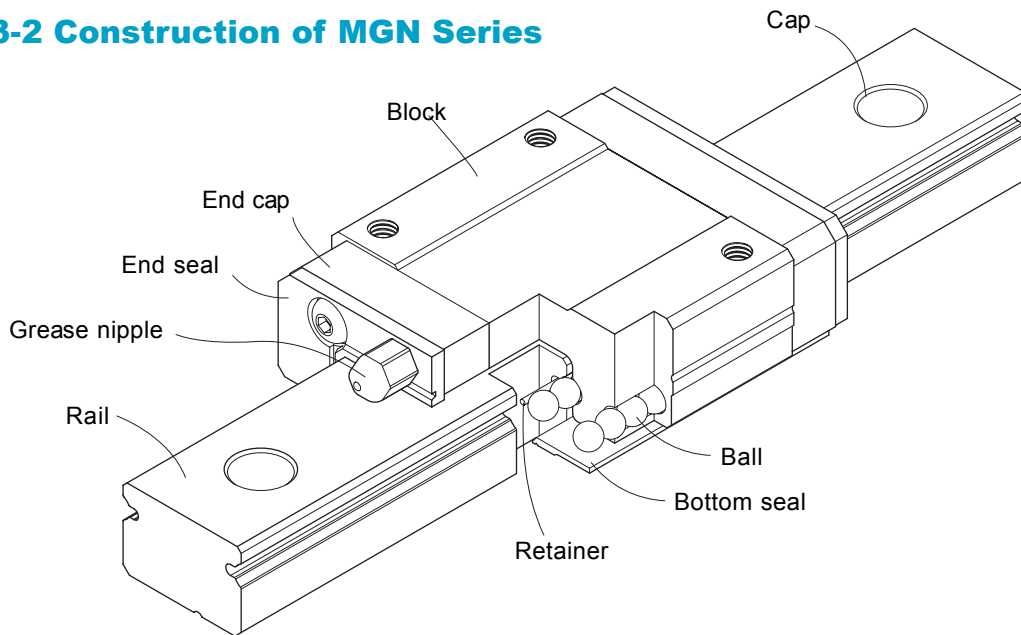


2-3 Miniature MGN/MGW Series

2-3-1 Features of MGN Series

1. Tiny and light weight, suitable for miniature equipment.
2. All material are special grade of stainless steel for anti-corrosion ability. Size 9,12 also provide alloy steel type.
3. Gothic arch contact design can sustain the load in all directions and is with the characteristic of High rigidity and high accuracy.
4. Steel balls are constrained by miniature retainer without losing balls when remove the block away from the rail.
5. Interchangeable type are available in some certain precision class.

2-3-2 Construction of MGN Series



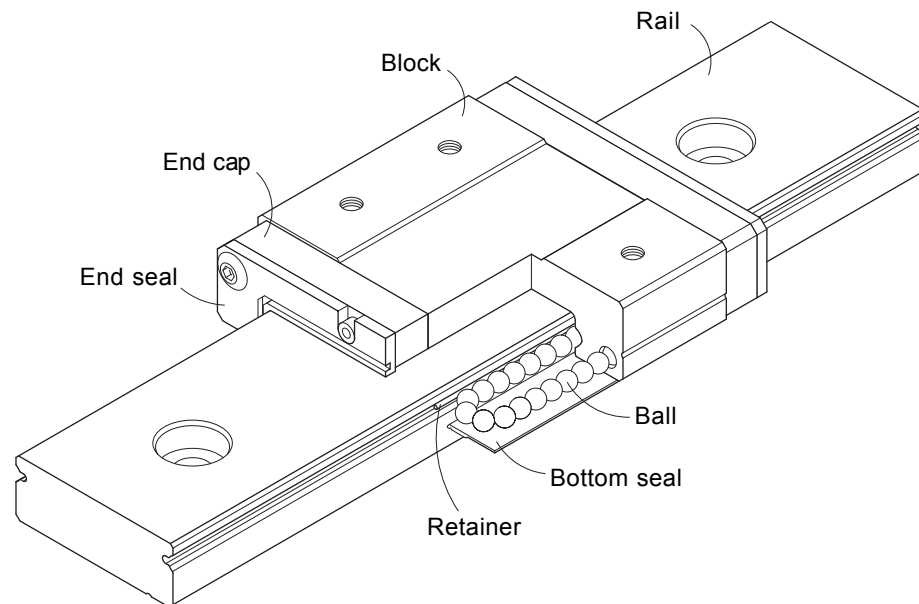
- ▶ Rolling Circulation System: Block, rail, end cap, ball, retainer.
- ▶ Lubrication System: The grease nipple is available for MGN15, grease gun can be used for lubricating.
- ▶ Dust Protection System: End seal, bottom seal (optional size12,15), cap (size12,15).

