

IKO

Anti-Creep Cage Crossed Roller Way

CRWG

*Built in rack and pinion giving
a creep free cage motion!*

PATENT PENDING



CAT-57129

Perfect solution for cage creeping problems by
a **built in rack and pinion** mechanism - an IKO original design.

Super high accuracy with Smooth linear motion.

IKO

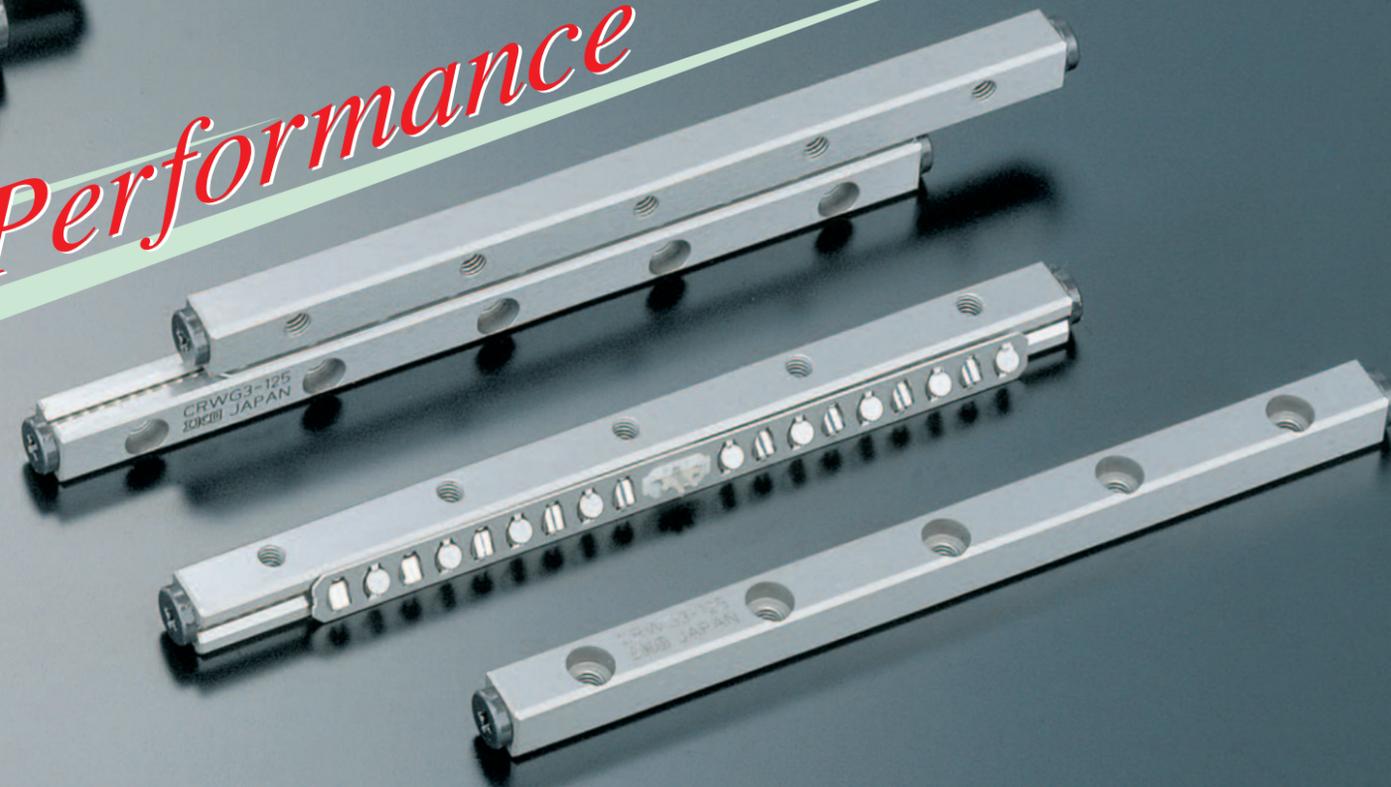
Anti-Creep Cage Crossed Roller Way

CRWG



Reliable Running

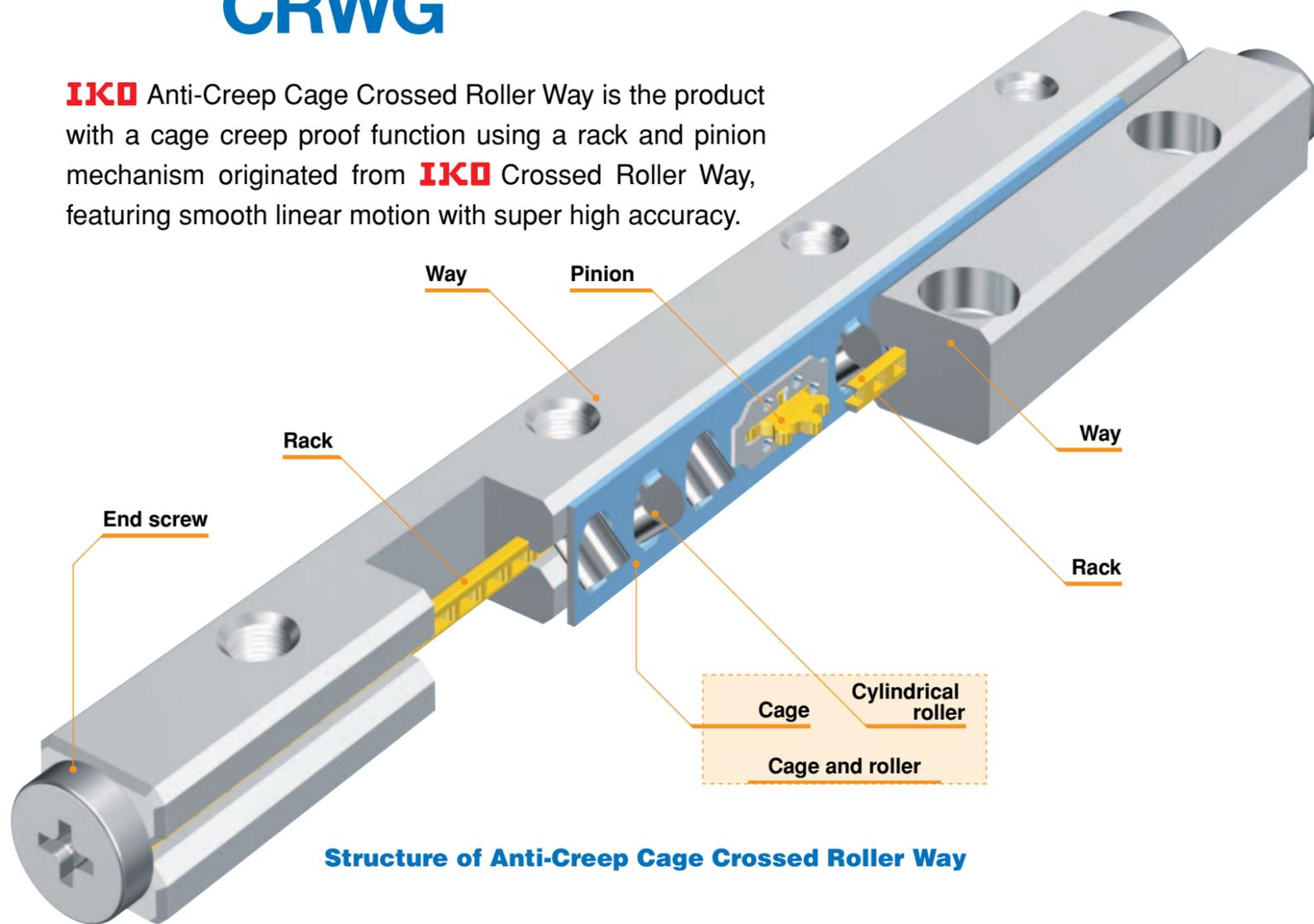
Performance



IKO Anti-Creep Cage Crossed Roller Way

CRWG

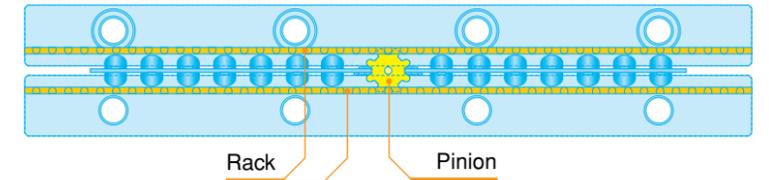
IKO Anti-Creep Cage Crossed Roller Way is the product with a cage creep proof function using a rack and pinion mechanism originated from IKO Crossed Roller Way, featuring smooth linear motion with super high accuracy.



Structure of Anti-Creep Cage Crossed Roller Way

Solution for cage creeping problems!

Our original design of built in rack and pinion mechanism has solved cage creeping problems.



Freedom in mounting

This series is reliable for applications such as a vertical axis for which the existing Crossed Roller Way is not easy to use.

Applicable to high-speed and high-tact operation

This series can be operated at high speed without the worry of cage creeping.

Energy-saving operation

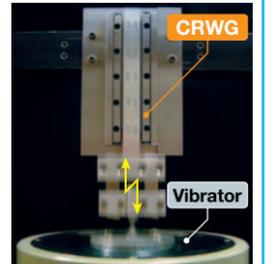
Any corrective operation for cage creeping is not necessary even for a long-time operation.

