Product
Specification
**Miniature
Guide
Ways**

Product Structure

End seal

Block

Plug

Rail hole

Ball bearing

Linear Guide

End cover

Circulation system
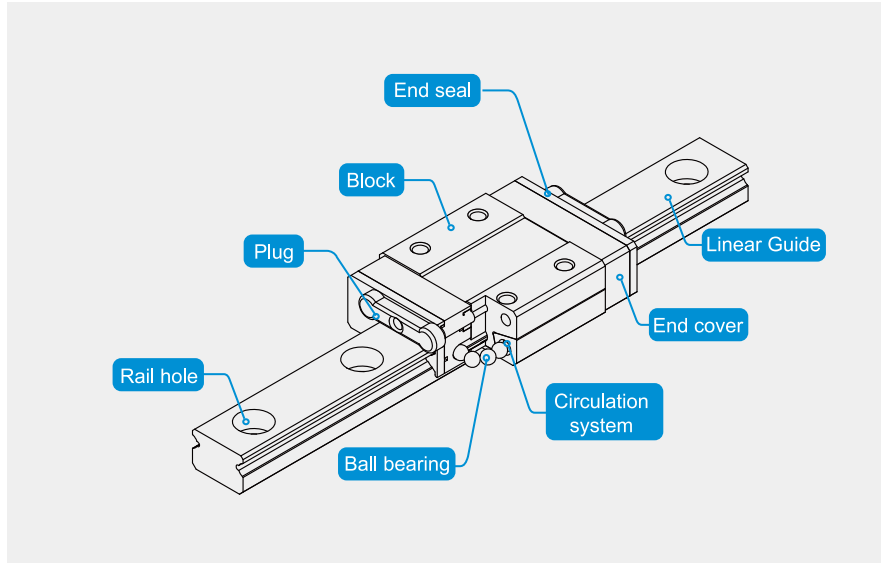
Product Character

◎ 4 contact points formed by circulated ball bearings in 45 degrees contact to the guide rail
surface to produce an even-loading performance of each side of the guide.
◎ Circulation system is a plastic part designed to reduce friction noise during block running.
◎ End and bottom seals design to prevent dust and foreign objects entering from block
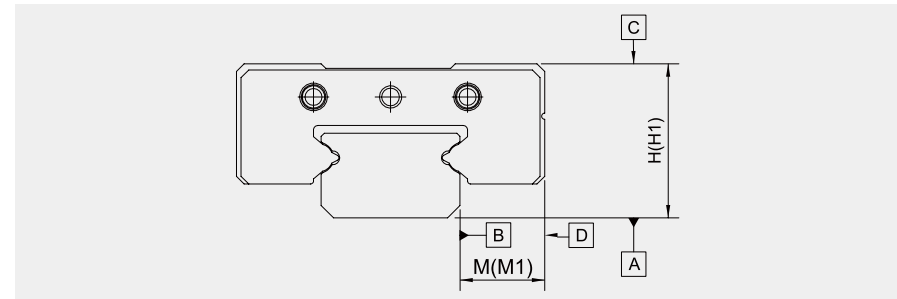running,to extend product usage life.

【Standard rail width】
◎ Fit to low profile equipment.
◎ Stainless steel material
◎ High rigidity and accuracy.

【Wide rail width】
◎ Suitable for single axis usage.
◎ High loading capacity.
◎ High rigidity and accuracy.
◎ Stainless steel material.

Accuracy Reference Table

Accuracy Reference of GSN and GSW				
Accuracy	Code	Standard (N)	High (H)	Precision (P)
H tolerance	H	±35(μm)	±15(μm)	±10(μm)
H tolerance between multiple blocks	H1	20(μm)	15(μm)	10(μm)
M tolerance	M	±35(μm)	±15(μm)	±10(μm)
M tolerance between multiple blocks	M1	25(μm)	15(μm)	10(μm)

Dynamics straightness (A-C)/(B-D) compare to rail length Accuracy Chart			
Rail Length	Accuracy		
	Standard Grade(N)	High Grade (H)	Precision Grade (P)
50Less	12	6	2
50-100	14	8	4
100~200	15	9	4
200~300	17	11	5
300~400	18	11	6
400~500	19	12	6
500~600	20	13	7
600~700	21	13	7
700~800	22	14	8
800~900	23	16	9
900~1000	25	18	11

Product Introduction

Usage Life Calculation

Usage life is a total moving distance achieved while the contact surface between the guide rails has been scratched that means limited critical conditions are produced after contact friction force circulated continuously between ball bearings and guide rails surface during block running with loading.

◎ Rated Usage Life Definition
Rated usage life means 90% of the tested linear guide rail surface without scratch situation from a certain quantity of linear guide moving under same conditions and rated loading.

◎ Usage Life Calcuation
Usage life is considered basic rated loading and total loading for calculation due to different working conditions.

C : Basic rated dynamic loading(kN)

L : Rated usage life(km)

P_c : Radial loading calculation(kN)

f_1 : Temperature factor

f_w : Loading factor

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

◎ Usage Life Time(L_h)
Please refer to the following calculation formula to have an idea usage life time if stroke and repeatable cycles per minute are fixed situation upon rated usage life figure is calculated.

L_h : Working life hours (hr)

ℓ_s : Stroke length (mm)

n_1 : Travel times per minute (min₁)

$$L_h = \frac{L \times 10^6}{2 \times \ell_s \times n_1 \times 60}$$

Life Factor

◎ Hardness Factor(f_h)
Hardness of contact surface on cycling guide rails requires HRC56-60. Guide rail rated life and usage life will be reduced in case lower hardness. Use Hardness factor shown on (Fig. 1) to multiple the rated dynamic and static loading equals to available reference figures.

