

NIPPON THOMPSON CO., LTD. (JAPAN)

Head Office : 19-19, Takanawa 2-chome, Minato-ku,
Tokyo, 108-8586, Japan
Phone : +81 (0)3-3448-5850
Fax : +81 (0)3-3447-7637
E-mail : ntt@ikonet.co.jp
URL : <https://www.ikont.co.jp/eg/>
Plant : Gifu, Kamakura

IKO INTERNATIONAL, INC. (U.S.A.)

East Coast Operations (Sales Head Office)

91 Walsh Drive,
Parsippany, NJ, 07054,
U.S.A.
Phone : +1-973-402-0254
Toll Free : +1-800-922-0337
Fax : +1-973-402-0441
E-mail : eco@ikonet.co.jp

Midwest Operations

101 Mark Street, Unit-G,
Wood Dale, IL, 60191,
U.S.A.
Phone : +1-630-766-6464
Toll Free : +1-800-323-6694
Fax : +1-630-766-6869
E-mail : mwo@ikonet.co.jp

Minnesota Sales Office

1500 McAndrews Road West, Suite 210,
Burnsville, MN, 55337,
U.S.A.
Phone : +1-952-892-8415
Toll Free : +1-800-323-6694
Fax : +1-952-892-1722
E-mail : mwo@ikonet.co.jp

West Coast Operations

9830 Norwalk Boulevard, Suite 198,
Santa Fe Springs, CA, 90670,
U.S.A.
Phone : +1 562-941-1019
Toll Free : +1-800-252-3665
Fax : +1-562-941-4027
E-mail : wco@ikonet.co.jp

Silicon Valley Sales Office

1500 Wyatt Drive, Suite 10,
Santa Clara, CA, 95054,
U.S.A.
Phone : +1-408-492-0240
Toll Free : +1-800-252-3665
Fax : +1-408-492-0245
E-mail : wco@ikonet.co.jp

Southeast Operations

2150 Boggs Road, Suite 100,
Duluth, GA, 30096,
U.S.A.
Phone : +1-770-418-1904
Toll Free : +1-800-874-6445
Fax : +1-770-418-9403
E-mail : seo@ikonet.co.jp

Southwest Operations

8105 N. Beltline Road, Suite 130,
Irving, TX, 75063,
U.S.A.
Phone : +1-972-929-1515
Toll Free : +1-800-295-7886
Fax : +1-972-915-0060
E-mail : swo@ikonet.co.jp

IKO THOMPSON BEARINGS CANADA, INC.(CANADA)

731-2425, Matheson Boulevard East, 7th floor,
Mississauga, Ontario, L4W 5K4, Canada
Phone : +1-905-361-2872
Fax : +1-905-361-6401
E-mail : itc@ikonet.co.jp

IKO BRASIL SERVIÇOS EMPRESARIAIS EIRELI (BRAZIL)

Rua Frei Caneca 1407,
Condominio Edificio Barão de Monte Cedro,
Cjs. 801/802, Consolação, São Paulo- SP
Cep: 01307-909
Phone : +55 (0)11-2366-3033
E-mail : itb@ikonet.co.jp

NIPPON THOMPSON EUROPE B.V. (EUROPE)

The Netherlands (Sales Head Office)

Sheffieldstraat 35,
3047 AN Rotterdam,
The Netherlands
Phone : +31 (0)10-462 68 68
E-mail : nte@ikonet.co.jp

Germany Branch

Mündelheimer Weg 54,
40472 Düsseldorf,
Germany
Phone : +49 (0)211-41 40 61
Fax : +49 (0)211-42 76 93
E-mail : ntd@ikonet.co.jp

Regensburg Sales Office

Im Gewerbepark D 30,
93059 Regensburg,
Germany
Phone : +49 (0)941-20 60 70
Fax : +49 (0)941-20 60 719
E-mail : ntdr@iko-nt.de

Neunkirchen Sales Office

Gruben Str. 95c,
66540 Neunkirchen,
Germany
Phone : +49 (0)6821-99 98 60
Fax : +49 (0)6821-99 98 626
E-mail : ntdn@iko-nt.de

U.K. Branch

2 Vincent Avenue, Crownhill,
Milton Keynes, Bucks, MK8 0AB,
United Kingdom
Phone : +44 (0)1908-566144
Fax : +44 (0)1908-565458
E-mail : sales@iko.co.uk

Spain Branch

Autovia Madrid-Barcelona, Km. 43,700
Polig. Ind. AIDA - Nove A-8, Ofic. 2-1ª
19200 Azuqueca de Henares,
(Guadalajara) Spain
Phone : +34 949-26 33 90
Fax : +34 949-26 31 13
E-mail : nts@ikonet.co.jp

France Branch

Bâtiment le Raphaël-Paris, Nord 2,
22 avenue des Nations
BP54394 Villepinte
95943 ROISSY C.D.G Cedex
France
Phone : +33 (0)1-48 16 57 39
Fax : +33 (0)1-48 16 57 46
E-mail : ntf@ikont.eu

IKO THOMPSON ASIA CO., LTD. (THAILAND)

1-7 Zuellig House, 3rd Floor,
Silom Road, Silom, Bangrak,
Bangkok 10500, Thailand
Phone : +66 (0)2-637-5115
FAX : +66 (0)2-637-5116
E-mail : ita@ikonet.co.jp

See you again at

IKO Website

<https://www.ikont.co.jp/eg/>

IKO THOMPSON KOREA CO.,LTD. (KOREA)

2F, 111, Yeouigongwon-ro,
Yeongdeungpo-gu, Seoul, Korea
Phone : +82 (0)2-6337-5851
Fax : +82 (0)2-6337-5852
E-mail : itk@ikonet.co.jp

IKO-THOMPSON (SHANGHAI) LTD. (CHINA)

Shanghai (Sales Head Office)

1608-10, MetroPlaza No.555, LouShanGuan
Road, ChangNing District, Shanghai,
People's Republic of China, 200051
Phone : +86 (0)21-3250-5525
Fax : +86 (0)21-3250-5526
E-mail : ntc@ikonet.co.jp

Beijing Branch

Room1506, Jingtai Tower,
NO.24, Jianguomenwai Avenue,
Chaoyang District, Beijing
People's Republic of China, 100022
Phone : +86 (0)10-6515-7681
Fax : +86 (0)10-6515-7689
E-mail : ntc@ikonet.co.jp

Guangzhou Branch

Room 834, Garden Tower, Garden Hotel
368 Huanshi East Road, Yuexiu District, Guangzhou,
Guangdong
People's Republic of China, 510064
Phone : +86 (0)20-8384-0797
Fax : +86 (0)20-8381-2863
E-mail : ntc@ikonet.co.jp

Wuhan Branch

Room 2300, Truroll Plaza No.72, Wusheng Road,
Qiao kou District, Wuhan, Hubei,
People's Republic of China, 430033
Phone : +86 (0)27-8556-1610
Fax : +86 (0)27-8556-1630
E-mail : ntc@ikonet.co.jp

Shenzhen Branch

Room 420, Oriental Plaza,
1072 Jianshe Road, Luohu District,
Shenzhen, Guangdong,
People's Republic of China, 518001
Phone : +86 (0)755-2265-0553
Fax : +86 (0)755-2298-0665
E-mail : ntc@ikonet.co.jp

Ningbo Office

Room 3406, Zhongnongxin Building, No.181,
Zhongshan East Road, Haishu Ward, Ningbo, Zhejiang,
People's Republic of China, 315000
Phone : +86 (0)574-8718-9535
Fax : +86 (0)574-8718-9533
E-mail : ntc@ikonet.co.jp

Qingdao Office

Room 1007, Building B, Haida Center, No.179,
Taoliu Road, Shibei District, Qingdao City, Shandong,
People's Republic of China, 266555
Phone : +86 (0)532-8670-2246
FAX : +86 (0)532-8670-2242
E-mail : ntc@ikonet.co.jp

Shenyang Office

2-1203 Tower I, City Plaza Shenyang NO.206,
Nanjing North Street, Heping District, Shenyang,
People's Republic of China, 110001
Phone : +86 (0)24-2334-2662
FAX : +86 (0)24-2334-2442
E-mail : ntc@ikonet.co.jp

IKO Linear Motion Rolling Guide Series General Catalog

BLUE



Recognizing that conservation of the global environment is the top-priority challenge for the world's population, Nippon Thompson will conduct its activities with consideration of the environment as a corporate social responsibility, reduce its negative impact on the environment, and help foster a rich global environment.

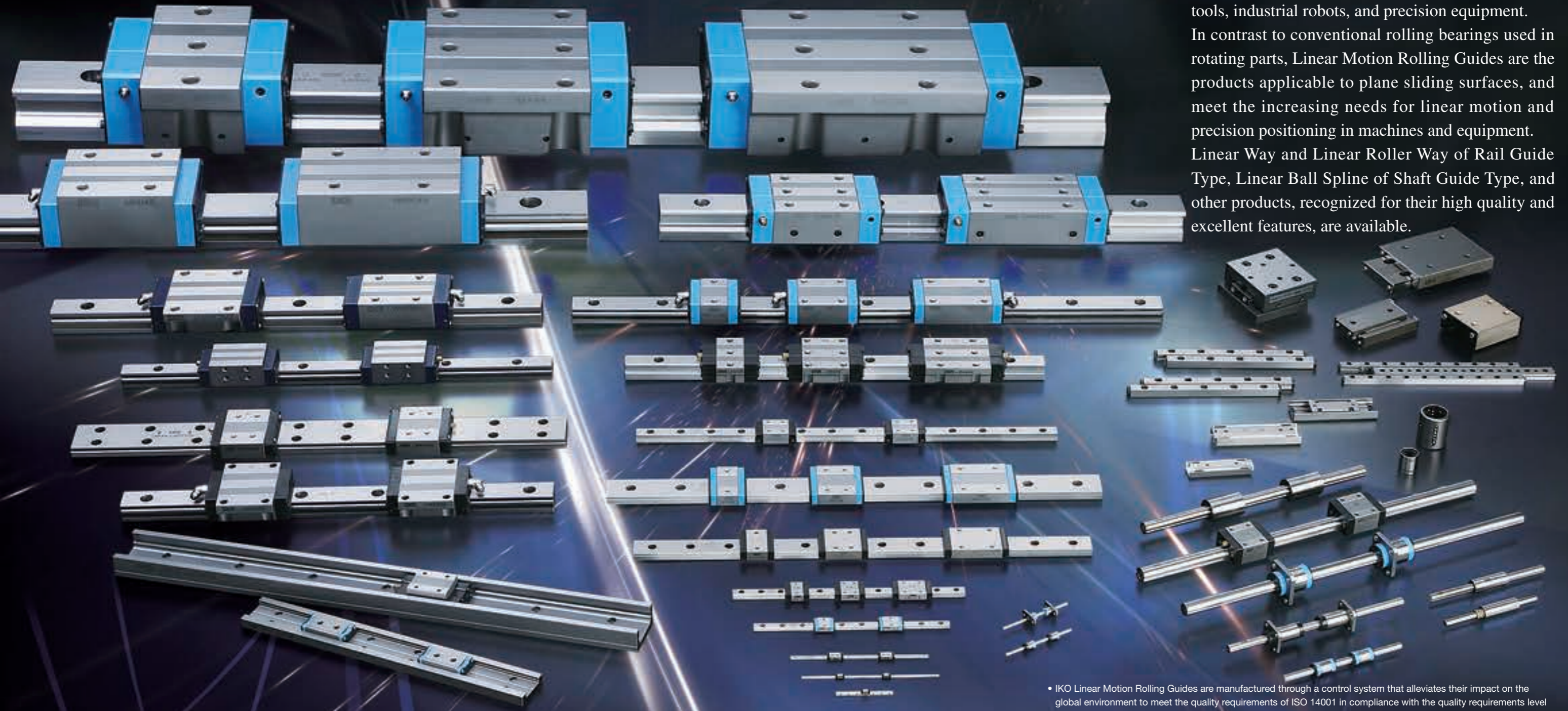
**ISO 9001 & 14001 Quality system
registration certificate**



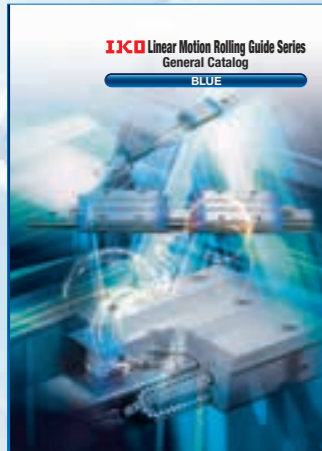
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Eco-friendly and Excellent Quality

IKO Linear Motion Rolling Guides are used with satisfactory results for various applications requiring precision positioning such as semi-conductor manufacturing equipment, large sized machine tools, industrial robots, and precision equipment. In contrast to conventional rolling bearings used in rotating parts, Linear Motion Rolling Guides are the products applicable to plane sliding surfaces, and meet the increasing needs for linear motion and precision positioning in machines and equipment. Linear Way and Linear Roller Way of Rail Guide Type, Linear Ball Spline of Shaft Guide Type, and other products, recognized for their high quality and excellent features, are available.



- IKO Linear Motion Rolling Guides are manufactured through a control system that alleviates their impact on the global environment to meet the quality requirements of ISO 14001 in compliance with the quality requirements level of ISO 9001 for quality improvement.
- The standard products listed in this catalog comply with the specifications of the six hazardous materials mentioned cited in the European RoHS Directive.



Recorded in CAT-1578E








Linear Way Linear Roller Way

	C-Lube Maintenance Free Series		
 Ball Type Miniature Series Super small-size linear motion rolling guide produced by original small sizing technology	C-Lube Linear Way ML ML : Standard type MLF : Wide type	Linear Way L LWL : Standard type LWLF : Wide type	
 Ball Type Miniature Value Series Economical linear motion rolling guides without changing the superior performance of Ball Type Miniature Series	C-Lube Linear Way MLV MLV		
 Ball Type Low Profile/Light Weight Series Super low profile and super light weight linear motion rolling guides with high load capacity	C-Lube Linear Way MV MV		
 Ball Type Compact Series Versatile linear motion rolling guides pursuing compactness in every aspect	C-Lube Linear Way ME ME : Flange type mounting from bottom MET : Flange type mounting from top MES : Block type mounting from top	Linear Way E LWE : Flange type mounting from bottom LWET : Flange type mounting from top LWES : Block type mounting from top	Low Decibel Linear Way E LWE...Q : Flange type mounting from bottom LWET...Q : Flange type mounting from top LWES...Q : Block type mounting from top
 Ball Type High Rigidity Series High rigidity linear motion rolling guides designed to evenly support high load capacity by incorporating large-diameter balls	C-Lube Linear Way MH MH : Flange type mounting from bottom MHT : Flange type mounting from top MHD : Block type mounting from top MHS : Compact block type mounting from top	Linear Way H LWH : Flange type mounting from bottom LWHT : Flange type mounting from top LWHD : Block type mounting from top LWHS : Compact block type mounting from top LWHY : Side mounting type	
 Ball Type Wide Rail Type Series Linear motion rolling guide suitable to single-row use due to having resistance to across-the-width moment load by using a wide track rail		Linear Way F LWFH : Flange type mounting from top / bottom LWFF : Flange type mounting from top / bottom LWFS : Block type mounting from top	
 Ball Type U-Shaped Track Rail Series Linear motion rolling guide of high track rail rigidity with U-shaped track rail	C-Lube Linear Way MUL MUL : Small type	Linear Way U LWU...B : Standard ball-retained type	
 Roller Type Linear motion rolling guide that has achieved the highest level of performance in all characteristics utilizing the roller's superior characteristic	C-Lube Linear Roller Way Super MX MX : Flange type mounting from top / bottom MXD : Block type mounting from top MXS : Compact block type mounting from top MXN : Low profile flange type mounting from top / bottom MXNS : Low profile block type mounting from top	Linear Roller Way Super X LRX : Flange type mounting from top / bottom LRXD : Block type mounting from top LRXS : Compact block type mounting from top	
 Roller Type Roller type linear motion rolling guide with cylindrical rollers in four-rows		Linear Roller Way X LRWX : Block type mounting from top LRWXH : Flange type mounting from bottom	
 Module Type Minimum compact linear motion rolling guide with both a track rail and slide member provided		Linear Way Module LWLM : Ball type small type LWM : Ball type standard type LRWM : Roller type	



Recorded in CAT-1579E

Crossed Roller Way Linear Slide Unit Linear Ball Spline Linear Bushing Stroke Rotary Bushing Roller Way & Flat Roller Cage

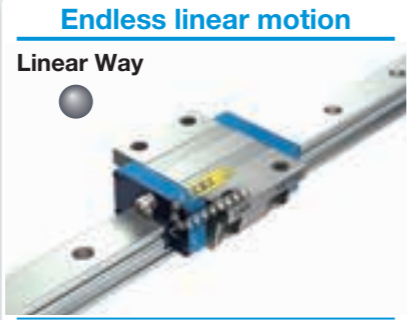




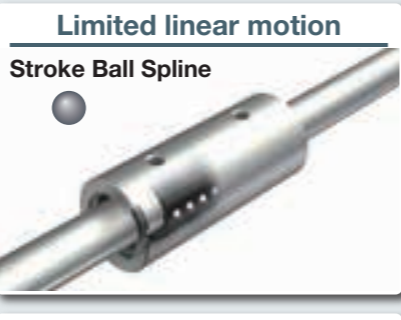




 Crossed Roller Way Linear motion rolling guide incorporating a roller cage between two ways whose two V-shaped surfaces are used as track groove		Anti-Creep Cage Crossed Roller Way CRWG	Anti-Creep Cage Crossed Roller Way H CRWG...H	Crossed Roller Way CRW : Standard type CRWM : Module type
 Linear Slide Unit Light weight, small, and compact linear motion rolling guide that has achieved light and smooth motion		Anti-Creep Cage Crossed Roller Way Unit CRWUG	Crossed Roller Way Unit CRWU / CRWU...R / CRWU...RS	
 High Rigidity Precision Linear Slide Unit BWU			Precision Linear Slide Unit BSP : Limited linear motion type BSPG : Built-in rack & pinion type BSR : Endless linear motion type	Linear Slide Unit BSU...A
 Linear Ball Spline Linear motion rolling guide performing linear motion while performing torque transmission along the spline shaft by external cylinder or slide unit	C-Lube Linear Ball Spline MAG MAG : Standard type MAGF : Flange type	Linear Ball Spline G LSAG : Standard type LSAGF : Flange type	Block Type Linear Ball Spline LSB	Stroke Ball Spline LS
 Linear Bushing A wide variety of linear motion rolling guides facilitating the rolling motion in bush guide portion		Linear Bushing G LMG	Linear Bushing LM / LME / LMB	Miniature Linear Bushing LMS
 Stroke Rotary Bushing Linear motion rolling guide enabling the rolling motion and rotary and linear motion in axial direction		Stroke Rotary Bushing ST : Ordinary type ST...B : For heavy load	Miniature Stroke Rotary Bushing STSI : Assembled set with a shaft STS : Assembled set without a shaft	Stroke Rotary Cage BG
 Roller Way & Flat Roller Cage High accuracy linear motion rolling guide providing high rigidity in load direction		Roller Way RW / SR / GSN	Flat Roller Cage FT : Single row type FTW...A : Double row angle type	

IKO Types and Specifications of

Linear Motion Rolling Guide Series

Types of Linear Motion Rolling Guides

Specifications of Linear Motion Rolling Guides

Type	Description	Endless linear motion	Limited linear motion
Rail Guide Type	The Rail Guide Type achieves linear motion along a rail. This product can receive a complex load and features high performance, excellent total balance and easy handling.	Linear Way 	Crossed Roller Way 
		Linear Roller Way 	Linear Slide Unit 
Shaft Guide Type	The Shaft Guide Type achieves linear motion along a shaft. This product is easy to handle and suitable for relatively low load conditions. Some shaft guide products can achieve both rotation and reciprocating linear motion.	Linear Ball Spline 	Stroke Ball Spline 
		Linear Bushing 	Limited linear motion + rotation Stroke Rotary Bushing 
Flat Guide Type	The Flat Guide Type achieves linear motion on a surface. This product can receive only a unidirectional load but feature high rigidity in the load direction.	Roller Way 	Flat Roller Cage 

Type	Type of rolling element	Type of motion	Load direction and load carrying capacity	Rigidity	Frictional characteristic	Ease of mounting	General applications	Item-listed catalog
Rail Guide Type	Ball	Endless linear motion	Complex load, medium to heavy load	○	○	◎	• NC machine tool • Precision working machine • Robot • Transfer machine	BLUE
	Roller	Endless linear motion	Complex load, heavy to extra-heavy load	◎	○	◎	• Heavy duty machine tool • Large working machine • High-rigidity robot	BLUE
	Roller	Limited linear motion	Complex load, medium load	○	◎	◎	• Precision working machine • Electronic parts assembling machine • Precision measuring instrument	RED
	Ball	Limited linear motion	Complex load, light to medium load	△	◎	◎	• Electronic parts assembling machine	RED
Shaft Guide Type	Ball	Endless linear motion	Complex load, medium to heavy load	○	○	○	• Robot • Testing and inspection equipment • Transfer machine	RED
	Ball	Endless linear motion	Radial load, light load	△	○	○	• Packaging machine • Measuring instrument • Medical instrument	RED
	Ball	Limited linear motion	Complex load, medium to heavy load	○	◎	○	• Robot • Testing and inspection equipment	RED
	Ball	Limited linear motion + rotation	Radial load, light load	△	◎	○	• Printing press • Press die set • Precision measuring instrument	RED
Flat Guide Type	Roller	Endless linear motion	Unidirectional load, extra-heavy load	◎	○	△	• NC machine tool • Precision working machine	RED
	Roller	Limited linear motion	Unidirectional load, extra-heavy load	◎	◎	○	• Precision working machine • Optical measuring instrument	RED

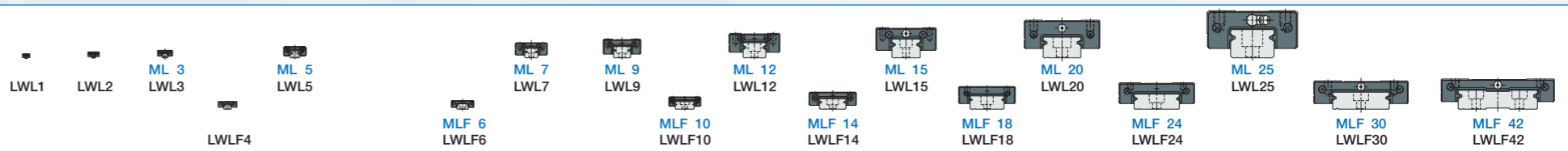
Code description ◎Excellent ○Good △Fair



Ball Type Miniature Series

C-Lube Linear Way ML Linear Way L / Micro Linear Way L

Super small-size linear motion rolling guide produced by original small sizing technology



Ball Type Miniature Value Series

C-Lube Linear Way MLV

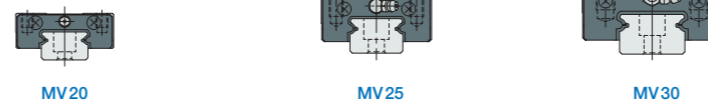
Economical linear motion rolling guides without changing the superior performance of Ball Type Miniature Series



Ball Type Low Profile/Light Weight Series

C-Lube Linear Way MV

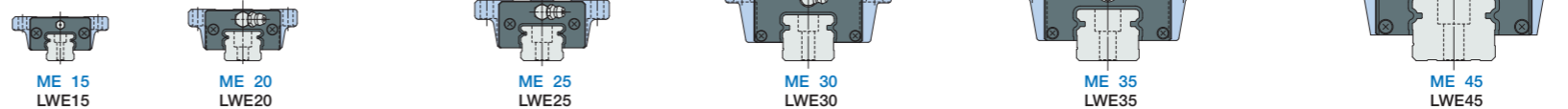
Super low profile and super light weight linear motion rolling guides with high load capacity



Ball Type Compact Series

C-Lube Linear Way ME Linear Way E / Low Decibel Linear Way E

Versatile linear motion rolling guides pursuing compactness in every aspect



Ball Type High Rigidity Series

C-Lube Linear Way MH Linear Way H

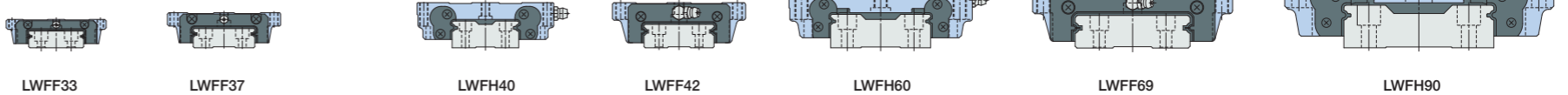
High rigidity linear motion rolling guides designed to evenly support high load capacity by incorporating large-diameter balls



Ball Type Wide Type Series

Linear Way F

Linear motion rolling guide suitable to single-row use due to having resistance to across-the-width moment load by using a wide track rail



Ball Type U-Shaped Track Rail Series

C-Lube Linear Way MUL Linear Way U

Linear motion rolling guide of high track rail rigidity with U-shaped track rail



Roller Type

C-Lube Linear Roller Way Super MX Linear Roller Way Super X

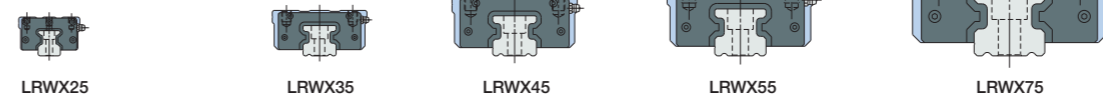
Linear motion rolling guide that has achieved the highest level of performance in all characteristics utilizing the roller's superior characteristic



Roller Type

Linear Roller Way X

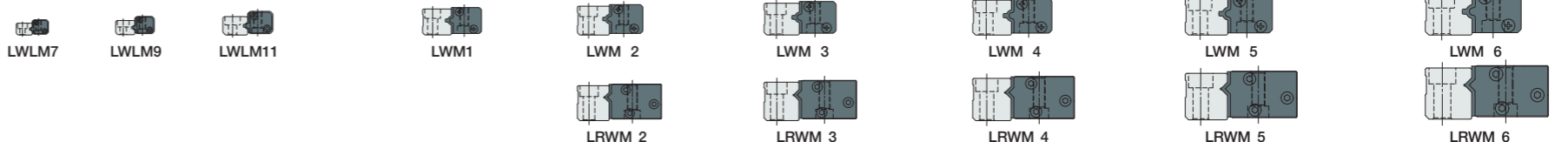
Roller type linear motion rolling guide with cylindrical rollers in four-rows



Module Type

Linear Way Module

Minimum compact linear motion rolling guide with both a track rail and slide member provided



ML · LWL

MLV

MV

ME · LWE

MH · LWH

LWF

MUL · LWU

MX · LRX

LRWX

LW(L)M · LRWM

Environment

IKO Gentle to The Earth

Nippon Thompson Co., Ltd. is working to develop global environment-friendly products.

It is committed to developing products that make its customer's machinery and equipment more reliable, thereby contributing to preserving the global environment.

This development stance manifests well in the keyword "Oil Minimum".



Our pursuit of Oil Minimum has led to the creation of IKO's proprietary family of lubricating parts as "C-Lube".

"C-Lube" minimizes usage of lubrication oil and supplies the optimal amount of lubrication oil for long period of time. So it realizes long term maintenance free and contributes to the global environment preservation.



The "Interchangeable" is a result of our consideration to the environment and radical pursuit of elimination of material and inventory waste.

Interchangeable is a collective name of "systems of products selection from users' perspective" which allows free interchange and replacement totally retaining the accuracy and preload of slide units and track rails.

The integration of maintenance free and advanced interchangeable system with C-Lube is the "Free & Interchangeable".



Eco-friendly specification

Reducing usage of lubrication oil



U.S. PATENTED

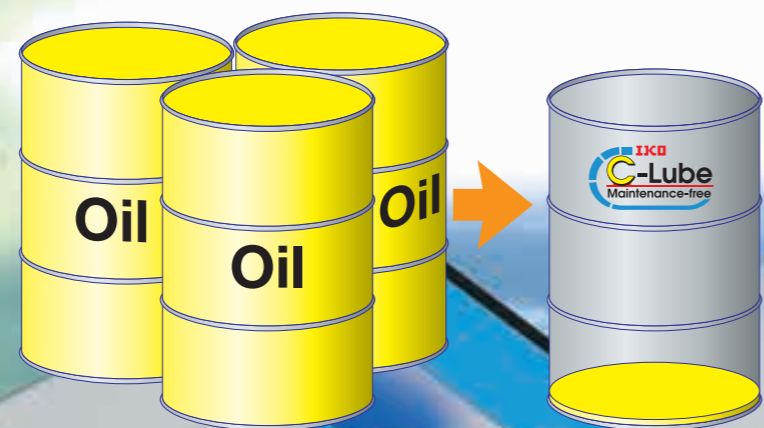
C-Lube Linear Way ML	Linear Way L	
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C-Lube Linear Way MLV	Linear Way E	
No. 8465206	No. 7677804 6176617 5967667	
C-Lube Linear Way MV	Linear Way H	
No. 6712511 6729761	No. 7677804 6082899 6517244 5967667 6461045 5622433 6250805 6176617	
C-Lube Linear Way ME	Linear Way F	
No. 7748905 7677804 6729761 6712511	No. 6176617 5967667	
C-Lube Linear Way MH	Linear Way U	
No. 7832929 6712511 7762723 7748905 7677804 6729761	No. 6880975 6176617 6851857 6082899 6517244 5967667 6461045 6309107	
C-Lube Linear Way MUL		
No. 5435649		
C-Lube Linear Roller Way Super MX		
No. 8403563 7950852 8403562 7927016 8123408 7862234 8113714 7832930 8033730 7997800	No. 8585288 7458721 8506166 7458720 8206036 5800064 8113714 7780356 7534042	
Linear Roller Way Super X		
No. 7832930 6766897 7458721 6461045 7458720 6176617	No. 7341378 5622433 5967667 5464288 5800064	

Eco-friendly

Consumption of precious oil resource is minimized! And elimination of oil feeder and its piping reduces the initial cost!

Contributes to reduction of total cost and environmental loads!!

Oil usage reduction effect

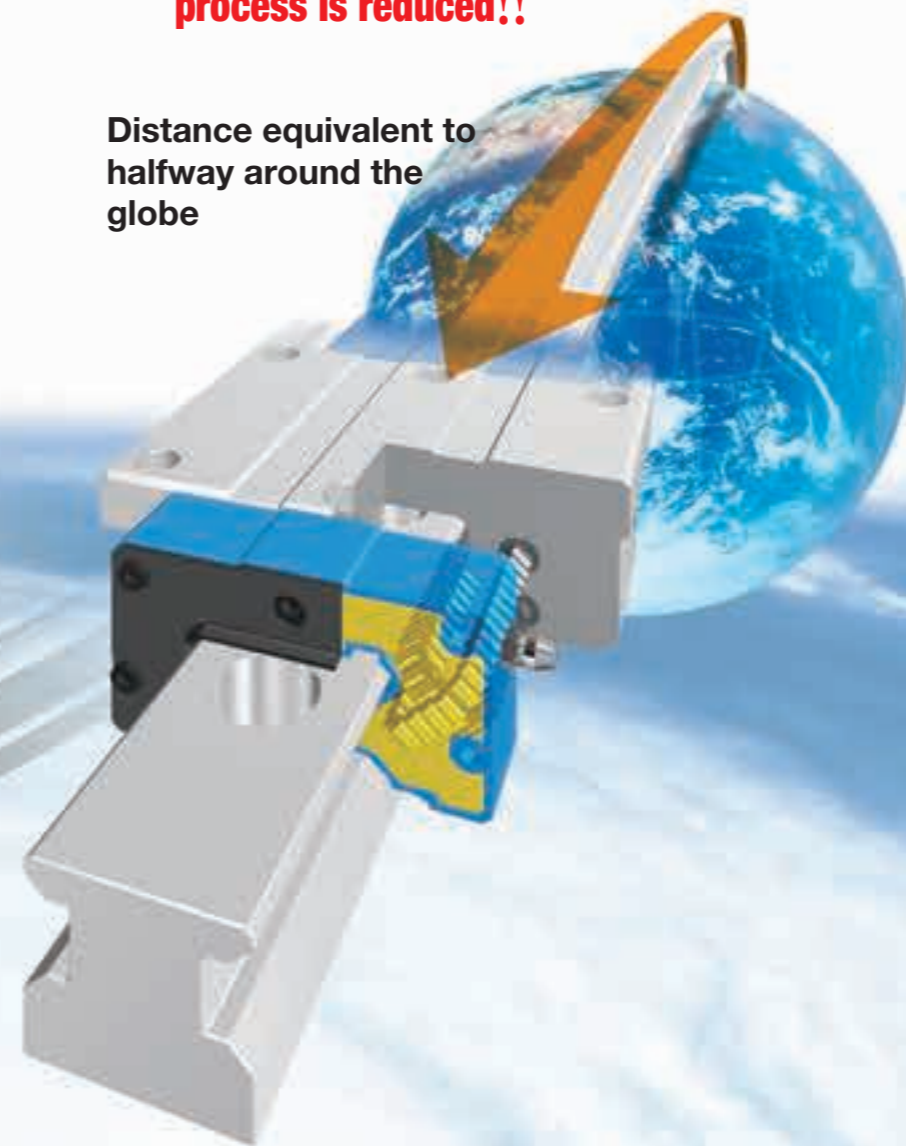


Maintenance free

Endures running over 20,000 km without oil feeding!

Troublesome lubrication maintenance process is reduced!!

Distance equivalent to halfway around the globe

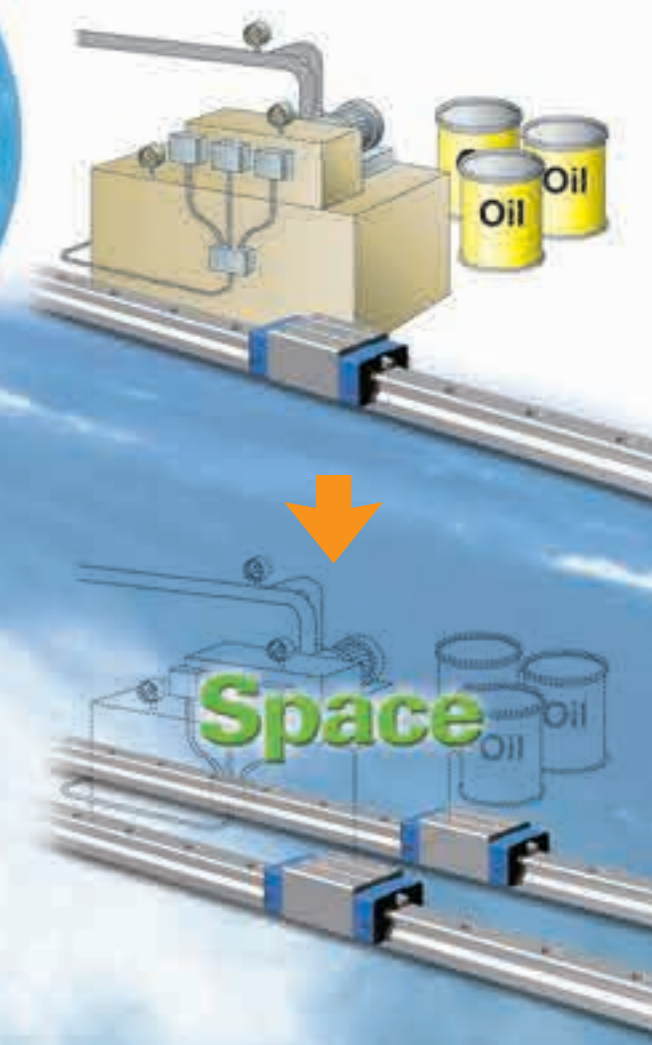


Compactness

The space consuming oil feeder is eliminated to save the space!

Freedom of machine designing is expanded for user!!

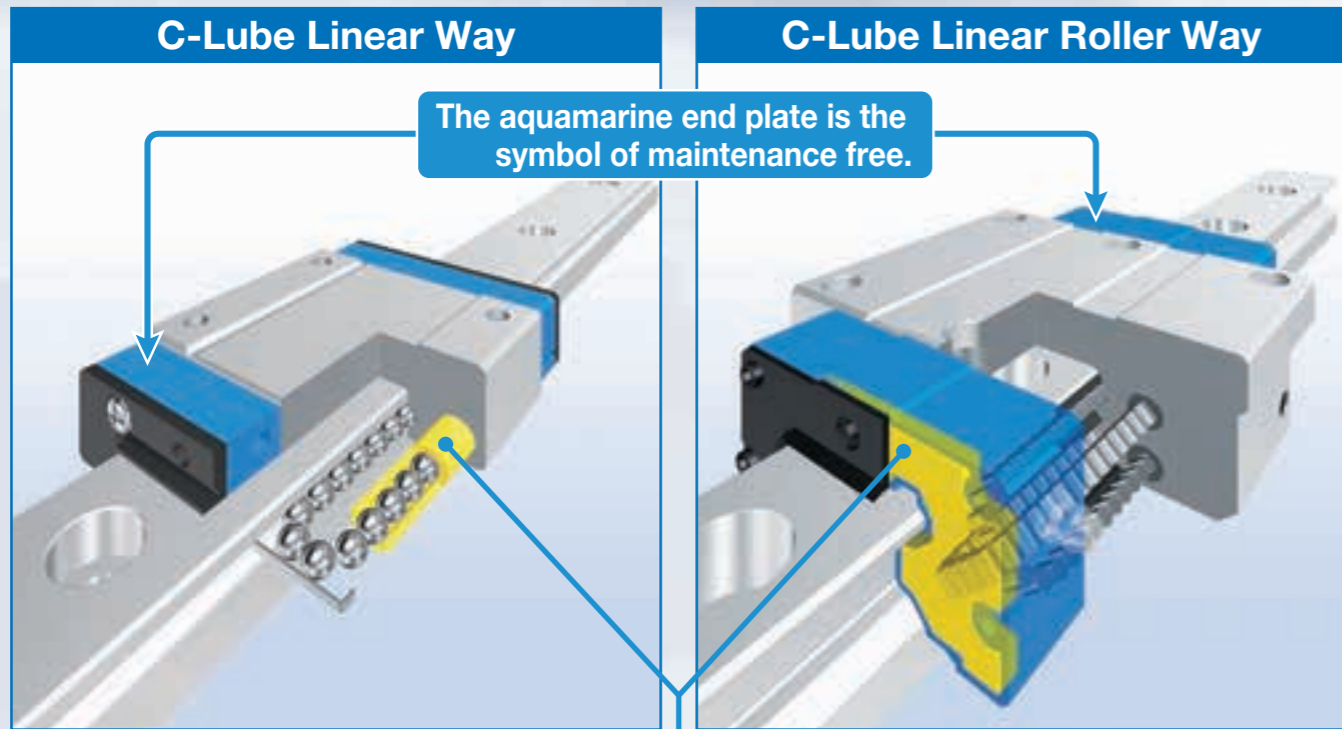
Efficient use of space





Features of C-Lube Linear Way and C-Lube Linear Roller Way

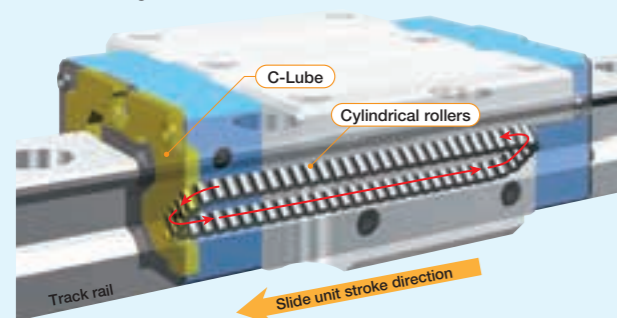
Original and world's first structure with [C-Lube]



C-Lube integrated

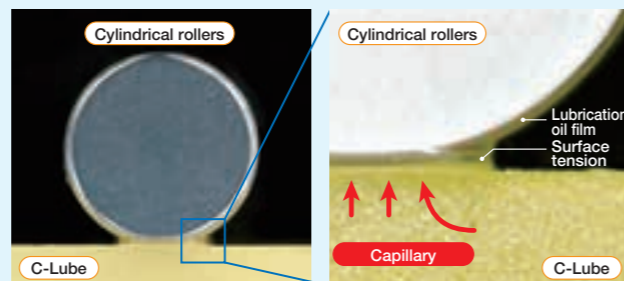
Lubrication oil is carried through circulation of rolling elements

The lubrication oil is supplied directly to the rolling elements, not to the track rail. When rolling elements make contact with the capillary lubricating element integrated with the circulation path of slide unit rolling elements, the lubrication oil is supplied to surfaces of rolling elements and carried to the loading area through circulation of rolling elements. This results in adequate lubrication oil being properly maintained in the loading area and lubrication performance will last for a long time.



Lubrication oil is directly supplied to surfaces of the rolling elements

The surface of capillary lubricating element is always covered with the lubrication oil. Lubrication oil is continuously supplied to the surface of rolling elements by surface tension in the contact of capillary lubricating element surface and rolling elements. On the surface of capillary lubricating element with which the rolling elements make contact, new lubrication oil is always supplied from the other sections.



Long term maintenance free is realized with oil impregnated with C-Lube only !!

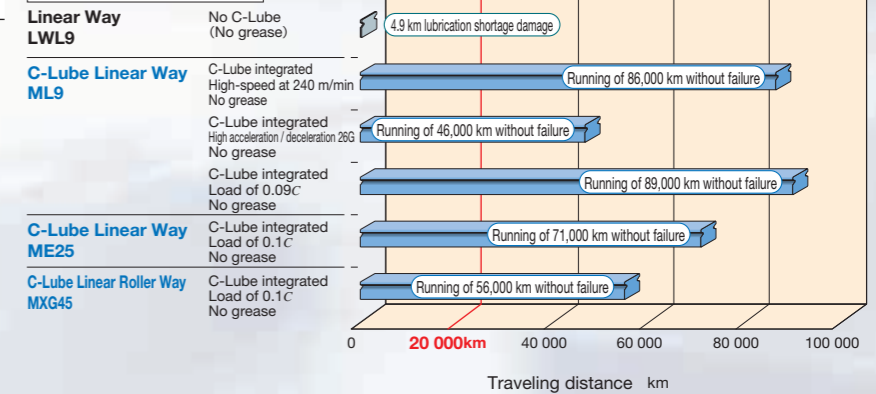
Maintenance free

This endures running over 20,000 km without oil feeding with lubrication oil in the C-Lube only. Furthermore, grease is pre-packed in the slide unit so long term maintenance free can be realized.

Maintenance free is achieved until the end of device life!

*1. Typical device life is assumed. Re-greasing may be necessary depending on use conditions.

Durability test result

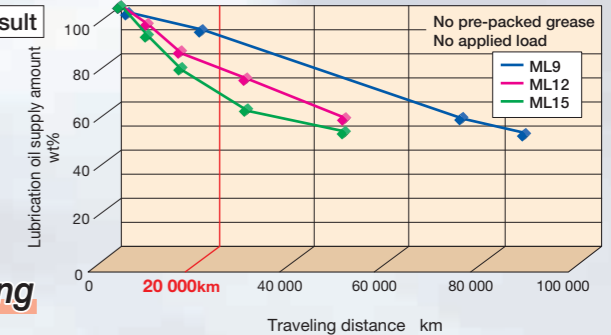


Eco-friendly

As lubrication oil in C-Lube is supplied by the amount necessary to maintain lubrication performance of the rolling guide, the consumption of lubrication oil is reduced and lubrication performance is maintained even when it run for a long period.

Eco-friendly specification reducing usage of lubrication oil!

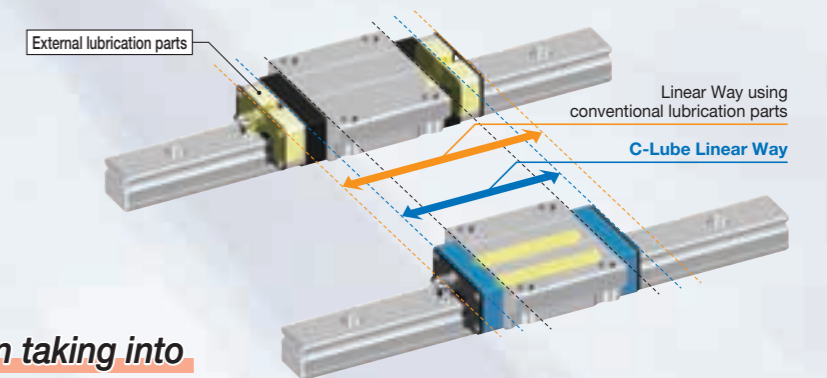
Oil supply test result



Compact

As C-Lube Linear Way and C-Lube Linear Roller Way are integrated with lubrication part C-Lube, their slide units are not long unlike types with external lubrication parts. Replacement of conventional parts is easy free from constraints of mounting space and stroke length.

Compact design taking into account compactness!

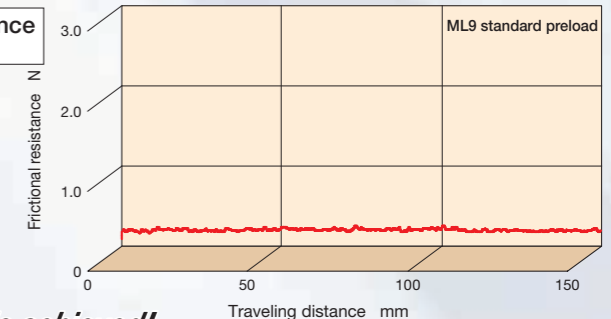


Smooth

C-Lube Linear Way and C-Lube Linear Roller Way do not generate slide resistance unlike lubrication parts external to the slide unit that make contact with the track rail. Driving force follow-up property is superior and energy is saved by improvement of accuracy and reduction of friction loss.

Light and smooth motion is achieved!

Frictional resistance test result



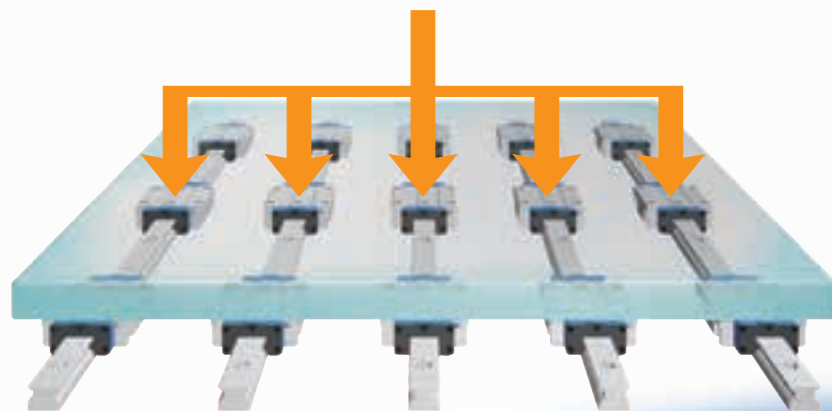
Ultimate **Interchangeable** pursuit of elimination

system by radical of any waste

Accuracy interchangeability

Three accuracy classes are available!
Height variation can be controlled with multiple assembled sets!

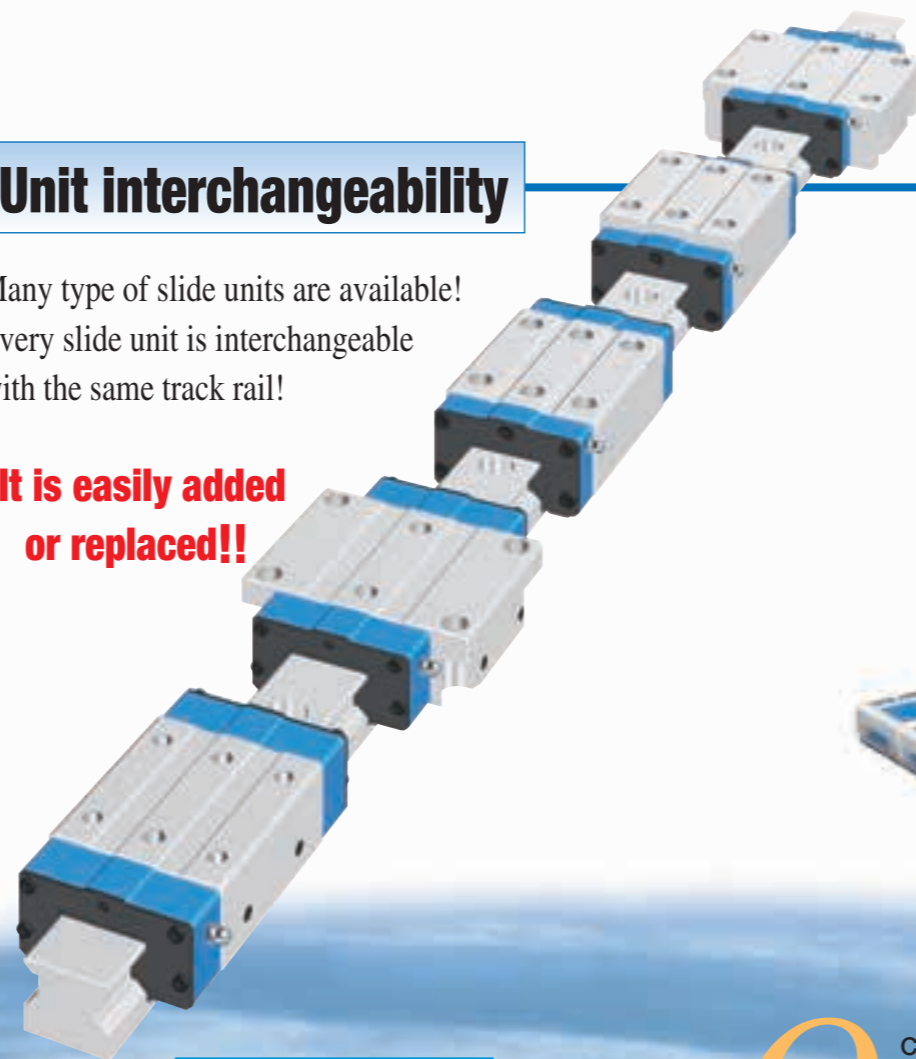
High accuracy of the device can be maintained in the multiple-use environment!!



Unit interchangeability

Many type of slide units are available!
Every slide unit is interchangeable with the same track rail!

It is easily added or replaced!!



Short delivery products

Separate delivery of slide unit and track rail!

You may order what you need by any quantity at any time!!



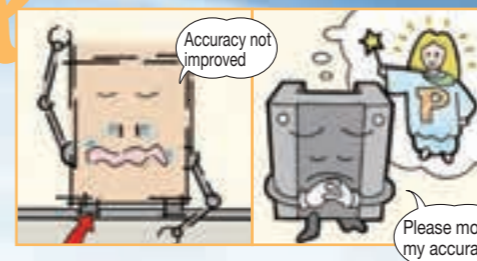
Q I dropped the Linear Way unit by mistake, and the unit is damaged. Can I replace it?



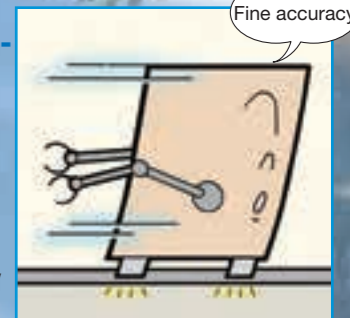
A **Unit interchangeability**
If you use Linear Way of Interchangeable specification, you may need to replace only slide unit.



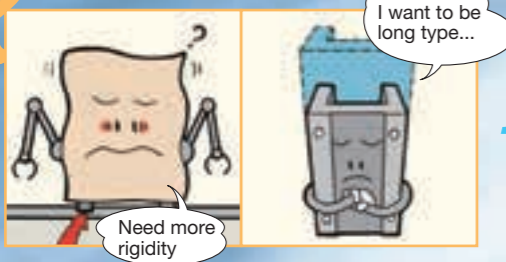
Q Calculated accuracy cannot be achieved after assembly of the device?



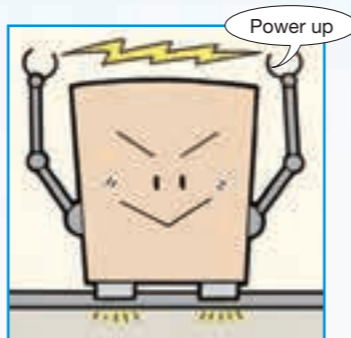
A **Accuracy interchangeability, preload interchangeability**
How do you like to use accuracy higher by one class or higher preload type?
As accuracy of the interchangeable products is controlled strictly by parts, setting can be modified.



Q I need to increase the rigidity of the unit because of sudden specification change.



A **Unit interchangeability**
The rigidity can be improved easily by increasing the unit length.



Q I carelessly forgot to arrange some parts, but I need them urgently. Can it be delivered soon?



A **Short delivery available**
Interchangeable parts are available for short delivery, they can be delivered quickly with our perfect inventory system.
Slide unit and track rail can be ordered individually.



Free combination is enabled for model, accuracy, preload!!

Ultimate interchangeable system

Interchangeable specification

- Requirements of ;**
- Wish to improve the rigidity and life of machines
 - Wish to improve the accuracy of machines
 - Wish to replace the slide unit immediately
 - The number of slide units is in short
 - Wish to replace the track rail immediately
 - The length of track rail is not sufficient
 - Wish to store only the slide units in stock for emergency

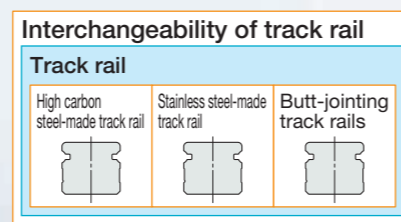
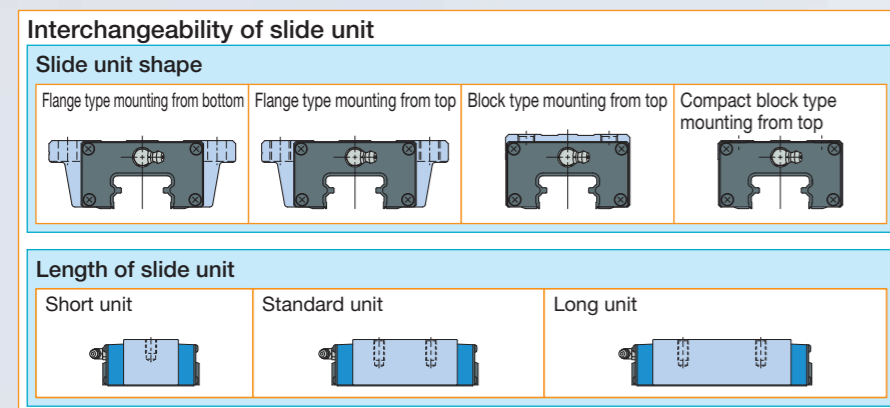
- Interchangeable specification realizes ;**
- Wish to prepare for a sudden design change
 - Wish to select freely the combination of high accuracy and preload
 - Slide unit and track rail are separately handled
 - Free combination of slide unit and track rail can be selected
 - Compactness-independent storing of slide units and track rails

Select the products as many as you wish.



Unit interchangeability

A wide variety of slide unit models with different sectional shape and length are provided, for free replacement on the same track rail.



Free selection is possible for slide units and track rails!

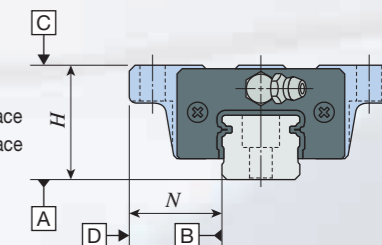
Interchangeable specification has realized the incomparable high interchangeability by severely managing the dimensions of slide unit and track rail with the background of unique high processing technology. This feature allows independent handling of slide unit and track rail, thus allowing you to select free combination and to order any products for any volume at any necessary time.

Accuracy interchangeability

Three accuracy classes of Ordinary, High and Precision class are provided, to support even high traveling accuracy purposes. In addition, as height variation of multiple assembled sets is managed with high accuracy, you may use parallel track rails at ease.

Standard setting up to precision

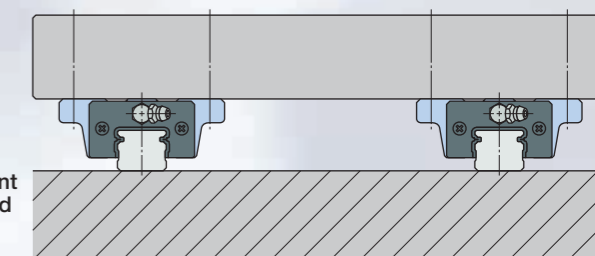
- Tolerances of dimensions H and N
- Variation of dimensions H and N in 1 set
- Parallelism in operation of the C surface to A surface
- Parallelism in operation of the D surface to B surface



It allows the accuracy improvement of units without design changes!

Corresponding to parallel arrangement of multiple assembled sets as standard

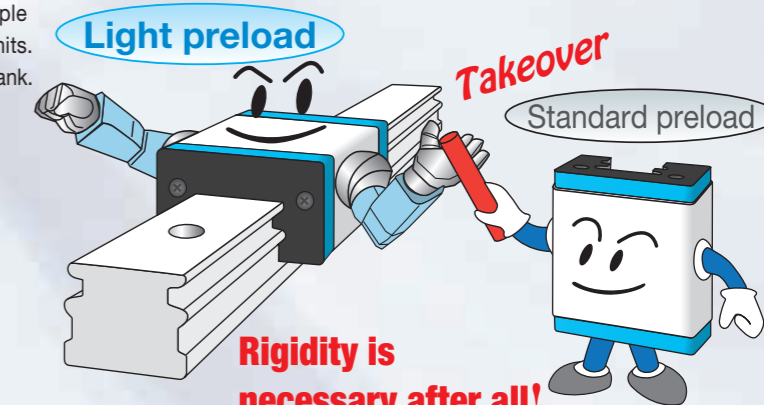
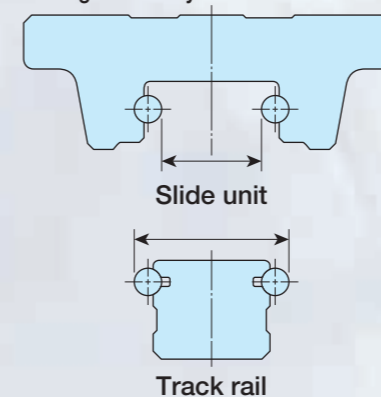
- Variation of dimensions H of multiple assembled sets is specified



Preload interchangeability

The high accuracy dimensions management utilizing the simple structure achieved the interchangeability of preloaded slide units. It supports the applications requiring the rigidity of one higher rank.

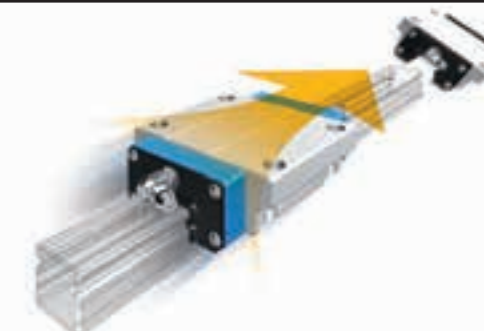
High preload setting is possible thanks to high accuracy dimensions control



It allows the rigidity improvement of units without design changes!

Maintenance free is achieved only by replacing the slide unit!

By replacing the interchangeable Linear Way or Linear Roller Way slide unit with C-Lube Linear Way or C-Lube Linear Roller Way slide unit, maintenance free is achieved while using the same track rail.



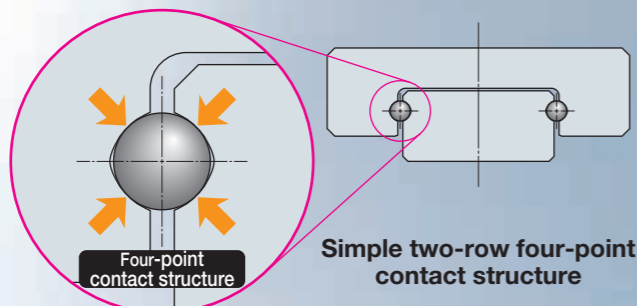
IKO's excellent features realized by contact in two-row raceways

a simple structure by **four-points**

Two-row four-point contact type simple structure

IKO adopts two-row four-point contact type for every Linear Way series. Thanks to our design know how and production technologies having been fostered for long time, high accuracy and smooth motion are realized in the micro series.

In addition, load in every direction can be received evenly and therefore stable high accuracy and rigidity can be achieved even in applications where load has variable direction and size or complex load is applied.



Essential for micro sizing!

Micro Linear Way L realized by simple structure

Micro Linear Way L for further needs of miniaturization produced by original small sizing technology. Wide variety of track rail width from 1 mm to 6 mm is available and high accuracy of micro positioning mechanism is realized.



World's smallest size!

- High accuracy even with the smallest size of 1 mm*!
*Track rail width of 1 mm
- Even the smallest size of 1 mm can be securely mounted and fixed**!
**Tapped rail specification
- Even the smallest size of 1 mm can ensure stable operation!

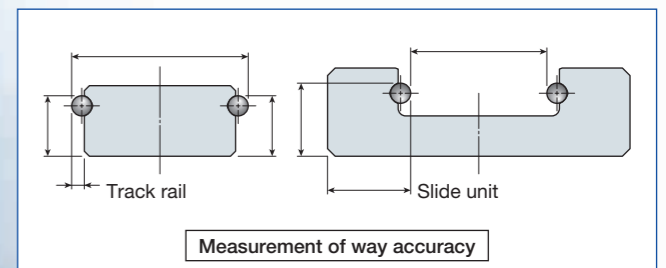
IKO Micro Linear Way L
LWL1

LWL1 can be used for further super miniaturization of machines and devices with free-minded thinking.

Interchangeable

The simple structure of four-contact in two-row raceway yields small manufacturing errors or accuracy measurement errors, allowing the maintenance of each raceway in the high dimensions accuracy.

This technology realizes interchangeable specification and high interchangeable system in every series!



As the ball is stabilized during track groove measurement, measurement of high accuracy and precise pre-load management are possible.

Variety of models and size variations

A wide variety of models and sizes, such as super miniature size of only 1 mm track rail width, is provided for your selection to meet each requirement.

Series	Model	Size	Track rail width	
			Min	Max
C-Lube Linear Way ML	ML	20 models	15 sizes	3 ~ 42 mm
	LWL	22 models	18 sizes	1 ~ 42 mm
C-Lube Linear Way MLV	MLV	1 model	3 sizes	7 ~ 12 mm
C-Lube Linear Way MV	MV	1 model	3 sizes	20 ~ 30 mm
C-Lube Linear Way ME	ME	18 models	6 sizes	15 ~ 45 mm
	LWE	21 models	6 sizes	15 ~ 45 mm
C-Lube Linear Way MH	MH	17 models	9 sizes	8 ~ 45 mm
	LWH	19 models	11 sizes	8 ~ 65 mm
Linear Way F	LWF	4 models	7 sizes	33 ~ 90 mm
C-Lube Linear Way MUL	MUL	1 model	2 sizes	25 ~ 30 mm
	LWU	1 model	4 sizes	40 ~ 86 mm



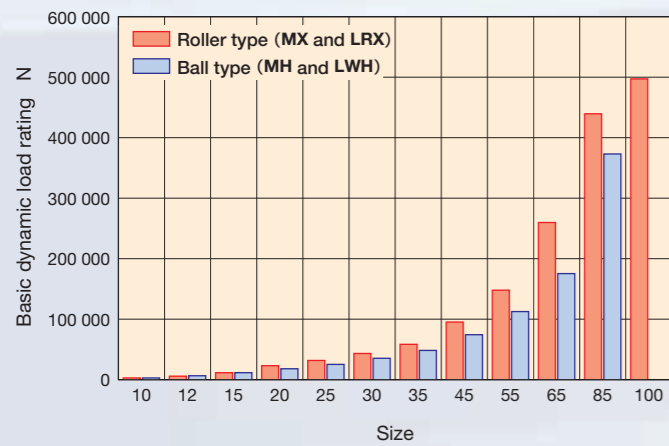
Ultimate high performance produced by world's

first roller guide structure of IKO

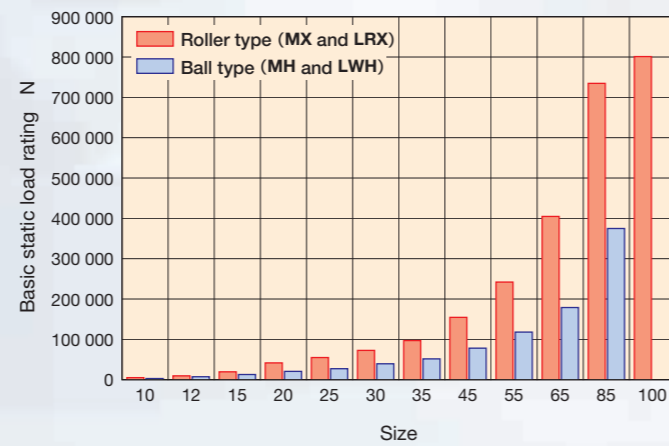
Super high load capacity

The Linear Roller Way Super X has a large contact area with the way and a number of cylindrical rollers with excellent load capacity, which allows to achieve larger load rating.

Comparison of basic dynamic load rating



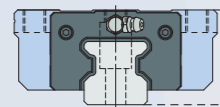
Comparison of basic static load rating



Size smaller by one size than the ball type can be used!

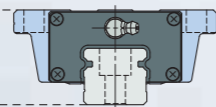
Long life

⟨Roller Type⟩ MXG45



$C = 124\,000\text{ N}$
 $C_0 = 223\,000\text{ N}$

⟨Ball Type⟩ MHG45



$C = 95\,200\text{ N}$
 $C_0 = 114\,000\text{ N}$

Same size

C : Basic dynamic load rating N
 C_0 : Basic static load rating N
 L : Life km
 P : Applied load N

Roller type has large basic dynamic load rating C and long life due to the different "index"!

[Life calculation example]

Roller Type

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

Applied load
In case of 10000 N

$$L \approx 220\,000\text{ km}$$

Ball Type

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

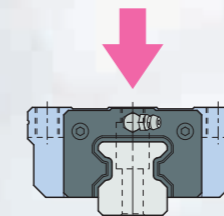
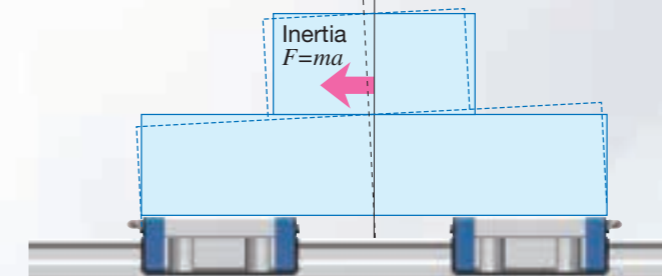
$$L \approx 43\,000\text{ km}$$

Significant increase!

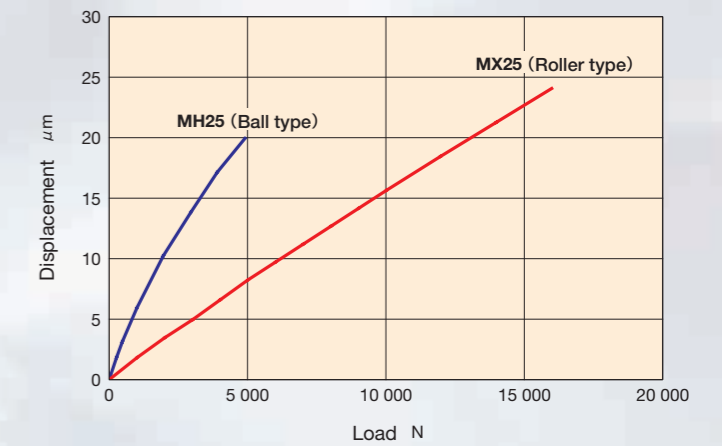
Super high rigidity

The rigidity of linear motion rolling guide significantly affects properties of machines and devices to be incorporated.

The Linear Roller Way Super X achieves high rigidity as a number of small cylindrical rollers with smaller elastic deformation relative to load than that of balls are incorporated in the slide unit.



Comparison of elastic deformation



Well-balanced high rigidity is realized in every direction!

A variety of models and size variations



Ball Type Miniature Series

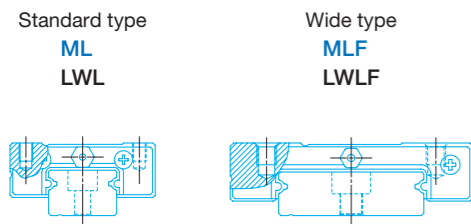
C-Lube Linear Way ML C-Lube Linear Way MLV Linear Way L

Thanks to the structure with two rows of balls to contact with the way at four points, stable accuracy and rigidity can be achieved even in applications where load has variable direction and size or complex load is applied, despite its very small body.

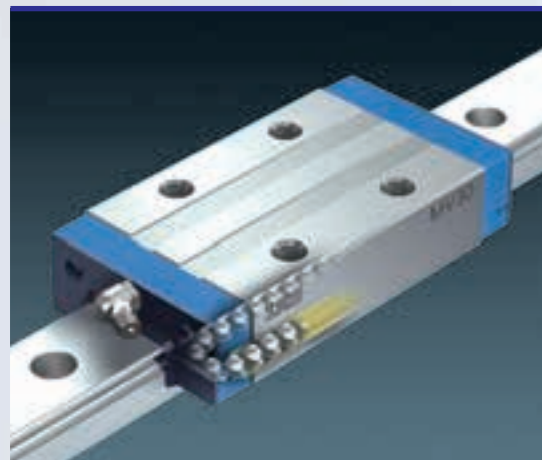


Micro Linear Way L

As the lineup of track rail width from 1 mm to 6 mm is available, you can select an optimal product for the specifications of your machine and device. For LWL1, world's smallest size is realized: track rail width of 1 mm, slide unit width of 4 mm and assembly height of 2.5 mm.



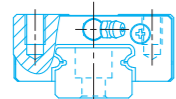
Length of slide unit		Size	
C	Short	Standard type	1, 2, 3, 5, 7, 9, 12, 15, 20, 25
No symbol	Standard	Wide type	4, 6, 10, 14, 18, 24, 30, 42
G	Long		
L	Extra long		



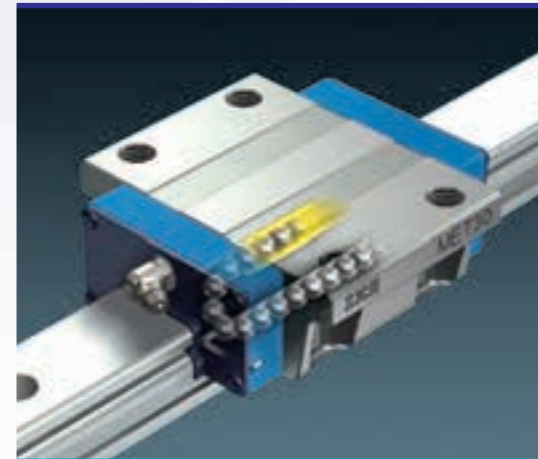
Ball Type Low Profile/Light Weight Series

C-Lube Linear Way MV

Despite its extra low profile and extra light weight, this linear motion rolling guide has the maximum load rating among the ball types while achieving high load capacity.



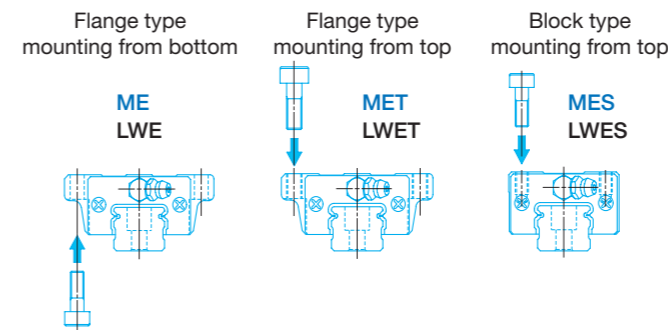
Length of slide unit	Size
Standard	20, 25, 30



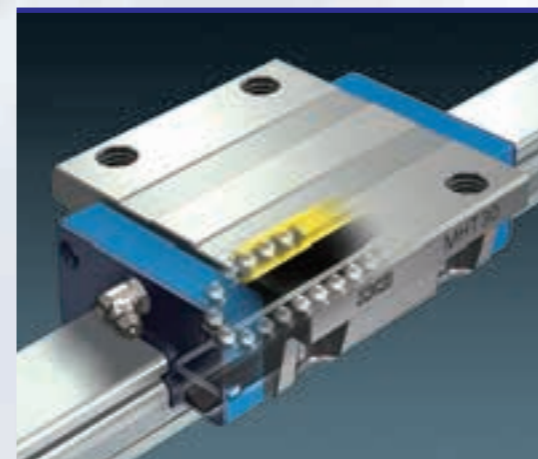
Ball Type Compact Series

C-Lube Linear Way ME Linear Way E Low Decibel Linear Way E

Versatile linear motion rolling guide that has achieved utility pursuing compactness in every aspect. Low decibel types with resin separator to prevent direct contact between balls are also available.



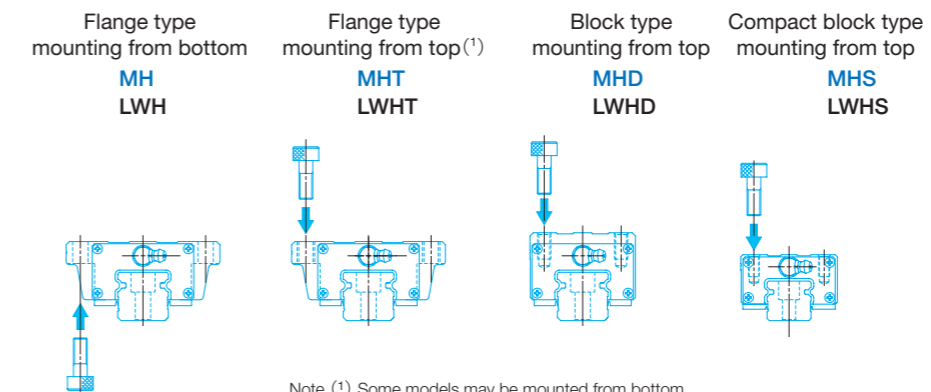
Length of slide unit		Size
C	Short	15, 20, 25, 30, 35, 45
No symbol	Standard	
G	Long	



Ball Type High Rigidity Series

C-Lube Linear Way MH Linear Way H

High rigidity linear motion rolling guides designed to evenly support high load capacity by incorporating large-diameter balls. Stable accuracy and rigidity can be achieved even in applications where load with variable direction and size and complex load are applied.

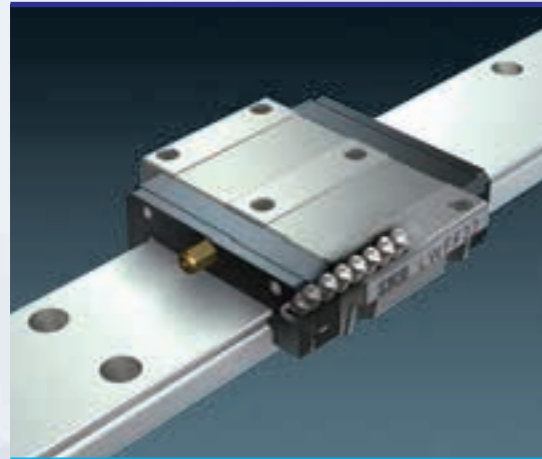


Length of slide unit	
C	Short
No symbol	Standard
G	Long

Note (1) Some models may be mounted from bottom.

Size
8, 10, 12, 15, 20, 25, 30, 35, 45, 55, 65

A variety of models and size variations

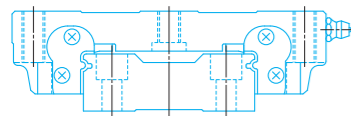


Ball Type Wide Type Series

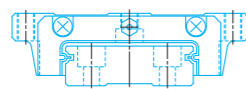
Linear Way F

As wide track rail is used and the distance between the load points is long, this is a linear motion rolling guide suitable to single-row use due to the structure resistant to across-the-width moment load. It is also resistant to complex load.

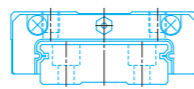
Flange type mounting from top / bottom
LWFH



Flange type mounting from top / bottom
LWFF



Block type mounting from top
LWFS



Length of slide unit	
No symbol	Standard
Size	
LWFH	40,60,90
LWFF	33,37,42,69
LWFS	33,37,42

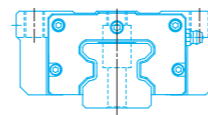


Roller Type

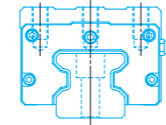
**C-Lube Linear Roller Way Super MX
Linear Roller Way Super X**

Linear motion rolling guide that has achieved the highest level of performance in all characteristics utilizing the roller's superior characteristic, such as rigidity, load capacity, running accuracy and vibration damping property. With extra long unit with the maximum slide unit length, load capacity and rigidity are improved and running performance with super high accuracy is realized.

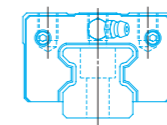
Flange type mounting from top / bottom
MX⁽¹⁾
LRX⁽¹⁾



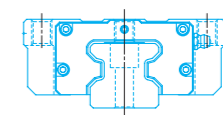
Block type mounting from top
MXD
LRXD



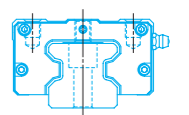
Compact block type mounting from top
MXS
LRXS



Low profile flange type mounting from top
MXN

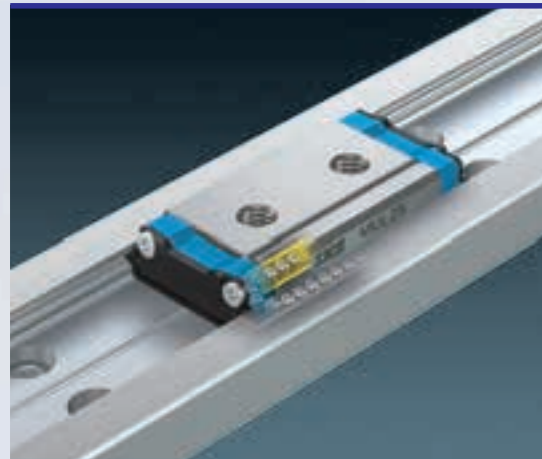


Low profile block type mounting from top
MXNS



Note (1) Size 20 series allows only for mounting from top and model mounting from bottom is MXH and LRXH.

Length of slide unit				Size
C	No symbol	G	L	10, 12, 15, 20, 25, 30, 35, 45, 55, 65, 85, 100
Short	Standard	Long	Extra long	

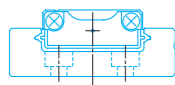


Ball Type U-Shaped Track Rail Series

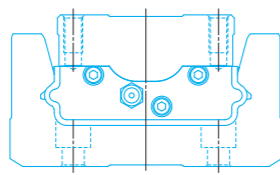
**C-Lube Linear Way MUL
Linear Way U**

Linear motion rolling guide of the structure with way inside the track rail of U-shaped section and slide unit therein. With the U-shaped track rail, rigidity against the track rail moment load and torsion is significantly improved.

Small type
MUL



Standard type
LWU



Length of slide unit	
No symbol	Standard
Size	
MUL	25, 30
LWU	40, 50, 60, 86

**Four-row roller guide of world's smallest size
Track rail width of 10 mm**

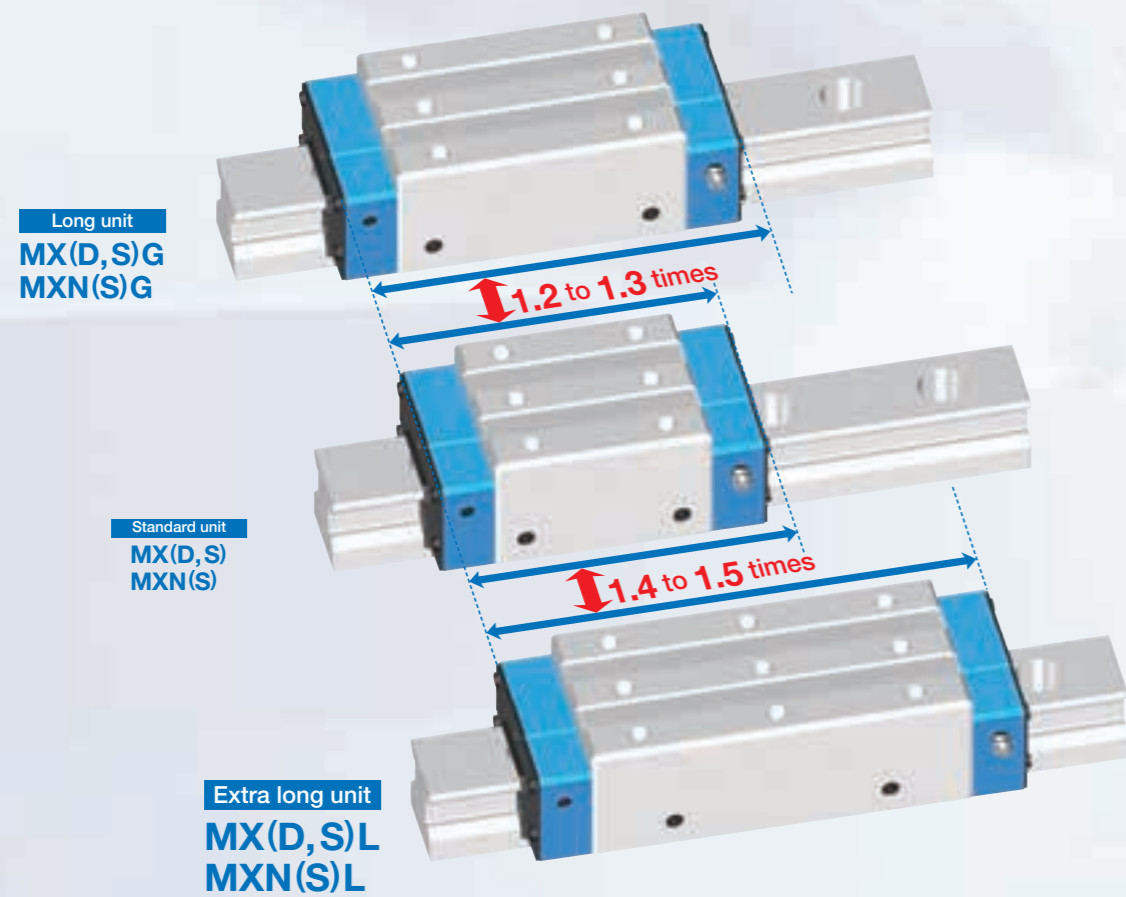
Super high rigidity
Super high load capacity
High running performance
Excellent frictional characteristics

Stainless steel made
LRXD10...SL

Features of extra long unit

C-Lube Linear Roller Way Super MX

Length of slide unit is **1.4 to 1.5 times longer** than that of standard unit



Further improvement of running accuracy

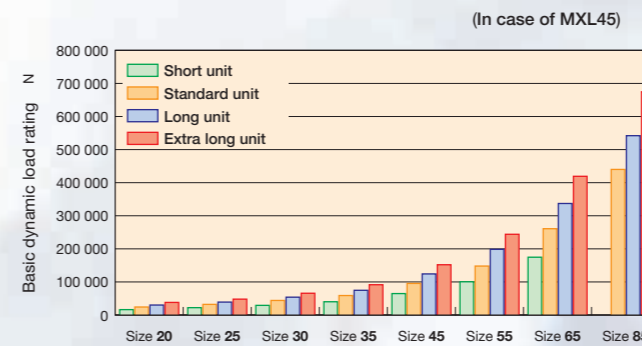
Load capacity and rigidity are significantly improved!!

Load capacity of machine or device is improved

As its basic dynamic load rating and basic static load rating are larger than those of Long type by 122% and 129%, respectively, life and margin safety of machine or device are improved.

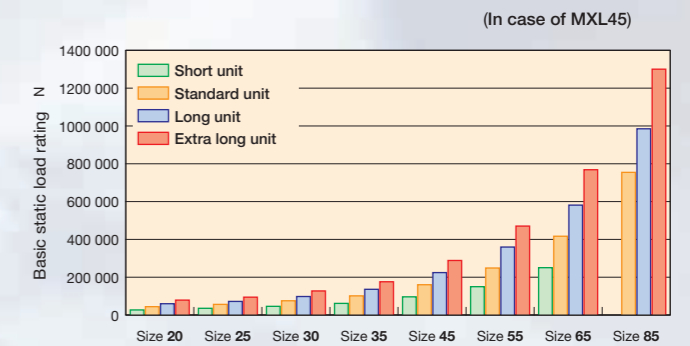
Comparison of basic dynamic load rating

Increased to **158%** relative to standard unit!
Increased to **122%** relative to long unit!



Comparison of basic static load rating

Increased to **181%** relative to standard unit!
Increased to **129%** relative to long unit!

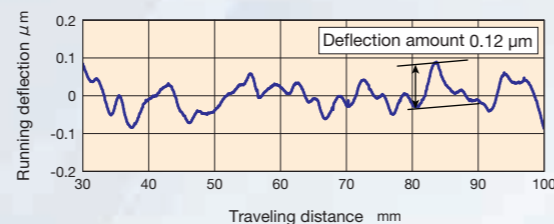
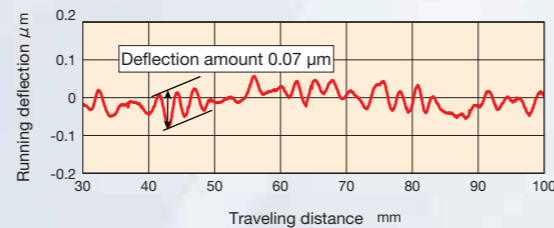
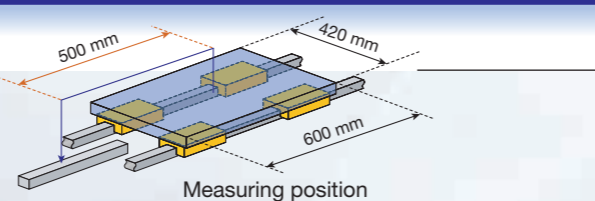
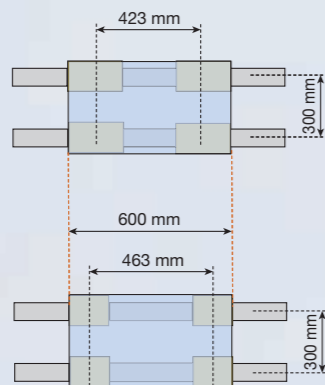


Super accurate feeding mechanism is realized

As running accuracy is as low as a half of that of long unit, feeding mechanism with super high accuracy can be realized.

Test conditions

Test portion	Extra long unit
Preload	T ₃ preload



Test conditions

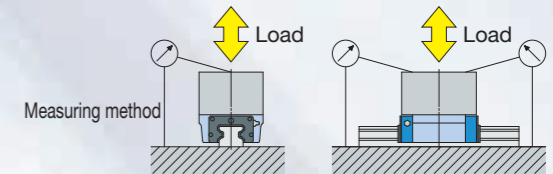
Test portion	Long unit
Preload	T ₃ preload

High accuracy running performance is realized without major change of machine or device design⁽¹⁾!

Note (1) Position of the slide unit mounting hole is changed.

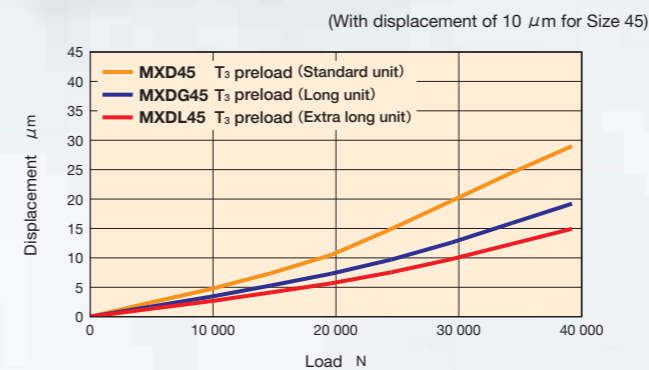
Contributing to improvement of machine or device rigidity

Elastic deformation relative to load is small in comparison with long unit, device rigidity is improved, accuracy is improved, and resonance can be avoided.



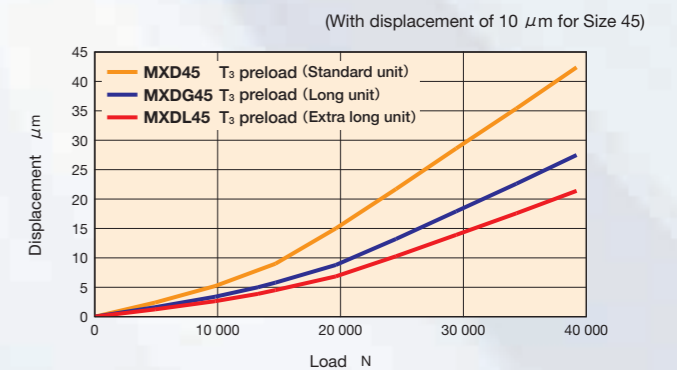
Comparison of elastic deformation under downward load

Rigidity increased to **155%** relative to standard unit!
Rigidity increased to **117%** relative to long unit!



Comparison of elastic deformation under upward load

Rigidity increased to **152%** relative to standard unit!
Rigidity increased to **113%** relative to long unit!



C-Lube Linear Roller Way Super MX

MX MASTER GRADE

Introducing the low fluctuation specification product, for superb high-precision feed!

The C-Lube Linear Roller Way Super MX low fluctuation specification MX Master Grade has special precision processing on the roller raceway surface, significantly reducing fluctuation compared to the standard extra long unit and thus making it the ideal product for ultra-precision working machine shaft guides, which require high-precision, high-quality machining.



Applicable products

Series	C-Lube Linear Roller Way Super MX
Supported models	MXL, MXDL, MXSL, MXNL, MXNSL
Size	30·35·45·55

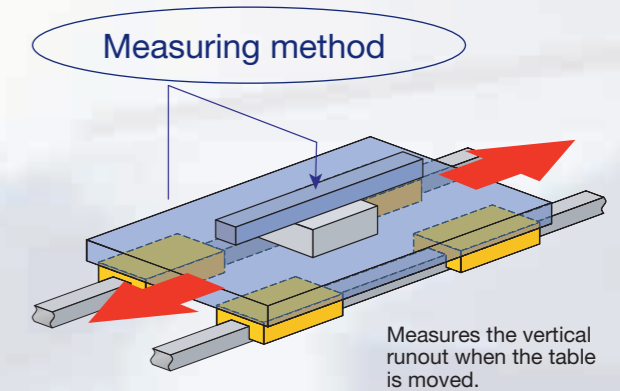
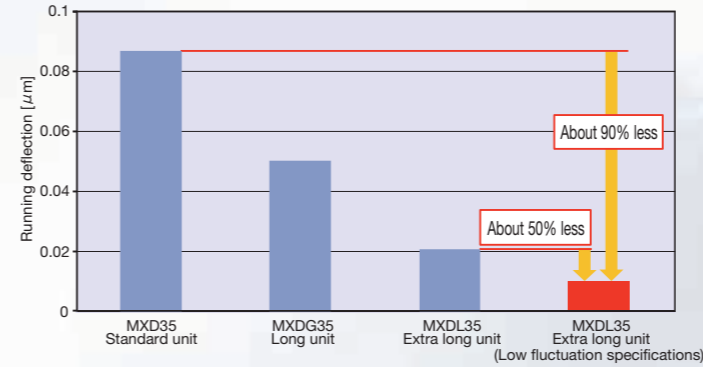
MX Master Grade (low fluctuation specifications) is a special order product; if needed please contact IKO.

Features

1 Special raceway processing suppresses miniscule running deflection and significantly reduces pulsation compared to standard extra long units.

Fluctuation comparison data

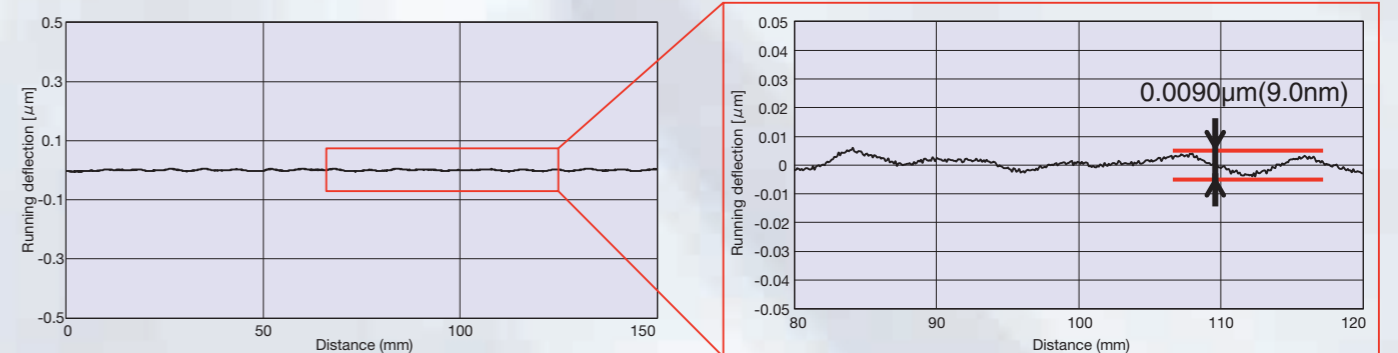
Pulsation: Refers to the running deflection related to movement of the rolling elements within the Linear Roller Way.



Super low fluctuation is achieved!
About 50% less fluctuation compared with the standard extra long unit!

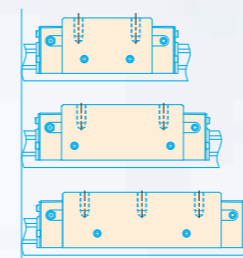
2 Low fluctuation makes it ideal for ultra-precision working machine shaft guides, which require high-precision, high-quality machining.

Fluctuation data



The **running deflection value** is within **0.0090µm(9.0nm)** in actual measurement!
 Improve machining quality with the use of MX Master Grade!

3 The extra long unit contributes to improved load capacity and rigidity in mechanical equipment.



Standard

Long

Extra long

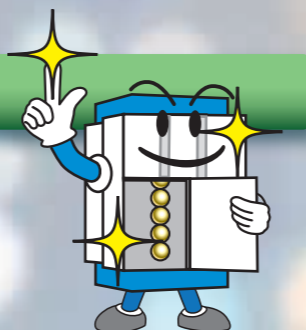
Elastic deformation relative to load is low in comparison with the standard and long types, device rigidity is improved, accuracy is improved, and resonance can be avoided.

IKO's unique ideas and experiences special environment applications.

IKO Linear Way and Linear Roller Way are available for various special environment by using different materials and grease, surface treatment and dust protection measures, etc. Typical application fields and major countermeasures are described below.

Clean Environment

When the Linear Way or Linear Roller Way is used in clean environment such as a clean room, it is required that the environment is not polluted by dust-generation by the Linear Way or Linear Roller Way and it must have excellent rust prevention property as rust prevention oil cannot be used.



Vacuum Environment

When the Linear Way or Linear Roller Way is used in vacuum environment, it is required that the gas discharged from the Linear Way or Linear Roller Way does not pollute the environment or reduce the degree of vacuum, and it must have excellent rust prevention property as rust prevention oil cannot be used.



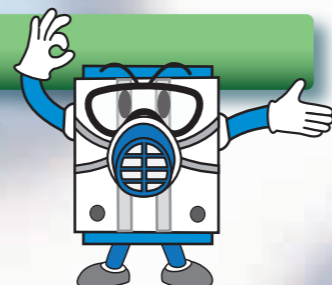
Heat Resistance Measures

When the Linear Way is used in an environment where temperature is higher than usual, heat resistance of synthetic resin components and metal parts will be an issue.



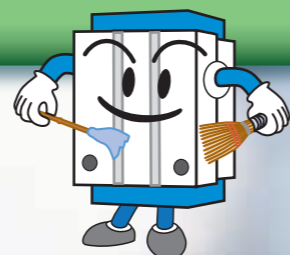
Dust Protection

If dust such as metal or wooden chips get into the way of the Linear Way or Linear Roller Way, reduction of life and accuracy may be caused. Therefore, measures to prevent foreign substances from entering into the way are necessary.



Spatter Protection

Spatter of welding, etc. is so hot that it adheres to components. Foreign substances adhering to the track rail firmly cannot be fully removed by normal dust protection measures, so measures to avoid adherence and enhanced foreign substances removal measures are necessary.



are utilized to explore new world for

Clean

- Stainless Linear Way and Linear Roller Way
- Black chrome surface treatment
- Specified grease (CG2 or CGL grease)
- ◇ Fluorine grease

Corrosion resistance

- Hybrid C-Lube Linear Way L
- Non-magnetic stainless Linear Roller Way Super X
- Stainless Linear Way and Linear Roller Way
- Black chrome surface treatment

Vacuum

- No end seal
- Stainless steel end plate
- ◇ Fluorine grease

Heat resistance

- Stainless steel end plate
- Special environment seal
- ◇ High temperature grease

Foreign substances (wood chips and metal powder, etc.)

- Linear Way H Ultra seal specification
- Track rail mounting from bottom
- Double end seals
- Scrapers
- C-Wiper
- Caps for rail mounting holes
- Rail cover plate for track rail
- Rail cover sheet
- Female threads for bellows
- Specific bellows

Spatter

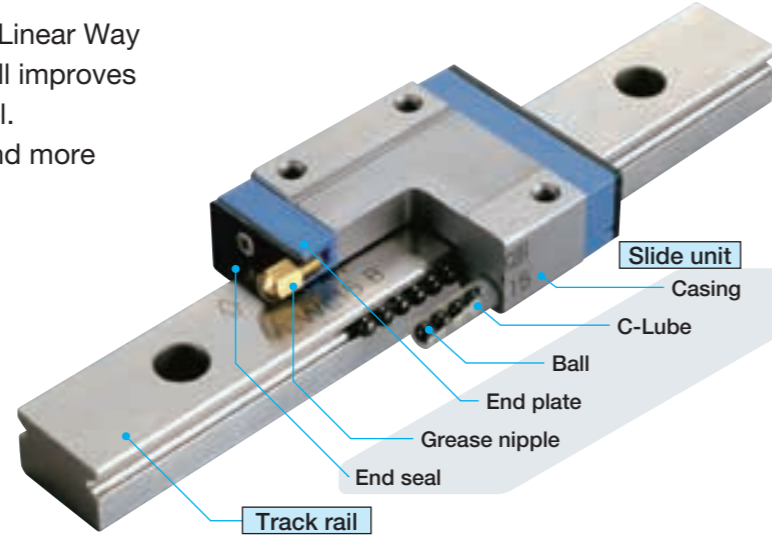
- Scrapers
- Caps for rail mounting holes (aluminum alloy)
- Rail cover sheet
- Fluorine black chrome surface treatment
- Stainless steel end plate

- Linear motion rolling guide series for special environment :
Collective name of linear motion rolling guide series models corresponding to special environment.
- Special specification for special environment :
Special specification corresponding to special environment by combination of linear motion rolling guide series.
- ◇ Lubricant :
Lubricant suitable for each special environment can be selected.

Hybrid C-Lube Linear Way ML

ML.../HB

While maintenance free performance of C-Lube Linear Way ML is maintained, the silicon nitride ceramics ball improves high-speed performance and reduces noise level. Ceramics has more resistance to deformation and more rigidity than bearing steel and stainless steel.



Standard specification	
Casing	Martensitic stainless steel
Track rail	Martensitic stainless steel
Ball	Silicon nitride ceramics
C-Lube	Capillary lubricating element (Porous resin)

Features

- Superior high-speed performance** ... More than three times durability
- Noise reduction** ... Noise reduction by about 4.5 dB
- High rigidity** ... Displacement volume reduced by about 10%
- Superior abrasion resistance** ... Preload reduction volume is about one fourth

※ All of the above based on comparison with our C-Lube Linear Way ML



Maintenance free
Achieved long term maintenance free

Eco-friendly
Minimized lubrication oil consumption

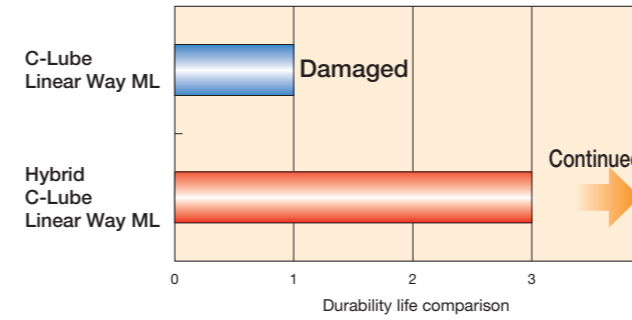
Compact
Integral lubrication parts

Smooth
Excellent sliding characteristic

Performance

More than three times durability

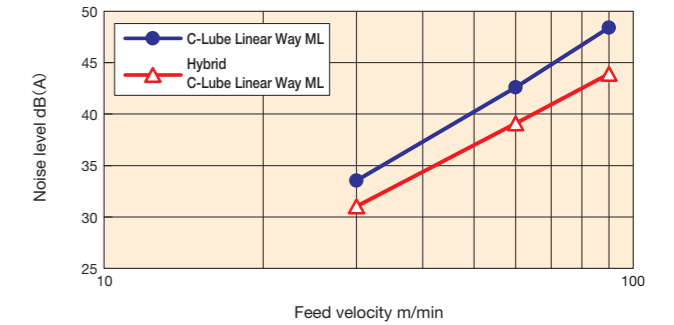
High-speed performance



Test conditions Model : ML12 Velocity: 300 m/min Acceleration: 40 G

Noise reduction by about 4.5 dB

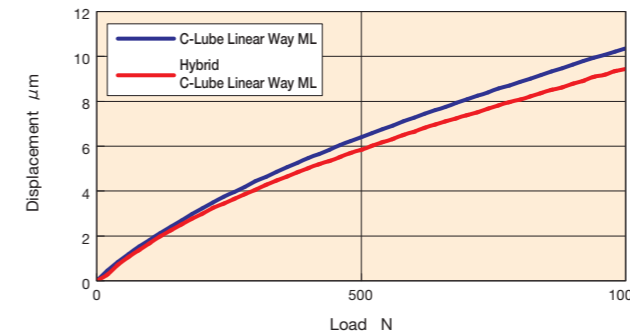
Low decibel



Test conditions Model : ML12 Measurement velocity: 30, 60, 90 m/min

Small deformation of rolling elements and excellent rigidity

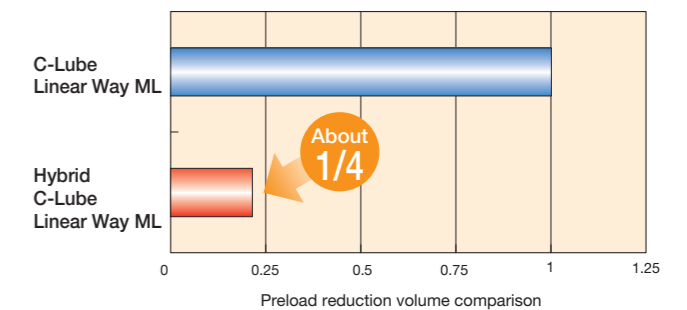
High rigidity



Test conditions Model : ML12 Preload: Standard Preload Load direction: Downward

Low preload reduction volume and accuracy maintained after operation

Abrasion resistance

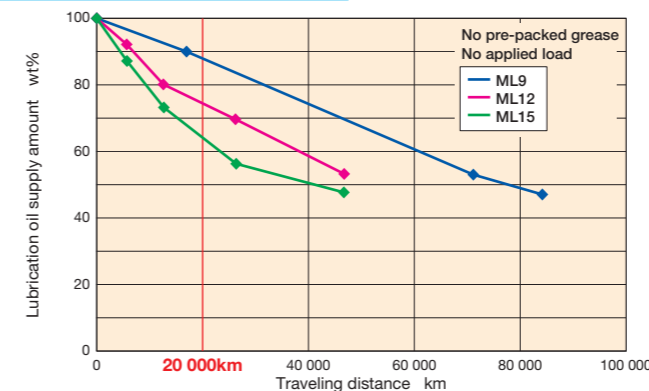


Test conditions Model : ML12 Velocity: 300 m/min Acceleration: 40 G Traveling distance: 13,000 km

Basic performance of C-Lube Linear Way

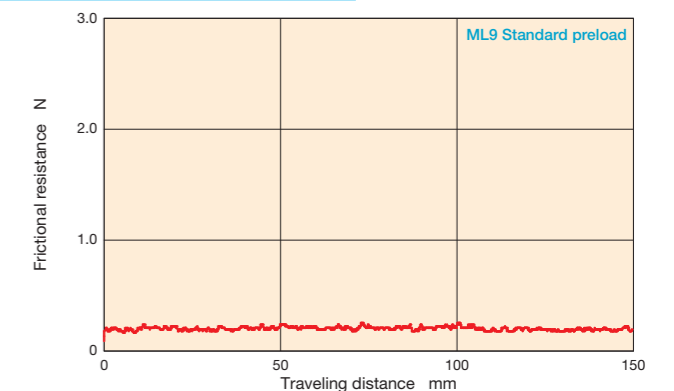
Achieved long term maintenance free

Maintenance free



Achieved light and smooth sliding

Sliding characteristic

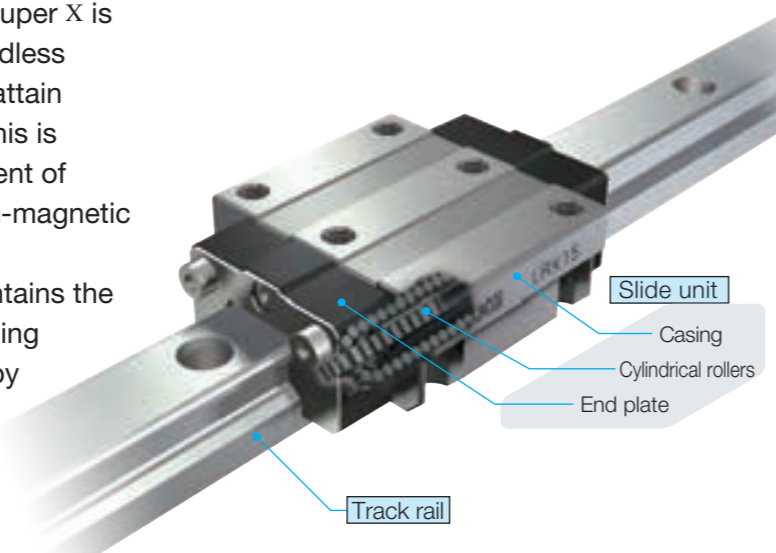


1N=0.102kgf=0.2248lbs.
1mm=0.03937inch

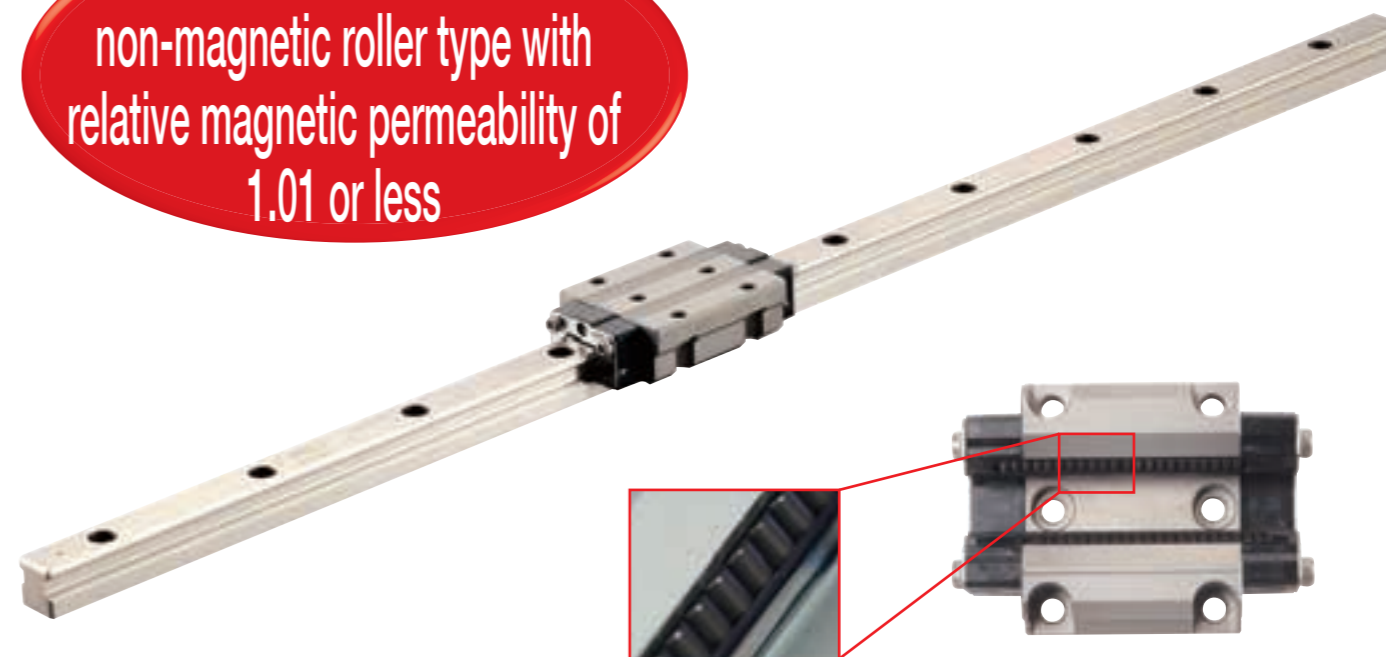
Non-magnetic stainless Linear Roller Way Super X

The non-magnetic stainless Linear Roller Way Super X is the world's first non-magnetic stainless steel endless motion roller type linear motion rolling guide to attain relative magnetic permeability of 1.01 or less. This is accomplished through the dedicated development of silicon nitride ceramic cylindrical rollers and non-magnetic stainless steel casings and track rails.

Despite being non-magnetic material it still maintains the superior vibration characteristics, excellent running accuracy, and friction characteristics provided by the Linear Roller Way Super X. This allows for accurate and rapid positioning in environments affected by minimal magnetism.



The world's first non-magnetic roller type with relative magnetic permeability of 1.01 or less



Features

World first for roller types

The first non-magnetic specifications ever realized in the world for endless motion roller type linear motion rolling guides

Relative magnetic permeability 1.01 or less

Allows for accurate and rapid positioning in environments affected by minimal magnetism

High corrosion resistance

Optimal for use in clean environment thanks to non-magnetic stainless steel

High running accuracy

The superb vibration characteristics of roller type linear motion rolling guides allow superior running accuracy

Non-magnetic stainless steel characteristics

Material name	Non-magnetic stainless steel	Silicon nitride ceramics	Non-magnetic hard alloy
Characteristics			
Relative magnetic permeability ⁽¹⁾	1.01 or less (1.005)	1 (0.999991)	1 (1.0002)
Electric conductivity	○	×	○
Hardness (HV)	380~450	1400~1600	1200~1450
Linear expansion coefficient (×10 ⁻⁶ /°C)	19.0 (20~400°C)	3.2 (20~400°C)	5.1 (20~400°C)
Specific gravity (g/cm)	7.9	3.2	14.5
Main ingredients	Fe, Mn, Cr	Si ₃ N ₄	Ni, WC
Cost	○	△	△
Remarks	—	Good corrosion resistance	Sintered alloy

Note⁽¹⁾ () is only an example of the measurement value.

Selection of lubricant

By setting appropriate lubricants such as vacuum grease and low dust-generating grease, any operating environment can be supported.

● Applicable products

Series	Linear Roller Way Super X
Main model	LRX15, LRXD15, LRXS15

For detailed specifications or manufacturing information, please contact IKO.

■ Main component materials

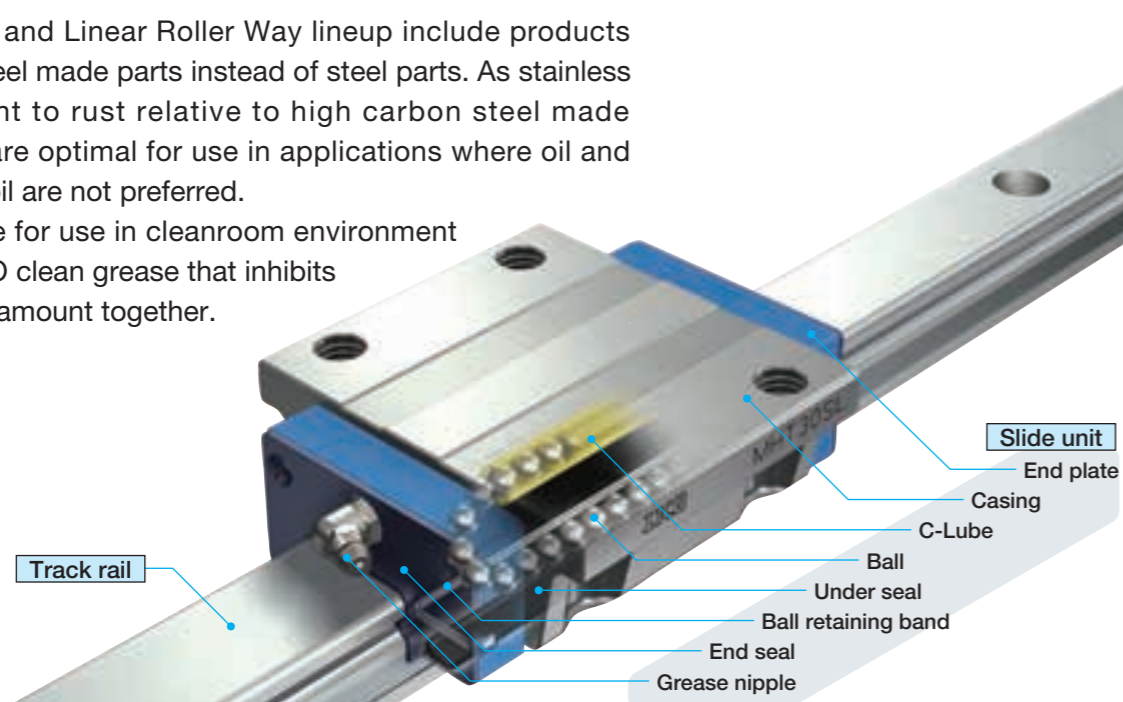
Casing	Non-magnetic stainless steel
Track rail	Non-magnetic stainless steel
Cylindrical roller	Silicon nitride ceramics
End plate	Engineering plastic

Stainless Linear Way and Linear Roller Way

A variety of stainless steel series

IKO Linear Way and Linear Roller Way lineup include products with stainless steel made parts instead of steel parts. As stainless steel is resistant to rust relative to high carbon steel made products, they are optimal for use in applications where oil and rust prevention oil are not preferred.

It is also suitable for use in cleanroom environment room, so use IKO clean grease that inhibits dust-generation amount together.



Main component materials	
Casing	Martensitic stainless steel
Track rail	Martensitic stainless steel
Ball	Martensitic stainless steel
Ball retaining band	Stainless steel
End plate	Engineering plastic
End seal	Stainless steel + Synthetic rubber
Grease nipple	Brass

Series name

Linear Way

Ball Type Miniature Series

- C-Lube Linear Way ML
- C-Lube Linear Way MLV
- Linear Way L
- Micro Linear Way L

Ball Type Compact Series

- C-Lube Linear Way ME
- Linear Way E

Ball Type High Rigidity Series

- C-Lube Linear Way MH
- Linear Way H

Ball Type Wide Type Series

- Linear Way F

Ball Type U-Shaped Track Rail Series

- C-Lube Linear Way MUL

Linear Roller Way

Roller Type

- C-Lube Linear Roller Way Super MX
- Linear Roller Way Super X

Combination with special specification corresponds to use in special environment!

Rust prevention

Black chrome surface treatment /L

Black chrome surface treatment on the track rail and slide unit improves rust prevention capacity.

Fluorine black chrome surface treatment /LF

Coating of fluorinated resin is applied over the black chrome surface treatment to prevent foreign substances from sticking and improve the rust prevention capacity.

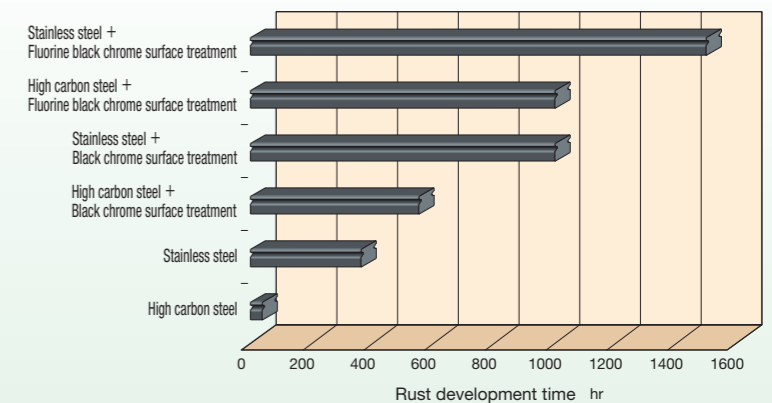


Black chrome surface treatment

Features

- Thin film
- Uniform film
- Strong adhesion
- Excellent rust prevention capacity
- Low temperature processing to prevent distortion
- No peeling and no effects on life and cleanroom environment

Corrosion resistance comparison based on humidity cabinet test



Test conditions Temperature 50°C, Relative humidity 95%RH

Special specification for special environment

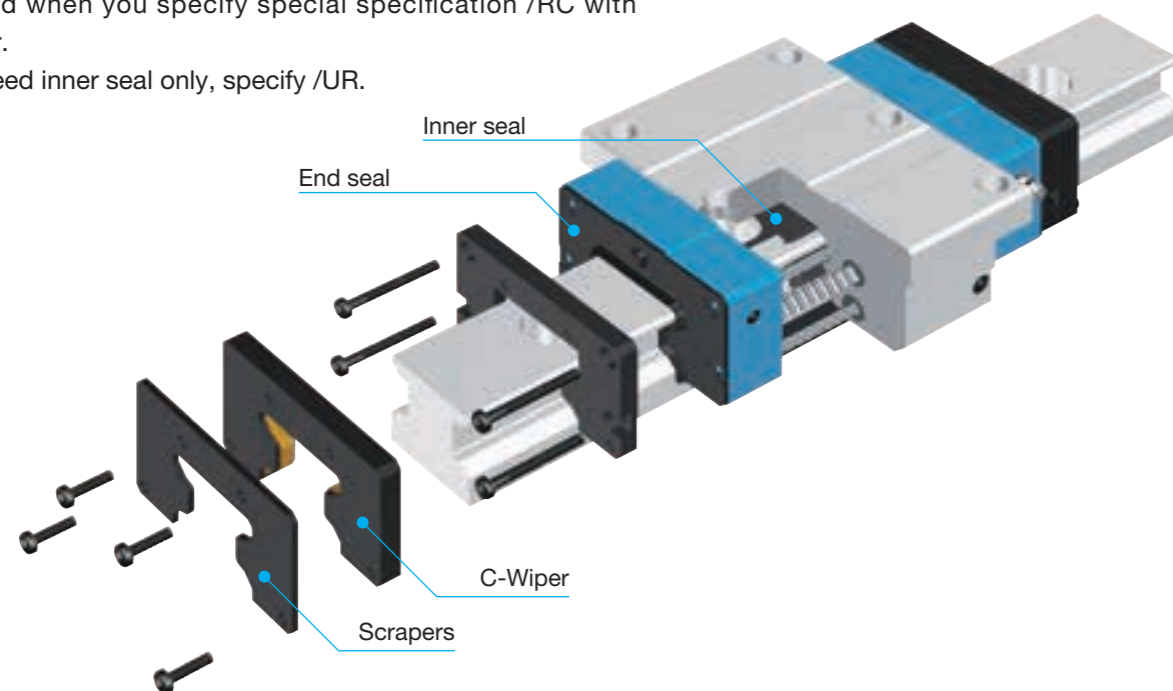
IKO Linear Way and Linear Roller Way lineup include following special specifications to correspond to various special environments.

Dust protection

C-Wiper /RC

Mounted to the outside of end seal, it may be used for long time even under environment where metal chips are spattering. End seal, inner seal (/UR) and scraper (/Z) may be equipped as standard when you specify special specification /RC with C-Wiper.

If you need inner seal only, specify /UR.



Applicable C-Wiper size

Model	Length of slide unit	Model code	Size								
			12	15	20	25	30	35	45	55	65
Flange type mounting from top / bottom	Short	MXC	—	—	○ ⁽¹⁾	○	○	○	○	○	○
	Standard	MX	—	—	○ ⁽¹⁾	○	○	○	○	○	○
	Long	MXG	—	—	○ ⁽¹⁾	○	○	○	○	○	○
	Extra long	MXL	—	—	○ ⁽¹⁾	○	○	○	○	○	○
Block type mounting from top	Short	MXDC	—	—	○	○	○	○	○	○	○
	Standard	MXD	—	—	○	○	○	○	○	○	○
	Long	MXDG	—	—	○	○	○	○	○	○	○
Compact block type mounting from top	Short	MXSC	—	—	○	○	○	—	—	—	—
	Standard	MXS	—	—	○	○	○	○	○	○	—
	Long	MXSG	—	—	○	○	○	○	○	○	—
Low profile flange type mounting from top	Standard	MXSL	—	—	○	○	○	—	—	—	—
	Long	MXN	—	—	—	—	○	○	○	○	—
	Extra long	MXNG	—	—	—	—	○	○	○	○	—
Low profile block type mounting from top	Standard	MXNL	—	—	—	—	○	○	○	○	—
	Long	MXNS	—	—	—	—	○	○	○	○	—
	Extra long	MXNSG	—	—	—	—	○	○	○	○	—
		MXNSL	—	—	—	—	○	○	○	○	—

Note ⁽¹⁾ Also applicable to models mounting from bottom (MXHC20, MXH20, MXHG20, MXHL20).

