

Product  
Specification  
**Slide Rail  
Set**



# GR V 03 - 75 - S - H

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

Model No.	Material			
	Rail	Retainer	Roller	Ball Bearing
GRV	SUSJ2	SUS304	SUSJ2	X
GRD				
GRV-S	SUS440C+Ni	SUS304	SUS440C	X
GRD-S				
GRVP	SUSJ2	POM	SUSJ2	X
GRDP				
GBV	SUSJ2	Phosphor bronze (C5191)	X	SUSJ2
GBD				

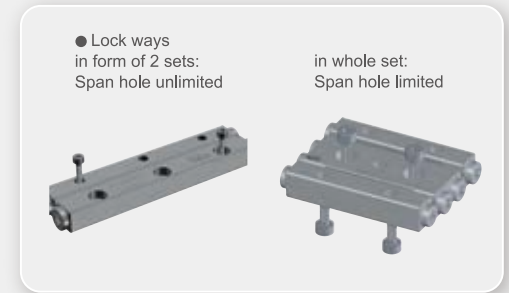
GRV-S; GRD-S Series are suitable for application to clean rooms.

© Rails have been finished with cryogenic treatment (Refer to P.0451)



## Selection Procedure- Crossed Roller Slide Rail Set

- Rolling element retainer selection upon load request :
- Heavy duty → roller, light duty → ball bearing.
- To decide "rolling element diameter"
- Model type selected per installation way.
- Specification confirmed.
- Material selection per environment :  
SUSJ2 or SUS440C.



## 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 latness. 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 bearing 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 :

- Reduce friction between running parts greatly, so that it could prevent lock and decrease abrasion.
- Forming oilfilm on rolling surface to reduce abrasion of metal medium to extend life of rolling elements.
- Covering on metal surface to prevent rust.

© Relevant request of lubricant Compatibility (Refer to P.0450)



## 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)



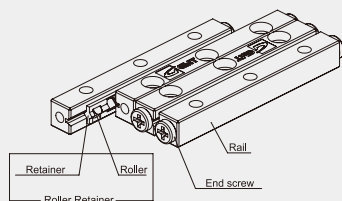
GRVP



GRDP

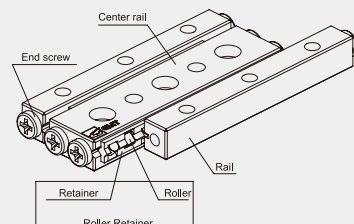


GRV (GRV-S/GRVP)



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

GRD (GRD-S/GRDP)



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 bearings 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.

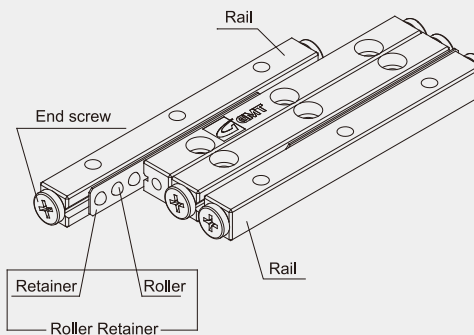
GBV



GBD

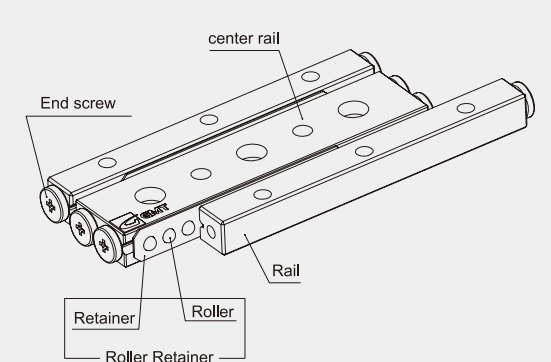


GBV



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

GBD

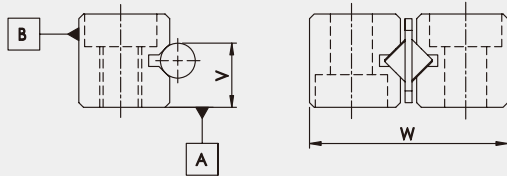


1 set =  
1 center rail + 2 rails + 2 ball retainers + 8 end screws

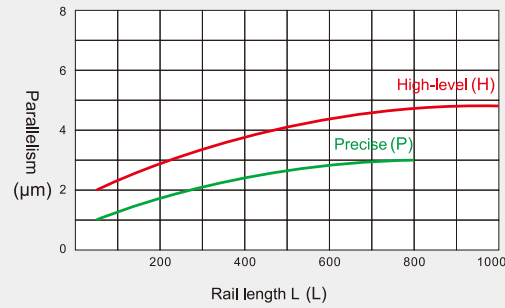


### Accuracy Specification

#### Measure way



#### Rail Length and Parallelism of Rolling Plane



#### Accuracy Level

Item	Highlevel	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 bearing, 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 unit moves alternately, to ensure a quiet movement motion.

#### Straightness

High-level(H)			Precise level(P)		
Length(mm)		Straightness (µm)	Length(mm)		Straightness (µm)
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 account 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.

$$SW \leq 0.8 S \quad S : \text{Stroke length, mm}$$

$$SW : \text{Stroke length in use, mm}$$

$$\text{If } SW=120\text{mm} \quad S \geq (1 / 0.8) \times 120=150$$

As Rail shown in GMT catalog the maximum stroke would be 154mm, product model no. is GRV04-200.

#### Allowable Load Calculation

$$F=2 (Z / 2) FU \quad Z : \text{roller quantity}$$

$$Z / 2 : \text{integer, no remainder}$$

$$FU : \text{Load capacity (N) for each roller (as catalog statistic)}$$

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

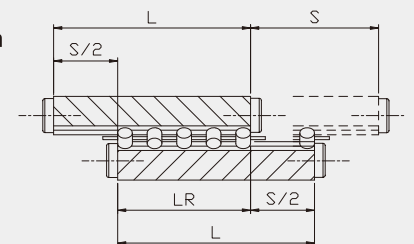
Guide length is decided by stroke length and max. slide length, and calculation depends on end screws and stopper specification. Distance between two end rollers in the retainer is to have stroke length deduct half of max. stroke length.

$$L_R = L - \frac{S}{2}$$

$L_R$  : 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 $\Sigma C$	$B^{3/4} * \cos \frac{\pi}{4} * C$	$B^{3/4} * 2^{7/9} * \cos \frac{\pi}{4} * C$	
Basic static load rating $\Sigma Co$	$B * \cos \frac{\pi}{4} * Co$	$B * 2^{7/9} * Co$	

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

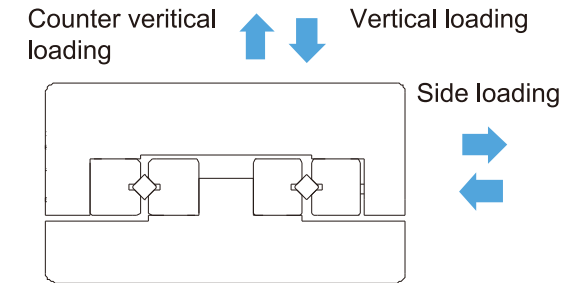
### Load Capacity of Roller

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

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



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 bearing

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

Roller bearing

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

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)

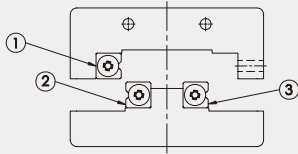
Stroke in use is less or equal to 80% of rail stroke     $Sw \leq 0.8S$

### Rail Length (L)

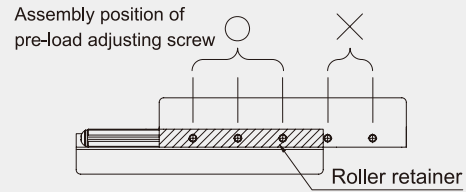
Rail length shall be higher than 1.5 times to stroke length in use, or 1.2 times to rail stroke length.  
 $L \geq 1.5Sw$     or     $L \geq 1.2S$



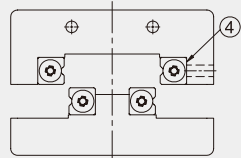
**1** Lay oil in low viscosity on contact planes, fix rail (code ①~③) with regular torque.



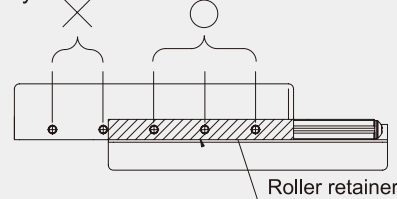
**5** Move table to end of one side, and lock pre-load adjusting screw slightly.



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

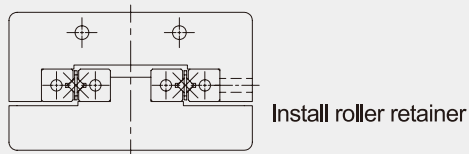


**6** Move table to the end of another side, as above description, and lock pre-load adjusting screw slightly.

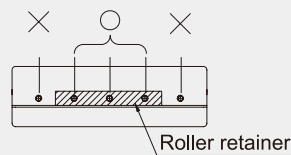


**3** Disassemble end screw from end of one side, and carefully insert roller retainer to nearby center of the rail.

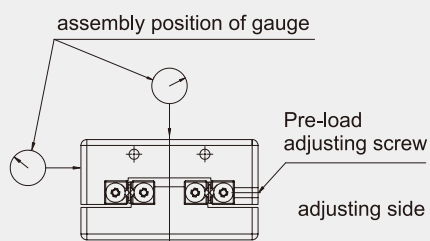
(3-1) Lock the end screw again.  
(3-2) Slowly move table back and forth to the rail end, and adjust roller retainer position to rail center.



**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.

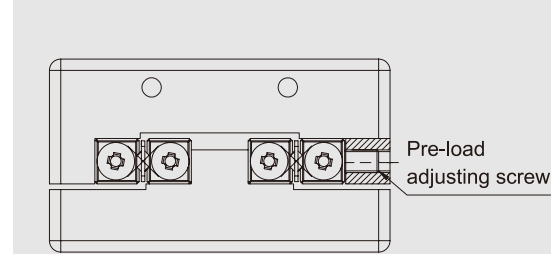


**4** Fix gauges both in center and side of the table (level plane)

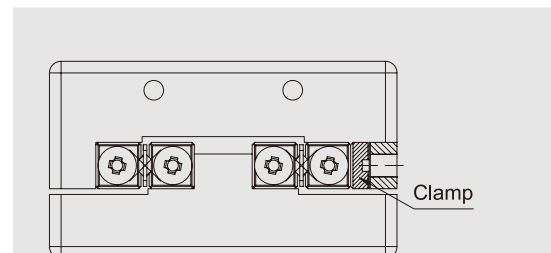


**8** Finally surely lock the rail (code ④). As steps of screw adjustment, move table back and forth, then have the table over roller retainer, and lock screws in order.

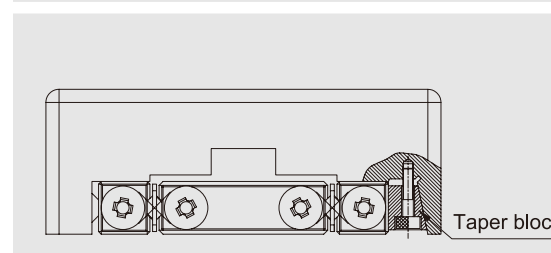
O : Loading on to pre-load adjusting screw.  
X : Loading off to pre-load adjusting screw.



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



Use clamp to meet require of accuracy and rigidity.

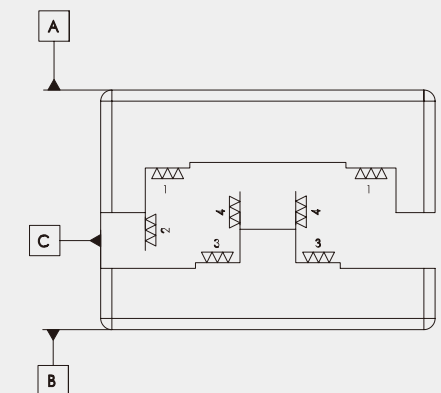


Use taper block to meet special requirement of high rigidity and high accuracy.

### 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.





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

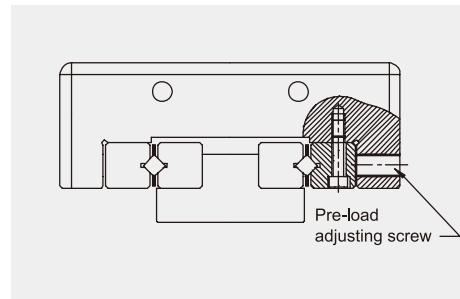
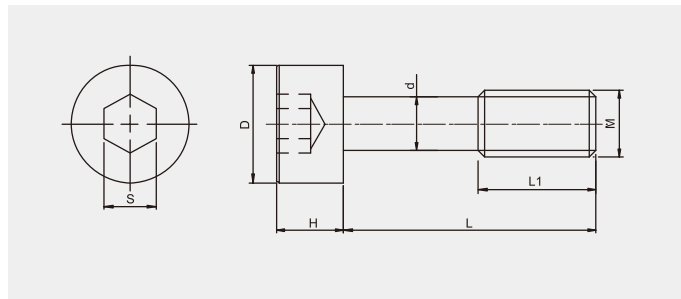
Fix Screw Lock Torque (Unit/n · m)

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.