No cage creeping even under high-tact operation in vertical axis.

《Durability test》

Test conditions

Model No.	CRWG3	
Test method	Vibration test machine	
Operating conditions	Mounting	Vertical
	Maximum speed	827 mm/s
	Acceleration	15 G
	Cycle	31 Hz
	Stroke	8 mm
Mass of moving part	330 g	
Number of cycles	One hundred million cycles	

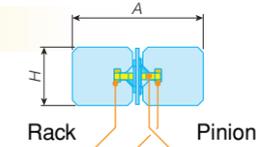


《Test result》

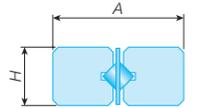
No cage creeping or no failure in any component is found.

Interchangeable in dimensions!

The series has a special structure of having the racks placed inside the way. This provides full interchangeability with the existing Crossed Roller Way in mounting dimensions.



Anti-Creep Cage Crossed Roller Way



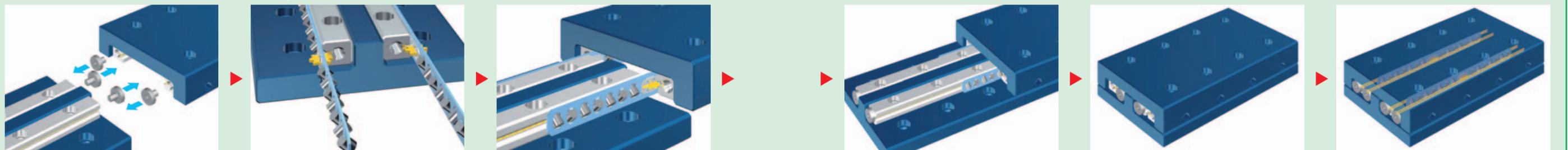
Crossed Roller Way

Easy replacement from the existing Crossed Roller Way

Since the series has the same external dimensions to those of the existing Crossed Roller Way and can be easily replaced without any modification on the machine or equipment using the existing Crossed Roller Way.

Mounting method

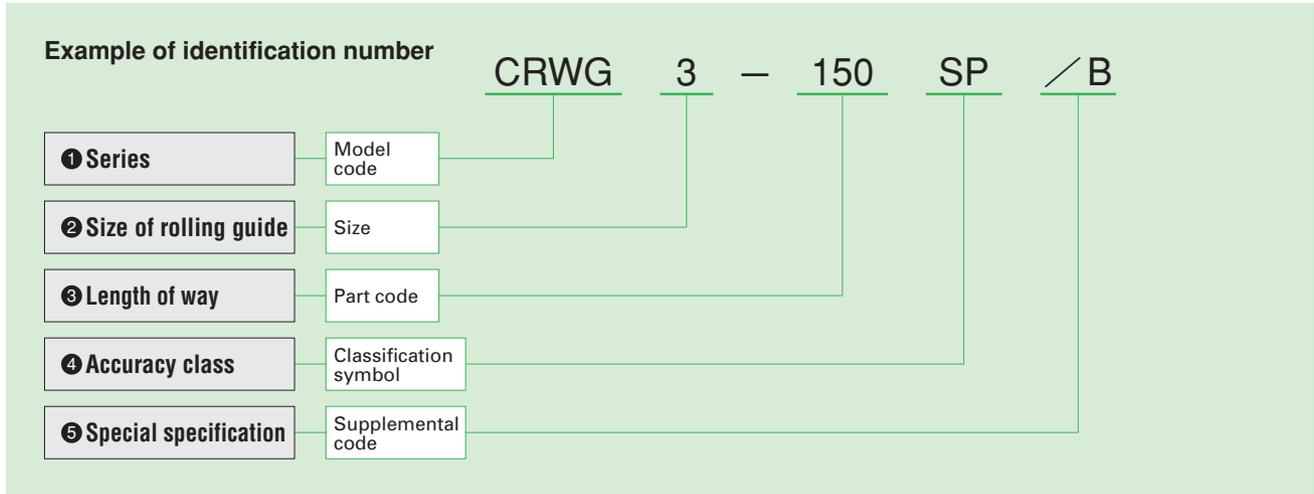
- Remove the end screws of the ways on the ends where the roller cages to be inserted.
- Set the roller cages onto the ways of the bed making sure to locate the center of pinions to the edges of ways to engage with the ends of the racks. At this time, be careful not to deform the cages.
- Engage the ends of the racks of the ways of table with the pinions by adjusting table location in height and width directions.
- Assemble the table by sliding in parallel to the bed with a care not to give uneven load to the rack and pinions.
- Reinstall the end screws of the ways that were removed earlier.
- Slide the table slowly in full stroke length and make sure that the roller cages are in the center position.