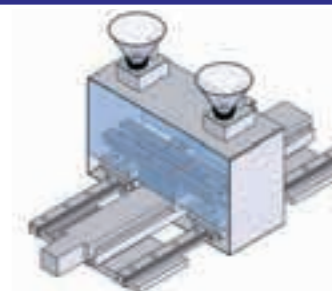
Dust protection

Durability test result backing excellent dust protection effect of [C-Wiper]!

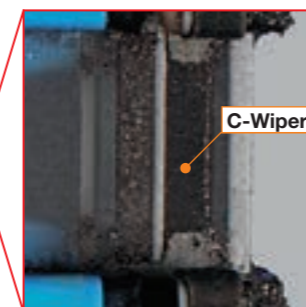
Durability test in environment with foreign substances

Test conditions

Test portion	MX35 T3 preload / caps for rail mounting holes and C-Wiper included
Maximum velocity	18 m/min
Stroke length	500 mm
Foreign substances	Fine metal chips Particle diameter lower than 125 μm Hardness 40 ~ 50HRC Application dose 1 g/hr (total dose: 1 kg)



After operation of 1,000 km



After operation of 1,000 km



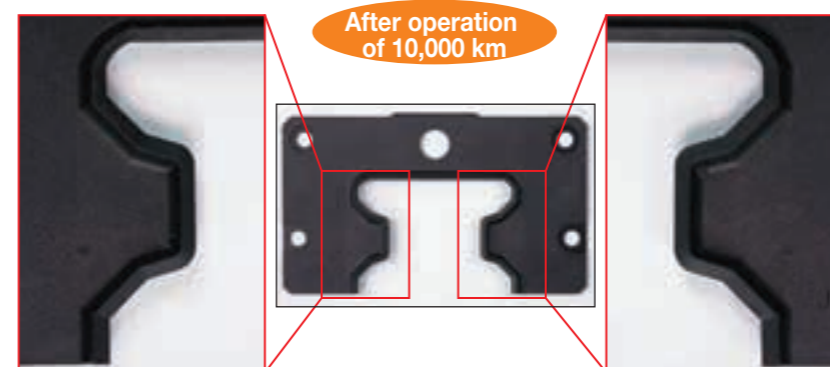
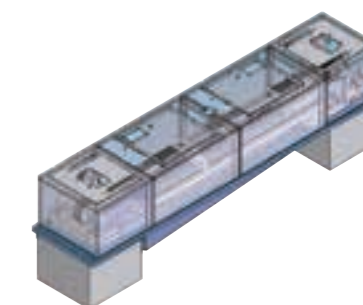
Only few foreign substances may get into the slide unit.

Only few foreign substances get into the way!

Durability test in coolant mist environment

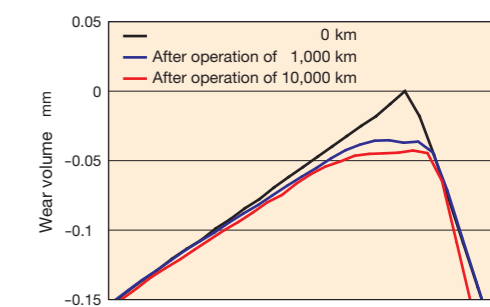
Test conditions

Test portion	MX35 T3 preload / caps for rail mounting holes and C-Wiper included
Maximum velocity	115.2 m/min
Stroke length	300 mm
Coolant	Soluble type Dilute strength 20 times Spray amount 5 cc/hr



End seal is not damaged.

Wear condition of end seal lip tip



Wear on the end seal is negligible!

Special specification for special environment

Dust protection

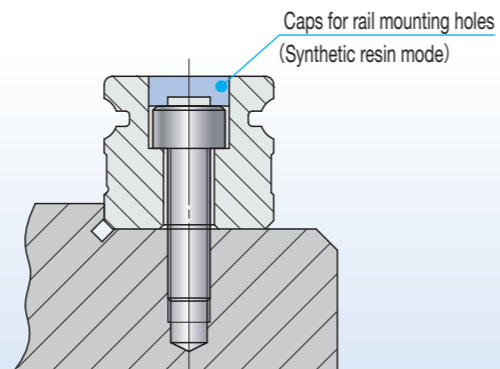
Rail cover sheet

Rail cover sheet that consists of steel plate and adhesive tape and fastened to the dedicated track rail with groove on the track rail prevents foreign substances from entering into the slide unit.



Caps for rail mounting holes /F

Caps for rail mounting holes close the track rail mounting holes to prevent foreign substances from entering into the slide unit.
Contact IKO for aluminum alloy caps for rail mounting holes.



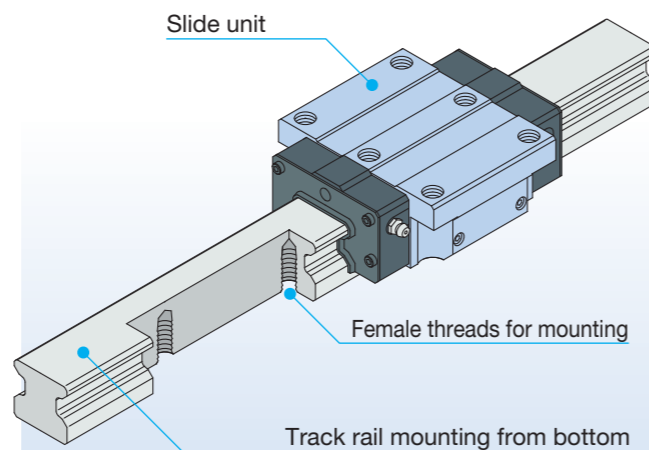
Rail cover plate /PS

Rail cover plate totally covers the upper surface of the track rail to prevent foreign substances from entering into the track rail.



Track rail mounting from bottom

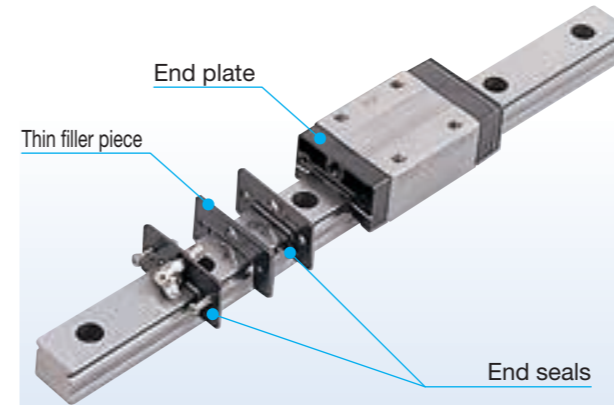
This is the specification that track rail is fixed from the mounting surface side. As there are no mounting holes on the track rail upper surface, adherence with the seal is superior and better dust protection effect is achieved.



Dust protection

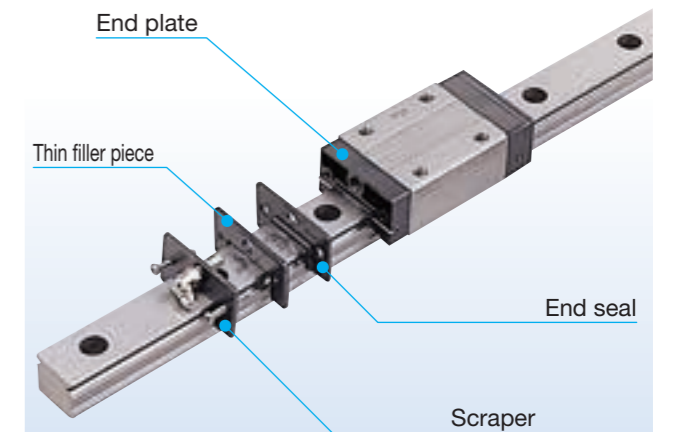
Double end seals /V

Double end seals improve the dust protection property further.



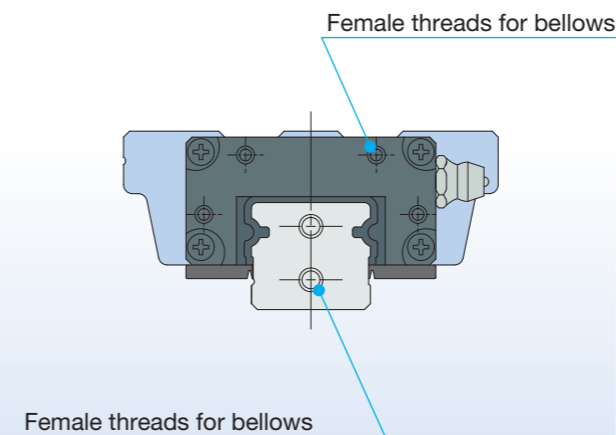
Scraper /Z

Mounted to the outside of end seal, it may remove large foreign substances adhering to the track rail.



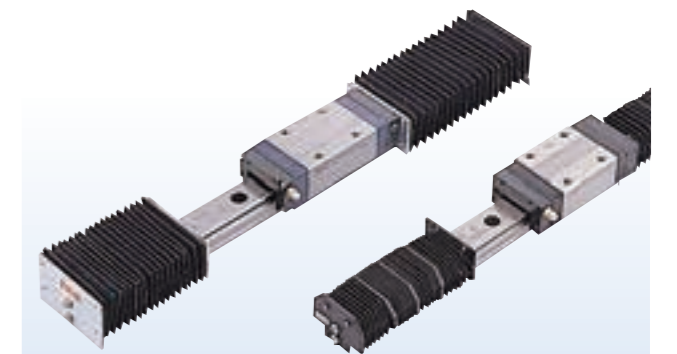
Female threads for bellows /J

Female threads for bellows are prepared on the slide unit and track rail ends.



Specific bellows

Dust protection cover over the exposed part of the track rail.



Special specification for special environment

Lubrication

With C-Lube plate /Q

Lubrication parts to substantially reduce the need for lubrication management, i.e. grease job.

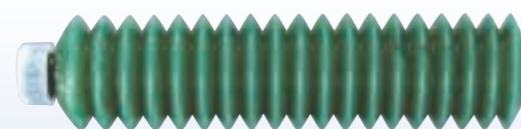


Low Dust-Generation Grease for Clean Environment CGL /YCL

For this grease, mixed soap is used as thickener and synthetic oil and low pour point mineral oil are mixed with base oil, so it has excellent low dust generating performance, rolling resistance, lubrication, and rust prevention property.

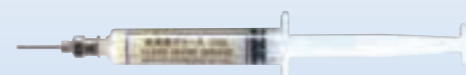
Bellows cartridge (80 g)

JG80 /CGL



With miniature greaser (2.5 ml)

MG2.5 /CGL

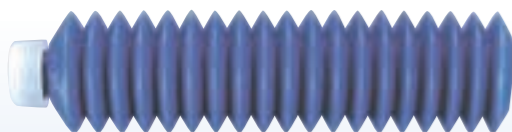


Low Dust-Generation Grease for Clean Environment CG2 /YCG

For this grease, urea is used as thickener and synthetic oil is used as base oil, so it has excellent low dust generating performance, operating temperature range, lubrication property, rust prevention property and oxidation stability.

Bellows cartridge (80 g)

JG80 /CG2



With miniature greaser (2.5 ml)

MG2.5 /CG2



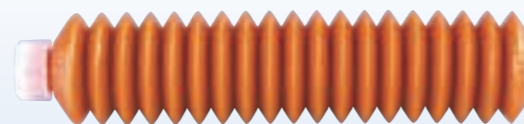
MG10 /CG2 with 10 ml are also available.

Anti-Fretting Corrosion Grease AF2 /YAF

Grease with excellent fretting-proof corrosion property.

Bellows cartridge (80 g)

JG80 /AF2



With miniature greaser (2.5 ml)

MG2.5 /AF2



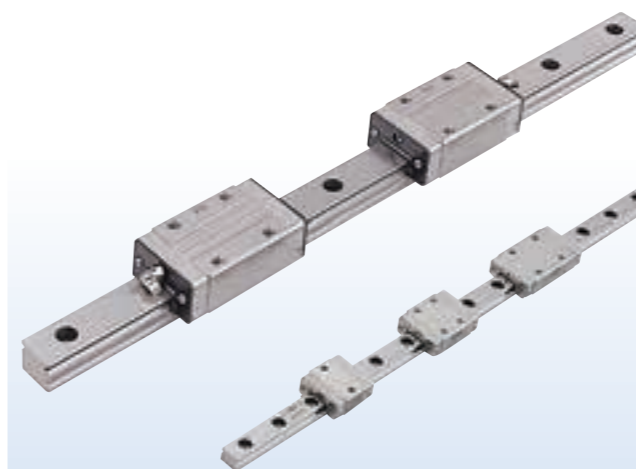
Other special grease

For special grease for vacuum or high temperature, please contact IKO.

Others

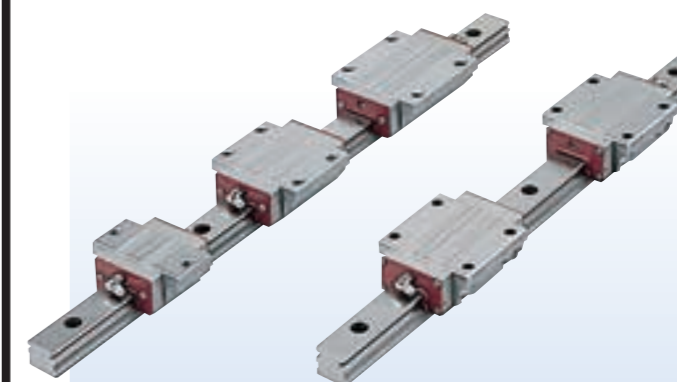
Stainless steel end plate /BS

End plate is changed to stainless steel.



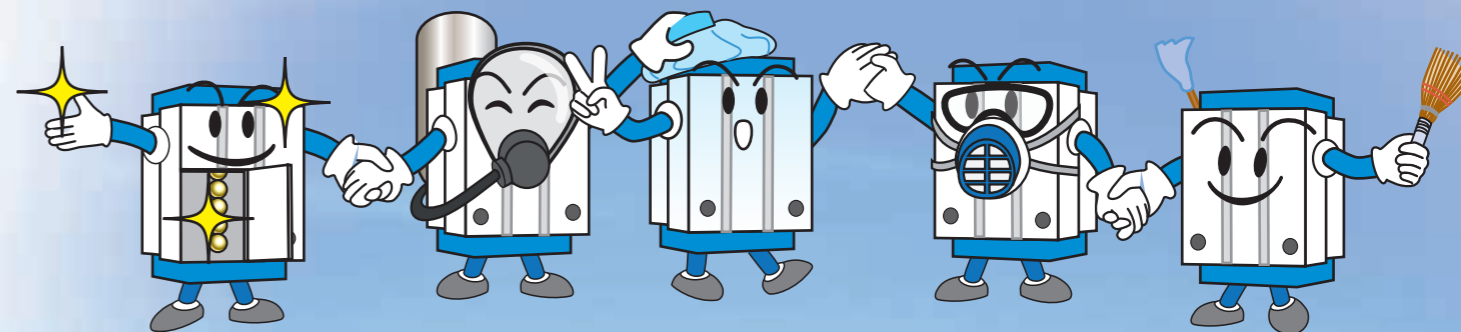
Special environment seal /RE

The end and under seals are replaced with end seals for special environment that can be used at high temperatures. When it is used in high temperature environment, stainless steel end plate (/BS) and high temperature grease should be combined.

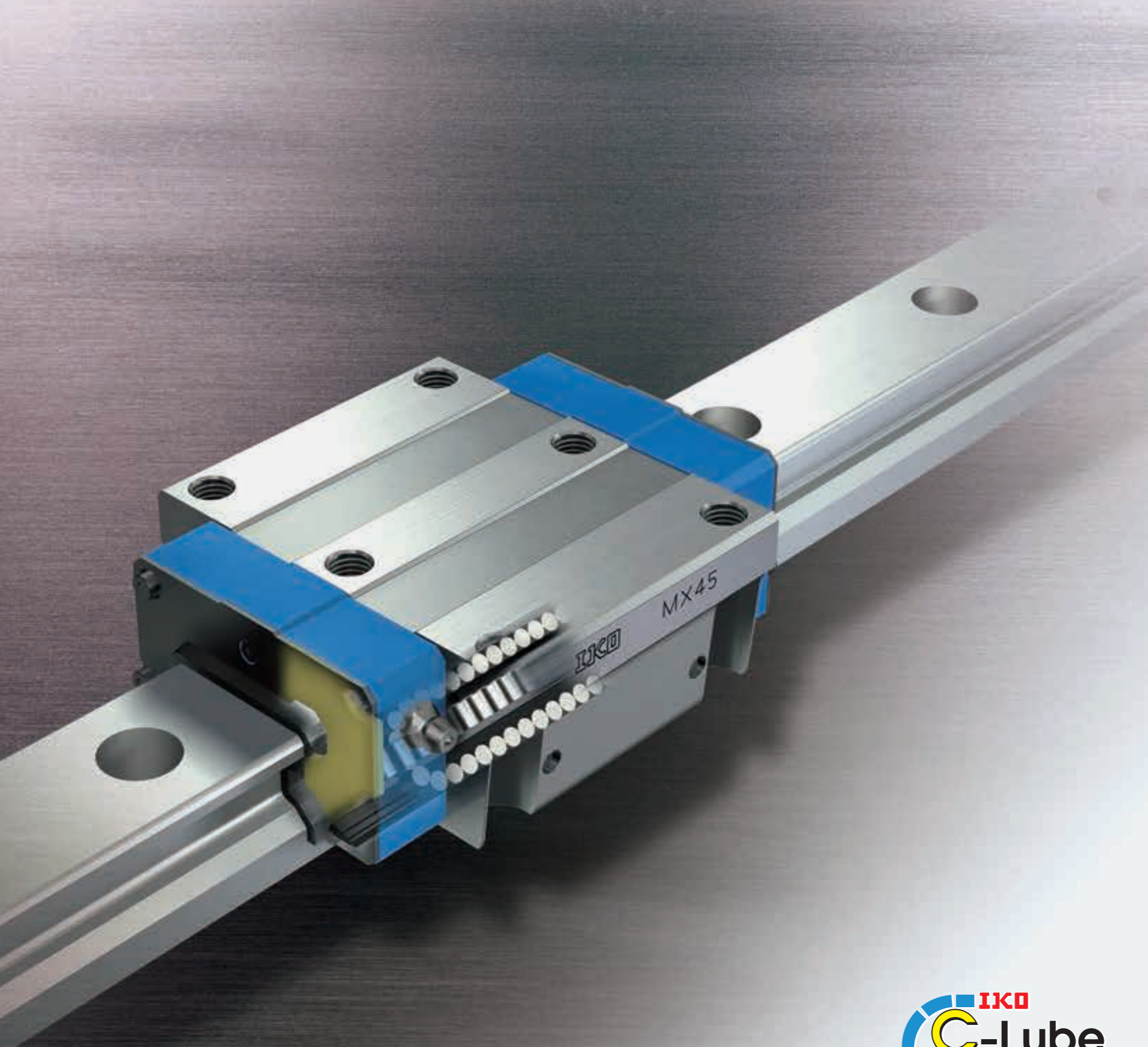


The photo shows a combination of special environment seal (/RE) and stainless steel end plate (/BS).

IKO can offer products for special environment!



If needed, please contact IKO.



Explanation and Dimension Table for Respective Product Series

Rail Guide Type

- C-Lube Linear Way ML
Linear Way L
Explanation II-5
Dimension Table II-23
- C-Lube Linear Way MLV
Explanation II-41
Dimension Table II-47
- C-Lube Linear Way MV
Explanation II-51
Dimension Table II-59
- C-Lube Linear Way ME
Linear Way E
Explanation II-63
Dimension Table II-75
- C-Lube Linear Way MH
Linear Way H
Explanation II-89
Dimension Table II-107
- Linear Way F
Explanation II-135
Dimension Table II-149
- C-Lube Linear Way MUL
Linear Way U
Explanation II-157
Dimension Table II-167
- C-Lube Linear Roller Way Super MX
Linear Roller Way Super X
Explanation II-171
Dimension Table II-191
- Linear Roller Way X
Explanation II-219
Dimension Table II-227
- Linear Way Module
Explanation II-233
Dimension Table II-241

General Explanation

- General Explanation III-2



C-Lube Linear Way ML Linear Way L

ML • LWL

C-Lube Linear Way ML

ML



The aquamarine end plate is the symbol of maintenance free.



Points

Extremely small size realized by simple structure

For details P.I-19

Super small-size linear motion rolling guide produced by two-row four-point contact simple structure and original small sizing technology. The track rail width of LWL1, the smallest size, is only 1mm.

Wide range of variations for your needs

For details P.I-25

The slide unit shape can be selected from two types, the standard type and the wide type suited for single-row track rail uses, and there are four types with different lengths of slide unit with same section. Furthermore, the track rail has the variation of standard type and tapped rail type with the screw thread implanted, allowing you to select an optimal product for the specifications of your machine and device.

Ball retained type for easy operation

The slide unit of ball retained type incorporates the ball retaining band, which prevents the ball from dropping down when the slide unit is removed from the track rail.

This safety structure brings you an easy operation to the machines / equipment.

Stainless steel selections for excellent corrosion resistance

For details P.I-39

Stainless steel highly corrosion-resistant is used as the basic specification, so that the products are suitable for applications where rust prevention oil is not preferred, such as in cleanroom environment. High carbon steel products suited to general purposes are also provided.

Widely supports special environment uses

For details P.I-33

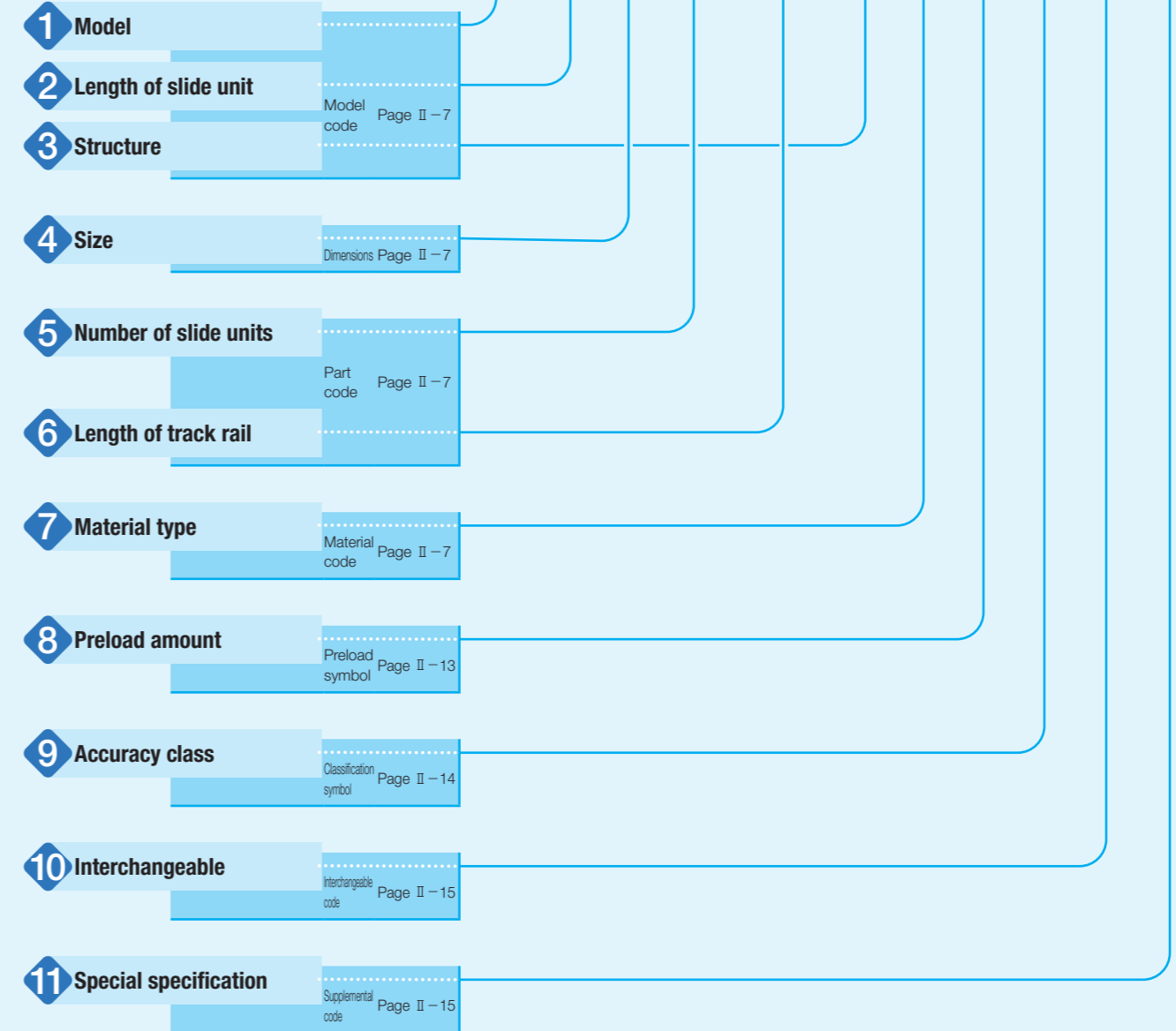
C-Lube Linear Way L for special environment uses are provided as a series. Increasingly varied special environment uses are supported, such as by high-speed / low-noise specifications by combining silicon nitride ceramics and low dust-generation specifications.

Identification Number and Specification

Example of an identification number

The specifications of ML(F) and LWL(F) series are indicated by the identification number. Indicate the identification number, consisting of a model code, dimensions, a part code, a material code, a preload symbol, a classification symbol, an interchangeable code, and any supplemental codes for each specification to apply.

Non-interchangeable specification	1	2	4	5	6	3	7	8	9	10	11
Assembled set	ML	C	12	C1	R200			T ₁	P		/U
Interchangeable specification											
Single slide unit	ML	C	12	C1				T ₁	P	S1	/U
Single track rail (1)	LWL		12		R200	B			P	S1	
Assembled set	ML	C	12	C1	R200			T ₁	P	S1	/U



Note (1) Indicate "LWL...B" or "LWLF...B" for the model code of the single track rail regardless of the series and the combination of slide unit models.
 1N=0.102kgf=0.2248lbs.
 1mm=0.03937inch

Identification Number and Specification — Model · Length of Slide Unit ·

1 Model

C-Lube Linear Way ML (ML(F) series) Standard type : ML
Wide type : MLF

Linear way L ⁽¹⁾ (LWL (F) series) Standard type : LWL
Wide type : LWLF

For applicable models and sizes, see Table 2.1 and Table 2.2.
Indicate "LWL...B" or "LWLF...B" for the model code of the single track rail regardless of the series and the combination of slide unit models.

Note ⁽¹⁾ This model has no built-in C-Lube.

2 Length of slide unit

Short : C For applicable models and sizes, see Table 2.1 and Table 2.2.
Standard : No symbol
Long : G
Extra long : L

3 Structure

Table 1.1 Structure of ML and LWL

Model	Types and sizes of track rails	Structure	
ML	Standard rail specification Size: 5~25	Ball retained type : No symbol	
	Tapped rail specification Size: 3 Size: 5, 7, 9	Ball non-retained type : No symbol Ball retained type : N	
LWL	Standard rail specification	Ball retained type : B	
	Tapped rail specification	Mounting from bottom Size: 2, 3	Ball non-retained type : No symbol
		Mounting from lateral Size: 5, 7, 9	Ball retained type : N
	Solid rail specification Size: 1	Ball non-retained type : Y	
	Solid rail specification Size: 1	Ball non-retained type : No symbol	

Table 1.2 Structure of MLF and LWLF

Model	Types of track rails	Structure
MLF	Standard rail specification Size: 6	Ball non-retained type : No symbol
	Tapped rail specification Size: 10~42	Ball retained type : N
LWLF	Standard rail specification Size: 6	Ball non-retained type : No symbol
	Tapped rail specification Size: 10~18	Ball retained type : B Ball non-retained type : N

For applicable models and sizes, see Table 2.1 and Table 2.2.

4 Size

Standard type 1, 2, 3, 5, 7, 9, 12, 15, 20, 25 For applicable models and sizes, see Table 2.1 and Table 2.2.
Wide type 4, 6, 10, 14, 18, 24, 30, 42

5 Number of slide units

: C○ For an assembled set, indicates the number of slide units assembled on a track rail. For a single slide unit, only "C1" is specified.

6 Length of track rail


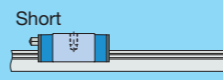

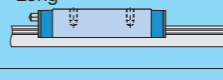

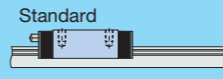
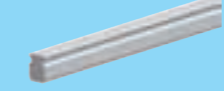
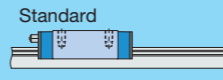
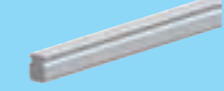
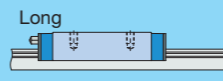
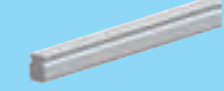
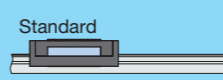
: R○ Indicate the length of track rail in mm. For standard and maximum lengths, see Table 3.1, Table 3.2, and Table 3.3.

7 Material type

Stainless steel made : No symbol For applicable models and sizes, see Table 2.1 and Table 2.2.
High carbon steel made : CS

Structure · Size · Number of Slide Unit · Length of Track Rail · Material Type —


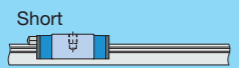
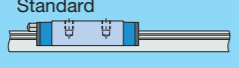



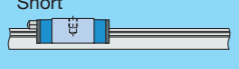

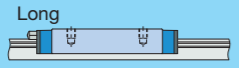
Table 2.1 Models and sizes of standard type ML(F) and LWL(F) series

Types of track rails	Material type	Length of slide unit	Structure	Model	Size											
					1	2	3	5	7	9	12	15	20	25		
Standard rail specification 	Stainless steel made	Short 	Ball retained type	MLC	○	○	○	○	○	○	○	○	○	○	○	○
		LWLC...B		○	○	○	○	○	○	○	○	○	○	○		
		ML		○	○	○	○	○	○	○	○	○	○	○		
		LWL...B		○	○	○	○	○	○	○	○	○	○	○		
Tapped rail specification Mounting from bottom 	Stainless steel made	Long 	Ball retained type	MLG	○	○	○	○	○	○	○	○	○	○	○	
		LWLG...B		○	○	○	○	○	○	○	○	○	○			
		MLL		○	○	○	○	○	○	○	○	○	○	○		
		LWL...BCS		○	○	○	○	○	○	○	○	○	○	○		
Tapped rail specification Mounting from lateral 	High carbon steel made	Standard 	Ball non-retained type	MLC	○	○	○	○	○	○	○	○	○	○	○	
		LWLC		○	○	○	○	○	○	○	○	○	○	○		
		MLC...N		○	○	○	○	○	○	○	○	○	○	○		
		LWLC...N		○	○	○	○	○	○	○	○	○	○	○		
Solid rail specification 	Stainless steel made	Standard 	Ball non-retained type	ML	○	○	○	○	○	○	○	○	○	○	○	
		LWL		○	○	○	○	○	○	○	○	○	○	○		
		ML...N		○	○	○	○	○	○	○	○	○	○	○		
		LWL...N		○	○	○	○	○	○	○	○	○	○	○		
Solid rail specification 	Stainless steel made	Long 	Ball retained type	MLG...N	○	○	○	○	○	○	○	○	○	○	○	
		LWLG...N		○	○	○	○	○	○	○	○	○	○	○		
		MLL...N		○	○	○	○	○	○	○	○	○	○	○		
		LWL...Y		○	○	○	○	○	○	○	○	○	○	○		
Solid rail specification 	High carbon steel made	Standard 	Ball non-retained type	LWL	○	○	○	○	○	○	○	○	○	○	○	

Remark: For the models indicated in , the interchangeable specification is available.

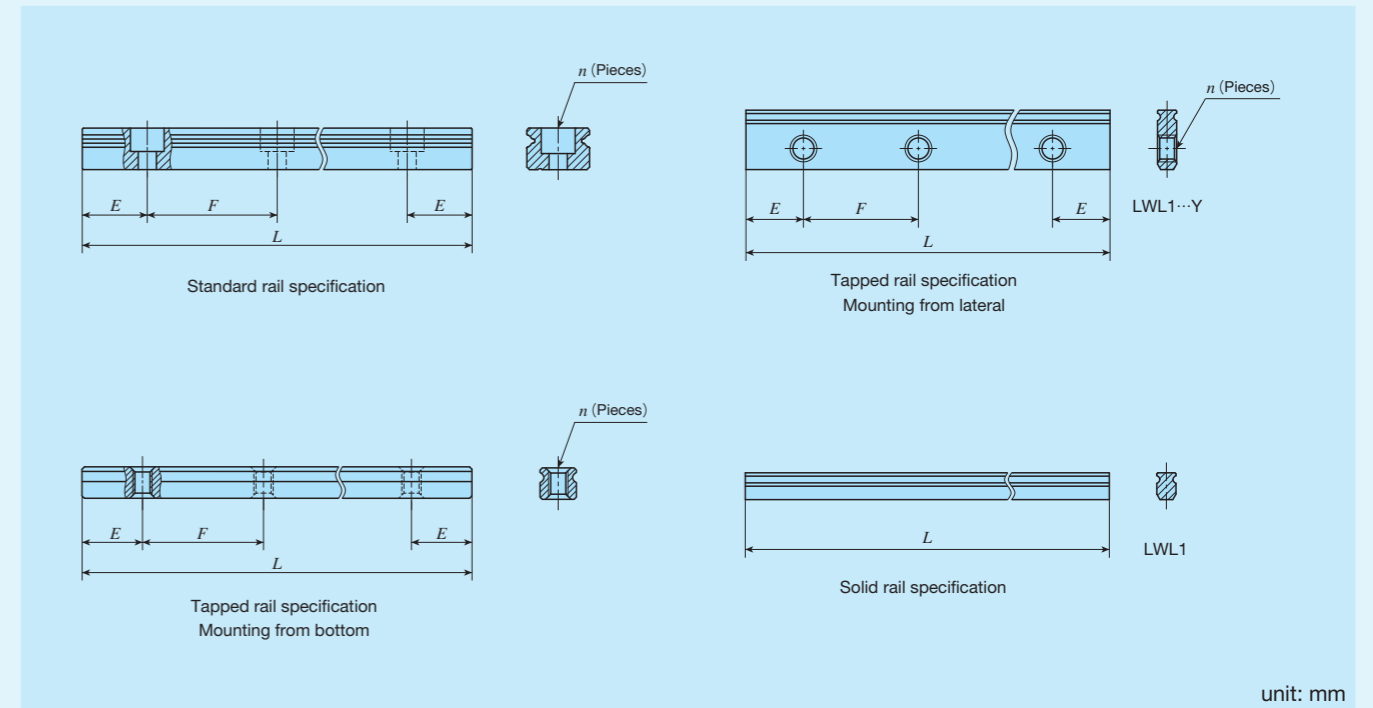
ML · LWL

Table 2.2 Models and sizes of wide type ML(F) and LWL(F) series

Types of track rails	Material type	Length of slide unit	Structure	Model	Size							
					4	6	10	14	18	24	30	42
Standard rail specification 	Stainless steel made	Short 	Ball retained type	MLFC	-	-	○	○	○	○	○	○
				LWLF...B	-	-	○	○	○	○	○	○
		Ball non-retained type	MLFC	-	○	-	-	-	-	-	-	-
			LWLF	-	○	-	-	-	-	-	-	-
		Standard 	Ball retained type	MLF	-	-	○	○	○	○	○	○
				LWLF...B	-	-	○	○	○	○	○	○
		Ball non-retained type	MLF	-	○	-	-	-	-	-	-	
		LWLF	○	○	-	-	-	-	-	-	-	
	Long 	Ball retained type	MLFG	-	-	-	○	○	○	○	○	
			LWLF...B	-	-	-	○	○	○	○	○	
	High carbon steel made	Standard 	Ball retained type	LWLF...BCS	-	-	-	-	○	○	○	
Tapped rail specification Mounting from bottom 	Stainless steel made	Short 	Ball retained type	MLFC...N	-	-	○	○	○	-	-	-
				LWLF...N	-	-	○	○	○	-	-	-
		Ball non-retained type	MLFC...N	-	○	-	-	-	-	-	-	-
			LWLF...N	-	○	-	-	-	-	-	-	-
		Standard 	Ball retained type	MLF...N	-	-	○	○	○	-	-	-
				LWLF...N	-	-	○	○	○	-	-	-
		Ball non-retained type	MLF...N	-	○	-	-	-	-	-	-	
		LWLF...N	-	○	-	-	-	-	-	-	-	
	Long 	Ball retained type	MLFG...N	-	-	-	○	○	-	-	-	
			LWLF...N	-	-	-	○	○	-	-	-	

Remark: For the models indicated in , the interchangeable specification is available.

Table 3.1 Standard and maximum length of stainless steel track rail (Standard type)



unit: mm

Item	Identification number						
	LWL1...Y	LWL1	LWL2	ML 3 LWL3	ML 5 LWL5...B	ML 7 LWL7...B	
Standard length L (n)	18 (3) 30 (5) 42 (7)	18 (-) 30 (-) 42 (-)	32 (4) 40 (5) 56 (7) 80 (10)	30 (3) 40 (4) 60 (6) 80 (8) 100 (10)	60 (4) 90 (6) 105 (7) 120 (8) 150 (10)	60 (4) 90 (6) 120 (8) 150 (10) 180 (12) 240 (16)	
Pitch of mounting holes F	6	-	8	10	15	15	
E	3	-	4	5	7.5	7.5	
Standard E or higher dimensions ⁽¹⁾ below	2.5 5.5	-	2.5 6.5	3 8	4 11.5	4.5 12	
Maximum length ⁽²⁾	102	102	104 (200)	150 (300)	210 (510)	300 (990)	
Maximum number of butt-jointing track rail ⁽³⁾	-	-	-	-	5	7	
Maximum length of butt-jointing track rail ⁽³⁾	-	-	-	-	915	1 905	
Item	Identification number						
	ML 9 LWL9...B	ML 12 LWL12...B	ML 15 LWL15...B	ML 20 LWL20...B	ML 25 LWL25...B		
Standard length L (n)	60 (3) 80 (4) 120 (6) 160 (8) 220 (11) 280 (14)	100 (4) 150 (6) 200 (8) 275 (11) 350 (14) 475 (19)	160 (4) 240 (6) 320 (8) 440 (11) 560 (14) 680 (17)	180 (3) 240 (4) 320 (6) 480 (8) 660 (11) 840 (14)	240 (4) 300 (5) 360 (6) 480 (8) 660 (11) 900 (15)		
Pitch of mounting holes F	20	25	40	60	60		
E	10	12.5	20	30	30		
Standard E or higher dimensions ⁽¹⁾ below	4.5 14.5	5 17.5	5.5 25.5	8 38	9 39		
Maximum length ⁽²⁾	860 (1 200)	1 000 (1 450)	1 000 (1 480)	960 (1 800)	960 (1 800)		
Maximum number of butt-jointing track rail ⁽³⁾	2	2	2	2	2		
Maximum length of butt-jointing track rail ⁽³⁾	1 660	1 925	1 880	1 740	1 740		

Notes ⁽¹⁾ Not applicable to track rail with stopper pins (supplemental code "S").

⁽²⁾ Length up to the value in () can be produced. If needed, please contact IKO.

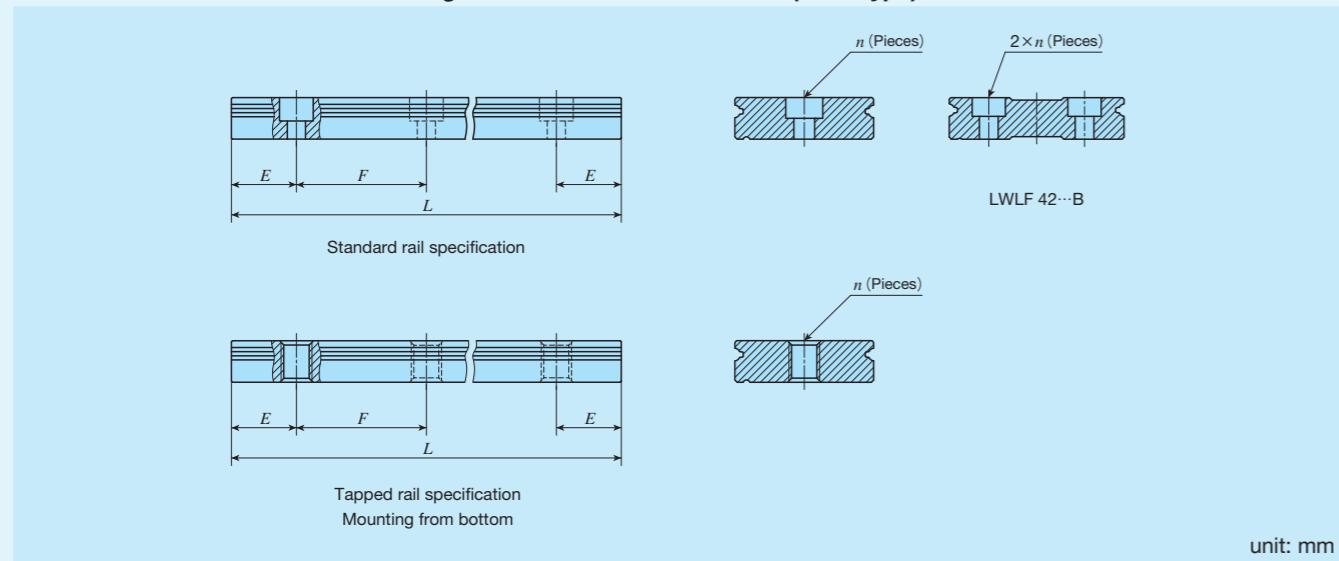
⁽³⁾ Not applicable to interchangeable specifications or tapped rail specifications.

Remarks 1. A typical identification number is indicated, but is applied to all models of the same size.

2. Indicate "LWL...B" for the model code of the single track rail regardless of the series and the combination of slide unit models.

3. If not directed, E dimensions for both ends will be the same within the range of standard E dimensions. To change the dimensions, indicate the specified rail mounting hole positions "/ E " of special specification. For more information, see page III-30.

Table 3.2 Standard and maximum length of stainless steel track rail (Wide type)



Item	Identification number	unit: mm			
		LWLF4	MLF 6 LWLF6	MLF 10 LWLF10...B	MLF 14 LWLF14...B
Standard length L (n)		40 (4)	60 (4)	60 (3)	90 (3)
		60 (6)	90 (6)	80 (4)	120 (4)
		70 (7)	105 (7)	120 (6)	150 (5)
		80 (8)	120 (8)	160 (8)	180 (6)
		100 (10)	150 (10)	220 (11)	240 (8)
Pitch of mounting holes F		10	15	20	30
E		5	7.5	10	15
Standard E or higher dimensions ⁽¹⁾ below		3.5	4.5	4.5	5.5
		8.5	12	14.5	20.5
Maximum length ⁽²⁾		180 (300)	240 (300)	300 (500)	300 (990)
Maximum number of butt-jointing track rail ⁽³⁾		—	—	7	8
Maximum length of butt-jointing track rail ⁽³⁾		—	—	1 840	1 950
Item	Identification number	unit: mm			
		MLF 18 LWLF18...B	MLF 24 LWLF24...B	MLF 30 LWLF30...B	MLF 42 LWLF42...B
Standard length L (n)		90 (3)	120 (3)	160 (4)	160 (4)
		120 (4)	160 (4)	240 (6)	240 (6)
		150 (5)	240 (6)	320 (8)	320 (8)
		180 (6)	320 (8)	440 (11)	440 (11)
		240 (8)	400 (10)	560 (14)	560 (14)
Pitch of mounting holes F		30	40	40	40
E		15	20	20	20
Standard E or higher dimensions ⁽¹⁾ below		5.5	6.5	6.5	6.5
		20.5	26.5	26.5	26.5
Maximum length ⁽²⁾		690 (1 860)	680 (1 960)	680 (2 000)	680 (2 000)
Maximum number of butt-jointing track rail ⁽³⁾		3	3	3	3
Maximum length of butt-jointing track rail ⁽³⁾		1 920	1 840	1 840	1 840

Notes ⁽¹⁾ Not applicable to track rail with stopper pins (supplemental code "/S").

⁽²⁾ Length up to the value in () can be produced. If needed, please contact IKO.

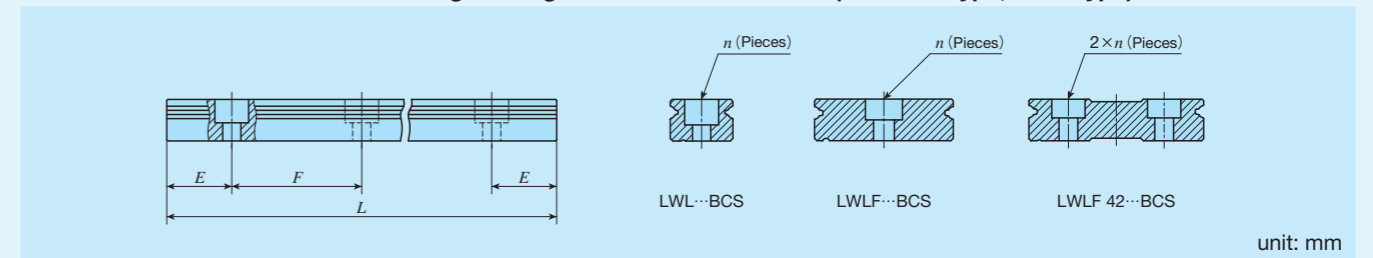
⁽³⁾ Not applicable to interchangeable specifications or tapped rail specifications.

Remarks 1. A typical identification number is indicated, but is applied to all models of the same size.

2. Indicate "LWLF...B" for the model code of the single track rail regardless of the series and the combination of slide unit models.

3. If not directed, E dimensions for both ends will be the same within the range of standard E dimensions. To change the dimensions, indicate the specified rail mounting hole positions "/E" of special specification. For more information, see page III-30.

Table 3.3 Standard and maximum length of high carbon steel track rail (Standard type, Wide type)



Item	Identification number	unit: mm			
		LWL 9...BCS	LWL12...BCS	LWL15...BCS	LWL20...BCS
Standard length L (n)		80 (4)	100 (4)	160 (4)	180 (3)
		160 (8)	200 (8)	320 (8)	240 (4)
		220 (11)	275 (11)	440 (11)	360 (6)
		280 (14)	350 (14)	560 (14)	480 (8)
		380 (19)	475 (19)	680 (17)	660 (11)
		500 (25)	600 (24)	800 (20)	900 (15)
Pitch of mounting holes F		20	25	40	60
E		10	12.5	20	30
Standard E or higher dimensions ⁽¹⁾ below		4.5	5	5.5	8
		14.5	17.5	25.5	38
Maximum length		1 000	1 500	1 520	1 560
Item	Identification number	unit: mm			
		LWLF18...BCS	LWLF24...BCS	LWLF30...BCS	LWLF42...BCS
Standard length L (n)		90 (3)	120 (3)	160 (4)	160 (4)
		180 (6)	240 (6)	320 (8)	320 (8)
		240 (8)	320 (8)	440 (11)	440 (11)
		300 (10)	400 (10)	560 (14)	560 (14)
		420 (14)	600 (15)	680 (17)	680 (17)
		510 (17)	720 (18)	800 (20)	800 (20)
Pitch of mounting holes F		30	40	40	40
E		15	20	20	20
Standard E or higher dimensions ⁽¹⁾ below		5.5	6.5	6.5	6.5
		20.5	26.5	26.5	26.5
Maximum length		1 500	1 520	1 600	1 600

Note ⁽¹⁾ Not applicable to track rail with stopper pins (supplemental code "/S").

Remarks 1. A typical identification number is indicated, but is applied to all models of the same size.

2. If not directed, E dimensions for both ends will be the same within the range of standard E dimensions. To change the dimensions, indicate the specified rail mounting hole positions "/E" of special specification. For more information, see page III-30.

— Preload Amount —

8 Preload amount	Clearance	: T ₀	Specify this item for an assembled set or a single slide unit. For details of the preload amount, see Table 4. For applicable preload types, see Table 5.1 and Table 5.2.
	Standard	: No symbol	
	Light preload	: T ₁	

Table 4 Preload amount

Preload type	Item	Preload symbol	Preload amount N	Operational conditions
Clearance		T ₀	0 ⁽¹⁾	• Very light motion
Standard		(No symbol)	0 ⁽²⁾	• Light and precise motion
Light preload		T ₁	0.02 C ₀	• Almost no vibrations • Load is evenly balanced • Light and precise motion

Notes ⁽¹⁾ There is zero or subtle clearance.

⁽²⁾ Indicates zero or minimal amount of preload.

Remark: C₀ indicates the basic static load rating.

Table 5.1 Application of preload (Standard type)

Size	Preload type (preload symbol)		
	Clearance (T ₀)	Standard (No symbol)	Light preload (T ₁)
1	○	—	—
2	○	—	—
3	○	—	—
5	○	○	—
7	○ ⁽¹⁾	○	○ ⁽¹⁾
9	○ ⁽¹⁾	○	○ ⁽¹⁾
12	○ ⁽¹⁾	○	○ ⁽¹⁾
15	○ ⁽¹⁾	○	○ ⁽¹⁾
20	○	○	○
25	○	○	○

Note ⁽¹⁾ Not applicable when /HB is specified.

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

Table 5.2 Application of preload (Wide type)

Size	Preload type (preload symbol)		
	Clearance (T ₀)	Standard (No symbol)	Light preload (T ₁)
4	○	—	—
6	○	—	—
10	○	○	—
14	○	○	○
18	○	○	○
24	○	○	○
30	○	○	○
42	○	○	○

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

— Accuracy class —

9 Accuracy class	High	: H	For interchangeable specification products, assemble a slide unit and a track rail of the same accuracy class. Size 1 series have "No symbols." For the details of accuracy class, see Table 6.1 and 6.2.
	Precision	: P	

Table 6.1 Tolerance and allowable values (Series of size 1)

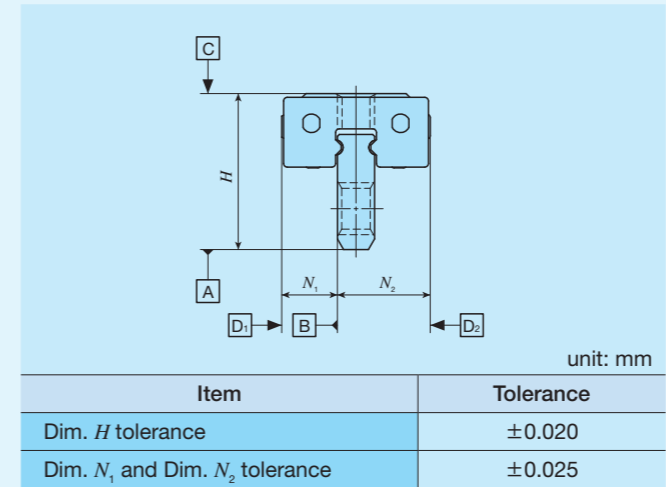
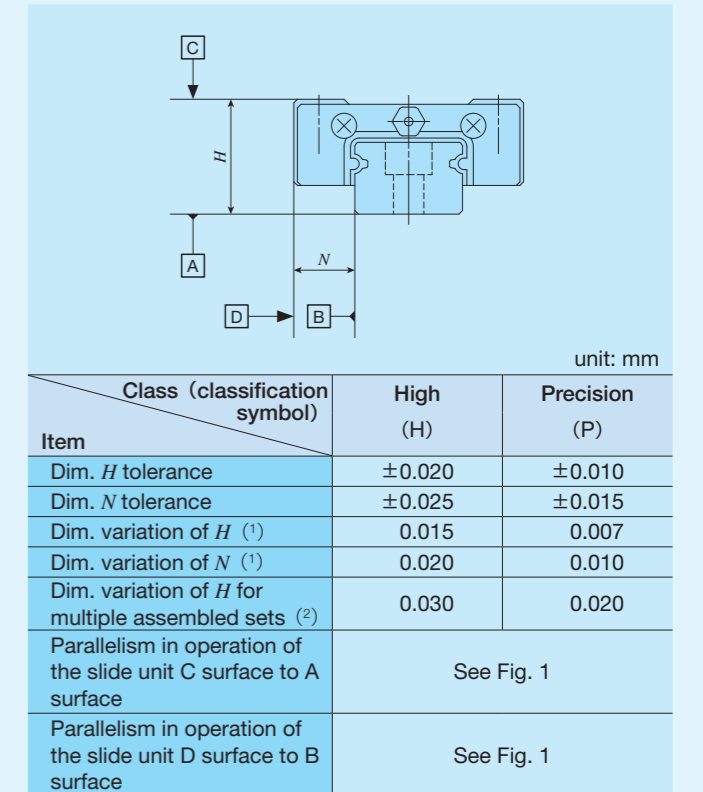


Table 6.2 Tolerance and allowance (Series of size 2 or higher)



Notes ⁽¹⁾ It means the size variation between slide units mounted on the same track rail.

⁽²⁾ Applicable to the interchangeable specification.

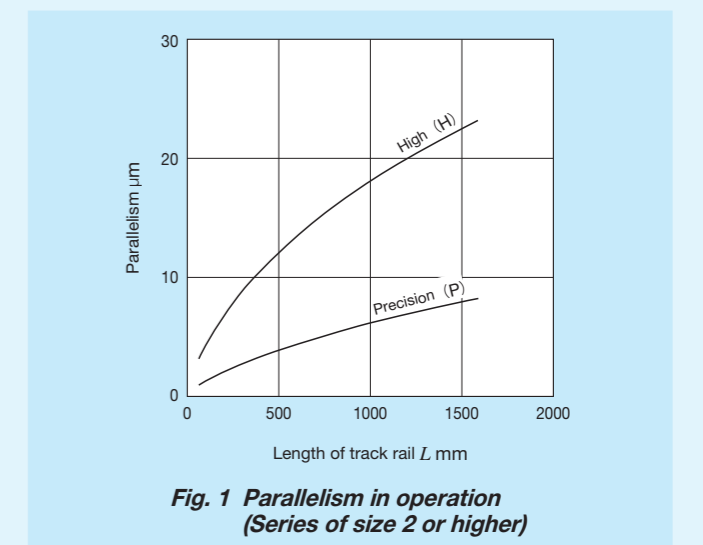
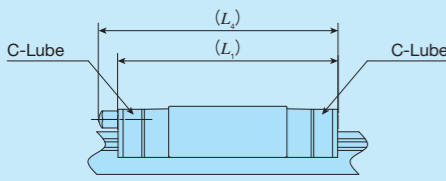


Table 9 Dimension of slide unit with C-Lube plate (Supplemental code /Q)



unit: mm

Identification number	L_1	L_4	Identification number	L_1	L_4
LWLC 5...B	22	—	LWLFC 10...B	26.5	—
LWL 5...B	25	—	LWLF 10...B	30.5	—
LWLC 7...B	27	—	LWLFC 14...B	30.5	—
LWL 7...B	31.5	—	LWLF 14...B	39.5	—
LWLG 7...B	39	—	LWLFG 14...B	50	—
LWLC 9...B	30	—	LWLFC 18...B	34.5	—
LWL 9...B	39	—	LWLF 18...B	46.5	—
LWLG 9...B	49	—	LWLFG 18...B	58.5	—
LWLC 12...B	33	—	LWLFC 24...B	38.5	—
LWL 12...B	42	—	LWLF 24...B	52	—
LWLG 12...B	52	—	LWLFG 24...B	67	—
LWLC 15...B	42	47	LWLFC 30...B	45.5	50
LWL 15...B	52	57	LWLF 30...B	59.5	64
LWLG 15...B	67	72	LWLFG 30...B	78.5	83
LWLC 20...B	48	53	LWLFC 42...B	51.5	56
LWL 20...B	60	65	LWLF 42...B	65	70
LWLG 20...B	78	83	LWLFG 42...B	84.5	89
LWLC 25...B	63.5	74			
LWL 25...B	87.5	98			
LWLG 25...B	107.5	117			

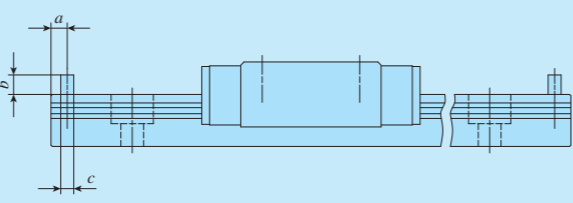
Remarks 1. The dimensions of the slide unit with C-Lube at both ends are indicated.
 2. A typical identification number is indicated, but is applied to all LWL(F) series models of the same size.

Table 10 Load rating / static moment rating of Hybrid C-Lube Linear Way (Supplemental code /HB)

Identification number	C N	C_0 N	T_0 N·m	$T_x^{(1)}$ N·m	$T_y^{(1)}$ N·m
MLC 7.../HB	937	965	3.5	1.6 12.6	1.3 10.6
ML 7.../HB	1 330	1 610	5.9	4.0 23.9	3.3 20.1
MLG 7.../HB	1 690	2 250	8.2	7.5 43.1	6.3 36.2
MLC 9.../HB	1 180	1 260	5.9	2.4 18.2	2.1 15.3
ML 9.../HB	1 810	2 340	10.9	7.7 43.4	6.5 36.4
MLG 9.../HB	2 370	3 420	15.9	15.9 83.6	13.4 70.1
MLL 9.../HB	2 870	4 500	20.9	27.1 134	22.7 112
MLC 12.../HB	2 210	2 030	12.6	4.5 35.5	3.8 29.8
ML 12.../HB	3 330	3 650	22.6	13.1 79.2	11.0 66.4
MLG 12.../HB	4 310	5 270	32.7	26.0 143	21.9 120
MLL 12.../HB	5 820	8 110	50.3	59.3 288	49.8 242
MLC 15.../HB	3 490	3 310	25.5	9.9 71.8	8.3 60.3
ML 15.../HB	4 980	5 520	42.5	25.3 146	21.2 122
MLG 15.../HB	6 620	8 280	63.7	54.3 288	45.5 241
MLL 15.../HB	8 370	11 600	89.2	104 497	86.9 417

Note (1) The upper values of T_x and T_y are for one slide unit and the lower values are for two slide units in close contact.

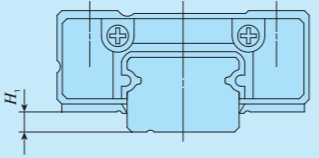
Table 11 Dimension of track rail with stopper pins (Supplemental code /S)



unit: mm

Size	a	b	c
5	—	2	1.6
7	—	2.5	2
9	—	3	2
—	10	2	1.6
12	—	3	2
—	14	3	2
15	—	4	2
—	18	3	2
20	—	5	2
—	24	3	2
25	—	5	2
—	30	4	2
—	42	5	2

Table 12 H_1 dimension with under seal (Supplemental code /U)



unit: mm

Size	H_1
9	—
12	—
15	—
—	18
20	—
—	24
25	—
—	30
—	42

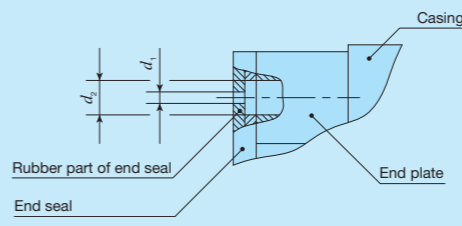
Note (1) The dimensions are the same as those before mounting of under seal.

Lubrication

Lithium-soap base grease (MULTEMP PS No.2 [KYODO YUSHI CO., LTD.]) is pre-packed in ML(F) and LWL(F) series. Additionally, ML(F) series has C-Lube placed in the recirculation part of balls, so that the interval for reapplying lubricant can be extended and maintenance works such as grease job can be reduced significantly.

ML(F) series and LWL(F) series have grease nipple or oil hole as indicated in Table 14. Since the Size 1, 2, 3, 4 and 6 series do not have an oil hole, apply grease directly to the raceway part of the track rail for re-greasing. Supply nozzles fit to each shapes of grease nipple and dedicated supplying equipment (miniature greasers) fit to oil holes are also available. For order of these parts for lubrication, see Table 13 and Table 14.1 on Page III-23, and Table 15 on page III-24.

Table 13 Oil hole specifications



unit: mm

Size	d_1	d_2
5	10	1.1
7	14	1.2
9	18	1.5
12	24	2

Table 14 Parts for lubrication

Size	Grease nipple type (1)	Applicable supply nozzle type	Bolt size of female threads for piping
5, 7, 9, 12	Oil hole	Miniature greaser	—
15, 20	A-M3	A-5120V A-5240V B-5120V B-5240V	—
25	B-M4	A-8120V B-8120V	M4

Note (1) For grease nipple specification, see Table 14.1 on page III-23.
 Remark: Stainless steel grease nipple is also available. If needed, please contact IKO.

Dust Protection



The slide units of ML(F) series and LWL(F) series are equipped with end seals as standard for dust protection. However, if large amount of contaminant or dust are floating, or if large particles of foreign substances such as chips or sand may adhere to the track rail, it is recommended to attach a protective cover to the linear motion mechanism. No end seal is provided for size 1, 2, 3, 4 or 6 series. For applications in the environment not clean enough, cover the entire unit with a protective case, etc. to prevent harmful foreign substances such as dust and particles from outside to enter.

Precaution for Use

① Mounting surface, reference mounting surface and general mounting structure

When mounting the ML(F) series and LWL(F) series, properly align the reference mounting surfaces B and D (D1 or D2) of the track rail and slide unit with the reference mounting surface of the table and bed and fix them. (See Fig. 2)

Reference mounting surfaces B and D (D1 or D2) and mounting surfaces A and C are precisely ground. By machining the mounting surface of the mating member, such as machine or device, to high accuracy and mounting them properly, stable linear motion with high accuracy is obtained.

Reference mounting surface of the slide unit of size 2 or higher is the opposite side of the  mark. The track rail reference mounting surface is identified by locating the  mark on the top surface of the track rail. It is the side surface above the mark (in the direction of the arrow). (See Fig. 5.2)

Reference mounting surface of the slide unit of size 1 is located at both right and left sides (D1 and D2). (See Fig. 5.1)

The track rail of LWL1...Y has the mounting structure of lateral direction. Two types of mounting structure as shown in Fig. 3.1 and Fig. 3.2 are available.

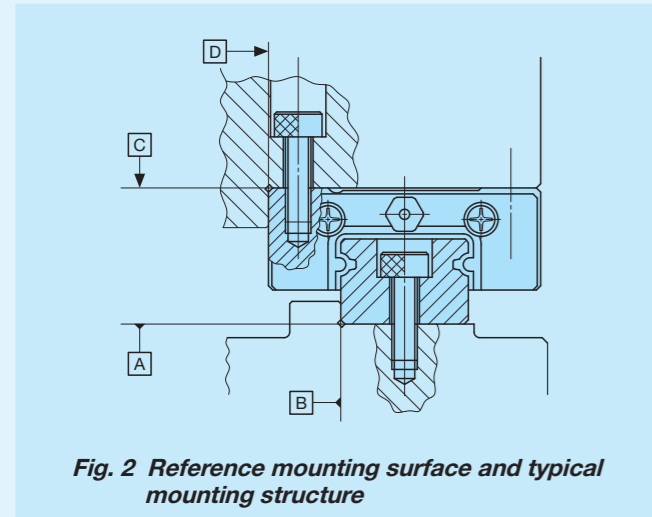


Fig. 2 Reference mounting surface and typical mounting structure

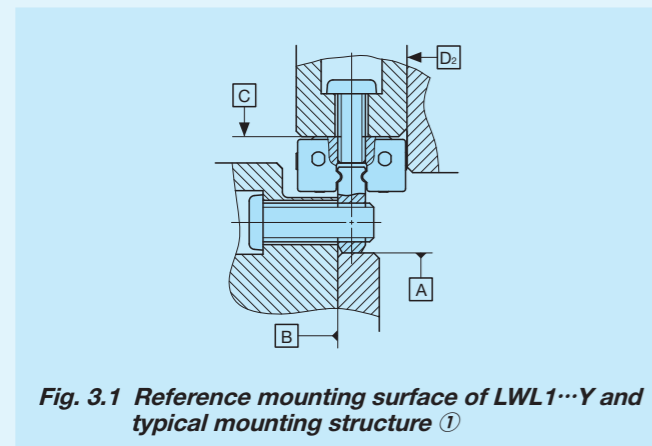


Fig. 3.1 Reference mounting surface of LWL1...Y and typical mounting structure ①

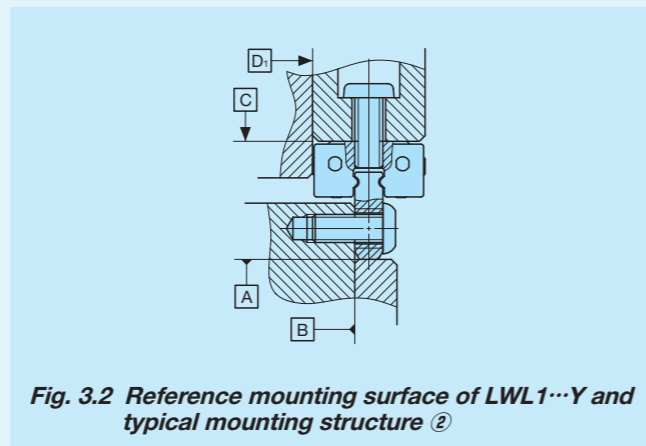


Fig. 3.2 Reference mounting surface of LWL1...Y and typical mounting structure ②

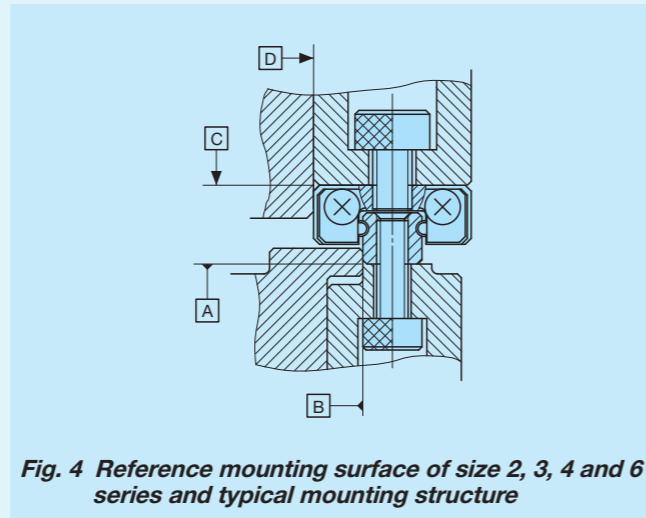


Fig. 4 Reference mounting surface of size 2, 3, 4 and 6 series and typical mounting structure

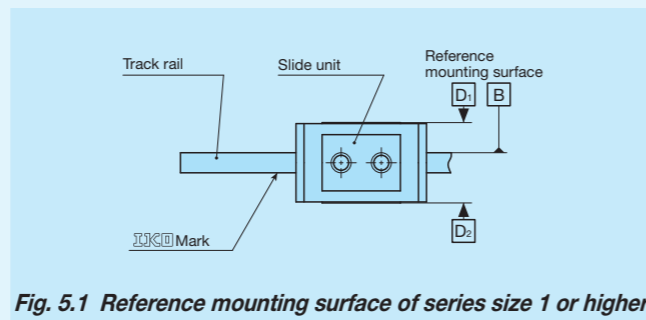


Fig. 5.1 Reference mounting surface of series size 1 or higher

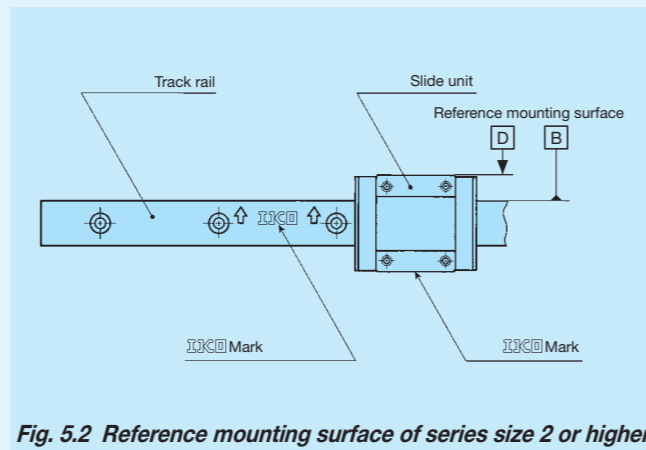


Fig. 5.2 Reference mounting surface of series size 2 or higher

② Mounting screws for slide unit

To mount a slide unit, tightly fasten the bolt against female thread of slide unit.

The female thread is created through holes of the slide unit for size 1 series, and also through holes for the slide unit and track rail for size 2, 3, 4 and 6 series. When the fixing thread depth of the mounting screw goes too deep, it can interfere with the track rail and impact the running accuracy or product life so that the fixing thread depth should be within the screwing depth specified in the dimension table.

Also prepare the small screws dedicated to precision devices (head diameter 1.8 mm or smaller) for the mounting bolt of slide unit of size 1.

③ Mounting screws for track rail

In the size 2 and 3 series and tapped rail specifications, track rail mounting bolts are not appended. Prepare mounting bolts whose fixing thread depth is less than H_4 in dimension table.

④ Shoulder height and corner radius of the reference mounting surface

For the opposite corner of the mating reference mounting, it is recommended to have relieved fillet as indicated in Fig. 6. Recommended value for the shoulder height on the mating side is indicated in Table 16.

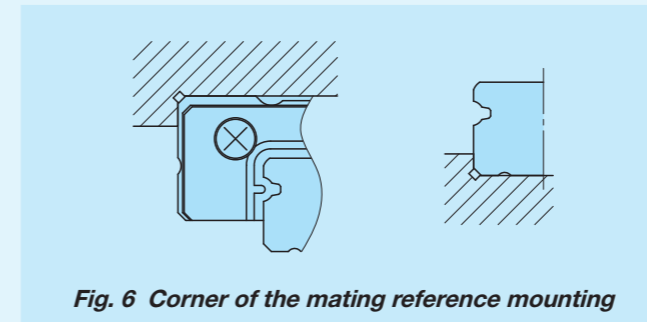


Fig. 6 Corner of the mating reference mounting

⑤ Tightening torque for fixing screw

Typical tightening torque for mounting ML(F) series and LWL(F) series to the steel mating member material is indicated in Table 15. When vibration and shock of the machine or device are large, fluctuating load is large, or moment load is applied, fix it by using the torque 1.2 to 1.5 times larger than the value indicated in the table as necessary. If the mating member material is cast iron or aluminum alloy, reduce the tightening torque depending on the strength characteristics of the mating member material.

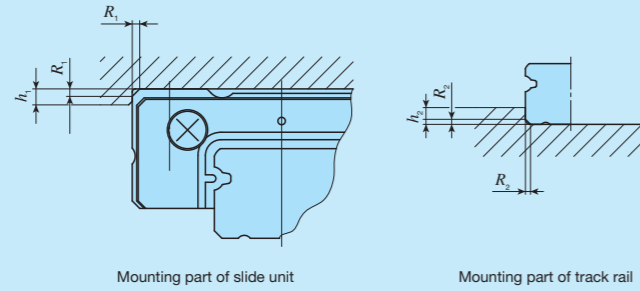
Table 15 Tightening torque for fixing screw

Bolt size	Tightening torque N · m	
	Stainless steel-made screw	High carbon steel-made screw
M1 ×0.25	0.04	—
M1.4×0.3	0.10	—
M1.6×0.35	0.15	—
M2 ×0.4	0.31	—
M2.5×0.45	0.62	—
M3 ×0.5	1.1	1.3
M4 ×0.7	2.5	2.9
M5 ×0.8	5.0	5.7
M6 ×1	8.5	—

Remarks 1. The tightening torque is calculated based on strength division 8.8 and property division A2-70.

2. It is recommended that the tightening torque of slide unit mounting holes for series size 1 is to be 70 to 80 % of the values in the table.

Table 16 Shoulder height and corner radius of the reference mounting surface



unit: mm

Identification number		Mounting part of slide unit		Mounting part of track rail	
		Shoulder height h_1	Corner radius R_1 (Maximum)	Shoulder height h_2 ⁽¹⁾	Corner radius R_2 (Maximum)
-	LWL 1...Y	1.3	-	2	-
-	LWL 1			-	-
-	LWL 2	1	0.1	0.5	0.05
ML 3	LWL 3	1.2	0.15	0.8	0.1
ML 5	LWL 5...B	2	0.3	0.8	0.2
ML 7	LWL 7...B	2.5	0.2	1.2	0.2
ML 9	LWL 9...B	3	0.2	1.5	0.2
-	LWL 9...BCS		0.4		
ML 12	LWL 12...B	4	0.2	2.5	0.2
-	LWL 12...BCS		0.4		
ML 15	LWL 15...B	4.5	0.2	3	0.2
-	LWL 15...BCS		0.4		
ML 20	LWL 20...B	5	0.2	4	0.2
-	LWL 20...BCS		0.4		
ML 25	LWL 25...B	6.5	0.7	4	0.7
-	LWLF 4	1.5	0.1	0.8	0.1
MLF 6	LWLF 6	2	0.1	0.8	0.1
MLF 10	LWLF 10...B	2	0.3	1.2	0.2
MLF 14	LWLF 14...B	2.5	0.2	1.2	0.2
MLF 18	LWLF 18...B	3	0.2	2.5	0.2
-	LWLF 18...BCS		0.4		
MLF 24	LWLF 24...B	4	0.2	2.5	0.2
-	LWLF 24...BCS		0.4		
MLF 30	LWLF 30...B	4.5	0.2	2.5	0.2
-	LWLF 30...BCS		0.4		
MLF 42	LWLF 42...B	5	0.2	3	0.2
-	LWLF 42...BCS		0.4		

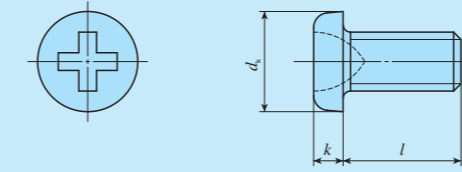
Note ⁽¹⁾ For models with under seals (supplemental code "U"), it is recommended to use the values 1mm smaller than the values in the table. However for the models of size 9 with under seal, 0.8 mm is recommended.

Remark: A typical identification number is indicated, but is applied to all models of the same size.

Track rail mounting bolts for slide unit and tapped rail specification

For LWL(F) series, track rail mounting bolts for slide unit and tapped rail specification shown in Table 17 and Table 18 are available. If these parts are necessary, please contact IKO. Note that the dimensions are different from the appended track rail mounting bolts.

Table 17 Cross-recessed pan head screw for precision equipment

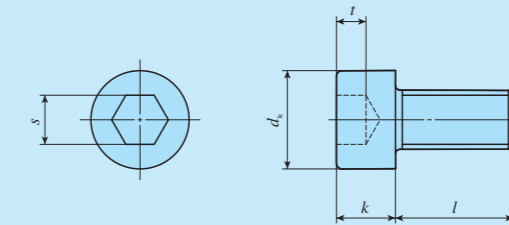


unit: mm

Bolt size (d)	Pitch of screw P	d_k	k	l
M1	0.25	1.8	0.45	3, 4, 5
M1.4 ⁽¹⁾	0.3	2.5	0.8	2.5, 3, 4
M1.6 ⁽¹⁾	0.35	2.8	0.85	4, 5, 6
M2 ⁽¹⁾	0.4	3.5	1	3, 4, 5

Note ⁽¹⁾ Based on cross-recessed head screw for precision equipment (Number 0) in Japan Camera Industry Standard JCIS 10-70.

Table 18 Hexagon socket head bolt



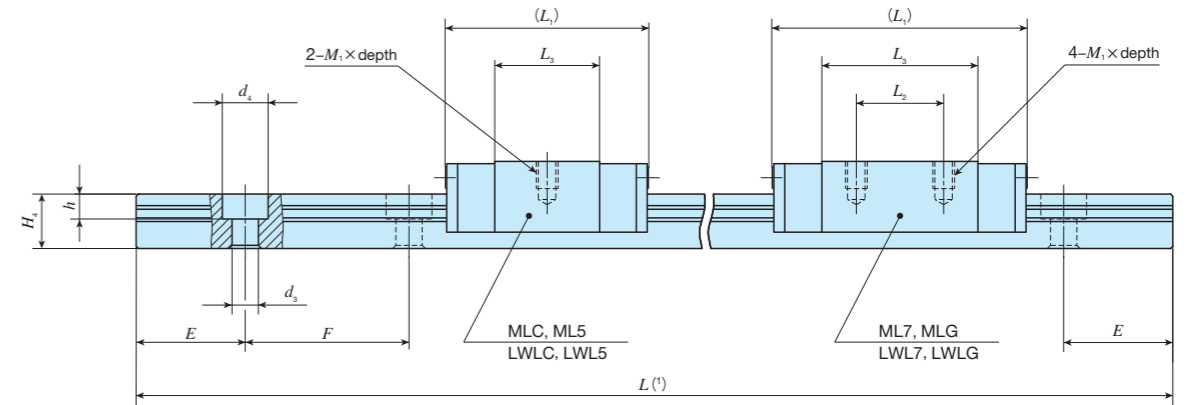
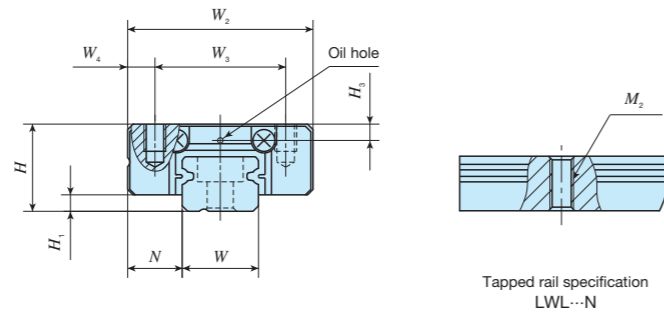
unit: mm

Bolt size (d)	Pitch of screw P	d_k	k	s	t	l
M1.4	0.3	2.6	1.4	1.3	0.6	2.5, 3, 4
M1.6 ⁽¹⁾	0.35	3	1.6	1.5	0.7	4, 5, 6
M2 ⁽¹⁾	0.4	3.8	2	1.5	1	3, 4, 5

Note ⁽¹⁾ Based on hexagon socket head bolts equivalent to JIS B 1176.

IKO C-Lube Linear Way ML

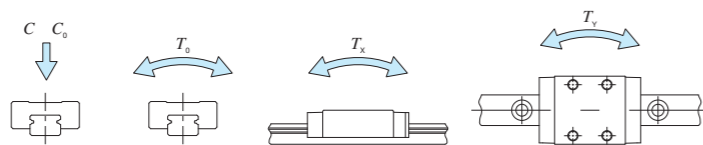
Standard type											
Shape	ML • LWL										
Size	<table border="1"> <tr> <td>1</td> <td>2</td> <td>3</td> <td>5</td> <td>7</td> </tr> <tr> <td>9</td> <td>12</td> <td>15</td> <td>20</td> <td>25</td> </tr> </table>	1	2	3	5	7	9	12	15	20	25
1	2	3	5	7							
9	12	15	20	25							



Identification number	Interchangeable	Mass (Ref.) g		Dimensions of assembly mm			Dimensions of slide unit mm							Dimensions of track rail mm						Appended mounting bolt for track rail (2) mm	Basic dynamic load rating (4) C N	Basic static load rating (4) C0 N	Static moment rating (4) N·m									
		Slide unit	Track rail (per 100 mm)	H	H1	N	W2	W3	W4	L1	L2	L3	M1×depth	H3	W	H4	M2	d3	d4				h	E	F	T0	Tx	Ty				
MLC 5	LWLC 5...B	○	3.4	12	6	1	3.5	12	8	2	16	-	9.6	M2×1.5	1.2	5	3.7	-	2.4	3.6	0.8	7.5	15	Cross-recessed pan head screw for precision equipment M2×6	562	841	2.2	1.4 8.5	1.2 7.2			
MLC 5...N*	LWLC 5...N*	-	13	M2.5 Through														-	-	-	M2.5×ℓ (3) (Not appended)											
ML 5	LWL 5...B	○	4.3	12														19	12.6	-	2.4			3.6						0.8	Cross-recessed pan head screw for precision equipment M2×6	
ML 5...N*	LWL 5...N*	-	4.3	13														M2.5 Through	-	-	-			M2.5×ℓ (3) (Not appended)								
MLC 7	LWLC 7...B	○	6.7	22	8	1.5	5	17	12	2.5	19	-	9.6	M2×2.5	1.5	7	5	-	2.4	4.2	2.3	7.5	15	Hexagon socket head bolt M2×6	937	1 140	4.1	1.8 14.9	1.5 12.5			
MLC 7...N*	LWLC 7...N*	-	6.7	24														M3 Through	-	-	-			M3×ℓ (3) (Not appended)								
ML 7	LWL 7...B	○	9.1	22														23.5	8	14.3	-			2.4						4.2	2.3	Hexagon socket head bolt M2×6
ML 7...N*	LWL 7...N*	-	9.1	24														M3 Through	-	-	-			M3×ℓ (3) (Not appended)								
MLG 7	LWLG 7...B	○	13	22	31	12	21.6	-	-	-	31	12	21.6	-	-	7	5	-	2.4	4.2	2.3	7.5	15	Hexagon socket head bolt M2×6	1 690	2 650	9.7	8.8 50.7	7.4 42.5			
MLG 7...N*	LWLG 7...N*	-	13	24														M3 Through	-	-	-			M3×ℓ (3) (Not appended)								
MLG 7	LWLG 7...B	○	14	22														-	-	-	-			2.4						4.2	2.3	Hexagon socket head bolt M2×6
MLG 7...N*	LWLG 7...N*	-	14	24														M3 Through	-	-	-			M3×ℓ (3) (Not appended)								

Notes (1) Track rail lengths L are shown in Table 3.1 on page II - 10.
 (2) The appended track rail mounting bolts are hexagon socket head bolts equivalent to JIS B 1176 or JCS10-70 cross-recessed pan head screw for precision equipment.
 (3) Choose screws whose dimension allow fixing thread depth into track rail ℓ to be less than H_4 .
 (4) The direction of basic dynamic load rating (C), basic static load rating (C_0), and static moment rating (T_0 , T_x , T_y) are shown in the sketches below.
 The upper values of T_x and T_y are for one slide unit and the lower values are for two slide units in close contact.
 If hybrid C-Lube Linear Way specification (supplemental code "/HB") is selected in MLC7, ML7, and MLG7, see Table 10 on page II - 17.

Remarks 1. The specification of oil hole is shown in Table 13 on page II - 18.
 2. The identification numbers with * are our semi-standard items.

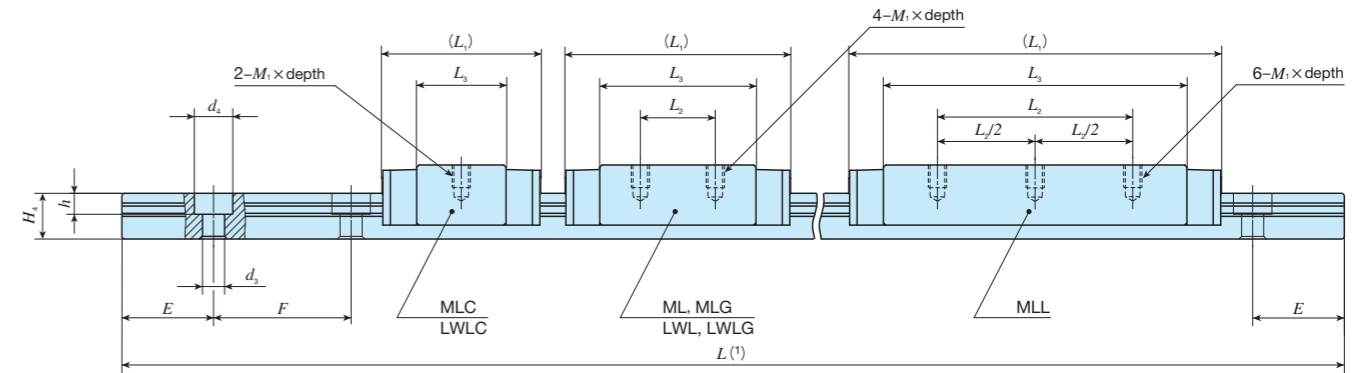
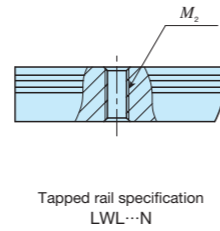
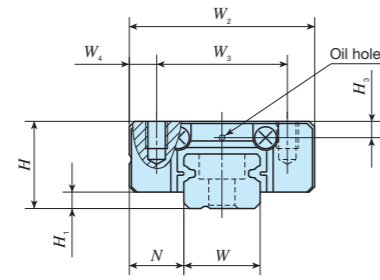


Example of identification number of assembled set

Model code	Dimensions	Part code	Model code	Preload symbol	Classification symbol	Interchangeable code	Supplemental code
ML	C	7	C2	R120	T1	P	/D
1	2	3	4	5	6	7	8
1 Model	2 Length of slide unit	3 Size	4 Number of slide unit (2)	5 Length of track rail (120 mm)	6 Preload amount	7 Accuracy class	8 Interchangeable
ML LWL...B LWL...N	C Short No symbol Standard G Long	5, 7	2	120	T0 Clearance No symbol Standard T1 Light preload	H High P Precision	No symbol Non-interchangeable specification S1 S1 specification S2 S2 specification
							9 Special specification
							A, BS, D, E, HB, I, LR MN, N, Q, RE, S, W, Y

IKO C-Lube Linear Way ML

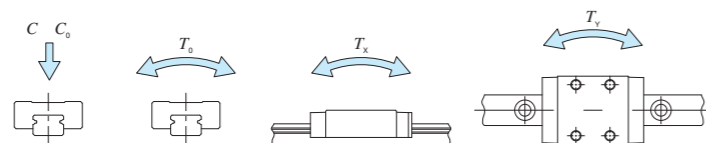
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Shape	ML • LWL										
Size	<table border="1"> <tr> <td>1</td><td>2</td><td>3</td><td>5</td><td>7</td> </tr> <tr> <td>9</td><td>12</td><td>15</td><td>20</td><td>25</td> </tr> </table>	1	2	3	5	7	9	12	15	20	25
1	2	3	5	7							
9	12	15	20	25							



Identification number	Interchangeable	Mass (Ref.) g		Dimensions of assembly mm			Dimensions of slide unit mm							Dimensions of track rail mm						Appended mounting bolt for track rail mm Bolt size × ℓ	Basic dynamic load rating (4) C N	Basic static load rating (4) C0 N	Static moment rating (4)						
		Slide unit	Track rail (per 100 mm)	H	H1	N	W2	W3	W4	L1	L2	L3	M1 × depth	H3	W	H4	M2	d3	d4				h	E	F	T0 N · m	Tx N · m	Ty N · m	
MLC 9	LWLC 9...B	○	11	35	10	2	5.5	20	15	2.5	M3×3	2.2	21.5	—	11.9	9	6	—	3.5	6	3.5	10	20	M3×8	1 180	1 480	6.9	2.9 21.4	2.4 18.0
MLC 9...N*	LWLC 9...N*	—	37	—									—	—															
ML 9	LWL 9...B	○	18	35									30	10	20.8			—	3.5	6	3.5			M3×8					
—	LWL 9...BCS	○	19	35									—	—	—			—	—	—	—			M4 × ℓ (3) (Not appended)					
ML 9...N*	LWL 9...N*	—	18	37									—	—	—			—	—	—	—			M4 × ℓ (3) (Not appended)					
MLG 9	LWLG 9...B	○	26	35									40.5	15	30.9			—	3.5	6	3.5			M3×8					
MLG 9...N*	LWLG 9...N*	—	26	37									—	—	—			—	—	—	—			M4 × ℓ (3) (Not appended)					
MLL 9	—	○	34	35									50	26	40.4			—	3.5	6	3.5			M3×8					
MLL 9...N*	—	—	34	37									—	—	—			—	—	—	—			M4 × ℓ (3) (Not appended)					
MLC 12	LWLC 12...B	○	22	35									13	3	7.5			27	20	3.5	M3×3.5			2.7					
ML 12	LWL 12...B	○	34	35	34	15	21.6	—	—	—	—																		
—	LWL 12...BCS	○	35	35	—	—	—	—	—	—	—																		
MLG 12	LWLG 12...B	○	48	35	44	20	32	—	—	—	—																		
—	LWLG 12...N*	○	51	35	—	—	—	—	—	—	—																		
MLL 12	—	○	70	35	59.5	30	47.3	—	—	—	—																		

Notes (1) Track rail lengths L are shown in Table 3.1 on page II - 10 and Table 3.3 on page II - 12.
 (2) The appended track rail mounting bolts are hexagon socket head bolts equivalent to JIS B 1176. For stainless steel model, stainless steel bolts are appended.
 (3) Choose screws whose dimension allow fixing thread depth into track rail ℓ to be less than H_4 .
 (4) The direction of basic dynamic load rating (C), basic static load rating (C_0), and static moment rating (T_0 , T_x , T_y) are shown in the sketches below.
 The upper values of T_x and T_y are for one slide unit and the lower values are for two slide units in close contact.
 If hybrid C-Lube Linear Way specification (supplemental code "/HB") is selected in ML series, see Table 10 on page II - 17.

Remarks 1. The specification of oil hole is shown in Table 13 on page II - 18.
 2. The identification numbers with * are our semi-standard items.

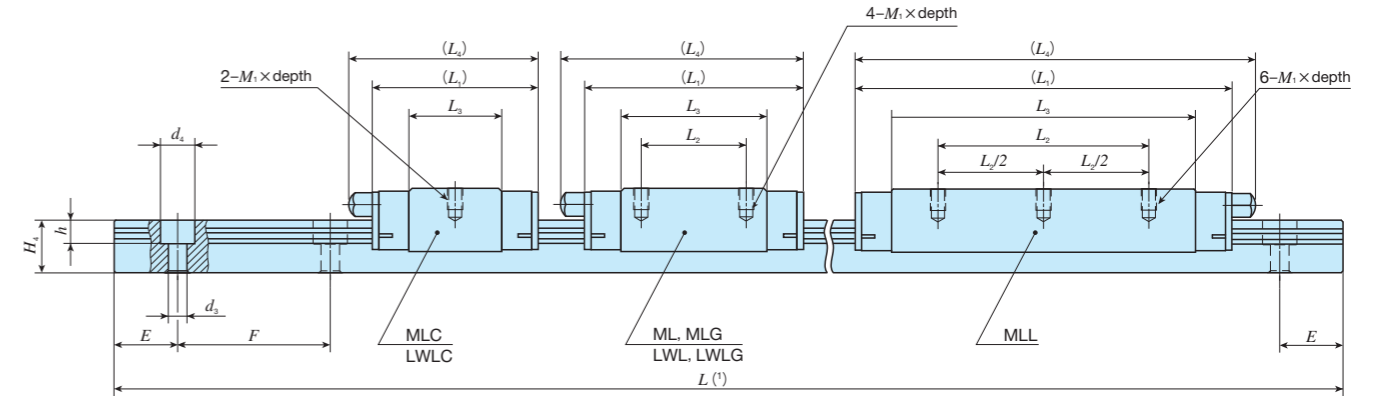
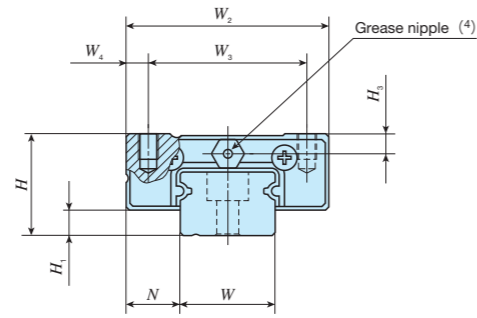


Example of identification number of assembled set

Model code	Dimensions	Part code	Model code	Material code	Preload symbol	Classification symbol	Interchangeable code	Supplemental code
ML	G	9	C2	R160	T1	P	/D	
①	②	③	④	⑤	⑥	⑦	⑧	⑩
① Model	② Length of slide unit		③ Size		⑦ Preload amount		⑩ Interchangeable	
ML LWL...B LWL...N	Standard type	9, 12		T0 Clearance T1 Standard T2 Light preload		No symbol Non-interchangeable specification S1 S1 specification S2 S2 specification		
C Short No symbol Standard G Long L Extra high rigidity long	④ Number of slide unit (2)		⑤ Length of track rail (160 mm)		⑧ Accuracy class		⑩ Special specification	
					H High P Precision		A, BS, D, E, HB, I, LR, MN N, Q, RE, S, U, W, Y	
⑥ Material type		⑨ Accuracy class		⑩ Special specification				
No symbol Stainless steel made CS High carbon steel made								

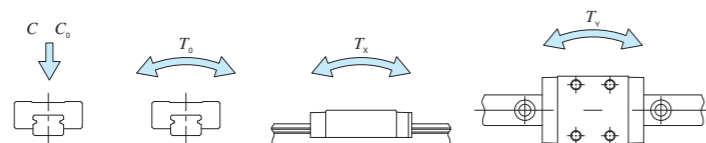
IKO C-Lube Linear Way ML

Standard type											
Shape	ML • LWL										
Size	<table border="1"> <tr> <td>1</td><td>2</td><td>3</td><td>5</td><td>7</td> </tr> <tr> <td>9</td><td>12</td><td>15</td><td>20</td><td>25</td> </tr> </table>	1	2	3	5	7	9	12	15	20	25
1	2	3	5	7							
9	12	15	20	25							



Identification number	Interchangeable	Mass (Ref.) g		Dimensions of assembly mm							Dimensions of slide unit mm					Dimensions of track rail mm						Appended mounting bolt for track rail (2) mm	Basic dynamic load rating (3) C N	Basic static load rating (3) C0 N	Static moment rating (3) N·m			
		Slide unit	Track rail (per 100 mm)	H	H1	N	W2	W3	W4	L1	L2	L3	L4	M1 × depth	H3	W	H4	d3	d4	h	E				F	Bolt size × ℓ	T0	Tx
MLC 15	○	43	107	16	4	8.5	32	25	3.5	32	—	17.8	37	M3×4	3.1	15	10	3.5	6.5	4.5	20	40	M3×10	3 490	3 890	30.0	11.7 84.5	9.8 70.9
LWLC 15...B	○	42								42	20	27.9	47															
ML 15	○	63								42	20	27.8	47															
LWL 15...B	○	64								42	20	27.8	47															
LWL 15...BCS	○	64								42	20	27.8	47															
MLG 15	○	93								57	25	42.8	62															
LWLG 15...B	○	95	57	25	42.7	62																						
MLL 15	○	122	72	40	57.7	76																						
MLC 20	○	89	156	20	5	10	40	30	5	38	—	22.3	43	M4×6	4.2	20	11	6	9.5	5.5	30	60	M5×14	4 580	5 300	54.0	19.4 134	16.3 112
LWLC 20...B	○	89								50	25	34.6	55															
ML 20	○	130								50	25	34.6	55															
LWL 20...B	○	133								50	25	34.6	55															
LWL 20...BCS	○	133								50	25	34.6	55															
MLG 20	○	189								68	30	52.3	73															
LWLG 20...B	○	196	68	30	52.3	73																						
MLC 25	○	189	243	25	5	12.5	48	35	6.5	54.5	—	31.9	64	M6×7	5	23	15	7	11.0	9.0	30	60	M6×16	9 120	10 600	128	57.4 376	48.1 316
LWLC 25...B	○	190								78	35	55.7	88															
ML 25	○	305								78	35	55.7	88															
LWL 25...B	○	310								78	35	55.7	88															
MLG 25	○	405	98	40	75.5	108																						
LWLG 25...B	○	413	98	40	75.5	108																						

- Notes (1) Track rail lengths L are shown in Table 3.1 on page II-10 and Table 3.3 on page II-12.
 (2) The appended track rail mounting bolts are hexagon socket head bolts equivalent to JIS B 1176. For stainless steel model, stainless steel bolts are appended.
 (3) The direction of basic dynamic load rating (C), basic static load rating (C_0), and static moment rating (T_0 , T_x , T_y) are shown in the sketches below. The upper values of T_x and T_y are for one slide unit and the lower values are for two slide units in close contact. If hybrid C-Lube Linear Way specification (supplemental code "/HB") is selected in MLC15, ML15, MLG15, and MLL15, see Table 10 on page II-17.
 (4) The shapes of grease nipple vary by size. The specifications are shown in Table 14 on page II-18.



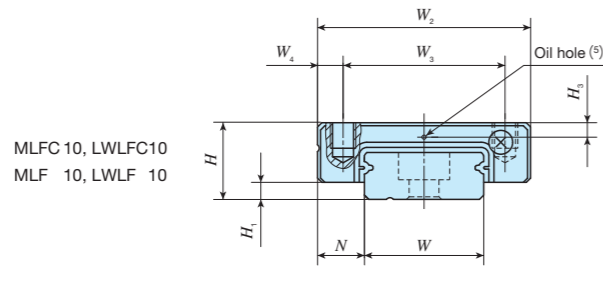
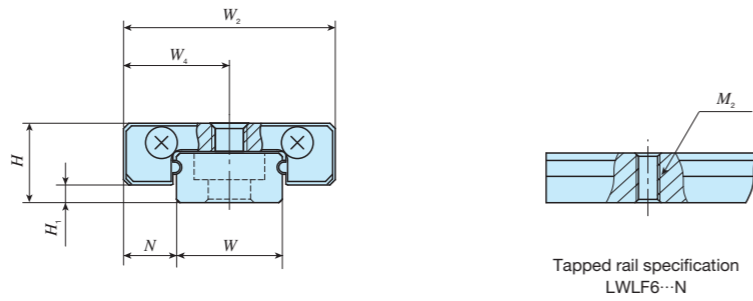
Example of identification number of assembled set

Model code	Dimensions	Part code	Model code	Material code	Preload symbol	Classification symbol	Interchangeable code	Supplemental code	
ML	G	15	C2	R320	T1	P	/D		
①	②	③	④	⑤	⑥	⑦	⑧	⑩	
① Model ML LWL...B Standard type	② Length of slide unit C Short No symbol Standard G Long L Extra high rigidity long	③ Size 15, 20, 25	④ Number of slide unit (2)	⑤ Length of track rail (320 mm)	⑥ Material type No symbol Stainless steel made CS High carbon steel made	⑦ Preload amount T0 Clearance No symbol Standard T1 Light preload	⑧ Accuracy class H High P Precision	⑨ Interchangeable No symbol Non-interchangeable specification S1 S1 specification S2 S2 specification	⑩ Special specification A, BS, D, E, HB, I, LR, MN N, Q, RE, S, U, W, Y

IKO C-Lube Linear Way ML

Wide type				
Shape	MLF • LWLF			
Size	4	6	10	14
	18	24	30	42

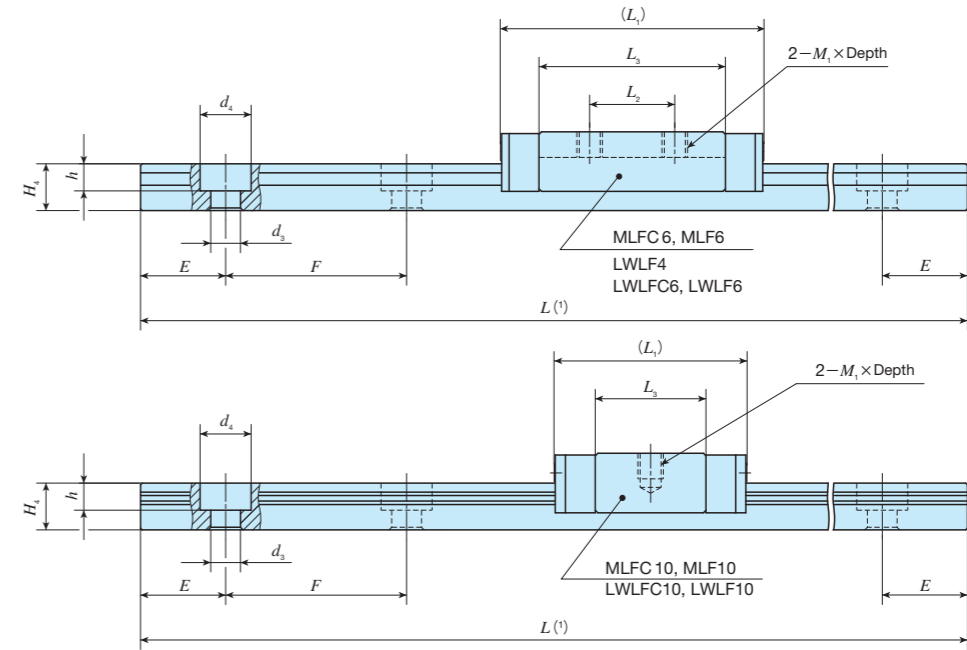
LWLF 4
MLFC 6, LWLFC 6
MLF 6, LWLF 6



MLFC 10, LWLFC 10
MLF 10, LWLF 10

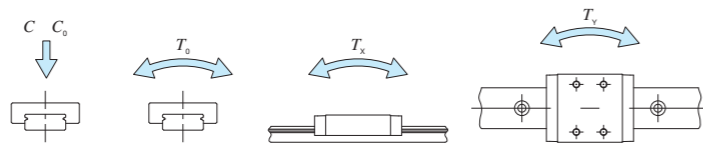
Tapped rail specification
LWLF6...N

Tapped rail specification
LWLF6...N



Identification number		Interchangeable	Mass (Ref.) g		Dimensions of assembly mm			Dimensions of slide unit mm							Dimensions of track rail mm						Appended mounting bolt for track rail mm Bolt size × ℓ	Basic dynamic load rating (1) C N	Basic static load rating (4) C0 N	Static moment rating (4)																															
MLF series	LWLF series (No C-Lube)		Slide unit	Track rail (per 100 mm)	H	H1	N	W2	W3	W4	L1	L2	L3	M1 × depth	H3	W	H4	M2	d3	d4				h	E	F	T0 N · m	Tx N · m	Ty N · m																										
—	LWLF 4(2)	—	2.1	6.8	4	1	3	10	—	5	17	6.5	11.9	M2 × 1.3	—	4	2.6	—	1.8	2.8	0.75	5	10	Cross-recessed pan head screw for precision equipment M1.6 × 5	390	677	1.4	1.3 7.1	1.5 8.4																										
MLFC 6(2)	LWLF 6(2)	—	2.1	13	4.5	1	3	12	—	6	15	4.5	9.8	M2 × 1.6	—	6	2.8	—	2.4	4	1.5	7.5	15	Cross-recessed pan head screw for precision equipment M2 × 4	334	542	1.7	0.84 5.1	1.0 6.1																										
MLFC 6...N(2)*	LWLF 6...N(2)*	—	2.1	12																				—						—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		
MLF 6(2)	LWLF 6(2)	—	2.4	13																				—						—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
MLF 6...N(2)*	LWLF 6...N(2)*	—	2.4	12																				—						—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
MLF 6(2)	LWLF 6(2)	—	3.1	13	6.5	1.5	3.5	17	13	2	20	8	14.6	M2.5 × 1.5	1.3	10	4	—	2.9	4.8	1.6	10	20	Cross-recessed pan head screw for precision equipment M2 × 4	443	813	2.5	1.8 9.9	2.2 11.8																										
MLF 6...N(2)*	LWLF 6...N(2)*	—	3.4	12																				—						—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
MLFC 10	LWLF 10...B	○	6.1	28																				—						—	—	—	—	—	20.5	—	13.6	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
MLFC 10...N*	LWLF 10...N*	—	5.9	29																				—						—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
MLF 10	LWLF 10...B	○	7.6	28	6.5	1.5	3.5	17	13	2	24.5	—	17.6	M2.5 × 1.5	1.3	10	4	—	2.9	4.8	1.6	10	20	Cross-recessed pan head screw for precision equipment M2.5 × 7	712	1 180	6.1	2.6 14.9	2.2 12.5																										
MLF 10...N*	LWLF 10...N*	—	3.4	12																				—						—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
MLF 10	LWLF 10...B	○	6.1	28																				—						—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
MLF 10...N*	LWLF 10...N*	—	5.9	29																				—						—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
MLF 10...N*	LWLF 10...N*	—	7.6	28	6.5	1.5	3.5	17	13	2	24.5	—	17.6	M2.5 × 1.5	1.3	10	4	—	2.9	4.8	1.6	10	20	Cross-recessed pan head screw for precision equipment M2.5 × 7	849	1 510	7.8	4.2 22.4	3.5 18.8																										
MLF 10...N*	LWLF 10...N*	—	7.5	29																				—						—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	

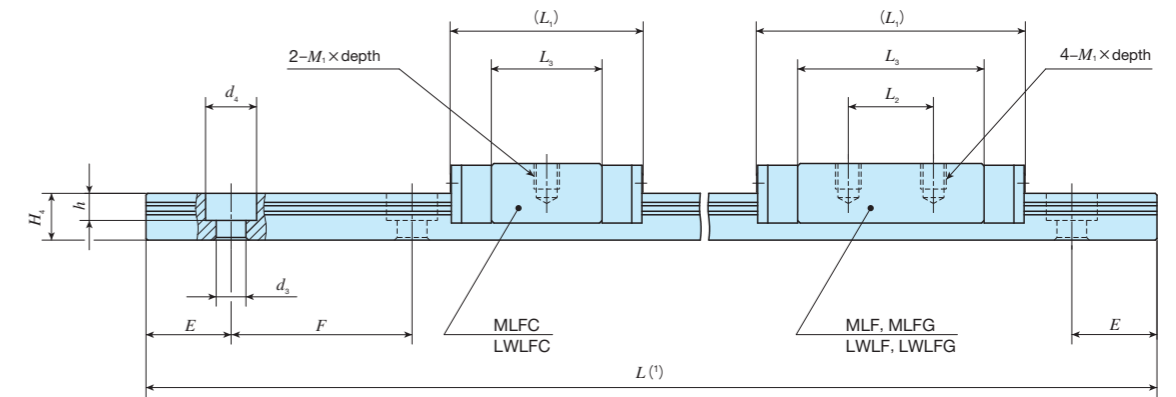
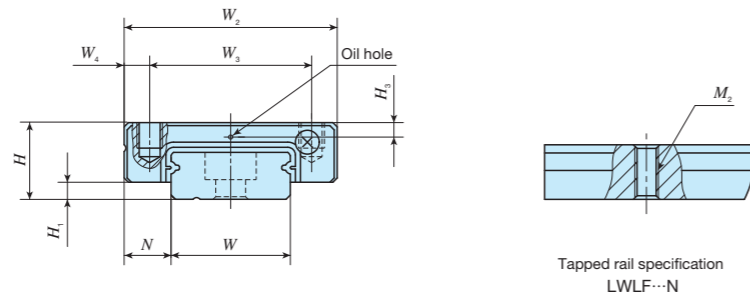
Notes (1) Track rail lengths L are shown in Table 3.2 on page II - 11.
 (2) Size 4 and 6 are non-retained-ball type. No end seal is attached.
 (3) Choose screws whose dimension allow fixing thread depth into track rail ℓ to be less than H_4 .
 (4) The direction of basic dynamic load rating (C), basic static load rating (C_0), and static moment rating (T_0 , T_x , T_y) are shown in the sketches below.
 The upper values of T_x and T_y are for one slide unit and the lower values are for two slide units in close contact.
 (5) No oil hole is prepared for size 4 and 6.
 The specification of oil hole for size 10 is shown in Table 13 on page II - 18.
 Remark: The identification numbers with * are our semi-standard items.



Example of identification number of assembled set

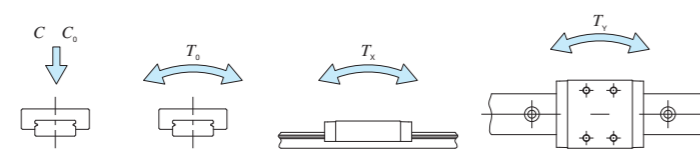
Model code	Dimensions	Part code	Model code	Preload symbol	Classification symbol	Interchangeable code	Supplemental code
MLF	C	10	C2	R120	T0	P	/D
①	②	③	④	⑤	⑥	⑦	⑧
① Model MLF LWLF(...B) LWLF...N Wide type	② Length of slide unit C Short No symbol Standard	③ Size 4, 6, 10	④ Number of slide unit (2)	⑤ Length of track rail (120 mm)	⑥ Preload amount T0 Clearance No symbol Standard	⑦ Accuracy class H High P Precision	⑧ Interchangeable No symbol Non-interchangeable specification S1 S1 specification S2 S2 specification
						⑨ Special specification A, BS, D, E, I, MN, N, Q RE, S, W, Y	

Wide type				
MLF • LWLF				
Shape				
Size	4	6	10	14
	18	24	30	42



Identification number	Interchangeable	Mass (Ref.) g		Dimensions of assembly mm			Dimensions of slide unit mm							Dimensions of track rail mm							Appended mounting bolt for track rail (2) mm	Basic dynamic load rating (4) C N	Basic static load rating (4) C0 N	Static moment rating (4)									
		Slide unit	Track rail (per 100 mm)	H	H1	N	W2	W3	W4	L1	L2	L3	M1 × depth	H3	W	H4	M2	d3	d4	h				E	F	T0 N · m	Tx N · m	Ty N · m					
MLFC 14	LWLF 14...B	○	13	54	9	2	5.5	25	19	3	31.5	10	22	M3×3	1.7	14	5.5	-	3.5	6	3.2	15	30	M3×8	1 240	1 700	12.2	3.8 24.6	3.2 20.7				
MLFC 14...N*	LWLF 14...N*	-	13	56																				22.5						-	13	M4 Through	M4 × ℓ (3) (Not appended)
MLF 14	LWLF 14...B	○	20	54																				22.5						-	13	-	M3×8
MLF 14...N*	LWLF 14...N*	-	20	56																				22.5						-	13	M4 Through	M4 × ℓ (3) (Not appended)
MLFG 14	LWLF 14...B	○	29	54																				42						19	32.5	-	M3×8
MLFG 14...N*	LWLF 14...N*	-	29	56																				42						19	32.5	M4 Through	M4 × ℓ (3) (Not appended)

Notes (1) Track rail lengths L are shown in Table 3.2 on page II - 11.
 (2) The appended track rail mounting bolts are hexagon socket head bolts equivalent to JIS B 1176.
 (3) Choose screws whose dimension allow fixing thread depth into track rail ℓ to be less than H_4 .
 (4) The direction of basic dynamic load rating (C), basic static load rating (C_0), and static moment rating (T_0 , T_x , T_y) are shown in the sketches below.
 The upper values of T_x and T_y are for one slide unit and the lower values are for two slide units in close contact.
 Remarks 1. The specification of oil hole is shown in Table 13 on page II - 18.
 2. The identification numbers with * are our semi-standard items.



Example of identification number of assembled set

Model code	Dimensions	Part code	Model code	Preload symbol	Classification symbol	Interchangeable code	Supplemental code
MLF	G	14	C2	R240	T1	P	/D
1	2	3	4	5	6	7	8

① Model

MLF	Wide type
LWLF...B	
LWLF...N	

② Length of slide unit

C	Short
No symbol	Standard
G	Long

③ Size

14

④ Number of slide unit (2)

⑤ Length of track rail (240 mm)

⑥ Preload amount

T0	Clearance
No symbol	Standard
T1	Light preload

⑦ Accuracy class

H	High
P	Precision

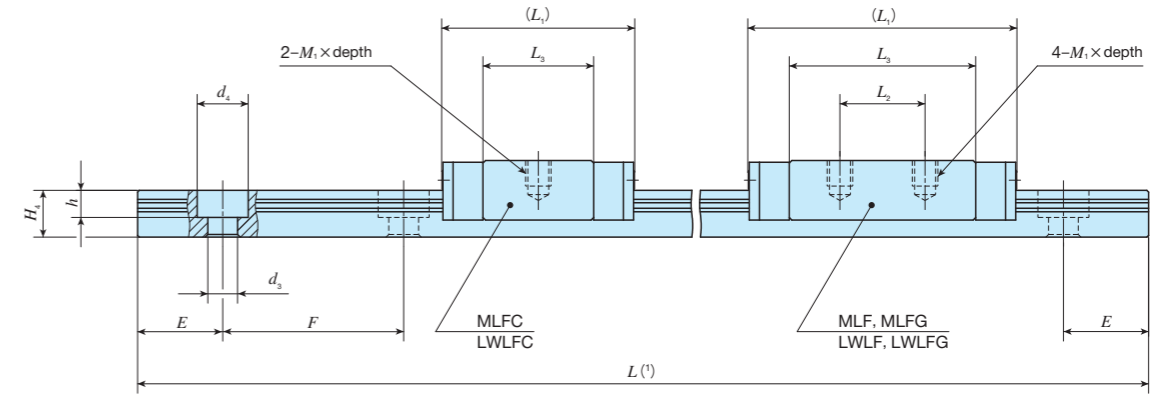
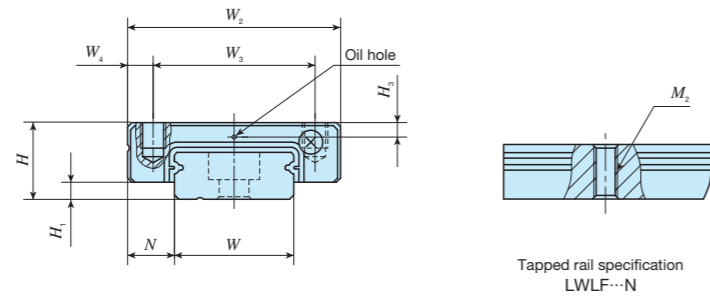
⑧ Interchangeable

No symbol	Non-interchangeable specification
S1	S1 specification
S2	S2 specification

⑨ Special specification

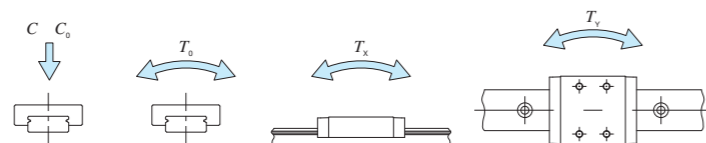
A, BS, D, E, I, LR, MN
N, Q, RE, S, W, Y

Wide type				
Shape	MLF • LWLF			
Size	4	6	10	14
	18	24	30	42



Identification number	Interchangeable	Mass (Ref.) g		Dimensions of assembly mm			Dimensions of slide unit mm							Dimensions of track rail mm							Appended mounting bolt for track rail (2) mm	Basic dynamic load rating (4) C N	Basic static load rating (4) C0 N	Static moment rating (4) N·m																																		
		Slide unit	Track rail (per 100 mm)	H	H1	N	W2	W3	W4	L1	L2	L3	M1×depth	H3	W	H4	M2	d3	d4	h				E	F	T0	Tx	Ty																														
MLFC 18	LWLFC 18...B	○	26	90	12	3	6	30	21	4.5	38.5	12	28.6	M3×3	2.5	18	7	-	3.5	6.5	4.5	15	30	M3×8	2 280	3 810	34.9	16.9	88.8	14.2	74.5																											
MLFC 18...N*	LWLFC 18...N*	-	92	26.5																												-	16.6	M4 Through	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MLF 18	LWLF 18...B	○	42	90																												23	3.5																									50.5
-	LWLF 18...BCS	○	44	92																												59	28	46.3	M4 Through	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MLFG 18	LWLFG 18...B	○	59	90																												59	28	46.3																								M4 Through
MLFG 18...N*	LWLFG 18...N*	-	61	92																												59	28	46.3	M4 Through	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MLFC 24	LWLFC 24...B	○	46	90																												30.5	-	17.7																								M3×3.5
MLF 24	LWLF 24...B	○	74	92																												44	15	31	M3×3.5	3.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
-	LWLF 24...BCS	○	76	92																												59	28	46.3																								M4 Through
MLFG 24	LWLFG 24...B	○	108	90																												59	28	46.3	M4 Through	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
-	LWLFG 24...N*	-	111	92	59	28	46.3	M4 Through	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-																											

Notes (1) Track rail lengths L are shown in Table 3.2 on page II - 11 and Table 3.3 on page II - 12.
 (2) The appended track rail mounting bolts are hexagon socket head bolts equivalent to JIS B 1176. For stainless steel model, stainless steel bolts are appended.
 (3) Choose screws whose dimension allow fixing thread depth into track rail ℓ to be less than H_4 .
 (4) The direction of basic dynamic load rating (C), basic static load rating (C_0), and static moment rating (T_0 , T_x , T_y) are shown in the sketches below.
 The upper values of T_x and T_y are for one slide unit and the lower values are for two slide units in close contact.
 Remarks 1. The specification of oil hole is shown in Table 13 on page II - 18.
 2. The identification numbers with * are our semi-standard items.

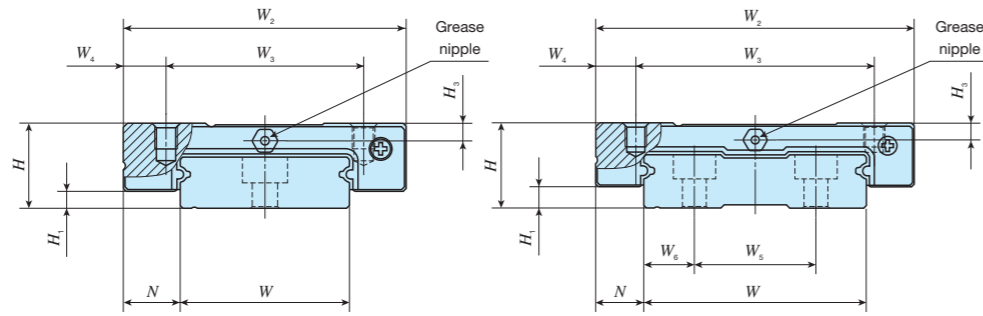


Example of identification number of assembled set

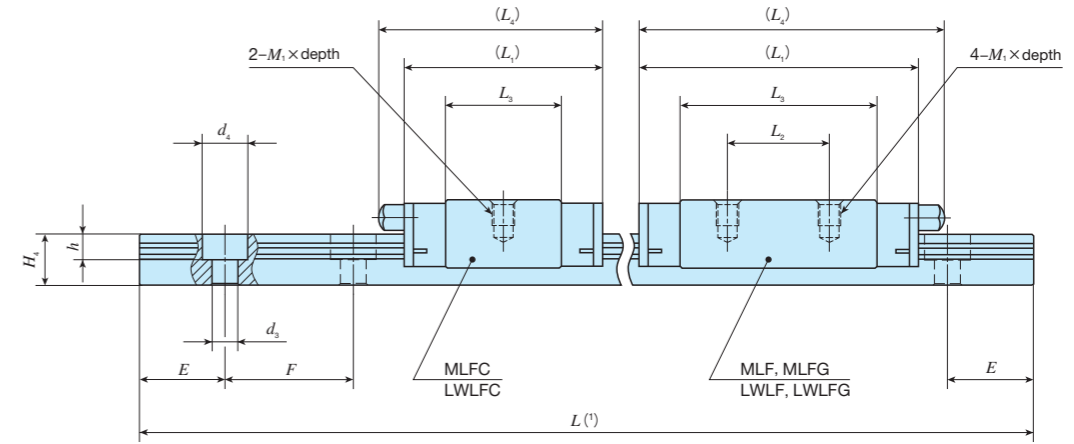
Model code	Dimensions	Part code	Model code	Material code	Preload symbol	Classification symbol	Interchangeable code	Supplemental code
MLF	G	18	C2	R300	T1	P	/D	
1	2	3	4	5	6	7	8	9
1 Model	2 Length of slide unit	3 Size	4 Number of slide unit (2)	5 Length of track rail (300 mm)	6 Material type	7 Preload amount	8 Accuracy class	9 Interchangeable
MLF LWLF...B Wide type LWLF...N	C Short No symbol Standard G Long	18, 24		300	No symbol Stainless steel made CS High carbon steel made	T0 Clearance No symbol Standard T1 Light preload	H High P Precision	No symbol Non-interchangeable specification S1 S1 specification S2 S2 specification
								10 Special specification
								A, BS, D, E, I, LR, MN N, Q, RE, S, U, W, Y

IKO C-Lube Linear Way ML

Wide type				
MLF • LWLF				
Shape				
Size	4	6	10	14
	18	24	30	42

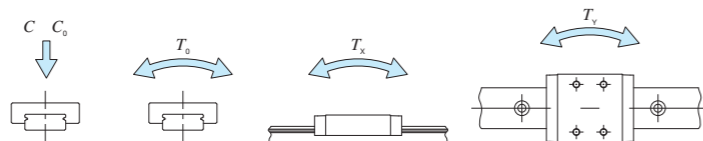


MLFC 42, LWLFC 42
MLF 42, LWLF 42
MLFG 42, LWLFG 42



Identification number	Interchangeable	Mass (Ref.) g		Dimensions of assembly mm			Dimensions of slide unit mm							Dimensions of track rail mm							Appended mounting bolt for track rail mm Bolt size × ℓ	Basic dynamic load rating ⁽²⁾ C N	Basic static load rating ⁽²⁾ C ₀ N	Static moment rating ⁽³⁾																										
		Slide unit	Track rail (per 100 mm)	H	H ₁	N	W ₂	W ₃	W ₄	L ₁	L ₂	L ₃	L ₄	M ₁ × depth	H ₃	W	H ₄	W ₅	W ₆	d ₃				d ₄	h	E	F	T ₀ N · m	T _x N · m	T _y N · m																				
MLFC 30	LWLFC 30...B	○	70	198	15	3	10	50	35	7.5	35.5	—	20.5	40	M4×4.5	3.1	30	9	—	—	4.5	8	4.5	20	40	M4×12	3 890	4 540	69.1	15.4 107	13.0 89.9																			
MLF 30	LWLF 30...B	○	111								49.5	18	34.8	54																		55	20	39	60	M4×4.5	7 050	9 840	209	61.3 333	51.4 280									
—	LWLF 30...BCS	○	112								68.5	35	53.8	73																												74.5	35	58.7	79	9 520	15 100	321	140 674	117 565
MLFG 30	LWLFG 30...B	○	167								74.5	35	58.7	79																																				
MLFC 42	LWLFC 42...B	○	95								41.5	—	25.7	46																		294	16	4	9	60	45	7.5	55	20	39	60	M4×4.5	3.2	42	10	23	9.5	4.5	8
MLF 42	LWLF 42...B	○	138	74.5	35	58.7	79	9 520	15 100	321	140 674	117 565																																						
—	LWLF 42...BCS	○	140	74.5	35	58.7	79						9 200	14 400	305	126 644	106 541																																	
MLFG 42	LWLFG 42...B	○	200	74.5	35	58.7	79											9 200	14 400	305	126 644	106 541																												
—	LWLFG 42...B	○	204	74.5	35	58.7	79																9 200	14 400	305	126 644	106 541																							

Notes (1) Track rail lengths L are shown in Table 3.2 on page II - 11 and Table 3.3 on page II - 12.
 (2) The appended track rail mounting bolts are hexagon socket head bolts equivalent to JIS B 1176. For stainless steel model, stainless steel bolts are appended.
 (3) The direction of basic dynamic load rating (C), basic static load rating (C_0), and static moment rating (T_0 , T_x , T_y) are shown in the sketches below.
 The upper values of T_x and T_y are for one slide unit and the lower values are for two slide units in close contact.
 Remark: The specifications of grease nipple are shown in Table 14 on page II - 18.



