IKO Features of Crossed Roller Way Series

A wide variety of series products including mechanism are available! Features of

IKO Crossed Roller Way is a linear motion rolling guide incorporating a roller cage between two ways whose two V-shaped surfaces are used as track groove. Arrangement of cylindrical rollers by orthogonalizing them alternately allows receiving of loads in any direction and executes extremely high-accuracy and smooth linear motion.

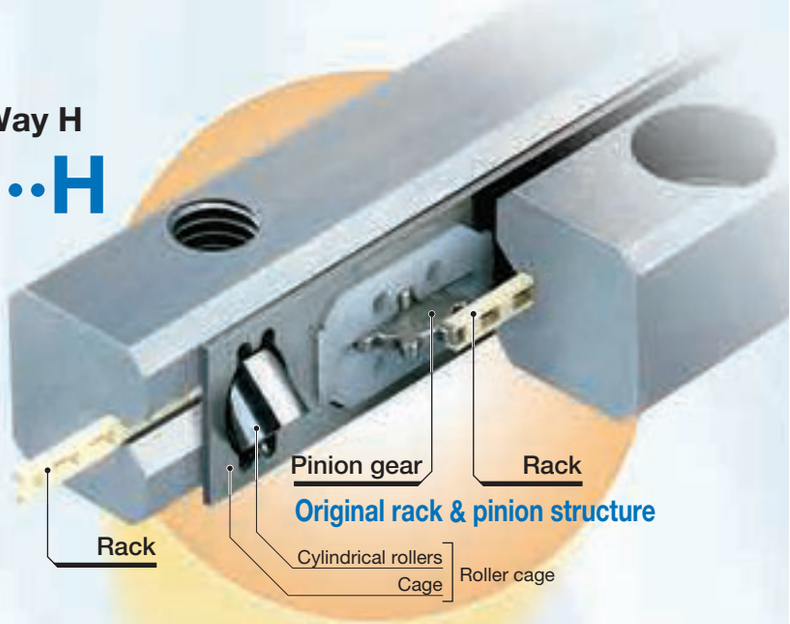
Crossed Roller Way
CRW·CRWM

Crossed Roller Way Unit
CRWU

Anti-Creep Cage Crossed Roller Way
CRWG

Anti-Creep Cage Crossed Roller Way H
CRWG···H

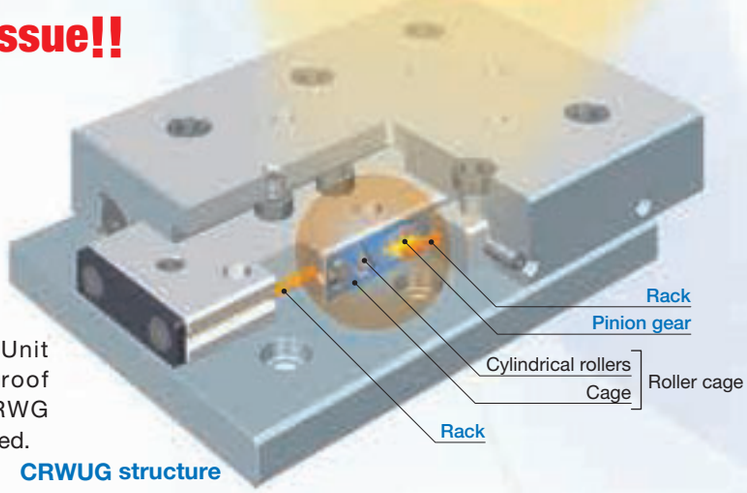
IKO Anti-Creep Cage Crossed Roller Way CRWG is a product with a cage creep IKO proof function using a rack and pinion mechanism originated from the Crossed Roller Way CRW featuring smooth linear motion with super high accuracy.
CRWG ··· H is high load capacity type of CRWG, which has achieved greatly increased load rating by redesigning of raceway of CRWG.



Built-in rack & pinion type
Solves cage creep issue!!

Anti-Creep Cage Crossed Roller Way Unit
CRWUG

IKO Anti-Creep Cage Crossed Roller Way Unit CRWUG is a product with a cage creep proof function-provided Crossed Roller Way CRWG mounted into a ground-finished rigid table and bed.



CRWUG structure

cage misalignment prevention
Crossed Roller Way

Features of Built-in Rack & Pinion Type

Solves Cage Creep Issue!

Perfect solution for cage creep issues by a built-in rack and pinion mechanism as an original design.

Freedom in Mounting

This series is reliable for applications such as vertical axis where Crossed Roller Way may have chances of cage creep.

High-Speed and High-Tact Operation

Any corrective operation for cage creep is not necessary even for high velocity operation.

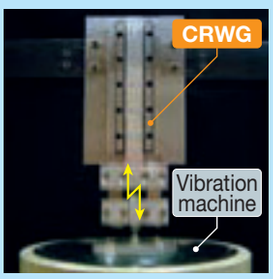
Saving Energy

No remedy motion of cage is necessary even in long term operation.

No cage creep even under high-tact operation in vertical axis!

《Durability test》 Test conditions

Model number	CRWG3	
Test method	Vibration test machine	
Condition	Posture	Vertical
	Maximum velocity	827 mm/s
	Acceleration	15 G
	Number of cycle	31 Hz
	Stroke length	8 mm
	Mass of moving part	330 g
Total cycles	100,000,000 cycles	



《Result》 No cage creep nor material damage in any component is found.

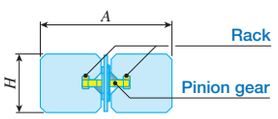
Interchangeable in Mounting Dimensions!

Adoption of original structure of arranging a rack inside the way keeps the same mounting dimensions as conventional Crossed Roller Way CRW.

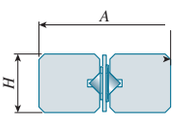
* The mounting dimensions of CRWG1··· H and CRW1 are different.

Easy Replacement

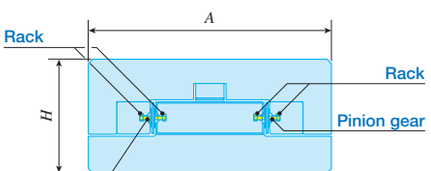
Since they have the same external dimensions to those of the existing Crossed Roller Way and Crossed Roller Way Unit, existing Crossed Roller Way and Crossed Roller Way Unit can be replaced without any mounting dimensions modification.



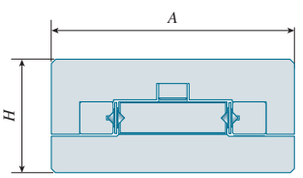
CRWG
CRWG···H



CRW



CRWUG



CRWU

Smooth and Extremely-High Accurate Operation!

Combination of precisely finished raceways and non-recirculating type linear motion rolling guide with super high precision rollers provides superbly smooth motion with very high accuracy.

Improved Running Accuracy

Extremely high running accuracy can be achieved without run deflection by recirculating type linear motion rolling guide.

Suitable for Micro-Feeding

Improvement of precision positioning accuracy and superior corresponding feature to micro-feeding command can be expected because of the linear motion without stick-slip by extremely small frictional resistance.

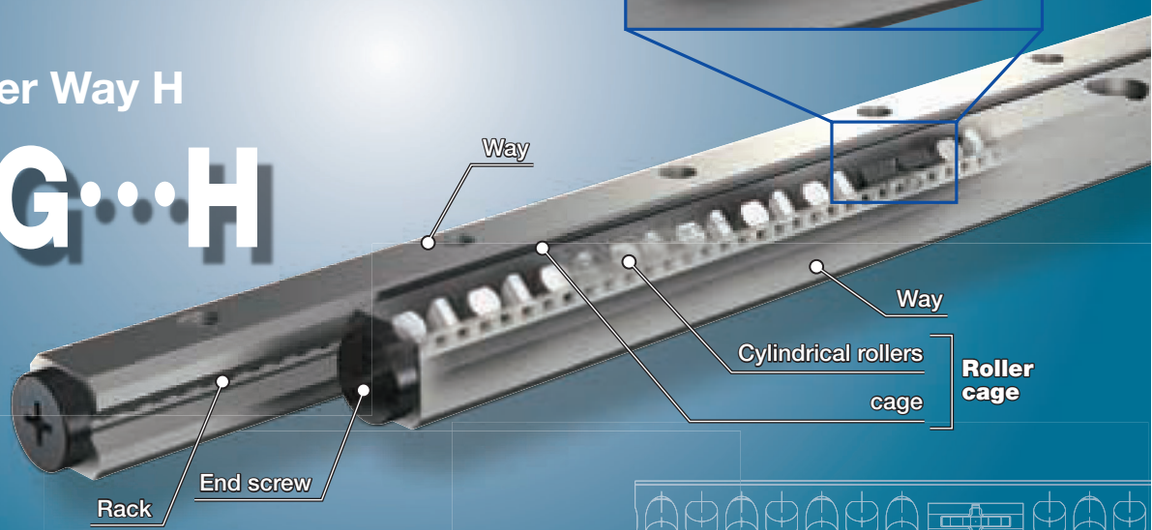
1N=0.102kgf=0.2248lbs.
1mm=0.03937inch

Anti-Creep Cage
Crossed Roller Way

CRWG

Anti-Creep Cage
Crossed Roller Way H

CRWG···H



Crossed Roller Way

CRW/CRWM

Points

Superior load balance

1 This unit has a roller cage with cylindrical rollers alternately orthogonalized between two ways whose two V-shaped surfaces are used as track groove, which allows receiving of loads in any direction.

Solves cage creep problem

2 CRWG and CRWG···H units, which have originally-designed rack and pinion mechanism built-in, solve the cage creep issue and support high-speed & high-tact operation and vertical axis application.

High load capacity type CRWG···H

3 CRWG···H has achieved greatly increased load rating by redesigning of raceway of CRWG, thereby downsizing the machine and equipment and prolonging their lifetime.

Standard type and module type

4 There are two types in the CRW: one is standard type of using four ways and two roller cages in combination as a set and the other is module type of integrating two internal ways in a single structure.

Easy mounting

5 The mounting holes of the way are provided with boring and female thread, so that the mounting structure is not restricted. The module type with two internal ways integrated in a single structure is simple in mounting structure, thus producing high accuracy linear motion.

Stainless steels superior in corrosion resistance are listed on lineup.

6 Products made of stainless steel are highly resistance to corrosion, so that they are suitable for applications where rust prevention oil is not preferred, such as in a cleanroom environment.

Identification Number and Specification

Example of an identification number

The specifications of CRWG series, CRWG···H series, and CRW series are indicated by the identification number. Indicate the identification number, consisting of a model code, a dimension, a part code, a material code, a classification symbol, and any supplemental codes for each specification to apply.

		1	2		3		1	4	5	6	7
CRWG series CRWG···H series		CRWG	3	–	150		H			SP	/B
CRW series	Standard type	CRW	3	–	150			C20	SL	SP	/U
		CRW	3	–	250×300			C36	SL	SP	/U
	Module type	CRWM	3	–	150			C20		SP	
		CRWM	3	–	250×150			C20		SP	

1 **Model** — Model code — Page Ⅱ−9

2 **Size** — Dimensions — Page Ⅱ−9

3 **Way length** — Part code — Page Ⅱ−10

4 **Number of cylindrical rollers** — Part code — Page Ⅱ−10

5 **Material type** — Material code — Page Ⅱ−10

6 **Accuracy class** — Classification symbol — Page Ⅱ−11

7 **Special specification** — Supplemental code — Page Ⅱ−11

Note: One set of the CRW, CRWG, and CRWG...H series consists of a combination of four ways and two roller cages.

1N=0.102kgf=0.2248lbs.
1mm=0.03937inch

Identification Number and Specification —Model · Size—

1 Model

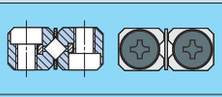
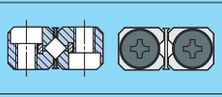
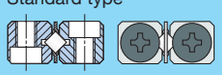
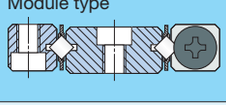
Anti-Creep Cage Crossed Roller Way (CRWG series)		: CRWG
Anti-Creep Cage Crossed Roller Way H (CRWG···H series)		: CRWG···H
Crossed Roller Way (CRW series)	Standard type	: CRW
	Module type	: CRWM

For applicable models and sizes, see Fig. 1.

2 Size

1, 2, 3, 4, 6, 9, 12, 15, 18, 24 For applicable models and sizes, see Table 1.

Table 1 Models and Sizes of CRWG series, CRWG···H series, and CRW series

Series	Shape	Material	Model	Size									
				1	2	3	4	6	9	12	15	18	24
CRWG		High carbon steel made	CRWG	–	○	○	○	○	–	–	–	–	–
CRWG···H		High carbon steel made	CRWG···H	○	○	○	○	–	–	–	–	–	–
CRW	Standard type 	High carbon steel made	CRW	○	○	○	○	○	○	○	○	○	○
		Stainless steel made	CRW···SL	○	○	○	○	○	–	–	–	–	–
	Module type 	High carbon steel made	CRWM	○	○	○	○	–	–	–	–	–	–

—Way length · Number of Cylindrical Rollers · Material Type—

3 Way length

○	The way length is indicated in mm. The CRW series can be combined with a way of different length. For details of way length, see the dimension tables on pages Ⅱ-27 to Ⅱ-52.
○×○	

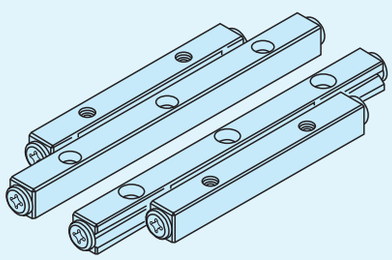
Specifying the combination of different way lengths

Combination of standard type

This combination consists of two short ways, two long ways, and two roller cages, as a set.
In this case, make sure to specify the number of rollers to be incorporated in the roller cages. (For calculation of incorporated rollers, see the Selection of CRW Series on page Ⅱ-17.)