Identification Number

The specification of Anti-Creep Cage Crossed Roller Way is indicated by the identification number. Indicate each specification by using a model code, size, part code, classification symbol, and supplemental codes.

The ordering unit is a set of the combination of 4 ways and 2 roller cages.



① Series	CRWG	
② Size of rolling guide	2, 3, 4	
③ Length of way	○	The length of the way is indicated in millimeters. For applicable way lengths, refer to the dimension table.
④ Accuracy class	Standard : No symbol Super precision : SP	For the allowable values of parallelism of the raceway to the reference mounting surface, see Fig. 1

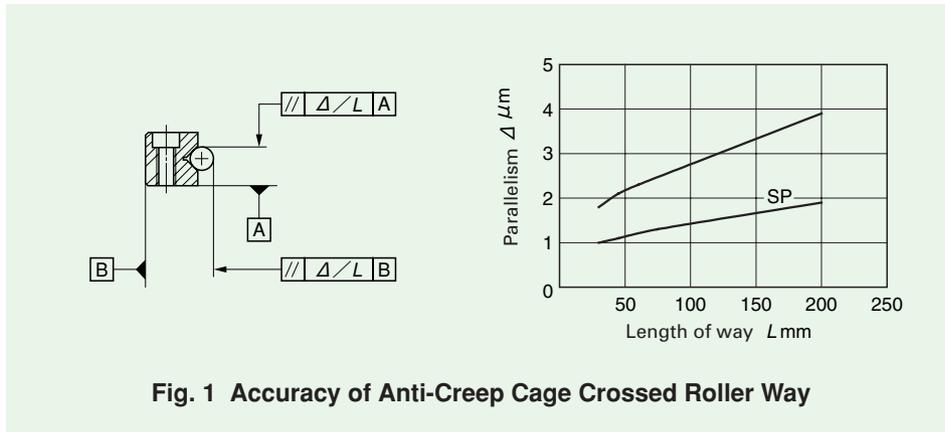


Fig. 1 Accuracy of Anti-Creep Cage Crossed Roller Way

⑤ Special specification	/B	The special mounting screws for ways are appended.
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Load Rating and Allowable Load

For the load rating and allowable load of Anti-Creep Cage Crossed Roller Way, values for a downward load provided when a combination of 4 ways and 2 roller cages is used in parallel are indicated.

An outline of them is described below.

The load ratings and allowable load of Anti-Creep Cage Crossed Roller Way are designed for equal load capacity in downward, upward, and lateral directions.

Basic dynamic load rating C

The basic dynamic load rating is defined as a constant load both in direction and magnitude under which a group of identical Crossed Roller Way are individually operated and 90% of those in the group can travel 100×10^3 meters free from material damage due to rolling contact fatigue.

Basic static load rating C_0

The basic static load rating is defined as the static load that gives a prescribed constant contact stress at the center of the contact area between a rolling element and raceways receiving the maximum load.

Allowable load F

The allowable load is a load under which the sum of elastic deformations of the rolling element and the raceways in the contact area subjected to the maximum contact stress is small enough to guarantee accuracy and smooth rolling movement.

Therefore, where very smooth and highly accurate linear motion is required, make sure to use a Anti-Creep Cage Crosse Roller Way well within the allowable load values.

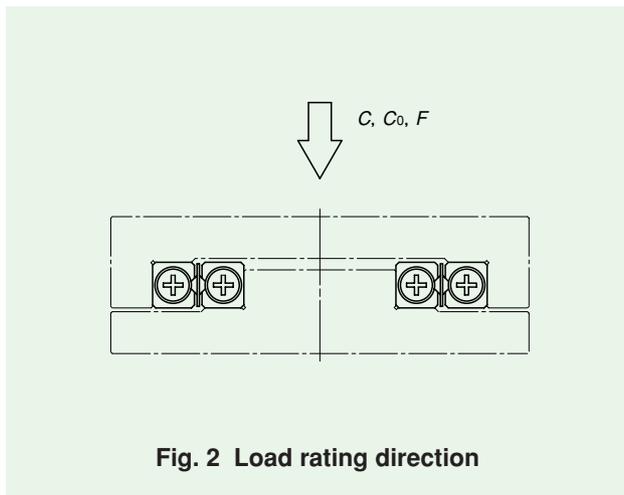


Fig. 2 Load rating direction

Special Specification

Special mounting screw /B

The way on the preload adjustment side is moved when the preload is adjusted. There should be some allowance for movement between the way fixing screw and the mounting hole. When such allowance cannot be provided or when the fixing screw is installed from the way side as shown in Fig. 3, it is convenient to use the attached special mounting screws.

