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Our needle bearing products boast high-precision, high-rigidity, and high-durability. They are widely used in production lines for advanced products, such as digital home appliances, as well as in manufacturing facilities for semiconductor manufacturing devices, precise construction machinery, and electron microscopes. Our technology supports every type of industry in the world.

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A needle roller bearing supporting radial load and a thrust ball bearing supporting axial load are assembled to create the complex bearing.This allows for a more compact equipment design as compared to installing a needle roller bearing and a thrust ball bearing separately.

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A durable stainless-steel bearing that is rust- and corrosion-resistant. Used in lithium ion battery intergrated system, semi-conductors,medical equipments, and food machinery.

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Our stud-type cam followers have a thick outer ring and can support heavy radial loads. They are designed for applications where the outer ring rotates. Also available in miniature models.

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INDEX

Technical information

NEEDLE ROLLER BEARINGS

CAM FOLLOWERS

ROLLER FOLLOWERS

STAINLESS STEEL

NEEDLE ROLLER BEARINGS STAINLESS STEEL

CAM FOLLOWERS STAINLESS STEEL

ROLLER FOLLOWERS STAINLESS STEEL

NEEDLE ROLLER BEARINGS

1 Bearing Life and Load Rating

1-1 Bearing life

Bearings are subjected to certain intensity of repeating stress on their track ring and rolling element even during operation under proper loading, appropriate mounting and sufficient lubrication. The stress may cause scaly damage formed on surface after certain time period due to its concentration at shallow vicinity under the surface. This phenomenon is called flaking (peeling-off of surface). Phenomenon that causes bearing to be unusable due to flaking caused by repeating cyclic stress under normal operating condition is called "life" of the bearing. Generally, bearing life is defined by total number of rotation of the bearing until flaking is generated on track surface. However, recognizing average life as criteria of bearing life is not appropriate for actual selection of bearing since fatigue limit of material varies. It shall be practical to consider the life guaranteed to most bearings (basic rating life) as a criterion. Phenomenon that bearing becomes inoperative due to heat-seizure, wear, fracture, scoring are regarded as "failure" caused by operating conditions and selection of bearing so that they and the life should be considered as different phenomena.

1-2 Basic rating life

Basic rating life of bearing shall be defined as a total number of rotation that 90% of the group of the same bearings can run without causing flaking due to rolling fatigue when they are operated under the same conditions.

In the case of rotation in certain constant speed, the basic rating life can be expressed in a total rotation time as well.

1-3 Basic dynamic load rating

A given static radial load under which a bearing theoretically endures basic rating life of one million rotations is referred to as a basic dynamic load rating.

1-4 Dynamic equivalent load

Dynamic equivalent radial load

A load that is virtually applied to the center of a bearing under which to obtain a life equivalent to that when both radial load and axial load are subjected to the bearing at the same time is called the dynamic equivalent radial load. In the case of needle bearing, its radial type is capable for loading radial load only so that just a radial load will be applied.

1-5 Bearing life calculation formula

The following relationship is applied to basic rating life, basic dynamic load rating and dynamic equivalent load of bearing.

$$L_{10} = (C_r / P_r)^p \cdots\cdots (1.1)$$

- L_{10} : Basic rating life 10^6rotation
- C_r : Basic dynamic load rating N
- P_r : Dynamic equivalent radial load N
- p : Ball bearing p = 10/3, Roller bearing p = 3

Basic rating life time can be expressed as total rotation time with given rotation per minute by the following formula.

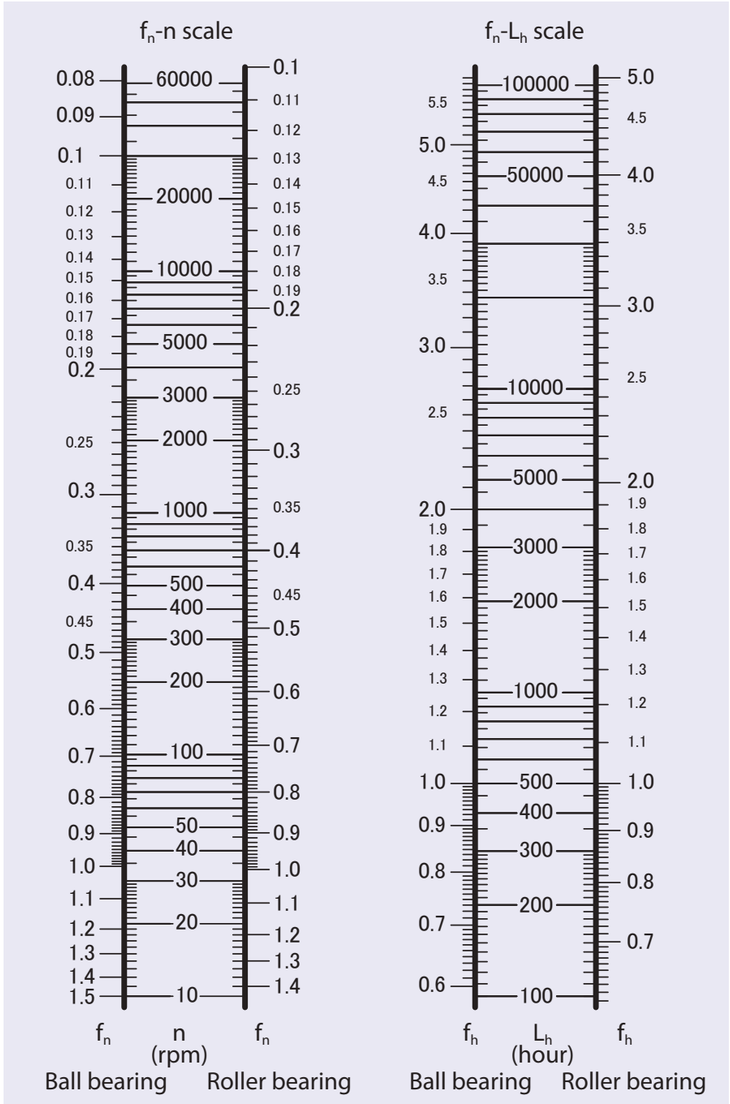
$$L_h = 10^6 L_{10} / 60n = 500 f_h^p \cdots\cdots (1.2)$$

$$f_h = f_n C_r / P_r \cdots\cdots (1.3)$$

$$f_n = (33.3 / n)^{1/p} \cdots\cdots (1.4)$$

- L_h : Basic rating life expressed in hour h
- n : Rotation per minute rpm
- f_h : Bearing life factor
- f_n : Speed factor

Basic rating life scale



1-6 Operating conditions and bearing life factor of bearing

Operating machinery and demanded life

Bearings should be selected based on setting up demanded life in accordance with operating machinery and operating condition.

