

C-Lube Linear Way ML Linear Way L

C-Lube Linear Way ML

ML



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

Oil hole

Linear Way L

LWL

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-41

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-31

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
1 Model	Model code Page II - 7									
2 Length of slide unit										
3 Structure										
4 Size										
5 Number of slide units	Part code Page II - 7									
6 Length of track rail										
7 Material type	Material code Page II - 7									
8 Preload amount										
9 Accuracy class	Classification symbol Page II - 14									
10 Interchangeable										
11 Special specification	Supplemental code Page II - 15									

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

1Model

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.

2Length of slide unit

Short : C
Standard : No symbol
Long : G
Extra long : L

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

3Structure

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	Ball non-retained type : No symbol
		Size: 5, 7, 9	Ball retained type : N
LWL	Standard rail specification		Ball retained type : B
	Tapped rail specification	Mounting from bottom	Size: 2, 3
		Size: 5, 7, 9	Ball non-retained type : No symbol
		Mounting from lateral	Size: 1
	Solid rail specification	Size: 1	Ball non-retained type : Y

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
		Size: 10~42	Ball retained type : No symbol
	Tapped rail specification	Size: 6	Ball non-retained type : N
LWLF		Size: 10~18	Ball retained type : N
	Standard rail specification	Size: 4, 6	Ball non-retained type : No symbol
		Size: 10~42	Ball retained type : B
	Tapped rail specification	Size: 6	Ball non-retained type : N
		Size: 10~18	Ball retained type : N

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

4Size

Standard type 1, 2, 3, 5, 7, 9, 12, 15, 20, 25
Wide type 4, 6, 10, 14, 18, 24, 30, 42

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

5Number 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.

6Length of track rail

: R○

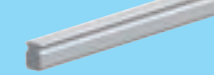
Indicate the length of track rail in mm.
For standard and maximum lengths, see Table 3.1, Table 3.2, and Table 3.3.

7Material type

Stainless steel made : No symbol
High carbon steel made : CS

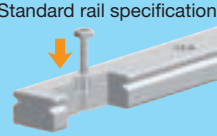
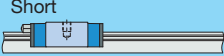
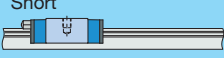
For applicable models and sizes, see Table 2.1 and Table 2.2.

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	—	—	—	○	○	○	○	○	○	○	○	
		Standard		ML	—	—	—	○	○	○	○	○	○	○	○	
				LWL…B	—	—	—	○	○	○	○	○	○	○	○	
	Long	MLG		—	—	—	—	○	○	○	○	○	○	○		
		LWLG…B		—	—	—	—	○	○	○	○	○	○	○		
	Extra long	MLL		—	—	—	—	—	○	○	○	—	—	—		
	High carbon steel made	Standard			LWL…BCS	—	—	—	—	—	○	○	○	○	—	—
Tapped rail specification Mounting from bottom 	Stainless steel made	Short		Ball non-retained type	MLC	—	—	○	—	—	—	—	—	—	—	—
					LWLC	—	—	○	—	—	—	—	—	—	—	—
			Ball retained type	MLC…N	—	—	—	○	○	○	—	—	—	—	—	—
				LWLC…N	—	—	—	○	○	○	—	—	—	—	—	
		Standard	Ball non-retained type	ML	—	—	○	—	—	—	—	—	—	—	—	—
				LWL	—	○	○	—	—	—	—	—	—	—	—	
		Long	Ball retained type	ML…N	—	—	—	○	○	○	—	—	—	—	—	—
				LWL…N	—	—	—	○	○	○	—	—	—	—	—	
		Extra long	Ball retained type	MLG…N	—	—	—	—	○	○	—	—	—	—	—	—
				LWLG…N	—	—	—	—	○	○	—	—	—	—	—	
Tapped rail specification Mounting from lateral 		Standard	Ball non-retained type	LWL…Y	○	—	—	—	—	—	—	—	—	—		
Solid rail specification 		Standard	Ball non-retained type	LWL	○	—	—	—	—	—	—	—	—	—		

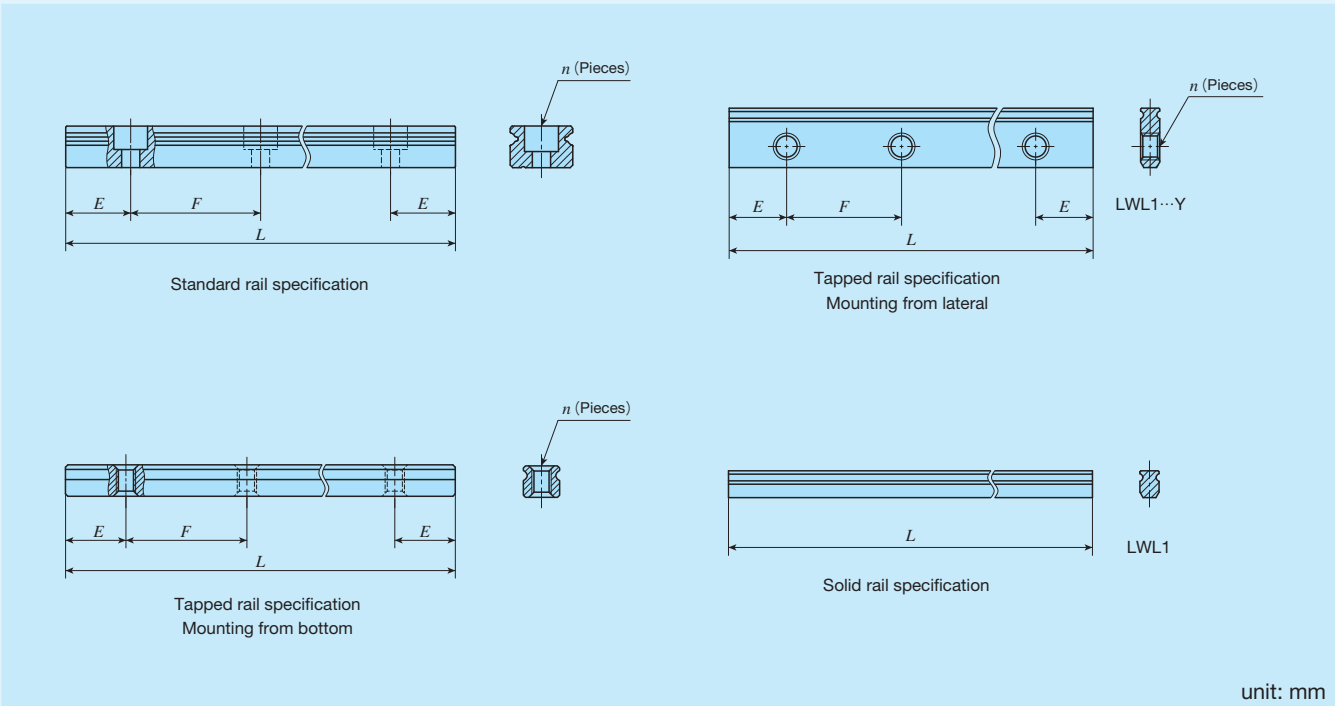
Remark: For the models indicated in , the interchangeable specification is available.

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	—	—	○	○	○	○	○	○
			Ball non-retained type	MLFC LWLFC...B	—	—	○	○	○	○	○	○
		 Standard	Ball retained type	MLF	—	—	○	○	○	○	○	○
			Ball non-retained type	MLF LWLF	—	○	—	—	—	—	—	—
		 Long	Ball retained type	MLFG	—	—	—	○	○	○	○	○
				LWLFG...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	—	—	○	○	○	—	—	—
				LWLFC...N	—	—	○	○	○	—	—	—
			Ball non-retained type	MLFC...N	—	○	—	—	—	—	—	—
				LWLFC...N	—	○	—	—	—	—	—	—
		 Standard	Ball retained type	MLF...N	—	—	○	○	○	—	—	—
				LWLF...N	—	—	○	○	○	—	—	—
			Ball non-retained type	MLF...N	—	○	—	—	—	—	—	—
				LWLF...N	—	○	—	—	—	—	—	—
		 Long	Ball retained type	MLFG...N	—	—	—	○	○	—	—	—
				LWLFG...N	—	—	—	○	○	—	—	—

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

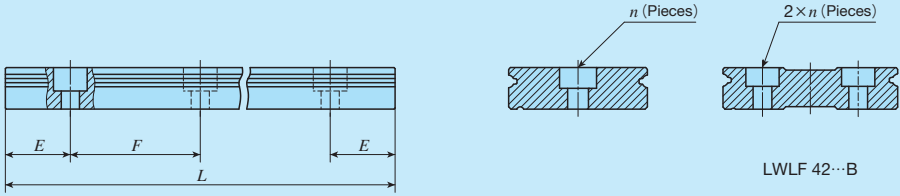
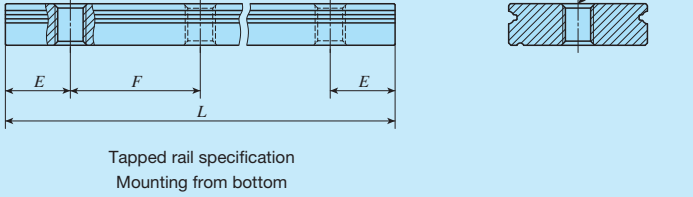
Table 3.1 Standard and maximum length of stainless steel track rail (Standard type)



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**. Not applicable to tapped rail specification.
⁽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.

