

## Linear Way Module



Linear Way Module

LWLM  
LWM

LRWM



Points

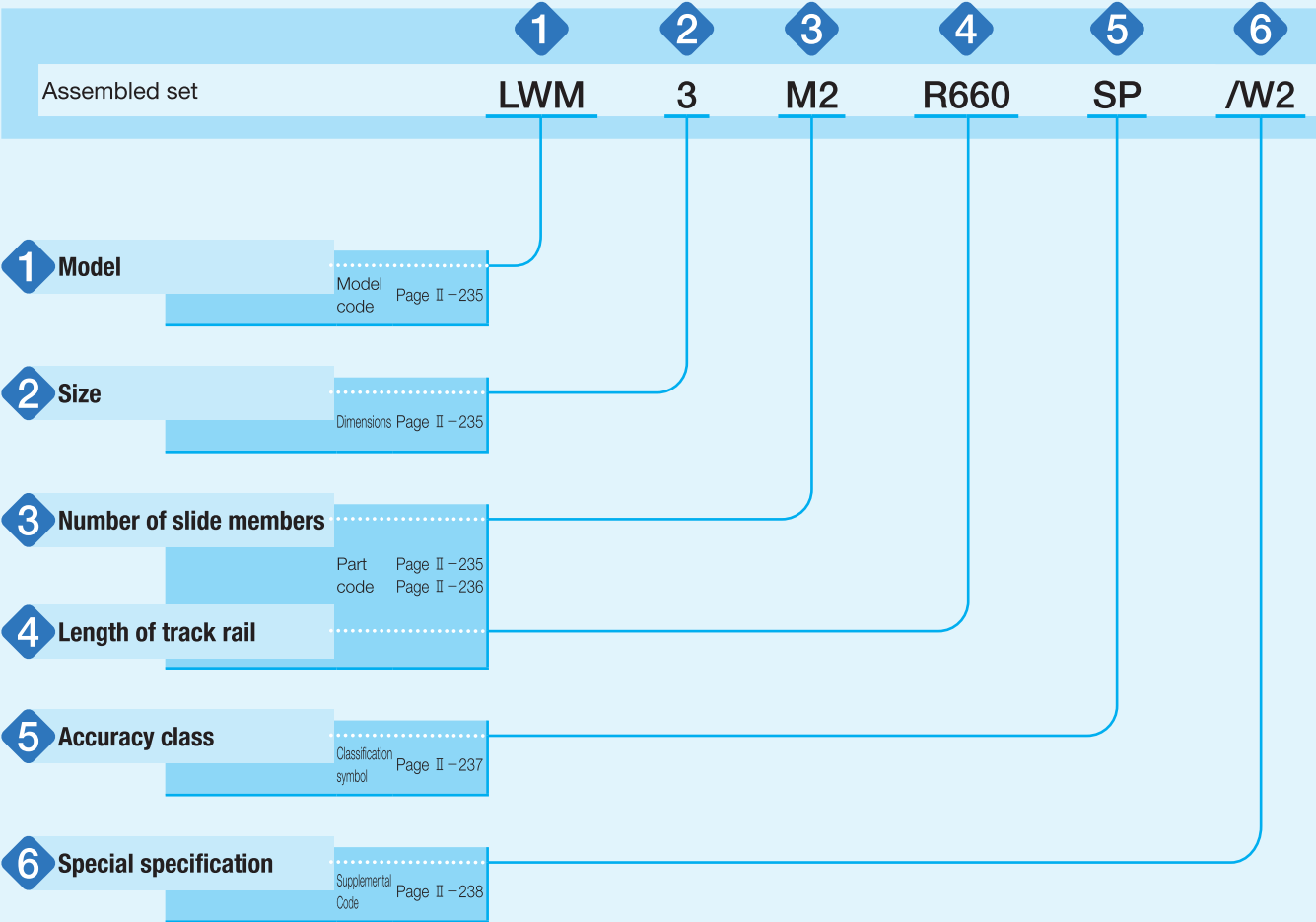
- **Compact module type**  
Compact linear motion rolling guides consisting of a set of track rail and slide member which forms the smallest unit of linear motion mechanism.