(Fig. 1)
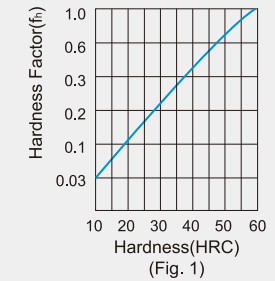
◎ Temperature factor(f_t)
Use Temperature factor shown on (Fig. 2) to multiple the basic rated loading equals to available reference figures when the working environment temperature is more than 100℃.


(Fig. 2)
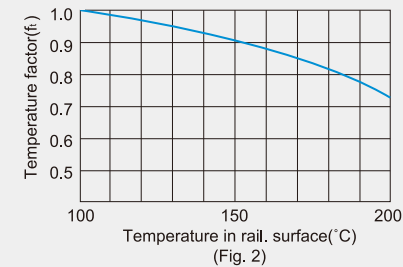
◎ Loading Factor(f_w)
Use the following loading factor (fW) generated from experienced vibration & drive force to calculate a reference loading figure due to rapid vibration or strong drive force during high speed running. as hardly getting precise calculations. Therefore, when the actual operating load data cannot be calculated, or when the impact of speed and vibration is very large, divide the basic rated load (C) except the corresponding empirical load factor in the following table.
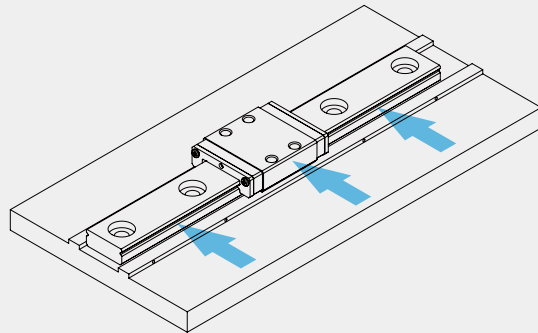
| Vibration / Drive force	Velocity (V)	Loading Factor (fW)
Softly	Slight speed V≦0.25m/s	1~1.2
Light	Low speed 0.25< V≦1m/s	1.2~1.5

Mounting Method

Remove and clean dust and foreign objects from assembly surface of the mounting base by the oils-tone.
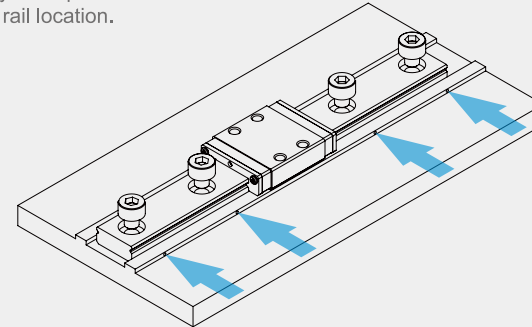
Oils-Tone
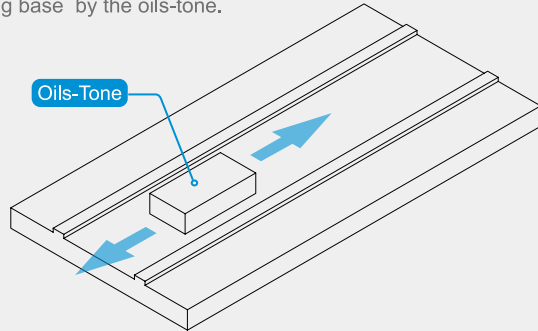
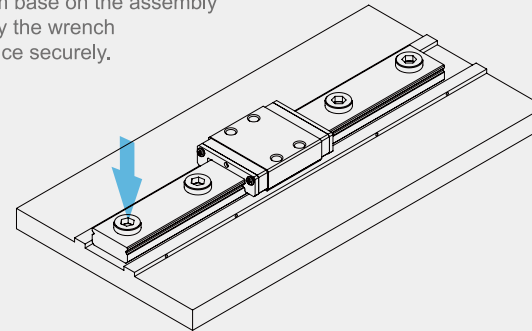Put and align the miniature guide rail on the mounting base.

Slightly screw on bolts to check mounting holes (not fasten yet) to position the guide rail bottom surface on the mounting base roughly.
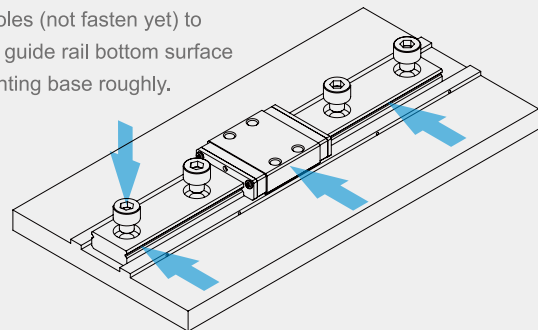
Use side-fixing screws to force the guide rail side datum surface to the assembly side tightly in sequence to ensure the guide rail location.

Tighten each bolt to force the guide rail bottom base on the assembly surface by the wrench in sequence securely.
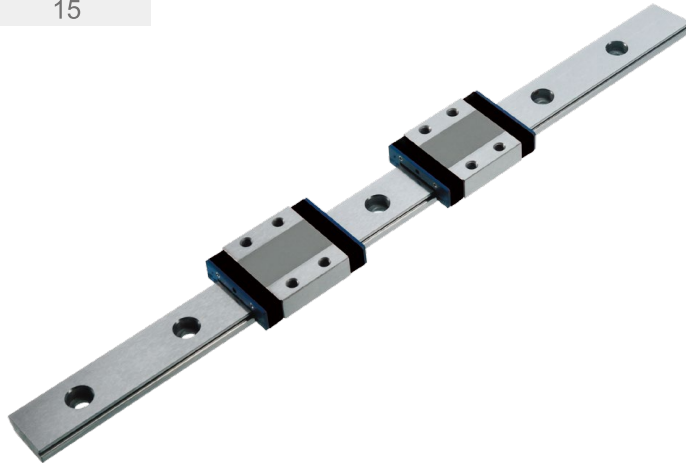
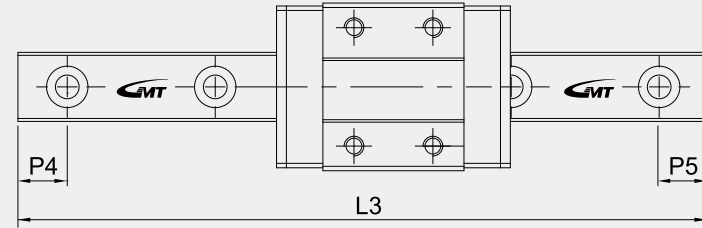Follow step 1 to step 5 repeatably to assembly other guide rails.