2-3-3 Feature of MGW Series

The design feature of wide type miniature guideway-MGW:

1. The design of enlarged width has increased the capacity of moment load.
2. Gothic arch contact design has high rigidity characteristic in all directions.
3. Steel balls are constrained by miniature retainer without losing balls when removing the block away from the rail.
4. All metal components are made of stainless steel for anti-corrosion ability.

2-3-4 Construction of MGW Series



- ▶ Rolling circulation system: Block, rail, end cap, ball, retainer.
- ▶ Lubrication system: The grease nipple is available for MGW15, grease gun can be used for lubricating.
- ▶ Dust protection system: End seal, bottom seal (optional size12,15), cap(size12,15).

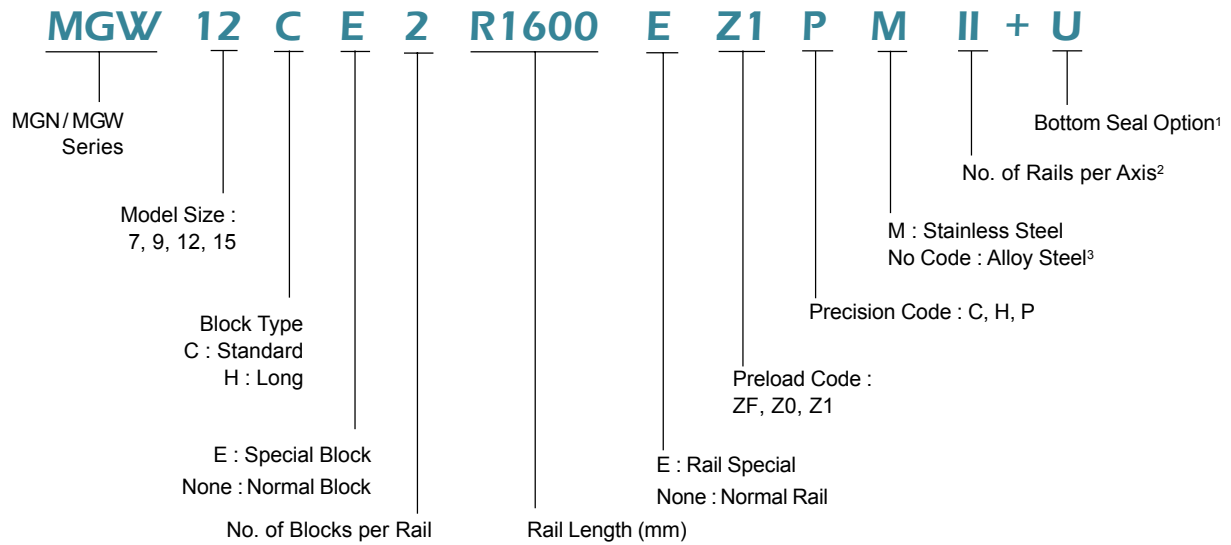
2-3-5 Application

MGN/MGW series can be used in many fields, such as semiconductor equipment, PCB assembly equipment, medical equipment, robots, measuring equipment, office automation equipment, and other miniature sliding mechanism.

2-3-6 Model Number of MGN/MGW Series

Linear guideway can be classified into non-interchangeable and interchangeable types. The sizes of two types are same. The interchangeable type is more convenient due to blacksand rails can be replaced. However, its precision is less than non-interchangeable type. Because of the strictly dimensional control, the interchangeable type linear guideway is a smart choice for customer when rails don't need to be paired for an axis. The model number contains the information of the size, type, accuracy class, preload class, and more.