- **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 <sup>(1)</sup> Linear Way M <sup>(1)</sup> Linear Roller Way M <sup>(1)</sup>	: LWLM : LWM : LRWM
		For applicable models and sizes, see Table 1.1, 1.2 and 1.3.		
		Note <sup>(1)</sup> This model has no built-in C-Lube.		
2	Size	7, 9, 11 1, 2, 3, 4, 5, 6	For applicable models and sizes, see Table 1.1, 1.2 and 1.3.	
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

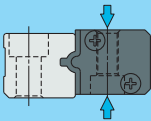
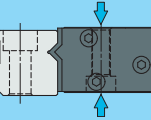
Shape	Model	Size					
		1	2	3	4	5	6
	LWM	○	○	○	○	○	○

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

The diagram illustrates a track rail assembly. It shows a long rail with multiple mounting holes. The total length is labeled  $L$ . The distance between two consecutive mounting holes is labeled  $F$ . The distance from the end of the rail to the first mounting hole is labeled  $E$ . The number of pieces is labeled  $n$  (Pieces).

unit: mm

<div>Identification number</div> <div>Item</div>	LWLM7	LWLM9	LWLM11			
Standard length $L$ ( $n$ )	60 ( 3) 80 ( 4) 120 ( 6) 160 ( 8)	100 ( 4) 150 ( 6) 200 ( 8) 275 (11)	160 ( 4) 240 ( 6) 320 ( 8) 440 (11)			
Pitch of mounting holes $F$	20	25	40			
$E$	10	12.5	20			
Standard $E$ dimensions <div>or higher below</div>	4.5 14.5	5 17.5	5.5 25.5			
Maximum length <sup>(1)</sup>	240 (500)	350 (900)	520 (1 000)			

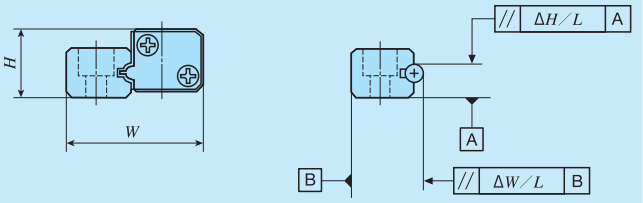
<div>Identification number</div> <div>Item</div>	LWM1	LWM2	LWM3	LWM4	LWM5	LWM6
Standard length $L$ ( $n$ )	240 ( 6) 360 ( 9) 480 (12)	240 ( 4) 360 ( 6) 480 ( 8)	480 ( 8) 660 (11) 840 (14)	800 (10) 1 040 (13) 1 200 (15)	800 ( 8) 1 200 (12) 1 500 (15)	1 200 (10) 1 920 (16) 2 520 (21)
Pitch of mounting holes $F$	40	60	60	80	100	120
$E$	20	30	30	40	50	60
Standard $E$ dimensions <div>or higher below</div>	7 27	8 38	9 39	10 50	12 62	13 73
Maximum length	1 240	1 260	1 260	1 520	1 500	2 520

<div>Identification number</div> <div>Item</div>	LRWM2	LRWM3	LRWM4	LRWM5	LRWM6		
Standard length $L$ ( $n$ )	480 ( 8) 660 (11) 840 (14)	480 ( 8) 660 (11) 840 (14)	800 (10) 1 040 (13) 1 200 (15)	800 ( 8) 1 200 (12) 1 500 (15)	1 200 (10)		
Pitch of mounting holes $F$	60	60	80	100	120		
$E$	30	30	40	50	60		
Standard $E$ dimensions <div>or higher below</div>	8 38	9 39	10 50	12 62	13 73		
Maximum length	1 800	1 860	1 920	1 600	1 200		

Note <sup>(1)</sup> 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.

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	Precision	Super precision
Item	(H)	(P)	(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> <sup>(1)</sup>	0.015	0.007	0.005
Dim. variation of <i>W</i> <sup>(1)</sup>	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.

