

# SHAFTS & BEARINGS

## Cam Followers

### Accuracy



**Table 1: Tolerances**

Series Dimensions & Symbols	Metric Series (1)		Miniature Series	Inch Series	
	Crowned Outer Ring	Cylindrical Outer Ring		Crowned Outer Ring	Cylindrical Outer Ring
Outside dia. of outer ring	0 -120	See Table 2.	See Table 3.	0 -50	0 -25
Stud dia. d1	h7		h6	+25 0	
Width of outer ring C	0 -120		0 -120	0 -130	

(1): Also applicable to NUCF series.



**Table 2: Accuracy of Outer Ring**

D Nominal outside dia. of outer ring mm		$\Delta D_{mp}$ Single plane mean outside dia. deviation		VDp Outside dia. variation in a single radial plane (max.)	VDmp Mean outside dia. variation (max.)	Kea Radial runout of assembled bearing outer ring (max.)
over	incl.	high	low			
6	18	0	-8	10	6	15
18	30	0	-9	12	7	15
30	50	0	-11	14	8	20
50	80	0	-13	16	10	25
80	120	0	-15	19	11	35



**Table 3: Accuracy of Outer Ring (Miniature Type Cam Followers)**

$\Delta D_{mp}$ Single plane mean outside dia. deviation								Kea Radial runout of assembled bearing outer ring (Max.)			
Class 0		Class 6		Class 5		Class 4		Class 0	Class 6	Class 5	Class 4
high	low	high	low	high	low	high	low				
0	-8	0	-7	0	-5	0	-4	15	8	5	4



**Table 4: Radial Internal Clearance**

Metric Series (2)	Identification Number (1)				Radial Internal Clearance	
	Heavy Duty Type Cam Followers	Miniature Type Cam Followers	Inch Series	Super Duty Type Cam Followers	Min.	Max.
CF 3-5	-	CFS2.5-CFS5	CR 8, CR 8-1	CRH 8-1, CRH 9	3	17
CF 6	-	CFS6	CR10, CR10-1	CRH10-1, CRH11	5	20
CF 8-CF12-1	-	-	CR12- CR22	CRH12- CRH22	5	25
CF16-CF20-1	-	-	CR24- CR36	CRH24- CRH36	10	30
CF24-CF30-2	-	-	-	CRH40- CRH44	10	40
-	NUCF10 R-NUCF24 R	-	-	-	20	45
-	NUCF24-1R-NUCF30-2R	-	-	-	25	50

(1): Also applicable to full complement type, crowned outer ring type, sealed type and with hexagon hole type.  
 (2): Only representative types are shown in the table, but applicable to all metric series.



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Pre-Packed Grease

Grease-prepacked Cam Followers and allowable temperature range are shown in Table 5. A good quality lithium soap based grease is prepacked.  
 For Cam Followers without prepacked grease, grease should be packed through the oil hole in the stud before use. If they are used without grease, wear of rolling parts may take place, leading to short bearing life.

**Table 5: Grease Prepacked Cam Followers and Allowable Temperature Range**

Series Stud dia. d1 <sup>(1)</sup> mm	Types	With Cage				Full Complement Type
		Shield Type		Sealed Type		
		Standard	With Hexagon Hole	Standard	With Hexagon Hole	
Metric Series Cam Followers	3, 4	CF	-20°C~+110°C	-20°C~+110°C	-20°C~+80°C	-
		CF...F	-20°C~+120°C	-20°C~+120°C <sup>(2)</sup>	-20°C~+80°C	-
	5	CFES	-20°C~+120°C	-20°C~+120°C	-20°C~+120°C	-20°C~+120°C
		CFE	-20°C~+120°C	-20°C~+120°C	-20°C~+120°C	-20°C~+120°C
	6~10	CF...W	-20°C~+120°C	-20°C~+120°C	-20°C~+120°C	-20°C~+120°C
			Grease is not prepacked.	Grease is not prepacked.	-20°C~+120°C	-20°C~+120°C
	12~30	CF-RU1, CF-FU1	-	-	-20°C~+120°C	-
		CF-SFU	-	-	-20°C~+120°C	-
	Inch Series	NUCF	-	-	-	-20°C~+120°C
		CFS	-	-20°C~+120°C	-	-20°C~+120°C
Inch Series	CR	-20°C~+120°C	-	-20°C~+120°C	-20°C~+120°C	
	CRH	-	-	-20°C~+120°C	-20°C~+120°C	

1): For Eccentric Type Cam Followers (CFE), thread dia. G shown in the dimension table is applicable in place of stud dia.

