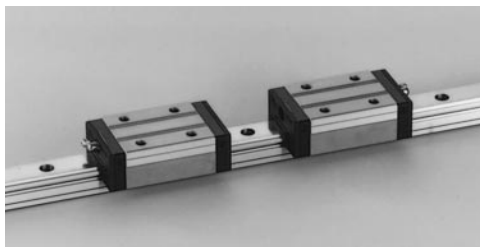


A-I-5.2 LS Series



(1) High self aligning capability (rolling direction)

Same as the DF combination in angular contact bearings, self-aligning capability is high because the cross point of the contact lines of balls and grooves comes inside, reducing moment rigidity. This increases the capacity to absorb the error of installation.

(2) High load carrying capacity to vertical direction

The contact angle is set at 50 degrees, increasing load carrying capacity as well as rigidity against the load in vertical direction.

(3) High resistance against shock load

The bottom ball groove is formed in gothic-arch and the center of the top and bottom grooves are offset as shown in Fig. I-5-6. The vertical load is usually carried by top 2 rows at where balls are contacting at two points. Because of this design, the bottom rows will carry the load when a large impact load is applied as shown in Fig. I-5-7. This assures high resistance to the shock load.

(4) Highly accurate

As shown in Fig. I-5-8, fixing the measuring rollers is simple thanks to the gothic-arch groove. This makes easy and accurate measuring of ball-grooves.

(5) Interchangeable rail and ball slide (short delivery time)

Randomly matching rails and ball slides are stocked as standardized interchangeable items. This reduces delivery time.

(6) Easy to handle, and designed with safety in mind.

Balls are retained in the retainer and do not fall out when the ball slide is withdrawn from the rail.

(7) Abundant models and sizes come in series.

Each series have several ball slide models, rendering the linear guide available for numerous uses. The LS Series also has standardized long stainless-steel rail (maximum: 3 500 mm).

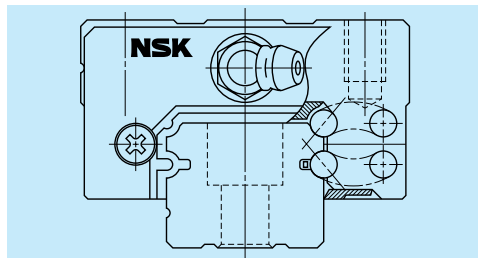


Fig. I-5-5 LS Series

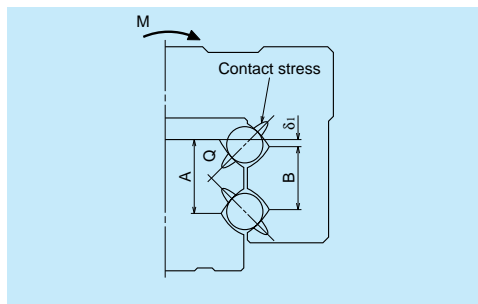


Fig. I-5-6 Enlarged illustration: Offset gothic-arch

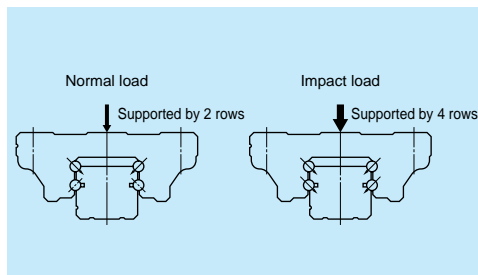


Fig. I-5-7 When load is applied

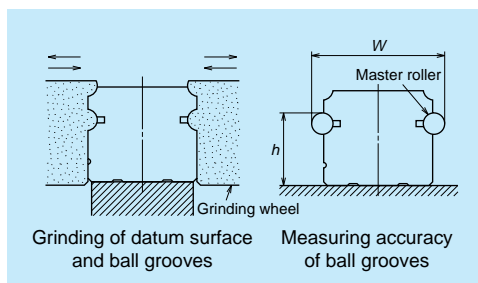


Fig. I-5-8 Rail-grinding and measuring

Dimensions of LS Series (Preloaded assembly)

LS-CL (Medium load type)
LS-AL (High load type)

• Specification number of preloaded assembly
(Custom made assembly)