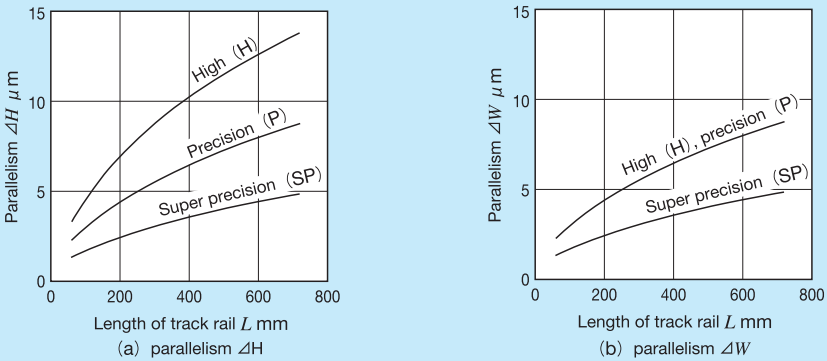


Fig.1.1 Track rail parallelism for LWLM

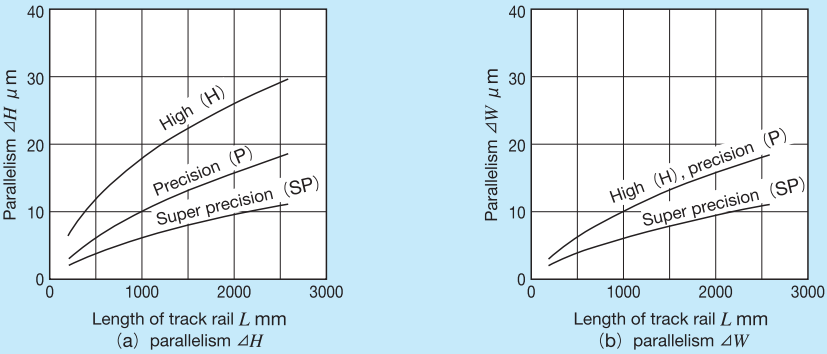


Fig.1.2 Track rail parallelism for LWM and LRWM

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.

Table 4 Application of special specifications

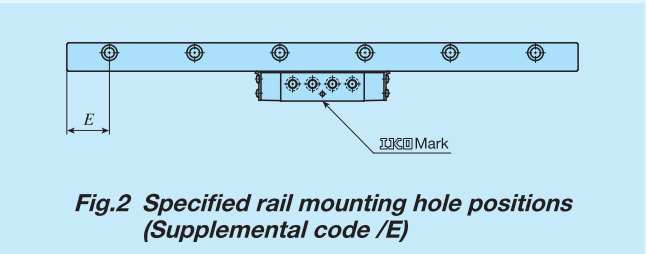
Special specification	Supplemental code	Model and size							
		LWLM			LWM, LRWM				
		7	9	11	1	2	3	4	5
Butt-jointing track rails	/A	×	×	×	○	○	○	○	○
Specified rail mounting hole positions	/E	○	○	○	○	○	○	○	○
Caps for rail mounting holes	/F	×	×	×	○	○	○	○	○
Inspection sheet	/I	○	○	○	○	○	○	○	○
Black chrome surface treatment	/LR	×	×	×	○	○	○	○	○
Fluorine black chrome surface treatment	/LFR	×	×	×	○	○	○	○	○
Without track rail mounting bolt	/MN	○	○	○	○ <sup>(1)</sup>	○ <sup>(1)</sup>	○ <sup>(1)</sup>	○ <sup>(1)</sup>	○ <sup>(1)</sup>
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.

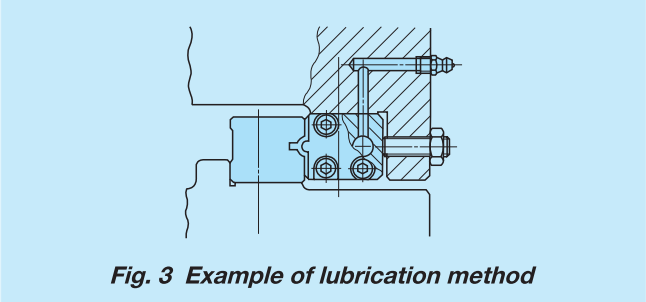


Remark: For details of specified rail mounting hole positions (supplemental code /E), see page Ⅲ-30.



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.