This special mounting screw is also available when the positional accuracy of the mounting holes and female screws of the machine on which the fixed side ways are mounted is not sufficient.

Table 1 Dimensions of special mounting screw

unit: mm

Size	Screw size	d	D	H	L	S
3	M3	2.3	5	3	12	5
4	M4	3.1	6	4	15	6

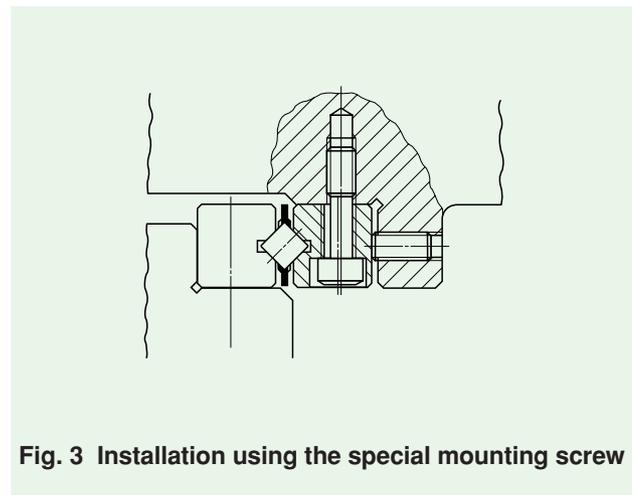


Fig. 3 Installation using the special mounting screw

Lubrication

Oil or grease is used as lubricant for Anti-Creep Cage Crossed Roller Ways. Generally oil is used for high-speed or low-friction operation and grease is used for low-speed operation. In case of grease lubrication, a good quality lithium-soap base grease is recommended. For low-speed operation with a light load, first apply grease or oil to raceways, rack gear, and pinion gear, and then re-lubricate periodically.

The structure shown in Fig. 4 makes the lubrication easy.

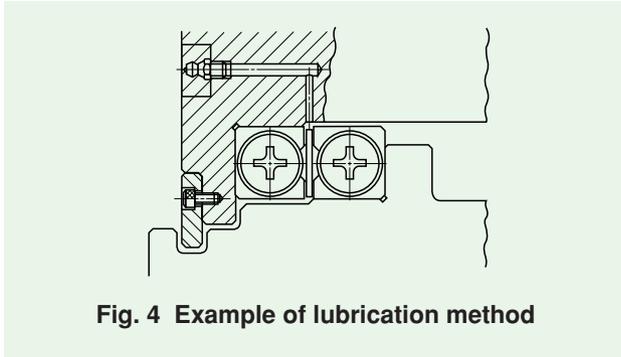


Fig. 4 Example of lubrication method

Dust Protection

Anti-Creep Cage Crossed Roller Way is finished in production very accurately. If harmful foreign materials such as dust or chips enter inside the ways, this will shorten the life or lower the accuracy. With the object of preventing external harmful foreign materials such as dust, chips and water from entering inside, it is recommended to install a non-contact-type labyrinth seal shown in Fig. 5 or a contact type wiper seal shown in Fig. 6 on both side faces.

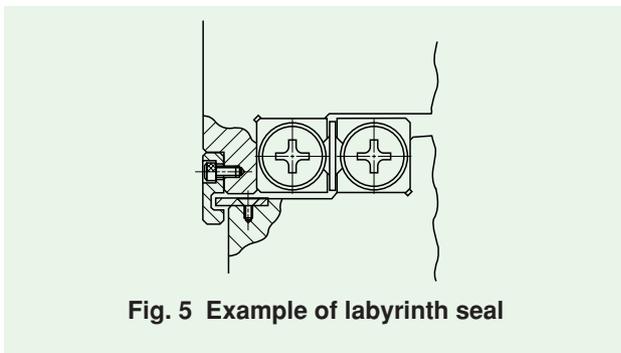


Fig. 5 Example of labyrinth seal

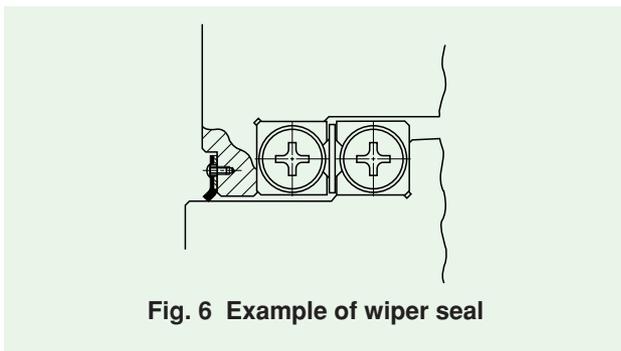


Fig. 6 Example of wiper seal

Precautions for use

① Specifications of Anti-Creep Cage Crossed Roller Way

Check whether the operating characteristics of the selected Anti-Creep Cage Crossed Roller Way are suitable for the application of the machine or equipment.