Model number	LH35 0840 AL C 2 - PN Z0 - II	II refers to a set of 2 linear guides; no code refers to one
Rail length (mm)	0840	
Ball slide shape	AL C	
Material/surface treatment (See Page A24)	C 2	
• C: Standard material		
• K: Stainless steel		
Number of ball slides per rail	2	
Preload code	Z0 - II	• Z0 fine clearance • Z1 slight preload • Z3 medium preload
Accuracy grade	PN	• PN normal grade • P6 precision grade • P5 high precision grade • P4 super precision grade • P3 ultra precision grade

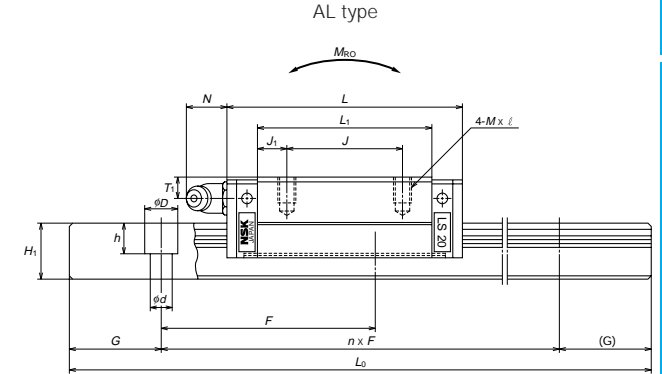
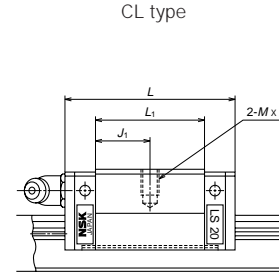
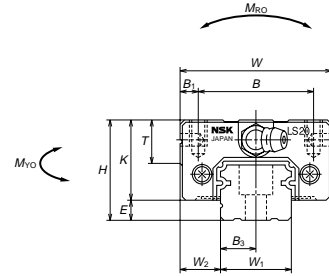


Table. I-5•8

Model No.	Assembly			Ball slide													
	Height	Width	Length	Mounting tap hole							Grease fitting						
				B	J	M x pitch x l	B1	L1	J1	K	T	Hole size	T1	N			
LS15CL	24	34	40.4	—	—	M4x0.7x6	4	23.6	11.8	—	—	—	—	—	—	—	—
LS15AL	4.6	9.5	56.8	26	26	M4x0.7x6	4	40	7	19.4	10	phi 3	6	3			
LS20CL	28	42	47.2	—	—	M5x0.8x7	5	30	15	—	—	—	—	—	—	—	—
LS20AL	6	11	65.2	32	32	M5x0.8x7	5	48	8	22	12	M6x0.75	5.5	11			
LS25CL	33	48	59.6	—	—	M6x1x9	6.5	38	19	—	—	—	—	—	—	—	—
LS25AL	7	12.5	81.6	35	35	M6x1x9	6.5	60	12.5	26	12	M6x0.75	7	11			
LS30CL	42	60	67.4	—	—	M8x1.25x12	10	42	21	—	—	—	—	—	—	—	—
LS30AL	9	16	96.4	40	40	M8x1.25x12	10	71	15.5	33	13	M6x0.75	8	11			
LS35CL	48	70	77	—	—	M8x1.25x12	10	49	24.5	—	—	—	—	—	—	—	—
LS35AL	10.5	18	108	50	50	M8x1.25x12	10	80	15	37.5	14	M6x0.75	8.5	11			

*Either M3 (3.5x6x4.5) or M4 (4.5x7.5x5.3) is available for mounting LS15 rail. "T" is added to the end of length code in the reference number of interchangeable rail with M4 mounting hole.

