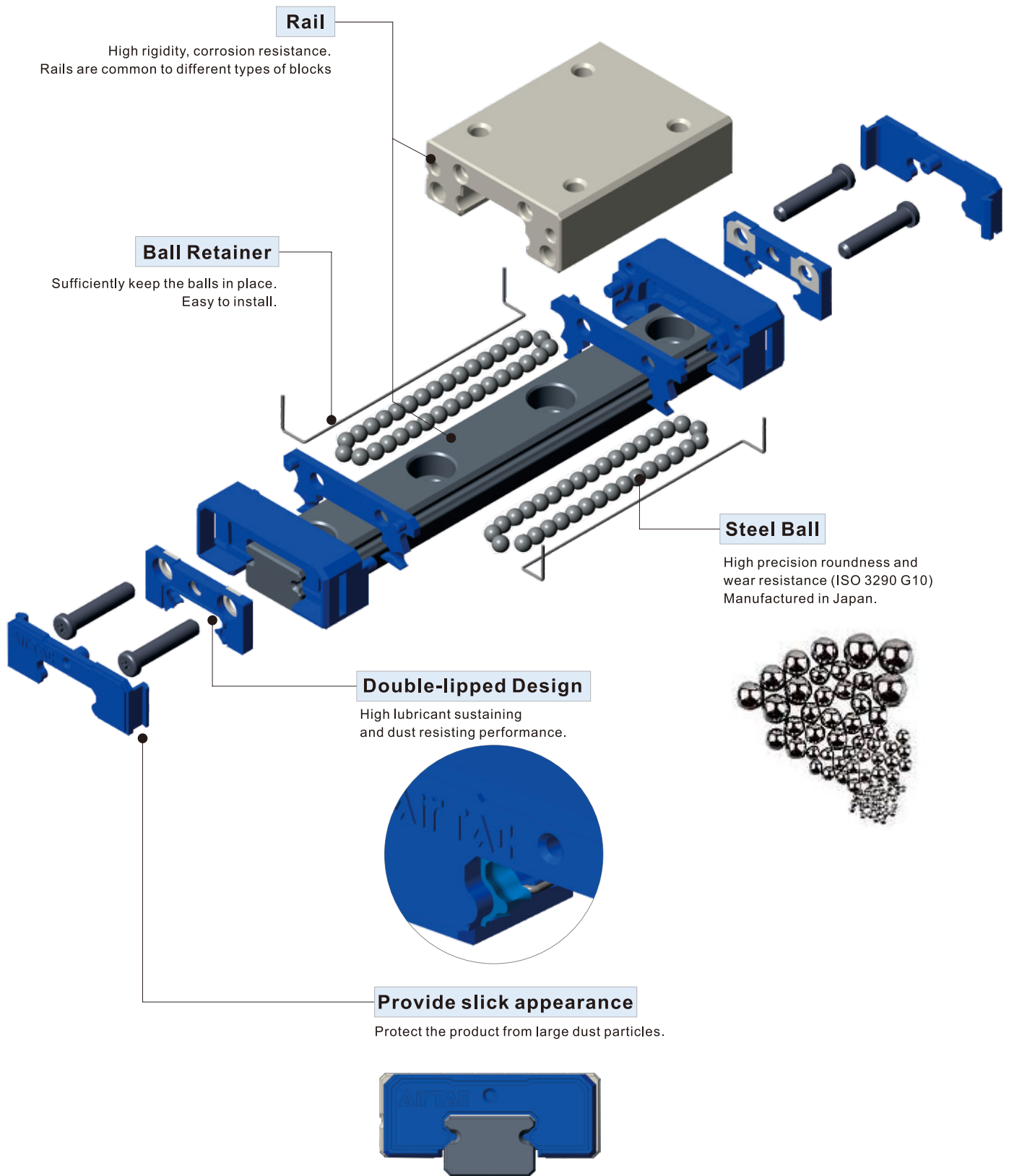
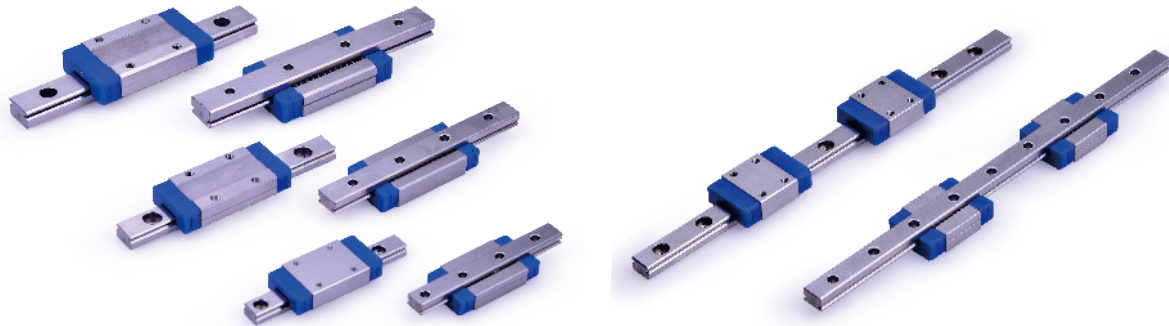