Example of identification number of assembled set

Model code	Dimensions	Part code	Model code	Material code	Preload symbol	Classification symbol	Interchangeable code	Supplemental code	
MLF	G	42	C2	R320	T ₁	P	/D		
①	②	③	④	⑤	⑥	⑦	⑧	⑨	
① Model MLF LWLF...B Wide type	② Length of slide unit C Short No symbol Standard G Long	③ Size 30, 42	④ Number of slide unit (2)	⑤ Length of track rail (320 mm)	⑥ Material type No symbol Stainless steel made CS High carbon steel made	⑦ Preload amount T ₀ Clearance No symbol Standard T ₁ Light preload	⑧ Accuracy class H High P Precision	⑨ Interchangeable No symbol Non-interchangeable specification S1 S1 specification S2 S2 specification	⑩ Special specification A, BS, D, E, I, LR, MN N, Q, RE, S, U, W, Y

C-Lube Linear Way MLV

MLV



C-Lube Linear Way MLV

MLV



Long term maintenance free compliant!

The aquamarine end plate is the symbol of maintenance free.

Track rail

Slide unit

Casing

Circulation pipe

C-Lube

Ball

End plate

Scraper

Ball retaining band

Oil hole

Points

1 Extremely small size realized by simple structure

For details [P.I-19](#)

Super small-size linear motion rolling guide produced by two-row four-point contact simple structure and original small sizing technology.

2 Long term maintenance free

For details [P.I-11](#)

The built-in "C-Lube", the capillary lubricating element, in the ball circulation pipes of the slide unit makes it long term maintenance free.

Lubrication oil is continuously supplied to the surface of rolling elements by surface tension in the contact of the capillary lubricating element surface and rolling elements.

3 Cost performance

Preserving the basic performance of C-Lube Linear Way ML as is, lower cost has been achieved by reviewing the structure including the ball recirculation part.

4 Ball retained type for easy operation

The slide unit incorporates the ball retaining band, which prevents the ball from dropping down when the slide unit is removed from the track rail. This safety structure brings you an easy operation to the machines/equipment.

5 Stainless steel selections for excellent corrosion resistance

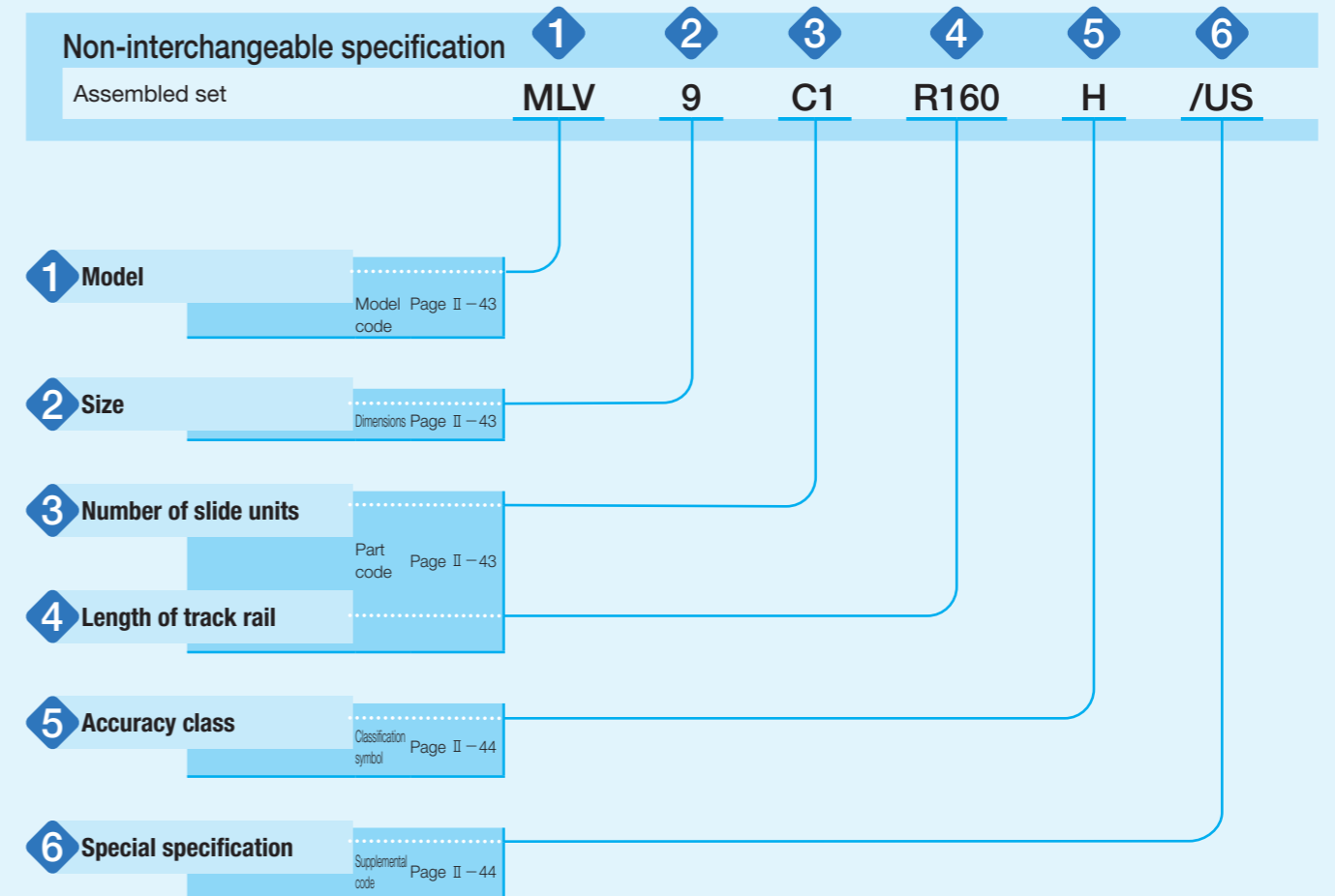
For details [P.I-39](#)

Stainless steel highly corrosion-resistant is used as the basic specification, so that the products are suitable for applications where rust prevention oil is not preferred, such as in cleanroom environment.

Identification Number and Specification

Example of an Identification Number

The specifications of the MLV series are indicated by the identification number. Indicate the identification number, consisting of a model code, dimensions, a part code, a classification symbol, and any supplemental codes for each specification to apply.



Identification Number and Specification — Model · Size · Number of Slide Unit · Length of Track Rail —

1 Model	C-Lube Linear Way MLV (MLV series)	: MLV
2 Size	7, 9, 12	
3 Number of slide units	: C○	Indicates the number of slide units assembled on a track rail.
4 Length of track rail	: R○	Indicate the length of track rail in mm. For standard and maximum lengths, see Table 1.

Table 1 Standard and maximum lengths of track rail

unit: mm

Identification number	MLV 7	MLV 9	MLV 12
Item			
Standard length L (n)	60 (4)	60 (3)	100 (4)
	90 (6)	80 (4)	150 (6)
	120 (8)	120 (6)	200 (8)
	150 (10)	160 (8)	275 (11)
	180 (12)	220 (11)	350 (14)
	240 (16)	280 (14)	475 (19)
Pitch of mounting holes F	15	20	25
E	7.5	10	12.5
Standard E or higher dimensions below	4.5	4.5	5
Maximum length	300	860	1 000

Remark: If not directed, E dimensions for both ends will be the same within the range of standard E dimensions. To change the dimensions, indicate the specified rail mounting hole positions "/E" of special specification. For more information, see page III-30.

— Accuracy Class · Special Specification —

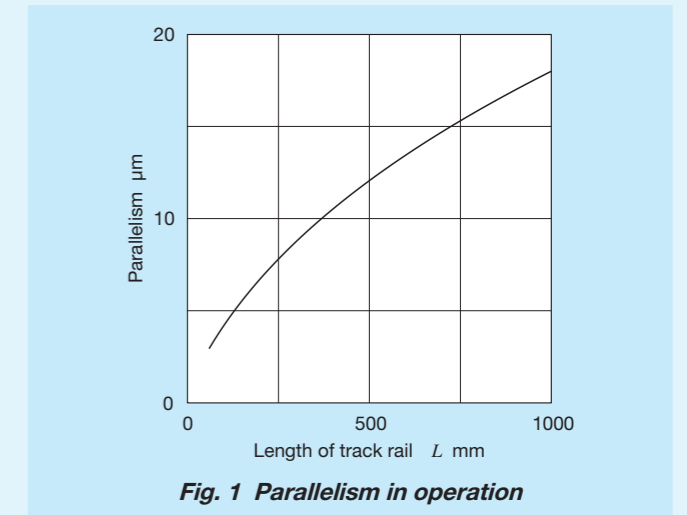
5 Accuracy class	High	: H	For details of accuracy class, see Table 2.
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Table 2 Tolerance and allowance

Unit: mm

Class (Classification symbol)	High (H)
Item	
Dim. H tolerance	± 0.020
Dim. N tolerance	± 0.025
Dim. variation of H (1)	0.015
Dim. variation of N (1)	0.020
Parallelism in operation of the slide unit C surface to A surface	See Fig. 1.
Parallelism in operation of the slide unit D surface to B surface	See Fig. 1.

Note (1) It means the size variation between slide units mounted on the same track rail.



6 Special specification	/D, /E, /MN, /US, /W○, /YCG	For applicable special specifications, see Table 3. For combination of multiple special specifications, see Table 4. For details of special specifications, see page III-29.
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Table 3 Application of special specifications

Special specification	Supplemental code	Size		
		7	9	12
Opposite reference surfaces arrangement	/D	○	○	○
Specified rail mounting hole positions	/E	○	○	○
Without track rail mounting bolt	/MN	○	○	○
End seal	/US	○	○	○
A group of multiple assembled sets	/W○	○	○	○
Specified grease (Low Dust-Generation Grease for Clean Environment CG2)	/YCG	○	○	○

Table 4 Combination of supplemental codes

E	—				
MN	○	○			
US	○	○	○		
W	○	—	○	○	
YCG	○	○	○	○	○
	D	E	MN	US	W

Remarks: 1. The combination of "—" shown in the table is not available.
2. When using multiple types for combination, please indicate by arranging the symbols in alphabetical order.

Preload

Preload for the MLV series is adjusted to have subtle clearance or minimal amount of preload.

Lubrication

Lithium-soap base grease (MULTEMP PS No.2 [KYODO YUSHI CO., LTD.]) is pre-packed in MLV series. Additionally, MLV series has C-Lube placed in the recirculation part of balls, so that the interval for reapplying lubricant can be extended and maintenance works such as grease job can be reduced significantly.

MLV series have an oil hole. (See Table 5)

Dedicated supplying equipment (miniature greasers) fit to oil holes are also available. For order of these parts for lubrication, see Table 13 on Page III-23.

Dust Protection

No end seal is provided for the MLV series. For applications in other than clean environment, cover the whole unit with a protective case, etc. to prevent harmful foreign substances such as dust and particles from entering.

We can also attach end seals (supplemental code "/US") on both sides of the slide unit. If needed, indicate the supplemental code.

Even with the use of the end seals to prevent dust from entering, if large amount of contaminants or dust are floating, or if large particles of foreign substances such as chips or sand may adhere to the track rail, it is recommended to attach a protective cover to the linear motion mechanism.

Table 5 Oil hole specifications

Size	d_1	d_2
7	0.5	1.2
9		1.5
12		2

unit: mm

Precaution for Use

1 Handling

A strong grip on the circulation pipes of the MLV series slide unit, will distort the circulation path, which may affect the operating performance; handle with care.

2 Mounting surface, reference mounting surface and typical mounting structure

When mounting the MLV series, properly align the reference mounting surfaces B and D of the track rail and the slide unit with the reference mounting surface of the table and the bed and fix them. (See Fig.2)

The reference mounting surfaces B and D and mounting surfaces A and C are precisely ground. Machining the mounting surface of the table and bed, such as machine or device, to high accuracy and mounting them properly will ensure stable linear motion with high accuracy.

Reference mounting surface of the slide unit is the upper surface when you see the mark on the C surface in normal position. The track rail reference mounting surface is identified by locating the mark on the top surface of the track rail. It is the side surface above the mark (in the direction the arrow point). (See Fig.3)

3 Shoulder height and corner radius of the reference mounting surface

For the opposite corner of the mating reference mounting, it is recommended to have relieved fillet as indicated in Fig. 4. Recommended value for the shoulder height on the mating side is indicated in Table 6.

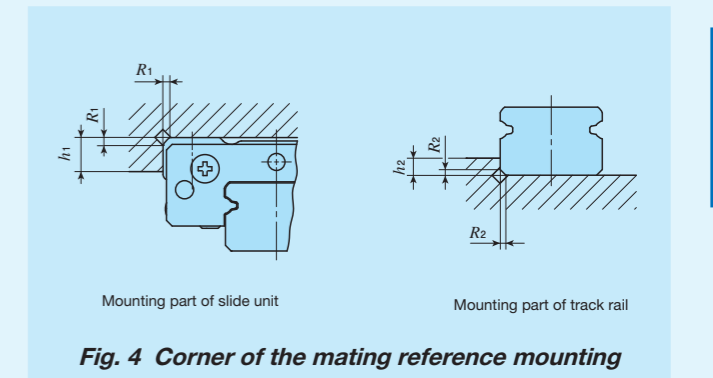


Table 6 Shoulder height and corner radius of the reference mounting surface

Size	Mounting part of slide unit		Mounting part of track rail	
	Shoulder height h_1	Corner radius R_1 (maximum)	Shoulder height h_2	Corner radius R_2 (maximum)
7	2.5	0.2	1.2	0.2
9	3	0.2	1.5	0.2
12	4	0.2	2.5	0.2

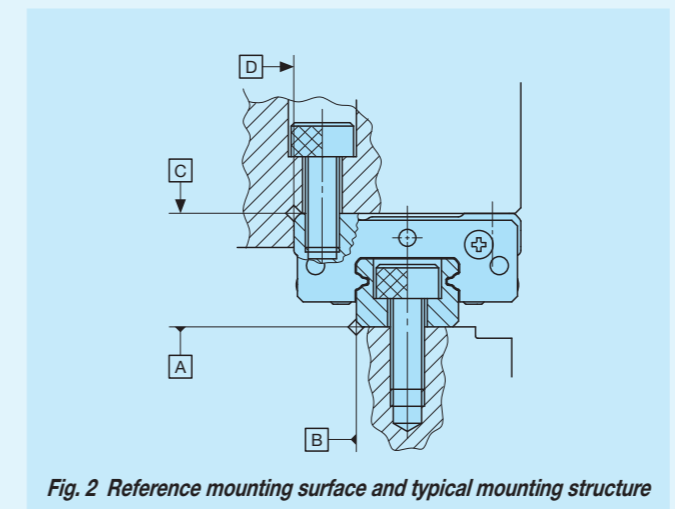


Fig. 2 Reference mounting surface and typical mounting structure

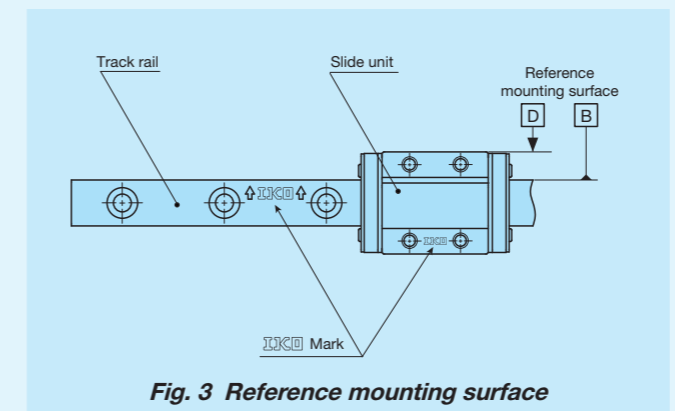


Fig. 3 Reference mounting surface

4 Tightening torque for fixing screw

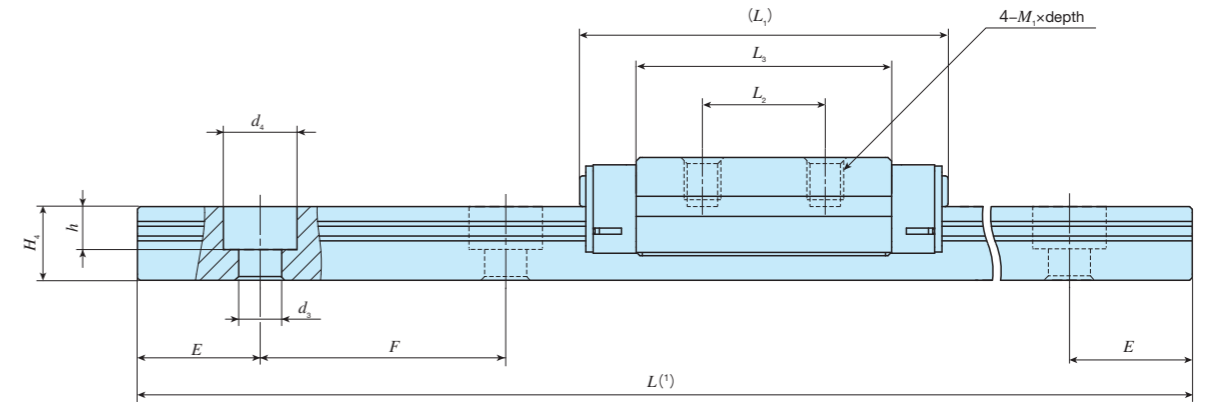
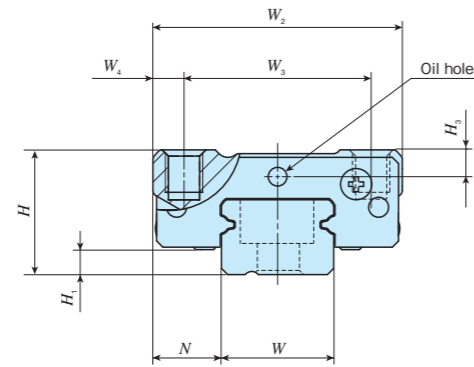
Typical tightening torque for mounting of the MLV series to the steel mating member material is indicated in Table 7. When vibration and shock of the machine or device are large, fluctuating load is large, or moment load is applied, fix it by using the torque 1.2 to 1.5 times larger than the value indicated in the table as necessary. If the mating member material is cast iron or aluminum alloy, reduce the tightening torque depending on the strength characteristics of the mating member material.

Table 7 Tightening torque for fixing screw

Bolt size	Tightening torque N · m
	Stainless steel-made screw
M2×0.4	0.31
M3×0.5	1.1

Remark: The tightening torque is calculated based on the property division A2-70.

Standard type			
Shape	MLV		
Size	7	9	12



Identification number	Mass (Ref.) g		Dimensions of assembly mm			Dimensions of slide unit mm								Dimensions of track rail mm						Appended mounting bolt for track rail (2) mm Bolt size × ℓ	Basic dynamic load rating (3) C N	Basic static load rating (3) C ₀ N	Static moment rating (3)			
	Slide unit	Track rail (Per 100 mm)	H	H ₁	N	W ₂	W ₃	W ₄	L ₁	L ₂	L ₃	M ₁ × depth	H ₃	W	H ₄	d ₃	d ₄	h	E				F	T ₀ N · m	T _x N · m	T _y N · m
MLV 7	8.4	22	8	1.5	5	17	12	2.5	23.5	8	14.3	M2×2	1.5	7	5	2.4	4.2	2.3	7.5	15	M2×6	1 330	1 890	6.9	4.7 28.2	3.9 23.6
MLV 9	17	35	10	2	5.5	20	15	2.5	30	10	20.8	M3×3	2.2	9	6	3.5	6	3.5	10	20	M3×8	1 810	2 760	12.8	9.1 51.1	7.6 42.9
MLV 12	31	65	13	3	7.5	27	20	3.5	34	15	21.6	M3×3.5	2.7	12	8	3.5	6.5	4.5	12.5	25	M3×8	3 330	4 290	26.6	15.4 93.1	12.9 78.2

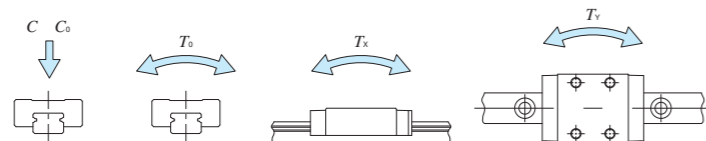
Notes (1) Track rail lengths L are shown in Table 1 on page II-43.

(2) The appended track rail mounting bolts are stainless steel hexagon socket head bolts equivalent to JIS B 1176.

(3) The direction of basic dynamic load rating (C), basic static load rating (C_0), and static moment rating (T_0 , T_x , T_y) are shown in the sketches below.

The upper values of T_x and T_y are for one slide unit and the lower values are for two slide units in close contact.

Remark: The specification of oil holes is shown in Table 5 on page II-45.



Example of identification number of assembled set

Model code Dimensions Part code Classification symbol Supplemental code

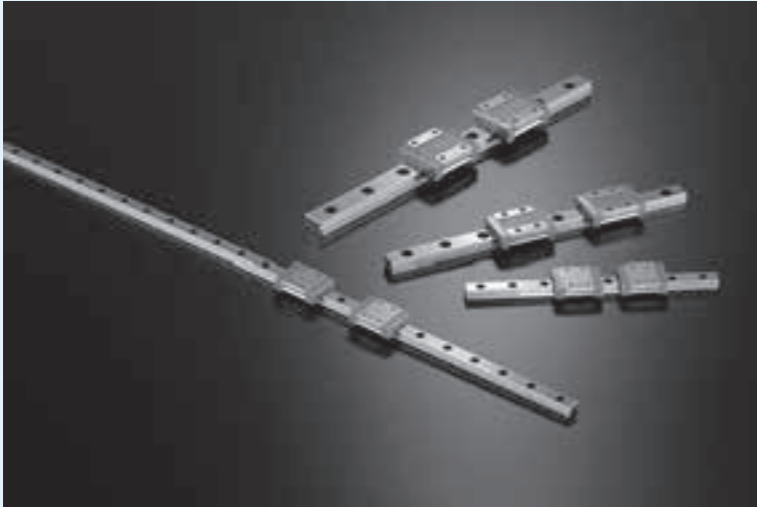
MLV **7** **C2** **R120** **H** **/US**

① ② ③ ④ ⑤ ⑥

① Model MLV C-Lube Linear Way MLV	④ Length of Track Rail (120mm)
② Size 7, 9, 12	⑤ Accuracy class H High
③ Number of slide units (2)	⑥ Special specification D, E, MN, US, W, YCG

C-Lube Linear Way MV

MV



C-Lube Linear Way MV

MV



Long term maintenance free compliant!

The aquamarine end plate is the symbol of maintenance free.

Track rail

Slide unit

Casing

C-Lube

Ball

End plate

End seal

Ball retaining band

Grease nipple

Points

1 Ultimate ball type linear motion rolling guide pursuing extra low profile and extra light weight

For details ▶ P.I-19

A linear motion rolling guide with extra low profile and extra light weight, achieved only because of the simple mechanism of two-row four-point contact structure.

2 High load capacity

Despite its extra low profile and extra light weight, it has the maximum load rating among the ball types and contributes to long life and increases safety of machine or device.

3 Long term maintenance free For details ▶ P.I-11

The built-in "C-Lube", the capillary lubricating element, in the ball circulation paths of the slide unit makes it long term maintenance free.

Lubrication oil is continuously supplied to the surface of rolling elements by surface tension in the contact of the capillary lubricating element surface and rolling elements.

4 Ball retained type for easy operation

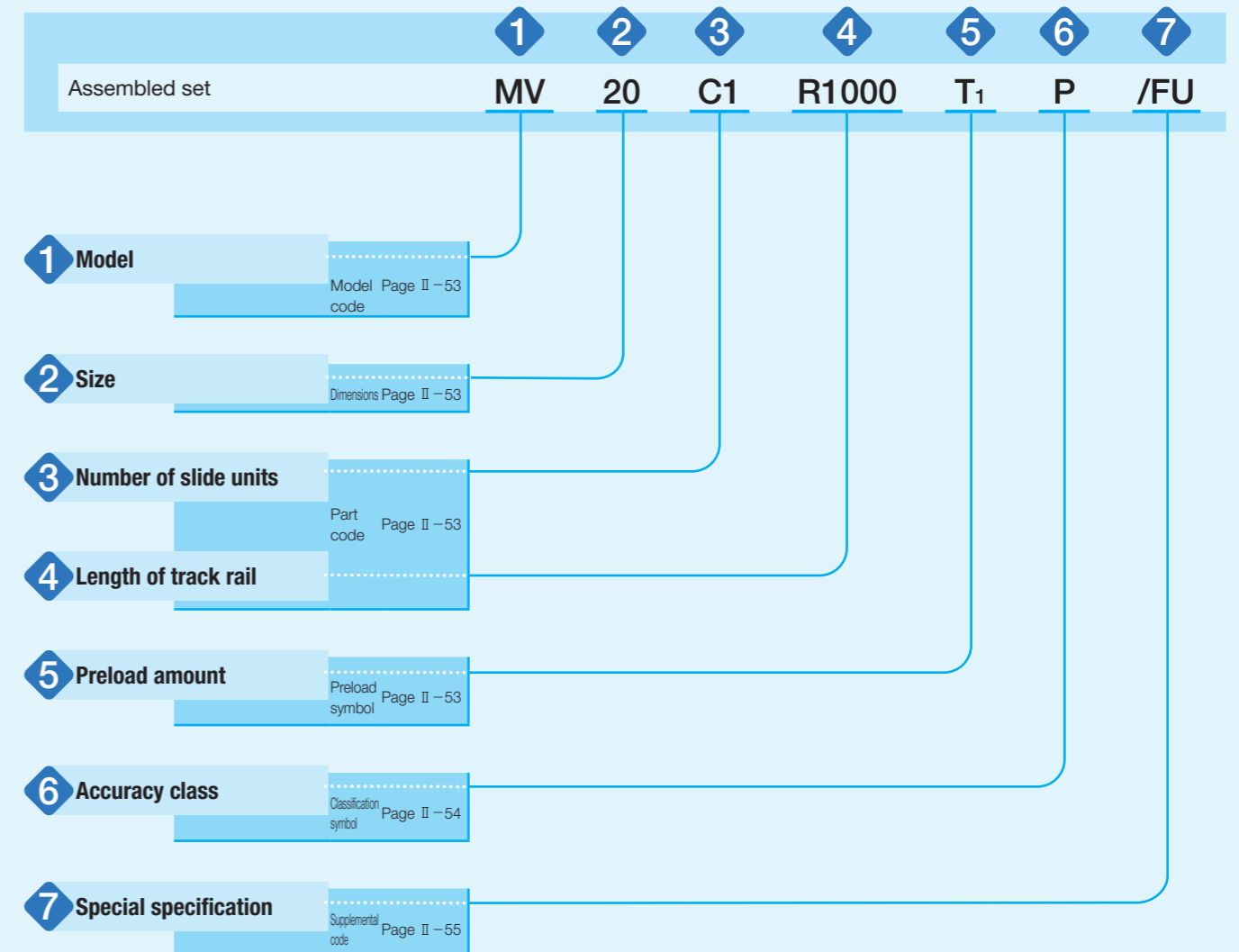
The slide unit incorporates the ball retaining band, which prevents the ball from dropping down when the slide unit is removed from the track rail. This safety structure brings you an easy operation to the machines/equipment.

Designation of Identification Number and Specification

Example of an Identification Number

The specifications of the MV series are indicated by the identification number.

Indicate the identification number, consisting of a model code, dimensions, a part code, a preload symbol, a classification symbol, and any supplemental codes for each specification to apply.



Identification Number and Specification – Model · Size · Number of Slide Unit · Length of Track Rail · Preload amount –

1 Model	C-Lube Linear Way MV : MV (MV series)
2 Size	20, 25, 30
3 Number of slide units	: C○ Indicates the number of slide units assembled on a track rail.
4 Length of track rail	: R○ Indicate the length of track rail in mm. For standard and maximum lengths, see Table 1.

Table 1 Standard and maximum lengths of track rail

Item	MV 20	MV 25	MV 30
Standard length L (n)	220 (4) 280 (5) 340 (6) 460 (8) 640 (11) 820 (14) 1 000 (17) 1 240 (21)	220 (4) 280 (5) 340 (6) 460 (8) 640 (11) 820 (14) 1 000 (17) 1 240 (21) 1 600 (27)	280 (4) 440 (6) 600 (8) 760 (10) 1 000 (13) 1 240 (16) 1 640 (21) 2 040 (26) 2 520 (32) 3 000 (38)
Pitch of mounting holes F	60	60	80
E	20	20	20
Standard E or higher dimensions below	8 38	9 39	9 49
Maximum length ⁽¹⁾	2 200 (2 980)	2 980	3 000

Note ⁽¹⁾ Length up to the value in () can be produced. If needed, please contact IKO.
Remark: If not directed, E dimensions for both ends will be the same within the range of E reference dimensions. To change the dimensions, indicate the specified rail mounting hole positions "/ E " of special specification. For more information, see page III -30.

5 Preload amount	Clearance : T _c Standard : No symbol Light preload : T ₁	For details of the preload amount, see Table 2.
-------------------------	--	---

Table 2 Preload amount

Preload type	Preload symbol	Preload amount N	Operational conditions
Clearance	T _c	0 ⁽¹⁾	· Very light motion · To absorb slight errors
Standard	(No symbol)	0 ⁽²⁾	· Light and precise motion
Light preload	T ₁	0.02C ₀	· Almost no vibrations · Load is evenly balanced · Light and precise motion

Notes ⁽¹⁾ Clearance of about 10 μm
⁽²⁾ Indicates zero or minimal amount of preload.
Remark: C₀ indicates the basic static load rating.

– Accuracy Class –

6 Accuracy class	Ordinary : No symbol High : H Precision : P Super precision : SP	For details of accuracy class, see Table 3. For applicable combinations of accuracy class and preload amount, see Table 4.
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Table 3 Tolerance and allowance

Class (Classification symbol)	Ordinary (No symbol)	High (H)	Precision (P)	Super precision (SP)
Dim. H tolerance	±0.080	±0.040	±0.020	±0.010
Dim. N tolerance	±0.100	±0.050	±0.025	±0.015
Dim. variation of H ⁽¹⁾	0.025	0.015	0.007	0.005
Dim. variation of N ⁽¹⁾	0.030	0.020	0.010	0.007
Parallelism in operation of the slide unit C surface to A surface	See Fig. 1.			
Parallelism in operation of the slide unit D surface to B surface	See Fig. 1.			

Note ⁽¹⁾ It means the size variation between slide units mounted on the same track rail.

Table 4 Combination of accuracy class and preload

Item (preload symbol)	Ordinary (No symbol)	High (H)	Precision (P)	Super precision (SP)
Clearance (T _c)	○	—	—	—
Standard (no symbol)	○	○	○	○
Light preload (T ₁)	—	○	○	○

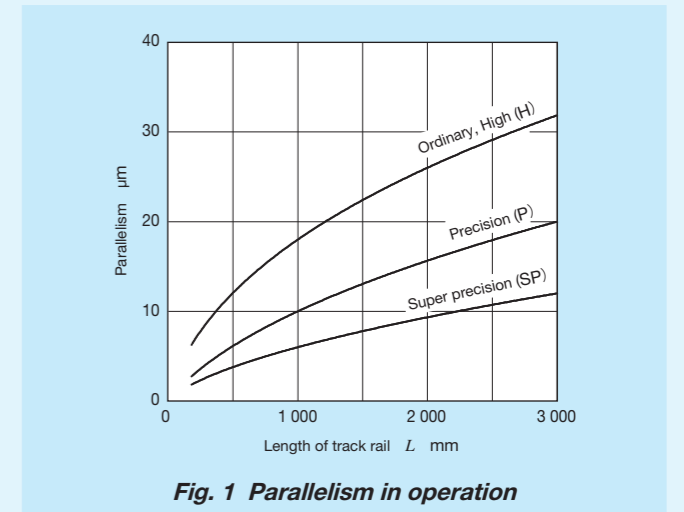


Fig. 1 Parallelism in operation

Lubrication

Lithium-soap base grease with extreme-pressure additive (Alvania EP grease 2 [SHOWA SHELL SEKIYU K. K.]) is pre-packed in MV series. Additionally, MV series has C-Lube placed in the recirculation part of balls, so that the interval for reapplying lubricant can be extended and maintenance works such as grease job can be reduced significantly.

MV series has grease nipple as indicated in Table 11. Supply nozzles fit to each shapes of grease nipple are also available. When these parts are desired, see Tables 14.1 and 14.2 on page III-23 and Table 15 on page III-24 to order.

Table 11 Parts for lubrication

Size	Grease nipple type (*)	Applicable supply nozzle type	Bolt size of female threads for piping
20	A-M3	A-5120V A-5240V B-5120V B-5240V	—
25	B-M4	A-8120V B-8120V	M4
30	B-M6	Grease gun available on the market	M6

Note (*) For grease nipple specification, see Table 14.1 and 14.2 on page III-23.
Remark: Stainless steel grease nipple is also available. If needed, please contact IKO.

Dust Protection

The slide units of MV series are equipped with end seals as standard for dust protection. However, if large amount of contaminant or dust are floating, or if large particles of foreign substances such as chips or sand may adhere to the track rail, it is recommended to cover the whole unit with bellows or telescope type shield, etc.

It is also effective to apply special specifications such as caps for rail mounting holes, under seal, double end seals and scrapers according to the use environment.

Precaution for Use

1 Mounting surface, reference mounting surface and typical mounting structure

When mounting the MV series, properly align the reference mounting surface B and D of the track rail and slide unit with the reference mounting surface of the table and bed and fix them. (See Fig.2)

The reference mounting surfaces B and D and mounting surfaces A and C are precisely ground. Machining the mounting surface of the table and bed, such as machine or device, to high accuracy and mounting them properly will ensure stable linear motion with high accuracy.

Reference mounting surface of the slide unit is the opposite side of the IKO mark. The track rail reference mounting surface is identified by locating the IKO mark on the top surface of the track rail. It is the side surface above the mark (in the direction of the arrow). (See Fig.3)

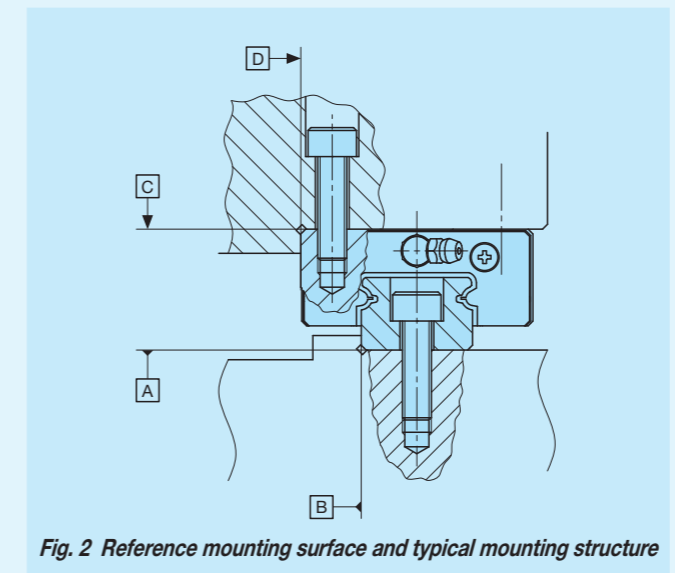


Fig. 2 Reference mounting surface and typical mounting structure

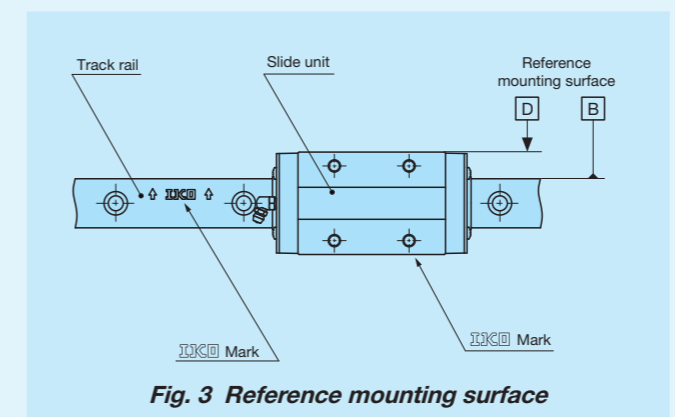


Fig. 3 Reference mounting surface

2 Shoulder height and corner radius of the reference mounting surface

For the opposite corner of the mating reference mounting, it is recommended to have relieved fillet as indicated in Fig.4. Recommended value for the shoulder height and corner radius on the mating side is indicated in Table 12.

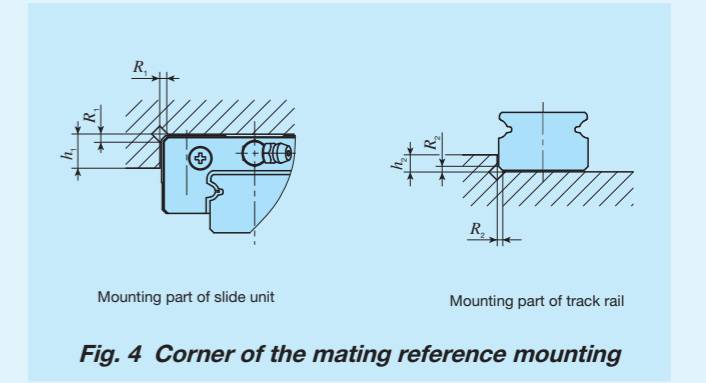


Fig. 4 Corner of the mating reference mounting

Table 12 Shoulder height and corner radius of the reference mounting surface

Size	Mounting part of slide unit		Mounting part of track rail	
	Shoulder height h_1	Corner radius R_1 (maximum)	Shoulder height h_2	Corner radius R_2 (maximum)
20	5	0.2	3	0.5
25	5	0.5	3	0.5
30	5	0.5	3	0.5

3 Tightening torque for fixing screw

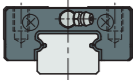
Typical tightening torque for mounting of the MV series to the steel mating member material is indicated in Table 13. When vibration and shock of the machine or device are large, fluctuating load is large, or moment load is applied, fix it by using the torque 1.2 to 1.5 times larger than the value indicated in the table as necessary. If the mating member material is cast iron or aluminum alloy, reduce the tightening torque depending on the strength characteristics of the mating member material.

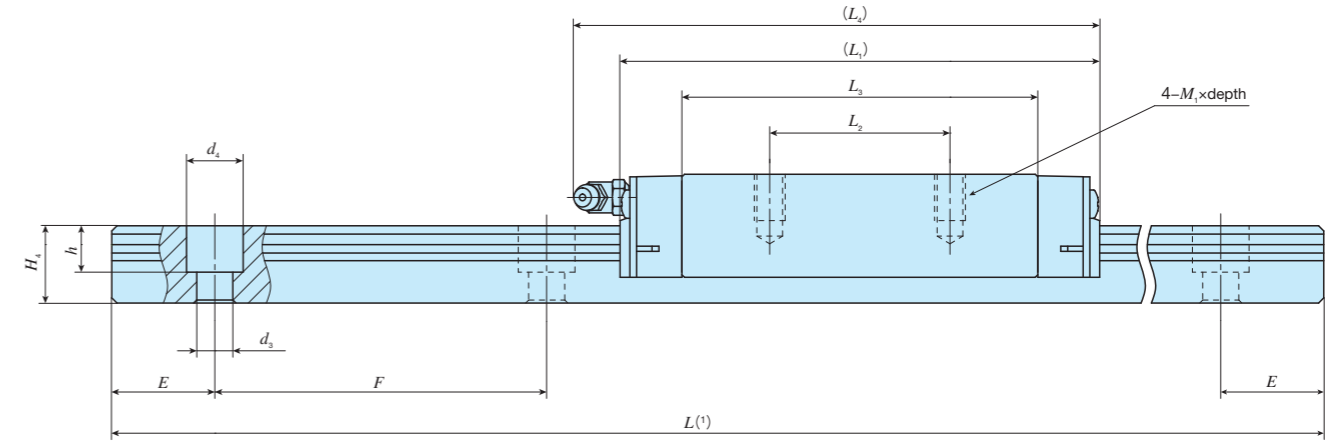
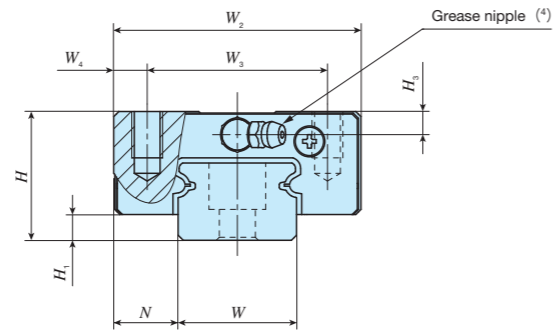
Table 13 Tightening torque for fixing screw

Bolt size	Tightening torque N · m	
	High carbon steel-made screw	Stainless steel-made screw
M5×0.8	8.0	5.0
M6×1	13.6	8.5
M8×1.25	32.7	20.4

Remark: The tightening torque is calculated based on strength division 12.9 and property division A2-70.



Standard type			
Shape	MV		
			
Size	20	25	30



Identification number	Mass (Ref.)		Dimensions of assembly mm			Dimensions of slide unit mm									Dimensions of track rail mm							Appended mounting bolt for track rail (2) mm Bolt size × ℓ	Basic dynamic load rating (3) C N	Basic static load rating (3) C ₀ N	Static moment rating (3)		
	Slide unit kg	Track rail kg/m	H	H ₁	N	W ₂	W ₃	W ₄	L ₁	L ₂	L ₃	L ₄	M ₁ × depth	H ₃	W	H ₄	d ₃	d ₄	h	E	F				T ₀	T _x	T _y
MV 20	0.18	1.66	20	5	11	42	32	5	73	32	51.2	76	M5×6	3.5	20	12	6	9.5	8.5	20	60	M5×14	19 600	25 600	138	115 624	102 555
MV 25	0.36	2.37	25	5	12.5	48	35	6.5	94	35	69.1	103	M6×9	4.5	23	15	7	11	9	20	60	M6×20	31 900	42 500	264	260 1 320	230 1 170
MV 30	0.72	3.33	30	6	16	60	40	10	116	40	86.6	126	M8×11	5	28	17	7	11	9	20	80	M6×20	46 300	61 800	468	467 2 350	414 2 090

Notes (1) Track rail lengths L are shown in Table 1 on page II-53.
 (2) Track rail mounting bolts are not appended. Hexagon socket head bolts of JIS B 1176 with strength division 12.9 are recommended.
 (3) The direction of basic dynamic load rating (C), basic static load rating (C_0), and static moment rating (T_0 , T_x , T_y) are shown in the sketches below. The upper values of T_x and T_y are for one slide unit and the lower values are for two slide units in close contact.
 (4) For specifications of grease nipple, see Table 11 on page II-57.

Example of identification number of assembled set

Model code	Dimensions	Part code	Preload symbol	Classification symbol	Supplemental code
MV	25	C2	R1000	T1	SP /FU
1	2	3	4	5	6

① Model
MV C-Lube Linear Way MV

② Size
20, 25, 30

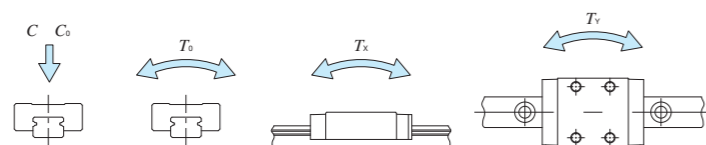
③ Number of slide units (2)

④ Length of Track Rail (1000mm)

⑤ Preload amount	
T _c	Clearance
No symbol	Standard
T ₁	Light preload

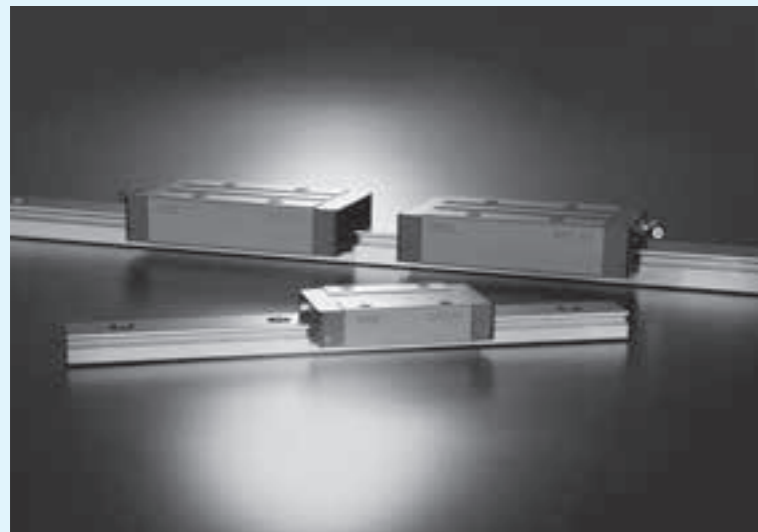
⑥ Accuracy class	
No symbol	Ordinary
H	High
P	Precision
SP	Super precision

⑦ Special specification
A, D, E, F, I, L, LF, MA, N, U, V, W, YCG, Z



C-Lube Linear Way ME Linear Way E

ME • LWE



C-Lube Linear Way ME

ME



long term maintenance free supported!

The aquamarine end plate is the symbol of maintenance free.

Track rail

Slide unit

Casing

C-Lube

Ball

End plate

Ball retaining band

End seal

Grease nipple

Linear Way E

LWE

Points

1 Compact and versatile series with utility

Versatile linear motion rolling guide that has achieved utility pursuing compactness in every aspect.

2 Wide range of variations for your needs

For details ▶ P.I-26

As two shapes of slide unit, flange type and block type (with small width) and 3 types with different slide unit length with same section are available, you can select an optimal product for the specifications of your machine and device.

3 Stainless steel selections superior in corrosion resistance are listed on lineup.

For details ▶ P.I-39

Products made of stainless steel are highly resistant to corrosion, so that they are suitable for applications where rust prevention oil is not preferred, such as in cleanroom environment.

4 Achieved smooth and quiet motion Low Decibel Linear Way E

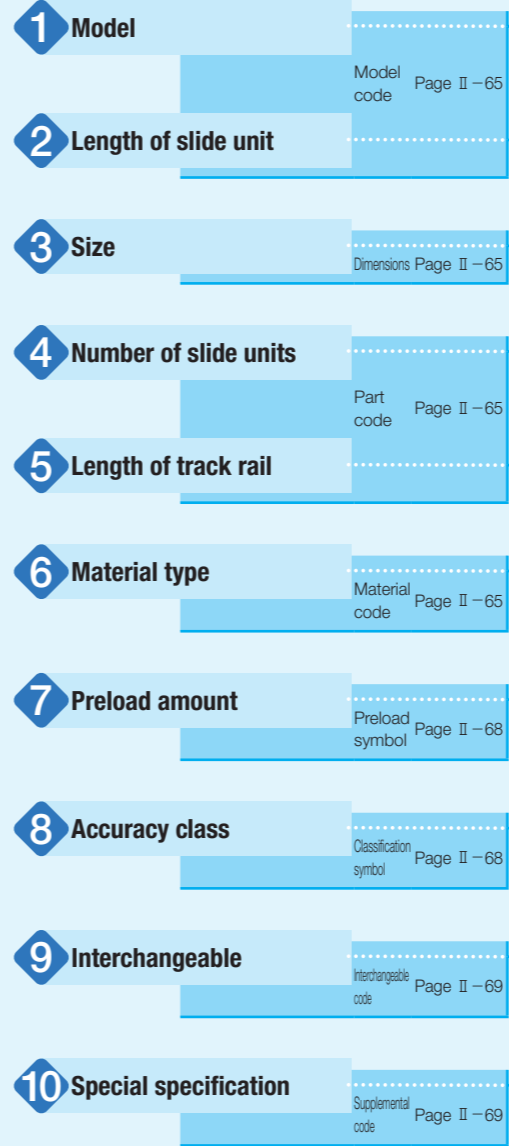
Due to resin separator built-in balls, Low Decibel Linear Way E achieved smooth and quiet motion by eliminating of direct contact of balls each other. This feature reduces noise level in factory and contributes to a human-friendly environment.

Identification Number and Specification

Example of an identification number

The specifications of ME and LWE (···Q) series are indicated by the identification number. Indicate the identification number, consisting of a model code, dimensions, a part code, a material code, a preload symbol, a classification symbol, an interchangeable code, and any supplemental codes for each specification to apply.

Non-interchangeable specification	1	2	3	4	5	1	6	7	8	9	10
Assembled set	ME	C	20	C1	R1000			T ₁	P		/FU
Interchangeable specification											
Single slide unit	ME	C	20	C1				T ₁	P	S1	/U
Single track rail (1)	LWE		20		R1000				P	S1	/F
Assembled set	ME	C	20	C1	R1000			T ₁	P	S1	/FU



Note (1) Indicate "LWE" for the model code of the single track rail regardless of the series and the combination of slide unit model.

Identification Number and Specification — Model · Length of Slide Unit · Size ·

1 Model	C-Lube Linear Way ME (ME series)	Flange type mounting from bottom : ME Flange type mounting from top : MET Block type mounting from top : MES
	Linear Way E ⁽¹⁾ (LWE series)	Flange type mounting from bottom : LWE Flange type mounting from top : LWET Block type mounting from top : LWES
	Low Decibel Linear Way E ⁽¹⁾ (LWE...Q series)	Flange type mounting from bottom : LWE...Q Flange type mounting from top : LWET...Q Block type mounting from top : LWES...Q
	For applicable models and sizes, see Table 1. Indicate "LWE" for the model code of single track rail regardless of the series and the slide unit model to be combined. Note ⁽¹⁾ This model has no built-in C-Lube.	
2 Length of slide unit	Short : C Standard : No symbol Long : G	For applicable models and sizes, see Table 1.
3 Size	15,20,25,30,35,45	For applicable models and sizes, see Table 1.
4 Number of slide units	: C○	For an assembled set, indicates the number of slide units assembled on a track rail. For a single slide unit, only "C1" is specified.
5 Length of track rail	: R○	Indicate the length of track rail in mm. For standard and maximum lengths, see Tables 2.1 and 2.2.
6 Material type	High carbon steel made : No symbol Stainless steel made ⁽²⁾ : SL	For applicable models and sizes, see Table 1. Note ⁽²⁾ Mount a standard grease nipple (brass) on the stainless steel type, too. Stainless steel grease nipple is also available. If needed, please contact IKO.

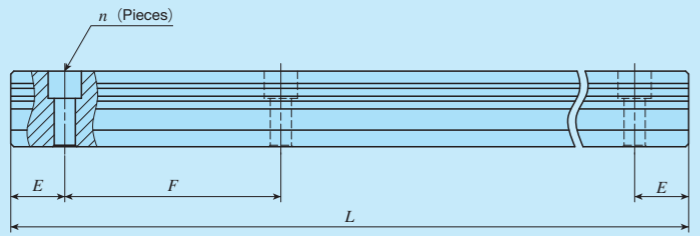
Number of Slide Unit · Length of Track Rail · Material—

Table 1 Models and sizes of ME and LWE (...Q) series

Material	Shape	Slide unit Length	Model	Size					
				15	20	25	30	35	45
High carbon steel made	Flange type mounting from bottom	Short	MEC	○	○	○	○	○	—
			LWEC	○	○	○	○	○	—
		Standard	ME	○	○	○	○	○	○
			LWE	○	○	○	○	○	○
			LWE...Q	○	○	○	○	○	—
		Long	MEG	○	○	○	○	—	—
		LWEG	○	○	○	○	—	—	
	Flange type mounting from top	Short	METC	○	○	○	○	○	—
			LWETC	○	○	○	○	○	—
		Standard	MET	○	○	○	○	○	○
			LWET	○	○	○	○	○	○
			LWET...Q	○	○	○	○	○	—
Long		METG	○	○	○	○	—	—	
	LWETG	○	○	○	○	—	—		
Block type mounting from top	Short	MESC	○	○	○	○	○	—	
		LWESC	○	○	○	○	○	—	
	Standard	MES	○	○	○	○	○	○	
		LWES	○	○	○	○	○	○	
		LWES...Q	○	○	○	○	○	—	
	Long	MESG	○	○	○	○	—	—	
	LWESG	○	○	○	○	—	—		
Stainless steel made	Flange type mounting from bottom	Short	MEC...SL	○	○	○	○	—	—
			LWEC...SL	○	○	○	○	—	—
		Standard	ME...SL	○	○	○	○	—	—
			LWE...SL	○	○	○	○	—	—
			LWE...Q...SL	○	○	○	○	—	—
		Long	MEG...SL	○	○	○	○	—	—
		LWEG...SL	○	○	○	○	—	—	
	Flange type mounting from top	Short	METC...SL	○	○	○	○	—	—
			LWETC...SL	○	○	○	○	—	—
		Standard	MET...SL	○	○	○	○	—	—
			LWET...SL	○	○	○	○	—	—
			LWET...Q...SL	○	○	○	○	—	—
Long		METG...SL	○	○	○	○	—	—	
	LWETG...SL	○	○	○	○	—	—		
Block type mounting from top	Short	MESC...SL	○	○	○	○	—	—	
		LWESC...SL	○	○	○	○	—	—	
	Standard	MES...SL	○	○	○	○	—	—	
		LWES...SL	○	○	○	○	—	—	
		LWES...Q...SL	○	○	○	○	—	—	
	Long	MESG...SL	○	○	○	○	—	—	
	LWESG...SL	○	○	○	○	—	—		

Remark: For the models indicated in , the interchangeable specification is available.

Table 2.1 Standard and maximum lengths of high carbon steel track rails



Item	Identification number	ME 15 LWE 15	ME 20 LWE 20	ME 25 LWE 25	ME 30 LWE 30	ME 35 LWE 35	ME 45 LWE 45
		LWE 15...Q	LWE 20...Q	LWE 25...Q	LWE 30...Q	LWE 35...Q	LWE 45
Standard length L (n)		160 (3)	220 (4)	220 (4)	280 (4)	280 (4)	570 (6)
		220 (4)	280 (5)	280 (5)	440 (6)	440 (6)	885 (9)
		280 (5)	340 (6)	340 (6)	600 (8)	600 (8)	1 200 (12)
		340 (6)	460 (8)	460 (8)	760 (10)	760 (10)	1 620 (16)
		460 (8)	640 (11)	640 (11)	1 000 (13)	1 000 (13)	2 040 (20)
		640 (11)	820 (14)	820 (14)	1 240 (16)	1 240 (16)	2 460 (24)
	820 (14)	1 000 (17)	1 000 (17)	1 640 (21)	1 640 (21)	2 985 (29)	
		1 240 (21)	1 240 (21)	2 040 (26)	2 040 (26)		
			1 600 (27)	2 520 (32)	2 520 (32)		
				3 000 (38)	3 000 (38)		
Pitch of mounting holes F		60	60	60	80	80	105
E (1)		20	20	20	20	20	22.5
Standard E dimensions (2)	or higher	6	8	9	9	10	12
	below	36	38	39	49	50	64.5
Maximum length (3)		1 600 (2 980)	2 200 (2 980)	2 980 (4 000)	3 000 (3 960)	3 000 (3 960)	2 985 (3 930)

unit: mm

Notes (1) When specifying a butt-jointing track rail (supplemental code "/T"), pay attention to the E dimension at the butt-jointing part.
 (2) Not applicable to the track rail with female threads for bellows (supplemental code "/J").
 (3) Length up to the value in () can be produced. If needed, please contact IKO. The values in () is not applicable to LWE...Q series.
 Remarks 1. A typical identification number is indicated, but is applied to all models of the same size.
 2. Indicate "LWE" for the model code of single track rail regardless of the series and the slide unit model to be combined.
 3. If not directed, E dimensions for both ends will be the same within the range of standard E dimensions. To change the dimensions, indicate the specified rail mounting hole positions "/E" of special specification. For more information, see page III -30.

Table 2.2 Standard and maximum lengths of stainless steel track rails unit: mm

Item	Identification number	ME 15...SL LWE 15...SL	ME 20...SL LWE 20...SL	ME 25...SL LWE 25...SL	ME 30...SL LWE 30...SL
	Standard length L (n)		160 (3)	220 (4)	220 (4)
		220 (4)	280 (5)	280 (5)	440 (6)
		280 (5)	340 (6)	340 (6)	600 (8)
		340 (6)	460 (8)	460 (8)	760 (10)
		460 (8)	640 (11)	640 (11)	1 000 (13)
		640 (11)	820 (14)	820 (14)	
	820 (14)	1 000 (17)	1 000 (17)		
Pitch of mounting holes F		60	60	60	80
E (1)		20	20	20	20
Standard E dimensions (2)	or higher	6	8	9	9
	below	36	38	39	49
Maximum length (3)		1 200 (1 600)	1 200 (1 960)	1 200 (1 960)	1 200 (1 960)

Notes (1) When specifying a butt-jointing track rail (supplemental code "/T"), pay attention to the E dimension at the butt-jointing part.
 (2) Not applicable to the track rail with female threads for bellows (supplemental code "/J").
 (3) Length up to the value in () can be produced. If needed, please contact IKO.
 Remarks 1. A typical identification number is indicated, but is applied to all models of the same size.
 2. Indicate "LWE" for the model code of single track rail regardless of the series and the slide unit model to be combined.
 3. If not directed, E dimensions for both ends will be the same within the range of standard E dimensions. To change the dimensions, indicate the specified rail mounting hole positions "/E" of special specification. For more information, see page III -30.

7 Preload amount	Clearance	: Tc	Specify this item for an assembled set or a single slide unit.
	Standard	: No symbol	For details of the preload amount, see Table 3.
	Light preload	: T1	For applicable combinations of accuracy class and preload amount, see Table 4.
	Medium preload	: T2	

8 Accuracy class	Ordinary	: No symbol	For interchangeable specification products, assemble a slide unit and a track rail of the same accuracy class.
	High	: H	For details of accuracy class, see Table 5.
	Precision	: P	
	Super precision	: SP	For applicable combinations of accuracy class and preload amount, see Table 4.

Table 3 Preload amount

Preload type	Preload symbol	Preload amount N	Operational conditions
Clearance	Tc	0(1)	• Very light motion • To absorb slight errors
Standard	(No symbol)	0(2)	• Light and precise motion • Almost no vibrations
Light preload	T1	0.02C ₀	• Load is evenly balanced • Light and precise motion
Medium preload	T2	0.05C ₀	• Medium vibration • Medium overhung load

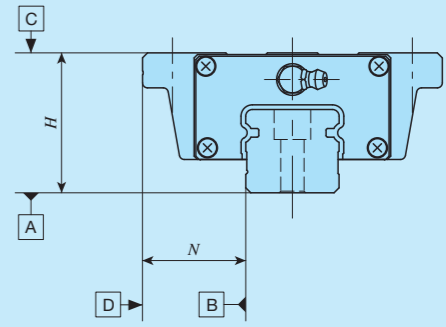
Notes (1) Clearance of about 10 μm
 (2) Indicates zero or minimal amount of preload
 Remark: C₀ indicates the basic static load rating.

Table 4 Combination of accuracy class and preload

Preload type (preload symbol)	Classification (classification symbol)			
	Ordinary (No symbol)	High (H)	Precision (P)	Super precision (SP)
Clearance (Tc) (1)	○	—	—	—
Standard (no symbol)	○	○	○	○
Light preload (T1)	—	○	○	○
Medium preload (T2) (1)	—	○	○	○

Note (1) Not applicable to LWE...Q series.
 Remark: The mark indicates that interchangeable specification products are available.

Table 5 Tolerance and allowance



Item	Class (classification symbol)	Tolerance and allowance			
		Ordinary (No symbol)	High (H)	Precision (P)	Super precision (SP)
Dim. H tolerance		±0.080	±0.040	±0.020	±0.010
Dim. N tolerance		±0.100	±0.050	±0.025	±0.015
Dim. variation of H (1)		0.025	0.015	0.007	0.005
Dim. variation of N (1)		0.030	0.020	0.010	0.007
Dim. variation of H for multiple assembled sets (2)		0.045	0.035	0.025	—
Parallelism in operation of the slide unit C surface to A surface		See Fig. 1.			
Parallelism in operation of the slide unit D surface to B surface		See Fig. 1.			

unit: mm

Notes (1) It means the size variation between slide units mounted on the same track rail.
 (2) Applicable to the interchangeable specification.

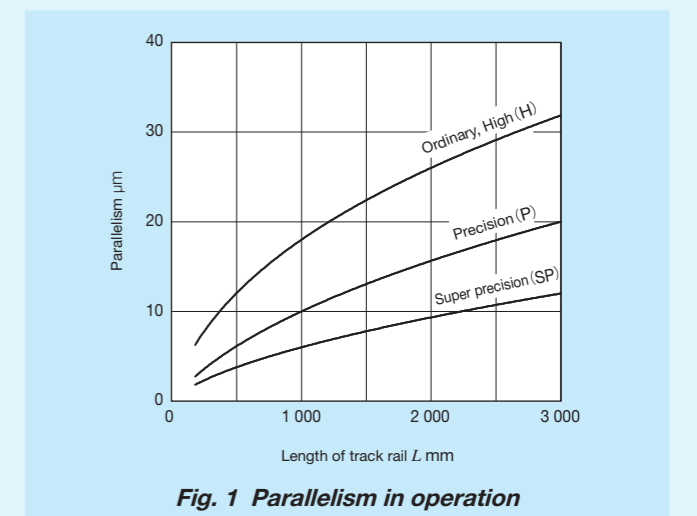
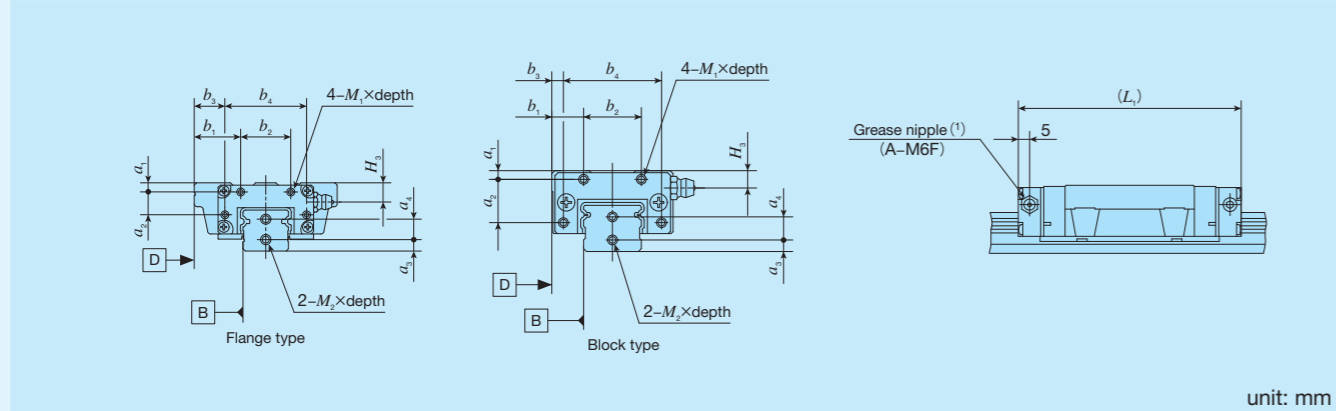


Table 8 Dimension of female threads for bellows (Supplemental code Single unit: /J Assembled set: /J /JJ)



Identification number			Slide unit								Track Rail										
			a ₁	a ₂	b ₁	b ₂	b ₃	b ₄	M ₁ ×depth	L ₁ ⁽²⁾	H ₃	a ₃	a ₄	M ₂ ×depth							
ME(T)C 15	LWE(T)C 15	—	3	12	18	12	28	M3×6	58	5.7	4	7	M3×6								
ME(T) 15	LWE(T) 15	LWE(T) 15...Q			74																
ME(T)G 15	LWE(T)G 15	—			87																
MESC 15	LWESC 15	—			58																
MES 15	LWES 15	LWES 15...Q			74																
MESG 15	LWESG 15	—			87																
ME(T)C 20	LWE(T)C 20	—			3	15			19.5					12.5	34	M3×6	64	6	4	8	M3×6
ME(T) 20	LWE(T) 20	LWE(T) 20...Q							83												
ME(T)G 20	LWE(T)G 20	—							99												
MESC 20	LWESC 20	—							64												
MES 20	LWES 20	LWES 20...Q	83																		
MESG 20	LWESG 20	—	99																		
ME(T)C 25	LWE(T)C 25	—	3.5	17			23.5	16.5	40	M3×6	76	7	5	9			M4×8				
ME(T) 25	LWE(T) 25	LWE(T) 25...Q					100														
ME(T)G 25	LWE(T)G 25	—					119														
MESC 25	LWESC 25	—					76														
MES 25	LWES 25	LWES 25...Q			100																
MESG 25	LWESG 25	—			119																
ME(T)C 30	LWE(T)C 30	—			5	17	28	20			50				M3×6	83		11	6	14	M4×8
ME(T) 30	LWE(T) 30	—					112														
—	—	LWE(T) 30...Q					111														
ME(T)G 30	LWE(T)G 30	—					144														
MESC 30	LWESC 30	—	83																		
MES 30	LWES 30	—	112																		
—	—	LWES 30...Q	111																		
MESG 30	LWESG 30	—	144																		
ME(T)C 35	LWE(T)C 35	—	6	20			30	20	60	M3×6		93	13	7		15	M4×8				
ME(T) 35	LWE(T) 35	—					126														
—	—	LWE(T) 35...Q			125																
MESC 35	LWESC 35	—			93																
MES 35	LWES 35	—			126																
—	—	LWES 35...Q			125																
ME(T) 45	LWE(T) 45	—			7	26	35	23			74	M4×8			138			15	8	19	M5×10
MES 45	LWES 45	—					18	6							125						

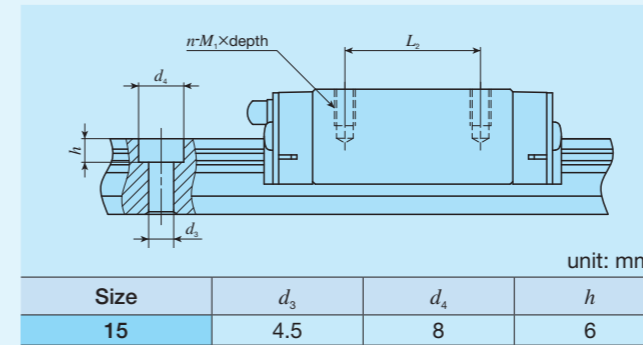
Notes (1) The specification and mounting positions of grease nipple are different from those of the standard specification product. Provided grease nipple for size 15 models is NPB2 type (special specification). For details of dimensions, please contact IKO.
 (2) Dimensions of the specification that female threads for bellows are fitted to both ends of the slide unit are indicated.
 Remark: This is also applicable to stainless steel models of the same size.

Table 9 Track rail mounting bolt size (Supplemental code /MA)

Size	Bolt size for track rail
15	M 3×16 M 4×16 ⁽¹⁾
20	M 5×16
25	M 6×20
30	M 6×25
35	M 8×30
45	M10×35

Note (1) Applicable to the track rail of supplemental code "/M4" of special specification.
 Remarks 1. Hexagon socket head bolts equivalent to JIS B 1176
 2. For stainless steel model, stainless steel made bolts are appended.

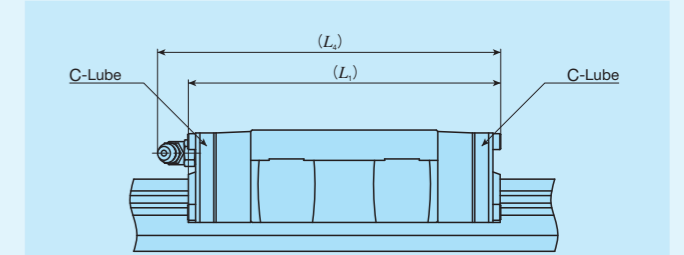
Table 10 Changed dimensions of mounting holes (Supplemental code /M4)



unit: mm

Size	d ₃	d ₄	h
15	4.5	8	6

Table 11 Dimension of slide unit with C-Lube plate (Supplemental code /Q)

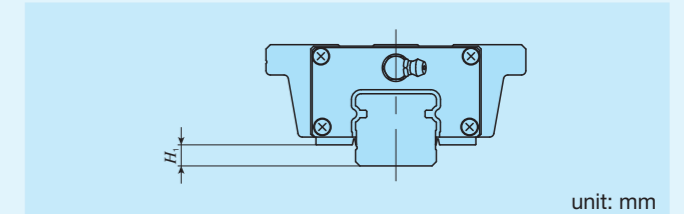


unit: mm

Identification number			L ₁	L ₂
LWEC 15	—	—	52	55
LWE 15	—	—	68	71
—	LWE15...Q	—		70
LWEG 15	—	—	81	83
LWEC 20	—	—	58	70
LWE 20	LWE20...Q	—	78	90
LWEG 20	—	—	94	105
LWEC 25	—	—	70	82
LWE 25	LWE25...Q	—	94	106
LWEG 25	—	—	113	125
LWEC 30	—	—	80	91
LWE 30	LWE30...Q	—	109	119
LWEG 30	—	—	141	151
LWEC 35	—	—	90	102
LWE 35	—	—	123	135
—	LWE35...Q	—	124	
LWE 45	—	—	138	148

Remarks 1. The dimensions of the slide unit with C-Lube at both ends are indicated.
 2. A typical identification number is indicated, but is applied to all LWE (...Q) series models of the same size.

Table 12 H₁ dimension with under seal (Supplemental code /U)

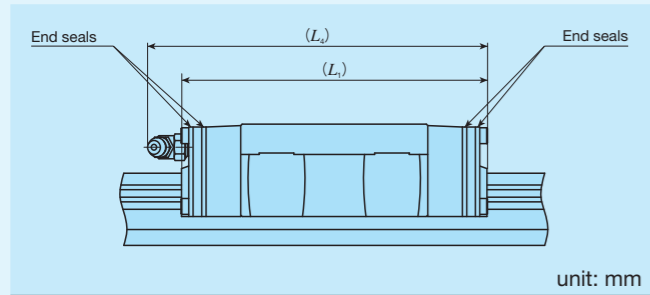


unit: mm

Identification number			H ₁
ME 15	LWE 15	—	5
ME 20	LWE 20	—	5
ME 25	LWE 25	—	6
ME 30	—	—	9
—	LWE 30	—	7
ME 35	—	—	10
—	LWE 35	—	8
ME 45	—	—	13
—	LWE 45	—	10

Remark: A typical identification number is indicated, but is applied to all models of the same size.

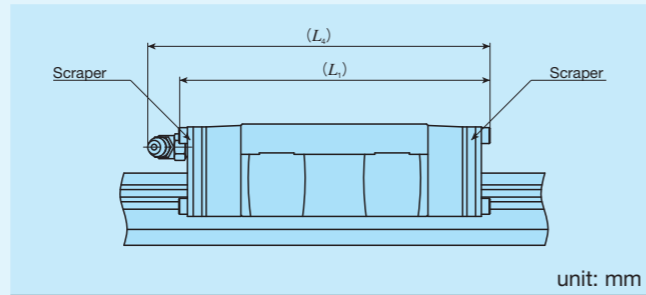
Table 13 Dimension of slide unit with double end seals
(Supplemental code Single unit: /V
Assembled set: /V /VV)



Identification number			L_1	L_4
MEC 15	LWEC 15	—	48	50
ME 15	LWE 15	LWE15...Q	64	66
MEG 15	LWEG 15	—	76	78
MEC 20	LWEC 20	—	54	68
ME 20	LWE 20	LWE20...Q	73	87
MEG 20	LWEG 20	—	89	103
MEC 25	LWEC 25	—	67	80
ME 25	LWE 25	LWE25...Q	91	104
MEG 25	LWEG 25	—	110	123
MEC 30	LWEC 30	—	78	89
ME 30	LWE 30	LWE30...Q	107	118
MEG 30	LWEG 30	—	138	150
MEC 35	LWEC 35	—	88	101
ME 35	LWE 35	LWE35...Q	121	134
ME 45	LWE 45	—	137	148

Remarks 1. The dimensions of the slide unit with double end seals at both ends are indicated.
2. A typical identification number is indicated, but is applied to all models of the same size.

Table 14 Dimension of slide unit with scrapers
(Supplemental code Single unit: /Z
Assembled set: /Z /ZZ)



Identification number			L_1	L_4
MEC 15	LWEC 15	—	48	50
ME 15	LWE 15	LWE15...Q	64	66
MEG 15	LWEG 15	—	77	79
MEC 20	LWEC 20	—	55	69
ME 20	LWE 20	LWE20...Q	75	88
MEG 20	LWEG 20	—	91	104
MEC 25	LWEC 25	—	69	81
ME 25	LWE 25	LWE25...Q	93	105
MEG 25	LWEG 25	—	112	124
MEC 30	LWEC 30	—	79	90
ME 30	LWE 30	—	108	119
—	—	LWE30...Q	109	119
MEG 30	LWEG 30	—	140	151
MEC 35	LWEC 35	—	89	101
ME 35	LWE 35	—	122	134
—	—	LWE35...Q	123	135
ME 45	LWE 45	—	138	148

Remarks 1. The dimensions of the slide unit with scraper at both ends are indicated.
2. A typical identification number is indicated, but is applied to all models of the same size.

Lubrication

Lithium-soap base grease with extreme-pressure additive (Alvania EP grease 2 [SHOWA SHELL SEKIYU K. K.]) is pre-packed in ME and LWE (...Q) series. Additionally, ME series has C-Lube placed in the recirculation part of balls, so that the interval for reapplying lubricant can be extended and maintenance works such as grease job can be reduced significantly.

ME and LWE (...Q) series have grease nipple as indicated in Table 15. Supply nozzles fit to each shapes of grease nipple are also available. For order of these parts for lubrication, see Table 14.1 on page III-23 and Table 15 on page III-24.

Table 15 Parts for lubrication

Size	Grease nipple type ⁽¹⁾	Applicable supply nozzle type	Bolt size of female threads for piping
15	A-M4	A-5120V A-5240V B-5120V B-5240V	M4
20	B-M6	Grease gun available on the market	M6
25			
30	JIS type 4		PT1/8
35			
45			

Note ⁽¹⁾ For grease nipple specification, see Tables 14.1 and 14.2 on page III-23.
Remark: Stainless steel grease nipple is also available. If needed, please contact IKO.

Dust Protection



The slide units of ME and LWE (...Q) series are equipped with end seals as standard for dust protection. However, if large amount of contaminant or dust are floating, or if large particles of foreign substances such as chips or sand may adhere to the track rail, it is recommended to cover the whole unit with bellows or telescope type shield, etc.

ME series and LWE (...Q) series are provided with specific bellows. The bellows are easy to mount and provide excellent dust protection. If needed, please refer to III-26 for ordering.

Precaution for Use

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

When mounting the ME and LWE (...Q) series, properly align the reference mounting surface B and D of the track rail and slide unit with the reference mounting surface of the table and bed and fix them. (See Fig. 2)

The reference mounting surfaces B and D and mounting surfaces A and C are precisely ground. Machining the mounting surface of the table and bed, such as machine or device, to high accuracy and mounting them properly will ensure stable linear motion with high accuracy. Reference mounting surface of the slide unit is the opposite side of the  mark. The track rail reference mounting surface is identified by locating the  mark on the top surface of the track rail. It is the side surface above the mark (in the direction of the arrow). (See Fig. 3.)

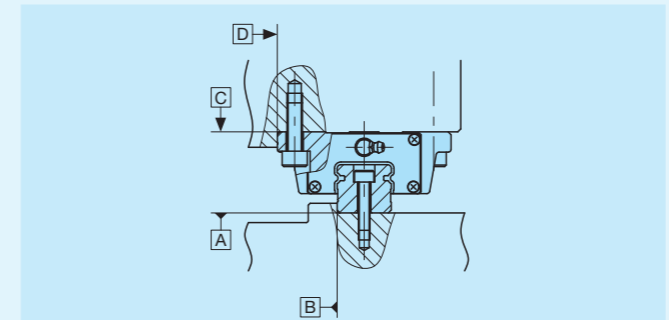


Fig. 2 Reference mounting surface and typical mounting structure

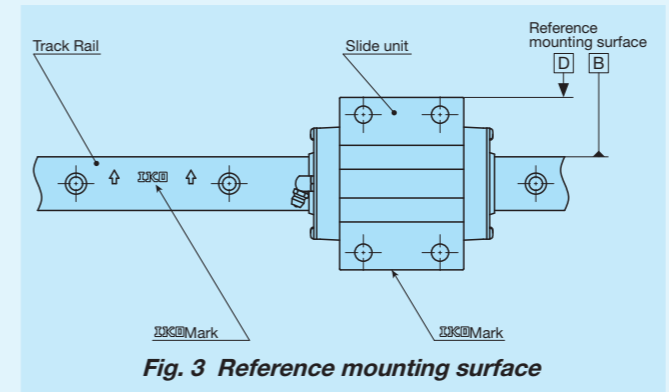


Fig. 3 Reference mounting surface

② Shoulder height and corner radius of the reference mounting surface

For the opposite corner of the mating reference mounting, it is recommended to have relieved fillet as indicated in Fig. 4. Recommended value for the shoulder height on the mating side is indicated in Table 17.

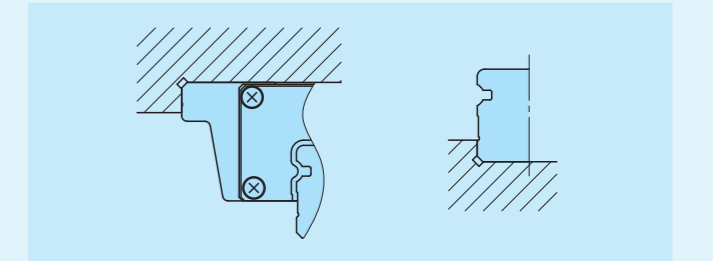


Fig. 4 Corner of the mating reference mounting

③ Tightening torque for fixing screw

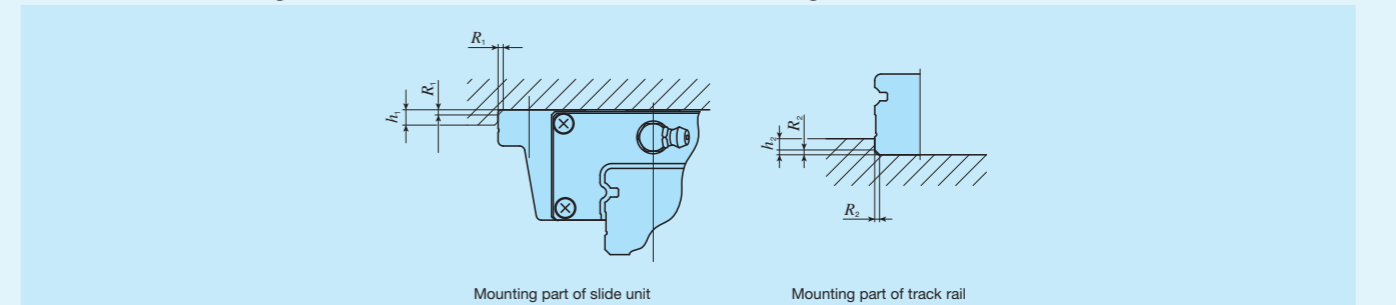
Typical tightening torque for mounting of the ME and LWE (...Q) series to the steel mating member material is indicated in Table 16. When vibration and shock of the machine or device are large, fluctuating load is large, or moment load is applied, fix it by using the torque 1.2 to 1.5 times larger than the value indicated in the table as necessary. If the mating member material is cast iron or aluminum alloy, reduce the tightening torque depending on the strength characteristics of the mating member material.

Table 16 Tightening torque for fixing screw

Bolt size	Tightening torque N · m	
	High carbon steel-made screw	Stainless steel-made screw
M 3×0.5	1.8	1.1
M 4×0.7	4.1	2.5
M 5×0.8	8.0	5.0
M 6×1	13.6	8.5
M 8×1.25	32.7	20.4
M10×1.5	63.9	—
M12×1.75	110	—

Remark: The tightening torque is calculated based on strength division 12.9 and property division A2-70.

Table 17 Shoulder height and corner radius of the reference mounting surface



Size	Mounting part of slide unit		Mounting part of track rail	
	Shoulder height h_1	Corner radius R_1 (maximum)	Shoulder height h_2	Corner radius R_2 (maximum)
15	4	1 (0.5) ⁽¹⁾	3	0.5
20	5	1 (0.5) ⁽¹⁾	3	0.5
25	6	1	4	1
30	8	1	5	1
35	8	1	6	1
45	8	1.5	7	1.5

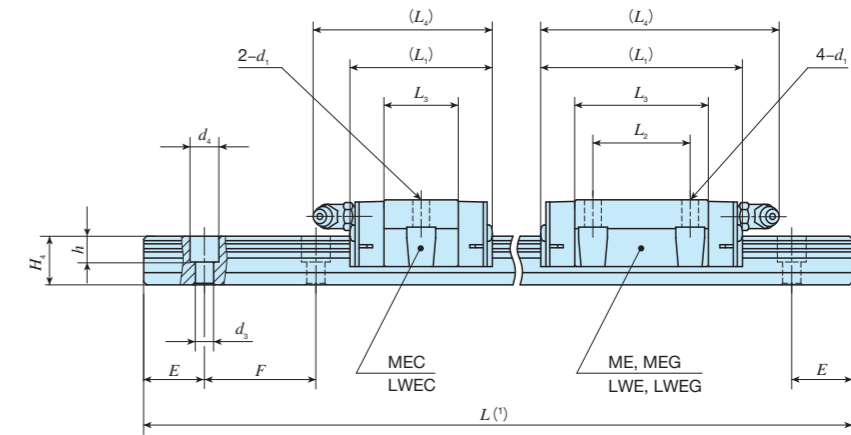
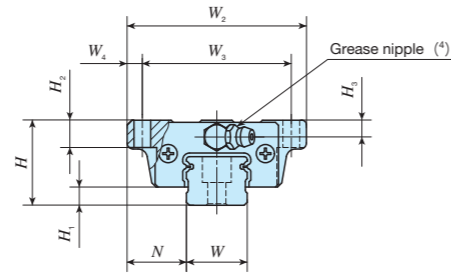
Note ⁽¹⁾ The values in () are applied to MES and LWES (...Q).

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

IKO C-Lube Linear Way ME

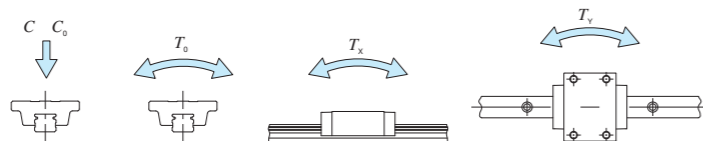
Flange type mounting from bottom

Shape	ME · LWE		
Size	15	20	25
	30	35	45



Identification number	Interchangeable	Mass (Ref.)		Dimensions of assembly mm					Dimensions of slide unit mm					Dimensions of track rail mm						Recommended mounting bolt for track rail (2) mm	Basic dynamic load rating (3) C N	Basic static load rating (3) C0 N	Static moment rating (3) N · m											
		Slide unit kg	Track rail kg/m	H	H1	N	W2	W3	W4	L1	L2	L3	L4	d1	H2	H3	W	H4	d3				d4	h	E	F	T0	Tx	Ty					
MEC 15	LWEC 15	○	0.11	1.57	24	5.8	18.5	52	41	5.5	57	26	38.4	61	4.5	7	4.5	15	14.5	3.6 (4.5)	6.5 (8)	4.5 (6)	20	60	M3×16 (M4×16)	5 240	5 480	43.8	21.3 ³ ₁₄₉	21.3 ³ ₁₄₉				
MEC 15...SL	LWEC 15...SL	○																								7 640	9 390	75.1	57.6 ³ ₃₃₃	57.6 ³ ₃₃₃				
ME 15	LWE 15	○																								6 550	8 610	68.9	53.0 ³ ₃₀₇	53.0 ³ ₃₀₇				
ME 15...SL	LWE 15...SL	○																								9 340	12 500	100	99.5 ³ ₅₃₃	99.5 ³ ₅₃₃				
—	LWE 15...Q	—																																
MEG 15	LWEG 15	○	0.24	2.28	28	5.8	19.5	59	49	5	67	32	44.2	78	5.5	9	5.5	20	16	6	9.5	8.5	20	60	M5×16	7 580	7 340	78.9	31.5 ³ ₂₃₅	31.5 ³ ₂₃₅				
MEC 20	LWEC 20	○																								7 570								
MEC 20...SL	LWEC 20...SL	○																								7 580								
—	LWEC 20...SL	○																								7 570								
ME 20	LWE 20	○																								11 600	13 400	145	95.6 ³ ₅₆₆	95.6 ³ ₅₆₆				
ME 20...SL	LWE 20...SL	○	0.30	2.28	28	5	19.5	59	49	5	67	32	44	78	5.5	9	5.5	20	16	6	9.5	8.5	20	60	M5×16	10 500	13 400	145	95.6 ³ ₅₆₆	95.6 ³ ₅₆₆				
—	LWE 20...Q	—																																
MEG 20	LWEG 20	○																								14 400					18 300	197	172 ³ ₉₃₀	172 ³ ₉₃₀
MEG 20...SL	LWEG 20...SL	○																																
—	LWEG 20...SL	○																																

Notes (1) Track rail lengths L are shown in Tables 2.1 and 2.2 on page II - 67.
 (2) Track rail mounting bolts are not appended. Hexagon socket head bolts of JIS B 1176 with strength division 12.9 are recommended.
 (3) The direction of basic dynamic load rating (C), basic static load rating (C_0), and static moment rating (T_0 , T_x , T_y) are shown in the sketches below. The upper values of T_x and T_y are for one slide unit and the lower values are for two slide units in close contact.
 (4) The shapes of grease nipple vary by size. The specifications are shown in Table 15 on page II - 73.
 Remark: The value in () represents dimensions when the track rail mounting hole dimension is set for M4 holes. Indicate the identification number with /M4 at the end.



Example of identification number of assembled set

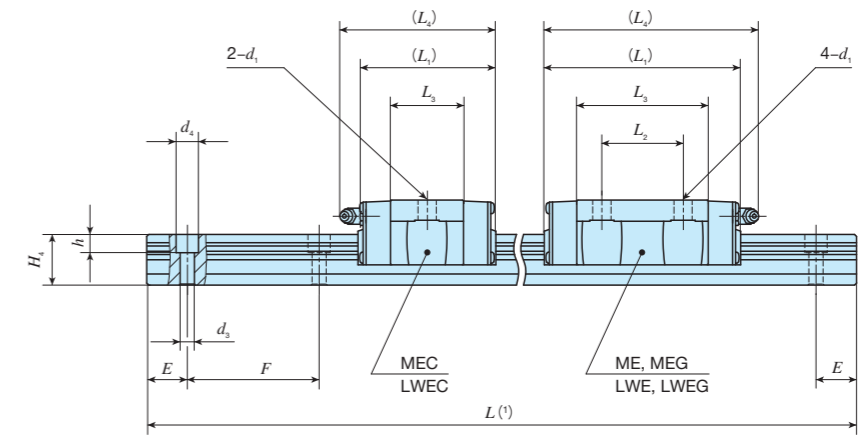
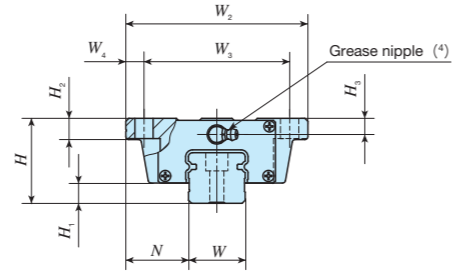
Model code	Dimensions	Part code	Model code	Material code	Preload symbol	Classification symbol	Interchangeable code	Supplemental code
ME	G	15	C2	R340	T1	P	—	/U
①	②	③	④	⑤	⑥	⑦	⑧	⑨

① Model ME LWE LWE...Q	② Length of slide unit C Short No symbol Standard G Long	③ Size 15, 20	④ Number of slide unit (2)	⑤ Length of track rail (340 mm)	⑥ Material type No symbol High carbon steel made SL Stainless steel made	⑦ Preload amount T0 Clearance No symbol Standard T1 Light preload T2 Medium preload	⑧ Accuracy class No symbol Ordinary H High P Precision SP Super precision	⑨ Interchangeable No symbol Non-interchangeable specification S1 S1 specification S2 S2 specification	⑩ Special specification A, BS, D, E, F, I, J, L, LF, MA M4, N, Q, RE, T, U, V, W, Y, Z
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IKO C-Lube Linear Way ME

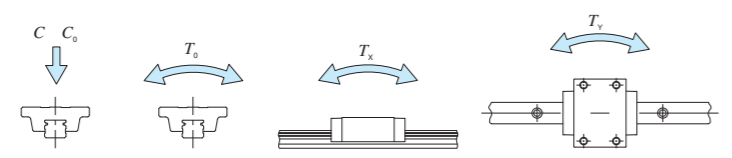
Flange type mounting from bottom

Shape	ME · LWE		
Size	15	20	25
	30	35	45



Identification number	Interchangeable	Mass (Ref.)		Dimensions of assembly mm			Dimensions of slide unit mm							Dimensions of track rail mm							Recommended mounting bolt for track rail mm Bolt size × ℓ	Basic dynamic load rating ⁽³⁾ C N	Basic static load rating ⁽³⁾ C ₀ N	Static moment rating ⁽³⁾						
		Slide unit kg	Track rail kg/m	H	H ₁	N	W ₂	W ₃	W ₄	L ₁	L ₂	L ₃	L ₄	d ₁	H 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	
MEC 25	LWEC 25	○	0.33	3.09	33	7	25	73	60	6.5	83	35	56	94	7	10	6.5	23	19	7	11	9	20	60	M 6×20	12 400	12 300	153	71.8 480	71.8 480
MEC 25...SL	LWEC 25...SL	○																												
ME 25	LWE 25	○																												
ME 25...SL	LWE 25...SL	○																												
—	LWE 25...Q	—																												
MEG 25	LWEG 25	○	0.56	3.09	33	6	25	73	60	6.5	83	35	56	94	7	10	6.5	23	19	7	11	9	20	60	M 6×20	18 100	21 100	262	195 1 090	195 1 090
MEG 25...SL	LWEG 25...SL	○																												
MEG 25...Q	LWEG 25...Q	—																												
MEG 25...Q	LWEG 25...Q	—																												
MEG 25...Q	LWEG 25...Q	—																												
MEC 30	LWEC 30	○	0.58	5.09	42	10	31	90	72	9	68	40	64.8	107	9	10	8	28	25	7	11	9	20	80	M 6×25	20 600	18 800	287	129 855	129 855
MEC 30...SL	LWEC 30...SL	○																												
ME 30	LWE 30	○																												
ME 30...SL	LWE 30...SL	○																												
—	LWE 30...Q	—																												
MEG 30	LWEG 30	○	0.99	5.04	42	10	31	90	72	9	68	40	64.8	107	9	10	8	28	25	7	11	9	20	80	M 6×25	29 500	31 300	479	328 1 920	328 1 920
MEG 30...SL	LWEG 30...SL	○																												
MEG 30...Q	LWEG 30...Q	—																												
MEG 30...Q	LWEG 30...Q	—																												
MEG 30...Q	LWEG 30...Q	—																												
MEC 35	LWEC 35	○	1.50	5.09	48	11	33	100	82	9	78	50	74.6	123	9	13	10	34	28	9	14	12	20	80	M 8×30	20 600	18 800	287	129 855	129 855
MEC 35...SL	LWEC 35...SL	○																												
ME 35	LWE 35	○																												
ME 35...SL	LWE 35...SL	○																												
—	LWE 35...Q	—																												
MEC 45	LWEC 45	○	0.84	6.85	60	14	37.5	120	100	10	125	60	81.4	136	11	15	13	45	34	11	17.5	14	22.5	105	M10×35	29 900	26 800	412	176 1 190	162 1 100
MEC 45...SL	LWEC 45...SL	○																												
ME 45	LWE 45	○																												
ME 45...SL	LWE 45...SL	○																												
—	LWE 45...Q	—																												

Notes (1) Track rail lengths *L* are shown in Tables 2.1 and 2.2 on page II - 67.
 (2) Track rail mounting bolts are not appended. Hexagon socket head bolts of JIS B 1176 with strength division 12.9 are recommended.
 (3) The direction of basic dynamic load rating (*C*), basic static load rating (*C₀*), and static moment rating (*T₀*, *T_x*, *T_y*) are shown in the sketches below. The upper values of *T_x* and *T_y* are for one slide unit and the lower values are for two slide units in close contact.
 (4) The shapes of grease nipple vary by size. The specifications are shown in Table 15 on page II - 73.



Example of identification number of assembled set

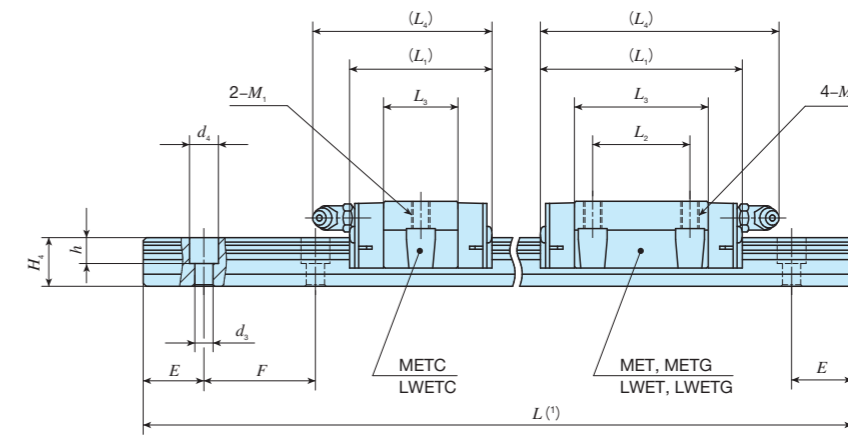
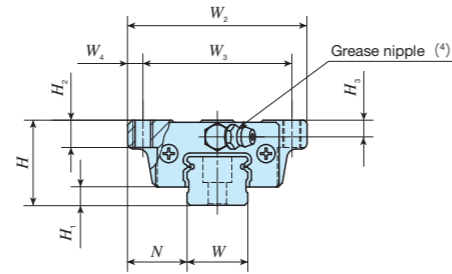
Model code: ME G 30 C2 R440
 Dimensions: 30
 Part code: C2
 Model code: R440
 Material code: —
 Preload symbol: T1
 Classification symbol: P
 Interchangeable code: —
 Supplemental code: /U

① Model	③ Size	⑦ Preload amount	⑨ Interchangeable
ME LWE LWE...Q	25, 30, 35, 45	T ₀ Clearance No symbol Standard T ₁ Light preload T ₂ Medium preload	No symbol Non-interchangeable specification S1 S1 specification S2 S2 specification
② Length of slide unit	④ Number of slide unit (2)	⑧ Accuracy class	⑩ Special specification
C Short No symbol Standard G Long	2	No symbol Ordinary H High P Precision SP Super precision	A, BS, D, E, F, I, J, L, LF, MA N, Q, RE, T, U, V, W, Y, Z
⑤ Length of track rail (440 mm)	⑥ Material type		
440	No symbol High carbon steel made SL Stainless steel made		

IKO C-Lube Linear Way ME

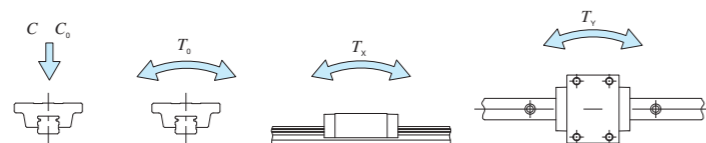
Flange type mounting from top

Shape	MET · LWET		
Size	15	20	25
	30	35	45



Identification number	Interchangeable	Mass (Ref.)		Dimensions of assembly mm			Dimensions of slide unit mm					Dimensions of track rail mm						Recommended mounting bolt for track rail (2) mm	Basic dynamic load rating (3) C N	Basic static load rating (3) C0 N	Static moment rating (3) N·m										
		Slide unit kg	Track rail kg/m	H	H1	N	W2	W3	W4	L1	L2	L3	L4	M1	H2	H3	W				H4	d3	d4	h	E	F	T0	Tx	Ty		
METC 15	LWETC 15	0.11	1.57	24	5.8	18.5	52	41	5.5	41	—	22.4	45	M5	7	4.5	15	14.5	3.6 (4.5)	6.5 (8)	4.5 (6)	20	60	M3×16 (M4×16)	5 240	5 480	43.8	21.3 ³ ₁₄₉	21.3 ³ ₁₄₉		
METC 15...SL	LWETC 15...SL									57	26	38.4	61												38.3	61	7 640	9 390	75.1	57.6 ³ ₃₃₃	57.6 ³ ₃₃₃
MET 15	LWET 15									5	38.3	61	38.3												61	6 550	8 610	68.9	53.0 ³ ₃₀₇	53.0 ³ ₃₀₇	
MET 15...SL	LWET 15...SL									5	38.3	61	38.3												61	6 550	8 610	68.9	53.0 ³ ₃₀₇	53.0 ³ ₃₀₇	
—	LWET 15...Q									5	38.3	61	38.3												61	6 550	8 610	68.9	53.0 ³ ₃₀₇	53.0 ³ ₃₀₇	
METG 15	LWETG 15	0.24	2.28	28	5.8	19.5	59	49	5	70	36	51.1	73	M6	9	5.5	20	16	6	9.5	8.5	20	60	M5×16	9 340	12 500	100	99.5 ³ ₅₃₃	99.5 ³ ₅₃₃		
METG 15...SL	LWETG 15...SL									47	—	24.7	58												24.5	58	11 600	13 400	145	95.6 ³ ₅₆₆	95.6 ³ ₅₆₆
METC 20	LWETC 20									47	—	24.7	58												24.5	58	11 600	13 400	145	95.6 ³ ₅₆₆	95.6 ³ ₅₆₆
METC 20...SL	LWETC 20...SL									47	—	24.7	58												24.5	58	11 600	13 400	145	95.6 ³ ₅₆₆	95.6 ³ ₅₆₆
MET 20	LWET 20									44	—	44.2	78												44	78	10 500	13 400	145	100 ³ ₅₆₂	100 ³ ₅₆₂
MET 20...SL	LWET 20...SL	44	—	44.2	78	44	78	10 500	13 400	145	100 ³ ₅₆₂	100 ³ ₅₆₂																			
—	LWET 20...Q	44	—	44.2	78	44	78	10 500	13 400	145	100 ³ ₅₆₂	100 ³ ₅₆₂																			
METG 20	LWETG 20	0.40	2.28	28	6	19.5	59	49	5	83	45	60.1	94	M6	9	5.5	20	16	6	9.5	8.5	20	60	M5×16	14 400	18 300	197	172 ³ ₉₃₀	172 ³ ₉₃₀		
METG 20...SL	LWETG 20...SL									83	45	60.1	94												59.9	94	14 400	18 300	197	172 ³ ₉₃₀	172 ³ ₉₃₀
METG 20	LWETG 20									83	45	60.1	94												59.9	94	14 400	18 300	197	172 ³ ₉₃₀	172 ³ ₉₃₀

Notes (1) Track rail lengths L are shown in Tables 2.1 and 2.2 on page II-67.
 (2) Track rail mounting bolts are not appended. Hexagon socket head bolts of JIS B 1176 with strength division 12.9 are recommended.
 (3) The direction of basic dynamic load rating (C), basic static load rating (C_0), and static moment rating (T_0 , T_x , T_y) are shown in the sketches below. The upper values of T_x and T_y are for one slide unit and the lower values are for two slide units in close contact.
 (4) The shapes of grease nipple vary by size. The specifications are shown in Table 15 on page II-73.
 Remark: The value in () represents dimensions when the track rail mounting hole dimension is set for M4 holes. Indicate the identification number with /M4 at the end.



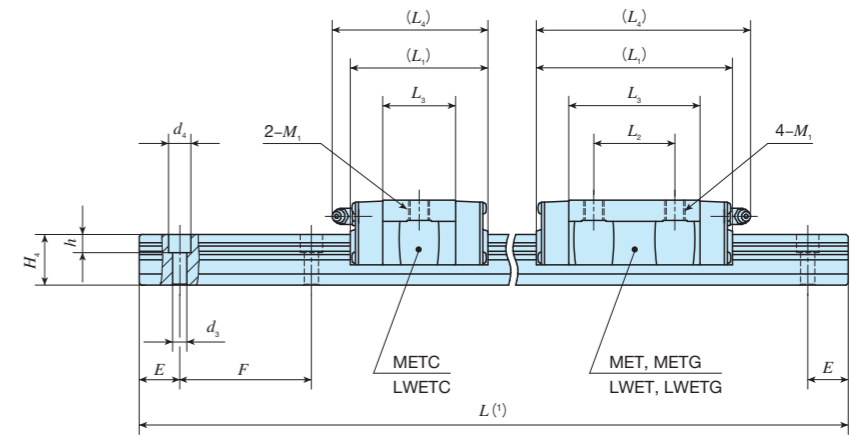
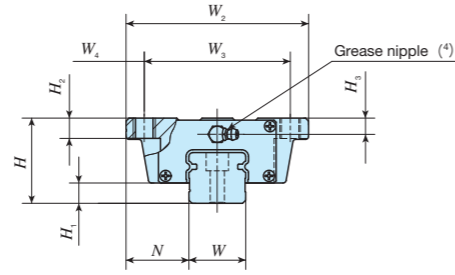
Example of identification number of assembled set

Model code	Dimensions	Part code	Model code	Material code	Preload symbol	Classification symbol	Interchangeable code	Supplemental code
MET	G	15	C2	R340	T1	P	/U	
①	②	③	④	⑤	⑥	⑦	⑧	⑨

① Model MET LWET LWET...Q Flange type mounting from top	③ Size 15, 20	⑦ Preload amount T0 Clearance No symbol Standard T1 Light preload T2 Medium preload	⑨ Interchangeable No symbol Non-interchangeable specification S1 S1 specification S2 S2 specification
② Length of slide unit C Short No symbol Standard G Long	④ Number of slide unit (2)	⑧ Accuracy class No symbol Ordinary H High P Precision SP Super precision	⑩ Special specification A, BS, D, E, F, I, J, L, LF, MA M4, N, Q, RE, T, U, V, W, Y, Z

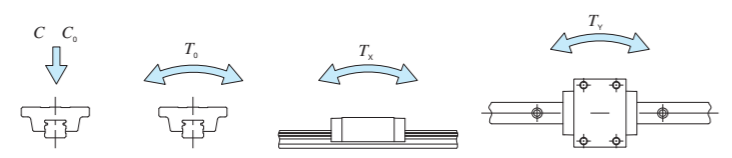
Flange type mounting from top

Shape	MET · LWET		
Size	15	20	25
	30	35	45



Identification number	ME series	LWE series (No C-Lube)	Interchangeable	Mass (Ref.)		Dimensions of assembly mm			Dimensions of slide unit mm					Dimensions of track rail mm						Recommended mounting bolt for track rail mm Bolt size × ℓ	Basic dynamic load rating ⁽³⁾ C N	Basic static load rating ⁽³⁾ C ₀ N	Static moment rating ⁽³⁾								
				Slide unit kg	Track rail kg/m	H	H ₁	N	W ₂	W ₃	W ₄	L ₁	L ₂	L ₃	L ₄	M ₁	H 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
METC 25	LWETC 25		○	0.33	3.09	33	7	25	73	60	6.5	83	35	56	94	M 8	10	6.5	23	19	7	11	9	20	60	M 6×20	12 400	12 300	153	71.8 480	71.8 480
METC 25...SL	LWETC 25...SL	○	18 100																								21 100	262	195 1 090	195 1 090	
MET 25	LWET 25	○	15 500																								19 400	240	175 1 010	175 1 010	
MET 25...SL	LWET 25...SL	○	22 200																								28 200	349	336 1 740	336 1 740	
METG 25	LWETG 25		○	0.73	5.09	42	10	31	90	72	9	102	50	75	113	M 10	10	8	28	25	7	11	9	20	80	M 6×25	20 600	18 800	287	129 855	129 855
METG 25...SL	LWETG 25...SL	○	29 500																								31 300	479	328 1 920	328 1 920	
MET 30	LWET 30	○	21 600																								26 400	398	278 1 580	278 1 580	
MET 30...SL	LWET 30...SL	○	39 200																								47 000	718	704 3 690	704 3 690	
METC 30	LWETC 30		○	0.58	5.04	48	11	33	100	82	9	68	-	36	78	M 10	13	10	34	28	9	14	12	20	80	M 8×30	29 900	26 800	412	176 1 190	162 1 100
METC 30...SL	LWETC 30...SL	○	42 900																								44 700	686	448 2 660	412 2 450	
MET 35	LWET 35	○	30 500																								37 600	687	482 2 550	482 2 550	
MET 35...SL	LWET 35...SL	○	61 100																								60 200	1 210	672 4 070	618 3 750	
METC 35	LWETC 35		○	1.50	11.2	60	14	37.5	120	100	10	125	60	81.4	136	M 12	15	13	45	34	11	17.5	14	22.5	105	M 10×35	61 100	60 200	1 210	672 4 070	618 3 750
METC 35...SL	LWETC 35...SL	○	29 900																								26 800	412	176 1 190	162 1 100	
MET 45	LWET 45	○	42 900																								44 700	686	448 2 660	412 2 450	
MET 45...SL	LWET 45...SL	○	30 500																								37 600	687	482 2 550	482 2 550	

Notes (1) Track rail lengths L are shown in Tables 2.1 and 2.2 on page II - 67.
 (2) Track rail mounting bolts are not appended. Hexagon socket head bolts of JIS B 1176 with strength division 12.9 are recommended.
 (3) The direction of basic dynamic load rating (C), basic static load rating (C₀), and static moment rating (T₀, T_x, T_y) are shown in the sketches below. The upper values of T_x and T_y are for one slide unit and the lower values are for two slide units in close contact.
 (4) The shapes of grease nipple vary by size. The specifications are shown in Table 15 on page II - 73.



Example of identification number of assembled set

Model code	Dimensions	Part code	Model code	Material code	Preload symbol	Classification symbol	Interchangeable code	Supplemental code
MET	G	30	C2	R440	T1	P	/U	
①	②	③	④	⑤	⑥	⑦	⑧	⑨

① Model

MET	Flange type mounting from top
LWET	
LWET...Q	

② Length of slide unit

C	Short
No symbol	Standard
G	Long

③ Size

25, 30, 35, 45

④ Number of slide unit (2)

⑤ Length of track rail (440 mm)

⑥ Material type

No symbol	High carbon steel made
SL	Stainless steel made

⑦ Preload amount

T ₀	Clearance
No symbol	Standard
T ₁	Light preload
T ₂	Medium preload

⑧ Accuracy class

No symbol	Ordinary
H	High
P	Precision
SP	Super precision

⑨ Interchangeable

No symbol	Non-interchangeable specification
S1	S1 specification
S2	S2 specification

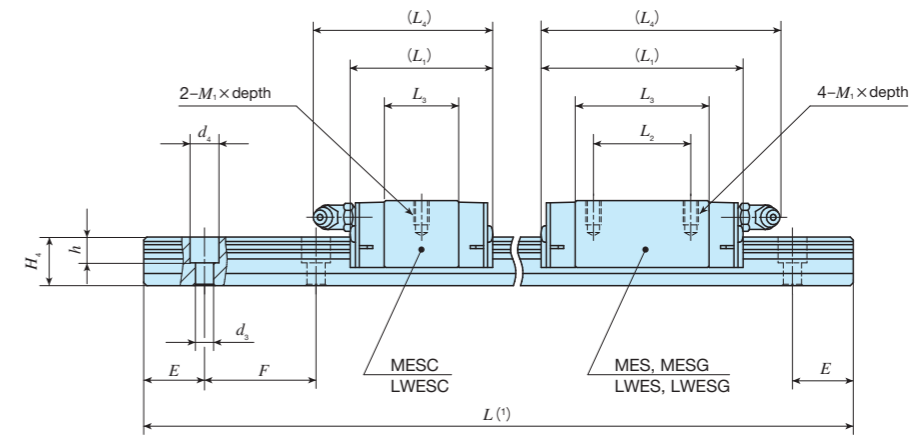
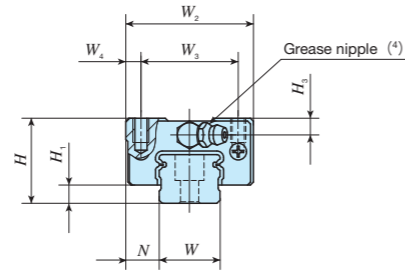
⑩ Special specification

A, BS, D, E, F, I, J, L, LF, MA, N, Q, RE, T, U, V, W, Y, Z

IKO C-Lube Linear Way ME

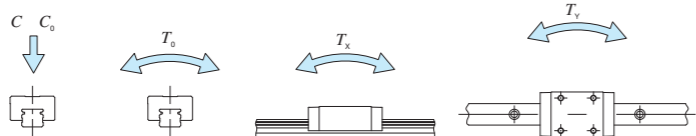
Block type mounting from top

Shape	MES · LWES		
Size	15	20	25
	30	35	45



Identification number	ME series	LWE series (No C-Lube)	Interchangeable	Mass (Ref.)		Dimensions of assembly mm			Dimensions of slide unit mm						Dimensions of track rail mm						Recommended mounting bolt for track rail (2) mm	Bolt size x ℓ	Basic dynamic load rating (3) C N	Basic static load rating (3) C0 N	Static moment rating (3)							
				Slide unit kg	Track rail kg/m	H	H1	N	W2	W3	W4	L1	L2	L3	L4	M1 x depth	H3	W	H4	d3					d4	h	E	F	T0 N·m	Tx N·m	Ty N·m	
MESC 15	LWESC 15		○	0.09	1.57	24	5.8	9.5	34	26	4	41	—	22.4	45	M4 x 7	4.5	15	14.5	3.6 (4.5)	6.5 (8)	4.5 (6)	20	60	M3 x 16 (M4 x 16)	5 240	5 480	43.8	21.3 149	21.3 149		
MESC 15...SL	LWESC 15...SL	○	57									26	38.4	61	7 640											9 390	75.1	57.6 333	57.6 333			
MES 15	LWES 15	○	5									38.3	61	6 550	8 610											68.9	53.0 307	53.0 307				
MES 15...SL	LWES 15...SL	○	70									36	51.1	73	9 340											12 500	100	99.5 533	99.5 533			
MESC 20	LWESC 20		○	0.15	2.28	28	6	11	42	32	5	47	—	24.7	58	M5 x 8	5.5	20	16	6	9.5	8.5	20	60	M5 x 16	7 580	7 340	78.9	31.5 235	31.5 235		
MESC 20...SL	LWESC 20...SL	○	44									44	78	11 600	13 400											145					95.6 566	95.6 566
MES 20	LWES 20	○	44									78	10 500													100 562					100 562	
MES 20...SL	LWES 20...SL	○	60.1									59.9	94	14 400	18 300											197					172 930	172 930
MESC 20	LWESC 20		○	0.25	2.28	28	6	11	42	32	5	83	45	60.1	94	M5 x 8	5.5	20	16	6	9.5	8.5	20	60	M5 x 16	14 400	18 300	197	172 930	172 930		
MESC 20...SL	LWESC 20...SL	○	60.1									59.9	94	14 400	18 300											197					172 930	172 930
MES 20	LWES 20	○	60.1									59.9	94	14 400	18 300											197					172 930	172 930
MES 20...SL	LWES 20...SL	○	60.1									59.9	94	14 400	18 300											197					172 930	172 930

Notes (1) Track rail lengths L are shown in Tables 2.1 and 2.2 on page II - 67.
 (2) Track rail mounting bolts are not appended. Hexagon socket head bolts of JIS B 1176 with strength division 12.9 are recommended.
 (3) The direction of basic dynamic load rating (C), basic static load rating (C_0), and static moment rating (T_0 , T_x , T_y) are shown in the sketches below. The upper values of T_x and T_y are for one slide unit and the lower values are for two slide units in close contact.
 (4) The shapes of grease nipple vary by size. The specifications are shown in Table 15 on page II - 73.
 Remark: The value in () represents dimensions when the track rail mounting hole dimension is set for M4 holes. Indicate the identification number with /M4 at the end.



Example of identification number of assembled set

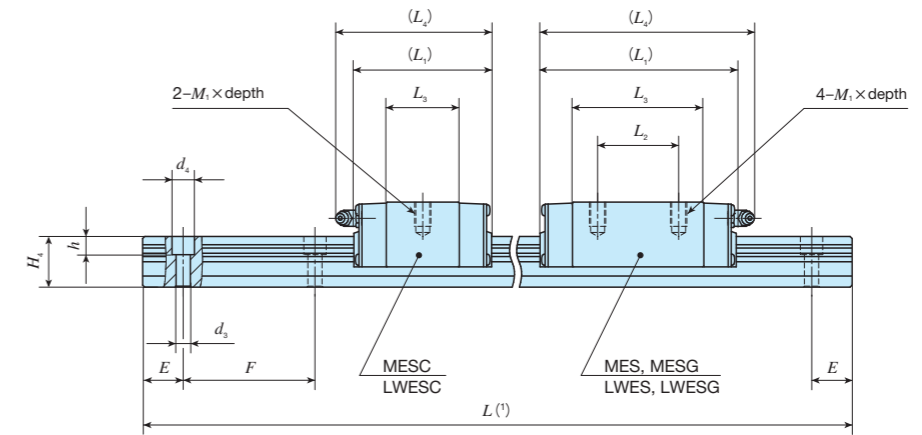
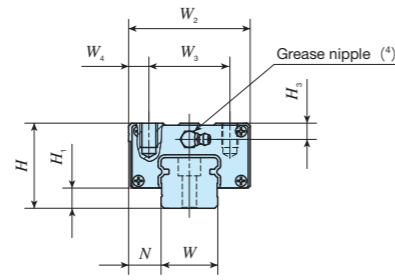
Model code	Dimensions	Part code	Model code	Material code	Preload symbol	Classification symbol	Interchangeable code	Supplemental code
MES	G	15	C2	R340	T1	P	/U	
1	2	3	4	5	6	7	8	9 10

① Model MES LWES LWES...Q	Block type mounting from top	③ Size 15, 20	⑦ Preload amount T0 Clearance No symbol Standard T1 Light preload T2 Medium preload	⑨ Interchangeable No symbol Non-interchangeable specification S1 S1 specification S2 S2 specification
② Length of slide unit C Short No symbol Standard G Long		④ Number of slide unit (2)	⑧ Accuracy class No symbol Ordinary H High P Precision SP Super precision	⑩ Special specification A, BS, D, E, F, I, J, L, LF, MA M4, N, Q, RE, T, U, V, W, Y, Z

IKO C-Lube Linear Way ME

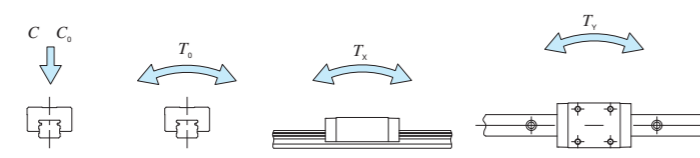
Block type mounting from top

Shape	MES · LWES		
Size	15	20	25
	30	35	45



Identification number	ME series	LWE series (No C-Lube)	Interchangeable	Mass (Ref.)		Dimensions of assembly mm			Dimensions of slide unit mm					Dimensions of track rail mm						Recommended mounting bolt for track rail (2) mm	Basic dynamic load rating (3) C N	Basic static load rating (3) C ₀ N	Static moment rating (3)																											
				Slide unit kg	Track rail kg/m	H	H ₁	N	W ₂	W ₃	W ₄	L ₁	L ₂	L ₃	L ₄	M ₁ × depth	H ₃	W	H ₄				d ₃	d ₄	h	E	F	T ₀ N · m	T _x N · m	T _y N · m																				
MESC 25	LWESC 25		○	0.26	3.09	33	7	12.5	48	35	6.5	59	—	32	70	M 6×9	6.5	23	19	7	11	9	20	60	M 6×20	12 400	12 300	153	71.8	71.8																				
MESC 25...SL	LWESC 25...SL	○	83									35	56	94	195													195																						
MES 25	LWES 25	○	6									175	175																																					
MES 25...SL	LWES 25...SL	○	7									1 010	1 010																																					
MESG 25	LWESG 25	○	○	0.55	5.09	42	10	16	60	40	10	102	50	75	113	M 8×12	8	28	25	7	11	9	20	80	M 6×25	22 200	28 200	349	336	336																				
MESG 25...SL	LWESG 25...SL	○	96									40	64.8	107	1 920													1 920																						
MESC 30	LWESC 30	○	○									0.78	5.04	42	10													16	60	40	10	68	—	36	78	M 8×12	8	28	25	7	11	9	20	80	M 6×25	20 600	18 800	287	129	129
MESC 30...SL	LWESC 30...SL	○	96																													40	64.8	106	278													278		
MES 30	LWES 30	○	○	1.13	5.09	42	10	16	60	40	10					129	60	96.5	139	M 8×12	8	28	25	7	11	9	20					80	M 6×25	29 500	31 300													479	328	328
MES 30...SL	LWES 30...SL	○	110													40	64.8	106	1 580																													1 580		
MESG 30	LWESG 30	○	○									1.21	6.85	48	11	18	70	50	10									78	—	41.6	90					M 8×12	10	34	28	9	14	12	20	80	M 8×30	29 900	26 800	412	176	162
MESG 30...SL	LWESG 30...SL	○	110																									40	64.8	106	2 448																	2 450		
MESC 35	LWESC 35	○	○	1.20	6.84	48	11	18	70	50	10									111	50	74.6	123	M 8×12	10	34	28	9	14	12	20	80	M 8×30	42 900	44 700													686	448	412
MES 35	LWES 35	○	110																	40	64.8	106	2 660																									2 450		
MES 45	LWES 45	○	○									2.05	11.2	60	14	20.5	86	60	13	125	60	81.4	136													M10×15	13	45	34	11	17.5	14	22.5	105	M10×35	61 100	60 200	1 210	672	618
MESC 45	LWESC 45	○	110																	40	64.8	106	4 070																									3 750		

Notes (1) Track rail lengths *L* are shown in Tables 2.1 and 2.2 on page II - 67.
 (2) Track rail mounting bolts are not appended. Hexagon socket head bolts of JIS B 1176 with strength division 12.9 are recommended.
 (3) The direction of basic dynamic load rating (*C*), basic static load rating (*C₀*), and static moment rating (*T₀*, *T_x*, *T_y*) are shown in the sketches below. The upper values of *T_x* and *T_y* are for one slide unit and the lower values are for two slide units in close contact.
 (4) The shapes of grease nipple vary by size. The specifications are shown in Table 15 on page II - 73.



Example of identification number of assembled set

Model code	Dimensions	Part code	Model code	Material code	Preload symbol	Classification symbol	Interchangeable code	Supplemental code
MES	G	30	C2	R440	T1	P		/U
1	2	3	4	5	7	8	9	10

1 Model

MES	Block type mounting from top
LWES	
LWES...Q	

2 Length of slide unit

C	Short
No symbol	Standard
G	Long

3 Size

25, 30, 35, 45

4 Number of slide unit (2)

5 Length of track rail (440 mm)

6 Material type

No symbol	High carbon steel made
SL	Stainless steel made

7 Preload amount

T ₀	Clearance
No symbol	Standard
T ₁	Light preload
T ₂	Medium preload

8 Accuracy class

No symbol	Ordinary
H	High
P	Precision
SP	Super precision

9 Interchangeable

No symbol	Non-interchangeable specification
S1	S1 specification
S2	S2 specification

10 Special specification

A, BS, D, E, F, I, J, L, LF, MA, N, Q, RE, T, U, V, W, Y, Z

C-Lube Linear Way MH Linear Way H



C-Lube Linear Way MH

MH



The aquamarine end plate is the symbol of maintenance free.

Track rail

Slide unit

Casing

C-Lube

Ball

End plate

Under seal

Ball retaining band

End seal

Grease nipple

Linear Way H

LWH

Points

- **High rigidity series with the largest-class load rating among ball types**

High rigidity linear motion rolling guides designed to evenly support high load capacity by incorporating large-diameter balls.

- **Wide range of variations for your needs** For details ▶ P.I-26

As the lineup of 5 types of slide unit shape including the flange type, block type with small width and side mounting type, etc., and 3 types with different slide unit length with same section are available, you can select an optimal product for the specifications of your machine and device.

- **Stainless steels selections superior in corrosion resistance are listed on lineup.** For details ▶ P.I-39

Products made of stainless steel are highly resistant to corrosion, so that they are suitable for applications where rust prevention oil is not preferred, such as in cleanroom environment.