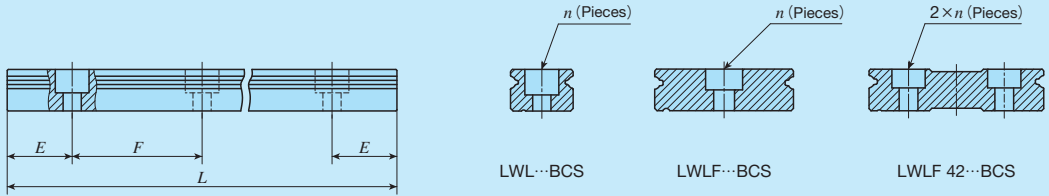
Table 3.2 Standard and maximum length of stainless steel track rail (Wide type)

 Standard rail specification  Tapped rail specification Mounting from bottom unit: mm <table><tr><th>Identification number</th><th>LWLF4</th><th>MLF 6 LWLF6</th><th>MLF 10 LWLF10...B</th><th>MLF 14 LWLF14...B</th></tr><tr><td>Standard length L (n)</td><td>40 (4) 60 (6) 70 (7) 80 (8) 100 (10)</td><td>60 (4) 90 (6) 105 (7) 120 (8) 150 (10)</td><td>60 (3) 80 (4) 120 (6) 160 (8) 220 (11) 280 (14)</td><td>90 (3) 120 (4) 150 (5) 180 (6) 240 (8) 300 (10)</td></tr><tr><td>Pitch of mounting holes F</td><td>10</td><td>15</td><td>20</td><td>30</td></tr><tr><td>E</td><td>5</td><td>7.5</td><td>10</td><td>15</td></tr><tr><td>Standard E or higher dimensions (1) below</td><td>3.5</td><td>4.5</td><td>4.5</td><td>5.5</td></tr><tr><td>Maximum length (2)</td><td>180 (300)</td><td>240 (300)</td><td>300 (500)</td><td>300 (990)</td></tr><tr><td>Maximum number of butt-jointing track rail (3)</td><td>—</td><td>—</td><td>7</td><td>8</td></tr><tr><td>Maximum length of butt-jointing track rail (3)</td><td>—</td><td>—</td><td>1 840</td><td>1 950</td></tr><tr><th>Identification number</th><th>MLF 18 LWLF18...B</th><th>MLF 24 LWLF24...B</th><th>MLF 30 LWLF30...B</th><th>MLF 42 LWLF42...B</th></tr><tr><td>Standard length L (n)</td><td>90 (3) 120 (4) 150 (5) 180 (6) 240 (8) 300 (10)</td><td>120 (3) 160 (4) 240 (6) 320 (8) 400 (10) 480 (12)</td><td>160 (4) 240 (6) 320 (8) 440 (11) 560 (14) 680 (17)</td><td>160 (4) 240 (6) 320 (8) 440 (11) 560 (14) 680 (17)</td></tr><tr><td>Pitch of mounting holes F</td><td>30</td><td>40</td><td>40</td><td>40</td></tr><tr><td>E</td><td>15</td><td>20</td><td>20</td><td>20</td></tr><tr><td>Standard E or higher dimensions (1) below</td><td>5.5</td><td>6.5</td><td>6.5</td><td>6.5</td></tr><tr><td>Maximum length (2)</td><td>690 (1 860)</td><td>680 (1 960)</td><td>680 (2 000)</td><td>680 (2 000)</td></tr><tr><td>Maximum number of butt-jointing track rail (3)</td><td>3</td><td>3</td><td>3</td><td>3</td></tr><tr><td>Maximum length of butt-jointing track rail (3)</td><td>1 920</td><td>1 840</td><td>1 840</td><td>1 840</td></tr></table>					Identification number	LWLF4	MLF 6 LWLF6	MLF 10 LWLF10...B	MLF 14 LWLF14...B	Standard length L (n)	40 (4) 60 (6) 70 (7) 80 (8) 100 (10)	60 (4) 90 (6) 105 (7) 120 (8) 150 (10)	60 (3) 80 (4) 120 (6) 160 (8) 220 (11) 280 (14)	90 (3) 120 (4) 150 (5) 180 (6) 240 (8) 300 (10)	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	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	Identification number	MLF 18 LWLF18...B	MLF 24 LWLF24...B	MLF 30 LWLF30...B	MLF 42 LWLF42...B	Standard length L (n)	90 (3) 120 (4) 150 (5) 180 (6) 240 (8) 300 (10)	120 (3) 160 (4) 240 (6) 320 (8) 400 (10) 480 (12)	160 (4) 240 (6) 320 (8) 440 (11) 560 (14) 680 (17)	160 (4) 240 (6) 320 (8) 440 (11) 560 (14) 680 (17)	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	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
Identification number	LWLF4	MLF 6 LWLF6	MLF 10 LWLF10...B	MLF 14 LWLF14...B																																																																																
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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**. Not applicable to tapped rail specifications.
(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)

 unit: mm <table><tr><th>Identification number</th><th>LWL 9...BCS</th><th>LWL12...BCS</th><th>LWL15...BCS</th><th>LWL20...BCS</th></tr><tr><td>Standard length L (n)</td><td>80 (4) 160 (8) 220 (11) 280 (14) 380 (19) 500 (25) 600 (30)</td><td>100 (4) 200 (8) 275 (11) 350 (14) 475 (19) 600 (24) 700 (28)</td><td>160 (4) 320 (8) 440 (11) 560 (14) 680 (17) 800 (20) 920 (23)</td><td>180 (3) 240 (4) 360 (6) 480 (8) 660 (11) 900 (15) 1 020 (17)</td></tr><tr><td>Pitch of mounting holes F</td><td>20</td><td>25</td><td>40</td><td>60</td></tr><tr><td>E</td><td>10</td><td>12.5</td><td>20</td><td>30</td></tr><tr><td>Standard E or higher dimensions (1) below</td><td>4.5</td><td>5</td><td>5.5</td><td>8</td></tr><tr><td>Maximum length</td><td>1 000</td><td>1 500</td><td>1 520</td><td>1 560</td></tr><tr><th>Identification number</th><th>LWLF18...BCS</th><th>LWLF24...BCS</th><th>LWLF30...BCS</th><th>LWLF42...BCS</th></tr><tr><td>Standard length L (n)</td><td>90 (3) 180 (6) 240 (8) 300 (10) 420 (14) 510 (17) 600 (20)</td><td>120 (3) 240 (6) 320 (8) 400 (10) 600 (15) 720 (18) 800 (20)</td><td>160 (4) 320 (8) 440 (11) 560 (14) 680 (17) 800 (20) 920 (23)</td><td>160 (4) 320 (8) 440 (11) 560 (14) 680 (17) 800 (20) 920 (23)</td></tr><tr><td>Pitch of mounting holes F</td><td>30</td><td>40</td><td>40</td><td>40</td></tr><tr><td>E</td><td>15</td><td>20</td><td>20</td><td>20</td></tr><tr><td>Standard E or higher dimensions (1) below</td><td>5.5</td><td>6.5</td><td>6.5</td><td>6.5</td></tr><tr><td>Maximum length</td><td>1 500</td><td>1 520</td><td>1 600</td><td>1 600</td></tr></table>					Identification number	LWL 9...BCS	LWL12...BCS	LWL15...BCS	LWL20...BCS	Standard length L (n)	80 (4) 160 (8) 220 (11) 280 (14) 380 (19) 500 (25) 600 (30)	100 (4) 200 (8) 275 (11) 350 (14) 475 (19) 600 (24) 700 (28)	160 (4) 320 (8) 440 (11) 560 (14) 680 (17) 800 (20) 920 (23)	180 (3) 240 (4) 360 (6) 480 (8) 660 (11) 900 (15) 1 020 (17)	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	Maximum length	1 000	1 500	1 520	1 560	Identification number	LWLF18...BCS	LWLF24...BCS	LWLF30...BCS	LWLF42...BCS	Standard length L (n)	90 (3) 180 (6) 240 (8) 300 (10) 420 (14) 510 (17) 600 (20)	120 (3) 240 (6) 320 (8) 400 (10) 600 (15) 720 (18) 800 (20)	160 (4) 320 (8) 440 (11) 560 (14) 680 (17) 800 (20) 920 (23)	160 (4) 320 (8) 440 (11) 560 (14) 680 (17) 800 (20) 920 (23)	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	Maximum length	1 500	1 520	1 600	1 600
Identification number	LWL 9...BCS	LWL12...BCS	LWL15...BCS	LWL20...BCS																																																												
Standard length L (n)	80 (4) 160 (8) 220 (11) 280 (14) 380 (19) 500 (25) 600 (30)	100 (4) 200 (8) 275 (11) 350 (14) 475 (19) 600 (24) 700 (28)	160 (4) 320 (8) 440 (11) 560 (14) 680 (17) 800 (20) 920 (23)	180 (3) 240 (4) 360 (6) 480 (8) 660 (11) 900 (15) 1 020 (17)																																																												
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																																																												
Maximum length	1 000	1 500	1 520	1 560																																																												
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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																																																												
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.

