



Cam Follower

THK General Catalog

Cam Follower

THK General Catalog

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Features of the Cam Follower

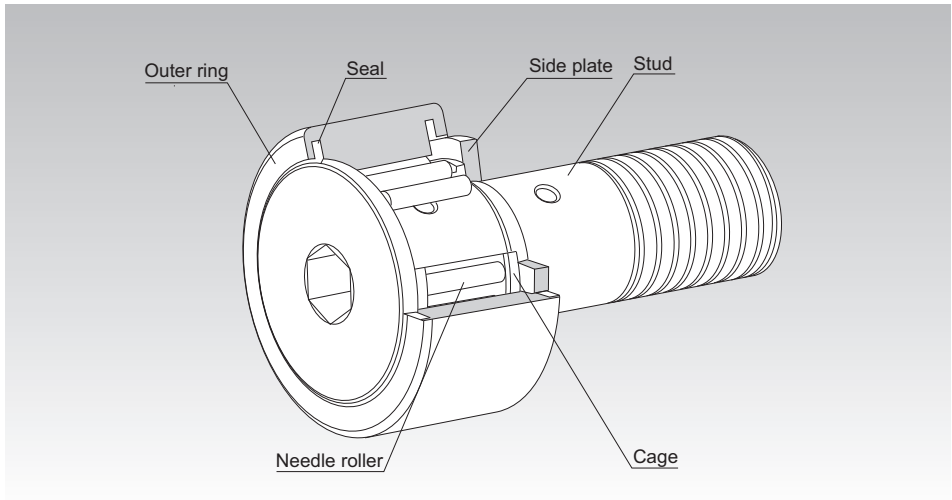


Fig.1 Structure of Cam Follower Model CF...UU-A

Structure and Features

The Cam Follower is a compact and highly rigid bearing with a shaft. It contains needle rollers and is used as a guide roller for cam mechanisms or straight motion.

Since its outer ring rotates while keeping direct contact with the mating surface, this product is thick-walled and designed to bear an impact load.

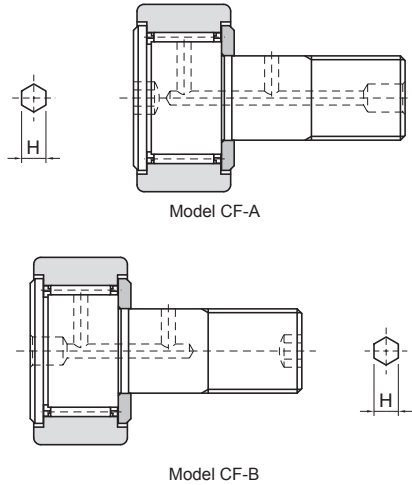
Inside the outer ring, needle rollers and a precision cage are incorporated. This prevents the product from skewing and achieves a superb rotation performance. And, as a result, the product is capable of easily withstanding high-speed rotation.

There are two types of the outer ring in shape: spherical and cylindrical. The spherical outer ring easily absorbs a distortion of the shaft center when the cam follower is installed and helps lighten a biased load.

The Cam Follower is used in a wide range of applications such as cam mechanisms of automatic machines, dedicated machines as well as carrier systems, conveyors, bookbinding machines, tool changers of machining centers, pallet changers, automatic coating machines, and sliding forks of automatic warehouses.

Cam Follower with a Hexagon Socket

For Cam Follower model CF, Cam Follower Containing Thrust Balls model CFN and Eccentric Cam Follower model CFH, hexagon socket studs that allow easy eccentricity adjustment are available. If desiring a hexagon socket on the stud head, add "A" to the end of the model number. If desiring a hexagon socket on the stud thread, add "B". ("B" applies to model CF12 or higher.)



The Same Dimension of the Hexagonal Width Across Flats (H Dimension) Applies to Both Type A and Type B.

Cam Follower Containing Thrust Balls

Even a slight mounting error in a high speed cam mechanism operating in a harsh environment could cause abnormal wear to the thrust unit of the cam follower. In such a case, using Cam Follower Containing Thrust Balls model CFN will bring about a significant effect in increasing the durability.

Models CFN5 to 12 are standard-stock items. If desiring a size other than the standard items, contact THK.

Model CFN is capable of receiving a thrust load caused by a slight mounting error. However, it is necessary to minimize a component of thrust force, or prevent it from occurring, when designing the cam mechanism and installing the Cam Follower.

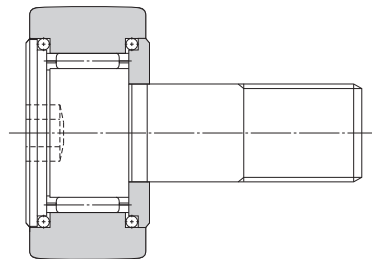


Fig.2

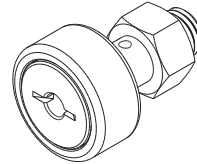
Types of the Cam Follower

Types and Features

Popular Type Cam Follower Model CF

It is a popular type of Cam Follower provided with a driver groove on the head of the stud. A highly corrosion resistant stainless steel type (symbol M) is also available.

Specification Table⇒ **A19-12**



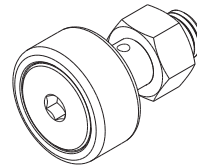
Model CF

Cam Follower with a Hexagon Socket Model CF-A

Since the stud head has a hexagon socket, this model can easily be installed using a hexagon wrench.

A type whose stud screw has a hexagon socket (CF-B) is also available. (applicable to stud diameter of 12 or greater)

Specification Table⇒ **A19-14**

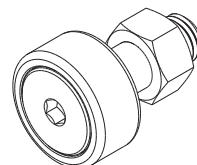


Model CF-A

Eccentric Cam Follower with a Hexagon Socket Model CFH-A

This model can be installed in the same mounting hole as that of model CF. Since the mounting shaft of the stud and the stud head are eccentric by 0.25 mm to 1.0 mm, the position of this model can easily be adjusted simply by turning the stud. Thus, it is a compact, highly accurate eccentric cam follower with an integral structure. As a result, the man-hours for machining and assembly can significantly be reduced because it is unnecessary to align the cam follower with the cam groove and machine the mounting-hole area with precision.

Specification Table⇒ **A19-18**

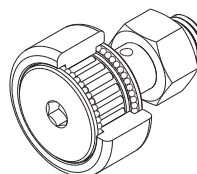


Model CFH-A

Cam Follower Containing Thrust Balls Model CFN

Based on the popular type Cam Follower, this model is incorporated with thrust load balls.

Specification Table⇒ **A19-20**



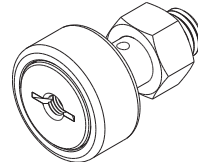
Model CFN

Cam Follower with a Tapped Hole for Greasing Model CFT

Specification Table⇒ **A**19-22

Basically the same as the popular type Cam Follower, this model is provided with tapped holes for piping on the stud head and the thread.

It is optimal for locations where an integrated piping for greasing is required.



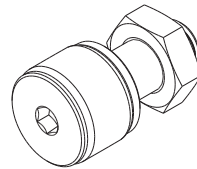
Model CFT

Outer ring compact cam follower model CFS

Specification Table⇒ **A**19-24

This product contains extremely fine needle rollers.

The outer ring external diameter is extremely small relative to the stud diameter, allowing a compact design.

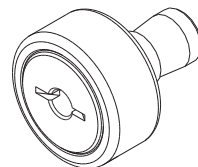


Model CFS

Easy-mount cam follower model CF-SFU

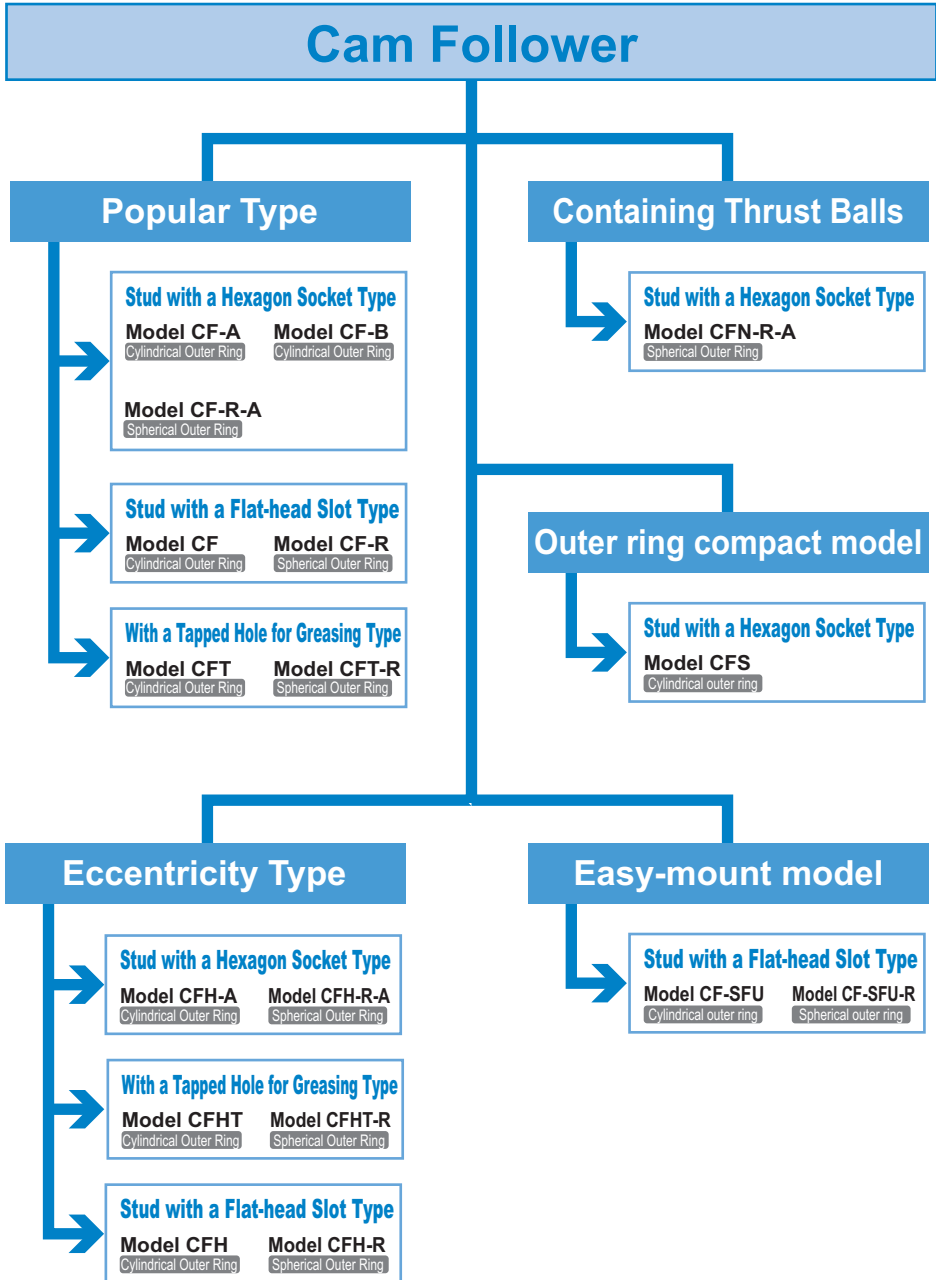
Specification Table⇒ **A**19-26

To simplify installation, a flat-head slot has been machined into the stud so that it can be secured with a screw. This is ideal for units where there is no space to fasten the stud. Model CF-SFU is only available with seals.



Model CF-SFU

Classification Table



Nominal Life

[Static Safety Factor]

The basic static load rating C_0 refers to the static load with constant direction and magnitude, under which the calculated contact stress in the center of the contact area between the roller and the raceway under the maximum load is 4000 MPa. (If the contact stress exceeds this level, it will affect the rotation.) This value is indicated as “ C_0 ” in the dimensional tables. When a load is statically or dynamically applied, it is necessary to consider the static safety factor as shown below.

$$\frac{C_0}{P_0} = f_s$$

f_s : Static safety factor in relation to C_0
(see Table1)

C_0 : Basic static load rating (kN)
 P_0 : Radial load (kN)

The permissible load (F_0) indicates the permissible value of the applied load determined by the strength of the stud section of the Cam Follower. Therefore, it is necessary to consider the static safety factor f_m against F_0 as well as f_s .

$$\frac{F_0}{P_0} = f_m$$

f_m : Static safety factor in relation to F_0
(see Table1)

F_0 : Permissible load (kN)
 P_0 : Radial load (kN)

Table1 Static Safety Factor (f_s, f_m)

| Load conditions | Lower limit of f_s and f_m |
|-----------------|--------------------------------|
| Normal load | 1 to 2 |
| Impact load | 2 to 3 |

[Nominal Life]

The service life of the Cam Follower is obtained from the following equation.

$$L = \left(\frac{f_r \cdot C}{f_w \cdot P_c} \right)^{\frac{10}{3}} \times 10^6$$

L : Nominal life
(The total number of revolutions that 90% of a group of identical Cam Follower units independently operating under the same conditions can achieve without showing flaking from rolling fatigue)

C : Basic dynamic load rating (kN)

P_c : Radial load (kN)

f_r : Temperature factor
(see Fig.1 on **A19-10**)

f_w : Load factor
(see Table2 on **A19-10**)

* The basic dynamic load rating (C) of the Cam Follower shows the load with interlocked direction and magnitude, under which the nominal life (L) is 1 million revolutions when a group of identical Cam Follower units independently operate. The basic dynamic load rating (C) is indicated in the corresponding specification table.

[Calculating the Service Life Time]

When the nominal life (L) has been obtained, the service life time (L_h) is obtained from the following equation.

● For Linear Motion

$$L_h = \frac{D \cdot \pi \cdot L}{2 \times \ell_s \cdot n_1 \times 60} \quad (\text{h})$$

L_h : Service life time
 L : Nominal life
 D : Bearing outer diameter (mm)
 ℓ_s : Stroke length (mm)
 n₁ : Number of reciprocations per minute (min⁻¹)

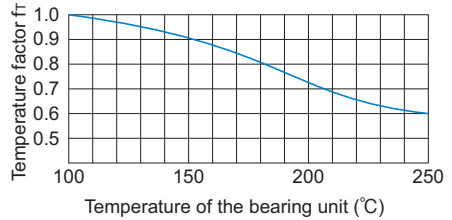


Fig.1 Temperature Factor (fr)

Note) The normal service temperature is 80°C or below. If the product is to be used at a higher temperature, contact THK.

● For Rotary Motion

$$L_h = \frac{D \cdot L}{D_1 \cdot n \times 60}$$

D₁ : Outer ring contact average diameter of the cam (mm)
 n : Revolutions per minute of the cam (min⁻¹)

Table2 Load Factor (f_w)

| Condition | f _w |
|------------------------------|----------------|
| Smooth motion without impact | 1 to 1.2 |
| Normal motion | 1.2 to 1.5 |
| Motion with severe impact | 1.5 to 3 |

Accuracy Standards

Cam Followers are manufactured with accuracies according to Table3. However, model CFS is manufactured in accordance with Table4.

