GONIO WAY

The gonio way is a curved cross roller slide way. It is a curved motion bearing utilizing low-friction, non-recirculating precision rollers. It is used when there is a need to change the gradient or obtain an accurate gradient angle without changing the center of rotation in high-precision optical and measurement equipment.

STRUCTURE AND ADVANTAGES

The gonio way RVF type consists of curved tracking bases with precisely ground V-grooves and flat installation surfaces, as well as curved roller cages. The gonio way RV type consists of curved rails with precisely machined V-grooves and curved roller cages. Precision rollers are employed as the rolling elements, since the rolling elements do not recirculate, the frictional resistance will not vary significantly, providing curved movement with extremely low frictional resistance.

Low Frictional Resistance and Minute Motion

The precision grinding and curved roller cage allow for extremely low frictional resistance. The negligible difference between static and dynamic frictions allows the gonio way to follow minute movements accurately, realizing curved movement of high accuracy.

Low Noise

Since gonio way employs a non-recirculating design, there is no noise from the circulating area. In addition, the curved roller cage realizes quiet operation without contact noise between the rolling elements.

High Rigidity and High Load Capacity

The rollers provide a larger contact area and less elastic deformation compared to the ball elements. Additionally, since the rollers do not recirculate, the effective number of rotating elements is larger, resulting in high rigidity and high load capacity.

Flat Installation Surface

The flat installation surfaces of the RVF type do not require complicated machining of tables and beds when installing the product. As a result, machining costs can be reduced greatly.

Same Rotation Center

The curved V-grooves, which are finished with a precise grinding process, provide an accurate center of rotation. Furthermore, the products are composed to provide identical rotation centers when products of each size are installed to two axes. (refer to Table G-17.)

Figure G-28 Structure of Gonio Way RVF type

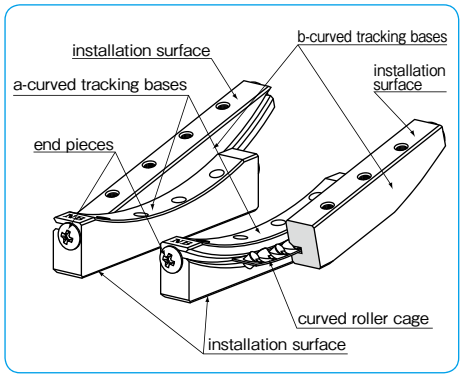
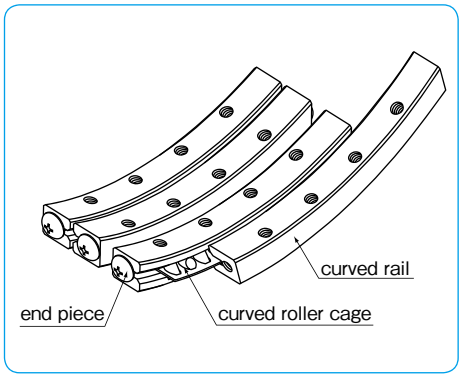


Figure G-29 Structure of Gonio Way RV type



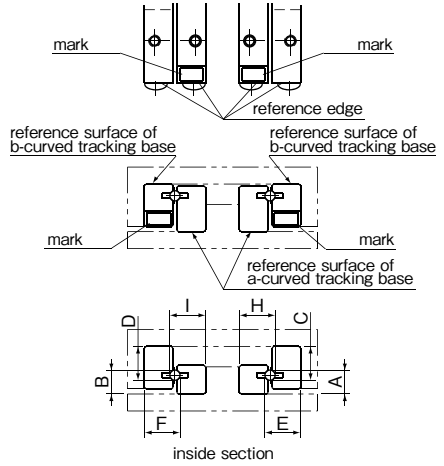
ACCURACY OF RVF TYPE

The accuracies of the gonio way RVF type are represented by mutual dimensional errors of four rails, which are measured along the overall length using the procedure as shown in Figure G-30.