Demanded life is determined by endurance duration for operating machinery and reliable operating periods.

Table-1 indicates demanded life that can be a typical reference.

Table-1 Operating condition and demanded life time factor (reference)

Operating conditions	Bearing life factor f_h				
	~3	2~4	3~5	4~7	6~
Short duration or occasional operation	Home appliance Electrical tools	Agricultural machinery Office equipment			
Short duration or occasional operation, but necessity for ensuring reliable operation	Medical equipment Measuring instrument	Home air conditioning Construction machinery Crane	Elevator	Crane (sheave wheel)	
Long duration operation but not full time		Small size motor General gear system Woodworking machinery Passenger car	Machine tools Factory general purpose motor Crusher	Important gear system Calendar roller for rubber and plastic Printing machine	
Continuous operation over eight hours a day		Rolling machine Escalator Conveyer Centrifugal separator	Air conditioner Large size motor Compressor, pump	Mine hoist Press machine	Pulp, papermaking machine
Operate 24 hours a day and must be non stop without accident					Water-work system Power generator system

1-7 Corrected rating life

Formula for basic rating life described above is applied to bearings whose reliability is 90%, whose material is for general purpose bearing and are manufactured in general quality standard as well as those operated under standard operating conditions. Corrected rating life should be calculated using correction factor a_1, a_2 and a_3 in the case that the reliability is over 90% or that life needs to be obtained for special bearing properties or for special operating conditions.

$$L_{na} = a_1 a_2 a_3 L_{10} \quad \cdots\cdots\cdots\cdots\cdots\cdots \quad (1.5)$$

L_{na} : Adjustment rating life 10^6 rotation
a_1 : Reliability factor
a_2 : Bearing special properties factor
a_3 : Operating conditions factor

1-7-1 Reliability factor

Reliability factor a_1

This is the bearing life corrected factor for reliability (100-n) % when probability of failure is n %. Value of the reliability factor a_1 is shown in Table-2.

Table-2 Reliability factor a_1

Reliability (%)	L_n	a_1
90	L_{10}	1
95	L_5	0.62
96	L_4	0.53
97	L_3	0.44
98	L_2	0.33
99	L_1	0.21

1-7-2 Bearing special properties factor

Bearing special properties factor a_2

Bearing special properties factor a_2 is used for adjusting variation of properties concerning life in the case that material type, quality or manufacturing process is special. This factor shall be a_2=1 for standard material and manufacturing method. It can be $a_2 > 1$ when special modified material or manufacturing method is used due to improved quality of bearing material or progress of manufacturing technology.

1-7-3 Operating conditions factor

Operating conditions factor a_3

This is a factor to adjust impact of operating conditions of bearing, especially effect of lubrication to fatigue life.

Bearing life is essentially a fatigue phenomenon of surface layer which is subjected to repeating cyclic load. Therefore, this factor will be a_3=1 under ideal lubrication condition when rolling element and track surface are completely isolated by oil film and surface failure can be ignored. Under poor lubrication condition such as low lubricant viscosity or under significantly slow rotation speed of rolling element, it would be $a_3 < 1$.

On the contrary, it can be $a_3 > 1$ under especially excellent lubrication condition. Generally, the bearing special properties factor a_2 can not be set to value exceeding 1 when $a_3 < 1$.

1-8 Adjustment of Basic Dynamic Load Rating for temperature and hardness factors

1-8-1 Temperature factor

While operating temperature of bearing is individually defined in accordance with material and structure, bearing is capable to be used at temperatures higher than 150 °C by applying special treatment for thermal resistance. However this will cause reduction of basic dynamic load rating as a result of reduction of permissive contact stress. Basic dynamic load rating with consideration for temperature increase is given by the following formula.

$$C_1 = f_1 C_r \quad \cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots \quad (1.6)$$

C_1 : Basic dynamic load rating with consideration for temperature increase N

f_1 : Temperature factor (Refer to Figure-1)

C_r : Basic dynamic load rating N

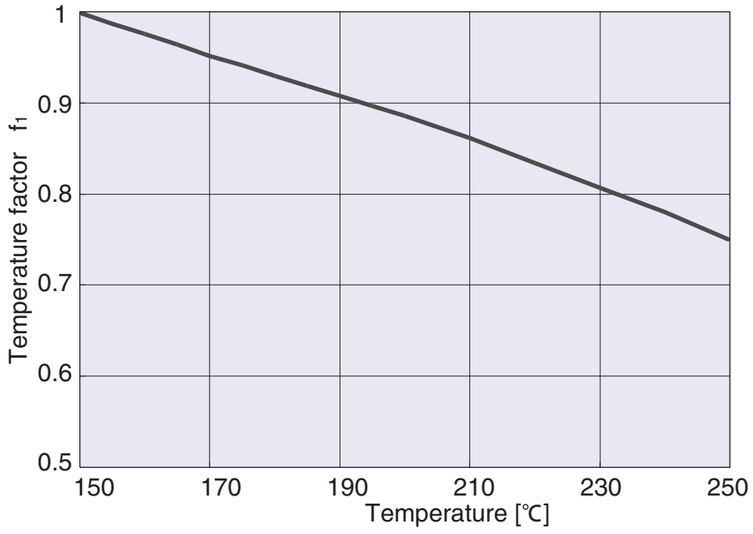


Figure-1

1-8-2 Hardness factor

The raceway surface should be HRC58 to 64 in the case of using shaft or housing as raceway instead of bearing inner ring or outer ring respectively. Basic dynamic load rating may be reduced in the case the surface hardness is lower than HRC58. Basic dynamic load rating with consideration for surface hardness is given by the following formula.

$$C_2 = f_2 C_r \quad \cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots \quad (1.7)$$

C_2 : Basic dynamic load rating with consideration for hardness N

f_2 : Hardness factor (Refer to Figure-2)

C_r : Basic dynamic load rating N

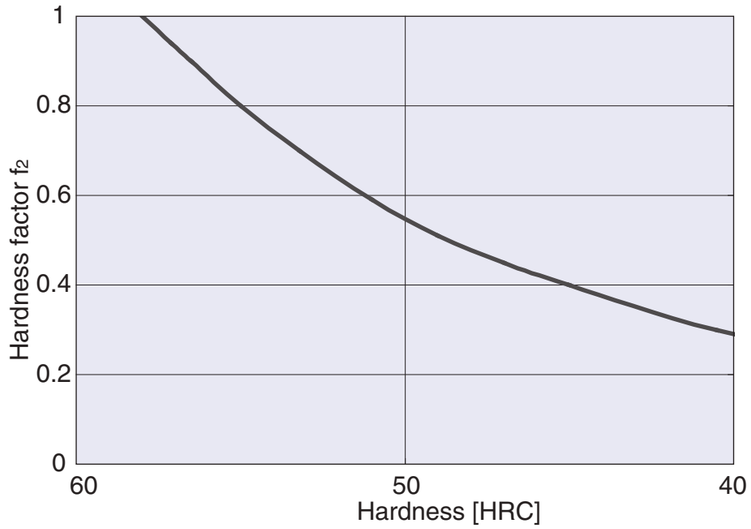


Figure-2

1-9 Basic static load rating

Basic static load rating is specified as a static load which corresponds to contact stress indicated in the table below at rolling element and the center of contact of track that are subjected to the maximum load. Total permanent deformation of rolling element and track occurred by the contact stress may be approximately 0.0001 times of diameter of the rolling element.