Example **CRW 6 – 300 × 400 C24**

- The number of cylindrical rollers to be incorporated in a unit: 24
- Length of long way: 400 mm
- Length of short way: 300 mm

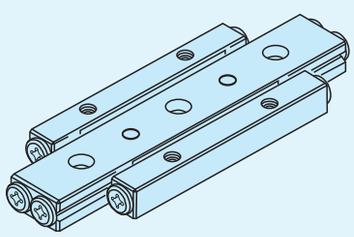


Combination of module type

This combination consists of one long center way, two short ways, and two roller cages, as a set.
In this case, make sure to specify the number of rollers to be incorporated in the roller cages. (For calculation of incorporated rollers, see the Selection of CRW Series on page Ⅱ-17.)

Example **CRWM 3 – 200 × 150 C20**

- The number of cylindrical rollers to be incorporated in a unit: 20
- Length of short outside way: 150 mm
- Length of long center way: 200 mm



4 Number of cylindrical rollers

: No symbol	This represents the number of cylindrical rollers incorporated into a CRW series cage. If not directed, the number of cylindrical rollers indicated in the dimension table shall be incorporated in a roller cage.
: C○	

5 Material type

High carbon steel made	: No symbol	For applicable models and sizes, see Fig. 1.
Stainless steel made	: SL	

1N=0.102kgf=0.2248lbs.
1mm=0.03937inch

6 Accuracy class

Standard	: No symbol	For parallelism of the raceway to reference mounting surface and the tolerance of the parallelism of two raceways of CRWM, see Fig. 1.
Super precision	: SP	

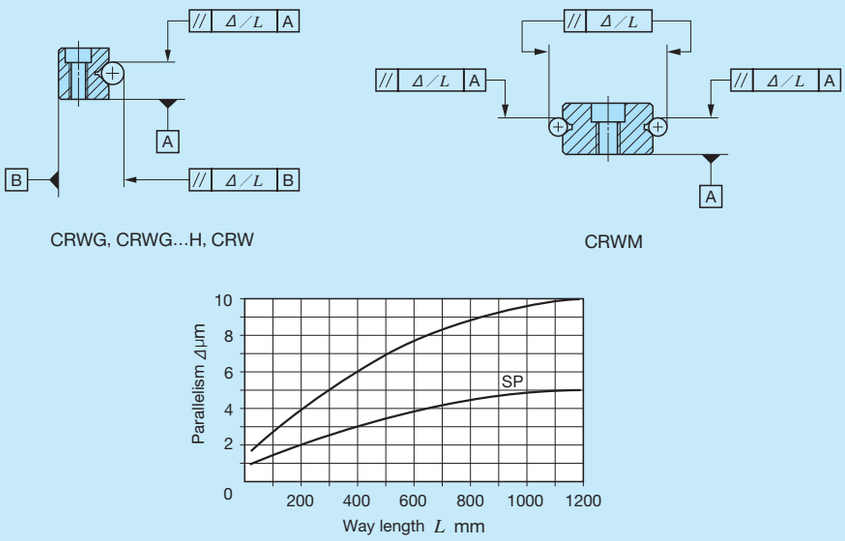


Fig. 1 Accuracy

7 Special specification

B, M, SA, SB, U

For applicable special specifications, see Table 2.
For combination of multiple special specifications, see Table 3.
For details of special specifications, see pages Ⅱ-11 to Ⅱ-14.

Table 2 Application of special specifications

Special specification	Supplemental code	Size									
		1	2	3	4	6	9	12	15	18	24
Special mounting screw	/B	—	—	○	○	○	○	○	○	○	○
High rigidity roller cage (1)	/M	—	—	—	—	○	○	○	○	○	○
End stopper SA (1)	/SA	—	○	○	○	○	○	○	○	○	○
End stopper SB (1)	/SB	—	○	○	○	○	○	○	○	○	○
Wiper seal (1)	/U	—	○	○	○	○	○	○	○	○	○

Notes (1) Applicable only to CRW series standard type. Not applicable to other series or shapes.

Table 3 Combination of special specifications

M	○			
SA	○	○		
SB	○	○	—	
U	○	○	—	—
	B	M	SA	SB

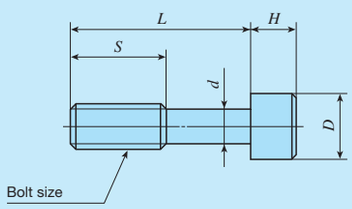
Remarks 1. The combination of "—" shown in the table is not available.
2. When using multiple types for combination, please indicate by arranging the symbols in alphabetical order.

—Special Specification—

Special mounting screw /B

Preload adjusting-side way can be moved by adjusting the preload. Allowance for movement is required between a way fixing screw and mounting hole, but special mounting screws are provided for the cases where enough allowance is not provided or a fixing screw should be mounted from the way side as shown in Fig. 2.
This special mounting screw can also be used for the case where the mounting hole for mounting the fixed-side way and positioning accuracy of female thread are not enough. This special mounting screw is high carbon steel-made only.

Table 4 Dimensions of special mounting screw



unit: mm

Size	Bolt size	*d*	*D*	*H*	*L*	*S*
3	M 3	2.3	5	3	12	5
4	M 4	3.1	6	4	15	6
6	M 5	3.9	8	5	20	8
9	M 6	4.6	8.5	6	30	12
12	M 8	6.2	11.5	8	40	17
15	M10	7.9	14	10	45	16
18	M12	9.6	16	12	50	19
24	M14	11.2	19.5	14	70	26

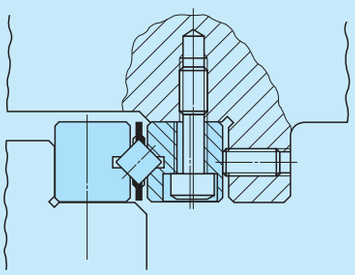
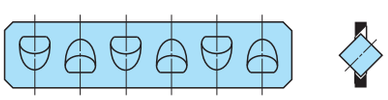


Fig. 2 Mounting by special mounting screw

High rigidity roller cage /M



The cage is changed into a high rigidity copper alloy-made cage designed to suit vertical axis application. This cage has a structure to prevent a roller from dropping off in one-side direction.
For using a high rigidity roller cage for vertical axis application, it is recommended to use the cage in combination with end stopper SB.

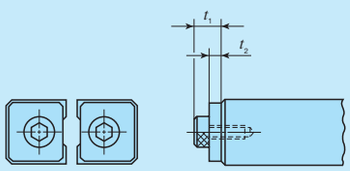
1N=0.102kgf=0.2248lbs.
1mm=0.03937inch

—Special Specification—

End stopper SA /SA

When the stroke frequency is high and cage creep may be caused by the vibration and non-uniformly varying load, the end screw is changed into end stopper SA.
For the series of size 1, an end stopper SA according to end stopper SA is included as standard.

Table 5 Dimensions of end stopper SA



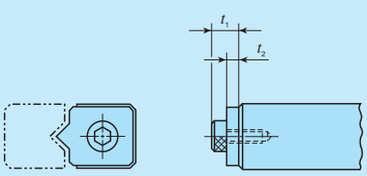
unit: mm

Size	t_1	t_2	Size	t_1	t_2
2	4.5	2	12	11	5
3	5	2	15	14	6
4	7	3	18	14	6
6	8	3	24	16	6
9	10	4			

End stopper SB /SB

When using a high rigidity roller cage for vertical axis application, the end screw is changed into end stopper SB to regulate the cage stroke at the end.
The end stopper SB cannot be mounted on all way ends. Standard mounting positions are shown in Fig. 3. The mounting positions can be changed by loosening the screw.

Table 6 Dimensions of end stopper SB



unit: mm

Size	t_1	t_2	Size	t_1	t_2
2	4.5	2	12	11	5
3	5	2	15	14	6
4	7	3	18	14	6
6	8	3	24	16	6
9	10	4			

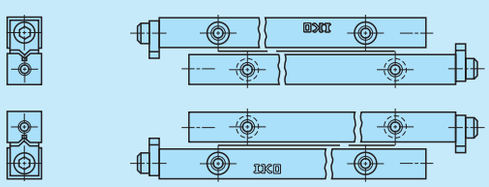


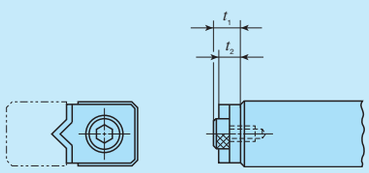
Fig. 3 Arrangement of end stopper SB

—Special Specification—

Wiper seal /U

In order to prevent foreign substances from entering into a raceway, the wiper seal is changed into the one with a function of end stopper SB.
The wiper seal cannot be mounted on all way ends. Standard mounting positions are shown in Fig. 4. The mounting positions can be changed by loosening the screw.

Table 7 Dimensions of wiper seal



unit: mm

Size	t_1	t_2
2	4.5	4
3	5	4
4	7	6
6	8	6
9	10	7.5

Size	t_1	t_2
12	11	8.5
15	14	11
18	14	11
24	16	11

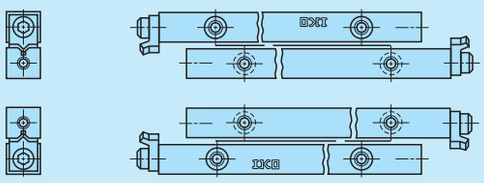


Fig. 4 Arrangement of wiper seal

1N=0.102kgf=0.2248lbs.
1mm=0.03937inch

Load Rating and Allowable Load

Basic dynamic load rating C, basic static load rating C_0, and allowable load F of the CRWG series and CRWG···H series show values for downward loads in case of parallel arrangement of four ways and two pairs of roller cages as one set. (Refer to Fig. 5) In addition, the upward and lateral load rating is the same as downward load rating.

For the CRW series, since the number of cylindrical rollers that share load of each direction varies, the load rating for each load direction and allowable load must be obtained. In addition, basic dynamic load rating C_U, basic static load rating C_{0U}, and allowable load F_U in the dimension table show values per cylindrical roller.

Basic dynamic load rating C, basic static load rating C_0, and allowable load F of the CRW series are obtained based on the equation indicated in Table 8.1 and Table 8.2.

For more information on the definition of load rating and calculated load, see page Ⅲ-3.

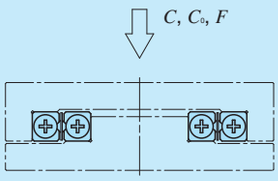


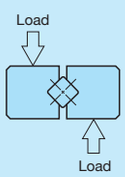
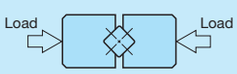
Fig. 5 Direction of load rating of the CRWG series and CRWG···H series

Allowable load

Allowable load refers to load of smooth rolling motion on contact surface to which maximum contact stress is applied and the sum of whose elastic deformation of rolling elements and raceway is small.

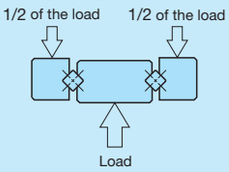
Therefore, use applied load within the allowable load range if very smooth rolling motion and high accuracy are required.

Table 8.1 Calculating formula of load rating and allowable load of standard type CRW series

	Upward and downward load (1)	Lateral load
Load direction		
Basic dynamic load rating C N	$C_r=\left\{\left(\frac{Z}{2}-1\right)2p\right\}^{1/36}\left(\frac{Z}{2}\right)^{3/4}C_U$ ·····(1)	$C_a=\left\{\left(\frac{Z}{2}-1\right)2p\right\}^{1/36}\left(\frac{Z}{2}\right)^{3/4}2^{7/9}C_U$ ·····(4)
Basic static load rating C_0 N	$C_{0r}=\left(\frac{Z}{2}\right)C_{0U}$ ·····(2)	$C_{0a}=2\left(\frac{Z}{2}\right)C_{0U}$ ·····(5)
Allowable load F N	$F_r=\left(\frac{Z}{2}\right)F_U$ ·····(3)	$F_a=2\left(\frac{Z}{2}\right)F_U$ ·····(6)
Code description	C_r : Basic dynamic load rating in case upward and downward load is applied N	
	C_a : Basic dynamic load rating in case lateral load is applied N	
	C_{0r} : Basic static load rating in case upward and downward load is applied N	
	C_{0a} : Basic static load rating in case lateral load is applied N	
	F_r : Allowable load in case upward and downward load is applied N	
	F_a : Allowable load in case lateral load is applied N	
	Z : The number of cylindrical rollers incorporated in a roller cage (omit the figures after the decimal fractions for $\frac{Z}{2}$)	
	p : Inter-pitch dimensions of cylindrical rollers mm	
	C_U : Basic dynamic load rating per cylindrical roller N	
	C_{0U} : Basic static load rating per cylindrical roller N	
	F_U : Allowable load per cylindrical roller N	

Note (1) : In case of parallel arrangement in this load direction, calculation must be performed based on the equations (7) , (8) , and (9) in Table 8.2.