Linear Motion Component ◗ Guides & Bearings ◗ Miniature Guide Ways

GMT GLOBAL INC.

Model No. Introduction

Linear Motion Component ◗ Guides & Bearings ◗ Miniature Guide Ways

GMT GLOBAL INC.

End Pitch & Rail Length

Product Introduction

Product Introduction

Specification Introduction

Product Type	Block Type		Block Quantity	Accuracy Grade		Preload Grade	
Miniature	N	Standard Block	Blocks on each rail	P	Precision grade	F	Micro-clearance
	L	Long block		H	High grade	0	No preload
				N	Standard grade	1	Light preload

GS 05 N N 2 20L - P -

| Nominal Dimensions	Rail Type		Rail Quantity	Rail Length
05	N	Standard width	Required rail quantity per axis	Refer to P. 0160 for standard length. Note: Length out of standard is available on request.
07	W	Wide rail		
09				
12				
15				

End Pitch & Rail Length

Unit: : mm

Specifications	GSN					GSW				
	5N	7N	9N	12N	15N	5W	7W	9W	12W	15W
Standard Length	40	40	55	70	70	50	50	50	70	110
	55	55	75	95	110	70	80	80	110	150
	70	70	95	120	150	90	110	110	150	190
	85	85	115	145	190	110	140	140	190	230
	100	100	135	170	230	130	170	170	230	270
		130	155	195	270	150	200	200	270	310
			175	220	310	170	260	260	310	430
			195	245	350		290	290	390	550
	N/A		275	270	390			320	470	670
		N/A	375	320	430	N/A			550	790
				370	470		N/A	N/A		
			N/A	470	550				N/A	N/A
				570	670					
				N/A	870					
Pitch	15	15	20	25	40	20	30	30	40	40
Standard End Pitch(P4)	3	3	4	4	4	4	3	4	4	4
Standard End Pitch (P5)	3	3	4	4	4	4	3	4	4	4
Available max. End Pitch	10	10	20	20	35	15	25	25	35	35
Max. Rail Length (L3)	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000

Standard Width Type
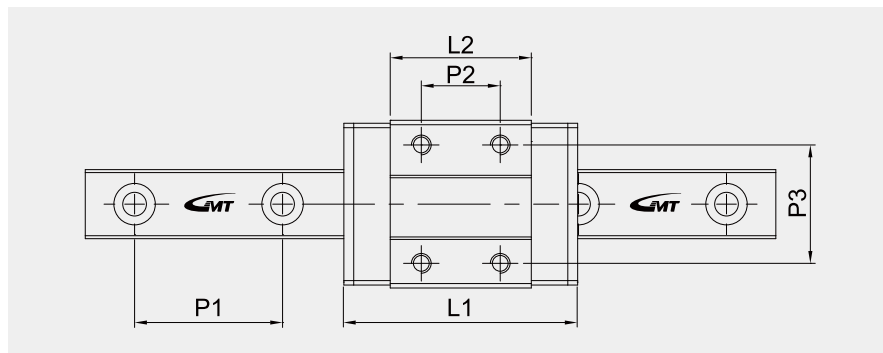
Unit: : mm

Model no.	Assembled Dimensions		Rail Dimensions				Block Dimensions			
	H2	W3	W2	H1	P1	ØDxØdxh1	W1	L1	L2	H3
GS05-N-N	6	3.5	5	3.5	15	3.5x2.4x1	12	16	10	4.5
GS05-N-L	6	3.5	5	3.5	15	3.5x2.4x1	12	19.6	13.5	4.5
GS07-N-N	8	5	7	4.7	15	4.2x2.4x2.3	17	23.7	14.3	6.5
GS07-N-L	8	5	7	4.7	15	4.2x2.4x2.3	17	31.2	21.8	6.5
GS09-N-N	10	5.5	9	5.5	20	6x3.5x3.5	20	30.6	20.5	7.8
GS09-N-L	10	5.5	9	5.5	20	6x3.5x3.5	20	40.9	30.8	7.8
GS12-N-N	13	7.5	12	7.5	25	6x3.5x4.5	27	35.4	22	10
GS12-N-L	13	7.5	12	7.5	25	6x3.5x4.5	27	47.6	34	10
GS15-N-N	16	8.5	15	9.5	40	6x3.5x4.5	32	43	27	12
GS15-N-L	16	8.5	15	9.5	40	6x3.5x4.5	32	60	44	12

◎ Plug thickness 1.5 mm of each is not included in block length L1.