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.

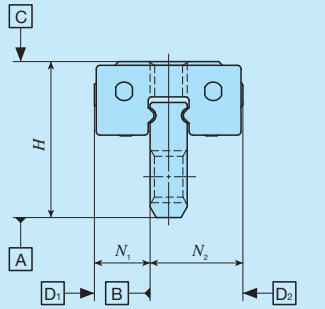
Table 5.2 Application of preload (Wide type)

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.

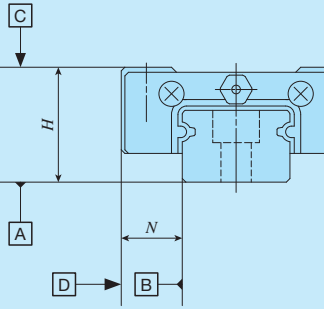
9	Accuracy class	High	: H	For interchangeable specification products, assemble a slide unit and a track rail of the same accuracy class. Size 1 series have "No symbols." For the details of accuracy class, see Table 6.1 and 6.2.
		Precision	: P	

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



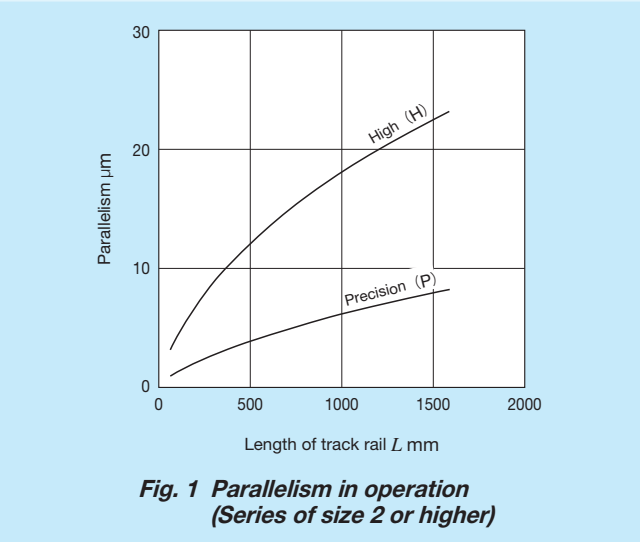
Item	Tolerance
Dim. H tolerance	±0.020
Dim. N ₁ and Dim. N ₂ tolerance	±0.025

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



Class (classification symbol)	High (H)	Precision (P)
Dim. H tolerance	±0.020	±0.010
Dim. N tolerance	±0.025	±0.015
Dim. variation of H ⁽¹⁾	0.015	0.007
Dim. variation of N ⁽¹⁾	0.020	0.010
Dim. variation of H for multiple assembled sets ⁽²⁾	0.030	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	

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



10 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 2.1 and Table 2.2. "No symbol" is indicated for non-interchangeable specification.

11 Special specification

/A, /BS, /D, /E, /HB, /I, /LR, /MN, /N, /Q, /RE, /S, /U, /W○, /Y○	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 specification, 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									
		1	2	3	5	7	9	12	15	20	25
		—	4	6	10	14	18	24	30	42	—
No end seal	/N	—	—	—	○	○	○	○	○	○	○
With C-Lube plate ⁽¹⁾	/Q	—	—	—	○	○	○	○	○	○	○
Under seal	/U	—	—	—	×	×	○	○	○	○	○

Note (1) Applicable to LWW(F) series.

Table 7.2 Application of special specifications (Interchangeable specification, single track rail)

Special specification	Supplemental code	Size									
		1	2	3	5	7	9	12	15	20	25
		—	4	6	10	14	18	24	30	42	—
Specified rail mounting hole positions	/E	—	—	—	○	○	○	○	○	○	○
Without track rail mounting bolt	/MN	—	—	—	○	○	○	○	○	○	○

Table 7.3 Application of special specifications (Interchangeable specification, assembled set)

Special specification	Supplemental code	Size									
		1	2	3	5	7	9	12	15	20	25
		—	4	6	10	14	18	24	30	42	—
Opposite reference surfaces arrangement	/D	—	—	—	○	○	○	○	○	○	○
Specified rail mounting hole positions	/E	—	—	—	○	○	○	○	○	○	○
Without track rail mounting bolt ⁽¹⁾	/MN	—	—	—	○	○	○	○	○	○	○
No end seal	/N	—	—	—	○	○	○	○	○	○	○
With C-Lube plate ⁽²⁾	/Q	—	—	—	○	○	○	○	○	○	○
Under seal	/U	—	—	—	×	×	○	○	○	○	○

Notes (1) Not applicable to tapped rail specification.

(2) Applicable to LWL(F) series.

Table 7.4 Application of special specifications (Non-interchangeable specification)

Special specification	Supplemental code	Size									
		1	2	3	5	7	9	12	15	20	25
		—	4	6	10	14	18	24	30	42	—
Butt-jointing track rails ⁽¹⁾ ⁽²⁾	/A	×	×	×	○	○	○	○	○	○	○
Stainless steel end plate ⁽³⁾	/BS	×	○ ⁽⁵⁾	○ ⁽⁵⁾	○	○	○	○	○	○	×
Opposite reference surfaces arrangement	/D	×	○	○	○	○	○	○	○	○	○
Specified rail mounting hole positions	/E	×	○	○	○	○	○	○	○	○	○
Hybrid C-Lube Linear Way	/HB	×	×	×	×	○ ⁽⁶⁾	○ ⁽⁶⁾	○ ⁽⁶⁾	○ ⁽⁶⁾	×	×
Inspection sheet	/I	×	○	○	○	○	○	○	○	○	○
Black chrome surface treatment (track rail)	/LR	×	×	×	×	○	○	○	○	○	○
Without track rail mounting bolt ⁽²⁾	/MN	×	○ ⁽⁷⁾	○ ⁽⁷⁾	○	○	○	○	○	○	○
No end seal	/N	×	×	×	○	○	○	○	○	○	○
With C-Lube plate ⁽³⁾	/Q	×	×	×	○	○	○	○	○	○	○
Special environment seal ⁽³⁾	/RE	×	×	×	○	○	○	○	○	○	×
Track rail with stopper pins	/S	×	×	×	○	○	○	○	○	○	○
Under seal	/U	×	×	×	×	×	○	○	○	○	○
A group of multiple assembled sets	/W○	×	○	○	○	○	○	○	○	○	○
Specified grease ⁽⁴⁾	/Y○	×	○ ⁽⁸⁾	○	○	○	○	○	○	○	○

Notes (1) Not applicable to high carbon steel made products.

(2) Not applicable to tapped rail specification.

(³) Applicable to LWL(F) series. / YCG is applicable

(4) ML(F) series is applicable only to /YCG.

(5) Not applicable to size 4 and 6 series.

(6) Applicable to size 7, 9, 12, and 15 of

(7) Not applicable to size 2 and 3 series.

(7) Not applicable to size 2 and 3 series.

(⁸) Applicable only to /YNG.

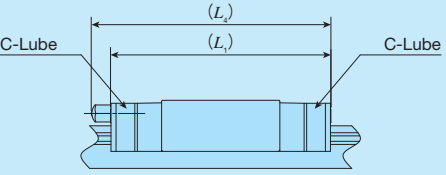
Table 8 *Combination of supplemental codes*

BS																
D																
E	-		-													
HB		-														
I																
LR	-															
MN																
N																
Q					-											
RE					-					-						
S																
U										-		-				
W				-												
Y				-						-						
	A	BS	D	E	HB	I	LR	MN	N	Q	RE	S	U	W	Y	

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 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)

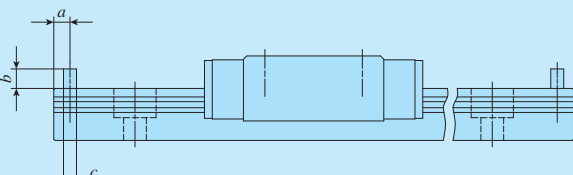
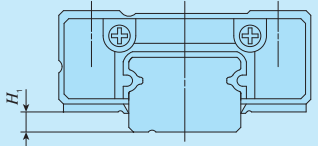
				
unit: mm				
Size	a	b	c	
5	—	2	2	1.6
7	—	2.5	2.5	2
9	—		3	
— 10	—		2	1.6
12	—		3	2
— 14	—	3	3	
15	—		4	
— 18	—		3	
20	—		5	
— 24	—	3.5	3	
25	—		5	
— 30	—		4	
— 42	—	2.5	5	

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

	
unit: mm	
Size	H_1
9	—
12	—
15	—
— 18	2
20	—
— 24	4
25	—
— 30	2
— 42	3

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

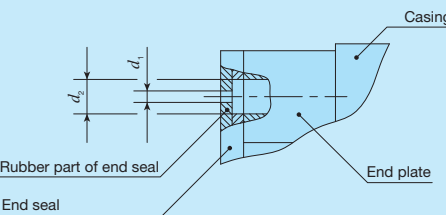
			
unit: mm			
Size	d_1	d_2	
5	10	0.5	1.1
7	14		1.2
9	18		1.5
12	24		2

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	10, 14, 18, 24	Oil hole	Miniature greaser
15, 20	30, 42	A-M3	A-5120V A-5240V B-5120V B-5240V
25	—	B-M4	A-8120V B-8120V

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.