Table 8.2 Calculating formula of load rating and allowable load of module type CRW series

	Upward and downward load	Lateral load
Load direction		
Basic dynamic load rating C N	$C_r=\left\{\left(\frac{Z}{2}-1\right)2p\right\}^{1/36}\left(\frac{Z}{2}\right)^{3/4}2^{7/9}C_U$ ·····(7)	$C_a=\left\{\left(\frac{Z}{2}-1\right)2p\right\}^{1/36}\left(\frac{Z}{2}\right)^{3/4}2^{7/9}C_U$ ·····(10)
Basic static load rating C_0 N	$C_{0r}=2\left(\frac{Z}{2}\right)C_{0U}$ ·····(8)	$C_{0a}=2\left(\frac{Z}{2}\right)C_{0U}$ ·····(11)
Allowable load F N	$F_r=2\left(\frac{Z}{2}\right)F_U$ ·····(9)	$F_a=2\left(\frac{Z}{2}\right)F_U$ ·····(12)
Code description	C_r : Basic dynamic load rating in case upward and downward load is applied N	
	C_a : Basic dynamic load rating in case lateral load is applied N	
	C_{0r} : Basic static load rating in case upward and downward load is applied N	
	C_{0a} : Basic static load rating in case lateral load is applied N	
	F_r : Allowable load in case upward and downward load is applied N	
	F_a : Allowable load in case lateral load is applied N	
	Z : The number of cylindrical rollers incorporated in a roller cage (omit the figures after the decimal fractions for $\frac{Z}{2}$)	
	p : Inter-pitch dimensions of cylindrical rollers mm	
	C_U : Basic dynamic load rating per cylindrical roller N	
	C_{0U} : Basic static load rating per cylindrical roller N	
	F_U : Allowable load per cylindrical roller N	

1N=0.102kgf=0.2248lbs.
1mm=0.03937inch

Selection of CRW Series

For selection of CRW series specifications, stroke length and the number of cylindrical rollers, as well as accuracy, load rating and allowable load, must be determined.

Stroke length and the number of cylindrical rollers

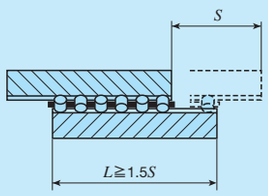
Stroke length of the CRW series affects the way length and the number of cylindrical rollers.
Therefore, select specifications by following the procedure below taking into account the stroke length used and applied load.

❶ Calculation of way length

The way length, which should be 1.5 times longer than the stroke length used, is obtained from the equation below.

$$L \geqq 1.5S \quad \cdots\cdots (13)$$

Where L: Way length mm
S: Stroke length used mm



❷ Calculation of maximum stroke length

Ideally the stroke length used should be less than 80% of the maximum stroke length, which is obtained from the equation below.

$$S_1 \geqq \frac{1}{0.8} S \quad \cdots\cdots (14)$$

Where S_1: Maximum stroke length mm
S: Stroke length used mm

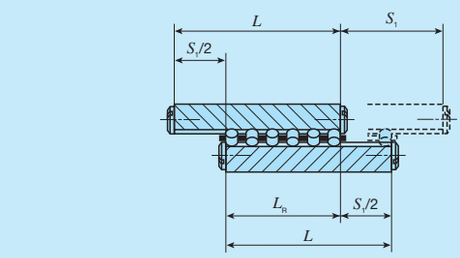
❸ Calculation of cage length and the number of rollers

With the way length and maximum stroke length determined, the allowable length for cage can be calculated.
Calculation method of the cage length varies depending on specifications of end screws and end stopper fitted to the way end.

(1) With standard end screws and end stopper SA (excluding Size 1 series)
The dimensions between rollers at both ends is obtained from the following equation by using a value obtained by subtracting a half of the maximum stroke length from the way length.

$$L_R = L - \frac{S_1}{2} \quad \cdots\cdots (15)$$

Where L_R : Allowable dimensions between rollers at both ends mm
L : Way length mm
S_1 : Maximum stroke length mm



The number of rollers to be incorporated in a roller cage is obtained by the following equation.

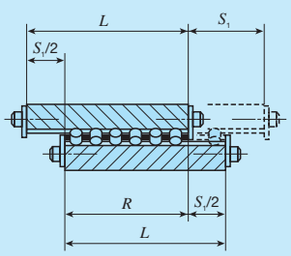
$$Z = \frac{L_R - D_W}{p} + 1 \quad \cdots\cdots (16)$$

Where Z : Number of cylindrical rollers (figures after the decimal fractions are omitted)
L_R : Allowed dimensions between rollers at both ends mm
D_W: Diameter of cylindrical rollers (refer to the dimension table) mm
p : Inter-pitch dimensions of cylindrical rollers (refer to the dimension table) mm

(2) For Size 1 series
The stroke length is regulated by cage and end stopper and the cage length is obtained by the following equation.

$$R=L-\frac{S_1}{2} \quad \cdots\cdots (17)$$

Where R: Allowable cage length mm
L: Way length mm
S_1: Maximum stroke length mm



The number of rollers to be incorporated in a roller cage is obtained by the following equation.

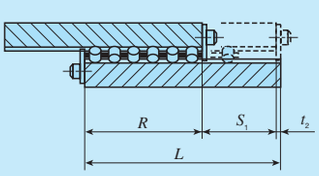
$$Z=\frac{R-2e}{p}+1 \quad \cdots\cdots (18)$$

Where Z : Number of cylindrical rollers (figures after the decimal fractions are omitted)
R: Allowable cage length mm
e : End dimension of cage (refer to the dimension table) mm
p : Inter-pitch dimensions of cylindrical rollers (refer to the dimension table) mm

(3) For end stopper SB and wiper seal
The stroke length is regulated by cage and end stopper or wiper seal and the cage length is obtained by the following equation.

$$R=L-t_2-S_1 \quad \cdots\cdots (19)$$

Where R : Allowable cage length mm
L : Way length mm
S_1: Maximum stroke length mm
t_2 : Thickness of end stopper SB or wiper seal mm (See Table 6 in page Ⅱ-13, and Table 7 in page Ⅱ-14)



The number of rollers to be incorporated in a roller cage is obtained by the equation (18) as with the Size 1 series.

Calculation examples

Form of use ····· CRW 6
Applied load ····· P = 7000 N
Stroke length ····· S = 195 mm

Select specifications for parallel use of Crossed Roller Way under the above conditions (refer to Fig. 26 in page Ⅱ-23).

❶ Calculation of way length

The way length L is calculated from the equation (13).

$$L \geqq 1.5S=1.5\times 195=292.5$$

Therefore, select L = 300 mm based on the standard length in the dimension table.

❷ Calculation of maximum stroke length

The maximum stroke length S_1 is calculated from the equation (14) .

$$S_1 \geqq \frac{1}{0.8}\ S=\frac{1}{0.8}\times 195 \fallingdotseq 244$$

Allowable dimensions between rollers at both ends L_R is calculated from the equation (15).

$$L_R=L-\frac{S_1}{2}=300-\frac{244}{2}=178$$

❸ Calculation of the number of rollers

The number of cylindrical rollers Z is calculated from the equation (16). However, D_W and p in this form are D_W = 6 mm、p = 9 mm according to the dimension table.

$$Z=\frac{L_R-D_W}{p}+1=\frac{178-6}{9}+1 \fallingdotseq 20.1$$

Therefore, it should be Z = 20 by omitting figures after the decimal fractions.

❹ Calculation of allowable load

Allowable load in parallel arrangement F is calculated from equation (9) described in Table 8.2 in page Ⅱ-16. However, allowable load per cylindrical roller F_U is F_U = 769 N according to the dimension table.

$$F=2\left(\frac{Z}{2}\right)F_U=2\left(\frac{20}{2}\right)\times 769=15380$$

Therefore, allowable load F is larger than applied load P = 7000 N. When allowable load becomes smaller than applied load, it is necessary to increase the number of cylindrical rollers by extending way length, or increase the cylindrical roller diameter.

❺ Determination of specifications

Specifications obtained in accordance with the above is CRW6-300 and the number of cylindrical rollers is 20.

1N=0.102kgf=0.2248lbs.
1mm=0.03937inch

Lubrication

Grease is not pre-packed in the CRWG series, CRWG···H series and CRW series, so please perform adequate lubrication as needed.
Both of oil lubrication and grease lubrication are available in the CRWG series, CRWG···H series and CRW series. Generally, oil lubrication should be selected for high speed or low frictional resistance, and grease lubrication for low speed. For grease lubrication, use of high-quality lithium-soap base grease is recommended. For light load and low speed, apply grease or oil to raceway, rack and pinion gear first and then reapply accordingly. However, the structure as indicated in the Fig. 6 allows for easy reapplication. In addition, since the clearance between ways is small for CRWG···H series, apply grease or oil directly to raceway for re-greasing.

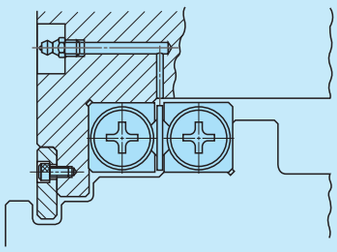


Fig. 6 Example of lubrication system

Dust Protection

Since the CRWG series, CRWG···H series and CRW series are finished with high accuracy, harmful foreign substances such as dust and particles entering into the bearing will cause low life or impaired accuracy. To prevent harmful foreign substances such as dust, particles and water from outside from entering, it is recommended to attach non-contact type labyrinth seal as indicated in Fig. 7, or contact type wiper seal as indicated in the Fig. 8 to both sides.

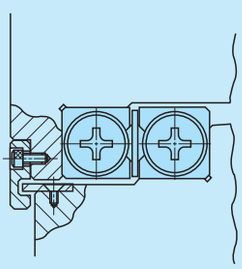


Fig. 7 Example of labyrinth seal

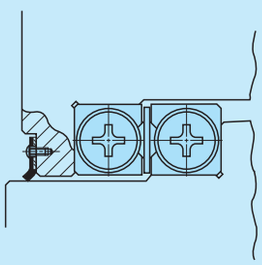


Fig. 8 Example of wiper seal

Precaution for Use

❶ Handling

As the CRWG series, CRWG···H series and CRW series are designed highly precisely, take extra care for handling.
A pinion gear and cylindrical roller are incorporated with the cage for the CRWG series and CRWG···H series. When the cage is dropped or handled roughly, the pinion gear and cylindrical roller may come off. Especially for CRWG···H, grabbing the cylindrical roller may take it off, so be sure to hold the cage body for handling. In addition, do not cut off the cage as doing so may cause pinion gear coming off and breakage of gear joint section.
A rack is incorporated with the way for the CRWG series and CRWG···H series. In operation, take note that the rack may come off when the end screw is removed.
Though the cage for the CRW series may cut off to necessary length, handle it with care not to deform it when cutting.

❷ Accuracy of mounting part

Examples of typical mounting surface processing are shown in Fig. 9.1 and Fig. 9.2.
General processing accuracy of mounting surface is according to Table 9. However, care should be exercised as mounting surface accuracy directly affects running accuracy. Especially when high running accuracy is required, the processing accuracy higher than that indicated in Table 9 is required.

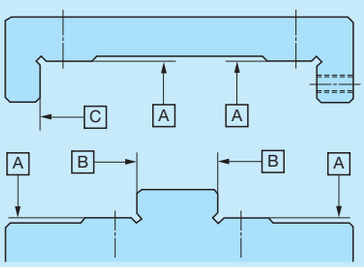


Fig. 9.1 Example of processing of CRWG, CRWG···H and CRW mounting surface

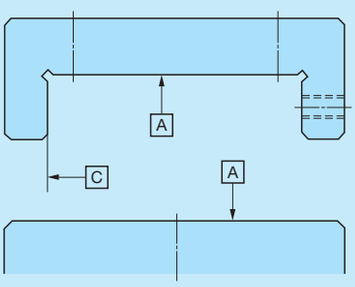


Fig. 9.2 Example of processing of CRWM mounting surface

Table 9 Accuracy of mounting part

Accuracy of A surface	· Directly affects running accuracy. For the flatness of two mounting surfaces on table and bed sides, allowable value approximate to the parallelism indicated in Fig. 1 in page Ⅱ-11 is recommended.
Accuracy of B and C surfaces	· Flatness Affects preload (refer to ❹ Preload adjustment mechanism). Ⅱ−11Allowable value approximate to the parallelism indicated in Fig. 1 in page Ⅱ-11 is recommended. · Squareness Affects rigidity in preload direction of the mounting part of the CRWG series, CRWG···H series and CRW series. Process to sufficiently high accuracy.

❸ Shape of mounting part

For the opposite corner of the mating reference mounting, it is recommended to have relieved fillet as indicated in Fig. 10.
In addition, a clearance of 0.5 mm or higher should be made between the way and the mating member material.