- (1) Dimensional tolerance of the cylindrical outer ring in outer diameter D : Table3
- (2) Dimensional tolerance of the spherical outer ring in outer diameter D: $\begin{smallmatrix} 0 \\ -0.05 \end{smallmatrix}$
- (3) Dimensional tolerance of the Cam Follower in stud diameter d : h7
- (4) Dimensional tolerance of the outer ring in width C: $\begin{smallmatrix} 0 \\ -0.12 \end{smallmatrix}$

Table3 Accuracy of the Outer Ring (JIS Class 0)

Unit: μm

| Nominal dimension of the bearing outer diameter (D) (mm) | | Tolerance of the bearing in outer diameter (Dm) ^(note) | | Tolerance of the outer ring in radial runout (max) |
|--|---------|---|-------|--|
| Above | Or less | Upper | Lower | |
| 6 | 18 | 0 | -8 | 15 |
| 18 | 30 | 0 | -9 | 15 |
| 30 | 50 | 0 | -11 | 20 |
| 50 | 80 | 0 | -13 | 25 |
| 80 | 120 | 0 | -15 | 35 |

Table4 Accuracy standards for CFS models.

Unit: mm

| | |
|---|-------------|
| (1) Dimensional tolerance for outer ring diameter D | 0 -0.008 |
| (2) Dimensional tolerance for stud diameter d | h6 |
| (3) Dimensional tolerance of the outer ring in width C: | 0 -0.12 |
| (4) Radial runout tolerance of the outer ring | 15μm |

Note) "Dm" represents the arithmetic average of the maximum and minimum diameters obtained in measuring the bearing outer diameter at two points.

Model CF-SFU is compatible with model CF.

Track Load Capacity

The track load capacity means the permissible load at which the outer ring of a bearing and the mating surface are capable of withstanding repeated use over a long period.

The track load capacity provided in the specification table indicates the value when using a steel material with tensile strength of 1.24 kN/mm² as the mating material. Therefore, it is possible to increase the track load capacity by increasing the hardness of the material. Fig.2 shows the hardness of the mating material and the track capacity factor in relation to tensile strength. To obtain the track load capacity of each mating material, multiply the track load capacity shown in the corresponding specification table by the respective track load factor.

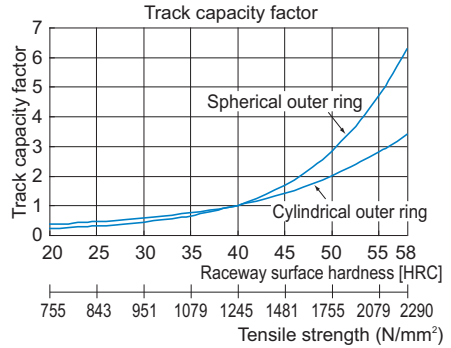


Fig.2 Track Capacity Factor

Note) For the mating material, we recommend using those materials with the raceway hardness of 20 HRC or higher and the tensile strength of 755 N/mm² or higher.

Radial Clearance

The radial clearance of Cam Followers is based on the value indicated in Table5 (both full-roller type and caged type share the same radial clearance). The radial clearance of CFS is indicated in Table6.

Table5 Radial Clearance

Unit: μm

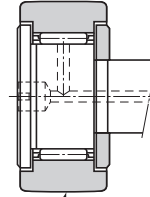
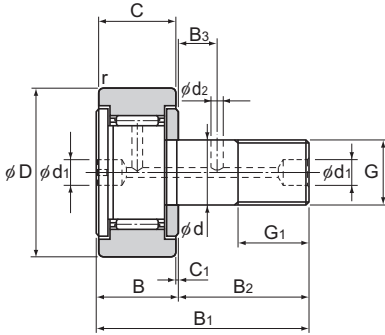
| Model No. | Radial Clearance (Caged type and full-roller type) | |
|------------------------------------|---|------|
| | Min. | Max. |
| CF, CFN, CFH, CFT, CFHT and CF-SFU | | |
| 3 to 4 | 3 | 17 |
| 5 to 8 | 5 | 20 |
| 10 to 12-1 | 5 | 25 |
| 16 to 20-1 | 10 | 30 |
| 24 to 30-2 | 10 | 40 |

Model CF-SFU is compatible with model CF(with cages).

Table6 Radial clearance for model CFS Unit: μm

| Stud diameter | Radial Clearance (Caged type and full-roller type) | |
|---------------|---|------|
| | Min. | Max. |
| 2.5 to 5 | 3 | 17 |
| 6 | 5 | 20 |

**Model CF (Popular Type (Cylindrical Outer Ring)), Model CF-M (Stainless Steel Type)
Model CF-R (Popular Type (Spherical Outer Ring)), Model CF-MR (Stainless Steel Type)**



R250 (CF5)
R500 (CF6 to CF18)
R1000 (CF20 to CF30)

Model CF-R

| Stud diameter d | Model No. | Main dimensions | | | | | | | | | | | Shoulder height f (Min.) | |
|--------------------|-----------|---------------------|-----------------------|---------------|----------------|------|----------------------------------|----------------|----------------|----------------|----------------|----------------|--------------------------------|------------------|
| | | Outer diameter D | Outer ring width C | Threaded G | G ₁ | B | Overall length B ₁ | B ₂ | B ₃ | C ₁ | d ₁ | d ₂ | | r _{min} |
| 5 | CF 5 | 13 | 9 | M5×0.8 | 7.5 | 10 | 23 | 13 | — | 0.5 | 3.1* | — | 0.3 | 9.7 |
| 6 | CF 6 | 16 | 11 | M6×1 | 8 | 12 | 28 | 16 | — | 0.6 | 4* | — | 0.3 | 11 |
| 8 | CF 8 | 19 | 11 | M8×1.25 | 10 | 12 | 32 | 20 | — | 0.6 | 4* | — | 0.3 | 13 |
| 10 | CF 10 | 22 | 12 | M10×1.25 | 12 | 13 | 36 | 23 | — | 0.6 | 4* | — | 0.3 | 15 |
| 10 | CF 10-1 | 26 | 12 | M10×1.25 | 12 | 13 | 36 | 23 | — | 0.6 | 4* | — | 0.3 | 15 |
| 12 | CF 12 | 30 | 14 | M12×1.5 | 13 | 15 | 40 | 25 | 6 | 0.6 | 6 | 3 | 0.6 | 20 |
| 12 | CF 12-1 | 32 | 14 | M12×1.5 | 13 | 15 | 40 | 25 | 6 | 0.6 | 6 | 3 | 0.6 | 20 |
| 16 | CF 16 | 35 | 18 | M16×1.5 | 17 | 19.5 | 52 | 32.5 | 8 | 0.8 | 6 | 3 | 0.6 | 24 |
| 18 | CF 18 | 40 | 20 | M18×1.5 | 19 | 21.5 | 58 | 36.5 | 8 | 0.8 | 6 | 3 | 1 | 26 |
| 20 | CF 20 | 52 | 24 | M20×1.5 | 21 | 25.5 | 66 | 40.5 | 9 | 0.8 | 8 | 4 | 1 | 36 |
| 20 | CF 20-1 | 47 | 24 | M20×1.5 | 21 | 25.5 | 66 | 40.5 | 9 | 0.8 | 8 | 4 | 1 | 36 |
| 24 | CF 24 | 62 | 29 | M24×1.5 | 25 | 30.5 | 80 | 49.5 | 11 | 0.8 | 8 | 4 | 1 | 40 |
| 24 | CF 24-1 | 72 | 29 | M24×1.5 | 25 | 30.5 | 80 | 49.5 | 11 | 0.8 | 8 | 4 | 1 | 40 |
| 30 | CF 30 | 80 | 35 | M30×1.5 | 32 | 37 | 100 | 63 | 15 | 1 | 8 | 4 | 1 | 46 |
| 30 | CF 30-1 | 85 | 35 | M30×1.5 | 32 | 37 | 100 | 63 | 15 | 1 | 8 | 4 | 1 | 46 |
| 30 | CF 30-2 | 90 | 35 | M30×1.5 | 32 | 37 | 100 | 63 | 15 | 1 | 8 | 4 | 1 | 46 |

Note) The seal must be used at temperature of 80°C or below.
Those models marked with "*" have a greasing hole only on the head.

Model number coding

CF6 V M UU R -N

Model number

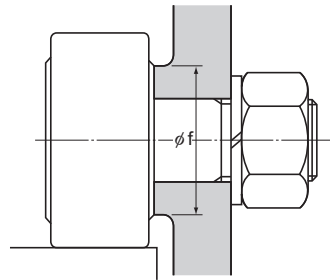
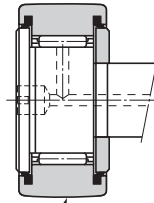
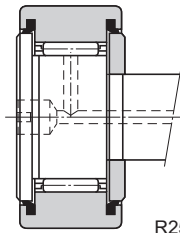
No symbol: With cage
V : Full-roller Type

No symbol: Carbon steel
M : Stainless steel

no symbol: without seal
UU : With seal
No Symbol : Cylindrical outer ring
R : Spherical outer ring

No symbol: Standard accessories (see **A19-30**)
N : Dedicated grease nipple (see **A19-30**)

Note) Full-roller Type is applicable for Stud Diameter 6 to 30.



R250(CF5)
R500(CF6 to CF18)
R1000(CF20 to CF30)

Model CF...UU

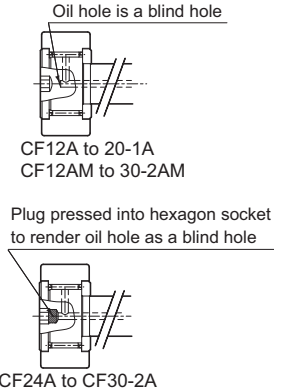
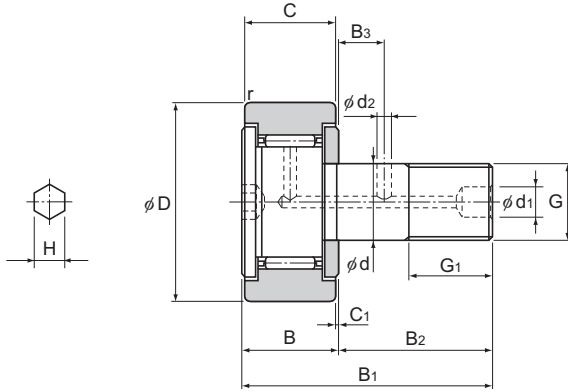
Model CF...UUR

Unit: mm

| | Basic load rating | | | | Maximum permissible load F ₀ kN | Track load capacity | | Rotational speed limit * | | Mass | |
|------|-------------------|----------------------|--------------|----------------------|--|------------------------------|----------------------------|--------------------------------|-----------------------------------|----------------|-------------------|
| | With cage | | Full rollers | | | Cylindrical outer ring kN | Spherical outer ring kN | With cage min ⁻¹ | Full rollers min ⁻¹ | With cage g | Full rollers g |
| | C kN | C ₀ kN | C kN | C ₀ kN | | | | | | | |
| 3.14 | 2.77 | — | — | 1.42 | 2.25 | 0.53 | 29000 | — | 10.5 | — | |
| 3.59 | 3.58 | 6.94 | 8.5 | 2.11 | 3.43 | 1.08 | 25000 | 11000 | 18.5 | 19 | |
| 4.17 | 4.65 | 8.13 | 11.2 | 4.73 | 4.02 | 1.37 | 20000 | 8700 | 28.5 | 29 | |
| 5.33 | 6.78 | 9.42 | 14.3 | 5.81 | 4.7 | 1.67 | 17000 | 7200 | 45 | 46 | |
| 5.33 | 6.78 | 9.42 | 14.3 | 5.81 | 5.49 | 2.06 | 17000 | 7200 | 60 | 61 | |
| 7.87 | 9.79 | 13.4 | 19.8 | 9.37 | 7.06 | 2.45 | 14000 | 5800 | 95 | 97 | |
| 7.87 | 9.79 | 13.4 | 19.8 | 9.37 | 7.45 | 2.74 | 14000 | 5800 | 105 | 107 | |
| 12 | 18.3 | 20.6 | 37.6 | 17.3 | 11.2 | 3.14 | 10000 | 4500 | 170 | 173 | |
| 14.7 | 25.2 | 25.2 | 51.3 | 26.1 | 14.4 | 3.72 | 8500 | 3800 | 250 | 255 | |
| 20.7 | 34.8 | 33.2 | 64.8 | 32.1 | 23.2 | 8.23 | 7000 | 3400 | 460 | 465 | |
| 20.7 | 34.8 | 33.2 | 64.8 | 32.1 | 21 | 7.15 | 7000 | 3400 | 385 | 390 | |
| 30.6 | 53.2 | 46.7 | 92.9 | 49.5 | 34.2 | 10.5 | 6500 | 2900 | 815 | 820 | |
| 30.6 | 53.2 | 46.7 | 92.9 | 49.5 | 39.8 | 12.9 | 6500 | 2900 | 1140 | 1140 | |
| 45.4 | 87.6 | 67.6 | 145 | 73.7 | 52.6 | 14.9 | 5000 | 2300 | 1870 | 1870 | |
| 45.4 | 87.6 | 67.6 | 145 | 73.7 | 56 | 16.1 | 5000 | 2300 | 2030 | 2030 | |
| 45.4 | 87.6 | 67.6 | 145 | 73.7 | 59.3 | 17.3 | 5000 | 2300 | 2220 | 2220 | |

Note) The rotation speed limit value in the table (*) applies to models that have no seal and use grease lubrication. With those models using oil lubrication, up to 130% of this value is permitted. With those attached with seals, up to 70% of this value is permitted.