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



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

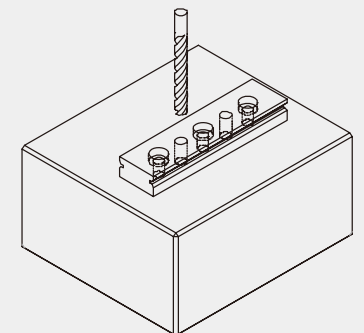
Any carelessness of falling off Crossed Roller Slide Rail Set or unusual collision and extruding, would appear identation made by contact of V-groove and rollers (ball bearings), to cause non-smooth motion, affected accuracy. Please be more careful in operation.

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.

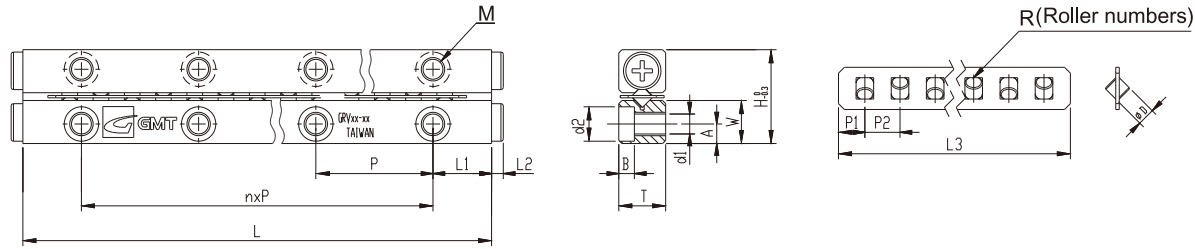
Locating Pin Hole

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

GRV / GRV - S



Specification

Model No.		Max. Stroke (mm)	Main Dimensions (mm)						Retainer Dimensions (mm)					
Standard	Antirust		H	T	W	L	n*p	L1	L2	ØD	L3	R	P1	P2
GRV00-20	GRV00-20-S	17	6.2	3	2.9	20	1*10	5	0.7	Ø1	12.4	6	1.3	2
GRV00-30	GRV00-30-S	21				30	2*10				16.4	8		
GRV00-40	GRV00-40-S	25				40	3*10				20.4	10		
GRV00-50	GRV00-50-S	29				50	4*10				24.4	12		
GRV00-60	GRV00-60-S	33				60	5*10				28.4	14		
GRV00-70	GRV00-70-S	37				70	6*10				32.4	16		
GRV00-80	GRV00-80-S	41				80	7*10				36.4	18		
GRV01-20	GRV01-20-S	13	8.5	4	3.9	20	1*10	5	1.3	Ø1.5	15.8	5	1.9	3
GRV01-30	GRV01-30-S	21				30	2*10				21.8	7		
GRV01-40	GRV01-40-S	29				40	3*10				27.8	9		
GRV01-50	GRV01-50-S	37				50	4*10				33.8	11		
GRV01-60	GRV01-60-S	45				60	5*10				39.8	13		
GRV01-70	GRV01-70-S	53				70	6*10				45.8	15		
GRV01-80	GRV01-80-S	61				80	7*10				51.8	17		
GRV02-30	GRV02-30-S	24	12	6	5.5	30	1*15	7.5	1.5	Ø2	21.6	5	2.8	4
GRV02-45	GRV02-45-S	30				45	2*15				33.6	8		
GRV02-60	GRV02-60-S	44				60	3*15				41.6	10		
GRV02-75	GRV02-75-S	58				75	4*15				49.6	12		
GRV02-90	GRV02-90-S	72				90	5*15				57.6	14		
GRV02-105	GRV02-105-S	86				105	6*15				65.6	16		
GRV02-120	GRV02-120-S	100				120	7*15				73.6	18		
GRV02-135	GRV02-135-S	106				135	8*15				85.6	21		
GRV02-150	GRV02-150-S	120				150	9*15				93.6	23		
GRV02-165	GRV02-165-S	134				165	10*15				101.6	25		
GRV02-180	GRV02-180-S	148				180	11*15				109.6	27		

Ordering Example :	GR	V	01	40	S	P
	Roller	V rail	Roller dia.	Rail length	Antirust	Precision Level

GRV / GRV - S



Material Specification

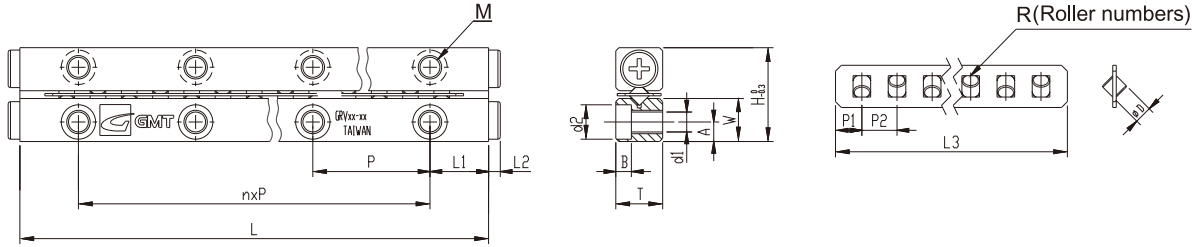
Material Component Model No.	Rail	Roller	Retainer
GRV	SUJ2		SUS304
GRV - S	SUS440C +Ni	SUS440C	

GRV-S No Surface finished to V-groove surface of the rail.

Mounting Dimensions (mm)					Load Per Roller			Weight (g) / 2 Pieces	
A	M	d1	d2	B	Basic Dynamic Load Rating	Basic Static Load Rating	Allowable Load	Standard	Antirust
1.2	M1.4	1.1	2.1	4	62N/1pcs	72N/1pcs	24N/1pcs	2.4	2.6
								3.5	3.8
								4.6	5
								5.7	6.2
								6.8	7.4
								7.9	8.6
1.8	M2	1.65	3	1.4	125N/1pcs	144N/1pcs	48N/1pcs	9	9.8
								4	4
								6	7
								8	9
								10	11
								12	13
2.5	M3	2.55	4.4	2	293N/1pcs	292N/1pcs	97N/1pcs	14	14
								16	17
								13	14
								20	21
								26	28
								32	35
								39	42
								45	48
								51	55
								58	62
								64	69
70	76								
77	82								



GRV / GRV - S



Specification

Model No.		Max. Stroke (mm)	Main Dimensions (mm)							Retainer Dimensions (mm)				
Standard	Antirust		H	T	W	L	n*p	L1	L2	ØD	L3	R	P1	P2
GRV03-50	GRV03-50-S	34	18	8	8.3	50	1*25	12.5	2	Ø3	36.4	7	3.2	5
GRV03-75	GRV03-75-S	54				75	2*25				51.4	10		
GRV03-100	GRV03-100-S	74				100	3*25				66.4	13		
GRV03-125	GRV03-125-S	104				125	4*25				76.4	15		
GRV03-150	GRV03-150-S	124				150	5*25				91.4	18		
GRV03-175	GRV03-175-S	144				175	6*25				106.4	21		
GRV03-200	GRV03-200-S	164				200	7*25				121.4	24		
GRV03-225	GRV03-225-S	184				225	8*25				136.4	27		
GRV03-250	GRV03-250-S	204				250	9*25				151.4	30		
GRV03-275	GRV03-275-S	224				275	10*25				166.4	33		
GRV03-300	GRV03-300-S	244	300	11*25	181.4	36								
GRV04-80	GRV04-80-S	54	22	11	10	80	1*40	20	2	Ø4	57.6	8	4.3	7
GRV04-120	GRV04-120-S	92				120	2*40				78.6	11		
GRV04-160	GRV04-160-S	130				160	3*40				99.6	14		
GRV04-200	GRV04-200-S	154				200	4*40				127.6	18		
GRV04-240	GRV04-240-S	192				240	5*40				148.6	21		
GRV04-280	GRV04-280-S	230				280	6*40				169.6	24		
GRV04-320	GRV04-320-S	254				320	7*40				197.6	28		
GRV04-360	GRV04-360-S	292				360	8*40				218.6	31		
GRV04-400	GRV04-400-S	330				400	9*40				239.6	34		
GRV04-440	GRV04-440-S	354				440	10*40				267.6	38		
GRV04-480	GRV04-480-S	392	480	11*40	288.6	41								

Ordering Example :	GR	V	03	75	S	P
	Roller	V rail	Roller dia.	Rail length	Antirust	Precision Level

GRV / GRV - S



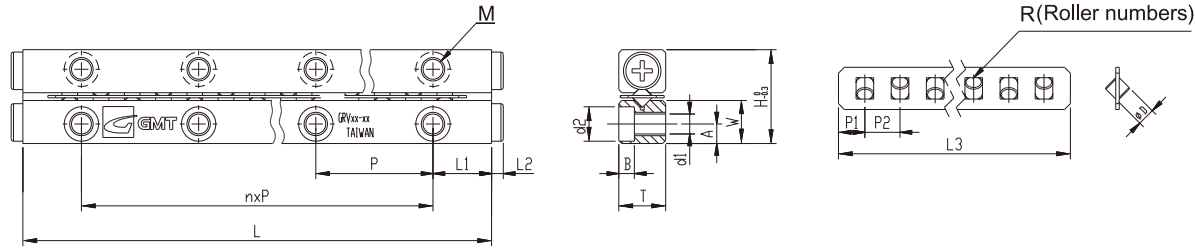
Material Specification

Material Component Model No.	Rail	Roller	Retainer
GRV	SUJ2		SUS304
GRV - S	SUS440C +Ni	SUS440C	

GRV-S No Surface finished to V-groove surface of the rail.

Mounting Dimensions (mm)					Load Per Roller			Weight (g) / 2 Pieces	
A	M	d1	d2	B	Basic Dynamic Load Rating	Basic Static Load Rating	Allowable Load	Standard	Antirust
3.5	M4	3.3	6	3.1	638N/1pcs	761N/1pcs	254N/1pcs	46	49
								68	73
								90	97
								112	120
								134	144
								157	168
								179	191
								201	215
								223	239
								245	262
267	286								
4.5	M5	4.3	7.5	4.1	1230N/1pcs	1170N/1pcs	390N/1pcs	122	130
								180	193
								238	254
								296	317
								355	380
								413	442
								472	505
								530	568
								589	631
								647	694
706	756								

GRV / GRV - S



Specification

Model No.		Max. Stroke (mm)	Main Dimensions (mm)							Retainer Dimensions (mm)				
Standard	Antirust		H	T	W	L	n*p	L1	L2	ØD	L3	R	P1	P2
GRV06-100	GRV06-100-S	80	31	15	14	100	1*50	25	2	Ø6	64.8	7	5.4	9
GRV06-150	GRV06-150-S	108				150	2*50				100.8	11		
GRV06-200	GRV06-200-S	154				200	3*50				127.8	14		
GRV06-250	GRV06-250-S	200				250	4*50				154.8	17		
GRV06-300	GRV06-300-S	246				300	5*50				181.8	20		
GRV06-350	GRV06-350-S	274				350	6*50				217.8	24		
GRV06-400	GRV06-400-S	320				400	7*50				244.8	27		
GRV06-450	GRV06-450-S	366				450	8*50				271.8	30		
GRV06-500	GRV06-500-S	412				500	9*50				298.8	33		
GRV06-550	GRV06-550-S	458				550	10*50				325.8	36		
GRV06-600	GRV06-600-S	486	600	11*50	361.8	40								
GRV09-200	/	158	44	22	20.2	200	1*100	50	3.5	Ø9	130.0	9	9	14
GRV09-300	/	246				300	2*100				186.0	13		
GRV09-400	/	306				400	3*100				256.0	18		
GRV09-500	/	394				500	4*100				312.0	22		
GRV09-600	/	482				600	5*100				368.0	26		
GRV09-700	/	570				700	6*100				424.0	30		
GRV09-800	/	658				800	7*100				480.0	34		
GRV09-900	/	746				900	8*100				536.0	38		
GRV09-1000	/	806				1000	9*100				606.0	43		
GRV09-1100	/	894				1100	10*100				662.0	47		
GRV09-1200	/	982	1200	11*100	718.0	51								
GRV12-200	/	160	58	28	26.9	200	1*100	50	3.5	Ø12	130.0	7	11	18
GRV12-300	/	216				300	2*100				202.0	11		
GRV12-400	/	308				400	3*100				256.0	14		
GRV12-500	/	400				500	4*100				310.0	17		
GRV12-600	/	492				600	5*100				364.0	20		
GRV12-700	/	548				700	6*100				436.0	24		
GRV12-800	/	640				800	7*100				490.0	27		
GRV12-900	/	732				900	8*100				544.0	30		
GRV12-1000	/	824				1000	9*100				598.0	33		
GRV12-1100	/	916				1100	10*100				652.0	36		
GRV12-1200	/	972	1200	11*100	724.0	40								

Ordering Example :	GR	V	06	200	S	P
	Roller	V rail	Roller dia.	Rail length	Antirust	Precision Level

GRV / GRV - S



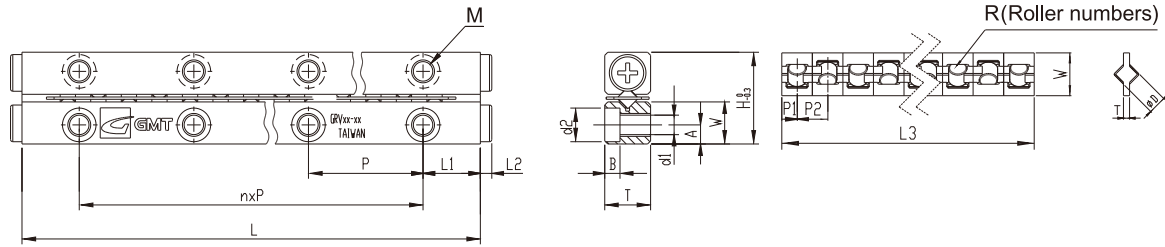
Material Specification

Material Component Model No.	Rail	Roller	Retainer
GRV	SUJ2		SUS304
GRV - S	SUS440C +Ni	SUS440C	

GRV-S No Surface finished to V-groove surface of the rail.