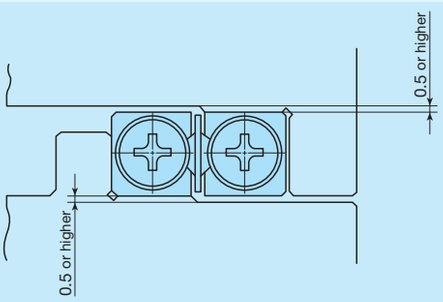


Fig. 10 Shape of mounting part

❹ Preload adjustment mechanism

For use with preload, use the preload adjusting screw as indicated in Fig. 11 as a general way. Preload adjusting screw nominal dimensions and mounting position should be in accordance with the way fixing bolt dimensions and position. Press the center of the way H dimensions.
Preload amount varies depending on operational conditions of your machine and device. However, as excessive preload may lead to short life and damage on the raceway, it is typically ideal to adjust to zero clearance or slight preload state. When accuracy and rigidity are required, use a push plate or tapered jib as indicated in Fig. 12 and Fig. 13, respectively.

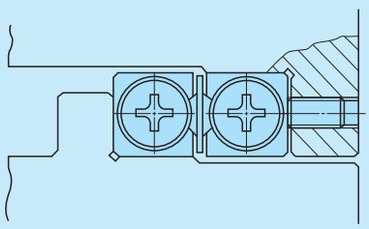


Fig. 11 Example of typical preload adjustment

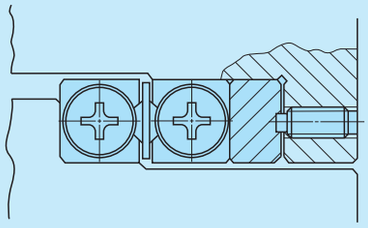


Fig. 12 Example of push plate

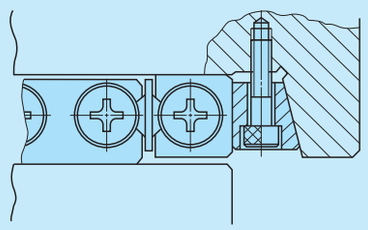


Fig. 13 Example of tapered jib

❺ Operating temperature

As synthetic resin components are used for the CRWG series and CRWG···H series, the maximum operating temperature is 120°C, while it should be lower than 100°C for continuous use. When it exceeds 100°C, contact IKO.
As synthetic resin components are not used for the CRW series, it may be used at high temperature. However, when it exceeds 100°C, contact IKO.

❻ Maximum velocity

Operating velocity should be lower than 50 m/min for the CRWG series and CRWG···H series, and lower than 30 m/min for the CRW series.

❼ Tightening torque for fixing screw

Typical tightening torque for mounting of the CRWG series, CRWG···H series and CRW series is indicated in Table 10. When vibration and shock are large or moment load is applied, it is recommended to fix by using the torque 1.3 times larger than that indicated in the table. In addition, when high running accuracy is required with no vibration and shock, it may be fixed by using torque smaller than that indicated in the table, however, it is recommended to use adhesive agent to fasten the screw, or to use stop bolts.

Table 10 Tightening torque for fixing screw

Bolt size	Tightening torque N · m
M 1.6×0.35	0.20
M 2 ×0.4	0.40
M 3 ×0.5	1.4
M 4 ×0.7	3.2
M 5 ×0.8	6.4
M 6 ×1	10.9
M 8 ×1.25	26.1
M10 ×1.5	51.1
M12 ×1.75	88.2
M14 ×2	140
M16 ×2	215

Remark:
When fixing screws used on the table side and bed side are not identical, fasten them all to the smaller tightening torque.

1N=0.102kgf=0.2248lbs.
1mm=0.03937inch

Mounting

Mounting of CRWG series and CRWG···H series

Typical mounting structure is shown in Fig. 14. For mounting at this point, generally follow the procedure below.

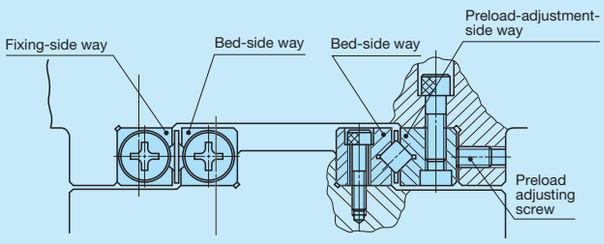


Fig. 14 Mounting example of CRWG and CRWG···H

❶ Preparation for mounting

- Products are packed by set (4 ways and 2 pairs of roller cages). Be careful not to mix with other sets.
- Remove end screws and end stopper, clean up each part with clean wash fluid and then apply rust prevention and lubrication oil.

❷ Cleanup of mounting surface

- Remove burrs and blemishes on the machine mounting surface with an oil-stone, etc. Be careful about corner groove on the mounting surface, too.
- Wipe off dust and dirt with clean cloth and apply rust prevention and lubrication oil lightly.

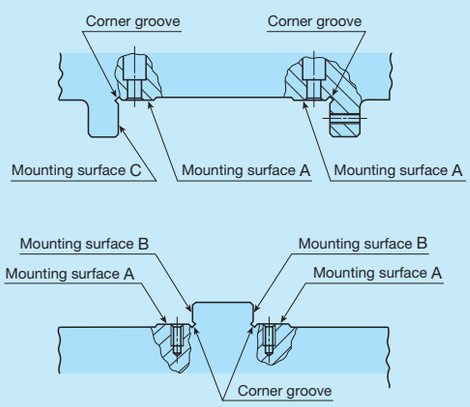


Fig. 15 Mounting surface

❸ Mounting of bed-side way

- Properly align the way with mounting surface and temporarily tighten fixing screws evenly to the tightening torque.
- While making the way sticking to B surface (refer to Fig. 15) tight, fully tighten the screws to the specified torque.
- When high running accuracy is required, fully and evenly tighten them to the specified torque while checking the parallelism of the raceway along the full length of the way.
- Typical tightening torque for fixing screw is according to Table 10 in page Ⅱ-20.

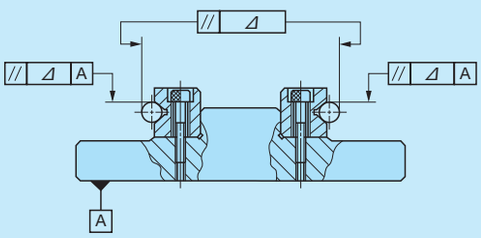


Fig. 16 Accuracy of way mounting

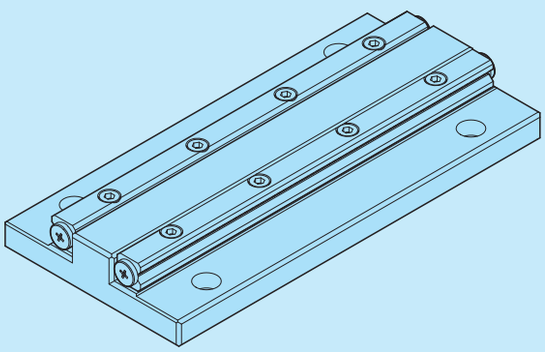


Fig. 17

❹ Operation of table and bed

- Position the roller cages at the stroke end positions of the bed-side way. (Refer to Fig. 18)
- Mate the pinion gear at the center of the cage and the rack of the way.
- At this point, be careful not to deform the cage.

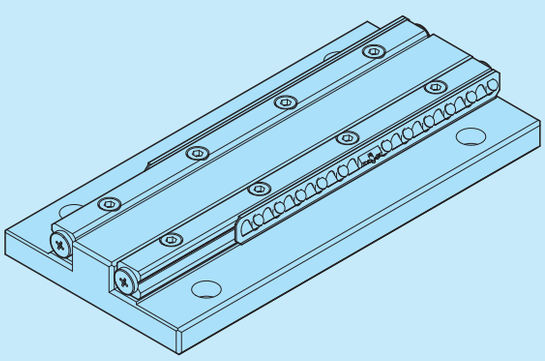


Fig. 18

· Position the table-side way in the stroke end position. (Refer to Fig. 19)
· Mate the pinion gear at the center of the cage and the rack of the table-side way.

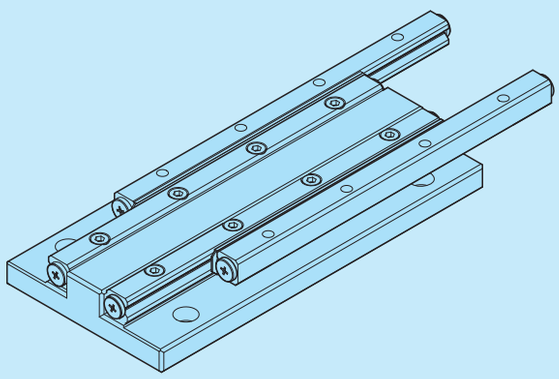


Fig. 19

· Position the table-side way approximately in the stroke center position. (Refer to Fig. 20)

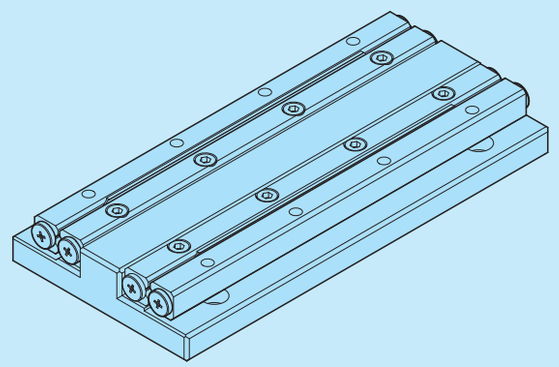


Fig. 20

· Position the table while holding the way to prevent it from moving. (Refer to Fig. 21)

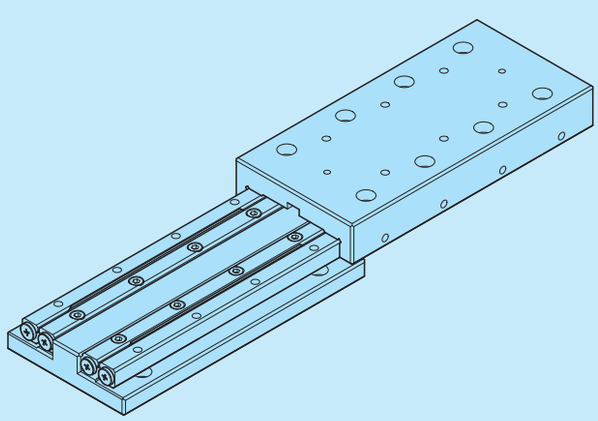


Fig. 21

· Temporarily tighten the table fixing screws. (Refer to Fig. 22)

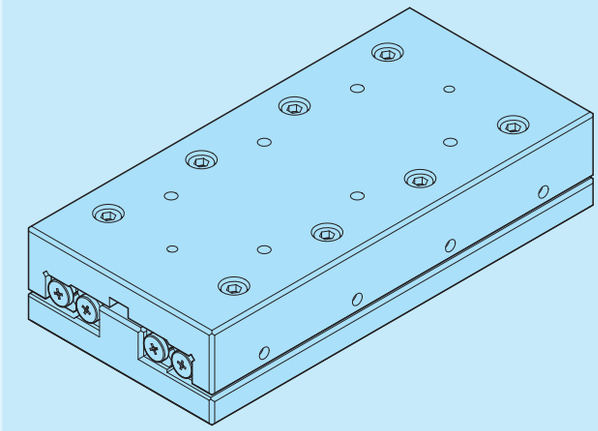


Fig. 22

· Fully stroke the table softly and check that it is within the stroke range used and cylindrical rollers on both ends of the cage do not contact with end screws of the way. If they make contact, take the procedure again. (Refer to Fig. 23)

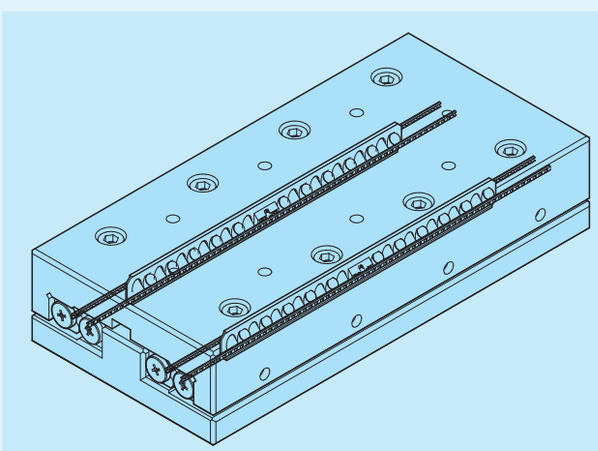


Fig. 23

1N=0.102kgf=0.2248lbs.
1mm=0.03937inch

❺ Preload adjustment

- Preload adjustment is performed with fixing screws of the table-side way tightened temporarily.
- Preload adjustment is started from the preload adjusting screw at the center of way length and then both ends in turn.
- While measuring the clearance on the table sides, tighten the preload adjusting screws subsequently until deflection of the dial gauge stops. Measure the tightening torque for preload adjusting screws at this point.
- When adjusting preload adjusting screw near either end, stroke the table softly and check that the cylindrical roller is on the preload adjusting screw section.
- After the above procedure, the clearance becomes zero or in slight preload state, but preload is still not adjusted evenly. With the same procedure again, re-adjust all the preload adjusting screws evenly to the torque previously measured.

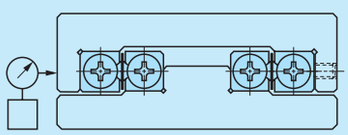


Fig. 24 Example of preload adjustment method

❻ Full tightening of preload-adjustment-side way

- Fixing screws are lightly tightened to even torque. As with preload adjusting screws, temporarily fix them to torque similar to the specified torque in turn from the way center to both ends.
- When tightening fixing screws near either end, stroke the table softly and check that the cylindrical roller is on fixing screw section.
- Finally with the same procedure, fully tighten all the fixing screws evenly to the specified torque.