2): Allowable temperature range of Stainless Steel Made Cam Followers is -20°C~+110°C.

T E C H N I C A L



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## Cam Followers

### Mounting



① Make the centre axis of mounting hole perpendicular to the moving direction of the Cam Follower and match the side shoulder accurately with the seating surface indicated by dimension "f" in the dimension tables. (See Fig.1). Then fix the Cam Follower with the nut. DO NOT hit the flange head of Cam Followers directly by a hammer, etc. It may lead to bearing failures such as irregular rotation and cracking.

② The IKO mark on the flange head of the stud indicates the position of the oil hole on the raceway. Avoid locating the oil hole within the loading zone. It may lead to short bearing life. (Refer to Fig.2). The hole located in the middle part of the stud perpendicular to the stud centre axis is used for greasing or locking.

③ When tightening the nut, the tightening torque should not exceed the values shown in the dimension tables. If the tightening torque is too large, it is possible that the threaded portion of the stud will be broken. When there are possibilities of loosening, a special nut such as a lock nut, a spring washer or a self-locking nut should be used.

④ In the case of Solid Eccentric Stud Type Cam Followers and Eccentric Type Cam Followers, the outer ring position can be adjusted by turning the stud using a screwdriver or hexagon bar wrench as appropriate. The stud is fixed by a nut and a spring-washer, etc. The tightening torque should not exceed the values of maximum tightening torque shown in the dimension tables.

When shock loads are applied and the adjusted eccentric amount has to be ensured, it is recommended to make holes in the housing, stud and eccentric collar, and fix the stud with a dowel pin. (Refer to Fig.3). However, when the stud diameter is less than 8mm (Eccentric collar dia. 11mm), it is difficult to make a hole in the stud because the stud is through-hardened.

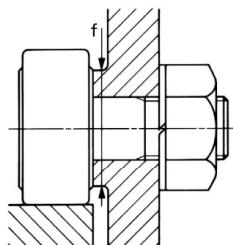
⑤ In the case of Eccentric Type Cam Followers, the length of the mounting hole should be no more than 0.5mm longer than the dimension B3 (Eccentric collar width) shown in the dimension table. (Refer to Fig.4).

⑥ For mounting the Easy Mounting Type Cam Followers, it is recommended to fix the screw from the upper side to the stepped portion of the stud. (Refer to Fig.5).

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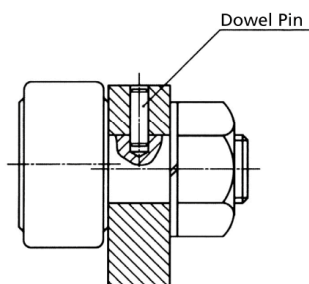
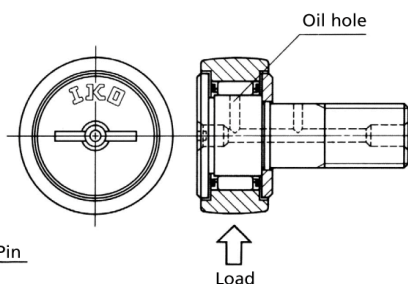
## Cam Followers

### Mounting



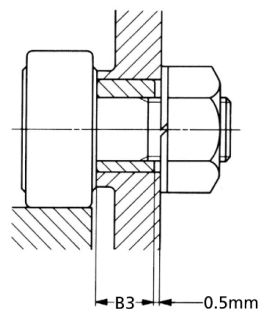
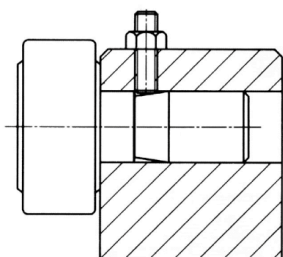
**Fig. 1:** Height of seating surface "f"