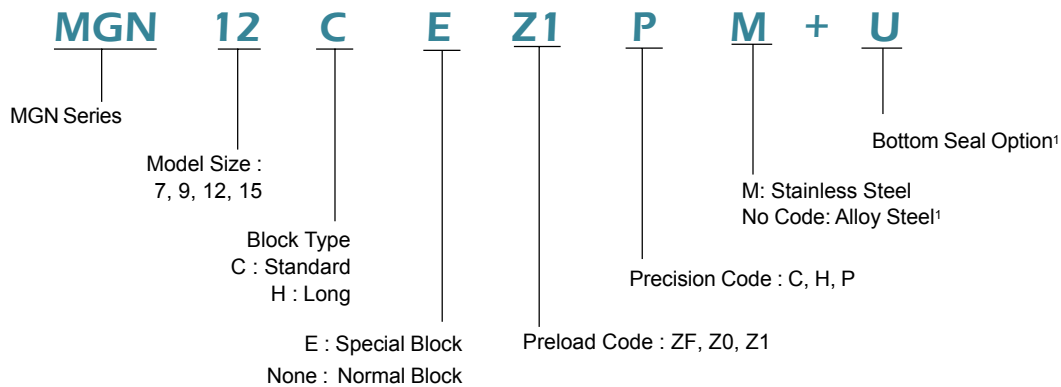
(1) Non-interchangeable type



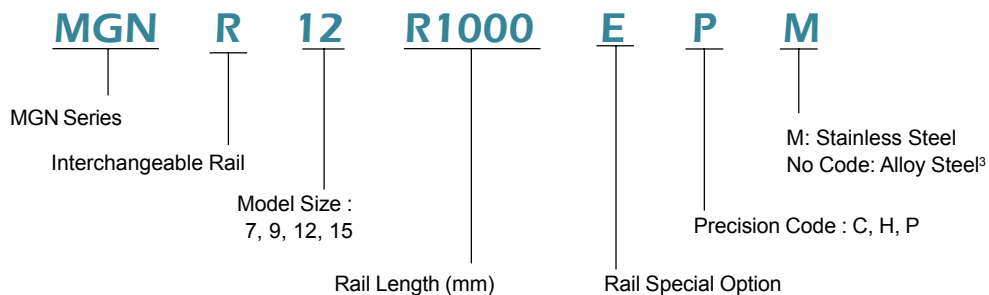
- Note: 1. The bottom seal is available for MGN & MGW 12, 15.
 2. The Roman numerals express the number of rails used in one axis. No symbol means the single rail in an axis.
 3. MGN series are made of stainless steel, but alloy steel is optional for size 9 & 12.
 MGW series are made of stainless steel.

(2) Interchangeable type

▶ Interchangeable block



▶ Interchangeable rail



2-3-7 Accuracy Standards

The accuracy of MGN/MGW series can be classified into three classes: normal(C), high(H), precision(P), super precision(SP), ultra precision (UP). Customers can select the proper linear guideway by the accuracy the application required.

(1) Non-interchangeable

The accuracy values are the means of measurements taken at the central part of each block.

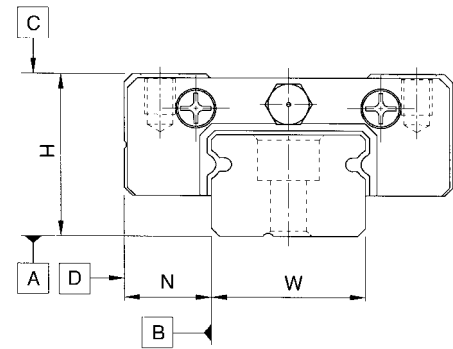


Table 2.48 Accuracy Standard of Non-interchangeable Type

Item	Normal (C)	High (H)	Precision (P)
Dimension tolerance of height H	± 0.04	± 0.02	± 0.01
Dimension tolerance of width N	± 0.04	± 0.025	± 0.015
Pair Variation of height H	0.03	0.015	0.007
Pair Variation of width N (Master Rail)	0.03	0.02	0.01
Running parallelism of block surface C to surface A	According to Table 2.50		
Running parallelism of block surface D to surface B	According to Table 2.50		

(2) Interchangeable

The multi sets pair variation of height has few difference between the interchangeable type and non-interchangeable type.

Table 2.49 Accuracy Standard of Interchangeable Type

Item	Normal (C)	High (H)	Precision (P)
Dimension tolerance of height H	± 0.04	± 0.02	± 0.01
Dimension tolerance of width N	± 0.04	± 0.025	± 0.015
One Set	Pair Variation of height H	0.03	0.007
	Pair Variation of width N	0.03	0.01
Pair variation of height H (Multi Sets)	0.07	0.04	0.02
Running parallelism of block surface C to surface A	According to Table 2.50		
Running parallelism of block surface D to surface B	According to Table 2.50		

(3) Accuracy of running parallelism

The running parallelism C to A and D to B are related to the rail length.