Product Introduction



LRM Series



Order Information

LRM 7 N 1 X 40 AA A H

① ② ③ ④ ⑤ ⑥ ⑦ ⑧

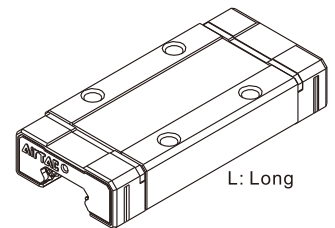
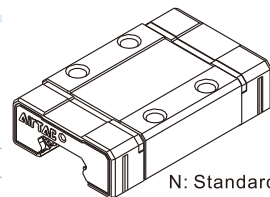
① Model Code	LRM : Miniature Linear Guide			
② Rail Width	5: 5mm	7: 7mm	9: 9mm	12: 12mm 15: 15mm
③ Rail Length	N: Standard L: Long			
④ Number of Block	1: One	2: Two	[Note: Amount of block on a single set of linear guide]	
⑤ Length of Rail	40: 40mm..... [Refer to rail spec. table for detail]			
⑥ Starting /End rail mounting hole positions	AA :Standard distance from the center of the last hole to the edge			
	AS□ : One side with customized distance from the center of the last hole to the edge [Take LRM12 as example: AS12 — One side mounting hole position is 12mm, and the other is standard(10mm)]			
	S□E□ : Both sides with customized distance from the center of the last hole to the edge [Take LRM12 as example: S6E12 — One side mounting hole position is 6mm, and the other is 12mm]			
⑦ Preload	A: Standard clearance		B: Light Preloaded	
⑧ Accuracy	H: High		P : Precision	

Block Ordering Information

LRM 7 N

① ② ③

① Model Code	LRM : Miniature Linear Guide
② Width of rail	7: 7mm 9: 9mm 12: 12mm 15: 15mm
③ BlockType	N: Standard L: Long



Rail Ordering Information

LRM 7 X 40 AA

① ② ③ ④

① Model Code	LRM : Miniature Linear Guide			
② Width of rail	7: 7mm	9: 9mm	12: 12mm	15: 15mm
③ Length of Rail	40: 40mm..... [Refer to rail spec. table for detail]			
④ Starting /End rail mounting hole positions	AA :Standard distance from the center of the last hole to the edge			
	AS□ : One side with customized distance from the center of the last hole to the edge [Take LRM12 as example: AS12 — One side mounting hole position is 12mm, and the other is standard(10mm)]			
	S□E□ : Both sides with customized distance from the center of the last hole to the edge [Take LRM12 as example: S6E12 — One side mounting hole position is 6mm, and the other is 12mm]			

Uncut Rail Order Information

LRM 7X985 AA

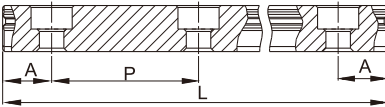
① ② ③ ④

① Model Code	LRM : Miniature Linear Guide			
② Width of rail	7:7mm	9:9mm	12:12mm	15:15mm
③ Length of Rail [Note]	985:985mm	995:995mm	995:995mm	990:990mm
④ Starting /End rail mounting hole positions	AA :Standard distance from the center of the last hole to the edge			

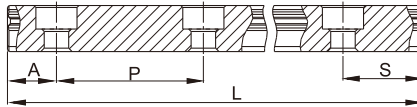
[Note] Rail length is the standard length for uncut rail corresponding to each width length.

Rail Specification

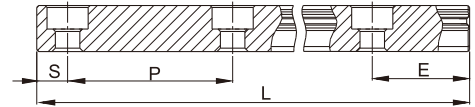
AA : Standard distance from the center of the last hole to the edge



AS□ : One side with customized distance from the center of the last hole to the edge



S□E□ : Both sides with customized distance from the center of the last hole to the edge



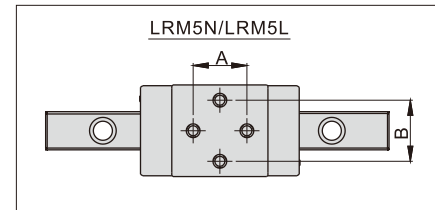
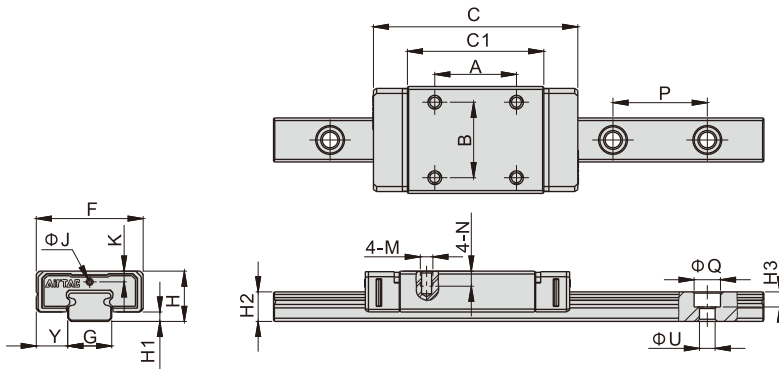
Model	Standard rail length(L)													Maximum length(L max)		
LRM5	40	55	70	85	100	115	130	145						490		
LRM7	40	55	70	85	100	115	130	145	160	175	190	205	220	235	250	985
LRM9	55	75	95	115	135	155	175	195	215	235	255	275	295	315	335	995
	355	375	395													
LRM12	70	95	120	145	170	195	220	245	270	295	320	345	370	395	420	995
	445	470	495													
LRM15	70	110	150	190	230	270	310	350	390	430	470	510	990			

Model	Pitch(P)	Standard rail mounting hole position(A)	Min. rail mounting hole position(S/E min)	Max. rail mounting hole position(S/E max)
LRM5	15	5	3	10
LRM7	15	5	3	10
LRM9	20	7.5	4	15
LRM12	25	10	4	20
LRM15	40	15	4	35

[Note] More than one rails need to be connected, if the required rail length exceeds Lmax.