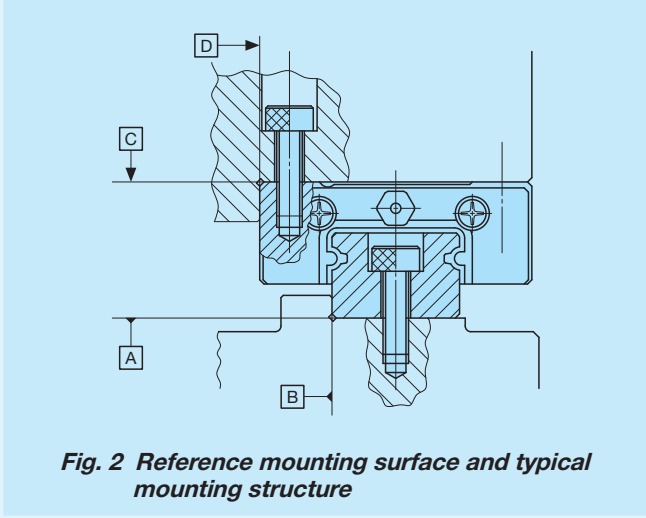


Fig. 2 Reference mounting surface and typical mounting structure

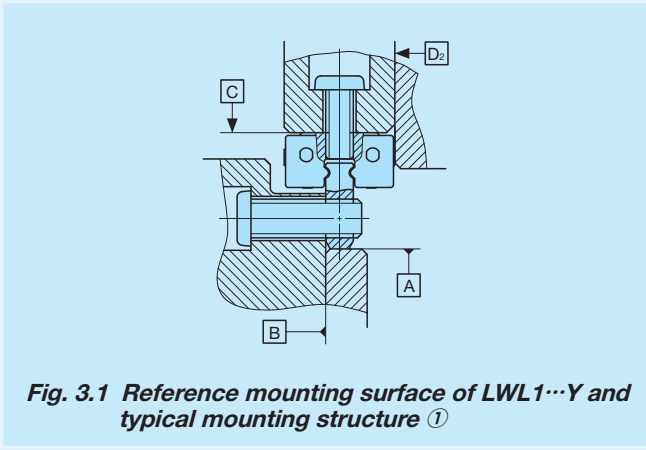


Fig. 3.1 Reference mounting surface of LWL1...Y and typical mounting structure ①

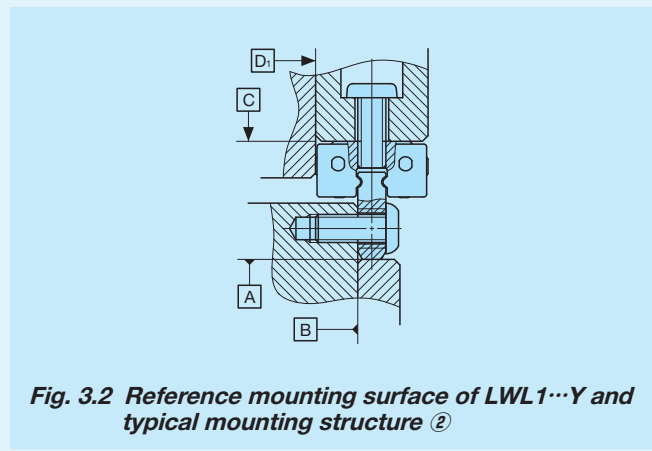


Fig. 3.2 Reference mounting surface of LWL1...Y and typical mounting structure ②

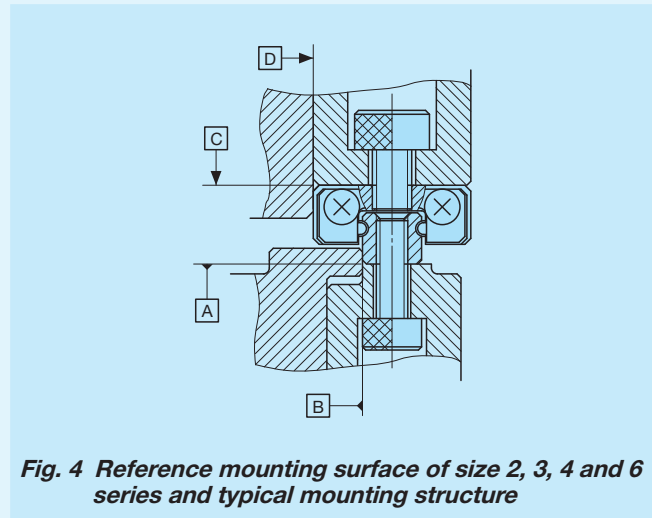


Fig. 4 Reference mounting surface of size 2, 3, 4 and 6 series and typical mounting structure

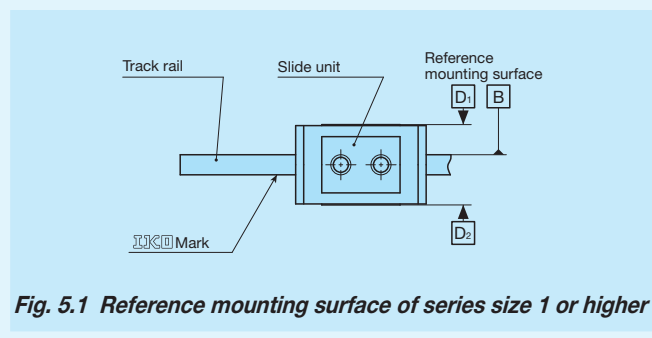


Fig. 5.1 Reference mounting surface of series size 1 or higher

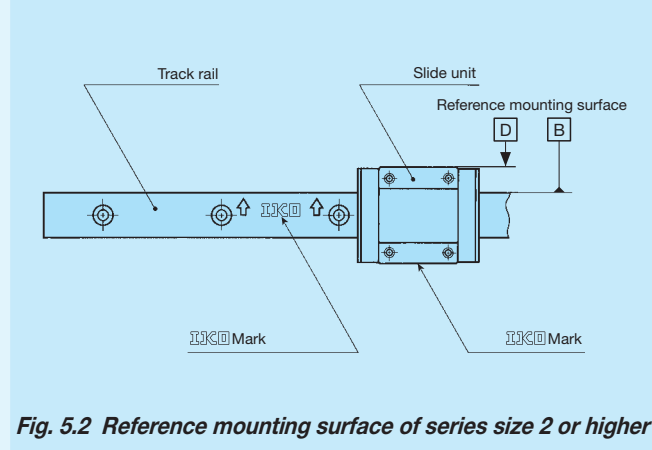


Fig. 5.2 Reference mounting surface of series size 2 or higher

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.

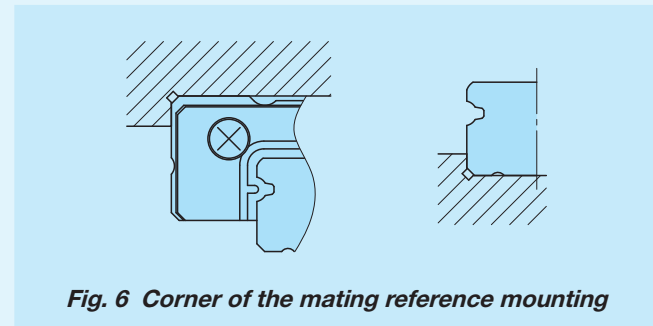


Fig. 6 Corner of the mating reference mounting

⑤ Tightening torque for fixing screw

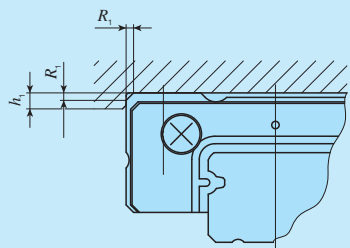
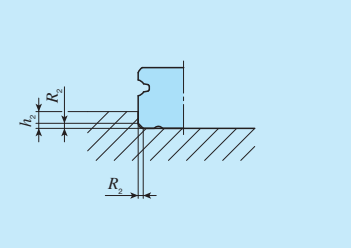
Typical tightening torque for mounting ML(F) series and LWL(F) series to the steel mating member material is indicated in Table 15. When vibration and shock of the machine or device are large, fluctuating load is large, or moment load is applied, fix it by using the torque 1.2 to 1.5 times larger than 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

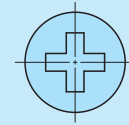
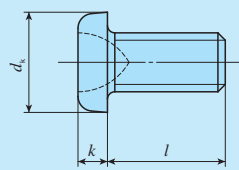
  Mounting part of slide unitMounting part of track rail unit: mm					
Identification number		Mounting part of slide unit		Mounting part of track rail	
		Shoulder height h_1	Corner radius R_1 (Maximum)	Shoulder height ⁽¹⁾ h_2	Corner radius R_2 (Maximum)
—	LWL 1…Y	1.3	—	2	—
—	LWL 1			—	
—	LWL 2	1	0.1	0.5	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.