Unit: mm

Rail							Basic load rating					Ball dia.	Weight	
Width	Height	Pitch	Mounting bolt hole	B3	G (recomm ended)	Max. length L _{max} () for stainless	Dynamic C	Static C ₀	Static moment			D _w	Ball slide (kg)	Rail (kg/m)
W ₁	H ₁	F	d x D x h				(N·m(kgf·m))							
15	12.5	60	* 3.5x6x4.5 4.5x7.5x5.3	7.5	20	2000 (1700)	4550 [465] 6700 [685]	8300 [845] 12500 [1270]	39 [4] 69 [4] 7 [5]	20 [2] 49 [5]	20 [2] 49 [5]	2.778	0.14 0.20	1.4
20	15.5	60	6x9.5x8.5	10	20	3960 (3500)	6550 [670] 8900 [910]	12200 [1240] 17500 [1780]	88 [9] 127 [13]	39 [4] 88 [9]	39 [4] 88 [9]	3.175	0.19 0.28	2.3
23	18	60	7x11x9	11.5	20	3960 (3500)	10600 [1080] 14400 [1470]	18600 [1900] 29100 [2970]	137 [14] 245 [25]	69 [7] 206 [21]	69 [7] 196 [20]	3.968	0.34 0.51	3.1
28	23	80	7x11x9	14	20	4000 (3500)	15900 [1620] 23400 [2390]	26500 [2700] 43000 [4400]	245 [25] 470 [48]	108 [11] 355 [36]	108 [11] 355 [36]	4.762	0.58 0.85	4.8
34	27.5	80	9x14x12	17	20	4000 (3500)	22100 [2250] 32500 [3320]	36000 [3650] 58500 [5940]	410 [42] 775 [79]	177 [18] 570 [58]	177 [18] 560 [57]	5.556	0.86 1.3	7.0

LS-EL (High load type)

• Specification number of preloaded assembly
(Custom made assembly)

LH35 0840 EL C 2 - PN Z0 - II

Model number: LH35 0840 EL C 2 - PN Z0 - II

Rail length (mm): 0840

Ball slide shape: EL

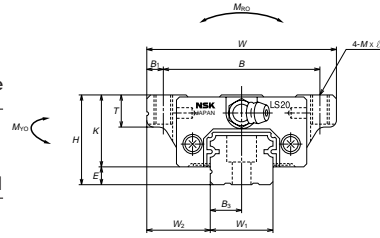
Material/surface treatment (See Page A24): C: Standard material, K: Stainless steel

Number of ball slides per rail: 2

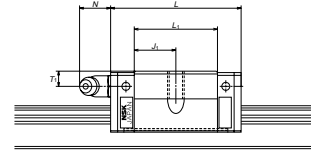
Preload code:
 • Z0 fine clearance
 • Z1 slight preload
 • Z3 medium preload

Accuracy grade:
 • PN normal grade
 • P6 precision grade
 • P5 high precision grade
 • P4 super precision grade
 • P3 ultra precision grade

II refers to a set of 2 linear guides; no code refers to one



JL type



EL type

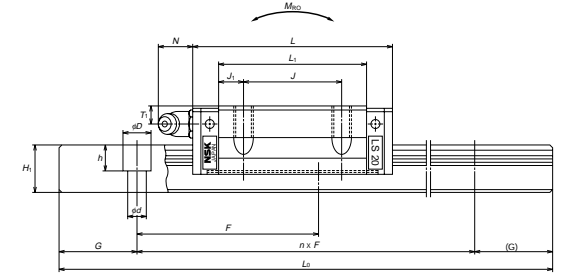


Table. I-5-9

Model No.	Assembly			Ball slide													
	Height <i>H</i>	<i>E</i>	<i>W</i> ₂	Width <i>W</i>	Length <i>L</i>	Mounting tap hole						Grease fitting					
						<i>B</i>	<i>J</i>	<i>M</i> x pitch x <i>ℓ</i>	<i>B</i> ₁	<i>L</i> ₁	<i>J</i> ₁	<i>K</i>	<i>T</i>	Hole size	<i>T</i> ₁	<i>N</i>	
LS15JL LS15EL	24	4.6	18.5	52	40.4 56.8	— 41	— 26	M5x0.8x6	5.5	23.6	11.8	7	19.4	8	φ3	6	3
LS20JL LS20EL	28	6	19.5	59	47.2 65.2	— 49	— 32	M6x1x10	5	30	15	8	22	10	M6x0.75	5.5	11
LS25JL LS25EL	33	7	25	73	59.6 81.6	— 60	— 35	M8x1.25x12	6.5	38	19	12.5	26	11	M6x0.75	7	11
LS30JL LS30EL	42	9	31	90	67.4 96.4	— 72	— 40	M10x1.5x18	9	42	21	15.5	33	11	M6x0.75	8	11
LS35JL LS35EL	48	10.5	33	100	77 108	— 82	— 50	M10x1.5x20	9	49	24.5	15	37.5	12	M6x0.75	8.5	11

*Either M3 (3.5x6x4.5) or M4 (4.5x7.5x5.3) is available for mounting LS15 rail. "T" is added to the end of length code in the reference number of interchangeable rail with M4 mounting hole.