Unit: mm

Specifications and Dimensions



Unit: mm

Model	External Dimension					Block Dimension							Rail Dimension					
	H	H1	F	Y	C	C1	A	B	M	N	K	ΦJ	G	H2	P	ΦQ	ΦU	H3
LRM5N	6	1.5	12	3.5	18.2	10	-	8	M2	1.5	1.3	0.7	5	3.5	15	3.5	2.2	1.1
LRM5L	6	1.5	12	3.5	21.2	13	7	8	M2	1.5	1.3	0.7	5	3.5	15	3.5	2.2	1.1
LRM7N	8	1.5	17	5	24.3	13.5	8	12	M2	2.3	1.7	0.7	7	4.7	15	4.2	2.4	2.4
LRM7L	8	1.5	17	5	32.5	21.7	13	12	M2	2.3	1.7	0.7	7	4.7	15	4.2	2.4	2.4
LRM9N	10	2	20	5.5	31	18.9	10	15	M3	2.8	2.2	1	9	5.6	20	6	3.5	3.4
LRM9L	10	2	20	5.5	42.1	30	16	15	M3	2.8	2.2	1	9	5.6	20	6	3.5	3.4
LRM12N	13	3	27	7.5	37.6	21.7	15	20	M3	4	3	1.5	12	7.5	25	6	3.5	4.4
LRM12L	13	3	27	7.5	48.4	32.5	20	20	M3	4	3	1.5	12	7.5	25	6	3.5	4.4
LRM15N	16	3.5	32	8.5	48	28	20	25	M3	4	3.7	M3	15	9.5	40	6	3.5	4.4
LRM15L	16	3.5	32	8.5	65	45	25	25	M3	4	3.7	M3	15	9.5	40	6	3.5	4.4

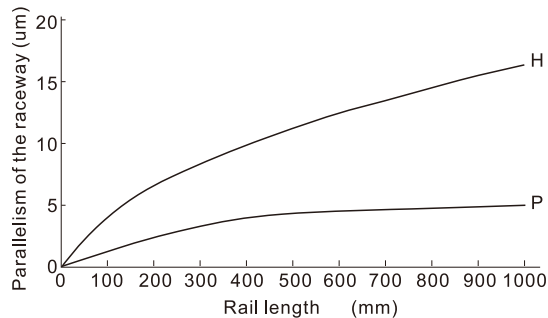
Model	Mounting Screw	Load Rating (kN)		Static Rated Moment (N.m)			Weight	
		C _{100B}	C ₀	M _R	M _p	M _v	Block(kg)	Rail(kg/m)
LRM5N	M2	0.33	0.55	1.68	0.99	0.99	0.0035	0.114
LRM5L	M2	0.48	0.9	2.4	2.08	2.08	0.004	0.114
LRM7N	M2	1.02	1.53	5.42	3.17	3.17	0.009	0.22
LRM7L	M2	1.43	2.45	9.27	7.96	7.96	0.014	0.22
LRM9N	M3	1.97	2.6	11.84	8.19	8.19	0.018	0.315
LRM9L	M3	2.61	4.11	19.73	18.94	18.94	0.027	0.315
LRM12N	M3	3.04	3.86	23.63	12.57	12.57	0.037	0.602
LRM12L	M3	3.96	5.9	40.96	32.57	32.57	0.053	0.602
LRM15N	M3	4.27	5.7	45.05	23.05	23.05	0.054	0.981
LRM15L	M3	6.53	9.53	70.08	63.69	63.69	0.088	0.981

Accuracy Classes

LRM miniature linear guide comes with 2 kinds of accuracy levels.

Accuracy Standards (mm)	Accuracy classes	
	H: High	P: Precision
Dimensional tolerance of H	±0.02	±0.01
Variation of heights ΔH	0.015	0.007
Dimensional tolerance of Y	±0.025	±0.015
Variation of widths ΔY	0.02	0.01

Rail Length and Parallelism of the raceway



Preload Classes

The LRM Miniature Linear Guide has two preload categories: A and B.

Adding appropriate preload levels would enhance rigidity, precision and torsion resistant performance of the linear guide.

Preload Level	Code	Preload Clearance (um)					Application
		5	7	9	12	15	
Clearance	A	+3~0	+4~0	+4~0	+5~0	+6~0	Smooth operation
Light Preloaded	B	0~-1	0~-3	0~-4	0~-5	0~-6	High Precision

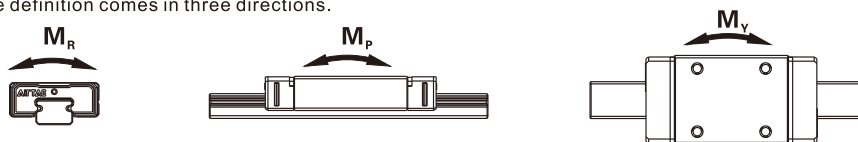
Load Capacity and Rating Life

1. Static Load Rating(C₀)

The magnitude of static load that results in total permanent deformation of ball and raceway equals to 0.0001 times of ball diameter.

2. Static Permissible Moment(M₀)

When the steel ball subjected to the maximum stress in the slider reaches a static rated load condition, this loading moment is called the "Static permissible moment". The definition comes in three directions.



3. Static Safety Factor(S₀)

Impact, vibration and inertial loading during start and stop moment lead to unexpected load on the linear guide way.

Therefore, when calculating the static load, safety factors must be considered.

Load Condition	S ₀
Normal Load	1.0~2.0
Load with Impacts or Vibrations	2.0~3.0

$$S_0 = \frac{C_0}{P} = \frac{M_0}{M}$$

- S₀ : Static safety factor
- C₀ : Static load rating (kN)
- M₀ : Static permissible moment (kN.m)
- P : Calculated working load (kN)
- M : Calculated applying moment (kN.m)

4. Load Factor(f_w)

The loads acting on a linear guide way include the weight of block, the inertia load at the times of start and stop, and the moment loads caused by overhanging. Therefore, the load on a linear guide way should be divided by the empirical factor.