Model CF-A (Cam Follower with Hexagon Socket (Cylindrical Outer Ring)), Model CF-M-A (Stainless Steel Type)
 Model CF-R-A (Cam Follower with Hexagon Socket (Spherical Outer Ring)), Model CF-MR-A (Stainless Steel Type)



| Stud diameter d | Model No. | Main dimensions | | | | | | | | | | | | | Shoulder height f (Min.) |
|--------------------|-----------|---------------------|-----------------------|---------------|----------------|------|----------------|----------------|----------------|----------------|----------------|----------------|--------|------------------|--------------------------------|
| | | Outer diameter D | Outer ring width C | Threaded G | G ₁ | B | B ₁ | B ₂ | B ₃ | C ₁ | d ₁ | d ₂ | H* | r _{min} | |
| 3 | CF 3-A | 10 | 7 | M3×0.5 | 5 | 8 | 17 | 9 | — | 0.5 | —* | — | 2(1.5) | 0.2 | 6.8 |
| 4 | CF 4-A | 12 | 8 | M4×0.7 | 6 | 9 | 20 | 11 | — | 0.5 | —* | — | 2.5(2) | 0.3 | 8.6 |
| 5 | CF 5-A | 13 | 9 | M5×0.8 | 7.5 | 10 | 23 | 13 | — | 0.5 | —* | — | 3(2.5) | 0.3 | 9.7 |
| 6 | CF 6-A | 16 | 11 | M6×1 | 8 | 12 | 28 | 16 | — | 0.6 | —* | — | 3 | 0.3 | 11 |
| 8 | CF 8-A | 19 | 11 | M8×1.25 | 10 | 12 | 32 | 20 | — | 0.6 | —* | — | 4 | 0.3 | 13 |
| 10 | CF 10-A | 22 | 12 | M10×1.25 | 12 | 13 | 36 | 23 | — | 0.6 | —* | — | 5 | 0.3 | 15 |
| 10 | CF 10-1-A | 26 | 12 | M10×1.25 | 12 | 13 | 36 | 23 | — | 0.6 | —* | — | 5 | 0.3 | 15 |
| 12 | CF 12-A | 30 | 14 | M12×1.5 | 13 | 15 | 40 | 25 | 6 | 0.6 | 6 | 3 | 6 | 0.6 | 20 |
| 12 | CF 12-1-A | 32 | 14 | M12×1.5 | 13 | 15 | 40 | 25 | 6 | 0.6 | 6 | 3 | 6 | 0.6 | 20 |
| 16 | CF 16-A | 35 | 18 | M16×1.5 | 17 | 19.5 | 52 | 32.5 | 8 | 0.8 | 6 | 3 | 6 | 0.6 | 24 |
| 18 | CF 18-A | 40 | 20 | M18×1.5 | 19 | 21.5 | 58 | 36.5 | 8 | 0.8 | 6 | 3 | 6 | 1 | 26 |
| 20 | CF 20-A | 52 | 24 | M20×1.5 | 21 | 25.5 | 66 | 40.5 | 9 | 0.8 | 8 | 4 | 8 | 1 | 36 |
| 20 | CF 20-1-A | 47 | 24 | M20×1.5 | 21 | 25.5 | 66 | 40.5 | 9 | 0.8 | 8 | 4 | 8 | 1 | 36 |
| 24 | CF 24-A | 62 | 29 | M24×1.5 | 25 | 30.5 | 80 | 49.5 | 11 | 0.8 | 8 | 4 | 8 | 1 | 40 |
| 24 | CF 24-1-A | 72 | 29 | M24×1.5 | 25 | 30.5 | 80 | 49.5 | 11 | 0.8 | 8 | 4 | 8 | 1 | 40 |
| 30 | CF 30-A | 80 | 35 | M30×1.5 | 32 | 37 | 100 | 63 | 15 | 1 | 8 | 4 | 8 | 1 | 46 |
| 30 | CF 30-1-A | 85 | 35 | M30×1.5 | 32 | 37 | 100 | 63 | 15 | 1 | 8 | 4 | 8 | 1 | 46 |
| 30 | CF 30-2-A | 90 | 35 | M30×1.5 | 32 | 37 | 100 | 63 | 15 | 1 | 8 | 4 | 8 | 1 | 46 |

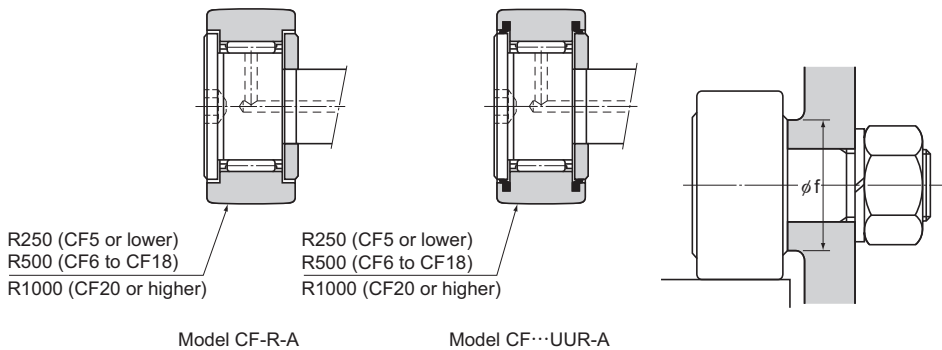
Note) The seal must be used at temperature of 80°C or below.
 Those models marked with "*" do not have a greasing hole and cannot be replenished with grease.

Model number coding

CF12 V M UU R -A N

Model number
 No symbol: With cage
 V : Full-roller Type
 No symbol: Carbon steel
 M : Stainless steel
 No symbol: without seal
 UU : With seal
 No symbol: Standard accessories (see **A19-30**)
 N : Dedicated grease nipple (see **A19-30**)
 Stud with a hexagon socket
 No Symbol : Cylindrical outer ring
 R : Spherical outer ring

Note) Full-roller Type is applicable for Stud Diameter 6 to 30.



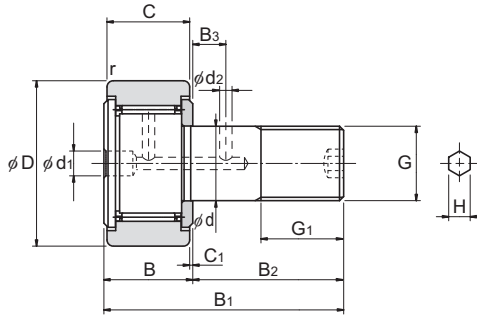
Unit: mm

| | Basic load rating | | | | Maximum permissible load F_0 kN | Track load capacity | | Rotational speed limit * | | Mass | |
|--|-------------------|-------------|--------------|-------------|---|------------------------------|----------------------------|--------------------------------|-----------------------------------|----------------|-------------------|
| | With cage | | Full rollers | | | Cylindrical outer ring kN | Spherical outer ring kN | With cage min^{-1} | Full rollers min^{-1} | With cage g | Full rollers g |
| | C kN | C_0 kN | C kN | C_0 kN | | | | | | | |
| | 1.47 | 1.18 | — | — | 0.36 | 1.37 | 0.37 | 47000 | — | 4.5 | — |
| | 2.06 | 2.05 | — | — | 0.78 | 1.76 | 0.47 | 37000 | — | 7.5 | — |
| | 3.14 | 2.77 | — | — | 1.42 | 2.25 | 0.53 | 29000 | — | 10.5 | — |
| | 3.59 | 3.58 | 6.94 | 8.5 | 2.11 | 3.43 | 1.08 | 25000 | 11000 | 18.5 | 19 |
| | 4.17 | 4.65 | 8.13 | 11.2 | 4.73 | 4.02 | 1.37 | 20000 | 8700 | 28.5 | 29 |
| | 5.33 | 6.78 | 9.42 | 14.3 | 5.81 | 4.7 | 1.67 | 17000 | 7200 | 45 | 46 |
| | 5.33 | 6.78 | 9.42 | 14.3 | 5.81 | 5.49 | 2.06 | 17000 | 7200 | 60 | 61 |
| | 7.87 | 9.79 | 13.4 | 19.8 | 9.37 | 7.06 | 2.45 | 14000 | 5800 | 95 | 97 |
| | 7.87 | 9.79 | 13.4 | 19.8 | 9.37 | 7.45 | 2.74 | 14000 | 5800 | 105 | 107 |
| | 12 | 18.3 | 20.6 | 37.6 | 17.3 | 11.2 | 3.14 | 10000 | 4500 | 170 | 173 |
| | 14.7 | 25.2 | 25.2 | 51.3 | 26.1 | 14.4 | 3.72 | 8500 | 3800 | 250 | 255 |
| | 20.7 | 34.8 | 33.2 | 64.8 | 32.1 | 23.2 | 8.23 | 7000 | 3400 | 460 | 465 |
| | 20.7 | 34.8 | 33.2 | 64.8 | 32.1 | 21 | 7.15 | 7000 | 3400 | 385 | 390 |
| | 30.6 | 53.2 | 46.7 | 92.9 | 49.5 | 34.2 | 10.5 | 6500 | 2900 | 815 | 820 |
| | 30.6 | 53.2 | 46.7 | 92.9 | 49.5 | 39.8 | 12.9 | 6500 | 2900 | 1140 | 1140 |
| | 45.4 | 87.6 | 67.6 | 145 | 73.7 | 52.6 | 14.9 | 5000 | 2300 | 1870 | 1870 |
| | 45.4 | 87.6 | 67.6 | 145 | 73.7 | 56 | 16.1 | 5000 | 2300 | 2030 | 2030 |
| | 45.4 | 87.6 | 67.6 | 145 | 73.7 | 59.3 | 17.3 | 5000 | 2300 | 2220 | 2220 |

Note) ★ indicates that the dimensions in the parentheses in this row apply to stainless steel types.
 The rotation speed limit value in the table (*) applies to models that have no seal and use grease lubrication. With those models using oil lubrication, up to 130% of this value is permitted. With those attached with seals, up to 70% of this value is permitted.

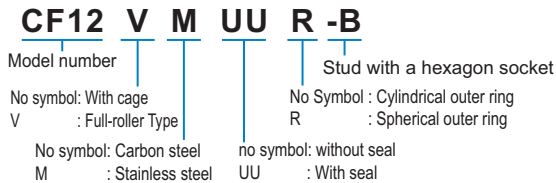
Note) CF24 or larger cam followers with hexagon sockets (symbol - A, excluding SUS models) are constructed with a plug fitted into the through hole that links the hexagon socket to the greasing hole (see dimensional drawing $\phi d_1, \phi d_2$: **A19-14**) to prevent grease leakages from the hexagon socket.
 During greasing, take care to ensure that the plug is not forced out of the hexagon socket by excessive pressure.

Model CF-B (Cam Follower with Hexagon Socket (Cylindrical Outer Ring)), Model CF-M-B (Made of Stainless Steel)
 Model CF-R-B (Cam Follower with Hexagon Socket (Spherical Outer Ring)), Model CF-MR-B (Made of Stainless Steel)

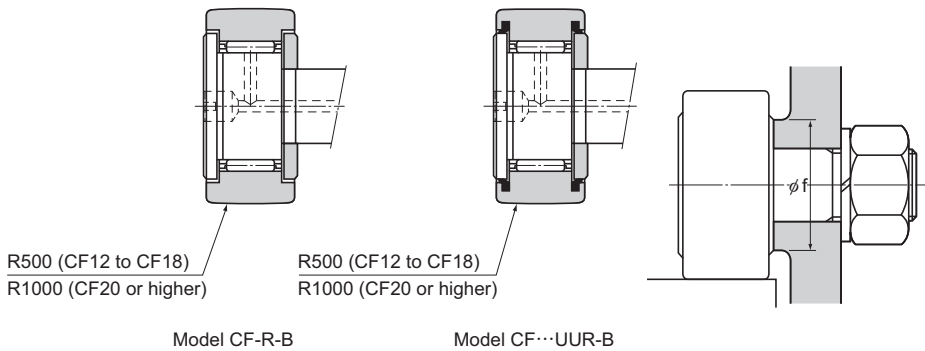


| Stud diameter d | Model No. | Main dimensions | | | | | | | | | | | | | |
|--------------------|-----------|---------------------|-----------------------|---------------|----------------|------|----------------------------------|----------------|----------------|----------------|----------------|----------------|----|------------------|-----------------------------|
| | | Outer diameter D | Outer ring width C | Threaded G | G ₁ | B | Overall length B ₁ | B ₂ | B ₃ | C ₁ | d ₁ | d ₂ | H* | r _{min} | Shoulder height f (Min.) |
| 12 | CF 12-B | 30 | 14 | M12×1.5 | 13 | 15 | 40 | 25 | 6 | 0.6 | 6 | 3 | 6 | 0.6 | 20 |
| 12 | CF 12-1-B | 32 | 14 | M12×1.5 | 13 | 15 | 40 | 25 | 6 | 0.6 | 6 | 3 | 6 | 0.6 | 20 |
| 16 | CF 16-B | 35 | 18 | M16×1.5 | 17 | 19.5 | 52 | 32.5 | 8 | 0.8 | 6 | 3 | 6 | 0.6 | 24 |
| 18 | CF 18-B | 40 | 20 | M18×1.5 | 19 | 21.5 | 58 | 36.5 | 8 | 0.8 | 6 | 3 | 6 | 1 | 26 |
| 20 | CF 20-B | 52 | 24 | M20×1.5 | 21 | 25.5 | 66 | 40.5 | 9 | 0.8 | 8 | 4 | 8 | 1 | 36 |
| 20 | CF 20-1-B | 47 | 24 | M20×1.5 | 21 | 25.5 | 66 | 40.5 | 9 | 0.8 | 8 | 4 | 8 | 1 | 36 |
| 24 | CF 24-B | 62 | 29 | M24×1.5 | 25 | 30.5 | 80 | 49.5 | 11 | 0.8 | 8 | 4 | 8 | 1 | 40 |
| 24 | CF 24-1-B | 72 | 29 | M24×1.5 | 25 | 30.5 | 80 | 49.5 | 11 | 0.8 | 8 | 4 | 8 | 1 | 40 |
| 30 | CF 30-B | 80 | 35 | M30×1.5 | 32 | 37 | 100 | 63 | 15 | 1 | 8 | 4 | 8 | 1 | 46 |
| 30 | CF 30-1-B | 85 | 35 | M30×1.5 | 32 | 37 | 100 | 63 | 15 | 1 | 8 | 4 | 8 | 1 | 46 |
| 30 | CF 30-2-B | 90 | 35 | M30×1.5 | 32 | 37 | 100 | 63 | 15 | 1 | 8 | 4 | 8 | 1 | 46 |

Model number coding



Note) Full-roller Type is applicable for Stud Diameter 12 to 30.