Table 2.50 Accuracy of Running Parallelism

Rail Length (mm)	Accuracy (µm)			Rail Length (mm)	Accuracy (µm)		
	C	H	P		C	H	P
50 & under	12	6	2	315 ~ 400	18	11	6
50 ~ 80	13	7	3	400 ~ 500	19	12	6
80 ~ 125	14	8	3.5	500 ~ 630	20	13	7
125 ~ 200	15	9	4	630 ~ 800	22	14	8
200 ~ 250	16	10	5	800 ~ 1,000	23	16	9
250 ~ 315	17	11	5	1,000 ~ 1,200	25	18	11

2-3-8 Preload

MGN/MGW series provides three preload levels for various applications.

Table 2.51 Preload Classes

Class	Code	Preload	Accuracy
Light Clearance	ZF	Clearance 4~10 μ m	C
Very Light Preload	Z0	0	C~P
Light Preload	Z1	0.02C	C~P

Note: "C" in column preload means basic dynamic load rating.

2-3-9 Dust Protection Equipment

End seals, standard equipment fixed on both sides of block, can prevent dust from block, so the accuracy and service life of linear guideway can be maintained. Bottom seals are fixed under the skirt portion of block to prevent dust entering. Customer can order bottom seals by adding the mark "+U" followed by the model number. Size 12,15 provides bottom seals for option, but size 7, 9 doesn't provide because of the space limit of H_1 . If the linear guideway is equipped with bottom seal, the lateral mounting surface of rail must not exceed H_1 .

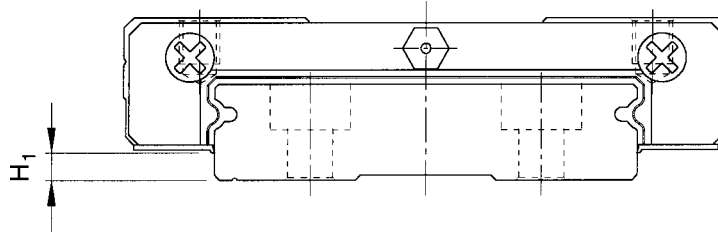


Table 2.52

Size	Bottom seal	H_1 mm	Size	Bottom seal	H_1 mm
MGN7	-	-	MGW7	-	-
MGN9	-	-	MGW9	-	-
MGN12	●	2	MGW12	●	2.6
MGN15	●	3	MGW15	●	2.6

2-3-10 Shoulder Heights and Fillets

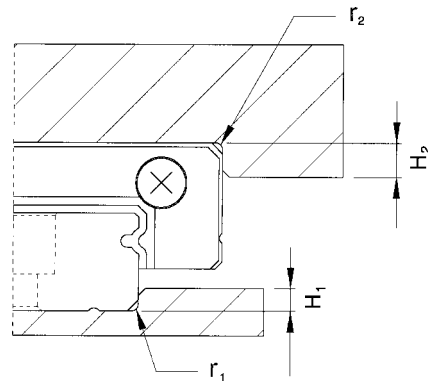
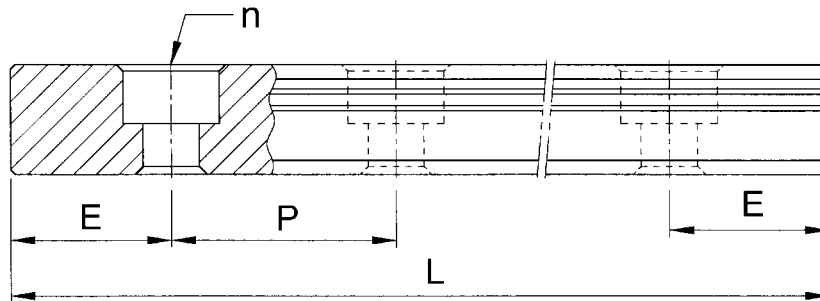