Type of bearing	Contact stress MPa
Roller bearing	4000

1-10 Static equivalent load

A load that is virtually applied to the center of a bearing under which to obtain a contact stress equivalent to the maximum contact stress that occurs at contact surface between rolling element and track, when both radial load and axial load are subjected to the bearing at the same time, is called a static equivalent load.

In the case of needle bearing, its radial type is capable for loading radial load only so that just a radial load will be applied.

$$P_{0r} = F_r \quad \cdots\cdots (1.8)$$

P_{0r} : Static equivalent radial load N

1-11 Static safety factor

Although permissive limit of static equivalent load is typically regarded as basic static load rating, its limit shall be set with consideration for safety since conditions required for bearings broadly vary. The static safety factor fs is given by the following formula (1.9). Table-3 shows its typical values.

$$f_s = \frac{C_{0r}}{P_{0r}} \quad \cdots\cdots (1.9)$$

f_s : Safety factor

C_{0r} : Basic static load rating N

Table-3 Static safety factor

Operating conditions of bearing	f_s
With high rotation accuracy With impact load	≧ 3
With standard rotation accuracy	≧ 1.5
With standard rotation accuracy and low speed	≧ 1

1-12 Permissive rotation speed

Increasing bearing rotation speed may cause a rise in bearing temperature due to abrasion heat generated inside of the bearing, which results in failure with heat-seizure. A threshold rotation speed up to which long duration of safe operation is enabled is referred to as a permissive rotation speed.

Permissive rotation speed varies depending on type, size and load of bearing, lubrication method and its radial clearance. It is an experimental value at which operation is enabled without causing heat generation exceeding certain limit.

2 Bearing load

2-1 Load factor

Operation in actual machinery is subjected to a load larger than theoretical axial directional load due to vibration and impact shock.

Actual load is given by calculation of load applied to axes system using load factor shown in Table-4.

$$K = f_w \cdot K_c \quad \cdots\cdots (2.1)$$

K : Actual load applied to axes system N

K_c : Theoretical calculation value N

f_w : Load factor (Table-4)

Table-4 Load factor

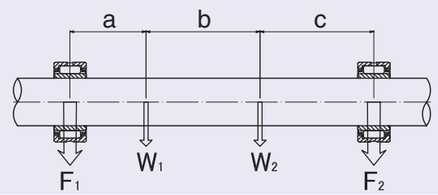
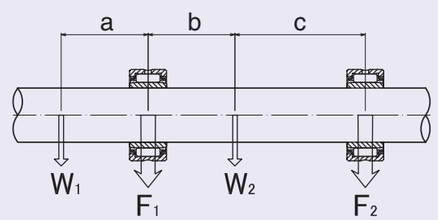
Degree of load	Examples	f_w
Smooth motion without any impacts	Air conditioner, measurement instruments, office equipment	1 ~1.2
With standard rotation	Gear box, vehicle, paper-making machine	1.2~1.5
Operation with vibration and impact shock	Rolling machine, construction machinery, crusher	1.5~3

2-2 Load distribution

Load distribution to bearing

Axes system is assumed as a static beam supported by bearings in order to distribute load acting on the axes system to the bearings. Table-5 shows calculation example of load distribution.

Table-5 Example of calculation of load distribution

Examples	Load calculation
	$F_1 = \frac{W_1(b+c) + W_2c}{a+b+c}$ $F_2 = \frac{W_1a + W_2(a+b)}{a+b+c}$
	$F_1 = \frac{W_1(a+b+c) + W_2c}{b+c}$ $F_2 = \frac{W_2b - W_1a}{b+c}$

2-3 Load transmission

Bearing loads in belt or chain transmission

The force acting on pulley or sprocket wheel when power is transmitted by a belt or chain is given by the following formula.

$$T = 9550P/N \quad \cdots\cdots (2.2)$$

$$F_t = 2000 \cdot T/d \quad \cdots\cdots (2.3)$$

- T : Torque acting on pulley or sprocket wheel N·m
- F_t : Effective force transmitted by belt or chain N
- P : Transmitted power kW
- N : Rotation per minute rpm
- d : Effective diameter of pulley or sprocket wheel mm

Load F_r acting on pulley shaft is given by multiplying effective transmitted force F_t by belt factor f_b shown in Table-6 in the case of belt transmission.

$$F_r = f_b F_t \quad \cdots\cdots (2.4)$$

Table-6 Belt factor

Type of belt	f_b
V belt	2 ~2.5
Flat belt (with tension pulley)	2.5~3
Flat belt (without tension pulley)	4 ~5

In the case of chain transmission, load acting on sprocket wheel shaft is given by the formula (2.4) as same as that of belt transmission using value between 1.2 and 1.5 as chain factor corresponding to f_b.

Bearing loads in gear transmission

In the case of power transmission by gear, methods of calculation vary depending on the type of gear since force acting on the gear is divided into radial load and axial load and their direction and ratio vary depending on the type of gear. In the case of the simplest flat gear, direction of load is radial load only and it is given by the following formula.

$$T = 9550P/N \quad \cdots\cdots (2.5)$$

$$F_t = 2000 \cdot T/d \quad \cdots\cdots (2.6)$$

$$F_r = Ft \cdot \tan \alpha \quad \cdots\cdots (2.7)$$

$$F_c = \sqrt{F_t^2 + F_r^2} \quad \cdots\cdots (2.8)$$

- T : Torque acting on gear N·m
- F_t : Force in tangent direction of gear N
- F_r : Force in radial direction of gear N
- F_c : Combine force acting perpendicular to gear N
- P : Transmitted power kW
- N : Rotation per minute rpm
- d : Pitch circle diameter of drive gear mm
- α : Pressure angle of gear

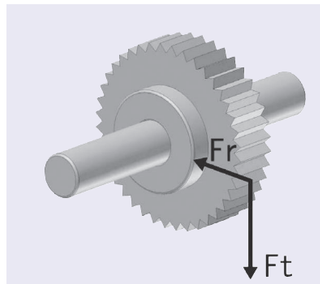


Figure-3

Value that is given by multiplying theoretical load by gear factor f_z in Table-7 shall be used as actual load since degree of vibration and impact shock affecting the theoretical load obtained by the formula above varies depending on the type of gear and accuracy of gear surface finish.