Loading condition	Service speed	f _w
No impacts & vibration	V ≤ 15m/min	1~1.2
Small impacts	15m/min < V ≤ 60m/min	1.2~1.5
Normal load	60m/min < V ≤ 120m/min	1.5~2.0
With impacts & vibration	V > 120m/min	2.0~3.5

5. Dynamic Load Rating(C_{100B})

C_{100B}: (According to ISO 14728-1) As the direction and magnitude remains the same, C100B is the maximum workload for the product to maintain its nominal life at 100km of operation.

LRM Series

6. Calculation of Nominal Life(L)

Recognizing that nominal life of a linear guide is affected by the actual working loads, the general calculation of the nominal life excluding the environmental factors is carried out as follow: :

$$L = \left(\frac{C_{100B}}{f_w \times P} \right)^3 \times 10^6$$

L = Nominal Life (m)

C_{100B} = Dynamic Load Rating (N)

f_w : Load Factor

P = Equivalent load (N)

Taking LRM9N for example, its C_{100B} is 1.97kN. Therefore, when the product bears a 1.5kN equivalent load P, $f_w=1$, its theoretical rated life can be calculated as follows:

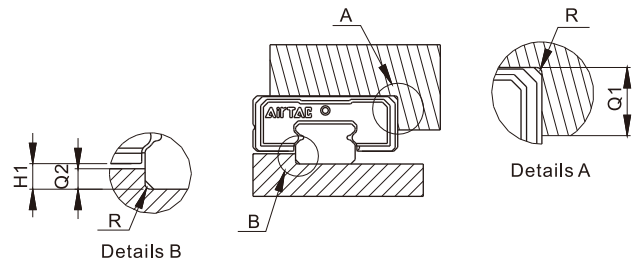
$$L = \left(\frac{C_{100B}}{f_w \times P} \right)^3 \times 10^6 = \left(\frac{1.97}{1 \times 1.5} \right)^3 \times 10^6 = 226529 \text{ m} = 226.5 \text{ km}$$

Installation Illustration

1. Height and Chamfer of Reference Edge

In order to ensure accurate assembly of LRM Linear Guide system, the corners of the datum edges can not exceed the recommended value in the following table.

Model	Q1	Q2	H1	R
LRM5	1.4	0.7	1	0.2
LRM7	5.5	1.2	1.5	0.2
LRM9	7	1.7	2	0.3
LRM12	9	2.7	3	0.4
LRM15	10	3.2	3.5	0.5

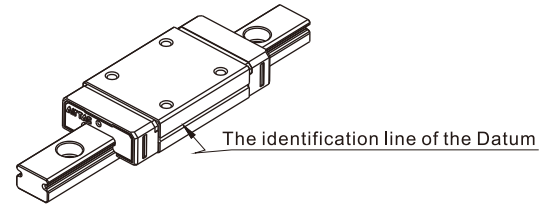


2. Screw Fastening Torque

Screw size	Screw fastening torque(N.m)	
	Stainless Steel	Carbon steel
M2	0.31	0.6
M3	1.1	1.3
M4	2.5	2.9

3. Datum plane

- The datum plane should be grounded or finely milled to ensure the promised accuracy.
- Rail : Both sides can be used as the datum plane.
- Block : Both sides can be used as the datum plane.
- In order to better achieve the walking accuracy, working with the same datum plane is recommended when mounting more than one blocks onto the rail



4. Lubrication

When the linear guide works in a good state of lubrication, it can reduce wear significantly and increase the rating life.

Lubricants have the following effects :

- Reduce the friction between the rolling element and the contact surface to minimize the wear.
- The formation of oil film between the contact surfaces can extend the rolling fatigue life.
- Prevent rust.

5. Lubrication Method

1. Please refer to the following table for oiling.
2. After greasing, move the blocks back and forth to distributes the oil evenly.
3. Lubrication can be done either manually or automatically.

Model	Initial lubrication (cm ³)	Lubricant supplement (cm ³)
LRM5N	0.02	0.01
LRM5L	0.03	0.015
LRM7N	0.1	0.05
LRM7L	0.13	0.07
LRM9N	0.2	0.1
LRM9L	0.28	0.14
LRM12N	0.34	0.17
LRM12L	0.45	0.23
LRM15N	0.72	0.36
LRM15L	1.0	0.50

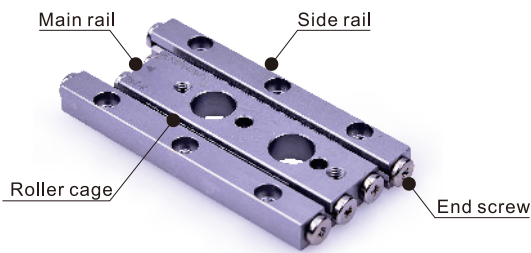
lubrication Note: In order to prevent deterioration, please avoid mixing different types of oil.



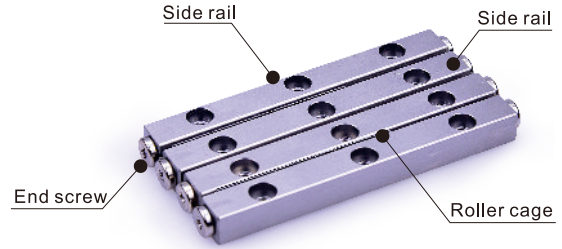
LGC Series Crossed Roller Way

Product Introduction

Crossed roller way provides non-cyclic linear motion with high rigidity and high accuracy. By alternately arranging the cylindrical rollers in an orthogonal manner, it reduces the friction between rolling medium. With a highly rigidified rail structure, the crossed roller way is advanced in working under higher loads and precision environment. The crossed roller way is widely used in high accuracy equipment and measuring instruments such as printer circuit board, distilling machine, optic measuring machines, optical stages and X-ray machines



Three-Row Type Of Crossed Roller Way



Four-Row Type Of Crossed Roller Way



Cylindrical roller with high precision roundness and wear resistance (ISO 3290 G2) is manufactured in Japan

Order Information

LGC 3 A 200 R25 - H

- ①
- ②
- ③
- ④
- ⑤
- ⑥



① Model Code	LGC : Crossed Roller Way
② Roller Diameter	1: Φ 1.5mm 2: Φ 2.0mm 3: Φ 3.0mm 4: Φ 4.0mm 6: Φ 6.0mm
③ Type [Note]	A: three-row type [Note] B: Four-row type
④ Rail dimension	200: rail length 200X100: main rail length is 200mm/side rail length is 100mm [Reference to spec. table for detail]
⑤ The number of rollers in each roller cage	R25: 25 rollers [Reference to spec. table for detail]
⑥ Accuracy class	H : High-accuracy grade P : Precision grade

[Note] LGC6: only for type B.