② Handling of Anti-Creep Cage Crossed Roller Way

Anti-Creep Cage Crossed Roller Ways are finished in production very accurately, so handle carefully.

A pinion is assembled in the roller cage. If the cage is dropped or handled roughly, the pinion may come off. As cutting off the cage may cause the pinion coming off or damage to the pinion mounting part, so please avoid cutting off the cage.

A rack is assembled in the way and fixed its position with the end screws. When assembling, the rack may come out from the way by removing the end screws.

③ Accuracy of the mounting part

The general configuration of mating mounting surfaces for Anti-Creep Cage Crossed Roller Way is shown Fig. 7.

Accuracy of the mating mounting surfaces are, in general, as shown in Table 2. The accuracy of the mating mounting surfaces directly affects the operating accuracy and performance of Anti-Creep Cage Crossed Roller Way. If very precise operating accuracy is required, higher accuracy of mating mounting surfaces than the values shown in Table 2 may be needed.

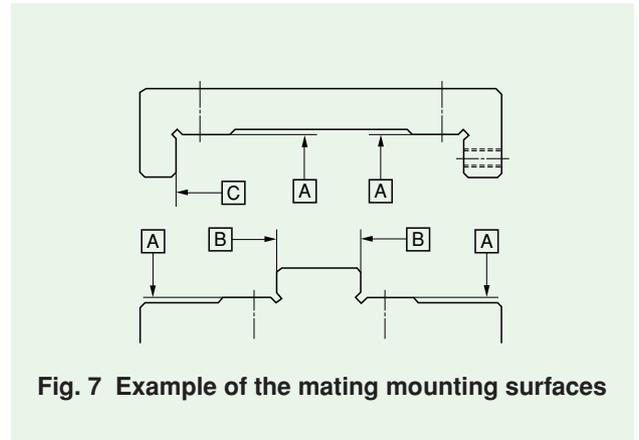


Fig. 7 Example of the mating mounting surfaces

Table 2 Accuracy of mating mounting surfaces

<p>A surface</p>	<ul style="list-style-type: none"> This accuracy directly affects the running accuracy. For the flatness of the respective 2 mounting surfaces on the table side and bed side, the value close to the parallelism shown in Fig. 1 on page 5 is recommended.
<p>B and C surfaces</p>	<ul style="list-style-type: none"> Flatness Flatness of these surfaces directly affects preload. For the flatness, the value close to the parallelism shown in Fig. 1 on page 5 is recommended. Squareness This accuracy directly affects the rigidity in the preload direction of the mounting part of Anti-Creep Cage Crossed Roller Way. Consequently, a high accuracy finish is necessary.

④ Shape of the mounting part

It is recommended to make a relieved fillet at the corner of the mating mounting surfaces.

Allow a clearance of 0.5mm or more between the way and the mating material of the other side.

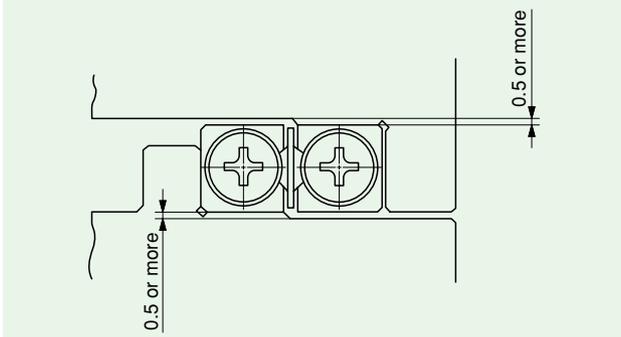


Fig. 8 Shape of the mounting part

⑤ Preload method

Preload adjusting screws are generally used for setting preload, as shown in Fig.9. The size of the preload adjusting screws are the same as that of the mounting screws for the ways. The position of the preload adjusting screws is at the same position as the mounting screws of the ways. For centering, use half of way height H .

Preload amounts differ according to the application of machine or equipment. Excessive preloads deteriorate life and often damage the raceways. Therefore, zero or minimal preload is recommended in general. If accuracy and rigidity are important, a setting plate as shown in Fig.10.1 or a tapered jib as shown in Fig.10.2 may be used.