Standard Width Type
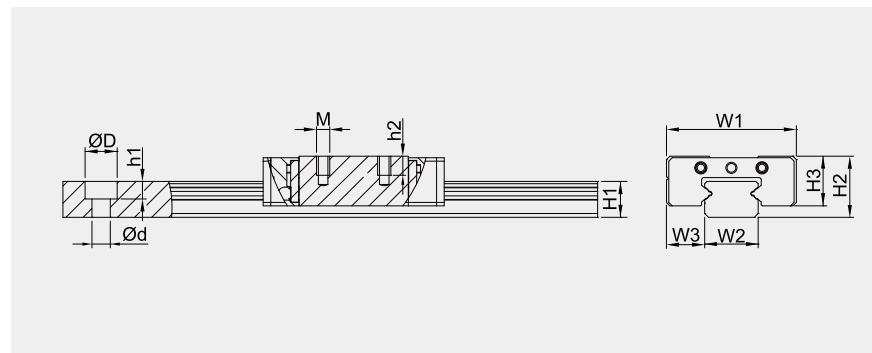
Model no.	Block Dimensions (mm)			Rated Loading (N)		Static Torque (Nm)			Weight	
	P2	P3	Mxh2	C	C0	M_R	M_P	M_Y	Block (g)	Rail (g/m)
GS05-N-N	-	8	M2x1.5	318	523	1.6	1.0	1.0	3	114
GS05-N-L	7	-	M2.6x2.0	447	855	2.3	2.0	2.0	4	114
GS07-N-N	8	12	M2x2.5	846	1330	4.9	3.1	3.1	8	211
GS07-N-L	13	12	M2x2.5	1245	2318	8.6	7.3	7.3	14	211
GS09-N-N	10	15	M3x3.0	1492	2370	11.1	6.1	6.1	18	295
GS09-N-L	16	15	M3x3.0	2028	3686	17.3	11.8	11.8	27	295
GS12-N-N	15	20	M3x3.5	2193	3292	20.4	12.3	12.3	33	590
GS12-N-L	20	20	M3x3.5	3078	5349	33.2	28.7	28.7	50	590
GS15-N-N	20	25	M3x5.5	3620	5311	41.4	25.7	25.7	60	911
GS15-N-L	25	25	M3x5.5	5083	8626	66.5	60.1	60.1	88	911

◎ Plug thickness 1.5 mm of each is not included in block length L1.

Wide Rail Type
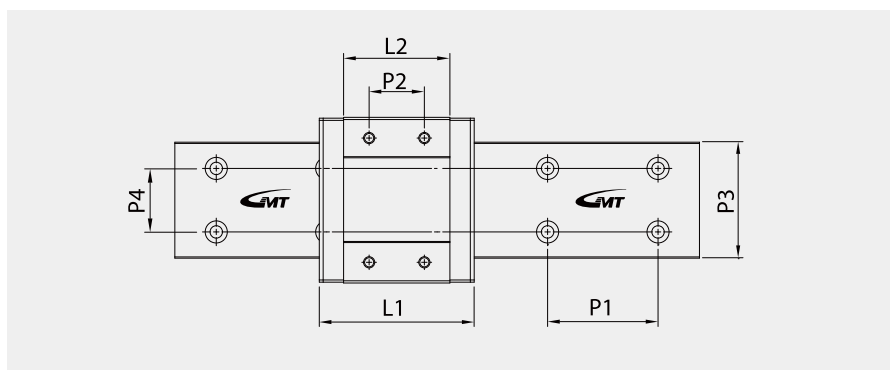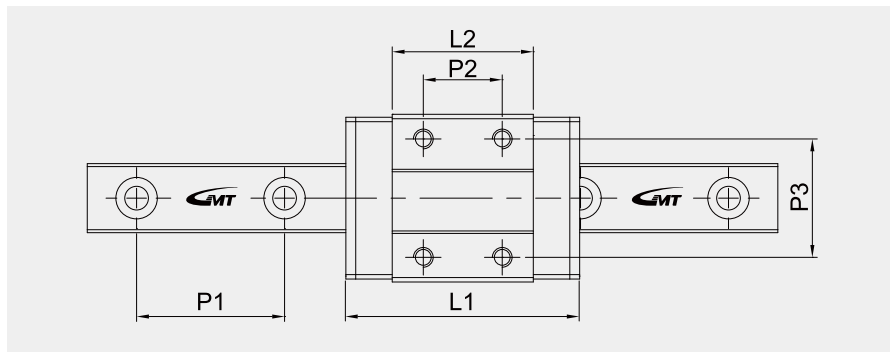
◎ Dimension P4 is referred to GS15-W-N / GS15-W-L models.

Unit: : mm

Model no.	Assembled Dimensions		Rail Dimensions (mm)					Block Dimensions (mm)			
	H2	W3	W2	H1	P1	P4	ØDxØdxh1	W1	L1	L2	H3
GS05-W-N	6.5	3.5	10	4	20		5.5x3x1.6	17	21.1	15.1	5
GS05-W-L	6.5	3.5	10	4	20		5.5x3x1.6	17	27.2	21.2	5
GS07-W-N	9	5.5	14	5.2	30		6x3.5x3.5	25	31.6	21.2	7
GS07-W-L	9	5.5	14	5.2	30		6x3.5x3.5	25	40.5	30.1	7
GS09-W-N	12	6	18	7.3	30		6x3.5x4.5	30	39.1	27.9	8.6
GS09-W-L	12	6	18	7.3	30		6x3.5x4.5	30	50.7	39.5	8.6
GS12-W-N	14	8	24	8.5	40		8x4.5x4.5	40	44.4	31	10.1
GS12-W-L	14	8	24	8.5	40		8x4.5x4.5	40	59.4	46	10.1
GS15-W-N	16	9	42	9.5	40	23	8x4.5x4.5	60	55.3	38.5	12
GS15-W-L	16	9	42	9.5	40	23	8x4.5x4.5	60	74.4	57.6	12

◎ Plug thickness 1.5 mm of each is not included in block length L1.