Cross Reference Table for Maximum Stroke & Roller numbers

LGC1		The quantity of rollers in one roller cage								
Max. Stroke (mm)	R6	R7	R8	R9	R10	R11	R13	R16	R19	
Shortest length of rails (mm)	20	12	7	-	-	-	-	-	-	-
	30	-	-	22	17	12	7	-	-	-
	40	-	-	-	-	-	27	17	-	-
	50	-	-	-	-	-	-	37	22	7
	60	-	-	-	-	-	-	-	42	27
	70	-	-	-	-	-	-	-	-	47
	80	-	-	-	-	-	-	-	-	67

The standard quantity of rollers

Alternative options of the quantity of rollers

LGC2		The quantity of rollers in one roller cage													
Max. Stroke (mm)	R6	R7	R8	R9	R10	R11	R13	R16	R19	R22	R25	R28	R32	R36	
Shortest length of rails (mm)	30	16	8	-	-	-	-	-	-	-	-	-	-	-	
	45	-	-	30	22	14	-	-	-	-	-	-	-	-	
	60	-	-	-	-	-	36	20	-	-	-	-	-	-	
	75	-	-	-	-	-	-	50	26	-	-	-	-	-	
	90	-	-	-	-	-	-	-	56	32	-	-	-	-	
	105	-	-	-	-	-	-	-	-	62	38	-	-	-	
	120	-	-	-	-	-	-	-	-	-	68	44	-	-	
	135	-	-	-	-	-	-	-	-	-	98	74	50	-	
	150	-	-	-	-	-	-	-	-	-	-	104	80	48	
	165	-	-	-	-	-	-	-	-	-	-	-	110	78	45
	180	-	-	-	-	-	-	-	-	-	-	-	-	140	108

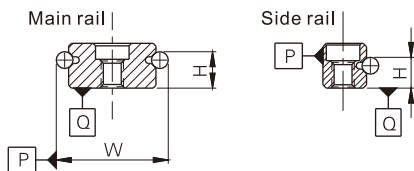
LGC3		The quantity of rollers in one roller cage													
Max. Stroke (mm)	R7	R8	R9	R10	R11	R13	R16	R19	R22	R25	R28	R32	R36	R40	
Shortest length of rails (mm)	50	34	24	14	-	-	-	-	-	-	-	-	-	-	
	75	-	-	-	54	44	24	-	-	-	-	-	-	-	
	100	-	-	-	-	74	44	-	-	-	-	-	-	-	
	125	-	-	-	-	-	94	64	-	-	-	-	-	-	
	150	-	-	-	-	-	-	114	84	54	-	-	-	-	
	175	-	-	-	-	-	-	-	134	104	74	-	-	-	
	200	-	-	-	-	-	-	-	-	154	124	84	-	-	
	225	-	-	-	-	-	-	-	-	-	174	134	94	-	
	250	-	-	-	-	-	-	-	-	-	-	184	144	104	
	275	-	-	-	-	-	-	-	-	-	-	-	234	194	154
	300	-	-	-	-	-	-	-	-	-	-	-	-	244	204

LGC4		The quantity of rollers in one roller cage														
Max. Stroke (mm)	R8	R9	R10	R11	R13	R16	R19	R22	R25	R28	R32	R36	R40	R45		
Shortest length of rails (mm)	80	54	40	26	-	-	-	-	-	-	-	-	-	-		
	120	-	-	-	92	64	-	-	-	-	-	-	-	-		
	160	-	-	-	-	-	102	60	-	-	-	-	-	-		
	200	-	-	-	-	-	-	140	98	56	-	-	-	-		
	240	-	-	-	-	-	-	-	178	136	94	-	-	-		
	280	-	-	-	-	-	-	-	-	216	174	118	-	-		
	320	-	-	-	-	-	-	-	-	-	254	198	142	86		
	360	-	-	-	-	-	-	-	-	-	-	278	222	166	96	
	400	-	-	-	-	-	-	-	-	-	-	-	358	302	246	176
	440	-	-	-	-	-	-	-	-	-	-	-	-	382	326	256
	480	-	-	-	-	-	-	-	-	-	-	-	-	-	406	336

LGC6		The quantity of rollers in one roller cage													
Max. Stroke (mm)	R8	R9	R11	R13	R16	R19	R22	R25	R28	R32	R36	R40	R45		
Shortest length of rails (mm)	100	62	44	-	-	-	-	-	-	-	-	-	-		
	150	-	-	108	72	-	-	-	-	-	-	-	-		
	200	-	-	-	-	118	64	-	-	-	-	-	-		
	250	-	-	-	-	-	164	110	56	-	-	-	-		
	300	-	-	-	-	-	-	210	156	102	-	-	-		
	350	-	-	-	-	-	-	-	256	202	130	-	-		
	400	-	-	-	-	-	-	-	-	302	230	158	-		
	450	-	-	-	-	-	-	-	-	-	330	258	186		
	500	-	-	-	-	-	-	-	-	-	-	358	286	196	
	550	-	-	-	-	-	-	-	-	-	-	-	458	386	296
	600	-	-	-	-	-	-	-	-	-	-	-	-	486	396