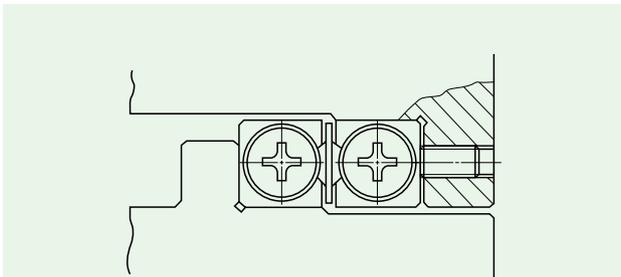


Fig. 9 General example of preload

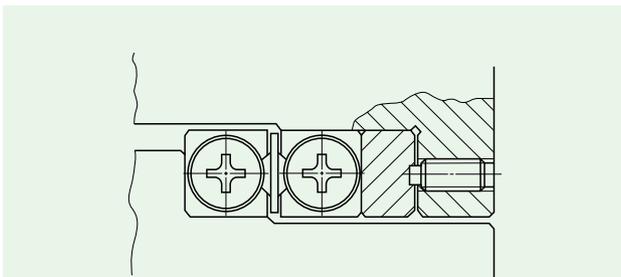


Fig. 10.1 Example of setting plate

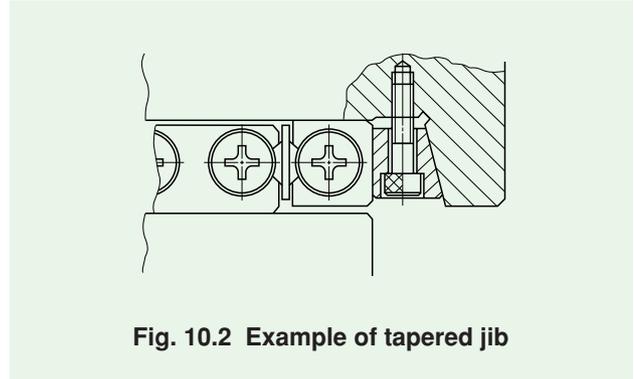


Fig. 10.2 Example of tapered jib

⑥ Maximum operating temperature

Anti-Creep Cage Crossed Roller Way contains synthetic resin parts. Accordingly, the maximum operating temperature is 120°C. In case of continuous operation, operating temperature can not exceed 100°C.

⑦ Maximum speed

The operating speed of Anti-Creep Cage Crossed Roller Way should not exceed 30m/min.

⑧ Tightening torque of mounting screws

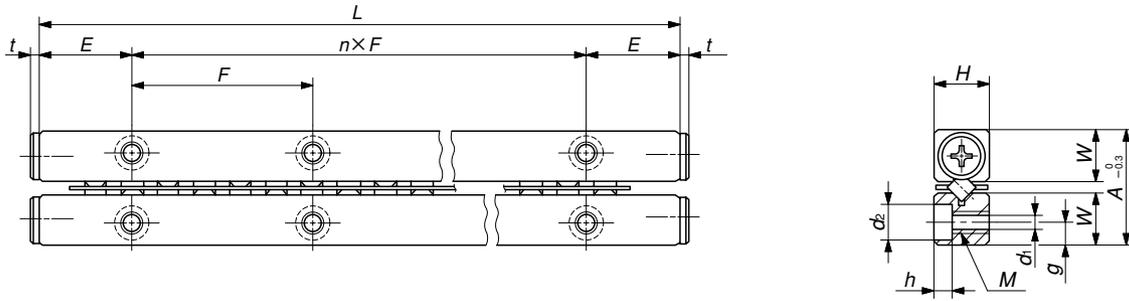
Tightening torque of mounting screws is shown in Table 3. If vibration or shock is large, or moment load is applied, it is recommended to tighten the screws to about 1.3 times the values shown in Table 3. If vibration and shock are not present and high operating accuracy is needed, a lower tightening torque than the values shown in Table 3 is suggested. In this case, adhesive or lock-screws may be used to prevent any subsequent loosening of the mounting screws.

Table 3 Tightening torque of screws

Screw size	Tightening torque N · m
M2 × 0.4	0.23
M3 × 0.5	1.4
M4 × 0.7	3.2
M5 × 0.8	6.3

Remark: If the screw sizes on table side and bed side are different, use the tightening torque of the smaller screw size for both screws.