Mounting Dimensions (mm)					Load Per Roller			Weight (g) / 2 Pieces	
A	M	d1	d2	B	Basic Dynamic Load Rating	Basic Static Load Rating	Allowable Load	Standard	Antirust
6	M6	5.3	9.5	5.2	2570N/1pcs	2632N/1pcs	877N/1pcs	287	311
								435	466
								577	618
								721	773
								864	925
								1006	1078
								1150	1232
								1292	1385
								1436	1539
								1579	1691
9	M8	6.8	10.5	6.2	7190N/1pcs	7274N/1pcs	2425N/1pcs	1273	1846
								1267	/
								1891	/
								2509	/
								3133	/
								3756	/
								4628.1	/
								4915.2	/
								5525.3	/
								6140.9	/
6751.1	/								
7361.2	/								
12	M10	8.5	13.5	8.2	14700N/1pcs	13187N/1pcs	4396N/1pcs	2114	/
								3161	/
								4195	/
								5242	/
								6276	/
								7734.8	/
								8829.2	/
								9261.2	/
								10281.7	/
								11302.3	/
12336.4	/								

GRVP



Specification

Model No.	Max. Stroke (mm)	Main Dimensions (mm)						Retainer Dimensions (mm)					
		H	T	W	L	n*p	L1	L2	ØD	L3	R	P1	P2
GRVP01-20	8.4	8.5	4	3.9	20	1*10	5	1.3	Ø1.5	15.8	5	1.9	3
GRVP01-30	16.4				30	2*10				21.8	7		
GRVP01-40	24.4				40	3*10				27.8	9		
GRVP01-50	32.4				50	4*10				33.8	11		
GRVP01-60	40.4				60	5*10				39.8	13		
GRVP01-70	48.4				70	6*10				45.8	15		
GRVP01-80	56.4				80	7*10				51.8	17		
GRVP02-30	16.8	12	6	5.5	30	1*15	7.5	1.5	Ø2	21.6	5	2.8	4
GRVP02-45	22.8				45	2*15				33.6	8		
GRVP02-60	36.8				60	3*15				41.6	10		
GRVP02-75	50.8				75	4*15				49.6	12		
GRVP02-90	64.8				90	5*15				57.6	14		
GRVP02-105	78.8				105	6*15				65.6	16		
GRVP02-120	92.8				120	7*15				73.6	18		
GRVP02-135	98.8				135	8*15				85.6	21		
GRVP02-150	112.8				150	9*15				93.6	23		
GRVP02-165	126.8				165	10*15				101.6	25		
GRVP02-180	140.8				180	11*15				109.6	27		
GRVP03-50	27.2	18	8	8.3	50	1*25	12.5	2	Ø3	36.4	7	3.2	5
GRVP03-75	47.2				75	2*25				51.4	10		
GRVP03-100	67.2				100	3*25				66.4	13		
GRVP03-125	97.2				125	4*25				76.4	15		
GRVP03-150	117.2				150	5*25				91.4	18		
GRVP03-175	137.2				175	6*25				106.4	21		
GRVP03-200	157.2				200	7*25				121.4	24		
GRVP03-225	177.2				225	8*25				136.4	27		
GRVP03-250	197.2				250	9*25				151.4	30		
GRVP03-275	217.2				275	10*25				166.4	33		
GRVP03-300	237.2				300	11*25				181.4	36		

Ordering Example :	GR	V	P	06	100	P
	Roller	V rail	POM Retainer	Roller dia.	Rail length	Precision Level

GRVP

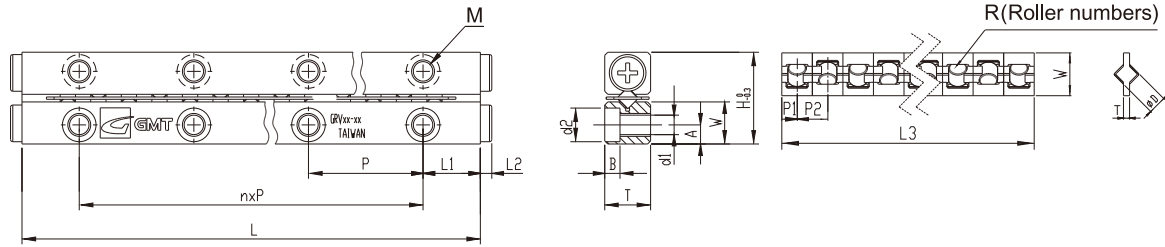


Material Specification

Material Component / Model No.	Rail	Roller	Retainer
GRVP	SUJ2		POM

Mounting Dimensions (mm)					Load Per Roller			Weight (g) / 2 Pieces
A	M	d1	d2	B	Basic Dynamic Load Rating	Basic Static Load Rating	Allowable Load	Standard
1.8	M2	1.65	3	1.4	125N/1pcs	144N/1pcs	48N/1pcs	4.0
								6.0
								8.0
								10.0
								12.0
								14.0
								16.0
2.5	M3	2.55	4.4	2	293N/1pcs	292N/1pcs	97N/1pcs	13.0
								20.0
								26.0
								32.0
								39.0
								45.0
								51.0
								58.0
								64.0
								70.0
								77.0
3.5	M4	3.3	6	3.1	638N/1pcs	761N/1pcs	254N/1pcs	46.0
								68.0
								90.0
								112.0
								134.0
								157.0
								179.0
								201.0
								223.0
								245.0
								267.0

GRVP



Specification

Model No.	Max. Stroke (mm)	Main Dimensions (mm)						Retainer Dimensions (mm)					
		H	T	W	L	n*p	L1	L2	ØD	L3	R	P1	P2
GRVP04-80	44.8	22	11	10	80	1*40	20	2	Ø4	57.6	8	4.3	7
GRVP04-120	82.8				120	2*40				78.6	11		
GRVP04-160	120.8				160	3*40				99.6	14		
GRVP04-200	144.8				200	4*40				127.6	18		
GRVP04-240	182.8				240	5*40				148.6	21		
GRVP04-280	220.8				280	6*40				169.6	24		
GRVP04-320	244.8				320	7*40				197.6	28		
GRVP04-360	282.8				360	8*40				218.6	31		
GRVP04-400	320.8				400	9*40				239.6	34		
GRVP04-440	344.8				440	10*40				267.6	38		
GRVP04-480	382.8	480	11*40	288.6	41								
GRVP06-100	70.4	31	15	14	100	1*50	25	2	Ø6	64.8	7	5.4	9
GRVP06-150	98.4				150	2*50				100.8	11		
GRVP06-200	144.4				200	3*50				127.8	14		
GRVP06-250	190.4				250	4*50				154.8	17		
GRVP06-300	236.4				300	5*50				181.8	20		
GRVP06-350	264.4				350	6*50				217.8	24		
GRVP06-400	310.4				400	7*50				244.8	27		
GRVP06-450	356.4				450	8*50				271.8	30		
GRVP06-500	402.4				500	9*50				298.8	33		
GRVP06-550	448.4				550	10*50				325.8	36		
GRVP06-600	476.4	600	11*50	361.8	40								

Ordering Example :	GR	V	P	06	100	P
	Roller	V rail	POM Retainer	Roller dia.	Rail length	Precision Level

GRVP

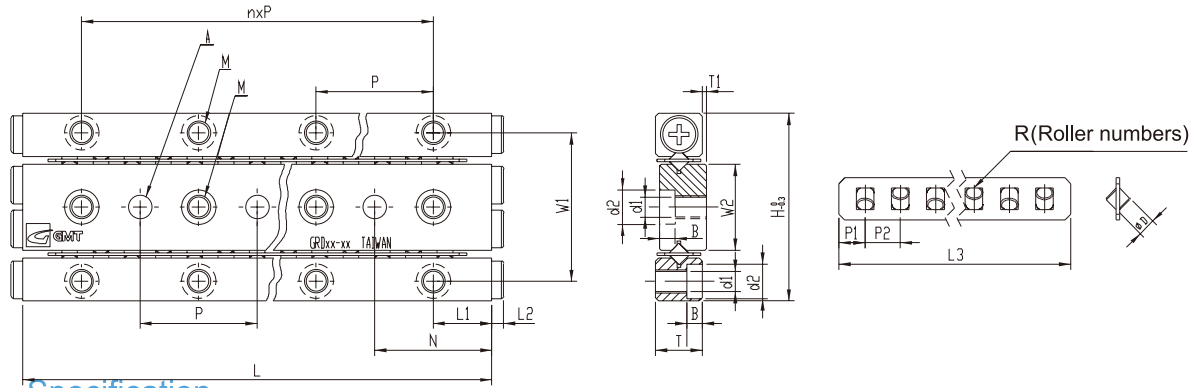


Material Specification

Material Component	Rail	Roller	Retainer
Model No.	SUJ2		POM
GRVP	SUJ2		POM

Mounting Dimensions (mm)					Load Per Roller			Weight (g) / 2 Pieces
A	M	d1	d2	B	Basic Dynamic Load Rating	Basic Static Load Rating	Allowable Load	Standard
4.5	M5	4.3	7.5	4.1	1230N/1pcs	1170N/1pcs	390N/1pcs	122
								180
								238
								296
								355
								413
								472
								530
								589
								647
706								
6	M6	5.3	9.5	5.2	2570N/1pcs	2632N/1pcs	877N/1pcs	287
								435
								577
								721
								864
								1006
								1150
								1292
								1436
								1579
1273								

GRD / GRD - S



Specification

Model No.		Max. Stroke (mm)	Main Dimensions (mm)								Retainer Dimensions (mm)					
Standard	Antirust		H	T	L	n*p	W1	W2	L1	L2	N	ØD	L3	R	P1	P2
GRD01-20	GRD01-20-S	13	17	4	20	1*10	13.4	7.8	5	1.3	10	Ø1.5	15.8	5	1.9	3
GRD01-30	GRD01-30-S	21			30	2*10							21.8	7		
GRD01-40	GRD01-40-S	29			40	3*10							27.8	9		
GRD01-50	GRD01-50-S	37			50	4*10							33.8	11		
GRD01-60	GRD01-60-S	45			60	5*10							39.8	13		
GRD01-70	GRD01-70-S	53			70	6*10							45.8	15		
GRD01-80	GRD01-80-S	61			80	7*10							51.8	17		
GRD02-30	GRD02-30-S	24	24	6	30	1*15	19	11	7.5	1.5	15	Ø2	21.6	5	2.8	4
GRD02-45	GRD02-45-S	30			45	2*15							33.6	8		
GRD02-60	GRD02-60-S	44			60	3*15							41.6	10		
GRD02-75	GRD02-75-S	58			75	4*15							49.6	12		
GRD02-90	GRD02-90-S	72			90	5*15							57.6	14		
GRD02-105	GRD02-105-S	86			105	6*15							65.6	16		
GRD02-120	GRD02-120-S	100			120	7*15							73.6	18		
GRD02-135	GRD02-135-S	106			135	8*15							85.6	21		
GRD02-150	GRD02-150-S	120			150	9*15							93.6	23		
GRD02-165	GRD02-165-S	134			165	10*15							101.6	25		
GRD02-180	GRD02-180-S	148			180	11*15							109.6	27		

Ordering Example :	GR	D	01	40	S	P
	Ball	D rail	Roller dia.	Rail length	Antirust	Precision Level

GRD / GRD - S



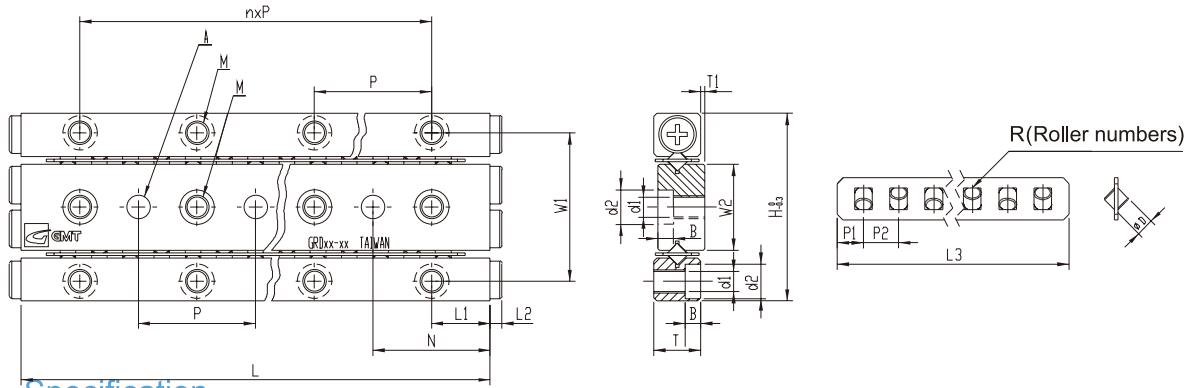
Material Specification

Material Component Model No.	Rail	Roller	Retainer
GRD	SUJ2		SUS304
GRD - S	SUS440C +Ni	SUS440C	

GRD-S No Surface finished to V-groove surface of the rail.