Mounting Bolt

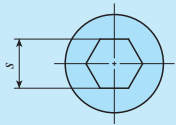
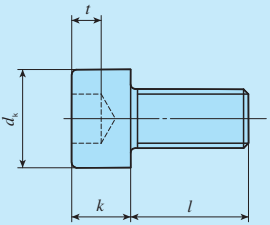
For LWL(F) series, track rail mounting bolt of slide unit and tapped rail specification shown in Table 17 and Table 18are available. If these parts are necessary, please contact **IKO**.

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

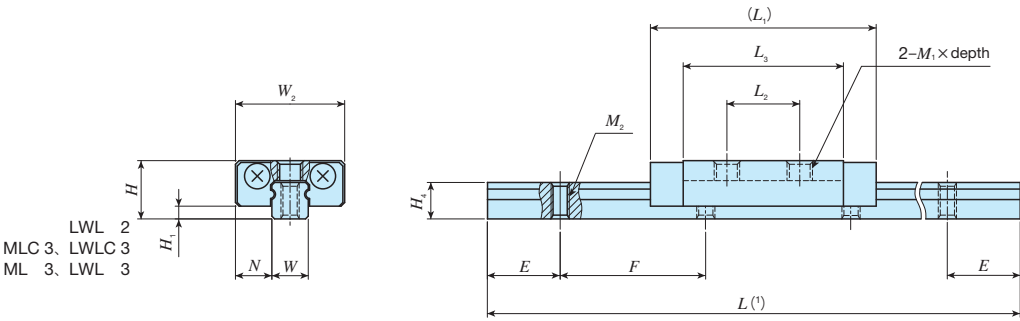
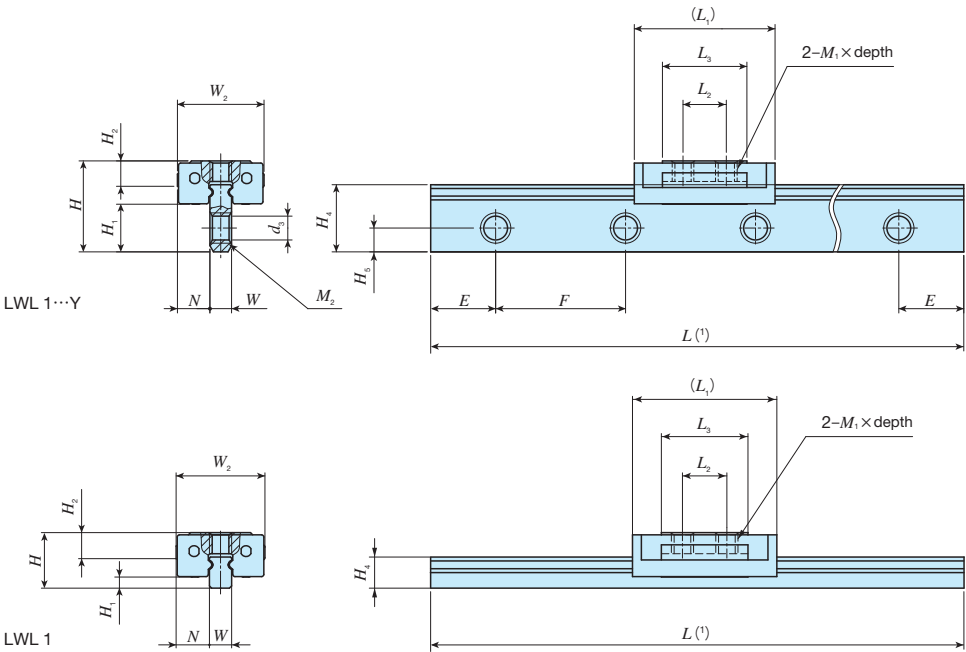
Note ⁽¹⁾ Based on cross-recessed head screw for precision equipment (Number 0) in Japan Camera Industry Standard JCIS 10-70.
Remark: The dimensions are different from the appended track rail mounting bolts.

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.

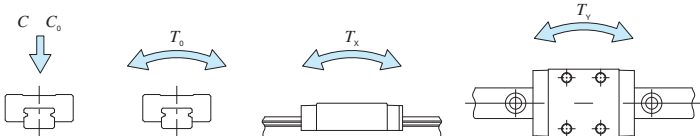
Standard type					
Shape	ML • LWL				
Size	1	2	3	5	7
	9	12	15	20	25



Identification number		Interchangeable	Mass (Ref.) g		Dimensions of assembly mm			Dimensions of slide unit mm							Dimensions of track rail mm						Mounting bolt for track rail ⁽²⁾ mm	Basic dynamic load rating ⁽⁵⁾	Basic static load rating ⁽⁵⁾	Static moment rating ⁽⁵⁾			
ML series	LWL series (No C-Lube)		Slide unit	Track rail (per 100 mm)	H	H ₁	N	W ₂	L ₁	L ₂	L ₃	M ₁ ×depth	H ₂		W	H ₄	H ₅	M ₂	d ₃	E	F	Bolt size×ℓ	C N	C ₀ N	T ₀ N・m	T _x N・m	T _y N・m
—	LWL 1…Y	—	0.16	2.1	4.2	2.2	1.5	4	6.5	2	3.9	M1 ×0.9	1.2		1	3.1	1.1	M1.4 Through	1.1	3	6	M1×ℓ or M1.4×ℓ ⁽³⁾	66.8	113	0.06	0.07 0.47	0.09 0.56
—	LWL 1	—		1.0	2.5	0.5										1.4	—	—	—	—	—	—					
—	LWL 2	—	0.9	2.8	3.2	0.7	2	6	12.5	4	8.8	M1.4×1.1	—		2	2	—	M1 Through	—	4	8	M1 ×ℓ ⁽⁴⁾	211	381	0.42	0.54 2.9	0.64 3.5
MLC 3	LWLC 3	—	0.9	5.3	4	1	2.5	8	10.5	3.5	7	M1.6×1.3	—	3	2.6	—	M1.6 Through	—	5	10	M1.6×ℓ ⁽⁴⁾	272	406	0.65	0.49 2.7	0.58 3.2	
		—	1.0						11.5		6.7											251	361	0.58	0.39 2.7	0.47 3.2	
ML 3	—	1.3	14.5						11	371	632	1.0										1.1 5.6	1.3 6.6				
	LWL 3	—	1.6						15.5	10.7	M2 ×1.3																

Notes (1) Track rail lengths L are shown in Table 3.1 on page II-10.
(2) Track rail mounting bolts are not appended.
(3) Prepare screws according to mounting structure.
(4) Choose screws whose dimension allow fixing thread depth into track rail ℓ to be less than H_4 .
(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.

Remarks 1. Metal parts are made of stainless steel.
2. Do not disassemble a slide unit from the track rail because steel balls are not retained. No end seal is attached.
3. The specification of small size mounting bolts (M2 and less) are show on page II-22. If needed, please contact IKO.



Example of identification number of assembled set

Model code	Dimensions	Part code	Model code	Preload symbol	Classification symbol	Supplemental code
LWL	2	C2 R80		T0	P	/D
1	2	3	4	5	6	7
1 Model	2 Length of slide unit	3 Size	4 Number of slide unit (2)	5 Length of track rail (80 mm)	6 Preload amount	7 Accuracy class
ML LWL LWL...Y	C No symbol	1, 2, 3			To Clearance	No symbol H P
Standard type	Short Standard					Ordinary High Precision
						8 Special specification
						BS, D, E, I, W, Y

1	2	3	5	7
9	12	15	20	25

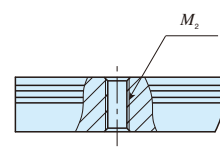
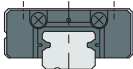
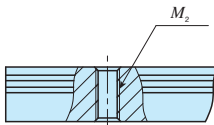
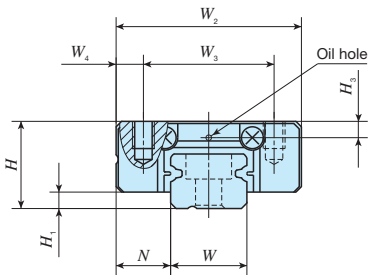


Figure 1 shows four schematic diagrams of test specimens. (a) A specimen with a vertical compressive load C applied downwards. (b) A specimen with a horizontal tensile load T_x applied to the left. (c) A specimen with a horizontal tensile load T_x applied to the right. (d) A specimen with a vertical tensile load T_y applied upwards.