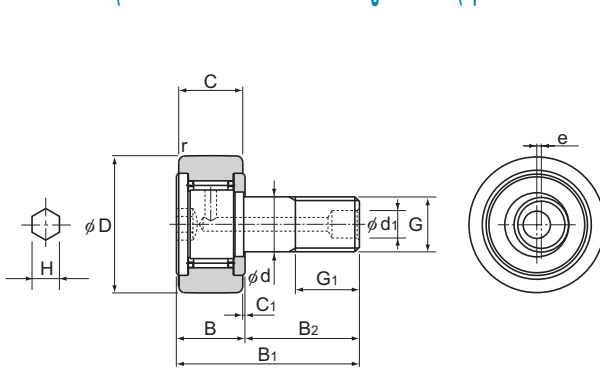
Unit: mm

| | Basic load rating | | | | Maximum permissible load F_0 kN | Track load capacity | | Rotational speed limit * | | Mass | |
|--|-------------------|-------------|--------------|-------------|---|------------------------------|----------------------------|--------------------------------|-----------------------------------|----------------|-------------------|
| | With cage | | Full rollers | | | Cylindrical outer ring kN | Spherical outer ring kN | With cage min^{-1} | Full rollers min^{-1} | With cage g | Full rollers g |
| | C kN | C_0 kN | C kN | C_0 kN | | | | | | | |
| | 7.87 | 9.79 | 13.4 | 19.8 | 9.37 | 7.06 | 2.45 | 14000 | 5800 | 95 | 97 |
| | 7.87 | 9.79 | 13.4 | 19.8 | 9.37 | 7.45 | 2.74 | 14000 | 5800 | 105 | 107 |
| | 12 | 18.3 | 20.6 | 37.6 | 17.3 | 11.2 | 3.14 | 10000 | 4500 | 170 | 173 |
| | 14.7 | 25.2 | 25.2 | 51.3 | 26.1 | 14.4 | 3.72 | 8500 | 3800 | 250 | 255 |
| | 20.7 | 34.8 | 33.2 | 64.8 | 32.1 | 23.2 | 8.23 | 7000 | 3400 | 460 | 465 |
| | 20.7 | 34.8 | 33.2 | 64.8 | 32.1 | 21 | 7.15 | 7000 | 3400 | 385 | 390 |
| | 30.6 | 53.2 | 46.7 | 92.9 | 49.5 | 34.2 | 10.5 | 6500 | 2900 | 815 | 820 |
| | 30.6 | 53.2 | 46.7 | 92.9 | 49.5 | 39.8 | 12.9 | 6500 | 2900 | 1140 | 1140 |
| | 45.4 | 87.6 | 67.6 | 145 | 73.7 | 52.6 | 14.9 | 5000 | 2300 | 1870 | 1870 |
| | 45.4 | 87.6 | 67.6 | 145 | 73.7 | 56 | 16.1 | 5000 | 2300 | 2030 | 2030 |
| | 45.4 | 87.6 | 67.6 | 145 | 73.7 | 59.3 | 17.3 | 5000 | 2300 | 2220 | 2220 |

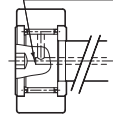
Note) ★ indicates that the dimensions in the parentheses in this row apply to stainless steel types.
 The rotation speed limit value in the table (*) applies to models that have no seal and use grease lubrication. With those models using oil lubrication, up to 130% of this value is permitted. With those attached with seals, up to 70% of this value is permitted.

Cam Follower

Model CFH-A (Eccentric Cam Follower with Hexagon Socket (Cylindrical Outer Ring)), Model CFH-M-A (Made of Stainless Steel)
 Model CFH-R-A (Eccentric Cam Follower with Hexagon Socket (Spherical Outer Ring)), Model CFH-MR-A (Made of Stainless Steel)

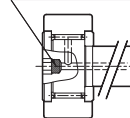


Oil hole is a blind hole



CFH12A to 20-1A
 CFH12AM to 30-2AM

Plug pressed into hexagon socket to render oil hole as a blind hole



CFH24A to CFH30-2A

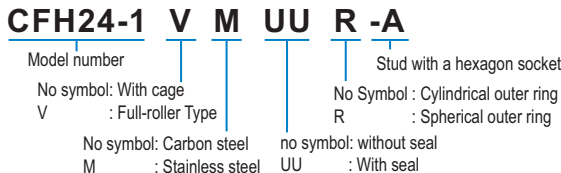
| Stud diameter | Model No. | Main dimensions | | | | | | | | | | | | |
|---------------|------------|-----------------|------------------|----------|----------------|------|----------------|----------------|----------------|----------------|--------|---------|--------------------------|-----|
| | | Outer diameter | Outer ring width | Threaded | | | Overall length | | | | Runout | | Shoulder height f (Min.) | |
| d | | D | C | G | G ₁ | B | B ₁ | B ₂ | C ₁ | d ₁ | e | H* | r _{min} | f |
| 5 | CFH 5-A | 13 | 9 | M5×0.8 | 7.5 | 10 | 23 | 13 | 0.5 | —* | 0.2 | 3 (2.5) | 0.3 | 9.7 |
| 6 | CFH 6-A | 16 | 11 | M6×1 | 8 | 12 | 28 | 16 | 0.6 | —* | 0.25 | 3 | 0.3 | 11 |
| 8 | CFH 8-A | 19 | 11 | M8×1.25 | 10 | 12 | 32 | 20 | 0.6 | —* | 0.25 | 4 | 0.3 | 13 |
| 10 | CFH 10-A | 22 | 12 | M10×1.25 | 12 | 13 | 36 | 23 | 0.6 | —* | 0.3 | 5 | 0.3 | 15 |
| 10 | CFH 10-1-A | 26 | 12 | M10×1.25 | 12 | 13 | 36 | 23 | 0.6 | —* | 0.3 | 5 | 0.3 | 15 |
| 12 | CFH 12-A | 30 | 14 | M12×1.5 | 13 | 15 | 40 | 25 | 0.6 | 6 | 0.4 | 6 | 0.6 | 20 |
| 12 | CFH 12-1-A | 32 | 14 | M12×1.5 | 13 | 15 | 40 | 25 | 0.6 | 6 | 0.4 | 6 | 0.6 | 20 |
| 16 | CFH 16-A | 35 | 18 | M16×1.5 | 17 | 19.5 | 52 | 32.5 | 0.8 | 6 | 0.5 | 6 | 0.6 | 24 |
| 18 | CFH 18-A | 40 | 20 | M18×1.5 | 19 | 21.5 | 58 | 36.5 | 0.8 | 6 | 0.6 | 6 | 1 | 26 |
| 20 | CFH 20-A | 52 | 24 | M20×1.5 | 21 | 25.5 | 66 | 40.5 | 0.8 | 8 | 0.7 | 8 | 1 | 36 |
| 20 | CFH 20-1-A | 47 | 24 | M20×1.5 | 21 | 25.5 | 66 | 40.5 | 0.8 | 8 | 0.7 | 8 | 1 | 36 |
| 24 | CFH 24-A | 62 | 29 | M24×1.5 | 25 | 30.5 | 80 | 49.5 | 0.8 | 8 | 0.8 | 8 | 1 | 40 |
| 24 | CFH 24-1-A | 72 | 29 | M24×1.5 | 25 | 30.5 | 80 | 49.5 | 0.8 | 8 | 0.8 | 8 | 1 | 40 |
| 30 | CFH 30-A | 80 | 35 | M30×1.5 | 32 | 37 | 100 | 63 | 1 | 8 | 1 | 8 | 1 | 46 |
| 30 | CFH 30-1-A | 85 | 35 | M30×1.5 | 32 | 37 | 100 | 63 | 1 | 8 | 1 | 8 | 1 | 46 |
| 30 | CFH 30-2-A | 90 | 35 | M30×1.5 | 32 | 37 | 100 | 63 | 1 | 8 | 1 | 8 | 1 | 46 |

Note) THK also manufactures types that have a driver groove and a greasing hole on the head. (Model numbers of types with a driver groove do not include symbol "A" in the end.)

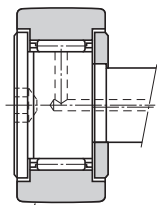
The seal must be used at temperature of 80°C or below.

Those models marked with "*" do not have a greasing hole and cannot be replenished with grease.

Model number coding

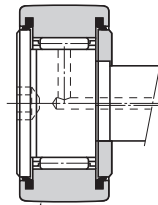


Note) Full-roller Type is applicable for Stud Diameter 6 to 30.



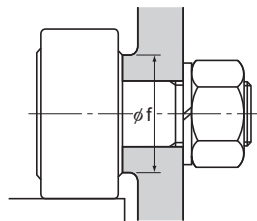
R500 (CFH18 or lower)
R1000 (CFH20 or higher)

Model CFH-R



R500 (CFH18 or lower)
R1000 (CFH20 or higher)

Model CFH...UUR



Unit: mm

| | Basic load rating | | | | Maximum permissible load F_0 kN | Track load capacity | | Rotational speed limit * | | Mass | |
|--|-------------------|-------------|--------------|-------------|---|------------------------------|----------------------------|--------------------------------|-----------------------------------|----------------|-------------------|
| | With cage | | Full rollers | | | Cylindrical outer ring kN | Spherical outer ring kN | With cage min^{-1} | Full rollers min^{-1} | With cage g | Full rollers g |
| | C kN | C_0 kN | C kN | C_0 kN | | | | | | | |
| | 3.14 | 2.77 | — | — | 1.42 | 2.25 | 0.53 | 29000 | — | 10.5 | — |
| | 3.59 | 3.58 | 6.94 | 8.5 | 2.11 | 3.43 | 1.08 | 25000 | 11000 | 18.5 | 19 |
| | 4.17 | 4.65 | 8.13 | 11.2 | 4.73 | 4.02 | 1.37 | 20000 | 8700 | 28.5 | 29 |
| | 5.33 | 6.78 | 9.42 | 14.3 | 5.81 | 4.7 | 1.67 | 17000 | 7200 | 45 | 46 |
| | 5.33 | 6.78 | 9.42 | 14.3 | 5.81 | 5.49 | 2.06 | 17000 | 7200 | 60 | 61 |
| | 7.87 | 9.79 | 13.4 | 19.8 | 9.37 | 7.06 | 2.45 | 14000 | 5800 | 95 | 97 |
| | 7.87 | 9.79 | 13.4 | 19.8 | 9.37 | 7.45 | 2.74 | 14000 | 5800 | 105 | 107 |
| | 12 | 18.3 | 20.6 | 37.6 | 17.3 | 11.2 | 3.14 | 10000 | 4500 | 170 | 173 |
| | 14.7 | 25.2 | 25.2 | 51.3 | 26.1 | 14.4 | 3.72 | 8500 | 3800 | 250 | 255 |
| | 20.7 | 34.8 | 33.2 | 64.8 | 32.1 | 23.2 | 8.23 | 7000 | 3400 | 460 | 465 |
| | 20.7 | 34.8 | 33.2 | 64.8 | 32.1 | 21 | 7.15 | 7000 | 3400 | 385 | 390 |
| | 30.6 | 53.2 | 46.7 | 92.9 | 49.5 | 34.2 | 10.5 | 6500 | 2900 | 815 | 820 |
| | 30.6 | 53.2 | 46.7 | 92.9 | 49.5 | 39.8 | 12.9 | 6500 | 2900 | 1140 | 1140 |
| | 45.4 | 87.6 | 67.6 | 145 | 73.7 | 52.6 | 14.9 | 5000 | 2300 | 1870 | 1870 |
| | 45.4 | 87.6 | 67.6 | 145 | 73.7 | 56 | 16.1 | 5000 | 2300 | 2030 | 2030 |
| | 45.4 | 87.6 | 67.6 | 145 | 73.7 | 59.3 | 17.3 | 5000 | 2300 | 2220 | 2220 |

Note1) ○: Model CFH5M-A made of stainless steel is available on a made-to-order basis. If planning to use this model, contact THK.

Note2) ★ indicates that the dimensions in the parentheses in this row apply to stainless steel types.

Note3) The rotation speed limit value in the table (*) applies to models that have no seal and use grease lubrication. With those models using oil lubrication, up to 130% of this value is permitted. With those attached with seals, up to 70% of this value is permitted.

• Eccentric type (model CFH) variations

Type in which the stud head side and screw side are tapped for pipe fitting (model CFHT)

Type with a hexagon socket in the stud head side (model CFHT-A) (suitable for stud diameters of 12 mm or more)

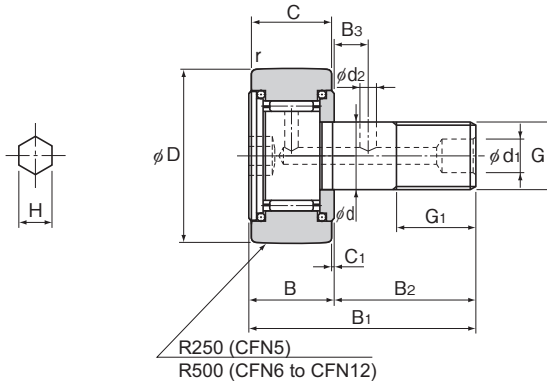
Type with a hexagon socket in the stud screw side (model CFHT-B) (suitable for stud diameters of 12 mm or more)

Contact THK for information on other variations.

Note4) CF24 or larger cam followers with hexagon sockets (symbol - A, excluding SUS models) are constructed with a plug fitted into the through hole that links the hexagon socket to the greasing hole (see dimensional drawing $\phi d_1, \phi d_2$: **A19-18**) to prevent grease leakages from the hexagon socket.

During greasing, take care to ensure that the plug is not forced out of the hexagon socket by excessive pressure.

Model CFN-R-A (Cam Follower Containing Thrust Balls)



| Stud diameter d | Model No. Spherical outer ring | Main | | | | | | | | | |
|--------------------|-----------------------------------|---------------------|-----------------------|---------------|----------------|----|---|----|----------------|----------------|----------------|
| | | Outer diameter D | Outer ring width C | Threaded G | G ₁ | B | Overall length B ₁ B ₂ | | B ₃ | C ₁ | d ₁ |
| 5 | CFN 5R-A | 13 | 9 | M5×0.8 | 7.5 | 10 | 23 | 13 | — | 0.5 | —* |
| 6 | CFN 6R-A | 16 | 11 | M6×1 | 8 | 12 | 28 | 16 | — | 0.6 | —* |
| 8 | CFN 8R-A | 19 | 11 | M8×1.25 | 10 | 12 | 32 | 20 | — | 0.6 | —* |
| 10 | CFN 10R-A | 22 | 12 | M10×1.25 | 12 | 13 | 36 | 23 | — | 0.6 | —* |
| 12 | CFN 12R-A | 30 | 14 | M12×1.5 | 13 | 15 | 40 | 25 | 6 | 0.6 | 6 |

Note) Those models marked with "*" do not have a greasing hole and cannot be replenished with grease.

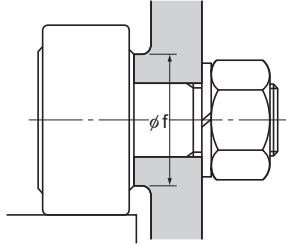
Model number coding

CFN12 R -A

Model number

R : Spherical outer ring

Stud with a hexagon socket

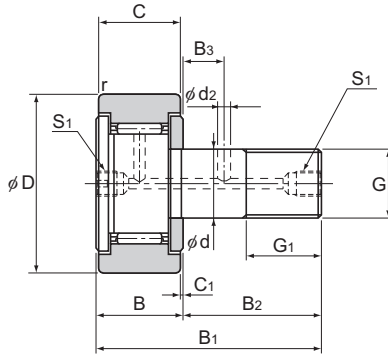


Unit: mm

| dimensions | | | | | Basic load rating | | Permissible thrust load | Maximum permissible load | Track load capacity | Rotational speed limit * | Mass |
|------------|---|------------|--------------------------|------|-------------------|-----|-------------------------|--------------------------|---------------------|--------------------------|------|
| d_2 | H | r_{amin} | Shoulder height f (Min.) | C | C_0 | | | | | | |
| | | | | kN | kN | N | kN | kN | min^{-1} | g | |
| —* | 3 | 0.3 | 10 | 3.14 | 2.77 | 160 | 1.42 | 0.53 | 29000 | 10.5 | |
| —* | 3 | 0.3 | 12 | 3.59 | 3.58 | 250 | 2.11 | 1.08 | 25000 | 18.5 | |
| —* | 4 | 0.3 | 14 | 4.17 | 4.65 | 290 | 4.73 | 1.37 | 20000 | 28.5 | |
| —* | 5 | 0.3 | 16.5 | 5.33 | 6.78 | 400 | 5.81 | 1.67 | 17000 | 45 | |
| 3 | 6 | 0.6 | 21.5 | 7.87 | 9.79 | 680 | 9.37 | 2.45 | 14000 | 95 | |

Note) The rotation speed limit value in the table (*) applies to models using grease lubrication. With those models using oil lubrication, up to 130% of this value is permitted.