Mounting Dimensions (mm)						Load Rer Roller			Weight (g) / 2 Pieces	
T1	M	d1	d2	A	B	Basic Dynamic Load Rating	Basic Static Load Rating	Allowable Load	Standard	Antirust
0.5	M2	1.65	3	2 <sup>+0.010</sup> <sub>0</sub>	1.4	125N/1pcs	144N/1pcs	48N/1pcs	9	9
									13	13
									17	18
									20	22
									24	26
									29	31
33	35									
0.5	M3	2.55	4.4	3 <sup>+0.010</sup> <sub>0</sub>	2	293N/1pcs	292N/1pcs	97N/1pcs	27	29
									40	43
									53	57
									66	70
									78	84
									91	98
									104	111
									117	125
									130	139
142	153									
155	166									

GRD / GRD - S



Specification

Model No.		Max. Stroke (mm)	Main Dimensions (mm)									Retainer Dimensions (mm)				
Standard	Antirust		H	T	L	n*p	W1	W2	L1	L2	N	ØD	L3	R	P1	P2
GRD03-50	GRD03-50-S	34	36	8	50	1*25	29	16.6	12.5	3	25	Ø3	36.4	7	3.2	5
GRD03-75	GRD03-75-S	54			75	2*25							51.4	10		
GRD03-100	GRD03-100-S	74			100	3*25							66.4	13		
GRD03-125	GRD03-125-S	104			125	4*25							76.4	15		
GRD03-150	GRD03-150-S	124			150	5*25							91.4	18		
GRD03-175	GRD03-175-S	144			175	6*25							106.4	21		
GRD03-200	GRD03-200-S	164			200	7*25							121.4	24		
GRD03-225	GRD03-225-S	184			225	8*25							136.4	27		
GRD03-250	GRD03-250-S	204			250	9*25							151.4	30		
GRD03-275	GRD03-275-S	224			275	10*25							166.4	33		
GRD03-300	GRD03-300-S	244	300	11*25	181.4	36										
GRD04-80	GRD04-80-S	54	44	11	80	1*40	35	20	20	2	40	Ø4	57.6	8	4.3	7
GRD04-120	GRD04-120-S	92			120	2*40							78.6	11		
GRD04-160	GRD04-160-S	130			160	3*40							99.6	14		
GRD04-200	GRD04-200-S	154			200	4*40							127.6	18		
GRD04-240	GRD04-240-S	192			240	5*40							148.6	21		
GRD04-280	GRD04-280-S	230			280	6*40							169.6	24		
GRD04-320	GRD04-320-S	254			320	7*40							197.6	28		
GRD04-360	GRD04-360-S	292			360	8*40							218.6	31		
GRD04-400	GRD04-400-S	330			400	9*40							239.6	34		
GRD04-440	GRD04-440-S	354			440	10*40							267.6	38		
GRD04-480	GRD04-480-S	392	480	11*40	288.6	41										

Ordering Example :	GR	D	03	75	S	P
	Ball	D rail	Roller dia.	Rail length	Antirust	Precision Level

GRD / GRD - S



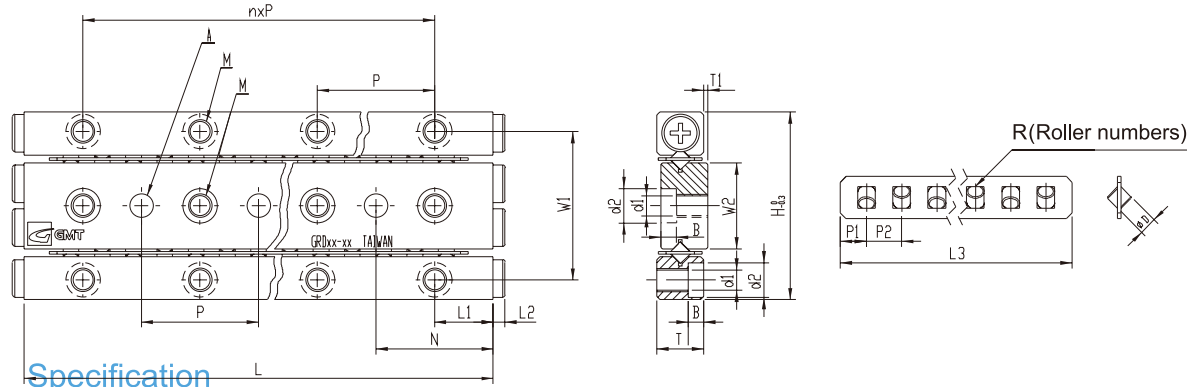
Material Specification

Material Component / Model No.	Rail	Roller	Retainer
GRD	SUJ2		SUS304
GRD - S	SUS440C +Ni	SUS440C	

GRD-S No Surface finished to V-groove surface of the rail.

Mounting Dimensions (mm)						Load Per Roller			Weight (g) / 2 Pieces	
T1	M	d1	d2	A	B	Basic Dynamic Load Rating	Basic Static Load Rating	Allowable Load	Standard	Antirust
0.5	M4	3.3	6	4 <sup>+0.012</sup> <sub>0</sub>	3.1	638N/1pcs	761N/1pcs	254N/1pcs	94	101
									139	148
									183	196
									228	244
									273	292
									317	340
									362	387
									406	435
									451	483
									496	531
540	579									
0.5	M5	4.3	7.5	5 <sup>+0.012</sup> <sub>0</sub>	4.1	1230N/1pcs	1170N/1pcs	390N/1pcs	248	265
									366	392
									484	518
									602	645
									722	773
									840	900
									959	1028
									1079	1156
									1197	1283
									1316	1411
1434	1538									

GRDP



Specification

Model No.	Max. Stroke (mm)	Main Dimensions (mm)								Retainer Dimensions (mm)					
		H	T	L	n*p	W1	W2	L1	L2	N	ØD	L3	R	P1	P2
GRDP01-20	13	17	4	20	1*10	13.4	7.8	5	1.3	10	Ø1.5	15.8	5	1.9	3
GRDP01-30	21			30	2*10							21.8	7		
GRDP01-40	29			40	3*10							27.8	9		
GRDP01-50	37			50	4*10							33.8	11		
GRDP01-60	45			60	5*10							39.8	13		
GRDP01-70	53			70	6*10							45.8	15		
GRDP01-80	61			80	7*10							51.8	17		
GRDP02-30	24	24	6	30	1*15	19	11	7.5	1.5	15	Ø2	21.6	5	2.8	4
GRDP02-45	30			45	2*15							33.6	8		
GRDP02-60	44			60	3*15							41.6	10		
GRDP02-75	58			75	4*15							49.6	12		
GRDP02-90	72			90	5*15							57.6	14		
GRDP02-105	86			105	6*15							65.6	16		
GRDP02-120	100			120	7*15							73.6	18		
GRDP02-135	106			135	8*15							85.6	21		
GRDP02-150	120			150	9*15							93.6	23		
GRDP02-165	134			165	10*15							101.6	25		
GRDP02-180	148	180	11*15	109.6	27										
GRDP03-50	34	36	8	50	1*25	29	16.6	12.5	2	2.5	Ø3	36.4	7	3.2	5
GRDP03-75	54			75	2*25							51.4	10		
GRDP03-100	74			100	3*25							66.4	13		
GRDP03-125	104			125	4*25							76.4	15		
GRDP03-150	124			150	5*25							91.4	18		
GRDP03-175	144			175	6*25							106.4	21		
GRDP03-200	164			200	7*25							121.4	24		
GRDP03-225	184			225	8*25							136.4	27		
GRDP03-250	204			250	9*25							151.4	30		
GRDP03-275	224			275	10*25							166.4	33		
GRDP03-300	244	300	11*25	181.4	36										
GRDP04-80	54	44	11	80	1*40	35	20	20	2	40	Ø4	57.6	8	4.3	7
GRDP04-120	92			120	2*40							78.6	11		
GRDP04-160	130			160	3*40							99.6	14		
GRDP04-200	154			200	4*40							127.6	18		
GRDP04-240	192			240	5*40							148.6	21		
GRDP04-280	230			280	6*40							169.6	24		
GRDP04-320	254			320	7*40							197.6	28		
GRDP04-360	292			360	8*40							218.6	31		
GRDP04-400	330			400	9*40							239.6	34		
GRDP04-440	354			440	10*40							267.6	38		
GRDP04-480	392	480	11*40	288.6	41										

Ordering Example :	GR	D	P	03	75	P
	Roller	D rail	POM Retainer	Roller dia.	Rail length	Precision Level

GRDP

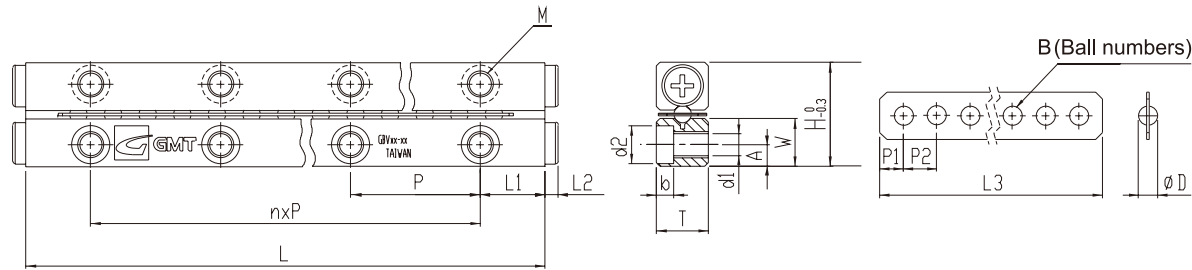


Material Specification

Material Component	Rail	Roller	Retainer
Model No.			
GRDP	SUJ2		POM

Mounting Dimensions (mm)						Load Per Roller			Weight (g) / 2 Pieces
T1	M	d1	d2	A	B	Basic Dynamic Load Rating	Basic Static Load Rating	Allowable Load	Standard
0.5	M2	1.65	3	2 <sup>+0.010</sup>	1.4	125N/1pcs	144N/1pcs	48N/1pcs	9
									13
									17
									20
									24
									29
									33
0.5	M3	2.55	4.4	3 <sup>+0.010</sup>	2	293N/1pcs	292N/1pcs	97N/1pcs	27
									40
									53
									66
									78
									91
									104
0.5	M4	3.3	6	4 <sup>+0.012</sup>	3.1	638N/1pcs	761N/1pcs	254N/1pcs	117
									130
									142
									155
									183
									228
									273
0.5	M5	4.3	7.5	5 <sup>+0.012</sup>	4.1	1230N/1pcs	1170N/1pcs	390N/1pcs	317
									362
									406
									451
									496
									540
									585
630									
675									
720									
765									
810									
855									
900									
945									
990									
1035									
1080									
1125									
1170									
1215									
1260									
1305									
1350									
1395									
1440									

GBV



Specification

Model No.	Max. Stroke (mm)	Main Dimensions (mm)						Retainer Dimensions (mm)					
		H	T	W	L	n*p	L1	L2	ØD	L3	B	P1	P2
GBV01-20	13	8.5	4	3.9	20	1*10	5	1.3	Ø1.5	15.5	5	1.75	3
GBV01-30	21				30	2*10				21.5	7		
GBV01-40	29				40	3*10				27.5	9		
GBV01-50	37				50	4*10				33.5	11		
GBV01-60	45				60	5*10				39.5	13		
GBV01-70	53				70	6*10				45.5	15		
GBV01-80	61				80	7*10				51.5	17		
GBV02-30	24	12	6	5.5	30	1*15	7.5	1.5	Ø2	20.6	5	2.3	4
GBV02-45	30				45	2*15				32.6	8		
GBV02-60	44				60	3*15				40.6	10		
GBV02-75	58				75	4*15				48.6	12		
GBV02-90	72				90	5*15				56.6	14		
GBV02-105	86				105	6*15				64.6	16		
GBV02-120	100				120	7*15				72.6	18		
GBV02-135	106				135	8*15				84.6	21		
GBV02-150	120				150	9*15				92.6	23		
GBV02-165	134				165	10*15				100.6	25		
GBV02-180	148				180	11*15				108.6	27		

Ordering Example :	GB	V	01	40	P
	Ball	V rail	Ball dia.	Rail length	Precision Level