IKO Anti-Creep Cage Crossed Roller Way CRWG

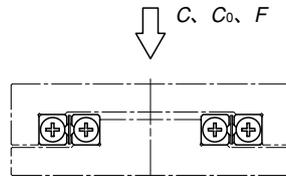


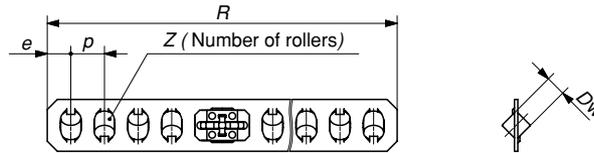
Model number	Mass (Ref.)		Boundary dimensions				Nominal dimensions mm				
	Way ⁽²⁾ g	Roller cage ⁽³⁾ g	A	H	L (n × F)	E	Dw	R	Z	p	e
CRWG 2- 30	6.53	0.38	12	6	30 (1 × 15)	7.5	2	25.6	4	4	2.8
CRWG 2- 45	9.53	0.72			45 (2 × 15)			41.6	8		
CRWG 2- 60	12.5	0.88			60 (3 × 15)			49.6	10		
CRWG 2- 75	15.5	1.22			75 (4 × 15)			65.6	14		
CRWG 2- 90	18.5	1.39			90 (5 × 15)			73.6	16		
CRWG 2-105	21.5	1.72			105 (6 × 15)			89.6	20		
CRWG 3- 50	22.8	1.69	18	8	50 (1 × 25)	12.5	3	42	6	5	3.5
CRWG 3- 75	33.3	2.71			75 (2 × 25)			62	10		
CRWG 3-100	43.8	3.72			100 (3 × 25)			82	14		
CRWG 3-125	54.4	4.74			125 (4 × 25)			102	18		
CRWG 3-150	64.9	5.75			150 (5 × 25)			122	22		
CRWG 4- 80	59.6	9.70	22	11	80 (1 × 40)	20	4	73	8	7	5
CRWG 4-120	88.0	12.0			120 (2 × 40)			101	12		
CRWG 4-160	116	14.3			160 (3 × 40)			129	16		
CRWG 4-200	145	16.7			200 (4 × 40)			157	20		

Note(1): The directions of basic dynamic load rating (C), basic static load rating (C₀), and allowable load (F) are shown in the sketch below.

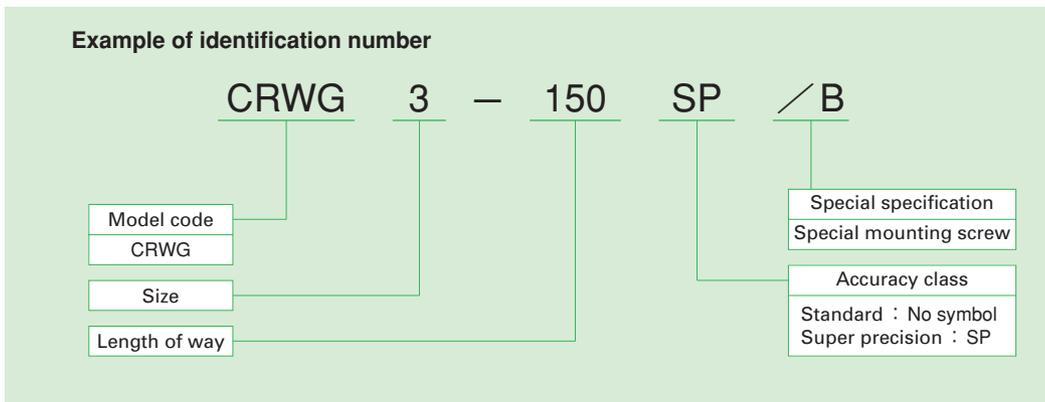
(2): The value shows mass of one piece of way.

(3): The value shows mass of one roller cage.





Mounting dimensions							Maximum stroke length mm	Basic dynamic load rating ⁽¹⁾ C N	Basic static load rating ⁽¹⁾ C ₀ N	Allowable load ⁽¹⁾ F N	Model number
W	g	M	d ₁	d ₂	h	t					
5.5	2.5	M3	2.55	4.4	2	1.5	9	879	1 170	389	CRWG 2- 30
							7	1 480	2 340	778	CRWG 2- 45
							21	1 750	2 920	973	CRWG 2- 60
							19	2 250	4 090	1 360	CRWG 2- 75
							33	2 490	4 670	1 560	CRWG 2- 90
							31	2 940	5 840	1 950	CRWG 2-105
8.3	3.5	M4	3.3	6	3.1	2	13	2 600	3 640	1 210	CRWG 3- 50
							23	3 810	6 060	2 020	CRWG 3- 75
							33	4 900	8 480	2 830	CRWG 3-100
							43	5 920	10 900	3 640	CRWG 3-125
							53	6 880	13 300	4 440	CRWG 3-150
10	4.5	M5	4.3	7.5	4.1	2	14	6 260	9 360	3 110	CRWG 4- 80
							38	8 480	14 000	4 670	CRWG 4-120
							62	10 500	18 700	6 220	CRWG 4-160
							86	12 400	23 400	7 780	CRWG 4-200





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