Accuracy Class of Raceway

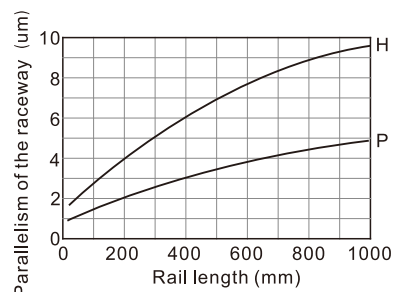
Accuracy Class



Unit: mm

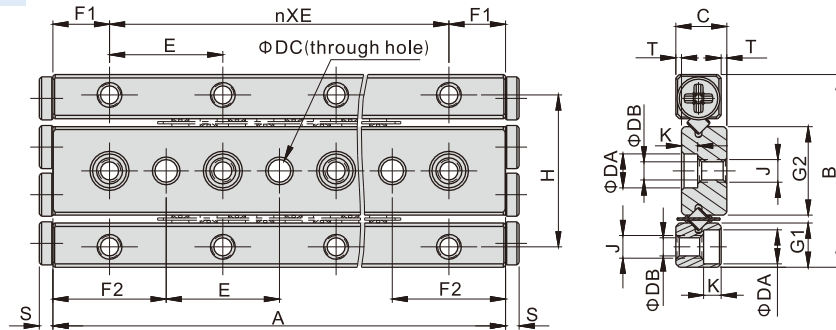
Item	High-accuracy grade(H)	Precision grade(P)
Dimensional tolerance of height H	±0.02	±0.01
Variation of heights H	0.01	0.005
Dimensional tolerance of width W	±0.02	±0.01

Rail Length and Parallelism of The Raceway



Specification Table

Dimensions of Three-row Type

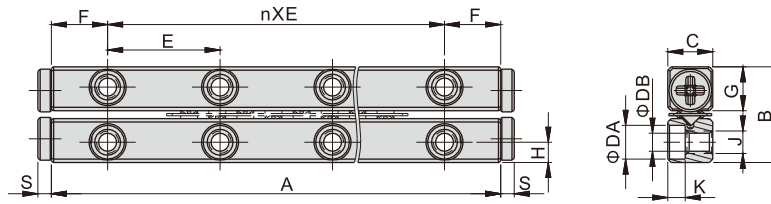


Model\Item	A	B	C	φDA	φDB	φDC	nXE	F1	F2	G1	G2	H	J	K	S	T
LGC1A20	20	17	4.5	3.0	1.55	2 ^{+0.03} / _{+0.005}	1X10	5	10	3.9	7.8	13.4	M2X0.4	1.5	1.2	0.5
LGC1A30	30						2X10									
LGC1A40	40						3X10									
LGC1A50	50						4X10									
LGC1A60	60						5X10									
LGC1A70	70						6X10									
LGC1A80	80						7X10									
LGC2A30	30						24									
LGC2A45	45	2X15														
LGC2A60	60	3X15														
LGC2A75	75	4X15														
LGC2A90	90	5X15														
LGC2A105	105	6X15														
LGC2A120	120	7X15														
LGC2A135	135	8X15														
LGC2A150	150	9X15														
LGC2A165	165	10X15														
LGC2A180	180	11X15														
LGC3A50	50	36	8.5	6.0	3.4	4 ^{+0.03} / _{+0.005}		1X25	12.5	25	8.3	16.6	29	M4X0.7	3.1	2
LGC3A75	75						2X25									
LGC3A100	100						3X25									
LGC3A125	125						4X25									
LGC3A150	150						5X25									
LGC3A175	175						6X25									
LGC3A200	200						7X25									
LGC3A225	225						8X25									
LGC3A250	250						9X25									
LGC3A275	275						10X25									
LGC3A300	300						11X25									
LGC4A80	80	44	11.5	7.5	4.3	5 ^{+0.03} / _{+0.005}	1X40	20	40	10	20	35	M5X0.8	4.1	2	0.5
LGC4A120	120						2X40									
LGC4A160	160						3X40									
LGC4A200	200						4X40									
LGC4A240	240						5X40									
LGC4A280	280						6X40									
LGC4A320	320						7X40									
LGC4A360	360						8X40									
LGC4A400	400						9X40									
LGC4A440	440						10X40									
LGC4A480	480						11X40									

[Note] One set includes one main rail, two side rails, two roller cages, and the corresponding screws for mounting.