Table 2.53 Shoulder Heights and Fillets

Size	Max. radius of fillets		Shoulder height	Shoulder height	Size	Max. radius of fillets		Shoulder height	Shoulder height
	r_1 (mm)	r_2 (mm)	H_1 (mm)	H_2 (mm)		r_1 (mm)	r_2 (mm)	H_1 (mm)	H_2 (mm)
MGN7	0.2	0.2	1.2	3	MGW7	0.2	0.2	1.7	3
MGN9	0.2	0.3	1.7	3	MGW9	0.3	0.3	2.5	3
MGN12	0.3	0.4	1.7	4	MGW12	0.4	0.4	3	4
MGN15	0.5	0.5	2.5	5	MGW15	0.4	0.8	3	5

2-3-11 Standard Length and Maximum Length of Linear Guideways

HIWIN has stock for standard length of rails. If non-standard length is required, it is recommended the E value should not be over 1/2 of pitch (P) to avoid unstable on the end part of rail, and not be less than E_{min} due to the possibility of the mounting hold broken.



$$L = (n - 1) \times P + 2 \times E \quad \dots \dots \dots \text{Eq. 2.11}$$

L : Total length of rail (mm)
 n : Number of mounting holes
 P : Distance between any two holes (mm)
 E : Distance from the center of the last hole to the edge (mm)

Table 2.54

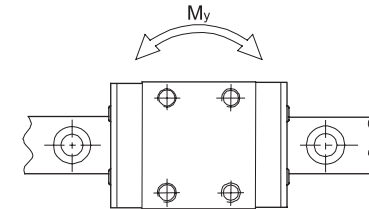
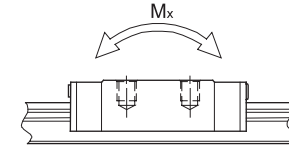
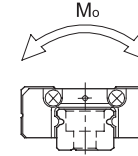
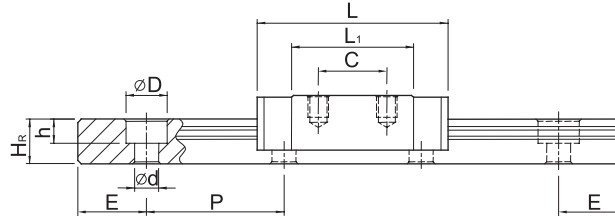
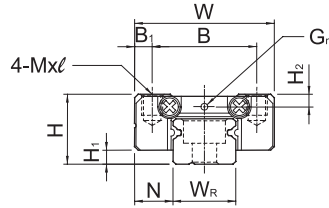
Item	MGNR	MGNR	MGNR	MGNR	MGNR	MGNR	MGWR	MGWR	MGWR	MGWR
	7M	9M	9	12M	12	15M	7M	9M	12M	15M
Standard Length L (n)	40(3)	55(3)		70(3)	70(2)	80(3)	80(3)	110(3)	110(3)	
	55(4)	75(4)		95(4)	110(3)	110(4)	110(4)	150(4)	150(4)	
	70(5)	95(5)		120(5)	150(4)	140(5)	140(5)	190(5)	190(5)	
	85(6)	115(6)		145(6)	190(5)	170(6)	170(6)	230(6)	230(6)	
	100(7)	135(7)		170(7)	230(6)	200(7)	200(7)	270(7)	270(7)	
	130(9)	155(8)		195(8)	270(7)	260(9)	230(8)	310(8)	310(8)	
		175(9)		220(9)	310(8)		260(9)	350(9)	350(9)	
		195(10)		245(10)	350(9)		290(10)	390(10)	390(10)	
		275(14)		270(11)	390(10)		350(14)	430(11)	430(11)	
		375(19)		320(13)	430(11)		500(19)	510(13)	510(13)	
				370(15)	470(12)			590(15)	590(15)	
				470(19)	550(14)			750(19)	750(19)	
			570(23)	670(17)			910(23)	910(23)		
				870(22)						
Pitch (P)	15	20		25	40	30	30	40	40	
Distance to End (E_0)	5	7.5		10	15	10	10	15	15	
Max. Standard Length	595	995	995	995	1195	990	590	590	990	990
Max. Length	600	1000	1000	1000	1200	1000	600	600	1000	1000

- Note: 1. Tolerance of E value for standard rail is 0.5~0.5 mm. Tolerance of E value for butt-joint is 0~0.3 mm.
 2. Maximum standard length means the max. rail length with standard E value on both side.
 3. The specification with "M" mark are stainless steel and without "M" mark are alloy steel.
 4. If smaller E value is needed, please contact HIWIN.