- **Series of ultra seal specification for excellent dust protection performance**

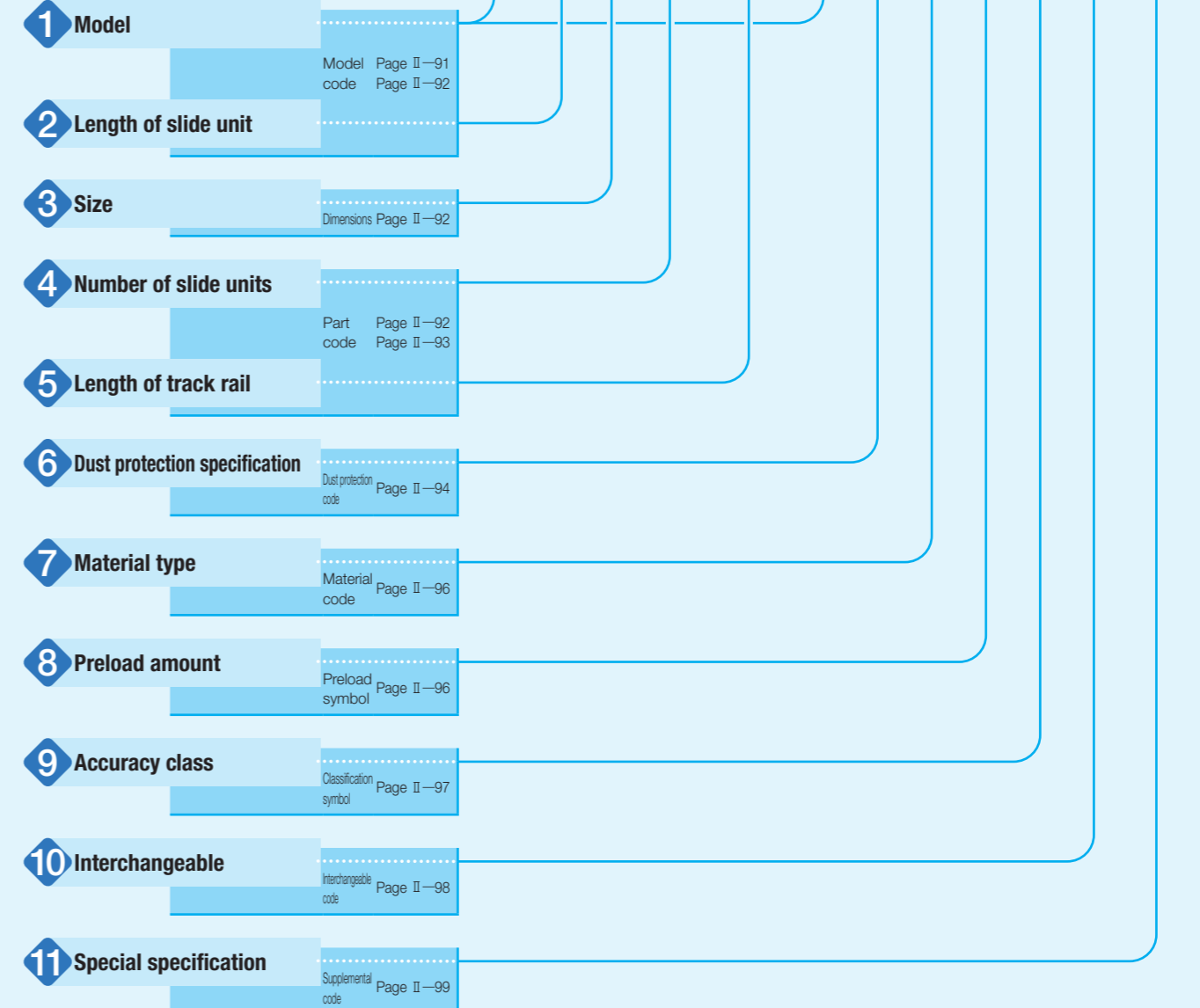
Products of ultra seal specifications have excellent dust protection performance thanks to the combination of the dedicated track rail finished with total ground and slide unit with end seal and under seal of special shapes. Special specification with inner seal further improves dust protection property of the ball circulation section against foreign substances from the upper surface of the track rail.

Identification Number and Specification

Example of an identification number

The specifications of MH and LWH series are indicated by the identification number. Indicate the identification number, consisting of a model code, dimensions, a part code, a dust protection code, a material code, a preload symbol, a classification symbol, an interchangeable code, and any supplemental codes for each specification to apply.

Non-interchangeable specification	1	2	3	4	5	6	7	8	9	10	11
Assembled set	MHT	G	20	C1	R840				T ₁	P	/FV
Interchangeable specification											
Single slide unit	MHT	G	20	C1					T ₁	P	S1 /V
Single track rail (1)	LWH		20		R840	B				P	S1 /F
Assembled set	MHT	G	20	C1	R840				T ₁	P	S1 /FV



Note (1) Indicate "LWH...B" or "LWH" for the model code of the single track rail regardless of the series and the combination of slide unit models.

MH · LWH

Identification Number and Specification — Model —

1 Model	C-Lube Linear Way MH (MH series)	Flange type mounting from bottom : MH Flange type mounting from top ⁽²⁾ : MHT Block type mounting from top : MHD Compact block type mounting from top : MHS
	Linear Way H ⁽¹⁾ (LWH series)	Flange type mounting from bottom : LWH (...B) Flange type mounting from top ⁽²⁾ : LWHT (...B) Block type mounting from top : LWHD (...B) Compact block type mounting from top : LWHS (...B) Side mounting type : LWHY

For applicable models and sizes, see Table 1.1 and Table 1.2.
Indicate "LWH...B" or "LWH" for the model code of the single track rail regardless of the series and the combination of slide unit models.

Notes ⁽¹⁾ This model has no built-in C-Lube.
⁽²⁾ Some models may be mounted upward.

Table 1.1 Models and sizes of MH and LWH series

Material	Shape	Length of slide unit	Model	Size											
				8	10	12	15	20	25	30	35	45	55	65	
High carbon steel made	Flange type mounting from bottom	Standard	MH	-	-	-	○	○	○	○	○	○	-	-	
			LWH...B	-	-	-	○	○	○	○	○	○	○	○	
			MH...M (U)	-	-	-	-	-	○	○	-	-	-	-	
		Long	LWH...M (U)	-	-	-	○	○	○	○	○	○	-	-	
			MHG	-	-	-	-	○	○	○	○	○	-	-	
			LWHG	-	-	-	-	○	○	○	○	○	○	○	
	Flange type mounting from top	Standard	MHT	-	-	○ ⁽¹⁾	○	○	○	○	○	○	-	-	
			LWHT...B	-	-	○ ⁽¹⁾⁽²⁾	○	○	○	○	○	○	○	○	
			MHT...M (U)	-	-	-	-	-	○	○	-	-	-	-	
		Long	LWHT...M (U)	-	-	-	○	○	○	○	○	○	-	-	
			MHTG	-	-	-	○ ⁽¹⁾	○	○	○	○	○	-	-	
			LWHTG	-	-	-	-	○	○	○	○	○	○	○	
	Block type mounting from top	Standard	MHD	-	-	○	○	-	○	○	○	○	-	-	
			LWHD...B	-	-	○ ⁽²⁾	○	-	○	○	○	○	○	○	
			MHD...M (U)	-	-	-	-	-	○	○	-	-	-	-	
		Long	LWHD...M (U)	-	-	-	○	-	○	○	○	○	-	-	
			MHDG	-	-	-	-	-	○	○	○	○	-	-	
			LWHDG	-	-	-	-	-	○	○	○	○	○	○	
Compact block type mounting from top	Standard	MHS	-	-	-	○	○	○	○	-	-	-	-		
		LWHS...B	-	-	-	○	○	○	○	-	-	-	-		
		MHS...M (U)	-	-	-	-	-	○	○	-	-	-	-		
	Long	LWHS...M (U)	-	-	-	○	○	○	○	-	-	-	-		
		MHSG	-	-	-	○	○	○	○	-	-	-	-		
		LWHS...G	-	-	-	-	○	○	○	○	-	-	-		
Side mounting type	Standard	LWHY	-	-	-	○	○	○	○	○	○	-	-		

Notes ⁽¹⁾ This may be mounted upward.
⁽²⁾ "...B" is not included in the model code.
Remark: For the models indicated in , the interchangeable specification is available.

— Length of Slide Unit · Size · Number of Slide Unit —

2 Length of slide unit	Short	: C	For applicable models and sizes, see Table 1.1 and Table 1.2.
	Standard	: No symbol	
	Long	: G	
3 Size	8, 10, 12, 15, 20, 25, 30, 35, 45, 55, 65		For applicable models and sizes, see Table 1.1 and Table 1.2.
	4 Number of slide units		: C○

Table 1.2 Models and sizes of MH and LWH series

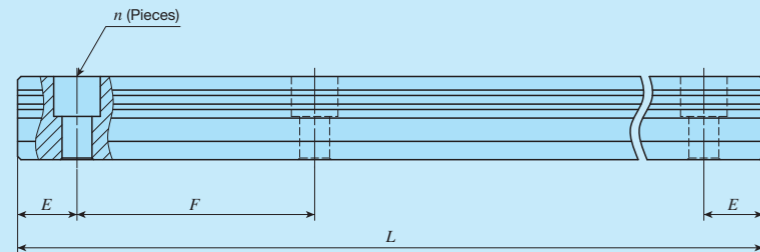
Material	Shape	Slide unit Length	Model	Size											
				8	10	12	15	20	25	30	35	45	55	65	
Stainless steel made	Flange type mounting from bottom	Standard	LWH...SL	-	-	-	○	○	○	○	○	-	-		
			MHT...SL	○ ⁽¹⁾	○ ⁽¹⁾	○ ⁽¹⁾	○	○	○	○	-	-	-	-	
	Flange type mounting from top	Standard	LWHT...SL	○ ⁽¹⁾	○ ⁽¹⁾	○ ⁽¹⁾	○	○	○	○	-	-	-	-	
			MHDC...SL	○	○	○	-	-	-	-	-	-	-	-	
	Block type mounting from top	Standard	LWDC...SL	○	○	○	-	-	-	-	-	-	-	-	
			MHD...SL	○	○	○	-	-	-	-	-	-	-	-	
		Long	LWHD...SL	○	○	○	-	-	-	-	-	-	-	-	
			MHDG...SL	○	○	○	-	-	-	-	-	-	-	-	
	Compact block type mounting from top	Standard	MHS...SL	-	-	-	○	○	○	○	-	-	-	-	
			LWHS...SL	-	-	-	○	○	○	○	-	-	-	-	

Note ⁽¹⁾ This may be mounted upward.
Remark: For the models indicated in , the interchangeable specification is available.

5 Length of track rail

: R O Indicate the length of track rail in mm.
For standard and maximum length, see Table 2.1 and Table 2.2.

Table 2.1 Standard and maximum length of high carbon steel track rail



unit: mm

Item	Identification number	MH 12 LWH12	MH 15 LWH15...B	MH 20 LWH20...B	MH 25 LWH25...B	MH 30 LWH30...B
Standard length L (n)		80 (2)	180 (3)	240 (4)	240 (4)	480 (6)
		160 (4)	240 (4)	480 (8)	480 (8)	640 (8)
		240 (6)	360 (6)	660 (11)	660 (11)	800 (10)
		320 (8)	480 (8)	840 (14)	840 (14)	1 040 (13)
		400 (10)	660 (11)	1 020 (17)	1 020 (17)	1 200 (15)
		480 (12)	900 (15)	1 200 (20)	1 200 (20)	1 520 (19)
		560 (14)	1 200 (20)	1 500 (25)	1 500 (25)	2 000 (25)
		640 (16)			1 980 (33)	
		720 (18)				
Pitch of mounting holes F		40	60	60	60	80
E		20	30	30	30	40
Standard E or higher dimensions ⁽¹⁾ below		5.5	7	8	9	10
Maximum length ⁽²⁾		1 480	1 500 (3 000)	1 980 (3 000)	3 000 (3 960)	2 960 (4 000)
Item	Identification number	MH 35 LWH35...B	MH 45 LWH45...B	LWH55...B	LWH65...B	
Standard length L (n)		480 (6)	840 (8)	840 (7)	1 500 (10)	
		640 (8)	1 050 (10)	1 200 (10)	1 950 (13)	
		800 (10)	1 260 (12)	1 560 (13)	3 000 (20)	
		1 040 (13)	1 470 (14)	1 920 (16)		
		1 200 (15)	1 995 (19)	3 000 (25)		
		1 520 (19)				
Pitch of mounting holes F		80	105	120	150	
E		40	52.5	60	75	
Standard E or higher dimensions ⁽¹⁾ below		10	12.5	15	17	
Maximum length ⁽²⁾		2 960 (4 000)	2 940 (3 990)	3 000 (3 960)	3 000 (3 900)	

Notes ⁽¹⁾ This does not apply to female threads for bellows (supplemental code "/J").

⁽²⁾ Length up to the value in () can be produced. If needed, please contact IKO.

Remarks 1. A typical identification number is indicated, but is applied to all models of the same size.

2. Indicate "LWH" for series of size 12 or "LWH...B" for series of size 15 or above for the model code of the single track rail regardless of the series and the combination of slide unit models.

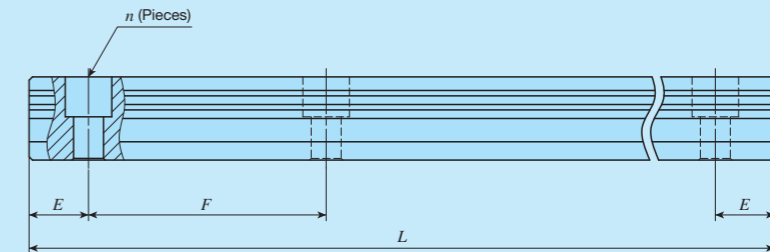
3. For ultra seal specification, refer to Table 2.3 and Table 2.4.

4. If not directed, E dimensions for both ends will be the same within the range of standard E dimensions. To change the dimensions, indicate the specified rail mounting hole positions "/E" of special specification. For more information, see page III -30.

6 Dust protection specification

Standard specification : No symbol For applicable models and sizes, see Table 1.1 and Table 1.2.
Ultra seal specification : M Each specification of ultra seal specification with track rail mounting from bottom is in compliance to the ultra seal specification.
Ultra seal specification with track rail mounting from bottom : MU Ultra seal specification with track rail mounting from bottom applies to products to fix the track rail on the mounting surface side by pressing in the aluminum alloy caps for rail mounting holes to the mounting hole of the track rail in advance. As the upper surface of the track rail is flat, adhesion to the seal is high and dust protection effect is improved further.
For track rail specifications, see Table 2.3 and Table 2.4.

Table 2.2 Standard and maximum length of stainless steel track rail



unit: mm

Item	Identification number	MH 8...SL LWH8...SL	MH 10...SL LWH10...SL	MH 12...SL LWH12...SL	MH 15...SL LWH15...SL	MH 20...SL LWH20...SL	MH 25...SL LWH25...SL	MH 30...SL LWH30...SL
Standard length L (n)		40 (2)	50 (2)	80 (2)	180 (3)	240 (4)	240 (4)	480 (6)
		80 (4)	100 (4)	160 (4)	240 (4)	480 (8)	480 (8)	640 (8)
		120 (6)	150 (6)	240 (6)	360 (6)	660 (11)	660 (11)	800 (10)
		160 (8)	200 (8)	320 (8)	480 (8)	840 (14)	840 (14)	1 040 (13)
		200 (10)	250 (10)	400 (10)	660 (11)			
		240 (12)	300 (12)	480 (12)				
		280 (14)	350 (14)	560 (14)				
			400 (16)	640 (16)				
			450 (18)	720 (18)				
Pitch of mounting holes F		20	25	40	60	60	60	80
E		10	12.5	20	30	30	30	40
Standard E or higher dimensions ⁽¹⁾ below		4.5	5	5.5	7	8	9	10
Maximum length ⁽²⁾		480 (1 000)	850 (1 000)	1 000 (1 480)	1 200 (1 500)	1 200 (3 000)	1 200 (3 000)	1 200 (2 960)

Notes ⁽¹⁾ This does not apply to female threads for bellows (supplemental code "/J").

⁽²⁾ Length up to the value in () can be produced. If needed, please contact IKO.

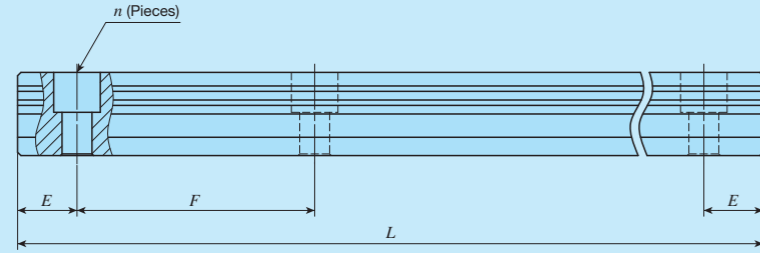
Remarks 1. A typical identification number is indicated, but is applied to all models of the same size.

2. Indicate "LWH" for the model code of the single track rail regardless of the series and the combination of slide unit models.

3. If not directed, E dimensions for both ends will be the same within the range of standard E dimensions. To change the dimensions, indicate the specified rail mounting hole positions "/E" of special specification. For more information, see page III -30.

—Length of Track Rail—

Table 2.3 Standard and maximum length of ultra seal specification high carbon steel track rail



unit: mm

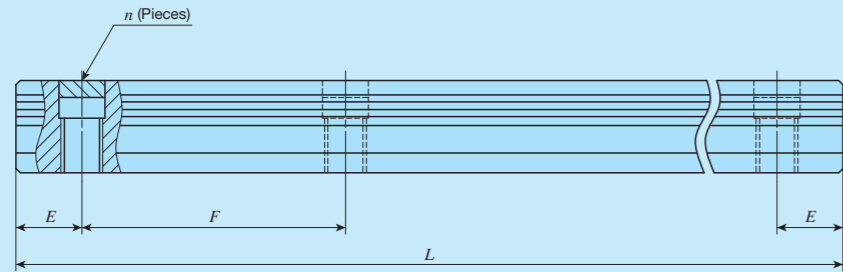
Item	Identification number					
	LWH15...M	LWH20...M	MH 25...M LWH25...M	MH 30...M LWH30...M	LWH35...M	LWH45...M
Standard length L (n)	180 (3)	240 (4)	240 (4)	480 (6)	480 (6)	840 (8)
	240 (4)	480 (8)	480 (8)	640 (8)	640 (8)	1 050 (10)
	360 (6)	660 (11)	660 (11)	800 (10)	800 (10)	1 260 (12)
	480 (8)	840 (14)	840 (14)	1 040 (13)	1 040 (13)	1 470 (14)
	660 (11)	1 020 (17)	1 020 (17)	1 200 (15)	1 200 (15)	1 995 (19)
		1 200 (20)	1 200 (20)	1 520 (19)	1 520 (19)	
Pitch of mounting holes F	60	60	60	80	80	105
E	30	30	30	40	40	52.5
Standard E or higher dimensions (1) below	7	8	9	10	10	12.5
	37	38	39	50	50	65
Maximum length	1 500	1 980	3 000	2 960	2 960	2 940
Maximum number of butt-jointing track rails	3	3	3	3	3	3
Maximum length of butt-jointing track rail	4 200	5 640	8 700	8 480	8 480	8 295

Note (1) This does not apply to female threads for bellows (supplemental code "/J").

Remarks 1. A typical identification number is indicated, but is applied to all models of the same size.

2. If not directed, E dimensions for both ends will be the same within the range of standard E dimensions. To change the dimensions, indicate the specified rail mounting hole positions "/E" of special specification. For more information, see page III -30.

Table 2.4 Standard and maximum length of ultra seal specification with track rail mounting from bottom



unit: mm

Item	Identification number					
	LWH15...MU	LWH20...MU	MH 25...MU LWH25...MU	MH 30...MU LWH30...MU	LWH35...MU	LWH45...MU
Standard length L (n)	180 (3)	240 (4)	240 (4)	480 (6)	480 (6)	840 (8)
	240 (4)	480 (8)	480 (8)	640 (8)	640 (8)	1 050 (10)
	360 (6)	660 (11)	660 (11)	800 (10)	800 (10)	1 260 (12)
	480 (8)	840 (14)	840 (14)	1 040 (13)	1 040 (13)	1 470 (14)
	660 (11)	1 020 (17)	1 020 (17)	1 200 (15)	1 200 (15)	1 995 (19)
		1 200 (20)	1 200 (20)	1 520 (19)	1 520 (19)	
Pitch of mounting holes F	60	60	60	80	80	105
E	30	30	30	40	40	52.5
Standard E or higher dimensions (1) below	7	8	9	10	10	12.5
	37	38	39	50	50	65
Maximum length	1 500	1 980	3 000	2 960	2 960	2 940
Maximum number of butt-jointing track rails	3	3	3	3	3	3
Maximum length of butt-jointing track rail	4 200	5 640	8 700	8 480	8 480	8 295

Note (1) This does not apply to female threads for bellows (supplemental code "/J").

Remarks 1. A typical identification number is indicated, but is applied to all models of the same size.

2. Track rail mounting bolt is not included.

3. If not directed, E dimensions for both ends will be the same within the range of standard E dimensions. To change the dimensions, indicate the specified rail mounting hole positions "/E" of special specification. For more information, see page III -30.

—Material Type · Preload Amount—

7 Material type

High carbon steel made : No symbol For applicable models and sizes, see Table 1.1 and
Stainless steel made (1) : SL Table 1.2.

Note (1) Mount a standard grease nipple (brass) on the stainless steel type, too.
Stainless steel grease nipple is also available. If needed, please contact IKO.

8 Preload amount

Clearance : T_0 Specify this item for an assembled set or a single slide unit.
Standard : No symbol For details of the preload amount, see Table 3.
Light preload : T_1 For applicable preload types, see Table 4.
Medium preload : T_2
Heavy preload : T_3

Table 3 Preload amount

Item	Preload symbol	Preload amount N	Operational conditions
Clearance	T_0	0 ⁽²⁾	· Very light motion
Standard	(No symbol)	0 ⁽³⁾	· Light and precise motion
Light preload	T_1	0.02 C_0	· Almost no vibrations · Load is evenly balanced · Light and precise motion
Medium preload	T_2	0.05 C_0	· Medium vibration · Medium overhung load
Heavy preload	T_3	0.08 C_0	· Operation with vibration and/or shock · Overhanging load applied · Heavy cutting

Notes (2) There is zero or subtle clearance.

(3) Indicates zero or minimal amount of preload.

Remark: C_0 indicates the basic static load rating.

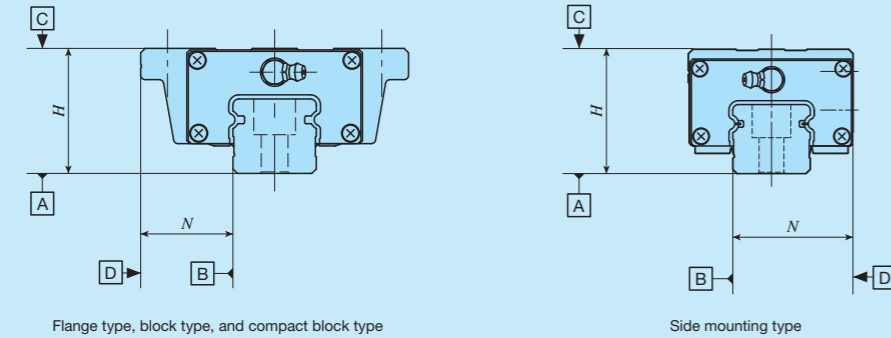
Table 4 Application of preload

Size	Preload type (preload symbol)				
	Clearance (T_0)	Standard (No symbol)	Light preload (T_1)	Medium preload (T_2)	Heavy preload (T_3)
8	○	○	○	—	—
10	○	○	○	—	—
12	○	○	○	—	—
15	—	○	○	○	○
20	—	○	○	○	○
25	—	○	○	○	○
30	—	○	○	○	○
35	—	○	○	○	○
45	—	○	○	○	○
55	—	○	○	○	○
65	—	○	○	○	○

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

9 Accuracy class	High	: H	For interchangeable specification products, assemble a slide unit and a track rail of the same accuracy class. For details of accuracy class, see Table 5.1 and Table 5.2. For applicable accuracy class, see Table 6.
	Precision	: P	
	Super precision	: SP	

Table 5.1 Tolerance and allowance (Series of size 15 or higher)



Item	Class (classification symbol)	High (H)	Precision (P)	Super precision (SP)
Dim. <i>H</i> tolerance		±0.040	±0.020	±0.010
Dim. <i>N</i> tolerance		±0.050	±0.025	±0.015
Dim. variation of <i>H</i> ⁽¹⁾		0.015	0.007	0.005
Dim. variation of <i>N</i> ⁽¹⁾		0.020	0.010	0.007
Dim. variation of <i>H</i> for multiple assembled sets ⁽²⁾		0.035	0.025	—
Slide unit against the A surface Parallelism during running on the C surface		See Fig. 1.1		
Slide unit against the B surface Parallelism during running on the D surface		See Fig. 1.1		

unit: mm

Notes ⁽¹⁾ It means the size variation between slide units mounted on the same track rail.
⁽²⁾ Applicable to the interchangeable specifications.

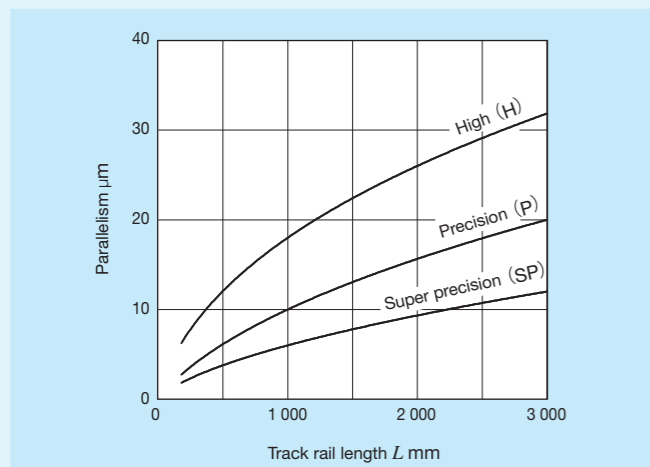
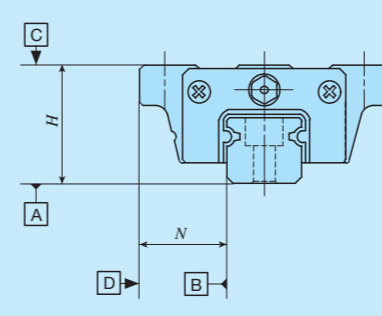


Fig. 1.1 Parallelism in operation (series of Size 15 or higher)

Table 5.2 Tolerance and allowance (Series of size 8 to 12)



Item	Class (classification symbol)	High (H)	Precision (P)
Dim. <i>H</i> tolerance		±0.020	±0.010
Dim. <i>N</i> tolerance		±0.025	±0.015
Dim. variation of <i>H</i> ⁽¹⁾		0.015	0.007
Dim. variation of <i>N</i> ⁽¹⁾		0.020	0.010
Dim. variation of <i>H</i> for multiple assembled sets ⁽²⁾		0.030	0.020
Parallelism in operation of the slide unit C surface to A surface		See Fig. 1.2	
Parallelism in operation of the slide unit D surface to B surface		See Fig. 1.2	

unit: mm

Notes ⁽¹⁾ It means the size variation between slide units mounted on the same track rail.
⁽²⁾ Applicable to the interchangeable specifications.

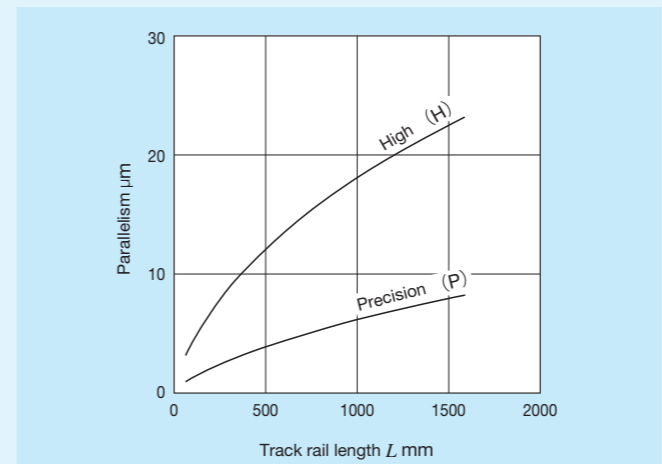



Fig. 1.2 Parallelism in operation (Series of size 8 to 12)

10 Interchangeable	S1 specification	: S1	This is specified for the interchangeable specifications. Assemble a track rail and a slide unit with the same interchangeable code. Performance and accuracy of "S1" and "S2" are the same. For applicable models and sizes, see Table 1.1 and Table 1.2. "No symbol" is indicated for non-interchangeable specification.
	S2 specification	: S2	
	Non-interchangeable specification	: No symbol	

Table 6 Application of accuracy class

Size	Class (classification symbol)		
	High (H)	Precision (P)	Super precision (SP)
8	○	○	—
10	○	○	—
12	○	○	—
15	○	○	○
20	○	○	○
25	○	○	○
30	○	○	○
35	○	○	○
45	○	○	○
55	○	○	○
65	○	○	○

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

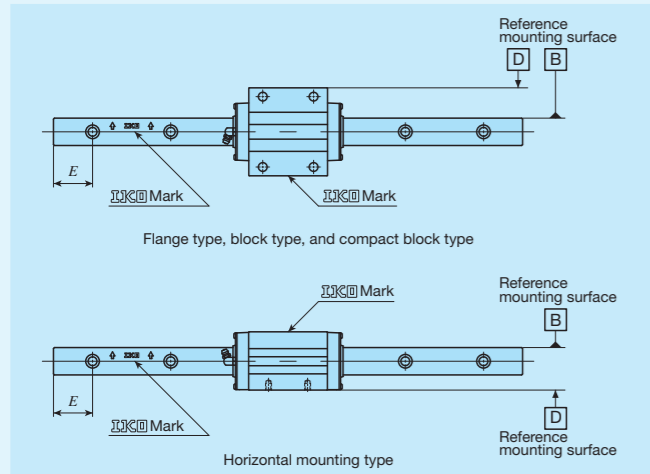


Fig. 2 Specified rail mounting hole positions (Supplemental code /E)

Remark: For details of specified rail mounting hole positions (supplemental code /E), see page III-30.

Table 9.1 Dimension of female threads for bellows (Supplemental code Single unit: /J Assembled set: /J /JJ)

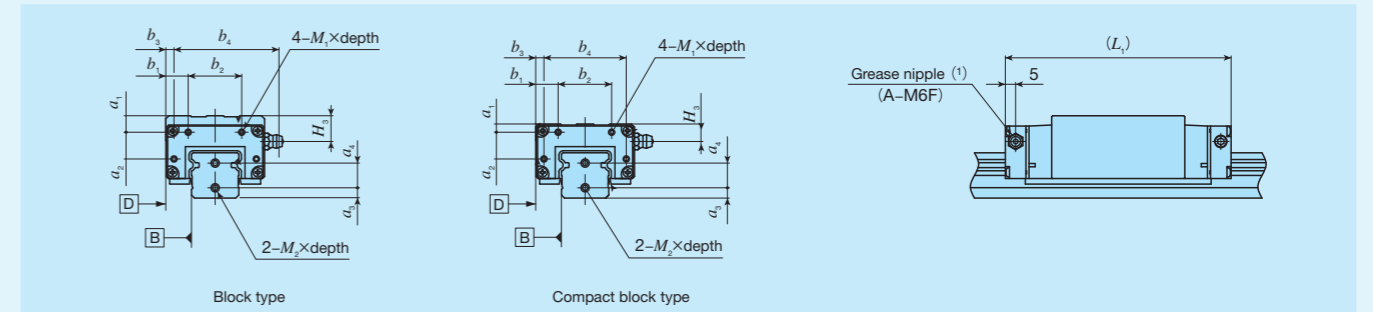
Identification number		Slide unit								Track rail			
		a ₁	a ₂	b ₁	b ₂	b ₃	b ₄	M ₁ ×depth	L ₁ ⁽²⁾	H ₃	a ₃	a ₄	M ₂ ×depth
MH(T) 15	LWH(T) 15...B	3	7	15.5	16	9.5	28	M3×6	83	6.5	4	8	M3×6
—	LWH(T) 15...M								86				
MHTG 15	—	4	10	20.5	22	13.5	36	M3×6	99	8.5	5	9	M4×8
MH(T) 20	LWH(T) 20...B								103				
—	LWH(T) 20...M(U)	4	13	22	26	15	40	M3×6	128	8.5	5	12	M4×8
MH(T)G 20	LWH(T)G 20								110				
MH(T) 25	LWH(T) 25...B	4	13	22	26	15	40	M3×6	115	8.5	5	12	M4×8
—	LWH(T) 25...M(U)								133				
MH(T)G 25	LWH(T)G 25	5	17	28	34	20	50	M3×6	128	11	6	14	M4×8
MH(T) 30	LWH(T) 30...B								133				
—	LWH(T) 30...M(U)	6	20	30	40	20	60	M3×6	154	13	7	15	M4×8
MH(T)G 30	LWH(T)G 30								137				
MH(T) 35	LWH(T) 35...B	7	26	35	50	23	74	M4×8	143	15	8	19	M5×10
—	LWH(T) 35...M(U)								165				
MH(T)G 35	LWH(T)G 35	7	32	40	60	27	86	M4×8	160	17	8	25	M5×10
MH(T) 45	LWH(T) 45...B								167				
—	LWH(T) 45...M(U)	10	46	50	70	32	106	M5×10	203	20	10	28	M6×12
MH(T)G 45	LWH(T)G 45								196				
—	LWH(T) 55...B	7	32	40	60	27	86	M4×8	248	17	8	25	M5×10
—	LWH(T)G 55								196				
—	LWH(T) 65...B	10	46	50	70	32	106	M5×10	240	20	10	28	M6×12
—	LWH(T)G 65								314				

Notes (1) The specification and mounting positions of grease nipple are different from those of the standard specification product. Provided grease nipple for size 15 models is NPB2 type (special specification). For details of dimensions, contact IKO.

(2) Dimensions of the specification that female threads for bellows are fitted to both ends of the slide unit are indicated.

Remark: This is also applicable to stainless steel models of the same size.

Table 9.2 Dimension of female threads for bellows (Supplemental code Single unit: /J Assembled set: /J /JJ)



unit: mm

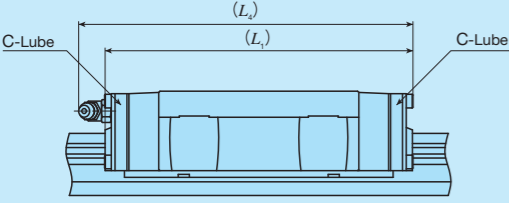
Identification number		Slide unit								Track rail			
		a ₁	a ₂	b ₁	b ₂	b ₃	b ₄	M ₁ ×depth	L ₁ ⁽²⁾	H ₃	a ₃	a ₄	M ₂ ×depth
MHD 15	LWHD 15...B	7	7	9	16	3	28	M3×6	83	10.5	4	8	M3×6
—	LWHD 15...M								86				
MHS 15	LWHS 15...B	3	7	9	16	3	28	M3×6	83	6.5	4	8	M3×6
—	LWHS 15...M(U)								86				
MHSG 15	—	4	10	11	22	4	36	M3×6	99	8.5	5	9	M4×8
MHS 20	LWHS 20...B								103				
—	LWHS 20...M(U)	8	13	11	26	4	40	M3×6	128	12.5	5	12	M4×8
MHSG 20	LWHS 20...M(U)								110				
MHD 25	LWHD 25...B	4	13	11	26	4	40	M3×6	115	8.5	5	12	M4×8
—	LWHD 25...M(U)								133				
MHDG 25	LWHDG 25	4	13	11	26	4	40	M3×6	110	8.5	5	12	M4×8
MHS 25	LWHS 25...B								115				
—	LWHS 25...M(U)	8	17	13	34	5	50	M3×6	133	14	6	14	M4×8
MHSG 25	LWHS 25...M(U)								128				
MHD 30	LWHD 30...B	5	17	13	34	5	50	M3×6	154	11	6	14	M4×8
—	LWHD 30...M(U)								128				
MHDG 30	LWHDG 30	10	46	28	70	10	106	M5×10	133	20	10	28	M6×12
MHS 30	LWHS 30...B								154				
—	LWHS 30...M(U)	13	20	15	40	5	60	M3×6	137	13	7	15	M4×8
MHSG 30	LWHS 30...M(U)								143				
MHD 35	LWHD 35...B	17	26	18	50	6	74	M4×8	165	25	8	19	M5×10
—	LWHD 35...M(U)								160				
MHDG 35	LWHDG 35	17	32	20	60	7	86	M4×8	167	27	8	25	M5×10
MHD 45	LWHD 45...B								203				
—	LWHD 45...M(U)	10	46	28	70	10	106	M5×10	196	20	10	28	M6×12
MHDG 45	LWHDG 45								248				
—	LWHD 55...B	7	32	40	60	27	86	M4×8	240	17	8	25	M5×10
—	LWHD 55...M(U)								314				
—	LWHD 65...B	10	46	50	70	32	106	M5×10	240	20	10	28	M6×12
—	LWHD 65...M(U)								314				

Notes (1) The specification and mounting positions of grease nipple are different from those of the standard specification product. Provided grease nipple for size 15 models is NPB2 type (special specification). For details of dimensions, contact IKO.

(2) Dimensions of the specification that female threads for bellows are fitted to both ends of the slide unit are indicated.

Remark: This is also applicable to stainless steel models of the same size.

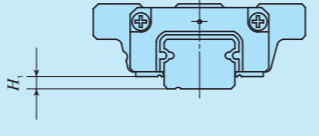
Table 10 Dimension of slide unit with C-Lube plate (Supplemental code /Q)



Identification number	L_1	L_4
LWHDC 8...SL	26	—
LWHT 8...SL	32	—
LWHD 8...SL		
LWHDG 8...SL	38.5	—
LWHDC 10...SL	34	—
LWHT 10...SL	42	—
LWHD 10...SL		
LWHDG 10...SL	50	—
LWHDC 12...SL	44	48
LWHT 12	56	60
LWHD 12		
LWHDG 12...SL	68	72
LWH 15...B	75	78
LWH 20...B	92	105
LWHG 20	121	134
LWH 25...B	105	116
LWHG 25	127	139
LWH 30...B	125	135
LWHG 30	151	161
LWH 35...B	134	146
LWHG 35	162	174
LWH 45...B	160	170
LWHG 45	203	214
LWH 55...B	196	207
LWHG 55	248	258
LWH 65...B	246	253
LWHG 65	321	328

Remarks 1. The dimensions of the slide unit with C-Lube at both ends are indicated.
2. A typical identification number is indicated, but is applied to all LWH series models of the same size.

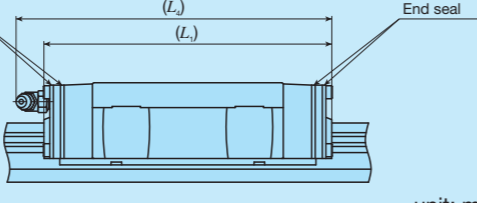
Table 11 H_1 dimension with under seal (Supplemental code /U)



Size	H_1
8	1.5
10	1.8
12	3.2 ⁽¹⁾

Note ⁽¹⁾ The dimensions are the same as those before mounting of under seal.

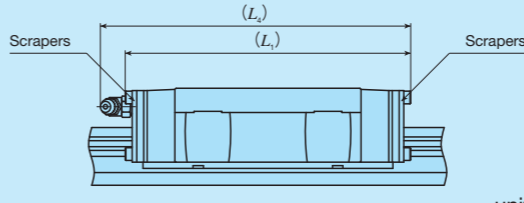
Table 12 Dimension of slide unit with double end seals (Supplemental code Single unit: /V Assembled set: /VV)



Identification number	L_1	L_4	
MH 15	LWH 15...B	72	77
—	LWH 15...M(U)	71	76
MHTG 15	—	88	93
MH 20	LWH 20...B	91	104
—	LWH 20...M(U)	90	103
MHG 20	LWHG 20	119	133
MH 25	LWH 25...B	104	116
MH 25...M(U)	LWH 25...M(U)	103	115
MHG 25	LWHG 25	127	139
MH 30	LWH 30...B	122	134
MH 30...M(U)	LWH 30...M(U)	121	
MHG 30	LWHG 30	148	160
MH 35	LWH 35...B	133	146
—	LWH 35...M(U)		
MHG 35	LWHG 35	161	173
MH 45	LWH 45...B	159	170
—	LWH 45...M(U)	158	
MHG 45	LWHG 45	202	213
—	LWH 55...B	195	206
—	LWHG 55	247	258
—	LWH 65...B	241	251
—	LWHG 65	316	325

Remarks 1. The dimensions of the slide unit with double end seals at both ends are indicated.
2. A typical identification number is indicated, but is applied to all models of the same size.

Table 13 Dimension of slide unit with scrapers (Supplemental code Single unit: /Z Assembled set: /ZZ)



Identification number	L_1	L_4	
MH 15	LWH 15...B	73	75
—	LWH 15...M(U)	72	74
MHTG 15	—	89	91
MH 20	LWH 20...B	91	104
—	LWH 20...M(U)	90	100
MHG 20	LWHG 20	119	133
MH 25	LWH 25...B	104	116
MH 25...M(U)	LWH 25...M(U)	103	112
MHG 25	LWHG 25	126	138
MH 30	LWH 30...B	124	135
MH 30...M(U)	LWH 30...M(U)	123	131
MHG 30	LWHG 30	150	161
MH 35	LWH 35...B	133	146
—	LWH 35...M(U)		
MHG 35	LWHG 35	161	174
MH 45	LWH 45...B	160	170
—	LWH 45...M(U)	159	
MHG 45	LWHG 45	203	214
—	LWH 55...B	196	207
—	LWHG 55	248	258
—	LWH 65...B	242	251
—	LWHG 65	317	326

Remarks 1. The dimensions of the slide unit with scraper at both ends are indicated.
2. A typical identification number is indicated, but is applied to all models of the same size.

Table 15 Parts for lubrication

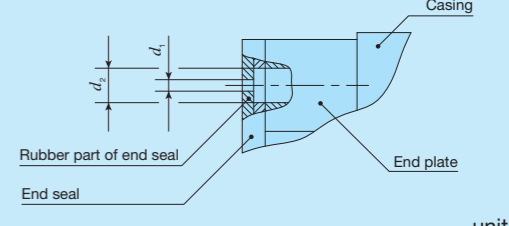
Size	Grease nipple type ⁽¹⁾	Applicable supply nozzle type	Bolt size of female threads for piping
8	Oil hole	Miniature greaser	—
10			—
12	A-M3	A-5120V A-5240V	—
15	A-M4	B-5120V B-5240V	M4
20	B-M6	Grease gun available on the market	M6
25			
30			
35			
45			
55	JIS type 4	PT1/8	
65			

Note ⁽¹⁾ For grease nipple specification, see Table 14.1 and Table 14.2 on page III-23.
Remark: Stainless steel grease nipple is also available. If needed, please contact IKO.

In the series of size 8 to 12 of MH series and LWH series, lithium-soap base grease (MULTEMP PS No.2, KYODO YUSHI) is pre-packed, and in the series of size 15 to 65, lithium-soap base grease with extreme-pressure additive (Alvania EP grease 2, [SHOWA SHELL SEKIYU K. K.]) is pre-packed. Additionally, MH series has C-Lube placed in the recirculation part of balls, so that the interval for reapplying lubricant can be extended and maintenance works such as grease job can be reduced significantly.

MH series and LWH series have grease nipple or oil hole as indicated in Table 15. Supply nozzles fit to each shapes of grease nipple and dedicated supplying equipment (miniature greasers) fit to oil holes are also available. For order of these parts for lubrication, see Table 13 and Table 14.1 on Page III-23, and Table 15 on page III-24.

Table 14 Oil hole specifications



Size	d_1	d_2
8	0.5	1.5
10		

Dust Protection

The slide units of MH series and LWH series are equipped with end seals and under seals as standard for dust protection. However, if large amount of contaminant or dust are floating, or if large particles of foreign substances such as chips or sand may adhere to the track rail, it is recommended to cover the whole unit with bellows or telescope type shield, etc. MH series and LWH series are provided with specific bellows. The bellows are easy to mount and provide excellent dust protection. If needed, please refer to III-26 for ordering. And, track rail mounting from bottom with no mounting hole on the upper surface of the track rail (Figure 3) is also available. If needed, contact IKO.

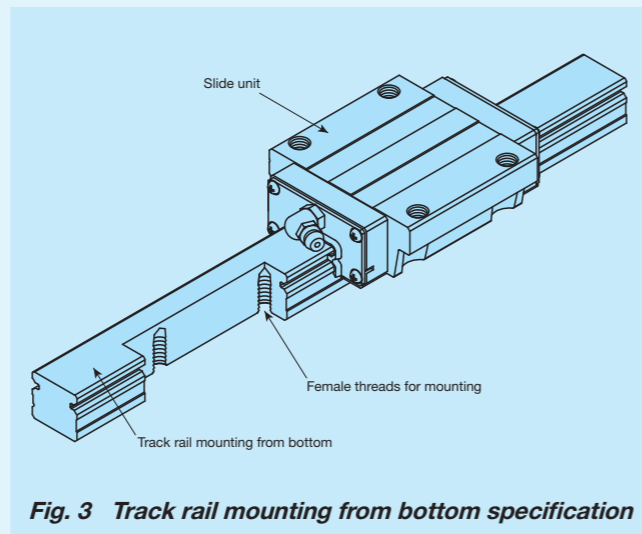


Fig. 3 Track rail mounting from bottom specification

Precaution for Use

1 Mounting surface, reference mounting surface and typical mounting structure

When mounting the MH series and LWH series, properly align the reference mounting surfaces B and D of the track rail and slide unit with the reference mounting surface of the table and bed and fix them. (See Fig. 4.)

The reference mounting surfaces B and D and mounting surfaces A and C are precisely ground. Machining the mounting surface of the table and bed, such as machine or device, to high accuracy and mounting them properly will ensure stable linear motion with high accuracy.

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

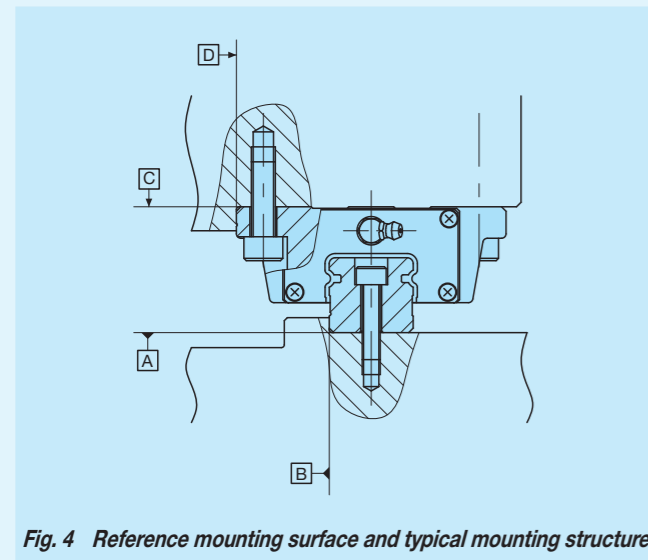


Fig. 4 Reference mounting surface and typical mounting structure

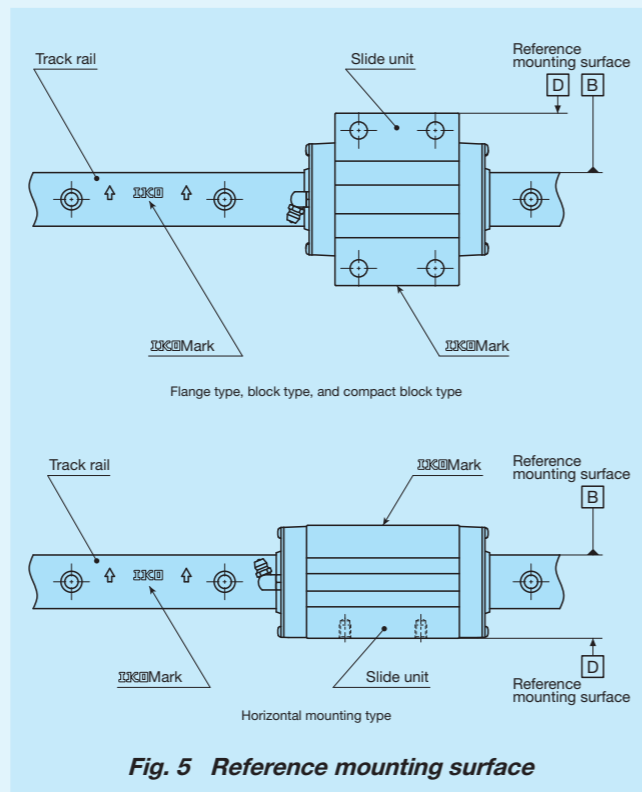


Fig. 5 Reference mounting surface

2 Shoulder height and corner radius of the reference mounting surface

For the opposite corner of the mating reference mounting, it is recommended to have relieved fillet as indicated in Fig. 6. Recommended value for the shoulder height and corner radius on the mating side is indicated in Table 16.

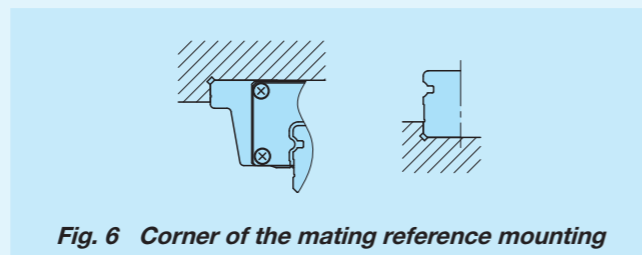
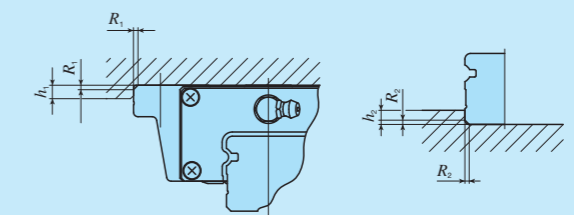


Fig. 6 Corner of the mating reference mounting

Table 16 Shoulder height and corner radius of the reference mounting surface



Size	Mounting part of slide unit		Mounting part of track rail	
	Shoulder height h_1	Corner radius R_1 (Maximum)	Shoulder height h_2	Corner radius R_2 (Maximum)
8	3.5(4) ⁽¹⁾	0.5	1.6 ⁽²⁾	0.2
10	4.5(5) ⁽¹⁾	0.5	1.9 ⁽²⁾	0.2
12	6	0.5	2.7 ⁽²⁾	0.7
15	4	0.5	3	0.5
20	5	0.5	3	0.5
25	6	1	4	1
30	8	1	5	1
35	8	1	6	1
45	8	1.5	7	1.5
55	10	1.5	8	1.5
65	10	1.5	10	1.5

unit: mm

Notes ⁽¹⁾ The values in () are applied to MHD and LWHD.

⁽²⁾ For models with under seals (supplemental code "/U"), it is recommended to use the values 0.6 mm smaller than the values in the table.

3 Tightening torque for fixing screw

Typical tightening torque for mounting of the MH series and LWH series to the steel mating member material is indicated in Table 17. When vibration and shock of the machine or device are large, fluctuating load is large, or moment load is applied, fix it by using the torque 1.2 to 1.5 times larger than the value indicated in the table as necessary. If the mating member material is cast iron or aluminum alloy, reduce the tightening torque depending on the strength characteristics of the mating member material.

Table 17 Tightening torque for fixing screw

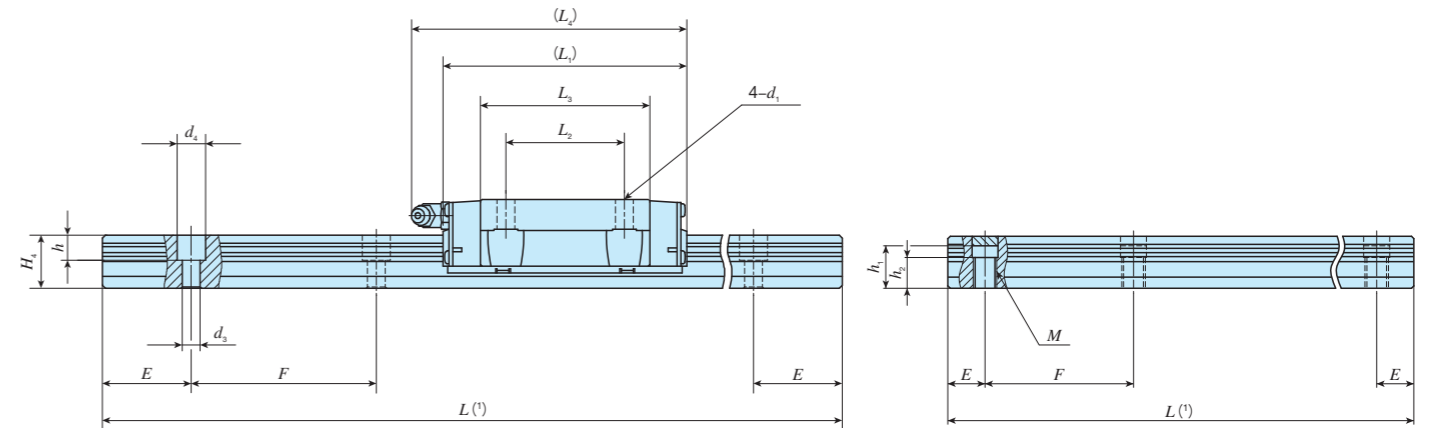
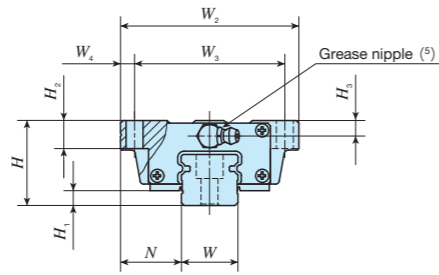
Bolt size	Tightening torque N · m		
	High carbon steel-made screw		Stainless steel-made screw
	Size: 12	Size: 15 to 65	
M 1.6×0.35	—	—	0.15
M 2 ×0.4	—	—	0.31
M 2.3×0.4	—	—	0.49
M 2.6×0.45	—	—	0.70
M 3 ×0.5	1.3	—	1.1
M 4 ×0.7	2.9	4.1	2.5
M 5 ×0.8	—	8.0	5.0
M 6 ×1	—	13.6	8.5
M 8 ×1.25	—	32.7	20.4
M10 ×1.5	—	63.9	40.0
M12 ×1.75	—	110	—
M14 ×2	—	175	—
M16 ×2	—	268	—

Remark: The tightening torque is calculated based on strength division 8.8 for high carbon steel bolts in product size 12, strength division 12.9 for carbon steel bolts in product size 15 to 65, and property division A2-70 for stainless steel bolts.

IKO C-Lube Linear Way MH

Flange type mounting from bottom

Shape	MH · LWH			
Size	15	20	25	30
	35	45	55	65



Ultra seal specification with track rail mounting from bottom

Identification number	Interchangeable	Mass (Ref.) Slide unit kg	Track rail kg/m	Dimensions of assembly mm			Dimensions of slide unit mm										Dimensions of track rail mm						Appended mounting bolt for track rail (3) mm	Basic dynamic load rating (4) N	Basic static load rating (4) N	Static moment rating (4)								
				H	H ₁	N	W ₂	W ₃	W ₄	L ₁	L ₂	L ₃	L ₄	d ₁	H ₂	H ₃	W	H ₄	d ₃	d ₄	h	M				h ₁ (2)	h ₂	E	F	Bolt size × ℓ	C ₀	T ₀	T _x	T _y
MH 15	○	0.22	1.47	24	4.5	16	47	38	4.5	66	30	44.2	69	4.5	7	4.5	15	15	4.5	8	6	-	-	-	30	60	M4×16	11 600	13 400	112	95.6	556	95.6	556
LWH 15...B	○											44.6																						
LWH 15...SL	○											44.6																						
LWH 15...MU*	○											44.6																						
MH 20	○	0.48	2.56	30	5	21.5	63	53	5	83	40	56	94	6	10	5.5	20	18	6	9.5	8.5	-	-	-	30	60	M5×18	18 100	21 100	232	195	1 090	195	1 090
LWH 20...B	○											57.2																						
LWH 20...SL	○											57.2																						
LWH 20...MU*	○											57.2																						
MHG 20	○	0.71								112		84.8	122																					
LWHG 20	○											86																						
MH 25	○	0.70	3.50	36	6.5	23.5	70	57	6.5	95	45	63.9	105	7	10	6.5	23	22	7	11	9	-	-	-	30	60	M6×22	25 200	28 800	362	309	1 690	309	1 690
LWH 25...B	○											64.7																						
LWH 25...SL	○											64.7																						
LWH 25...MU*	○											64.7																						
LWH 25...MU*	○											64.7																						
LWH 25...MU*	○											64.7																						
MHG 25	○	0.93								118		86.6	128																					
LWHG 25	○											87.4																						

Notes (1) Track rail lengths L are shown in Table 2.1 on page II-93, Table 2.2 on page II-94, and Tables 2.3 and 2.4 on page II-95.

(2) Choose bolts whose dimension allow fixing thread depth into track rail to be less than h_1 .

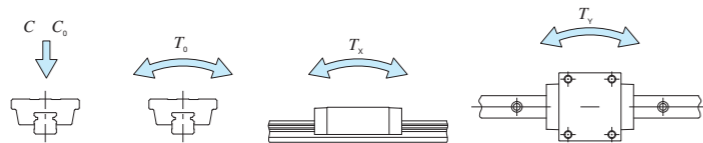
(3) The appended track rail mounting bolts are hexagon socket head bolts equivalent to JIS B 1176. For stainless steel model, stainless steel bolts are appended.

In an assembled set of MH series and LWH...MU model, track rail mounting bolts are not appended.

(4) The direction of basic dynamic load rating (C), basic static load rating (C_0), and static moment rating (T_0 , T_x , T_y) are shown in the sketches below. The upper values of T_x and T_y are for one slide unit and the lower values are for two slide units in close contact.

(5) The shapes of grease nipple vary by size. The specifications are shown in Table 15 on page II-104.

Remark: The identification numbers with * are our semi-standard items.



Example of identification number of assembled set

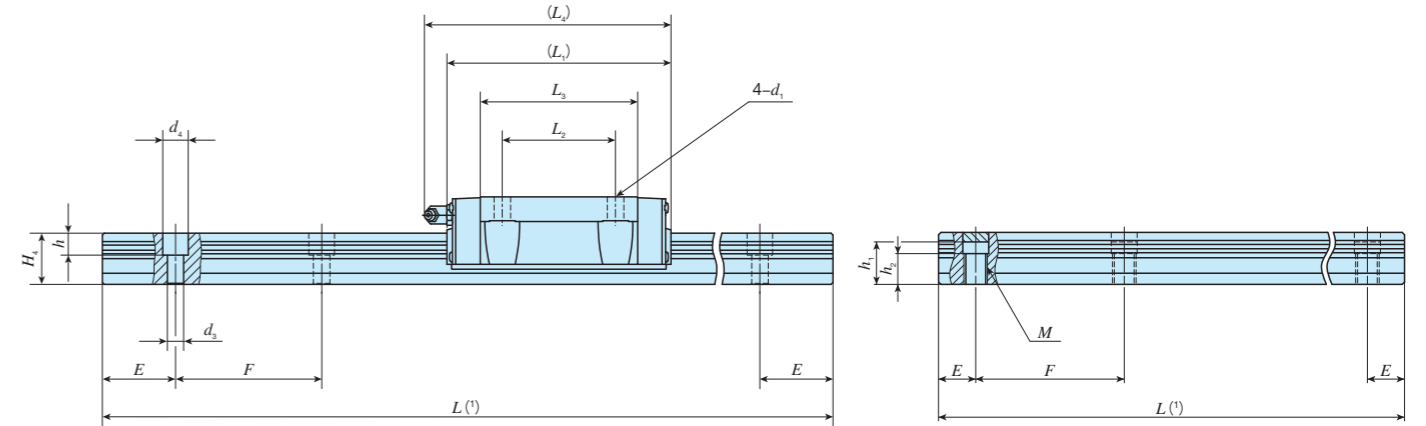
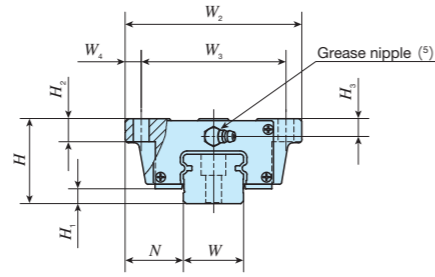
Model code	Dimensions	Part code	Model code	Dust protection code	Material code	Preload symbol	Classification symbol	Interchangeable code	Supplemental code
MH	G	20	C2	R480		T1	P		N
1	2	3	4	5	6	7	8	9	10

① Model	MH Flange type mounting from bottom	⑤ Length of track rail (480 mm)	R480	⑧ Preload amount	T1 Light preload	⑩ Interchangeable	No symbol Non-interchangeable specification
② Length of slide unit	G Standard	⑥ Dust protection code	M Ultra seal specification	T2 Medium preload	S1 S1 specification	⑪ Special specification	A, BS, D, E, F, I, J, L, LF, MA, MN, N, PS, Q, RE, T, UR, V, W, Y, Z
③ Size	15, 20, 25	MU Ultra seal specification with track rail mounting from bottom		T3 Heavy preload	S2 S2 specification		
④ Number of slide unit (2)		⑦ Material type	SL Stainless steel made	⑨ Accuracy class	SP Super precision		

IKO C-Lube Linear Way MH

Flange type mounting from bottom

Shape	MH · LWH			
Size	15	20	25	30
	35	45	55	65



Ultra seal specification with track rail mounting from bottom

Identification number	Interchangeable	Mass (Ref.) Slide unit kg / Track rail kg/m	Dimensions of assembly mm			Dimensions of slide unit mm											Dimensions of track rail mm						Appended mounting bolt for track rail (3) mm Bolt size × ℓ	Basic dynamic load rating (4) C N	Basic static load rating (4) C ₀ N	Static moment rating (4) T ₀ , T _x , T _y N · m						
			H	H ₁	N	W ₂	W ₃	W ₄	L ₁	L ₂	L ₃	L ₄	d ₁	H ₂	H ₃	W	H ₄	d ₃	d ₄	h	M	h ₁ (2)				h ₂	E	F	T ₀	T _x	T _y	
MH 30	○	1.28	4.82	42	7	31	90	72	9	113	52	80.6	123	9	10	8	28	25	9	14	12	-	-	-	40	80	M 8×28	35 400	40 700	623	536 2 820	536 2 820
LWH 30...B	○																															
LWH 30...SL	○																															
LWH 30...M*	-																															
MH 30...MU*	-	1.69	4.82	42	7	31	90	72	9	113	52	80.6	123	9	10	8	28	25	9	14	12	-	-	-	40	80	M 8×28	35 400	40 700	623	536 2 820	536 2 820
LWH 30...MU*	-																															
MHG 30	○	1.79	4.82	42	7	31	90	72	9	113	52	80.6	123	9	10	8	28	25	9	14	12	-	-	-	40	80	M 8×28	35 400	40 700	623	536 2 820	536 2 820
LWHG 30	○																															
MH 35	○	1.79	6.85	48	8	33	100	82	9	123	62	86.2	135	9	13	10	34	28	9	14	12	-	-	-	40	80	M 8×28	48 700	53 700	823	631 3 480	579 3 190
LWH 35...B	○																															
LWH 35...M*	-																															
LWH 35...MU*	-																															
MHG 35	○	2.35	6.85	48	8	33	100	82	9	123	62	86.2	135	9	13	10	34	28	9	14	12	-	-	-	40	80	M 8×28	48 700	53 700	823	631 3 480	579 3 190
LWHG 35	○																															
MH 45	○	3.17	10.7	60	10	37.5	120	100	10	147	80	103.4	158	11	15	13	45	34	14	20	17	-	-	-	52.5	105	M12×35	74 600	80 200	1 610	1 150 6 190	1 060 5 690
LWH 45...B	○																															
LWH 45...M*	-																															
LWH 45...MU*	-																															
MHG 45	○	4.34	10.7	60	10	37.5	120	100	10	147	80	103.4	158	11	15	13	45	34	14	20	17	-	-	-	52.5	105	M12×35	74 600	80 200	1 610	1 150 6 190	1 060 5 690
LWHG 45	○																															

Notes (1) Track rail lengths L are shown in Table 2.1 on page II-93, Table 2.2 on page II-94, and Tables 2.3 and 2.4 on page II-95.

(2) Choose bolts whose dimension allow fixing thread depth into track rail to be less than h_1 .

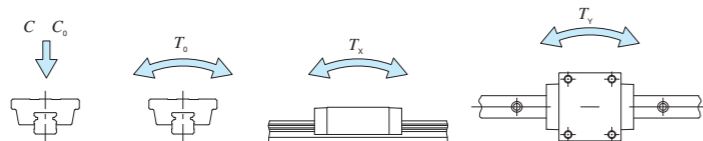
(3) The appended track rail mounting bolts are hexagon socket head bolts equivalent to JIS B 1176. For stainless steel model, stainless steel bolts are appended.

In an assembled set of MH series and LWH...MU model, track rail mounting bolts are not appended.

(4) The direction of basic dynamic load rating (C), basic static load rating (C_0), and static moment rating (T_0 , T_x , T_y) are shown in the sketches below. The upper values of T_x and T_y are for one slide unit and the lower values are for two slide units in close contact.

(5) The shapes of grease nipple vary by size. The specifications are shown in Table 15 on page II-104.

Remark: The identification numbers with * are our semi-standard items.



Example of identification number of assembled set

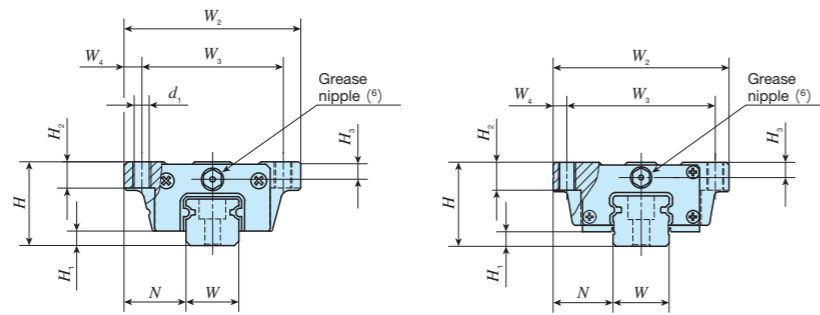
Model code	Dimensions	Part code	Model code	Dust protection code	Material code	Preload symbol	Classification symbol	Interchangeable code	Supplemental code
MH	G	35	C2	R800		T1	P		N
1	2	3	4	5	6	7	8	9	10

① Model	MH Flange type mounting from bottom	⑤ Length of track rail (800 mm)	⑧ Preload amount	T1 Standard	⑩ Interchangeable	No symbol Non-interchangeable specification
② Length of slide unit	No symbol Standard	⑥ Dust protection code	M Ultra seal specification	T2 Medium preload	S1 S1 specification	
③ Size	30, 35, 45	MU Ultra seal specification with track rail mounting from bottom	T3 Heavy preload	S2 S2 specification		
④ Number of slide unit (2)		⑦ Material type	No symbol High carbon steel made	⑨ Accuracy class		
		SL Stainless steel made	P Precision	H High		
			SP Super precision			

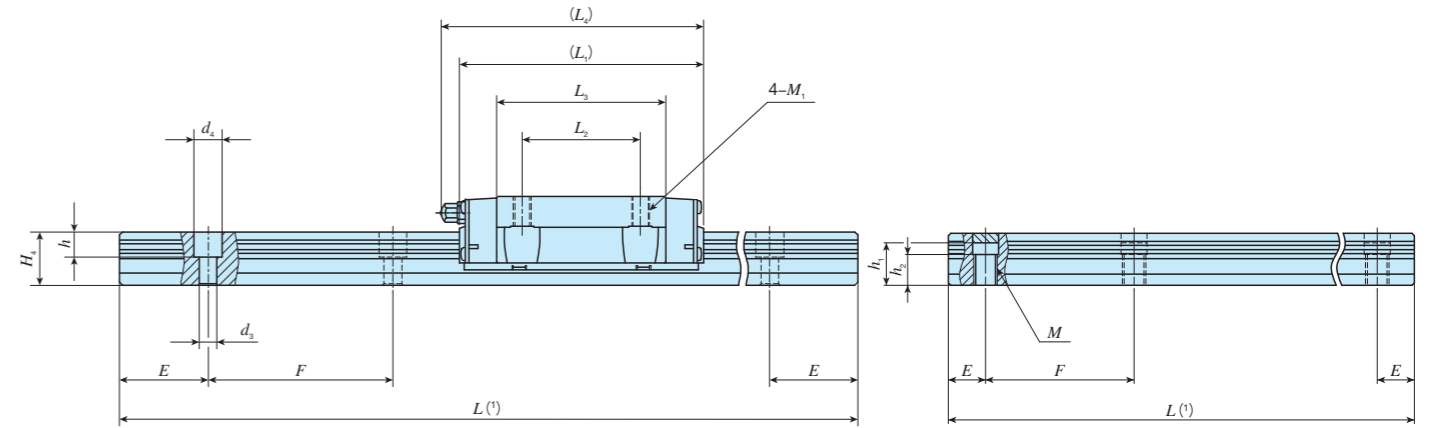
IKO C-Lube Linear Way MH

Flange type mounting from top

Shape	MHT · LWHT					
Size	8	10	12	15	20	25
	30	35	45	55	65	



MHT 8 ...SL, LWHT 8 ...SL
 MHT 10 ...SL, LWHT 10 ...SL
 MHT 12 (...SL), LWHT 12 (...SL)
 MHTG 15



Ultra seal specification with track rail mounting from bottom

Identification number	Interchangeable	Mass (Ref.)		Dimensions of assembly mm			Dimensions of slide unit mm										Dimensions of track rail mm						Appended mounting bolt for track rail (4) mm	Basic dynamic load rating (5) N	Basic static load rating (5) N	Static moment rating (5)								
		Slide unit kg	Track rail kg/m	H	H ₁	N	W ₂	W ₃	W ₄	L ₁	L ₂	L ₃	L ₄	d ₁ (2)	M ₁	H ₂	H ₃	W	H ₄	d ₃	d ₄	h				M	h ₁ (3)	h ₂	E	F	T ₀	T _x	T _y	
MHT 8...SL	LWHT 8...SL	0.015	0.32	10	2.1	8	24	19	2.5	24	10	15.3	-	1.9	M2.3	3.5	2	8	6	2.4	4.2	2.3	-	-	-	10	20	M2×8	1 510	2 120	8.8	5.5 32.0	4.7 26.9	
MHT 10...SL	LWHT 10...SL	0.031	0.47	12	2.4	10	30	24	3	32	12	21.4	-	2.6	M3	4.5	2.5	10	7	3.5	6	3.5	-	-	-	12.5	25	M3×8	2 640	3 700	19.2	13.3 73.8	11.1 61.9	
MHT 12	LWHT 12	0.108	0.86	19	3.2	14	40	32	4	46	15	31.6	50	3.4	M4	6	4	12	10.5	3.5	6	4.5	-	-	-	20	40	M3×12	6 260	8 330	51.6	44.7 237	37.5 199	
MHT 12...SL	LWHT 12...SL	0.11																																0.108
MHT 15	LWHT 15...B	0.22	1.47	24	4.5	16	47	38	4.5	66	30	44.2	69	-	M5	7	4.5	15	15	4.5	8	6	6	-	-	-	30	60	M4×16	11 600	13 400	112	95.6 556	95.6 556
MHT 15...SL	LWHT 15...SL	0.11										44.6																						
-	LWHT 15...M*	-										44.2																						
-	LWHT 15...MU*	-										44.6																						
MHTG 15	-	0.29	-	-	-	-	-	-	-	82	60.1	85	4.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Notes (1) Track rail lengths L are shown in Table 2.1 on page II-93, Table 2.2 on page II-94, and Tables 2.3 and 2.4 on page II-95.

(2) Series of size 8 to 12 and MHTG15 can also be mounted in upward direction.

(3) Choose bolts whose dimension allow fixing thread depth into track rail to be less than h_1 .

(4) The appended track rail mounting bolts are hexagon socket head bolts equivalent to JIS B 1176. For stainless steel model, stainless steel bolts are appended.

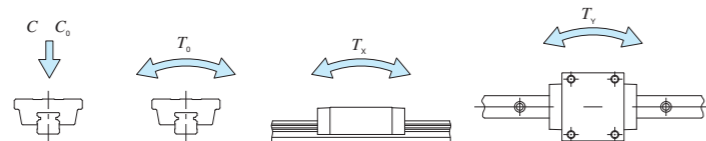
In an assembled set of MH series and LWHT...MU model, track rail mounting bolts are not appended.

(5) The direction of basic dynamic load rating (C), basic static load rating (C_0), and static moment rating (T_0 , T_x , T_y) are shown in the sketches below. The upper values of T_x and T_y are for one slide unit and the lower values are for two slide units in close contact.

(6) Series of size 8 and 10 are provided with an oil hole. The specifications of oil holes are shown in Table 14 on page II-104.

The shapes of grease nipples of size 12 and 15 vary by size. The specifications are shown in Table 15 on page II-104.

Remark: The identification numbers with * are our semi-standard items.



Example of identification number of assembled set

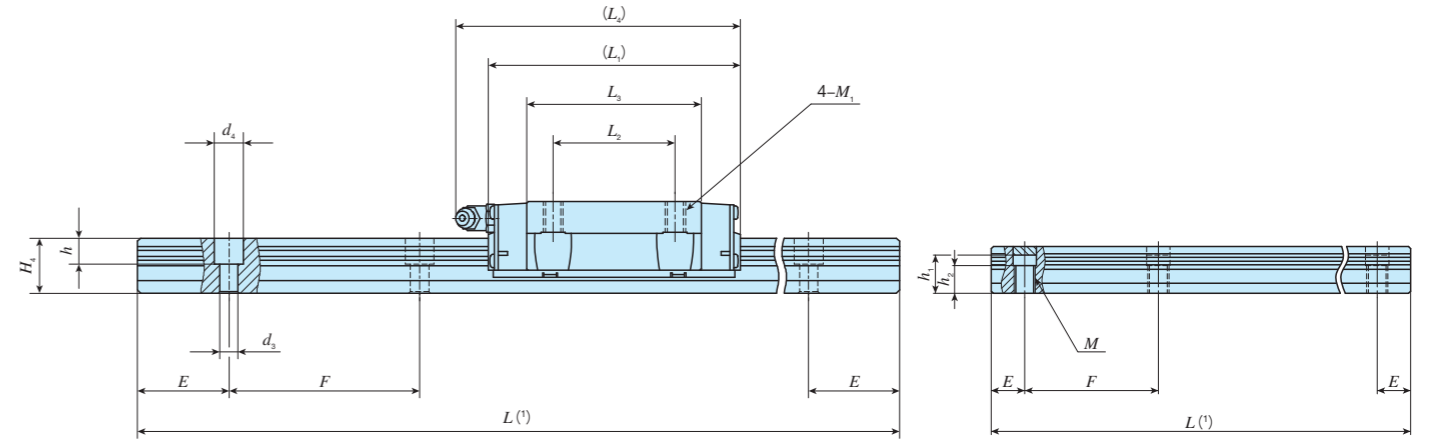
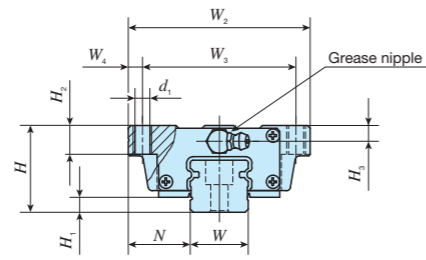
Model code	Dimensions	Part code	Model code	Dust protection code	Material code	Preload symbol	Classification symbol	Interchangeable code	Supplemental code
MHT	G	15	C2	R900		T ₁	P		N
1	2	3	4	5	6	7	8	9	10

① Model MHT LWHT (...B)	⑤ Length of track rail (900 mm) R900	⑧ Preload amount T ₁	⑩ Interchangeable No symbol Non-interchangeable specification S1 S1 specification S2 S2 specification
② Length of slide unit No symbol Standard G Long	⑥ Dust protection code No symbol Standard specification M Ultra seal specification MU Ultra seal specification with track rail mounting from bottom	⑨ Accuracy class H High P Precision SP Super precision	⑪ Special specification A, BS, D, E, F, I, J, L, LF, MA MN, N, Q, RE, T, U, V, W, Y, Z
③ Size 8, 10, 12, 15	⑦ Material type No symbol High carbon steel made SL Stainless steel made		
④ Number of slide unit (2)			

IKO C-Lube Linear Way MH

Flange type mounting from top

Shape	MHT · LWHT					
Size	8	10	12	15	20	25
	30	35	45	55	65	



Ultra seal specification with track rail mounting from bottom

Identification number	Interchangeable	Mass (Ref.)		Dimensions of assembly mm			Dimensions of slide unit mm										Dimensions of track rail mm								Appended mounting bolt for track rail (3) mm	Basic dynamic load rating (4) C N	Basic static load rating (4) C0 N	Static moment rating (4) N·m					
		Slide unit kg	Track rail kg/m	H	H1	N	W2	W3	W4	L1	L2	L3	L4	d1	M1	H2	H3	W	H4	d3	d4	h	M	h1(2)				h2	E	F	Bolt size × ℓ	T0	Tx
MHT 20	○	0.48	2.56	30	5	21.5	63	53	5	83	40	56	94	-	M6	10	5.5	20	18	6	9.5	8.5	-	-	-	30	60	M5×18	18 100	21 100	232	1 090	1 090
LWHT 20...B	○											57.2								6	9.5	8.5	-	-	-								
MHT 20...SL	○											56								-	-	-	-	-	-								
LWHT 20...SL	○											57.2								-	-	-	-	-	-								
LWHT 20...M*	-											-								-	-	-	-	-	-								
MHTG 20	○	0.71							112	40	84.8	122							6	9.5	8.5	-	-	-	30	60	M5×18	24 100	31 700	349	2 140	2 140	
LWHTG 20	○										86																-						-
MHT 25	○	0.70	3.50	36	6.5	23.5	70	57	6.5	95	45	63.9	105	-	M8	10	6.5	23	22	7	11	9	-	-	-	30	60	M6×22	25 200	28 800	362	1 690	1 690
LWHT 25...B	○											64.7								7	11	9	-	-	-								
MHT 25...SL	○											63.9								-	-	-	-	-	-								
LWHT 25...SL	○											64.7								-	-	-	-	-	-								
MHT 25...M*	-											-								-	-	-	-	-	-								
LWHT 25...M*	-											-								-	-	-	-	-	-								
MHT 25...MU*	-	-	-	-	-	-	-	-																									
LWHT 25...MU*	-	-	-	-	-	-	-	-																									
MHTG 25	○	0.93							118	45	86.6	128							7	11	9	-	-	-	30	60	M6×22	30 800	38 300	483	533 2 740	533 2 740	
LWHTG 25	○										87.4																						-

Notes (1) Track rail lengths L are shown in Table 2.1 on page II-93, Table 2.2 on page II-94, and Tables 2.3 and 2.4 on page II-95.

(2) Choose bolts whose dimension allow fixing thread depth into track rail to be less than h1.

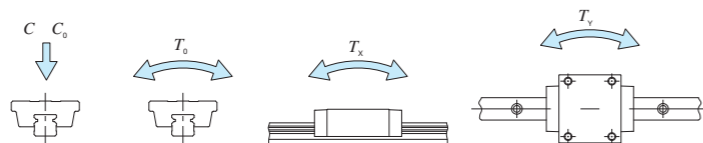
(3) The appended track rail mounting bolts are hexagon socket head bolts equivalent to JIS B 1176. For stainless steel model, stainless steel bolts are appended.

In an assembled set of MH series and LWHT...MU model, track rail mounting bolts are not appended.

(4) The direction of basic dynamic load rating (C), basic static load rating (C0), and static moment rating (T0, Tx, Ty) are shown in the sketches below. The upper values of Tx and Ty are for one slide unit and the lower values are for two slide units in close contact.

Remarks 1. The specifications of grease nipple are shown in Table 15 on page II-104.

2. The identification numbers with * are our semi-standard items.



Example of identification number of assembled set

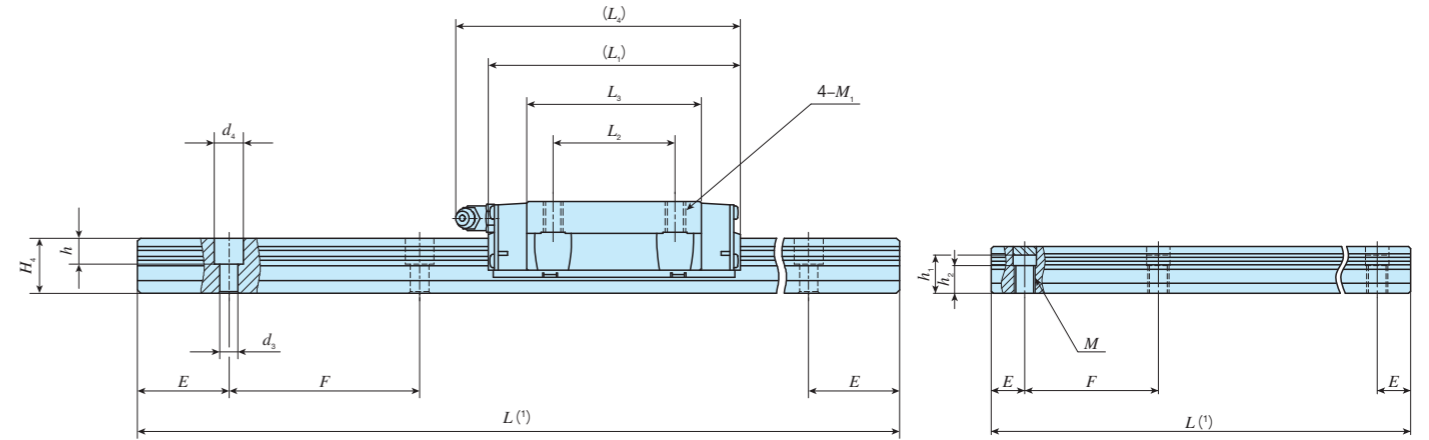
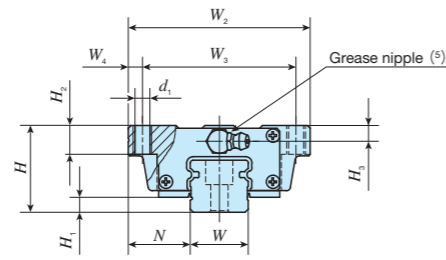
Model code	Dimensions	Part code	Model code	Dust protection code	Material code	Preload symbol	Classification symbol	Interchangeable code	Supplemental code
MHT	G	25	C2	R840		T1	P		/N
1	2	3	4	5	6	7	8	9	10

1 Model MHT LWHT (...B) Flange type mounting from top	5 Length of track rail (840 mm) R840	8 Preload amount No symbol Standard T1 Light preload T2 Medium preload T3 Heavy preload	10 Interchangeable No symbol Non-interchangeable specification S1 S1 specification S2 S2 specification
2 Length of slide unit No symbol Standard G Long	6 Dust protection code No symbol Standard specification M Ultra seal specification MU Ultra seal specification with track rail mounting from bottom	9 Accuracy class H High P Precision SP Super precision	11 Special specification A, BS, D, E, F, I, J, L, LF, MA MN, N, PS, Q, RE, T, UR, V, W, Y, Z
3 Size 20, 25	7 Material type No symbol High carbon steel made SL Stainless steel made		
4 Number of slide unit (2)			

IKO C-Lube Linear Way MH

Flange type mounting from top

Shape	MHT · LWHT					
Size	8	10	12	15	20	25
	30	35	45	55	65	



Identification number	Interchangeable	Mass (Ref.)		Dimensions of assembly mm			Dimensions of slide unit mm										Dimensions of track rail mm						Appended mounting bolt for track rail (3) mm	Basic dynamic load rating (4) C N	Basic static load rating (4) C ₀ N	Static moment rating (4)								
		Slide unit kg	Track rail 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	W	H ₄	d ₃	d ₄	h				M	h ₁ (2)	h ₂	E	F	Bolt size × ℓ	T ₀ N · m	T _x N · m	T _y N · m
MHT 30	○	1.28	4.82	42	9	31	90	72	9	113	52	80.6	123	-	M10	10	8	28	25	9	14	12	-	-	-	40	80	M 8×28	35 400	40 700	623	536 2 820	536 2 820	
LWHT 30···B	○				7																													
MHT 30···SL	○				9																													
LWHT 30···SL	○																																	
MHT 30···M*	-																																	
LWHT 30···M*	-																																	
MHTG 30	○	1.69		42	9				139	106.6	149																							
LWHTG30	○				7																													
MHT 35	○	1.79	6.85	48	10	33	100	82	9	123	62	86.2	135	-	M10	13	10	34	28	9	14	12	-	-	-	40	80	M 8×28	48 700	53 700	823	631 3 480	579 3 190	
LWHT 35···B	○				8																													
LWHT 35···M*	-																																	
LWHT 35···MU*	-																																	
MHTG 35	○	2.35		48	10				151	114	163																							
LWHTG35	○				8																													

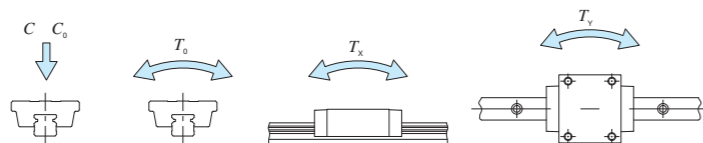
Notes (1) Track rail lengths L are shown in Table 2.1 on page II-93, Table 2.2 on page II-94, and Tables 2.3 and 2.4 on page II-95.
 (2) Choose bolts whose dimension allow fixing thread depth into track rail to be less than h_1 .
 (3) The appended track rail mounting bolts are hexagon socket head bolts equivalent to JIS B 1176. For stainless steel model, stainless steel bolts are appended.
 In an assembled set of MH series and LWHT···MU model, track rail mounting bolts are not appended.
 (4) The direction of basic dynamic load rating (C), basic static load rating (C_0), and static moment rating (T_0 , T_x , T_y) are shown in the sketches below. The upper values of T_x and T_y are for one slide unit and the lower values are for two slide units in close contact.
 (5) The shapes of grease nipple vary by size. The specifications are shown in Table 15 on page II-104.

Remark: The identification numbers with * are our semi-standard items.

Example of identification number of assembled set

Model code	Dimensions	Part code	Model code	Dust protection code	Material code	Preload symbol	Classification symbol	Interchangeable code	Supplemental code
MHT	G	35	C2	R1040		T ₁	P		N
1	2	3	4	5	6	7	8	9	10

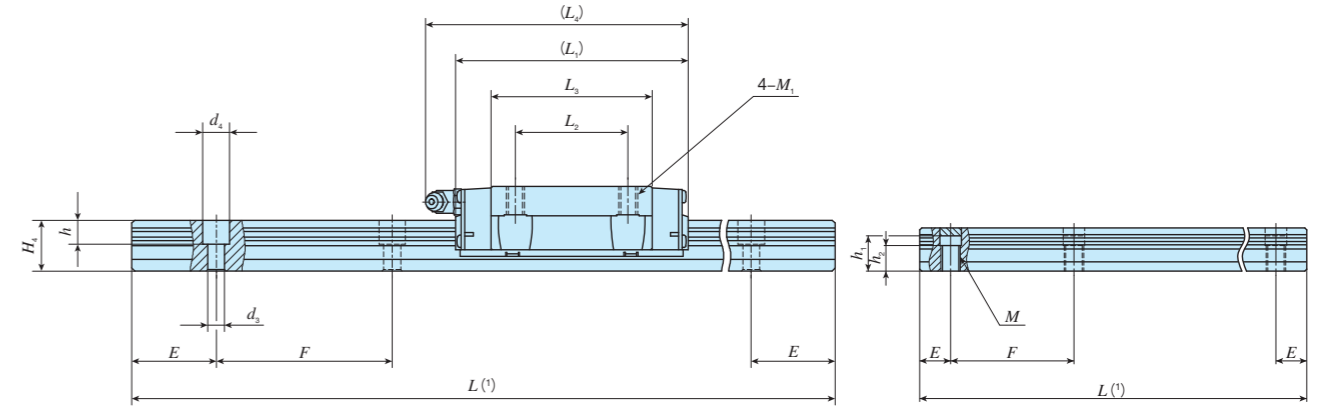
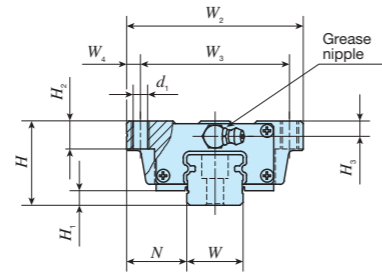
1 Model MHT LWHT (···B) Flange type mounting from top	5 Length of track rail (1,040 mm) No symbol Standard specification M Ultra seal specification MU Ultra seal specification with track rail mounting from bottom	8 Preload amount No symbol Standard T ₁ Light preload T ₂ Medium preload T ₃ Heavy preload	10 Interchangeable No symbol Non-interchangeable specification S1 S1 specification S2 S2 specification
2 Length of slide unit No symbol Standard G Long	7 Material type No symbol High carbon steel made SL Stainless steel made	9 Accuracy class H High P Precision SP Super precision	11 Special specification A, BS, D, E, F, I, J, L, LF, MA MN, N, PS, Q, RE, T, UR, V, W, Y, Z
3 Size 30, 35			
4 Number of slide unit (2)			



IKO C-Lube Linear Way MH

Flange type mounting from top

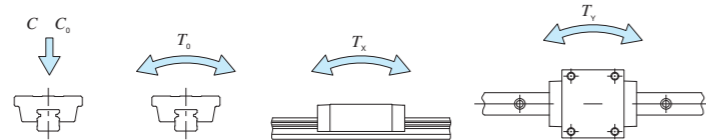
Shape	MHT · LWHT					
Size	8	10	12	15	20	25
	30	35	45	55	65	



Ultra seal specification with track rail mounting from bottom

Identification number	Interchangeable	Mass (Ref.)		Dimensions of assembly mm			Dimensions of slide unit mm										Dimensions of track rail mm								Appended mounting bolt for track rail (3) mm	Basic dynamic load rating (4) C N	Basic static load rating (4) C ₀ N	Static moment rating (4) N·m																															
		Slide unit kg	Track rail 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	M				h ₁ (2)	h ₂	E	F	Bolt size × ℓ	T ₀	T _x	T _y																								
MHT 45	○	3.17	10.7	60	13	37.5	120	100	10	147	80	103.4	158	-	M12	15	13	-	45	34	14	20	17	-	-	-	52.5	105	M12×35	74 600	80 200	1 610	1 150	1 060																									
LWHT 45...B	○				10																-	-	-	-	-	-			-						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
LWHT 45...M*	-				10																																																					-	-
LWHT 45...MU*	-	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-																							
MHTG 45	○	4.34																																			15.5	70	13	43.5	140	116	12	183	95	132	194	-	M14	17	14	-	53	41	16	23	20	-	-
LWHT 55...B	○	5.30	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-																								
LWHTG 45	○	4.34	10																																	-			-																-	-	-	-	-
LWHT 55...B	○	5.30	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-																						
LWHTG 55	○	7.40	10																																	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LWHT 65...B	○	12.3	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-																						
LWHTG 65	○	17.6	10																																	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LWHT 65...B	○	12.3	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-																						
LWHTG 65	○	17.6	10																																	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LWHT 65...B	○	12.3	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-																						
LWHTG 65	○	17.6	10																																	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LWHT 65...B	○	12.3	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-																						
LWHTG 65	○	17.6	10																																	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LWHT 65...B	○	12.3	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-																						
LWHTG 65	○	17.6	10																																	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes (1) Track rail lengths L are shown in Table 2.1 on page II-93 and Tables 2.3 and 2.4 on page II-95.
 (2) Choose bolts whose dimension allow fixing thread depth into track rail to be less than h_1 .
 (3) The appended track rail mounting bolts are hexagon socket head bolts equivalent to JIS B 1176. In an assembled set of MH series and LWHT...MU model, track rail mounting bolts are not appended.
 (4) The direction of basic dynamic load rating (C), basic static load rating (C_0), and static moment rating (T_0 , T_x , T_y) are shown in the sketches below. The upper values of T_x and T_y are for one slide unit and the lower values are for two slide units in close contact.
 Remarks 1. The specifications of grease nipple are shown in Table 15 on page II-104.
 2. The identification numbers with * are our semi-standard items.



Example of identification number of assembled set

Model code	Dimensions	Part code	Model code	Dust protection code	Preload symbol	Classification symbol	Interchangeable code	Supplemental code
MHT	G	45	C2	R1260	T1	P		N
1	2	3	4	5	6	7	8	9

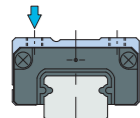
1 Model MHT LWHT (...B) Flange type mounting from top	5 Length of track rail (1,260 mm) No symbol Standard specification M Ultra seal specification MU Ultra seal specification with track rail mounting from bottom	7 Preload amount No symbol Standard T1 Light preload T2 Medium preload T3 Heavy preload	9 Interchangeable No symbol Non-interchangeable specification S1 S1 specification S2 S2 specification
2 Length of slide unit No symbol Standard G Long	6 Dust protection code No symbol Standard specification M Ultra seal specification MU Ultra seal specification with track rail mounting from bottom	8 Accuracy class H High P Precision SP Super precision	10 Special specification A, BS, D, E, F, I, J, L, LF, MA MN, N, PS, Q, RE, T, V, W, Y, Z
3 Size 45, 55, 65	4 Number of slide unit (2)		

IKO C-Lube Linear Way MH

Block type mounting from top

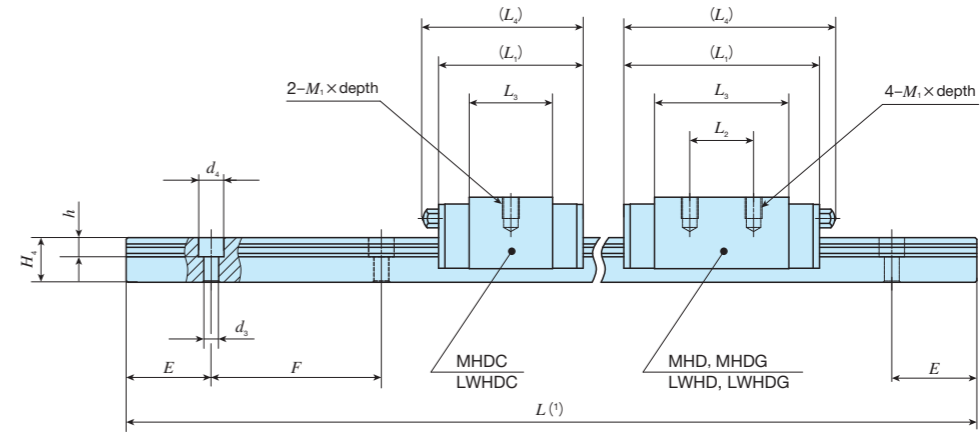
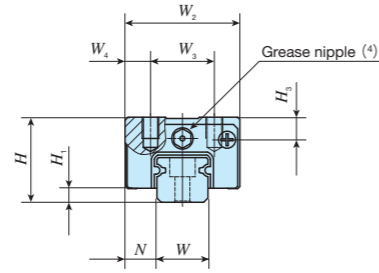
MHD · LWHD

Shape



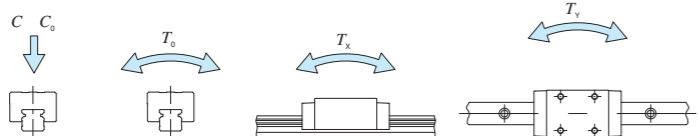
Size

8	10	12	15	25
30	35	45	55	65



Identification number	Interchangeable	Mass (Ref.)		Dimensions of assembly mm			Dimensions of slide unit mm							Dimensions of track rail mm						Appended mounting bolt for track rail (2) mm	Basic dynamic load rating (3) N	Basic static load rating (3) N	Static moment rating (3)						
		Slide unit kg	Track rail kg/m	H	H ₁	N	W ₂	W ₃	W ₄	L ₁	L ₂	L ₃	L ₄	M ₁ × depth	H ₃	W	H ₄	d ₃	d ₄				h	E	F	Bolt size × ℓ	T ₀ N · m	T _x N · m	T _y N · m
MHDC 8...SL	LWHDC 8...SL	○	0.008	0.32	11	2.1	4	16	10	3	18	—	9.0	—	M2 × 2.5	3	8	6	2.4	4.2	2.3	10	20	M2 × 8	1 050	1 270	5.3	2.2 15.5	1.8 13.0
MHD 8...SL	LWHD 8...SL	○	0.013								24	10	15.3												5.5 32.0	4.7 26.9			
MHDG 8...SL	LWHDG 8...SL	○	0.018								30.5	10	21.7												10.4 55.4	8.8 46.4			
MHDC 10...SL	LWHDC 10...SL	○	0.018	0.47	13	2.4	5	20	13	3.5	24	—	13.4	—	M2.6 × 3	3.5	10	7	3.5	6	3.5	12.5	25	M3 × 8	1 920	2 350	12.2	5.8 37.1	4.8 31.2
MHD 10...SL	LWHD 10...SL	○	0.026								32	12	21.4												13.3 73.8	11.1 61.9			
MHDG 10...SL	LWHDG 10...SL	○	0.035								40	12	29.4												23.8 123	20.0 103			
MHDC 12...SL	LWHDC 12...SL	○	0.057	0.86	20	3.2	7.5	27	15	6	34	—	19.6	—	M4 × 5	5	12	10.5	3.5	6	4.5	20	40	M3 × 12	4 560	5 300	32.8	19.4 117	16.3 98.5
MHD 12	LWHD 12	○	0.089								46	15	31.6												44.7 237	37.5 199			
MHDG 12...SL	LWHDG 12...SL	○	0.115								58	15	43.6												80.4 399	67.5 335			
MHDC 12...SL	LWHDC 12...SL	○	0.118																										

- Notes (1) Track rail lengths L are shown in Table 2.1 on page II-93 and Table 2.2 on page II-94.
 (2) The appended track rail mounting bolts are hexagon socket head bolts equivalent to JIS B 1176. For stainless steel model, stainless steel bolts are appended.
 In an assembled set of MH series, track rail mounting bolts are not appended.
 (3) The direction of basic dynamic load rating (C), basic static load rating (C_0), and static moment rating (T_0 , T_x , T_y) are shown in the sketches below. The upper values of T_x and T_y are for one slide unit and the lower values are for two slide units in close contact.
 (4) Series of size 8 and 10 are provided with an oil hole. The specifications of oil holes are shown in Table 14 on page II-104.
 The specification of grease nipple for size 12 is shown in Table 15 on page II-104.



Example of identification number of assembled set

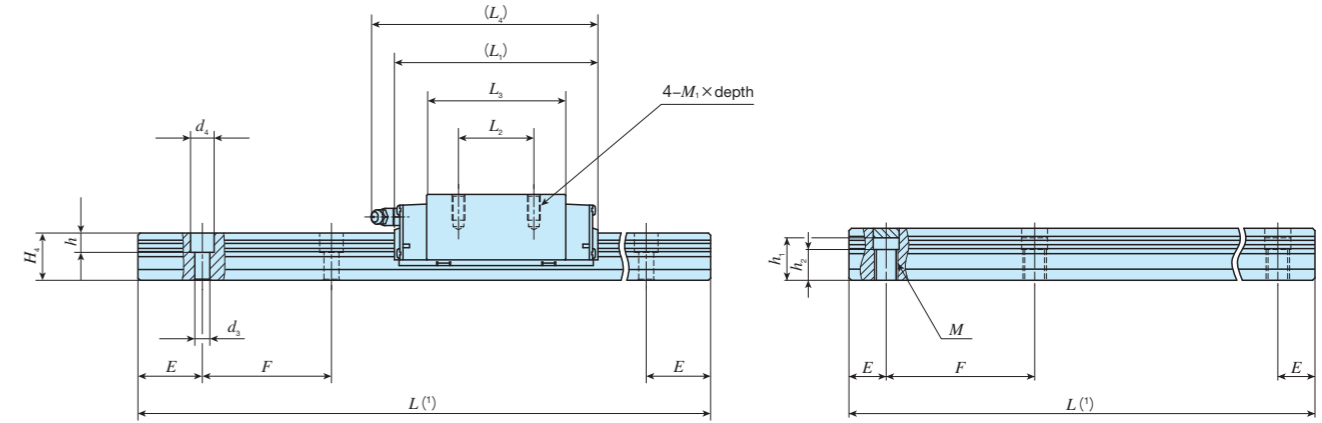
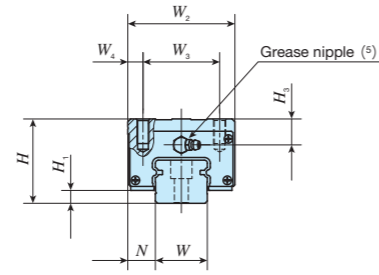
Model code	Dimensions	Part code	Material code	Preload symbol	Classification symbol	Interchangeable code	Supplemental code	
MHD	G	12	C2	R320	SL	T1	P	N
①	②	③	④	⑤	⑥	⑦	⑧	⑨

① Model	④ Number of slide unit (2)	⑦ Preload amount	⑨ Interchangeable
MHD LWHD Block type mounting from top		T ₀ Clearance No symbol Standard T ₁ Light preload	No symbol Non-interchangeable specification S1 S1 specification S2 S2 specification
② Length of slide unit	⑤ Length of track rail (320 mm)	⑧ Accuracy class	⑩ Special specification
C Short No symbol Standard G Long		H High P Precision	A, D, E, F, I, LR, MA MN, N, Q, U, W, Y
③ Size	⑥ Material type		
8, 10, 12	No symbol High carbon steel made SL Stainless steel made		

IKO C-Lube Linear Way MH

Block type mounting from top

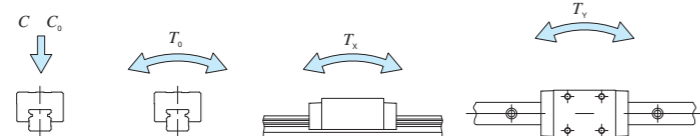
Shape	MHD · LWHD				
Size	8	10	12	15	25
	30	35	45	55	65



Ultra seal specification with track rail mounting from bottom

Identification number	Interchangeable	Mass (Ref.)		Dimensions of assembly mm			Dimensions of slide unit mm							Dimensions of track rail mm							Appended mounting bolt for track rail (3) mm	Basic dynamic load rating (4) C N	Basic static load rating (4) C0 N	Static moment rating (4) N·m								
		Slide unit kg	Track rail kg/m	H	H1	N	W2	W3	W4	L1	L2	L3	L4	M1 × depth	H3	W	H4	d3	d4	h				M	h1(2)	h2	E	F	Bolt size × ℓ	T0	Tx	Ty
MHD 15	○	0.23	1.47	28	4.5	9.5	34	26	4	66	26	44.2	69	M4 × 10	8.5	15	15	4.5	8	6	-	-	-	30	60	M4 × 16	11 600	13 400	112	95.6 556	95.6 556	
LWHD 15-B	○											44.6																				
LWHD 15-M*	-											44.6																				
MHD 25	○	0.65	3.50	40	6.5	12.5	48	35	6.5	95	35	63.9	105	M6 × 12	10.5	23	22	7	11	9	-	-	-	30	60	M6 × 22	25 200	28 800	362	309 690	309 690	
LWHD 25-B	○											64.7																				
MHD 25-M*	-											63.9																				
LWHD 25-M*	-											64.7																				
MHD 25-MU*	-											63.9																				
MHDG 25	○	0.80								118	50	86.6	128																			
LWHDG25	○											87.4																				
MHD 30	○	1.12	4.82	45	7	16	60	40	10	113	40	80.6	123	M8 × 16	11	28	25	9	14	12	-	-	-	40	80	M8 × 28	35 400	40 700	623	536 2 820	536 2 820	
LWHD 30-B	○																															9
MHD 30-M*	-																															7
MHD 30-MU*	-																															7
MHDG 30	○	1.44								139	60	106.6	149																			
LWHDG30	○											7																				

Notes (1) Track rail lengths L are shown in Table 2.1 on page II-93 and Tables 2.3 and 2.4 on page II-95.
 (2) Choose bolts whose dimension allow fixing thread depth into track rail to be less than h_1 .
 (3) The appended track rail mounting bolts are hexagon socket head bolts equivalent to JIS B 1176. In an assembled set of MH series and LWHD...MU model, track rail mounting bolts are not appended.
 (4) The direction of basic dynamic load rating (C), basic static load rating (C_0), and static moment rating (T_0 , T_x , T_y) are shown in the sketches below. The upper values of T_x and T_y are for one slide unit and the lower values are for two slide units in close contact.
 (5) The shapes of grease nipple vary by size. The specifications are shown in Table 15 on page II-104.
 Remark: The identification numbers with * are our semi-standard items.



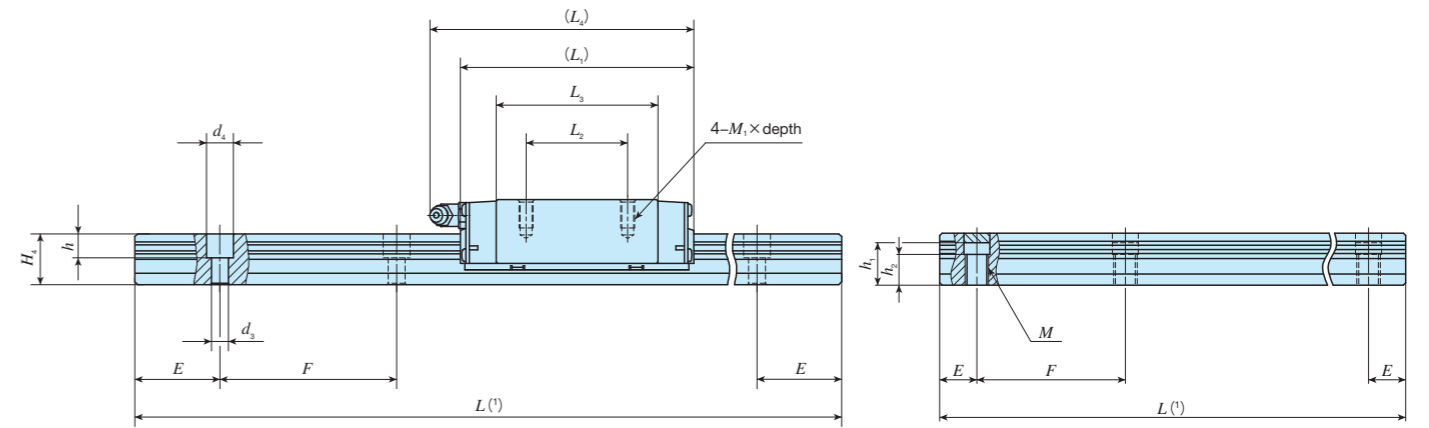
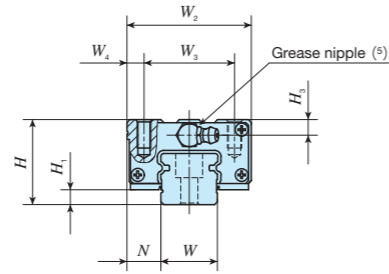
Example of identification number of assembled set

Model code	Dimensions	Part code	Model code	Dust protection code	Preload symbol	Classification symbol	Interchangeable code	Supplemental code
MHD	G	25	C2	R840		T1	P	N
1	2	3	4	5	6	7	8	9
1 Model	2 Length of slide unit	3 Length of track rail	4 Number of slide unit	5 Dust protection code	6 Preload amount	7 Interchangeable	8 Accuracy class	9 Special specification
MHD LWHD(...B)	No symbol Standard Long	840 mm	2	No symbol Standard specification M Ultra seal specification MU Ultra seal specification with track rail mounting from bottom	No symbol Standard T1 Light preload T2 Medium preload T3 Heavy preload	No symbol Non-interchangeable specification S1 S1 specification S2 S2 specification	H High P Precision SP Super precision	A, BS, D, E, F, I, J, L, LF, MA MN, N, PS, Q, RE, T, UR, V, W, Y, Z

IKO C-Lube Linear Way MH

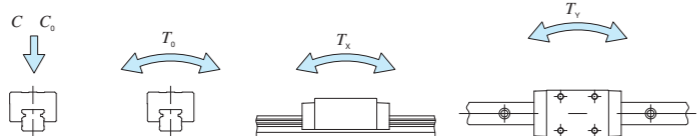
Compact block type mounting from top

Shape	MHS · LWHS			
Size	15	20	25	30



Identification number	Interchangeable	Mass (Ref.)		Dimensions of assembly mm			Dimensions of slide unit mm							Dimensions of track rail mm							Appended mounting bolt for track rail (3) mm	Basic dynamic load rating (4) C N	Basic static load rating (4) C0 N	Static moment rating (4) N·m							
		Slide unit kg	Track rail kg/m	H	H1	N	W2	W3	W4	L1	L2	L3	L4	M1×depth	H3	W	H4	d3	d4	h				M	h1(2)	h2	E	F	T0	Tx	Ty
MHS 15	○	0.18	1.47	24	4.5	9.5	34	26	4	66	26	44.2	69	M4×8	4.5	15	15	4.5	8	6	-	-	-	30	60	M4×16	11 600	13 400	112	95.6 556	95.6 556
LWHS 15···B	○											44.6																			
MHS 15···SL	○											44.2																			
LWHS 15···SL	○											44.6																			
LWHS 15···M*	-											-																			
LWHS 15···MU*	-	-																													
MHSG 15	○	0.25	-	-	-	-	-	-	-	82	-	60.1	85	-	-	-	4.5	8	6	-	-	-	-	30	60	M4×16	14 400	18 300	153	172 918	172 918
MHS 20	○	0.36	2.56	30	5	12	44	32	6	83	36	56	94	M5×10	5.5	20	18	6	9.5	8.5	-	-	-	30	60	M5×18	18 100	21 100	232	195 1 090	195 1 090
LWHS 20···B	○											57.2																			
MHS 20···SL	○											56																			
LWHS 20···SL	○											57.2																			
LWHS 20···M*	-											-																			
LWHS 20···MU*	-	-																													
MHSG 20	○	0.53	-	-	-	-	-	-	-	112	50	84.8 86	122	-	-	-	6	9.5	8.5	-	-	-	-	30	60	M5×18	24 100	31 700	349	421 2 140	421 2 140

Notes (1) Track rail lengths L are shown in Table 2.1 on page II-93, Table 2.2 on page II-94, and Tables 2.3 and 2.4 on page II-95.
 (2) Choose bolts whose dimension allow fixing thread depth into track rail to be less than h_1 .
 (3) The appended track rail mounting bolts are hexagon socket head bolts equivalent to JIS B 1176. For stainless steel model, stainless steel bolts are appended.
 In an assembled set of MH series and LWHS···MU model, track rail mounting bolts are not appended.
 (4) The direction of basic dynamic load rating (C), basic static load rating (C_0), and static moment rating (T_0 , T_x , T_y) are shown in the sketches below. The upper values of T_x and T_y are for one slide unit and the lower values are for two slide units in close contact.
 (5) The shapes of grease nipple vary by size. The specifications are shown in Table 15 on page II-104.
 Remark: The identification numbers with * are our semi-standard items.



Example of identification number of assembled set

Model code	Dimensions	Part code	Model code	Dust protection code	Material code	Preload symbol	Classification symbol	Interchangeable code	Supplemental code
MHS	G	20	C2	R480		T1	P		N
1	2	3	4	5	6	7	8	9	10

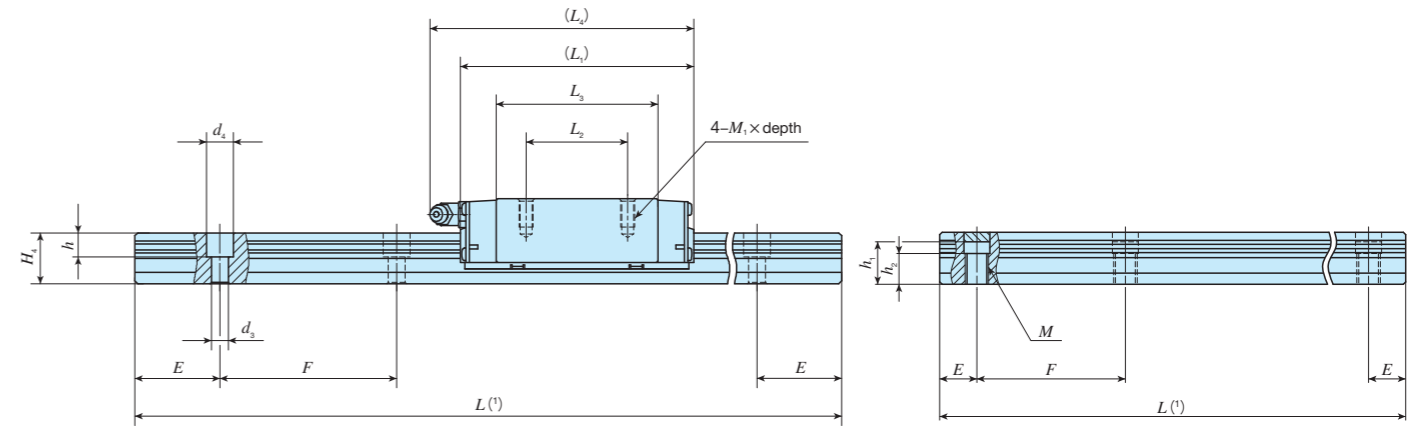
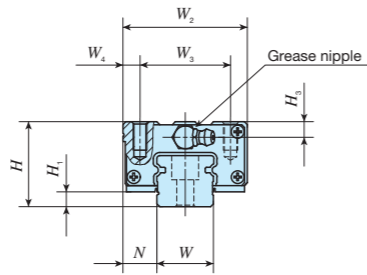
① Model MHS Compact block type mounting from top LWHS(···B)	⑤ Length of track rail (480 mm)	⑧ Preload amount No symbol Standard T1 Light preload T2 Medium preload T3 Heavy preload	⑩ Interchangeable No symbol Non-interchangeable specification S1 S1 specification S2 S2 specification
② Length of slide unit No symbol Standard G Long	⑥ Dust protection code No symbol Standard specification M Ultra seal specification MU Ultra seal specification with track rail mounting from bottom	⑨ Accuracy class H High P Precision SP Super precision	⑪ Special specification A, BS, D, E, F, I, J, L, LF, MA MN, N, Q, RE, T, V, W, Y, Z
③ Size 15, 20	⑦ Material type No symbol High carbon steel made SL Stainless steel made		
④ Number of slide unit (2)			

MH · LWHS

IKO C-Lube Linear Way MH

Compact block type mounting from top

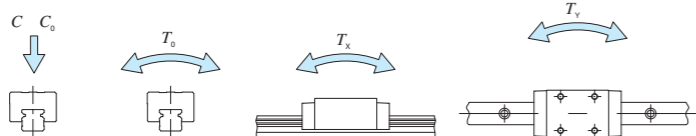
Shape	MHS · LWHS			
Size	15	20	25	30



Ultra seal specification with track rail mounting from bottom

Identification number	Interchangeable	Mass (Ref.)		Dimensions of assembly mm			Dimensions of slide unit mm							Dimensions of track rail mm								Appended mounting bolt for track rail (3) mm	Basic dynamic load rating (4) C N	Basic static load rating (4) C0 N	Static moment rating (4) N·m						
		Slide unit kg	Track rail kg/m	H	H1	N	W2	W3	W4	L1	L2	L3	L4	M1×depth	H3	W	H4	d3	d4	h	M				h1(2)	h2	E	F	T0	Tx	Ty
MHS 25	○	0.55	3.50	36	6.5	12.5	48	35	6.5	95	35	63.9	105	M6×12	6.5	23	22	7	11	9	-	-	-	30	60	M6×22	25 200	28 800	362	1 309	1 690
LWHS 25...B	○											64.7																			
MHS 25...SL	○											63.9																			
LWHS 25...SL	○											64.7																			
MHS 25...M*	-											63.9																			
LWHS 25...M*	-											64.7																			
MHS 25...MU*	-	-	-	-	-	-	-	-	-	-	-	63.9	-	-	-	-	-	-	M10	18	13	-	-	-	-	-	-	-	-		
LWHS 25...MU*	-	-	-	-	-	-	-	-	-	-	-	64.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MHSG 25	○	0.67										86.6	128												M6×22	30 800	38 300	483	533	2 740	
LWHS 25	○											87.4																			
MHS 30	○	1.00	4.82	42	7	16	60	40	10	113	40	80.6	123	M8×16	8	28	25	9	14	12	-	-	-	40	80	M8×28	35 400	40 700	623	536	2 820
LWHS 30...B	○											9																			
MHS 30...SL	○											7																			
LWHS 30...SL	○											9																			
MHS 30...M*	-											7																			
LWHS 30...M*	-											7																			
MHS 30...MU*	-	-	-	-	-	-	-	-	-	-	-	80.6	-	-	-	-	-	-	M12	20	13	-	-	-	-	-	-	-	-		
LWHS 30...MU*	-	-	-	-	-	-	-	-	-	-	-	80.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MHSG 30	○	1.29										106.6	149												M8×28	42 700	53 200	814	894	4 460	
LWHS 30	○											9																			
LWHS 30	○	7																													

Notes (1) Track rail lengths L are shown in Table 2.1 on page II-93, Table 2.2 on page II-94, and Tables 2.3 and 2.4 on page II-95.
 (2) Choose bolts whose dimension allow fixing thread depth into track rail to be less than h_1 .
 (3) The appended track rail mounting bolts are hexagon socket head bolts equivalent to JIS B 1176. For stainless steel model, stainless steel bolts are appended.
 In an assembled set of MH series and LWHS...MU model, track rail mounting bolts are not appended.
 (4) The direction of basic dynamic load rating (C), basic static load rating (C_0), and static moment rating (T_0 , T_x , T_y) are shown in the sketches below. The upper values of T_x and T_y are for one slide unit and the lower values are for two slide units in close contact.
 Remarks 1. The specifications of grease nipple are shown in Table 15 on page II-104.
 2. The identification numbers with * are our semi-standard items.



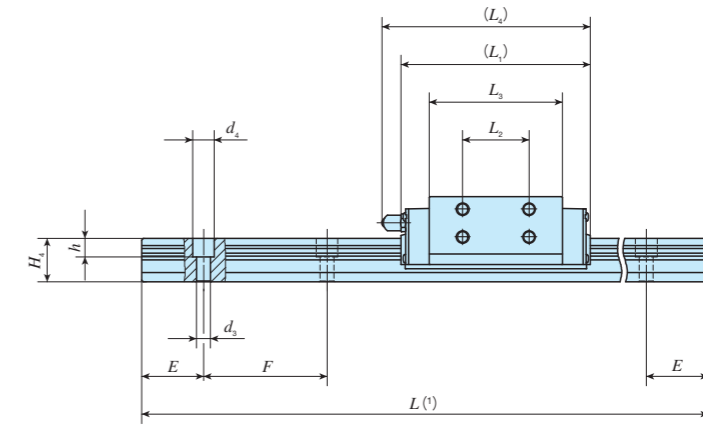
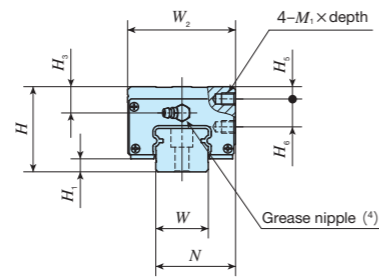
Example of identification number of assembled set

Model code	Dimensions	Part code	Model code	Dust protection code	Material code	Preload symbol	Classification symbol	Interchangeable code	Supplemental code
MHS	G	30	C2	R480		T1	P		N
1	2	3	4	5	6	7	8	9	10

① Model MHS LWHS(...B)	⑤ Length of track rail (480 mm)	⑧ Preload amount No symbol Standard T1 Light preload T2 Medium preload T3 Heavy preload	⑩ Interchangeable No symbol Non-interchangeable specification S1 S1 specification S2 S2 specification
② Length of slide unit No symbol Standard G Long	⑥ Dust protection code No symbol Standard specification M Ultra seal specification MU Ultra seal specification with track rail mounting from bottom	⑨ Accuracy class H High P Precision SP Super precision	⑪ Special specification A, BS, D, E, F, I, J, L, LF, MA MN, N, PS, Q, RE, T, UR, V, W, Y, Z
③ Size 25, 30	⑦ Material type No symbol High carbon steel made SL Stainless steel made		
④ Number of slide unit (2)			

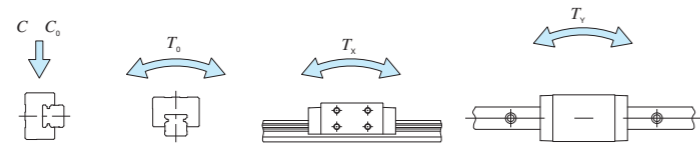
IKO C-Lube Linear Way MH

Side mounting type			
Shape	LWHY		
Size	15	20	25
	30	35	45



Identification number		Interchangeable	Mass (Ref.)		Dimensions of assembly mm			Dimensions of slide unit mm							Dimensions of track rail mm						Appended mounting bolt for track rail (2) Bolt size × ℓ	Basic dynamic load rating (3) C N	Basic static load rating (3) C0 N	Static moment rating (3)					
MH series	LWH series (No C-Lube)		Slide unit kg	Track rail kg/m	H	H1	N	W2	L1	L2	L3	L4	M1 × depth	H3	H5	H6	W	H4	d3	d4				h	E	F	T0 N · m	Tx N · m	Ty N · m
—	LWHY 15*	—	0.23	1.47	28	4.5	24.3	34	66	18	44.6	69	M 4 × 4	8.5	4	9	15	15	4.5	8	6	30	60	M 4 × 16	11 600	13 400	112	95.6 556	95.6 556
—	LWHY 20*	—	0.36	2.56	30	5	31.5	43.7	83	25	57.2	94	M 5 × 5	5.5	4	10	20	18	6	9.5	8.5	30	60	M 5 × 18	18 100	21 100	232	195 1 090	195 1 090
—	LWHY 25*	—	0.65	3.50	40	6.5	35	47.7	95	30	64.7	105	M 6 × 6	10.5	6	12	23	22	7	11	9	30	60	M 6 × 22	25 200	28 800	362	309 1 690	309 1 690
—	LWHY 30*	—	1.12	4.82	45	7	43.5	59.7	113	40	80.6	123	M 6 × 7	11	8	14	28	25	9	14	12	40	80	M 8 × 28	35 400	40 700	623	536 2 820	536 2 820
—	LWHY 35*	—	1.74	6.85	55	8	51.5	69.7	123	43	86.2	135	M 8 × 9	17	8	18	34	28	9	14	12	40	80	M 8 × 28	38 000	41 900	823	631 3 480	579 3 190
—	LWHY 45*	—	3.30	10.7	70	10	65	85.7	147	55	103.4	158	M10 × 11	23	10	22	45	34	14	20	17	52.5	105	M12 × 35	58 300	62 600	1 610	1 150 6 190	1 060 5 690

Notes (1) Track rail lengths L are shown in Table 2.1 on page II-93.
 (2) The appended track rail mounting bolts are hexagon socket head bolts equivalent to JIS B 1176.
 (3) The direction of basic dynamic load rating (C), basic static load rating (C_0), and static moment rating (T_0 , T_x , T_y) are shown in the sketches below. The upper values of T_x and T_y are for one slide unit and the lower values are for two slide units in close contact.
 (4) The shapes of grease nipple vary by size. The specifications are shown in Table 15 on page II-104.
 Remark: The identification numbers with * are our semi-standard items.