❼ Check after assembly

- Fully stroke the table softly and check that running is smooth without abnormal noise.
- Measure the table upper and side surfaces with dial gauge or the like and check the running accuracy.

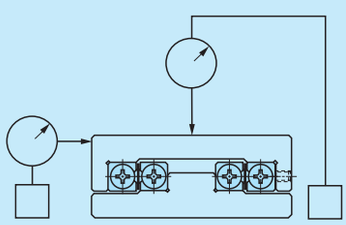


Fig. 25 Accuracy check after assembly

Mounting of standard type CRW series

Typical mounting structure is shown in Fig. 26. For mounting at this point, generally follow the procedure below.

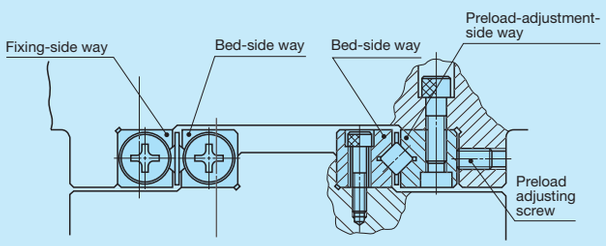


Fig. 26 Mounting example of standard type CRW series

❶ Preparation for mounting

- Products are packed by set (4 ways and 2 pairs of roller cages). Be careful not to mix with other sets.
- Remove end screws and end stopper, clean up each part with clean wash fluid and then apply rust prevention and lubrication oil.

❷ Cleanup of mounting surface

- Remove burrs and blemishes on the machine mounting surface with an oil-stone, etc. Be careful about corner groove on the mounting surface, too.
- Wipe off dust and dirt with clean cloth and apply rust prevention and lubrication oil lightly.

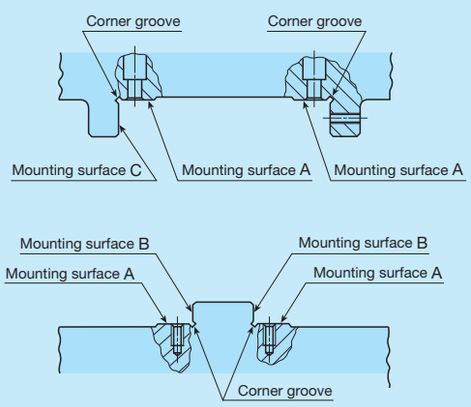


Fig. 27 Mounting surface

❸ Mounting of bed-side way

- Properly align the way with mounting surface and temporarily tighten fixing screws evenly to the tightening torque.
- While making the way sticking to B surface (refer to Fig. 27) tight, fully tighten the screws to the specified torque.
- When high running accuracy is required, fully and evenly tighten them to the specified torque while checking the parallelism of the raceway along the full length of the way.
- Typical tightening torque for fixing screw is according to Table 10 in page Ⅱ-20.

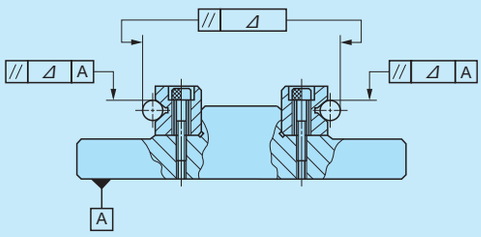


Fig. 28 Accuracy of way mounting

❹ Mounting of table-side way

- Properly align the fixing-side way with mounting surface and temporarily tighten fixing screws evenly to the tightening torque.
- While making the fixing-side way sticking to C surface tight, fully tighten the screws to the specified torque.
- Set back the preload adjusting screws in advance, make the preload-adjusting-side way sticking to the mounting surface, and then temporarily tighten fixing screws lightly to the even torque.

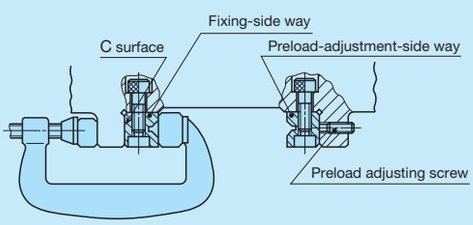


Fig. 29 Mounting of table-side way

❺ Operation of table and bed

- Make alignment of the position in height and cross direction so that the roller cage can be inserted between the table-side way and bed-side way.
- Carefully insert the roller cage and assembly it at approximate center of the way length. At this point, be careful not to deform the cage.
- Mount end screws and end stopper of each way.
- Push the entire table against the preload adjusting screws and tighten the preload adjusting screws to make temporary adjustment until the clearance between ways becomes zero.
- Fully stroke the table softly and correct the roller cage position to the center.

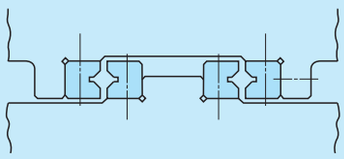


Fig. 30 Position alignment before operation

❻ Preload adjustment

- Preload adjustment is performed with fixing screws of the preload-adjusting-side way tightened temporarily.
- Preload adjustment is started from the preload adjusting screw at the center of way length and then both ends in turn.
- While measuring the clearance on the table sides, tighten the preload adjusting screws subsequently until deflection of the dial gauge stops. Measure the tightening torque for preload adjusting screws at this point.
- When adjusting preload adjusting screw near either end, stroke the table softly and check that the cylindrical roller is on the preload adjusting screw section.
- After the above procedure, the clearance becomes zero or in slight preload state, but preload is still not adjusted evenly. With the same procedure again, re-adjust all the preload adjusting screws evenly to the torque previously measured.

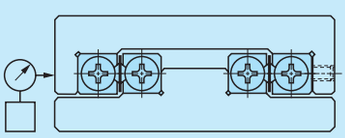


Fig. 31 Example of preload adjustment method

1N=0.102kgf=0.2248lbs.
1mm=0.03937inch

❼ Full tightening of preload-adjustment-side way

- Fixing screws are lightly tightened to even torque. As with preload adjusting screws, temporarily fix them to torque similar to the specified torque in turn from the way center to both ends.
- When tightening fixing screws near either end, stroke the table softly and check that the cylindrical roller is on fixing screw section.
- Finally with the same procedure, fully tighten all the fixing screws evenly to the specified torque.

❽ Check after assembly

- Fully stroke the table softly and check that running is smooth without abnormal noise.
- Measure the table upper and side surfaces with dial gauge or the like and check the running accuracy.

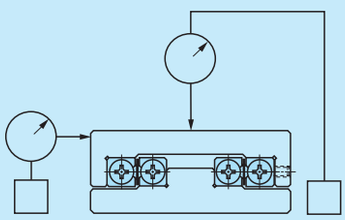


Fig. 32 Accuracy check after assembly

Mounting of module type CRW series

Typical mounting structure of CRWM is shown in Fig. 33. For mounting at this point, generally follow the procedure below.

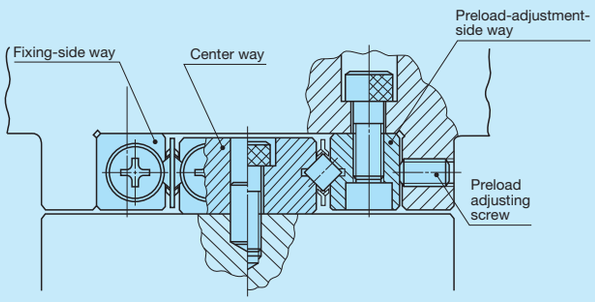


Fig. 33 Example of mounting of CRWM

❶ Preparation for mounting

- Crossed Roller Way CRWM is packed by set (1 center way, 2 ways and 2 pairs of roller cages). Be careful not to mix with other sets.
- Remove end screws and end stopper, clean up each part with clean wash fluid and then apply rust prevention and lubrication oil.

❷ Cleanup of mounting surface

- Remove burrs and blemishes on the machine mounting surface with an oil-stone, etc. Be careful about corner groove on the mounting surface, too.
- Wipe off dust and dirt with clean cloth and apply rust prevention and lubrication oil lightly.

❸ Mounting of center way

- Roughly align the center way to the mounting surface and lightly fix it with fixing screws.
- While measuring mounting parallelism of the center way and raceway to the reference surface of running parallelism for position correction, temporarily tighten the fixing screws to the even tightening torque.
- Evenly tighten all the fixing screws to the specified tightening torque.

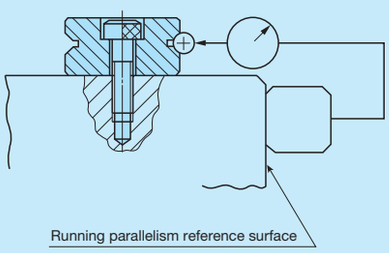


Fig. 34 Mounting accuracy check for center way

❹ Processing of dowel pin hole

- When dowel pins are used, machine holes on the bed in alignment with dowel pin holes near either end of the center way.
- Dowel pin hole of the center way is finished for H7. Finish bed holes in the same way.
- Diameter and its allowance of dowel pin hole of the center way vary depending on the dimension table.
- Eliminate cutting chips and clean up again as necessary. When machines for mounting of the center way are large, clean them up with the center way removed and then reassemble.
- Load the dowel pins and check the parallelism of the reference surface of the running parallelism and the raceway of the center way again.

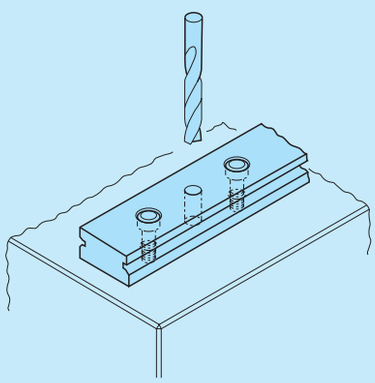


Fig. 35 Machining of dowel pin hole

❺ Mounting of table-side way

- Follow the mounting of standard type CRW series.

❻ Operation of table and bed

- Follow the mounting of standard type CRW series.

❼ Preload adjustment

- Follow the mounting of standard type CRW series.

❽ Full tightening of preload-adjustment-side way

- Follow the mounting of standard type CRW series.

❾ Check after assembly

- Follow the mounting of standard type CRW series.

Mating marks module type CRW series

CRWM has mating marks to ensure the best running accuracy after mounting based on the parallelism measurement result of reference mounting surface and raceway. When assembling the ways, align the mating marks of ways with the same end side as indicated in Fig. 36.

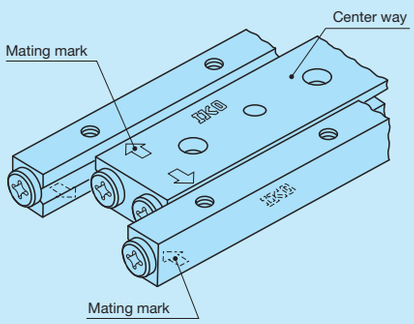
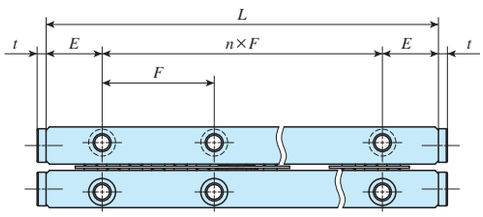


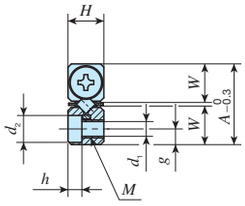
Fig. 36 Mating marks of CRWM

1N=0.102kgf=0.2248lbs.
1mm=0.03937inch

IKO Anti-Creep Cage Crossed Roller Way

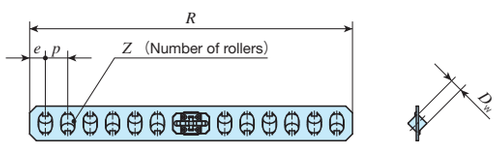
Shape	CRWG			
Size	2	3	4	6





Identification number	Mass (Ref.) Way (1) g	Mass (Ref.) Roller cage (2) g	Boundary dimensions A	Boundary dimensions H	Boundary dimensions L(n×F)	Boundary dimensions E	Dimension of roller cage D_w	Dimension of roller cage R
CRWG 2- 30	6.53	0.38	12	6	30(1×15)	7.5	2	25.6
CRWG 2- 45	9.53	0.72			45(2×15)			41.6
CRWG 2- 60	12.5	0.88			60(3×15)			49.6
CRWG 2- 75	15.5	1.22			75(4×15)			65.6
CRWG 2- 90	18.5	1.39			90(5×15)			73.6
CRWG 2-105	21.5	1.72			105(6×15)			89.6
CRWG 2-120	24.5	1.89			120(7×15)			97.6
CRWG 2-135	27.5	2.22			135(8×15)			113.6
CRWG 2-150	30.5	2.39			150(9×15)			121.6
CRWG 3- 50	22.8	1.69	18	8	50(1×25)	12.5	3	42
CRWG 3- 75	33.3	2.71			75(2×25)			62
CRWG 3-100	43.8	3.72			100(3×25)			82
CRWG 3-125	54.4	4.74			125(4×25)			102
CRWG 3-150	64.9	5.75			150(5×25)			122
CRWG 3-175	75.4	6.77			175(6×25)			142
CRWG 3-200	85.9	7.78			200(7×25)			162
CRWG 3-225	96.4	8.80			225(8×25)			182
CRWG 3-250	107	9.81			250(9×25)			202

Notes (1) The value shows the mass of a piece of way.
(2) The value shows the mass of a roller cage.
(3) This is the value when a combination of four ways and two roller cages is used in parallel arrangement.