$$F = f_z F_c \quad \cdots\cdots (2.9)$$

Table-7 Gear factor

Type of gear	f_z
Precision gear (Both of pitch error and geometric error is 0.02 mm or less)	1.05~1.1
Ordinary machined gear (Both of pitch error and geometric error is between 0.02 mm and 0.1 mm)	1.1 ~1.3

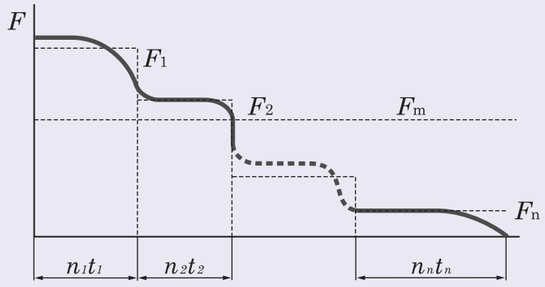
Average load

Average load F_m which is converted so as to apply even life to each bearing may be used in the case that load acting on bearing is unstable and changes in various cycle.

(1) Fluctuating step load

Average load F_m is given by formula (2.10) in the case that bearing load F_1, F_2, $F_3\cdots$ is applied with rotation speed and operation duration of n_1, n_2, $n_3\cdots$ and t_1, t_2, $t_3\cdots$ respectively.

$$F_m = [(F_1^{10/3} \cdot n_1 t_1 + F_2^{10/3} \cdot n_2 t_2 + \cdots + F_n^{10/3} \cdot n_n t_n) / (n_1 t_1 + n_2 t_2 + \cdots + n_n t_n)]^{3/10} \quad \cdots\cdots (2.10)$$

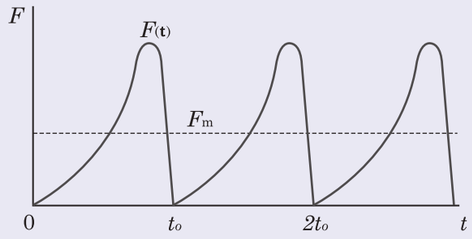


Figur-4 Load changing in stepping increment

(2) Continuously fluctuating load

Average load is given by formula (2.11) in the case that the load can be expressed in function $F(t)$ of time t with cycle t_0.

$$F_m = \left[\frac{1}{t_0}\int_0^{t_0} F(t)^{10/3} dt\right]^{3/10} \quad \cdots\cdots (2.11)$$

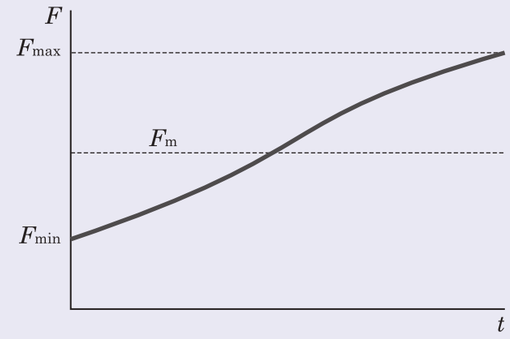


Figur-5 Load changing in function of time

(3) Roughly linear load

Average load F_m is approximately given by formula (2.12).

$$F_m = \frac{F_{min} + 2F_{max}}{3} \quad \cdots\cdots (2.12)$$



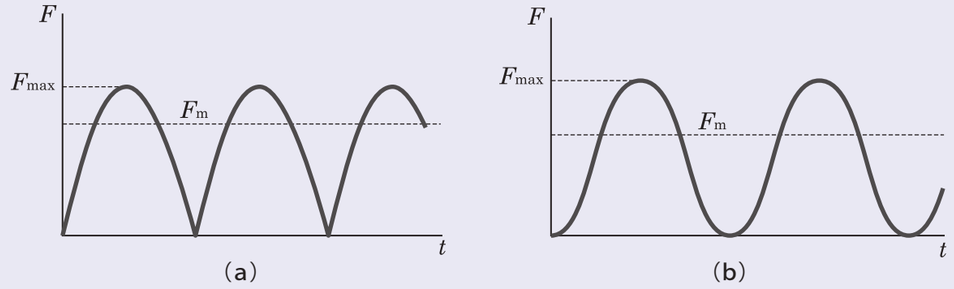
Figur-6 Load changing in linear increase

(4) Sinusoidal fluctuating load

Average load F_m is approximately given by formula (2.13) and formula (2.14).

$$\text{(a): } F_m = 0.75F_{max} \quad \cdots\cdots (2.13)$$

$$\text{(b): } F_m = 0.65F_{max} \quad \cdots\cdots (2.14)$$



Figur-7 Load changing in sinusoidal wave fluctuation

3 Bearing accuracy

3-1 Accuracy

Dimensional accuracy, geometrical accuracy and rotation accuracy of bearing are specified in ISO standards and JIS B 1514 (Rolling bearings - Tolerances of bearings).
Accuracy class of needle bearing is specified by four classes from lowest class 0 to 6th, 5th and 4th class in the highest. While high accuracy bearing in 5th or 4th class may be used in application for the case high rotation accuracy is demanded or high speed rotation, class 0 is used in most of general purpose application.

Table-8 Accuracy of inner ring

Unit: μm

d Nominal bearing bore diameter (mm)		Δ_{dmp} Deviation of mean bore diameter in a single plane								V_{dsp} Variation of bore diameter in a single plane				V_{dmp} Variation of mean bore diameter in a single plane				K_{ia} Radial runout of inner ring of assembled bearing				S_d Reference face runout with bore (Inner ring)		Δ_{Bs} Deviation of a single inner ring width				V_{Bs} Variation of inner rings width				d Nominal bearing bore diameter (mm)	
		0		6		5		4		0	6	5	4	0	6	5	4	0	6	5	4	5	4	0, 6		5, 4		0	6	5	4		
Over	Incl.	high	low	high	low	high	low	high	low	max.				max.				max.				max.		high	low	high	low	max.				Over	Incl.
2.5[1]	10	0	-8	0	-7	0	-5	0	-4	10	9	5	4	6	5	3	2	10	6	4	2.5	7	3	0	-120	0	-40	15	15	5	2.5	2.5[1]	10
10	18	0	-8	0	-7	0	-5	0	-4	10	9	5	4	6	5	3	2	10	7	4	2.5	7	3	0	-120	0	-80	20	20	5	2.5	10	18
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120	150	0	-25	0	-18	0	-13	0	-10	31	23	13	10	19	14	7	5	30	18	8	6	10	6	0	-250	0	-250	30	30	8	5	120	150
150	180	0	-25	0	-18	0	-13	0	-10	31	23	13	10	19	14	7	5	30	18	8	6	10	6	0	-250	0	-250	30	30	8	5	150	180
180	250	0	-30	0	-22	0	-15	0	-12	38	28	15	12	23	17	8	6	40	20	10	8	11	7	0	-300	0	-300	30	30	10	6	180	250
250	315	0	-35	0	-25	0	-18	—	—	44	31	18	—	26	19	9	—	50	25	13	—	13	—	0	-350	0	-350	35	35	13	—	250	315