Example of identification number of assembled set

Model code	Dimensions	Part code	Preload symbol	Classification symbol	Supplemental code
LWHY	30	C2 R480	T1	P	/N
①	②	③	④	⑤	⑥

① Model
LWHY Side mounting type

② Size
15, 20, 25, 30, 35, 45

③ Number of slide unit (2)

④ Length of track rail (480 mm)

⑤ Preload amount
No symbol Standard
T1 Light preload
T2 Medium preload
T3 Heavy preload

⑥ Accuracy class
H High
P Precision
SP Super precision

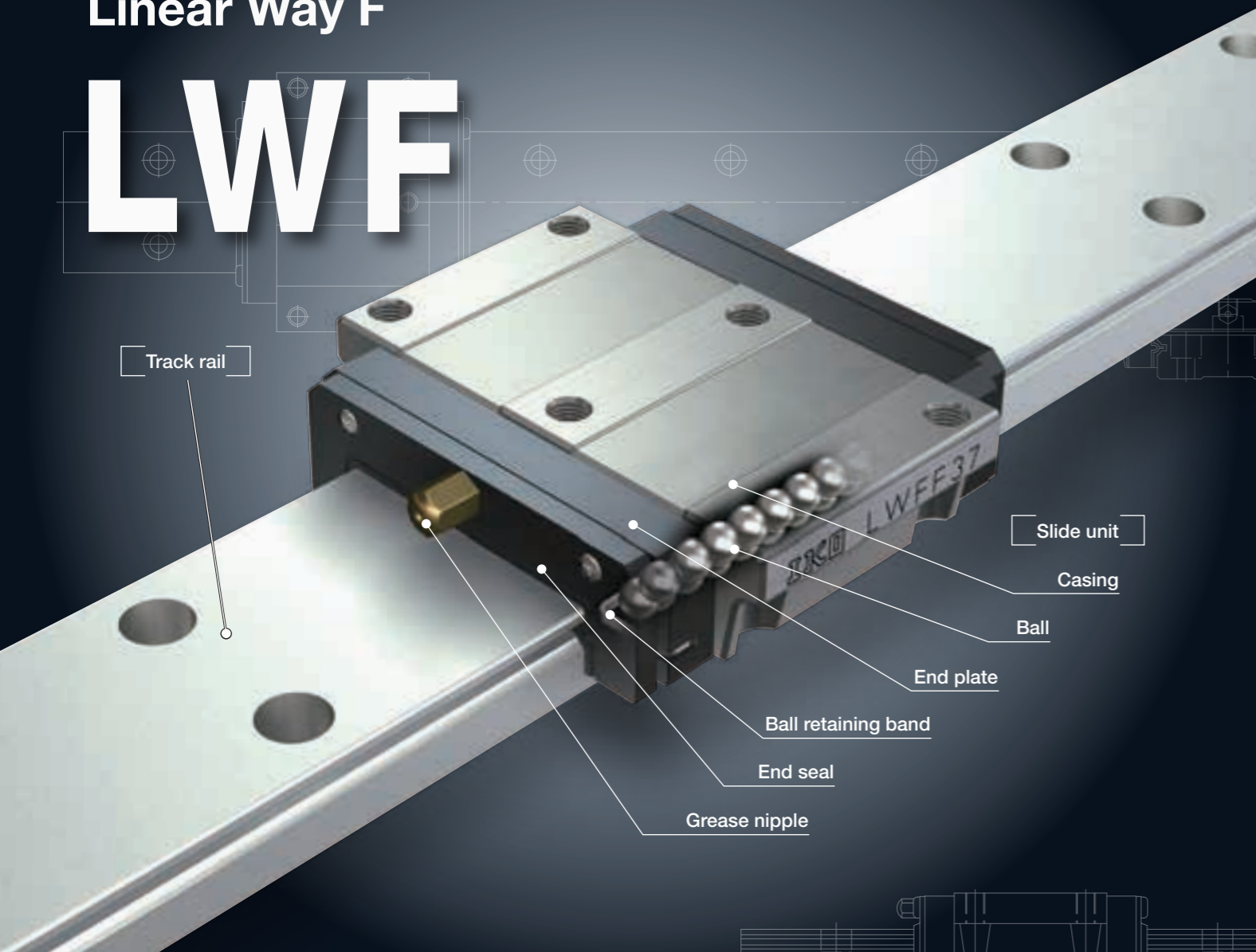
⑦ Special specification
A, E, F, I, L, LF, MA, N,
PS, RE, Y, Z

Linear Way F



Linear Way F

LWFF



Points

1 Wide rail type series resistant to moment load

As track rail width is wide and distance between moment load points is long, this is a linear motion rolling guide resistant to moment load and complex load and suitable for serial use.

2 Slide unit shapes for various usage

As the lineup of three types of slide unit shape including two flange types with different dimensional series and block type with small width are available, you can select an optimal product for the specifications of your machine and device.

3 Stainless steel selections superior in corrosion resistance are listed on lineup. For details P.I-39

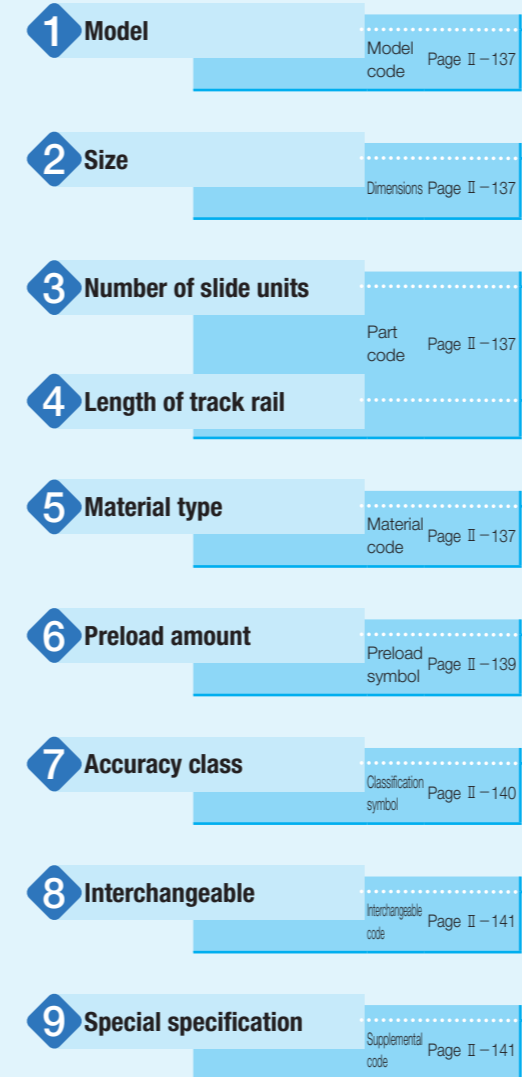
Products made of stainless steel are highly resistant to corrosion, so that they are suitable for applications where rust prevention oil is not preferred, such as in a cleanroom environment.

Identification Number and Specification

Example of an identification number

The specification of LWF series is indicated by the identification number. Indicate the identification number, consisting of a model code, dimensions, a part code, a material code, a preload symbol, a classification symbol, an interchangeable code, and any supplemental codes for each specification to apply.

	1	2	3	4	5	6	7	8	9
Non-interchangeable specification									
Assembled set	LWFF	37	C1	R800		T ₁	P		/FZ
Interchangeable specification									
Single slide unit	LWFS	37	C1		SL	T ₁	P	S1	/Z
Single track rail ⁽¹⁾	LWFF	37		R800	SL		P	S1	/F
Assembled set	LWFS	37	C1	R800	SL	T ₁	P	S1	/FZ



Note ⁽¹⁾ Indicate "LWFF" for the model code of the single track rail of block type LWFS mounting from top or stainless steel LWFS.

Identification Number and Specification — Model · Size · Number of Slide Unit ·

1 Model	Linear Way F ⁽¹⁾ (LWF series)	Flange type mounting from top / bottom	: LWFH : LWFF
		Block type mounting from top	: LWFS
For applicable models and sizes, see Table 1. Indicate "LWFF" for the model code of the single track rail of block type LWFS mounting from top or stainless steel LWFS.			
Note ⁽¹⁾ This model has no built-in C-Lube.			
2 Size	33,37,40,42,60,69,90	For applicable models and sizes, see Table 1.	
3 Number of slide units	: C○	For an assembled set, indicates the number of slide units assembled on a track rail. For a single slide unit, only "C1" is specified.	
4 Length of track rail	: R○	Indicate the length of track rail in mm. For standard and maximum length, see Table 2.1 and Table 2.2.	
5 Material type	High carbon steel made : No symbol Stainless steel made ⁽²⁾ : SL	For applicable models and sizes, see Table 1. Note ⁽²⁾ Mount a standard grease nipple (brass) on the stainless steel type, too. Stainless steel grease nipple is also available. If needed, please contact IKO.	

Table 1 Models and sizes of LWF series

Material	Shape	Model	Size						
			33	37	40	42	60	69	90
High carbon steel made	Flange type mounting from top/bottom	LWFH	—	—	○	—	○	—	○
	Flange type mounting from top/bottom	LWFF	○	○	—	○	—	○	—
	Block type mounting from top	LWFS	○	○	—	—	—	—	—
Stainless steel made	Block type mounting from top	LWFS...SL	○	○	—	○	—	—	—

Remark: For the models indicated in , the interchangeable specification is available.

Length of Track Rail · Material Type—

Table 2.1 Standard and maximum length of high carbon steel track rail

unit: mm

Identification number	LWFH40	LWFH60	LWFH90	
Item				
Standard length L (n)	180 (3)	240 (3)	480 (6)	
	240 (4)	480 (5)	640 (8)	
	360 (6)	640 (8)	800 (10)	
	480 (8)	800 (10)	1 040 (13)	
	660 (11)	1 040 (13)	1 200 (15)	
	840 (14)		1 520 (19)	
Pitch of mounting holes F	60	80	80	
E	30	40	40	
Standard E dimensions ⁽¹⁾	or higher	8	10	
	below	38	50	
Maximum length ⁽²⁾	1 500	1 520	1 520	
Identification number	LWFF33 LWFS33	LWFF37 LWFS37	LWFF42	LWFF69
Item				
Standard length L (n)	120 (3)	150 (3)	180 (3)	320 (4)
	200 (5)	250 (5)	240 (4)	480 (6)
	320 (8)	400 (8)	360 (6)	800 (10)
	480 (12)	500 (10)	480 (8)	1 040 (13)
	600 (12)	600 (12)	660 (11)	1 280 (16)
	560 (14)	800 (16)	840 (14)	1 600 (20)
Pitch of mounting holes F	40	50	60	80
E	20	25	30	40
Standard E dimensions ⁽¹⁾	or higher	7	7	9
	below	27	32	49
Maximum length ⁽²⁾	1 600	2 000	1 980	2 000

Notes ⁽¹⁾ This does not apply to female threads for bellows (supplemental code "/J").

⁽²⁾ We can produce products longer than the maximum length. If needed, please contact IKO.

Remarks 1. Indicate "LWFF" for the model code of the single track rail of block type LWFS mounting from top.

2. If not directed, E dimensions for both ends will be the same within the range of standard E dimensions. To change the dimensions, indicate the specified rail mounting hole positions "/E" of special specification. For more information, see page III-30.

Table 2.2 Standard and maximum length of stainless steel track rail

unit: mm

Identification number	LWFS33...SL	LWFS37...SL	LWFS42...SL
Item			
Standard length L (n)	120 (3)	150 (3)	180 (3)
	200 (5)	250 (5)	240 (4)
	320 (8)	400 (8)	360 (6)
	480 (12)	500 (10)	480 (8)
	600 (12)	600 (12)	660 (11)
	560 (14)	800 (16)	840 (14)
Pitch of mounting holes F	40	50	60
E	20	25	30
Standard E dimensions ⁽¹⁾	or higher	7	7
	below	27	32
Maximum length ⁽²⁾	1 200	1 200	1 200

Notes ⁽¹⁾ This does not apply to female threads for bellows (supplemental code "/J").

⁽²⁾ We can produce products longer than the maximum length. If needed, please contact IKO.

Remarks 1. Indicate "LWFF" for the model code of the single track rail.

2. If not directed, E dimensions for both ends will be the same within the range of standard E dimensions. To change the dimensions, indicate the specified rail mounting hole positions "/E" of special specification. For more information, see page III-30.

—Preload Amount—

6	Preload amount	Standard	: No symbol	Specify this item for an assembled set or a single slide unit.
		Light preload	: T ₁	For details of the preload amount, see Table 3.
		Medium preload	: T ₂	For applicable preload types, see Table 4.

Table 3 Preload amount

Preload type	Item	Preload symbol	Preload amount N	Operational conditions
Standard	(No symbol)	0 ⁽¹⁾	<ul style="list-style-type: none"> Light and precise motion 	
Light preload	T ₁	0.02C ₀	<ul style="list-style-type: none"> Almost no vibrations Load is evenly balanced Light and precise motion 	
Medium preload	T ₂	0.05C ₀	<ul style="list-style-type: none"> Medium vibration Medium overhung load 	

Note ⁽¹⁾ Indicates zero or minimal amount of preload.
 Remark: C₀ indicates the basic static load rating.

Table 4 Application of preload

Size	Preload type (preload symbol)		
	Standard (No symbol)	Light preload (T ₁)	Medium preload (T ₂)
33	○	○	○
37	○	○	○
40	○	○	○
42	○	○	○
60	○	○	○
69	○	○	○
90	○	○	○

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

—Accuracy Class—

7	Accuracy class	High	: H	For interchangeable specification products, assemble a slide unit and a track rail of the same accuracy class.
		Precision	: P	For details of accuracy class, see Table 5.
		Super precision	: SP	For applicable accuracy class, see Table 6.

Table 5 Tolerance and allowance

unit: mm

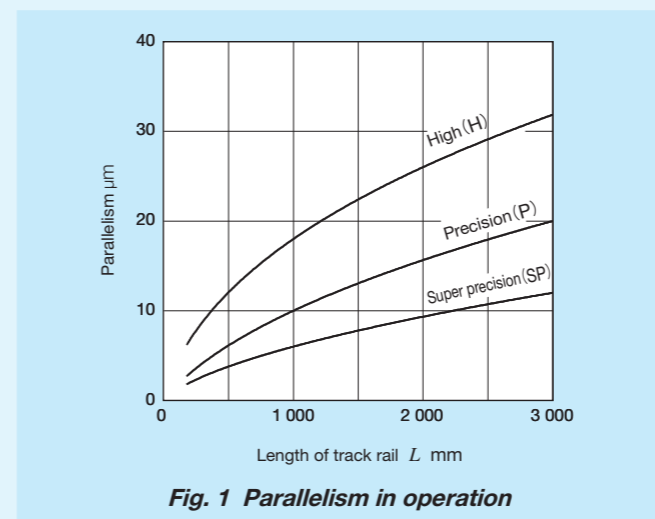
Item	Class (classification symbol)	High (H)	Precision (P)	Super precision (SP)
Dim. H tolerance		±0.040	±0.020	±0.010
Dim. N tolerance		±0.050	±0.025	±0.015
Dim. variation of H ⁽¹⁾		0.015	0.007	0.005
Dim. variation of N ⁽¹⁾		0.020	0.010	0.007
Dim. variation of H for multiple assembled sets ⁽²⁾		0.035	0.025	—
Parallelism in operation of the slide unit C surface to A surface		See Fig. 1		
Parallelism in operation of the slide unit D surface to B surface		See Fig. 1		

Notes ⁽¹⁾ It means the size variation between slide units mounted on the same track rail.
⁽²⁾ Applicable to the interchangeable specifications.

Table 6 Application of accuracy class

Size	Class (classification symbol)		
	High (H)	Precision (P)	Super precision (SP)
33	○	○	○
37	○	○	○
40	○	○	○
42	○	○	○
60	○	○	○
69	○	○	○
90	○	○	○

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



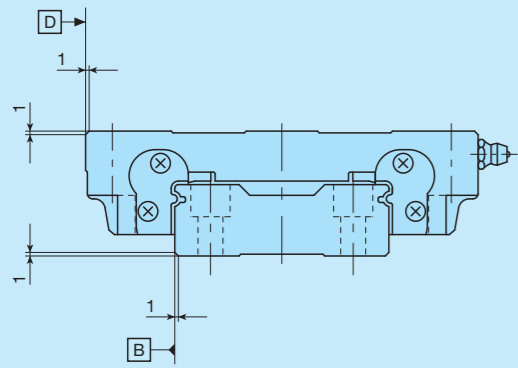
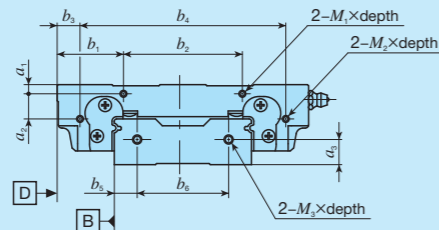


Fig. 2 Dimension of chamfered reference surface (Supplemental code /C /CC)

Remark: Add chamfer to the reference mounting surface of the slide unit and track rail.
For corner R of the mounting section, see Table 17.2 on page II - 148.

Table 9 Dimension of female threads for bellows (Supplemental code Single unit: /J Assembled set: /J /JJ)

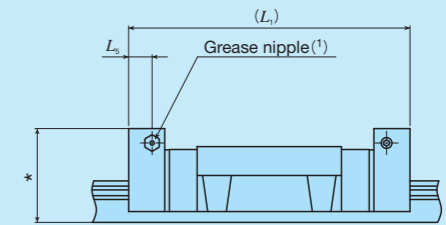
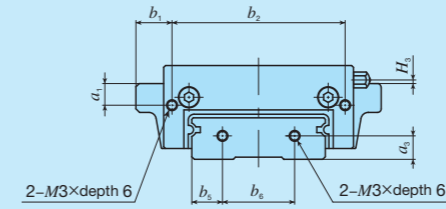


unit: mm

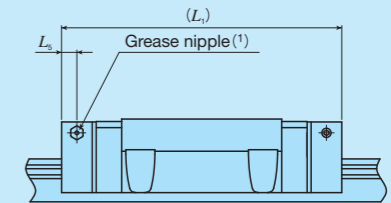
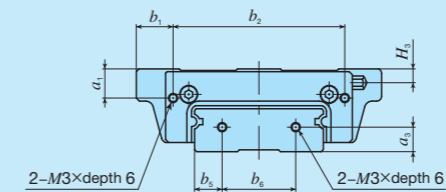
Identification number	Slide unit								Track rail			
	a_1	a_2	b_1	b_2	b_3	b_4	$M_1 \times \text{depth}$	$M_2 \times \text{depth}$	a_3	b_5	b_6	$M_3 \times \text{depth}$
LWFH 40	3	—	23.5	35	—	—	M3×6	—	9	8	24	M3×6
LWFH 60	4	11	29	52	10	90	M3×6	M3×3	11	10	40	M4×8
LWFH 90	6	17	41	80	13	136	M3×5	M3×5	13	15	60	M4×8

Table 10 Dimension of female threads for bellows (Supplemental code Single unit: /J Assembled set: /J /JJ)

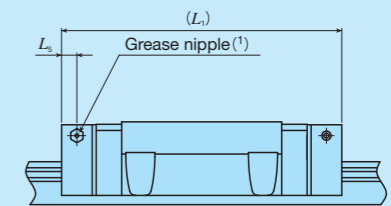
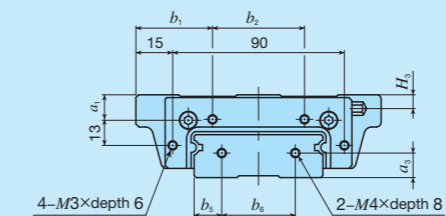
Size 33, 37



Size 42



Size 69



unit: mm

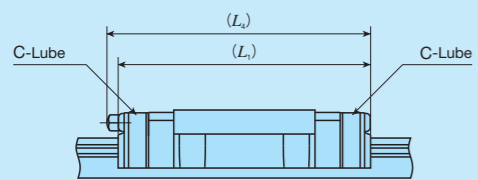
Identification number	Slide unit						Track rail		
	a_1	b_1	b_2	$L_1^{(2)}$	L_2	H_3	a_3	b_5	b_6
LWFF 33	4	8.25	43.5	71	5	1	6	7.5	18
LWFS 33(...SL)		3.25							
LWFF 37	6	10	48	78	5	1	6.5	8.5	20
LWFS 37(...SL)		3							
LWFF 42	9.5	12	56	92	7	4.5	8	9	24
LWFS 42...SL		3							
LWFF 69	9	35	50	125	7	5	11	14.5	40

Notes (1) Grease nipple specifications and mounting position are different from standard specifications. Provided grease nipple is A-M3 for size 37 and 42 models, and A-M4 for size 69 model. For grease nipple specification, see Table 15 on page II - 146.

(2) Dimensions of the specification that female threads for bellows are fitted to both ends of the slide unit are indicated.

Remark: Dimensions indicated by * mark for series of size 33 and Size 37 is higher than the H dimension of Linear Way F. For details, contact IKO.

Table 11 Dimension of slide unit with C-Lube plate (Supplemental code /Q)

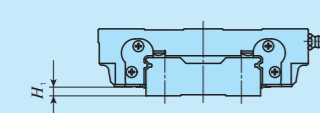


unit: mm

Size	L_1	L_4
33	64	66
37	73	75
40	78	—
42	86	98
60	98	—
69	121	132
90	131	—

Remark: The dimensions of the slide unit with C-Lube at both ends are indicated.

Table 12 H_1 dimension with under seal (Supplemental code /U)

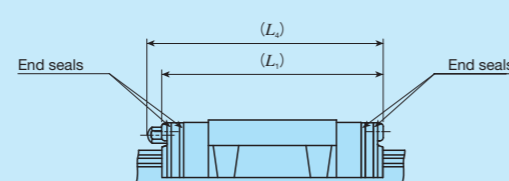


unit: mm

Size	H_1
40	3
60	4
90	5

Remark: H_1 dimensions of series of the Size 33, 37, 42, and 69 are the same as dimensions before mounting of under seal.

Table 13 Dimension of slide unit with double end seals (Supplemental code Single unit: /V Assembled set: /V /VV)

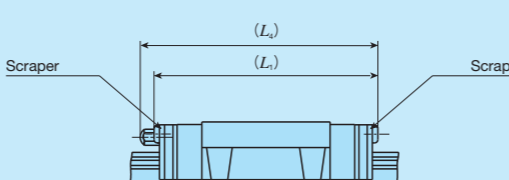


unit: mm

Size	L_1	L_4
33	61	64
37	70	74
42	82	96
69	117	130

Remark: The dimensions of the slide unit with double end seals at both ends are indicated.

Table 14 Dimension of slide unit with scrapers (Supplemental code Single unit: /Z Assembled set: /Z /ZZ)



unit: mm

Size	L_1	L_4
33	62	64
37	71	75
40	80	—
42	84	97
60	100	—
69	119	131
90	130	—

Remark: The dimensions of the slide unit with scraper at both ends are indicated.

Lubrication

Lithium-soap base grease with extreme-pressure additive (Alvania EP grease 2 [SHOWA SHELL SEKIYU K. K.]) is pre-packed in LWF series.

LWF series has grease nipple as indicated in Table 15. Supply nozzles fit to each shapes of grease nipple are also available. For order of these parts for lubrication, see Table 14.1 on page III-23 and Table 15 on page III-24.

Table 15 Parts for lubrication

Size	Grease nipple type ⁽¹⁾	Applicable supply nozzle type	Bolt size of female threads for piping
33	A-M3	A-5120V A-5240V	—
37	A-M4	B-5120V B-5240V	M4
40	JIS type 1	Grease gun available on the market	M6
42	B-M6		
60	JIS type 1		
69	B-M6		
90	JIS type 1		

Note ⁽¹⁾ For grease nipple specification, see Table 14.1 and Table 14.2 on page III-23.

Remark: Stainless steel grease nipple is also available. If needed, please contact IKO.

Dust Protection

The slide units of LWF series are equipped with end seals as standard for dust protection. However, if large amount of contaminant or dust are floating, or if large particles of foreign substances such as chips or sand may adhere to the track rail, it is recommended to cover the whole unit with bellows or telescope type shield, etc.



LWF series is provided with specific bellows. The bellows are easy to mount and provide excellent dust protection. If needed, please refer to III-26 for ordering.

Precaution for Use

① Mounting surface, reference mounting surface and typical mounting structure

When mounting the LWF series, properly align the reference mounting surface B and D of the track rail and slide unit with the reference mounting surface of the table and bed and fix them. (See Fig. 3.)

The reference mounting surfaces B and D and mounting surfaces A and C are precisely ground. Machining the mounting surface of the table and bed, such as machine or device, to high accuracy and mounting them properly will ensure stable linear motion with high accuracy.

Reference mounting surface of the slide unit is the opposite side of the  mark. The track rail reference mounting surface is identified by locating the  mark on the top surface of the track rail. It is the side surface above the mark (in the direction of the arrow). (See Fig. 4)

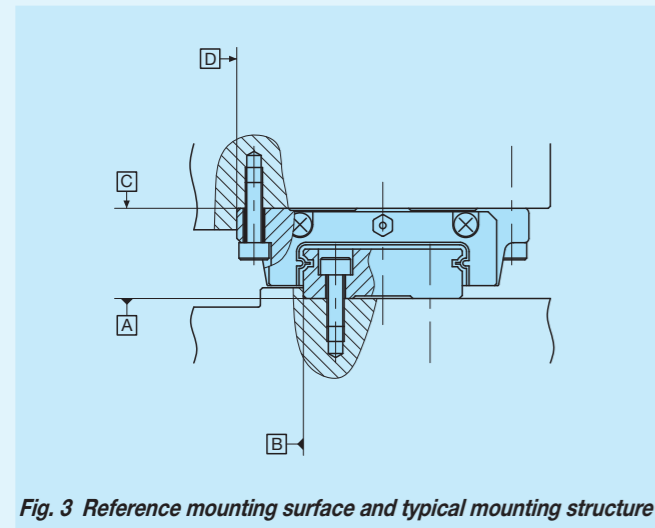


Fig. 3 Reference mounting surface and typical mounting structure

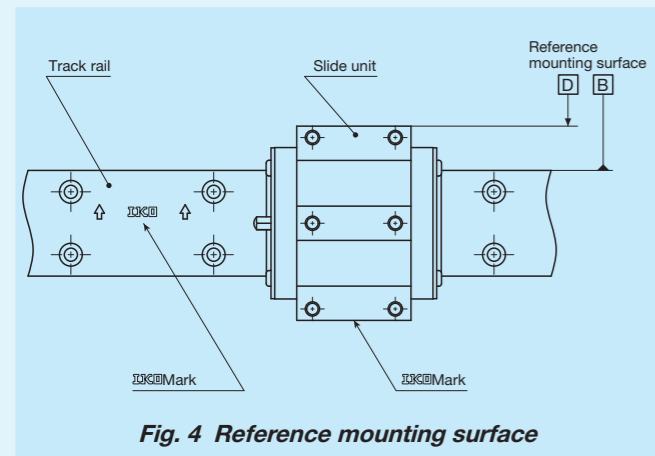


Fig. 4 Reference mounting surface

② Shoulder height and corner radius of the reference mounting surface

For the opposite corner of the mating reference mounting, it is recommended to have relieved fillet as indicated in Fig. 5. Recommended value for the shoulder height and corner radius on the mating side is indicated in Table 17.1 and Table 17.2.

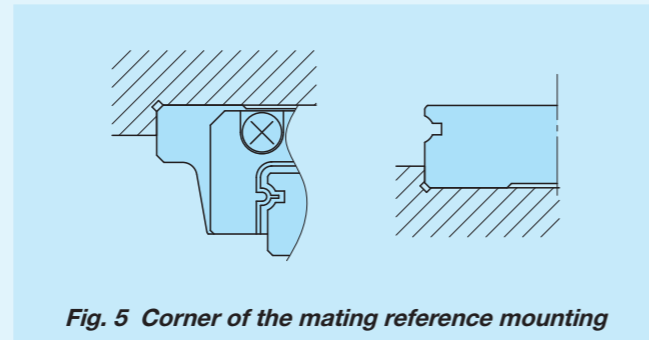


Fig. 5 Corner of the mating reference mounting

③ Tightening torque for fixing screw

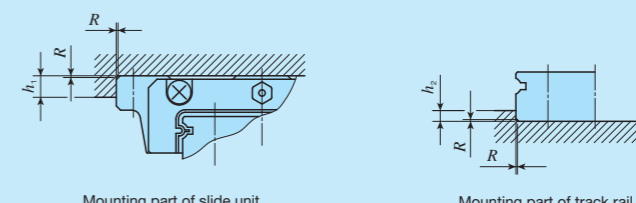
Typical tightening torque for mounting of the LWF series to the steel mating member material is indicated in Table 16. When vibration and shock of the machine or device are large, fluctuating load is large, or moment load is applied, fix it by using the torque 1.2 to 1.5 times larger than the value indicated in the table as necessary. If the mating member material is cast iron or aluminum alloy, reduce the tightening torque depending on the strength characteristics of the mating member material.

Table 16 Tightening torque for fixing screw

Bolt size	Tightening torque N · m	
	High carbon steel-made screw	Stainless steel-made screw
M 4×0.7	4.1	2.5
M 5×0.8	8.0	5.0
M 6×1	13.6	8.5
M 8×1.25	32.7	—
M10×1.5	63.9	—

Remark: The tightening torque is calculated based on strength division 12.9 and property division A2-70.

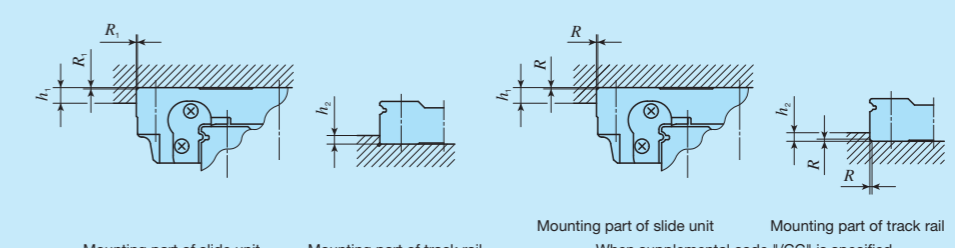
Table 17.1 Shoulder height and corner radius of the reference mounting surface



Size	Mounting part of slide unit		Mounting part of track rail	
	Shoulder height h_1	Corner radius R (Maximum)	Shoulder height h_2	Corner radius R (Maximum)
33	4	0.4	2	0.4
37	5	0.4	2.5	0.4
42	5	0.4	2.5	0.4
69	5	0.8	3.5	0.8

unit: mm

Table 17.2 Shoulder height and corner radius of the reference mounting surface

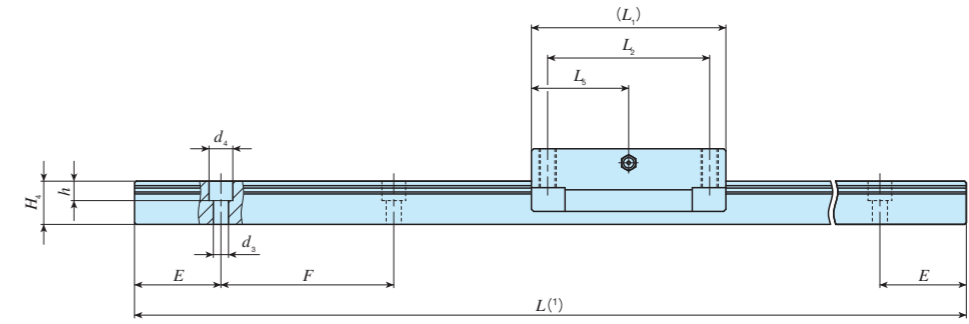
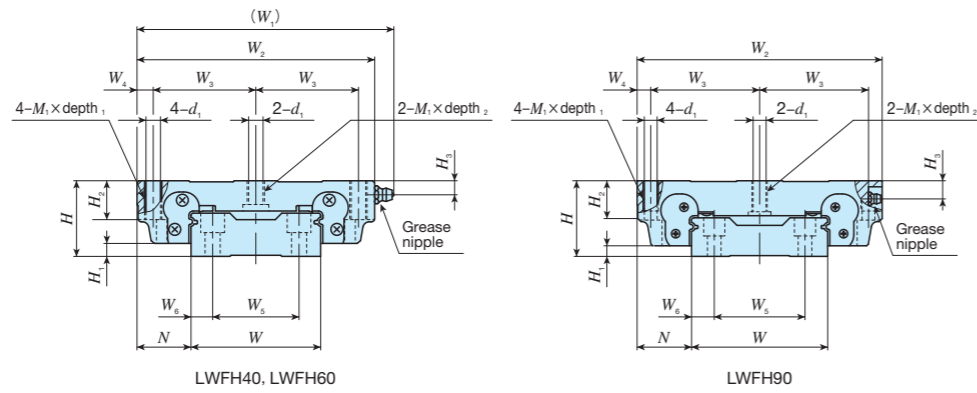


Size	Mounting part of slide unit		Mounting part of track rail	Corner radius when supplemental code "/CC" is specified R (Maximum)
	Shoulder height h_1	Corner radius R (Maximum)	Shoulder height h_2	
40	4	0.3	3	1
60	6	0.5	4	1
90	8	0.5	6	1

unit: mm

Flange type mounting from top / bottom

Shape	LWFH		
Size	40	60	90



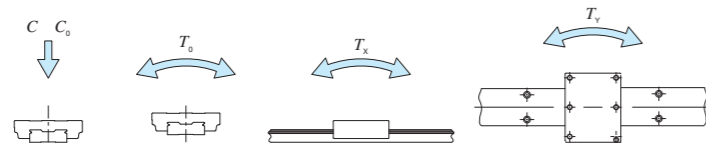
Identification number	Interchangeable	Mass(Ref.)		Dimensions of assembly			Dimensions of slide unit										Dimensions of track rail						Appended mounting bolt for track rail (2) mm	Basic dynamic load rating (3) C	Basic static load rating (3) C ₀	Static moment rating (3)							
		Slide unit kg	Track rail kg/m	H	H ₁	N	W ₁	W ₂	W ₃	W ₄	L ₁	L ₂	L ₃	d ₁	M ₁ ×depth ₁	depth ₂	H ₂	H ₃	W	H ₄	W ₅	W ₆				d ₃	d ₄	h	E	F	Bolt size×ℓ	N	N
LWFH 40	○	0.58	4.60	27	5	21	91	82	37	4	70	60	27.5	4.3	M 5×14	8	14	6.5	40	16	24	8	4.5	7.2	6	30	60	M4×16	12 600	16 600	280	108 612	99.3 563
LWFH 60	○	1.29	8.60	35	6	25	119	110	47.5	7.5	90	75	45	6.7	M 8×18	11	18	6.5	60	20	40	10	7	11	9	40	80	M6×22	16 100	23 500	600	210 1 090	193 998
LWFH 90	○	4.06	16.5	50	7	36	-	162	72	9	120	100	60	8.6	M10×20	20.5	26	12	90	25.5	60	15	9	14	12	40	80	M8×28	31 600	43 300	1 650	513 2 680	470 2 460

Notes (1) Track rail lengths L are shown in Table 2.1 on page II - 138.

(2) The appended track rail mounting bolts are hexagon socket head bolts equivalent to JIS B 1176. For size 40, small-head bolts are appended.

(3) The direction of basic dynamic load rating (C), basic static load rating (C_0), and static moment rating (T_0 , T_x , T_y) are shown in the sketches below. The upper values of T_x and T_y are for one slide unit and the lower values are for two slide units in close contact.

Remark: The specifications of grease nipple are shown in Table 15 on page II - 146.



Example of identification number of assembled set

Model code Dimensions Part code Preload symbol Classification symbol Interchangeable code Supplemental code

LWFH **60** **C2** **R800** **T1** **P** **/U**

① ② ③ ④ ⑤ ⑥ ⑦ ⑧

① Model

LWFH Flange type mounting from top / bottom

② Size

40, 60, 90

③ Number of slide unit (2)

④ Length of track rail (800 mm)

⑤ Preload amount

No symbol Standard

T1 Light preload

T2 Medium preload

⑥ Accuracy class

H High

P Precision

SP Super precision

⑦ Interchangeable

No symbol Non-interchangeable specification

S1 S1 specification


S2 S2 specification

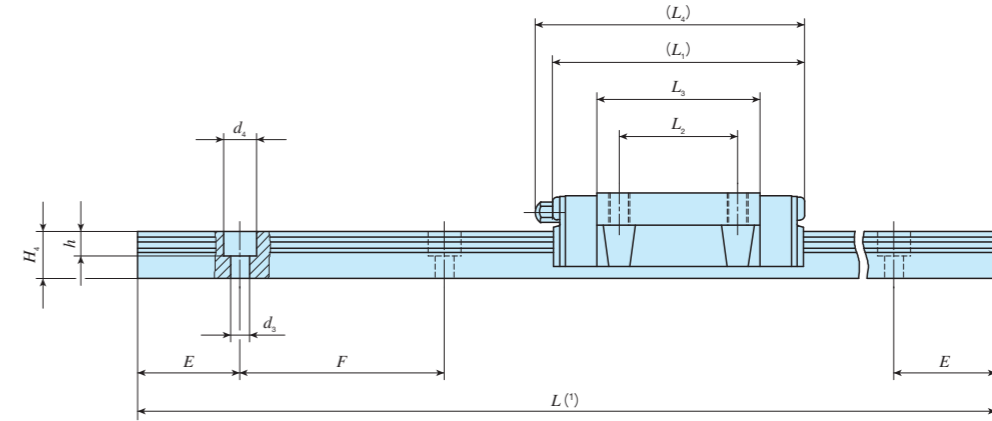
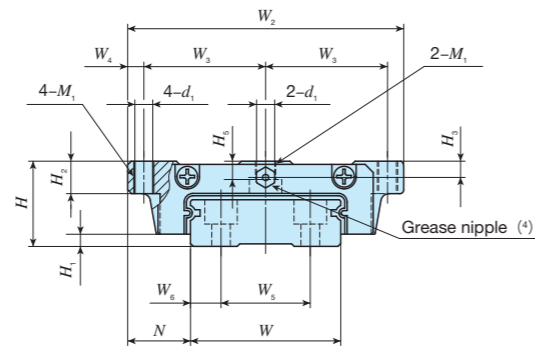
⑧ Special specification

A, C, D, E, F, I, J, L, LF

MN, N, Q, U, W, Y, Z

Flange type mounting from top / bottom

Shape				
Size	33	37	42	69



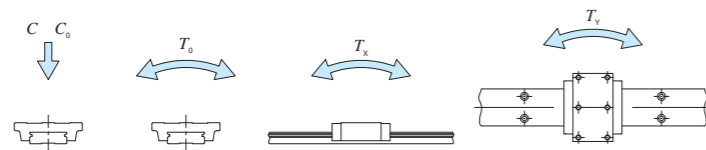
Identification number	Interchangeable	Mass(Ref.)		Dimensions of assembly			Dimensions of slide unit											Dimensions of track rail						Appended mounting bolt for track rail (2) mm	Basic dynamic load rating (3) N	Basic static load rating (3) N	Static moment rating (3)						
		Slide unit kg	Track rail 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	W ₅	W ₆	d ₃				d ₄	h	E	F	T ₀	T _x	T _y
LWFF 33	○	0.14	2.41	17	2.5	13.5	60	26.5	3.5	54	26	35.3	56	3.3	M4	6	3.2	3.7	33	10	18	7.5	4.6	8	6	20	40	M4×10	6 530	8 610	146	49.0 292	49.0 292
LWFF 37	○	0.23	3.05	21	3	15.5	68	30	4	62	29	40	66	4.4	M5	8	4	4.5	37	11.5	22	7.5	4.6	8	6	25	50	M4×12	9 840	12 200	235	80.0 480	80.0 480
LWFF 42	○	0.49	4.30	27	3	19	80	35	5	75	40	52.2	86	5.3	M6	10	6	7	42	14	24	9	4.6	8	6	30	60	M4×16	15 500	19 400	424	165 904	165 904
LWFF 69	○	1.40	9.51	35	4	25.5	120	53.5	6.5	109	60	79.5	120	7	M8	14	8	8	69	19.5	40	14.5	7	11	9	40	80	M6×22	34 900	44 100	1 560	581 2 940	488 2 460

Notes (1) Track rail lengths L are shown in Table 2.1 on page II – 138.

(2) The appended track rail mounting bolts are hexagon socket head bolts equivalent to JIS B 1176.

(3) The direction of basic dynamic load rating (C), basic static load rating (C_0), and static moment rating (T_0 , T_x , T_y) are shown in the sketches below. The upper values of T_x and T_y are for one slide unit and the lower values are for two slide units in close contact.

(4) The shapes of grease nipple vary by size. The specifications are shown in Table 15 on page II – 146.



Example of identification number of assembled set

Model code Dimensions Part code Preload symbol Classification symbol Interchangeable code Supplemental code

LWFF **37** **C2** **R800** **T1** **P** **/U**

① ② ③ ④ ⑤ ⑥ ⑦ ⑧

① Model

LWFF Flange type mounting from top / bottom

② Size

33, 37, 42, 69

③ Number of slide unit (2)

④ Length of track rail (800 mm)

⑤ Preload amount

No symbol Standard
T1 Light preload
T2 Medium preload

⑥ Accuracy class

H High
P Precision
SP Super precision

⑦ Interchangeable

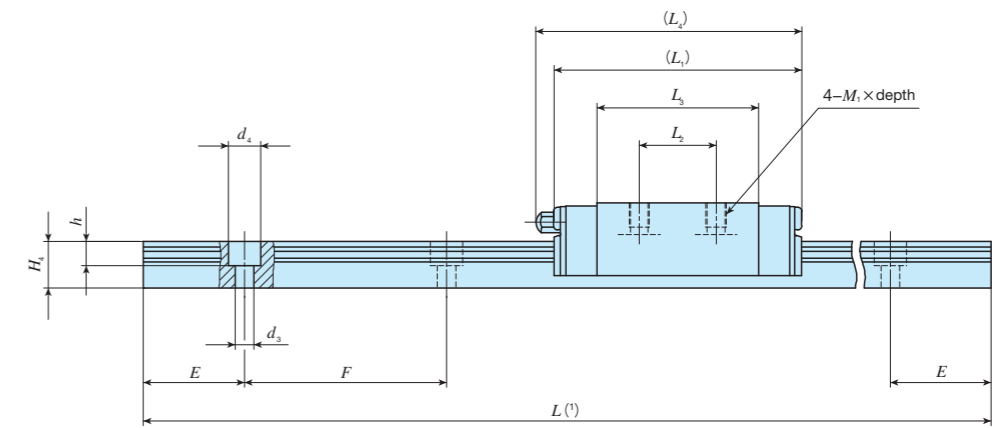
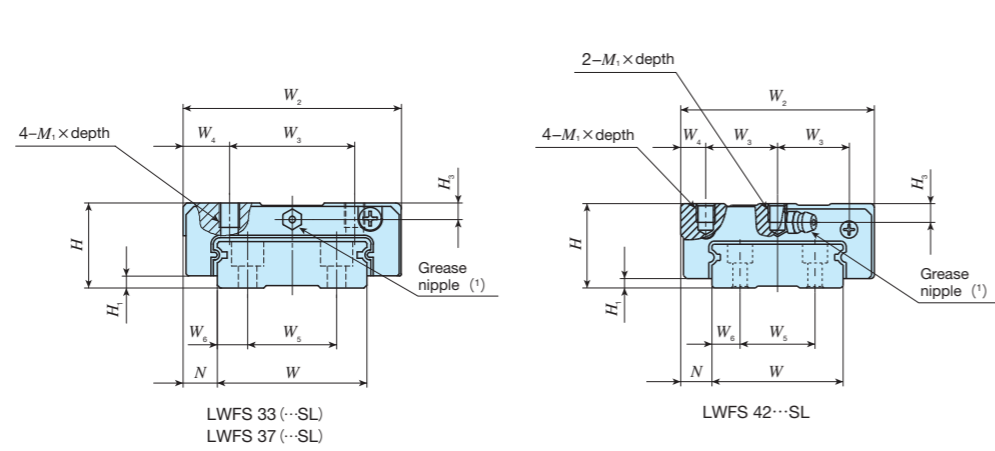
No symbol Non-interchangeable specification
S1 S1 specification
S2 S2 specification

⑧ Special specification

A, D, E, F, I, J, L, LF
MN, N, Q, U, V, W, Y, Z

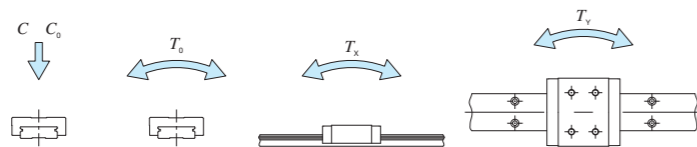
Block type mounting from top

Shape			
Size	33	37	42



Identification number	Interchangeable	Mass(Ref.)		Dimensions of assembly			Dimensions of slide unit									Dimensions of track rail						Appended mounting bolt for track rail (2) mm	Basic dynamic load rating (3) N	Basic static load rating (3) N	Static moment rating (3)							
		Slide unit kg	Track rail kg/m	H	H ₁	N	W ₂	W ₃	W ₄	L ₁	L ₂	L ₃	L ₄	M ₁ × depth	H ₃	W	H ₄	W ₅	W ₆	d ₃	d ₄				h	E	F	T ₀	T _x	T _y		
LWFS 33	○	0.13	2.41	17	2.5	8.5	50	29	10.5	54	15	35.3	56	M4×5	3.2	33	10	18	7.5	4.6	8	6	20	40	M4×10	6 530	8 610	146	49.0 292 ⁰	49.0 292 ⁰		
LWFS 33...SL	○			LWFS 37	○	0.20	3.05	21	3	8.5	54	31	11.5	62	19	40	66	M5×6	4	37	11.5	22	7.5	4.6	8	6	25	50	M4×12	9 840	12 200	235
LWFS 37...SL	○	LWFS 42...SL	○	0.40	4.30			27	3	10	62	23	8	75	32	52.2	86	M6×6	6	42	14	24	9	4.6	8	6	30	60	M4×16	15 500	19 400	424

- Notes (1) Track rail lengths L are shown in Tables 2.1 and 2.2 on page II - 138.
 (2) The appended track rail mounting bolts are hexagon socket head bolts equivalent to JIS B 1176. For stainless steel model, stainless steel bolts are appended.
 (3) The direction of basic dynamic load rating (C), basic static load rating (C_0), and static moment rating (T_0 , T_x , T_y) are shown in the sketches below. The upper values of T_x and T_y are for one slide unit and the lower values are for two slide units in close contact.
 (4) The shapes of grease nipple vary by size. The specifications are shown in Table 15 on page II - 146.



Example of identification number of assembled set

Model code Dimensions Part code Material code Preload symbol Classification symbol Interchangeable code Supplemental code

LWFS 37 C2 R800 T1 P /U

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

① Model LWFS Block type mounting from top	③ Number of slide unit (2)	⑥ Preload amount No symbol Standard T1 Light preload T2 Medium preload	⑧ Interchangeable No symbol Non-interchangeable specification S1 S1 specification S2 S2 specification
② Size 33, 37, 42	④ Length of track rail (800 mm)	⑦ Accuracy class H High P Precision SP Super precision	⑨ Special specification A, D, E, F, I, J, L, LF MN, N, Q, U, V, W, Y, Z
⑤ Material type No symbol High carbon steel made SL Stainless steel made			

C-Lube Linear Way MUL Linear Way U



C-Lube Linear Way MUL

MUL



long term maintenance free supported!

The aquamarine end plate is the symbol of maintenance free.

Track rail

Slide unit

Casing

C-Lube

Ball

End plate

Ball retaining band

End seal

Oil hole

Linear Way U
LWU

Points

1 Original U-shaped track rail

MUL and LWU series are the linear motion rolling guides adopting the U-shaped track rail to greatly increase rigidity of track rail under moment load and torsion.

2 Expanded freedom of design for use as a structure beam

Because of the high rigidity of the track rail, the track rail can be used as a structure beam, such as a cantilever or both-end support in the machine and equipment. Therefore, freedom of design is expanded for user.

3 Additional machining available for corresponding to needs

High carbon steel track rail can be machined additionally to fix mechanical components such as a driving mechanism on the track rail directly at user.

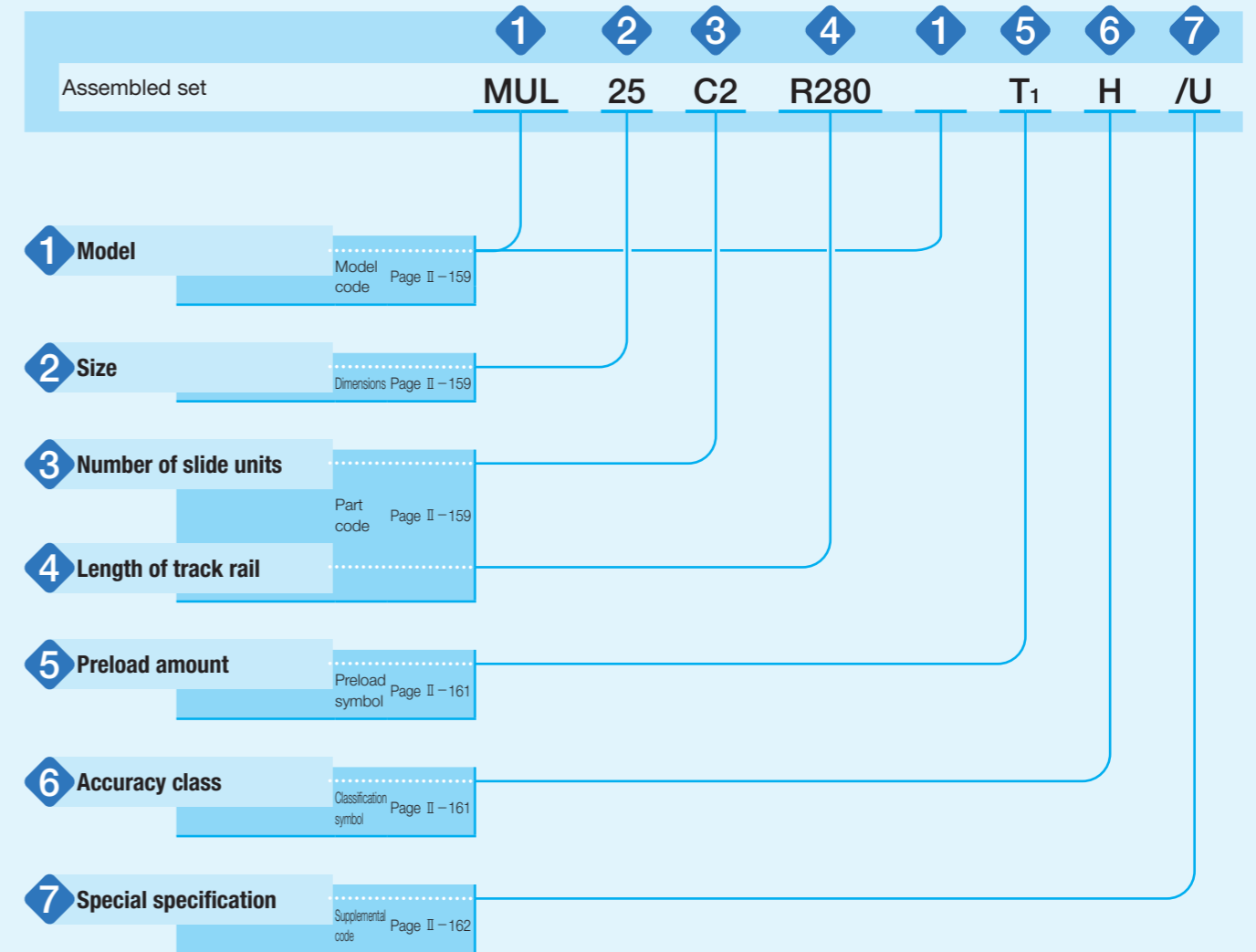
4 Stainless steel selections superior in corrosion resistance are listed on lineup. For details P.I-39

The main metal components made of corrosion-resistant stainless steel are available for small size of 25 mm and 30 mm of track rail width. They are suitable for applications where rust prevention oil is not preferred, such as in a cleanroom environment.

Identification Number and Specification

Example of an identification number

The specifications of MUL and LWU series are indicated by the identification number. Indicate the identification number, consisting of a model code, dimensions, a part code, a preload symbol, a classification symbol, and any supplemental codes for each specification to apply.

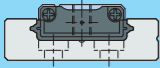
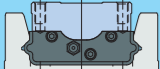


MUL · LWU

Identification Number and Specification — Model · Structure · Size · Number of Slide unit ·

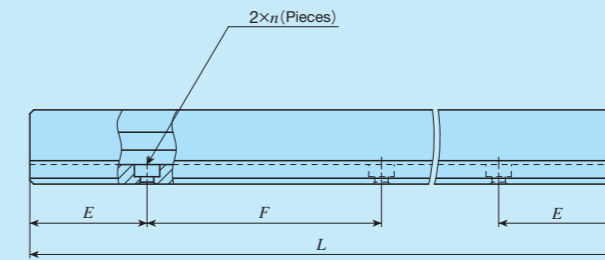
1 Model	C-Lube Linear Way MUL (MUL series)	Small type	: MUL
	Linear Way U ⁽¹⁾ (LWU series)	Standard type	: LWU
For applicable models and sizes, see Table 1.			
Note ⁽¹⁾ This model has no built-in C-Lube.			
2 Size	25,30,40,50,60,86	For applicable models and sizes, see Table 1.	
3 Number of slide units	: C○	Indicates the number of slide units assembled on a track rail.	
4 Length of track rail	: R○	Indicate the length of track rail in mm. For standard and maximum lengths, see Table 2.	

Table 1 Models and sizes of MUL and LWU series

Shape	Material	Model	Size					
			25	30	40	50	60	86
Small type 	Stainless steel made	MUL	○	○	—	—	—	—
Standard type 			High carbon steel made	LWU···B	—	—	○	○

Length of Track Rail —

Table 2 Standard and maximum lengths of track rail



unit: mm

Identification number	MUL25	MUL30	LWU40···B	LWU50···B
	Item			
Standard length L (n)	105 (3)	120 (3)	180 (3)	240 (3)
	140 (4)	160 (4)	240 (4)	320 (4)
	175 (5)	200 (5)	300 (5)	400 (5)
	210 (6)	240 (6)	360 (6)	480 (6)
	245 (7)	280 (7)	420 (7)	560 (7)
	280 (8)	320 (8)	480 (8)	640 (8)
Pitch of mounting holes F	35	40	60	80
E	17.5	20	30	40
Standard E dimensions	or higher	4.5	4.5	—
	below	22	24.5	—
Maximum length ⁽¹⁾	420 (840)	480 (960)	720	800
Identification number	LWU60···B	LWU86···B		
	Item			
Standard length L (n)	300 (3)	300 (3)		
	400 (4)	400 (4)		
	500 (5)	500 (5)		
	600 (6)	600 (6)		
	700 (7)	700 (7)		
	800 (8)	800 (8)		
Pitch of mounting holes F	100	100		
E	50	50		
Maximum length ⁽¹⁾	1 000	1 200		

Note ⁽¹⁾ Length up to the value in () can be produced. If needed, please contact IKO.

Remarks 1. If not directed, E dimensions for both ends will be the same within the range of standard E dimensions. To change the dimensions, indicate the specified rail mounting hole positions "/ E " of special specification. For more information, see page III-30.

— Preload Amount · Accuracy Class —

5 Preload amount	Standard	: No symbol	For details of the preload amount, see Table 3.
	Light preload	: T ₁	

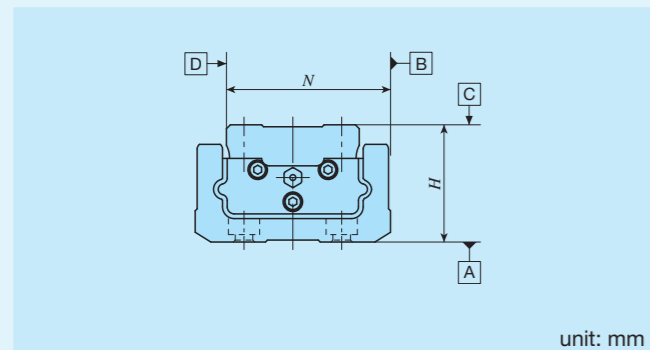
Table 3 Preload amount

Preload type	Preload symbol	Preload amount N	Operational conditions
Standard	(No symbol)	0 ⁽¹⁾	· Light and precise motion
Light preload	T ₁	0.02C ₀	· Almost no vibrations · Load is evenly balanced · Light and precise motion

Note ⁽¹⁾ Indicates zero or minimal amount of preload.
Remark: C₀ indicates the basic static load rating.

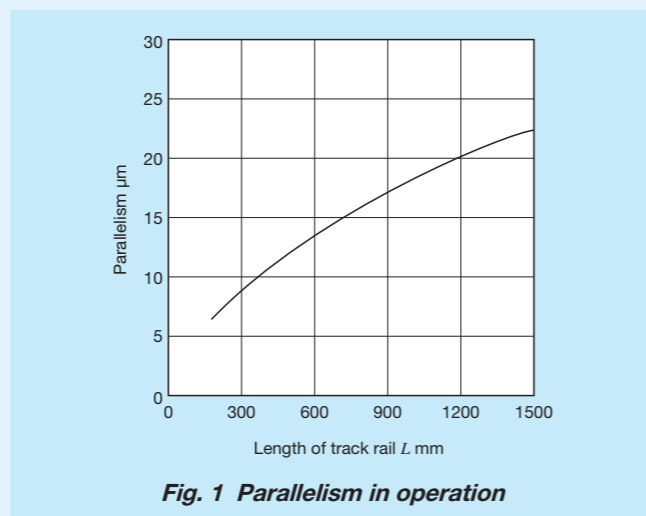
6 Accuracy class	Ordinary	: No symbol	For details of accuracy class, see Table 4.
	High	: H	

Table 4 Tolerance and allowance



Item	Class (classification symbol)	
	Ordinary (No symbol)	High (H)
Dim. H tolerance	±0.100	±0.050
Dim. N tolerance	±0.100	±0.050
Dim. variation of H ⁽¹⁾	0.050	0.040
Dim. variation of N ⁽¹⁾	0.050	0.040
Parallelism in operation of the slide unit C surface to A surface	See Fig. 1	
Parallelism in operation of the slide unit D surface to B surface	See Fig. 1	

Note ⁽¹⁾ It means the size variation between slide units mounted on the same track rail.



— Special Specification —

7 Special specification	/E, /LO, /MA, /Q, /U○, /W○	For applicable special specifications, see Table 5. For combination of multiple special specifications, see Table 6. For details of special specifications, see page III-29.

Table 5 Application of special specifications

Special specification	Supplemental code	Size					
		25	30	40	50	60	86
Specified rail mounting hole positions	/E	○	○	×	×	×	×
Black chrome surface treatment	/LO	○ ⁽¹⁾	○ ⁽¹⁾	○	○	○	○
With track rail mounting bolt	/MA	○	○	○	○	○	○
With C-Lube plate	/Q	×	×	○	○	○	○
Upper seal	/U	○	○	×	×	×	×
A group of multiple assembled sets	/W○	○	○	○	○	○	○

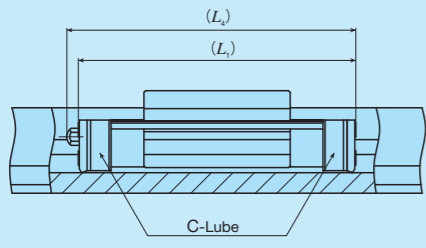
Notes ⁽¹⁾ Applicable only to "/LR".

Table 6 Combination of supplemental codes

L	○				
MA	○	○			
Q	-	○	○		
U	○	○	○	-	
W	-	○	○	○	○
	E	L	MA	Q	U

Remarks 1. The combination of "-" shown in the table is not available.
2. When using multiple types for combination, please indicate by arranging the symbols in alphabetical order.

Table 7 Dimension of slide unit with C-Lube plate (Supplemental code /Q)

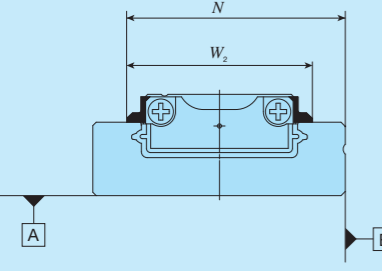


unit: mm

Size	L_1	L_4
40	67	68
50	82	83
60	95	100
86	142	146

Remark: The dimensions of the slide unit with C-Lube at both ends are indicated.

Table 8 Dimension of slide unit with upper seal (Supplemental code /U)



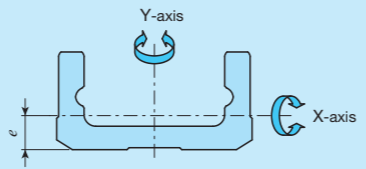
unit: mm

Size	N	W_2
25	21.4	18
30	25.9	22

Moment of Inertia of Sectional Area

High rigidity design of C-Lube Linear Way MUL and LWU are achieved by adopting a U-shaped track rail. The moment of inertia of sectional area of track rails are shown in Table 9.

Table 9 Moment of inertia of sectional area of track rails



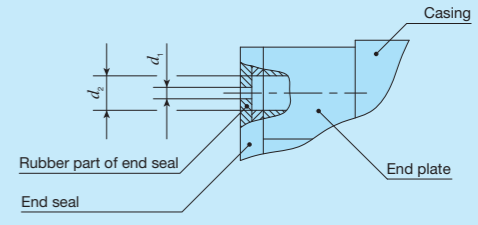
Identification number	Moment of inertia of sectional area mm^4		Center of gravity e mm
	I_x	I_y	
MUL 25	3.7×10^2	7.5×10^3	2.6
MUL 30	9.3×10^2	1.7×10^4	3.3
LWU 40···B	1.0×10^4	6.8×10^4	6.6
LWU 50···B	2.8×10^4	1.7×10^5	8.7
LWU 60···B	6.3×10^4	3.9×10^5	10.7
LWU 86···B	2.4×10^5	1.6×10^6	14.6

Lubrication

In the MUL series, lithium soap base grease (MULTEMP PS No.2, KYODO YUSHI) is prepacked, and in the LWU···B series, lithium soap base grease with extreme-pressure additive (Alvania EP grease 2 [SHOWA SHELL SEKIYU K. K.]) is prepacked. Additionally, MUL series has C-Lube placed in the recirculation part of balls, so that the interval for reapplying lubricant can be extended and maintenance works such as grease job can be reduced significantly.

MUL series and LWU series have grease nipple or oil hole as indicated in Table 11. Supply nozzles fit to each shapes of grease nipple and dedicated supplying equipment (miniature greasers) fit to oil holes are also available. For order of these parts for lubrication, see Table 13 and Table 14.1 on page III-23, and Table 15 on page III-24.

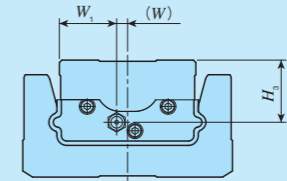
Table 10 Oil hole specifications



unit: mm

Size	d_1	d_2
25	0.5	1.2
30		1.5

Table 11 Lubrication parts and position of grease nipple



Size	Grease nipple type ⁽¹⁾	Applicable supply nozzle type	Bolt size of female threads for piping	Grease nipple position mm		
				W_1	W	H_3
25	Oil hole	Miniature greaser	—	7	0	2.9
30				9	0	3.75
40	A-M4	A-5120V	M4	13	0	10.5
50		B-5120V		17	0	13.5
60	JIS type 1	Grease gun available on the market	M6	19	0	14.5
86				23.5	4.5	25.5

Note ⁽¹⁾ For grease nipple specification, see Tables 14.1 and 14.2 on page III-23.

Remark: Stainless steel grease nipple is also available. If needed, please contact IKO.

Dust Protection


The slide units of MUL series and LWU series are equipped with end seals and upper seals as standard for dust protection. However, if large amount of contaminant or dust are floating, or if large particles of foreign substances such as chips or sand may adhere to the track rail, it is recommended to attach a protective cover to the linear motion mechanism.

Precaution for Use

① Mounting surface, reference mounting surface and typical mounting structure

When mounting the MUL series and LWU series, properly align the reference mounting surfaces B and D of the track rail and slide unit with the reference mounting surface of the table and bed and fix them. (See Fig. 2)

The reference mounting surfaces B and D and mounting surfaces A and C are precisely ground. Machining the mounting surface of the table and bed, such as machine or device, to high accuracy and mounting them properly will ensure stable linear motion with high accuracy.

Reference mounting surfaces of slide unit and track rail of the MUL series and LWU series are the opposite side of the  mark. (See Fig. 3)

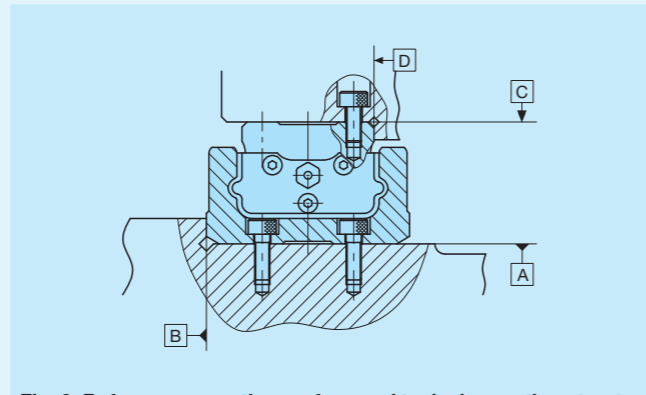


Fig. 2 Reference mounting surface and typical mounting structure

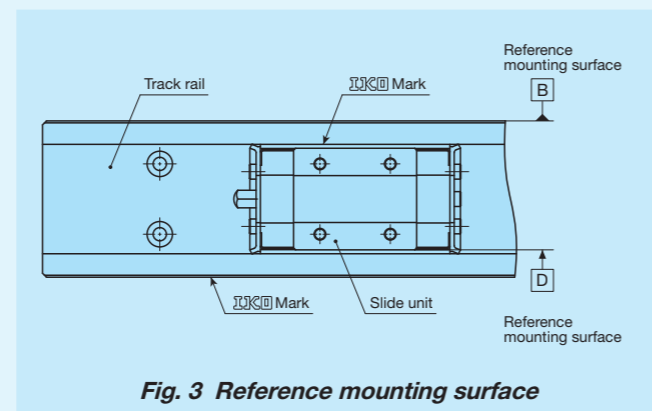


Fig. 3 Reference mounting surface

② Shoulder height and corner radius of the reference mounting surface

For the opposite corner of the mating reference mounting, it is recommended to have relieved fillet as indicated in Fig. 4. Recommended value for the shoulder height and corner radius on the mating side is indicated in Table 13.

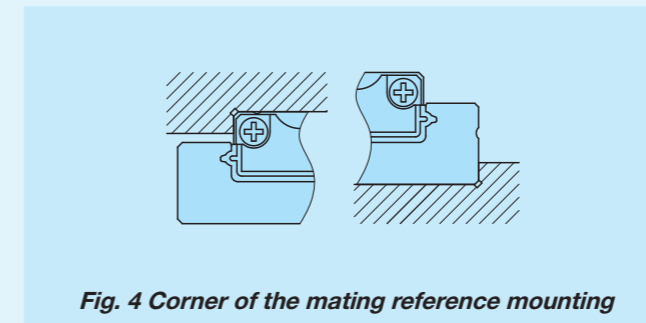


Fig. 4 Corner of the mating reference mounting

③ Tightening torque for fixing screw

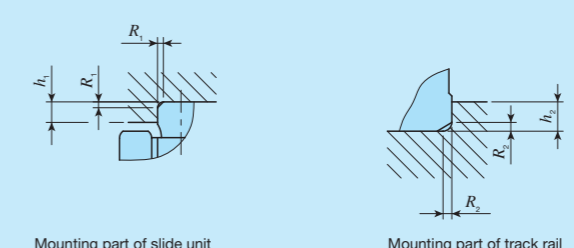
Typical tightening torque for mounting of the MUL series and LWU series to the steel mating member material is indicated in Table 12. When vibration and shock of the machine or device are large, fluctuating load is large, or moment load is applied, fix it by using the torque 1.2 to 1.5 times larger than the value indicated in the table as necessary. If the mating member material is cast iron or aluminum alloy, reduce the tightening torque depending on the strength characteristics of the mating member material.

Table 12 Tightening torque for fixing screw

Bolt size	Tightening torque N · m	
	Stainless steel-made screw	High carbon steel-made screw
M 2.5×0.45	0.62	—
M 3 ×0.5	—	1.8
M 4 ×0.7	—	4.1
M 5 ×0.8	—	8.0
M 6 ×1	—	13.6

Remark: The tightening torque is calculated based on strength division 12.9 and property division A2-70.

Table 13 Shoulder height and corner radius of the reference mounting surface



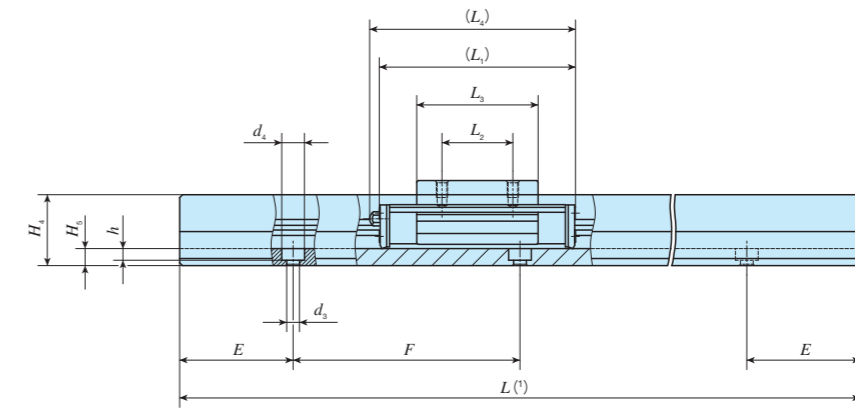
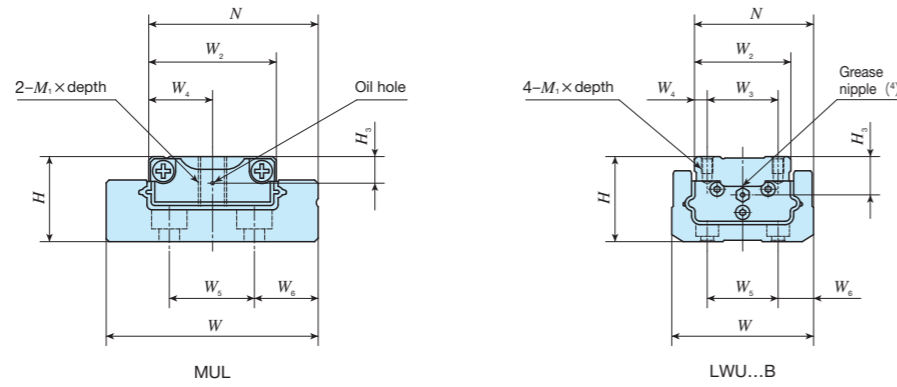
Size	Mounting part of slide unit		Mounting part of track rail	
	Shoulder height h_1	Corner radius R_1 (Maximum)	Shoulder height h_2	Corner radius R_2 (Maximum) ⁽¹⁾
25	1.5	0.2	2.5	—
30	2.5	0.2	3	—
40	3	0.5	5	1
50	3	0.5	7	2
60	3	0.5	9	2
86	4	0.5	11	2

unit: mm

Note ⁽¹⁾ In sizes 25 and 30, provide a relieved fillet as shown in Fig. 4.

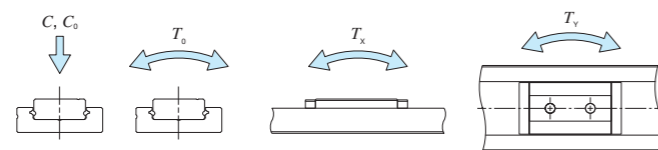
IKO C-Lube Linear Way MUL

Small type	
Shape	MUL
Size	25 30
Standard type	
Shape	LWU...B
Size	40 50 60 86



Identification number		Interchangeable	Mass(Ref.)		Dimensions of assembly mm		Dimensions of slide unit mm										Dimensions of track rail mm							Appended mounting bolt for track rail (2) mm Bolt size × ℓ	Basic dynamic load rating (3) C N	Basic static load rating (3) C0 N	Static moment rating (3) T				
MUL series	LWU series (No C-Lube)		Slide unit kg	Track rail kg/m	H	N	W2	W3	W4	L1	L2	L3	L4	M1 × depth	H3	W	H4	H5	W5	W6	d3	d4	h				E	F	T0	Tx	Ty
MUL 25	—	—	0.013	0.87	9	19.4	14	—	7	31	12	22	—	M 3 × 5	2.9	24.9	6.7	3.2	9	8	2.9	4.8	1.6	17.5	35	Cross-recessed pan head screw for precision equipment M 2.5 × 6	1 770	2 840	20.3	10.1 53.7	8.4 45.0
MUL 30	—	—	0.028 0.029	1.39	12	23.9	18	—	9	38	14	28.6	—	M 4 × 7	3.75	29.9	8.7	4.5	12	9	2.9	5	2.7	20	40	M 2.5 × 6	2 280	3 810	34.9	16.9 87.5	14.2 73.4
—	LWU 40...B	—	0.12	2.65 2.66	24	33	26	18	4	55	18	31.5	59	M 3 × 5	10.5	40	19	5	18	11	3.4	6.5	3.1	30	60	M 3 × 8 (Not appended)	8 410	9 780	134	53.0 351	53.0 351
—	LWU 50...B	—	0.27	4.06 4.08	30	42	34	25	4.5	70	25	42.8	73	M 4 × 6	13.5	50	25	6	25	12.5	4.5	8	4.1	40	80	M 4 × 10 (Not appended)	13 500	15 800	280	114 711	114 711
—	LWU 60...B	—	0.40	6.66 6.69	35	49	38	28	5	83	28	52.4	88	M 5 × 8	14.5	60	30	8	28	16	5.5	9.5	5.4	50	100	M 5 × 12 (Not appended)	18 800	21 600	425	181 1 150	181 1 150
—	LWU 86...B	—	1.32	14.1	48	71	56	46	5	130	46	93	134	M 6 × 12	25.5	86	42	13	46	20	7	11	7	50	100	M 6 × 16 (Not appended)	41 400	51 500	1 470	764 4 120	764 4 120

Notes (1) Track rail lengths L are shown in Table 2 on page II - 160.
 (2) The appended track rail mounting bolts are hexagon socket head bolts equivalent to JIS B 1176 or JIS B 1177 cross-recessed pan head screw for precision equipment. For the size 25 and 30 series, stainless steel bolts are appended. Track rail mounting bolts are not appended for MUL series.
 (3) The direction of basic dynamic load rating (C), basic static load rating (C_0), and static moment rating (T_0 , T_x , T_y) are shown in the sketches below. The upper values of T_x and T_y are for one slide unit and the lower values are for two slide units in close contact.
 (4) The shapes of grease nipple vary by size. The specifications are shown in Table 11 on page II - 164.
 Remark: The specification of oil hole is shown in Table 10 on page II - 164.



Example of identification number of assembled set

Model code Dimensions Part code Model code Preload symbol Classification symbol Supplemental code
MUL 25 C2 R280 **T1** **H** **/LR**

① Model	MUL LWU...B	③ Number of slide unit (2)	④ Preload amount	⑦ Special specification
② Size	25, 30, 40, 50, 60, 86	④ Length of track rail (280 mm)	T1 Standard Light preload	E, LR, MA, Q, U, W
			⑥ Accuracy class	
			No symbol H	Ordinary High

C-Lube Linear Roller Way Super MX Linear Roller Way Super X



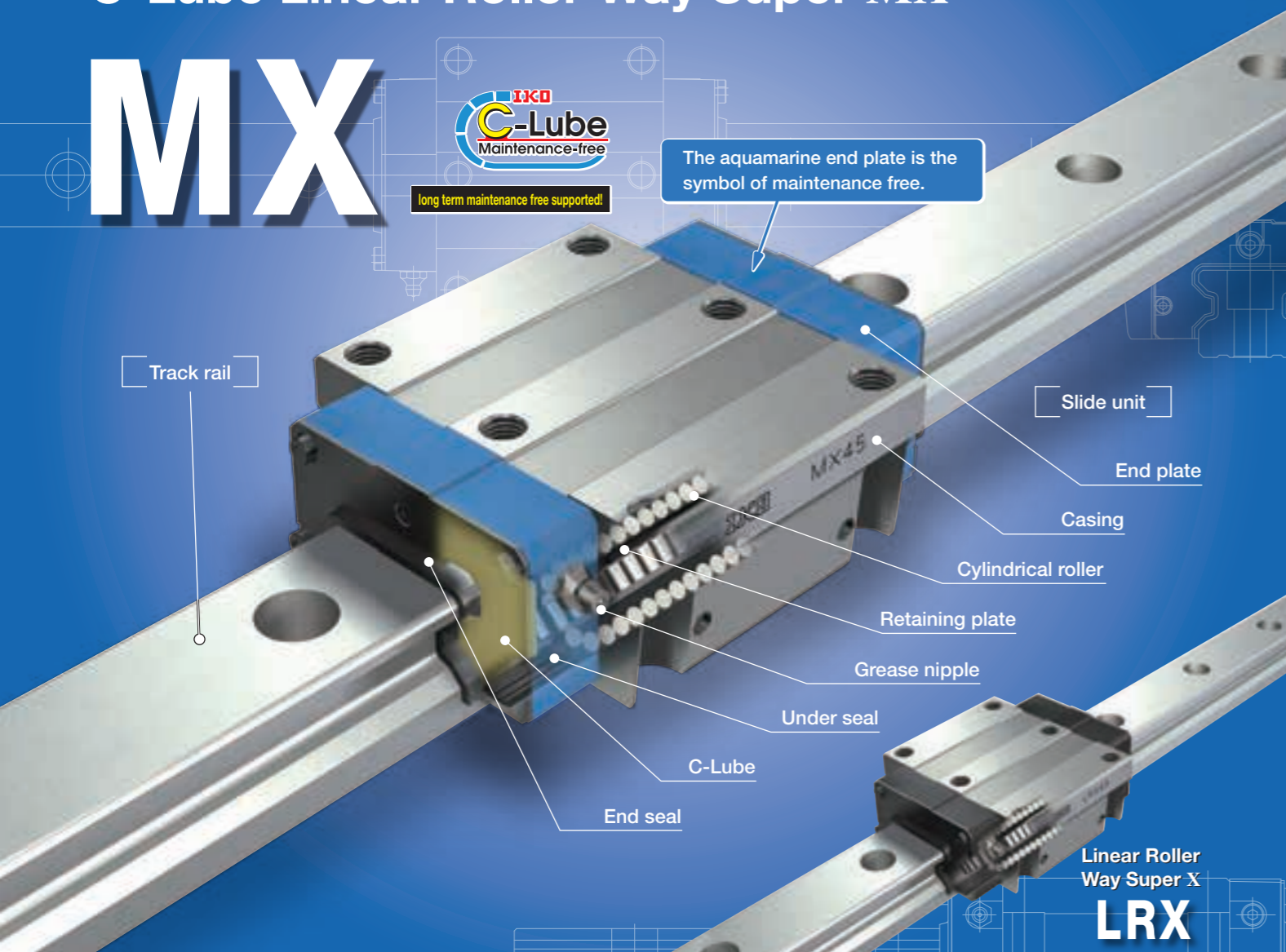
C-Lube Linear Roller Way Super MX

MX



long term maintenance free supported!

The aquamarine end plate is the symbol of maintenance free.



Points

● **Roller type linear motion rolling guides having the highest level of rolling guide performance** For details ▶ P.I-21

Linear motion rolling guide that has achieved the highest level of performance in all characteristics, including load capacity, rigidity, friction characteristics and accuracy, brought about by utilizing the roller's excellent characteristic.

● **Wide range of variations for your needs** For details ▶ P.I-28

A wide variety of products, including five types of different slide unit shape such as the flange type, low profile flange type and low profile block type with low cross sectional height, etc., and four types of different slide unit length with varying lengths with same section are available. You can select an optimal product for the specifications of your machine and device.

● **Extra long unit** For details ▶ P.I-29

Extra long slide unit series having the length 1.4 to 1.5 times of standard type is now available. With more rollers built into the slide units, the new series not only have the enhanced load capacity and rigidity but also exhibit super accuracy running performance.

● **Stainless steels selections superior in corrosion resistance are listed on lineup.** For details ▶ P.I-39

A series of stainless steel products is available from the miniature size of track rail width 10 mm. They are highly corrosion-resistant and suitable for applications where rust prevention oil is not preferred, such as in cleanroom environment.

● **Easy replacement from ball type** For details ▶ P.I-24

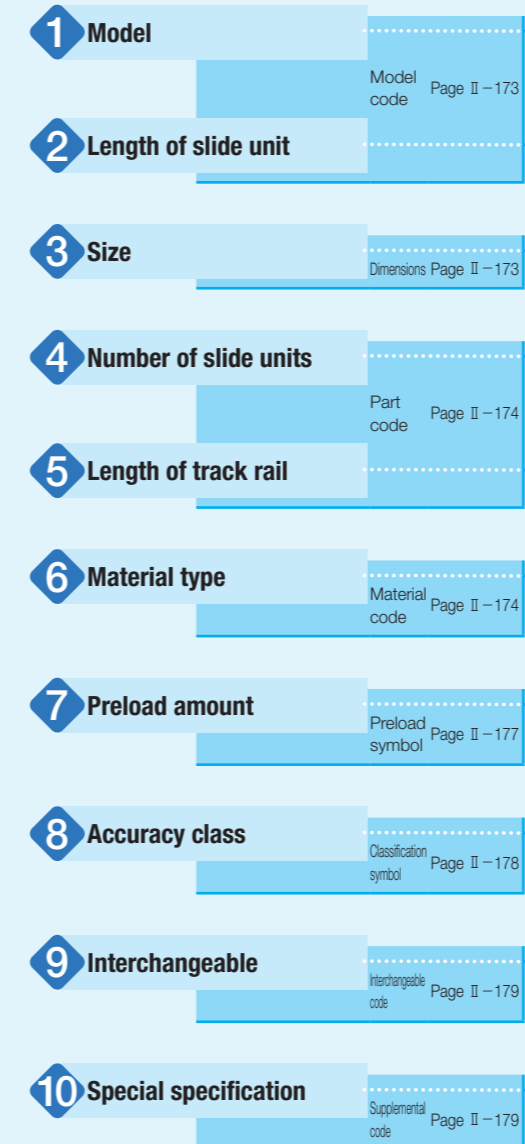
Mounting dimensions are compatible with MH / LWH series of ball type. Therefore, replacement to roller type is possible without major design changes of machine and device.

Identification Number and Specification

Example of an identification number

The specifications of MX and LRX series are indicated by the identification number. Indicate the identification number, consisting of a model code, dimensions, a part code, a material code, a preload symbol, a classification symbol, an interchangeable code, and any supplemental codes for each specification to apply.

Non-interchangeable specification	1	2	3	4	5	6	7	8	9	10
Assembled set	MX	G	15	C2	R240		T ₁	P		/Z
Interchangeable specification										
Single slide unit	MX	G	15	C1			T ₁	P	S1	/Z
Single track rail (*)	LRX		15		R240			P	S1	
Assembled set	MX	G	15	C2	R240		T ₁	P	S1	/Z



Note (*) Indicate "LRX" for the model code of the single track rail regardless of the series and the combination of slide unit model.

Identification Number and Specification — Model · Length of Slide Unit · Size —

1 Model	C-Lube Linear Roller Way Super MX (MX series)	Flange type mounting from top / bottom : MX ⁽²⁾ Block type mounting from top : MXD Compact block type mounting from top : MXS Low profile flange type mounting from top : MXN Low profile block type mounting from top : MXNS
	Linear Roller Way Super X ⁽¹⁾ (LRX series)	Flange type mounting from top / bottom : LRX ⁽²⁾ Block type mounting from top : LRXD Compact block type mounting from top : LRXS

For applicable models and sizes, see Table 1.1 and Table 1.2.
Indicate "LRX" for the model code of the single track rail regardless of the series and the combination of slide unit models.

Notes ⁽¹⁾ This model has no built-in C-Lube.
⁽²⁾ Series of size 20 can only be mounted by the bolts from top. The models with the same dimensions allowing mounting from bottom are "MXH" and "LRXH."

2 Length of slide unit	Short	: C	For applicable models and sizes, see Table 1.1 and Table 1.2.
	Standard	: No symbol	
	Long	: G	
	Extra long	: L	

3 Size	10, 12, 15, 20, 25, 30, 35, 45, 55, 65, 85, 100	For applicable models and sizes, see Table 1.1 and Table 1.2.
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Table 1.1 Models and sizes of MX and LRX series

Material	Shape	Slide unit Length	Model	Size																									
				10	12	15	20	25	30	35	45	55	65	85	100														
High carbon steel made	Flange type mounting from top / bottom	Short	MXC	-	○	○	○ ⁽¹⁾	○	○	○	○	○	○	-	-	LRXC	-	○	○	○ ⁽¹⁾	○	○	○	○	○	○	-	-	
			MX	-	○	○	○ ⁽¹⁾	○	○	○	○	○	○	○	-	-	LRX	-	○	○	○ ⁽¹⁾	○	○	○	○	○	○	-	-
		Long	MXG	-	○	○	○ ⁽¹⁾	○	○	○	○	○	○	○	-	-	LRXG	-	○	○	○ ⁽¹⁾	○	○	○	○	○	○	-	-
			MXL	-	-	-	○ ⁽¹⁾	○	○	○	○	○	○	○	-	-	LRXL	-	-	-	-	-	-	-	-	○	-	-	
		Extra long	MXDC	-	○	○	○	○	○	○	○	○	○	○	-	-	LRXDC	-	○	○	○	○	○	○	○	○	○	-	-
			MXD	-	○	○	○	○	○	○	○	○	○	○	-	-	LRXD	-	○	○	○	○	○	○	○	○	○	-	-
	Block type mounting from top	Long	MXDG	-	○	○	○	○	○	○	○	○	○	-	-	LRXDG	-	○	○	○	○	○	○	○	○	○	-	-	
			MXDL	-	-	-	○	○	○	○	○	○	○	-	-	LRXDL	-	-	-	-	-	-	-	-	-	○	-	-	

Note ⁽¹⁾ MXC20, MX20, MXG20, MXL20, LRXC20, LRX20 and LRXG20 can only be mounted by the bolts from top.
The models with the same dimensions allowing mounting from bottom are MXHC20, MXH20, MXHG20, MXHL20, LRXHC20, LRXH20 and LRXHG20.
Remark: For the models indicated in , the interchangeable specification is available.

— Number of Slide Unit · Length of Track Rail · Material Type —

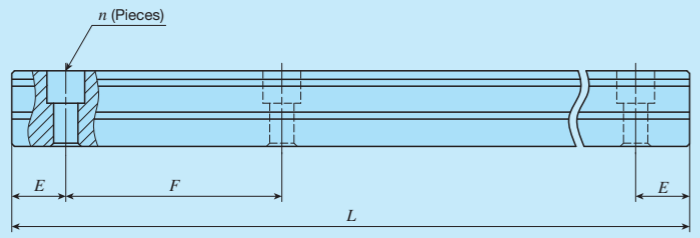
4 Number of slide units	: C○	For an assembled set, indicates the number of slide units assembled on a track rail. For a single slide unit, only "C1" is specified.
5 Length of track rail	: R○	Indicate the length of track rail in mm. For the standard and maximum lengths, see Table 2.1, Table 2.2, Table 2.3 and Table 2.4.
6 Material type	High carbon steel made : No symbol Stainless steel made ⁽¹⁾ : SL	For applicable models and sizes, see Table 1.1 and Table 1.2. Note ⁽¹⁾ Mount a standard grease nipple (brass) on the stainless steel type, too. Stainless steel grease nipple is also available. If needed, please contact IKO.

Table 1.2 Models and sizes of MX and LRX series

Material	Shape	Slide unit Length	Model	Size																							
				10	12	15	20	25	30	35	45	55	65	85	100												
High carbon steel made	Compact block type mounting from top	Short	MXSC	-	-	○	○	○	○	-	-	-	-	-	LRXSC	-	-	○	○	○	○	-	-	-	-	-	
			MXS	-	-	○	○	○	○	○	○	○	○	-	-	LRXS	-	-	○	○	○	○	-	-	-	-	-
		Long	MXSG	-	-	○	○	○	○	○	○	○	○	-	-	LRXSG	-	-	○	○	○	○	-	-	-	-	-
			MXSL	-	-	-	○	○	○	-	-	-	-	-	-												
		Extra long	MXN	-	-	-	-	-	○	○	○	○	-	-	MXNG	-	-	-	-	-	○	○	○	○	-	-	
			MXNL	-	-	-	-	-	-	-	○	○	○	-	-												
	Low profile flange type mounting from top	Standard	MXNS	-	-	-	-	-	○	○	○	○	-	-	MXNSG	-	-	-	-	-	○	○	○	○	-	-	
			MXNSL	-	-	-	-	-	-	○	○	○	○	-	-												
		Long	MXNS	-	-	-	-	-	-	○	○	○	○	-	-	MXNSG	-	-	-	-	-	○	○	○	○	-	-
			MXNSL	-	-	-	-	-	-	-	○	○	○	-	-												
		Extra long	LRXDC...SL	-	○	○	○	○	○	-	-	-	-	-	MXD...SL	○	○	○	○	○	○	-	-	-	-	-	
			LRXD...SL	○	○	○	○	○	○	-	-	-	-	-													
	Block type mounting from top	Long	LRXDG...SL	-	○	○	○	○	○	-	-	-	-														

Remark: For the models indicated in , the interchangeable specification is available.

Table 2.1 Standard and maximum length of high carbon steel track rail



Item	Identification number	MX 12 LRX12	MX 15 LRX15	MX 20 LRX20	MX 25 LRX25	MX 30 LRX30	MX 35 LRX35
Standard length L (n)		80 (2)	180 (3)	240 (4)	240 (4)	480 (6)	480 (6)
		160 (4)	240 (4)	480 (8)	480 (8)	640 (8)	640 (8)
		240 (6)	360 (6)	660 (11)	660 (11)	800 (10)	800 (10)
		320 (8)	480 (8)	840 (14)	840 (14)	1 040 (13)	1 040 (13)
		400 (10)	660 (11)	1 020 (17)	1 020 (17)	1 200 (15)	1 200 (15)
		480 (12)		1 200 (20)	1 200 (20)	1 520 (19)	1 520 (19)
		560 (14)		1 500 (25)	1 500 (25)		
		640 (16)					
		720 (18)					
	Pitch of mounting holes F		40	60	60	60	80
E		20	30	30	30	40	40
Standard E dimensions (1)	or higher	5.5	7	8	9	10	10
	below	25.5	37	38	39	50	50
Maximum length (2)		1 480	1 500 (1 980)	1 980 (3 000)	3 000 (3 960)	2 960 (4 000)	2 960 (4 000)

Item	Identification number	MX 45 LRX45	MX 55 LRX55	MX 65 LRX65	LRX85	LRXG100
Standard length L (n)		840 (8)	840 (7)	1 500 (10)	1 620 (9)	1 500 (10)
		1 050 (10)	1 200 (10)	1 950 (13)	1 980 (11)	1 950 (13)
		1 260 (12)	1 560 (13)	3 000 (20)	2 340 (13)	3 000 (20)
		1 470 (14)	1 920 (16)		2 700 (15)	
		1 995 (19)	3 000 (25)			
Pitch of mounting holes F		105	120	150	180	150
E		52.5	60	75	90	75
Standard E dimensions (1)	or higher	12.5	15	17	23	29
	below	65	75	92	113	104
Maximum length (2)		2 940 (3 990)	3 000 (3 960)	3 000 (3 900)	2 880	3 000

Notes (1) This does not apply to female threads for bellows (Supplemental code "/J").

(2) Length up to the value in () can be produced. If needed, please contact IKO.

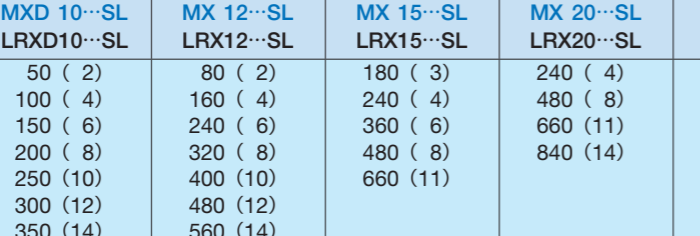
Remarks 1. A typical identification number is indicated, but is applied to all models of the same size.

2. Indicate "LRX" for the model code of the single track rail regardless of the series and the combination of slide unit models.

3. In the case where track rail mounting hole is half pitch specification (Supplemental code "/HP"), see Table 2.3.

4. If not directed, E dimensions for both ends will be the same within the range of standard E dimensions. To change the dimensions, indicate the specified rail mounting hole positions "/E" of special specification. For more information, see page III-30.

Table 2.2 Standard and maximum length of stainless steel track rail



Item	Identification number	MXD 10...SL LRXD10...SL	MX 12...SL LRX12...SL	MX 15...SL LRX15...SL	MX 20...SL LRX20...SL	MX 25...SL LRX25...SL	MX 30...SL LRX30...SL
Standard length L (n)		50 (2)	80 (2)	180 (3)	240 (4)	240 (4)	480 (6)
		100 (4)	160 (4)	240 (4)	480 (8)	480 (8)	640 (8)
		150 (6)	240 (6)	360 (6)	660 (11)	660 (11)	800 (10)
		200 (8)	320 (8)	480 (8)	840 (14)	840 (14)	1 040 (13)
		250 (10)	400 (10)	660 (11)			
		300 (12)	480 (12)				
		350 (14)	560 (14)				
		400 (16)	640 (16)				
		450 (18)	720 (18)				
		500 (20)					
Pitch of mounting holes F		25	40	60	60	60	80
E		12.5	20	30	30	30	40
Standard E dimensions (1)	or higher	5	5.5	7	8	9	10
	below	17.5	25.5	37	38	39	50
Maximum length (2)		850 (1 000)	1 000 (1 480)	1 200 (1 980)	1 200 (1 980)	1 200 (1 980)	1 200 (2 000)

Notes (1) This does not apply to female threads for bellows (Supplemental code "/J").

(2) Length up to the value in () can be produced. If needed, please contact IKO.


Remarks 1. A typical identification number is indicated, but is applied to all models of the same size.

2. Indicate "LRX" for the model code of the single track rail regardless of the series and the combination of slide unit models.

3. In the case where track rail mounting hole is half pitch specification (Supplemental code "/HP"), see Table 2.4.

4. If not directed, E dimensions for both ends will be the same within the range of standard E dimensions. To change the dimensions, indicate the specified rail mounting hole positions "/E" of special specification. For more information, see page III-30.

Table 2.3 Standard and maximum length of high carbon steel track rail (Half pitch mounting holes specification supplemental code /HP)



Item	Identification number	MX 12.../HP LRX12.../HP	MX 15.../HP LRX15.../HP	MX 20.../HP LRX20.../HP	MX 25.../HP LRX25.../HP	MX 30.../HP LRX30.../HP	MX 35.../HP LRX35.../HP
Standard length L (n)		80 (4)	180 (6)	240 (8)	480 (16)	480 (12)	480 (12)
		160 (8)	240 (8)	480 (16)	660 (22)	640 (16)	640 (16)
		240 (12)	360 (12)	660 (22)	840 (28)	800 (20)	800 (20)
		320 (16)	480 (16)	840 (28)	1 020 (34)	1 040 (26)	1 040 (26)
		400 (20)	660 (22)	1 020 (34)	1 200 (40)	1 200 (30)	1 200 (30)
		480 (24)		1 200 (40)	1 500 (50)	1 520 (38)	1 520 (38)
		560 (28)		1 500 (50)			
		640 (32)					
		720 (36)					
	Pitch of mounting holes F		20	30	30	30	40
E		10	15	15	15	20	20
Standard E dimensions (1)	or higher	5.5	7	8	9	10	10
	below	15.5	22	23	24	30	30
Maximum length (2)		1 480	1 500 (1 980)	1 980 (3 000)	3 000 (3 960)	2 960 (4 000)	2 960 (4 000)

Item	Identification number	MX 45.../HP LRX45.../HP	MX 55.../HP LRX55.../HP	MX 65.../HP LRX65.../HP	LRX85.../HP
Standard length L (n)		840 (16)	840 (14)	1 500 (20)	1 620 (18)
		1 050 (20)	1 200 (20)	1 950 (26)	1 980 (22)
		1 260 (24)	1 560 (26)	3 000 (40)	2 340 (26)
		1 470 (28)	1 920 (32)		2 700 (30)
		1 995 (38)	3 000 (50)		
Pitch of mounting holes F		52.5	60	75	90
E		26.25	30	37.5	45
Standard E dimensions (1)	or higher	12.5	15	17	23
	below	38.75	45	54.5	68
Maximum length (2)		2 940 (3 990)	3 000 (3 960)	3 000 (3 900)	2 970

Notes (1) This does not apply to female threads for bellows (Supplemental code "/J").

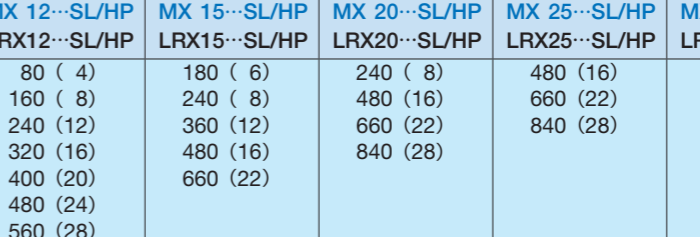
(2) Length up to the value in () can be produced. If needed, please contact IKO.

Remarks 1. A typical identification number is indicated, but is applied to all models of the same size.

2. Indicate "LRX" for the model code of the single track rail regardless of the series and the combination of slide unit models.

3. If not directed, E dimensions for both ends will be the same within the range of standard E dimensions. To change the dimensions, indicate the specified rail mounting hole positions "/E" of special specification. For more information, see page III-30.

Table 2.4 Standard and maximum length of stainless steel track rail (Half pitch mounting holes specification supplemental code /HP)



Item	Identification number	MX 12...SL/HP LRX12...SL/HP	MX 15...SL/HP LRX15...SL/HP	MX 20...SL/HP LRX20...SL/HP	MX 25...SL/HP LRX25...SL/HP	MX 30...SL/HP LRX30...SL/HP
Standard length L (n)		80 (4)	180 (6)	240 (8)	480 (16)	480 (12)
		160 (8)	240 (8)	480 (16)	660 (22)	640 (16)
		240 (12)	360 (12)	660 (22)	840 (28)	800 (20)
		320 (16)	480 (16)	840 (28)		1 040 (26)
		400 (20)	660 (22)			
		480 (24)				
		560 (28)				
		640 (32)				
		720 (36)				
	Pitch of mounting holes F		20	30	30	30
E		10	15	15	15	20
Standard E dimensions (1)	or higher	5.5	7	8	9	10
	below	15.5	22	23	24	30
Maximum length (2)		1 000 (1 480)	1 200 (1 980)	1 200 (1 980)	1 200 (1 980)	1 200 (2 000)

Notes (1) This does not apply to female threads for bellows (Supplemental code "/J").

(2) Length up to the value in () can be produced. If needed, please contact IKO.

Remarks 1. A typical identification number is indicated, but is applied to all models of the same size.

2. Indicate "LRX" for the model code of the single track rail regardless of the series and the combination of slide unit models.

3. If not directed, E dimensions for both ends will be the same within the range of standard E dimensions. To change the dimensions, indicate the specified rail mounting hole positions "/E" of special specification. For more information, see page III-30.

—Preload Amount—

7 Preload amount	Standard	: No symbol	Specify this item for an assembled set or a single slide unit.
	Light preload	: T ₁	
	Medium preload	: T ₂	For details of the preload amount, see Table 3.
	Heavy preload	: T ₃	For applicable preload types, see Table 4.

Table 3 Preload amount

Preload type	Item	Preload symbol	Preload amount N	Operational conditions
Standard	(No symbol)		0 ⁽¹⁾	• Light and precise motion
Light preload		T ₁	0.02 C ₀	• Almost no vibrations • Load is evenly balanced • Light and precise motion
Medium preload		T ₂	0.05 C ₀	• Medium vibration • Medium overhung load
Heavy preload		T ₃	0.08 C ₀	• Operation with vibration and/or shock • Overhanging load applied • Heavy cutting

Note ⁽¹⁾ Indicates zero or minimal amount of preload.
Remark: C₀ indicates the basic static load rating.

Table 4 Application of preload

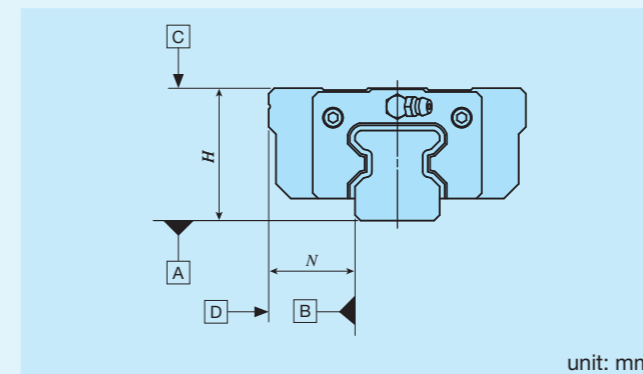
Size	Preload type (preload symbol)			
	Standard (No symbol)	Light preload (T ₁)	Medium preload (T ₂)	Heavy preload (T ₃)
10	○	○	—	—
12	○	○	○	○
15	○	○	○	○
20	○	○	○	○
25	○	○	○	○
30	○	○	○	○
35	○	○	○	○
45	○	○	○	○
55	○	○	○	○
65	○	○	○	○
85	○	○	○	○
100	○	○	○	○

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

—Accuracy Class—

8 Accuracy class	High	: H	For interchangeable specification products, assemble a slide unit and a track rail of the same accuracy class.
	Precision	: P	For details of accuracy class, see Table 5.
	Super precision	: SP	
	Ultra precision	: UP	For applicable accuracy class, see Table 6.

Table 5 Tolerance and allowance



Item	Class (classification symbol)			
	High (H)	Precision (P)	Super precision (SP)	Ultra precision (UP)
Dim. H tolerance	±0.040	±0.020	±0.010	±0.008
Dim. N tolerance	±0.050	±0.025	±0.015	±0.010
Dim. variation of H ⁽¹⁾	0.015	0.007	0.005	0.003
Dim. variation of N ⁽¹⁾	0.020	0.010	0.007	0.003
Dim. variation of H for multiple assembled sets ⁽²⁾	0.035	0.025	—	—
Parallelism in operation of the slide unit C surface to A surface	See Fig. 1			
Parallelism in operation of the slide unit D surface to B surface	See Fig. 1			

Notes ⁽¹⁾ It means the size variation between slide units mounted on the same track rail.
⁽²⁾ Applicable to the interchangeable specification.

Table 6 Application of accuracy class

Size	Class (classification symbol)			
	High (H)	Precision (P)	Super precision (SP)	Ultra precision (UP)
10	○	○	○	○
12	○	○	○	○
15	○	○	○	○
20	○	○	○	○
25	○	○	○	○
30	○	○	○	○
35	○	○	○	○
45	○	○	○	○
55	○	○	○	○
65	○	○	○	○
85	○	○	○	○
100	○	○	○	○

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

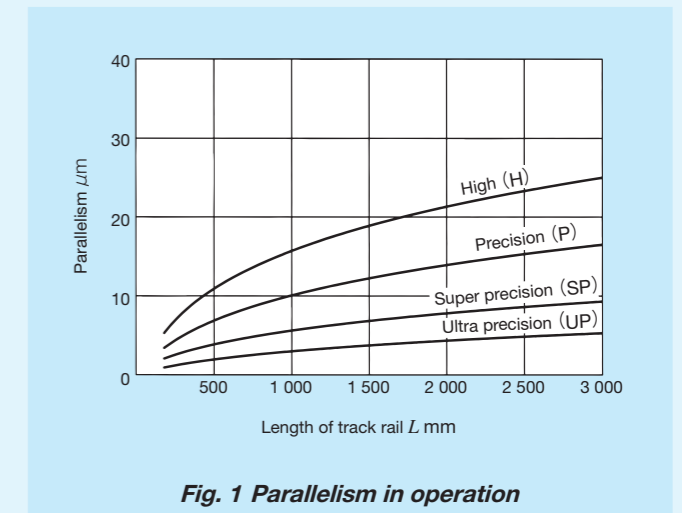


Fig. 1 Parallelism in operation

9 Interchangeable	S1 specification	: S1	This is specified for the interchangeable specifications.
	S2 specification	: S2	Assemble a track rail and a slide unit with the same interchangeable code. Performance and accuracy of "S1" and "S2" are the same.
	Non-interchangeable specification	: No symbol	For applicable models and sizes, see Table 1.1 and Table 1.2. "No symbol" is indicated for non-interchangeable specification.

10 Special specification	/A, /D, /E, /F, /GE, /HP, /I, /JO, /LO, /LFO, /MA, /MN, /N, /PS, /Q, /RCO, /T, /UR, /VO, /WO, /YO, /ZO	For applicable special specifications, see Tables 7.1, 7.2, 7.3, and 7.4. For combination of multiple special specifications, see Table 8. For details of special specifications, see page III – 29.
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Table 7.1 Application of special specifications (Interchangeable specification, single slide unit)

Special specification	Supplemental code	Size											
		10	12	15	20	25	30	35	45	55	65	85	100
Changed pitch of slide unit middle mounting holes ⁽¹⁾	/GE	–	×	○	○	○	○	○	○	○	○	–	–
Female threads for bellows ⁽²⁾	/JO	–	×	○	○	○	○	○	○	○	○	–	–
No end seal ⁽³⁾	/N	–	○	○	○	○	○	○	○	×	×	–	–
With C-Lube plate ⁽⁴⁾	/Q	–	○	○	○	○	○	○	○	○	○	–	–
Double end seals	/VO	–	○	○	○	○	○	○	○	○	○	–	–
Scrapers	/ZO	–	○	○	○	○	○	○	○	○	○	–	–

Notes ⁽¹⁾ Applicable to flange type (MX, MXG, MXH20, MXHG20, LRX, LRXG, LRXH20, LRXHG20).
⁽²⁾ Not applicable to stainless steel made products.
⁽³⁾ Not applicable to low profile flange type (MXN, MXNG, MXNL) and low profile block type (MXNS, MXNSG, MXNSL).
⁽⁴⁾ Applicable to LRX series.

Table 7.2 Application of special specifications (Interchangeable specification, single track rail)

Special specification	Supplemental code	Size											
		10	12	15	20	25	30	35	45	55	65	85	100
Specified rail mounting hole positions	/E	–	○	○	○	○	○	○	○	○	○	–	–
Caps for rail mounting holes	/F	–	○	○	○	○	○	○	○	○	○	–	–
Half pitch mounting holes for track rail	/HP	–	○	○	○	○	○	○	○	○	○	–	–
Female threads for bellows ⁽¹⁾	/J	–	×	○	○	○	○	○	○	○	○	–	–
Black chrome surface treatment	/LR	–	○	○	○	○	○	○	○	○	○	–	–
Without track rail mounting bolt	/MN	–	○	○	○	○	○	○	○	○	○	–	–
Butt-jointing track rails	/T	–	○	○	○	○	○	○	○	○	○	–	–

Note ⁽¹⁾ Not applicable to stainless steel made products.

Table 7.3 Application of special specifications (Interchangeable specification, assembled set)

Special specification	Supplemental code	Size												
		10	12	15	20	25	30	35	45	55	65	85	100	
Opposite reference surfaces arrangement	/D	–	○	○	○	○	○	○	○	○	○	–	–	
Specified rail mounting hole positions	/E	–	○	○	○	○	○	○	○	○	○	–	–	
Caps for rail mounting holes	/F	–	○	○	○	○	○	○	○	○	○	–	–	
Changed pitch of slide unit middle mounting holes ⁽¹⁾	/GE	–	×	○	○	○	○	○	○	○	○	–	–	
Half pitch mounting holes for track rail	/HP	–	○	○	○	○	○	○	○	○	○	–	–	
Female threads for bellows ⁽²⁾	/JO	–	×	○	○	○	○	○	○	○	○	–	–	
Black chrome surface treatment	/LO	–	○	○	○	○	○	○	○	○	○	–	–	
Fluorine black chrome surface treatment	/LFO	–	○	○	○	○	○	○	○	○	○	–	–	
With track rail mounting bolt ⁽³⁾	/MA	–	○	○	○	○	○	○	○	○	○	–	–	
Without track rail mounting bolt ⁽⁴⁾	/MN	–	○	○	○	○	○	○	○	○	○	–	–	
No end seal ⁽⁵⁾	/N	–	○	○	○	○	○	○	○	○	×	×	–	–
With C-Lube plate ⁽⁴⁾	/Q	–	○	○	○	○	○	○	○	○	○	–	–	
Butt-jointing track rails	/T	–	○	○	○	○	○	○	○	○	○	–	–	
Double end seals	/VO	–	○	○	○	○	○	○	○	○	○	–	–	
Specified grease ⁽⁶⁾	/YO	–	○	○	○	○	○	○	○	○	○	–	–	
Scrapers	/ZO	–	○	○	○	○	○	○	○	○	○	–	–	

Notes ⁽¹⁾ Applicable to flange type (MX, MXG, MXH20, MXHG20, LRX, LRXG, LRXH20, LRXHG20).
⁽²⁾ Not applicable to stainless steel made products.
⁽³⁾ Applicable to MX series.
⁽⁴⁾ Applicable to LRX series.
⁽⁵⁾ Not applicable to low profile flange type (MXN, MXNG, MXNL) and low profile block type (MXNS, MXNSG, MXNSL).
⁽⁶⁾ MX series is applicable only to /YCG.

Table 7.4 Application of special specifications (Non-interchangeable specification)

Special specification	Supplemental code	Size											
		10	12	15	20	25	30	35	45	55	65	85	100
Butt-jointing track rails	/A	○	○	○	○	○	○	○	○	○	○	○	○
Opposite reference surfaces arrangement	/D	○	○	○	○	○	○	○	○	○	○	○	○
Specified rail mounting hole positions	/E	○	○	○	○	○	○	○	○	○	○	○	○
Caps for rail mounting holes	/F	×	○	○	○	○	○	○	○	○	○	○	○
Changed pitch of slide unit middle mounting holes ⁽¹⁾	/GE	×	×	○	○	○	○	○	○	○	○	×	○
Half pitch mounting holes for track rail	/HP	×	○	○	○	○	○	○	○	○	○	○	×
Inspection sheet	/I	○	○	○	○	○	○	○	○	○	○	○	○
Female threads for bellows	/JO	×	×	○	○	○	○	○	○	○	○	○	×
Black chrome surface treatment	/LO	×	○	○	○	○	○	○	○	○	○	×	×
Fluorine black chrome surface treatment	/LFO	×	○	○	○	○	○	○	○	○	○	×	×
With track rail mounting bolt ⁽²⁾	/MA	○	○	○	○	○	○	○	○	○	○	×	×
Without track rail mounting bolt ⁽³⁾	/MN	○	○	○	○	○	○	○	○	○	○	○	○
No end seal ⁽⁴⁾	/N	○	○	○	○	○	○	○	○	○	×	×	×
Rail cover plate for track rail ⁽³⁾	/PS	×	×	×	×	×	×	○	○	○	×	×	×
With C-Lube plate ⁽³⁾	/Q	○	○	○	○	○	○	○	○	○	○	○	×
C-Wiper ⁽²⁾ ⁽⁵⁾	/RCO	×	×	×	○	○	○	○	○	○	○	×	×
Inner seal ⁽²⁾	/UR	×	×	×	○	○	○	○	○	○	○	×	×
Double end seals	/VO	×	○	○	○	○	○	○	○	○	○	○	○
A group of multiple assembled sets ⁽⁶⁾	/WO	○	○	○	○	○	○	○	○	○	○	○	×
Specified grease ⁽⁷⁾	/YO	○	○	○	○	○	○	○	○	○	○	○	○
Scrapers	/ZO	×	○	○	○	○	○	○	○	○	○	○	○

Notes ⁽¹⁾ Applicable to flange type (MX, MXG, MXH20, MXHG20, LRX, LRXG, LRXH20, LRXHG20).
⁽²⁾ Applicable to MX series.
⁽³⁾ Applicable to LRX series.
⁽⁴⁾ Not applicable to low profile flange type (MXN, MXNG, MXNL) and low profile block type (MXNS, MXNSG, MXNSL).
⁽⁵⁾ Since inner seal and scraper are mounted simultaneously, indication of "/UR" or "/Z" is not necessary.
⁽⁶⁾ LRX85, LRXG85, LRL85, LRLD85, LRLDG85, LRLDL85 are applicable only to High (H) and Precision (P).
⁽⁷⁾ MX series is applicable only to /YCG.

Table 10.2 Dimension of female threads for bellows (Supplemental code Single unit: /J Assembled set: /J /JJ)

Identification number		Slide unit							Track rail									
		a_1	a_2	b_1	b_2	b_3	b_4	$M_1 \times \text{depth}$	$L_1^{(1)}$	a_3	a_4	$M_2 \times \text{depth}$						
MXC 35	LRXC 35	6	16	30	20	60	M3 × 6	99	8	16	M4 × 8							
MX 35	LRX 35							131										
MXG 35	LRXG 35							159										
MXL 35	—			191														
MXDC 35	LRXDC 35			99														
MXD 35	LRXD 35			131														
MXDG 35	LRXDG 35	13	15	5	60	M3 × 6	159	8	16	M4 × 8								
MXDL 35	—						191											
MXS 35	—						131											
MXSG 35	—	7	21	35	23	74	M4 × 8	159	10	19	M5 × 10							
MXC 45	LRXC 45							123										
MX 45	LRX 45							163										
MXG 45	LRXG 45			203														
MXL 45	—			243														
MXDC 45	LRXDC 45			123														
MXD 45	LRXD 45	17	18	6	74	M4 × 8	163	10	19	M5 × 10								
MXDG 45	LRXDG 45						203											
MXDL 45	—						243											
MXS 45	—	7	27	40	26	88	M4 × 8	163	10	24	M5 × 10							
MXSG 45	—							203										
MXC 55	LRXC 55							145										
MX 55	LRX 55			193														
MXG 55	LRXG 55			247														
MXL 55	—			301														
MXDC 55	LRXDC 55	17	20	6	88	M4 × 8	145	10	24	M5 × 10								
MXD 55	LRXD 55						193											
MXDG 55	LRXDG 55						247											
MXDL 55	—	8.7	37	47.5	31	108	M5 × 10	301	14	28	M6 × 12							
MXS 55	—							193										
MXSG 55	—							247										
MXC 65	—			15	45			62.5				90	140	M6 × 10	191	14.5	38	M6 × 12
—	LRXC 65														192			
MX 65	—														255			
—	LRX 65	15	45	62.5	90	140	M6 × 10	256	14.5	38	M6 × 12							
MXG 65	—							319										
—	LRXG 65							320										
MXL 65	—	15	45	38	90	140	M6 × 10	391	14.5	38	M6 × 12							
MXDC 65	LRXDC 65							191										
MXD 65	—							192										
—	LRXD 65	15	45	38	90	140	M6 × 10	255	14.5	38	M6 × 12							
MXDG 65	—							256										
—	LRXDG 65							319										
MXDL 65	—	15	45	38	90	140	M6 × 10	320	14.5	38	M6 × 12							
—	LRX 85							391										
—	LRXG 85							334										
—	LRXL 85	15	45	38	90	140	M6 × 10	406	14.5	38	M6 × 12							
—	LRXD 85							505										
—	LRXDG 85							334										
—	LRXDL 85	15	45	38	90	140	M6 × 10	406	14.5	38	M6 × 12							
—	—							505										
—	—							505										

Note (1) Dimensions of the specification that female threads for bellows are fitted to both ends of the slide unit are indicated.

Table 10.3 Dimension of female threads for bellows (Supplemental code Single unit: /J Assembled set: /J /JJ)

Identification number	Slide unit								Track rail			
	$a_1^{(1)}$	a_2	b_1	b_2	b_3	b_4	$M_1 \times \text{depth}$	$L_1^{(2)}$	H_3	a_3	a_4	$M_2 \times \text{depth}$
MXN 30	14.5	—	20	50	—	—	M3 × 6	128	0.8	7	14	M4 × 8
MXNG 30								149				
MXNL 30								177				
MXNS 30			128									
MXNSG 30			149									
MXNSL 30			177									
MXN 35	2	16	30	40	60	M3 × 6	131	—	8	16	M4 × 8	
MXNG 35							159					
MXNL 35							191					
MXNS 35			131									
MXNSG 35			159									
MXNSL 35			191									
MXN 45	1	21	35	50	74	M4 × 8	163	—	10	19	M5 × 10	
MXNG 45							203					
MXNL 45							243					
MXNS 45			163									
MXNSG 45			203									
MXNSL 45			243									
MXN 55	0	27	40	60	88	M4 × 8	193	—	10	24	M5 × 10	
MXNG 55							247					
MXNL 55							301					
MXNS 55			193									
MXNSG 55			247									
MXNSL 55			301									

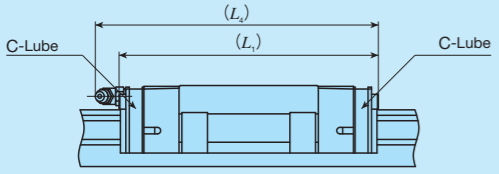
Notes (1) a_1 shows the dimension between mounting surface C and upper female thread.

(2) Dimensions of the specification that female threads for bellows are fitted to both ends of the slide unit are indicated.

Remark: The dimension of * is higher than the dimensions of assembly H. For details of dimensions, contact IKO.

Table 11.1 Dimension of slide unit with C-Lube plate (Supplemental code /Q)

Size: 10, 12, 15, 20, 25, 30



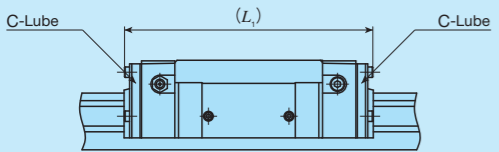
unit: mm

Identification number	L_1	L_4
LRXD 10...SL	44	—
LRXC 12	47	50
LRX 12	57	60
LRXG 12	68	71
LRXC 15	63	64
LRX 15	79	80
LRXG 15	95	96
LRXC 20	76	84
LRX 20	96	104
LRXG 20	116	124
LRXC 25	85	93
LRX 25	109	117
LRXG 25	124	132
LRXC 30	96	107
LRX 30	124	135
LRXG 30	145	156

Remarks 1. The dimensions of the slide unit with C-Lube at both ends are indicated.
2. A typical identification number is indicated, but is applied to all LRX series models of the same type.

Table 11.2 Dimension of slide unit with C-Lube plate (Supplemental code /Q)

Size: 35, 45, 55, 65, 85



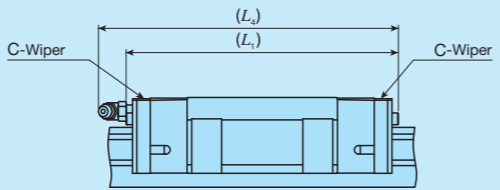
unit: mm

Identification number	L_1
LRXC 35	103
LRX 35	135
LRXG 35	163
LRXC 45	127
LRX 45	167
LRXG 45	207
LRXC 55	149
LRX 55	197
LRXG 55	251
LRXC 65	198
LRX 65	262
LRXG 65	326
LRX 85	341
LRXG 85	413
LRXL 85	512

Remarks 1. The dimensions of the slide unit with C-Lube at both ends are indicated.
2. A typical identification number is indicated, but is applied to all LRX series models of the same type.

Table 12.1 Dimension of slide unit with C-Wiper (Supplemental code Assembled set: /RC /RCC)

Size: 20, 25, 30



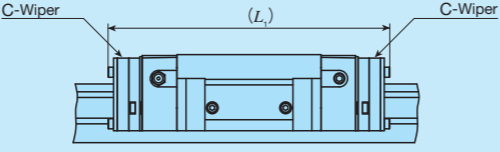
unit: mm

Identification number	L_1	L_4
MXC 20	80	90
MX 20	100	110
MXG 20	120	130
MXL 20	142	153
MXC 25	89	99
MX 25	113	123
MXG 25	128	138
MXL 25	152	162
MXC 30	100	113
MX 30	128	141
MXN 30	—	138
MXG 30	149	162
MXNG 30	—	159
MXL 30	—	190
MXNL 30	177	187

Remarks 1. The dimensions of the slide unit with C-Wiper at both ends are indicated.
2. A typical identification number is indicated, but is applied to all MX series models of the same size.