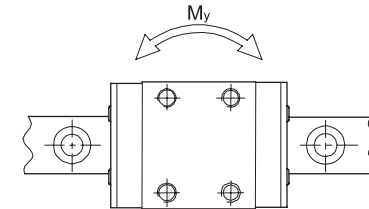
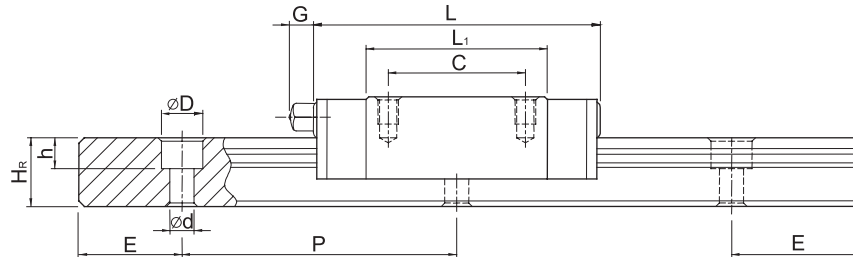
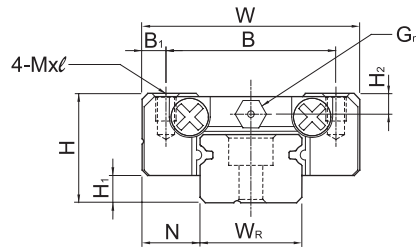
2-3-12 Dimensions for HIWIN MGN/MGW Series

(1) MGN-C / MGN-H

► MGN 7, MGN 9, MGN 12



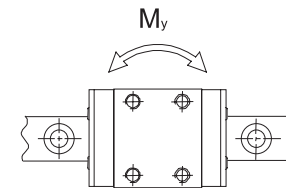
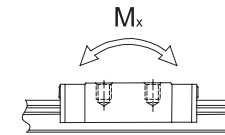
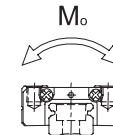
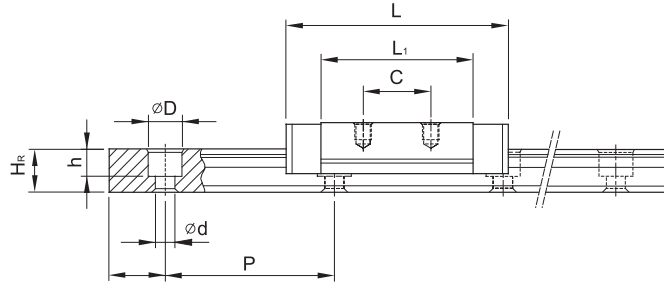
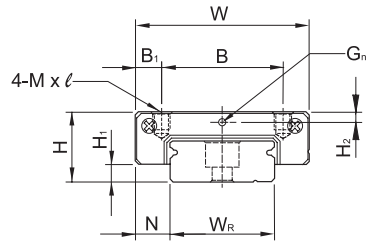
► MGN 15