1) 2.5 mm is included in this dimension group

Table-9 Accuracy of outer ring

Unit: μm

D Nominal bearing outside diameter (mm)		Δ_{Dmp} Deviation of mean outside diameter in a single plane								V_{Dsp} Variation of outside diameter in a single plane				V_{Dmp} Variation of mean outside diameter in a single plane				K_{ea} Radial runout of outer ring of assembled bearing				S_D Variation of outside surface generatrix inclination with face (outer ring)		Δ_{Cs} Deviation of a single outer ring width		V_{Cs} Variation of outer ring width				D Nominal bearing outside diameter (mm)	
		0		6		5		4		0	6	5	4	0	6	5	4	0	6	5	4	5	4	0, 6, 5, 4				0	6	5	4		
Over	Incl.	high	low	high	low	high	low	high	low	max.				max.				max.				max.		high	low			max.				Over	Incl.
2.5[2]	6	0	-8	0	-7	0	-5	0	-4	10	9	5	4	6	5	3	2	15	8	5	3	8	4	Depending on tolerance of Δ_{Bs} for D of the same bearing.		Depending on tolerance of V_{Bs} for D of the same bearing.				5	2.5	2.5[2]	6
6	18	0	-8	0	-7	0	-5	0	-4	10	9	5	4	6	5	3	2	15	8	5	3	8	4							5	2.5	6	18
18	30	0	-9	0	-8	0	-6	0	-5	12	10	6	5	7	6	3	2.5	15	9	6	4	8	4							5	2.5	18	30
30	50	0	-11	0	-9	0	-7	0	-6	14	11	7	6	8	7	4	3	20	10	7	5	8	4							5	2.5	30	50
50	80	0	-13	0	-11	0	-9	0	-7	16	14	9	7	10	8	5	3.5	25	13	8	5	8	4							6	3	50	80
80	120	0	-15	0	-13	0	-10	0	-8	19	16	10	8	11	10	5	4	35	18	10	6	9	5							8	4	80	120
120	150	0	-18	0	-15	0	-11	0	-9	23	19	11	9	14	11	6	5	40	20	11	7	10	5							8	5	120	150
150	180	0	-25	0	-18	0	-13	0	-10	31	23	13	10	19	14	7	5	45	23	13	8	10	5							8	5	150	180
180	250	0	-30	0	-20	0	-15	0	-11	38	25	15	11	23	15	8	6	50	25	15	10	11	7							10	7	180	250
250	315	0	-35	0	-25	0	-18	0	-13	44	31	18	13	26	19	9	7	60	30	18	11	13	8							11	7	250	315

2) 2.5 mm is included in this dimension group

Table-10 Permissive tolerance of chamfer Unit: mm

r_s min	d Nominal bearing bore diameter		Radial direction	Axial direction
	Over	Incl.	r_s max	
0.15	—	—	0.3	0.6
0.2	—	—	0.5	0.8
0.3	— 40	40 —	0.6 0.8	1 1
0.6	— 40	40 —	1 1.3	2 2
1	— 50	50 —	1.5 1.9	3 3
1.1	— 120	120 —	2 2.5	3.5 4
1.5	— 120	120 —	2.3 3	4 5
2	— 80 220	80 220 —	3 3.5 3.8	4.5 5 6
2.1	— 280	280 —	4 4.5	6.5 7
2.5	— 100 280	100 280 —	3.8 4.5 5	6 6 7
3	— 280	280 —	5 5.5	8 8
4	—	—	6.5	9

* Remark Although no particular shape is specified for chamfer surface, its outline in axial plane must be within virtual arc of r_s min radius that is tangent to slope of inner ring and inner diameter face of bearing, or tangent to side of outer ring and bearing outer diameter. (Reference diagram)

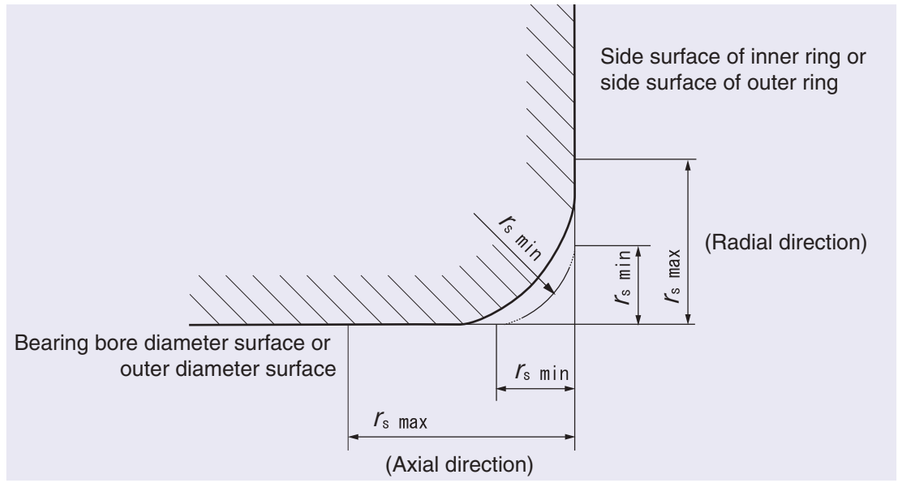


Table-11 Tolerance of minimum value of diameter of inscribed circle to roller Unit: μm

F_w (mm) Inscribed circle diameter		Dimension difference of ΔF_w min Variation of minimum value of diameter of inscribed circle to roller	
Over	Incl.	high	low
3	6	+18	+10
6	10	+22	+13
10	18	+27	+16
18	30	+33	+20
30	50	+41	+25
50	80	+49	+30
80	120	+58	+36
120	180	+68	+43
180	250	+79	+50
250	315	+88	+56

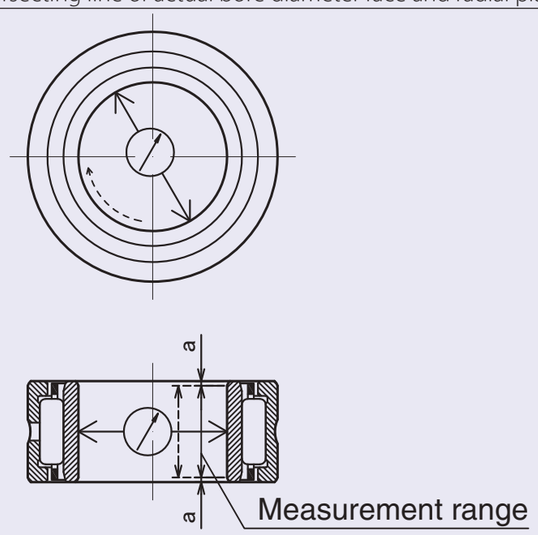
This means diameter of roller that achieves zero radial clearance in at least one radial direction in the case of using cylindrical roller instead of bearing inner ring.