Table 12.2 Dimension of slide unit with C-Wiper (Supplemental code Assembled set: /RC /RCC)

Size: 35, 45, 55, 65



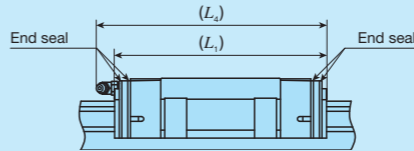
unit: mm

Identification number	L_1
MXC 35	123
MX 35	155
MXG 35	183
MXL 35	215
MXC 45	149
MX 45	189
MXG 45	229
MXL 45	269
MXC 55	172
MX 55	220
MXG 55	274
MXL 55	328
MXC 65	223
MX 65	287
MXG 65	351
MXL 65	423

Remarks 1. The dimensions of the slide unit with C-Wiper at both ends are indicated.
2. A typical identification number is indicated, but is applied to all MX series models of the same size.

Table 13.1 Dimension of slide unit with double end seals (Supplemental code Single unit: /V Assembled set: /V /VV)

Size: 12, 15, 20, 25, 30



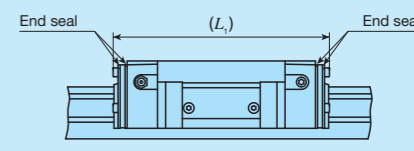
unit: mm

Identification number	L_1	L_4
MXC 12	—	49
—	LRXC 12	44
MX 12	—	58
—	LRX 12	54
MXG 12	—	70
—	LRXG 12	65
MXC 15	LRXC 15	58
MX 15	LRX 15	74
MXG 15	LRXG 15	90
MXC 20	LRXC 20	73
MX 20	LRX 20	93
MXG 20	LRXG 20	113
MXL 20	—	135
MXC 25	LRXC 25	83
MX 25	LRX 25	107
MXG 25	LRXG 25	122
MXL 25	—	146
MXC 30	LRXC 30	93
MX 30	LRX 30	121
MXN 30	—	—
MXG 30	LRXG 30	142
MXNG 30	—	—
MXL 30	—	170
MXNL 30	—	180

Remarks 1. The dimensions of the slide unit with double end seals at both ends are indicated.
2. A typical identification number is indicated, but is applied to all models of the same size.

Table 13.2 Dimension of slide unit with double end seals (Supplemental code Single unit: /V Assembled set: /V /VV)

Size: 35, 45, 55, 65, 85, 100



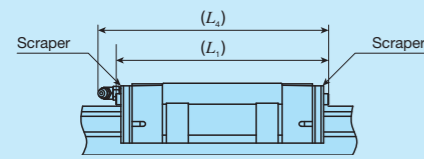
unit: mm

Identification number	L_1	
MXC 35	LRXC 35	101
MX 35	LRX 35	133
MXG 35	LRXG 35	161
MXL 35	—	193
MXC 45	LRXC 45	127
MX 45	LRX 45	167
MXG 45	LRXG 45	207
MXL 45	—	247
MXC 55	LRXC 55	149
MX 55	LRX 55	197
MXG 55	LRXG 55	251
MXL 55	—	305
MXC 65	—	192
—	LRXC 65	193
MX 65	—	256
—	LRX 65	257
MXG 65	—	320
—	LRXG 65	321
MXL 65	—	392
—	LRX 85	338
—	LRXG 85	410
—	LRXL 85	509
—	LRXG 100	376

Remarks 1. The dimensions of the slide unit with double end seals at both ends are indicated.
2. A typical identification number is indicated, but is applied to all models of the same size.

Table 14.1 Dimension of slide unit with scrapers
(Supplemental code Single unit: /Z
Assembled set: /Z /ZZ)

Size: 12, 15, 20, 25, 30



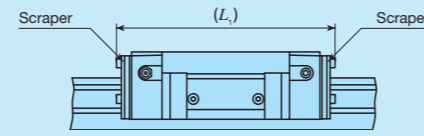
unit: mm

Identification number		L_1	L_4
MXC 12	—	50	53
—	LRXC 12	45	48
MX 12	—	60	63
—	LRX 12	56	58
MXG 12	—	71	74
—	LRXG 12	66	69
MXC 15	LRXC 15	60	61
MX 15	LRX 15	76	77
MXG 15	LRXG 15	92	93
MXC 20	LRXC 20	74	83
MX 20	LRX 20	94	103
MXG 20	LRXG 20	114	123
MXL 20	—	137	146
MXC 25	LRXC 25	85	93
MX 25	LRX 25	109	117
MXG 25	LRXG 25	124	132
MXL 25	—	148	156
MXC 30	LRXC 30	96	107
MX 30	LRX 30	124	135
MXN 30	—	—	132
MXG 30	LRXG 30	145	156
MXNG 30	—	—	153
MXL 30	—	173	184
MXNL 30	—	—	181

Remarks 1. The dimensions of the slide unit with scraper at both ends are indicated.
2. A typical identification number is indicated, but is applied to all models of the same size.

Table 14.2 Dimension of slide unit with scrapers
(Supplemental code Single unit: /Z
Assembled set: /Z /ZZ)

Size: 35, 45, 55, 65, 85, 100



unit: mm

Identification number		L_1
MXC 35	LRXC 35	103
MX 35	LRX 35	135
MXG 35	LRXG 35	163
MXL 35	—	195
MXC 45	LRXC 45	129
MX 45	LRX 45	169
MXG 45	LRXG 45	209
MXL 45	—	249
MXC 55	LRXC 55	151
MX 55	LRX 55	199
MXG 55	LRXG 55	253
MXL 55	—	307
MXC 65	LRXC 65	194
MX 65	LRX 65	258
MXG 65	LRXG 65	322
MXL 65	—	394
—	LRX 85	339
—	LRXG 85	411
—	LRXL 85	510
—	LRXG 100	378

Remarks 1. The dimensions of the slide unit with scraper at both ends are indicated.
2. A typical identification number is indicated, but is applied to all models of the same size.

Lubrication

Lithium-soap base grease with extreme-pressure additive (Alvania EP grease 2 [SHOWA SHELL SEKIYU K. K.]) is pre-packed in MX series and LRX series. Additionally, MX series has C-Lube placed in the recirculation part of cylindrical roller, so that the interval for reapplying lubricant can be extended and maintenance works such as grease job can be reduced significantly.

MX series and LRX series have grease nipple or oil hole as indicated in Table 15. Supply nozzles fit to each shapes of grease nipple and dedicated supplying equipment (miniature greasers) fit to oil holes are also available. For order of these parts for lubrication, see Table 13 and Table 14.1 on Page III-23, and Table 15 on page III-24.

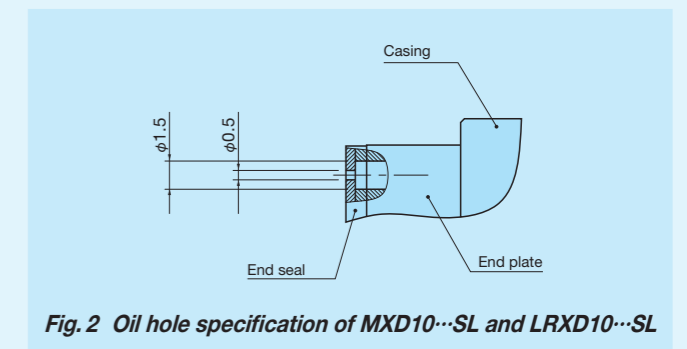


Fig. 2 Oil hole specification of MXD10...SL and LRXD10...SL

Table 15 Parts for lubrication

Size	Grease nipple type ⁽¹⁾	Applicable supply nozzle type	Bolt size of female threads for piping
10	Oil hole	Miniature greaser	—
12	A-M3	A-5120V A-5240V	—
15 ⁽²⁾	A-M4	B-5120V B-5240V	M4
20 ⁽²⁾	B-M4	A-8120V	
25 ⁽²⁾		B-8120V	
30 ^{(3) (4)}	B-M6	Grease gun available on the market	M6
35 ⁽⁵⁾	JIS1 type		PT1/8
45 ⁽⁶⁾	JIS2 type		
55			
65			
85	A-PT1/4		PT1/4
100			

Notes ⁽¹⁾ For grease nipple specification, see Table 14.1 and Table 14.2 in page III-23.

⁽²⁾ The grease nipple when female threads for bellows (supplemental code "/J") is specified is A-M3.

⁽³⁾ The grease nipple when female threads for bellows (supplemental code "/J") is specified is A-M4.

⁽⁴⁾ The grease nipple for MXN30 is B-M4. The grease nipple when female threads for bellows (supplemental code "/J") is specified is A-M4.

⁽⁵⁾ The size of the grease nipple mounting thread hole for MXN35 in the slide unit travelling direction is smaller than that of the crosswise direction. When the grease nipple is mounted along the travelling direction, contact IKO.

⁽⁶⁾ The grease nipple for MXN45 is JIS type1.

Remark: Stainless steel grease nipple is also available. If needed, please contact IKO.

Dust Protection

The slide units of MX series and LRX series are equipped with end seals and under seals as standard for dust protection. However, if large amount of contaminant or dust are floating, or if large particles of foreign substances such as chips or sand may adhere to the track rail, it is recommended to cover the whole unit with bellows or telescope type shield, etc. MX series and LRX series are provided with specific bellows. The bellows are easy to mount and provide excellent dust protection. If needed, please refer to III-26 for ordering. Also the rail cover sheet to cover the mounting hole of track rail (Fig. 3) and track rail mounting from bottom with no mounting hole on the upper surface (Fig. 4) are available. If needed, please contact IKO.

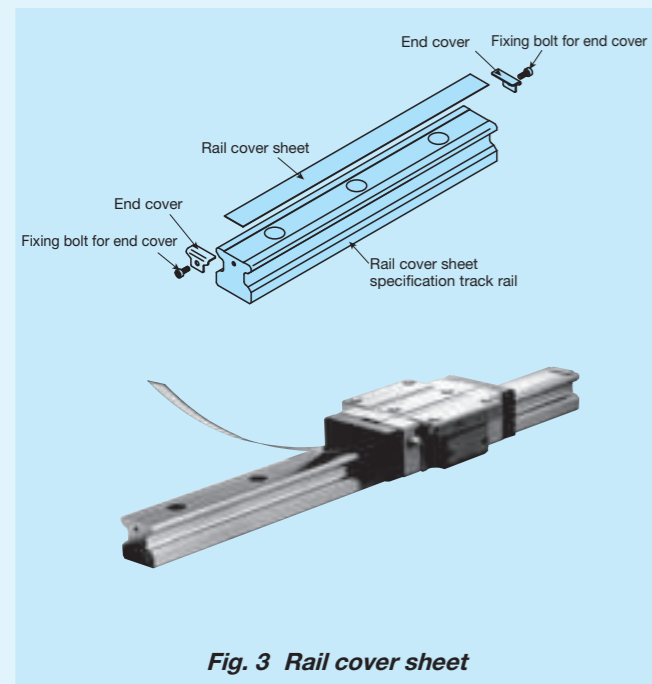


Fig. 3 Rail cover sheet

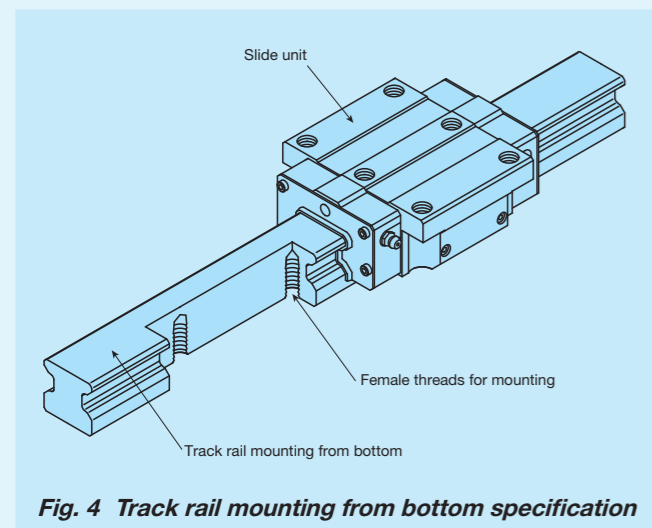


Fig. 4 Track rail mounting from bottom specification

Precaution for Use

1 Mounting surface, reference mounting surface and typical mounting structure

When mounting the MX series and LRX series, properly align the reference mounting surfaces B and D of the track rail and slide unit with the reference mounting surface of the table and bed and fix them. (See Fig. 5.)

The reference mounting surfaces B and D and mounting surfaces A and C are precisely ground. Machining the mounting surface of the table and bed, such as machine or device, to high accuracy and mounting them properly will ensure stable linear motion with high accuracy.

Reference mounting surface of the slide unit is the opposite side of the IKO mark. The track rail reference mounting surface is identified by locating the IKO mark on the top surface of the track rail. It is the side surface above the mark (in the direction of the arrow). (See Fig. 6.)

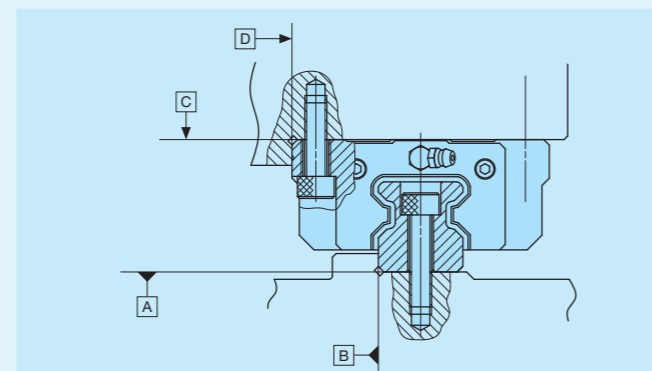


Fig. 5 Reference mounting surface and typical mounting structure

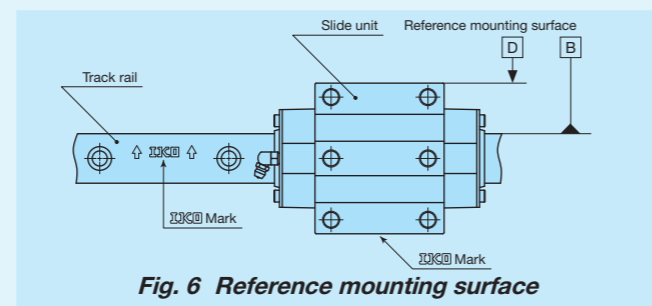


Fig. 6 Reference mounting surface

2 Fixing the slide unit

Slide unit is also provided with mounting holes in the middle of width direction (see Fig. 7) and some products have the arrangement to receive the applied load in a good balance. When designing machines or equipment, consider the arrangement so that the mounting holes in the middle of slide unit can also be used to fix the units, to use the highest performance out of the product. To fix the slide unit of compact block type or low profile block type, we recommend to secure the fixing thread depth of Table 16.1 and Table 16.2. Also, with the low profile flange type and low profile block type, make sure that the fixing thread depth for the mounting screw in the middle of slide unit width direction should be less than the maximum fixing thread depth of the dimension table.

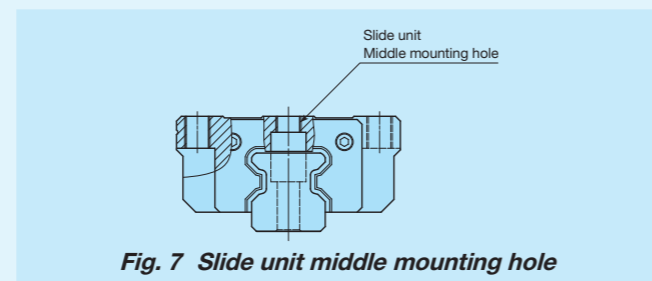


Fig. 7 Slide unit middle mounting hole

Table 16.1 Fixing thread depth for slide unit mounting hole of compact block type unit: mm

Identification number	Recommended minimum fixing thread depth
MXS 15	4.5
MXS 20	5.5
MXS 25	7
MXS 30	9

Remark: A typical identification number is indicated, but is applied to all compact block types of the same size.

Table 16.2 Fixing thread depth for slide unit mounting hole of low profile block type unit: mm

Identification number	Recommended minimum fixing thread depth
MXNS 30	8
MXNS 35	8.5
MXNS 45	10.5
MXNS 55	14

Remark: A typical identification number is indicated, but is applied to all low profile block types of the same size.

3 Shoulder height and corner radius of the reference mounting surface

For the opposite corner of the mating reference mounting, it is recommended to have relieved fillet as indicated in Fig. 8, but you may also use it with providing corner radius R as shown in Table 17. Recommended value for the shoulder height and corner radius on the mating side is indicated in Table 17.

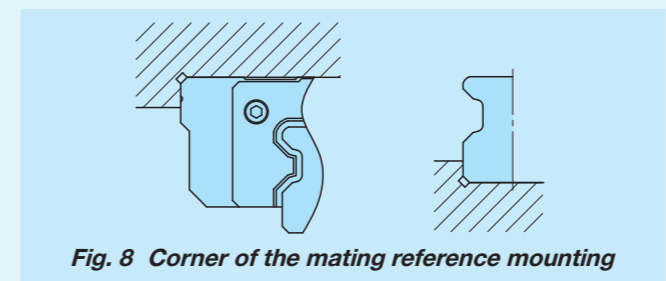


Fig. 8 Corner of the mating reference mounting

Table 17 Shoulder height and corner radius of the reference mounting surface unit: mm

Size	Shoulder height of slide unit mounting part h_1	Shoulder height of track rail mounting part h_2	Corner radius R (Maximum)
10	4	1	0.3
12	4	2	0.5
15	4	3	0.5
20	5	4	0.5
25	6	5	1
30	8	5.5	1
35	8	5.5	1
45	8	7	1.5
55	10	8	1.5
65	10	10	1.5
85	14	14	2.5 (Slide unit) 1.5 (Track rail)
100	14	13	2.5

4 Tightening torque for fixing screw

Typical tightening torque for mounting of the MX series and LRX series to the steel mating member material is indicated in Table 18. When vibration and shock of the machine or device are large, fluctuating load is large, or moment load is applied, fix it by using the torque 1.2 to 1.5 times larger than the value indicated in the table as necessary. If the mating member material is cast iron or aluminum alloy, reduce the tightening torque depending on the strength characteristics of the mating member material.

Table 18 Tightening torque for fixing screw

Bolt size	Tightening torque N · m		Stainless steel-made screw
	High carbon steel-made screw	Size 85 and 100	
M 2.6×0.45	—	—	0.70
M 3 ×0.5	1.8	—	1.1
M 4 ×0.7	4.1	—	2.5
M 5 ×0.8	8.0	—	5.0
M 6 ×1	13.6	—	8.5
M 8 ×1.25	32.7	—	20.4
M10 ×1.5	63.9	—	—
M12 ×1.75	110	—	—
M14 ×2	175	—	—
M16 ×2	268	—	—
M20 ×2.5	522	—	—
M24 ×3	—	749	—
M30 ×3.5	—	1 490	—

Remarks 1. The tightening torque is calculated based on strength division 12.9 for product size 12 to 65, strength division 10.9 for product sizes 85 and 100, and property division A2-70 for stainless steel bolts.

2. It is recommended that the tightening torque of slide unit middle mounting holes for size 15, 20, 25, 30, 35 of flange type (MXC, MX, MXG, MXL, LRXC, LRX, LRXG) is to be 70 to 80% of the values in the table.

5 Remarks

- As LRX(D)(G,L)85 and LRXG100 are heavyweight products, we recommend the use of eyebolts for transport and assembly. For eyebolt mounting, use the slide unit mounting holes and the track rail female threads for eyebolts (Fig. 9). For the LRXG100 track rail, also use the LRXG100 track rail dedicated eyebolt adapter (Fig. 10).
- LRX(D)(G,L)85 slide unit eyebolts (JIS B1168 M20) and LRX85 track rail dedicated eyebolts (Fig. 11) are not appended. If needed, please contact IKO.

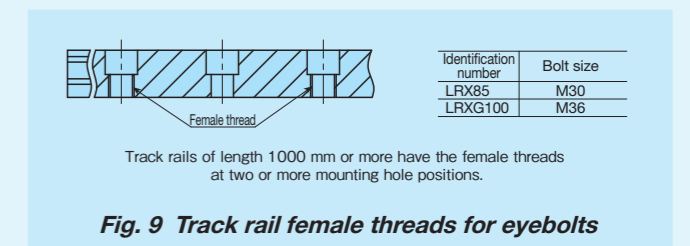


Fig. 9 Track rail female threads for eyebolts

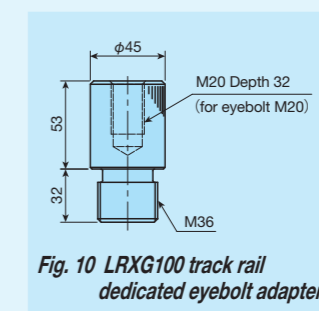


Fig. 10 LRXG100 track rail dedicated eyebolt adapter

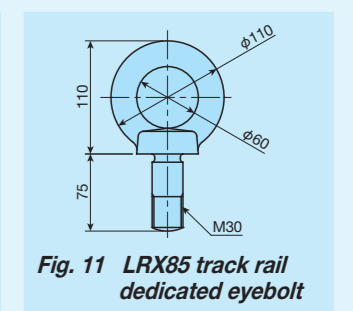
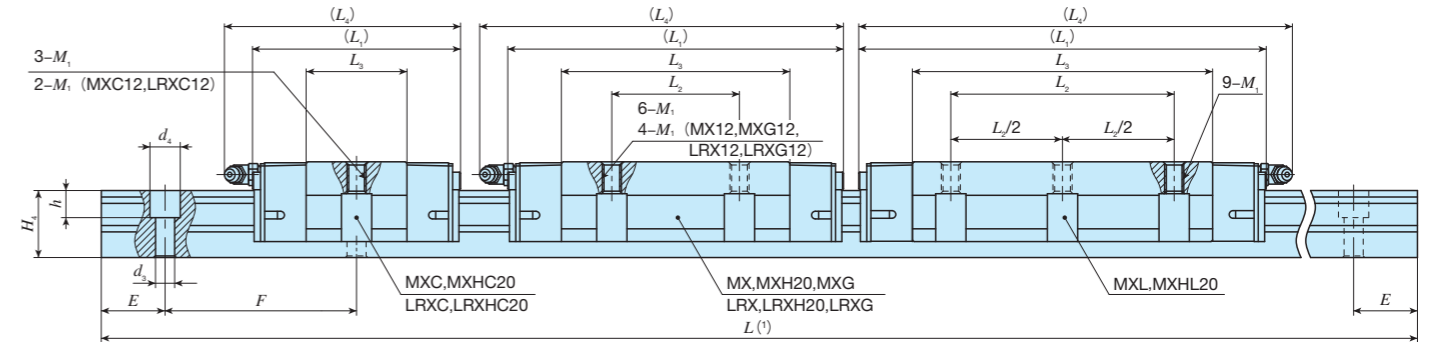
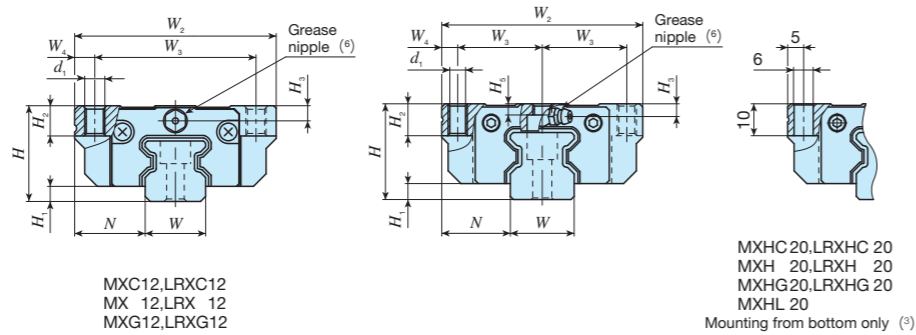


Fig. 11 LRX85 track rail dedicated eyebolt

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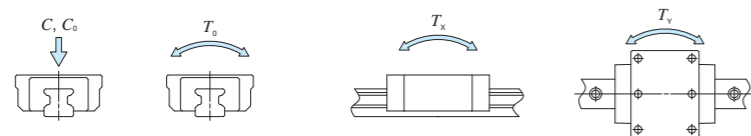
Flange type mounting from top / bottom

Shape	MX • LRX				
Size	12	15	20	25	30
	35	45	55	65	85



Identification number	Interchangeable	Mass (Ref.)		Dimensions of assembly mm										Dimensions of slide unit mm										Dimensions of track rail mm						Appended mounting bolt for track rail (3)	Basic dynamic load rating (4)	Basic static load rating (4)	Static moment rating (4)		
		Slide unit kg	Track rail kg/m	H	H1	N	W2	W3	W4	L1	L2	L3	L4	d1	M1	H2	H3	H5	W	H4	d3	d4	h	E	F	Bolt size × ℓ	C N	C0 N	T0 N · m				Tx N · m	Ty N · m	
MXC 12	○	0.058	0.92	19	3	14	40	32	4	40	—	15.8	44	3.4	M4	6	3	—	12	12	3.5	6	4.5	20	40	M3 × 12	4 250	6 500	49.4	18.6	18.6				
LRXC 12	○									37	—	14.8	40														170	16.3	170						
MX 12	○	0.092	0.92	19	3	14	40	32	4	50	15	25.4	53	3.4	M4	6	3	—	12	12	3.5	6	4.5	20	40	M3 × 12	6 120	10 400	79.1	45.8	45.8				
LRX 12	○									47		—	25.3														50	343	37.1	343					
MXG 12	○	0.13	0.92	19	3	14	40	32	4	61	15	36.6	64	3.4	M4	6	3	—	12	12	3.5	6	4.5	20	40	M3 × 12	8 120	15 000	114	92.7	92.7				
LRXG 12	○									58		—	35.8														61	628	45.2	628					
MXC 15	○	0.13	1.65	24	4	16	47	19	4.5	52	—	24	55	4.4	M5	7	3.5	3	15	16.5	4.5	8	6	30	60	M4 × 16	7 730	12 000	113	50.6	50.6				
LRXC 15	○									68	—	40	71														942	136	942						
MX 15	○	0.20	1.65	24	4	16	47	19	4.5	84	30	56	87	4.4	M5	7	3.5	3	15	16.5	4.5	8	6	30	60	M4 × 16	11 500	20 000	188	136	136				
LRX 15	○									84	—	56	87														1 590	262	1 590						
MXG 15	○	0.28	1.65	24	4	16	47	19	4.5	84	30	56	87	4.4	M5	7	3.5	3	15	16.5	4.5	8	6	30	60	M4 × 16	14 900	28 000	263	262	262				
MXC 20(2)	○	0.29	2.73	30	5	21.5	63	26.5	5	66	—	31.6	74	—(2)	M6(2)	10	4	3.5	20	21	6	9.5	8.5	30	60	M5 × 20	16 100	26 400	341	150	150				
LRXC 20(2)	○									86	—	51.6	94														2 520	379	2 520						
MX 20(2)	○	0.44	2.73	30	5	21.5	63	26.5	5	106	40	71.6	114	—(2)	M6(2)	10	4	3.5	20	21	6	9.5	8.5	30	60	M5 × 20	23 400	42 700	550	379	379				
LRX 20(2)	○									106	—	71.6	114														4 200	713	4 200						
MXG 20(2)	○	0.61	2.73	30	5	21.5	63	26.5	5	128	70	94.1	137	—(2)	M6(2)	10	4	3.5	20	21	6	9.5	8.5	30	60	M5 × 20	30 100	58 900	760	713	713				
MXL 20(2)	—	0.80	2.73	30	5	21.5	63	26.5	5	128	70	94.1	137	—	—	10	4	3.5	20	21	6	9.5	8.5	30	60	M5 × 20	37 200	77 200	996	1 210	1 210				
MXHC 20(3)	○	0.29	2.73	30	5	21.5	63	26.5	5	66	—	31.6	74	—	—	10	4	3.5	20	21	6	9.5	8.5	30	60	M5 × 20	16 100	26 400	341	150	150				
LRXHC 20(3)	○									86	—	51.6	94														2 520	379	2 520						
MXH 20(3)	○	0.44	2.73	30	5	21.5	63	26.5	5	106	40	71.6	114	—	—	10	4	3.5	20	21	6	9.5	8.5	30	60	M5 × 20	23 400	42 700	550	379	379				
LRXH 20(3)	○									106	—	71.6	114														4 200	713	4 200						
MXHG 20(3)	○	0.61	2.73	30	5	21.5	63	26.5	5	128	70	94.1	137	—	—	10	4	3.5	20	21	6	9.5	8.5	30	60	M5 × 20	30 100	58 900	760	713	713				
MXHL 20(3)	—	0.80	2.73	30	5	21.5	63	26.5	5	128	70	94.1	137	—	—	10	4	3.5	20	21	6	9.5	8.5	30	60	M5 × 20	37 200	77 200	996	1 210	1 210				

Notes (1) Track rail lengths L are shown in Table 2.1 on page II - 175 and Table 2.3 on page II - 176 .
 (2) The mounting bolt can be mounted only in downward direction.
 (3) The mounting bolt can be mounted only in upward direction.
 (4) The appended track rail mounting bolts are hexagon socket head bolts equivalent to JIS B 1176. In an assembled set of MX series, track rail mounting bolts are not appended.
 (5) The direction of basic dynamic load rating (C), basic static load rating (C_0), and static moment rating (T_0 , T_x , T_y) are shown in the sketches below. The upper values of T_x and T_y are for one slide unit and the lower values are for two slide units in close contact.
 (6) The shapes of grease nipple vary by size. The specifications are shown in Table 15 on page II - 188.
 Remark: A grease nipple mounting thread hole is provided on the right and left end plates respectively.



Example of identification number of assembled set

Model code Dimensions Part code Preload symbol Classification symbol Interchangeable code Supplemental code

MX **G** **15** **C2** **R360** **T1** **P** **/F**

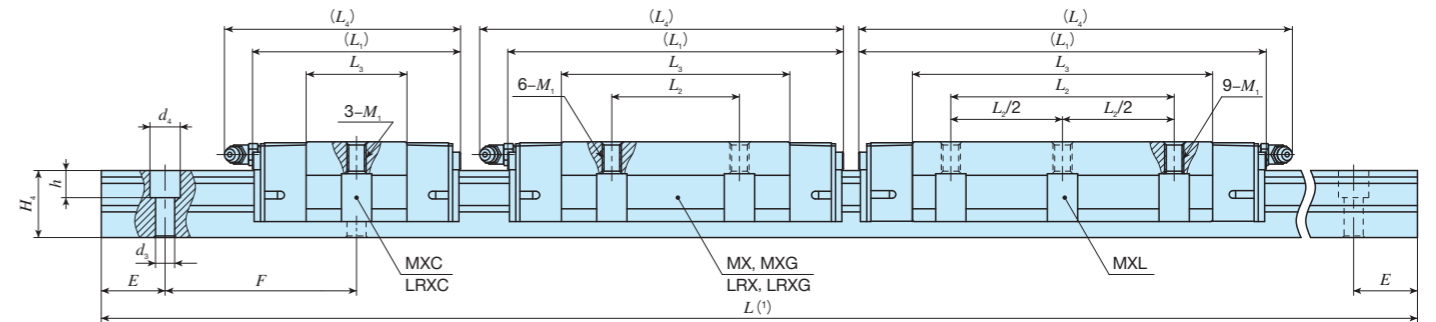
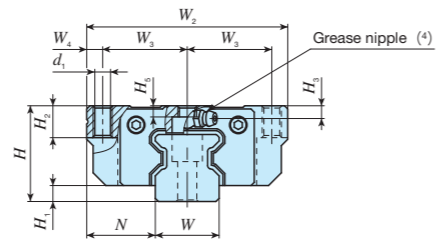
① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

① Model	MX Flange type mounting from top / bottom LRX Flange type mounting from bottom	③ Size	12, 15, 20	⑥ Preload amount	No symbol Standard T1 Light preload T2 Medium preload T3 Heavy preload	⑧ Interchangeable	No symbol Non-interchangeable specification S1 S1 specification S2 S2 specification
② Length of slide unit	C Short No symbol Standard G Long L Extra long	④ Number of slide unit (2)		⑦ Accuracy class	H High P Precision SP Super precision UP Ultra precision	⑨ Special specification	A, D, E, F, GE, HP, I, J, L LF, MA, MN, N, Q, RC, T UR, V, W, Y, Z
⑤ Length of track rail (360 mm)							

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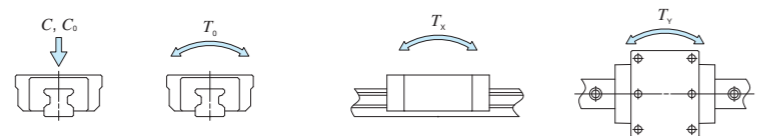
Flange type mounting from top / bottom

Shape	MX • LRX				
Size	12	15	20	25	30
	35	45	55	65	85



Identification number	Interchangeable	Mass (Ref.)		Dimensions of slide unit mm											Dimensions of track rail mm						Appended mounting bolt for track rail (2)	Basic dynamic load rating (3)	Basic static load rating (3)	Static moment rating (3)								
		Slide unit kg	Track rail 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	Bolt size × ℓ	C	C ₀	T ₀
MXC 25	LRXC 25	○	0.44	3.59	36	6	23.5	70	28.5	6.5	74	—	36	83	7	M 8	10	5	5	23	24.5	7	11	9	30	60	M6×25	21 600	33 800	500	213	213
MX 25	LRX 25	○	0.67								98	45	60	107														885	885			
MXG 25	LRXG 25	○	0.84								113	75	122	5 380														5 380				
MXL 25	—	—	1.08								137	70	99	146														8 480	8 480			
MXC 30	LRXC 30	○	0.78	5.01	42	6.5	31	90	36	9	85	—	42.4	95	8.5	M10	10	6.5	5.5	28	28	9	14	12	40	80	M8×28	29 200	44 600	808	329	329
MX 30	LRX 30	○	1.20								113	52	70.4	123														883	883			
MXG 30	LRXG 30	○	1.58								134	91.4	144	5 780														5 780				
MXL 30	—	—	2.03								162	80	119.4	172														8 740	8 740			

Notes (1) Track rail lengths L are shown in Table 2.1 on page II-175 and Table 2.3 on page II-176.
 (2) The appended track rail mounting bolts are hexagon socket head bolts equivalent to JIS B 1176. In an assembled set of MX series, track rail mounting bolts are not appended.
 (3) The direction of basic dynamic load rating (C), basic static load rating (C_0), and static moment rating (T_0 , T_x , T_y) are shown in the sketches below. The upper values of T_x and T_y are for one slide unit and the lower values are for two slide units in close contact.
 (4) The shapes of grease nipple vary by size. The specifications are shown in Table 15 on page II-188.
 Remark: A grease nipple mounting thread hole is provided on the right and left end plates respectively.



Example of identification number of assembled set

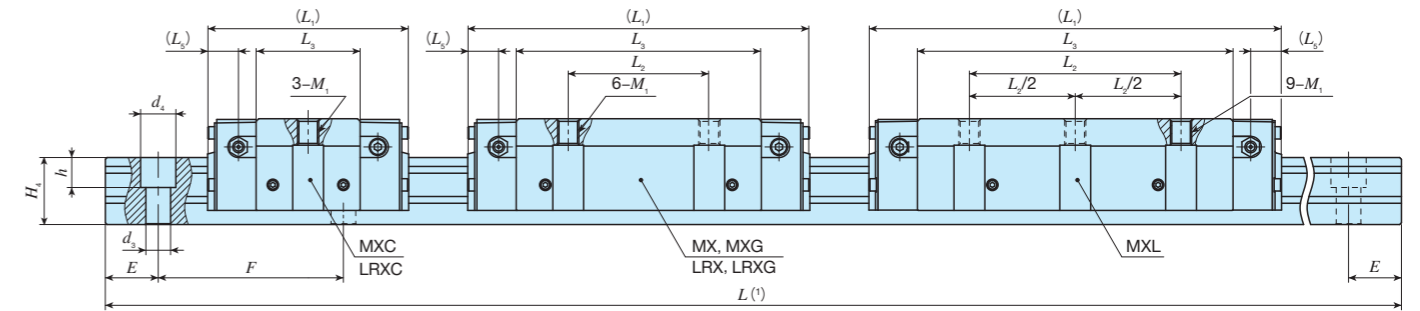
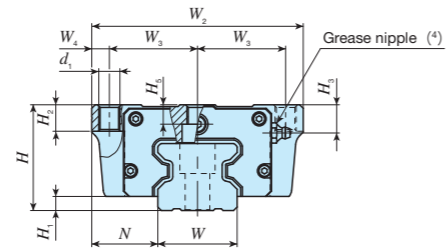
Model code	Dimensions	Part code	Preload symbol	Classification symbol	Interchangeable code	Supplemental code	
MX	G	25	C2	R840	T1	P	/F
①	②	③	④	⑤	⑥	⑦	⑧

① Model	③ Size	⑥ Preload amount	⑧ Interchangeable
MX Flange type mounting from top / bottom	25, 30	No symbol Standard T1 Light preload T2 Medium preload T3 Heavy preload	No symbol Non-interchangeable specification S1 S1 specification S2 S2 specification
② Length of slide unit	④ Number of slide unit (2)	⑦ Accuracy class	⑨ Special specification
C Short No symbol Standard G Long L Extra long		H High P Precision SP Super precision UP Ultra precision	A, D, E, F, GE, HP, I, J, L LF, MA, MN, N, Q, RC, T UR, V, W, Y, Z
⑤ Length of track rail (840 mm)			

IKO C-Lube Linear Roller Way Super MX

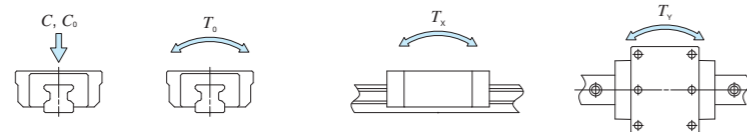
Flange type mounting from top / bottom

Shape	MX • LRX				
Size	12	15	20	25	30
	35	45	55	65	100



Identification number	Interchangeable	Mass (Ref.)		Dimensions of assembly mm			Dimensions of slide unit mm							Dimensions of track rail mm						Appended mounting bolt for track rail (2)	Basic dynamic load rating (3)	Basic static load rating (3)	Static moment rating (3)								
		Slide unit kg	Track rail kg/m	H	H ₁	N	W ₂	W ₃	W ₄	L ₁	L ₂	L ₃	L ₅	d ₁	M ₁	H ₂	H ₃	H ₅	W				H ₄	d ₃	d ₄	h	E	F	Bolt size × ℓ	C N	C ₀ N
MXC 35	○	1.13	6.88	48	6.5	33	100	41	9	92	—	46.6	12.7	8.5	M10	13	13	7	34	32	9	14	12	40	80	M 8×35	39 500	60 000	1 300	506	506
LRXC 35	○	124								78.6	12.7	3 950	3 950																		
MX 35	○	1.76								62	12.5	1 360	1 360																		
LRX 35	○	152								106.6	12.5	8 470	8 470																		
MXG 35	○	2.41	10.8	60	8	37.5	120	50	10	184	100	138.6	12.7	10.5	M12	15	16	11	45	38	14	20	17	52.5	105	M12×40	74 200	135 000	2 930	2 440	2 440
LRXG 35	○	114								59	12.5	13 800	13 800																		
MXL 35	—	3.00								154	99	16 800	16 800																		
—	—	194								139	17.5	21 300	21 300																		
MXC 45	○	2.11	10.8	60	8	37.5	120	50	10	234	120	179	12.7	10.5	M12	15	16	11	45	38	14	20	17	52.5	105	M12×40	90 800	175 000	3 800	4 060	4 060
LRXC 45	○	114								59	12.5	21 300	21 300																		
MX 45	○	3.26								154	99	16 800	16 800																		
LRX 45	○	194								139	17.5	29 000	29 000																		
MXG 45	○	4.60	10.8	60	8	37.5	120	50	10	234	120	179	12.7	10.5	M12	15	16	11	45	38	14	20	17	52.5	105	M12×40	124 000	223 000	6 200	5 220	5 220
LRXG 45	○	4.60								234	120	179	12.7														29 000	29 000			
MXL 45	—	5.66	151 000	287 000	7 980	8 560	8 560																								

Notes (1) Track rail lengths L are shown in Table 2.1 on page II-175 and Table 2.3 on page II-176.
 (2) The appended track rail mounting bolts are hexagon socket head bolts equivalent to JIS B 1176. In an assembled set of MX series, track rail mounting bolts are not appended.
 (3) The direction of basic dynamic load rating (C), basic static load rating (C_0), and static moment rating (T_0 , T_x , T_y) are shown in the sketches below. The upper values of T_x and T_y are for one slide unit and the lower values are for two slide units in close contact.
 (4) The shapes of grease nipple vary by size. The specifications are shown in Table 15 on page II-188.
 Remark: Three grease nipple mounting thread holes are provided on the right and left end plates respectively.



Example of identification number of assembled set

Model code Dimensions Part code Preload symbol Classification symbol Interchangeable code Supplemental code

MX G 35 C2 R1200 T2 P /F

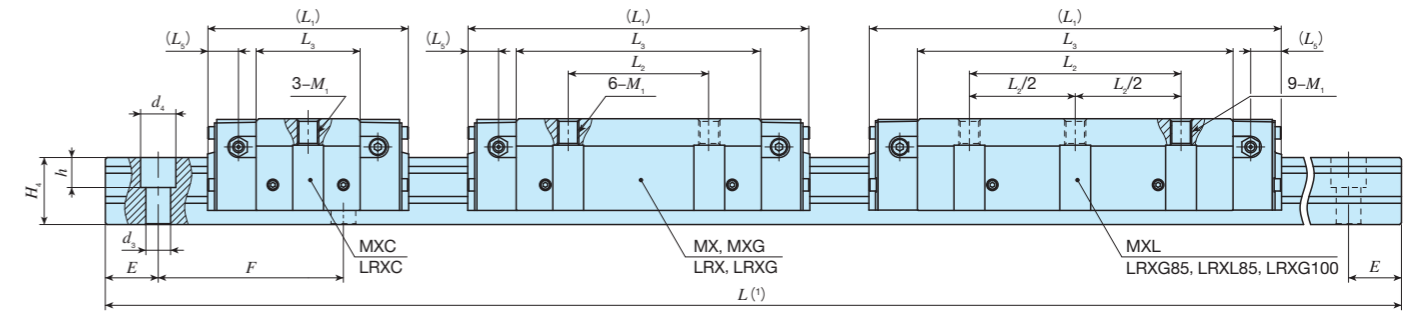
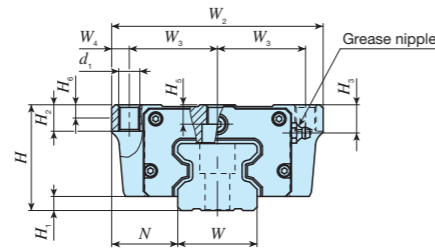
① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

① Model MX Flange type mounting from top / bottom LRX	② Length of slide unit C Short No symbol Standard G Long L Extra long	③ Size 35, 45	④ Number of slide unit (2)	⑤ Length of track rail (1,200 mm)	⑥ Preload amount No symbol Standard T1 Light preload T2 Medium preload T3 Heavy preload	⑦ Accuracy class H High P Precision SP Super precision UP Ultra precision	⑧ Interchangeable No symbol Non-interchangeable specification S1 S1 specification S2 S2 specification	⑨ Special specification A, D, E, F, GE, HP, I, J, L LF, MA, MN, N, PS, Q RC, T, UR, V, W, Y, Z
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IKO C-Lube Linear Roller Way Super MX

Flange type mounting from top / bottom

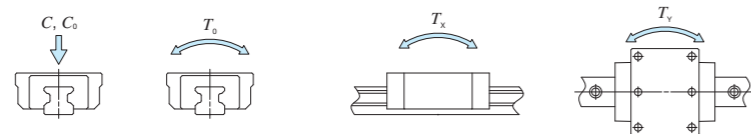
Shape	MX • LRX				
Size	12	15	20	25	30
	35	45	55	65	85



Identification number	Interchangeable	Mass (Ref.)		Dimensions of assembly mm											Dimensions of slide unit mm											Dimensions of track rail mm						Appended mounting bolt for track rail (2)	Basic dynamic load rating (3)	Basic static load rating (3)	Static moment rating (3)												
		Slide unit kg	Track rail kg/m	H	H1	N	W2	W3	W4	L1	L2	L3	L5	d1	M1	H2	H3	H5	H6	W	H4	d3	d4	h	E	F	Bolt size × ℓ	C N	C0 N	T0 N·m	Tx N·m				Ty N·m												
MXC 55	LRXC 55	○	3.49	14.1	70	9	43.5	140	58	12	136	—	72	20	12.5	M14	17	16	14	—	53	43	16	23	20	60	120	M14×45	99 700	149 000	4 830	1 880	1 880														
MX 55	LRX 55	○	5.42								184	—	120																95	120	5 040	5 040															
MXG 55	LRXG 55	○	7.93								238	—	174																—	—	10 400	10 400															
MXL 55	—	—	10.1								292	150	228																—	—	17 700	17 700															
MXC 65	LRXC 65	○	7.18	22.6	90	12	53.5	170	71	14	180	—	95	26.3	14.5	M16	23	18	18.5	—	63	56	18	26	22	75	150	M16×60	174 000	249 000	9 790	4 200	4 200														
MX 65	LRX 65	○	11.5								181	—	26.6	110															159	32 000	32 000																
MXG 65	LRXG 65	○	16.0								244	—	26.3	—															—	4 200	4 200																
MXL 65	—	—	20.8								245	—	26.6	—															—	11 300	11 300																
—	LRX 85	—	25.4	36.7	110	16	65	215	92.5	15	308	—	223	26.3	27.5	17.8	M20	35	22	25.5	20	85	67	26.5	39	30	90	180	M24×70	260 000	415 000	16 300	11 300	11 300													
—	LRXG 85	—	32.7								309	—	26.6	—																—	69 000	69 000															
—	LRXL 85	—	44.0								380	200	295	26.3																—	11 300	11 300															
—	LRXG 100*	—	43.0								323	140	232	—																—	69 300	69 300															
—	LRX 85	—	25.4	36.7	110	16	65	215	92.5	15	395	200	304	27.5	17.8	M20	35	22	25.5	20	85	67	26.5	39	30	90	180	M24×70	440 000	753 000	38 900	29 500	29 500														
—	LRXG 85	—	32.7								494	280	403	—															—	163 000	163 000																
—	LRXL 85	—	44.0								395	200	304	27.5															17.8	M20	35	22	25.5	20	85	67	26.5	39	30	90	180	M24×70	542 000	985 000	50 800	50 000	50 000
—	LRXG 100*	—	43.0								494	280	403	—																																	
—	LRXG 100*	—	43.0	43.2	120	15	75	250	110	15	362	200	262	29.7	17.8	M20	35	30	30.5	—	100	70	33	48	36	75	150	M30×80	498 000	821 000	49 700	35 800	35 800														

Notes (1) Track rail lengths L are shown in Table 2.1 on page II-175 and Table 2.3 on page II-176.
 (2) The appended track rail mounting bolts are hexagon socket head bolts equivalent to JIS B 1176. In an assembled set of MX series, track rail mounting bolts are not appended.
 (3) The direction of basic dynamic load rating (C), basic static load rating (C_0), and static moment rating (T_0 , T_x , T_y) are shown in the sketches below. The upper values of T_x and T_y are for one slide unit and the lower values are for two slide units in close contact.

Remarks 1. The specifications of grease nipple are shown in Table 15 on page II-188.
 2. Three grease nipple mounting thread holes are provided on the right and left end plates respectively.
 3. The identification numbers with * are our semi-standard items.



Example of identification number of assembled set

Model code Dimensions Part code Preload symbol Classification symbol Interchangeable code Supplemental code

MX G 55 C2 R3000 T2 P /F

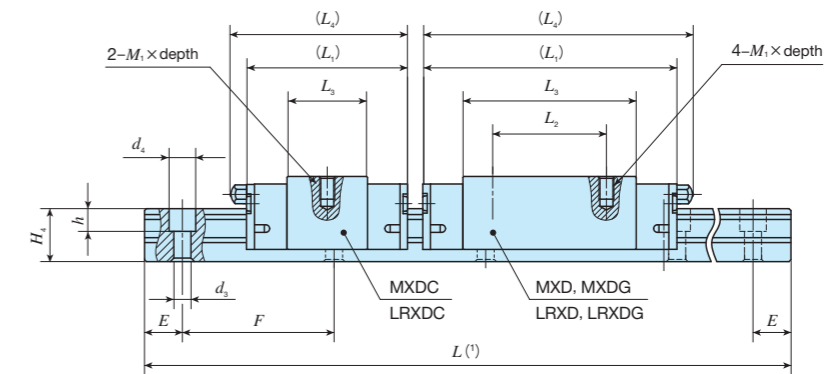
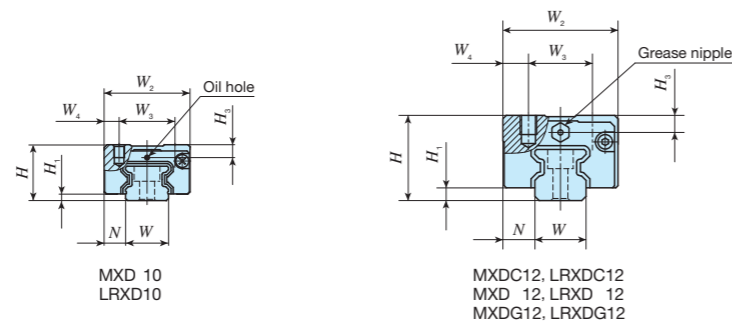
① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

① Model MX Flange type mounting from top / bottom LRX	② Length of slide unit C Short No symbol Standard G Long L Extra long	③ Size 55, 65, 85, 100	④ Number of slide unit (2)	⑤ Length of track rail (3,000 mm)	⑥ Preload amount No symbol Standard T1 Light preload T2 Medium preload T3 Heavy preload	⑦ Accuracy class H High P Precision SP Super precision UP Ultra precision	⑧ Interchangeable No symbol Non-interchangeable specification S1 S1 specification S2 S2 specification	⑨ Special specification A, D, E, F, GE, HP, I, J, L LF, MA, MN, PS, Q, RC T, UR, V, W, Y, Z
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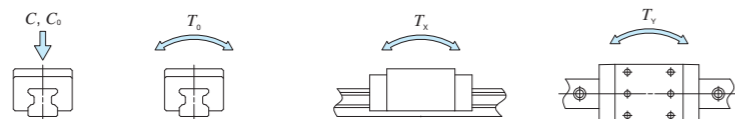
Block type mounting from top

Shape	MXD • LRXD					
Size	10	12	15	20	25	30
	35	45	55	65	85	



Identification number	Interchangeable	Mass (Ref.)		Dimensions of assembly mm			Dimensions of slide unit mm							Dimensions of track rail mm						Appended mounting bolt for track rail (2)	Basic dynamic load rating (3)	Basic static load rating (3)	Static moment rating (3)					
		Slide unit kg	Track rail kg/m	H	H1	N	W2	W3	W4	L1	L2	L3	L4	M1 x depth	H3	W	H4	d3	d4				h	E	F	Bolt size x l	C N	C0 N
MXD 10...SL	—	0.028	0.48	13	1.5	5	20	13	3.5	36	12	20.8	—	M2.6 x 3	3	10	8	3.5	6	3.5	12.5	25	M3 x 10	3 200	5 880	37.9	20.9	20.9
LRXD 10...SL	—																										147	147
MXDC 12	○	0.045	0.92	20	3	7.5	27	15	6	40	—	15.8	44	M4 x 4.5	4	12	12	3.5	6	4.5	20	40	M3 x 12	4 250	6 500	49.4	18.6	18.6
LRXDC 12	○																										196	196
—	○	0.072	0.92	20	3	7.5	27	15	6	37	—	14.8	40	M4 x 4.5	4	12	12	3.5	6	4.5	20	40	M3 x 12	3 900	6 090	46.3	16.3	16.3
LRXDC 12...SL	○																										170	170
MXD 12	○	0.072	0.92	20	3	7.5	27	15	6	50	—	25.4	53	M4 x 4.5	4	12	12	3.5	6	4.5	20	40	M3 x 12	6 120	10 400	79.1	45.8	45.8
LRXD 12	○																										371	371
MXD 12...SL	○	0.072	0.92	20	3	7.5	27	15	6	47	15	25.3	50	M4 x 4.5	4	12	12	3.5	6	4.5	20	40	M3 x 12	5 890	10 400	78.7	45.2	45.2
LRXD 12...SL	○																										343	343
MXDG 12	○	0.097	0.92	20	3	7.5	27	15	6	50	—	25.4	53	M4 x 4.5	4	12	12	3.5	6	4.5	20	40	M3 x 12	6 120	15 000	114	92.7	92.7
LRXDG 12	○																										628	628
—	○	0.097	0.92	20	3	7.5	27	15	6	61	—	36.6	64	M4 x 4.5	4	12	12	3.5	6	4.5	20	40	M3 x 12	8 120	14 600	111	88.6	88.6
LRXDG 12...SL	○																										581	581

- Notes (1) Track rail lengths L are shown in Tables 2.1 and 2.2 on page II-175 and Tables 2.3 and 2.4 on page II-176.
 (2) The appended track rail mounting bolts are hexagon socket head bolts equivalent to JIS B 1176. For stainless steel model, stainless steel bolts are appended.
 In an assembled set of MX series, track rail mounting bolts are not appended.
 (3) The direction of basic dynamic load rating (C), basic static load rating (C_0), and static moment rating (T_0 , T_x , T_y) are shown in the sketches below. The upper values of T_x and T_y are for one slide unit and the lower values are for two slide units in close contact.
 Remarks 1. The specification of oil hole is shown in Fig. 2 on page II-188.
 2. The specifications of grease nipple are shown in Table 15 on page II-188.
 3. For size 12 series, a grease nipple mounting thread hole is provided on the right and left end plates respectively.



Example of identification number of assembled set

Model code	Dimensions	Part code	Material code	Preload symbol	Classification symbol	Interchangeable code	Supplemental code
MXD	G	12	C2	R560	T1	P	/F
①	②	③	④	⑤	⑥	⑦	⑧

① Model MXD LRXD Block type mounting from top	④ Number of slide unit (2)	⑦ Preload amount No symbol Standard T1 Light preload T2 Medium preload T3 Heavy preload	⑩ Interchangeable No symbol Non-interchangeable specification S1 S1 specification S2 S2 specification
② Length of slide unit C Short No symbol Standard G Long	⑤ Length of track rail (560 mm)	⑧ Accuracy class H High P Precision SP Super precision UP Ultra precision	⑪ Special specification A, D, E, F, HP, I, L, LF MA, MN, N, Q, T, V, W Y, Z
③ Size 10, 12	⑥ Material type No symbol High carbon steel made SL Stainless steel made		

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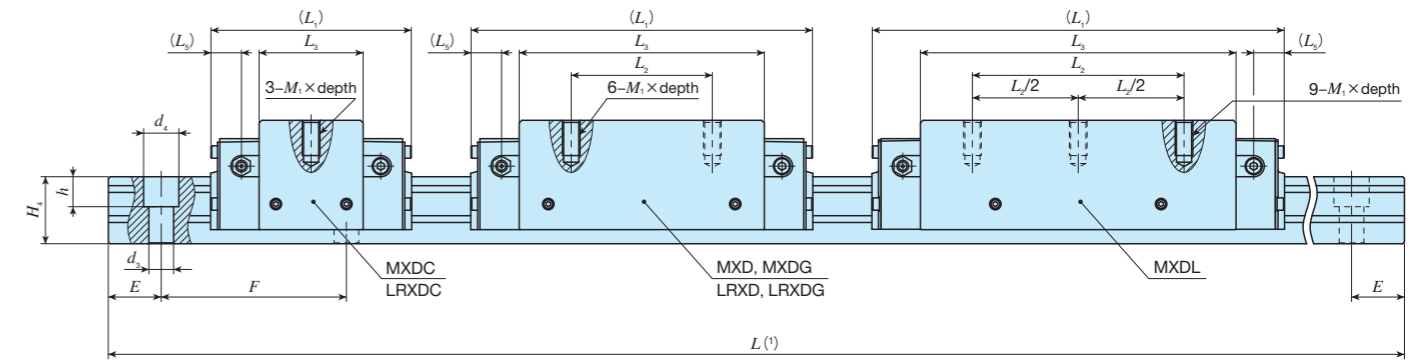
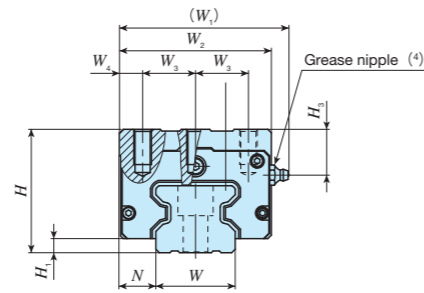
Block type mounting from top

MXD • LRXD

Shape

Size

10	12	15	20	25	30
35	45	55	65	85	



Identification number	Interchangeable	Mass (Ref.)		Dimensions of assembly mm								Dimensions of slide unit mm					Dimensions of track rail mm					Appended mounting bolt for track rail (2)	Basic dynamic load rating (3)	Basic static load rating (3)	Static moment rating (3)							
		Slide unit kg	Track rail kg/m	H	H1	N	W1	W2	W3	W4	L1	L2	L3	L5	M1 × depth	H3	W	H4	d3	d4	h				E	F	C N	C0 N	T0 N·m	Tx N·m	Ty N·m	
MXDC 35	○	0.97	6.88	55	6.5	18	78	70	25	10	92	—	46.6	12.7	M 8×16	20	34	32	9	14	12	40	80	M 8×35	39 500	60 000	1 300	3 506	3 950			
LRXDC 35	○										124	50	78.6	12.7											58 700	100 000	2 170	1 360	8 470	1 360	8 470	
MXD 35	○										152	72	106.6	12.7											74 200	135 000	2 930	2 440	13 800	2 440	13 800	
LRXDG 35	○										184	100	138.6	12.5											90 800	175 000	3 800	4 060	21 300	4 060	21 300	
MXDL 35	—	—	—	—	—	—	—	—	—	—	184	100	138.6	12.7	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
MXDC 45	○	2.01	10.8	70	8	20.5	96	86	30	13	114	—	59	17.5	M10×20	26	45	38	14	20	17	52.5	105	M12×40	64 100	95 600	2 660	1 010	7 800	1 010	7 800	
LRXDC 45	○										154	60	99	12.5											95 400	159 000	4 430	2 700	16 800	2 700	16 800	
MXD 45	○										194	80	139	12.5											124 000	223 000	6 200	5 220	29 000	5 220	29 000	
LRXDG 45	○										234	120	179	12.5											151 000	287 000	7 980	8 560	44 400	8 560	44 400	

Notes (1) Track rail lengths L are shown in Table 2.1 on page II-175 and Table 2.3 on page II-176.

(2) The appended track rail mounting bolts are hexagon socket head bolts equivalent to JIS B 1176. In an assembled set of MX series, track rail mounting bolts are not appended.

(3) The direction of basic dynamic load rating (C), basic static load rating (C_0), and static moment rating (T_0 , T_x , T_y) are shown in the sketches below. The upper values of T_x and T_y are for one slide unit and the lower values are for two slide units in close contact.

(4) The shapes of grease nipple vary by size. The specifications are shown in Table 15 on page II-188.

Remark: Three grease nipple mounting thread holes are provided on the right and left end plates respectively.

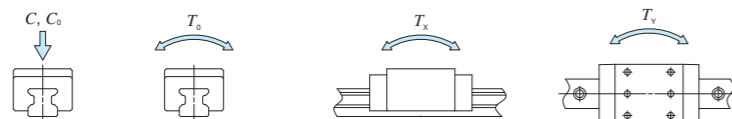
Example of identification number of assembled set

Model code Dimensions Part code Preload symbol Classification symbol Interchangeable code Supplemental code

MXD **G** **35** **C2** **R1200** **T2** **P** **/F**

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

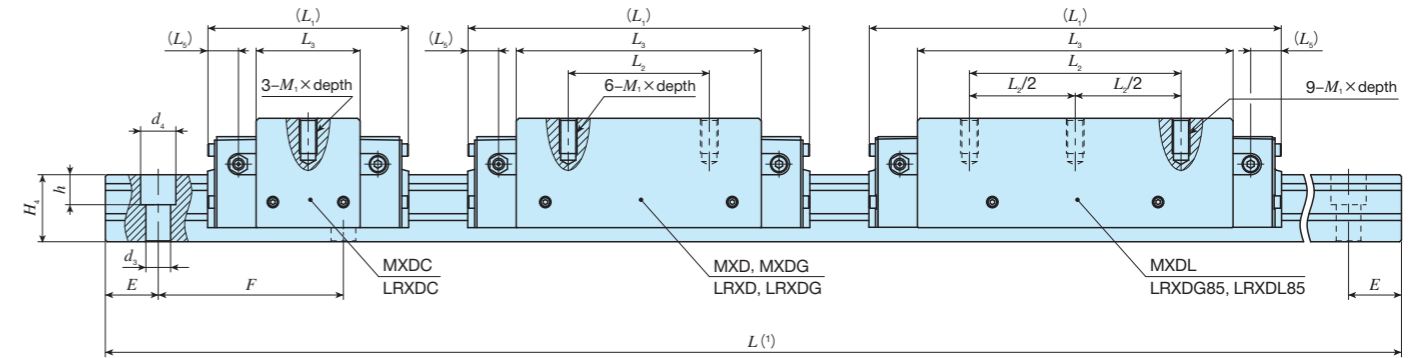
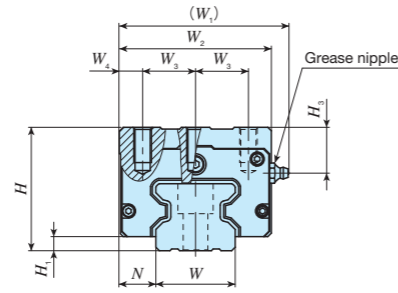
① Model	③ Size	⑥ Preload amount	⑧ Interchangeable
MXD LRXD	35, 45	No symbol Standard T1 Light preload T2 Medium preload T3 Heavy preload	No symbol Non-interchangeable specification S1 S1 specification S2 S2 specification
② Length of slide unit	④ Number of slide unit (2)	⑦ Accuracy class	⑨ Special specification
C Short No symbol Standard G Long L Extra long		H High P Precision SP Super precision UP Ultra precision	A, D, E, F, HP, I, J, L, LF MA, MN, N, PS, Q, RC, T UR, V, W, Y, Z
⑤ Length of track rail (1,200 mm)			



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Block type mounting from top

Shape	MXD • LRXD					
Size	10	12	15	20	25	30
	35	45	55	65	85	



Identification number	Interchangeable	Mass (Ref.)		Dimensions of slide unit mm										Dimensions of track rail mm						Appended mounting bolt for track rail (2)	Basic dynamic load rating (3)	Basic static load rating (3)	Static moment rating (3)							
		Slide unit kg	Track rail kg/m	H	H1	N	W1	W2	W3	W4	L1	L2	L3	L5	M1 x depth	H3	W	H4	d3				d4	h	E	F	C N	C0 N	T0 N·m	Tx N·m
MXDC 55	LRXDC 55	○	3.17	14.1	80	9	23.5	110	100	37.5	12.5	136	-	72	20	M12x25	26	53	43	16	23	20	60	120	M14x45	99 700	149 000	4 830	1 880	1 880
MXD 55	LRXD 55	○	4.97									184	75	120												5 040	5 040			
MXDG 55	LRXDG 55	○	7.06									238	95	174												10 400	10 400			
MXDL 55	-	-	9.08									292	150	228												17 700	17 700			
MXDC 65	LRXDC 65	○	5.52	22.6	90	12	31.5	135	126	38	25	180	-	95	26.3	M16x25	18	63	56	18	26	22	75	150	M16x60	174 000	249 000	9 790	4 200	4 200
MXD 65	LRXD 65	○	8.70									244	70	159												11 300	11 300			
MXDG 65	LRXDG 65	○	12.1									308	120	223												21 800	21 800			
MXDL 65	-	-	15.5									309	200	295												29 500	29 500			
MXDC 85	LRXDC 85	○	19.9	36.7	110	16	40.5	175	166	60	23	323	140	232	27.5	M20x30	22	85	67	26.5	39	30	90	180	M24x70	440 000	753 000	38 900	50 000	50 000
MXD 85	LRXD 85	○	25.5									395	200	304												163 000	163 000			
MXDG 85	LRXDG 85	○	34.1									494	280	403												257 000	257 000			
MXDL 85	LRXDL 85	○	34.1									494	280	403												422 000	422 000			

Notes (1) Track rail lengths L are shown in Table 2.1 on page II-175 and Table 2.3 on page II-176.
 (2) The appended track rail mounting bolts are hexagon socket head bolts equivalent to JIS B 1176. In an assembled set of MX series, track rail mounting bolts are not appended.
 (3) The direction of basic dynamic load rating (C), basic static load rating (C_0), and static moment rating (T_0 , T_x , T_y) are shown in the sketches below. The upper values of T_x and T_y are for one slide unit and the lower values are for two slide units in close contact.

Remarks 1. The specifications of grease nipple are shown in Table 15 on page II-188.
 2. Three grease nipple mounting thread holes are provided on the right and left end plates respectively.

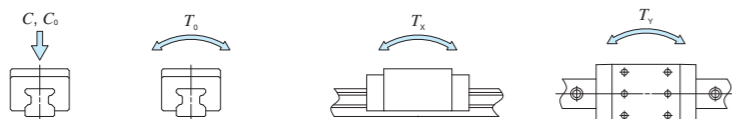
Example of identification number of assembled set

Model code Dimensions Part code Preload symbol Classification symbol Interchangeable code Supplemental code

MXD **G** **55** **C2** **R3000** **T2** **P** **-** **/F**

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

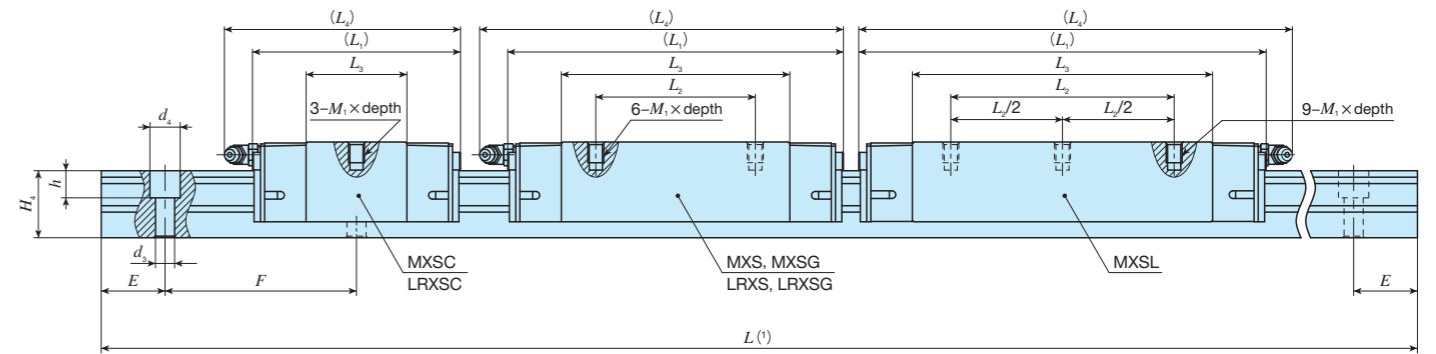
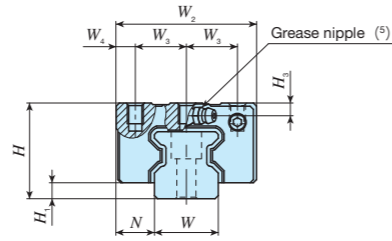
① Model MXD LRXD Block type mounting from top	③ Size 55, 65, 85	⑥ Preload amount No symbol Standard T1 Light preload T2 Medium preload T3 Heavy preload	⑧ Interchangeable No symbol Non-interchangeable specification S1 S1 specification S2 S2 specification
② Length of slide unit C Short No symbol Standard G Long L Extra long	④ Number of slide unit (2)	⑦ Accuracy class H High P Precision SP Super precision UP Ultra precision	⑨ Special specification A, D, E, F, HP, I, J, L, LF MA, MN, PS, Q, RC, T UR, V, W, Y, Z
⑤ Length of track rail (3,000 mm)			



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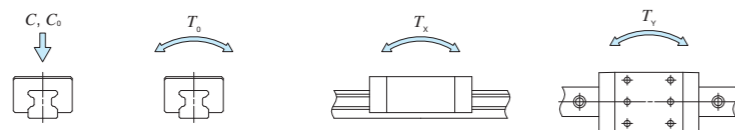
Compact block type mounting from top

Shape	MXS • LRXS			
Size	15	20	25	30
	35	45	55	



Identification number	Interchangeable	Mass (Ref.)		Dimensions of assembly mm											Dimensions of slide unit mm							Dimensions of track rail mm							Appended mounting bolt for track rail (3)	Basic dynamic load rating (4)	Basic static load rating (4)	Static moment rating (4)		
		Slide unit kg	Track rail kg/m	H	H1	N	W2	W3	W4	L1	L2	L3	L4	M1 × depth (2)	H3	W	H4	d3	d4	h	E	F	Bolt size × ℓ	C N	C0 N	T0 N · m	Tx N · m	Ty N · m						
MXSC 15	LRXSC 15	○	0.099	1.65	24	4	9.5	34	13	4	52	—	24	55	M4 × 5.5	3.5	15	16.5	4.5	8	6	30	60	M4 × 16	7 730	12 000	113	50.6	50.6					
MXS 15	LRXS 15	○	0.15								68	26	40	71											136	136								
MXSG 15	LRXSG 15	○	0.21								84	56	87	262											262									
MXSC 20	LRXSC 20	○	0.21	2.73	30	5	12	44	16	6	66	—	31.6	74	M5 × 6.5	4	20	21	6	9.5	8.5	30	60	M5 × 20	16 100	26 400	341	150	150					
MXS 20	LRXS 20	○	0.31								86	36	51.6	94											379	379								
MXSG 20	LRXSG 20	○	0.42								106	50	71.6	114											2 520	2 520								
MXSL 20	—	—	0.55								128	70	94.1	137											4 200	4 200								
MXSC 25	LRXSC 25	○	0.30	3.59	36	6	12.5	48	17.5	6.5	74	—	36	83	M6 × 9	5	23	24.5	7	11	9	30	60	M6 × 25	21 600	33 800	500	213	213					
MXS 25	LRXS 25	○	0.47								98	35	60	107											3 800	3 800								
MXSG 25	LRXSG 25	○	0.57								113	50	75	122											5 380	5 380								
MXSL 25	—	—	0.74								137	70	99	146											8 480	8 480								
MXSC 30	LRXSC 30	○	0.54	5.01	42	6.5	16	60	20	10	85	—	42.4	95	M8 × 11	6.5	28	28	9	14	12	40	80	M8 × 28	29 200	44 600	808	329	329					
MXS 30	LRXS 30	○	0.83								113	40	70.4	123											5 780	5 780								
MXSG 30	LRXSG 30	○	1.05								134	60	91.4	144											8 740	8 740								
MXSL 30	—	—	1.37								162	80	119.4	172											13 600	13 600								

Notes (1) Track rail lengths L are shown in Table 2.1 on page II-175 and Table 2.3 on page II-176.
 (2) For the fixing thread depth of the slide unit mounting hole, the value indicated in Table 16.1 on page II-190 is recommended.
 (3) The appended track rail mounting bolts are hexagon socket head bolts equivalent to JIS B 1176. In an assembled set of MX series, track rail mounting bolts are not appended.
 (4) The direction of basic dynamic load rating (C), basic static load rating (C_0), and static moment rating (T_0 , T_x , T_y) are shown in the sketches below. The upper values of T_x and T_y are for one slide unit and the lower values are for two slide units in close contact.
 (5) The shapes of grease nipple vary by size. The specifications are shown in Table 15 on page II-188.
 Remark: A grease nipple mounting thread hole is provided on the right and left end plates respectively.



Example of identification number of assembled set

Model code Dimensions Part code Preload symbol Classification symbol Interchangeable code Supplemental code

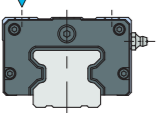
MXS G 25 C2 R840 T1 P /F

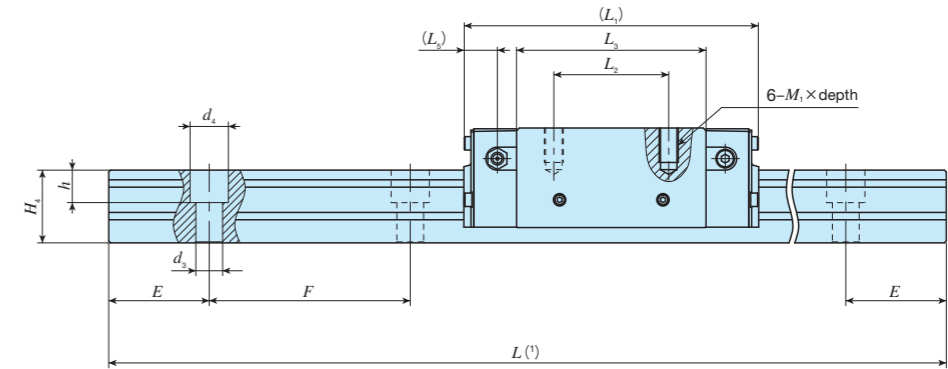
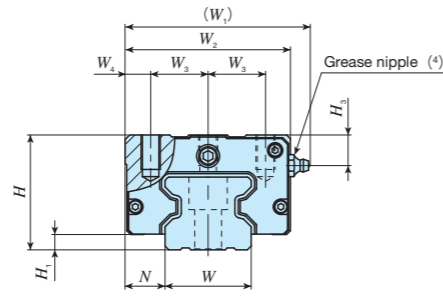
① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

① Model MXS Compact block type mounting from top LRXS	② Length of slide unit C Short No symbol Standard G Long L Extra long	③ Size 15, 20, 25, 30	④ Number of slide unit (2)	⑤ Length of track rail (840 mm)	⑥ Preload amount No symbol Standard T1 Light preload T2 Medium preload T3 Heavy preload	⑦ Accuracy class H High P Precision SP Super precision UP Ultra precision	⑧ Interchangeable No symbol Non-interchangeable specification S1 S1 specification S2 S2 specification	⑨ Special specification A, D, E, F, HP, I, J, L, LF MA, MN, N, Q, RC, T, UR V, W, Y, Z
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IKO C-Lube Linear Roller Way Super MX

Compact block type mounting from top

Shape	MXS			
				
Size	15	20	25	30
	35	45	55	



Identification number	Interchangeable	Mass (Ref.)		Dimensions of assembly mm								Dimensions of slide unit mm					Dimensions of track rail mm						Mounting bolt for track rail (2)	Basic dynamic load rating (3) C N	Basic static load rating (3) C ₀ N	Static moment rating (3)			
		Slide unit kg	Track rail kg/m	H	H ₁	N	W ₁	W ₂	W ₃	W ₄	L ₁	L ₂	L ₃	L ₅	M ₁ × depth	H ₃	W	H ₄	d ₃	d ₄	h	E				F	Bolt size × ℓ	T ₀ N · m	T _x N · m
MXS 35	○	1.22	6.88	48	6.5	18	78	70	25	10	124	50	78.6	12.7	M 8×12	13	34	32	9	14	12	40	80	M 8×35	58 700	100 000	2 170	1 360 8 470	1 360 8 470
MXSG 35	○	1.61		152	72	106.6	16	45	38	14	20	17	52.5			105	74 200	135 000	2 930	2 440 13 800	2 440 13 800								
MXS 45	○	2.37	10.8	60	8	20.5	96	86	30	13	154	60	99	17.5	M10×18	16	45	38	14	20	17	52.5	105	M12×40	95 400	159 000	4 430	2 700 16 800	2 700 16 800
MXSG 45	○	3.27		194	80	139	16	53	43	16	23	20	60			120	124 000	223 000	6 200	5 220 29 000	5 220 29 000								
MXS 55	○	3.96	14.1	70	9	23.5	110	100	37.5	12.5	184	75	120	20	M12×20	16	53	43	16	23	20	60	120	M14×45	148 000	248 000	8 040	5 040 31 100	5 040 31 100
MXSG 55	○	5.63		238	95	174	16	53	43	16	23	20	60			120	198 000	359 000	11 700	10 400 57 000	10 400 57 000								

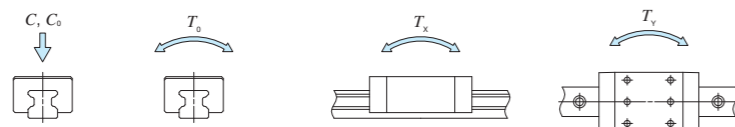
Notes (1) Track rail lengths L are shown in Table 2.1 on page II-175 and Table 2.3 on page II-176.

(2) Track rail mounting bolts are not appended.

(3) The direction of basic dynamic load rating (C), basic static load rating (C_0), and static moment rating (T_0 , T_x , T_y) are shown in the sketches below. The upper values of T_x and T_y are for one slide unit and the lower values are for two slide units in close contact.

(4) The shapes of grease nipple vary by size. The specifications are shown in Table 15 on page II-188.

Remark: Three grease nipple mounting thread holes are provided on the right and left end plates respectively.



Example of identification number of assembled set

Model code Dimensions Part code Preload symbol Classification symbol Interchangeable code Supplemental code

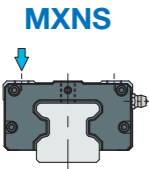
MXS G 45 C2 R1470 T1 P /F

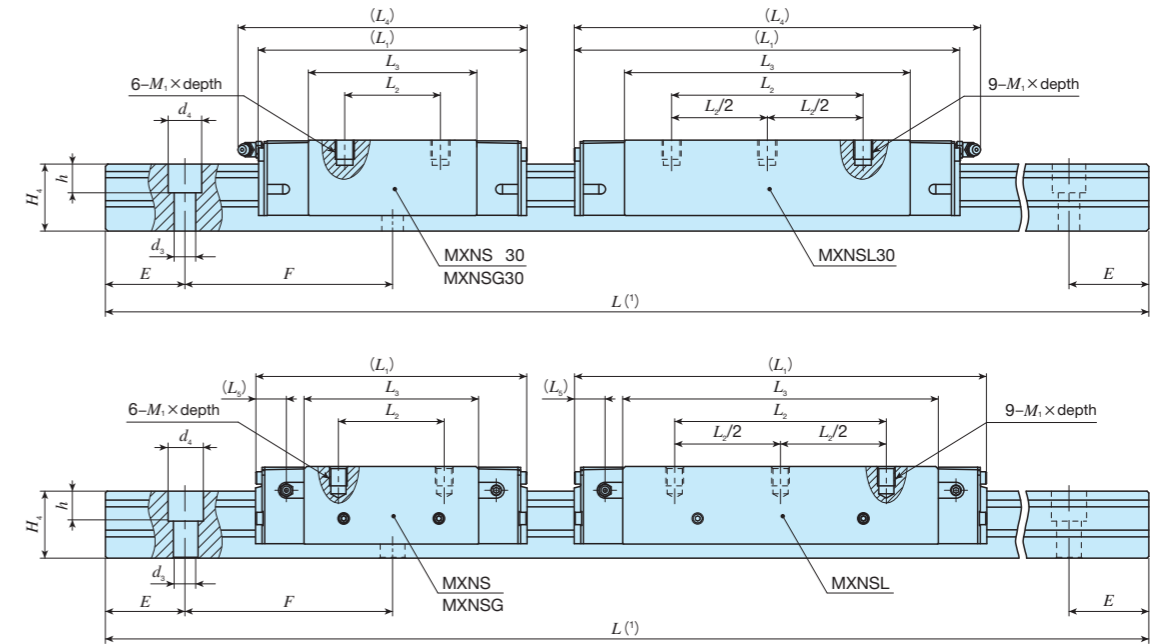
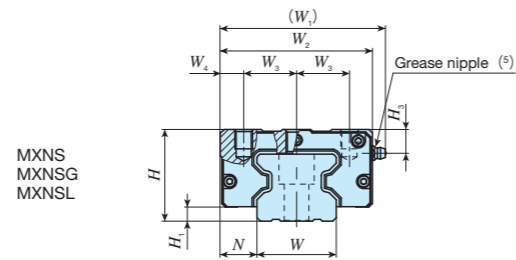
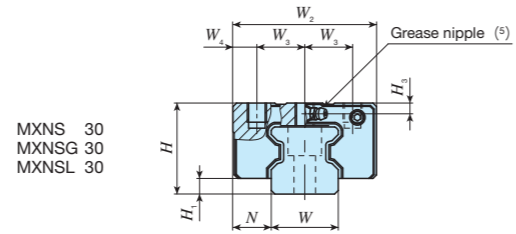
① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

① Model	MXS Compact block type mounting from top	③ Size	35, 45, 55	⑥ Preload amount	No symbol Standard T1 Light preload T2 Medium preload T3 Heavy preload	⑧ Interchangeable	No symbol Non-interchangeable specification S1 S1 specification S2 S2 specification
② Length of slide unit	No symbol Standard G Long	④ Number of slide unit (2)		⑦ Accuracy class	H High P Precision SP Super precision UP Ultra precision	⑨ Special specification	A, D, E, F, HP, I, J, L, LF MA, N, RC, T, UR, V, W, Z
⑤ Length of track rail (1,470 mm)							

IKO C-Lube Linear Roller Way Super MX

Low profile block type mounting from top

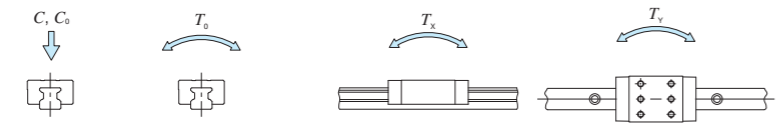
Shape				
Size	30	35	45	55



Identification number	LRX series (No C-Lube)	Interchangeable	Mass (Ref.) Slide unit kg / Track rail kg/m	Dimensions of assembly mm		Dimensions of slide unit mm											Dimensions of track rail mm						Mounting bolt for track rail (3) Bolt size x l	Basic dynamic load rating (4) C N	Basic static load rating (4) C0 N	Static moment rating (4)											
				H	H1	N	W1	W2	W3	W4	L1	L2	L3	L4	L5	M1 x depth (2)	Maximum fixing thread depth (2)	H3	W	H4	d3	d4				h	E	F	T0 N·m	Tx N·m	Ty N·m						
MXNS 30	-	○	0.70	5.01	38	6.5	16	-	60	20	10	113	40	70.4	121	-	M 8 x 8	9	4.5	28	28	9	14	12	40	80	M 8 x 28	43 400	74 400	1 350	883 5 780	883 5 780					
MXNSG 30	-	○	0.90		134	60	91.4	142	12.7	M 8 x 9	11	11	34	32	9													14	12	40	80	M 8 x 35	53 200	96 700	1 750	1 470 8 740	1 470 8 740
MXNSL 30	-	-	1.14		162	80	119.4	170																									17.5	M10 x 11	13	13.5	45
MXNS 35	-	○	1.08	6.88	44	6.5	18	78	70	25	10	124	50	78.6	-	M 8 x 9	11	11	34	32	9	14	12	40	80	M 8 x 35	58 700	100 000	2 170	1 360 8 470	1 360 8 470						
MXNSG 35	-	○	1.42		152	72	106.6	12.7	M 8 x 9	11	11	34	32	9													14	12	40	80	M 8 x 35	74 200	135 000	2 930	2 440 13 800	2 440 13 800	
MXNSL 35	-	-	1.81		184	100	138.6																									17.5	M10 x 11	13	13.5	45	38
MXNS 45	-	○	1.84	10.8	52	8	20.5	94	86	30	13	154	60	99	-	M10 x 11	13	13.5	45	38	14	20	17	52.5	105	M12 x 40	95 400	159 000	4 430	2 700 16 800	2 700 16 800						
MXNSG 45	-	○	2.58		194	80	139	12.7	M10 x 11	13	13.5	45	38	14													20	17	52.5	105	M12 x 40	124 000	223 000	6 200	5 220 29 000	5 220 29 000	
MXNSL 45	-	-	3.29		234	120	179																									17.5	M10 x 11	13	13.5	45	38
MXNS 55	-	○	3.31	14.1	63	9	23.5	110	100	37.5	12.5	184	75	120	-	M12 x 15	19	16	53	43	16	23	20	60	120	M14 x 45	148 000	248 000	8 040	5 040 31 100	5 040 31 100						
MXNSG 55	-	○	4.83		238	95	174	12.7	M12 x 15	19	16	53	43	16													23	20	60	120	M14 x 45	198 000	359 000	11 700	10 400 57 000	10 400 57 000	
MXNSL 55	-	-	6.28		292	150	228																									17.5	M12 x 15	19	16	53	43

Notes (1) Track rail lengths L are shown in Table 2.1 on page II-175 and Table 2.3 on page II-176.
 (2) For the fixing thread depth of the slide unit mounting hole, the value indicated in Table 16.2 on page II-190 is recommended.
 The fixing thread depth of mounting screw in the middle of the way in the slide unit width direction should be less than the maximum fixing thread depth.
 (3) Track rail mounting bolts are not appended.
 (4) The direction of basic dynamic load rating (C), basic static load rating (C0), and static moment rating (T0, Tx, Ty) are shown in the sketches below. The upper values of Tx and Ty are for one slide unit and the lower values are for two slide units in close contact.
 (5) The shapes of grease nipple vary by size. The specifications are shown in Table 15 on page II-188.

Remarks 1. For size 30 series, a grease nipple mounting thread hole is provided on the right and left end plates respectively.
 2. For size 35, 45, and 55 series, three grease nipple mounting thread holes are provided on the right and left end plates respectively. However, the size of thread hole for size 35 in the slide unit travelling direction is smaller than that of the crosswise direction. When the grease nipple is mounted along the travelling direction, contact IKO.



Example of identification number of assembled set

Model code: MXNS G 55 C2 R3000 T2 P /F

Dimensions: 55 (Size), C2 (Length of slide unit), R3000 (Length of track rail)

Part code: MXNS G

Preload symbol: T2

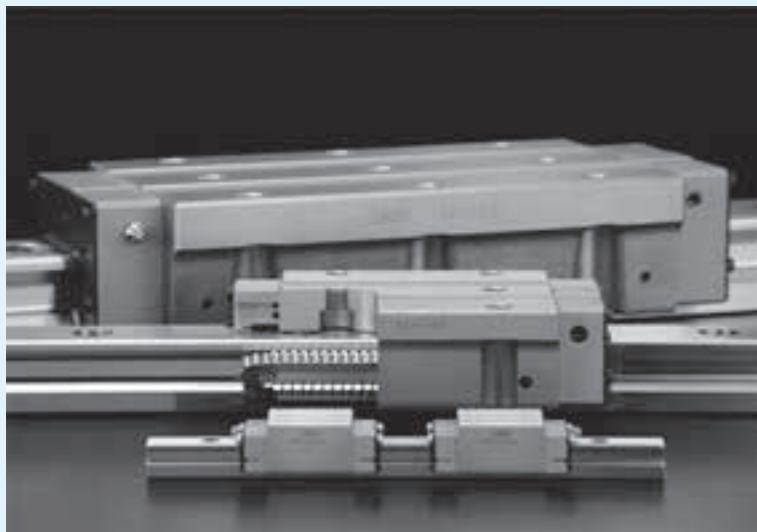
Classification symbol: P

Interchangeable code: /F

Supplemental code: F

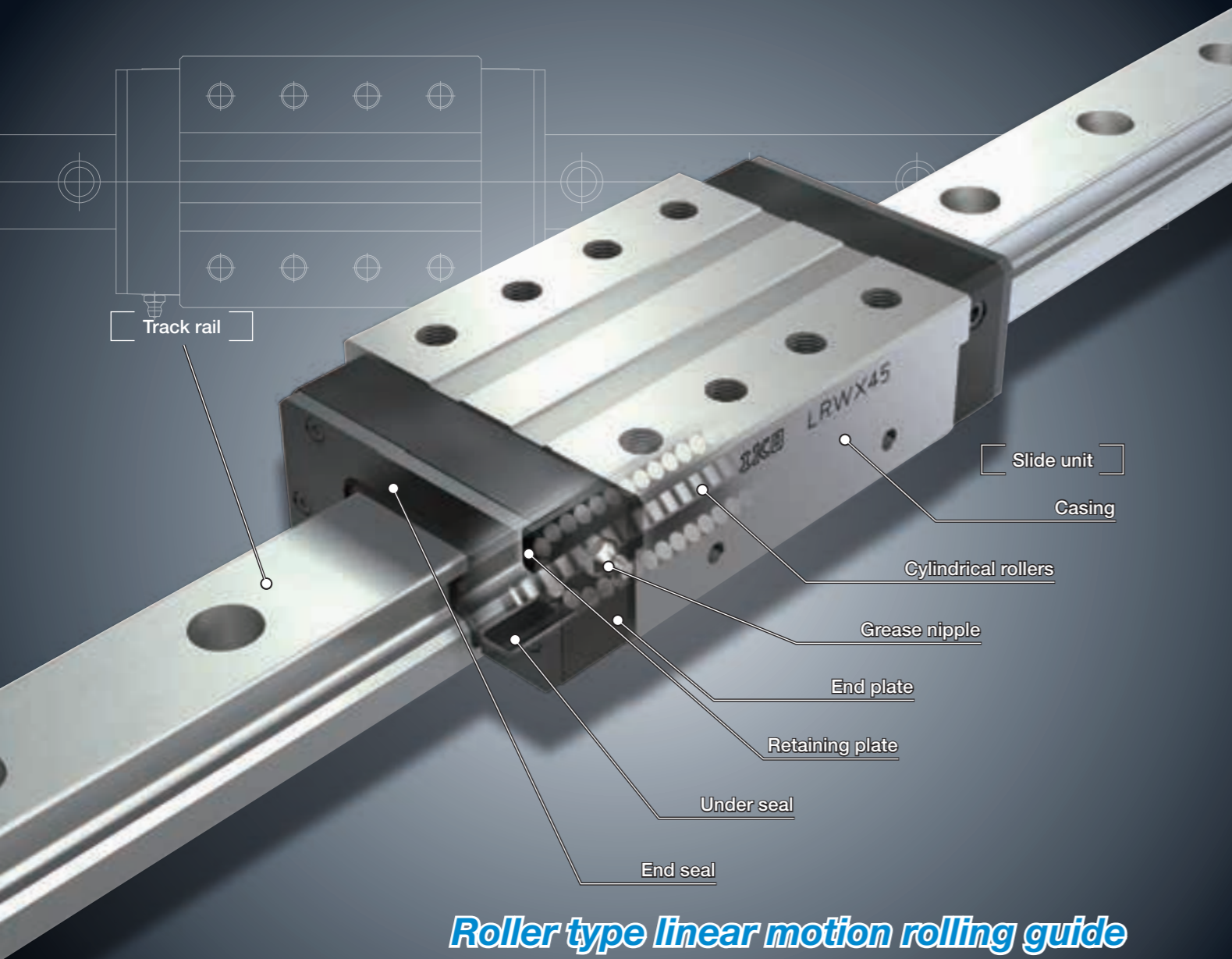
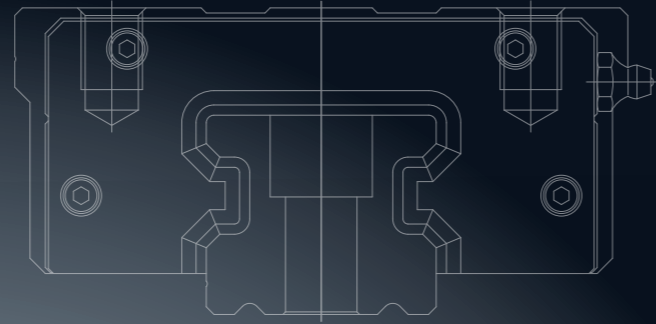
① Model MXNS Low profile block type mounting from top	③ Size 30, 35, 45, 55	⑥ Preload amount No symbol Standard T1 Light preload T2 Medium preload T3 Heavy preload	⑨ Interchangeable No symbol Non-interchangeable specification S1 S1 specification S2 S2 specification
② Length of slide unit No symbol Standard G Long L Extra long	④ Number of slide unit (2)	⑦ Accuracy class H High P Precision SP Super precision UP Ultra precision	⑧ Special specification A, D, E, F, HP, I, J, L, LF MA, RC, T, UR, V, W, Z
⑤ Length of track rail (3,000 mm)			

Linear Roller Way X



Linear Roller Way X

LRWX



**Roller type linear motion rolling guide
with cylindrical rollers in four-rows!**

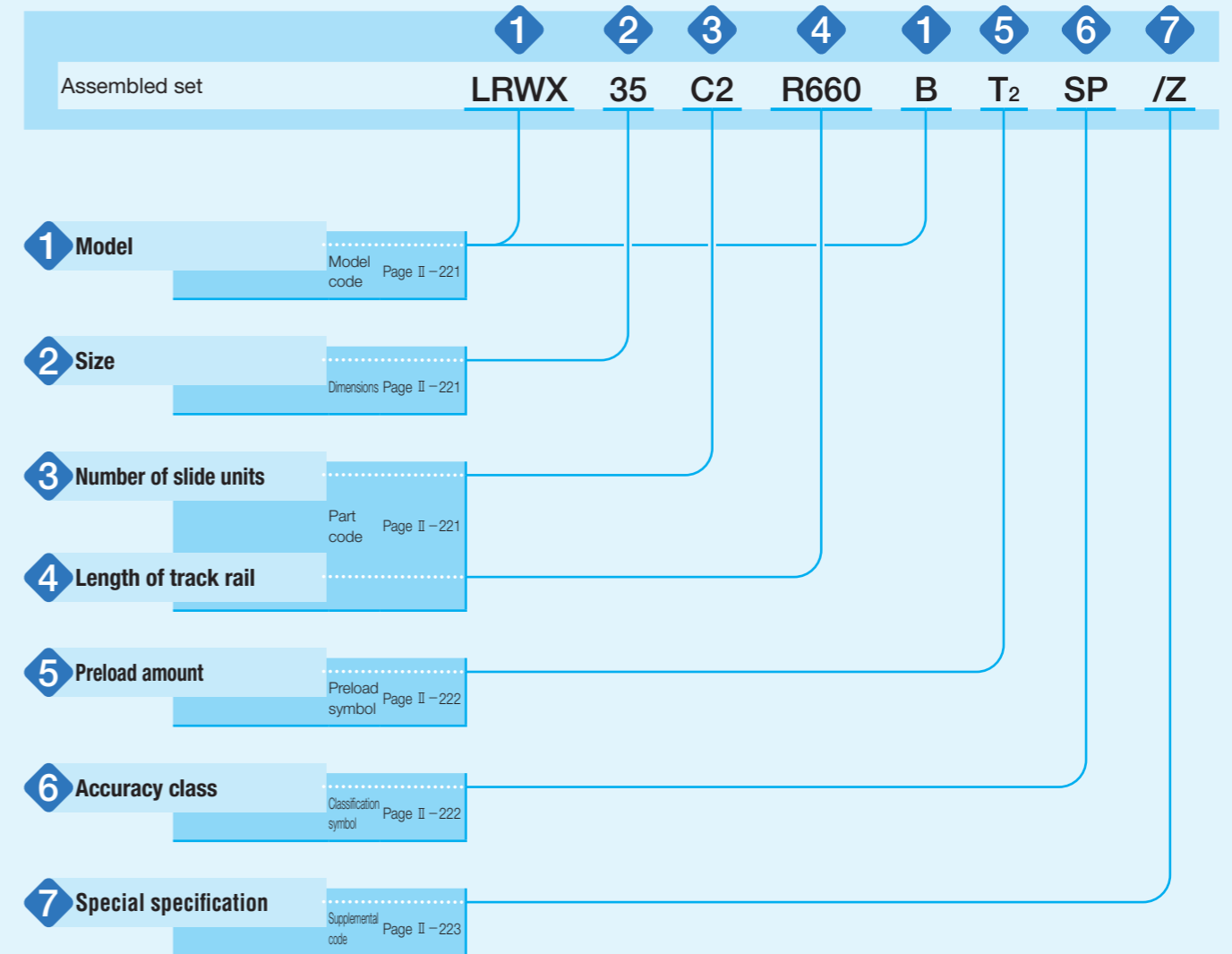
**Well-balanced roller arrangement
enabling equal resistance to all direction loads!**

**Slide unit shape block type and flange type are available
and can be selected according to the application!**

Identification Number and Specification

Example of an identification number

The specification of LRWX series is indicated by the identification number. Indicate the identification number, consisting of a model code, dimensions, a part code, a preload symbol, a classification symbol, and any supplemental codes for each specification to apply.



Identification Number and Specification – Model · Size · Number of Slide Unit · Length of Track Rail –

1 Model	Linear Roller Way X ⁽¹⁾ (LRWX series)	Block type mounting from top : LRWX...B Flange type mounting from bottom : LRWXH
	For applicable models and sizes, see Table 1. Note ⁽¹⁾ This model has no built-in C-Lube.	
2 Size	25,35,45,55,75	For applicable models and sizes, see Table 1.
3 Number of slide units	: C○	Indicates the number of slide units assembled on a track rail.
4 Length of track rail	: R○	Indicate the length of track rail in mm. For standard and maximum lengths, see Table 2.

Table 1 Models and sizes of LRWX series

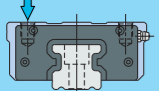
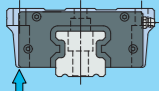
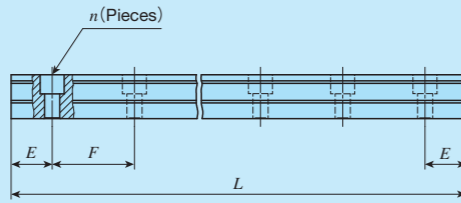
Shape	Model	Size				
		25	35	45	55	75
Block type mounting from top 	LRWX...B	○	○	○	○	○
Flange type mounting from bottom 	LRWXH	—	○	○	○	○

Table 2 Standard and maximum lengths of track rail



Item	Identification number	LRWX25...B	LRWX25...B/HP ⁽³⁾	LRWX 35...B LRWXH35	LRWX 45...B LRWXH45	LRWX 55...B LRWXH55	LRWX 75...B LRWXH75
		Standard length L (n)		480 (8) 660 (11) 840 (14) 1 020 (17) 1 200 (20) 1 500 (25)	480 (16) 660 (22) 840 (28) 1 020 (34) 1 200 (40) 1 500 (50)	480 (8) 660 (11) 840 (14) 1 020 (17) 1 200 (20) 1 500 (25)	800 (10) 1 040 (13) 1 200 (15) 1 520 (19) 1 920 (24) 3 000 (30)
Pitch of mounting holes F		60	30	60	80	100	120
E		30	15	30	40	50	60
Standard E or higher dimensions ⁽¹⁾ below		9	9	12	15	18	23
Maximum length ⁽²⁾		1 980 (3 000)	1 980 (3 000)	3 000 (3 960)	2 960 (4 000)	3 000 (4 000)	3 000 (3 960)

Notes ⁽¹⁾ Not applicable to female threads for bellows (supplemental code "J").

⁽²⁾ Length up to the value in () can be produced. If needed, please contact IKO.

⁽³⁾ This indicates the dimension for the half pitch mounting holes specification of track rail.

Remark: If not directed, E dimensions for both ends will be the same within the range of standard E dimensions. To change the dimensions, indicate the specified rail mounting hole positions "E" of special specification. For more information, see page III-30.

– Preload Amount · Accuracy Class –

5 Preload amount	Standard : No symbol Light preload : T ₁ Medium preload : T ₂ Heavy preload : T ₃	For details of the preload amount, see Table 3.
6 Accuracy class	High : H Precision : P Super precision : SP Ultra precision : UP	For details of accuracy class, see Table 4.

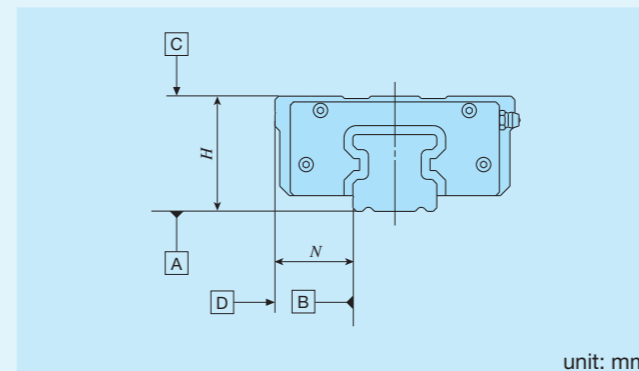
Table 3 Preload amount

Preload type	Item	Preload symbol	Preload amount N	Operational conditions
Standard	(No symbol)		0 ⁽¹⁾	· Light and precise motion
Light preload	T ₁		0.02 C ₀	· Almost no vibrations · Load is evenly balanced · Light and precise motion
Medium preload	T ₂		0.05 C ₀	· Medium vibration · Medium overhung load
Heavy preload	T ₃		0.08 C ₀	· Operation with vibration and / or shock · Overhanging load applied · Heavy cutting

Note ⁽¹⁾ Indicates zero or minimal amount of preload.

Remark: C₀ indicates the basic static load rating.

Table 4 Tolerance and allowance



Item	Class (classification symbol)			
	High (H)	Precision (P)	Super precision (SP)	Ultra precision (UP)
Dim. H tolerance	±0.040	±0.020	±0.010	±0.008
Dim. N tolerance	±0.050	±0.025	±0.015	±0.010
Dim. variation of H ⁽¹⁾	0.015	0.007	0.005	0.003
Dim. variation of N ⁽¹⁾	0.020	0.010	0.007	0.003
Dim. variation of H for multiple assembled sets	0.035	0.025	—	—
Parallelism in operation of the slide unit C surface to A surface	See Fig. 1			
Parallelism in operation of the slide unit D surface to B surface	See Fig. 1			

Note ⁽¹⁾ It means the size variation between slide units mounted on the same track rail.

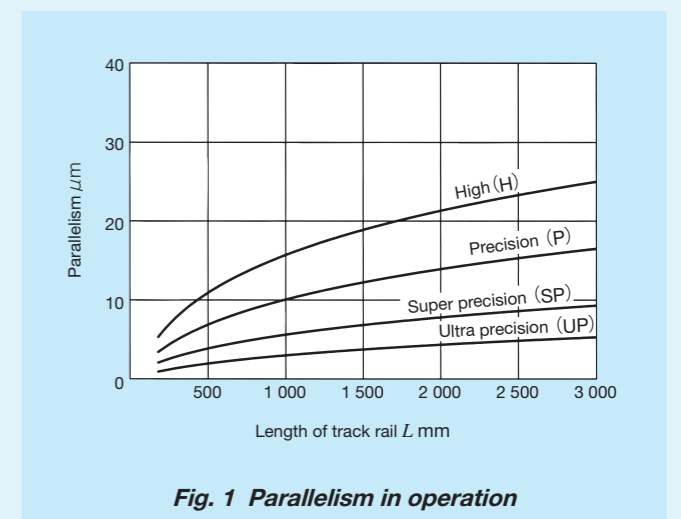


Fig. 1 Parallelism in operation

Lubrication

Lithium-soap base grease with extreme-pressure additive (Alvania EP Grease 2 [SHOWA SHELL SEKIYU K. K.]) is pre-packed in LRWX series. LRWX series has grease nipple as indicated in Table 10.

Table 10 Parts for lubrication

Size	Grease nipple type (1)	Applicable supply nozzle type	Bolt size of female threads for piping
25	JIS type 1	Grease gun available on the market	M6
35			
45	JIS type 2		PT1/8
55			
75			

Note (1) For grease nipple specification, see Table 14.2 on page III-23.
Remark: Stainless steel grease nipple is also available. If needed, please contact IKO.

Dust Protection

The slide units of LRWX series are equipped with end seals and under seals as standard for dust protection. However, if large amount of contaminant or dust are floating, or if large particles of foreign substances such as chips or sand may adhere to the track rail, it is recommended to cover the whole unit with bellows or telescope type shield, etc. LRWX series is provided with specific bellows. The bellows are easy to mount and provide excellent dust protection. If



needed, please refer to III-26 for ordering.

Precaution for Use

1 Mounting surface, reference mounting surface and typical mounting structure

When mounting the LRWX series, properly align the reference mounting surfaces B and D of the track rail and slide unit with the reference mounting surface of the table and bed and fix them. (See Fig. 3)

Reference mounting surfaces B and D and mounting surfaces A and C are ground precisely. Machining the mounting surface of the table and bed, such as machine or device, to high accuracy and mounting them properly will ensure stable linear motion with high accuracy.

Reference mounting surface of the slide unit is the opposite side of the  mark. The track rail reference mounting surface is identified by locating the  mark on the top surface of the track rail. It is the side surface above the mark (in the direction of the arrow). (See Fig. 4)

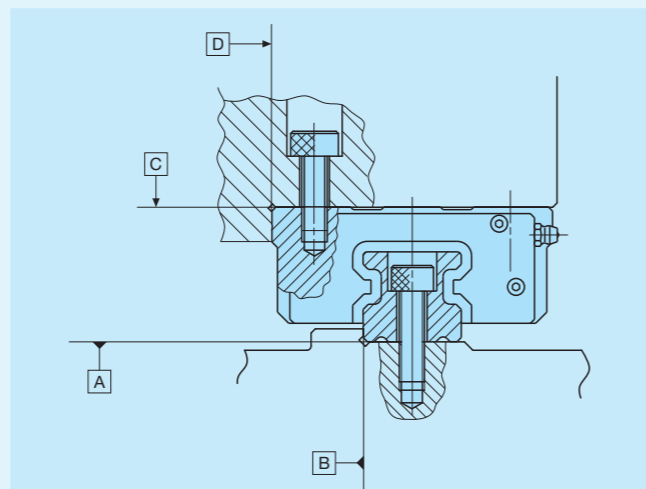


Fig. 3 Reference mounting surface and typical mounting structure

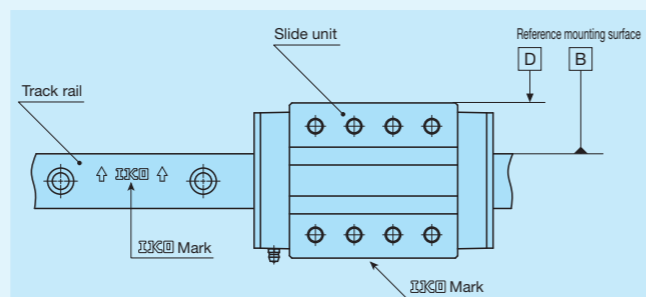


Fig. 4 Reference mounting surface

2 Fixing the slide unit

Slide unit of LRWX25... B and LRWXH is also provided with mounting holes in the middle of width direction (see Fig. 5) and has the arrangement to receive the applied load in a good balance. When designing machines or equipment, consider the arrangement so that the mounting holes in the middle of slide unit can also be used to fix the units, to use the highest performance out of the product.

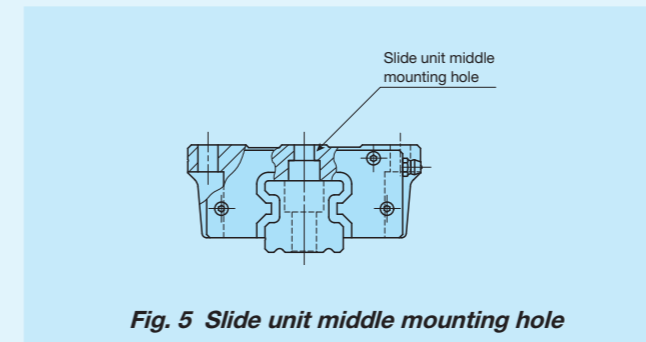


Fig. 5 Slide unit middle mounting hole

3 Shoulder height and corner radius of the reference mounting surface

For the opposite corner of the mating reference mounting, it is recommended to have relieved fillet as indicated in Fig. 6, but you may also use it with providing corner radius R as shown in Table 11. Recommended value for the shoulder height and corner radius on the mating side is indicated in Table 11.

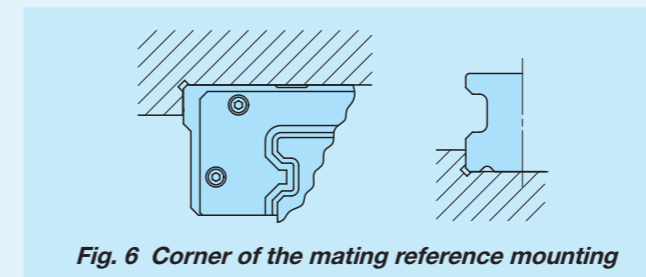


Fig. 6 Corner of the mating reference mounting

Table 11 Shoulder height and corner radius of the reference mounting surface

Size	Shoulder height of slide unit mounting part	Shoulder height of track rail mounting part	Corner radius R (Maximum)
	h_1	h_2	
25	6	4	1
35	8	5.5	1
45	8	6	1
55	10	8	1.5
75	10	8	1.5

unit: mm

4 Tightening torque for fixing screw

Typical tightening torque for mounting of the LRWX series to the steel mating member material is indicated in Table 12. When vibration and shock of the machine or device are large, fluctuating load is large, or moment load is applied, fix it by using the torque 1.2 to 1.5 times larger than the value indicated in the table as necessary. If the mating member material is cast iron or aluminum alloy, reduce the tightening torque depending on the strength characteristics of the mating member material.

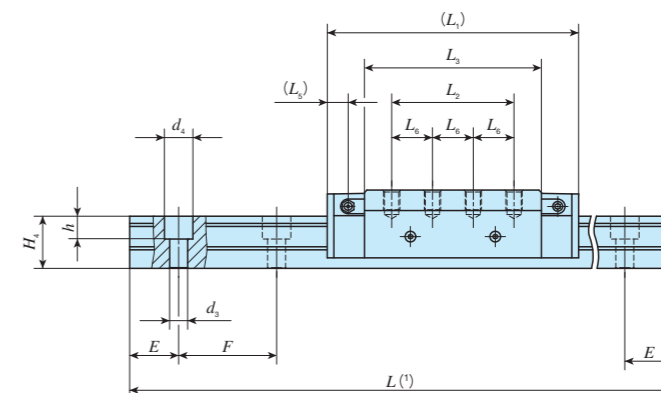
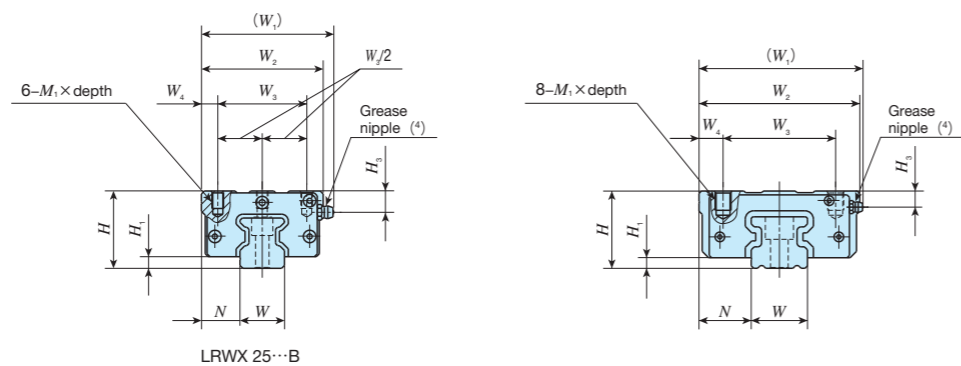
Table 12 Tightening torque for fixing screw

Bolt size	Tightening torque N · m
	High carbon steel-made screw
M 6×1	13.6
M 8×1.25	32.7
M10×1.5	63.9
M12×1.75	110
M16×2	268
M24×3	749

Remark: The tightening torque is calculated based on strength division 12.9 for product size up to 55, and strength division 10.9 for product size 75.

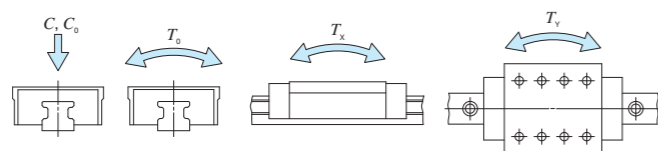
Block type mounting from top

Shape	LRWX...B				
Size	25	35	45	55	75



Identification number	Mass (Ref.)		Dimensions of assembly mm			Dimensions of slide unit mm										Dimensions of track rail mm						Appended mounting bolt for track rail ⁽²⁾	Basic dynamic load rating ⁽³⁾ C	Basic static load rating ⁽³⁾ C ₀	Static moment rating ⁽³⁾				
	Slide unit kg	Track rail kg/m	H	H ₁	N	W ₁	W ₂	W ₃	W ₄	L ₁	L ₂	L ₃	L ₅	L ₆	M ₁ × depth	H ₃	W	H ₄	d ₃	d ₄	h				E	F	Bolt size × ℓ	N	N
LRWX 25...B	0.93	3.70	40	6	20	69	63	46	8.5	109	45	74.4	11	—	M 6 × 9	11	23	26	7	11	9	30	60	M 6 × 28	32 700	70 300	1 110	885 5 170	885 5 170
LRWX 35...B	2.65	6.66	48	6.5	32.5	103	100	70	15	154	75	108.4	12.8	25	M10 × 12	10	35	32	11	17.5	14	30	60	M10 × 35	49 900	91 100	2 150	1 660 9 450	1 660 9 450
LRWX 45...B	5.32	10.3	60	8	37.5	125	120	82	19	205	105	144	18.5	35	M12 × 16	14.5	45	39	14	20	16	40	80	M12 × 40	93 300	167 000	5 000	4 030 23 000	4 030 23 000
LRWX 55...B	9.09	15.3	70	9	42.5	142	140	95	22.5	262	135	189	24.5	45	M12 × 18	16	55	47	18	26	21	50	100	M16 × 50	186 000	330 000	12 200	10 700 57 900	10 700 57 900
LRWX 75...B	19.0	25.1	90	10	52.5	190	180	123	28.5	346	180	240	45	60	M16 × 25	20	75	57	26	39	30	60	120	M24 × 60	298 000	518 000	25 200	20 900 121 000	20 900 121 000

- Notes ⁽¹⁾ Track rail lengths *L* are shown in Table 2 on page II-221.
⁽²⁾ The appended track rail mounting bolts are hexagon socket head bolts equivalent to JIS B 1176.
⁽³⁾ The direction of basic dynamic load rating (*C*), basic static load rating (*C₀*), and static moment rating (*T₀*, *T_x*, *T_y*) are shown in the sketches below. The upper values of *T_x* and *T_y* are for one slide unit and the lower values are for two slide units in close contact.
⁽⁴⁾ The shapes of grease nipple vary by size. The specifications are shown in Table 10 on page II-225.



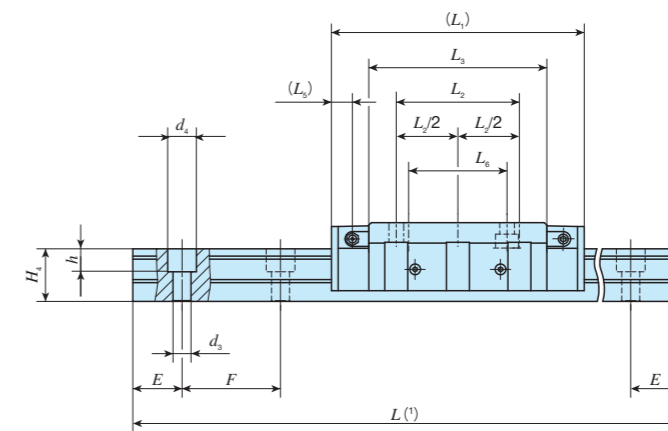
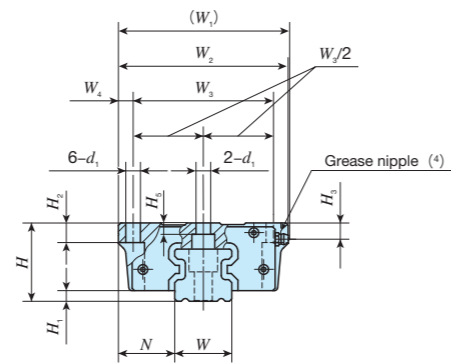
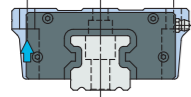
Example of identification number of assembled set

Model code	Dimensions	Part code	Model code	Preload symbol	Classification symbol	Supplemental code
LRWX	35	C2	R840	B	T ₁	P /W2
①	②	③	④	⑤	⑥	⑦
① Model LRWX...B Block type mounting from top	② Size 25, 35, 45, 55, 75	③ Number of slide unit (2)	④ Length of track rail (840 mm)	⑤ Preload amount No symbol Standard T ₁ Light preload T ₂ Medium preload T ₃ Heavy preload	⑥ Accuracy class H High P Precision SP Super precision UP Ultra precision	⑦ Special specification A, D, E, F, HP, I, J L, LF, O, V, W, Y, Z

IKO Linear Roller Way X

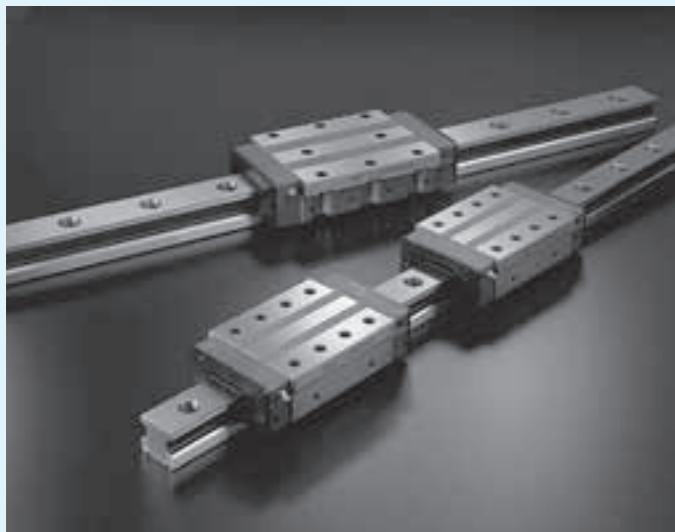
Flange type mounting from bottom

Shape	LRWXH			
Size	35	45	55	75



Identification number	Mass (Ref.)		Dimensions of assembly mm			Dimensions of slide unit mm											Dimensions of track rail mm						Appended mounting bolt for track rail (2)	Basic dynamic load rating (3)	Basic static load rating (3)	Static moment rating (3)																																																																																																																																																																																																																																																																																																																																																																																																																																				
	Slide unit kg	Track rail kg/m	H	H ₁	N	W ₁	W ₂	W ₃	W ₄	W ₅	W ₆	W ₇	W ₈	W ₉	W ₁₀	W ₁₁	W ₁₂	W ₁₃	W ₁₄	W ₁₅	W ₁₆	W ₁₇				W ₁₈	W ₁₉	W ₂₀	W ₂₁	W ₂₂	W ₂₃	W ₂₄	W ₂₅	W ₂₆	W ₂₇	W ₂₈	W ₂₉	W ₃₀	W ₃₁	W ₃₂	W ₃₃	W ₃₄	W ₃₅	W ₃₆	W ₃₇	W ₃₈	W ₃₉	W ₄₀	W ₄₁	W ₄₂	W ₄₃	W ₄₄	W ₄₅	W ₄₆	W ₄₇	W ₄₈	W ₄₉	W ₅₀	W ₅₁	W ₅₂	W ₅₃	W ₅₄	W ₅₅	W ₅₆	W ₅₇	W ₅₈	W ₅₉	W ₆₀	W ₆₁	W ₆₂	W ₆₃	W ₆₄	W ₆₅	W ₆₆	W ₆₇	W ₆₈	W ₆₉	W ₇₀	W ₇₁	W ₇₂	W ₇₃	W ₇₄	W ₇₅	W ₇₆	W ₇₇	W ₇₈	W ₇₉	W ₈₀	W ₈₁	W ₈₂	W ₈₃	W ₈₄	W ₈₅	W ₈₆	W ₈₇	W ₈₈	W ₈₉	W ₉₀	W ₉₁	W ₉₂	W ₉₃	W ₉₄	W ₉₅	W ₉₆	W ₉₇	W ₉₈	W ₉₉	W ₁₀₀	W ₁₀₁	W ₁₀₂	W ₁₀₃	W ₁₀₄	W ₁₀₅	W ₁₀₆	W ₁₀₇	W ₁₀₈	W ₁₀₉	W ₁₁₀	W ₁₁₁	W ₁₁₂	W ₁₁₃	W ₁₁₄	W ₁₁₅	W ₁₁₆	W ₁₁₇	W ₁₁₈	W ₁₁₉	W ₁₂₀	W ₁₂₁	W ₁₂₂	W ₁₂₃	W ₁₂₄	W ₁₂₅	W ₁₂₆	W ₁₂₇	W ₁₂₈	W ₁₂₉	W ₁₃₀	W ₁₃₁	W ₁₃₂	W ₁₃₃	W ₁₃₄	W ₁₃₅	W ₁₃₆	W ₁₃₇	W ₁₃₈	W ₁₃₉	W ₁₄₀	W ₁₄₁	W ₁₄₂	W ₁₄₃	W ₁₄₄	W ₁₄₅	W ₁₄₆	W ₁₄₇	W ₁₄₈	W ₁₄₉	W ₁₅₀	W ₁₅₁	W ₁₅₂	W ₁₅₃	W ₁₅₄	W ₁₅₅	W ₁₅₆	W ₁₅₇	W ₁₅₈	W ₁₅₉	W ₁₆₀	W ₁₆₁	W ₁₆₂	W ₁₆₃	W ₁₆₄	W ₁₆₅	W ₁₆₆	W ₁₆₇	W ₁₆₈	W ₁₆₉	W ₁₇₀	W ₁₇₁	W ₁₇₂	W ₁₇₃	W ₁₇₄	W ₁₇₅	W ₁₇₆	W ₁₇₇	W ₁₇₈	W ₁₇₉	W ₁₈₀	W ₁₈₁	W ₁₈₂	W ₁₈₃	W ₁₈₄	W ₁₈₅	W ₁₈₆	W ₁₈₇	W ₁₈₈	W ₁₈₉	W ₁₉₀	W ₁₉₁	W ₁₉₂	W ₁₉₃	W ₁₉₄	W ₁₉₅	W ₁₉₆	W ₁₉₇	W ₁₉₈	W ₁₉₉	W ₂₀₀	W ₂₀₁	W ₂₀₂	W ₂₀₃	W ₂₀₄	W ₂₀₅	W ₂₀₆	W ₂₀₇	W ₂₀₈	W ₂₀₉	W ₂₁₀	W ₂₁₁	W ₂₁₂	W ₂₁₃	W ₂₁₄	W ₂₁₅	W ₂₁₆	W ₂₁₇	W ₂₁₈	W ₂₁₉	W ₂₂₀	W ₂₂₁	W ₂₂₂	W ₂₂₃	W ₂₂₄	W ₂₂₅	W ₂₂₆	W ₂₂₇	W ₂₂₈	W ₂₂₉	W ₂₃₀	W ₂₃₁	W ₂₃₂	W ₂₃₃	W ₂₃₄	W ₂₃₅	W ₂₃₆	W ₂₃₇	W ₂₃₈	W ₂₃₉	W ₂₄₀	W ₂₄₁	W ₂₄₂	W ₂₄₃	W ₂₄₄	W ₂₄₅	W ₂₄₆	W ₂₄₇	W ₂₄₈	W ₂₄₉	W ₂₅₀	W ₂₅₁	W ₂₅₂	W ₂₅₃	W ₂₅₄	W ₂₅₅	W ₂₅₆	W ₂₅₇	W ₂₅₈	W ₂₅₉	W ₂₆₀	W ₂₆₁	W ₂₆₂	W ₂₆₃	W ₂₆₄	W ₂₆₅	W ₂₆₆	W ₂₆₇	W ₂₆₈	W ₂₆₉	W ₂₇₀	W ₂₇₁	W ₂₇₂	W ₂₇₃	W ₂₇₄	W ₂₇₅	W ₂₇₆	W ₂₇₇	W ₂₇₈	W ₂₇₉	W ₂₈₀	W ₂₈₁	W ₂₈₂	W ₂₈₃	W ₂₈₄	W ₂₈₅	W ₂₈₆	W ₂₈₇	W ₂₈₈	W ₂₈₉	W ₂₉₀	W ₂₉₁	W ₂₉₂	W ₂₉₃	W ₂₉₄	W ₂₉₅	W ₂₉₆	W ₂₉₇	W ₂₉₈	W ₂₉₉	W ₃₀₀	W ₃₀₁	W ₃₀₂	W ₃₀₃	W ₃₀₄	W ₃₀₅	W ₃₀₆	W ₃₀₇	W ₃₀₈	W ₃₀₉	W ₃₁₀	W ₃₁₁	W ₃₁₂	W ₃₁₃	W ₃₁₄	W ₃₁₅	W ₃₁₆	W ₃₁₇	W ₃₁₈	W ₃₁₉	W ₃₂₀	W ₃₂₁	W ₃₂₂	W ₃₂₃	W ₃₂₄	W ₃₂₅	W ₃₂₆	W ₃₂₇	W ₃₂₈	W ₃₂₉	W ₃₃₀	W ₃₃₁	W ₃₃₂	W ₃₃₃	W ₃₃₄	W ₃₃₅	W ₃₃₆	W ₃₃₇	W ₃₃₈	W ₃₃₉	W ₃₄₀	W ₃₄₁	W ₃₄₂	W ₃₄₃	W ₃₄₄	W ₃₄₅	W ₃₄₆	W ₃₄₇	W ₃₄₈	W ₃₄₉	W ₃₅₀	W ₃₅₁	W ₃₅₂	W ₃₅₃	W ₃₅₄	W ₃₅₅	W ₃₅₆	W ₃₅₇	W ₃₅₈	W ₃₅₉	W ₃₆₀	W ₃₆₁	W ₃₆₂	W ₃₆₃	W ₃₆₄	W ₃₆₅	W ₃₆₆	W ₃₆₇	W ₃₆₈	W ₃₆₉	W ₃₇₀	W ₃₇₁	W ₃₇₂	W ₃₇₃	W ₃₇₄	W ₃₇₅	W ₃₇₆	W ₃₇₇	W ₃₇₈	W ₃₇₉	W ₃₈₀	W ₃₈₁	W ₃₈₂	W ₃₈₃	W ₃₈₄	W ₃₈₅	W ₃₈₆	W ₃₈₇	W ₃₈₈	W ₃₈₉	W ₃₉₀	W ₃₉₁	W ₃₉₂	W ₃₉₃	W ₃₉₄	W ₃₉₅	W ₃₉₆	W ₃₉₇	W ₃₉₈	W ₃₉₉	W ₄₀₀	W ₄₀₁	W ₄₀₂	W ₄₀₃	W ₄₀₄	W ₄₀₅	W ₄₀₆	W ₄₀₇	W ₄₀₈	W ₄₀₉	W ₄₁₀	W ₄₁₁	W ₄₁₂	W ₄₁₃	W ₄₁₄	W ₄₁₅	W ₄₁₆	W ₄₁₇	W ₄₁₈	W ₄₁₉	W ₄₂₀	W ₄₂₁	W ₄₂₂	W ₄₂₃	W ₄₂₄	W ₄₂₅	W ₄₂₆	W ₄₂₇	W ₄₂₈	W ₄₂₉	W ₄₃₀	W ₄₃₁	W ₄₃₂	W ₄₃₃	W ₄₃₄	W ₄₃₅	W ₄₃₆	W ₄₃₇	W ₄₃₈

Linear Way Module



Linear Way Module

LWLM LWM



LRWM

Points

● Compact module type

Compact linear motion rolling guides consisting of a set of track rail and slide member which forms the smallest unit of linear motion mechanism.