Specification Table

Dimensions of Four-row Type

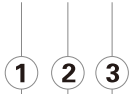


Model\Item	A	B	C	ϕDA	ϕDB	nXE	F	G	H	J	K	S
LGC1B20	20	8.5	4	3.0	1.55	1X10	5	3.9	1.8	M2X0.4	1.5	1.2
LGC1B30	30					2X10						
LGC1B40	40					3X10						
LGC1B50	50					4X10						
LGC1B60	60					5X10						
LGC1B70	70					6X10						
LGC1B80	80					7X10						
LGC2B30	30	12	6	4.4	2.5	1X15	7.5	5.5	2.5	M3X0.5	2.1	1.5
LGC2B45	45					2X15						
LGC2B60	60					3X15						
LGC2B75	75					4X15						
LGC2B90	90					5X15						
LGC2B105	105					6X15						
LGC2B120	120					7X15						
LGC2B135	135					8X15						
LGC2B150	150					9X15						
LGC2B165	165					10X15						
LGC2B180	180					11X15						
LGC3B50	50	18	8	6.0	3.4	1X25	12.5	8.3	3.5	M4X0.7	3.1	2
LGC3B75	75					2X25						
LGC3B100	100					3X25						
LGC3B125	125					4X25						
LGC3B150	150					5X25						
LGC3B175	175					6X25						
LGC3B200	200					7X25						
LGC3B225	225					8X25						
LGC3B250	250					9X25						
LGC3B275	275					10X25						
LGC3B300	300					11X25						
LGC4B80	80	22	11	7.5	4.3	1X40	20	10	4.5	M5X0.8	4.1	2
LGC4B120	120					2X40						
LGC4B160	160					3X40						
LGC4B200	200					4X40						
LGC4B240	240					5X40						
LGC4B280	280					6X40						
LGC4B320	320					7X40						
LGC4B360	360					8X40						
LGC4B400	400					9X40						
LGC4B440	440					10X40						
LGC4B480	480					11X40						
LGC6B100	100	31	15	9	5.3	1X50	25	14.7	6	M6X1.0	5.2	3
LGC6B150	150					2X50						
LGC6B200	200					3X50						
LGC6B250	250					4X50						
LGC6B300	300					5X50						
LGC6B350	350					6X50						
LGC6B400	400					7X50						
LGC6B450	450					8X50						
LGC6B500	500					9X50						
LGC6B550	550					10X50						
LGC6B600	600					11X50						

[Note] One set includes four side rails, two roller cages, and the corresponding screws for mounting.

Roller Cage Ordering Information

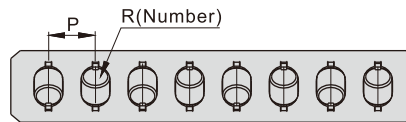
LGC 3 R25



① Model Code	LGC : Crossed Roller Way
② Roller Diameter	1: Φ 1.5mm 2: Φ 2.0mm 3: Φ 3.0mm 4: Φ 4.0mm 6: Φ 6.0mm
③ The number of rollers	R25:25 rollers [Reference to spec. table for detail]

Specification Table

Informations of Roller Cage



ModelItem	P	R	Basic Dynamic Load Rating (C1)	Basic Static Load Rating (C0)	Allowable Load (F0)
LGC1R6		6	125N per roller	120N per roller	39N per roller
LGC1R7		7			
LGC1R8		8			
LGC1R9		9			
LGC1R10	2.5	10			
LGC1R11		11			
LGC1R13		13			
LGC1R16		16			
LGC1R19		19			
LGC2R6		6			
LGC2R7		7			
LGC2R8		8			
LGC2R9		9			
LGC2R10		10			
LGC2R11		11			
LGC2R13		13			
LGC2R16	4	16			
LGC2R19		19			
LGC2R22		22			
LGC2R25		25			
LGC2R28		28			
LGC2R32		32			
LGC2R36		36			
LGC3R7		7	640N per roller	610N per roller	203N per roller
LGC3R8		8			
LGC3R9		9			
LGC3R10		10			
LGC3R11		11			
LGC3R13		13			
LGC3R16		16			
LGC3R19	5	19			
LGC3R22		22			
LGC3R25		25			
LGC3R28		28			
LGC3R32		32			
LGC3R36		36			
LGC3R40		40			

ModelItem	P	R	Basic Dynamic Load Rating (C1)	Basic Static Load Rating (C0)	Allowable Load (F0)
LGC4R8		8	1230N per roller	1170N per roller	390N per roller
LGC4R9		9			
LGC4R10		10			
LGC4R11		11			
LGC4R13		13			
LGC4R16		16			
LGC4R19		19			
LGC4R22	7	22			
LGC4R25		25			
LGC4R28		28			
LGC4R32		32			
LGC4R36		36			
LGC4R40		40			
LGC4R45		45			
LGC6R8		8	3175N per roller	2550N per roller	810N per roller
LGC6R9		9			
LGC6R11		11			
LGC6R13		13			
LGC6R16		16			
LGC6R19		19			
LGC6R22	9	22			
LGC6R25		25			
LGC6R28		28			
LGC6R32		32			
LGC6R36		36			
LGC6R40		40			
LGC6R45		45			

User Manual

Load Rating

Load direction	Vertical load		Lateral load	
Type	Three-Row type	Four-Row type	Three-Row type	Four-Row type
Schematic				
Basic dynamic load rating - Ca (N)	$Ca = \{2P \times (\frac{R}{2} - 1)\}^{\frac{1}{36}} \times (\frac{R}{2})^{\frac{3}{4}} \times C1$ * Effective roller number R/2: rounded to the nearest whole number (EX : 5/2=2.5 , take 2)		$Ca = \{2P \times (\frac{R}{2} - 1)\}^{\frac{1}{36}} \times (\frac{R}{2})^{\frac{3}{4}} \times 2^{\frac{7}{9}} \times C1$ * Effective roller number R/2: rounded to the nearest whole number (EX : 5/2=2.5 , take 2)	
Basic Static load rating - Ca0 (N)	Ca0=R × C0		Ca0=R × C0	
Allowable load-Fa0 (N)	Fa0=R × F0		Fa0=R × F0	

P: Inter-pitch dimensions of cylindrical rollers (mm)
 R: The number of cylindrical rollers incorporated in a roller cage
 C1: Basic dynamic load rating per cylindrical roller (N)
 C0: Basic static load rating per cylindrical roller (N)
 F0: Allowable load per cylindrical roller (N)

Ex : Calculate LGC3A180R25 basic load rating
 From specification table(Informations of Roller Cage)
 Inter-pitch dimensions of cylindrical rollers : P = 5 mm
 The number of cylindrical rollers incorporated in a roller cage : R = 25
 Basic dynamic load rating per cylindrical roller : C1 = 640 N
 Basic static load rating per cylindrical roller : C0 = 610N
 Allowable load per cylindrical roller: F0=203N
 Effective roller number R/2 = 12.5, take 12
 Take these parameters into calculation, we can get
 For upward and downward load :Basic dynamic load rating Ca = 4,701.88 N;
 Basic Static load rating Ca0 = 15,250 N;
 Allowable load Fa0 = 5,075 N;
 For Lateral load : Basic dynamic load rating Ca = 8,061.31 N;
 Basic Static load rating Ca0 = 15,250 N;
 Allowable load Fa0 = 5,075 N.