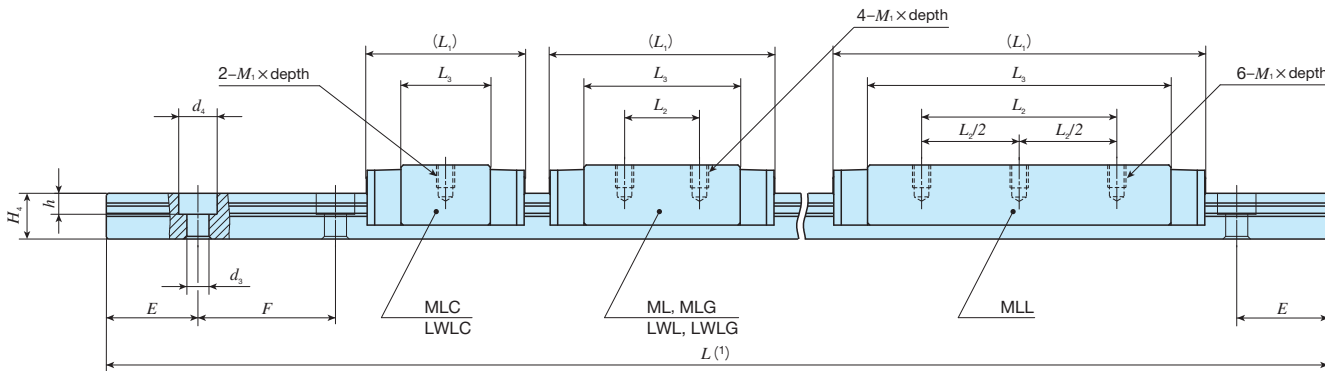
⑨ Special specification
A, BS, D, E, HB, I, LR
MN, N, Q, RE, S, W, Y

IKO C-Lube Linear Way ML

Standard type					
Shape	ML • LWL				
					
Size	1	2	3	5	7
	9	12	15	20	25

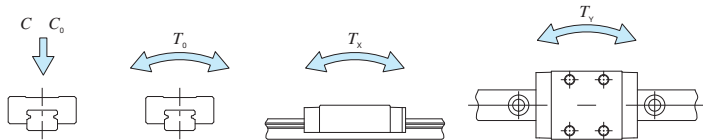


Tapped rail specification
LWL...N



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 ⁽²⁾ mm	Basic dynamic load rating ⁽⁴⁾	Basic static load rating ⁽⁴⁾	Static moment rating ⁽⁴⁾			
ML series	LWL series (No C-Lube)			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	M ₂	d ₃	d ₄	h	E	F	Bolt size×ℓ	C N	C ₀ N	T ₀ N・m	T _x N・m
MLC 9	LWLC 9…B	○	11	35	10	2	5.5	20	15	2.5	21.5	—	11.9	M3×3	2.2		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															M4 Through	—	—	—			M4×ℓ ⁽³⁾ (Not appended)					
ML 9	LWL 9…B	○	18	30															10	20.8	M3×8	1 810			2 760	12.8	9.1 51.1	7.6 42.9		
—	LWL 9…BCS	○	19								35	—	3.5								6								3.5	M4×ℓ ⁽³⁾ (Not appended)
ML 9…N*	LWL 9…N*	—	18								37	M4 Through	—								—	—			M4×ℓ ⁽³⁾ (Not appended)					
MLG 9	LWLG 9…B	○	26	40.5							15	30.9	M3×8						2 370	4 030	18.7	18.7 98.3			15.7 82.5					
—	LWLG 9…B	○	28										35													—	3.5	6	3.5	M4×ℓ ⁽³⁾ (Not appended)
MLG 9…N*	LWLG 9…N*	—	26										37						M4 Through	—	—	—			M4×ℓ ⁽³⁾ (Not appended)					
MLL 9	—	○	34	35							50	26	40.4						M3×8	2 870	5 300	24.6			31.9 157	26.7 132				
MLL 9…N*	—	—		37															M4 Through								—	—	—	M4×ℓ ⁽³⁾ (Not appended)
MLC 12	LWLC 12…B	○	22	65	13	3	7.5	27	20	3.5	25	—	13	M3×3.5	2.7		12	8	—	3.5	6.5	4.5	12.5	25	M3×8	2 210	2 380	14.8	5.3 41.7	4.5 35.0
ML 12	LWL 12…B	○	34								34	15	21.6													3 330	4 290	26.6	15.4 93.1	12.9 78.2
—	LWL 12…BCS	○	35								44	20	32													4 310	6 200	38.4	30.6 168	25.7 141
MLG 12	LWLG 12…B	○	48								59.5	30	47.3													5 820	9 540	59.1	69.8 339	58.6 285
—	LWLG 12…B	○	51																											
MLL 12	—	○	70																											

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.

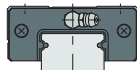


Example of identification number of assembled set

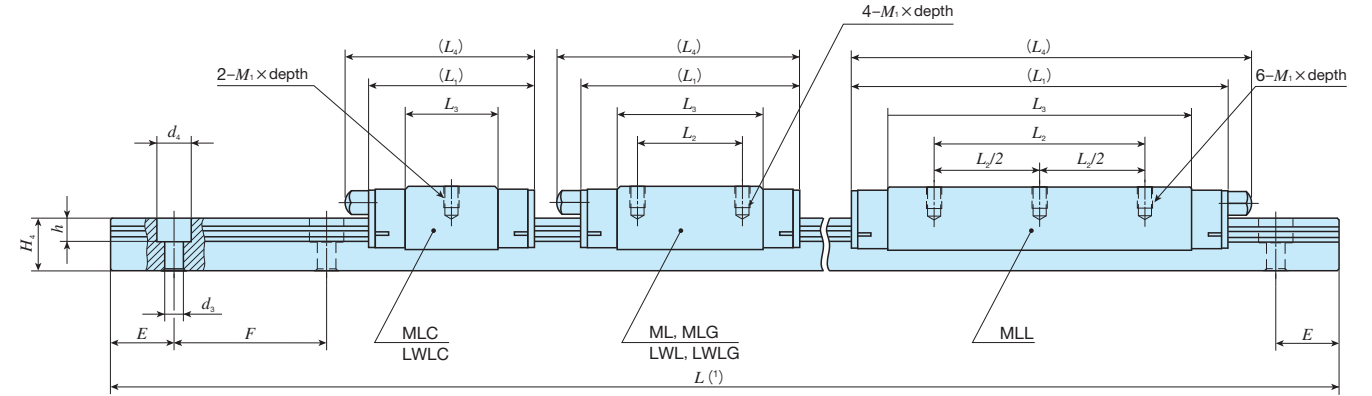
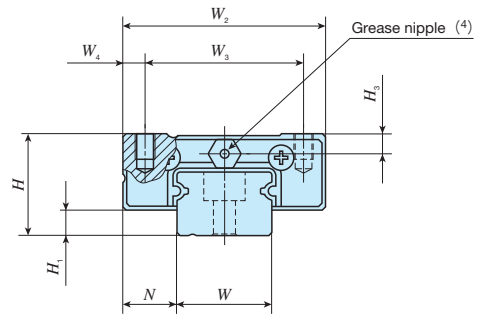
Model code	Dimensions	Part code	Model code	Material code	Preload symbol	Classification symbol	Interchangeable code	Supplemental code
ML	G	9	C2	R160	—	—	—	—
1	2	3	4	5	6	7	8	9
10								
① Model		③ Size		⑦ Preload amount		⑨ Interchangeable		
ML	Standard type	9, 12		T0	Clearance	No symbol	No interchange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

Standard type

ML • LWL



Size	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⁾	Basic static load rating ⁽³⁾	Static moment rating ⁽³⁾		
ML series	LWL series (No C-Lube)		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	d ₃	d ₄	h	E	F	Bolt size×ℓ	C N	C ₀ N	T ₀ N・m	T _x N・m	T _y N・m	
MLC 15		○	43	107	16	4	8.5	32	25	3.5			17.8	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								32	—	17.7																	37
ML 15		○	63										27.9																	
	LWL 15…B	○	64								42	20	27.8																	47
—	LWL 15…BCS	○																												
MLG 15		○									57	25	42.8																	62
	LWLG 15…B	○									57	25	42.7																	62
MLL 15	—	○	122								72	40	57.7																	76
MLC 20	LWLC 20…B	○	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
ML 20		○	130								50	25	34.6	55																
	LWL 20…B	○	133																											
—	LWL 20…BCS	○																												
MLG 20		○	189								68	30	52.3	73																
	LWLG 20…B	○	196																											
MLC 25		○	189	243	25	5	12.5	48	35	6.5			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								54.5	—																		
ML 25		○	305								78	35	55.7	88																
	LWL 25…B	○	310																											
MLG 25		○	405								98	40	75.5	108																
	LWLG 25…B	○	413																											

Notes (1) Track rail lengths L are shown in Table 3.1 on page II – 10 and Table 3.3 on page II – 12.

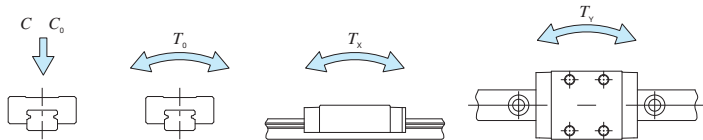
(2) The appended track rail mounting bolts are hexagon socket head bolts equivalent to JIS B 1176. For stainless steel model, stainless steel bolts are appended.

