200	713 4 200	MXG 20 ⁽¹⁾																					
MX 25	☆	0.67	3.59	36	6	23.5	70	28.5	6.5	98	45	60	107	7	M 8	10	5	5	23	24.5	7	11	9	30	60	M6×25	32 100	56 300	833	573 3 800	573 3 800	MX 25
MXG 25	☆	0.84		113	75	122	70 300	1 040	885 5 380	885 5 380	MXG 25																					
MX 30	☆	1.20	5.01	42	6.5	31	90	36	9	113	52	70.4	123	8.5	M10	10	6.5	5.5	28	28	9	14	12	40	80	M8×28	43 400	74 400	1 350	883 5 780	883 5 780	MX 30
MXG 30	☆	1.58		134	91.4	144	96 700	1 750	1 470 8 740	1 470 8 740	MXG 30																					

Note ⁽¹⁾: MX20 can be mounted from top only. For mounting from bottom, MXH20 which has same dimensions as above model, can be used.

⁽²⁾: Track rail length L are shown in Table 18.

⁽³⁾: Track rail mounting bolts are not appended. Hexagon socket bolts of JIS B 1176 strength division 12.9 or equivalent are recommended.

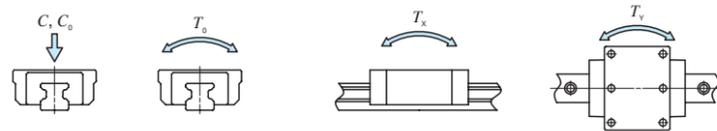
⁽⁴⁾: The directions of basic dynamic load rating (C), basic static load rating (C₀) and static moment rating (T₀, T_x and T_y) are shown in the sketches below.

The upper values in the T_x and T_y column apply to one slide unit, and the lower values apply to two units in close contact.

Remark 1: The mark ☆ indicates that interchangeable specification products are available.

2: For grease nipple specification, see Table 13.

3: A grease nipple mounting thread is provided on the left and right end plates respectively.



Example of identification number for assembled set

Model code	Size	Part code	Preload symbol	Class symbol	Interchangeable code	Supplemental code
MX	G	25	C2	R840	T₁	P
S2	/F					

Series
MX Flange type, mounting from top and bottom

Length of slide unit
No symbol Standard
G High rigidity long

Size
15, 20, 25, 30

Number of slide unit (two units)

Preload amount
No symbol Standard
T₁ Light preload
T₂ Medium preload
T₃ Heavy preload

Accuracy class
H High
P Precision
SP Super precision
UP Ultra precision

Length of track rail (840mm)

Special specification
A, D, E, F, GE, HP, I, J, L, LF, MA, MN, N, T, V, W, Z

Interchangeable code
S2 Interchangeable specification
No symbol Non interchangeable specification

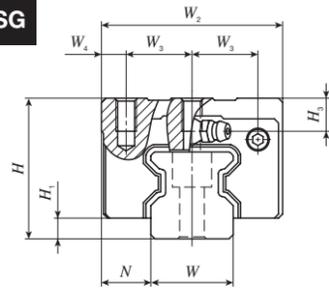
IKO G-Sleeve Linear Roller Way Super MX

Block type,
mounting from top

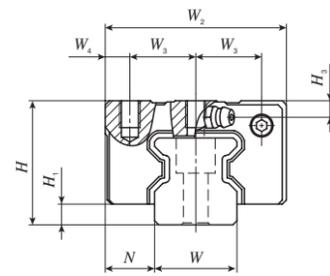
Compact block type,
mounting from top

Standard : MXD
High rigidity long : MXDG

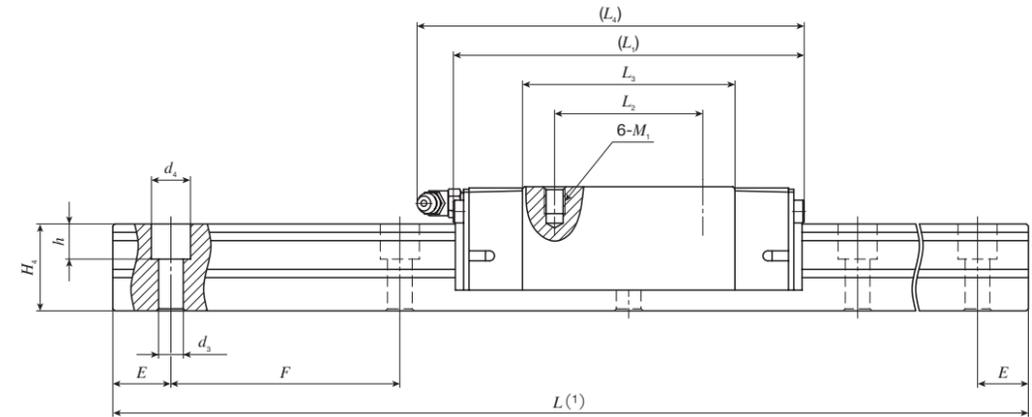
Standard : MXS
High rigidity long : MXSG