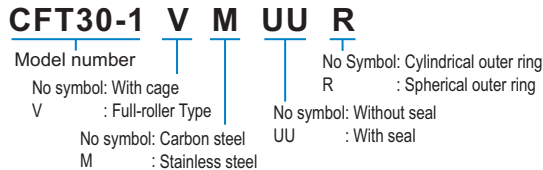
Model CFT (Cam Follower with Tapped Greasing Hole (Cylindrical Outer Ring)), Model CFT-M (Made of Stainless Steel)
 Model CFT-R (Cam Follower with Tapped Greasing Hole (Spherical Outer Ring)), Model CFT-MR (Made of Stainless Steel)



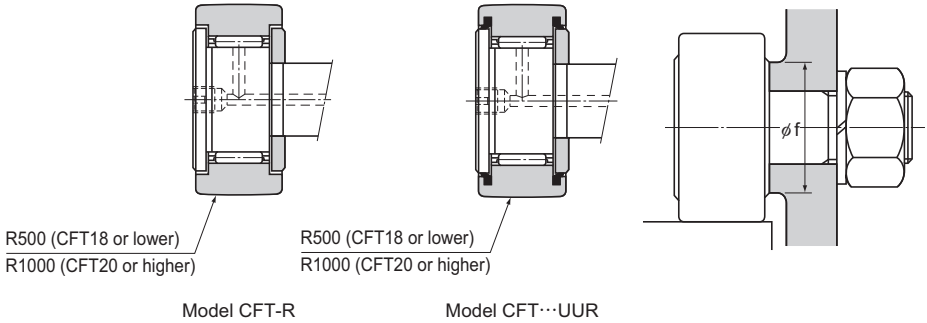
| Stud diameter d | Model No. | Main dimensions | | | | | | | | | | | | |
|--------------------|-----------|---------------------|-----------------------|---------------|----------------|------|----------------------------------|----------------|----------------|----------------|----------------|----------------|------------------|-----------------------------|
| | | Outer diameter D | Outer ring width C | Threaded G | G ₁ | B | Overall length B ₁ | B ₂ | B ₃ | C ₁ | S ₁ | d ₂ | r _{min} | Shoulder height f (Min.) |
| 6 | CFT 6 | 16 | 11 | M6×1 | 8 | 12 | 28 | 16 | — | 0.6 | M6×0.75* | — | 0.3 | 11 |
| 8 | CFT 8 | 19 | 11 | M8×1.25 | 10 | 12 | 32 | 20 | — | 0.6 | M6×0.75* | — | 0.3 | 13 |
| 10 | CFT 10 | 22 | 12 | M10×1.25 | 12 | 13 | 36 | 23 | — | 0.6 | M6×0.75* | — | 0.3 | 15 |
| 10 | CFT 10-1 | 26 | 12 | M10×1.25 | 12 | 13 | 36 | 23 | — | 0.6 | M6×0.75* | — | 0.3 | 15 |
| 12 | CFT 12 | 30 | 14 | M12×1.5 | 13 | 15 | 40 | 25 | 6 | 0.6 | M6×0.75 | 3 | 0.6 | 20 |
| 12 | CFT 12-1 | 32 | 14 | M12×1.5 | 13 | 15 | 40 | 25 | 6 | 0.6 | M6×0.75 | 3 | 0.6 | 20 |
| 16 | CFT 16 | 35 | 18 | M16×1.5 | 17 | 19.5 | 52 | 32.5 | 8 | 0.8 | PT 1/8 | 3 | 0.6 | 24 |
| 18 | CFT 18 | 40 | 20 | M18×1.5 | 19 | 21.5 | 58 | 36.5 | 8 | 0.8 | PT 1/8 | 3 | 1 | 26 |
| 20 | CFT 20 | 52 | 24 | M20×1.5 | 21 | 25.5 | 66 | 40.5 | 9 | 0.8 | PT 1/8 | 4 | 1 | 36 |
| 20 | CFT 20-1 | 47 | 24 | M20×1.5 | 21 | 25.5 | 66 | 40.5 | 9 | 0.8 | PT 1/8 | 4 | 1 | 36 |
| 24 | CFT 24 | 62 | 29 | M24×1.5 | 25 | 30.5 | 80 | 49.5 | 11 | 0.8 | PT 1/8 | 4 | 1 | 40 |
| 24 | CFT 24-1 | 72 | 29 | M24×1.5 | 25 | 30.5 | 80 | 49.5 | 11 | 0.8 | PT 1/8 | 4 | 1 | 40 |
| 30 | CFT 30 | 80 | 35 | M30×1.5 | 32 | 37 | 100 | 63 | 15 | 1 | PT 1/8 | 4 | 1 | 46 |
| 30 | CFT 30-1 | 85 | 35 | M30×1.5 | 32 | 37 | 100 | 63 | 15 | 1 | PT 1/8 | 4 | 1 | 46 |
| 30 | CFT 30-2 | 90 | 35 | M30×1.5 | 32 | 37 | 100 | 63 | 15 | 1 | PT 1/8 | 4 | 1 | 46 |

Note) The seal must be used at temperature of 80°C or below.
 Those models marked with "*" have a greasing hole only on the head.

Model number coding



Note) Full-roller Type is applicable for Stud Diameter 6 to 30.



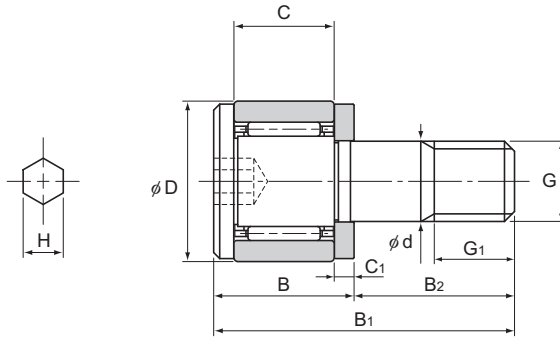
Unit: mm

| | Basic load rating | | | | Maximum permissible load F ₀ kN | Track load capacity | | Rotational speed limit * | | Mass | |
|--|-------------------|----------------------|--------------|----------------------|--|------------------------------|----------------------------|--------------------------------|-----------------------------------|----------------|-------------------|
| | With cage | | Full rollers | | | Cylindrical outer ring kN | Spherical outer ring kN | With cage min ⁻¹ | Full rollers min ⁻¹ | With cage g | Full rollers g |
| | C kN | C ₀ kN | C kN | C ₀ kN | | | | | | | |
| | 3.59 | 3.58 | 6.94 | 8.5 | 2.11 | 3.43 | 1.08 | 25000 | 11000 | 18.5 | 19 |
| | 4.17 | 4.65 | 8.13 | 11.2 | 4.73 | 4.02 | 1.37 | 20000 | 8700 | 28.5 | 29 |
| | 5.33 | 6.78 | 9.42 | 14.3 | 5.81 | 4.7 | 1.67 | 17000 | 7200 | 45 | 46 |
| | 5.33 | 6.78 | 9.42 | 14.3 | 5.81 | 5.49 | 2.06 | 17000 | 7200 | 60 | 61 |
| | 7.87 | 9.79 | 13.4 | 19.8 | 9.37 | 7.06 | 2.45 | 14000 | 5800 | 95 | 97 |
| | 7.87 | 9.79 | 13.4 | 19.8 | 9.37 | 7.45 | 2.74 | 14000 | 5800 | 105 | 107 |
| | 12 | 18.3 | 20.6 | 37.6 | 17.3 | 11.2 | 3.14 | 10000 | 4500 | 170 | 173 |
| | 14.7 | 25.2 | 25.2 | 51.3 | 26.1 | 14.4 | 3.72 | 8500 | 3800 | 250 | 255 |
| | 20.7 | 34.8 | 33.2 | 64.8 | 32.1 | 23.2 | 8.23 | 7000 | 3400 | 460 | 465 |
| | 20.7 | 34.8 | 33.2 | 64.8 | 32.1 | 21 | 7.15 | 7000 | 3400 | 385 | 390 |
| | 30.6 | 53.2 | 46.7 | 92.9 | 49.5 | 34.2 | 10.5 | 6500 | 2900 | 815 | 820 |
| | 30.6 | 53.2 | 46.7 | 92.9 | 49.5 | 39.8 | 12.9 | 6500 | 2900 | 1140 | 1140 |
| | 45.4 | 87.6 | 67.6 | 145 | 73.7 | 52.6 | 14.9 | 5000 | 2300 | 1870 | 1870 |
| | 45.4 | 87.6 | 67.6 | 145 | 73.7 | 56 | 16.1 | 5000 | 2300 | 2030 | 2030 |
| | 45.4 | 87.6 | 67.6 | 145 | 73.7 | 59.3 | 17.3 | 5000 | 2300 | 2220 | 2220 |

Note) The rotation speed limit value in the table (*) applies to models that have no seal and use grease lubrication. With those models using oil lubrication, up to 130% of this value is permitted. With those attached with seals, up to 70% of this value is permitted.

- Greasing tap type (model CFT) variations
 Type with a hexagon socket in the stud head side (model CFT-A) (suitable for stud diameters of 12 mm or more)
 Type with a hexagon socket in the stud screw side (model CFT-B) (suitable for stud diameters of 12 mm or more)
 Contact THK for information on other variations.

Outer ring compact model cam followers Models CFS-A, CFS-MA (stainless steel)



| Stud diameter | Model No. | Main dimensions | | | | | | | | | |
|---------------|-----------|-----------------|------------------|-----------|----------------|-----|----------------|----------------|----------------|-----|-----------------|
| | | Outer diameter | Outer ring width | Threaded | | | Overall length | | | | Shoulder height |
| d | Model No. | D | C | G | G ₁ | B | B ₁ | B ₂ | C ₁ | H | f (Min.) |
| 2.5 | CFS 2.5-A | 5 | 3 | M2.5×0.45 | 2.5 | 4.5 | 9.5 | 5 | 0.7 | 0.9 | 4.8 |
| 3 | CFS 3-A | 6 | 4 | M3×0.5 | 3 | 5.5 | 11.5 | 6 | 0.7 | 1.5 | 5.8 |
| 4 | CFS 4-A | 8 | 5 | M4×0.7 | 4 | 7 | 15 | 8 | 1 | 2 | 7.7 |
| 5 | CFS 5-A | 10 | 6 | M5×0.8 | 5 | 8 | 18 | 10 | 1 | 2.5 | 9.6 |
| 6 | CFS 6-A | 12 | 7 | M6×1.0 | 6 | 9.5 | 21.5 | 12 | 1.2 | 3 | 11.6 |

Model number coding

CFS3 V M -A

Model No.

No symbol: With cage

V : Full-roller Type

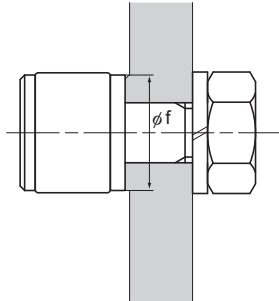
No symbol: Carbon steel

M : Stainless steel

Stud head with a hexagon socket

Note1) Model CFS is only compatible with cylindrical outer ring types without seals and with stud head hexagon sockets.

Note2) Full-roller Type is applicable for Stud Diameter 2.5 to 6.

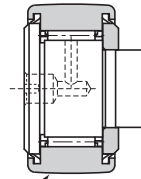
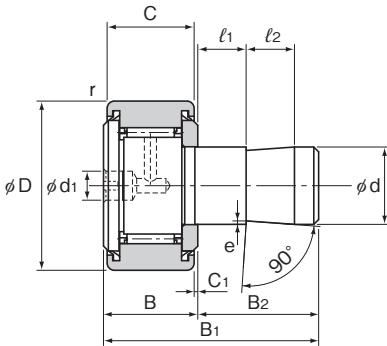


Unit: mm

| | Basic load rating | | | | Maximum permissible load F_0 kN | Track load capacity Cylindrical outer ring kN | Mass | |
|--|-------------------|-------------|--------------|-------------|---|---|----------------|-------------------|
| | With cage | | Full rollers | | | | With cage g | Full rollers g |
| | C kN | C_0 kN | C kN | C_0 kN | | | | |
| | 0.41 | 0.335 | 1 | 1.08 | 0.26 | 0.3 | 1 | 1 |
| | 0.63 | 0.61 | 1.37 | 1.77 | 0.36 | 0.48 | 2 | 2 |
| | 1.08 | 1.08 | 2.35 | 3.04 | 0.78 | 0.77 | 4 | 4 |
| | 1.57 | 1.86 | 3.14 | 4.71 | 1.42 | 1.18 | 7 | 7 |
| | 2.06 | 2.16 | 4.61 | 6.27 | 2.11 | 1.54 | 13 | 13 |

* Since model CFS does not have a greasing hole, it cannot be replenished with grease.

Easy-mount cam followers Models CF-SFU (cylindrical outer ring), CF-SFU-R (spherical outer ring)



R500 (CF-SFU-6 to CF-SFU-18)
R1000 (CF-SFU-20 or later)

Model CF-SFU...R

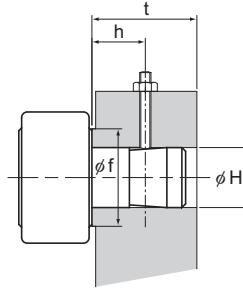
| Stud diameter | Model No. | Main dimensions | | | | | | | | | | | |
|---------------|-------------|-----------------|------------------|------|----------------|----------------|----------------|----------------|----------------|----------------|------------------|-----|--|
| | | Outer diameter | Outer ring width | | Overall length | | | | | | | | |
| d | | D | C | B | B ₁ | B ₂ | C ₁ | l ₁ | l ₂ | d ₁ | r _{smn} | e | |
| 6 | CF-SFU-6 | 16 | 11 | 12 | 32 | 20 | 0.6 | 5 | 10 | 4 | 0.3 | 0.3 | |
| 8 | CF-SFU-8 | 19 | 11 | 12 | 32 | 20 | 0.6 | 5 | 10 | 4 | 0.3 | 0.5 | |
| 10 | CF-SFU-10 | 22 | 12 | 13 | 33 | 20 | 0.6 | 5 | 10 | 4 | 0.3 | 0.5 | |
| 10 | CF-SFU-10-1 | 26 | 12 | 13 | 33 | 20 | 0.6 | 5 | 10 | 4 | 0.3 | 0.5 | |
| 12 | CF-SFU-12 | 30 | 14 | 15 | 35 | 20 | 0.6 | 5 | 10 | 6 | 0.6 | 1 | |
| 12 | CF-SFU-12-1 | 32 | 14 | 15 | 35 | 20 | 0.6 | 5 | 10 | 6 | 0.6 | 1 | |
| 16 | CF-SFU-16 | 35 | 18 | 19.5 | 44.5 | 25 | 0.8 | 10 | 10 | 6 | 0.6 | 1 | |
| 18 | CF-SFU-18 | 40 | 20 | 21.5 | 46.5 | 25 | 0.8 | 10 | 10 | 6 | 1 | 1 | |
| 20 | CF-SFU-20 | 52 | 24 | 25.5 | 50.5 | 25 | 0.8 | 10 | 10 | 8 | 1 | 1 | |
| 20 | CF-SFU-20-1 | 47 | 24 | 25.5 | 50.5 | 25 | 0.8 | 10 | 10 | 8 | 1 | 1 | |

Model number coding

CF-SFU-6 R

Model No. Spherical outer ring

Note) Model CF-SFU is fitted with UU seals even where no UU symbol is used.