Wide Rail Type
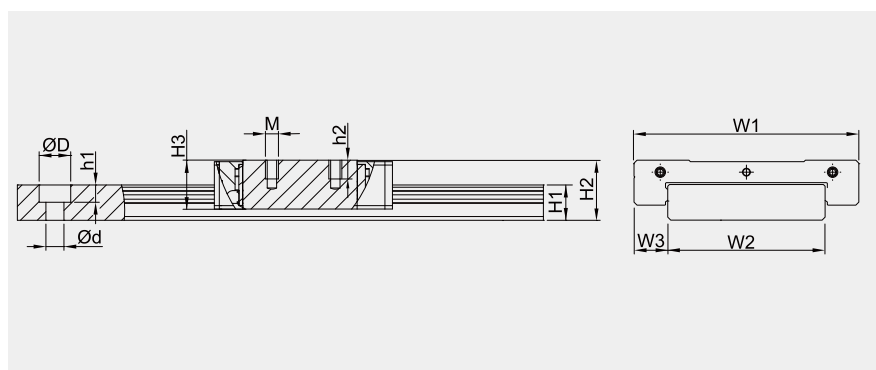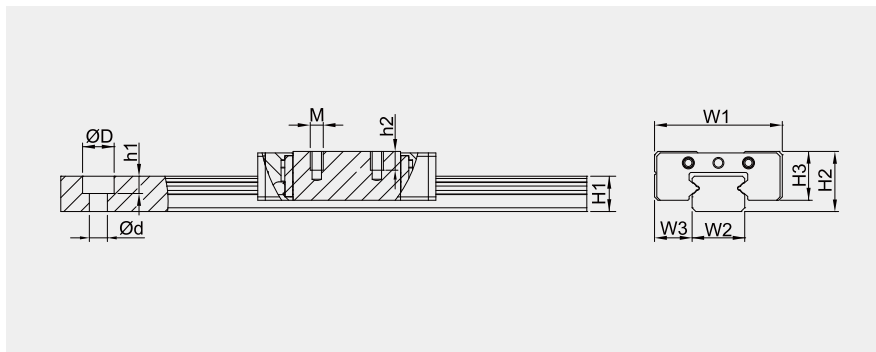
◎ Dimension P4 is referred to GS15-W-N / GS15-W-L models.

Model no.	Block Dimensions (mm)			Rated Loading (N)		Static Torque (Nm)			Weight	
	P2	P3	Mxh2	C	C0	M_R	M_P	M_Y	Block (g)	Rail (g/m)
GS05-W-N	6.5	13	M2.5x1.5	451	855	4.4	2.1	2.1	6	274
GS05-W-L	11	13	M2.5x1.5	584	1249	6.5	3.9	3.9	8	274
GS07-W-N	10	19	M3x3	1121	1990	14.3	6.9	6.9	19	506
GS07-W-L	19	19	M3x3	1492	2983	21.5	14.2	14.2	26	506
GS09-W-N	12	21	M3x3	1929	3425	31.5	13.0	13.0	36	921
GS09-W-L	24	23	M3x3	2423	4741	43.6	25.4	25.4	50	921
GS12-W-N	15	28	M3x3.5	2912	4940	60.5	25.0	25.0	64	1443
GS12-W-L	28	28	M3x3.5	3867	7410	90.8	53.6	53.6	91	1443
GS15-W-N	20	45	M4x4.5	4812	7966	163.1	43.4	43.4	134	2762
GS15-W-L	35	45	M4x4.5	6389	11951	244.7	88.4	88.4	196	2762

◎ Plug thickness 1.5 mm of each is not included in block length L1.

Product Introduction

GR V 03 - 75 - S - H

Transmission Type	Rail Type		Roller (Ball) Diameter (mm)	Rail Length (mm)	Corrosion resistance Material	Precision Level
GR	V-Rails	D-Rails	03	75	S	H
GR : Roller SUS304 Retainer			00：Ø1.0 01：Ø1.5 02：Ø2.0 03：Ø3.0 04：Ø4.0 06：Ø6.0 09：Ø9.0			
GB : Ball SUS304 Retainer				Length selection as specification table	S:SUS440C + Ni	P:Precision Grade H:High Grade
GR : Roller POM Retainer			P - POM Retainer 01：Ø1.5 02：Ø2.0 03：Ø3.0 04：Ø4.0 06：Ø6.0			
GR : Roller Anti-Creep			02：Ø2.0 03：Ø3.0 04：Ø4.0 06：Ø6.0			

Model No.	Material			
	Rail	Retainer	Roller	Ball
GRV	SUJ2	SUS304	SUJ2	X
GRD				
GRV-S	SUS440C+Ni	SUS304	SUS440C	X
GRD-S				
GRVG-S		Brass + Ni		X
GRVP	SUJ2	POM	SUJ2	X
GRDP				
GRVG		Brass		X
GBV	SUJ2	Phosphor bronze (C5191)	X	SUJ2
GBD				

GRV-S; GRD-S; GRVG-S Series are antirust and corrosion resistant specification, and suitable for application to clean rooms.

◎Rails have been finished with cryogentic treatment (Refer to P.0451)

Selection Procedure- Crossed Roller Slide Rail Set

1. Rolling element retainer selection upon load request：
2. Heavy duty → roller, light duty→ ball.
3. To decide "rolling element diameter"
4. Model type selected per installation way.
5. Specification confirmed.
6. Material selection per environment：
   SUJ2 or SUS440C.

• Lock ways
in form of 2 sets:
Span hole unlimited

in whole set:
Span hole limited
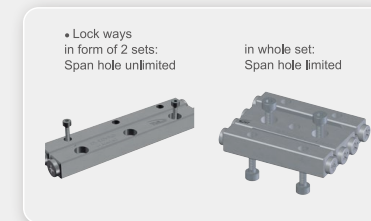
GMT Crossed Roller Slide Rail Set

Composed of two pieces of stainless steel rails with V-grooves, been hardened and ground forming precisely, and rolling elements. Roller type moves in connective 90 degrees alternately to meet requirement of high parallelism and high flatness. In construction, rolling elements are transmitted in cross-contact by precise roller and V-grooves in rails, and in non circulation.Variation caused by friction resistance is little as well, even almost no difference between starting friction resistance and dynamic friction resistance in light duty. High accuracy moving and loading capacity could be performed.