Unit: mm

Rail							Basic load rating					Ball dia.		Weight	
Width <i>W</i> ₁	Height <i>H</i> ₁	Pitch <i>F</i>	Mounting bolt hole <i>d</i> x <i>D</i> x <i>h</i>	<i>B</i> ₃	<i>G</i> (recomm ended)	Max. length <i>L</i> _{0max} () For stainless	Dynamic <i>C</i>	Static <i>C</i> ₀	Static moment <i>M</i> _{RO} <i>M</i> _{PO} <i>M</i> _{VO}			<i>D</i> _W	Ball slide (kg)	Rail (kg/m)	
<i>W</i> ₁	<i>H</i> ₁	<i>F</i>	<i>d</i> x <i>D</i> x <i>h</i>	<i>B</i> ₃	<i>G</i>	<i>L</i> _{0max}	(N[kgf])	(N[kgf])	(N · m[kgf · m])	(N · m[kgf · m])					
15	12.5	60	* 3.5x6x4.5 4.5x7.5x5.3	7.5	20	2000 (1700)	4550 [465] 6700 [685]	8300 [845] 12500 [1270]	39 [4] 69 [7]	20 [2] 49 [5]	20 [2] 49 [5]	2.778	0.17 0.26	1.4	
20	15.5	60	6x9.5x8.5	10	20	3960 (3500)	6550 [670] 8900 [910]	12200 [1240] 17500 [1780]	88 [9] 127 [13]	39 [4] 88 [9]	39 [4] 88 [9]	3.175	0.24 0.35	2.3	
23	18	60	7x11x9	11.5	20	3960 (3500)	10600 [1080] 14400 [1470]	18600 [1900] 29100 [2970]	137 [14] 245 [25]	69 [7] 206 [21]	69 [7] 196 [20]	3.968	0.44 0.66	3.1	
28	23	80	7x11x9	14	20	4000 (3500)	15900 [1620] 23400 [2390]	26500 [2700] 43000 [4400]	245 [25] 470 [48]	108 [11] 355 [36]	108 [11] 355 [36]	4.762	0.76 1.2	4.8	
34	27.5	80	9x14x12	17	20	4000 (3500)	22100 [2250] 32500 [3320]	36000 [3650] 58500 [5940]	410 [42] 775 [79]	177 [18] 570 [58]	177 [18] 560 [57]	5.556	1.2 1.7	7.0	

Dimensions of LS Series (Interchangeable ball slide)

LAS-CL (Medium load type)

LAS-AL (High load type)

• See "Table I-4-6 Standardized LS series in stock" on Page A30 for reference number of each interchangeable ball slide.

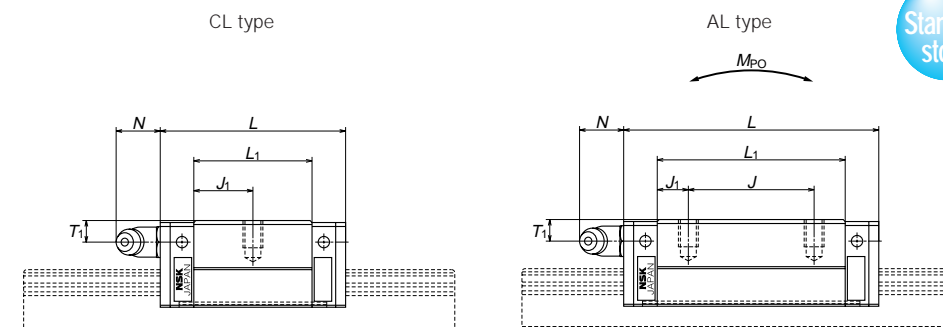
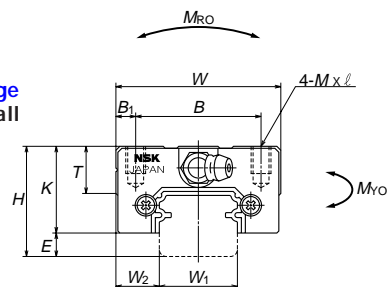