Static Safety Factor(S₀)

Realizing that for any unexpected start or stop caused by external forces when the crossed roller way is at rest or in motion, it is necessary to consider a static safety factors against the work loads.

Load Condition	S ₀
Normal Load	1.0~1.3
Load with Impacts or Vibrations	2.0~3.0

$$S_0 = \frac{Ca0}{F}$$

 S₀: Static safety factor
 Ca0: Basic static load rating (kN)
 F: Calculated working load (kN)

Nominal Life(L)

Nominal life is calculated as follow:

$$L = \left(\frac{f_t}{f_w} \cdot \frac{C_a}{F}\right)^{\frac{10}{3}} \times 100$$

L: Nominal life (km)
 C_a: Basic dynamic load rating (kN)
 F: Calculated working load (kN)
 f_t: Temperature factor (Reference to Temperature Factor Chart)
 f_w: Load factor (Reference to Load Factor Table)

Calculating the Service Life Time(L_n)

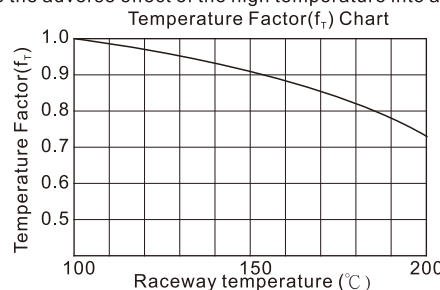
Based on the calculated nominal life, the Service Life Time is obtained through the following equation as if the stroke length and the value of reciprocations per minutes remain constant.

$$L_n = \frac{L \times 10^6}{2 \times l_s \times m \times 60}$$

L_n: Service life time (h)
 l_s: Stroke length (mm)
 m: Number of reciprocations per minute (min⁻¹)

Temperature Factor(f_t)

If the environmental temperature exceeds 100°C, take the adverse effect of the high temperature into account by multiplying the basic load ratings by the temperature factor.



LGC Series

Load Factor(f_w)

In general, reciprocating machines tend to involve vibrations or impact during operation. It is extremely difficult to accurately determine the impact caused by high-speed motion or frequent start and stop motion. However, the calibrated load can be expected by experience. The basic load rating(C_a or Ca_0) divide into load factor(f_w) in the following table to calibrate from speed effect and vibrations.

Load Factor Table		
Vibrations/Impact	Speed(V)	f_w
Faint	$V \leq 0.25\text{m/s}$	1~1.2
Weak	$0.25 < V \leq 1\text{m/s}$	1.2~1.5

Stroke

When the crossed roller way is in motion, the roller cage will move about half the travel distance of the work platform in the same direction at the same time. The distance from the loading center to the center of roller cage will change based on the work load of the platform.

Therefore, in order to maintain the stability and accuracy of the crossed roller way, please follow the instructions in Cross Reference Table for Max. stroke & Roller Numbers.

EX : Roller diameter is 6 mm, High-accuracy grade, the length of rails are 300mm and 200mm, and the required working stroke length is 50mm.

According to the specification (Cross Reference Table for Max. Stroke & Roller Numbers), The admissible numbers of roller are 16 and 19 with the shortest length of rails in 200 mm. Then, the maximum stroke length, 118 mm and 64 mm, are both longer than working stroke length which is 50mm.

→ Satisfying user requirement.

Mounting Screw

Tightening torque for fixing screw

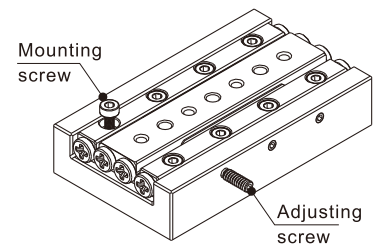
Identification number	Bolt size	Tightening torque(N.m)
LGC1	M1.4X0.3PX6L	0.14
LGC2	M2.0X0.4PX8L	0.40
LGC3	M3.0X0.5PX9.5L	1.40
LGC4	M4.0X0.7PX16L	3.20
LGC6	M5.0X0.8PX20L	6.60

※High strength screw is preferred.

Adjusting Screw

Tightening torque for fixing screw

Identification number	Bolt size	Tightening torque(N.m)
LGC1	M2	0.008
LGC2	M3	0.012
LGC3	M4	0.05
LGC4	M4	0.08
LGC6	M5	0.2



Precautions on use

1. Handle with caution:

Dropping the crossed roller way may cause damages on the rolling surface, hence affects the accuracy or smooth motion.

2. Adjustment:

Fail to adjust the preload or mounting surfaces correctly will affect the product lifetime and accuracy. Make sure to assemble, install, and adjust the product with care. Appropriate preload will help with rigidity and accuracy; yet overloading the crossed roller way will result in damages and deformation. On installation, please follow the installation procedure and recommended torque.

3. Use as a Set:

The accuracy of the rails has been matched within each set. The accuracy will differ when combining products of different sets

4. Allowable Load:

The allowable load is a load under which the sum of elastic deformations of the rolling element and the raceway in the contact area subject to the maximum contact stress is small enough to guarantee smooth rolling movement. When very smooth and highly accurate linear motion is required, make sure to use the product within the allowable load.

5. Cage Slippage:

The roller cage can slip under high speed motion, vertical application, unbalanced-loading, and vibrating conditions.

It is advised to avoid excessive workloads. Also, setting the stroke within its maximum allowance with safety factors taken into account will help avoid extrusion and damages on the product.