◎Comparison of roller and ball character (Refer to P.0209~P.0210)

Crossed Roller Slide Rail Set Application

Widely applied to accuracy moving device in heavy duty or light duty, in variety of measuring instrument, Printed Circuit Board drilling machine…etc, or slide table used in Optical Measuring Instrument, Precise Gauge in Optical Experiment, precision fine tuning Optical Stage, Operation Mechanism, Survey Device, precise positioning, quantitative movement, X-ray Device & Micro-hole EDM.

Lubrication

Linear motion needs effective lubrication. Abrasion increase of rolling elements and life decrease would be caused in running without lubrication.
Function of lubrication：
1.Reduce friction between running parts greatly, so that it could prevent lock and decrease abrasion.
2.Forming oilfilm on rolling surface to reduce abrasion of metal medium to extend life of rolling elements.
3.Covering on metal surface to prevent rust.

◎Relevant request of lubricant Compatibilty (Refer to P.0450)

Product Introduction

Roller Type

- GRV / GRD / GRV-S / GRD-S / GRVP / GRDP are composed of precise crossed rollers with hardened steel formed precisely to be V-grooves rail guides to create linear motion element in high accuracy.
- Limited stroke linear motion system with high rigidity, mid-hard load and spry moment.
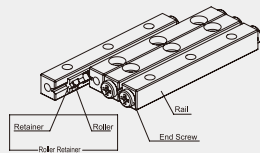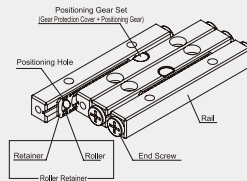
GRV (GRV-S)

GRD (GRD-S)

GRVP

GRVG

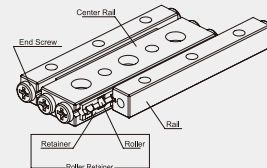### GRDP

GRV (GRV-S / GRVP)

Rail
Retainer
Roller
End Screw
Roller Retainer

1 set =
4 rails + 2 roller retainers
+ 8 end screws

GRVG (GRVG-S)

Positioning Gear Set
(Gear Protection Cover + Positioning Gear)
Positioning Hole
Retainer
Roller
End Screw
Rail
Roller Retainer

1 set =
4 rails + 2 roller retainers
+ 8 end screws

GRD (GRD-S / GRDP)

Center Rail
End Screw
Retainer
Roller
Rail
Roller Retainer

1 set =
1 center rail + 2 rails + 2 roller retainers
+ 8 end screws

Ball Type

- GBV&GBD are composed of ball retainer combined with precise ball arranged in smaller clearance, with the exclusive rails been heat treatment and cryogenic finish, then, forming precisely grinding V-grooves.
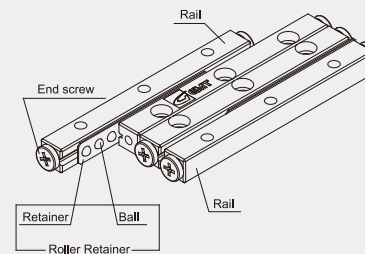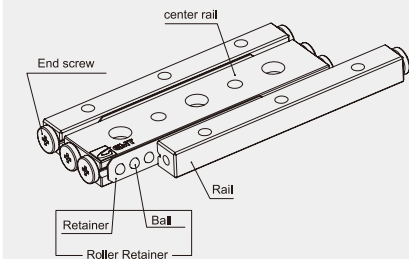- Limited stroke linear motion system with low friction, light load and high accuracy.

GBV

GBD

GBV

Rail
End screw
Retainer
Ball
Roller Retainer
Rail

1 set =
4 rails + 2 ball retainers + 8 end screws

GBD

center rail
End screw
Retainer
Ball
Roller Retainer
Rail

1 set =
1 center rail + 2 rails + 2 ball retainers + 8 end screws

Product Introduction

Accuracy Specification

Measure way

Rail Length and Parallelism of Rolling Plane

High-level (H)

Precise (P)

Parallelism (μm)

Rail length L (L)
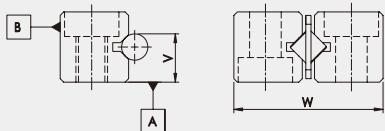
Accuracy Level

Item	Highleve	Precise Level
	H	P
Parallelism of rolling plane to A&B	As shown drawing	
Allowable dimension tolerance to Height V	±0.02	±0.01
Paired mutual tolerance to Height V	0.01	0.005
Allowable tolerance to Width W dimension	0 -0.20	0 -0.10
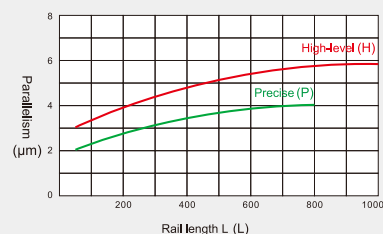
Advantages

Suited To Micro-Movement

Due to tiny friction resistance, and almost no difference between starting friction resistance and dynamic friction resistance. In case of tiny movement could also maintain correct trace perform high precision on the linear motion mechanism.

Stability in Low Speed

Even in case of light loading, its variation of friction resistance is also tiny, so stability from low to high speed could be kept.

High Rigidity, High Loading Capacity

Comparison of roller and ball, larger contact area, less elasticity deformation, and non-circulation, great number of units rotating effectively, so high rigidity and large load capacity.

Low Noise

GMT Crossed Roller Slide Rail Set has no circulated rotating, no noise occurred.Using roller slide way with roller retainer makes no noise caused by contact friction in between each rolling uint moves alternately, to ensure a quiet movement motion.