Table. I-5-11

Model No.	Assembly			Ball slide									
	Height <i>H</i>	<i>E</i>	<i>W</i> ₂	Width <i>W</i>	Length <i>L</i>	Mounting tap hole			<i>B</i> ₁	<i>L</i> ₁	<i>J</i> ₁	<i>K</i>	<i>T</i>
						<i>B</i>	<i>J</i>	<i>M</i> x pitch x <i>ℓ</i>					
LAS15CL	24	4.6	9.5	34	40.4	—	—	M4×0.7×6	4	23.6	11.8	19.4	10
LAS15AL					56.8	26	26			40	7		
LAS20CL	28	6	11	42	47.2	—	—	M5×0.8×7	5	30	15	22	12
LAS20AL					65.2	32	32			48	8		
LAS25CL	33	7	12.5	48	59.6	—	—	M6×1×9	6.5	38	19	26	12
LAS25AL					81.6	35	35			60	12.5		
LAS30CL	42	9	16	60	67.4	—	—	M8×1.25×12	10	42	21	33	13
LAS30AL					96.4	40	40			71	15.5		
LAS35CL	48	10.5	18	70	77	—	—	M8×1.25×12	10	49	24.5	37.5	14
LAS35AL					108	50	50			80	15		

Unit: mm

Grease fitting			Basic load rating					Ball dia. <i>D</i> _w	Weight Ball slide (kg)	
			Dynamic		Static					
Hole size	<i>T</i> ₁	<i>N</i>	<i>C</i>	<i>C</i> ₀	<i>M</i> _{ro}	<i>M</i> _{po}	<i>M</i> _{vo}	<i>D</i> _w	Ball slide (kg)	
			(N[kgf])							(N · m[kgf · m])
φ 3	6	3	4550	8300	39	20	20	2.778	0.14	
			[465]	[845]	[4]	[2]	[2]			
			6700	12500	69	49	49			
M6×0.75	5.5	11	6550	12200	88	39	39	3.175	0.19	
			[670]	[1240]	[9]	[4]	[4]			
			8900	17500	127	88	88			
M6×0.75	7	11	10600	18600	137	69	69	3.968	0.34	
			[1080]	[1900]	[14]	[7]	[7]			
			14400	29100	245	206	196			
M6×0.75	8	11	15900	26500	245	108	108	4.762	0.58	
			[1620]	[2700]	[25]	[11]	[11]			
			23400	43000	470	355	355			
M6×0.75	8.5	11	22100	36000	410	177	177	5.556	0.86	
			[2250]	[3650]	[42]	[18]	[18]			
			32500	58500	775	570	560			
			[3320]	[5940]	[79]	[58]	[57]		1.3	

LAS-EL (High load type)

• See "Table I-4•6 Standardized LS series in stock" on Page A30 for reference number of each interchangeable ball slide.

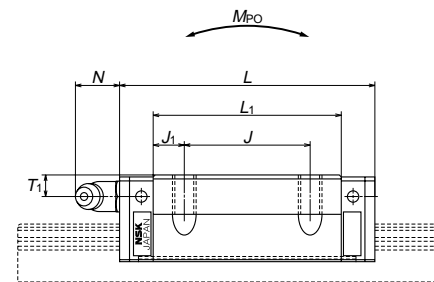
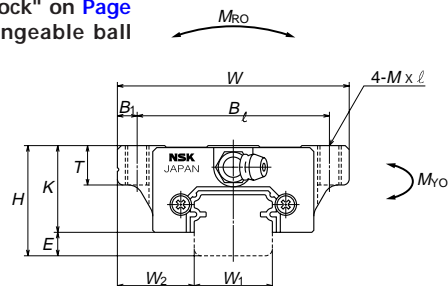