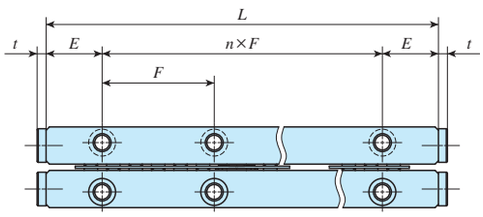


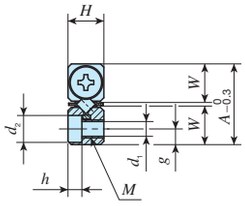
Nominal dimensions mm										Maximum stroke length	Basic dynamic load rating $C^{(3)}$	Basic static load rating $C_0{}^{(3)}$	Allowable load $F^{(3)}$
			Mounting dimensions										
	Z	p	e	W	g	M	d_1	d_2	h	t	mm	N	N	N
	4	4	2.8	5.5	2.5	M3	2.55	4.4	2	1.5	9	913	1 180	392
	8										7	1 570	2 350	783
	10										21	1 860	2 940	979
	14										19	2 420	4 110	1 370
	16										33	2 680	4 700	1 570
	20										31	3 190	5 880	1 960
	22										45	3 440	6 460	2 150
	26										43	3 910	7 640	2 550
	28										57	4 150	8 230	2 740
	6	5	3.5	8.3	3.5	M4	3.3	6	3.1	2	13	2 740	3 660	1 220
	10										23	4 080	6 090	2 030
	14										33	5 300	8 530	2 840
	18										43	6 440	11 000	3 660
	22										53	7 530	13 400	4 470
	26										63	8 570	15 800	5 280
	30										73	9 580	18 300	6 090
	34										83	10 600	20 700	6 910
	38										93	11 500	23 200	7 720

1N=0.102kgf=0.2248lbs.
1mm=0.03937inch

IKO Anti-Creep Cage Crossed Roller Way

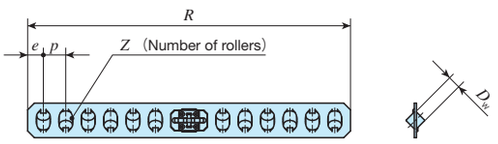
Shape	CRWG			
Size	2	3	4	6





Identification number	Mass (Ref.) Way (1) g	Mass (Ref.) Roller cage (2) g	Boundary dimensions A	Boundary dimensions H	Boundary dimensions L(n×F)	Boundary dimensions E	Dimension of roller cage D_w	Dimension of roller cage R
CRWG 4- 80	59.6	9.70	22	11	80(1×40)	20	4	73
CRWG 4-120	88.0	12.0			120(2×40)			101
CRWG 4-160	116	14.3			160(3×40)			129
CRWG 4-200	145	16.7			200(4×40)			157
CRWG 4-240	173	20.1			240(5×40)			199
CRWG 4-280	201	22.5			280(6×40)			227
CRWG 4-320	230	24.8			320(7×40)			255
CRWG 6-100	147	12.0	31	15	100(1×50)	25	6	75
CRWG 6-150	216	22.6			150(2×50)			129
CRWG 6-200	285	29.7			200(3×50)			165
CRWG 6-250	353	36.8			250(4×50)			201
CRWG 6-300	422	43.9			300(5×50)			237
CRWG 6-350	491	51.0			350(6×50)			273

Notes (1) The value shows the mass of a piece of way.
(2) The value shows the mass of a roller cage.
(3) This is the value when a combination of four ways and two roller cages is used in parallel arrangement.

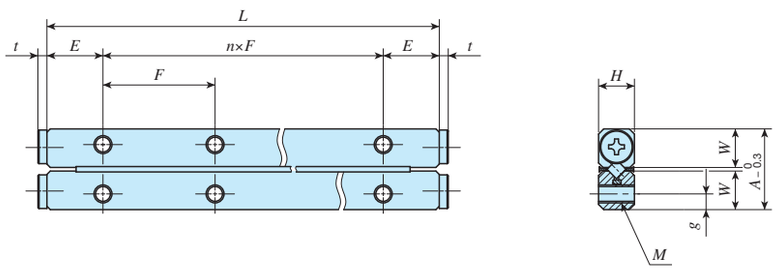


Nominal dimensions mm											Maximum stroke length	Basic dynamic load rating $C^{(3)}$	Basic static load rating $C_0{}^{(3)}$	Allowable load $F^{(3)}$
				Mounting dimensions										
	Z	p	e	W	g	M	d_1	d_2	h	t	mm	N	N	N
	8	7	5	10	4.5	M5	4.3	7.5	4.1	2	14	6 690	9 400	3 130
	12										38	9 180	14 100	4 700
	16										62	11 500	18 800	6 270
	20										86	13 700	23 500	7 830
	26										82	16 700	30 600	10 200
	30										106	18 700	35 300	11 800
	34										130	20 600	40 000	13 300
	6	9	6	14	6	M6	5.3	9.5	5.2	3	48	11 200	13 800	4 610
	12										40	19 300	27 700	9 230
	16										68	24 100	36 900	12 300
	20										96	28 700	46 100	15 400
	24										124	33 000	55 400	18 500
	28										150	37 200	64 600	21 500

1N=0.102kgf=0.2248lbs.
1mm=0.03937inch

IKO Anti-Creep Cage Crossed Roller Way H

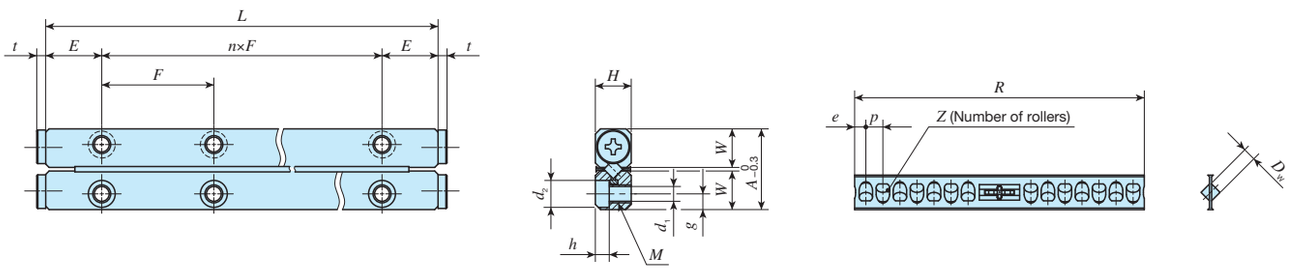
Shape	CRWG···H
Size	1 2 3 4



CRWG 1···H

Identification number	Mass (Ref.) Way (1) g	Mass (Ref.) Roller cage (2) g	Boundary dimensions A	Boundary dimensions H	Boundary dimensions L(n×F)	Boundary dimensions E	Dimension of roller cage D_w	Dimension of roller cage R
CRWG 1- 20H	2.05	0.16	8.5	4	20(1×10)	5	1.5	16.5
CRWG 1- 30H	3.07	0.25			30(2×10)			24.5
CRWG 1- 40H	4.10	0.30			40(3×10)			28.5
CRWG 1- 50H	5.13	0.39			50(4×10)			36.5
CRWG 1- 60H	6.15	0.44			60(5×10)			40.5
CRWG 1- 70H	7.18	0.53			70(6×10)			48.5
CRWG 1- 80H	8.21	0.67			80(7×10)			61.5
CRWG 2- 30H	6.53	0.40	12	6	30(1×15)	7.5	2	21.7
CRWG 2- 45H	9.53	0.73			45(2×15)			36.7
CRWG 2- 60H	12.5	0.95			60(3×15)			46.7
CRWG 2- 75H	15.5	1.27			75(4×15)			61.7
CRWG 2- 90H	18.5	1.38			90(5×15)			66.7
CRWG 2-105H	21.5	1.71			105(6×15)			81.7
CRWG 2-120H	24.5	1.93			120(7×15)			91.7
CRWG 2-135H	27.5	2.26			135(8×15)			106.7
CRWG 2-150H	30.5	2.48			150(9×15)			117.5
CRWG 3- 50H	22.8	1.58	18	8	50(1×25)	12.5	3	41.8
CRWG 3- 75H	33.7	2.28			75(2×25)			57
CRWG 3-100H	44.7	3.33			100(3×25)			79.8
CRWG 3-125H	55.7	4.02			125(4×25)			95
CRWG 3-150H	66.7	5.07			150(5×25)			117.8
CRWG 3-175H	77.6	5.69			175(6×25)			133
CRWG 3-200H	88.6	6.81			200(7×25)			155.8
CRWG 3-225H	99.6	7.85			225(8×25)			178.6
CRWG 3-250H	111	8.55			250(9×25)			193.8
CRWG 4- 80H	61.4	4.35	22	11	80(1×40)	20	4	59.4
CRWG 4-120H	92.7	6.80			120(2×40)			88.2
CRWG 4-160H	124	9.25			160(3×40)			117
CRWG 4-200H	155	11.7			200(4×40)			145.8
CRWG 4-240H	186	15.0			240(5×40)			184.2
CRWG 4-280H	218	17.4			280(6×40)			213
CRWG 4-320H	249	19.9			320(7×40)			241.8

Notes (1) The value shows the mass of a piece of way.
(2) The value shows the mass of a roller cage.
(3) This is the value when a combination of four ways and two roller cages is used in parallel arrangement.



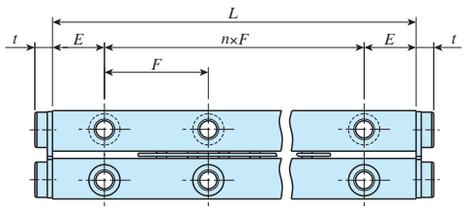
CRWG···H

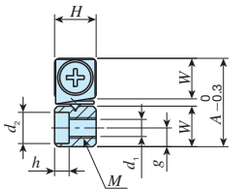
Nominal dimensions mm										Maximum stroke length	Basic dynamic load rating C(3)	Basic static load rating C_0(3)	Allowable load F(3)
			Mounting dimensions										
	Z	p	e	W	g	M	d_1	d_2	h	t	mm	N	N	N
	6	2	1.25	3.9	1.7	M1.6	–	–	–	0.7	3	525	717	239
	10										7	782	1 200	398
	12										19	901	1 430	478
	16										23	1 130	1 910	638
	18										35	1 230	2 150	717
	22										39	1 440	2 630	877
	28		1.75								35	1 740	3 350	1 120
	6	2.5	1.6	5.5	2.5	M3	2.55	4.4	2	1.5	12	1 090	1 500	500
	12										12	1 860	3 000	1 000
	16										22	2 330	4 000	1 330
	22										22	2 980	5 500	1 830
	24										42	3 190	6 000	2 000
	30										42	3 790	7 500	2 500
	34										52	4 180	8 500	2 830
	40										52	4 740	10 000	3 330
	44		2								62	5 100	11 000	3 670
	8	3.8	2.5	8.6	3.5	M4	3.3	6	3.1	2	9	4 260	6 490	2 160
	12										29	5 840	9 730	3 240
	18										33	8 000	14 600	4 870
	22										53	9 350	17 800	5 950
	28										57	11 300	22 700	7 570
	32										77	12 500	26 000	8 650
	38										81	14 300	30 800	10 300
	44										86	16 000	35 700	11 900
	48										105	17 100	38 900	13 000
	10	4.8	3	10.6	4.5	M5	4.3	7.5	4.1	2	33	10 500	17 100	5 690
	16										55	15 200	27 300	9 100
	22										78	19 500	37 500	12 500
	28										100	23 500	47 800	15 900
	36										103	28 600	61 400	20 500
	42										126	32 200	71 700	23 900
	48										148	35 700	81 900	27 300

1N=0.102kgf=0.2248lbs.
1mm=0.03937inch

IKO Crossed Roller Way

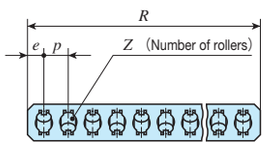
Standard type					
Shape	CRW CRW···SL				
Size	1	2	3	4	6
	9	12	15	18	24





Identification number	Mass (Ref.) Way (1) kg/m	Mass (Ref.) Roller cage (2) g	Boundary dimensions A	Boundary dimensions H	Boundary dimensions $L(n\times F)$	Boundary dimensions E	Dimension of roller cage D_w	Dimension of roller cage R
CRW 1- 20	0.12	0.38	8.5	4	20 (1×10)	5	1.5	16.5
CRW 1- 20 SL								
CRW 1- 30					30 (2×10)			25.5
CRW 1- 30 SL								
CRW 1- 40					40 (3×10)			31.5
CRW 1- 40 SL								
CRW 1- 50					50 (4×10)			37.5
CRW 1- 50 SL								
CRW 1- 60					60 (5×10)			43.5
CRW 1- 60 SL								
CRW 1- 70					70 (6×10)			52.5
CRW 1- 70 SL								
CRW 1- 80					80 (7×10)			61.5
CRW 1- 80 SL								

Notes (1) The value shows the mass per meter of a way.
(2) The value shows the mass of a roller cage with ten cylindrical rollers.
(3) The value shows the load of a cylindrical roller.