3-2 Measurement method

Measurement of single bore diameter

Table-12 Bearing bore diameter

Type and definition of accuracy	
d_{mp} Mean bore diameter in a single plane	Arithmetic mean of maximum and minimum value of the single bore diameters in a single radial plane. $d_{mp}=\frac{d_{sp\,max}+d_{sp\,min}}{2}$ d_{sp}: Single inner diameter in a particular radial plane.
Δ_{dmp} Deviation of mean bore diameter in a single plane	Difference between the mean bore diameter and nominal more diameter. $\Delta_{dmp}=d_{mp}-d$ d: Nominal bearing bore diameter.
V_{dsp} Variation of single bore diameter in a single plane	Difference between maximum and minimum value of single bore diameter in single radial plane. $V_{dsp}=d_{sp\,max}-d_{sp\,min}$
V_{dmp} Variation of mean bore diameter in a single plane	Difference between maximum and minimum value of the mean bore diameter in a single plane in individual track ring basically with cylindrical inner diameter face. $V_{dmp}=d_{mp\,max}-d_{mp\,min}$
Δ_{ds} deviation of single bore diameter	Difference between single bore diameter and nominal bore diameter. $\Delta_{ds}=d_s-d$ d_s: Distance between two parallel straight lines which are tangent to intersecting line of actual bore diameter face and radial plane.



Method of measurement of bearing bore diameter

Zero the gauge indicator to the appropriate size using gauge blocks or a master ring.

In several angular directions and in a single radial plane, measure and record the largest and the smallest single bore diameters, $d_{sp\,max}$ and $d_{sp\,min}$.

Repeat angular measurements and recordings in several radial planes to determine the largest and the smallest single bore diameter of an individual ring, $d_{s\,max}$ and $d_{s\,min}$.

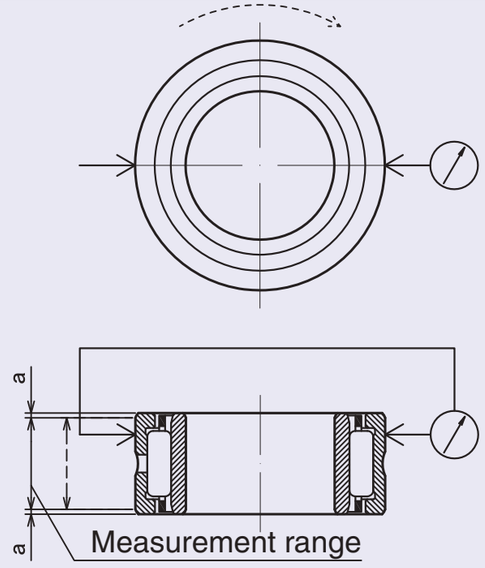
Table-13 Measurement area limit Unit: mm

$r_{s\,min}$		a
Over	or less	
-	0.6	$r_{s\,max}+0.5$
0.6	-	$1.2\times r_{s\,max}$

Measurement of single outside diameter

Table-14 Bearing outer diameter

Type and definition of accuracy	
D_{mp} mean outside diameter in a single plane	Arithmetic mean of maximum and minimum value of the single outside diameters in a single radial plane. $D_{mp}=\frac{D_{sp\,max}+D_{sp\,min}}{2}$ D_{sp}: Single outside diameter in a particular radial plane
Δ_{Dmp} Deviation of mean outside diameter in a single plane	Difference between the mean outside diameter in a single plane of cylindrical outside diameter face and nominal outside diameter. $\Delta_{Dmp}=D_{mp}-D$ D: Nominal bearing outside diameter.
V_{Dsp} deviation of single outside diameter	Difference between maximum and minimum value of the mean outside diameter in a single radial plane. $V_{Dsp}=D_{sp\,max}-D_{sp\,min}$
V_{Dmp} Variation of mean outside diameter in a single plane	Difference between maximum and minimum value of the mean outside diameter in a single plane in individual track ring with basically cylindrical outer diameter face. $V_{Dmp}=D_{mp\,max}-D_{mp\,min}$
Δ_{Ds} deviation of single bore diameter	Difference between single outside diameter in basically cylindrical outside diameter face and nominal outside diameter. $\Delta_{Ds}=D_s-D$ D_s: Distance between two parallel straight lines which are tangent to intersecting line of actual outer diameter face and radial plane.



Method of measurement of bearing outer diameter

Zero the gauge indicator to the appropriate size using gauge blocks or a master.

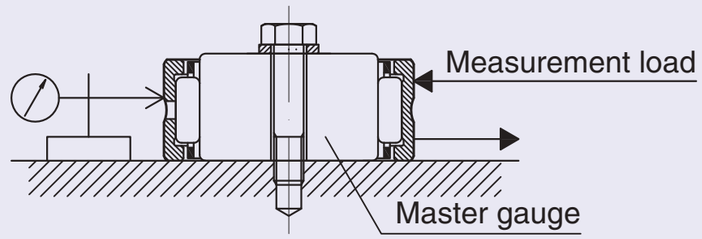
In several angular directions and in a single radial plane, measure and record the largest and the smallest single outside diameters, $D_{sp\,max}$ and $D_{sp\,min}$.

Repeat and record measurements in several radial planes to determine the largest and the smallest single outside diameter of an individual ring, $D_{s\,max}$ and $D_{s\,min}$.

Measurement of single bore diameter of rolling element complement

Table-15 Measurement of single bore diameter of rolling element complement

Type and definition of accuracy	
F_{ws} Nominal bore diameter of rolling element complement	Distance between two parallel straight lines which are tangent to intersecting line of inscribed circle of rolling element complement and radial plane in radial bearing without inner ring.
$F_{ws\,min}$ Minimum nominal bore diameter of rolling element complement	Minimum nominal bore diameter of rolling element complement in radial bearing without inner ring. Remark Minimum nominal bore diameter of rolling element complement is diameter of cylinder whose radial clearance becomes zero in at least one radial direction.



Measurement of single bore diameter of rolling element complement

Fasten the master gauge to a surface plate.

Position the bearing on the master gauge and apply the indicator in the radial direction to the approximate middle of the width on the ring outside surface.

Measure the amount of movement of the outer ring in the radial direction by applying sufficient load on the outer ring in the same radial direction as that of the indicator and in the opposite radial direction.