**Fig. 2:** Oil hole position and loading direction



**Fig. 3:** Mounting example of Solid Eccentric Stud Type Cam Follower

**Fig. 4:** Mounting example of Eccentric Type Cam Follower



**Fig. 5:** Mounting example of Easy Mounting Type Cam Follower

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# SHAFTS & BEARINGS

## Thrust Disc Type Cam Followers

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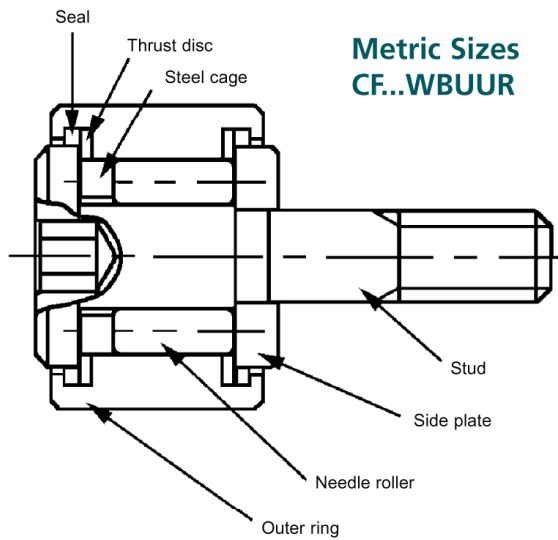
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These are small sizes of metric series cam followers. Wide variations in size and shape are available.

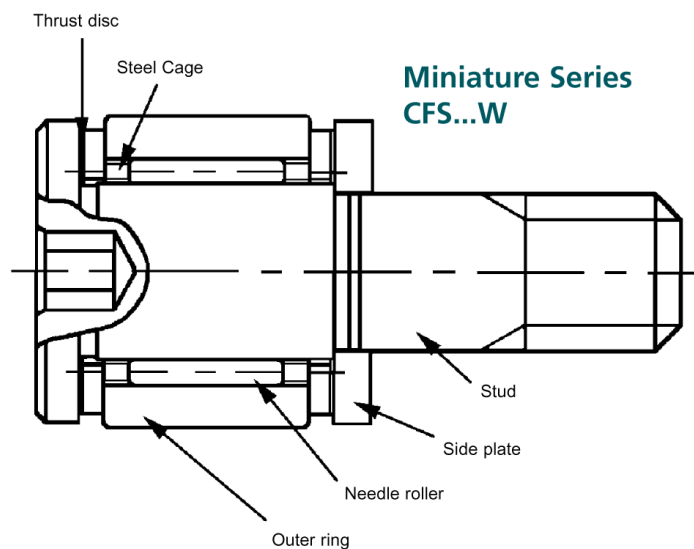
Thrust Disc Type Cam Followers have special resin thrust discs superior in wear and heat resistance assembled between the sliding surfaces of outer ring shoulders, stud head and side plate.

# SHAFTS & BEARINGS

## Thrust Disc Type Cam Followers

Minicam series are compactly designed cam followers with the stud diameter 2 to 6mm and the outer ring outside diameter 4.5 to 13mm. They are suitable for use as follower bearings in lightly loaded high precision cam mechanisms and linear motion mechanisms, and used widely in applications such as electric parts manufacturing and inspection equipment, precision measuring instruments, and OA equipment.

Thrust disc type cam followers reduce wear and heat generation due to axial loads caused by misalignment, etc. Stainless steel made cam followers are highly resistant to corrosion, and best suited for use at places where oil cannot be used, in environments exposed to water splashes or in clean rooms.



These are compactly designed bearings, incorporating very thin needle rollers in an outer ring with a smaller outside diameter compared to the standard type with the same stud size. They are used in electronic devices, OA equipment, small-size index devices, etc.

Thrust Disc Type Cam Followers have special resin thrust discs superior in wear and heat resistance assembled between the sliding surfaces of outer ring shoulders, stud head and side plate.