Dust Protection

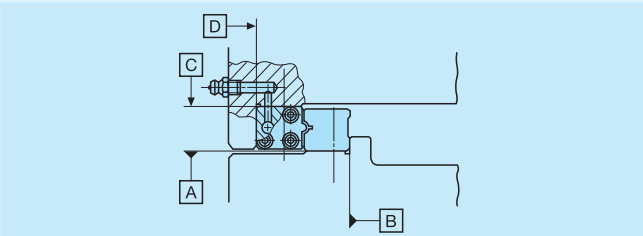
The slide members of Linear Way Module series are equipped with end seals as standard for dust protection. However, if large amount of contaminant or dust are floating, or if large

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

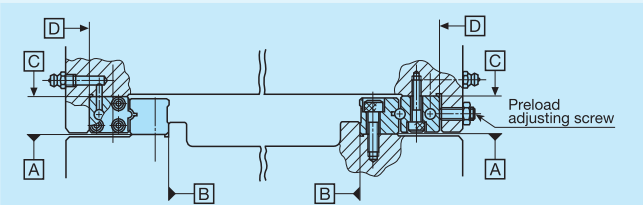
1 Mounting surface, reference mounting surface and typical mounting structure

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.



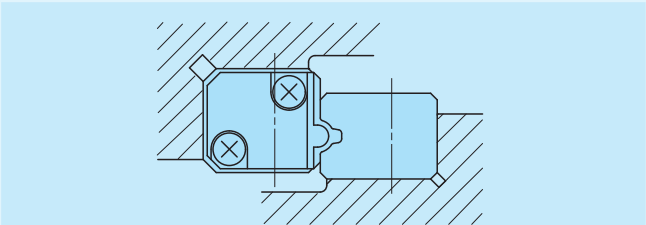
2 Fixing the slide member

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.



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.



4 Tightening torque for fixing screw

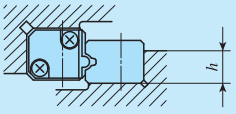
Typical tightening torque for mounting of Linear Way Module series to the steel mating member material is indicated in Table 6. When vibration and shock of the machine or device are large, fluctuating load is large, or moment load is applied, fix it by using the torque 1.2 to 1.5 times larger than the 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	—

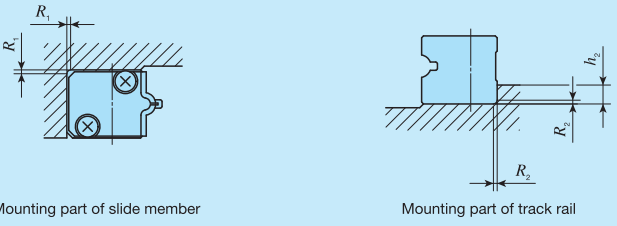
Remark: The tightening torque is calculated based on strength division 12.9 and property division A2-70.

Table 7.1 Shoulder height of the reference mounting surface for LWLM



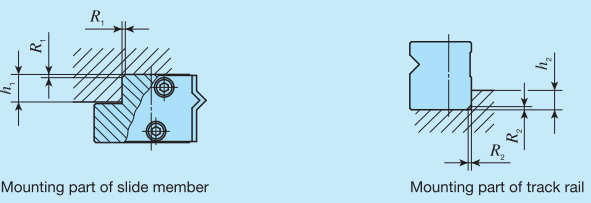
Size	Mounting part of track rail shoulder height $h$
	unit: mm
7	4
9	5
11	6

Table 7.2 Shoulder height and corner radius of the reference mounting surface for LWM

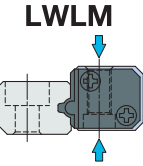


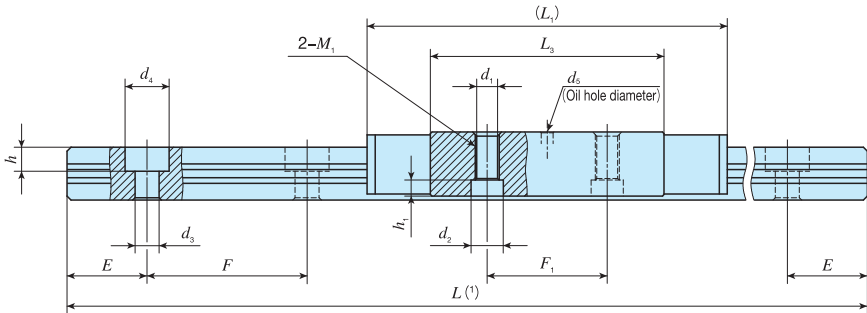
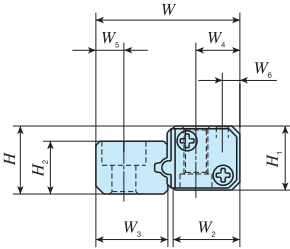
Size	Mounting part of slide member Corner radius $R_1$ (Maximum)	Mounting part of track rail	
		Shoulder height $h_2$	Corner radius $R_2$ (Maximum)
1	0.8	4	0.8
2	1	5	1
3	1	5	1
4	1.5	6	1
5	1.5	6	1
6	1.5	8	1.5