Record indicator readings at the extreme radial positions of the outer ring. Rotate the bearing and repeat the measurement in several different angular positions to determine the largest and the smallest readings, $F_{ws\,max}$ and $F_{ws\,min}$.

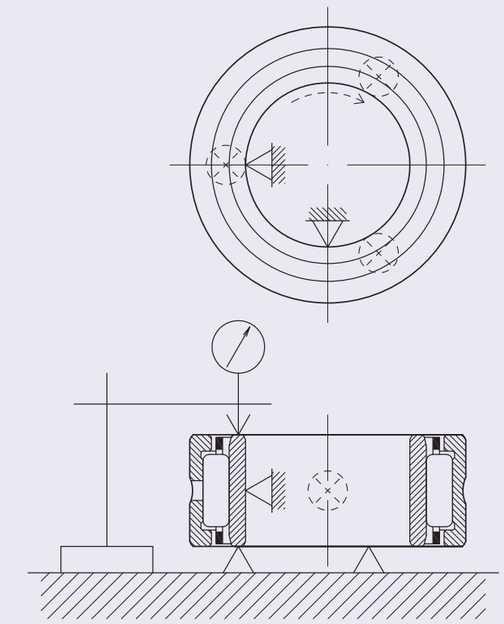
Table-16 Radial measurement load

F_w mm		Measurement load N
Over	Incl.	min.
—	30	50
30	50	60
50	80	70
80	—	80

Measurement of single inner ring width (or outer ring width)

Table-17 Measurement of single inner ring width (or outer ring width)

Type and definition of accuracy	
Δ_{Bs} Deviation of single inner ring width	Difference between single inner ring width and nominal inner ring width. $\Delta_{Bs}=B_s-B$
V_{Bs} Variation of inner ring width	Difference between maximum and minimum value of the single bore diameter width in each inner ring. $V_{Bs}=B_{s\,max}-B_{s\,min}$
Δ_{Cs} Deviation of single outer ring width	Difference between single outer ring width and norminal outer ring width $\Delta_{Cs}=C_s-C$
V_{Cs} Variation of outer ring width	Difference between maximum and minimum value of the single outer ring width in each outer ring. $V_{Cs}=C_{s\,max}-C_{s\,min}$



Measurement of single inner ring width (or outer ring width)

Zero the gauge indicator to the appropriate height from the reference surface using gauge blocks or a master.

Support one face of the ring on three equally spaced fixed supports of equal height and provide two suitable radial supports on the bore surface set at 90° to each other to center the ring.

Position the indicator against the other face of the ring opposite one fixed support.

Rotate the ring one revolution and measure and record the largest and the smallest single ring width, $B_{s\,max}$ and $B_{s\,min}$ ($C_{s\,max}$ and $C_{s\,min}$).

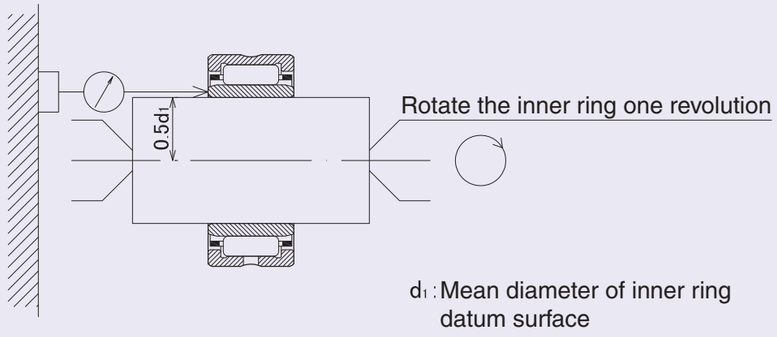
Measurement of perpendicularity of inner ring face with respect to the bore (S_d)

Use a precision arbor having a taper of approximately 1:5000 on diameter.

Mount the bearing assembly on the tapered arbor and place the arbor between two centres so that it can be accurately rotated.

Position the indicator against the reference face of the inner ring at a radial distance from the arbor axis of half the mean diameter of the face.

Take indicator readings while rotating the inner ring one revolution.



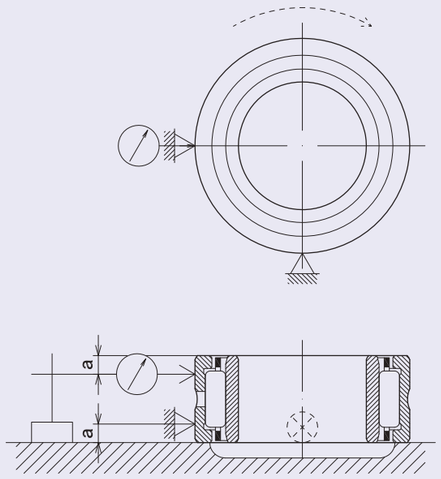
Measurement of perpendicularity of inner ring face with respect to the bore

Measurement of perpendicularity of outer ring outside surface with respect to the face (S_D)

Support the reference face of the outer ring on a surface plate leaving the inner ring, if an assembled bearing, free. Locate the outer ring cylindrical outside surface against two supports set at 90° to each other to centre the outer ring.

Position the indicator directly above one support. The indicator and the two supports are axially located at the extremes of the measurement zone.

Take indicator readings while rotating the outer ring one revolution.



Measurement of perpendicularity of outer ring outside surface with respect to the face

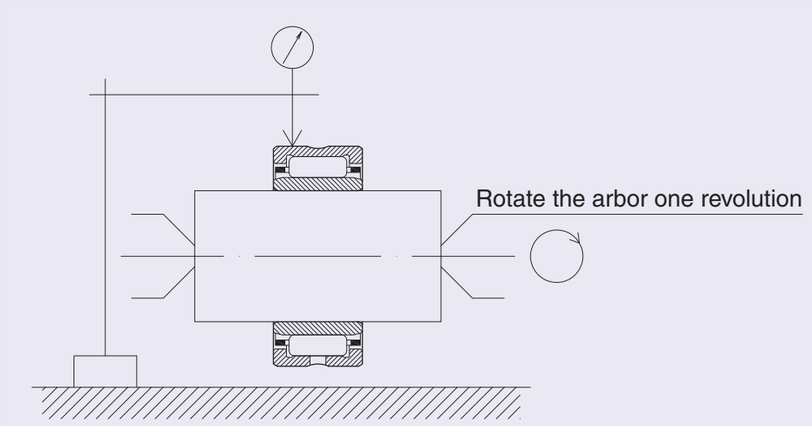
Measurement of radial runout of inner ring (K_{ia})

Use a precision arbor having a taper of approximately 1:5000 on diameter.

Mount the bearing assembly on the tapered arbor and place the arbor between two centres so that it can be accurately rotated.