MXD
MXDG

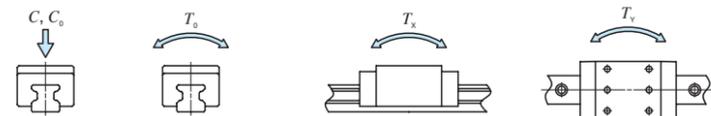


MXS
MXSG



Model number	Interchangeable	Mass (Reference)		Dimension of assembly mm			Dimension of slide unit mm							Dimension of track rail mm						Recommended ⁽³⁾ mounting bolt for track rail mm Bolt size × length	Basic ⁽⁴⁾ dynamic load rating C N	Basic ⁽⁴⁾ static load rating C ₀ N	Static moment rating ⁽⁴⁾			Model number					
		Slide unit kg	Track rail ⁽¹⁾ kg/m	H	H ₁	N	W ₂	W ₃	W ₄	L ₁	L ₂	L ₃	L ₄	M ₁ × depth ⁽²⁾	H ₃	W	H ₄	d ₃	d ₄				h	E	F		T ₀ N·m	T _x N·m	T _y N·m		
MXD 15	☆	0.19	1.65	28	4	9.5	34	13	4	68	26	40	71	M4 × 8	7.5	15	16.5	4.5	8	6	30	60	M4 × 16	11 500	20 000	188	136 942	136 942	MXD 15		
MXDG 15	☆	0.25		84						56		87	14 900											28 000	263	262 1 590	262 1 590	MXDG 15			
MXS 15	☆	0.15		24						68		40	71											M4 × 5.5	3.5	11 500	20 000	188	136 942	136 942	MXS 15
MXSG 15	☆	0.21		84						56		87	14 900													28 000	263	262 1 590	262 1 590	MXSG 15	
MXD 20	☆	0.38	2.73	34	5	12	44	16	6	86	36	51.6	94	M5 × 8	8	20	21	6	9.5	8.5	30	60	M5 × 20	23 400	42 700	550	379 2 520	379 2 520	MXD 20		
MXDG 20	☆	0.52		106						50	71.6	114	30 100											58 900	760	713 4 200	713 4 200	MXDG 20			
MXS 20	☆	0.31		30						86	36	51.6	94	M5 × 6.5	4									23 400	42 700	550	379 2 520	379 2 520	MXS 20		
MXSG 20	☆	0.42		106						50	71.6	114	30 100											58 900	760	713 4 200	713 4 200	MXSG 20			
MXD 25	☆	0.55	3.59	40	6	12.5	48	17.5	6.5	98	35	60	107	M6 × 12	9	23	24.5	7	11	9	30	60	M6 × 25	32 100	56 300	833	573 3 800	573 3 800	MXD 25		
MXDG 25	☆	0.68		113						50	75	122	38 200											70 300	1 040	885 5 380	885 5 380	MXDG 25			
MXS 25	☆	0.47		36						98	35	60	107	M6 × 9	5									32 100	56 300	833	573 3 800	573 3 800	MXS 25		
MXSG 25	☆	0.57		113						50	75	122	38 200											70 300	1 040	885 5 380	885 5 380	MXSG 25			
MXD 30	☆	0.92	5.01	45	6.5	16	60	20	10	113	40	70.4	123	M8 × 12	9.5	28	28	9	14	12	40	80	M8 × 28	43 400	74 400	1 350	883 5 780	883 5 780	MXD 30		
MXDG 30	☆	1.18		134						60	91.4	144	53 200											96 700	1 750	1 470 8 740	1 470 8 740	MXDG 30			
MXS 30	☆	0.83		42						113	40	70.4	123	M8 × 11	6.5									43 400	74 400	1 350	883 5 780	883 5 780	MXS 30		
MXSG 30	☆	1.05		134						60	91.4	144	53 200											96 700	1 750	1 470 8 740	1 470 8 740	MXSG 30			

Note (1): Track rail length L are shown in Table 18.
 (2): Recommended screw depth for MXS15, MXS20 and MXS25 are shown in Table 14.
 (3): Track rail mounting bolts are not appended. Hexagon socket bolts of JIS B 1176 strength division 12.9 or equivalent are recommended.
 (4): The directions of basic dynamic load rating (C), basic static load rating (C₀) and static moment rating (T₀, T_x and T_y) are shown in the sketches below. The upper values in the T_x and T_y column apply to one slide unit, and the lower values apply to two units in close contact.
 Remark 1: The mark ☆ indicates that interchangeable specification products are available.
 2: For grease nipple specification, see Table 13.
 3: A grease nipple mounting thread is provided on the left and right end plates respectively.