Table 7.3 Shoulder height and corner radius of the reference mounting surface for LRWM



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

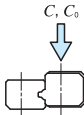
Linear Way LM				
Shape				
Size	7	9	11	



Identification number	Mass (Ref.)		Dimensions of assembly mm		Dimensions of slide member mm													Dimensions of track rail mm								Appended mounting bolt for track rail <sup>(2)</sup>	Basic dynamic load rating <sup>(3)</sup>	Basic static load rating <sup>(3)</sup>
	Linear Way Module series (No C-Lube)	Slide member g	Track rail g/m	H	W	H <sub>1</sub>	W <sub>2</sub>	W <sub>4</sub>	W <sub>6</sub>	L <sub>1</sub>	L <sub>3</sub>	F <sub>1</sub>	d <sub>1</sub>	d <sub>2</sub>		h <sub>1</sub>	M <sub>1</sub>	d <sub>5</sub>	H <sub>2</sub>	W <sub>3</sub>	W <sub>5</sub>	d <sub>3</sub>	d <sub>4</sub>	h	E	F	Bolt size× ℓ	C N
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 <sup>(4)</sup>	— <sup>(4)</sup>	— <sup>(4)</sup>	10	20	M2.6×8 <sup>(4)</sup>	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 <sup>(1)</sup> Track rail lengths *L* are shown in Table 2 on page II-236.  
<sup>(2)</sup> The appended mounting bolts are stainless steel hexagon socket head bolts equivalent to JIS B 1176.  
<sup>(3)</sup> The direction of basic dynamic load rating (*C*) and basic static load rating (*C<sub>0</sub>*) are shown in the sketch below.  
<sup>(4)</sup> 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	
<u>LWLM</u>	<u>9</u>	<u>M2</u>	<u>R200</u>	<u>P</u>	<u>/W2</u>
①	②	③	④	⑤	⑥
① Model		⑤ Accuracy class		⑥ Special specification	
LWLM    Linear Way LM		H    High P    Precision SP    Super precision		E, I, MN, W, Y	
② Size					
7, 9, 11					
③ Number of slide member (2)					
④ Length of track rail (200 mm)					

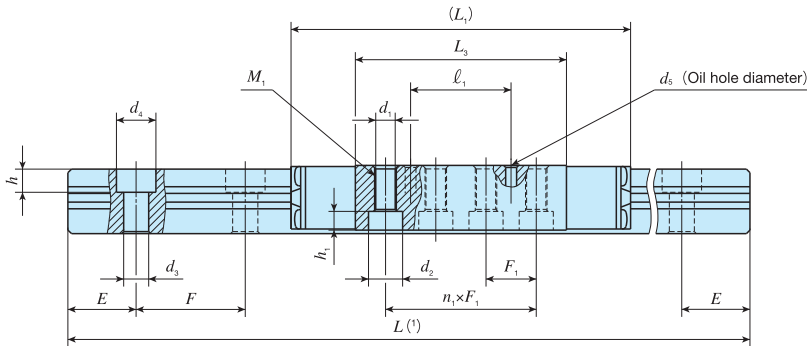
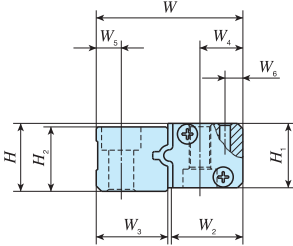
Linear Way M