Straightness

High-level(H)			Precise level(P)		
Length(mm)		Straightness (um)	Length(mm)		Straightness (um)
Above	Below		Above	Below	
—	50	2.0	—	50	1.0
50	100	2.0	50	100	1.0
100	160	3.0	100	160	2.0
160	310	3.0	160	310	2.0
310	510	4.0	310	510	3.0
510	600	4.0	510	600	3.0

(Ra 0.2 μm)   (Ra 0.1 μm)

In selecting slide rail set, stroke length and roller quantity shall be taken into accout besides accuracy, load capacity and rated capacity.

|	
Maximum Stroke Length Calculation and Selection	(EX) In case of using cross roller side by side, which specification should be chosen? Specification… ....GRV04 Loading………………..P=4000N Stroke length…………SW=120mm SOL: Expected stroke length lower than 80% of rail stroke length, required stroke length could be calculated by formula as below. SW ≦ 0.8 S S：Stroke length, mm SW：Stroke length in use, mm If SW=120mm S ≥ (1 / 0.8) x 120=150 As Rail shown in GMT catalog the maximum stroke would be 154mm, product model no. is GRV04-200.

Allowable Load Calculation	F=2 (Z / 2) FU Z：roller quantity
	                      Z / 2：integer, no remainder
	                      FU：Load capacity (N) for each roller （as catalog statistic)
	
	SOL: Searched from catalog : Z=18 , FU = 390 , F = 2 (18 / 2) x 390 =7020 N
	So allowed load F is bigger than loading P=4000 N
	Load ratio =4000/7020*100=56.98%
	It's mid-load to product spec, model no.GRV04-200.

Calculation of Retainer Length and Roller Quantity	Guide length is decided by stroke length and max. slide length, and calculation depends on end screws and stopper specification. Distance between two end rollers in the retainer is to have stroke length deduct half of max. stroke length. $L_R = L - \dfrac{S}{2}$ L_R：rated distance between two rollers in ends of retainer mm L：rail length mm S：stroke length mm
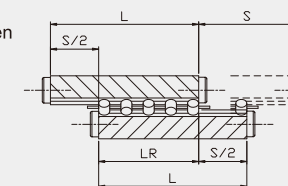
Load Capacity of Ball Bearing

| Condition	Single-Axis Use	Single-Axis Vertical Use	Dual-Axes Abreast Use
Loading direction			
Basic dynamic load rating ΣC	$B^{3/4} * \cos\frac{\pi}{4} * C$	$B^{3/4} * 2^{7/9} * \cos\frac{\pi}{4} * C$	
Basic static load rating ΣCo	$B * \cos\frac{\pi}{4} * Co$	$B * 2^{7/9} * Co$	

C：basic dynamic load rating (N)　　Co：basic static load rating(N)
B：ball quantity in sigle row

Load Capacity of Roller

Condition	Single-Axis Use	Single-Axis Vertical Use	Dual-Axes Abreast Use
Loading direction			
Basic dynamic load rating ΣC	$C = (\frac{R}{2})^{3/4} * C$	$C = (\frac{R}{2})^{3/4} * C * 2^{7/9}$	
Basic static load rating ΣCo	$Co = \frac{R}{2} * Co$	$Co = R * Co$	

C：Basic dynamic load rating (N)　　Co：Basic static load rating(N)
R：Roller quantity in sigle row　　R/2：Integer, no remainder

Safety Factory Fd in Different Loading Direction

Counter veritical loading　　Vertical loading
Side loading
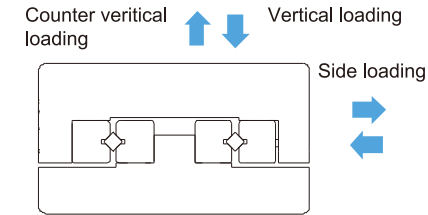
Classification	Loading Direction	Fd
Basic Dynamic Loading	Vertical	1.0
	Side	0.9
	Counter vertical	0.8
Basic Static Loading	Vertical	1.0
	Side	0.9
	Counter vertical	0.8

Safety Factor Fv in Variable Loading

Running Condition	Fv
Normal Running	1~0.5
Smooth Motion Required	0.5~0.25
Vibration, Shock	0.3~0.2

Common contact factor Fc in single rail

Quantity of Linear System Assembled in Single Shaft	Conact Factor Fc
1	1.00
2	0.81
3	0.72
4	0.66
5	0.61

Life Calculation

Ball
$$L = (F_d * F_v * \frac{\sum C}{P})^{10/3} * 50$$

Roller
$$L = (F_d * F_v * \frac{\sum C}{P})^{3} * 50$$

L：Usage life (km)　　Fd：Safety factor in loading direction　　P：Loading
Fv：Safety factor in variable direction

Rail Stroke (S), Stroke in Use (Sw)

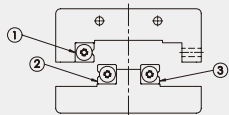Stroke in use is less or equal to 80% of rail stroke　　$Sw \leqq 0.8S$

Rail Length (L)
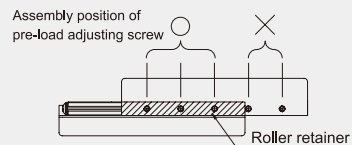
Rail length shall be higher than 1.5 times to stroke length in use, or 1.2 times to rail stroke length.

$L \geqq 1.5Sw$　　or　　$L \geqq 1.2S$

Product Introduction
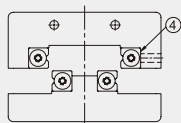
1 Lay oil in low viscosity on contact planes, fix rail (code①~③) with regular torque.

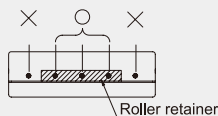**2** Temporarily lock rail in adjusted side (code ④)

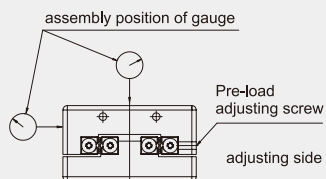**3** Disassemble end screw from end of one side, and carefully insert roller retainer to nearby center of the rail.
(3-1) Lock the end screw again.
(3-2) Slowly move table back and forth to the rail end, and adjust roller retainer position to rail center.