GBV



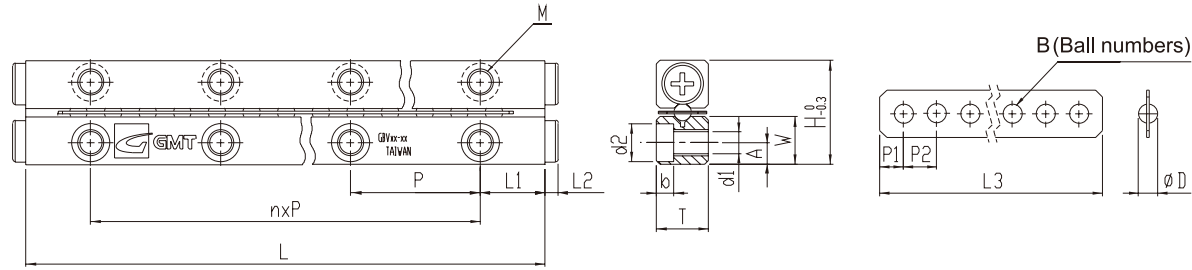
Material Specification

Material Component	Rail	Ball Bearing	Retainer
Model No.			
GBV		SUJ2	Phosphor bronze (C5191)

Mounting Dimensions (mm)					Load Per Ball Bearing			Weight (g) / 2 Pieces
A	M	d1	d2	b	Basic Dynamic Load Rating	Basic Static Load Rating	Allowable Load	Standard
1.8	M2	1.65	3	1.4	7.6N/1pcs	21N/1pcs	7.0N/1pcs	4
								6
								8
								10
								12
								14
2.5	M3	2.55	4.4	2	12N/1pcs	37N/1pcs	12.3N/1pcs	16
								13
								20
								26
								32
								39
								45
								51
								58
								64
								70
77								



GBV



Specification

Model No.	Max. Stroke (mm)	Main Dimensions (mm)						Retainer Dimensions (mm)					
		H	T	W	L	n*p	L1	L2	ØD	L3	B	P1	P2
GBV03-50	34	18	8	8.3	50	1*25	12.5	2	Ø3	35.7	7	2.86	5
GBV03-75	54				75	2*25				50.7	10		
GBV03-100	74				100	3*25				65.7	13		
GBV03-125	104				125	4*25				75.7	15		
GBV03-150	124				150	5*25				90.7	18		
GBV03-175	144				175	6*25				105.7	21		
GBV03-200	164				200	7*25				120.7	24		
GBV03-225	184				225	8*25				135.7	27		
GBV03-250	204				250	9*25				150.7	30		
GBV03-275	224				275	10*25				165.7	33		
GBV03-300	244				300	11*25				180.7	36		
GBV04-80	54	22	11	10	80	1*40	20	2	Ø4	56.8	8	3.9	7
GBV04-120	92				120	2*40				77.8	11		
GBV04-160	130				160	3*40				98.8	14		
GBV04-200	154				200	4*40				126.8	18		
GBV04-240	192				240	5*40				147.8	21		
GBV04-280	230				280	6*40				168.8	24		
GBV04-320	254				320	7*40				196.8	28		
GBV04-360	292				360	8*40				217.8	31		
GBV04-400	330				400	9*40				238.8	34		
GBV04-440	354				440	10*40				266.8	38		
GBV04-480	392				480	11*40				287.8	41		

Ordering Example :	GB	V	03	75	P
	Ball	V rail	Ball dia.	Rail length	Precision Level

GBV

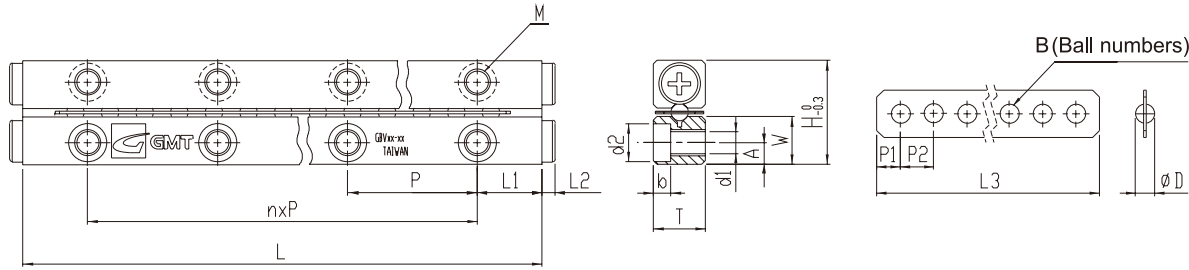


Material Specification

Material Component	Rail	Ball Bearing	Retainer
Model No.			
GBV		SUJ2	Phosphor bronze (C5191)

Mounting Dimensions (mm)					Load Per Ball Bearing			Weight (g) / 2 Pieces
A	M	d1	d2	b	Basic Dynamic Load Rating	Basic Static Load Rating	Allowable Load	Standard
3.5	M4	3.3	6	3.1	26.5N/1pcs	84N/1pcs	28N/1pcs	46
								68
								90
								112
								134
								156
								178
								200
								222
								244
								266
4.5	M5	4.3	7.5	4.1	43N/1pcs	148N/1pcs	49.3N/1pcs	121
								179
								237
								295
								353
								411
								470
								528
								586
								645
								703

GBV



Specification

Model No.	Max. Stroke (mm)	Main Dimensions (mm)						Retainer Dimensions (mm)					
		H	T	W	L	n*p	L1	L2	ØD	L3	B	P1	P2
GBV06-100	80	31	15	14	100	1*50	25	2	6	63.6	7	4.8	9
GBV06-150	108				150	2*50				99.6	11		
GBV06-200	154				200	3*50				126.6	14		
GBV06-250	200				250	4*50				153.6	17		
GBV06-300	246				300	5*50				180.6	20		
GBV06-350	274				350	6*50				216.6	24		
GBV06-400	320				400	7*50				243.6	27		
GBV06-450	366				450	8*50				270.6	30		
GBV06-500	412				500	9*50				297.6	33		
GBV06-550	458				550	10*50				324.6	36		
GBV06-600	486	600	11*50	360.6	40								

GBV

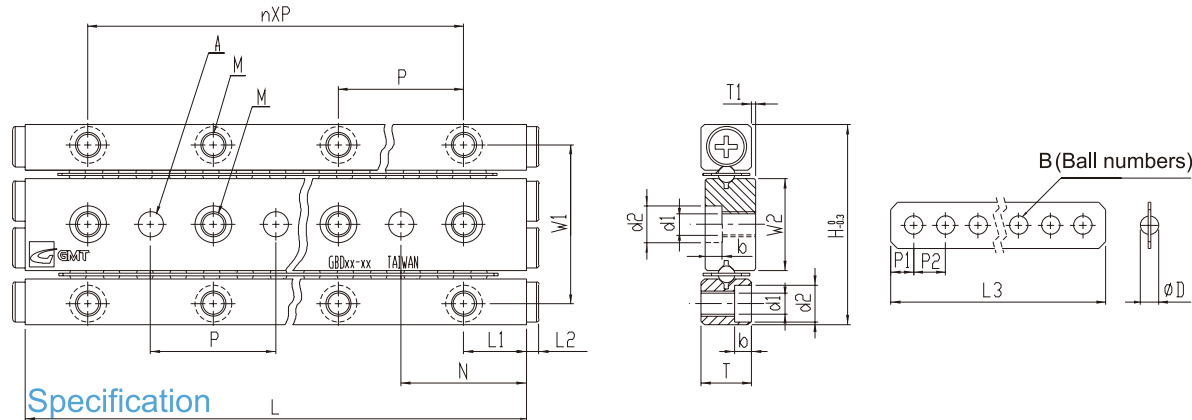


Material specification

Material Component	Rail	Ball Bearing	Retainer
Model No.			
GBV	SUJ2		Phosphor bronze (C5191)

Mounting Dimensions (mm)					Load Per Ball Bearing			Weight (g) / 2 Pieces
A	M	d1	d2	b	Basic Dynamic Load Rating	Basic Static Load Rating	Allowable Load	Standard
6	M6	5.3	9.5	5.2	92N/1pcs	330N/1pcs	110N/1pcs	287
								429
								571
								712
								852
								993
								1135
								1275
								1417
								1558
								1250

GBD



Specification

Model No.	Max. Stroke (mm)	Main Dimensions (mm)									Retainer Dimensions (mm)					
		H	T	L	n*p	W1	W2	L1	L2	N	ØD	L3	B	P1	P2	T1
GBD01-20	13	17	4	20	1*10	13.4	7.8	5	1.3	10	Ø1.5	15.5	5	1.75	3	0.5
GBD01-30	21			30	2*10							21.5	7			
GBD01-40	29			40	3*10							27.5	9			
GBD01-50	37			50	4*10							33.5	11			
GBD01-60	45			60	5*10							39.5	13			
GBD01-70	53			70	6*10							45.5	15			
GBD01-80	61			80	7*10							51.5	17			
GBD02-30	24	24	6	30	1*15	19	11	7.5	1.5	15	Ø2	20.6	5	2.3	4	0.5
GBD02-45	30			45	2*15							32.6	8			
GBD02-60	44			60	3*15							40.6	10			
GBD02-75	58			75	4*15							48.6	12			
GBD02-90	72			90	5*15							56.6	14			
GBD02-105	86			105	6*15							64.6	16			
GBD02-120	100			120	7*15							72.6	18			
GBD02-135	106			135	8*15							84.6	21			
GBD02-150	120			150	9*15							92.6	23			
GBD02-165	134			165	10*15							100.6	25			
GBD02-180	148			180	11*15							108.6	27			

Ordering Example :	GB	D	01	40	P
	Ball	D rail	Ball dia.	Rail length	Precision Level

GBD

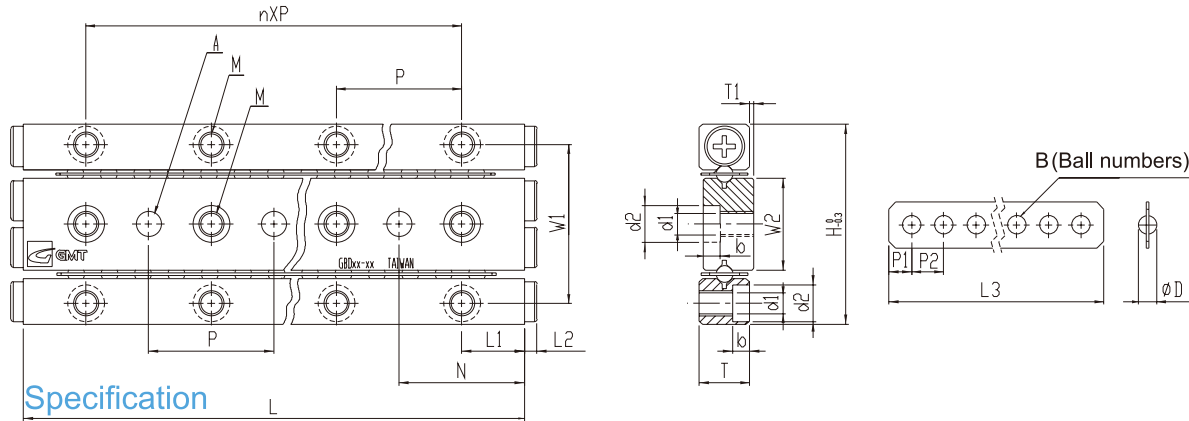


Material Specification

Material Component	Rail	Ball Bearing	Retainer
Model No.			
GBD	SUJ2		Phosphor bronze (C5191)

Mounting Dimensions (mm)					Load Per Ball Bearing			Weight (g) / 2 Pieces
M	d1	d2	A	B	Basic Dynamic Load Rating	Basic Static Load Rating	Allowable Load	Standard
M2	1.65	3	2 <sup>+0.010</sup> <sub>0</sub>	1.4	7.6N/1pcs	21N/1pcs	7.0N/1pcs	9
								13
								16
								20
								24
								28
M3	2.55	4.4	3 <sup>+0.010</sup> <sub>0</sub>	2	12N/1pcs	37N/1pcs	12.3N/1pcs	33
								27
								40
								53
								66
								78
								91
								104
								117
129								
142								
155								

GBD



Specification

Model No.	Max. Stroke (mm)	Main Dimensions (mm)									Retainer Dimensions (mm)					
		H	T	L	n*p	W1	W2	L1	L2	N	ØD	L3	B	P1	P2	T1
GBD03-50	34	36	8	50	1*25	29	16.6	12.5	2	25	Ø3	35.7	7	2.86	5	0.5
GBD03-75	54			75	2*25							50.7	10			
GBD03-100	74			100	3*25							65.7	13			
GBD03-125	104			125	4*25							75.7	15			
GBD03-150	124			150	5*25							90.7	18			
GBD03-175	144			175	6*25							105.7	21			
GBD03-200	164			200	7*25							120.7	24			
GBD03-225	184			225	8*25							135.7	27			
GBD03-250	204			250	9*25							150.7	30			
GBD03-275	224			275	10*25							165.7	33			
GBD03-300	244	300	11*25	180.7	36											
GBD04-80	54	44	11	80	1*40	35	20	20	2	40	Ø4	56.8	8	3.9	7	0.5
GBD04-120	92			120	2*40							77.8	11			
GBD04-160	130			160	3*40							98.8	14			
GBD04-200	154			200	4*40							126.8	18			
GBD04-240	192			240	5*40							147.8	21			
GBD04-280	230			280	6*40							168.8	24			
GBD04-320	254			320	7*40							196.8	28			
GBD04-360	292			360	8*40							217.8	31			
GBD04-400	330			400	9*40							238.8	34			
GBD04-440	354			440	10*40							266.8	38			
GBD04-480	392	480	11*40	287.8	41											