Example of identification number for assembled set

Model code	Size	Part code	Preload symbol	Class symbol	Interchangeable code	Supplemental code
MXD	G	25	C2	R840	T1	P
					S2	/F

Series

MXD Block type, mounting from top
MXS Compact block type, mounting from top

Length of slide unit

No symbol Standard
G High rigidity long

Size

15, 20, 25, 30

Number of slide unit (two units)

Preload amount

No symbol Standard
T1 Light preload
T2 Medium preload
T3 Heavy preload

Accuracy class

H High
P Precision
SP Super precision
UP Ultra precision

Length of track rail (840mm)

Special specification

A, D, E, F, GE, HP, I, J, L, LF, MA, MN, N, T, V, W, Z

Interchangeable code

S2 Interchangeable specification
No symbol Non interchangeable specification

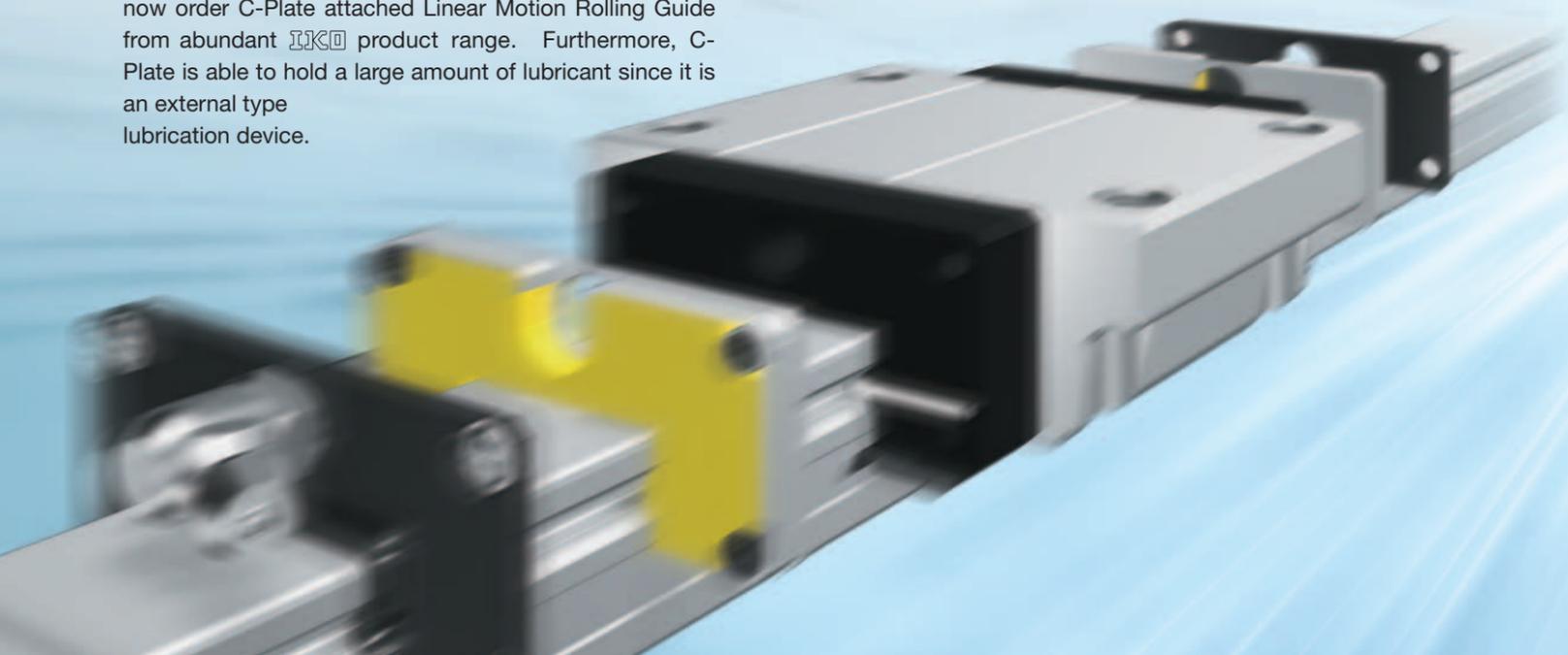
Other Maintenance Free Series

C-Plate can be installed on Linear Way, Linear Roller Way and Ball Spline G.