Table G-13 Accuracy unit／μm

part number	mutual error between A and B mutual error between C and D	mutual error between E and F mutual error between H and I
RVF2050- 70	10	10
RVF2050- 87		
RVF2050-103		
RVF2050-120		
RVF3070- 85		
RVF3070-110		
RVF3100-125		
RVF3100-160		

Figure G-30 Accuracy Measuring Method



ACCURACY OF RV TYPE

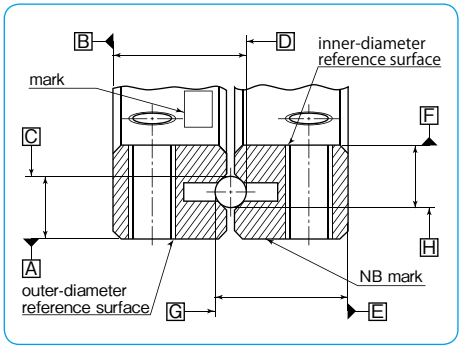
The accuracies of the gonio way RV type are represented by mutual dimensional errors of four rails, which are measured along the overall length using the procedure as shown in Figure G-31.

Table G-14 Accuracy unit／μm

part number	accuracy
RV2040- 50	10
RV2060- 60	
RV3070- 90	
RV3070-110	
RV3100-160	

The reference surfaces are located on the opposite side of the mark. There are inner reference surface and outer reference surface in one set of RV.

Figure G-31 Accuracy Measuring Method



RATED LIFE

The life of a gonio way is obtained using the following equations.

Rated Life

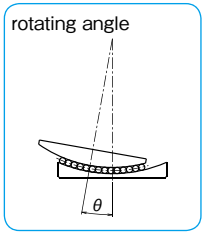
$$L=\frac{90}{\theta}\times\left(\frac{f_T}{f_W}\times\frac{C}{P}\right)^{\frac{10}{3}}$$

L: travel life (10^6cycles) θ: rotating angle (degree)
C: basic dynamic load rating (N) P: applied load (N)
f_T: temperature coefficient f_W: applied load coefficient
※Refer to page Eng-5 for the coeffieients.

Life Time

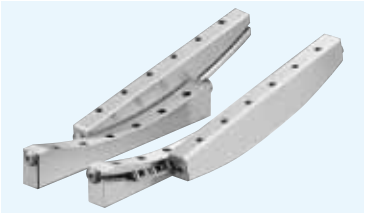
$$L_h=\frac{L\times10^6}{60\times n}$$

Lh: life time (hr)
n: number of cycles per minute (cpm)



RVF TYPE

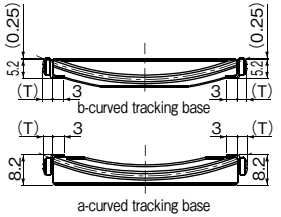
– Gonio Way flat-installation-surface –



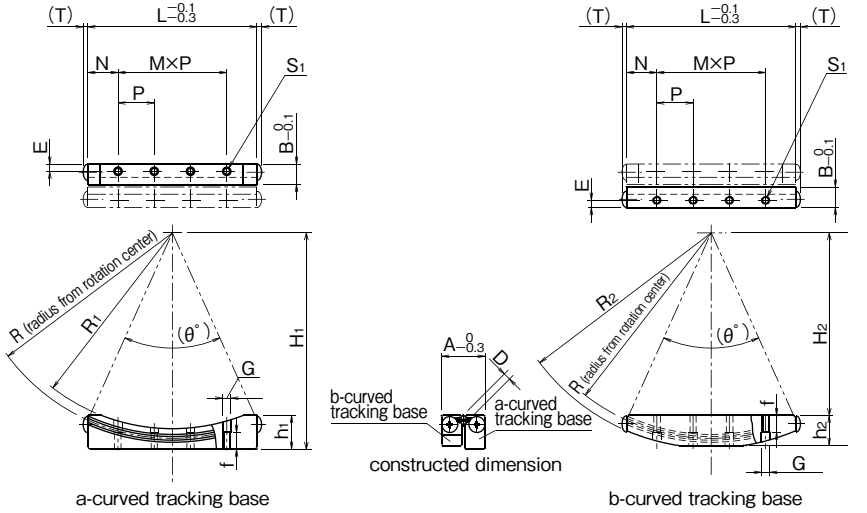
part number structure

example **RVF 3 100 - 125 - 16Z**

- RVF type
- size
- rail length
- radius from rotation center
- number of rollers



RVF2050-70-10Z
RVF2050-87-10Z



One set consists of 2 a-curved tracking bases, 2 b-curved tracking bases, 2 roller cages, 8 end pieces, and 2 edge reference plates.