Table. I-5•12

Model No.	Assembly			Ball slide									
	Height <i>H</i>	<i>E</i>	<i>W</i> ₂	Width <i>W</i>	Length <i>L</i>	Mounting tap hole			<i>B</i> ₁	<i>L</i> ₁	<i>J</i> ₁	<i>K</i>	<i>T</i>
						<i>B</i>	<i>J</i>	<i>M</i> × pitch × <i>l</i>					
LAS15EL	24	4.6	18.5	52	56.8	41	26	M5×0.8×6	5.5	40	7	19.4	8
LAS20EL	28	6	19.5	59	65.2	49	32	M6×1×10	5	48	8	22	10
LAS25EL	33	7	25	73	81.6	60	35	M8×1.25×12	6.5	60	12.5	26	11
LAS30EL	42	9	31	90	96.4	72	40	M10×1.5×18	9	71	15.5	33	11
LAS35EL	48	10.5	33	100	108	82	50	M10×1.5×20	9	80	15	37.5	12

Unit: mm

Grease fitting			Basic load rating					Ball dia.	Weight
Hole size	<i>T</i> ₁	<i>N</i>	Dynamic	Static	Static moment			<i>D</i> _w	Ball slide (kg)
			<i>C</i> (N[kgfl])	<i>C</i> ₀	<i>M</i> _{ro}	<i>M</i> _{po}	<i>M</i> _{vo}		
φ 3	6	3	6700 [685]	12500 [1270]	69 [7]	49 [5]	49 [5]	2.778	0.26
M6×0.75	5.5	11	8900 [910]	17500 [1780]	127 [13]	88 [9]	88 [9]	3.175	0.35
M6×0.75	7	11	14400 [1470]	29100 [2970]	245 [25]	206 [21]	196 [20]	3.968	0.66
M6×0.75	8	11	23400 [2390]	43000 [4400]	470 [48]	355 [36]	355 [36]	4.762	1.2
M6×0.75	8.5	11	32500 [3320]	58500 [5940]	775 [79]	570 [58]	560 [57]	5.556	1.7

LAS-KL (Medium load type)
 LAS-FL (High load type)

• See "Table I-4-6 Standardized LS series in stock" on Page A30 for reference number of each interchangeable ball slide.

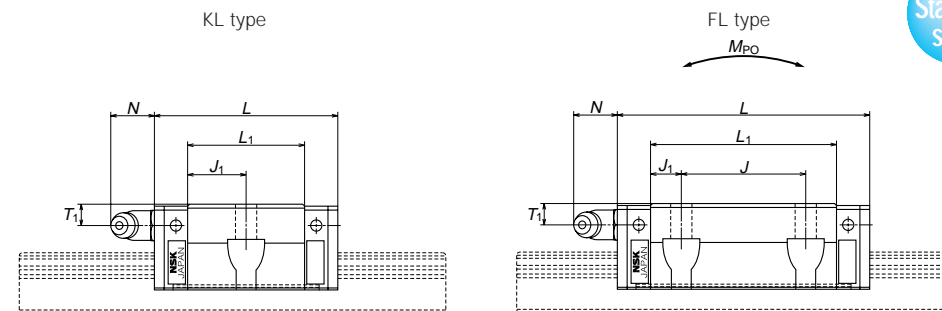
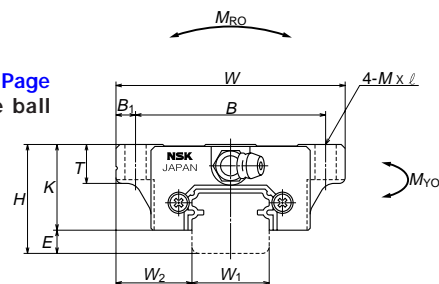