Ordering Example :	GB	D	03	75	P
	Ball	D rail	Ball dia.	Rail length	Precision Level

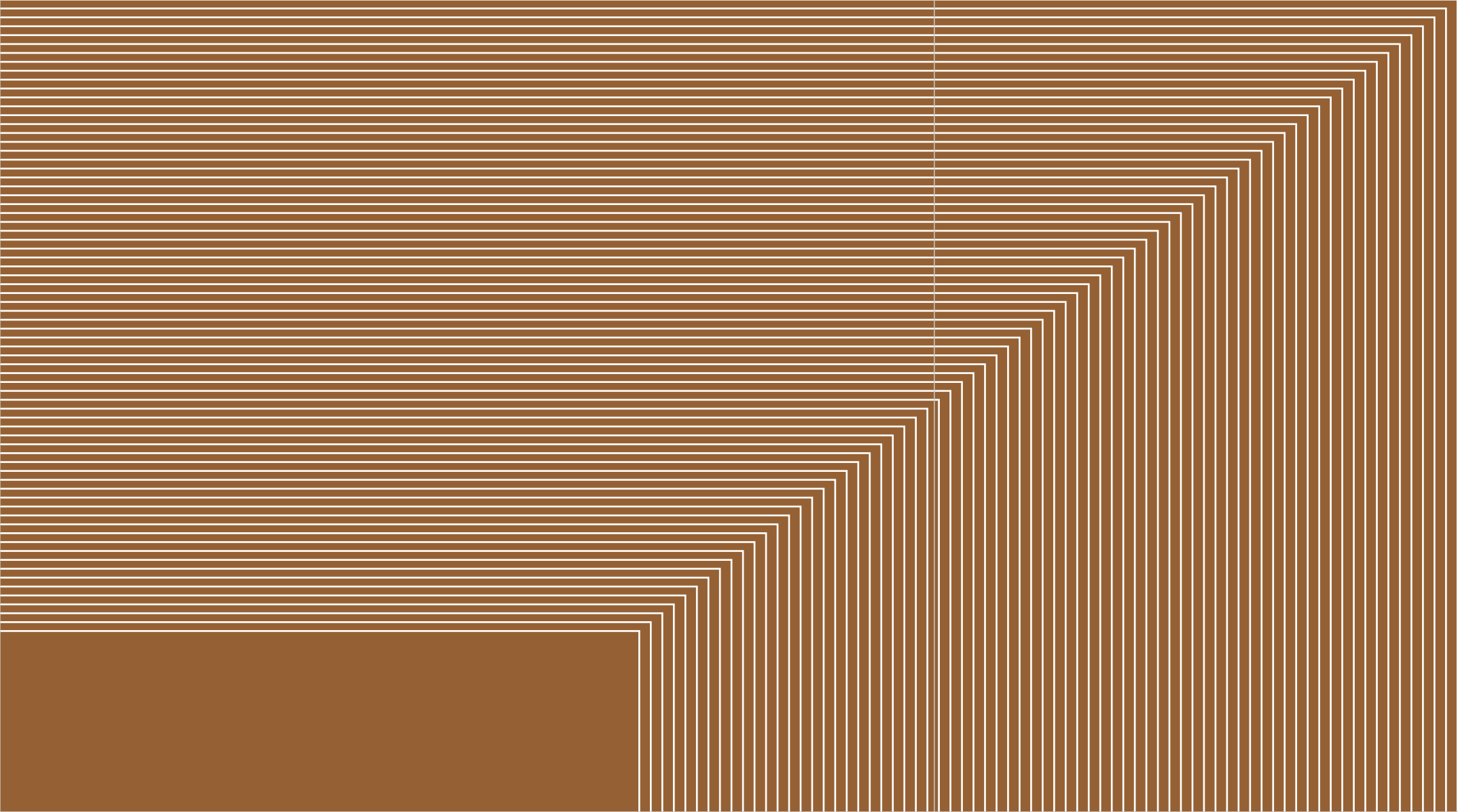
GBD



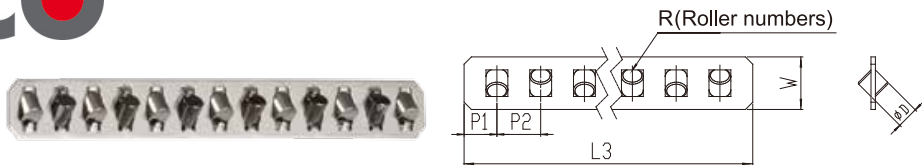
Material Specification

Material Component	Rail	Ball Bearing	Retainer
Model No.			
GBD		SUJ2	Phosphor bronze (C5191)

Mounting Dimensions (mm)					Load Per Ball Bearing			Weight (g) / 2 Pieces
M	d1	d2	A	b	Basic Dynamic Load Rating	Basic Static Load Rating	Allowable Load	Standard
M4	3.3	6	4 <sup>+0.012</sup>	3.1	26.5N/1pcs	84N/1pcs	28N/1pcs	94
								139
								183
								228
								272
								317
								361
								406
								450
								495
539								
M5	4.3	7.5	5 <sup>+0.012</sup>	4.1	43N/1pcs	148N/1pcs	49.3N/1pcs	247
								365
								483
								601
								720
								838
								957
								1076
								1194
								1314
1432								



Product  
Specification  
**Retainer**



Guide code, EX : GR0206 GR= roller (GB=ball), 02=diameter, 06= roller numbers

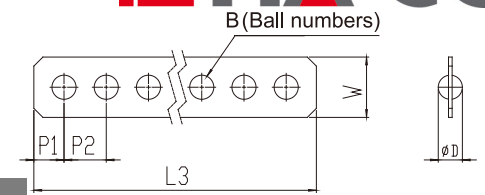
Model no.	Retainer dimensions (mm)					Basic dynamic load rating C N	Basic static load rating Co N	Material standard / Antirust		Material corrosion-resisting	
	ØD	P1	P2	T (thickness)	W (width)			Retainer	Roller	Retainer	Roller
GR01	Ø1.5	1.9	3	0.2	3.75	125	144	SUS304	SUJ2	SUS304	SUS440C
GR02	Ø2.0	2.8	4	0.3	5.50	293	292				
GR03	Ø3.0	3.2	5	0.4	7.50	638	761				
GR04	Ø4.0	4.3	7	0.5	9.80	1230	1170				
GR06	Ø6.0	5.4	9	0.8	14.00	2570	2632				
GR09	Ø9.0	9.0	14	1.0	20.50	7190	7274				
GR12	Ø12.0	11.0	18	1.2	26.50	14700	13187				

Model no.	Retainer dimensions (mm)						Rail length	Model no.	Retainer dimensions (mm)						Rail length		
	ØD	P1	P2	T (thickness)	W (width)	L3 (length)			R (roller qty)	ØD	P1	P2	T (thickness)	W (width)		L3 (length)	R (roller qty)
GR0105	Ø1.5	1.9	3	0.2	3.75	15.8	5	GRV01-20	GR0408	Ø4	4.3	7	0.5	9.8	57.6	8	GRV04-80
GR0107						21.8	7	GRV01-30	GR0411						78.6	11	GRV04-120
GR0109						27.8	9	GRV01-40	GR0414						99.6	14	GRV04-160
GR0111						33.8	11	GRV01-50	GR0418						127.6	18	GRV04-200
GR0113						39.8	13	GRV01-60	GR0421						148.6	21	GRV04-240
GR0115						45.8	15	GRV01-70	GR0424						169.6	24	GRV04-280
GR0117	51.8	17	GRV01-80	GR0428	197.6	28	GRV04-320										
GR0205	Ø2	2.8	4	0.3	5.5	21.6	5	GRV02-30	GR0431	Ø6	5.4	9	0.8	14	218.6	31	GRV04-360
GR0208						33.6	8	GRV02-45	GR0434						239.6	34	GRV04-400
GR0210						41.6	10	GRV02-60	GR0438						267.6	38	GRV04-440
GR0212						49.6	12	GRV02-75	GR0441						288.6	41	GRV04-480
GR0214						57.6	14	GRV02-90	GR0607						64.8	7	GRV06-100
GR0216						65.6	16	GRV02-105	GR0611						100.8	11	GRV06-150
GR0218						73.6	18	GRV02-120	GR0614						127.8	14	GRV06-200
GR0221						85.6	21	GRV02-135	GR0617						154.8	17	GRV06-250
GR0223						93.6	23	GRV02-150	GR0620						181.8	20	GRV06-300
GR0225						101.6	25	GRV02-165	GR0624						217.8	24	GRV06-350
GR0227						109.6	27	GRV02-180	GR0627						244.8	27	GRV06-400
GR0307						36.4	7	GRV03-50	GR0630						271.8	30	GRV06-450
GR0310	51.4	10	GRV03-75	GR0633	298.8	33	GRV06-500										
GR0313	66.4	13	GRV03-100	GR0636	325.8	36	GRV06-550										
GR0315	76.4	15	GRV03-125	GR0640	361.8	40	GRV06-600										
GR0318	91.4	18	GRV03-150	GR0909	130	9	GRV09-200										
GR0321	106.4	21	GRV03-175	GR0913	186	13	GRV09-300										
GR0324	121.4	24	GRV03-200	GR0918	256	18	GRV09-400										
GR0327	136.4	27	GRV03-225	GR0922	312	22	GRV09-500										
GR0330	151.4	30	GRV03-250	GR0926	368	26	GRV09-600										
GR0333	166.4	33	GRV03-275	GR1207	130	7	GRV12-200										
GR0336	181.4	36	GRV03-300	GR1211	202	11	GRV12-300										
					GR1214	256	14	GRV12-400									
					GR1217	310	17	GRV12-500									
					GR1220	364	20	GRV12-600									

Model no.	GR	02	08
	Roller	Diameter	Roller numbers
	GR-S	02	08
	Roller Antirust Material	Diameter	Roller numbers

GR	03	12	03
Type	Dia	Roller(ball) qty	Roller(ball) material
GR : Roller	01=Ø1.5	per request	S : SUS440C
	02=Ø2		
	03=Ø3		
	04=Ø4		
	06=Ø6		

★ Customized specification, purchasement per appoint roller quantity with the standard roller diameter.



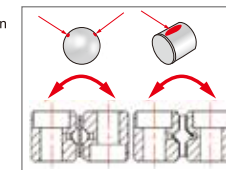
Guide code, EX : GB0310 GB= BALL (GR=roller), 02=Diameter, 10= ball numbers

Model no.	Retainer dimensions (mm)					Basic dynamic load rating C N	Basic static load rating Co N	Material standard	
	ØD	P1	P2	T (thickness)	W (width)			Retainer	Ball
GB01	Ø1.5	1.75	3	0.2	3.5	7.6	21.0	Phosphory bronze (C5191)	SUJ2
GB02	Ø2.0	2.30	4	0.3	5.0	12.0	37.0		
GB03	Ø3.0	2.86	5	0.4	7.0	26.5	84.0		
GB04	Ø4.0	3.90	7	0.5	9.0	43.0	148.0		
GB06	Ø6.0	4.80	9	0.6	13.5	92.0	330.0		

Model no.	Retainer dimensions (mm)						Rail length	Model no.	Retainer dimensions (mm)						Rail length		
	ØD	P1	P2	T (thickness)	W (width)	L3 (length)			R (ball qty)	ØD	P1	P2	T (thickness)	W (width)		L3 (length)	R (ball qty)
GB0105	Ø1.5	1.75	3	0.2	3.5	15.5	5	GBV01-20	GB0408	Ø4	3.9	7	0.5	9	56.8	8	GBV04-80
GB0107						21.5	7	GBV01-30	GB0411						77.8	11	GBV04-120
GB0109						27.5	9	GBV01-40	GB0414						98.8	14	GBV04-160
GB0111						33.5	11	GBV01-50	GB0418						126.8	18	GBV04-200
GB0113						39.5	13	GBV01-60	GB0421						147.8	21	GBV04-240
GB0115						45.5	15	GBV01-70	GB0424						168.8	24	GBV04-280
GB0117	51.5	17	GBV01-80	GB0428	196.8	28	GBV04-320										
GB0205	Ø2	2.3	4	0.3	5	20.6	5	GBV02-30	GB0431	Ø6	4.8	9	0.6	13.5	217.8	31	GBV04-360
GB0208						32.6	8	GBV02-45	GB0434						238.8	34	GBV04-400
GB0210						40.6	10	GBV02-60	GB0438						266.8	38	GBV04-440
GB0212						48.6	12	GBV02-75	GB0441						287.8	41	GBV04-480
GB0214						56.6	14	GBV02-90	GB0607						63.6	7	GBV06-100
GB0216						64.6	16	GBV02-105	GB0611						99.6	11	GBV06-150
GB0218						72.6	18	GBV02-120	GB0614						126.6	14	GBV06-200
GB0221						84.6	21	GBV02-135	GB0617						153.6	17	GBV06-250
GB0223						92.6	23	GBV02-150	GB0620						180.6	20	GBV06-300
GB0225						100.6	25	GBV02-165	GB0624						216.6	24	GBV06-350
GB0227						108.6	27	GBV02-180	GB0627						243.6	27	GBV06-400
GB0307						Ø3	2.86	5	0.4						7	35.7	7
GB0310	50.7	10	GBV03-75	GB0633	297.6					33	GBV06-500						
GB0313	65.7	13	GBV03-100	GB0636	324.6					36	GBV06-550						
GB0315	75.7	15	GBV03-125	GB0640	360.6					40	GBV06-600						
GB0318	90.7	18	GBV03-150														
GB0321	105.7	21	GBV03-175														
GB0324	120.7	24	GBV03-200														
GB0327	135.7	27	GBV03-225														
GB0330	150.7	30	GBV03-250														
GB0333	165.7	33	GBV03-275														
GB0336	180.7	36	GBV03-300														