● Models for various usage

Three models are available; LWLM and LWM using the ball for rolling elements, and LRWM using the roller.

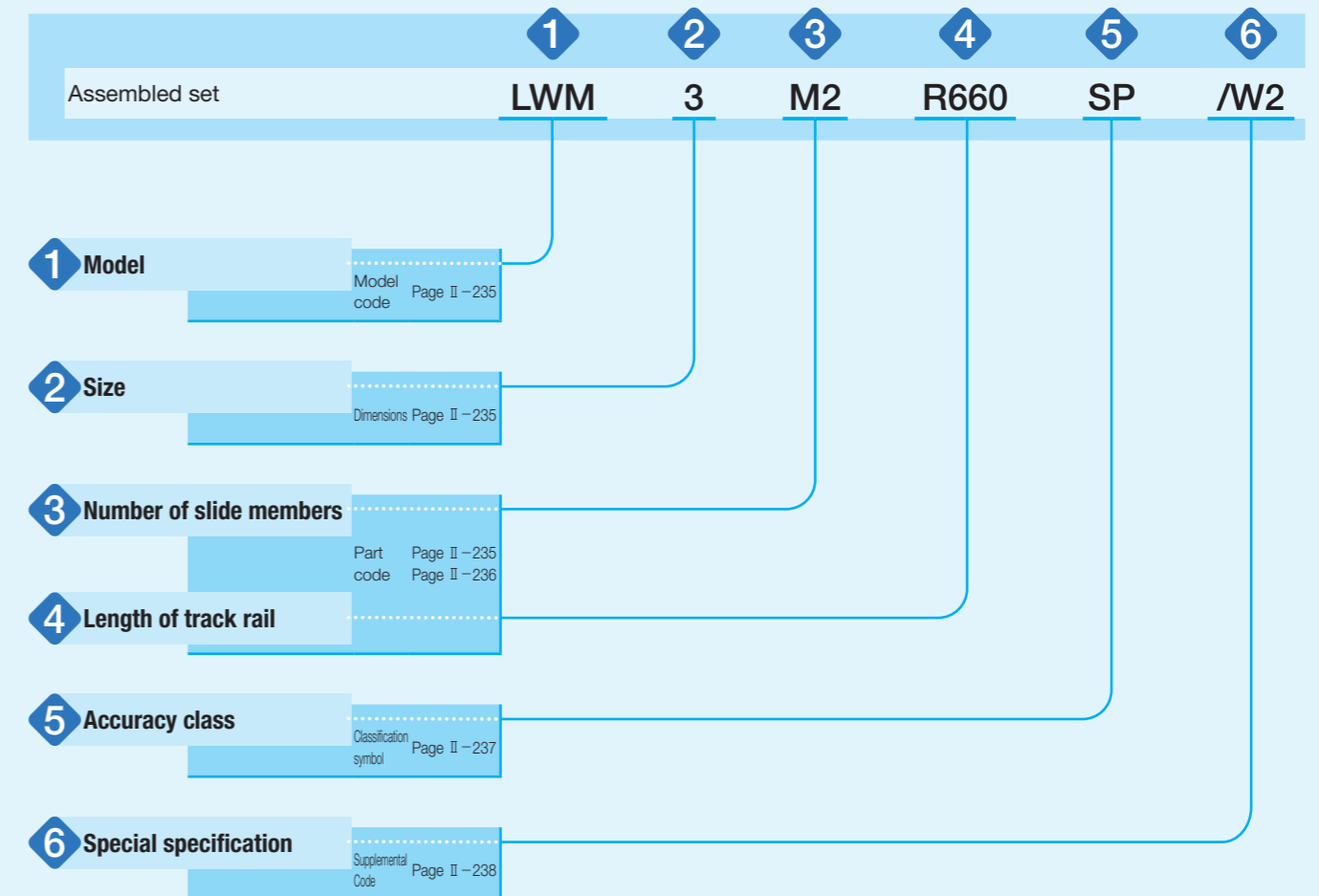
● Stainless steel selections for excellent corrosion resistance

LWLM is made of stainless steel of excellent corrosion resistance. They are suitable for applications where rust prevention oil is not preferred, such as in cleanroom environment.

Identification Number and Specification

Example of an identification number

The specification of Linear Way Module series is indicated by the identification number. Indicate the identification number, consisting of a model code, dimensions, a part code, a classification symbol, and any supplemental codes for each specification to apply.



Identification Number and Specification —Model · Size · Number of Slide Member—

1 Model	Linear Way Module	Linear Way LM ⁽¹⁾	: LWLM
		Linear Way M ⁽¹⁾	: LWM
		Linear Roller Way M ⁽¹⁾	: LRWM
For applicable models and sizes, see Table 1.1, 1.2 and 1.3.			
Note ⁽¹⁾ This model has no built-in C-Lube.			
2 Size	7, 9, 11	For applicable models and sizes, see Table 1.1, 1.2 and 1.3.	
	1, 2, 3, 4, 5, 6		
3 Number of slide members		: M○	Indicates the number of slide members assembled on a track rail.

Table 1.1 Model and sizes of LWLM series

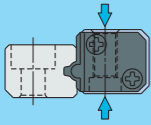
Shape	Model	Size		
		7	9	11
	LWLM	○	○	○

Table 1.2 Model and sizes of LWM series

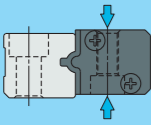
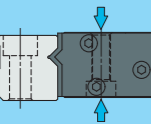
Shape	Model	Size					
		1	2	3	4	5	6
	LWM	○	○	○	○	○	○

Table 1.3 Model and sizes of LRWM series

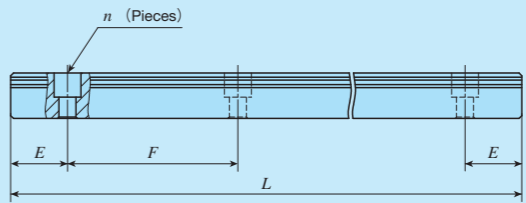
Shape	Model	Size				
		2	3	4	5	6
	LRWM	○	○	○	○	○

—Length of Track Rail—

4 Length of track rail		: R○	Indicate the length of track rail in mm. For standard and maximum lengths, see Table 2.
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Table 2 Standard and maximum lengths of track rail

unit: mm



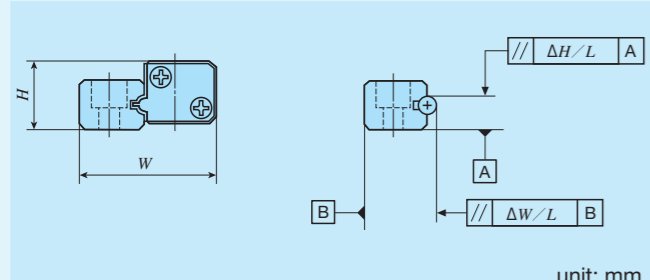
Item	Identification number	LWLM7	LWLM9	LWLM11			
Standard length L (n)		60 (3)	100 (4)	160 (4)			
		80 (4)	150 (6)	240 (6)			
		120 (6)	200 (8)	320 (8)			
		160 (8)	275 (11)	440 (11)			
Pitch of mounting holes F		20	25	40			
E	Standard E	10	12.5	20			
	or higher dimensions below	4.5	5	5.5			
Maximum length ⁽¹⁾		240 (500)	350 (900)	520 (1 000)			
Item	Identification number	LWM1	LWM2	LWM3	LWM4	LWM5	LWM6
Standard length L (n)		240 (6)	240 (4)	480 (8)	800 (10)	800 (8)	1 200 (10)
		360 (9)	360 (6)	660 (11)	1 040 (13)	1 200 (12)	1 920 (16)
		480 (12)	480 (8)	840 (14)	1 200 (15)	1 500 (15)	2 520 (21)
Pitch of mounting holes F		40	60	60	80	100	120
E	Standard E	20	30	30	40	50	60
	or higher dimensions below	7	8	9	10	12	13
Maximum length		27	38	39	50	62	73
Maximum length		1 240	1 260	1 260	1 520	1 500	2 520
Item	Identification number	LRWM2	LRWM3	LRWM4	LRWM5	LRWM6	
Standard length L (n)		480 (8)	480 (8)	800 (10)	800 (8)	1 200 (10)	
		660 (11)	660 (11)	1 040 (13)	1 200 (12)		
		840 (14)	840 (14)	1 200 (15)	1 500 (15)		
Pitch of mounting holes F		60	60	80	100	120	
E	Standard E	30	30	40	50	60	
	or higher dimensions below	8	9	10	12	13	
Maximum length		38	39	50	62	73	
Maximum length		1 800	1 860	1 920	1 600	1 200	

Note ⁽¹⁾ Length up to the value in () can be produced. If needed, please contact IKO.
Remark: If not directed, E dimensions for both ends will be the same within the range of standard E dimensions. To change the dimensions, indicate the specified rail mounting hole positions "/ E " of special specification. For more information, see page III -30.

—Accuracy Class—

5 Accuracy class	High	: H	For details of accuracy class, see Table 3.
	Precision	: P	
	Super precision	: SP	

Table 3 Tolerance and allowance



unit: mm			
Class (classification symbol)	High (H)	Precision (P)	Super precision (SP)
Dim. <i>H</i> tolerance	±0.040	±0.020	±0.010
Dim. <i>W</i> tolerance	±0.050	±0.025	±0.015
Dim. variation of <i>H</i> ⁽¹⁾	0.015	0.007	0.005
Dim. variation of <i>W</i> ⁽¹⁾	0.020	0.010	0.007
Track rail parallelism Δ <i>H</i>	See Fig. 1.1 and Fig. 1.2		
Track rail parallelism Δ <i>W</i>	See Fig. 1.1 and Fig. 1.2		

Note (1) It means the size variation between slide members mounted on the same track rail.

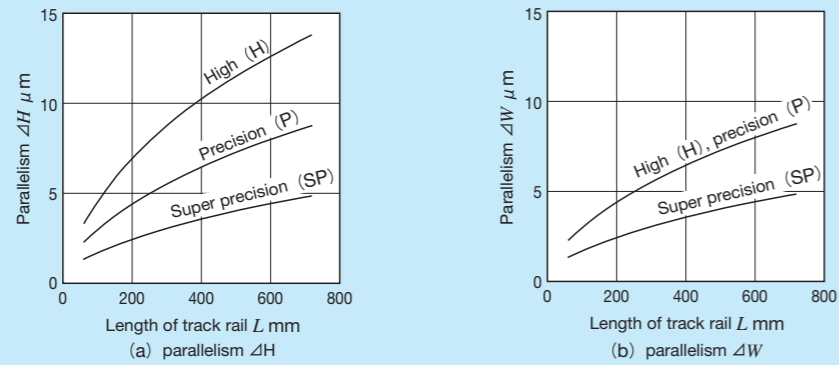


Fig. 1.1 Track rail parallelism for LWLM

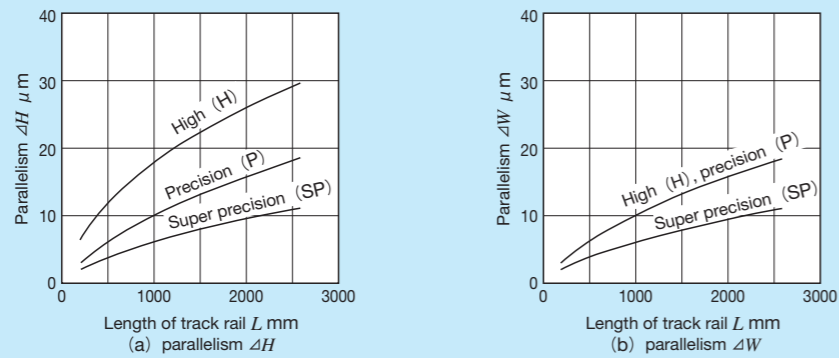


Fig. 1.2 Track rail parallelism for LWM and LRWM

—Special Specification—

6 Special specification	/A, /E, /F, /I, /LR, /LFR, /MN, /W○, /Y○	For applicable special specifications, see Table 4. For combination of multiple special specifications, see Table 5. For details of special specifications, see page III-29.
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Table 4 Application of special specifications

Special specification	Supplemental code	Model and size								
		LWLM			LWM, LRWM					
		7	9	11	1	2	3	4	5	6
Butt-jointing track rails	/A	×	×	×	○	○	○	○	○	○
Specified rail mounting hole positions	/E	○	○	○	○	○	○	○	○	○
Caps for rail mounting holes	/F	×	×	×	○	○	○	○	○	○
Inspection sheet	/I	○	○	○	○	○	○	○	○	○
Black chrome surface treatment	/LR	×	×	×	○	○	○	○	○	○
Fluorine black chrome surface treatment	/LFR	×	×	×	○	○	○	○	○	○
Without track rail mounting bolt	/MN	○	○	○	○ ⁽¹⁾	○ ⁽¹⁾	○ ⁽¹⁾	○ ⁽¹⁾	○ ⁽¹⁾	○ ⁽¹⁾
A group of multiple assembled sets	/W○	○	○	○	○	○	○	○	○	○
Specified grease	/Y○	○	○	○	○	○	○	○	○	○

Note (1) None of mounting bolts for slide member and track rail are appended.

Table 5 Combination of supplemental codes

E	-								
F	○	○							
I	○	○	○						
LR	○	○	○	○					
LFR	○	○	○	○	-				
MN	○	○	○	○	○	○			
W	○	-	○	○	○	○	○		
Y	○	○	○	○	○	○	○	○	
	A	E	F	I	LR	LFR	MN	W	

Remarks 1. The combination of "-" shown in the table is not available.

2. When using multiple types for combination, please indicate by arranging the symbols in alphabetical order.

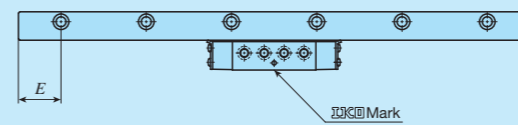


Fig. 2 Specified rail mounting hole positions (Supplemental code /E)

Remark: For details of specified rail mounting hole positions (supplemental code /E), see page III-30.

Lubrication

Lithium-soap base grease with extreme-pressure additive (Alvania EP Grease 2 [SHOWA SHELL SEKIYU K. K.]) is pre-packed in Linear Way Module series. Though grease nipples are not appended to Linear Way Module series, oil holes are provided to slide member so that the grease or lubrication oil supplied from machines / devices is directly guided to the rolling elements recirculation route. Lubrication is easily conducted by providing the supply route in the machines / devices as shown in Fig. 3.

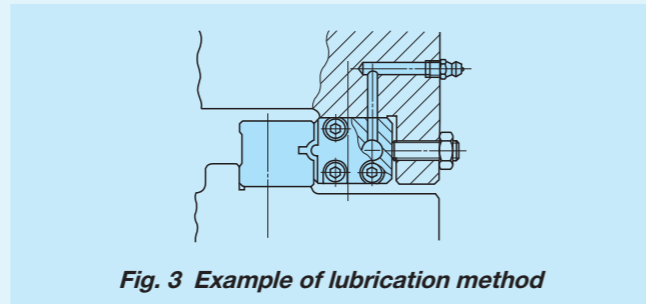


Fig. 3 Example of lubrication method

Dust Protection

The slide members of Linear Way Module series are equipped with end seals as standard for dust protection. However, if large amount of contaminant or dust are floating, or if large

particles of foreign substances such as chips or sand may adhere to the track rail, it is recommended to cover the whole unit with bellows or telescope type shield, etc.

Precaution for Use

1 Mounting surface, reference mounting surface and typical mounting structure

When mounting the Linear Way Module series, properly align the reference mounting surfaces B and D of the track rail and slide member with the reference mounting surface of the table and bed and fix them. (See Fig. 4) The reference mounting surfaces B and D and mounting surfaces A and C are precisely ground. Machining the mounting surface of the table and bed, such as machine or device, to high accuracy and mounting them properly will ensure stable linear motion with high accuracy.

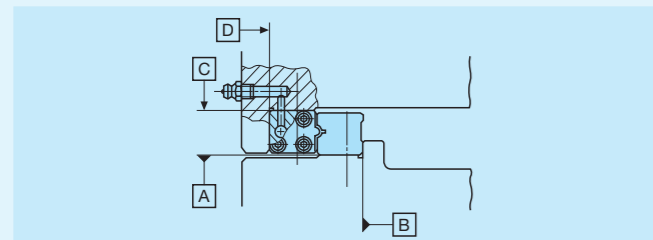


Fig. 4 Reference mounting surface and typical mounting structure

2 Fixing the slide member

Typical mounting structure of Linear Way Module series is shown in Fig. 5. As a convenient means to eliminate play or to give preload in linear motion rolling mechanism, preload adjusting screws are often used.

Set the preload adjusting screws at the positions of fixing bolts of slide member and in the middle of the height of slide member, and then press the slide member by tightening the screw.

For mounting the slide member of Linear Way Module LWLM, it is recommended to fix the slide member from the table side, because the allowance for the preload adjustment in the bolt hole of slide member is small. In this case, the bolt hole and the counterbore in the table should be made larger to give the adjustment allowance.

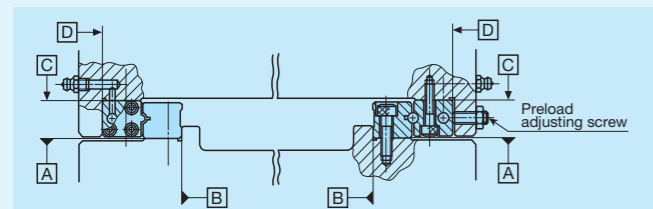


Fig. 5 Mounting by preload adjusting screws

Preload amount varies depending on operational conditions of your machine and device. However, as excessive preload may lead to short life and damage on the raceway, it is typically ideal to adjust to zero clearance or slight preload state.

3 Shoulder height and corner radius of the reference mounting surface

For the opposite corner of the mating reference mounting, it is recommended to have relieved fillet as indicated in Fig. 6. Recommended value for the shoulder height and corner radius on the mating side is indicated in Table 7.1, Table 7.2 and Table 7.3.

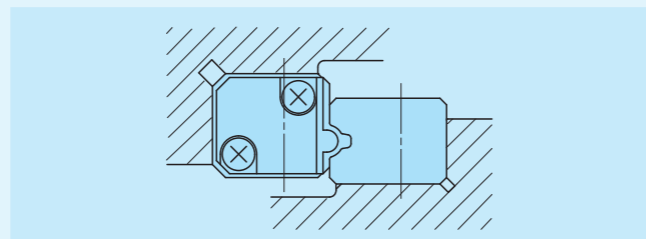


Fig. 6 Corner of the mating reference mounting

4 Tightening torque for fixing screw

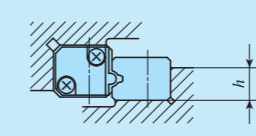
Typical tightening torque for mounting of Linear Way Module series to the steel mating member material is indicated in Table 6. When vibration and shock of the machine or device are large, fluctuating load is large, or moment load is applied, fix it by using the torque 1.2 to 1.5 times larger than the value indicated in the table as necessary. If the mating member material is cast iron or aluminum alloy, reduce the tightening torque depending on the strength characteristics of the mating member material.

Table 6 Tightening torque for fixing screw

Bolt size	Tightening torque N · m	
	High carbon steel-made screw	Stainless steel-made screw
M 2.6×0.45	—	0.7
M 3 ×0.5	1.8	1.1
M 4 ×0.7	4.1	—
M 5 ×0.8	8.0	—
M 6 ×1	13.6	—
M 8 ×1.25	32.7	—
M10 ×1.5	63.9	—
M12 ×1.75	110	—

Remark: The tightening torque is calculated based on strength division 12.9 and property division A2-70.

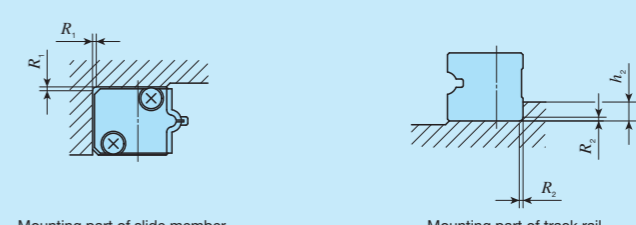
Table 7.1 Shoulder height of the reference mounting surface for LWLM



unit: mm

Size	Mounting part of track rail shoulder height h
7	4
9	5
11	6

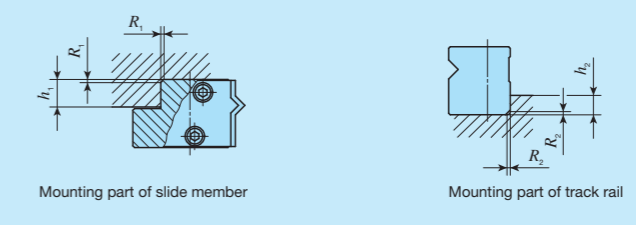
Table 7.2 Shoulder height and corner radius of the reference mounting surface for LWM



unit: mm

Size	Mounting part of slide member Corner radius R_1 (Maximum)	Mounting part of track rail	
		Shoulder height h_2	Corner radius R_2 (Maximum)
1	0.8	4	0.8
2	1	5	1
3	1	5	1
4	1.5	6	1
5	1.5	6	1
6	1.5	8	1.5

Table 7.3 Shoulder height and corner radius of the reference mounting surface for LRWM

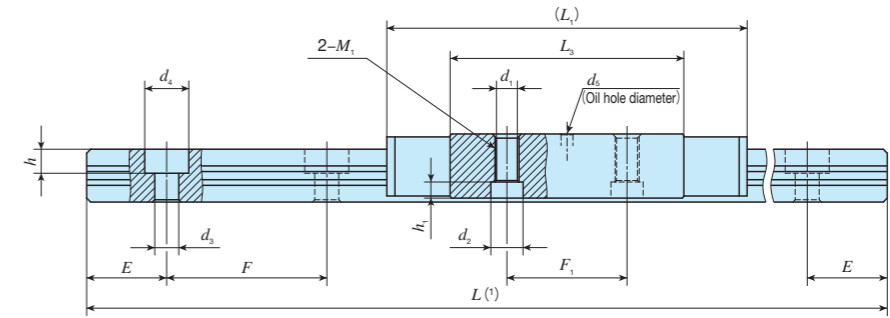
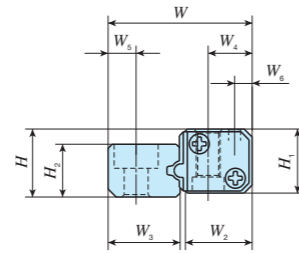


unit: mm

Size	Mounting part of slide member		Mounting part of track rail	
	Shoulder height h_1	Corner radius R_1 (Maximum)	Shoulder height h_2	Corner radius R_2 (Maximum)
2	7	1	5	1
3	8.5	1	6	1
4	10.5	1.5	6	1
5	12.5	1.5	8	1
6	14.5	2	8	1.5

IKO Linear Way Module

Linear Way LM			
Shape	LWLM		
Size	7	9	11



Identification number	Mass (Ref.)		Dimensions of assembly mm		Dimensions of slide member mm										Dimensions of track rail mm						Appended mounting bolt for track rail ⁽²⁾	Basic dynamic load rating ⁽³⁾	Basic static load rating ⁽³⁾				
	Slide member g	Track rail g/m	H	W	H ₁	W ₂	W ₄	W ₆	L ₁	L ₃	F ₁	d ₁	d ₂	h ₁	M ₁	d ₅	H ₂	W ₃	W ₅	d ₃				d ₄	h	E	F
LWLM 7*	10	210	7	15	6.6	7.8	5	2.5	38	24	12	—	—	—	M2.6	1	4.8	6.8	3.3	3 ⁽⁴⁾	— ⁽⁴⁾	— ⁽⁴⁾	10	20	M2.6 × 8 ⁽⁴⁾	1 730	2 020
LWLM 9*	16	390	8.5	18	8	8.6	5.5	2.2	45	29.2	15	—	—	—	M3	1.5	6.6	9	3.5	3	5.5	3	12.5	25	M2.6 × 8	2 780	3 150
LWLM 11*	32	590	11	23	10	11.8	7	3	52	32.8	15	2.55	5	3	M3	2	8	10.8	5	3.5	6	4.5	20	40	M3 × 8	4 080	4 240

Notes ⁽¹⁾ Track rail lengths L are shown in Table 2 on page II - 236.

⁽²⁾ The appended mounting bolts are stainless steel hexagon socket head bolts equivalent to JIS B 1176.

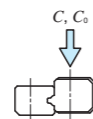
⁽³⁾ The direction of basic dynamic load rating (C) and basic static load rating (C_0) are shown in the sketch below.

⁽⁴⁾ Track rail mounting holes have no counterbore.

When the appended track rail mounting bolts are used, the height from track rail bottom surface to bolt head is 7.4 mm.

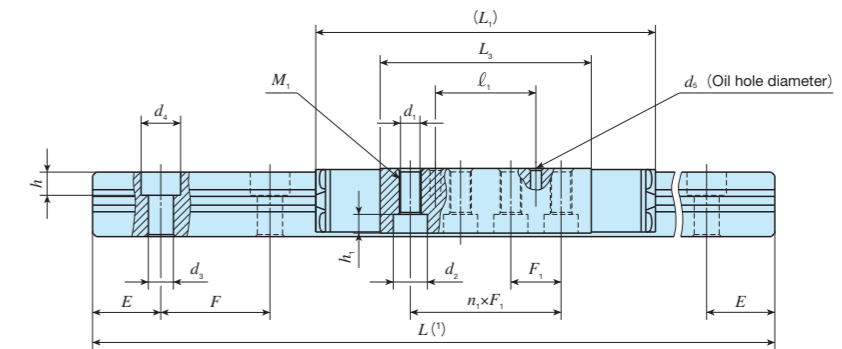
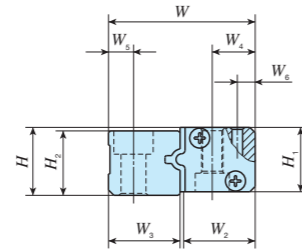
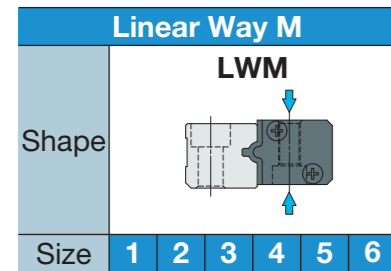
Remarks 1. Slide member mounting bolts are not appended.

2. The identification numbers with * are our semi-standard items.



Example of identification number of assembled set

Model code	Dimensions	Part code	Classification symbol	Supplemental code
LWLM	9	M2 R200	P	/W2
①	②	③	④	⑤
① Model LWLM Linear Way LM	② Size 7, 9, 11	③ Number of slide member (2)	④ Length of track rail (200 mm)	⑤ Accuracy class H High P Precision SP Super precision
				⑥ Special specification E, I, MN, W, Y



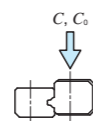
Identification number	Mass (Ref.)		Dimensions of assembly mm		Dimensions of slide member mm										Appended mounting bolt for slide member ⁽²⁾	Dimensions of track rail mm								Appended mounting bolt for track rail ⁽²⁾	Basic dynamic load rating ⁽³⁾ C N	Basic static load rating ⁽³⁾ C ₀ N			
	Slide member kg	Track rail kg/m	H	W	H ₁	W ₂	W ₄	W ₆	L ₁	L ₃	n ₁ ×F ₁	d ₁	d ₂	h ₁		M ₁	ℓ ₁	d ₅	Bolt size×ℓ	H ₂	W ₃	W ₅	d ₃				d ₄	h	E
LWM 1*	0.07	1.20	14	28	13	14.6	9	4	64	41.2	2×13	3.4	6.5	3.1	M 4	13	2	M3×14	13	13	5.5	4.5	8	4.5	20	40	M 4×14	4 720	6 410
LWM 2*	0.11	1.93	17	35	16	17	10	4	75	47.2	2×15	4.4	8	4.1	M 5	15	3	M4×18	16	17	6	6	9.5	5.4	30	60	M 5×18	7 150	9 240
LWM 3*	0.17	2.71	19	41	18	20	12	5	95	58.8	3×14	5.4	9.5	5.2	M 6	—	3	M5×20	18	20	7	7	11	6.5	30	60	M 6×20	13 700	16 600
LWM 4*	0.32	3.49	21	51	20	25	15	6	122	80.6	3×20	6.8	11	6.2	M 8	—	3	M6×22	20	25	9	9	14	9	40	80	M 8×22	23 200	27 400
LWM 5*	0.56	5.25	25	63	24	30	18	8	145	94.8	4×20	6.8	11	6.2	M 8	20	3	M6×28	24	31	12	11	17.5	11	50	100	M10×25	35 300	41 000
LWM 6*	1.35	7.56	31	78	30	40	24	11	180	131	5×22	8.6	14	8.2	M10	—	3	M8×35	30	36	14	14	20	13	60	120	M12×35	74 100	80 900

Notes ⁽¹⁾ Track rail lengths *L* are shown in Table 2 on page II-236.

⁽²⁾ The appended mounting bolts are hexagon socket head bolts equivalent to JIS B 1176.

⁽³⁾ The direction of basic dynamic load rating (*C*) and basic static load rating (*C*₀) are shown in the sketch below.

Remark: The identification numbers with * are our semi-standard items.



Example of identification number of assembled set

Model code Dimensions Part code Classification symbol Supplemental code

LWM **3** **M2 R660** **P** **/W2**

① ② ③ ④ ⑤ ⑥

① Model
LWM Linear Way M

② Size
1, 2, 3, 4, 5, 6

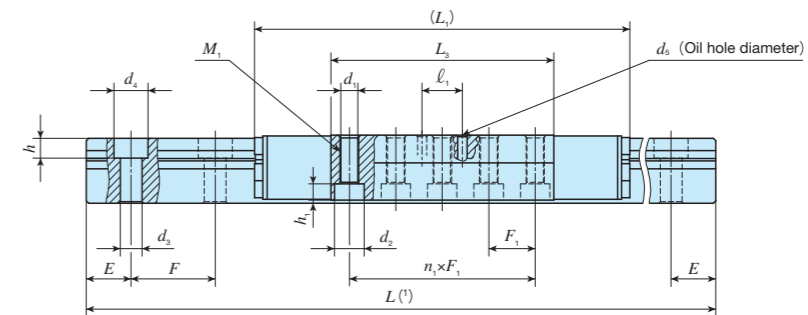
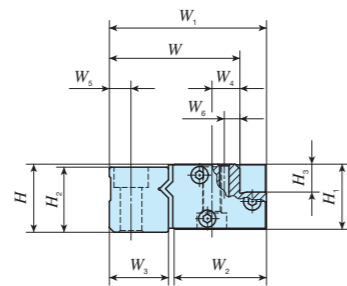
③ Number of slide member (2)

④ Length of track rail (660 mm)

⑤ Accuracy class
H High
P Precision
SP Super precision

⑥ Special specification
A, E, F, I, LR, LFR
MN, W, Y

Linear Roller Way M						
Shape	LRWM					
Size	2	3	4	5	6	



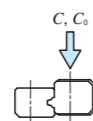
Identification number	Mass (Ref.)		Dimensions of assembly mm			Dimensions of slide member mm															Appended mounting bolt for slide member ⁽²⁾	Dimensions of track rail mm										Appended mounting bolt for track rail ⁽²⁾	Basic dynamic load rating ⁽³⁾ C N	Basic static load rating ⁽³⁾ C ₀ N
	Slide member kg	Track rail kg/m	H	W	W ₁	H ₁	H ₃	W ₂	W ₄	L ₁	L ₃	n ₁ ×F ₁	M ₁	d ₁	d ₂	h ₁	W ₆	ℓ ₁	d ₅	Bolt size × ℓ		H ₂	W ₃	W ₅	d ₃	d ₄	h	E	F	Bolt size × ℓ				
LRWM 2*	0.26	1.98	19	33	39.6	18	7.5	22.9	8	105	63	4×12	M 5	4.4	8	4.1	4	10	3	M4×20	18	15	6	6	9.5	5.4	30	60	M 5×20	9 700	10 800			
LRWM 3*	0.46	2.92	22	42	50.6	21	9	29.8	9	122	72	4×15	M 6	5.4	9.5	5.2	5	13	3	M5×25	21	19	7	7	11	6.5	30	60	M 6×25	18 500	20 300			
LRWM 4*	0.98	4.64	28	56	65.6	27	11	39.4	13	157	96	5×16	M 8	6.8	11	6.2	6	—	3	M6×32	27	24	9	9	14	8.6	40	80	M 8×32	36 500	39 800			
LRWM 5*	2.03	6.85	33	70	81.6	32	13	49.1	16	212	140	5×24	M10	8.6	14	8.2	7	—	3	M8×35	32	30	12	11	17.5	10.8	50	100	M10×35	67 900	75 500			
LRWM 6*	3.42	9.25	38	83	96.6	37	15	58.6	21	256	168	6×25	M10	8.6	14	8.2	8	28	3	M8×40	37	35	14	14	20	13	60	120	M12×40	99 800	109 000			

Notes ⁽¹⁾ Track rail lengths *L* are shown in Table 2 on page II-236.

⁽²⁾ The appended mounting bolts are hexagon socket head bolts equivalent to JIS B 1176.

⁽³⁾ The direction of basic dynamic load rating (*C*) and basic static load rating (*C₀*) are shown in the sketch below.

Remark: The identification numbers with * are our semi-standard items.



Example of identification number of assembled set

Model code	Dimensions	Part code	Classification symbol	Supplemental code	
LRWM	3	M2 R660	P	/W2	
①	②	③	④	⑤	
① Model LRWM Linear Roller Way M	② Size 2, 3, 4, 5, 6	③ Number of slide member (2)	④ Length of track rail (660 mm)	⑤ Accuracy class H High P Precision SP Super precision	⑥ Special specification A, E, F, I, LR, LFR MN, W, Y

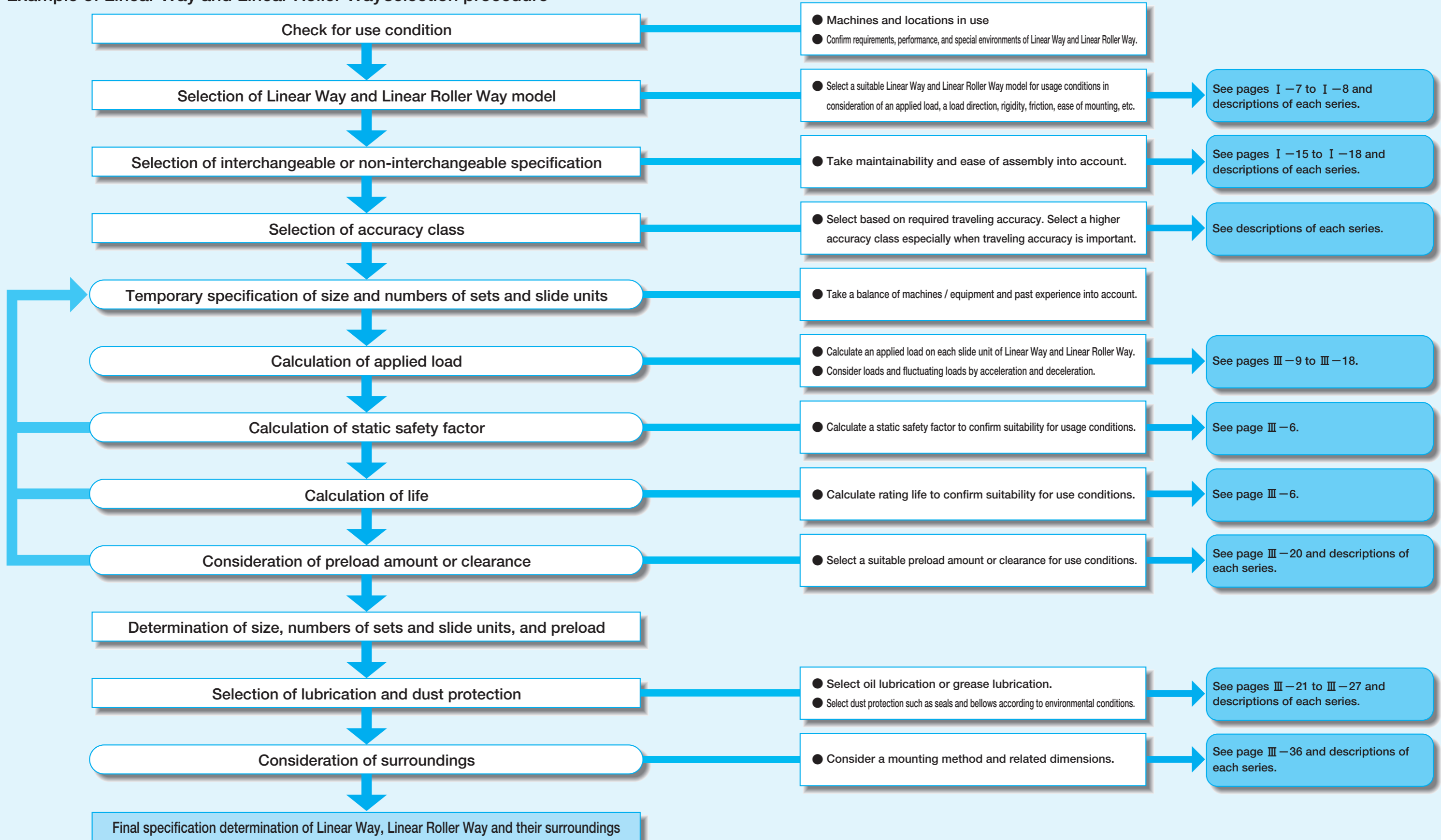
General Explanation



Selection Procedure

Selection of Linear Way and Linear Roller Way should be considered from the most important required matter to details in order. Typical procedure is shown below.

Example of Linear Way and Linear Roller Way selection procedure



Load Rating and Life

Life of linear motion rolling guides

Even in normal operational status, a linear motion rolling guide will reach the end of its life after a certain period of operations. As repeated load is constantly applied onto a raceway and rolling elements of the linear motion rolling guide, this leads to leprous damage (scale-like wear fragments) called fatigue flaking due to rolling contact fatigue of materials, it will be unusable at the end. Total traveling distance before occurrence of this fatigue flaking on a raceway or rolling elements is called the life of linear motion rolling guide.

As the life of linear motion rolling guide may vary depending on material fatigue phenomenon, rating life based on statistic calculation is used.

Rating life

Rating life of linear motion rolling guide refers to the total traveling distance 90% of a group of the same linear motion rolling guide can operate without linear motion rolling guide material damages due to rolling contact fatigue when they are operated individually under the same conditions.

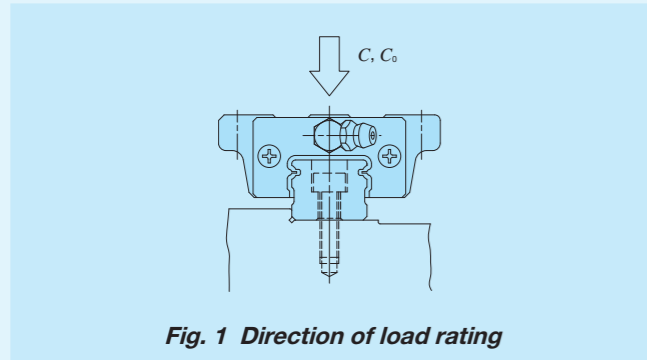


Fig. 1 Direction of load rating

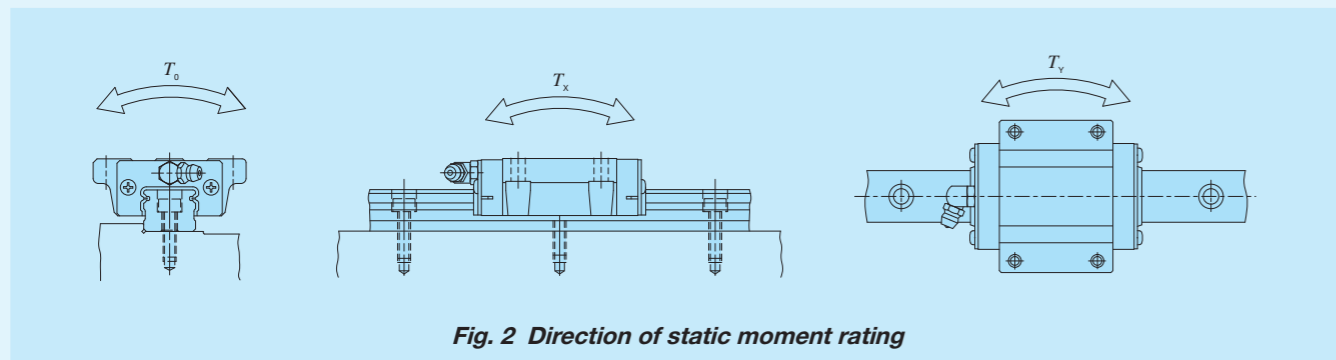


Fig. 2 Direction of static moment rating

Basic dynamic load rating C

Complying with ISO 14728-1

Basic dynamic load rating refers to load with certain direction and size that is logically endurable for rating life of 50×10^3 m when a group of the same linear motion rolling guides is operated individually under the same conditions.

Basic static load rating C_0

Complying with ISO 14728-2

Basic static load rating refers to static load generating a certain contact stress at the center of contact part of the rolling elements and a raceway under maximum load, which is the load at the allowable limit for normal rolling motion. Generally, it is used considering static safety factor.

Static moment rating T_0, T_x, T_y

Static moment rating refers to static moment load generating a certain contact stress at the center of contact parts of rolling elements and a raceway under the maximum load when the moment load shown in Fig. 2 is loaded, which is the moment load at the allowable limit for normal rolling motion. Generally, it is used considering static safety factor.

Calculating formula of life

The rating life calculation formulas are shown below.

Linear Way

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

Linear Roller Way

$$L = 50 \left(\frac{C}{P} \right)^{10/3} \dots \dots \dots (2)$$

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

Life time can be calculated by applying a stroke length and a number of strokes per minute to the formula below.

$$L_h = \frac{10^6 L}{2Sn_1 \times 60} \dots \dots \dots (3)$$

where, L_h : Rating life in hours, h
 S : Stroke length, mm
 n_1 : Number of strokes per minute, min^{-1}

Load factor

Load applied to a linear motion rolling guide can be larger than theoretical load due to machine vibration or shock. Generally, the applied load is obtained by multiplying it by the load factor indicated in Table 1.

Table 1 Load factor

Operating conditions	f_w
Smooth operation free from shock	1 ~ 1.2
Normal operation	1.2 ~ 1.5
Operation with shock load	1.5 ~ 3

Static safety factor

Generally, basic static load rating and static moment rating is considered as load at the allowable limit for normal rolling motion. However, static safety factor must be considered according to operating conditions and required performance of the linear motion rolling guide.

Static safety factor can be obtained by the following equation and typical values are indicated in Tables 2.1 and 2.2.

Equation (5) is a representative equation for a moment load. Moment load and static moment rating in each direction is applied for the calculation.

$$f_s = \frac{C_0}{P_0} \dots \dots \dots (4)$$

$$f_s = \frac{T_0}{M_0} \dots \dots \dots (5)$$

where, f_s : Static safety factor
 C_0 : Basic static load rating, N
 P_0 : Static equivalent load, N
 T_0 : Static moment rating, N · m
 M_0 : Moment load in each direction, N · m (maximum moment load)

Table 2.1 Static safety factor for Linear Way

Operational conditions	f_s
Operation with vibration and / or shock	3 ~ 5
High operating performance	2 ~ 4
Normal operating conditions	1 ~ 3

Table 2.2 Static safety factor for Linear Roller Way

Operational conditions	f_s
Operation with vibration and / or shock	4 ~ 6
High operating performance	3 ~ 5
Normal operating conditions	2.5 ~ 3

Dynamic equivalent load

When a load is applied in a direction other than that of the basic dynamic load rating or a complex load is applied, the dynamic equivalent load must be calculated to obtain the basic rating life.

Obtain the downward and lateral conversion loads from the loads and moments in various directions.

$$F_{re} = k_r |F_r| + \frac{C_0}{T_0} |M_0| + \frac{C_0}{T_x} |M_x| \dots\dots\dots (6)$$

$$F_{ae} = k_a |F_a| + \frac{C_0}{T_y} |M_y| \dots\dots\dots (7)$$

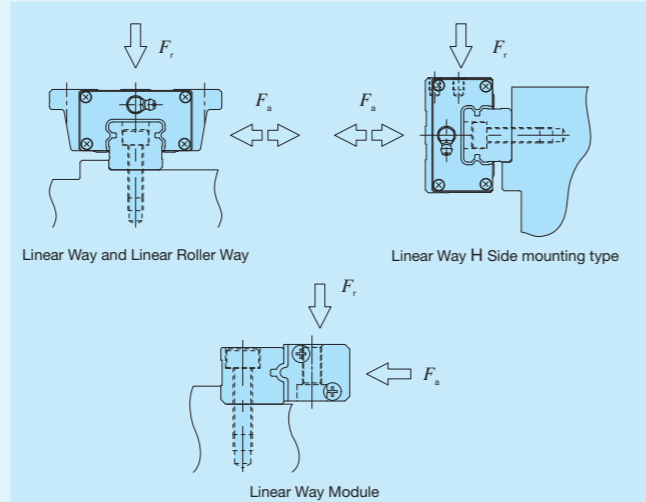
[For Linear Way H Side mounting type (LWHY)]

$$F_{ae} = k_a |F_a| + \frac{C_0}{T_0} |M_0| + \frac{C_0}{T_x} |M_x| \dots\dots\dots (8)$$

$$F_{re} = k_r |F_r| + \frac{C_0}{T_y} |M_y| \dots\dots\dots (9)$$

- where, F_{re} : Downward conversion load, N
- F_{ae} : Lateral conversion load, N
- F_r : Downward load, N
- F_a : Lateral load, N
- M_0 : Moment load in the T_0 direction, N · m
- M_x : Moment load in the T_x direction, N · m
- M_y : Moment load in the T_y direction, N · m
- k_r, k_a : Conversion factors for load direction (See Table 3)
- C_0 : Basic static load rating, N
- T_0 : Static moment rating in the T_0 direction, N · m
- T_x : Static moment rating in the T_x direction, N · m
- T_y : Static moment rating in the T_y direction, N · m

Table 3 Conversion factor for load direction



Series name and size		Conversion factor		
		k_r		k_a
		$F_r \geq 0$	$F_r < 0$	
C-Lube Linear Way ML Linear Way L	Ball retained type	1	1	1.19
	Ball non-retained type	1	1	0.84
C-Lube Linear Way MLV		1	1	1.19
C-Lube Linear Way MV		1	1.23	1.35
C-Lube Linear Way ME Linear Way E	15~30	1	1	1
	35~45	1	1.19	1.28
Low Decibel Linear Way E		1	1	1
C-Lube Linear Way MH Linear Way H	8~12	1	1	1.19
	15~30	1	1	1
	35~65	1	1.19	1.28
Linear Way H Horizontal mounting type	15~30	1	1	1
	35~45 ⁽¹⁾	1	1	0.84 0.95
Linear Way F	33~42	1	1	1
	69	1	1	1.19
	LWFH	1	1.19	1.28
C-Lube Linear Way MUL Linear Way U	25, 30 40~86	1	1	1.19 1
C-Lube Linear Roller Way Super MX Linear Roller Way Super X		1	1	1
Linear Roller Way X		1	1	1
Linear Way Module	LWLM	1	1	0.73
	LWM	1~5	1	1.13
		6	1	1.28
	LRWM	1	1	0.58

Note ⁽¹⁾ The upper value of k_a columns represents the right direction and the lower value represents the left direction.

Obtain the dynamic equivalent load from the downward and lateral conversion loads.

$$P = XF_{re} + YF_{ae} \dots\dots\dots (10)$$

- where, P : Dynamic equivalent load, N
- X, Y : Dynamic equivalent load factor (See Table 4)
- F_{re} : Downward conversion load, N
- F_{ae} : Lateral conversion load, N

Table 4 Dynamic equivalent load factor

Class	X	Y
$ F_{re} \geq F_{ae} $	1	0.6
$ F_{re} < F_{ae} $	0.6	1

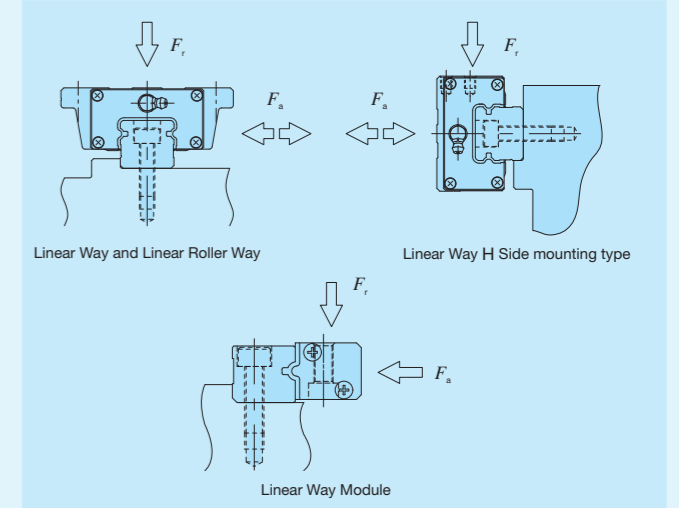
Static equivalent load

When a load is applied in a direction other than that of the basic static load rating or a complex load is applied, the static equivalent load must be calculated to obtain the static safety factor.

$$P_0 = k_{or} |F_r| + k_{oa} |F_a| + \frac{C_0}{T_0} |M_0| + \frac{C_0}{T_x} |M_x| + \frac{C_0}{T_y} |M_y| \dots\dots (11)$$

- where, P_0 : Static equivalent load, N
- F_r : Downward load, N
- F_a : Lateral load, N
- M_0 : Moment load in the T_0 direction, N · m
- M_x : Moment load in the T_x direction, N · m
- M_y : Moment load in the T_y direction, N · m
- k_{or}, k_{oa} : Conversion factors for load direction (See Table 5)
- C_0 : Basic static load rating, N
- T_0 : Static moment rating in the T_0 direction, N · m
- T_x : Static moment rating in the T_x direction, N · m
- T_y : Static moment rating in the T_y direction, N · m

Table 5 Conversion factor for load direction



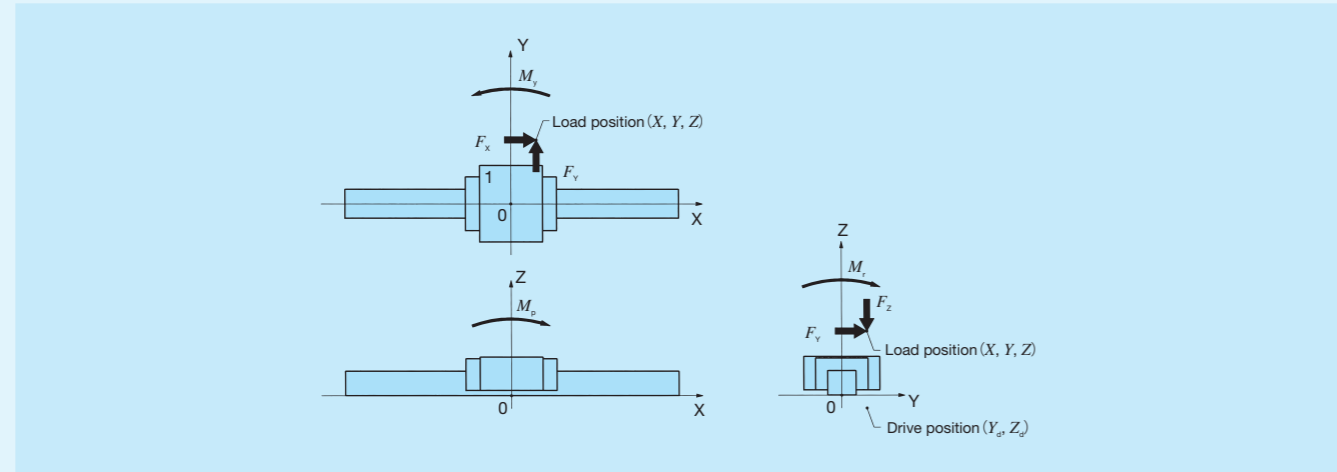
Series name and size		Conversion factor		
		k_{or}		k_{oa}
		$F_r \geq 0$	$F_r < 0$	
C-Lube Linear Way ML Linear Way L	Ball retained type	1	1	1.19
	Ball non-retained type	1	1	0.84
C-Lube Linear Way MLV		1	1	1.19
C-Lube Linear Way MV		1	1.88	2.08
C-Lube Linear Way ME Linear Way E	15~30	1	1	1
	35~45	1	1.19	1.28
Low Decibel Linear Way E		1	1	1
C-Lube Linear Way MH Linear Way H	8~12	1	1	1.19
	15~30	1	1	1
	35~65	1	1.19	1.28
Linear Way H Horizontal mounting type	15~30	1	1	1
	35~45 ⁽¹⁾	1	1	0.78 0.93
Linear Way F	33~42	1	1	1
	69	1	1	1.19
	LWFH	1	1.19	1.28
C-Lube Linear Way MUL Linear Way U	25, 30 40~86	1	1	1.19 1
C-Lube Linear Roller Way Super MX Linear Roller Way Super X		1	1	1
Linear Roller Way X		1	1	1
Linear Way Module	LWLM	1	1	0.60
	LWM	1~5	1	1.19
		6	1	1.43
	LRWM	1	1	0.50

Note ⁽¹⁾ The upper value of k_{oa} columns represents the right direction and the lower value represents the left direction.

Calculated Load

Examples of calculation for the loads applied to Linear Way and Linear Roller Way that is incorporated in machine / equipment is shown in Table 6.1 to Table 6.6.

Table 6.1 One track rail and one slide unit



Slide unit No.	Load applied on the slide unit				
	Downward load F_r	Lateral load F_a	Moment load in the T_0 direction M_0	Moment load in the T_x direction M_x	Moment load in the T_y direction M_y
1	F_z	F_y	M_r	M_p	M_y

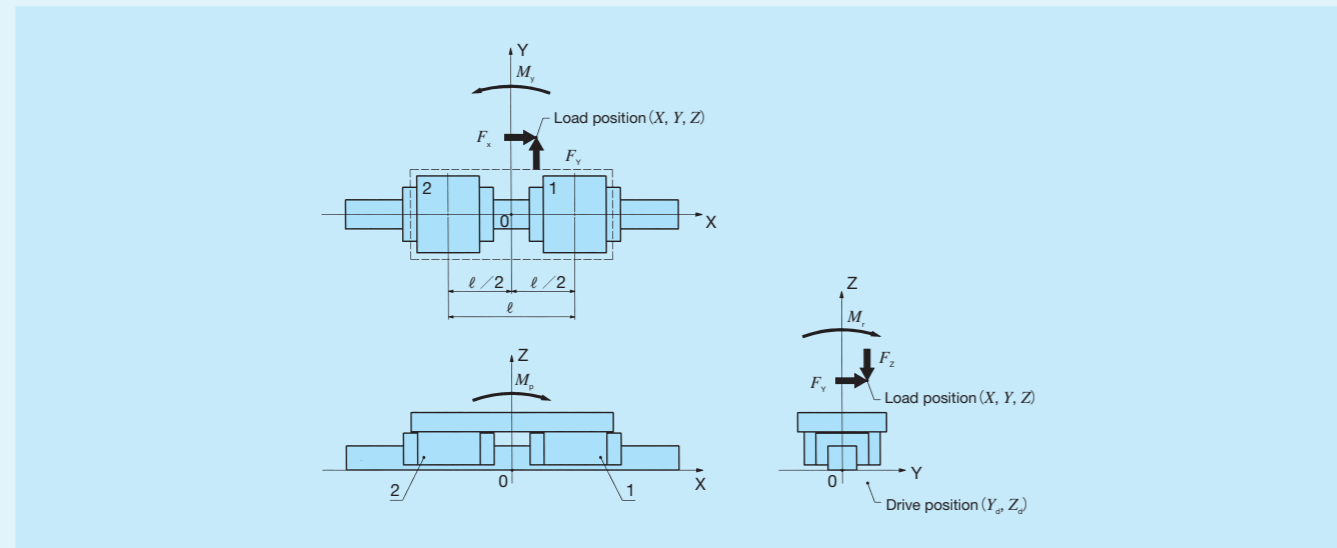
Remark: The moment loads in each direction M_x, M_p, M_y can be obtained by the following equation.

$$M_r = F_y Z + F_z Y$$

$$M_p = F_x (Z - Z_d) + F_z X$$

$$M_y = -F_x (Y - Y_d) + F_y X$$

Table 6.2 One track rail and two slide units



Slide unit No.	Load applied on the slide unit		
	Downward load F_r	Lateral load F_a	Moment load in the T_0 direction M_0
1	$\frac{F_z}{2} + \frac{M_p}{l}$	$\frac{F_y}{2} + \frac{M_y}{l}$	$\frac{M_r}{2}$
2	$\frac{F_z}{2} - \frac{M_p}{l}$	$\frac{F_y}{2} - \frac{M_y}{l}$	$\frac{M_r}{2}$

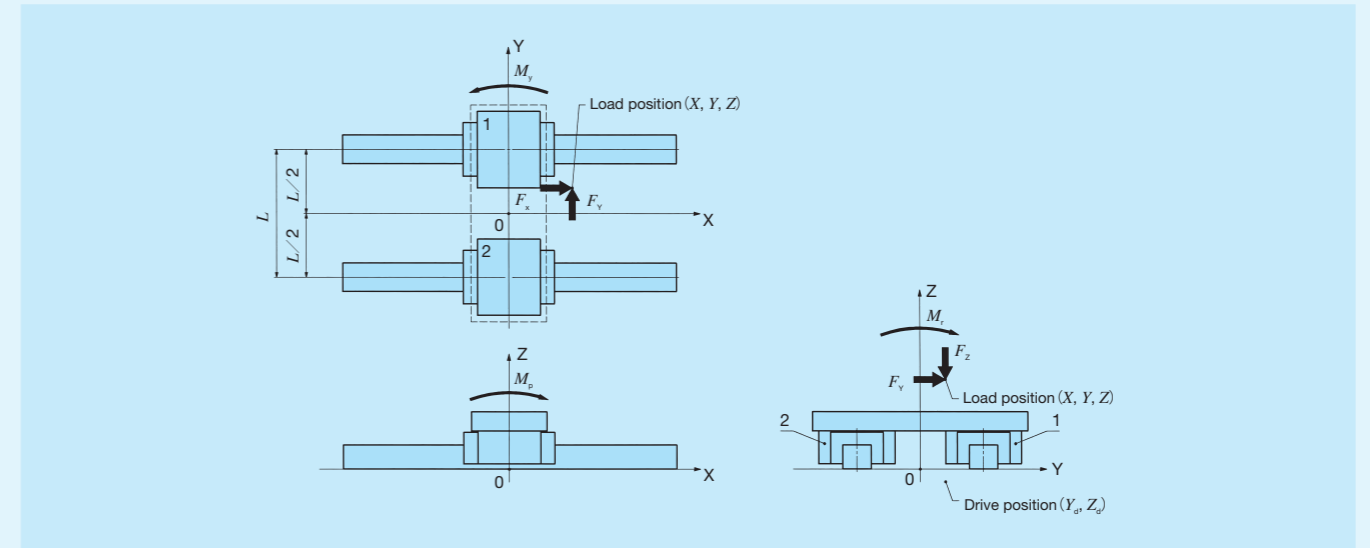
Remark: The moment loads in each direction M_x, M_p, M_y can be obtained by the following equation.

$$M_r = F_y Z + F_z Y$$

$$M_p = F_x (Z - Z_d) + F_z X$$

$$M_y = -F_x (Y - Y_d) + F_y X$$

Table 6.3 Two track rails and one slide unit



Slide unit No.	Load applied on the slide unit			
	Downward load F_r	Lateral load F_a	Moment load in the T_x direction M_x	Moment load in the T_y direction M_y
1	$\frac{F_z}{2} + \frac{M_r}{L}$	$\frac{F_y}{2}$	$\frac{M_p}{2}$	$\frac{M_y}{2}$
2	$\frac{F_z}{2} - \frac{M_r}{L}$	$\frac{F_y}{2}$	$\frac{M_p}{2}$	$\frac{M_y}{2}$

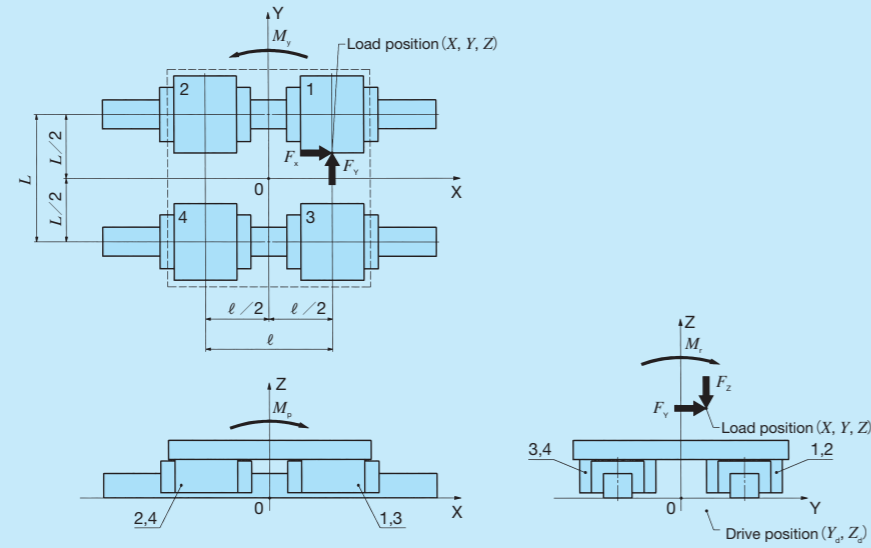
Remark: The moment loads in each direction M_x, M_p, M_y can be obtained by the following equation.

$$M_r = F_y Z + F_z Y$$

$$M_p = F_x (Z - Z_d) + F_z X$$

$$M_y = -F_x (Y - Y_d) + F_y X$$

Table 6.4 Two track rails and two slide units



Slide unit No.	Load applied on the slide unit	
	Downward load F_r	Lateral load F_a
1	$\frac{F_z}{4} + \frac{M_r}{2L} + \frac{M_p}{2l}$	$\frac{F_y}{4} + \frac{M_y}{2l}$
2	$\frac{F_z}{4} + \frac{M_r}{2L} - \frac{M_p}{2l}$	$\frac{F_y}{4} - \frac{M_y}{2l}$
3	$\frac{F_z}{4} - \frac{M_r}{2L} + \frac{M_p}{2l}$	$\frac{F_y}{4} + \frac{M_y}{2l}$
4	$\frac{F_z}{4} - \frac{M_r}{2L} - \frac{M_p}{2l}$	$\frac{F_y}{4} - \frac{M_y}{2l}$

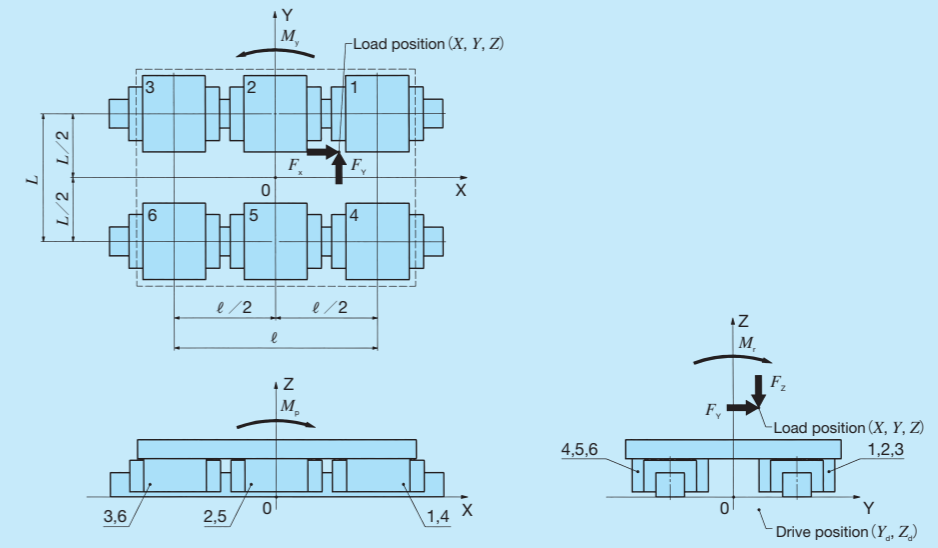
Remark: The moment loads in each direction M_r , M_p , M_y can be obtained by the following equation.

$$M_r = F_y Z + F_z Y$$

$$M_p = F_x (Z - Z_d) + F_z X$$

$$M_y = -F_x (Y - Y_d) + F_y X$$

Table 6.5 Two track rails and three slide units



Slide unit No.	Load applied on the slide unit	
	Downward load F_r	Lateral load F_a
1	$\frac{F_z}{6} + \frac{M_r}{3L} + \frac{M_p}{2l}$	$\frac{F_y}{6} + \frac{M_y}{2l}$
2	$\frac{F_z}{6} + \frac{M_r}{3L}$	$\frac{F_y}{6}$
3	$\frac{F_z}{6} + \frac{M_r}{3L} - \frac{M_p}{2l}$	$\frac{F_y}{6} - \frac{M_y}{2l}$
4	$\frac{F_z}{6} - \frac{M_r}{3L} + \frac{M_p}{2l}$	$\frac{F_y}{6} + \frac{M_y}{2l}$
5	$\frac{F_z}{6} - \frac{M_r}{3L}$	$\frac{F_y}{6}$
6	$\frac{F_z}{6} - \frac{M_r}{3L} - \frac{M_p}{2l}$	$\frac{F_y}{6} - \frac{M_y}{2l}$

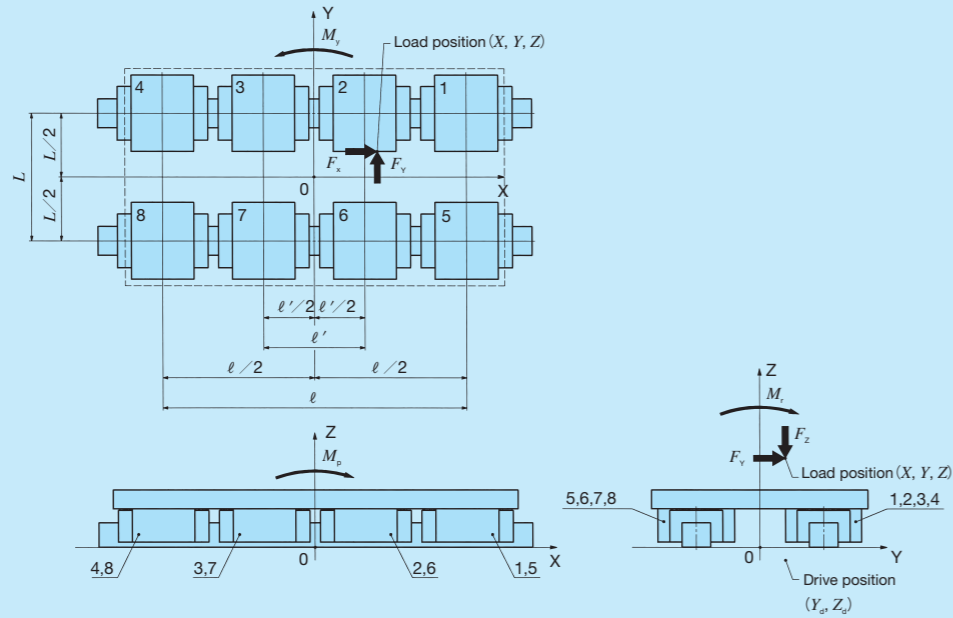
Remark: The moment loads in each direction M_r , M_p , M_y can be obtained by the following equation.

$$M_r = F_y Z + F_z Y$$

$$M_p = F_x (Z - Z_d) + F_z X$$

$$M_y = -F_x (Y - Y_d) + F_y X$$

Table 6.6 Two track rails and four slide units



Slide unit No.	Load applied on the slide unit	
	Downward load F_r	Lateral load F_a
1	$\frac{F_z}{8} + \frac{M_r}{4L} + \frac{M_p}{2} \frac{\ell}{\ell^2 + \ell'^2}$	$\frac{F_y}{8} + \frac{M_y}{2} \frac{\ell}{\ell^2 + \ell'^2}$
2	$\frac{F_z}{8} + \frac{M_r}{4L} + \frac{M_p}{2} \frac{\ell'}{\ell^2 + \ell'^2}$	$\frac{F_y}{8} + \frac{M_y}{2} \frac{\ell'}{\ell^2 + \ell'^2}$
3	$\frac{F_z}{8} + \frac{M_r}{4L} - \frac{M_p}{2} \frac{\ell'}{\ell^2 + \ell'^2}$	$\frac{F_y}{8} - \frac{M_y}{2} \frac{\ell'}{\ell^2 + \ell'^2}$
4	$\frac{F_z}{8} + \frac{M_r}{4L} - \frac{M_p}{2} \frac{\ell}{\ell^2 + \ell'^2}$	$\frac{F_y}{8} - \frac{M_y}{2} \frac{\ell}{\ell^2 + \ell'^2}$
5	$\frac{F_z}{8} - \frac{M_r}{4L} + \frac{M_p}{2} \frac{\ell}{\ell^2 + \ell'^2}$	$\frac{F_y}{8} + \frac{M_y}{2} \frac{\ell}{\ell^2 + \ell'^2}$
6	$\frac{F_z}{8} - \frac{M_r}{4L} + \frac{M_p}{2} \frac{\ell'}{\ell^2 + \ell'^2}$	$\frac{F_y}{8} + \frac{M_y}{2} \frac{\ell'}{\ell^2 + \ell'^2}$
7	$\frac{F_z}{8} - \frac{M_r}{4L} - \frac{M_p}{2} \frac{\ell'}{\ell^2 + \ell'^2}$	$\frac{F_y}{8} - \frac{M_y}{2} \frac{\ell'}{\ell^2 + \ell'^2}$
8	$\frac{F_z}{8} - \frac{M_r}{4L} - \frac{M_p}{2} \frac{\ell}{\ell^2 + \ell'^2}$	$\frac{F_y}{8} - \frac{M_y}{2} \frac{\ell}{\ell^2 + \ell'^2}$

Remark: The moment loads in each direction M_r , M_p , M_y can be obtained by the following equation.

$$M_r = F_y Z + F_z Y$$

$$M_p = F_x (Z - Z_d) + F_z X$$

$$M_y = -F_x (Y - Y_d) + F_y X$$

Mean Equivalent Load for Fluctuating Load

When the load on the Linear Way and Linear Roller Way varies, instead of dynamic equivalent load P , the mean equivalent load P_m is used for calculating formula of life. The mean equivalent load is a load converted to give life equal to that for fluctuating load. It is obtained by the following formula:

$$P_m = \sqrt[p]{\frac{1}{L} \int_0^L P_n^p dL} \dots \dots \dots (12)$$

- where, P_m : Mean equivalent load, N
- L : Total traveling distance, m
- P_n : Fluctuating load, N
- p : Exponent (ball type: 3, roller type: 10/3)

Table 7 gives calculation examples of the mean equivalent load for typical fluctuating loads.

Table 7 Mean equivalent load for fluctuating load

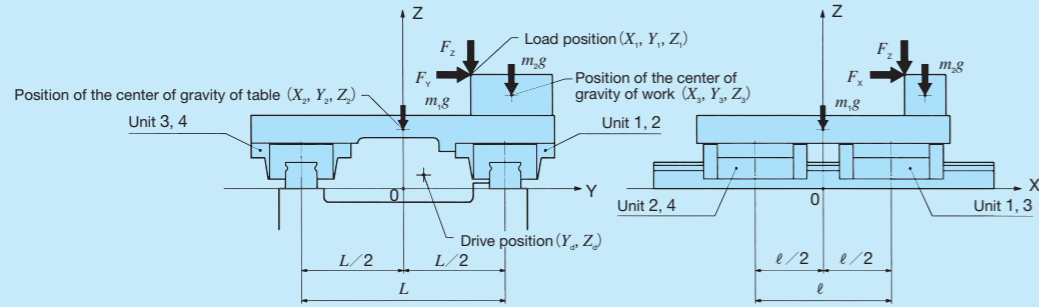
Example	Mean equivalent load
<p>① Stepwise changing load</p>	$P_m = \sqrt[p]{\frac{1}{L} (P_1^p L_1 + P_2^p L_2 + \dots + P_n^p L_n)}$ <p>where, L_1 : Total traveling distance receiving the load P_1, m L_2 : Total traveling distance receiving the load P_2, m L_n : Total traveling distance receiving the load P_n, m</p>
<p>② Monotonously changing load</p>	$P_m \doteq \frac{1}{3} (2P_{max} + P_{min})$ <p>where, P_{max} : Maximum value of fluctuating load, N P_{min} : Minimum value of fluctuating load, N</p>

Examples of Load and Life Calculation

Example 1

Linear Way Model.....	ME 25 C2 R640 H
Basic dynamic load rating.....	$C = 18100 \text{ N}$
Basic static load rating.....	$C_0 = 21100 \text{ N}$
Applied load.....	$F_{x1} = 1000 \text{ N}$
.....	$F_{y1} = 2000 \text{ N}$
.....	$F_{z1} = 1000 \text{ N}$
Load position.....	$X_1 = 60 \text{ mm}$
.....	$Y_1 = 50 \text{ mm}$
.....	$Z_1 = 83 \text{ mm}$
Table mass.....	$m_1 = 10 \text{ kg}$
Position of the center of gravity of table.....	$X_2 = 0 \text{ mm}$
.....	$Y_2 = 0 \text{ mm}$
.....	$Z_2 = 43 \text{ mm}$

Work mass.....	$m_2 = 10 \text{ kg}$
Position of center of gravity of work.....	$X_3 = 75 \text{ mm}$
.....	$Y_3 = 80 \text{ mm}$
.....	$Z_3 = 68 \text{ mm}$
Number of strokes per minute.....	$n_1 = 5 \text{ min}^{-1}$
Stroke length.....	$S = 100 \text{ mm}$
Distance between slide units.....	$\ell = 100 \text{ mm}$
Distance between the track rails.....	$L = 150 \text{ mm}$
Drive position.....	$Y_d = 150 \text{ mm}$
.....	$Z_d = 10 \text{ mm}$



The life and static safety factor in the case of Example 1 is calculated. Load factor f_w is assumed to be 1.5.

① Calculation of load on the slide unit

Due to the applied load and the table weight, moment load occurs around each coordinate axis of the Linear Way as shown below.

$$M_r = \Sigma (F_y Z) + \Sigma (F_z Y) = F_{y1} Z_1 + F_{z1} Y_1 + m_1 g Y_2 + m_2 g Y_3$$

$$= 2000 \times 83 + 1000 \times 50 + 10 \times 9.8 \times 0 + 10 \times 9.8 \times 80$$

$$\approx 224000$$

$$M_p = \Sigma \{F_x (Z - Z_d)\} + \Sigma (F_z X) = F_{x1} (Z_1 - Z_d) + F_{z1} X_1 + m_1 g X_2$$

$$+ m_2 g X_3$$

$$= 1000 \times (83 - 10) + 1000 \times 60 + 10 \times 9.8 \times 0 + 10 \times 9.8 \times 75$$

$$\approx 140000$$

$$M_y = -\Sigma \{F_x (Y - Y_d)\} + \Sigma (F_y X) = -F_{x1} (Y_1 - Y_d) + F_{y1} X_1$$

$$= -1000 \times (50 - 150) + 2000 \times 60 = 220000$$

where, M_r : Moment load in the rolling direction, N · mm
 M_p : Moment load in the pitching direction, N · mm
 M_y : Moment load in the yawing direction, N · mm

The loads applied on each slide unit are calculated according to Table 6.4 on page III - 11.

$$F_{r1} = \frac{\Sigma F_z}{4} + \frac{M_r}{2L} + \frac{M_p}{2\ell} = \frac{F_{z1} + m_1 g + m_2 g}{4} + \frac{M_r}{2L} + \frac{M_p}{2\ell}$$

$$= \frac{1000 + 10 \times 9.8 + 10 \times 9.8}{4} + \frac{224000}{2 \times 150} + \frac{140000}{2 \times 100}$$

$$\approx 1750$$

$$F_{r2} = \frac{\Sigma F_z}{4} + \frac{M_r}{2L} - \frac{M_p}{2\ell} = \frac{F_{z1} + m_1 g + m_2 g}{4} + \frac{M_r}{2L} - \frac{M_p}{2\ell} \approx 346$$

$$F_{r3} = \frac{\Sigma F_z}{4} - \frac{M_r}{2L} + \frac{M_p}{2\ell} = \frac{F_{z1} + m_1 g + m_2 g}{4} - \frac{M_r}{2L} + \frac{M_p}{2\ell} \approx 252$$

$$F_{r4} = \frac{\Sigma F_z}{4} - \frac{M_r}{2L} - \frac{M_p}{2\ell} = \frac{F_{z1} + m_1 g + m_2 g}{4} - \frac{M_r}{2L} - \frac{M_p}{2\ell}$$

$$\approx -1150$$

$$F_{a1} = F_{a3} = \frac{\Sigma F_y}{4} + \frac{M_y}{2\ell} = \frac{F_{y1}}{4} + \frac{M_y}{2\ell}$$

$$= \frac{2000}{4} + \frac{220000}{2 \times 100} = 1600$$

$$F_{a2} = F_{a4} = \frac{\Sigma F_y}{4} - \frac{M_y}{2\ell} = \frac{F_{y1}}{4} - \frac{M_y}{2\ell} = -600$$

② Calculating of rating life

The upward / downward load and lateral load are converted by formula (6) and (7) on page III - 7.

$$F_{re1} = k_r |F_{r1}| = 1 \times 1750 = 1750$$

$$F_{re2} = k_r |F_{r2}| = 1 \times 346 = 346$$

$$F_{re3} = k_r |F_{r3}| = 1 \times 252 = 252$$

$$F_{re4} = k_r |F_{r4}| = 1 \times 1150 = 1150$$

$$F_{ae1} = k_a |F_{a1}| = 1 \times 1600 = 1600$$

$$F_{ae2} = k_a |F_{a2}| = 1 \times 600 = 600$$

$$F_{ae3} = k_a |F_{a3}| = 1 \times 1600 = 1600$$

$$F_{ae4} = k_a |F_{a4}| = 1 \times 600 = 600$$

where, k_r, k_a : Conversion factors for load direction (See Table 3 on page III - 7.)

The dynamic equivalent load is calculated by formula (10) on page III - 7.

$$P_1 = X |F_{re1}| + Y |F_{ae1}| = 1 \times 1750 + 0.6 \times 1600 = 2710$$

$$P_2 = X |F_{re2}| + Y |F_{ae2}| = 0.6 \times 346 + 1 \times 600 \approx 808$$

$$P_3 = X |F_{re3}| + Y |F_{ae3}| = 0.6 \times 252 + 1 \times 1600 \approx 1750$$

$$P_4 = X |F_{re4}| + Y |F_{ae4}| = 1 \times 1150 + 0.6 \times 600 = 1510$$

The basic rating life of slide unit 1 receiving the largest dynamic equivalent load is calculated. The basic rating life is obtained by the formula (1) given on the page III - 6 considering the load factor f_w (see Table 1 on page III - 6).

$$L_1 = 50 \left(\frac{C}{f_w P_1} \right)^3 = 50 \times \left(\frac{18100}{1.5 \times 2710} \right)^3 \approx 4410$$

$$L_{h1} = \frac{10^6 L_1}{2S n_1 \times 60} = \frac{10^6 \times 4410}{2 \times 100 \times 5 \times 60} \approx 73500$$

As the result of calculation above, the basic rating life is about 73,500 hours.

③ Calculating of static safety factor

The static equivalent load is calculated from the upward / downward load and lateral load by formula (11) on page III - 8.

$$P_{01} = k_{or} |F_{r1}| + k_{oa} |F_{a1}| = 1 \times 1750 + 1 \times 1600 = 3350$$

$$P_{02} = k_{or} |F_{r2}| + k_{oa} |F_{a2}| = 1 \times 346 + 1 \times 600 = 946$$

$$P_{03} = k_{or} |F_{r3}| + k_{oa} |F_{a3}| = 1 \times 252 + 1 \times 1600 = 1852$$

$$P_{04} = k_{or} |F_{r4}| + k_{oa} |F_{a4}| = 1 \times 1150 + 1 \times 600 = 1750$$

where, k_{or}, k_{oa} : Conversion factors for load direction (See Table 5 on page III - 8.)

The static safety factor of slide unit 1 receiving the largest static equivalent load is calculated. The static safety factor is calculated by formula (4) on page III - 6.

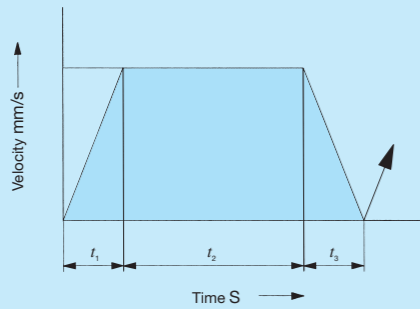
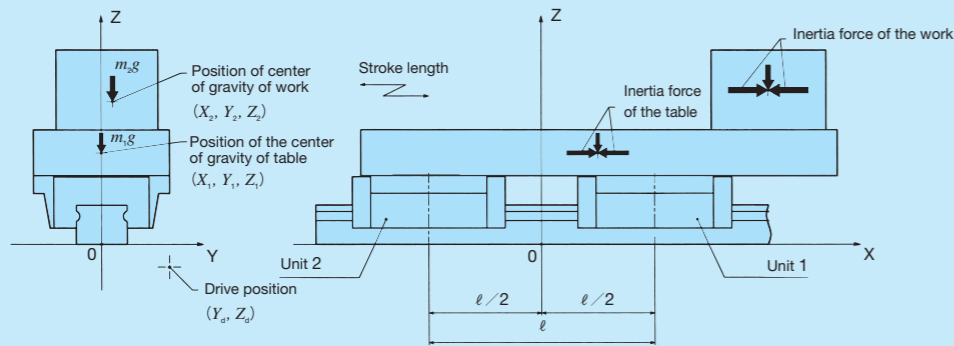
$$f_{s1} = \frac{C_0}{P_{01}} = \frac{21100}{3350} \approx 6.3$$

As the result of calculation above, the static safety factor is about 6.3.

Example 2

Linear Way Model.....MH 45 C2 R1050 H
 Basic dynamic load rating..... $C = 74600 \text{ N}$
 Basic static load rating..... $C_0 = 80200 \text{ N}$
 Static moment rating in the T_0 direction..... $T_0 = 1610 \text{ N} \cdot \text{m}$
 Table mass..... $m_1 = 100 \text{ kg}$
 Position of the center of gravity of table.....
 ... $X_1 = 50 \text{ mm}$
 ... $Y_1 = 0 \text{ mm}$
 ... $Z_1 = 80 \text{ mm}$
 Work mass..... $m_2 = 1000 \text{ kg}$
 Position of center of gravity of work.....
 ... $X_2 = 200 \text{ mm}$
 ... $Y_2 = 10 \text{ mm}$
 ... $Z_2 = 130 \text{ mm}$

Distance between slide units... $\ell = 200 \text{ mm}$
 Stroke length..... $S = 500 \text{ mm}$
 Number of strokes per minute... $n_1 = 6 \text{ min}^{-1}$
 Maximum traveling velocity... $V = 100 \text{ mm/s}$
 Time spent for acceleration... $t_1 = 0.1 \text{ s}$
 Time spent during constant speed motion... $t_2 = 4.9 \text{ s}$
 Time spent for deceleration... $t_3 = 0.1 \text{ s}$
 Drive position..... $Y_d = 60 \text{ mm}$
 $Z_d = -20 \text{ mm}$



The life and static safety factor in the case of Example 2 is calculated. Load factor f_w is assumed to be 1.5.

① Calculation of load on the slide unit

Due to the applied load and the table mass and inertia force, moment load occurs around each coordinate axis of the Linear Way as shown below.

(During acceleration at the start of motion)

$$M_r = \sum (F_y Z) + \sum (F_z Y) = m_1 g Y_1 + m_2 g Y_2 = 100 \times 9.8 \times 0 + 1000 \times 9.8 \times 10 \approx 98000$$

$$M_p = \sum \{F_x (Z - Z_d)\} + \sum (F_z X)$$

$$= m_1 \frac{V_{\max}}{1000 \times t_1} (Z_1 - Z_d) + m_2 \frac{V_{\max}}{1000 \times t_1} (Z_2 - Z_d) + m_1 g X_1 + m_2 g X_2$$

$$= 100 \times \frac{100}{1000 \times 0.1} \times (80 + 20) + 1000 \times \frac{100}{1000 \times 0.1} \times (130 + 20) + 100 \times 9.8 \times 50 + 1000 \times 9.8 \times 200 \approx 2169000$$

$$M_y = -\sum \{F_x (Y - Y_d)\} + \sum (F_z Y)$$

$$= -m_1 \frac{V_{\max}}{1000 \times t_1} (Y_1 - Y_d) - m_2 \frac{V_{\max}}{1000 \times t_1} (Y_2 - Y_d)$$

$$= -100 \times \frac{100}{1000 \times 0.1} \times (0 - 60) - 1000 \times \frac{100}{1000 \times 0.1} \times (10 - 60) \approx 56000$$

(During constant speed motion)

$$M_r = m_1 g Y_1 + m_2 g Y_2 \approx 98000$$

$$M_p = m_1 g X_1 + m_2 g X_2 \approx 2010000$$

$$M_y = 0$$

(During deceleration at the end of motion)

$$M_r = m_1 g Y_1 + m_2 g Y_2 \approx 98000$$

$$M_p = -m_1 \frac{V_{\max}}{1000 \times t_3} (Z_1 - Z_d) - m_2 \frac{V_{\max}}{1000 \times t_3} (Z_2 - Z_d) + m_1 g X_1 + m_2 g X_2 \approx 1850000$$

$$M_y = m_1 \frac{V_{\max}}{1000 \times t_3} (Y_1 - Y_d) + m_2 \frac{V_{\max}}{1000 \times t_3} (Y_2 - Y_d) \approx -56000$$

where, M_r : Moment load in the rolling direction, $\text{N} \cdot \text{mm}$
 M_p : Moment load in the pitching direction, $\text{N} \cdot \text{mm}$
 M_y : Moment load in the yawing direction, $\text{N} \cdot \text{mm}$

The loads applied on each slide unit are calculated according to Table 6.2 on page III-9.

(During acceleration at the start of motion)

$$F_{r1} = \frac{\sum F_z + M_p}{\ell} = \frac{m_1 g + m_2 g}{\ell} + \frac{M_p}{\ell}$$

$$= \frac{100 \times 9.8 + 1000 \times 9.8}{200} + \frac{2169000}{200} \approx 16200$$

$$F_{r2} = \frac{\sum F_z + M_p}{\ell} = \frac{m_1 g + m_2 g}{\ell} - \frac{M_p}{\ell} \approx -5460$$

$$F_{a1} = \frac{\sum F_y + M_y}{\ell} = 280$$

$$F_{a2} = \frac{\sum F_y - M_y}{\ell} = -280$$

$$M_{o1} = M_{o2} = \frac{M_r}{2} = 49000$$

(During constant speed motion)

$$F_{r1} = \frac{100 \times 9.8 + 1000 \times 9.8}{2} + \frac{2010000}{200} \approx 15400$$

$$F_{r2} \approx -4660$$

$$F_{a1} = F_{a2} = 0$$

$$M_{o1} = M_{o2} = 49000$$

(During deceleration at the end of motion)

$$F_{r1} = \frac{100 \times 9.8 + 1000 \times 9.8}{2} + \frac{1850000}{200} \approx 14600$$

$$F_{r2} \approx -3860$$

$$F_{a1} \approx -280$$

$$F_{a2} \approx 280$$

$$M_{o1} = M_{o2} = 49000$$

② Calculating of rating life

The upward / downward load, lateral load and the moment load along T_0 direction are calculated by the formula (6) and (7) on page III-7, and the dynamic equivalent load is calculated by formula (10).

(During acceleration at the start of motion)

$$F_{re1} = k_r |F_{r1}| + \frac{C_0}{T_0} |M_{o1}| = 1 \times 16200 + \frac{80200}{1610} \times \frac{49000}{1000} \approx 18600$$

$$F_{re2} = 1 \times 5460 + \frac{80200}{1610} \times \frac{49000}{1000} \approx 7900$$

$$F_{ae1} = k_a |F_{a1}| = 1.28 \times 280 \approx 358$$

$$F_{ae2} = 1.28 \times 280 \approx 358$$

$$P_{1a} = X F_{re1} + Y F_{ae1} = 1 \times 18600 + 0.6 \times 358 \approx 18800$$

$$P_{2a} = X F_{re2} + Y F_{ae2} = 1 \times 7900 + 0.6 \times 358 \approx 8110$$

(During constant speed motion)

$$F_{re1} = 1 \times 15400 + \frac{80200}{1610} \times \frac{49000}{1000} \approx 17800$$

$$F_{re2} = 1 \times 4660 + \frac{80200}{1610} \times \frac{49000}{1000} \approx 7100$$

$$F_{ae1} = 0$$

$$F_{ae2} = 0$$

$$P_{1b} = 17800$$

$$P_{2b} = 7100$$

(During deceleration at the end of motion)

$$F_{re1} = 1 \times 14600 + \frac{80200}{1610} \times \frac{49000}{1000} \approx 17000$$

$$F_{re2} = 1 \times 3860 + \frac{80200}{1610} \times \frac{49000}{1000} \approx 6300$$

$$F_{ae1} = 1.28 \times 280 \approx 358$$

$$F_{ae2} = 1.28 \times 280 \approx 358$$

$$P_{1c} = 1 \times 17000 + 0.6 \times 358 \approx 17200$$

$$P_{2c} = 1 \times 6300 + 0.6 \times 358 \approx 6510$$

Because the dynamic equivalent load changes stepwise along the traveling distance, the mean equivalent load is calculated from ① in Table 7 on page III-14.

$$P_{m1} = \sqrt[3]{\frac{1}{S} (P_{1a}^3 \frac{V_{\max} t_1}{2} + P_{1b}^3 V_{\max} t_2 + P_{1c}^3 \frac{V_{\max} t_3}{2})}$$

$$= \left\{ \frac{1}{500} \times \left(18800^3 \times \frac{100 \times 0.1}{2} + 17800^3 \times 100 \times 4.9 + 17200^3 \times \frac{100 \times 0.1}{2} \right) \right\}^{1/3} \approx 17800$$

$$P_{m2} = \left\{ \frac{1}{500} \times \left(8110^3 \times \frac{100 \times 0.1}{2} + 7100^3 \times 100 \times 4.9 + 6510^3 \times \frac{100 \times 0.1}{2} \right) \right\}^{1/3} \approx 7110$$

The basic rating life of slide unit 1 receiving the largest dynamic equivalent load is calculated. The basic rating life is obtained by the formula (1) given on the page III-6 considering the load factor f_w (see Table 1 on page III-6).

$$L_1 = 50 \left(\frac{C}{f_w P_{m1}} \right)^3 = 50 \left(\frac{74600}{1.5 \times 17800} \right)^3 \approx 1090$$

$$L_{h1} = \frac{10^6 L_1}{2S n_1 \times 60} = \frac{10^6 \times 1090}{2 \times 500 \times 6 \times 60} \approx 3030$$

As the result of calculation above, the basic rating life is about 3,030 hours.

③ Calculating of static safety factor

The static equivalent load is calculated from the upward / downward load and lateral load by formula (11) on page III-8.

(During acceleration at the start of motion)

$$P_{o1a} = k_{or} |F_{r1}| + k_{oa} |F_{a1}| + \frac{C_0}{T_0} |M_{o1}| = 1 \times 16200 + 1.28 \times 280 + \frac{80200}{1610} \times \frac{49000}{1000} \approx 19000$$

$$P_{o2a} = k_{or} |F_{r2}| + k_{oa} |F_{a2}| + \frac{C_0}{T_0} |M_{o2}| = 1.19 \times 5460 + 1.28 \times 280 + \frac{80200}{1610} \times \frac{49000}{1000} \approx 9300$$

(During constant speed motion)

$$P_{o1b} = 1 \times 15400 + 1.28 \times 0 + \frac{80200}{1610} \times \frac{49000}{1000} \approx 19000$$

$$P_{o2b} = 1.19 \times 4660 + 1.28 \times 0 + \frac{80200}{1610} \times \frac{49000}{1000} \approx 7990$$

(During deceleration at the end of motion)

$$P_{o1c} = 1 \times 14600 + 1.28 \times 280 + \frac{80200}{1610} \times \frac{49000}{1000} \approx 17400$$

$$P_{o2c} = 1.19 \times 3860 + 1.28 \times 280 + \frac{80200}{1610} \times \frac{49000}{1000} \approx 7390$$

The static safety factor of slide unit 1 during acceleration at the start of motion receiving the largest static equivalent load is calculated. The static safety factor is calculated by formula (4) on page III-6.

$$f_s = \frac{C_0}{P_{o1a}} = \frac{80200}{19000} \approx 4.2$$

As the result of calculation above, the static safety factor is about 4.2.

Accuracy

Five classes of accuracy, ordinary, high, precision, super precision, and ultra precision are specified for Linear Way and Linear Roller Way.

The outline of applicable accuracy classes is shown in Table 8. For details, see an explanation of each series.

Table 8 Accuracy classes and series

Series name	Class (classification symbol)	Ordinary (No symbol)	High (H)	Precision (P)	Super precision (SP)	Ultra precision (UP)
C-Lube Linear Way ML Linear Way L		—	○	○	—	—
C-Lube Linear Way MLV		—	○	—	—	—
C-Lube Linear Way MV		○	○	○	○	—
C-Lube Linear Way ME Linear Way E		○	○	○	○	—
C-Lube Linear Way MH Linear Way H		—	○	○	○	—
Linear Way F		—	○	○	○	—
C-Lube Linear Way MUL Linear Way U		○	○	—	—	—
C-Lube Linear Roller Way Super MX Linear Roller Way Super X		—	○	○	○	○
Linear Roller Way X		—	○	○	○	○
Linear Way Module		—	○	○	○	—

Preload

Objectives of preload

In some cases, the linear motion rolling guide is used with clearance given to the linear motion rolling guide when light motion with small load is required. However, for some applications, it may be used with play in the guiding mechanism removed or with preload to increase rigidity.

Preload is applied to the contact parts of a raceway and rolling elements with internal stress generated in advance. When an external load is applied on the preloaded linear motion rolling guide, shock absorbing with this internal stress makes elastic deformation smaller, and its rigidity is increased. (See Fig. 3)

Preload setting

Preload amount is determined by considering the characteristics of the machines or equipments on which the linear motion rolling guide is mounted and the nature of load acting on the linear motion rolling guide. The standard amount of preload for linear motion rolling guides is, in general, approx. 1/3 of load when the rolling elements are balls (steel balls) and approx. 1/2 of load when they are rollers (cylindrical rollers). If the linear motion rolling guides are required to have very high rigidity to withstand vibration or fluctuating load, a larger preload may be applied. For applicable preload amount, see Table 9. For details, see an explanation of each series.

Precaution for preload selection

Even when high rigidity must be required, excessive preload should be avoided, because it will produce an excessive stress between rolling elements and raceways, and eventually result in short life of linear motion rolling guides. It is important to apply a proper amount of preload, considering the operational conditions. When using with a large preload, contact IKO.

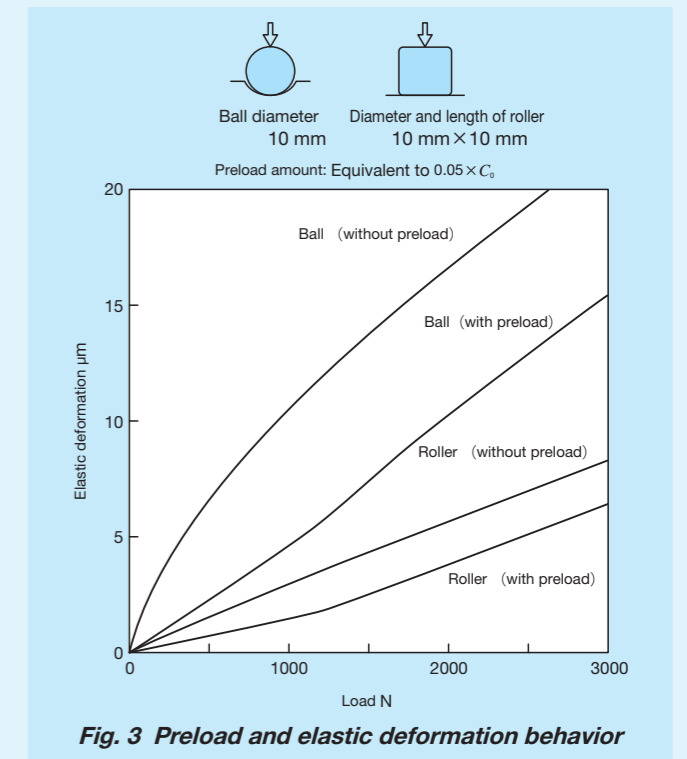


Table 9 Series and preload amount

Series name	Preload (preload symbol)	Clearance (T _c)	Clearance (T ₀)	Standard (No symbol)	Light preload (T ₁)	Medium preload (T ₂)	Heavy preload (T ₃)
C-Lube Linear Way ML Linear Way L		—	○	○	○	—	—
C-Lube Linear Way MLV ⁽¹⁾		—	—	—	—	—	—
C-Lube Linear Way MV		○	—	○	○	—	—
C-Lube Linear Way ME Linear Way E		○	—	○	○	○	—
C-Lube Linear Way MH Linear Way H		—	○	○	○	○	○
Linear Way F		—	—	○	○	○	—
C-Lube Linear Way MUL Linear Way U		—	—	○	○	—	—
C-Lube Linear Roller Way Super MX Linear Roller Way Super X		—	—	○	○	○	○
Linear Roller Way X		—	—	○	○	○	○

Note ⁽¹⁾ Preload is adjusted to have subtle clearance or minimal amount of preload.

Friction of linear motion rolling guide

The static friction (start-up friction) of linear motion rolling guides is much lower than that of conventional plain guides. Also, the difference between static friction and dynamic friction is small, and frictional resistance varies little when velocity changes. These are excellent features of linear motion rolling guides, and account for their ability to reduce power consumption, suppress operating temperature rise, and increase traveling speed.

Since frictional resistance and variation are small, high-speed response characteristics to motion commands and high accuracy positioning can be achieved.

Friction coefficient

The frictional resistance of linear motion rolling guides varies with their model, applied load, velocity and characteristics of lubricant. Generally, lubricant or seals are major factors in determining the frictional resistance in light load or high-speed operation, while the amount of load is the major factor in heavy load or low speed operation. The frictional resistance of linear motion rolling guides depends on various factors, but generally the following formula is used.

$$F = \mu P \dots\dots\dots(13)$$

where, F : Frictional resistance, N
 μ : Dynamic friction coefficient
 P : Applied load, N

For sealed guides, seal resistance is added to the above value, but this resistance varies greatly depending on the interference amount of seal lip and lubrication conditions.

Where the lubrication and mounting condition are correct and the load is moderate, the friction coefficients of Linear Way and Linear Roller Way in operation are within the range shown in Table 10. Generally, friction coefficient is large under small load.

Table 10 Friction coefficient

Series name	Dynamic friction coefficient μ ⁽¹⁾
Linear Way	0.0040~0.0060
Linear Roller Way	0.0020~0.0040

Note ⁽¹⁾ These friction coefficients do not include seal.

Objectives of lubrication

The objectives of applying lubricant for linear motion rolling guides is to keep raceways, rolling elements, etc. in a linear motion rolling guide from metal contact, and thereby reduce friction and wear preventing heat generation and seizure. When an adequate oil film is formed at the rolling contact area between the raceways and rolling elements, the contact stress due to load can be reduced. To manage the formation of adequate oil film is important for ensuring the reliability of linear motion rolling mechanism.

Selection of lubricant

To obtain the full performance of linear motion rolling guides, it is necessary to select an appropriate lubricant and lubrication method by considering the model, load and velocity of each linear motion rolling guide. However, as compared with plain guides, lubrication of linear motion rolling guides is much simpler. Only a small amount of lubrication oil is needed and replenishment interval is longer, so maintenance can be greatly reduced. Grease and oil are the two most commonly used lubricants for linear motion rolling guides.

Grease lubrication

For linear motion rolling guides, lithium-soap base grease (Consistency No.2 of JIS) is commonly used. For rolling guides operating under heavy load conditions, grease containing extreme pressure additives is recommended.

In clean and high-vacuum environments, where low dust generating performance and low vaporization characteristics are required, greases containing a synthetic-base oil or a soap other than the lithium-soap base are used. For applications in these environments, due consideration is necessary to select a grease that is suitable for the operating conditions of linear motion rolling guide and achieves satisfactory lubrication performance at the same time.

Table 11 Pre-packed grease list

Series name	Pre-packed grease
C-Lube Linear Way ML Linear Way L	MULTEMP PS No.2 [KYODO YUSHI CO., LTD.]
C-Lube Linear Way MLV	Alvania EP Grease 2 [SHOWA SHELL SEKIYU K. K.]
C-Lube Linear Way MV	
C-Lube Linear Way ME Linear Way E	
C-Lube Linear Way MH ⁽¹⁾ Linear Way H ⁽¹⁾	
Linear Way F	MULTEMP PS No.2 [KYODO YUSHI CO., LTD.]
C-Lube Linear Way MUL Linear Way U ⁽²⁾	
C-Lube Linear Roller Way Super MX Linear Roller Way Super X	
Linear Roller Way X	Alvania EP Grease 2 [SHOWA SHELL SEKIYU K. K.]
Linear Way Module	

Notes ⁽¹⁾ MULTEMP PS No.2 is pre-packed in size 8 to 12 series.
⁽²⁾ Alvania EP Grease 2 is pre-packed in size 40 to 86 series.

Grease replenishment interval

The quality of any grease will gradually deteriorate as operating time passes. Therefore, periodic replenishment is necessary. Grease replenishment interval varies depending on the operating conditions. A six month interval is generally recommended, and if the machine operation consists of reciprocating motions with many cycles and long strokes, replenishment every three month is recommended.

In addition, linear motion rolling guides in which the lubrication part "C-Lube" is built deliver long-term maintenance free performance. This eliminates the need for lubrication mechanism and workload which used to be necessary for linear motion rolling guides and significantly reduces maintenance cost.

Grease replenishment method

New grease must be supplied through a grease feed device such as a grease nipple until old grease is discharged. After grease is replenished, running-in is performed and excess grease will be discharged to outside of the linear motion rolling guide. Discharged grease must then be removed before starting the operation. The amount of grease required for standard replenishment is about 1/3 to 1/2 of the free space inside the linear motion rolling guide. When grease is supplied from a grease nipple for the first time, there will be grease lost in the replenishment path. The amount lost should be taken into consideration.

Generally, immediately after grease is replenished, frictional resistance tends to increase. If additional running-in is performed for 10 to 20 reciprocating cycles after excess grease is discharged, frictional resistance becomes small and stable.

For applications where low frictional resistance is required, the replenishment amount of grease may be reduced, but it must be kept to an appropriate level so as not to give a bad influence on the lubrication performance.

Table 12 Grease brands used in linear motion rolling guide

Brand		Base oil	Thickener	Consistency	Range of operating temperature ⁽²⁾ °C	Usage
Alvania EP Grease 2	[SHOWA SHELL SEKIYU K. K.]	Mineral oil	Lithium	284	-20~110	General application with extreme-pressure additive
Alvania Grease S2	[SHOWA SHELL SEKIYU K. K.]	Mineral oil	Lithium	283	-25~120	General application
MULTEMP PS No.2	[KYODO YUSHI CO., LTD.]	Synthetic oil, Mineral oil	Lithium	275	-50~130	General application
IKO Low Dust-Generation Grease for Clean Environment CG2	[NIPPON THOMPSON CO., LTD.]	Synthetic oil	Urea	280	-40~200	For clean environment Long life
IKO Low Dust-Generation Grease for Clean Environment CGL	[NIPPON THOMPSON CO., LTD.]	Synthetic oil, Mineral oil	Lithium / Calcium	225	-30~120	For clean environment Low sliding
Klüberalfa GR Y-VAC3 ⁽¹⁾	[NOK KLUEBER]	Synthetic oil	Ethylene tetra-fluoride	No.3	-20~250	For vacuum
IKO Anti-Fretting Corrosion Grease AF2	[NIPPON THOMPSON CO., LTD.]	Synthetic oil	Urea	285	-50~170	Fretting-proof
6459 Grease N	[SHOWA SHELL SEKIYU K. K.]	Mineral oil	Poly-urea	305	—	Fretting-proof

Notes ⁽¹⁾ Set replenishment intervals to short.

⁽²⁾ The ranges of operating temperature are quoted from the grease manufacturer's cataloged values, but do not guarantee regular use under high temperature environment.

Remarks Check with the chosen grease manufacturer's catalog before use.

For grease for applications other than those listed, please contact IKO.

Mixing of different type of grease

Mixing different types of grease may result in changing the properties of base oil, soap base, or additives used, and, in some cases, severely deteriorate the lubrication performance or cause trouble due to chemical changes of additives. Old grease should therefore be removed thoroughly before filling with new grease.

Lubrication part "C-Lube"

C-Lube is a porous resin with molding formed fine resin powder. It is a lubrication part impregnated with a large amount of lubrication oil in its open pores by capillary inside.

Lubrication oil is supplied directly to balls (steel balls) or rollers (cylindrical rollers), not to the track rail. When the balls or rollers have contact with C-Lube built in the slide unit, lubrication oil is supplied to the surface of the balls or rollers. As the balls or rollers circulate, the lubricant is distributed to the loading area along the track rail. This results in adequate lubrication oil being properly maintained in the loading area and lubrication performance will last for a long time.

The surface of C-Lube is always covered with the lubrication oil. Lubrication oil is continuously supplied to the surface of balls or rollers by surface tension in the contact of C-Lube surface and balls or rollers.

Oil lubrication

For oil lubrication, heavy load requires high oil viscosity and high velocity requires low oil viscosity. Generally, for linear motion rolling guides operating under heavy load, lubrication oil with a viscosity of about 68 mm²/s is used. For linear motion rolling guides under light load at high-speed operation, lubrication oil with a viscosity of about 13 mm²/s is used.

Miniature greaser

The miniature greaser is specially prepared for grease replenishment for Linear Way and Linear Roller Way with an oil hole. Table 13 shows types of grease and specifications of miniature greasers.



Table 13 Grease type and miniature greaser

Identification number	Grease name	Amount	Outer diameter of grease feed needle
MG10 / MT2	MULTEMP PS No.2 [KYODO YUSHI CO., LTD.]	10 ml	φ 1 mm
MG10 / CG2	IKO Low Dust-Generation Grease for Clean Environment CG2		
MG2.5 / EP2	Alvania EP Grease 2 [SHOWA SHELL SEKIYU K. K.]	2.5 ml	
MG2.5 / CG2	IKO Low Dust-Generation Grease for Clean Environment CG2		
MG2.5 / CGL	IKO Low Dust-Generation Grease for Clean Environment CGL		
MG2.5 / AF2	IKO Anti-Fretting Corrosion Grease AF2		

Grease nipple and supply nozzle

Tables 14.1 and 14.2 show the specifications of grease nipples and applicable types of supply nozzles, and Table 15 shows the specifications of supply nozzles.

Table 14.1 Grease nipple and applicable supply nozzle type

Grease nipple		Applicable supply nozzle type	
Type	Dimensions and shape	Type	Shape
A-M3		A-5120V A-5240V B-5120V B-5240V	Straight type
A-M4			Straight type with angle
B-M4		A-8120V B-8120V	

Table 14.2 Grease nipple and applicable supply nozzle type

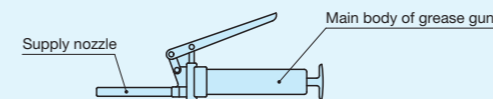
Grease nipple		Applicable supply nozzle type	
Type	Dimensions and shape	Type	Shape
B-M6			
JIS type 1		Straight type	
JIS type 2		Products available on the market	Chuck type
JIS type 4			Hose type
A-PT 1/4			

Note (1) For straight type, chuck type and hose type supply nozzles available on the market, it is recommended to use one with an outer diameter D of 13 mm or less.

Table 15 Types and dimensions of supply nozzle

Type	Dimensions and shape
A-5120V	
A-5240V	
B-5120V	
B-5240V	
A-8120V	
B-8120V	

Remark: The supply nozzles shown in the table can be mounted on the main body of a common grease gun available on the market shown below. If needed, specify the supply nozzle type and place an order to IKO.



Piping joint

When applying centralized grease or oil lubrication, detach the grease nipple or plug from the slide unit, and replace them with piping joints, which are prepared for various female threads for piping. Use them after confirming the dimensions of the piping joints and H_3 dimensions in the dimensions table of each models, because the top face of some piping joints is at the same or higher level than the top face of slide unit. Fig. 4.1 and 4.2 and Tables 16.1, 16.2, 16.3, and 16.4 show identification number and dimensions of piping joints. Note that some of them are not applicable for the slide units of special specifications. Piping joints can be mounted on Linear Way and Linear Roller Way prior to delivery upon request. If needed, please contact IKO.

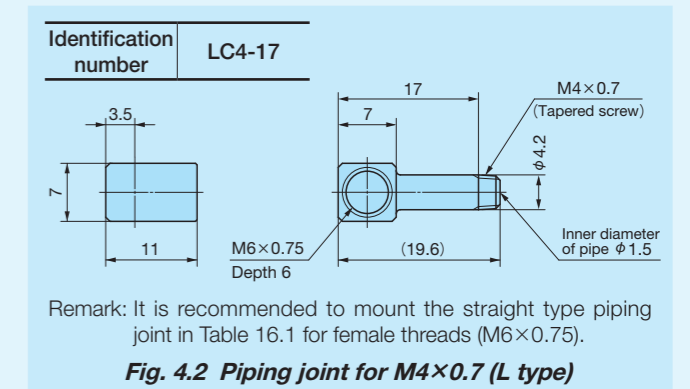
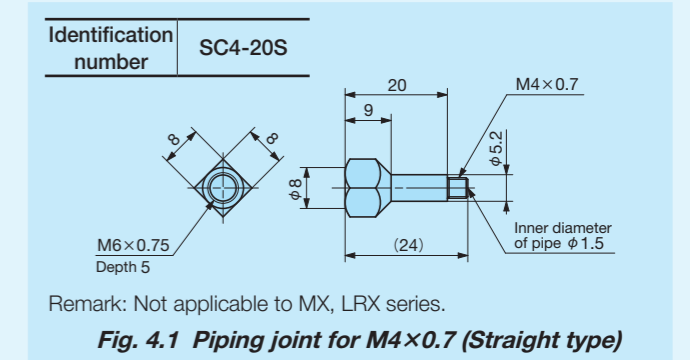
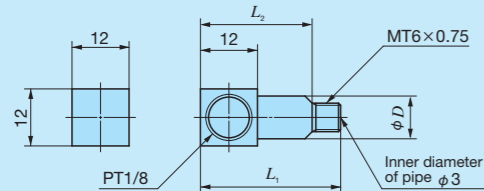


Table 16.1 Piping joint for M6×0.75 (Straight type)

Identification number	unit: mm			
	L_1	L_2	L_3	D
SC6-16	22	12.4	16	9
SC6-22S	28	12	22	6
SC6-25S	31	12	25	6

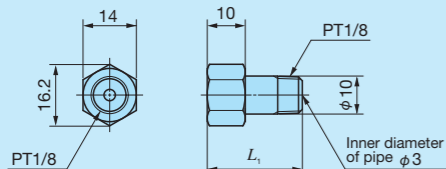
Table 16.2 Piping joint for M6×0.75 (L type)



Identification number	L_1	L_2	D
LC6-18	25	18	9
LC6-22S	28	—	6
LC6-24	30.5	23.5	9
LC6-25S	31	—	6

unit: mm

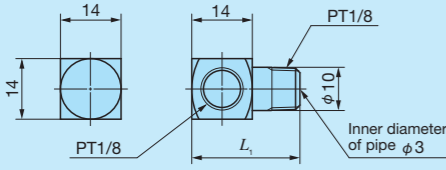
Table 16.3 Piping joint for PT1/8 (Straight type)



Identification number	L_1
SC1/8-19S	25
SC1/8-34S	40

unit: mm

Table 16.4 Piping joint for PT1/8 (L type)



Identification number	L_1
LC1/8-19S	25
LC1/8-34S	40

unit: mm

Dust Protection

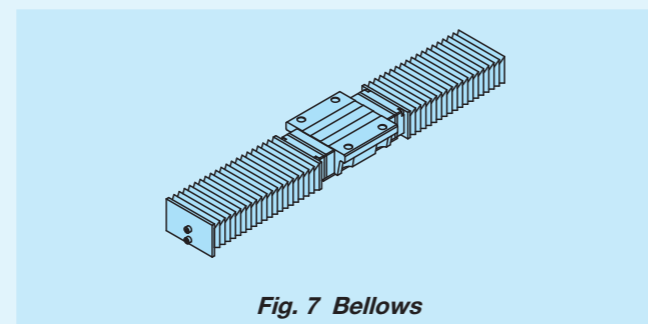
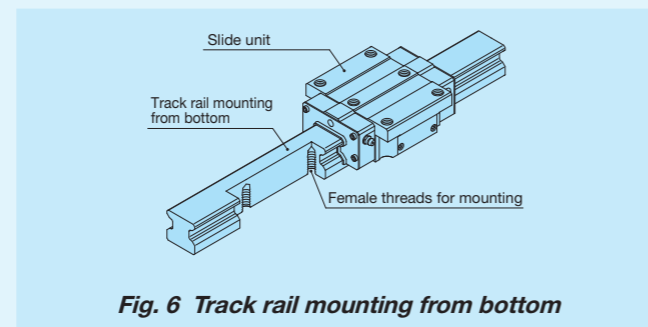
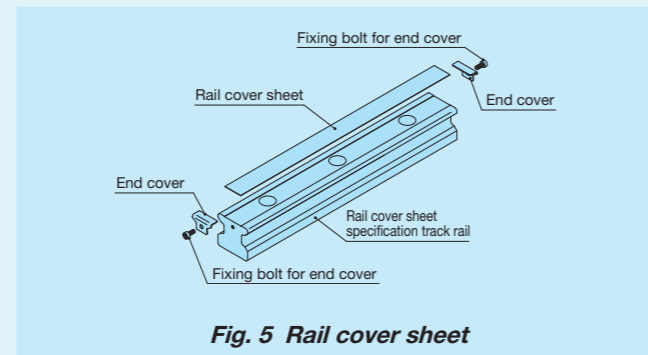
Purpose of dust protection

To obtain the full performance of linear motion rolling guides, it is important to protect them from the intrusion of dust and other harmful foreign substances. Select an effective sealing or dust-protection device to withstand any operating conditions that might be imposed.

Method of dust protection

Linear Way and Linear Roller Way have end seals as a standard specification. In addition, double seals or scrapers are provided as special specifications for improvement in dust protection performance. Also caps and a rail cover sheet to cover the mounting hole of track rail (Fig. 5) and track rail mounting from bottom with no mounting hole on the upper surface (Fig. 6) will further increase the reliability of dust protection.

However, if large amount of contaminant or dust are floating, or if large particles of foreign substances such as chips or sand may adhere to the raceway, complete dust protection becomes difficult. In this case, it is recommended to cover the whole unit with bellows (Fig. 7), telescope type shield, etc. When rail cover sheet or track rails mounting from bottom specification is needed, please contact IKO.

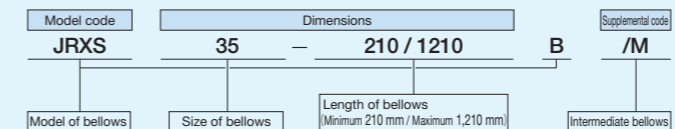


Specific bellows

The specific bellows are manufactured to match the dimensions of Linear Way and Linear Roller Way for easy mounting and excellent dust protection. If special bellows to be used in an upside-down position or those made of heat-resistant material are needed, please contact IKO.

Identification number of bellows

The identification number of bellows consists of a model code, dimensions, and any supplemental codes. Its standard arrangement is shown below.