Table. I-5-13

Model No.	Assembly			Ball slide									
	Height <i>H</i>	<i>E</i>	<i>W</i> ₂	Width <i>W</i>	Length <i>L</i>	Mounting hole			<i>B</i> ₁	<i>L</i> ₁	<i>J</i> ₁	<i>K</i>	<i>T</i>
						<i>B</i>	<i>J</i>	<i>Q</i> × <i>ℓ</i>					
LAS15KL	24	4.6	18.5	52	40.4	—	—	4.5×7	5.5	23.6	11.8	19.4	8
LAS15FL					56.8	41	26			40	7		
LAS20KL	28	6	19.5	59	47.2	—	—	5.5×9	5	30	15	22	10
LAS20FL					65.2	49	32		5	48	8		
LAS25KL	33	7	25	73	59.6	—	—	7×10	6.5	38	19	26	11
LAS25FL					81.6	60	35		6.5	60	12.5		
LAS30KL	42	9	31	90	67.4	—	—	9×12	9	42	21	33	11
LAS30FL					96.4	72	40		9	71	15.5		
LAS35KL	48	10.5	33	100	77	—	—	9×13	9	49	24.5	37.5	12
LAS35FL					108	82	50		9	80	15		

Unit: mm

Grease fitting			Basic load rating					Ball dia. <i>D</i> _w	Weight Ball slide (kg)
			Dynamic		Static				
Hole size	<i>T</i> ₁	<i>N</i>	<i>C</i>	<i>C</i> ₀	Static moment			<i>D</i> _w	Ball slide (kg)
			(N[kgf])			(N·m[kgf·m])			
φ 3	6	3	4550	8300	39	20	20	2.778	0.17
			[465]	[845]	[4]	[2]	[2]		
			6700	12500	69	49	49		
M6 × 0.75	5.5	11	6550	12200	88	39	39	3.175	0.24
			[670]	[1240]	[9]	[4]	[4]		
			8900	17500	127	88	88		
M6 × 0.75	7	11	10600	18600	137	69	69	3.968	0.44
			[1080]	[1900]	[14]	[7]	[7]		
			14400	29100	245	206	196		
M6 × 0.75	8	11	15900	26500	245	108	108	4.762	0.76
			[1620]	[2700]	[25]	[11]	[11]		
			23400	43000	470	355	355		
M6 × 0.75	8.5	11	22100	36000	410	177	177	5.556	1.2
			[2250]	[3650]	[42]	[18]	[18]		
			32500	58500	775	570	560		
M6 × 0.75			[3320]	[5940]	[79]	[58]	[57]		

LS Series (Interchangeable part)

Dimensions of LS Series (Interchangeable rail)



Regular rails Butting rails

L1S (Fine clearance) L1S...J (Fine clearance)

L1S-Z (slight Preload) L1S...JZ (slight Preload)

• See "Table I-4•6 Standardized LS series in stock" on Page A30 for reference number of each interchangeable rail.

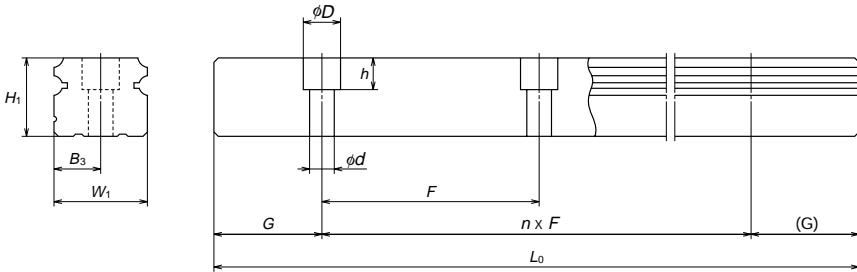


Table I-5•14

Unit: mm

Model No.	Rail							Weight
	Width W_1	Height H_1	Pitch F	Mounting bolt hole $d \times D \times h$	B_3	G Recommended	Max. length $L_{MAX.}$ () for stainless	Rail (Kg/m)
L1S15	15	12.5	60	3.5×6×4.5* 4.5×7.5×5.3	7.5	20	2000 (1700)	1.4
L1S20	20	15.5	60	6×9.5×8.5	10	20	3960 (3500)	2.3
L1S25	23	18	60	7×11×9	11.5	20	3960 (3500)	3.1
L1S30	28	23	80	7×11×9	14	20	4000 (3500)	4.8
L1S35	34	27.5	80	9×14×12	17	20	4000 (3500)	7.0

G dimension is $1/2F^{0.5}$ for butting rail.

* Bolt holes of L1S15 is available in M3 (3.5 x 6 x 4.5) and M4 (4.5 x 7 x 5.3).

Please refer to Page A30 for their reference numbers.