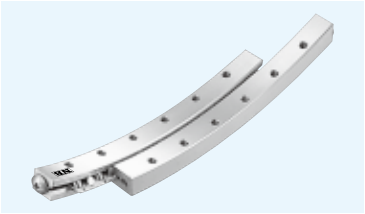
part number	rotation range	roller diameter D mm	number of rollers Z	major dimensions L mm	R mm	R1 mm	R2 mm	H1 mm	H2 mm	h1 mm	h2 mm	A mm	B mm
RVF2050- 70-10Z	± 5°	2	10	50	70	67	73	72.5	64.5	7.5	7.5	15	7.25
RVF2050- 87-10Z			10		87	84	89.5	89.5	81.5	7.5	7.5		
RVF2050-103-10Z			10		103	100	106	105.5	97.5	7.5	8		
RVF2050-120- 9Z			9		120	117	123	122.5	114.5	7.5	8		
RVF3070- 85-10Z	±10°	3	10	70	85	81	89	89.5	75.5	14	12.5	18	8.5
RVF3070-110-10Z			10		110	106	114	114.5	100.5	12.8	12.5		
RVF3100-125-16Z			16	100	125	121	129	129.5	110.5	17.5	18		8.5
RVF3100-160-14Z			14		160	156	164	164.5	145.5	15	18		

※ Please refer to page G-64 for information on cage dimensions.

part number	M×P mm	N mm	E mm	S1	f mm	G mm	T mm	θ°	basic load rating dynamic C N	basic load rating static Co N	allowable load F N	mass (one set) g	part number
RVF2050- 70-10Z	3×12.5	6.25	2.5	M2.5	4	3	2.7	41.8°	1,180	2,400	800	66	RVF2050- 70-10Z
RVF2050- 87-10Z								33.3°	1,060	2,430	810	70	RVF2050- 87-10Z
RVF2050-103-10Z	3×13	5.5					1.5	28.0°	998	2,440	815	70	RVF2050-103-10Z
RVF2050-120- 9Z								24.0°	751	1,970	657	70	RVF2050-120- 9Z
RVF3070- 85-10Z	3×15	12.5	3	M3	7	3.5	1.9	48.6°	2,680	5,530	1,840	182	RVF3070- 85-10Z
RVF3070-110-10Z								37.1°	2,440	5,620	1,870	182	RVF3070-110-10Z
RVF3100-125-16Z	5×15	12.5	3	M3	7	3.5	1.9	47.1°	3,520	8,850	2,950	327	RVF3100-125-16Z
RVF3100-160-14Z								36.4°	2,860	7,890	2,630	323	RVF3100-160-14Z

1N≒0.102kgf

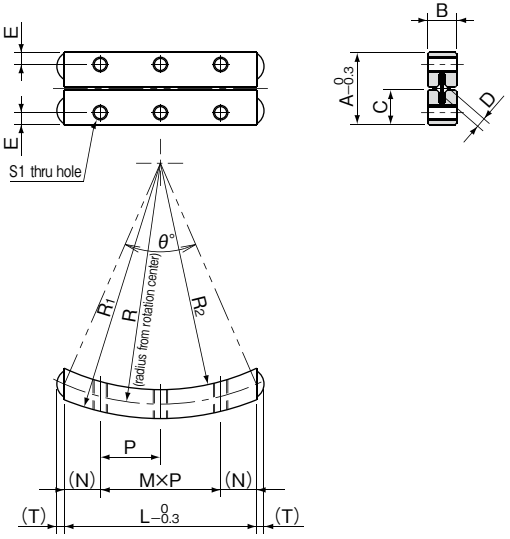
RV TYPE
– Gonio Way –



part number structure

example **RV 3 070 - 110 - 10Z**

- RV type
- size
- rail length
- radius from rotation center
- number of rollers



One set consists of 4 curved rails, 2 curved roller cages, and 8 end pieces.