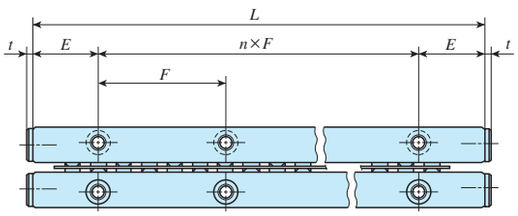


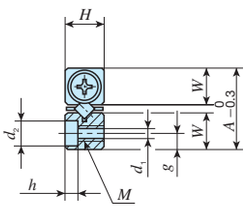
Nominal dimensions mm				Mounting dimensions							Basic dynamic load rating C_U (3) N	Basic static load rating C_{0U} (3) N	Allowable load F_U (3) N
	Z	p	e	W	g	M	d_1	d_2	h	t			
	5	3	2.25	3.9	1.8	M2	1.65	3	1.4	1.7	125	120	39.8
	8												
	10												
	12												
	14												
	17												
	20												

1N=0.102kgf=0.2248lbs.
1mm=0.03937inch

IKO Crossed Roller Way

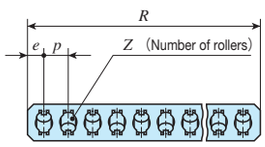
Standard type					
Shape	CRW CRW···SL				
Size	1	2	3	4	6
	9	12	15	18	24





Identification number	Mass (Ref.) Way (1) kg/m	Mass (Ref.) Roller cage (2) g	Boundary dimensions A	Boundary dimensions H	Boundary dimensions L(n×F)	Boundary dimensions E	Dimension of roller cage D_w	Dimension of roller cage R
CRW 2- 30	0.24	0.98	12	6	30 (1×15)	7.5	2	29.6
CRW 2- 30 SL								
CRW 2- 45					45 (2×15)			41.6
CRW 2- 45 SL								
CRW 2- 60					60 (3×15)			53.6
CRW 2- 60 SL								
CRW 2- 75					75 (4×15)			65.6
CRW 2- 75 SL								
CRW 2- 90					90 (5×15)			77.6
CRW 2- 90 SL								
CRW 2-105					105 (6×15)			89.6
CRW 2-105 SL								
CRW 2-120					120 (7×15)			101.6
CRW 2-120 SL								
CRW 2-135					135 (8×15)			113.6
CRW 2-135 SL								
CRW 2-150					150 (9×15)			125.6
CRW 2-150 SL								
CRW 2-165					165 (10×15)			137.6
CRW 2-165 SL								
CRW 2-180					180 (11×15)			149.6
CRW 2-180 SL								

Notes (1) The value shows the mass per meter of a way.
(2) The value shows the mass of a roller cage with ten cylindrical rollers.
(3) The value shows the load of a cylindrical roller.

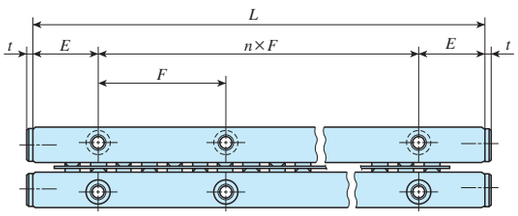


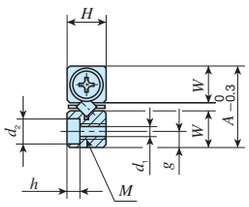
Nominal dimensions mm				Mounting dimensions							Basic dynamic load rating	Basic static load rating	Allowable load
	Z	p	e	W	g	M	d_1	d_2	h	t	C_U(3) N	C_{0U}(3) N	F_U(3) N
	7												
	10												
	13												
	16												
	19												
	22	4	2.8	5.5	2.5	M3	2.55	4.4	2	1.5	293	294	97.9
	25												
	28												
	31												
	34												
	37												

1N=0.102kgf=0.2248lbs.
1mm=0.03937inch

IKO Crossed Roller Way

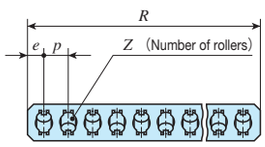
Standard type					
Shape	CRW CRW···SL				
Size	1	2	3	4	6
	9	12	15	18	24





Identification number	Mass (Ref.) Way (1) kg/m	Mass (Ref.) Roller cage (2) g	Boundary dimensions A	Boundary dimensions H	Boundary dimensions L(n×F)	Boundary dimensions E	Dimension of roller cage D_w	Dimension of roller cage R
CRW 3- 50	0.50	2.96	18	8	50 (1×25)	12.5	3	42
CRW 3- 50 SL								
CRW 3- 75					75 (2×25)			62
CRW 3- 75 SL								
CRW 3-100					100 (3×25)			82
CRW 3-100 SL								
CRW 3-125					125 (4×25)			102
CRW 3-125 SL								
CRW 3-150					150 (5×25)			122
CRW 3-150 SL								
CRW 3-175					175 (6×25)			142
CRW 3-175 SL								
CRW 3-200					200 (7×25)			162
CRW 3-200 SL								
CRW 3-225					225 (8×25)			182
CRW 3-225 SL								
CRW 3-250					250 (9×25)			202
CRW 3-250 SL								
CRW 3-275					275 (10×25)			222
CRW 3-275 SL								
CRW 3-300					300 (11×25)			242
CRW 3-300 SL								

Notes (1) The value shows the mass per meter of a way.
(2) The value shows the mass of a roller cage with ten cylindrical rollers.
(3) The value shows the load of a cylindrical roller.

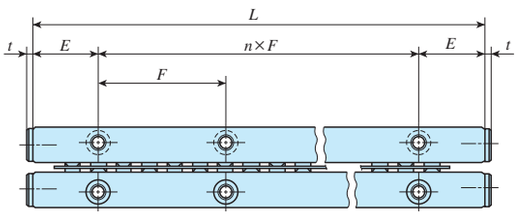


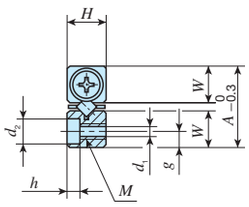
Nominal dimensions mm				Mounting dimensions							Basic dynamic load rating C_U (3) N	Basic static load rating C_{0U} (3) N	Allowable load F_U (3) N
	Z	p	e	W	g	M	d_1	d_2	h	t			
	8	5	3.5	8.3	3.5	M4	3.3	6	3.1	2	638	609	203
	12												
	16												
	20												
	24												
	28												
	32												
	36												
	40												
	44												
	48												

1N=0.102kgf=0.2248lbs.
1mm=0.03937inch

IKO Crossed Roller Way

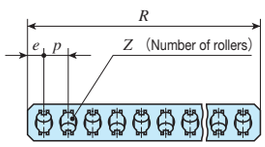
Standard type					
Shape	CRW CRW···SL				
Size	1	2	3	4	6
	9	12	15	18	24





Identification number	Mass (Ref.) Way (1) kg/m	Mass (Ref.) Roller cage (2) g	Boundary dimensions A	Boundary dimensions H	Boundary dimensions L(n×F)	Boundary dimensions E	Dimension of roller cage D_w	Dimension of roller cage R
CRW 4- 80	0.82	6.91	22	11	80 (1×40)	20	4	73
CRW 4- 80 SL								
CRW 4-120					120 (2×40)			101
CRW 4-120 SL								
CRW 4-160					160 (3×40)			136
CRW 4-160 SL								
CRW 4-200					200 (4×40)			164
CRW 4-200 SL								
CRW 4-240					240 (5×40)			199
CRW 4-240 SL								
CRW 4-280					280 (6×40)			227
CRW 4-280 SL								
CRW 4-320					320 (7×40)			262
CRW 4-320 SL								
CRW 4-360					360 (8×40)			297
CRW 4-360 SL								
CRW 4-400					400 (9×40)			325
CRW 4-400 SL								
CRW 4-440					440 (10×40)			360
CRW 4-440 SL								
CRW 4-480					480 (11×40)			388
CRW 4-480 SL								

Notes (1) The value shows the mass per meter of a way.
(2) The value shows the mass of a roller cage with ten cylindrical rollers.
(3) The value shows the load of a cylindrical roller.

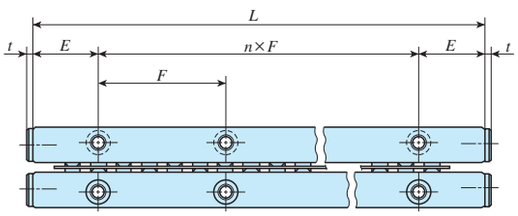


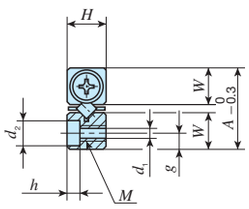
Nominal dimensions mm				Mounting dimensions							Basic dynamic load rating C_U (3) N	Basic static load rating C_{0U} (3) N	Allowable load F_U (3) N
	Z	p	e	W	g	M	d_1	d_2	h	t			
	10	7	5	10	4.5	M5	4.3	7.5	4.1	2	1 230	1 180	392
	14												
	19												
	23												
	28												
	32												
	37												
	42												
	46												
	51												
	55												

1N=0.102kgf=0.2248lbs.
1mm=0.03937inch

IKO Crossed Roller Way

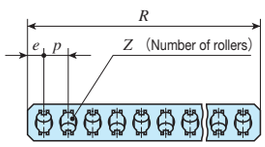
Standard type					
Shape	CRW CRW···SL				
Size	1	2	3	4	6
	9	12	15	18	24





Identification number	Mass (Ref.) Way (1) kg/m	Mass (Ref.) Roller cage (2) g	Boundary dimensions A	Boundary dimensions H	Boundary dimensions L(n×F)	Boundary dimensions E	Dimension of roller cage D_w	Dimension of roller cage R
CRW 6-100	1.57	20.3	31	15	100 (1×50)	25	6	84
CRW 6-100 SL								
CRW 6-150					150 (2×50)			129
CRW 6-150 SL								
CRW 6-200					200 (3×50)			165
CRW 6-200 SL								
CRW 6-250					250 (4×50)			210
CRW 6-250 SL								
CRW 6-300					300 (5×50)			246
CRW 6-300 SL								
CRW 6-350					350 (6×50)			282
CRW 6-350 SL								
CRW 6-400					400 (7×50)			327
CRW 6-400 SL								
CRW 6-450					450 (8×50)			363
CRW 6-450 SL								
CRW 6-500					500 (9×50)			408
CRW 6-500 SL								
CRW 6-550					550 (10×50)			444
CRW 6-550 SL								
CRW 6-600					600 (11×50)			489
CRW 6-600 SL								

Notes (1) The value shows the mass per meter of a way.
(2) The value shows the mass of a roller cage with ten cylindrical rollers.
(3) The value shows the load of a cylindrical roller.

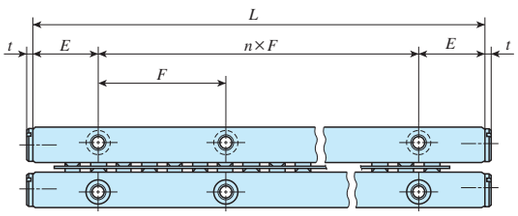


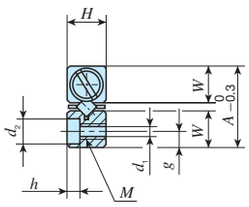
Nominal dimensions mm				Mounting dimensions							Basic dynamic load rating C_U (3) N	Basic static load rating C_{0U} (3) N	Allowable load F_U (3) N
	Z	p	e	W	g	M	d_1	d_2	h	t			
	9	9	6	14	6	M6	5.3	9.5	5.2	3	2 570	2 310	769
	14												
	18												
	23												
	27												
	31												
	36												
	40												
	45												
	49												
	54												

1N=0.102kgf=0.2248lbs.
1mm=0.03937inch

IKO Crossed Roller Way

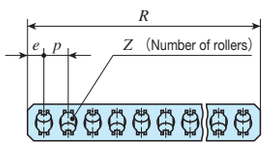
Standard type					
Shape	CRW				
Size	1	2	3	4	6
	9	12	15	18	24





Identification number	Mass (Ref.) Way (1) kg/m	Mass (Ref.) Roller cage (2) g	Boundary dimensions A	Boundary dimensions H	Boundary dimensions L(n×F)	Boundary dimensions E	Dimension of roller cage D_w	Dimension of roller cage R
CRW 9- 200	3.3	64.8	44	22	200 (1×100)	50	9	173
CRW 9- 300					300 (2×100)			257
CRW 9- 400					400 (3×100)			327
CRW 9- 500					500 (4×100)			411
CRW 9- 600					600 (5×100)			495
CRW 9- 700					700 (6×100)			565
CRW 9- 800					800 (7×100)			649
CRW 9- 900					900 (8×100)			733
CRW 9-1000					1 000 (9×100)			817
CRW 9-1100					1 100 (10×100)			887
CRW 9-1200					1 200 (11×100)			971
CRW 12- 200	5.57	146	58	28	200 (1×100)	50	12	168
CRW 12- 300					300 (2×100)			258
CRW 12- 400					400 (3×100)			330
CRW 12- 500					500 (4×100)			420
CRW 12- 600					600 (5×100)			492
CRW 12- 700					700 (6×100)			564
CRW 12- 800					800 (7×100)			654
CRW 12- 900					900 (8×100)			726
CRW 12-1000					1 000 (9×100)			816
CRW 12-1100					1 100 (10×100)			888
CRW 12-1200					1 200 (11×100)			978

Notes (1) The value shows the mass per meter of a way.
(2) The value shows the mass of a roller cage with ten cylindrical rollers.
(3) The value shows the load of a cylindrical roller.