Model no.	GB	03	10
	Ball	Dia.	Ball qty

● Character comparison of roller & ball



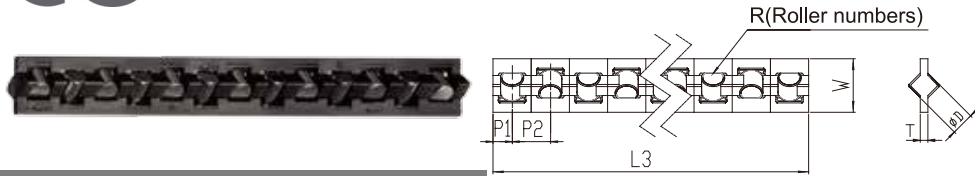
● Suggestion :

- (1)Ball type : Usually in light load, high speed, retainer is made of bronze alloy.
- (2)Roller type : Usually in mid-high load, high speed, retainer is made per environment request.
- (3)Running inertial, temperature rise, and environment shall be all taken into account while using.

Item	Roller	Ball
Rigidity	○○○○	○○
Load	○○○○	○○
Accuracy	○○○○	○○○
Life	○○○○	○○○
Friction	○○	○○○○
Speed	○○	○○○○

◎ : Normal ○○○ : Good ○○○○ : Better ○○○○○ : Best

★ Customized specification, purchasement per appoint roller quantity with the standard roller diameter.



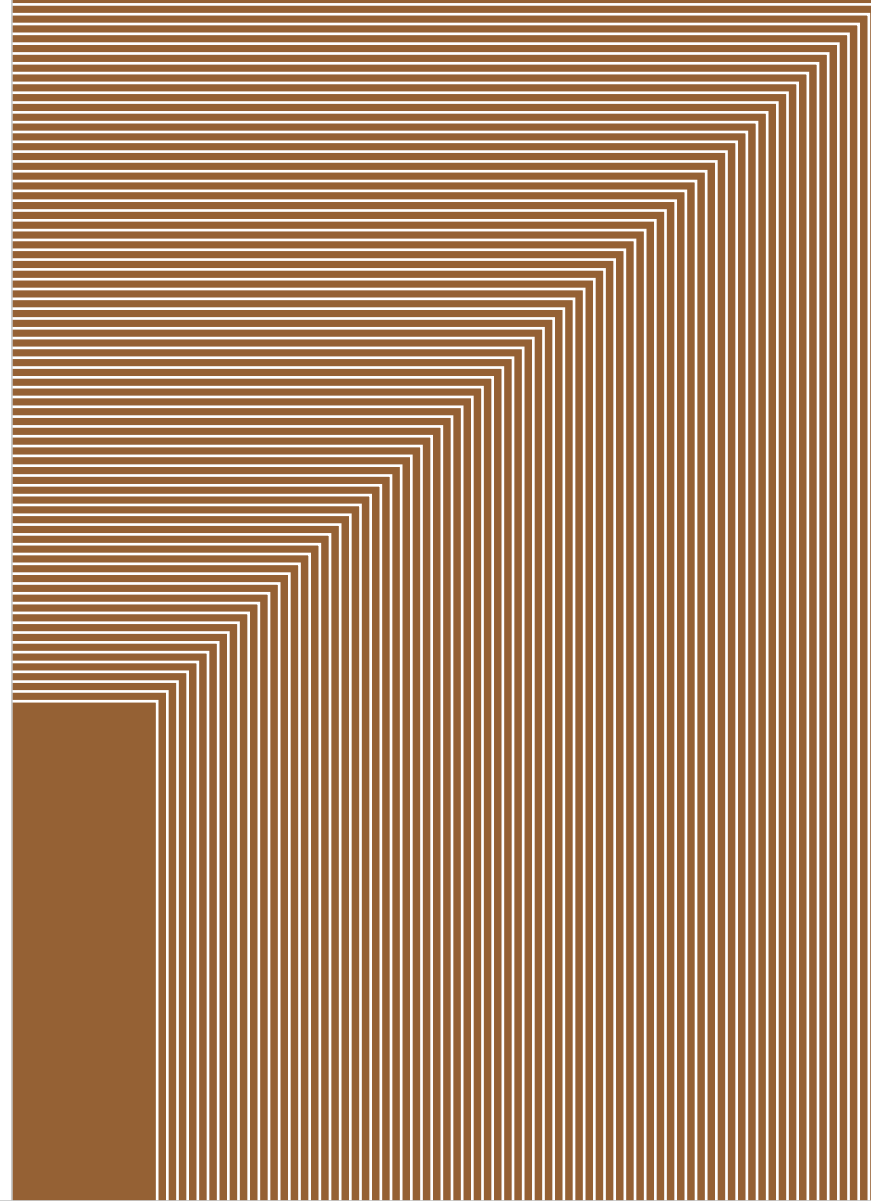
Guide code, EX : GR0206 GR= roller (GB=ball), 02=diameter, 06= roller numbers

Model no.	Retainer dimensions (mm)					Basic dynamic load rating	Basic static load rating	Material standard	
	ØD	P1	P2	T (thickness)	W (width)	C N	Co N	Retainer	Roller
GRP01	Ø1.5	1.9	3	0.5	3.8	125	144	POM	SUJ2
GRP02	Ø2.0	2.8	4	0.8	5	293	292		
GRP03	Ø3.0	3.2	5	0.9	7	638	761		
GRP04	Ø4.0	4.3	7	1.4	9.8	1230	1170		
GRP06	Ø6.0	5.4	9	1.9	14	2570	2632		

Model no.	Retainer dimensions (mm)							Rail length	Model no.	Retainer dimensions (mm)							Rail length
	ØD	P1	P2	T (thickness)	W (width)	L3 (length)	R (roller qty)			ØD	P1	P2	T (thickness)	W (width)	L3 (length)	R (roller qty)	
GRP0105	Ø1.5	1.9	3	0.5	3.8	15.8	5	GRVP01-20	GRP0408	Ø4	4.3	7	1.4	9.8	57.6	8	GRVP04-80
GRP0107						21.8	7	GRVP01-30	GRP0411						78.6	11	GRVP04-120
GRP0109						27.8	9	GRVP01-40	GRP0414						99.6	14	GRVP04-160
GRP0111						33.8	11	GRVP01-50	GRP0418						127.6	18	GRVP04-200
GRP0113						39.8	13	GRVP01-60	GRP0421						148.6	21	GRVP04-240
GRP0115	Ø2	2.8	4	0.8	5	45.8	15	GRVP01-70	GRP0424	Ø6	5.4	9	1.9	14	169.6	24	GRVP04-280
GRP0117						51.8	17	GRVP01-80	GRP0428						197.6	28	GRVP04-320
GRP0205						21.6	5	GRVP02-30	GRP0431						218.6	31	GRVP04-360
GRP0208						33.6	8	GRVP02-45	GRP0434						239.6	34	GRVP04-400
GRP0210						41.6	10	GRVP02-60	GRP0438						267.6	38	GRVP04-440
GRP0212	49.6	12	GRVP02-75	GRP0441	288.6	41	GRVP04-480										
GRP0214	Ø3	3.2	5	0.9	7	57.6	14	GRVP02-90	GRP0607	Ø6	5.4	9	1.9	14	64.8	7	GRVP06-100
GRP0216						65.6	16	GRVP02-105	GRP0611						100.8	11	GRVP06-150
GRP0218						73.6	18	GRVP02-120	GRP0614						127.8	14	GRVP06-200
GRP0221						85.6	21	GRVP02-135	GRP0617						154.8	17	GRVP06-250
GRP0223						93.6	23	GRVP02-150	GRP0620						181.8	20	GRVP06-300
GRP0225	101.6	25	GRVP02-165	GRP0624	217.8	24	GRVP06-350										
GRP0227	109.6	27	GRVP02-180	GRP0627	244.8	27	GRVP06-400										
GRP0307	Ø3	3.2	5	0.9	7	36.4	7	GRVP03-50	GRP0630	Ø6	5.4	9	1.9	14	271.8	30	GRVP06-450
GRP0310						51.4	10	GRVP03-75	GRP0633						298.8	33	GRVP06-500
GRP0313						66.4	13	GRVP03-100	GRP0636						325.8	36	GRVP06-550
GRP0315						76.4	15	GRVP03-125	GRP0640						361.8	40	GRVP06-600
GRP0318						91.4	18	GRVP03-150									
GRP0321	106.4	21	GRVP03-175														
GRP0324	121.4	24	GRVP03-200														
GRP0327	136.4	27	GRVP03-225														
GRP0330	151.4	30	GRVP03-250														
GRP0333	166.4	33	GRVP03-275														
GRP0336	181.4	36	GRVP03-300														

Model no.	GRP	02	12
	Roller	Diameter	Roller numbers

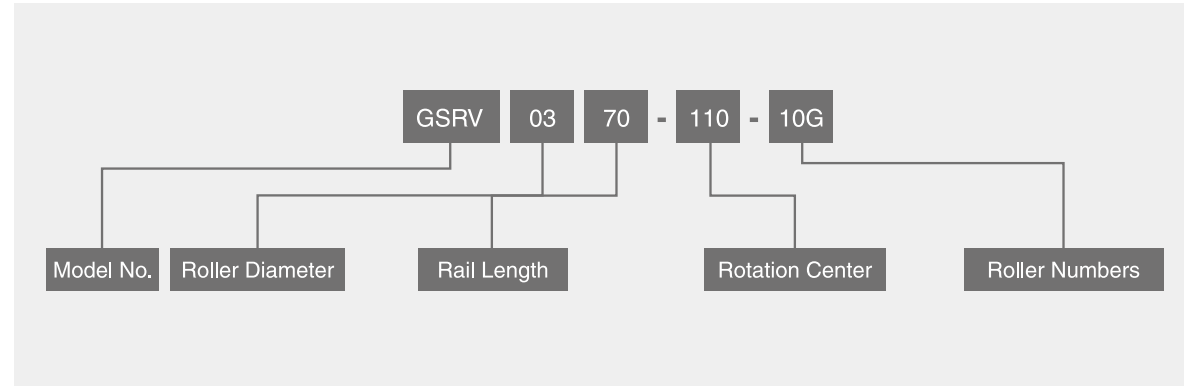
★ Customized specification, purchasement per appoint roller quantity with the standard roller diameter.