part number	rotation range	roller diameter D mm	number of rollers Z	major dimensions L mm	R mm	R1 mm	R2 mm	A mm	B mm	C mm
RV2040- 50- 7Z	±10°	2	7	40	50	53	47	15	6	7.25
RV2060- 60-12Z			12	60	60	63	57			
RV3070- 90-11Z	±10°	3	11	70	90	94	86	18	8	8.5
RV3070-110-10Z			10	70	110	114	106			
RV3100-160-14Z			14	100	160	164	156			

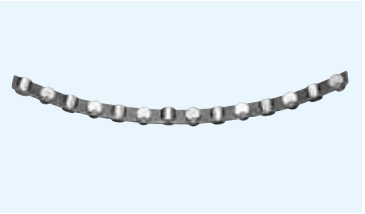
※ Please refer to page G-64 for information on cage dimensions.

M×P mm	N mm	E mm	S1	T mm	θ°	basic load rating dynamic C N	basic load rating static Co N	allowable load F N	mass (one set) g	part number
2×12.5	7.5	2.5	M3	1.5	47.2°	820	1,440	482	49	RV2040- 50- 7Z
3×12.5	11.25				60.0°	1,490	2,800	936	75	RV2060- 60-12Z
3×15	12.5	3	M3	1.9	45.8°	2,640	5,550	1,850	137	RV3070- 90-11Z
3×15					37.1°	2,440	5,620	1,870	135	RV3070-110-10Z
5×15					36.4°	2,860	7,890	2,630	193	RV3100-160-14Z

1N≒0.102kgf

CR TYPE

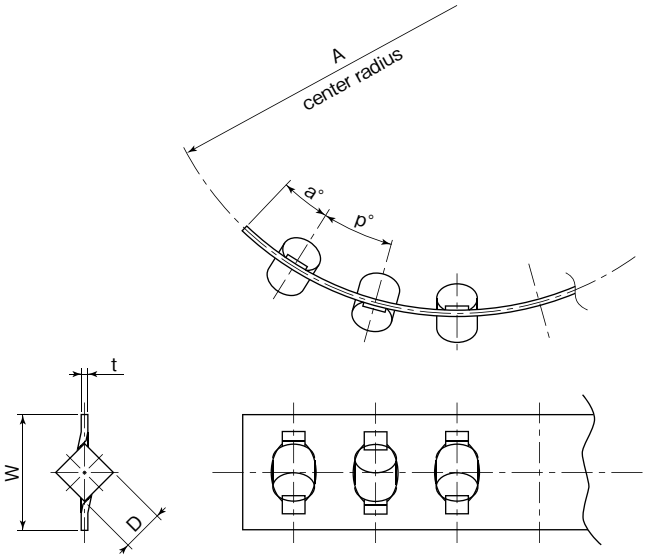
— Standard Curved Roller Cage —



part number structure

example **CR 3 - 110 - 10Z**

- CR type
- size
- center radius
- number of rollers



part number	roller diameter D mm	center radius A mm	t mm	w mm	p°	a°	applicable type
CR2- 50- 7Z	2	50	0.3	5.6	4.6°	2.9°	RV
CR2- 60-12Z		60			3.8°	2.4°	RV
CR2- 70-10Z		70			3.3°	2.0°	RVF
CR2- 87-10Z		87			2.6°	1.6°	RVF
CR2-103-10Z		103			2.2°	1.4°	RVF
CR2-120- 9Z		120			1.9°	1.2°	RVF
CR3- 85-10Z	3	85	0.4	7.2	3.4°	2.9°	RVF
CR3- 90-11Z		90			3.2°	1.9°	RV
CR3-110-10Z		110			2.6°	1.5°	RVF、RV
CR3-125-16Z		125			2.3°	1.3°	RVF
CR3-160-14Z		160			1.8°	1.0°	RVF、RV