Install roller retainer

4 Fix gauges both in center and side of the table (level plane)

assembly position of gauge

Pre-load adjusting screw

adjusting side

5 Move table to end of one side, and lock pre-load adjusting screw slightly.

Assembly position of pre-load adjusting screw

Roller retainer

6 Move table to the end of another side, as above description, and lock pre-load adjusting screw slightly.

Roller retainer

7 Return table back to center and lock pre-loads adjusting screw slightly. Adjust clearance of table to zero. In case of clearance free, move table back and forth, and index change performance on the fixed gauge would be smallest. Notice that, last adjustment of preloading is to set correct torque value with torque wrench and prepare to lock rail fix screw.
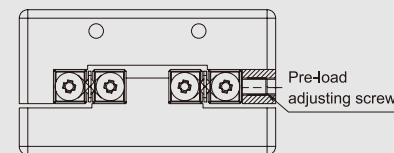
Roller retainer

8 Finally surely lock the rail (code ④). As steps of screw adjustment, move table back and forth, then have the table over roller retainer, and lock screws in order.
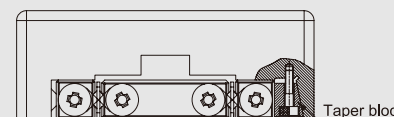
O：Loading on to pre-load adjusting screw.
x：Loading off to pre-load adjusting screw.

Product Introduction

Pre-load adjusting screw

In regular situation, use pre-load adjusting screw to adjust pre-load.
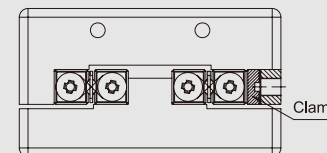
Clamp

Use clamp to meet require of accuracy and rigidity.

Taper block

Use taper block to meet special requirement of high rigidity and high accuracy.

Installation Precaution

- In order to let GMT Crossed Roller Slide Rail Set perform its excellent product function, it's recommended to install assembly planes with accuracy same as parallelism precisely processed in Crossed Roller Slide Rail Set.

- All burrs, dent, dust, miscellaneous objects on the rail of table and base need to be cleaned spotlessly and keep eyes on assembly operation application.

- Preload adjustment, too much preload would cause press damage to reduce life; it's normally recommended to use zero or tiny preload.

Accuracy of intallation assembly plane.

Product Introduction
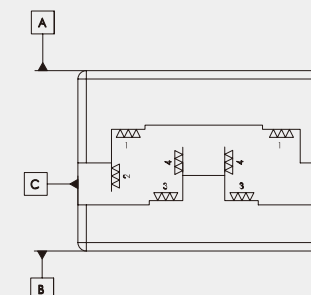
Pre-Load Adjusting Screw Lock Torque (Unit/n˙m)

Specification	Screw Size	Lock Torque
GRV1	M2	0.008
GRV2	M3	0.012
GRV3	M4	0.05
GRV4	M4	0.08
GRV6	M5	0.2
GRV9	M6	0.4

Fix Screw Lock Torque (Unit/n˙m)

Specification	Lock Torque
M2	0.28
M3	1.02
M4	2.37
M5	4.77
M6	8.14
M8	19.69

(Use steel alloy screw)

Reserved Lock Screw

GMT Crossed Roller SlideRail Set, used in socket-head screw hole assembly, it's recommended to use reserved lock screw.

Pre-load adjusting screw
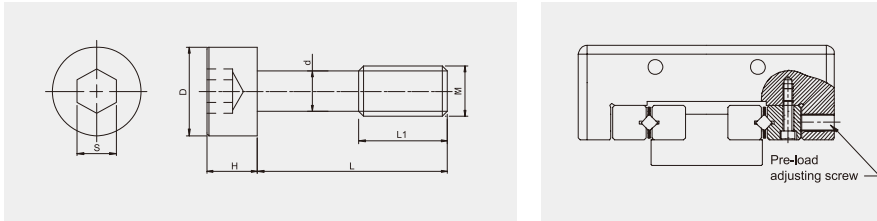
M (mm)	d (mm)	D (mm)	H (mm)	L (mm)	L1 (mm)	S (mm)	Slide way
M3	2.3	5	3	12	5	2.5	GRV3
M4	3.1	5.8	4	15	7	3	GRV4
M5	3.9	8	5	20	8	4	GRV6
M6	4.6	8.5	6	30	12	5	GRV9
M8	6.25	11.3	8	40	17	6	GRV12

Precaution

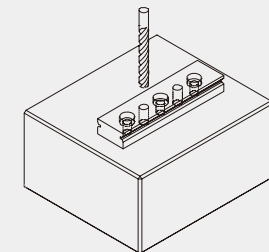|	
Adjustment	Operating under situations of improper accuracy of assembly plane & preloadadjustment, would cause running in low accuracy and slip-out to affect usage life. Notice more in adjustment.
Retainer Deviation	GMT Crossed Roller Slide Rail Set, in high speed or off-center load, vibration load, might cause retainer deviation. Please keep enough space for stroke design, and not to have over pre-load set.
End Screw	Ends of Crossed Roller Slide Rail Set are located with end screws, but this funtion is to prevent retainer falling off, instead of stopping mechanism. If requirement of stopping function, it's recommended to design reserved block mechanism.
Careful Operation	Any carelessness of falling off Crossed Roller Slide Rail Set or unusual collision and extruding, would appear identation made by contact of V-groove and rollers (ball), to cause non-smooth motion, affected accuracy. Please be more careful in operation.
Whole Set Match Principle	Crossed Roller Slide Rail Set accuracy is made by whole set as unit to precisely control it's error range. Different sets of slide rail set mixed in use may result in accuracy variation. Please notice more in assembling.
Locating Pin Hole	GMT Crossed Roller Slide Rail Set, application series - GRD&GBD series, locating pin hole processing needs to fix center rail on the plane, and drilling process. Be sure to clean all cutting bits out, and washing if necessary after pin hole process.

Locating pin hole processing