Shape

LWM

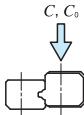
Size

123456



Identification number	Mass (Ref.)		Dimensions of assembly mm		Dimensions of slide member mm															Appended mounting bolt for slide member <sup>(2)</sup>	Dimensions of track rail mm										Appended mounting bolt for track rail <sup>(2)</sup>	Basic dynamic load rating <sup>(3)</sup>	Basic static load rating <sup>(3)</sup>
	Slide member kg	Track rail kg/m	H	W	H <sub>1</sub>	W <sub>2</sub>	W <sub>4</sub>	W <sub>6</sub>	L <sub>1</sub>	L <sub>3</sub>	n <sub>1</sub> ×F <sub>1</sub>	d <sub>1</sub>	d <sub>2</sub>	h <sub>1</sub>		M <sub>1</sub>	ℓ <sub>1</sub>	d <sub>5</sub>	Bolt size×ℓ		H <sub>2</sub>	W <sub>3</sub>	W <sub>5</sub>	d <sub>3</sub>	d <sub>4</sub>	h	E	F	Bolt size×ℓ	C N			
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 <sup>(1)</sup> Track rail lengths *L* are shown in Table 2 on page II – 236.  
<sup>(2)</sup> The appended mounting bolts are hexagon socket head bolts equivalent to JIS B 1176.  
<sup>(3)</sup> The direction of basic dynamic load rating (*C*) and basic static load rating (*C*<sub>0</sub>) are shown in the sketch below.  
Remark: The identification numbers with \* are our semi-standard items.



Example of identification number of assembled set

Model codeDimensionsPart codeClassification symbolSupplemental code

LWM3M2R660P/W2

123456

① Model

LWMLinear Way M

② Size

1, 2, 3, 4, 5, 6

③ Number of slide member <sup>(2)</sup>

④ Length of track rail (660 mm)

⑤ Accuracy class

HHigh

PPrecision

SPSuper precision

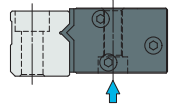
⑥ Special specification

A, E, F, I, LR, LFR

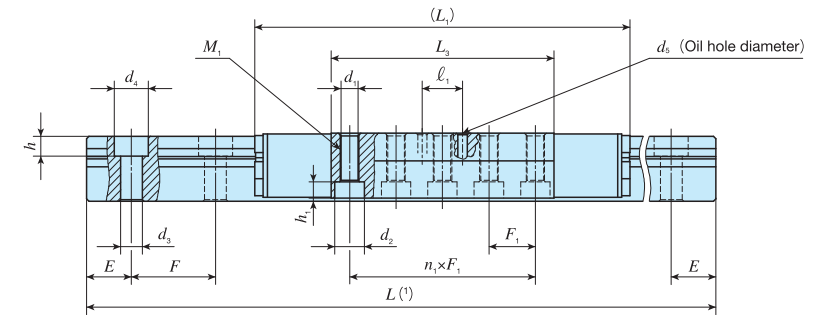
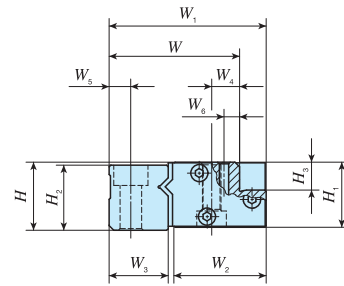
MN, W, Y

## Linear Roller Way M

## Shape

**LRWM**

Size	2	3	4	5	6
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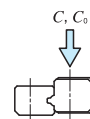
Identification number	Mass (Ref.)		Dimensions of assembly mm			Dimensions of slide member mm																Appended mounting bolt for slide member <sup>(2)</sup>	Dimensions of track rail mm									Appended mounting bolt for track rail <sup>(2)</sup>	Basic dynamic load rating <sup>(3)</sup>	Basic static load rating <sup>(3)</sup>
	Slide member kg	Track rail kg/m	H	W	W <sub>1</sub>	H <sub>1</sub>	H <sub>3</sub>	W <sub>2</sub>	W <sub>4</sub>	L <sub>1</sub>	L <sub>3</sub>	n <sub>1</sub> ×F <sub>1</sub>	M <sub>1</sub>	d <sub>1</sub>	d <sub>2</sub>	h <sub>1</sub>		W <sub>6</sub>	ℓ <sub>1</sub>	d <sub>5</sub>	Bolt size×ℓ		H <sub>2</sub>	W <sub>3</sub>	W <sub>5</sub>	d <sub>3</sub>	d <sub>4</sub>	h	E	F	Bolt size×ℓ			
Linear Way Module series (No C-Lube)																																		
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 ( $C_0$ ) 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
<b>LRWM</b>	<b>3</b>	<b>M2</b>	<b>R660</b>	<b>P</b>
<b>①</b>	<b>②</b>	<b>③</b>	<b>④</b>	<b>⑤</b>
<b>⑥</b>				