Unit: mm

| | Mounting dimensions | | | | Basic load rating | | Maximum permissible load F_0 | Track load capacity | | Rotational speed limit * | Mass |
|--|---|-----------------|------------------------------------|----------------------------|-------------------|-------------|-----------------------------------|----------------------------------|--------------------------------|------------------------------------|--------------------|
| | Mounting dimension H Tolerance H7 | t (Min.) | Shoulder height f (Min.) | h (reference value) | With cage | | | Cylindrical outer ring kN | Spherical outer ring kN | With cage min^{-1} | With cage g |
| | | | | | C kN | C_0 kN | | | | | |
| | 6 | 20 | 11 | 10 | 3.59 | 3.58 | 2.11 | 3.43 | 1.08 | 17500 | 19 |
| | 8 | 20 | 13 | 10 | 4.17 | 4.65 | 4.73 | 4.02 | 1.37 | 14000 | 28.5 |
| | 10 | 20 | 15 | 10 | 5.33 | 6.78 | 5.81 | 4.7 | 1.67 | 11900 | 43 |
| | 10 | 20 | 15 | 10 | 5.33 | 6.78 | 5.81 | 5.49 | 2.06 | 11900 | 58.5 |
| | 12 | 20 | 20 | 10 | 7.87 | 9.79 | 9.37 | 7.06 | 2.45 | 9800 | 93 |
| | 12 | 20 | 20 | 10 | 7.87 | 9.79 | 9.37 | 7.45 | 2.74 | 9800 | 103 |
| | 16 | 25 | 24 | 15 | 12 | 18.3 | 17.3 | 11.2 | 3.14 | 7000 | 163.5 |
| | 18 | 25 | 26 | 15 | 14.7 | 25.2 | 26.1 | 14.4 | 3.72 | 5950 | 235 |
| | 20 | 25 | 36 | 15 | 20.7 | 34.8 | 32.1 | 23.2 | 8.23 | 4900 | 436 |
| | 20 | 25 | 36 | 15 | 20.7 | 34.8 | 32.1 | 21 | 7.15 | 4900 | 361 |

Note) *The rotational speed limit applies to models with grease lubrication and seals.
Model CF-SFU is delivered with a stopper plug fitted.

Fit

For the dimensional tolerance of the Cam Follower in stud-mounting hole, we recommend the following fitting.

Table1 The dimensional tolerance of the stud-mounting hole

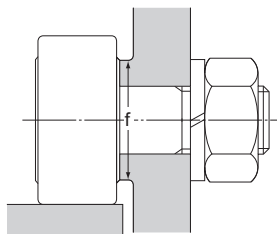
| Model No. | The dimensional tolerance of the stud-mounting hole |
|--|---|
| Models CF, CFN, CFH, CFT, CFHT, and CF-SFU | H7 |
| Model CFS | H6 |

Installation

[Mounting Section]

Establish perpendicularity between the stud-mounting hole and the mounting surface, and chamfer the mouth of the hole to the smallest possible radius, preferably C0.5. Also, the diameter of the mounting surface should preferably be at least equal to the dimension “f” indicated in the specification table.

If the outer ring unilaterally or unevenly contacts the mating raceway, we recommend using model CF-R, whose outer ring circumference is spherically ground.



[Mating Raceway]

For the material of the mating raceway, see Track Load Capacity on **A19-11**.

[Mounting Precautions]

Do not tap the bracket and directly tighten the product without using a nut as shown in Fig.1. Doing so may result in an insufficient tightening torque, or cause the bending stress to concentrate in the male thread and damage the stud if the thread is loosened.

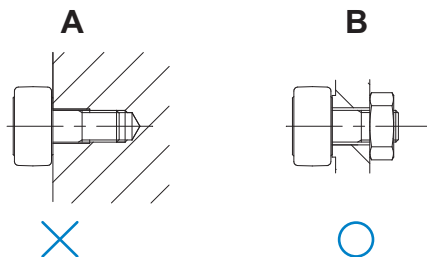


Fig.1

[Mounting model CF-SFU]

Refer to Fig.2 for information on how to mount CF-SFU models.

To the extent that CF-SFU models are designed for easy mounting and are therefore easy to remove, they are not suitable for uses where the loads applied are vibrating or involve impacts. For vibrating or impact loads, a normal cam follower secured by a nut is recommended.

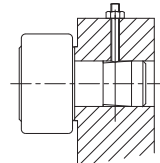



Fig.2

Accessories for the Cam Follower

Table1 shows accessories for standard types of Cam Followers. The dedicated grease nipple is attached at your request. If desiring the dedicated grease nipple, add symbol "N" to the end of the model number.

Example: CF 12 UUR -N

 Dedicated grease nipple

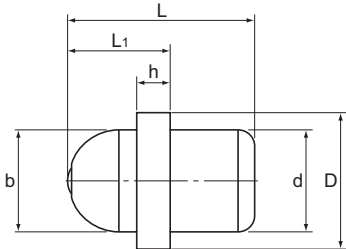


Table1 Accessories

| Model No. | | Plug ^{note 1} | Plug ^{note 2} | Nut JIS Class 2 | Grease |
|-----------|--------------|------------------------|------------------------|---------------------|--------------------|
| CF | Without seal | Included in package | Included in package | Included in package | Filled with grease |
| | With seal | Included in package | Included in package | Included in package | Filled with grease |
| CFN | | Included in package | Included in package | Included in package | Filled with grease |
| CFT | Without seal | — | — | Included in package | Filled with grease |
| | With seal | — | — | Included in package | Filled with grease |
| CFS | | — | — | Included in package | Filled with grease |
| CF-SFU | | Mounting | Included in package | — | Filled with grease |

Note1) The plug is used to prevent grease from leaking. However, it is not included in the packages of model CF5, and hexagon socket types of models CFN10 (R)-A and CF (CFH) 10-1 (R)-A or lower.

Note2) The plug is used to close an unused greasing hole. However, it is not attached to model CF (CFH) 10-1 or lower.

Table2 Specification Table for Grease Nipples

| Supported models | Nipple dimensions | | | | | | Nipple model No. |
|------------------|-------------------|---|-----|-----|----|----------------|------------------|
| | d | b | D | h | L | L ₁ | |
| CF, CFN, CFH | d | b | D | h | L | L ₁ | |
| 5 | 3.1 | 6 | 7.5 | 1.5 | 9 | 5.5 | NP3.2×3.5 |
| 6 to 10 | 4 | 6 | 7.5 | 1.5 | 10 | 5.5 | PB1021B |
| 12 to 18 | 6 | 6 | 8 | 2 | 11 | 6 | NP6×5 |
| 20 to 30 | 8 | 6 | 10 | 3 | 16 | 7 | NP8×9 |

Note) The grease nipple is not attached to models CFN10 (R)-A and CF (CFH) 10-1 (R)-A or lower.

Table3 lists grease nipples that can be attached to models CFT6 to 30. When ordering the product, specify the corresponding nipple model number.

Table3 Dedicated grease nipple for model CFT

| Supported model number | Corresponding nipple model number |
|------------------------|-----------------------------------|
| CFT 6 to 12 | A-M6F,B-M6F,C-M6F |
| CFT 16 to 30 | A-PT1/8,B-PT1/8,C-PT1/8 |

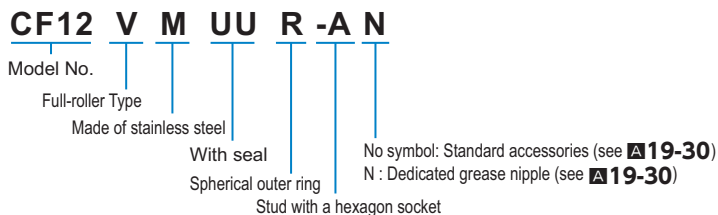
Note) For the dimensions and shapes of the grease nipples, see the General Catalog **A24-26**.

Model Number Coding

Model number configurations differ depending on the model features. Refer to the corresponding sample model number configuration.

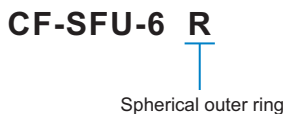
[Cam Follower]

- Models CF, CF-M, CF-R, CF-MR, CF-A, CF-M-A, CF-R-A, CF-MR-A, CF-B, CF-M-B, CF-R-B, CF-MR-B, CFH-A, CFH-M-A, CFH-R-A, CFH-MR-A, CFN-R-A, CFT, CFT-M, CFT-R, CFT-MR, CFS-A and CFS-MA



[Easy-mount cam follower]

- Models CF-SFU and CF-SFU-R

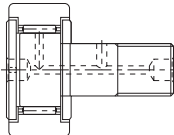
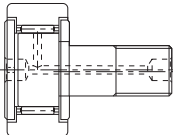
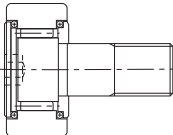


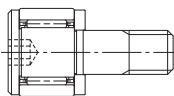
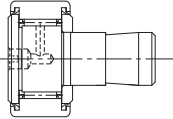
* The rotational speed limit applies to grease lubrication with seals.
 CF-SFU models are fitted with UU seals even where no UU symbol is used.

Types and Model Numbers of Cam Followers

The Cam Follower is divided into several types as indicated in Table1.

Table1 Types and Model Numbers of Cam Followers

| Type | | Popular Type | Eccentric Cam Follower | Containing Thrust Balls |
|------------------------|---------------------------------|---|---|---|
| Shape | |  |  |  |
| Cylindrical outer ring | Stud with a hexagon socket | CF-A (CF...UU-A) | CFH-A (CFH...UU-A) | — |
| | Stud with a Flat-head Slot | CF (CF...UU) | CFH (CFH...UU) | — |
| | With a Tapped Hole for Greasing | CFT (CFT...UU) | CFHT (CFHT...UU) | — |
| | Made of stainless steel | CF-M (CF...MUU) | CFH-M (CFH...MUU) | — |
| Spherical outer ring | Stud with a hexagon socket | CF-R-A (CF...UUR-A) | CFH-R-A (CFH...UUR-A) | CFN-R-A |
| | Stud with a Flat-head Slot | CF-R (CF...UUR) | CFH-R (CFH...UUR) | — |
| | With a Tapped Hole for Greasing | CFT-R (CFT...UUR) | CFHT-R (CFHT...UUR) | — |
| | Made of stainless steel | CF-MR (CF...MUUR) | CFH-MR (CFH...MUUR) | — |

| Type | Outer ring compact model | Easy-mount model | |
|------------------------|---|---|------------|
| Shape |  |  | |
| Cylindrical outer ring | Stud with a hexagon socket | CFS...A | — |
| | Stud with a Flat-head Slot | — | CF-SFU... |
| | With a Tapped Hole for Greasing | — | — |
| | Made of stainless steel | CFS...M-A | — |
| Spherical outer ring | Stud with a hexagon socket | — | — |
| | Stud with a Flat-head Slot | — | CF-SFU...R |
| | With a Tapped Hole for Greasing | — | — |
| | Made of stainless steel | — | — |

Note1) The symbols in the parentheses indicate model numbers of types with seals.

Note2) THK also manufactures low-speed full-roller types with long service lives. For these full-roller types, symbol "V" is indicated.

Note3) Symbol M indicates stainless steel type.

Example: CF 12 V UUR

└ Full-roller type

[Handling]

- (1) Disassembling components may cause dust to enter the system or degrade mounting accuracy of parts. Do not disassemble the product.
- (2) Dropping or hitting the Cam Follower may damage it. Giving an impact to it could also cause damage to its function even if the product looks intact.

[Lubrication]

- (1) The Cam Follower uses lithium soap-based grease No. 2 as standard grease (model CFN uses THK AFC Grease).
Replenish the product with a lubricant as appropriate during use. Do not mix lubricants of different properties (see **■19-14**).
- (2) We recommend applying a lubricant to the mating surface where the Cam Follower travels.
- (3) CF24, CFH24 or larger cam followers with hexagon sockets (symbol - A, excluding SUS models) are constructed with a plug fitted into the through hole that links the hexagon socket to the greasing hole (see dimensional drawing $\phi d_1, \phi d_2$ **■19-14**) to prevent grease leakages from the hexagon socket.
During greasing, take care to ensure that the plug is not forced out of the hexagon socket by excessive pressure.

[Precautions on Use]

- (1) When securing the Cam Follower, use a torque wrench or the like to tighten the product at a torque equivalent to the corresponding value in Table1 on **■19-13**.
- (2) The normal service temperature is 80°C or below. If the product is to be used at a higher temperature, contact THK.
- (3) When using the product in locations exposed to vibrations or an impact load or in a special environment such as a clean room, vacuum and low/high temperature, contact THK in advance.
- (4) Entrance of foreign material such as dust may cause damage or functional loss. Prevent foreign material, such as dust and cutting chips, from entering the product.
- (5) Cam Followers are designed for use under a radial load. Do not use the product under a thrust load.

[Storage]

When storing the Cam Follower, enclose it in a package designated by THK and store it while avoiding high temperature, low temperature and high humidity.



Cam Follower

THK General Catalog

Cam Follower

THK General Catalog

B Support Book

| | |
|--|---------|
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| Features of the Cam Follower | B 19-4 |
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Features of the Cam Follower

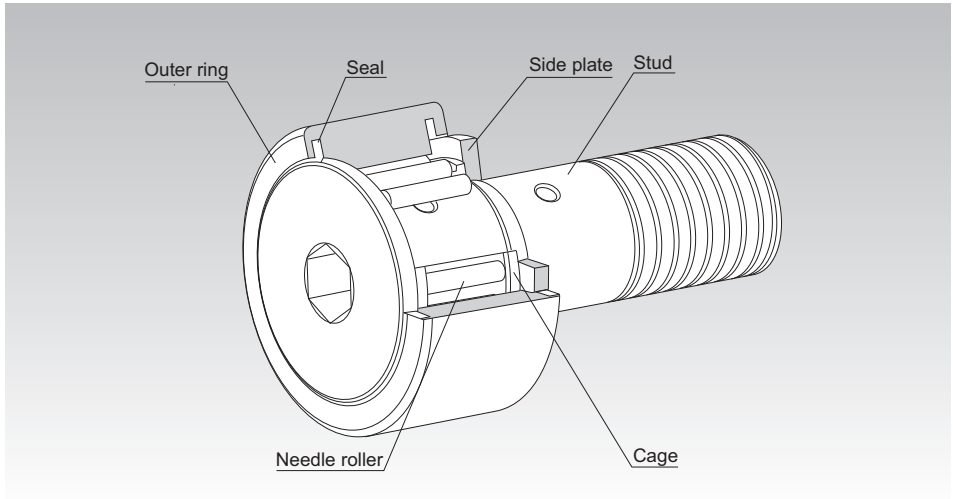


Fig.1 Structure of Cam Follower Model CF...UU-A

Structure and Features

The Cam Follower is a compact and highly rigid bearing with a shaft. It contains needle rollers and is used as a guide roller for cam mechanisms or straight motion.