Calculation of minimum length of bellows

The minimum necessary length of specific bellows is determined, by first calculating the necessary number of accordion pleats as follows.

$$ns = \frac{S}{\ell s_{\max} - \ell s_{\min}}$$

where, ns : Number of pleats (Raise decimal fractions)
 S : Stroke length, mm
 ℓs_{\max} : Maximum length of one pleat (See Tables 18.1 and 18.2)
 ℓs_{\min} : Minimum length of one pleat (See Tables 18.1 and 18.2)

$$L_{\min} = ns \times \ell s_{\min} + m \times 5 + 10$$

$$L_{\max} = S + L_{\min}$$

where, L_{\min} : Minimum length of bellows, mm
 L_{\max} : Maximum length of bellows, mm
 m : Number of internal guide plates (See Table 17)

Table 17 Number of internal guide plates for bellows

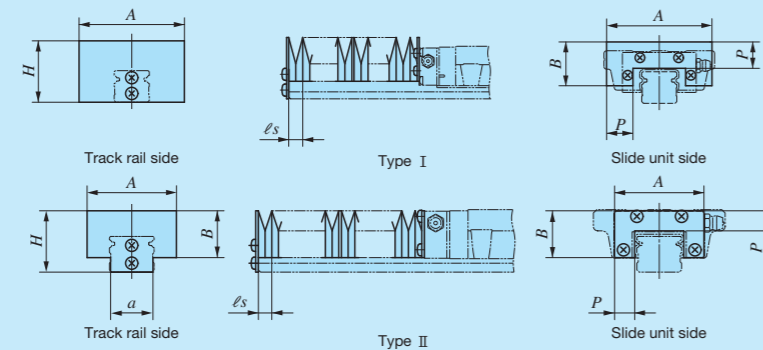
Model	P dimensions of specific bellows (1) mm		Number of internal guide plates m
	Above	Below	
JEF JRES	—	35	$m = \frac{ns}{7} - 1$
JES JHS JFS JRXS···B JFFS	—	22	$m = \frac{ns}{16}$ when $ns \leq 20$, then $m=0$
	22	25	$m = \frac{ns}{12}$ when $ns \leq 18$, then $m=0$
	25	35	$m = \frac{ns}{8}$

Note (1) For P dimensions, see Table 18.1 and Table 18.2.
 Remark: In calculating the number of internal guide plates m , raise the decimal fractions for JEF and JRES and omit the decimal fractions for others.

Intermediate bellows

Since different type of mounting plate is used for mounting bellows between slide units, add supplemental code "/M" onto the identification number when ordering. Reinforced bellows are also available, which are specially designed for use on long track rails or for lateral mounting. The width A of reinforced bellows is greater than that of standard type bellows. If needed, please contact IKO.

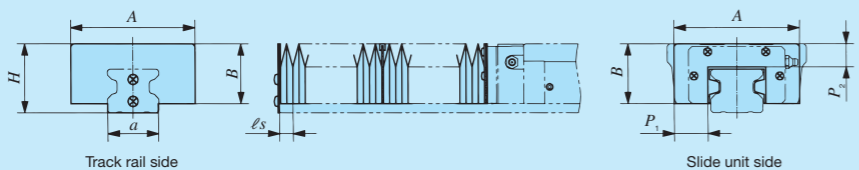
Table 18.1 Dimensions of bellows and applicable models



Series name	Size	Bellows model code	Type	H	A	a	B	P	$l_{s_{min}}$	$l_{s_{max}}$
C-Lube Linear Way ME Linear Way E	15	JEF 15	II	23.5	34	14	17	8	2	9
	20	JEF 20		27.5	40	19	21	9	2	10
	25	JEF 25		32	46	22	24	10	2	11
	30	JES 30		42	70	27	35	15	2	14
	35	JES 35		48	85	33	40	18	2	18.5
	45	JES 45		60	105	44	50	22	2	23.5
C-Lube Linear Way MH Linear Way H ⁽¹⁾	15	JHS 15	I	31 ⁽²⁾	55	—	19.5	15	2	14
	20	JHS 20		35 ⁽²⁾	60	—	25	15	2	14
	25	JHS 25		39 ⁽²⁾	64	—	29.5	15	2	14
	30	JHS 30		42	70	—	35	15	2	14
	35	JHS 35		48	85	—	40	18	2	18.5
	45	JHS 45		60	105	—	50	22	2	23.5
	55	JHS 55		70	120	—	57	25	2	28
	65	JHS 65		90	158	—	76	35	2	42
Linear Way F	33	JFFS 33	II	26 ⁽²⁾	66 ⁽³⁾	—	23	15	2	15
	37	JFFS 37	II	27.5 ⁽²⁾	70 ⁽³⁾	—	24	15	2	15
	40	JFS 40	I	32 ⁽²⁾	80	—	27	15	2	14
	42	JFFS 42	II	30.5 ⁽²⁾	76 ⁽³⁾	—	27.5	15	2	15
	60	JFS 60	I	36 ⁽²⁾	100	—	30	15	2	14
	69	JFFS 69	II	36 ⁽²⁾	106	—	31.5	15	2	15
90	JFS 90	I	50	150	—	43	22	2	23.5	

Notes ⁽¹⁾ Not applicable to horizontal mounting type LWHY.
⁽²⁾ The height of bellows may become higher than the height H of dimensions of assembly of slide units. Check H dimensions of each series in dimension table.
⁽³⁾ The width of bellows may become larger than the W_2 dimensions of slide units. Check with W_2 dimensions of each series in dimension table.

Table 18.2 Dimensions of bellows and applicable models



Series name	Size	Bellows model code	H	A	a	B	P_1	P_2	$l_{s_{min}}$	$l_{s_{max}}$
C-Lube Linear Roller Way Super MX Linear Roller Way Super X	15	JRES 15	34 ⁽¹⁾	55 ⁽²⁾	14	30	17.5	15	2	15
	20	JRES 20	39 ⁽¹⁾	60 ⁽²⁾	19	34	15	15	2	15
	25	JRES 25	42 ⁽¹⁾	65 ⁽²⁾	22	36	16.5	15	2	15
	30	JRES 30	46 ⁽¹⁾	70 ⁽²⁾	27	39.5	15	15	2	15
	35	JRES 35	48	88 ⁽²⁾	33	41.5	24	15	2	15
	45	JRES 45	60	108 ⁽²⁾	44	52	29	20	2	21
	55	JRES 55	70	122 ⁽²⁾	52	61	31	22	2	23.5
	65	JRES 65	88	140 ⁽²⁾	61	76	25	25	2	30
Linear Roller Way X	25	JRXS 25...B	40	60	22	34	15	12	2	10
	35	JRXS 35...B	48	88	34	41.5	24	15	2	14
	45	JRXS 45...B	60	108	44	52	29	20	2	21
	55	JRXS 55...B	70	122	54	61	31	22	2	23.5
	75	JRXS 75...B	90	160	74	80	40	30	2	36

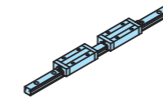
Notes ⁽¹⁾ The height of bellows may become higher than the height H of dimensions of assembly of slide units. Check H dimensions of each series in dimension table.
⁽²⁾ The width of bellows may become larger than the W_2 dimensions of slide units. Check W_2 dimensions of each series in dimension table.

Identification number and quantity for ordering

To order a set of Linear Way and Linear Roller Way, please specify the number of sets based on the number of track rails. For slide units of the interchangeable specification or single track rails, please specify the number of units.

Non-interchangeable specification

Assembled set



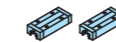
(When 1 set is needed)

Example of identification number indication
LWESG 25 C2 R640 SL T1 P /FU

Order quantity
1 set

Interchangeable specification

Single slide unit

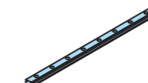


(When 2 pieces are needed)

Example of identification number indication
LWESG 25 C1 SL T1 P SO /U

Order quantity
2 pieces
Only C1 is specified. Please specify S1 or S2.

Single track rail

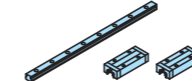


(When 1 unit is needed)

Example of identification number indication
LWE 25 R640 SL P SO /F

Order quantity
1 unit
Please specify S1 or S2.

Assembled set

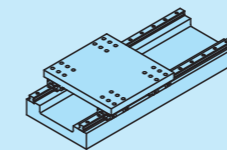


(When 1 set is needed)

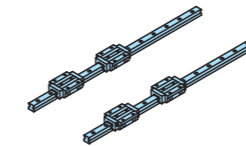
Example of identification number indication
LWESG 25 C2 R640 SL T1 P SO /FU

Order quantity
1 set
Please specify S1 or S2.

Specification with 1 multiple assembled sets as 1 assembled group (Special specification /W)



Linear Way and Linear Roller Way

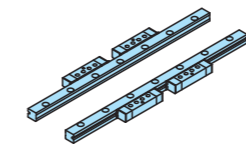


(When 2 sets as 1 assembled group is needed)

Example of identification number indication
LRX 45 C2 R1260 T3 SP /W2

Order quantity
2 sets

Linear Way Module



(When 2 sets as 1 assembled group is needed)

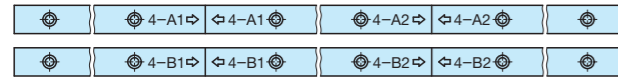
Example of identification number indication
LWM 2 M2 R480 P /W2

Order quantity
2 set

Special Specification

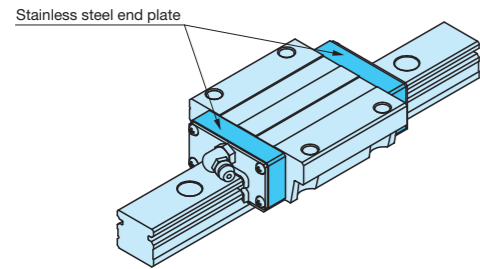
For Linear Way and Linear Roller Way, special specification described in pages III-29 through III-35 is available. There is limitation on applicable special specification. For details, see an explanation of each series.

Butt-jointing track rails /A



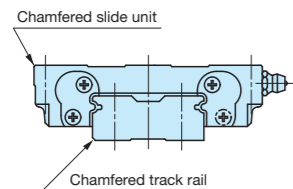
When the track rail of non-interchangeable specification is longer than the maximum length, two or more track rails should be butted in a linear motion direction. For length and number of track rails to butt, please contact IKO.

Stainless steel end plate /BS



The standard synthetic resin end plates are replaced with stainless steel end plates. The total length of the slide unit remains unchanged. In addition, for improvement of heat resistance, it is recommended to use "No end seal (supplemental code /N)" together.

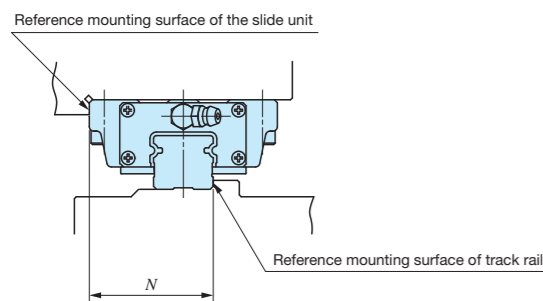
Chamfered reference surface /C /CC



Add chamfer to the reference mounting surface of the slide unit and track rail.

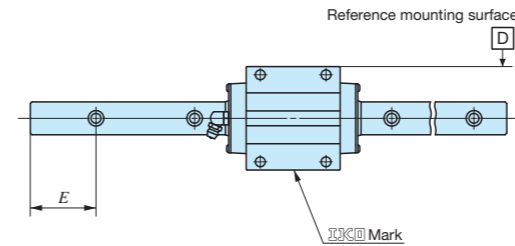
- ① /C Add chamfer to the reference mounting surface of the track rail.
- ② /CC Add chamfer to the reference mounting surface of the slide unit and track rail.

Opposite reference surfaces arrangement /D



Reference mounting surface of the track rail should be the opposite of the standard position. Accuracy of N dimensions and parallelism during operation remain unchanged.

Specified rail mounting hole positions /E



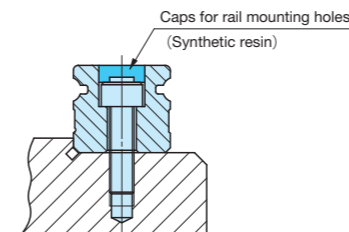
By specifying E dimensions from the mounting hole at the track rail left end to the left end surface when seen from IKO mark of the slide unit, specify the position of track rail mounting hole.

Specify the dimensions (in mm) after "/E".

In addition, E dimension range is limited. For details, please contact IKO.

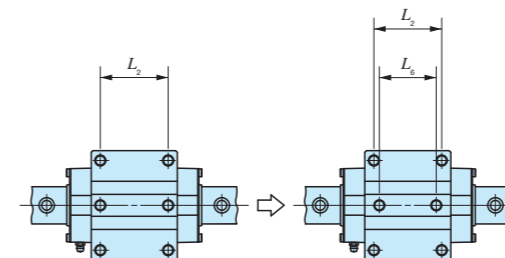
For Linear Way H horizontal mounting type and Linear Way Module series, see an explanation of each series.

Caps for rail mounting holes /F



Dedicated caps for rail mounting holes are included. They close track rail mounting holes to improve sealing property in a motion direction. Contact IKO for aluminum alloy caps for rail mounting holes.

Changed pitch of slide unit middle mounting holes /GE

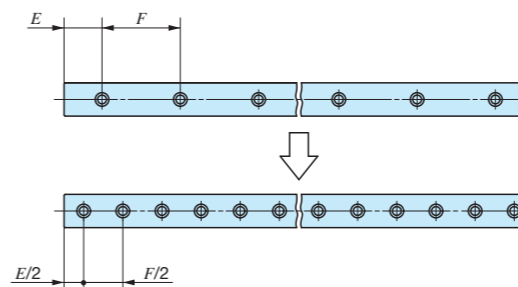


Change the dimension between mounting holes at the slide unit center.

Hybrid C-Lube Linear Way /HB

Change the material of rolling elements built into the slide unit to silicon nitride ceramics.

Half pitch mounting holes for track rail /HP

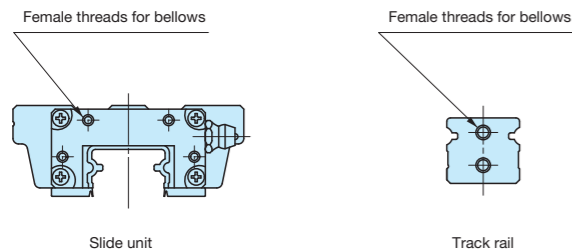


Set the pitch of track rail mounting holes to a half of the standard F dimension. The specification with bolts for track rail mounting holes are supplied with the required number of bolts.



Inspection sheet / I

Inspection sheet of *H* dimension, *N* dimension and parallelism during slide unit operation are appended in each set.

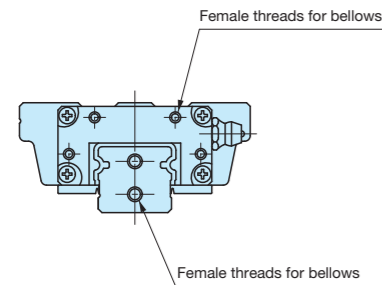
Female threads for bellows (Single unit) /J /JR /JL



For single slide unit or single track rail of the interchangeable specification, fit female threads for bellows.

- ① /J Fit female threads to both ends of the slide unit or track rail.
- ② /JR Fit female threads to a right end surface of the slide unit seen from  mark of the slide unit.
- ③ /JL Fit female threads to a left end surface of the slide unit seen from  mark of the slide unit.

Female threads for bellows (Assembled set) /J /JJ /JR /JS /JJS



For assembled set of the interchangeable specification or a non-interchangeable specification product, fit female threads for bellows to the slide unit and track rail.

- ① /J Fit female threads to both ends of the track rail and to slide unit end nearest to both ends of the track rail. (When only one slide unit is used, fit them to both ends of the track rail)
- ② /JJ When two or more slide units are used, fit female threads to both ends of the track rail and to both ends of each slide unit. (When only one slide unit is used, specify "/J")
- ③ /JR Fit female threads to both ends of the track rail.
- ④ /JS Fit female threads to slide unit end nearest to both ends of the track rail. (When only one slide unit is used, they are fitted to both ends of the track rail)
- ⑤ /JJS When two or more slide units are used, fit female threads to both ends of each slide unit. (When only one slide unit is used, specify "/JS")

Black chrome surface treatment /LC /LR /LCR

Acrylate resin coating is applied to improve the rust prevention property after black impregnated chrome surface treatment.

- ① /LC Perform casing treatment.
- ② /LR Perform track rail treatment.
- ③ /LCR Perform casing and track rail treatment.

Fluorine black chrome surface treatment /LFC /LFR /LFCR

Fluorinated resin coating is applied to improve the rust prevention property after black impregnated chrome surface treatment. In addition, this prevent foreign substances from sticking to the surface.

- ① /LFC Perform casing treatment.
- ② /LFR Perform track rail treatment.
- ③ /LFCR Perform casing and track rail treatment.

With track rail mounting bolt /MA

Recommended track rail mounting bolt is included. For bolt size, see the dimension table.

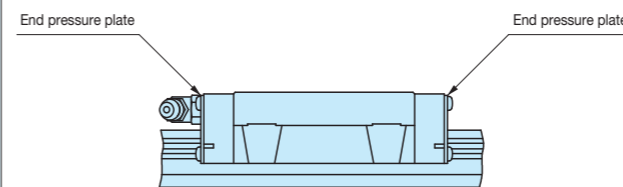
Without track rail mounting bolt /MN

Track rail mounting bolt is not included.

Changed size of mounting holes /M4

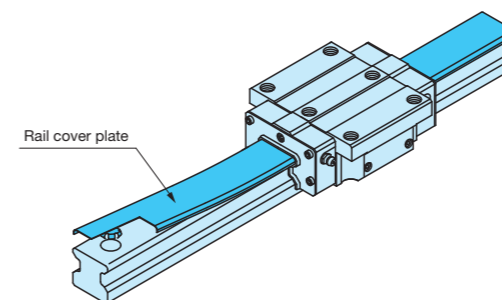
Set the M3 track rail mounting hole for ME15 to M4 track rail mounting holes. For combination with track rail mounting bolt (supplemental code "/MA"), specify "/MA4".

No end seal /N



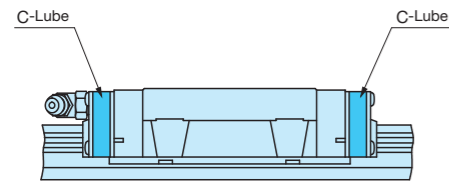
End seals at both ends of the slide unit can be replaced with end pressure plates, which do not come in contact with the track rail, to reduce frictional resistance. No under seal is attached. This specification is not effective for dust protection.

Rail cover plate for track rail /PS



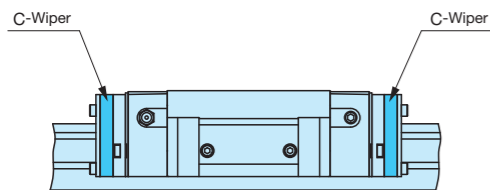
Deliver with the track rail cover plate mounted. Covering the upper surface with U-shape stainless steel thin plate after assembly of the track rail improves the sealing property further. Change the end seal to dedicated one. In addition, see the supplied rail cover plate instruction manual for mounting of rail cover plate.

With C-Lube plate /Q



The C-Lube impregnated with lubricant is attached inside the end seal of the slide unit, so that the interval for reapplying lubricant can be extended.

C-Wiper /RC /RCC



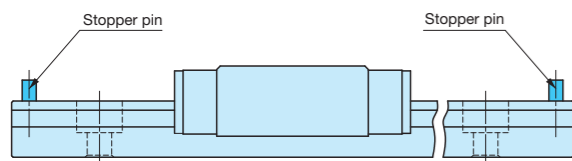
C-Wiper is mounted on the slide unit end to improve dust protection property. In addition, the slide unit with C-Wiper is equipped with inner seal (/UR) and scraper (/Z) together.

- ① /RC Fit C-Wiper to slide unit end nearest to both ends of the track rail. When only one slide unit is used, fit them to both ends of the track rail.
- ② /RCC When two or more slide units are used, fit C-Wiper to both ends of each slide unit.

Special environment seal /RE

The standard end seal and under seal are replaced with seals for special environment that can be used at high temperatures.

Track rail with stopper pins /S

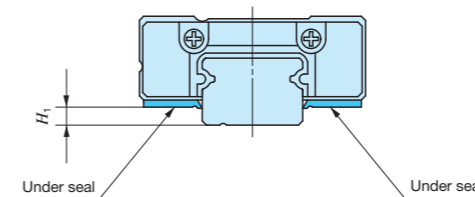


Mount stopper pins to both ends of the track rail as slide unit retainers.

Butt-jointing track rails (Interchangeable specification) /T

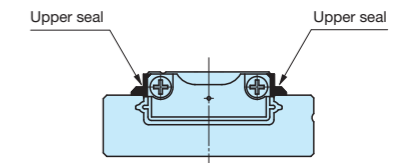
Finish the butted parts at both ends so as to set the interchangeable specification track rail in a linear motion direction. Butt the same interchangeable code for track rails. For non-interchangeable specification, specify butt-jointing track rails "/A".

Under seal (1) /U

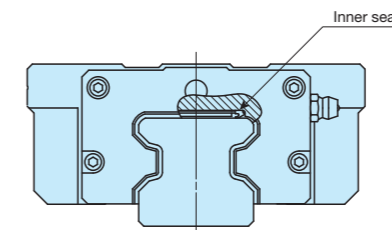


The seal is attached to the bottom of the slide unit to prevent foreign substances from entering from underneath.

Note (1) For C-Lube Linear Way UL and Linear Way U, attach "upper seal". The seal is attached to the upper end of the slide unit to prevent foreign substances from entering from above.

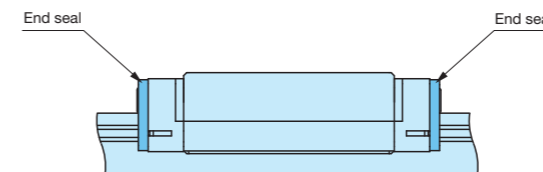


Inner seal /UR



Attach the inner seal to the inside of the slide unit. Inner seal improves dust protection property of the cylindrical roller circulation part against foreign substances from the upper surface of the track rail.



End seal /US



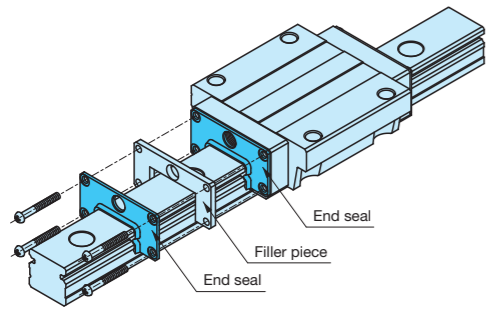
Attach end seals instead of scrapers on both sides of the slide unit in order to improve the dust protection performance.

Double seals (Single unit) /V /VR /VL

Double end seals are mounted to the interchangeable specification slide unit to improve the dust protection property.

- ① /V Apply double seals to both ends of the slide unit.
- ② /VR Apply double seals to a right end surface of the slide unit seen from the  mark of the slide unit.
- ③ /VL Apply double seals to a left end surface of the slide unit seen from the  mark of the slide unit.

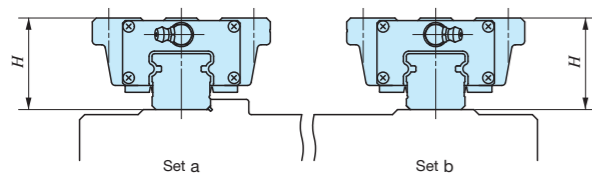
Double seals (Assembled set) /N /NV



Double end seals are mounted to the interchangeable specification assembled set or non-interchangeable specification product's slide unit to improve the dust protection property.

- ① /N Apply double seals to slide unit end nearest to both ends of the track rail. When only one slide unit is used, fit them to both ends of the track rail.
- ② /NV When two or more slide units are used, apply double seals to both ends of each slide unit.

A group of multiple assembled sets /W



Set the variation of *H* dimensions of the Linear Way and Linear Roller Way of multiple assembled sets on the same flat surface in the standard range. The variation of *H* dimensions of the multiple assembled sets is the same as the accuracy of one set. Indicate the number of sets after "/W" based on the number of units when specify.



Specified grease /YCG /YCL /YAF /YBR /YNG

The type of pre-packed grease can be changed by the supplemental code.

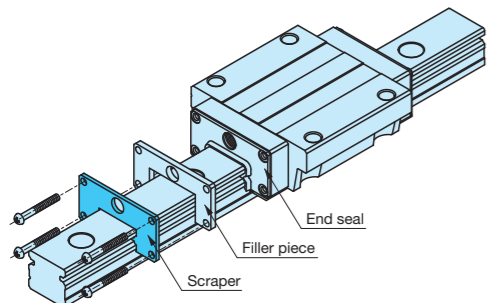
- ① /YCG Low Dust-Generation Grease for Clean Environment CG2 is pre-packed.
- ② /YCL Low Dust-Generation Grease for Clean Environment CGL is pre-packed.
- ③ /YAF Anti-Fretting Corrosion Grease AF2 is pre-packed.
- ④ /YBR MOLYCOTE BR2- Plus Grease [Dow Corning] is pre-packed.
- ⑤ /YNG No grease is pre-packed.

Scraper (Single unit) /Z /ZR /ZL

Mount a metal scraper to the interchangeable specification slide unit. The scraper is non-contact type and effectively eliminate large foreign substances adhering to the track rail.

- ① /Z Mount scrapers to both ends of the slide unit.
- ② /ZR Fit a scraper to a right end surface of the slide unit seen from  mark of the slide unit.
- ③ /ZL Fit a scraper to a left end surface of the slide unit seen from  mark of the slide unit.

Scraper (Assembled set) /Z /ZZ



Mount a metal scraper to the interchangeable specification assembled set or non-interchangeable specification product's slide unit. The scraper is non-contact type and effectively eliminate large foreign substances adhering to the track rail.

- ① /Z Fit a scraper to slide unit end nearest to both ends of the track rail. When only one slide unit is used, fit them to both ends of the track rail.
- ② /ZZ When two or more slide units are used, fit scrapers to both ends of each slide unit.

Precaution for Use

Operating temperature

The maximum operating temperature for linear motion rolling guide with integrated C-Lube is 80°C. The maximum operating temperature for linear motion rolling guide without integrated C-Lube is 120°C and temperature up to 100°C is allowed for continuous operation. When the temperature exceeds 100°C, please contact IKO. When specifying special specification with C-Lube plate (supplemental code "/Q"), utilize it below 80°C.

Multiple slide units used in close proximity

When using multiple slide units in close proximity, greater load may be applied than the calculated value depending on the deviation of slide unit mounting accuracy for the machine or device. In such cases, allowance for greater applied load than the calculated value should be made.

Lateral or upside-down mounting

For lateral or upside-down mounting of the Linear Way E and Linear Way F, specify the special specification (supplemental code "/U") with under seal as necessary to prevent foreign substances from entering into the slide unit.

Operation velocity

Operation velocity limit value of the Linear Way and Linear Roller Way depends on operation conditions such as motion characteristics, applied load, lubrication status, mounting accuracy and environment temperature. Reference values based on actual performance and experienced values as a reference of maximum velocity under typical operating conditions are indicated in Table 19.

Table 19 Reference maximum velocity

Size	Maximum velocity m/min
35	180
45	120
55	100
65	75

Cleaning and removing fat

Never clean up a linear motion rolling guide with integrated C-Lube with organic solvent or white kerosene with property of removing fat.

Lubrication oil supply point for oil lubrication

If the lubrication oil is supplied by a gravity drip system, enough lubrication oil may not be supplied to ways above the supply point, so lubrication path and supply point must be considered. For such applications, please contact IKO.

Precaution for Mounting

When mounting multiple assembled sets at the same time

- Interchangeable specification products For interchangeable specification products, assemble a slide unit and a track rail with the same interchangeable code ("S1" or "S2").
- Non-interchangeable specification products Do not change the combination of delivered slide unit and track rail.
- Product including multiple assembled sets For special specification (supplemental code "/W") products with multiple assembled sets, the delivered combination is managed as a group for variation. So do not mix with different group for mounting.

Assembling of slide unit and track rail

When assembling the slide unit on the track rail, correctly fit the grooves of the slide unit and the track rail and move the slide unit softly in parallel direction. Rough handling may result in damaging of seals or dropping of steel balls and cylindrical roller. For product including a dummy rail as a standard accessory, operation of the slide unit to the track rail can be made easier by using the dummy rail. Though the dummy rail is included as an accessory of products indicated in Table 21.1 and Table 21.2, it is also available for other products. If these parts are necessary, please contact IKO.

Mounting accuracy

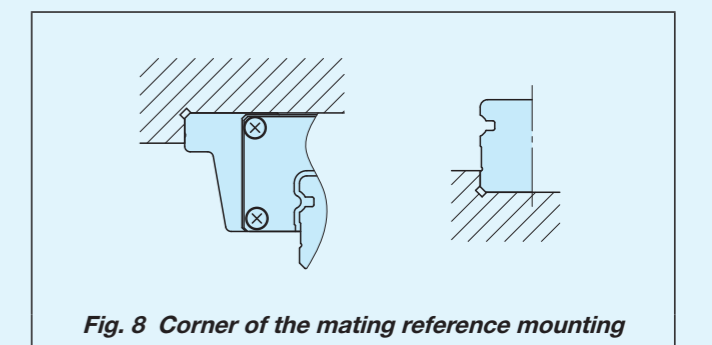
Deviation of accuracy of Linear Way and Linear Roller Way mounting surface or deviation of accuracy in mounting may generate large load over the calculated value. Note that such load could affect the life adversely. It enhances the reliability of Linear Way and Linear Roller Way to ensure high machining accuracy and assembly accuracy depending on operational conditions of the track rail and slide unit such as required motion accuracy and rigidity and to consider mounting structure that can maintain the accuracy and performance. Typical reference values for mounting parallelism between multiple assembled sets used are shown in Table 20.

Table 20 Parallelism between two mounting surfaces unit: μm

Classification	Ordinary (No symbol)	High (H)	Precision (P)	Super precision (SP)	Ultra precision (UP)
Parallelism	30	20	10	6	6

Shoulder height and corner radius of the reference mounting surface

For the shape of opposite corner of the reference surface, it is recommended to have relieved fillet as indicated in Fig. 8, but you may also use it with providing radius at the corner. For recommended values for the shoulder height and corner radius of the reference mounting surface, see an explanation of each series.



Precaution for Mounting

Table 21.1 Products appended with dummy rail

Series name and size	Interchangeable		Non-interchangeable specification Assembled set
	Single unit	Assembled set	
C-Lube Linear Way ML Linear Way L	○	See Table 21.2	See Table 21.2
C-Lube Linear Way MLV	—	—	—
C-Lube Linear Way MV	—	—	—
C-Lube Linear Way ME Linear Way E	○	—	—
C-Lube Linear Way MH Linear Way H	○	○	○
Linear Way F	○	—	—
C-Lube Linear Way MUL Linear Way U	—	—	○
C-Lube Linear Roller Way Super MX Linear Roller Way Super X	○	○	○
Linear Roller Way X	—	—	—

○: Appended

Table 21.2 Appended dummy rail model number for C-Lube Linear Way ML, C-Lube Linear Way MLV and Linear Way L

C-Lube Linear Way ML		C-Lube Linear Way MLV	Linear Way L	
Standard type	Wide type	Standard type	Standard type	Wide type
—	—	—	LWL 2	LWLF 4
MLC 3	MLFC 6	—	LWLC 3	LWLFC 6
ML 3	MLF 6	—	LWL 3	LWLF 6
MLC 5	MLFC 10	—	LWLC 5··B	LWLFC 10··B
ML 5	MLF 10	—	LWL 5··B	LWLF 10··B
MLC 7	MLFC 14	MLV 7	LWLC 7··B	LWLFC 14··B
ML 7	MLF 14	—	LWL 7··B	LWLF 14··B
MLG 7	MLFG 14	—	LWLG 7··B	LWLFG 14··B
MLC 9	MLFC 18	MLV 9	LWLC 9··B	LWLFC 18··B
ML 9	MLF 18	—	LWL 9··B	LWLF 18··B
MLG 9	MLFG 18	—	LWLG 9··B	LWLFG 18··B
MLL 9	—	—	—	—
MLG 12	MLFG 24	—	LWLG 12··B	LWLFG 24··B
MLL 12	—	—	—	—
MLG 15	MLFG 30	—	LWLG 15··B	LWLFG 30··B
MLL 15	—	—	—	—
MLG 20	MLFG 42	—	LWLG 20··B	LWLFG 42··B
MLG 25	—	—	LWLG 25··B	—

Cleanup of mounting surface

Remove burrs and blemishes by using oil-stone, etc. and wipe off rust prevention oil and dust with clean cloth from mounting surface and reference mounting surface of the machine or device to which the Linear Way or Linear Roller Way are mounted.

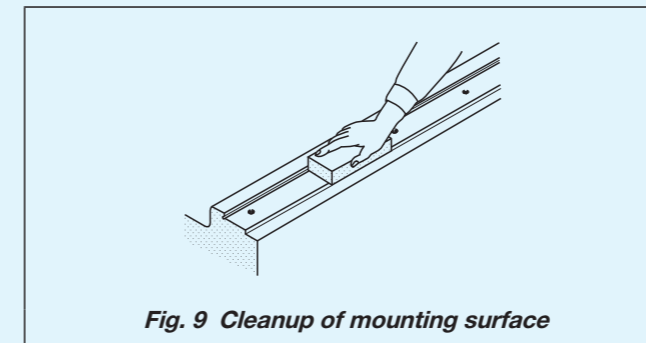


Fig. 9 Cleanup of mounting surface

Mounting of caps for rail mounting holes

When mounting the special specification caps for rail mounting holes (supplemental code "/F") on the track rail, use a flat applicator and stamp it by bits until it becomes plane with the track rail upper surface.

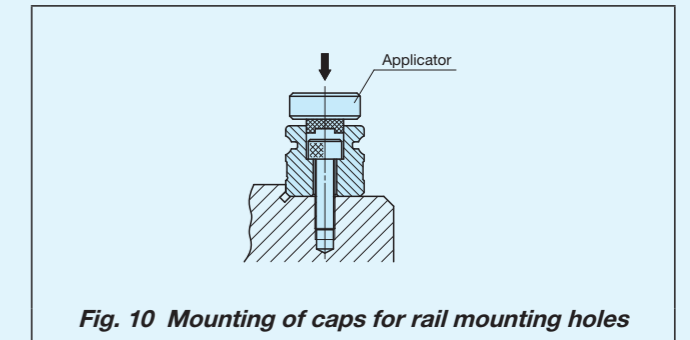


Fig. 10 Mounting of caps for rail mounting holes

Tightening torque for fixing screw

Typical fixing screw tightening torque to mount the Linear Way and Linear Roller Way is indicated in Table 22. When vibration and shock of the machine or device are large, fluctuating load is large, or moment load is applied, fix it by using the torque 1.2 to 1.5 times larger than the value indicated as necessary.

If the mating member material is cast iron or aluminum alloy, reduce the tightening torque depending on the strength characteristics of the mating member material.

For details, see an explanation of each series.

Though the track rail mounting bolts are appended as an accessory of products indicated in Table 23, it is also available for other products. If these parts are necessary, please contact IKO.

Table 22 Tightening torque for fixing screw

Bolt size	Tightening torque N · m			
	High carbon steel-made screw (Strength division 8.8)	High carbon steel-made screw (Strength division 10.9)	High carbon steel-made screw (Strength division 12.9)	Stainless steel-made screw (Property division A2-70)
M 1 ×0.25	—	—	—	0.04
M 1.4×0.3	—	—	—	0.10
M 1.6×0.35	—	—	—	0.15
M 2 ×0.4	—	—	—	0.31
M 2.3×0.4	—	—	—	0.49
M 2.5×0.45	—	—	—	0.62
M 2.6×0.45	—	—	—	0.70
M 3 ×0.5	1.3	—	1.8	1.1
M 4 ×0.7	2.9	—	4.1	2.5
M 5 ×0.8	5.7	—	8.0	5.0
M 6 ×1	—	—	13.6	8.5
M 8 ×1.25	—	—	32.7	20.4
M10 ×1.5	—	—	63.9	—
M12 ×1.75	—	—	110	—
M14 ×2	—	—	175	—
M16 ×2	—	—	268	—
M20 ×2.5	—	—	522	—
M24 ×3	—	749	—	—
M30 ×3.5	—	1 490	—	—

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

Table 23 Specifications of appended track rail mounting bolts

Series	Specifications of appended bolts				
	Size	Material type	Type	Material	Class
C-Lube Linear Way ML Standard type ⁽¹⁾	1~ 3 ⁽²⁾	Stainless steel made	JCIS 10-70 Cross-recessed pan head screw for precision equipment	Stainless steel made	—
Linear Way L Standard type ⁽¹⁾	5	Stainless steel made	JCIS 10-70 Cross-recessed pan head screw for precision equipment	Stainless steel made	—
	7~ 25	Stainless steel made	JIS B 1176 Hexagon socket head bolt	Stainless steel made	Property division A2-70
	9~ 20	High carbon steel made	JIS B 1176 Hexagon socket head bolt	High carbon steel made	Strength division 8.8
C-Lube Linear Way ML Wide type ⁽¹⁾	4~ 10	Stainless steel made	JCIS 10-70 Cross-recessed pan head screw for precision equipment	Stainless steel made	—
Linear Way L Wide type ⁽¹⁾	14~ 42	Stainless steel made	JIS B 1176 Hexagon socket head bolt	Stainless steel made	Property division A2-70
	18~ 42	High carbon steel made	JIS B 1176 Hexagon socket head bolt	High carbon steel made	Strength division 8.8
C-Lube Linear Way MLV		Stainless steel made	JIS B 1176 Hexagon socket head bolt	Stainless steel made	Property division A2-70
C-Lube Linear Way MV ⁽³⁾		High carbon steel made	JIS B 1176 Hexagon socket head bolt	High carbon steel made	Strength division 12.9
C-Lube Linear Way ME ⁽³⁾	Linear Way E ⁽³⁾	Stainless steel made	JIS B 1176 Hexagon socket head bolt	Stainless steel made	Property division A2-70
		High carbon steel made	JIS B 1176 Hexagon socket head bolt	High carbon steel made	Strength division 12.9
C-Lube Linear Way MH ⁽⁴⁾	Linear Way H ⁽⁵⁾	8~ 30	Stainless steel made	JIS B 1176 Hexagon socket head bolt	Property division A2-70
		12	High carbon steel made	JIS B 1176 Hexagon socket head bolt	Strength division 8.8
		15~ 65	High carbon steel made	JIS B 1176 Hexagon socket head bolt	High carbon steel made
Linear Way F		Stainless steel made	JIS B 1176 Hexagon socket head bolt	Stainless steel made	Property division A2-70
		High carbon steel made	JIS B 1176 Hexagon socket head bolt	High carbon steel made	Strength division 12.9
C-Lube Linear Way MUL ⁽³⁾	25	Stainless steel made	JCIS 10-70 Cross-recessed pan head screw for precision equipment	Stainless steel made	—
	30	Stainless steel made	JIS B 1176 Hexagon socket head bolt	Stainless steel made	Property division A2-70
Linear Way U ⁽³⁾	40~ 86	High carbon steel made	JIS B 1176 Hexagon socket head bolt	High carbon steel made	Strength division 12.9
C-Lube Linear Roller Way Super MX ⁽⁴⁾	Linear Roller Way Super X	Stainless steel made	JIS B 1176 Hexagon socket head bolt	Stainless steel made	Property division A2-70
		High carbon steel made	JIS B 1176 Hexagon socket head bolt	High carbon steel made	Strength division 12.9
		85~100	High carbon steel made	JIS B 1176 Hexagon socket head bolt	High carbon steel made
Linear Roller Way X	25~ 55	High carbon steel made	JIS B 1176 Hexagon socket head bolt	High carbon steel made	Strength division 12.9
	75	High carbon steel made	JIS B 1176 Hexagon socket head bolt	High carbon steel made	Strength division 10.9
Linear Way LM ⁽⁶⁾		Stainless steel made	JIS B 1176 Hexagon socket head bolt	Stainless steel made	Property division A2-70
Linear Way M ⁽⁷⁾		High carbon steel made	JIS B 1176 Hexagon socket head bolt	High carbon steel made	Strength division 12.9
Linear Roller Way M ⁽⁷⁾		High carbon steel made	JIS B 1176 Hexagon socket head bolt	High carbon steel made	Strength division 12.9

Notes (1) The bolts are not appended for tapped rail specification.

(2) The bolts are not appended. Specifications in the table are the ones prepared by IKO.

(3) The bolts are not appended. Specifications in the table are the ones when special specification "/MA" (with track rail mounting bolts) is specified.

(4) The bolts are not appended in an assembled set. Specifications in the table are the ones when special specification "/MA" (with track rail mounting bolts) is specified.

(5) The bolts are not appended in LWH...MU.

(6) Slide member mounting bolts are not appended.

(7) Slide member mounting bolts are also appended.

Mounting surface, reference mounting surface and typical mounting structure

When mounting Linear Way and Linear Roller Way, properly align the reference mounting surface B and D of the track rail and slide unit with the reference mounting surface of the table and bed and fix them. (See Fig. 11)

The reference mounting surfaces B and D and mounting surfaces A and C are precisely ground. Machining the mounting surface of the table and bed, such as machine or device, to high accuracy and mounting them properly will ensure stable linear motion with high accuracy.

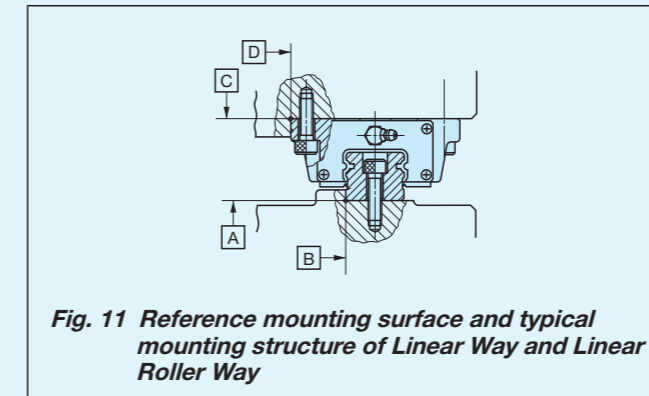




Fig. 11 Reference mounting surface and typical mounting structure of Linear Way and Linear Roller Way

Reference mounting surface of the slide unit is the opposite side of the  mark. The track rail reference mounting surface is identified by locating the  mark on the top surface of the track rail. It is the side surface above the mark (in the direction of the arrow). (See Fig. 12.)

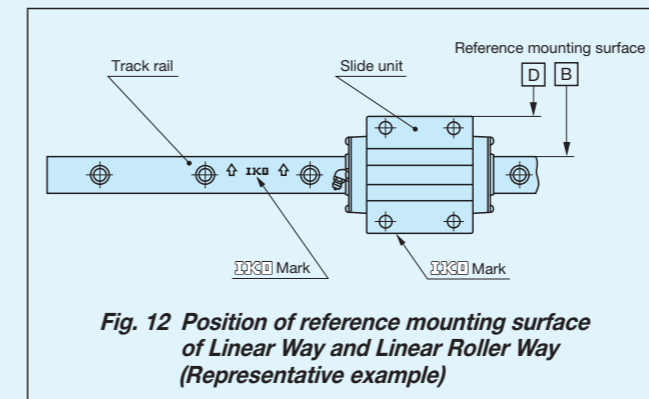


Fig. 12 Position of reference mounting surface of Linear Way and Linear Roller Way (Representative example)

Load direction and mounting structure

When lateral load, alternate load, or fluctuating load is applied onto the Linear Way or Linear Roller Way, securely fix the ends of slide unit and track rail as indicated in the Fig. 13 and Fig. 14.

When the load is small or operational conditions are not harsh, mounting methods indicated in Fig. 15 and Fig. 16 may be used.

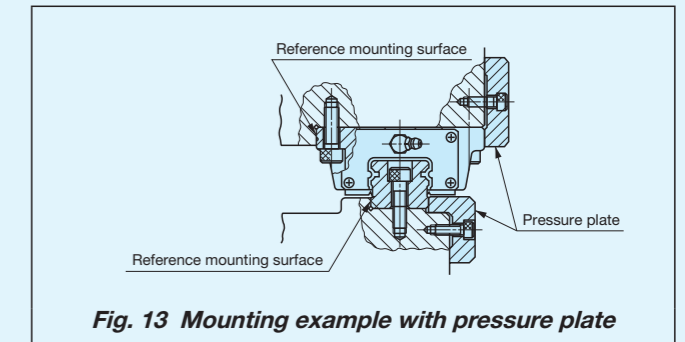


Fig. 13 Mounting example with pressure plate

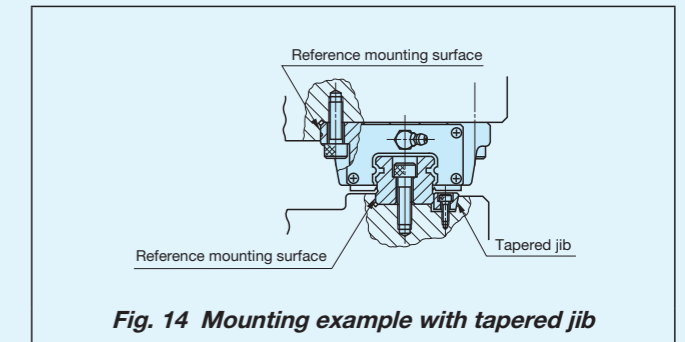


Fig. 14 Mounting example with tapered jib

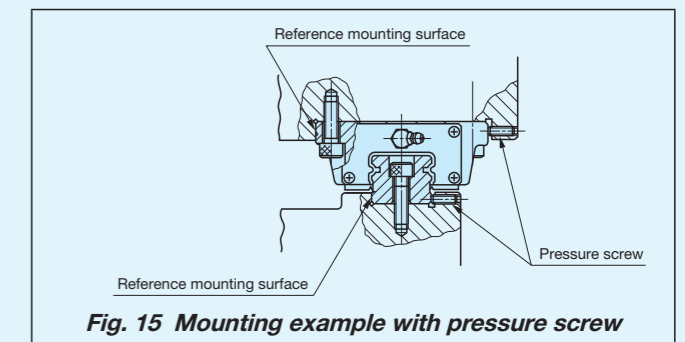


Fig. 15 Mounting example with pressure screw

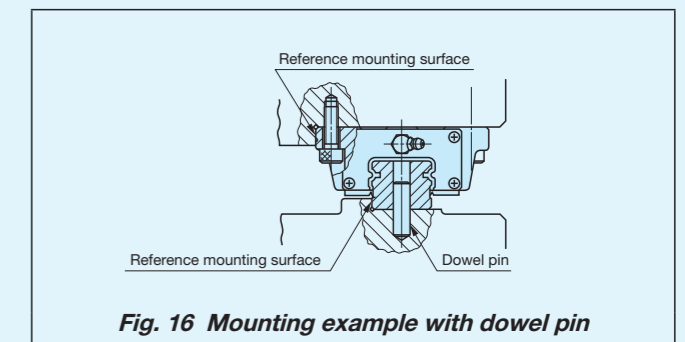


Fig. 16 Mounting example with dowel pin

Mounting Examples

Typical procedures to mount Linear Way and Linear Roller Way are described in Examples 1 to 4 using a Linear Way as a representative case.

Example 1. Typical operation

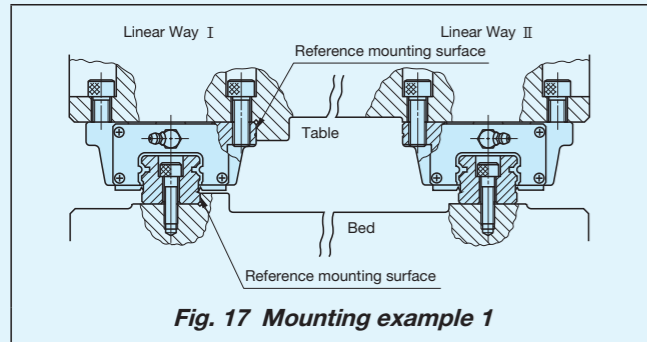


Fig. 17 Mounting example 1

For typical application without shock, reference mounting surface is prepared on each bed and table on the reference side. The mounting procedures are as follows. (See Fig. 17)

1 Cleanup of mounting surface and reference mounting surface

- Remove burrs and blemishes by using oil-stone, etc. from reference mounting surface and mounting surface of the machine or the device to which Linear Way is mounted and wipe off with clean cloth. (see Fig. 18)
- Wipe off rust prevention oil and dust on the reference mounting surface and the mounting surface of the Linear Way with clean cloth.

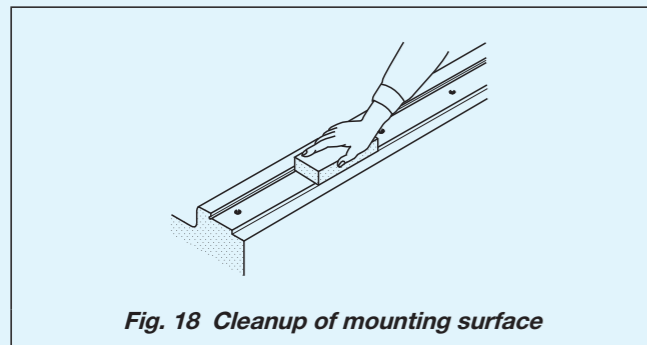


Fig. 18 Cleanup of mounting surface

2 Temporary fixing of Linear Way I and II track rails

- Align and temporarily fix them with reference mounting surface of each Linear Way track rail. (See Fig. 19) At this point, ensure that the fixing bolt does not interfere with the mounting hole.
- Fix the Linear Way II track rail to the bed.

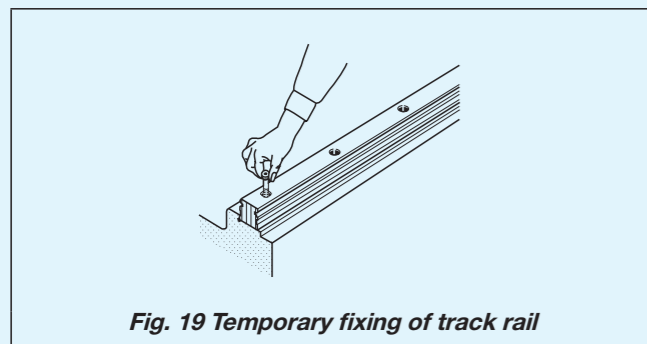


Fig. 19 Temporary fixing of track rail

3 Fixing of Linear Way I track rail

- Use small type vise or the like to stick track rail reference mounting surface to the reference mounting surface of the bed and tighten the fixing bolt at the same position. Repeat this method from one end to fix the track rail in order. (See Fig. 20)
- Linear Way II track rail should be left temporarily fixed.

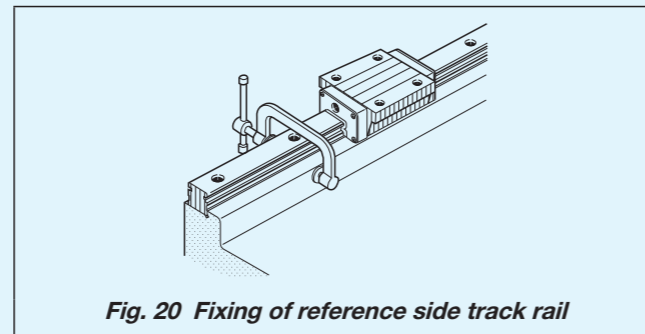


Fig. 20 Fixing of reference side track rail

4 Temporary fixing of Linear Way I and II slide units

- Align the Linear Way with the mounting position of the table and load the table gently.
- Temporarily fix the Linear Way I and II slide units to the table.

5 Fixing of Linear Way I slide unit

- Align the reference mounting surface of the Linear Way I slide unit with the reference mounting surface of the table correctly and fix them.

6 Fixing of Linear Way II slide unit

- Fix one of the Linear Way II slide units in a motion direction correctly and leave the other slide units temporarily fixed. (See Fig. 21)

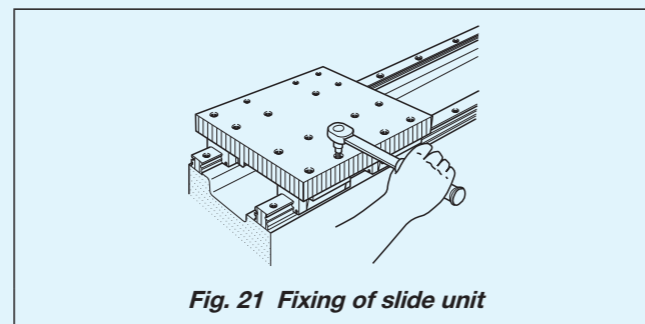


Fig. 21 Fixing of slide unit

7 Fixing of Linear Way II track rail

- Move the table and fix the Linear Way II track rail ensuring smooth motion status. At this point, tighten each fixing bolt immediately after the fixed slide unit of the Linear Way II passes on each of it. Repeat this method from one end to fix the track rail in order. (See Fig. 22)

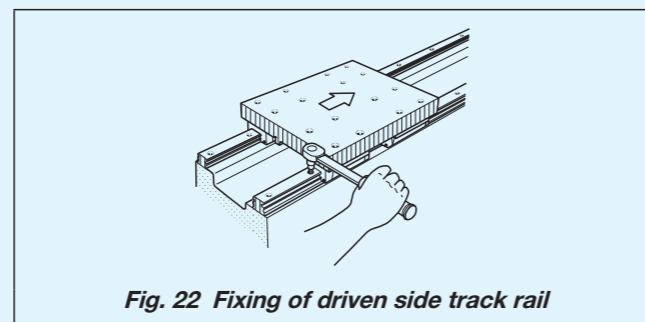


Fig. 22 Fixing of driven side track rail

8 Fixing of Linear Way II slide unit

- Fix the rest of the Linear Way II slide units.

Example 2. Operation for linear motion with accuracy and rigidity

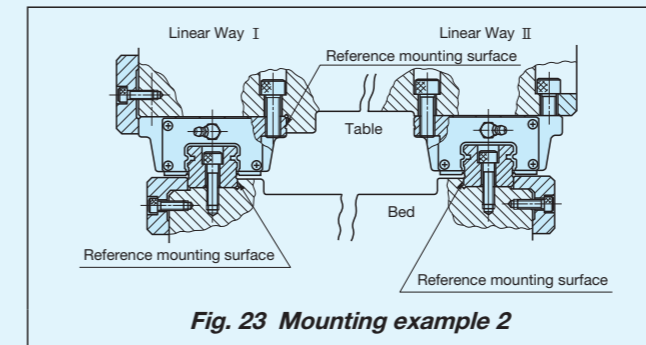


Fig. 23 Mounting example 2

If accuracy and rigidity of linear motion are required, prepare two reference mounting surfaces on the bed and one reference mounting surface on the table. The mounting procedures are as follows. (See Fig. 23)

1 Cleanup of mounting surface and reference mounting surface

- Remove burrs and blemishes by using oil-stone, etc. from reference mounting surface and mounting surface of the machine or the device to which Linear Way is mounted and wipe off with clean cloth. (see Fig. 24)
- Wipe off rust prevention oil and dust on the reference mounting surface and the mounting surface of the Linear Way with clean cloth.

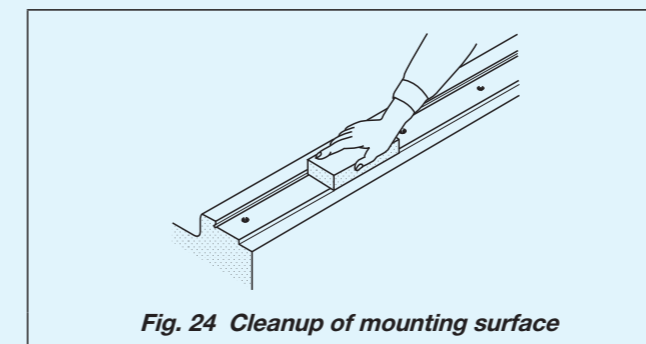


Fig. 24 Cleanup of mounting surface

2 Temporary fixing of Linear Way I and II track rails

- Align and temporarily fix them with reference mounting surface of each Linear Way track rail. (See Fig. 25) At this point, ensure that the fixing bolt does not interfere with the mounting hole.

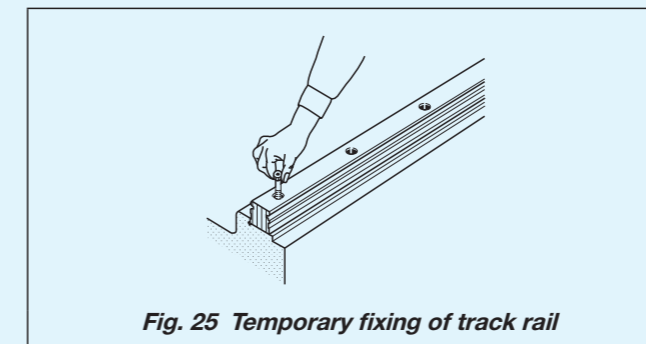


Fig. 25 Temporary fixing of track rail

3 Fixing of Linear Way I and II track rails

- Stick the track rail reference mounting surface of the Linear Way I to the reference mounting surface of the bed with pressure plate or pressure screws and tighten the track rail fixing bolt at the same position. Repeat this method from one end to fix the track rail in order. (See Fig. 26)

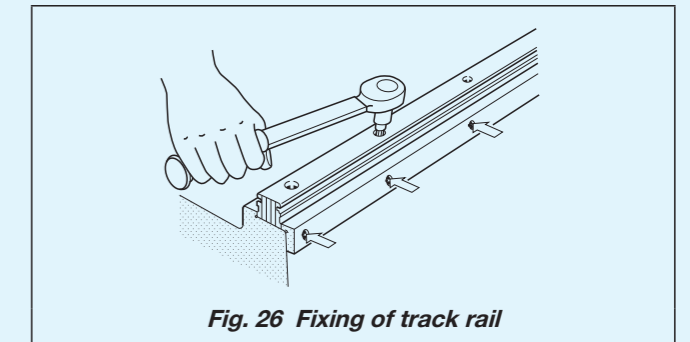


Fig. 26 Fixing of track rail

4 Temporary fixing of Linear Way I and II slide units

- Align the slide unit with the mounting position of the table and load the table gently. Temporarily fix the Linear Way I and II slide units to the table.

5 Fixing of Linear Way I slide unit

- Align the reference mounting surface of the Linear Way I slide unit with the reference mounting surface of the table correctly and fix them with pressure plate or pressure screws.

6 Fixing of Linear Way II slide unit

- Move the table ensuring smooth motion status, and fix the Linear Way II slide unit. (See Fig. 27)

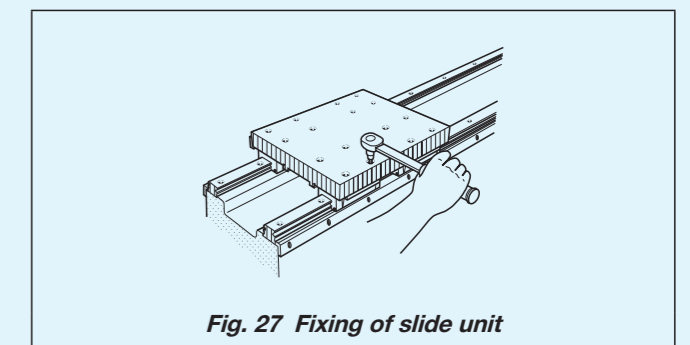
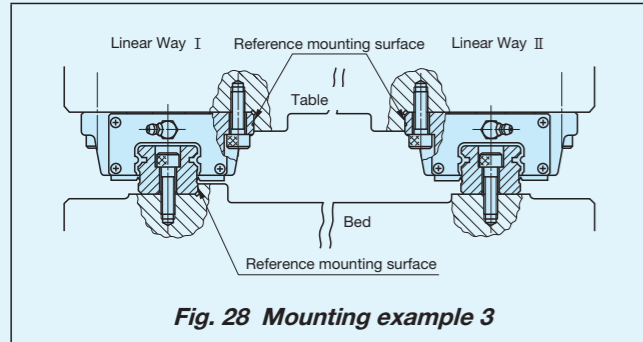


Fig. 27 Fixing of slide unit

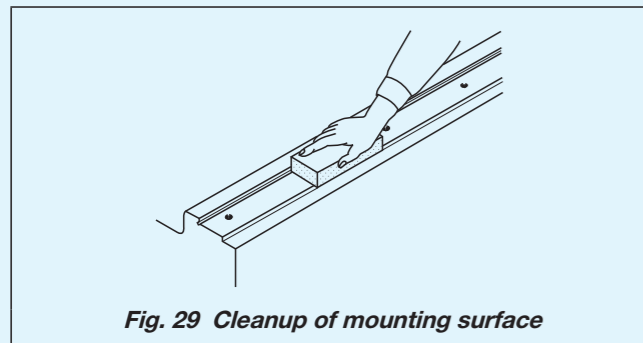
Example 3 Operation in case the slide unit is fixed separated from the track rail



If it cannot be fixed securely with the table loaded, prepare one reference mounting surface on the bed and two reference mounting surfaces on the table. The mounting procedures are as follows. (See Fig. 28)

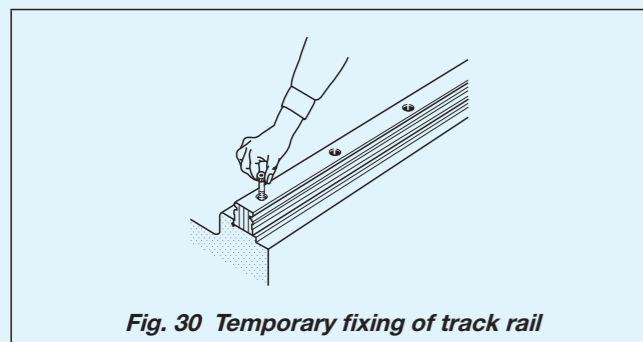
1 Cleanup of mounting surface and reference mounting surface

- Remove burrs and blemishes by using oil-stone, etc. from reference mounting surface and mounting surface of the machine or the device to which Linear Way is mounted and wipe off with clean cloth. (see Fig. 29)
- Wipe off rust prevention oil and dust on the reference mounting surface and the mounting surface of the Linear Way with clean cloth.



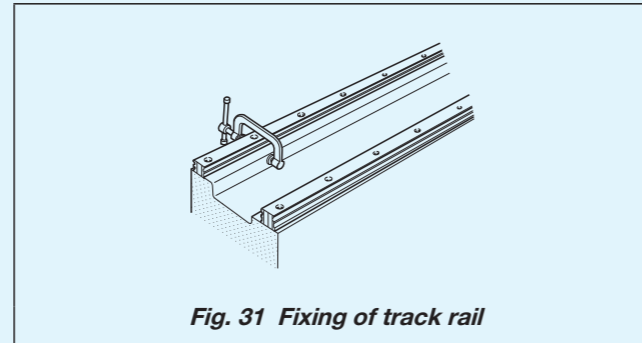
2 Temporary fixing of Linear Way I and II track rails

- Align and temporarily fix them with reference mounting surface of each Linear Way track rail. (See Fig. 30)
- At this point, ensure that the fixing bolt does not interfere with the mounting hole.



3 Fixing of Linear Way I track rail

- Use small type vise or the like to stick track rail reference mounting surface to the reference mounting surface of the bed and tighten the fixing bolt at the same position. Repeat this method from one end to fix the track rail in order. (See Fig. 31)
- Linear Way II track rail should be left temporarily fixed.

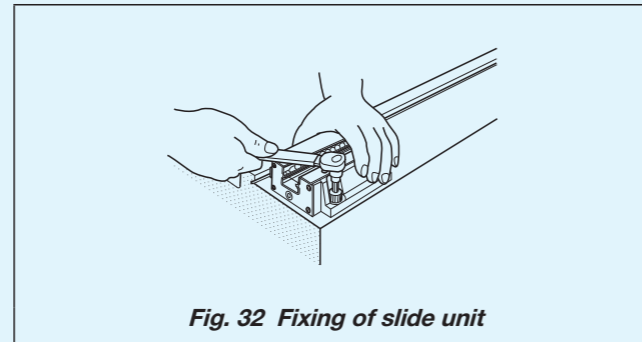


4 Separation of track rail and slide unit

- After checking the combination and positions of Linear Way I and II track rails and slide units, separate each slide unit from the track rail.

5 Fixing of Linear Way I and II slide units

- Align with the reference mounting surface of the Linear Way I and II slide units correctly, and fix them. (See Fig. 32)



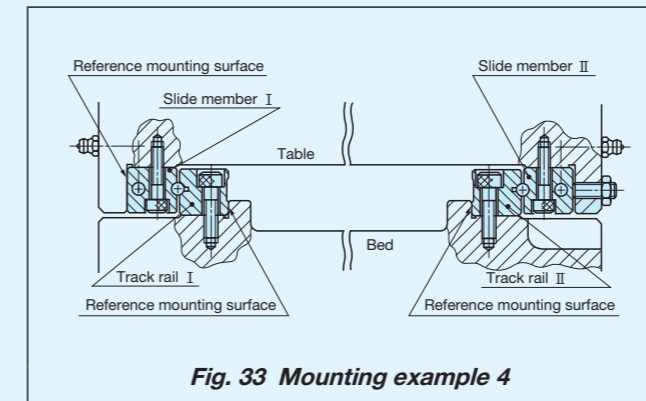
6 Setting of track rail and slide unit

- Insert and assemble the slide unit fixed to the table slowly with care while aligning it with the track rail fixed and temporarily fixed to the bed to maintain parallelism.

7 Fixing of Linear Way II track rail

- Move the table and fix the Linear Way II track rail ensuring smooth motion status. At this point, tighten each fixing bolt immediately after the fixed slide unit of the Linear Way II passes on each of it. Repeat this method from one end to fix the track rail in order.

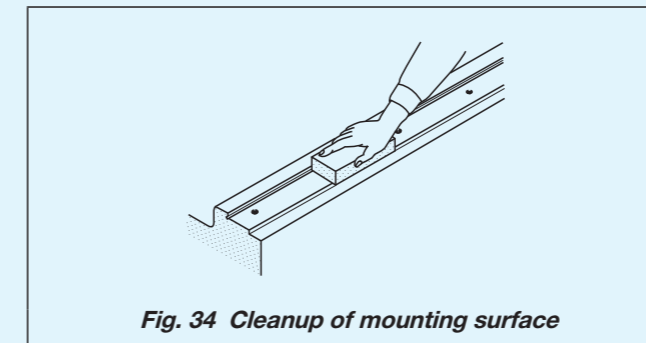
Example 4. Operation of Linear Way Module



For the Linear Way Module, normally 2 sets are used in parallel as indicated in Fig. 33. For the mounting, typically follow the procedure below (see Fig. 33).

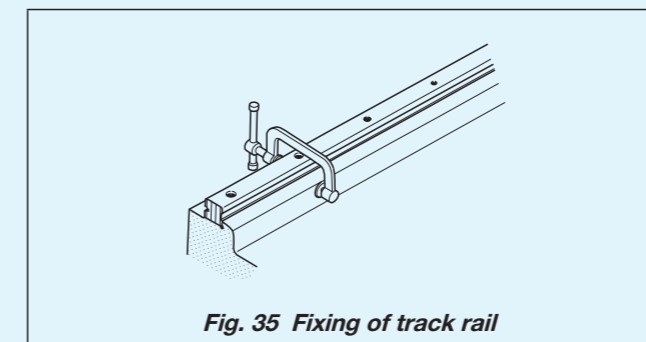
1 Cleanup of mounting surface and reference mounting surface

- Remove burrs and blemishes by using oil-stone, etc. from reference mounting surface and mounting surface of the machine or the device to which Linear Way Module is mounted and wipe off with clean cloth (see Fig. 34).
- Wipe off rust prevention oil and dust on the reference mounting surface and the mounting surface of the Linear Way Module with clean cloth.



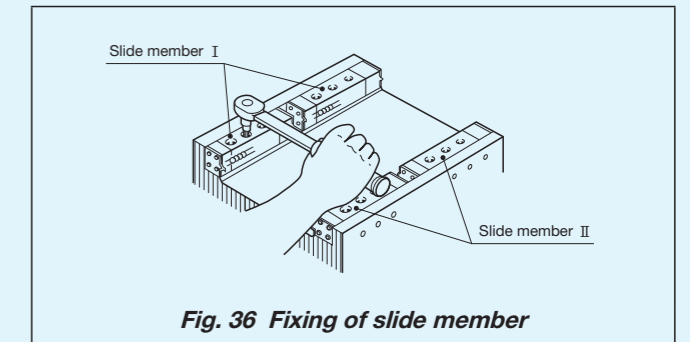
2 Fixing of track rail

- Align the reference mounting surfaces of track rails I and II with the reference mounting surfaces of the bed correctly, stick them by using small type vise, and tighten the fixing bolts at the same position (see Fig. 35).



3 Fixing the slide member

- Align the reference mounting surface of the slide member I with the reference mounting surface of the table correctly, tighten the fixing bolt to fix them, and temporarily fix the slide member II (see Fig. 36).

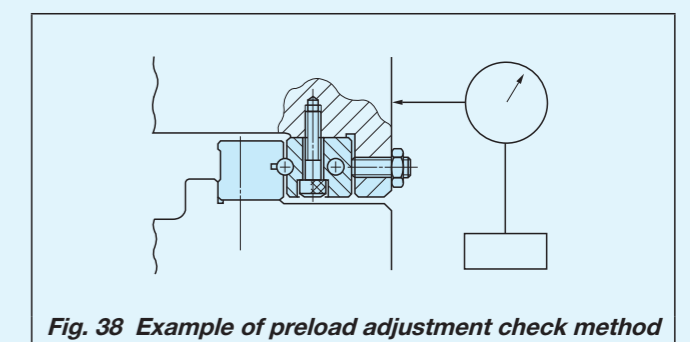
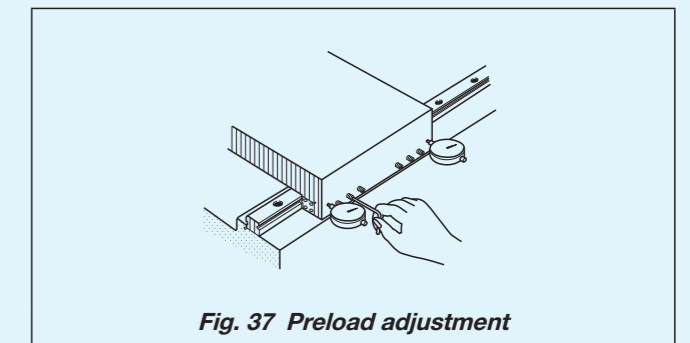


4 Setting of table and bed

- Insert and assemble the slide member fixed to the table slowly with care while aligning it with the track rail fixed to the bed to maintain parallelism.

5 Fixing the slide member II

- As indicated in Fig. 37, tighten the preload adjusting screw at the center first and then all the rest preload adjusting screws in order while measuring the clearance by using the dial gauge.
- The position where the dial gauge deflection stops after moving the table to right and left indicates zero preload or slight preload state.
- After preload adjustment, tighten the fixing bolt to fix them.



Mounting of reference side track rail

Mounting methods of reference side track rail are indicated below. Select a method suitable for the specifications of your machine or device.

1 Method to use reference mounting surface

· Stick track rail reference mounting surface to the reference mounting surface of the bed by using a pressure plate or small type vise, and tighten the fixing bolt at the same position. Repeat this method from one end to fix the track rail in order.

2 Method to use temporary reference surface

· Prepare temporary reference surface around the mounting surface of the bed, temporarily fix the track rail, fix the measurement stand on the upper surface of the slide unit as indicated in Fig. 39, place an indicator onto the temporary reference surface, and fix them from one end of the track rail in order while maintaining straightness.

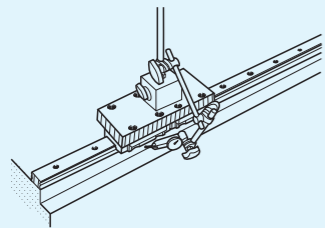


Fig. 39 Method to use temporary reference surface

3 Method with straight-edge

· After temporary fixing of the track rail, apply an indicator to the reference mounting surface of the track rail as indicated in Fig. 40 and fix them from one end of the track rail in order referring to the straight-edge while maintaining straightness.

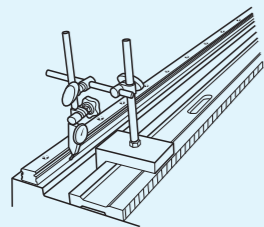


Fig. 40 Method with straight-edge

Mounting of driven side track rail

Mounting methods of driven side track rail are indicated below. Select a method suitable for the specifications of your machine or device.

1 Method to use reference mounting surface

· Stick track rail reference mounting surface to the reference mounting surface of the bed by using a pressure plate or small type vise, and tighten the fixing bolt at the same position. Repeat this method from one end to fix the track rail in order.

2 Method to follow the reference side track rail

· Correctly mount the reference side track rail and one of the driven slide units in motion direction, temporarily fix the rest of slide units and track rails, and fix them from one end of the driven side track rail in order ensuring smooth motion status.

3 Method with straight-edge

· After temporary fixing of the track rail, apply an indicator to the reference mounting surface of the track rail as indicated in Fig. 40 and fix them from one end of the track rail in order referring to the straight-edge while maintaining straightness.

4 Method to use reference side Linear Way

· Fix a measurement stand onto the upper surface of the reference side slide unit as indicated in Fig. 41, place an indicator onto the reference mounting surface of the driven side track rail, and fix them from one end in order while maintaining parallelism.

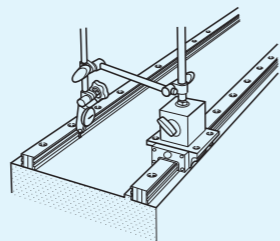


Fig. 41 Method to use reference side Linear Way

Mounting procedures when track rails are butt-jointed

When multiple track rails are butt-jointed, it is necessary to specify special specification butted track rails (non-interchangeable specification, supplemental code "/A") or butt-jointing track rails (interchangeable specification, supplemental code "/T").

Butt-jointing track rails have a butt-jointing mark on the track rail end surface as indicated in Fig. 42. Typical method to butt-joint the track rails is as follows.

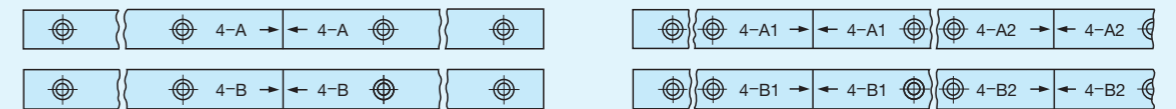


Fig. 42 Butt-jointing mark

1 Align the butt-jointing mark on the track rail end surface and temporarily fix it. Since butt-jointing track rails are interchangeable, no butt-jointing position is specified.

2 Correctly align the reference mounting surface of the track rail with that of the bed in order. At this point, use a small type vise or the like to stick the reference mounting surfaces of the bed and track rail together so as to eliminate any step at the joint part of the track rail. (See Fig. 43)

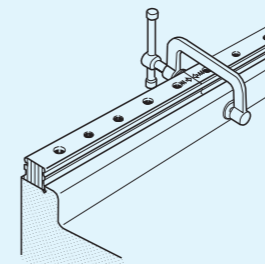
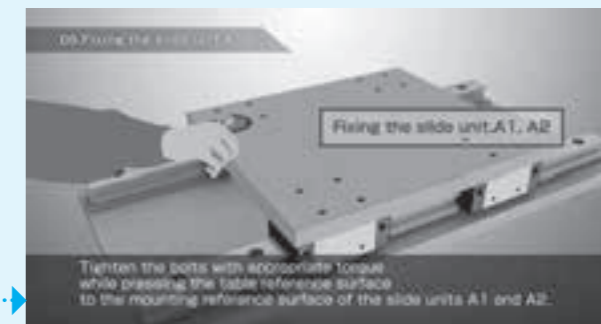


Fig. 43 Method to butt-joint track rails

Guide to Mounting Videos

Instructional videos about the mounting methods for linear motion rolling guides are available on the IKO website. Please utilize them when necessary.

<https://www.iko.co.jp/eg/>



Reference tables

Statements

● Unit Conversion Rate Table

SI, CGS series and gravity system unit cross-reference table

Amount Unit system	Length	Mass	Time	Acceleration	Force	Stress and pressure
SI	m	kg	s	m/s ²	N	Pa
CGS series	cm	g	s	Gal	dyn	dyn/cm ²
Gravity system	m	kgf·s ² /m	s	m/s ²	kgf	kgf/m ²

SI unit conversion

Amount	Unit name	Code	SI conversion rate	SI unit name	Code
Angle	D	°	$\pi/180$	Radian	rad
	Min	'	$\pi/10\ 800$		
	Sec	"	$\pi/648\ 000$		
Length	Meter	m	1	Meter	m
	Micron	μ	10^{-6}		
	Angstrom	Å	10^{-10}		
	X ray unit		$\approx 1.002\ 08 \times 10^{-13}$		
	Nautical mile	n mile	1852		
Area	Square meter	m ²	1	Square meter	m ²
	Are	a	10^2		
	Hectare	ha	10^4		
Volume	Cubic meter	m ³	1	Cubic meter	m ³
	Liter	l, L	10^{-3}		
Mass	Kilogram	kg	1	Kilogram	kg
	Ton	t	10^3		
	Atomic mass unit	u	$\approx 1.660\ 57 \times 10^{-27}$		
Time	Sec	s	1	Sec	s
	Min	min	60		
	Hr	h	3 600		
	Day	d	86 400		
Velocity	Meter per second	m/s	1	Meter per second	m/s
	Knot	kn	$1\ 852/3\ 600$		
Frequency and vibration	Number of cycle	s ⁻¹	1	Hertz	Hz
Number of rotations	Rotation per minute	min ⁻¹	1/60	Per second	s ⁻¹
Angular velocity	Radian per second	rad/s	1	Radian per second	rad/s
Acceleration	Meter per second	m/s ²	1	Meter per second	m/s ²
	G	G	9.806 65		
Force	Weight in kg	kgf	9.806 65	Newton	N
	Weight in ton	tf	9 806.65		
	Dyne	dyn	10^{-5}		
Force moment load	Weight in kg meter	kgf·m	9.806 65	Newton meter	N·m
Stress and pressure	Weight in kg per square meter	kgf/m ²	9.806 65	Pascal	Pa
	Weight in kg per square cm	kgf/cm ²	$9.806\ 65 \times 10^4$		
	Weight in kg per square mm	kgf/mm ²	$9.806\ 65 \times 10^6$		

Energy	Power	Temperature	Viscosity	Kinetic viscosity	Flux	Flux density	Magnetic field intensity
J	W	K	Pa·s	m ² /s	Wb	T	A/m
erg	erg/s	°C	P	St	Mx	Gs	Oe
kgf·m	kgf·m/s	°C	kgf·s/m ²	m ² /s	—	—	—

Amount	Unit name	Code	SI conversion rate	SI unit name	Code
Pressure	Meter water column	mH ₂ O	9 806.65	Pascal	Pa
	millimeter of mercury column	mmHg	$101\ 325/760$		
	Torr	Torr	$101\ 325/760$		
	Air pressure	atm	101 325		
	Bar	bar	10^5		
Energy	Erg	erg	10^{-7}	Joule	J
	IT calorie	cal _{IT}	4.186 8		
	Weight in kg meter	kgf·m	9.806 65		
	Kilowatt per hour	kW·h	3.600×10^6		
	French horse-power per hour	PS·h	$\approx 2.647\ 79 \times 10^6$		
Electron volt	eV	$\approx 1.602\ 19 \times 10^{-19}$			
Power and motivity	Watt	W	1	Watt	W
	French horse-power	PS	≈ 735.5		
	Weight in kg meter per second	kgf·m/s	9.806 65		
Viscosity	Poise	P	10^{-1}	Pascal second	Pa·s
	Centipoise	cP	10^{-3}		
	Weight in kg second per square meter	kgf·s/m ²	9.806 65		
Kinetic viscosity	Stokes	St	10^{-4}	Square meter per second	m ² /s
	Centistokes	cSt	10^{-6}		
Temperature	D	°C	+273.15	Kelvin	K
Radioactivity	Curie	Ci	3.7×10^{10}	Becquerel	Bq
	Exposure radiation dose	Roentgen	2.58×10^{-4}		
	Absorbed dose	Rad	10^{-2}		
	Dose equivalent	Rem	10^{-2}		
Flux	Maxwell	Mx	10^{-8}	Weber	Wb
Flux density	Gamma	γ	10^{-9}	Tesla	T
	Gauss	Gs	10^{-4}		
Magnetic field intensity	Oersted	Oe	$10^3/4\pi$	Ampere per meter	A/m
Electric charge	Coulomb	C	1	Coulomb	C
	Electric potential difference	Volt	V		
Capacitance	Farad	F	1	Farad	F
	(Electric) Resistance	Ohm	Ω		
(Electric) Conductance	Siemens	S	1	Siemens	S
	Inductance	Henry	H		
Current	Ampere	A	1	Ampere	A

● Inch-mm Conversion Table

1 inch=25.4mm

inch		0"	1"	2"	3"	4"	5"	6"	7"	8"
Fractional number	Decimal number									
1 / 64"	0.015625	0.397	25.400	50.800	76.200	101.600	127.000	152.400	177.800	203.200
1 / 32"	0.031250	0.794	25.797	51.197	76.597	101.997	127.397	152.797	178.197	203.597
3 / 64"	0.046875	1.191	26.194	51.594	76.994	102.394	127.794	153.194	178.594	203.994
1 / 16"	0.062500	1.588	26.591	51.991	77.391	102.791	128.191	153.591	178.991	204.391
5 / 64"	0.078125	1.984	26.988	52.388	77.788	103.188	128.588	153.988	179.388	204.788
3 / 32"	0.093750	2.381	27.384	52.784	78.184	103.584	128.984	154.384	179.784	205.184
7 / 64"	0.109375	2.778	27.781	53.181	78.581	103.981	129.381	154.781	180.181	205.581
1 / 8"	0.125000	3.175	28.178	53.578	78.978	104.378	129.778	155.178	180.578	205.978
9 / 64"	0.140625	3.572	28.575	53.975	79.375	104.775	130.175	155.575	180.975	206.375
5 / 32"	0.156250	3.969	28.972	54.372	79.772	105.172	130.572	155.972	181.372	206.772
11 / 64"	0.171875	4.366	29.369	54.769	80.169	105.569	130.969	156.369	181.769	207.169
3 / 16"	0.187500	4.762	29.766	55.166	80.566	105.966	131.366	156.766	182.166	207.566
13 / 64"	0.203125	5.159	30.162	55.562	80.962	106.362	131.762	157.162	182.562	207.962
7 / 32"	0.218750	5.556	30.559	55.959	81.359	106.759	132.159	157.559	182.959	208.359
15 / 64"	0.234375	5.953	30.956	56.356	81.756	107.156	132.556	157.956	183.356	208.756
1 / 4"	0.250000	6.350	31.353	56.753	82.153	107.553	132.953	158.353	183.753	209.153
17 / 64"	0.265625	6.747	31.750	57.150	82.550	107.950	133.350	158.750	184.150	209.550
9 / 32"	0.281250	7.144	32.147	57.547	82.947	108.347	133.747	159.147	184.547	209.947
19 / 64"	0.296875	7.541	32.544	57.944	83.344	108.744	134.144	159.544	184.944	210.344
5 / 16"	0.312500	7.938	32.941	58.341	83.741	109.141	134.541	159.941	185.341	210.741
21 / 64"	0.328125	8.334	33.338	58.738	84.138	109.538	134.938	160.338	185.738	211.138
11 / 32"	0.343750	8.731	33.734	59.134	84.534	109.934	135.334	160.734	186.134	211.534
23 / 64"	0.359375	9.128	34.131	59.531	84.931	110.331	135.731	161.131	186.531	211.931
3 / 8"	0.375000	9.525	34.528	59.928	85.328	110.728	136.128	161.528	186.928	212.328
25 / 64"	0.390625	9.922	34.925	60.325	85.725	111.125	136.525	161.925	187.325	212.725
13 / 32"	0.406250	10.319	35.322	60.722	86.122	111.522	136.922	162.322	187.722	213.122
27 / 64"	0.421875	10.716	35.719	61.119	86.519	111.919	137.319	162.719	188.119	213.519
7 / 16"	0.437500	11.112	36.116	61.516	86.916	112.316	137.716	163.116	188.516	213.916
29 / 64"	0.453125	11.509	36.512	61.912	87.312	112.712	138.112	163.512	188.912	214.312
15 / 32"	0.468750	11.906	36.909	62.309	87.709	113.109	138.509	163.909	189.309	214.709
31 / 64"	0.484375	12.303	37.306	62.706	88.106	113.506	138.906	164.306	189.706	215.106
1 / 2"	0.500000	12.700	37.703	63.103	88.503	113.903	139.303	164.703	190.103	215.503
			38.100	63.500	88.900	114.300	139.700	165.100	190.500	215.900

1 inch=25.4mm

inch		0"	1"	2"	3"	4"	5"	6"	7"	8"
Fractional number	Decimal number									
33 / 64"	0.515625	13.097	38.497	63.897	89.297	114.697	140.097	165.497	190.897	216.297
17 / 32"	0.531250	13.494	38.894	64.294	89.694	115.094	140.494	165.894	191.294	216.694
35 / 64"	0.546875	13.891	39.291	64.691	90.091	115.491	140.891	166.291	191.691	217.091
9 / 16"	0.562500	14.288	39.688	65.088	90.488	115.888	141.288	166.688	192.088	217.488
37 / 64"	0.578125	14.684	40.084	65.484	90.884	116.284	141.684	167.084	192.484	217.884
19 / 32"	0.593750	15.081	40.481	65.881	91.281	116.681	142.081	167.481	192.881	218.281
39 / 64"	0.609375	15.478	40.878	66.278	91.678	117.078	142.478	167.878	193.278	218.678
5 / 8"	0.625000	15.875	41.275	66.675	92.075	117.475	142.875	168.275	193.675	219.075
41 / 64"	0.640625	16.272	41.672	67.072	92.472	117.872	143.272	168.672	194.072	219.472
21 / 32"	0.656250	16.669	42.069	67.469	92.869	118.269	143.669	169.069	194.469	219.869
43 / 64"	0.671875	17.066	42.466	67.866	93.266	118.666	144.066	169.466	194.866	220.266
11 / 16"	0.687500	17.462	42.862	68.262	93.662	119.062	144.462	169.862	195.262	220.662
45 / 64"	0.703125	17.859	43.259	68.659	94.059	119.459	144.859	170.259	195.659	221.059
23 / 32"	0.718750	18.256	43.656	69.056	94.456	119.856	145.256	170.656	196.056	221.456
47 / 64"	0.734375	18.653	44.053	69.453	94.853	120.253	145.653	171.053	196.453	221.853
3 / 4"	0.750000	19.050	44.450	69.850	95.250	120.650	146.050	171.450	196.850	222.250
49 / 64"	0.765625	19.447	44.847	70.247	95.647	121.047	146.447	171.847	197.247	222.647
25 / 32"	0.781250	19.844	45.244	70.644	96.044	121.444	146.844	172.244	197.644	223.044
51 / 64"	0.796875	20.241	45.641	71.041	96.441	121.841	147.241	172.641	198.041	223.441
13 / 16"	0.812500	20.638	46.038	71.438	96.838	122.238	147.638	173.038	198.438	223.838
53 / 64"	0.828125	21.034	46.434	71.834	97.234	122.634	148.034	173.434	198.834	224.234
27 / 32"	0.843750	21.431	46.831	72.231	97.631	123.031	148.431	173.831	199.231	224.631
55 / 64"	0.859375	21.828	47.228	72.628	98.028	123.428	148.828	174.228	199.628	225.028
7 / 8"	0.875000	22.225	47.625	73.025	98.425	123.825	149.225	174.625	200.025	225.425
57 / 64"	0.890625	22.622	48.022	73.422	98.822	124.222	149.622	175.022	200.422	225.822
29 / 32"	0.906250	23.019	48.419	73.819	99.219	124.619	150.019	175.419	200.819	226.219
59 / 64"	0.921875	23.416	48.816	74.216	99.616	125.016	150.416	175.816	201.216	226.616
15 / 16"	0.937500	23.812	49.212	74.612	100.012	125.412	150.812	176.212	201.612	227.012
61 / 64"	0.953125	24.209	49.609	75.009	100.409	125.809	151.209	176.609	202.009	227.409
31 / 32"	0.968750	24.606	50.006	75.406	100.806	126.206	151.606	177.006	202.406	227.806
63 / 64"	0.984375	25.003	50.403	75.803	101.203	126.603	152.003	177.403	202.803	228.203

● Hardness Conversion Table (Reference)

Rockwell C scale hardness Load 1471N HRC	Vickers hardness HV	Brinell hardness		Rockwell hardness		Shore hardness HS
		Standard ball	Tungsten Carbide ball	A scale	B scale	
				Load 588.4N Diamond circular cone	Load 980.7N Diameter 1/16in ball	
68	940	—	—	85.6	—	97
67	900	—	—	85.0	—	95
66	865	—	—	84.5	—	92
65	832	—	(739)	83.9	—	91
64	800	—	(722)	83.4	—	88
63	772	—	(705)	82.8	—	87
62	746	—	(688)	82.3	—	85
61	720	—	(670)	81.8	—	83
60	697	—	(654)	81.2	—	81
59	674	—	(634)	80.7	—	80
58	653	—	615	80.1	—	78
57	633	—	595	79.6	—	76
56	613	—	577	79.0	—	75
55	595	—	560	78.5	—	74
54	577	—	543	78.0	—	72
53	560	—	525	77.4	—	71
52	544	(500)	512	76.8	—	69
51	528	(487)	496	76.3	—	68
50	513	(475)	481	75.9	—	67
49	498	(464)	469	75.2	—	66
48	484	451	455	74.7	—	64
47	471	442	443	74.1	—	63
46	458	432	432	73.6	—	62
45	446	421	421	73.1	—	60
44	434	409	409	72.5	—	58
43	423	400	400	72.0	—	57
42	412	390	390	71.5	—	56
41	402	381	381	70.9	—	55
40	392	371	371	70.4	—	54
39	382	362	362	69.9	—	52

Rockwell C scale hardness Load 1471N HRC	Vickers hardness HV	Brinell hardness		Rockwell hardness		Shore hardness HS
		Standard ball	Tungsten Carbide ball	A scale	B scale	
				Load 588.4N Diamond circular cone	Load 980.7N Diameter 1/16in ball	
38	372	353	353	69.4	—	51
37	363	344	344	68.9	—	50
36	354	336	336	68.4	(109.0)	49
35	345	327	327	67.9	(108.5)	48
34	336	319	319	67.4	(108.0)	47
33	327	311	311	66.8	(107.5)	46
32	318	301	301	66.3	(107.0)	44
31	310	294	294	65.8	(106.0)	43
30	302	286	286	65.3	(105.5)	42
29	294	279	279	64.7	(104.5)	41
28	286	271	271	64.3	(104.0)	41
27	279	264	264	63.8	(103.0)	40
26	272	258	258	63.3	(102.5)	38
25	266	253	253	62.8	(101.5)	38
24	260	247	247	62.4	(101.0)	37
23	254	243	243	62.0	100.0	36
22	248	237	237	61.5	99.0	35
21	243	231	231	61.0	98.5	35
20	238	226	226	60.5	97.8	34
(18)	230	219	219	—	96.7	33
(16)	222	212	212	—	95.5	32
(14)	213	203	203	—	93.9	31
(12)	204	194	194	—	92.3	29
(10)	196	187	187	—	90.7	28
(8)	188	179	179	—	89.5	27
(6)	180	171	171	—	87.1	26
(4)	173	165	165	—	85.5	25
(2)	166	158	158	—	83.5	24
(0)	160	152	152	—	81.7	24

● Tolerances of Shaft Dimensions

Classification of diameter mm		b12		c12		d6		e6		e12		f5		f6		g5	
Above	Below	H	L	H	L	H	L	H	L	H	L	H	L	H	L	H	L
—	3	-140	-240	-60	-160	-20	-26	-14	-20	-14	-114	-6	-10	-6	-12	-2	-6
3	6	-140	-260	-70	-190	-30	-38	-20	-28	-20	-140	-10	-15	-10	-18	-4	-9
6	10	-150	-300	-80	-230	-40	-49	-25	-34	-25	-175	-13	-19	-13	-22	-5	-11
10	18	-150	-330	-95	-275	-50	-61	-32	-43	-32	-212	-16	-24	-16	-27	-6	-14
18	30	-160	-370	-110	-320	-65	-78	-40	-53	-40	-250	-20	-29	-20	-33	-7	-16
30	40	-170	-420	-120	-370	-80	-96	-50	-66	-50	-300	-25	-36	-25	-41	-9	-20
40	50	-180	-430	-130	-380												
50	65	-190	-490	-140	-440	-100	-119	-60	-79	-60	-360	-30	-43	-30	-49	-10	-23
65	80	-200	-500	-150	-450												
80	100	-220	-570	-170	-520	-120	-142	-72	-94	-72	-422	-36	-51	-36	-58	-12	-27
100	120	-240	-590	-180	-530												
120	140	-260	-660	-200	-600	-145	-170	-85	-110	-85	-485	-43	-61	-43	-68	-14	-32
140	160	-280	-680	-210	-610												
160	180	-310	-710	-230	-630												
180	200	-340	-800	-240	-700	-170	-199	-100	-129	-100	-560	-50	-70	-50	-79	-15	-35
200	225	-380	-840	-260	-720												
225	250	-420	-880	-280	-740												
250	280	-480	-1000	-300	-820	-190	-222	-110	-142	-110	-630	-56	-79	-56	-88	-17	-40
280	315	-540	-1060	-330	-850												
315	355	-600	-1170	-360	-930	-210	-246	-125	-161	-125	-695	-62	-87	-62	-98	-18	-43
355	400	-680	-1250	-400	-970												
400	450	-760	-1390	-440	-1070	-230	-270	-135	-175	-135	-765	-68	-95	-68	-108	-20	-47
450	500	-840	-1470	-480	-1110												

Classification of diameter mm		h12		js5		j5		js6		j6		j7		k5		k6	
Above	Below	H	L	H	L	H	L	H	L	H	L	H	L	H	L	H	L
—	3	0	-100	+2	-2	+2	-2	+3	-3	+4	-2	+6	-4	+4	0	+6	0
3	6	0	-120	+2.5	-2.5	+3	-2	+4	-4	+6	-2	+8	-4	+6	+1	+9	+1
6	10	0	-150	+3	-3	+4	-2	+4.5	-4.5	+7	-2	+10	-5	+7	+1	+10	+1
10	18	0	-180	+4	-4	+5	-3	+5.5	-5.5	+8	-3	+12	-6	+9	+1	+12	+1
18	30	0	-210	+4.5	-4.5	+5	-4	+6.5	-6.5	+9	-4	+13	-8	+11	+2	+15	+2
30	40	0	-250	+5.5	-5.5	+6	-5	+8	-8	+11	-5	+15	-10	+13	+2	+18	+2
40	50																
50	65	0	-300	+6.5	-6.5	+6	-7	+9.5	-9.5	+12	-7	+18	-12	+15	+2	+21	+2
65	80																
80	100	0	-350	+7.5	-7.5	+6	-9	+11	-11	+13	-9	+20	-15	+18	+3	+25	+3
100	120																
120	140	0	-400	+9	-9	+7	-11	+12.5	-12.5	+14	-11	+22	-18	+21	+3	+28	+3
140	160																
160	180																
180	200	0	-460	+10	-10	+7	-13	+14.5	-14.5	+16	-13	+25	-21	+24	+4	+33	+4
200	225																
225	250																
250	280	0	-520	+11.5	-11.5	+7	-16	+16	-16	+16	-16	+26	-26	+27	+4	+36	+4
280	315																
315	355	0	-570	+12.5	-12.5	+7	-18	+18	-18	+18	-18	+29	-28	+29	+4	+40	+4
355	400																
400	450	0	-630	+13.5	-13.5	+7	-20	+20	-20	+20	-20	+31	-32	+32	+5	+45	+5
450	500																

unit: μm

Classification of diameter mm		g6		h5		h6		h7		h8		h9		h10		h11	
Above	Below	H	L	H	L	H	L	H	L	H	L	H	L	H	L	H	L
—	3	-2	-8	0	-4	0	-6	0	-10	0	-14	0	-25	0	-40	0	-60
3	6	-4	-12	0	-5	0	-8	0	-12	0	-18	0	-30	0	-48	0	-75
6	10	-5	-14	0	-6	0	-9	0	-15	0	-22	0	-36	0	-58	0	-90
10	18	-6	-17	0	-8	0	-11	0	-18	0	-27	0	-43	0	-70	0	-110
18	30	-7	-20	0	-9	0	-13	0	-21	0	-33	0	-52	0	-84	0	-130
30	40	-9	-25	0	-11	0	-16	0	-25	0	-39	0	-62	0	-100	0	-160
40	50																
50	65	-10	-29	0	-13	0	-19	0	-30	0	-46	0	-74	0	-120	0	-190
65	80																
80	100	-12	-34	0	-15	0	-22	0	-35	0	-54	0	-87	0	-140	0	-220
100	120																
120	140	-14	-39	0	-18	0	-25	0	-40	0	-63	0	-100	0	-160	0	-250
140	160																
160	180																
180	200	-15	-44	0	-20	0	-29	0	-46	0	-72	0	-115	0	-185	0	-290
200	225																
225	250																
250	280	-17	-49	0	-23	0	-32	0	-52	0	-81	0	-130	0	-210	0	-320
280	315																
315	355	-18	-54	0	-25	0	-36	0	-57	0	-89	0	-140	0	-230	0	-360
355	400																
400	450	-20	-60	0	-27	0	-40	0	-63	0	-97	0	-155	0	-250	0	-400
450	500																

unit: μm

Classification of diameter mm		m5		m6		n5		n6		p6	
Above	Below	H	L	H	L	H	L	H	L	H	L
—	3	+6	+2	+8	+2	+8	+4	+10	+4	+12	+6
3	6	+9	+4	+12	+4	+13	+8	+16	+8	+20	+12
6	10	+12	+6	+15	+6	+16	+10	+19	+10	+24	+15
10	18	+15	+7	+18	+7	+20	+12	+23	+12	+29	+18
18	30	+17	+8	+21	+8	+24	+15	+28	+15	+35	+22
30	40	+20	+9	+25	+9	+28	+17	+33	+17	+42	+26
40	50										
50	65	+24	+11	+30	+11	+33	+20	+39	+20	+51	+32
65	80										
80	100	+28	+13	+35	+13	+38	+23	+45	+23	+59	+37
100	120										
120	140	+33	+15	+40	+15	+45	+27	+52	+27	+68	+43
140	160										
160	180										
180	200	+37	+17	+46	+17	+51	+31	+60	+31	+79	+50
200	225										
225	250										
250	280	+43	+20	+52	+20	+57	+34	+66	+34	+88	+56
280	315										
315	355	+46	+21	+57	+21	+62	+37	+73	+37	+98	+62
355	400										
400	450	+50	+23	+63	+23	+67	+40	+80	+40	+108	+68
450	500										

● Tolerances of Housing Hole Dimensions

Classification of diameter mm		B12		E7		E11		E12		F6		F7		G6		G7	
Above	Below	H	L	H	L	H	L	H	L	H	L	H	L	H	L	H	L
—	3	+ 240	+140	+ 24	+ 14	+ 74	+ 14	+114	+ 14	+ 12	+ 6	+ 16	+ 6	+ 8	+ 2	+12	+ 2
3	6	+ 260	+140	+ 32	+ 20	+ 95	+ 20	+140	+ 20	+ 18	+10	+ 22	+10	+12	+ 4	+16	+ 4
6	10	+ 300	+150	+ 40	+ 25	+115	+ 25	+175	+ 25	+ 22	+13	+ 28	+13	+14	+ 5	+20	+ 5
10	18	+ 330	+150	+ 50	+ 32	+142	+ 32	+212	+ 32	+ 27	+16	+ 34	+16	+17	+ 6	+24	+ 6
18	30	+ 370	+160	+ 61	+ 40	+170	+ 40	+250	+ 40	+ 33	+20	+ 41	+20	+20	+ 7	+28	+ 7
30	40	+ 420	+170	+ 75	+ 50	+210	+ 50	+300	+ 50	+ 41	+25	+ 50	+25	+25	+ 9	+34	+ 9
40	50	+ 430	+180														
50	65	+ 490	+190	+ 90	+ 60	+250	+ 60	+360	+ 60	+ 49	+30	+ 60	+30	+29	+10	+40	+10
65	80	+ 500	+200														
80	100	+ 570	+220	+107	+ 72	+292	+ 72	+422	+ 72	+ 58	+36	+ 71	+36	+34	+12	+47	+12
100	120	+ 590	+240														
120	140	+ 660	+260														
140	160	+ 680	+280	+125	+ 85	+335	+ 85	+485	+ 85	+ 68	+43	+ 83	+43	+39	+14	+54	+14
160	180	+ 710	+310														
180	200	+ 800	+340														
200	225	+ 840	+380	+146	+100	+390	+100	+560	+100	+ 79	+50	+ 96	+50	+44	+15	+61	+15
225	250	+ 880	+420														
250	280	+1000	+480	+162	+110	+430	+110	+630	+110	+ 88	+56	+108	+56	+49	+17	+69	+17
280	315	+1060	+540														
315	355	+1170	+600	+182	+125	+485	+125	+695	+125	+ 98	+62	+119	+62	+54	+18	+75	+18
355	400	+1250	+680														
400	450	+1390	+760	+198	+135	+535	+135	+765	+135	+108	+68	+131	+68	+60	+20	+83	+20
450	500	+1470	+840														

Classification of diameter mm		JS7		J7		K5		K6		K7		M6		M7		N6	
Above	Below	H	L	H	L	H	L	H	L	H	L	H	L	H	L	H	L
—	3	+ 5	- 5	+ 4	- 6	0	- 4	0	- 6	0	-10	- 2	- 8	-2	-12	- 4	-10
3	6	+ 6	- 6	+ 6	- 6	0	- 5	+2	- 6	+ 3	- 9	- 1	- 9	0	-12	- 5	-13
6	10	+ 7	- 7	+ 8	- 7	+1	- 5	+2	- 7	+ 5	-10	- 3	-12	0	-15	- 7	-16
10	18	+ 9	- 9	+10	- 8	+2	- 6	+2	- 9	+ 6	-12	- 4	-15	0	-18	- 9	-20
18	30	+10	-10	+12	- 9	+1	- 8	+2	-11	+ 6	-15	- 4	-17	0	-21	-11	-24
30	40	+12	-12	+14	-11	+2	- 9	+3	-13	+ 7	-18	- 4	-20	0	-25	-12	-28
40	50																
50	65	+15	-15	+18	-12	+3	-10	+4	-15	+ 9	-21	- 5	-24	0	-30	-14	-33
65	80																
80	100	+17	-17	+22	-13	+2	-13	+4	-18	+10	-25	- 6	-28	0	-35	-16	-38
100	120																
120	140																
140	160	+20	-20	+26	-14	+3	-15	+4	-21	+12	-28	- 8	-33	0	-40	-20	-45
160	180																
180	200																
200	225	+23	-23	+30	-16	+2	-18	+5	-24	+13	-33	- 8	-37	0	-46	-22	-51
225	250																
250	280	+26	-26	+36	-16	+3	-20	+5	-27	+16	-36	- 9	-41	0	-52	-25	-57
280	315																
315	355	+28	-28	+39	-18	+3	-22	+7	-29	+17	-40	-10	-46	0	-57	-26	-62
355	400																
400	450	+31	-31	+43	-20	+2	-25	+8	-32	+18	-45	-10	-50	0	-63	-27	-67
450	500																

unit: μm

Classification of diameter mm		H6		H7		H8		H9		H10		H11		JS6		J6	
Above	Below	H	L	H	L	H	L	H	L	H	L	H	L	H	L	H	L
—	3	+ 6	0	+10	0	+14	0	+ 25	0	+ 40	0	+ 60	0	+ 3	- 3	+ 2	-4
3	6	+ 8	0	+12	0	+18	0	+ 30	0	+ 48	0	+ 75	0	+ 4	- 4	+ 5	-3
6	10	+ 9	0	+15	0	+22	0	+ 36	0	+ 58	0	+ 90	0	+ 4.5	- 4.5	+ 5	-4
10	18	+11	0	+18	0	+27	0	+ 43	0	+ 70	0	+110	0	+ 5.5	- 5.5	+ 6	-5
18	30	+13	0	+21	0	+33	0	+ 52	0	+ 84	0	+130	0	+ 6.5	- 6.5	+ 8	-5
30	40																
40	50	+16	0	+25	0	+39	0	+ 62	0	+100	0	+160	0	+ 8	- 8	+10	-6
50	65																
65	80	+19	0	+30	0	+46	0	+ 74	0	+120	0	+190	0	+ 9.5	- 9.5	+13	-6
80	100																
100	120	+22	0	+35	0	+54	0	+ 87	0	+140	0	+220	0	+11	-11	+16	-6
120	140																
140	160	+25	0	+40	0	+63	0	+100	0	+160	0	+250	0	+12.5	-12.5	+18	-7
160	180																
180	200	+29	0	+46	0	+72	0	+115	0	+185	0	+290	0	+14.5	-14.5	+22	-7
200	225																
225	250	+32	0	+52	0	+81	0	+130	0	+210	0	+320	0	+16	-16	+25	-7
250	280																
280	315	+36	0	+57	0	+89	0	+140	0	+230	0	+360	0	+18	-18	+29	-7
315	355																
355	400	+40	0	+63	0	+97	0	+155	0	+250	0	+400	0	+20	-20	+33	-7
400	450																
450	500																

unit: μm

Classification of diameter mm		N7		P6		P7		R7		S7	
Above	Below	H	L	H	L	H	L	H	L	H	L
—	3	- 4	-14	- 6	-12	- 6	- 16	- 10	- 20	- 14	- 24
3	6	- 4	-16	- 9	-17	- 8	- 20	- 11	- 23	- 15	- 27
6	10	- 4	-19	-12	-21	- 9	- 24	- 13	- 28	- 17	- 32
10	18	- 5	-23	-15	-26	-11	- 29	- 16	- 34	- 21	- 39
18	30	- 7	-28	-18	-31	-14	- 35	- 20	- 41	- 27	- 48
30	40	- 8	-33	-21	-37	-17	- 42	- 25	- 50	- 34	- 59
40	50										
50	65	- 9	-39	-26	-45	-21	- 51	- 30	- 60	- 42	- 72
65	80										
80	100	-10	-45	-30	-52	-24	- 59	- 38	- 73	- 58	- 93
100	120										
120	140	-12	-52	-36	-61	-28	- 68	- 48	- 88	- 77	-117
140	160										
160	180										
180	200	-14	-60	-41	-70	-33	- 79	- 60	-106	-105	-151
200	225										
225	250										
250	280	-14	-66	-47	-79	-36	- 88	- 74	-126	-138	-190
280	315										
315	355	-16	-73	-51	-87	-41	- 98	- 87	-144	-169	-226
355	400										
400	450	-17	-80	-55	-95	-45	-108	-103	-166	-209	-272
450	500										

Model Code Index

Model code	Series name	Catalog name	Page	Model code	Series name	Catalog name	Page
B				LM...F AJ	Linear Bushing	RED	II-181
B				LM...F OP	Linear Bushing	RED	II-181
BG	Stroke Rotary Cage	RED	II-212	LM...F UU	Linear Bushing	RED	II-183
BK...A	Miniature Stroke Rotary Bushing	RED	II-207	LM...F UU AJ	Linear Bushing	RED	II-183
BSP...SL	Precision Linear Slide Unit	RED	II- 89	LM...F UU OP	Linear Bushing	RED	II-183
BSPG...SL	Precision Linear Slide Unit	RED	II- 91	LM...N	Linear Bushing	RED	II-167
BSR...SL	Precision Linear Slide Unit	RED	II- 93	LM...N AJ	Linear Bushing	RED	II-167
BSU...A	Linear Slide Unit	RED	II- 99	LM...N F	Linear Bushing	RED	II-181
BWU	High Rigidity Precision Linear Slide Unit	RED	II- 81	LM...N F AJ	Linear Bushing	RED	II-181
C				LM...N F OP	Linear Bushing	RED	II-181
C				LM...N F UU	Linear Bushing	RED	II-183
CRW	Crossed Roller Way	RED	II- 33	LM...N F UU AJ	Linear Bushing	RED	II-183
CRW...SL	Crossed Roller Way	RED	II- 33	LM...N F UU OP	Linear Bushing	RED	II-183
CRWG	Anti-Creep Cage Crossed Roller Way	RED	II- 27	LM...N OP	Linear Bushing	RED	II-167
CRWG...H	Anti-Creep Cage Crossed Roller Way H	RED	II- 31	LM...N UU	Linear Bushing	RED	II-171
CRWM	Crossed Roller Way	RED	II- 49	LM...N UU AJ	Linear Bushing	RED	II-171
CRWU	Crossed Roller Way Unit	RED	II- 63	LM...N UU OP	Linear Bushing	RED	II-171
CRWU...R	Crossed Roller Way Unit	RED	II- 67	LM...OP	Linear Bushing	RED	II-167
CRWU...RS	Crossed Roller Way Unit	RED	II- 71	LM...UU	Linear Bushing	RED	II-171
CRWUG	Anti-Creep Cage Crossed Roller Way Unit	RED	II- 61	LM...UU AJ	Linear Bushing	RED	II-171
F				LM...UU OP	Linear Bushing	RED	II-171
F				LMB	Linear Bushing	RED	II-179
FT	Flat Roller Cage	RED	II-231	LMB...AJ	Linear Bushing	RED	II-179
FT...N	Flat Roller Cage	RED	II-231	LMB...N	Linear Bushing	RED	II-179
FT...V	Flat Roller Cage	RED	II-231	LMB...N AJ	Linear Bushing	RED	II-179
FTW...A	Flat Roller Cage	RED	II-232	LMB...N OP	Linear Bushing	RED	II-179
FTW...VA	Flat Roller Cage	RED	II-232	LMB...OP	Linear Bushing	RED	II-179
G				LME	Linear Bushing	RED	II-175
G				LME...AJ	Linear Bushing	RED	II-175
GSN	Roller Way	RED	II-224	LME...F	Linear Bushing	RED	II-185
L				LME...F AJ	Linear Bushing	RED	II-185
L				LME...F OP	Linear Bushing	RED	II-185
LM	Linear Bushing	RED	II-167	LME...F UU	Linear Bushing	RED	II-187
LM...AJ	Linear Bushing	RED	II-167	LME...F UU AJ	Linear Bushing	RED	II-187
LM...F	Linear Bushing	RED	II-181	LME...F UU OP	Linear Bushing	RED	II-187
L				LME...N	Linear Bushing	RED	II-175
L				LME...N AJ	Linear Bushing	RED	II-175
L				LME...N F	Linear Bushing	RED	II-185
L				LME...N F AJ	Linear Bushing	RED	II-185

Note: BLUE denotes CAT-1578E, while RED denotes CAT-1579E

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Model code	Series name	Catalog name	Page	Model code	Series name	Catalog name	Page
LME...N F OP	Linear Bushing	RED	II-185	LRXS	Linear Roller Way Super X	BLUE	II-209
LME...N F UU	Linear Bushing	RED	II-187	LRXSC	Linear Roller Way Super X	BLUE	II-209
LME...N F UU AJ	Linear Bushing	RED	II-187	LRXSG	Linear Roller Way Super X	BLUE	II-209
LME...N F UU OP	Linear Bushing	RED	II-187	LS	Stroke Ball Spline	RED	II-149
LME...N OP	Linear Bushing	RED	II-175	LSAG	Linear Ball Spline G	RED	II-123
LME...N UU	Linear Bushing	RED	II-177	LSAGF	Linear Ball Spline G	RED	II-127
LME...N UU AJ	Linear Bushing	RED	II-177	LSAGFL	Linear Ball Spline G	RED	II-127
LME...N UU OP	Linear Bushing	RED	II-177	LSAGFLT	Linear Ball Spline G	RED	II-127
LME...OP	Linear Bushing	RED	II-175	LSAGFT	Linear Ball Spline G	RED	II-127
LME...UU	Linear Bushing	RED	II-177	LSAGL	Linear Ball Spline G	RED	II-123
LME...UU AJ	Linear Bushing	RED	II-177	LSAGLT	Linear Ball Spline G	RED	II-123
LME...UU OP	Linear Bushing	RED	II-177	LSAGT	Linear Ball Spline G	RED	II-123
LMG	Linear Bushing G	RED	II-159	LSB	Block Type Linear Ball Spline	RED	II-141
LMGT	Linear Bushing G	RED	II-159	LSB...SL	Block Type Linear Ball Spline	RED	II-141
LMS	Miniature Linear Bushing	RED	II-192	LSBT	Block Type Linear Ball Spline	RED	II-141
LMS...F	Miniature Linear Bushing	RED	II-192	LST	Stroke Ball Spline	RED	II-149
LMS...F UU	Miniature Linear Bushing	RED	II-192	LWE	Linear Way E	BLUE	II- 75
LMS...UU	Miniature Linear Bushing	RED	II-192	LWE...Q	Low Decibel Linear Way E	BLUE	II- 75
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Note: BLUE denotes CAT-1578E, while RED denotes CAT-1579E

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IKO Linear Motion Rolling Guide Series,

Configuration of General Catalog

IKO Linear Motion Rolling Guide Series General Catalog Consists of **BLUE** (CAT-1578E) and

RED (CAT-1579E), the two volumes.

BLUE



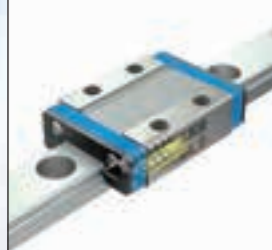
CAT-1578E

【Models】

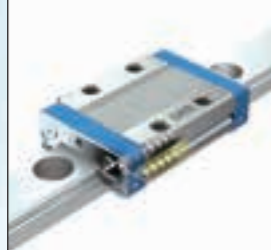
- Rail Guide Type
Endless Linear Motion Type

C-Lube Linear Way ML Linear Way L C-Lube Linear Way MLV C-Lube Linear Way MV Linear Way E C-Lube Linear Way ME Linear Way H C-Lube Linear Way MH

ML · LWL



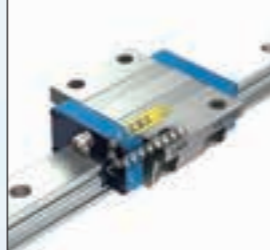
MLV



MV



ME · LWE



MH · LWH



Linear Way F

LWF



C-Lube Linear Way MUL Linear Way U

MUL · LWU



C-Lube Linear Roller Way Super MX Linear Roller Way Super X

MX · LRX



Linear Roller Way X

LRWX



Linear Way Module

LWLM · LWM
LRWM



RED



CAT-1579E

【Models】

- Rail Guide Type
Limited Linear Motion Type
- Shaft Guide Type
Endless Linear Motion Type
Limited Linear Motion Type
Limited Linear Motion Type + Rolling Motion Type
- Flat Guide Type
Endless Linear Motion Type
Limited Linear Motion Type

Rail Guide Type
Crossed Roller Way

CRW(G)(···H)
CRWU(G)



Rail Guide Type
Linear Slide Unit

BWU · BSP(G)
BSU···A



Shaft Guide Type
Linear Ball Spline

MAG · LSAG
LSB · LS



Shaft Guide Type
Linear Bushing

LMG · LM · LMS



Shaft Guide Type
Stroke Rotary Bushing

ST · STSI · BG



Flat Guide Type
Roller Way & Flat Roller Cage

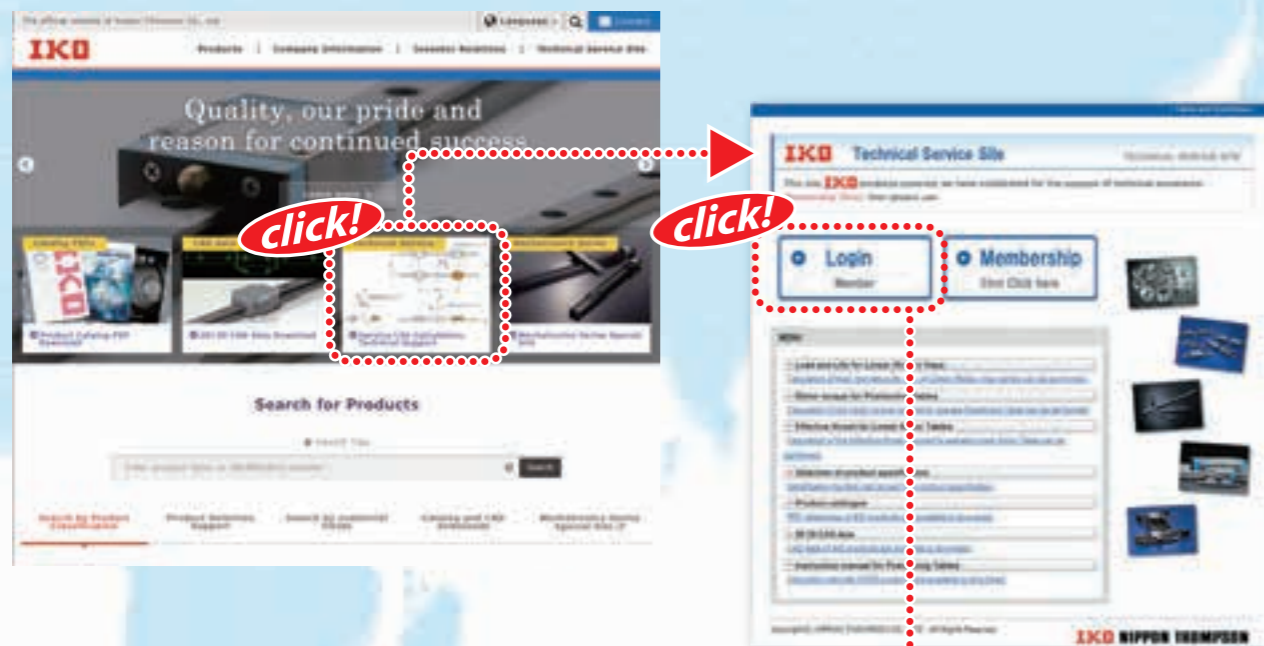
RW · SR · GSN
FT · FTW···A



IKO Introduction of Technical Service Site

"IKO Technical Service Site" can be accessed from our home page. The site provides various tools for selecting Linear Ways and Linear Roller Ways. Please utilize these tools for assistance when selecting products. Additionally the site also provides CAD data and product catalogs for the Needle Series, Linear Motion Rolling Guide Series, and Mechatronics Series for download. Please utilize them to improve your design efficiency.

<https://www.ikont.co.jp/eg/>



1. Technical calculations

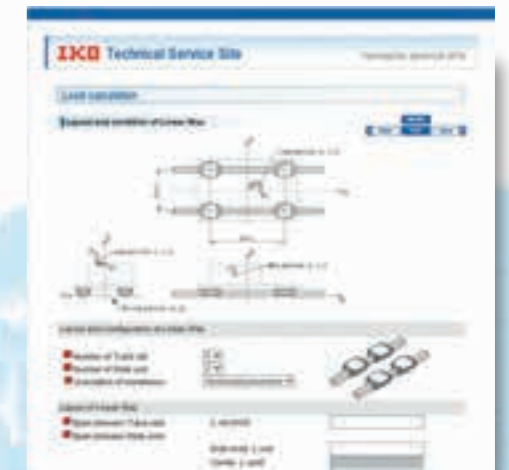
For Linear Way/Linear Roller Way load and life calculation, you can obtain the calculated load and the rating life by entering the operating conditions.

Also you can derive the motor torque required for operation and the effective propulsion force during operation in the sections of motor torque calculation and calculation of effective propulsion force of linear motor tables respectively, and output the calculation results in PDF format, as well as save the histories.

2. Selection of Identification Number

By selecting such specification as model code, dimensions, part code, material code, preload symbol, classification symbol, interchangeable code and supplemental code of Linear ways/Linear roller ways, you can easily specify the identification number used for ordering.

Also you can browse the CAD data of the selected products, calculate the load, and output the selection results in PDF format, as well as save the histories.



3. Downloading CAD data

2-dimensional CAD data (DXF file)

There are two types of figures, brief figure and detailed figure. The brief figure shows only the external view lines, and the detailed figure shows the detailed lines. The drawing consists of three drawings: front view, side view and plain view. The scale shows only the original size (1:1), and it does not show dimension lines.



3-dimensional CAD data

It is linked to the mechanical parts CAD library "PART community". Entering the rail dimension and option contents to the detail, you can view the 2D/3D CAD data suitable for the specification for free of charge.



4. Downloading Catalog and Operation Manual

You can download product catalogs of needle series, linear motion rolling guide series and mechatronics series, operation manuals of precision positioning tables and various electrical components in PDF format, as well as support software for precision positioning tables. If you would like a copy of our catalog, please visit the IKO official website and apply for the catalog, or contact our regional office or sales office nearby.

Oil Minimum

IKO Gentle to The Earth

Nippon Thompson Co., Ltd. is working to develop global environment-friendly products.

It is committed to developing products that make its customers' machinery and equipment more reliable, thereby contributing to preserving the global environment.

This development stance manifests well in the keyword "Oil Minimum."

Our pursuit of Oil Minimum has led to the creation of IKO's proprietary family of lubricating parts as "C-Lube."

- IKO Linear Motion Rolling Guides are manufactured through a control system that alleviates their impact on the global environment to meet the quality requirements of ISO 14001 in compliance with the quality requirements level of ISO 9001 for quality improvement.
- The standard products listed in this catalog comply with the specifications of the six hazardous materials mentioned cited in the European RoHS Directive.

IKO Products Underpin Sustain Technology Leaps

Nippon Thompson Co., Ltd. was the first Japanese manufacturer to develop needle bearings on its own and has since expanded into the arena of linear motion rolling guides (Linear Motion Series and Mechatro Series) on the support of its advanced expertise. The company now offers a vast assortment of ingenious products, including the world's first C-Lube Maintenance-Free Series, to address increasingly diversified customer needs and thus sustain technology leaps.

C-Lube Maintenance-Free Series Products Evolving from the "Oil Minimum" Concept

We have developed lubricating parts impregnated with a large amount of lubricant as C-Lube Series to save the customer's oiling management workload and built them into bearings and linear motion rolling guides. The C-Lube Series not only keeps products maintenance-free for long by giving them an optimal and minimal amount of a lubricant for an extended period of time but also contributes greatly to preserving the global environment.