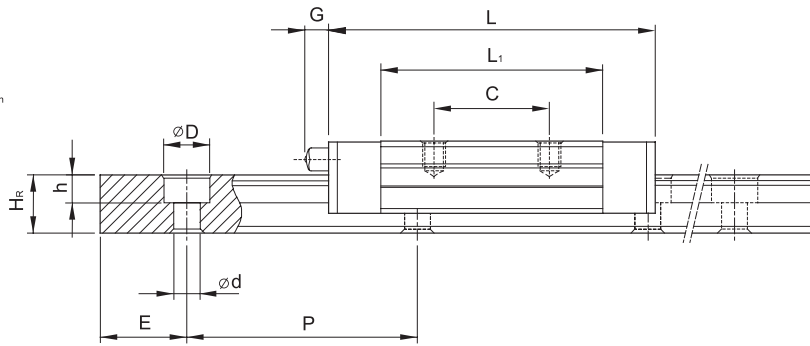
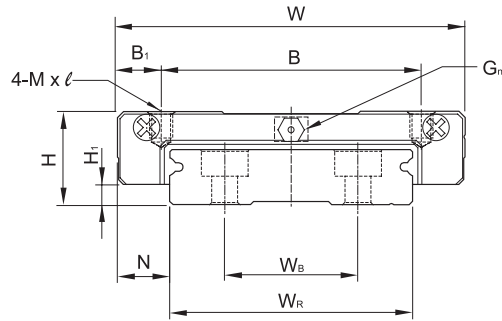
Model No.	Dimensions of Assembly (mm)		Dimensions of Block (mm)										Dimensions of Rail (mm)							Mounting Bolt for Rail (mm)	Basic Dynamic Load Rating C (kgf)	Basic Static Load Rating C ₀ (kgf)	Static Rated Moment			Weight		
	H	H ₁	N	W	B	B ₁	C	L ₁	L	G	G _n	M x ℓ	H ₂	W _R	H _R	D	h	d	P				E	M ₀ (kgf-m)	M _x (kgf-m)	M _y (kgf-m)	Block (g)	Rail (kg/m)
MGN 7C MGN 7H	8	1.5	5	17	12	2.5	8 13	13.5 21.8	22.5 30.8	-	∅0.8	M2 x 2.5	1.5	7	4.8	4.2	2.3	2.4	15	5	M2x6	100 140	127 200	0.48 0.78	0.29 0.49	0.29 0.49	10 15	0.22
MGN 9C MGN 9H	10	2	5.5	20	15	2.5	10 16	18.9 29.9	28.9 39.9	-	∅0.8	M3 x 3	1.8	9	6.5	6	3.5	3.5	20	7.5	M3x8	190 260	260 410	1.2 2	0.75 1.9	0.75 1.9	16 26	0.38
MGN 12C MGN 12H	13	3	7.5	27	20	3.5	15 20	21.7 32.4	34.7 45.4	-	∅0.8	M3 x 3.5	2.5	12	8	6	4.5	3.5	25	10	M3x8	290 380	400 600	2.6 3.9	1.4 3.7	1.4 3.7	34 54	0.65
MGN 15C MGN 15H	16	4	8.5	32	25	3.5	20 25	26.7 43.4	42.1 58.8	4.5	GN3S	M3 x 4	3	15	10	6	4.5	3.5	40	15	M3x10	470 650	570 930	4.6 7.5	2.2 5.9	2.2 5.9	59 92	1.06

(2) MGW-C / MGW-H

► MGW 7, MGW 9, MGW 12



► MGW 15



Model No.	Dimensions of Assembly (mm)			Dimensions of Block (mm)									Dimensions of Rail (mm)										Mounting Bolt for Rail (mm)	Basic Dynamic Load Rating C (kgf)	Basic Static Load Rating C ₀ (kgf)	Static Rated Moment			Weight	
	H	H ₁	N	W	B	B ₁	C	L ₁	L	G	G _n	M x l	H ₂	W _R	W _B	H _R	D	h	d	P	E	M ₀ (kgf-m)				M _x (kgf-m)	M _y (kgf-m)	Block (g)	Rail (kg/m)	
MGW 7C	9	1.9	5.5	25	19	3	10	21	31.2	-	ø0.9	M3x3	1.85	14	-	5.2	6	3.2	3.5	30	10	M3x6	140	210	1.6	0.73	0.73	20	0.51	
MGW 7H							19	30.8	41								6	3.2	3.5	30	10	M3x6	180	320	2.39	1.58	1.58	29		
MGW 9C	12	2.9	6	30	21	4.5	12	27.5	39.3	-	ø1.0	M3x3	2.4	18	-	7	6	4.5	3.5	30	10	M3x8	280	420	4.09	1.93	1.93	40	0.91	
MGW 9H					23	3.5	24	38.5	50.7								6	4.5	3.5	30	10	M3x8	350	600	5.56	3.47	3.47	57		
MGW 12C	14	3.4	8	40	28	6	15	31.3	46.1	-	ø1.8	M3x3.6	2.8	24	-	8.5	8	4.5	4.5	40	15	M4x8	400	570	7.17	2.83	2.83	71	1.49	
MGW 12H							28	45.6	60.4								8	4.5	4.5	40	15	M4x8	520	840	10.47	5.85	5.85	103		
MGW 15C	16	3.4	9	60	45	7.5	20	38	54.8	5.2	GN3S	M4x4.2	3.2	42	23	9.5	8	4.5	4.5	40	15	M4x10	690	940	20.32	5.78	5.78	143	2.86	
MGW 15H							35	57	73.8								8	4.5	4.5	40	15	M4x10	910	1410	30.48	12.5	12.5	215		