IKO Maintenance Free Series

Linear Motion Rolling Guide Series with C-Plate

IKO Linear Motion Rolling Guide Series with C-Plate is a linear motion rolling guide slide unit or external cylinder with lubrication plates equipped on the ends. You can now order C-Plate attached Linear Motion Rolling Guide from abundant IKO product range. Furthermore, C-Plate is able to hold a large amount of lubricant since it is an external type lubrication device.



Many variations

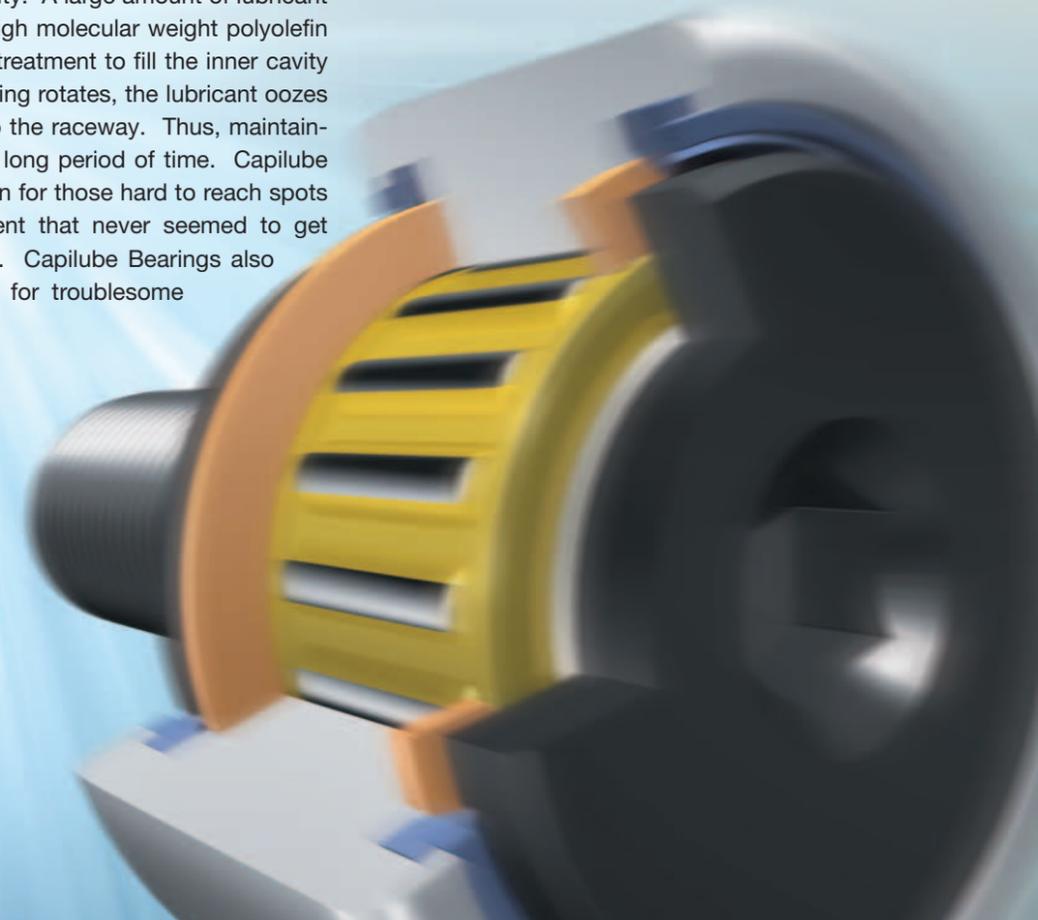
- Linear Way L
- Linear Way E
- Low Decibel Linear Way E
- Linear Way H
- Linear Way F
- Linear Way U
- Linear Roller Way Super X
- Linear Roller Way X
- Ball Spline G

Capilube integrated in IKO Needle Bearing Series whose outside diameter of the outer ring is 80 mm or less.

IKO Maintenance Free Series

Capilube Bearing

Capilube Bearing is a revolutionary bearing that is pre-packed with a thermosetting solid lubricant known as "Capilube" in its bearing cavity. A large amount of lubricant and fine particles of ultra high molecular weight polyolefin resin are solidified by heat treatment to fill the inner cavity of the bearing. As the bearing rotates, the lubricant oozes out in suitable amount onto the raceway. Thus, maintaining proper lubrication for a long period of time. Capilube Bearings are a great solution for those hard to reach spots on machines and equipment that never seemed to get greased when they need it. Capilube Bearings also reduce man-hours needed for troublesome lubrication control.



Capilube Cam Follower
CF.../SG



Machined type • Shell type Capilube Bearing
※ Applicable to caged type only