Since its outer ring rotates while keeping direct contact with the mating surface, this product is thick-walled and designed to bear an impact load.

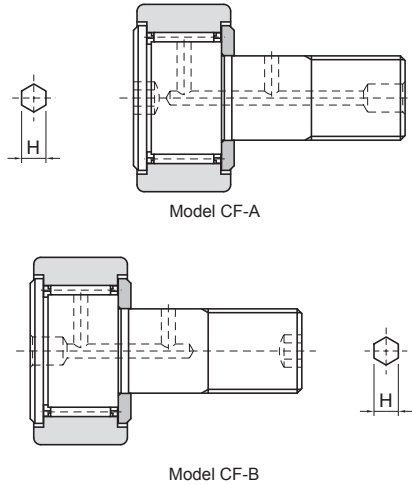
Inside the outer ring, needle rollers and a precision cage are incorporated. This prevents the product from skewing and achieves a superb rotation performance. And, as a result, the product is capable of easily withstanding high-speed rotation.

There are two types of the outer ring in shape: spherical and cylindrical. The spherical outer ring easily absorbs a distortion of the shaft center when the cam follower is installed and helps lighten a biased load.

The Cam Follower is used in a wide range of applications such as cam mechanisms of automatic machines, dedicated machines as well as carrier systems, conveyors, bookbinding machines, tool changers of machining centers, pallet changers, automatic coating machines, and sliding forks of automatic warehouses.

Cam Follower with a Hexagon Socket

For Cam Follower model CF, Cam Follower Containing Thrust Balls model CFN and Eccentric Cam Follower model CFH, hexagon socket studs that allow easy eccentricity adjustment are available. If desiring a hexagon socket on the stud head, add "A" to the end of the model number. If desiring a hexagon socket on the stud thread, add "B". ("B" applies to model CF12 or higher.)



The Same Dimension of the Hexagonal Width Across Flats (H Dimension) Applies to Both Type A and Type B.

Cam Follower Containing Thrust Balls

Even a slight mounting error in a high speed cam mechanism operating in a harsh environment could cause abnormal wear to the thrust unit of the cam follower. In such a case, using Cam Follower Containing Thrust Balls model CFN will bring about a significant effect in increasing the durability.

Models CFN5 to 12 are standard-stock items. If desiring a size other than the standard items, contact THK.

Model CFN is capable of receiving a thrust load caused by a slight mounting error. However, it is necessary to minimize a component of thrust force, or prevent it from occurring, when designing the cam mechanism and installing the Cam Follower.

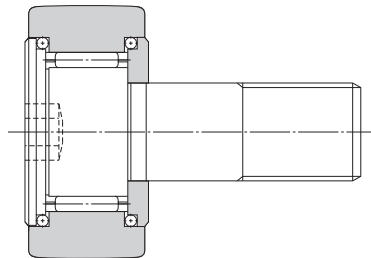


Fig.2

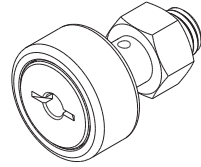
Types of the Cam Follower

Types and Features

Popular Type Cam Follower Model CF

It is a popular type of Cam Follower provided with a driver groove on the head of the stud. A highly corrosion resistant stainless steel type (symbol M) is also available.

Specification Table⇒ **A19-12**



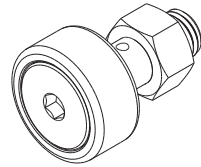
Model CF

Cam Follower with a Hexagon Socket Model CF-A

Since the stud head has a hexagon socket, this model can easily be installed using a hexagon wrench.

A type whose stud screw has a hexagon socket (CF-B) is also available. (applicable to stud diameter of 12 or greater)

Specification Table⇒ **A19-14**

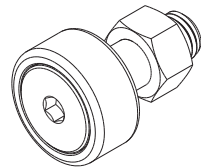


Model CF-A

Eccentric Cam Follower with a Hexagon Socket Model CFH-A

This model can be installed in the same mounting hole as that of model CF. Since the mounting shaft of the stud and the stud head are eccentric by 0.25 mm to 1.0 mm, the position of this model can easily be adjusted simply by turning the stud. Thus, it is a compact, highly accurate eccentric cam follower with an integral structure. As a result, the man-hours for machining and assembly can significantly be reduced because it is unnecessary to align the cam follower with the cam groove and machine the mounting-hole area with precision.

Specification Table⇒ **A19-18**

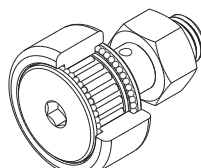


Model CFH-A

Cam Follower Containing Thrust Balls Model CFN

Based on the popular type Cam Follower, this model is incorporated with thrust load balls.

Specification Table⇒ **A19-20**



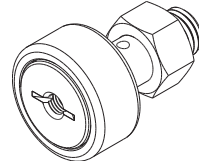
Model CFN

Cam Follower with a Tapped Hole for Greasing Model CFT

Specification Table⇒ **A** 19-22

Basically the same as the popular type Cam Follower, this model is provided with tapped holes for piping on the stud head and the thread.

It is optimal for locations where an integrated piping for greasing is required.



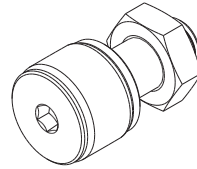
Model CFT

Outer ring compact cam follower model CFS

Specification Table⇒ **A** 19-24

This product contains extremely fine needle rollers.

The outer ring external diameter is extremely small relative to the stud diameter, allowing a compact design.

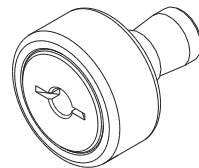


Model CFS

Easy-mount cam follower model CF-SFU

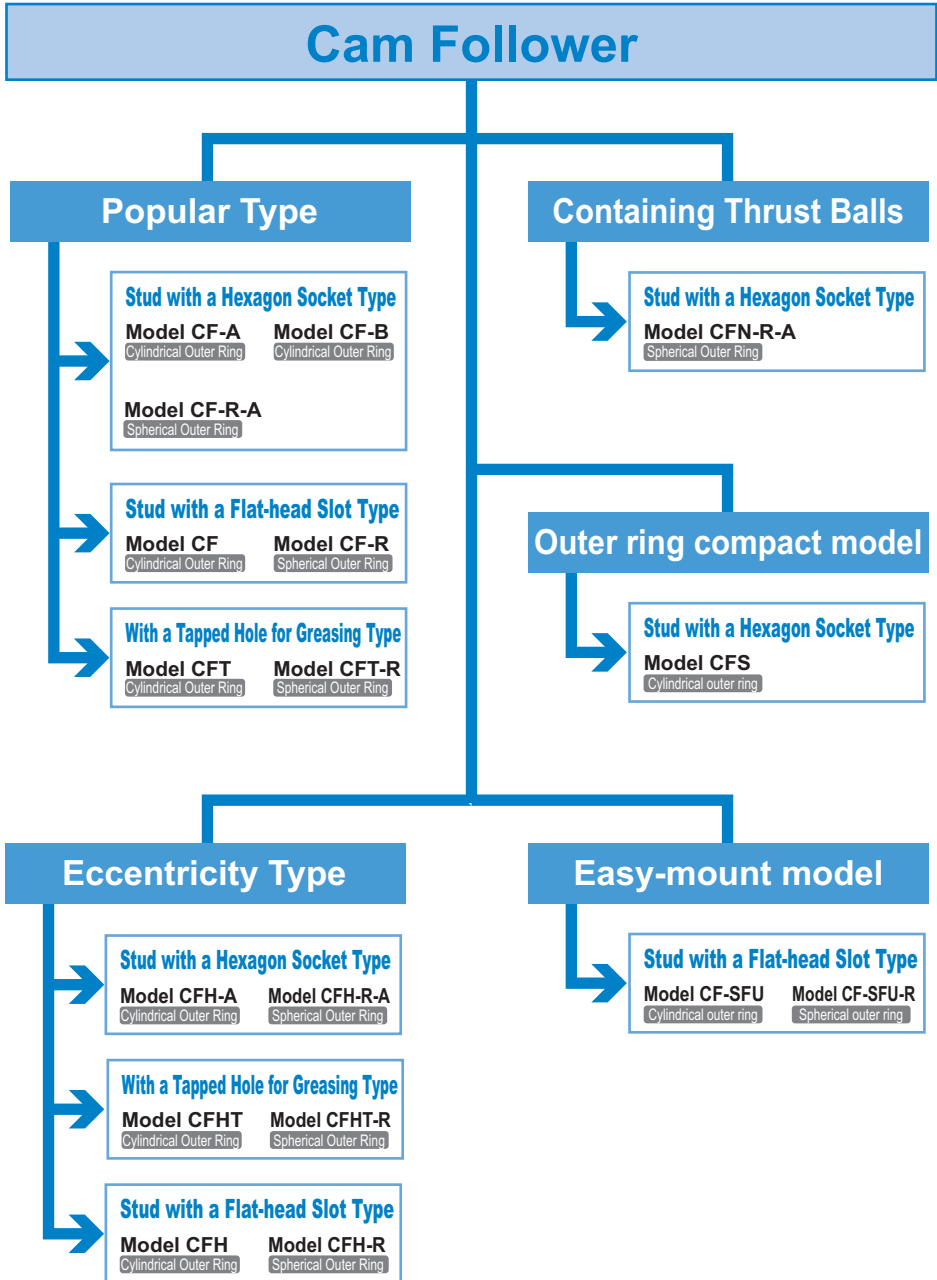
Specification Table⇒ **A** 19-26

To simplify installation, a flat-head slot has been machined into the stud so that it can be secured with a screw. This is ideal for units where there is no space to fasten the stud. Model CF-SFU is only available with seals.



Model CF-SFU

Classification Table



Nominal Life

[Static Safety Factor]

The basic static load rating C_0 refers to the static load with constant direction and magnitude, under which the calculated contact stress in the center of the contact area between the roller and the raceway under the maximum load is 4000 MPa. (If the contact stress exceeds this level, it will affect the rotation.) This value is indicated as “ C_0 ” in the dimensional tables. When a load is statically or dynamically applied, it is necessary to consider the static safety factor as shown below.

$$\frac{C_0}{P_0} = f_s$$

f_s : Static safety factor in relation to C_0
(see Table1)

C_0 : Basic static load rating (kN)
 P_0 : Radial load (kN)

The permissible load (F_0) indicates the permissible value of the applied load determined by the strength of the stud section of the Cam Follower. Therefore, it is necessary to consider the static safety factor f_m against F_0 as well as f_s .

$$\frac{F_0}{P_0} = f_m$$

f_m : Static safety factor in relation to F_0
(see Table1)

F_0 : Permissible load (kN)
 P_0 : Radial load (kN)

Table1 Static Safety Factor (f_s, f_m)

| Load conditions | Lower limit of f_s and f_m |
|-----------------|--------------------------------|
| Normal load | 1 to 2 |
| Impact load | 2 to 3 |

[Nominal Life]

The service life of the Cam Follower is obtained from the following equation.

$$L = \left(\frac{f_r \cdot C}{f_w \cdot P_c} \right)^{\frac{10}{3}} \times 10^6$$

L : Nominal life
(The total number of revolutions that 90% of a group of identical Cam Follower units independently operating under the same conditions can achieve without showing flaking from rolling fatigue)

C : Basic dynamic load rating (kN)
 P_c : Radial load (kN)
 f_r : Temperature factor
(see Fig.1 on [B19-10](#))

f_w : Load factor
(see Table2 on [B19-10](#))

* The basic dynamic load rating (C) of the Cam Follower shows the load with interlocked direction and magnitude, under which the nominal life (L) is 1 million revolutions when a group of identical Cam Follower units independently operate. The basic dynamic load rating (C) is indicated in the corresponding specification table.

[Calculating the Service Life Time]

When the nominal life (L) has been obtained, the service life time (L_h) is obtained from the following equation.

● For Linear Motion

$$L_h = \frac{D \cdot \pi \cdot L}{2 \times \ell_s \cdot n_1 \times 60}$$

L_h : Service life time (h)

L : Nominal life

D : Bearing outer diameter (mm)

ℓ_s : Stroke length (mm)

n_1 : Number of reciprocations per minute (min^{-1})

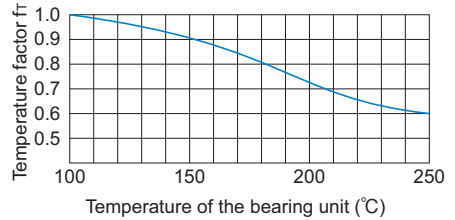


Fig.1 Temperature Factor (f_t)

Note) The normal service temperature is 80°C or below. If the product is to be used at a higher temperature, contact THK.

● For Rotary Motion

$$L_h = \frac{D \cdot L}{D_1 \cdot n \times 60}$$

D_1 : Outer ring contact average diameter of the cam (mm)

n : Revolutions per minute of the cam (min^{-1})

Table2 Load Factor (f_w)

| Condition | f_w |
|------------------------------|------------|
| Smooth motion without impact | 1 to 1.2 |
| Normal motion | 1.2 to 1.5 |
| Motion with severe impact | 1.5 to 3 |

Track Load Capacity

The track load capacity means the permissible load at which the outer ring of a bearing and the mating surface are capable of withstanding repeated use over a long period.

The track load capacity provided in the specification table indicates the value when using a steel material with tensile strength of 1.24 kN/mm^2 as the mating material. Therefore, it is possible to increase the track load capacity by increasing the hardness of the material. Fig.2 shows the hardness of the mating material and the track capacity factor in relation to tensile strength. To obtain the track load capacity of each mating material, multiply the track load capacity shown in the corresponding specification table by the respective track load factor.

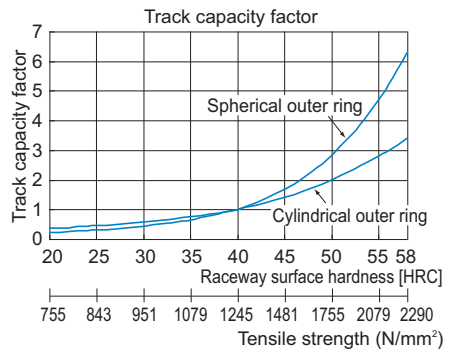


Fig.2 Track Capacity Factor

Note) For the mating material, we recommend using those materials with the raceway hardness of 20 HRC or higher and the tensile strength of 755 N/mm^2 or higher.