⁽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

1

G

2

15

3

C2

4

R320

5

1

6

T₁

7

P

8

9

/D

10

① Model

ML

LWL---B

Standard type

③ Size

15, 20, 25

⑦ Preload amount

T₀

No symbol

Clearance

Standard

T₁

Light preload

⑨ Interchangeable

No symbol

S1

S2

Non-interchangeable specification

S1 specification

S2 specification

② Length of slide unit

C

No symbol

G

L

Short

Standard

Long

Extra high rigidity long

⑤ Length of track rail (320 mm)

⑥ Material type

No symbol

CS

Stainless steel made

High carbon steel made

⑧ Accuracy class

H

P

High

Precision

⑩ Special specification

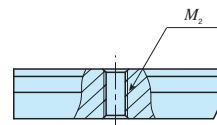
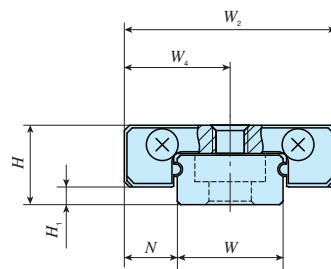
A, BS, D, E, HB, I, LR, MN
N, Q, RE, S, U, W, Y

MLF • LWLF

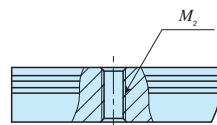
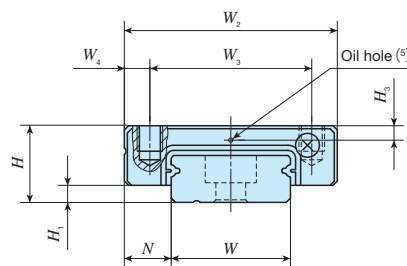
A diagram of a rectangular plate with a central square hole and two circular holes on either side. A vertical centerline is shown passing through the middle of the plate and the square hole.

4	6	10	14
18	24	30	42

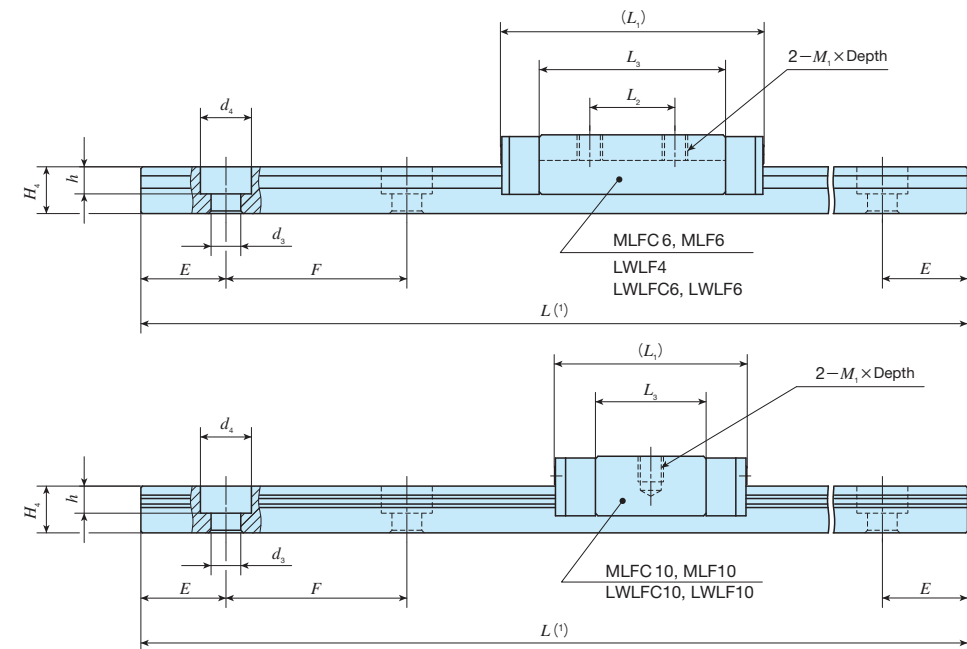
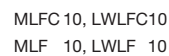
LWLF 4
MLFC 6, LWLFC 6
MLF 6, LWLF 6



Tapped rail specification
LWLF6...N

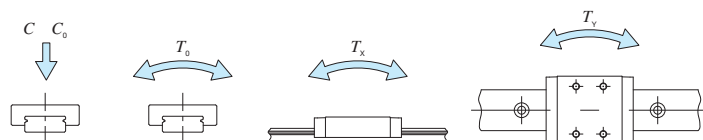


Tapped rail specification
LWLF...N



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.

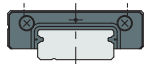


Model code		Dimensions	Part code		Model code	Preload symbol	Classification symbol	Interchangeable code	Supplemental code
<u>MLF</u>	<u>C</u>	<u>10</u>	<u>C2</u>	<u>R120</u>	<u> </u>	<u>T₀</u>	<u>P</u>	<u> </u>	<u>/D</u>
1	2	3	4	5	1	6	7	8	9

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

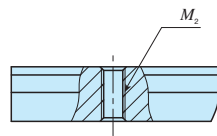
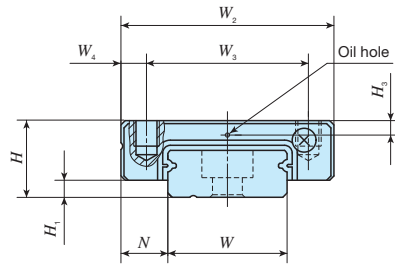
MLF • LWLF

Shape

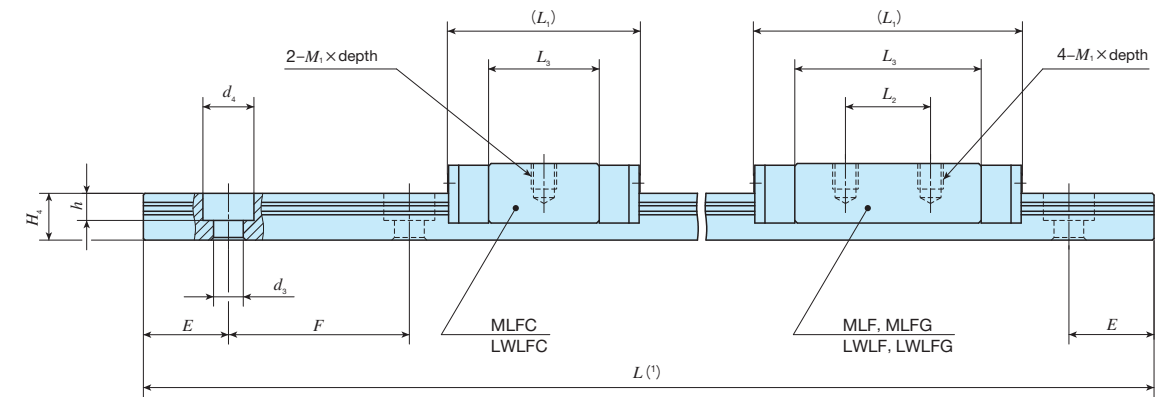


Size

4	6	10	14
18	24	30	42



Tapped rail specification
LWLF...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 ⁽²⁾ mm		Basic dynamic load rating ⁽⁴⁾	Basic static load rating ⁽⁴⁾	Static moment rating ⁽⁴⁾		
MFL series	LWLF series (No C-Lube)		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	M ₂	d ₃	d ₄	h	E	F	Bolt size×ℓ	C N	C ₀ N	T ₀ N·m	T _x N·m	T _y N·m
MLFC 14	LWLFC 14··B	○	13	54	9	2	5.5	25	19	3	22.5	—	13	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*	LWLFC 14··N*	—		56														M4 Through	—	—	—			M4×ℓ ⁽³⁾ (Not appended)					
MLF 14	LWLF 14··B	○	20	54							31.5	10	22					M3×8	1 770	2 840	20.3			10.1 54.7	8.4 45.9				
		○	21																							—	3.5	6	3.2
MLF 14··N*	LWLF 14··N*	—	20	56							42	19	32.5					M3×8	2 320	4 160	29.8			21.0 104	17.6 87.6				
		—	21																							—	3.5	6	3.2
MLFG 14	LWLFG 14··B	○	29	54						42	19	32.5	M3×8					2 320	4 160	29.8	21.0 104			17.6 87.6					
		○	31																						—	3.5	6	3.2	M4×ℓ ⁽³⁾ (Not appended)
MLFG 14··N*	LWLFG 14··N*	—	29	56						42	19	32.5	M3×8					2 320	4 160	29.8	21.0 104			17.6 87.6					
		—	31		—	3.5	6	3.2	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.

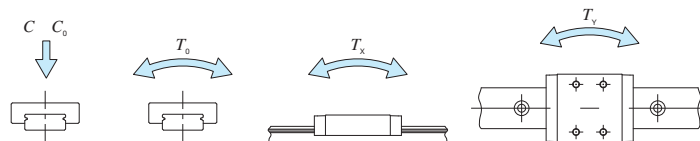
(3) Choose screws whose dimension allow fixing thread depth into track rail ℓ to be less than H_4 .