Product Specification  
**Gonio Ways**

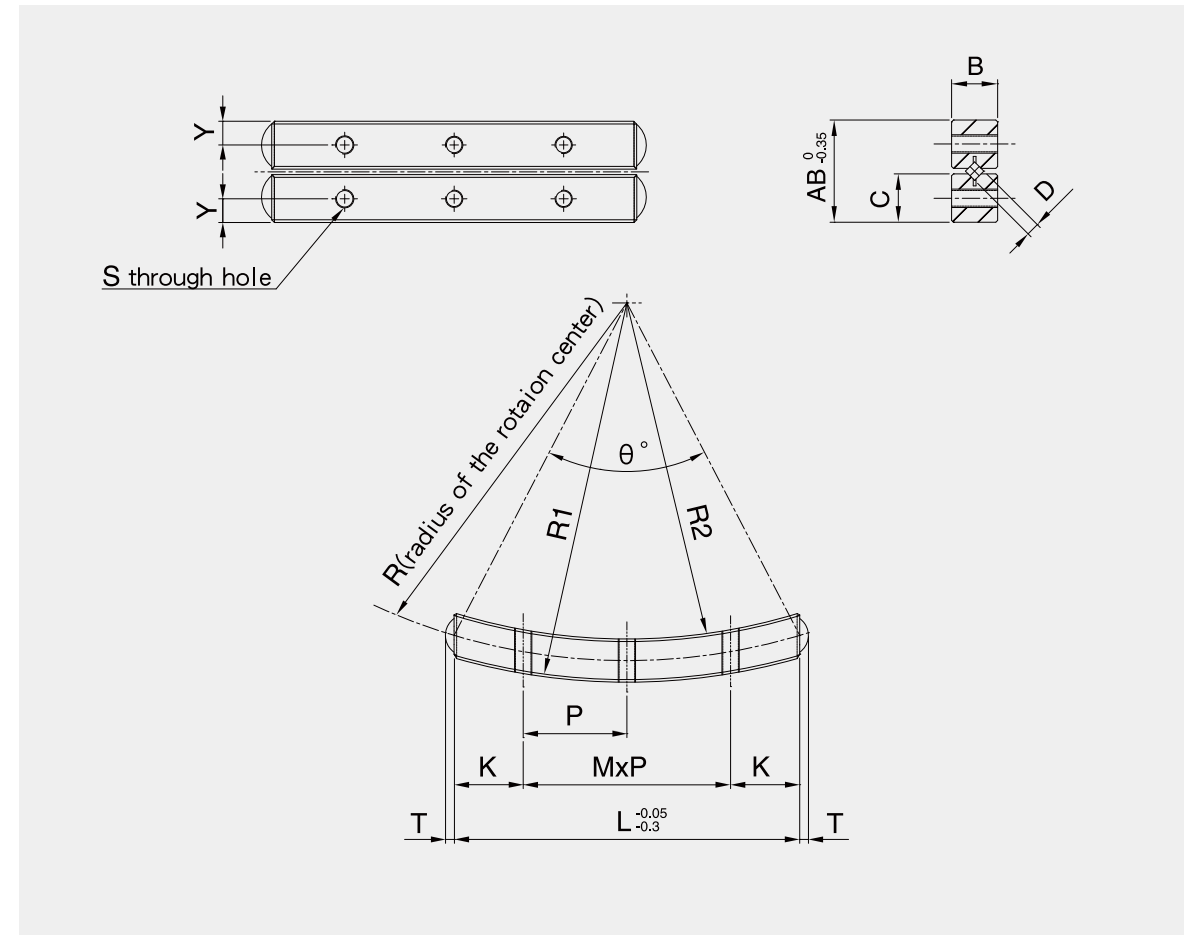


## Model No. Introductions



## Product Specification

◎ One set of GSRV models contains 4 gonio way rails, 2 roller retainers and 8 retaining screws.



## Product Introduction

Are non-circulating arc movement rails whose precise cross rollers have extremely low friction resistance to provide a stable arc movement.

They are mainly used in locating operations where rotation centers remain unchanged and correct changes of tilting degrees are required, they may also be applied to meet the purposes of optical instruments and measuring devices requiring high accuracy.

## Product Features

- ◎ High rigidity and high loads
- ◎ Identical locations of rotation centers
- ◎ Low friction and accurate movement
- ◎ Easy installation
- ◎ Low noise

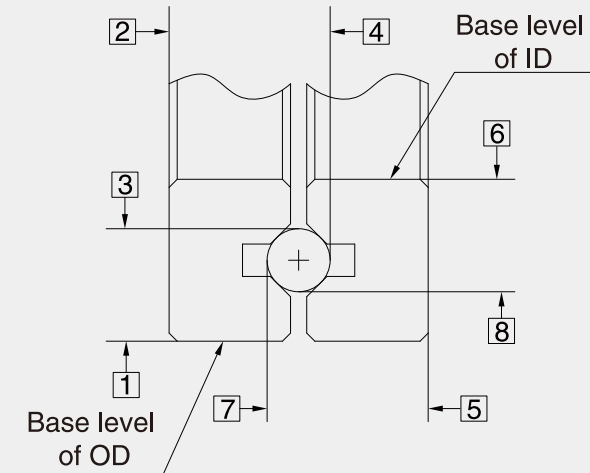




### Accuracy

⊙ The accuracy of GSRV models of gonio ways is measured by the method shown in the following figure which measures the mutual deviations among the 4 rails along their full length.

Model No.	Accuracy
GSRV0240-50	10 μm
GSRV0260-60	
GSRV0370-90	
GSRV0370-110	
GSRV03100-160	
Model No.	Accuracy
GSCRV0240-51	10 μm
GSCRV0240-70	
GSCRV0240-89.5	
GSCRV0260-65	
GSCRV0260-89	
GSCRV0260-113.5	
GSCRV0260-138.5	



### Rated Life

- $L_r$  : Rated life( $10^6$  reciprocation number)
- $\theta$  : Rotating angle
- $C$  : Basic dynamic rated load(N)
- $F$  : Action load(N)
- $f_t$  : Temperature coefficient
- $f_L$  : Load coefficient

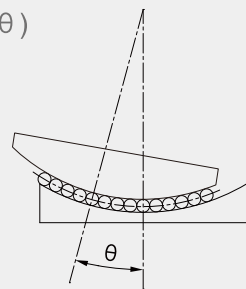
$$L_r = \frac{90}{\theta} \times \left( \frac{f_t}{f_L} \times \frac{C}{F} \right)^{\frac{10}{3}}$$

### Lifetime

- $L_t$  : Lifetime(hr)
- $r$  : Reciprocation number per minute(pm)

$$L_t = \frac{L_r \times 10^6}{60 \times r}$$

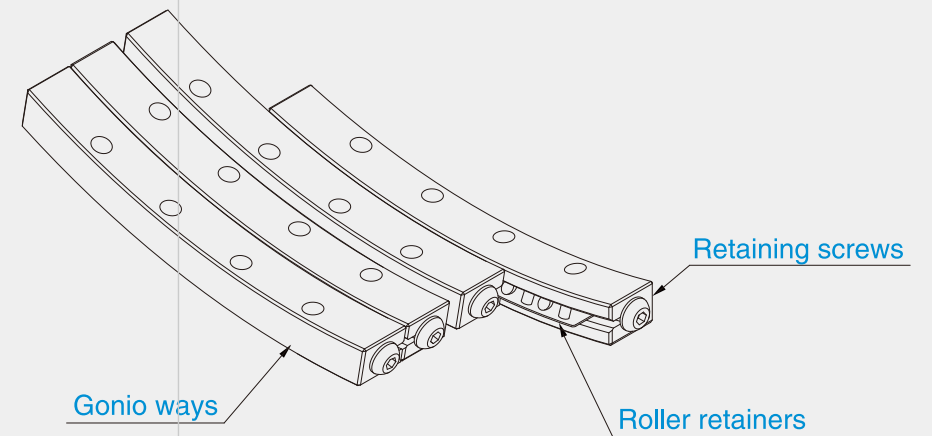
Rotating angle( $\theta$ )



### Product Structure

GSRV model (figure 1) of gonio ways are made up of precisely ground V-shaped rail and retainers equipped with crossed rollers.

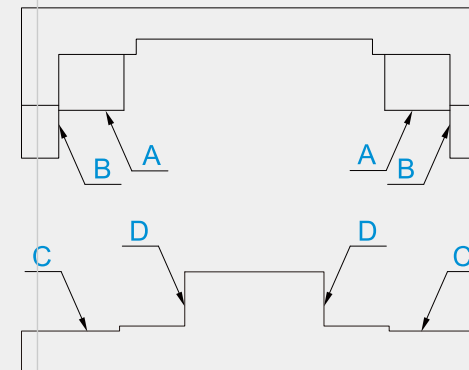
Figure 1



### Product Installation

Accuracy of the installation surface as shown in figure 2, surface A, B, C, D accuracy will directly affect the movement accuracy of gonio ways.

Figure 2





### Installation Sequence

- (1) Firstly, clean the sliding ways and the installation surface on the seat to prevent the entry of foreign objects during installation.
- (2) Apply low viscosity lubricant onto each installation surface and lock gonio ways a, b, c to each surface intallation by using the suggested torque force.(Figure 3-1)
- (3) Temporarily lock gonio by way d.(Figure 3-2)
- (4) Remove the retaining screws from any end and insert the roller retainers into the central position of the gonio way, upon the completion of the above operations, restore the screw to its original position.(Figure 3-3)
- (5) Try moving the sliding way horizontally to its maximal traveling end and adjust the roller retainer to its central position.(Figure 3-4)
- (6) Install a micrometer at the side of the sliding way base level.(Figure 3~4).

Figure 3 Installation Sequence

Figure 3-1 Fix gonio ways a-c

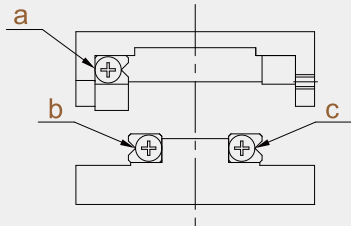


Figure 3-2 Temporarily lock gonio way d

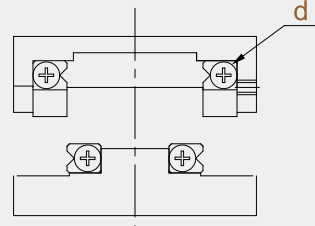


Figure 3-3 Insert the roller retainer

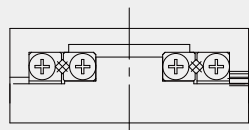
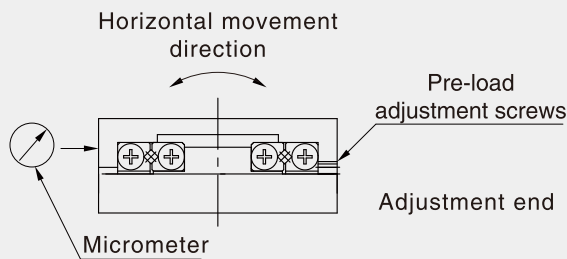


Figure 3-4



- (7) Move the sliding way to the traveling end at any side and slightly lock pre-load adjustment screw above the roller retainer. (Figure 3-5)
- (8) Move the sliding way to the traveling end at the other side and slightly lock pre-load adjustment screw.(Figure 3-6)
- (9) Move the sliding way to the central position and slightly lock the adjustment screw at the central position.(Figure 3-7)
- (10) Repeat operations from (7) to (9) until there is no backlash when moving the slide. Caution against applying excessiye pre-load.
- (11) Once there is no back lash in moving direction, the micromer reading is minimal and stable when the sliding way is moving, at this time, carry out final calibration of the pre-load by repeating operations from (7) to (9) by the torque force recommended to lock.
- (12) Tighten the gonio way d which has been temporarily locked per pre-load adjustment screws in sequence locking available.

Figure 3 Installation Sequence

○ : Adjustment screws locking available  
× : Adjustment screws locking prohibited

Figure 3-5

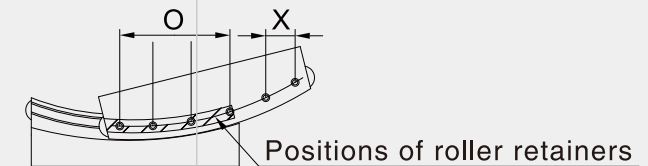


Figure 3-6

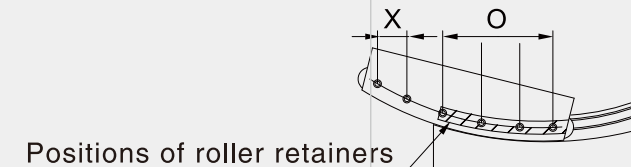
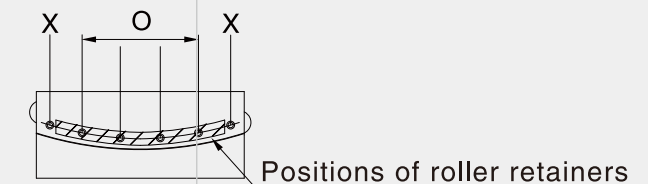


Figure 3-7





## Precaution

### ◎ Lubrication of Retainers

Use lithium soap based lubricating grease.

### ◎ Deviation of Retainers

Retainers will deviate from their correct positions when gonio ways are used under conditions of high speed, vibrations and unbalanced loads.

To minimize this deviation, maintain additional travel distance and avoid excessive pre-stressed loads.

### ◎ Dust-Proof

Gonio ways may not realize their ideal performance due to dust or foreign objects likely to penetrate into their interior depending on operating environment. It is recommended to protect gonio ways by using external dust-proof covers on them if they are to be used in harsh environments.

### ◎ Damping Boards

Screws are installed on the end faces of the gonio ways to prevent the retainers falling.

### ◎ Environment for Using Gonio Ways

It is recommended to use our gonio ways in environments with temperature ranging from -20° to 110°.

### ◎ Using a Paired Set Is a Principle

The accuracy for using gonio ways is based on the unit of a complete set to realize a precise control on the mutual deviation range.

The mixed use of gonio ways from different sets will result in a reduction of their accuracy, exercise caution when assembling gonio ways.

### ◎ Adjustments

When used under such circumstances where the accuracy on the installation face or the pre-load has not been fully adjusted, their movement accuracy will drop, thus resulting in the deflection or distortion and rendering it likely to reduce their use performance and life, exercise extreme caution during adjustment.

### ◎ Allowable Load

Please refer to the highest values of loads when the total flexible distortion on the contact parts remains small and a smooth rolling can still be performed under the maximal contact stress on the rolling body and rail surface.

In request of high accuracy and smooth environment, please handle within its design and permitted loads.