Example of Calculating a Track Load Capacity

Obtain the track load capacity when heat-treating the mating material, which a bearing whose outer ring has a track load capacity of 5.29 kN contacts, to hardness of 50 HRC.

The track capacity factor when the hardness is 50 HRC is 2.84, as indicated in Fig.2. Therefore, the desired track load capacity is calculated as follows.

The track load capacity = $5.29 \text{ kN} \times 2.84 = 15.0 \text{ kN}$

Installation

[Installing the Cam Follower]

If the Cam Follower is to be used under a heavy load, it is necessary to install the product so that the greasing hole on the stud is out of the loaded area. To help identify the position of the greasing hole, the THK logo is marked on the side face of the stud collar. (See Fig.1.)

The vertical hole in the middle of the stud is used as a whirl stop or a greasing hole.

Make sure that the outer ring is evenly in contact with the mating surface. When installing the Cam Follower, also make sure its axis is perpendicular to the traveling direction.

● Using spring washers

If a spring washer is used to secure a cam follower, take care to check that the spring washer has no burrs or sharp edges. If there are burrs or sharp edges, contact between burrs or edges and the nut or flash washer used for mounting will cause abrasion and the abraded fragments will adhere to the stud screw. This will result in damage or incomplete tightening when the nut is tightened and may damage the screw section.

● About the installation procedure

When mounting the Cam Follower, secure the flat-blade screwdriver groove and the hex wrench and turn the nut using a spanner.

If turning the flat-blade screwdriver groove and the hex wrench side, the flat-blade screwdriver groove or the hexagon hole of the Cam Follower may be fractured.

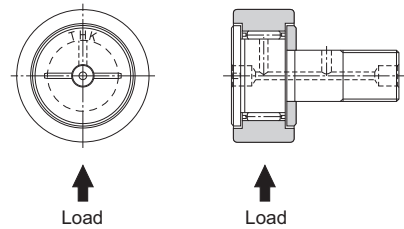
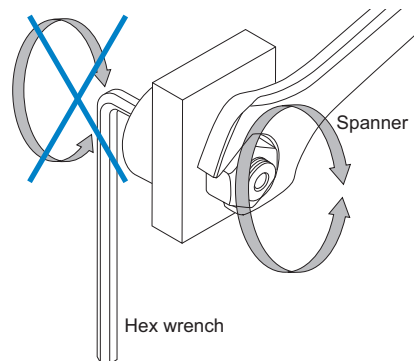


Fig.1 Positions of the THK Logo and the Greasing Holes



● Tightening Torque for the Stud

Since the stud of the Cam Follower receives bending stress and tensile stress caused by a bearing load, it is necessary to keep the tightening torque of the screw from exceeding the values indicated in Table1.

If the mounting screw may be loosened due to vibrations or impact, use a spring washer, thin nuts of JIS B 1181 Class 3 as double-nuts or a special nut capable of preventing itself from loosening.

Table1 Maximum Tightening Torque of the Screw

| Model No CF, CFN, CFH, CFT and CFS | Maximum tightening torque N-m |
|---------------------------------------|----------------------------------|
| 2.5 | 0.18 |
| 3 | 0.392 |
| 4 | 0.98 |
| 5 | 1.96 |
| 6 | 2.94 |
| 8 | 7.84 |
| 10 10-1 | 16.7 |
| 12 12-1 | 29.4 |
| 16 | 70.6 |
| 18 | 98 |
| 20 20-1 | 137 |
| 24 24-1 | 245* |
| 30 30-1 30-2 | 480* |

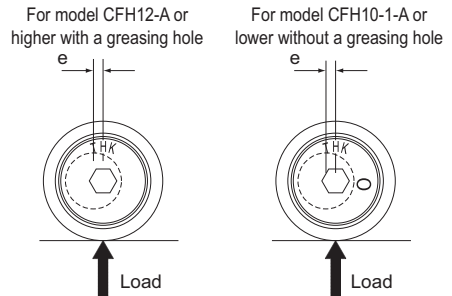
Note)* is the value in case of the standard material (carbon steel). If a stainless steel type is to be used, the maximum value is 70% of this value. 1 N-m equals to 0.102 kgf-m.

[Installing the Eccentric Cam Follower]

The eccentricity is adjusted in the following steps.

- (1) Insert the stud into the mounting hole, and lightly tighten the nut until the nut starts turning. In doing so, position the THK logo in relation to the load direction as shown in Fig.2.
- (2) Use the hexagon socket on the stud head to turn the stud and adjust the clearance between the stud and the mating contact surface.
- (3) After adjusting the clearance, tighten the nut while keeping the stud from turning. Be sure the maximum tightening torque in (see Table1) is not exceeded.

The surface of the Cam Follower stud is hardened. Take this into account when machining the stud.



The figure shows the position of the THK logo in relation to the eccentricity direction for model CFH12-A or higher with a greasing hole.

For model CFH10-1-A or lower without a greasing hole, the "O" mark indicates the eccentricity direction. There is no relationship between the THK logo and the eccentricity direction.

Fig.2

Contamination Protection and Lubrication

The Cam Follower models include seal types (model numbers: "...UU"), which are incorporated with special synthetic rubber seals that are highly resistant to wear in order to prevent foreign material from entering the interior of the cam follower and the lubricant from leaking.

Since the Cam Follower contains high-quality lithium soap based grease No. 2, you can start using the product without replenishing grease. Model CFN contains THK AFC Grease.

To replenish the Cam Follower with grease, fill grease into the greasing hole on the stud. However, note that some of the models with stud diameters of 10 mm or less do not have a greasing hole and are provided with initial lubrication only, and therefore do not allow replenishment of grease.

The appropriate fill quantity is a half to one third of the space inside the bearing. The lubrication interval varies depending on the operating conditions. As a guide, however, replenish grease of the same group every six months to two years for types with a cage, or every one to 6 months for full-roller types.

Even with types equipped with seals ("...UU"), surplus grease may seep during the initial operation period or immediately after resumption of grease replenishment. If desiring to avoid contamination of the surrounding area of the machine by grease, first perform seasoning or the like in advance, and then wipe the seeping surplus grease.

When driving the dedicated grease nipple onto the Cam Follower, use a jig like the one shown in Fig.3 to provide pressure to the flange of the nipple.

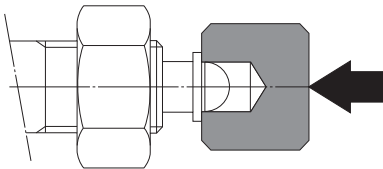


Fig.3

Accessories for the Cam Follower

Table1 shows accessories for standard types of Cam Followers. The dedicated grease nipple is attached at your request. If desiring the dedicated grease nipple, add symbol "N" to the end of the model number.

Example: CF 12 UUR -N

 Dedicated grease nipple

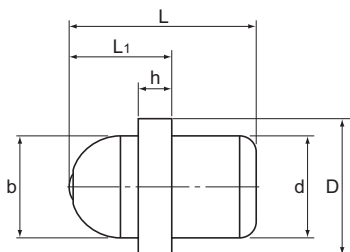


Table1 Accessories

| Model No. | | Plug ^{note 1} | Plug ^{note 2} | Nut JIS Class 2 | Grease |
|-----------|--------------|------------------------|------------------------|---------------------|--------------------|
| CF | Without seal | Included in package | Included in package | Included in package | Filled with grease |
| | CFH | With seal | Included in package | Included in package | Filled with grease |
| CFN | | Included in package | Included in package | Included in package | Filled with grease |
| CFT | Without seal | — | — | Included in package | Filled with grease |
| | With seal | — | — | Included in package | Filled with grease |
| CFS | | — | — | Included in package | Filled with grease |
| CF-SFU | | Mounting | Included in package | — | Filled with grease |

Note1) The plug is used to prevent grease from leaking. However, it is not included in the packages of model CF5, and hexagon socket types of models CFN10 (R)-A and CF (CFH) 10-1 (R)-A or lower.

Note2) The plug is used to close an unused greasing hole. However, it is not attached to model CF (CFH) 10-1 or lower.

Table2 Specification Table for Grease Nipples

| Supported models | Nipple dimensions | | | | | | Nipple model No. |
|------------------|-------------------|---|-----|-----|----|----------------|------------------|
| | d | b | D | h | L | L ₁ | |
| 5 | 3.1 | 6 | 7.5 | 1.5 | 9 | 5.5 | NP3.2×3.5 |
| 6 to 10 | 4 | 6 | 7.5 | 1.5 | 10 | 5.5 | PB1021B |
| 12 to 18 | 6 | 6 | 8 | 2 | 11 | 6 | NP6×5 |
| 20 to 30 | 8 | 6 | 10 | 3 | 16 | 7 | NP8×9 |

Note) The grease nipple is not attached to models CFN10 (R)-A and CF (CFH) 10-1 (R)-A or lower.

Table3 lists grease nipples that can be attached to models CFT6 to 30. When ordering the product, specify the corresponding nipple model number.

Table3 Dedicated grease nipple for model CFT

| Supported model number | Corresponding nipple model number |
|------------------------|-----------------------------------|
| CFT 6 to 12 | A-M6F,B-M6F,C-M6F |
| CFT 16 to 30 | A-PT1/8,B-PT1/8,C-PT1/8 |

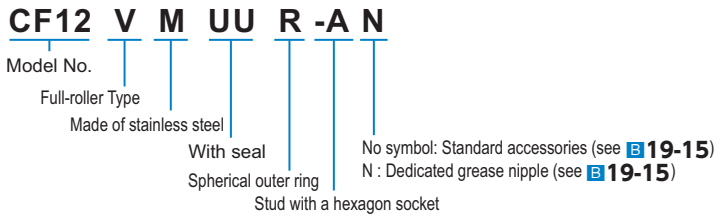
Note) For the dimensions and shapes of the grease nipples, see the General Catalog **A24-26**.

Model Number Coding

Model number configurations differ depending on the model features. Refer to the corresponding sample model number configuration.

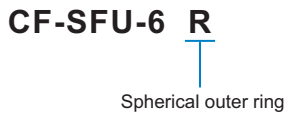
[Cam Follower]

- Models CF, CF-M, CF-R, CF-MR, CF-A, CF-M-A, CF-R-A, CF-MR-A, CF-B, CF-M-B, CFR-B, CF-MR-B, CFH-A, CFH-M-A, CFH-R-A, CFH-MR-A, CFN-R-A, CFT, CFT-M, CFT-R, CFT-MR, CFS-A and CFS-MA



[Easy-mount cam follower]

- Models CF-SFU and CF-SFU-R

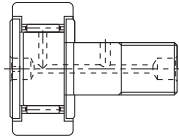
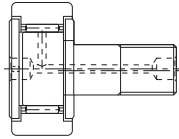
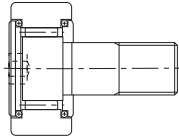


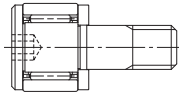
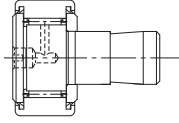
* The rotational speed limit applies to grease lubrication with seals.
CF-SFU models are fitted with UU seals even where no UU symbol is used.

Types and Model Numbers of Cam Followers

The Cam Follower is divided into several types as indicated in Table 1.

Table 1 Types and Model Numbers of Cam Followers

| Type | | Popular Type | Eccentric Cam Follower | Containing Thrust Balls |
|------------------------|---------------------------------|---|---|--|
| Shape | |  |  |  |
| Cylindrical outer ring | Stud with a hexagon socket | CF-A (CF...UU-A) | CFH-A (CFH...UU-A) | — |
| | Stud with a Flat-head Slot | CF (CF...UU) | CFH (CFH...UU) | — |
| | With a Tapped Hole for Greasing | CFT (CFT...UU) | CFHT (CFHT...UU) | — |
| | Made of stainless steel | CF-M (CF...MUU) | CFH-M (CFH...MUU) | — |
| Spherical outer ring | Stud with a hexagon socket | CF-R-A (CF...UUR-A) | CFH-R-A (CFH...UUR-A) | CFN-R-A |
| | Stud with a Flat-head Slot | CF-R (CF...UUR) | CFH-R (CFH...UUR) | — |
| | With a Tapped Hole for Greasing | CFT-R (CFT...UUR) | CFHT-R (CFHT...UUR) | — |
| | Made of stainless steel | CF-MR (CF...MUUR) | CFH-MR (CFH...MUUR) | — |

| Type | | Outer ring compact model | Easy-mount model |
|------------------------|---------------------------------|---|---|
| Shape | |  |  |
| Cylindrical outer ring | Stud with a hexagon socket | CFS...A | — |
| | Stud with a Flat-head Slot | — | CF-SFU... |
| | With a Tapped Hole for Greasing | — | — |
| | Made of stainless steel | CFS...M-A | — |
| Spherical outer ring | Stud with a hexagon socket | — | — |
| | Stud with a Flat-head Slot | — | CF-SFU...R |
| | With a Tapped Hole for Greasing | — | — |
| | Made of stainless steel | — | — |

Note1) The symbols in the parentheses indicate model numbers of types with seals.

Note2) THK also manufactures low-speed full-roller types with long service lives. For these full-roller types, symbol "V" is indicated.

Note3) Symbol M indicates stainless steel type.

Example: CF 12 V UUR

└ Full-roller type

[Handling]

- (1) Disassembling components may cause dust to enter the system or degrade mounting accuracy of parts. Do not disassemble the product.
- (2) Dropping or hitting the Cam Follower may damage it. Giving an impact to it could also cause damage to its function even if the product looks intact.

[Lubrication]

- (1) The Cam Follower uses lithium soap-based grease No. 2 as standard grease (model CFN uses THK AFC Grease).
Replenish the product with a lubricant as appropriate during use. Do not mix lubricants of different properties (see **B19-14**).
- (2) We recommend applying a lubricant to the mating surface where the Cam Follower travels.
- (3) CF24, CFH24 or larger cam followers with hexagon sockets (symbol - A, excluding SUS models) are constructed with a plug fitted into the through hole that links the hexagon socket to the greasing hole (see dimensional drawing $\phi d_1, \phi d_2$ **B19-14**) to prevent grease leakages from the hexagon socket.
During greasing, take care to ensure that the plug is not forced out of the hexagon socket by excessive pressure.

[Precautions on Use]

- (1) When securing the Cam Follower, use a torque wrench or the like to tighten the product at a torque equivalent to the corresponding value in Table1 on **B19-13**.
- (2) The normal service temperature is 80°C or below. If the product is to be used at a higher temperature, contact THK.
- (3) When using the product in locations exposed to vibrations or an impact load or in a special environment such as a clean room, vacuum and low/high temperature, contact THK in advance.
- (4) Entrance of foreign material such as dust may cause damage or functional loss. Prevent foreign material, such as dust and cutting chips, from entering the product.
- (5) Cam Followers are designed for use under a radial load. Do not use the product under a thrust load.

[Storage]

When storing the Cam Follower, enclose it in a package designated by THK and store it while avoiding high temperature, low temperature and high humidity.