(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
<u>MLF</u>	<u>G</u>	<u>14</u>	<u>C2</u>	<u>R240</u>	<u> </u>	<u>T₁</u>	<u>P</u>	<u> </u>	<u>/D</u>
1	2	3	4	5	1	6	7	8	9

① Model	
MLF	Wide type
LWLF...B	
LWLF...N	

③ Size	14
--------	----

④ Number of slide unit (2)

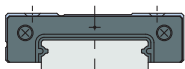
⑥ Preload amount	
T ₀	Clearance
No symbol	Standard
T ₁	Light preload

⑦ Accuracy class	
H	High
P	Precision

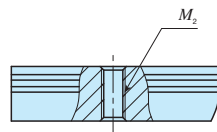
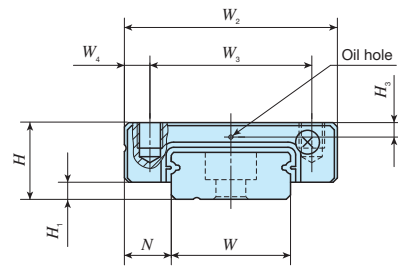
⑧ Interchangeable	
No symbol	Non-interchangeable specification
S1	S1 specification
S2	S2 specification

⑨ Special specification
A, BS, D, E, I, LR, MN
N, Q, RE, S, W, Y

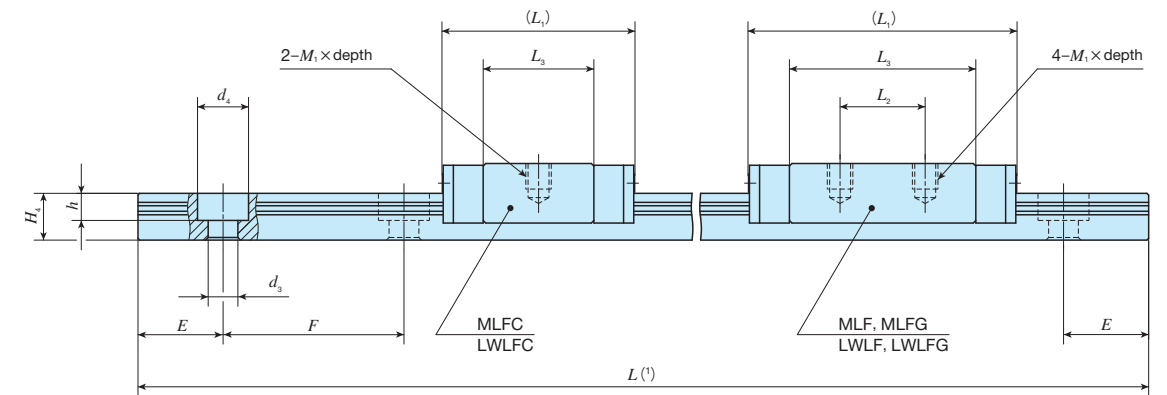
MLF • LWLF



Size	4	6	10	14
	18	24	30	42



Tapped rail specification
LWLF...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 ⁽²⁾ mm	Basic dynamic load rating ⁽⁴⁾	Basic static load rating ⁽⁴⁾	Static moment rating ⁽⁴⁾								
MLF series	LWLF series (No C-Lube)		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	M ₂	d ₃	d ₄	h	E	F				Bolt size×ℓ	C N	C ₀ N	T ₀ N・m	T _x N・m	T _y N・m			
MLFC 18	LWLF 18…B	○	26	90	12	3	6	30	21	4.5	26.5	—	16.6	M3×3	2.5	18	7	—	3.5	6.5	4.5	15	30	M3×8	1 510	2 120	19.4	5.5 35.9	4.7 30.1						
MLFC 18…N*	LWLF 18…N*	—		92														M4 Through	—	—	—			M4×ℓ ⁽³⁾ (Not appended)											
MLF 18	LWLF 18…B	○	42	90							—	3.5	6.5					4.5	M3×8																
—	LWLF 18…BCS	○	44	92							M4 Through	—	—					—	M4×ℓ ⁽³⁾ (Not appended)																
MLF 18…N*	LWLF 18…N*	—	42	92					23	3.5	50.5	24	40.4					M3×3.5	3.2	24	8			—	4.5	8	4.5	20	40	M4×10	2 870	5 300	48.5	31.9 159	26.7 134
MLFG 18	LWLF 18…B	○	59	90																															
MLFG 18…N*	LWLF 18…N*	—	59	92																											M4 Through	—	—	—	M4×ℓ ⁽³⁾ (Not appended)
—	LWLF 18…BCS	○	61	92																											—	3.5	6.5	4.5	M4×ℓ ⁽³⁾ (Not appended)
MLFC 24	LWLF 24…B	○	46	139	14	3	8	40	28	6	30.5	—	17.7	M3×3.5	3.2	24	8	—	4.5	8	4.5	20	40	M4×10	2 800	3 340	40.7	9.7 67.6	8.2 56.8						
MLF 24	LWLF 24…B	○	74																											76					
—	LWLF 24…BCS	○	76								76	59	28												46.3										
MLFG 24	LWLF 24…B	○	108								111																								
—	LWLF 24…BCS	○	108								111	59	28												46.3										
MLFG 24	LWLF 24…B	○	111								111	59	28												46.3										

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.

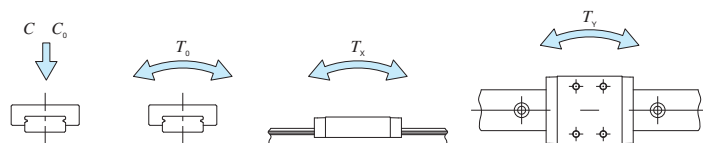
(³) Choose screws whose dimension allow fixing thread depth into track rail ℓ to be less than H_4 .

(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
<u>MLF</u>	<u>G</u>	<u>18</u>	<u>C2</u>	<u>R300</u>	<u> </u>	<u> </u>	<u>T₁</u>	<u>P</u>	<u> </u>	<u>/D</u>
1	2	3	4	5	1	6	7	8	9	10

① Model	
MLF	Wide type
LWLF...B	
LWLF...N	

③ Size	18, 24
--------	--------

④ Number of slide unit (2)

⑤ Length of track rail (300 mm)	
⑥ Material type	
No symbol	Stainless steel made
CS	High carbon steel made

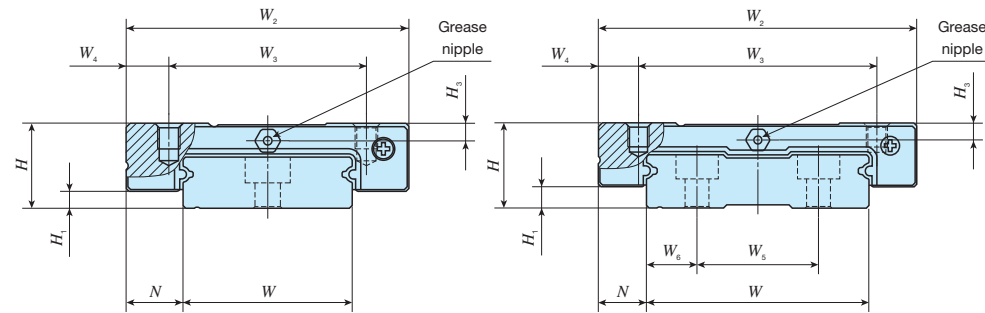
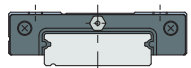
⑦ Preload amount	
T ₀	Clearance
No symbol	Standard
T ₁	Light preload

⑧ Accuracy class	
H	High
P	Precision

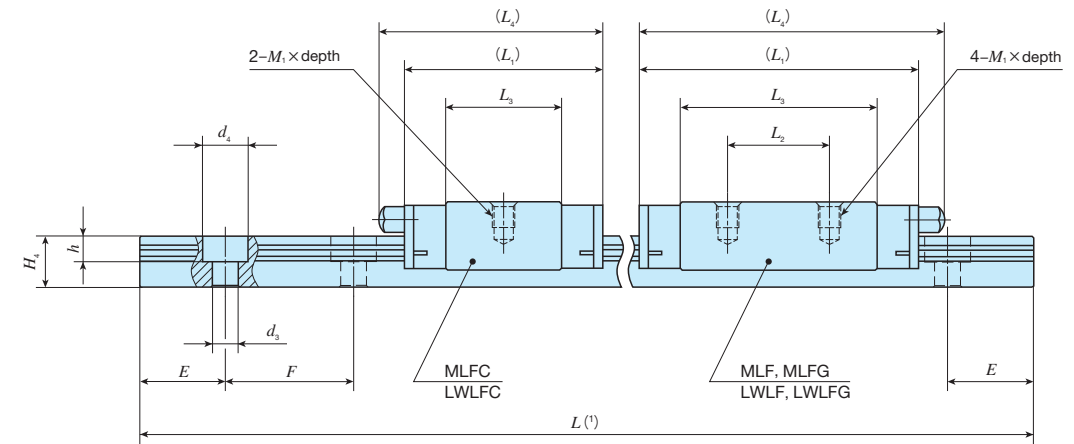
⑨ Interchangeable	
No symbol	Non-interchangeable specification
S1	S1 specification
S2	S2 specification

⑩ Special specification
A, BS, D, E, I, LR, MN
N, Q, RE, S, U, W, Y

4	6	10	14
18	24	30	42



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



⑩ Special specification
A, BS, D, E, I, LR, MN
N, Q, RE, S, U, W, Y