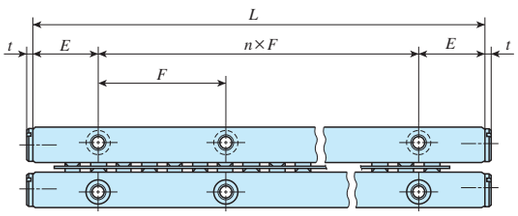


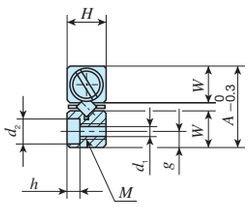
Nominal dimensions mm				Mounting dimensions						Basic dynamic load rating	Basic static load rating	Allowable load
	Z	p	e	W	g	M	d_1	d_2	h	t	C_U (3) N	C_{0U} (3) N	F_U (3) N
	12	14	9.5	20.2	9	M 8	6.8	10.5	6.2	3	7 190	6 600	2 200
	18												
	23												
	29												
	35												
	40												
	46												
	52												
	58												
	63												
	69												
	9	18	12	26.9	12	M10	8.5	13.5	8.2	3	14 700	13 600	4 540
	14												
	18												
	23												
	27												
	31												
	36												
	40												
	45												
	49												
	54												

1N=0.102kgf=0.2248lbs.
1mm=0.03937inch

IKO Crossed Roller Way

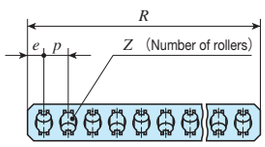
Standard type					
Shape	CRW				
Size	1	2	3	4	6
	9	12	15	18	24





Identification number	Mass (Ref.) Way (1) kg/m	Mass (Ref.) Roller cage (2) g	Boundary dimensions A	Boundary dimensions H	Boundary dimensions L(n×F)	Boundary dimensions E	Dimension of roller cage D_w	Dimension of roller cage R
CRW 15- 300*	8.75	273	71	36	300 (2×100)	50	15	261
CRW 15- 400*					400 (3×100)			330
CRW 15- 500*					500 (4×100)			422
CRW 15- 600*					600 (5×100)			491
CRW 15- 700*					700 (6×100)			583
CRW 15- 800*					800 (7×100)			652
CRW 15- 900*					900 (8×100)			744
CRW 15-1000*					1 000 (9×100)			813
CRW 15-1100*					1 100 (10×100)			905
CRW 15-1200*					1 200 (11×100)			974
CRW 18- 300*	11.3	447	83	40	300 (2×100)	50	18	262
CRW 18- 400*					400 (3×100)			346
CRW 18- 500*					500 (4×100)			430
CRW 18- 600*					600 (5×100)			514
CRW 18- 700*					700 (6×100)			570
CRW 18- 800*					800 (7×100)			654
CRW 18- 900*					900 (8×100)			738
CRW 18-1000*					1 000 (9×100)			822
CRW 18-1100*					1 100 (10×100)			906
CRW 18-1200*					1 200 (11×100)			990

Notes (1) The value shows the mass per meter of a way.
(2) The value shows the mass of a roller cage with ten cylindrical rollers.
(3) The value shows the load of a cylindrical roller.
Remark: The identification numbers with * are our semi-standard items.

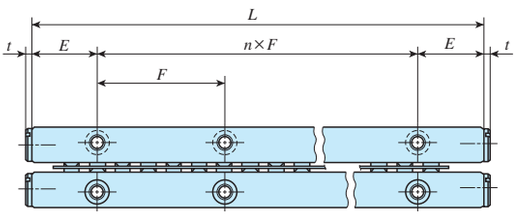


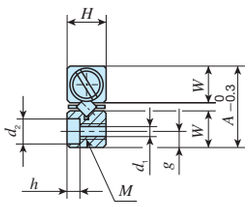
Nominal dimensions mm				Mounting dimensions						Basic dynamic load rating	Basic static load rating	Allowable load
	Z	p	e	W	g	M	d_1	d_2	h	t	C_U (3) N	C_{0U} (3) N	F_U (3) N
	11	23	15.5	33	14	M12	10.5	16.5	10.2	5	23 800	21 900	7 300
	14												
	18												
	21												
	25												
	28												
	32												
	35												
	39												
	42												
	9	28	19	38.5	18	M14	12.5	18.5	12.2	5	35 800	32 700	10 900
	12												
	15												
	18												
	20												
	23												
	26												
	29												
	32												
	35												

1N=0.102kgf=0.2248lbs.
1mm=0.03937inch

IKO Crossed Roller Way

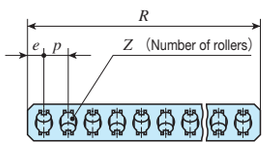
Standard type					
Shape	CRW				
Size	1	2	3	4	6
	9	12	15	18	24





Identification number	Mass (Ref.) Way (1) kg/m	Mass (Ref.) Roller cage (2) g	Boundary dimensions A	Boundary dimensions H	Boundary dimensions L(n×F)	Boundary dimensions E	Dimension of roller cage D_w	Dimension of roller cage R
CRW 24- 400*	20.6	1 060	110	55	400 (3×100)	50	24	336
CRW 24- 500*					500 (4×100)			408
CRW 24- 600*					600 (5×100)			516
CRW 24- 700*					700 (6×100)			588
CRW 24- 800*					800 (7×100)			660
CRW 24- 900*					900 (8×100)			732
CRW 24-1000*					1 000 (9×100)			840
CRW 24-1100*					1 100 (10×100)			912
CRW 24-1200*					1 200 (11×100)			984

Notes (1) The value shows the mass per meter of a way.
(2) The value shows the mass of a roller cage with ten cylindrical rollers.
(3) The value shows the load of a cylindrical roller.
Remark: The identification numbers with * are our semi-standard items.

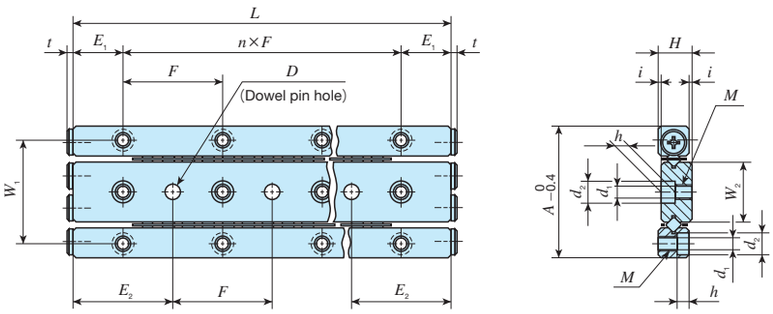


Nominal dimensions mm				Mounting dimensions						Basic dynamic load rating	Basic static load rating	Allowable load
	Z	p	e	W	g	M	d_1	d_2	h	t	C_U (3) N	C_{0U} (3) N	F_U (3) N
	9	36	24	51.5	24	M16	14.5	22.5	14.2	5	69 600	63 500	21 200
	11												
	14												
	16												
	18												
	20												
	23												
	25												
	27												

1N=0.102kgf=0.2248lbs.
1mm=0.03937inch

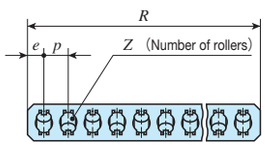
IKO Crossed Roller Way

Module type				
Shape	CRWM			
Size	1	2	3	4



Identification number	Mass (Ref.)		Boundary dimensions				Dimension of roller cage			
	Way (1) kg/m	Roller cage (2) g	A	H	L(n×F)	i	D_w	R	Z	
CRWM 1- 20	0.49	0.38	17	4.5	20 (1×10)	0.5	1.5	16.5	5	
CRWM 1- 30					30 (2×10)			25.5	8	
CRWM 1- 40					40 (3×10)			31.5	10	
CRWM 1- 50					50 (4×10)			37.5	12	
CRWM 1- 60					60 (5×10)			43.5	14	
CRWM 1- 70					70 (6×10)			52.5	17	
CRWM 1- 80					80 (7×10)			61.5	20	
CRWM 2- 30	0.99	0.98	24	6.5	30 (1×15)	0.5	2	29.6	7	
CRWM 2- 45					45 (2×15)			41.6	10	
CRWM 2- 60					60 (3×15)			53.6	13	
CRWM 2- 75					75 (4×15)			65.6	16	
CRWM 2- 90					90 (5×15)			77.6	19	
CRWM 2-105					105 (6×15)			89.6	22	
CRWM 2-120					120 (7×15)			101.6	25	
CRWM 2-135					135 (8×15)			113.6	28	
CRWM 2-150					150 (9×15)			125.6	31	
CRWM 2-165					165 (10×15)			137.6	34	
CRWM 2-180					180 (11×15)			149.6	37	

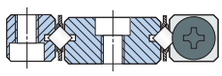
Notes (1) The value shows the total mass per meter of a set of three ways.
(2) The value shows the mass of a roller cage with ten cylindrical rollers.
(3) The value shows the load of a cylindrical roller.

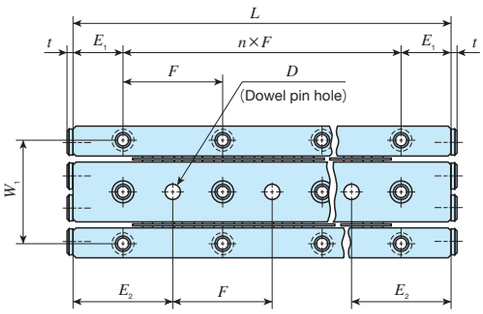


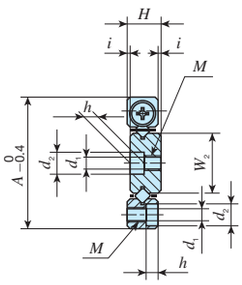
Nominal dimensions and tolerances mm														Basic dynamic load rating	Basic static load rating	Allowable load
	Mounting dimensions															
	p	e	W_1	W_2	E_1	E_2	M	d_1	d_2	h	D	Dim. D tolerance	t	C_U (3) N	C_{0U} (3) N	F_U (3) N
	3	2.25	13.4	7.8	5	10	M2	1.65	3	1.4	2	+0.010 0	1.7	125	120	39.8
	4	2.8	19	11	7.5	15	M3	2.55	4.4	2	3	+0.010 0	1.5	293	294	97.9

1N=0.102kgf=0.2248lbs.
1mm=0.03937inch

IKO Crossed Roller Way

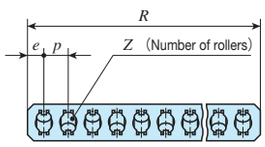
Module type				
Shape	CRWM 			
Size	1	2	3	4





Identification number	Mass (Ref.)		Boundary dimensions				Dimension of roller cage			
	Way (1) kg/m	Roller cage (2) g	A	H	$L(n\times F)$	i	D_w	R	Z	
CRWM 3- 50	1.99	2.96	36	8.5	50 (1×25)	0.5	3	42	8	
CRWM 3- 75					75 (2×25)			62	12	
CRWM 3-100					100 (3×25)			82	16	
CRWM 3-125					125 (4×25)			102	20	
CRWM 3-150					150 (5×25)			122	24	
CRWM 3-175					175 (6×25)			142	28	
CRWM 3-200					200 (7×25)			162	32	
CRWM 3-225					225 (8×25)			182	36	
CRWM 3-250					250 (9×25)			202	40	
CRWM 3-275					275 (10×25)			222	44	
CRWM 3-300					300 (11×25)			242	48	
CRWM 4- 80	3.28	6.91	44	11.5	80 (1×40)	0.5	4	73	10	
CRWM 4-120					120 (2×40)			101	14	
CRWM 4-160					160 (3×40)			136	19	
CRWM 4-200					200 (4×40)			164	23	
CRWM 4-240					240 (5×40)			199	28	
CRWM 4-280					280 (6×40)			227	32	
CRWM 4-320					320 (7×40)			262	37	
CRWM 4-360					360 (8×40)			297	42	
CRWM 4-400					400 (9×40)			325	46	
CRWM 4-440					440 (10×40)			360	51	
CRWM 4-480					480 (11×40)			388	55	

Notes (1) The value shows the total mass per meter of a set of three ways.
(2) The value shows the mass of a roller cage with ten cylindrical rollers.
(3) The value shows the load of a cylindrical roller.



Nominal dimensions and tolerances mm														Basic dynamic load rating	Basic static load rating	Allowable load
	Mounting dimensions													C_U (3)	C_{0U} (3)	F_U (3)
	p	e	W_1	W_2	E_1	E_2	M	d_1	d_2	h	D	Dim. D tolerance	t	N	N	N
	5	3.5	29	16.6	12.5	25	M4	3.3	6	3.1	4	+0.012 0	2	638	609	203
	7	5	35	20	20	40	M5	4.3	7.5	4.1	5	+0.012 0	2	1 230	1 180	392

1N=0.102kgf=0.2248lbs.
1mm=0.03937inch