Position the indicator against the outside surface of the outer ring as close as possible to the middle of the outer ring raceway.

Hold the outer ring to prevent rotation but ensure its weight is supported by the rolling elements. Take indicator readings while rotating the arbor one revolution.



Measurement of radial runout of inner ring

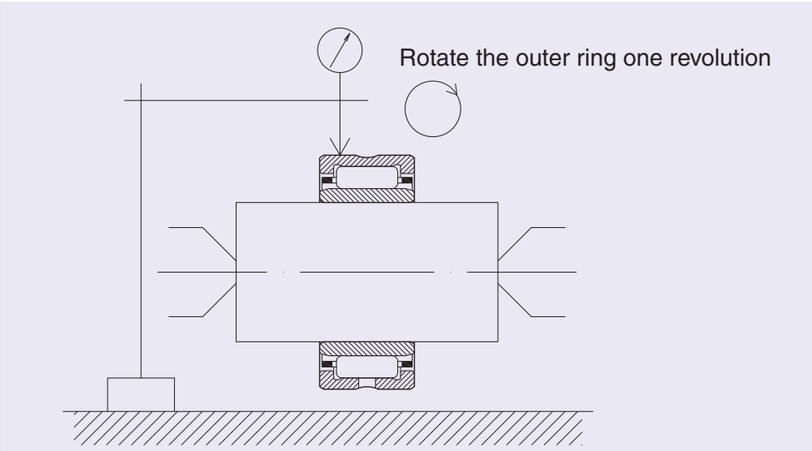
Measurement of radial runout of outer ring (K_{ea})

Use a precision arbor having a taper of approximately 1:5000 on diameter.

Mount the bearing assembly on the tapered arbor and place the arbor between two centres so that it can be accurately rotated.

Position the indicator against the outside surface of the outer ring as close as possible to the middle of the outer ring raceway.

Hold the inner ring stationary. Take indicator readings while rotating the outer ring one revolution.



Measurement of radial runout of outer ring

4 Internal clearance of bearing

4-1 Radial internal clearance of bearing

Radial internal clearance of bearing means a displacement of either inner ring or outer ring, which is free side, when the specified measurement load is applied to it alternatively in radial direction while locking the opposite component in the condition before mounting the bearing on shaft or housing. This measurement loads are quite small and they are specified in JIS B 1515:2006 (Rolling bearings - Tolerances). Radial internal clearance of needle bearing with inner ring is specified in JIS B 1520:1995 (radial internal clearance of bearing). Clearances shown in Table-18 are categorized in group C2, CN, C3, C4, C5 starting from smaller clearance and group CN is applied to general application.

■ Radial internal clearance of bearing

Table-18 Internal clearance of radial bearing

Category	Description
C2	Radial clearance smaller than standard clearance
CN clearance	Standard radial clearance
C3, C4, C5	Radial clearance larger than standard clearance

Table-19 Value of radial internal clearance of needle bearing

Unit: μm

d Nominal bearing bore diameter (mm)		Clearance category									
		C2		CN		C3		C4		C5	
Over	Incl.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.
-	10	0	25	20	45	35	60	50	75	-	-
10	24	0	25	20	45	35	60	50	75	65	90
24	30	0	25	20	45	35	60	50	75	70	95
30	40	5	30	25	50	45	70	60	85	80	105
40	50	5	35	30	60	50	80	70	100	95	125
50	65	10	40	40	70	60	90	80	110	110	140
65	80	10	45	40	75	65	100	90	125	130	165
80	100	15	50	50	85	75	110	105	140	155	190
100	120	15	55	50	90	85	125	125	165	180	220
120	140	15	60	60	105	100	145	145	190	200	245
140	160	20	70	70	120	115	165	165	215	225	275
160	180	25	75	75	125	120	170	170	220	250	300
180	200	35	90	90	145	140	195	195	250	275	330
200	225	45	105	105	165	160	220	220	280	305	365
225	250	45	110	110	175	170	235	235	300	330	395

Remark Nominal number C2,C3,C4 are displayed as part code suffix for these bearings (excluding CN clearance). Example) NA 4903 C2

4-2 Selection of radial internal clearance of bearing

Selection of clearance

Radial internal clearance of needle bearing in operation may generally becomes smaller than initial radial internal clearance. Temperature difference between inner and outer bearing during operation and fit cause this change. The radial internal clearance has a significant impact to life, vibration and heat generation of bearing.

Typically, larger radial internal clearance causes increase of vibration and smaller one results in heat generation or reduction of life due to excessive force between rolling element and track. Initial radial internal clearance may be selected as slightly larger than zero clearance in consideration for the internal clearance during operation. Bearing is designed to have suitable radial clearance by selecting CN clearance for general application.

Reduction of radial internal clearance due to fits

When bearing is installed to shaft or housing, radial internal clearance reduces due to expansion or shrinking of track with elastic deformation.

Reduction of radial clearance due to temperature difference between inner and outer ring

Friction heat generated by rotation of bearing will be released to outside through shaft and/or housing. In general application, radial internal clearance may be reduced as much as the difference of amount of thermal expansion between inner and outer ring since outer ring becomes cooler than inner ring due to larger heat release from housing than that from shaft.

5 Fits

5-1 Purpose of fits

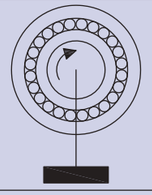
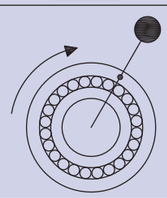
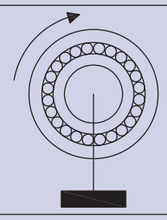
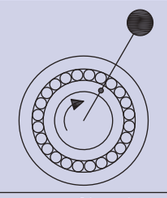
Purpose of "fits" for a bearing is to fixate a bearing with sufficient "interference" between inner ring and shaft or between outer ring and housing. Insufficient "fits" may cause harmful phenomena which result in damaging bearing or shortening its life such as abnormal wear in fitting surface, abnormal heat by abrasion powder, abnormal rotation and vibration due to slip of fitting surface. Therefore, it is imperative to select proper fits for application.

5-2 Selection of fits

Condition for selection of fits

Selection of bearing "fits" needs to consider following points. Properties and size of load in application, condition of temperature, accuracy of rotation, material, finish, wall thickness of shaft and housing and easiness of assembling/disassembling.
"Fits" as shown in Table-20 is generally determined based on properties of load and condition of rotation.

Table-20 Properties of radial load and fits

Properties of bearing load			Fits	
			Inner ring	Outer ring
Load with rotating inner ring Load with stationary outer ring		Inner ring: rotation Outer ring: stationary Loading direction: constant	Tight fit	Loose fit
		Inner ring: stationary Outer ring: rotation Loading direction: rotate together with outer ring		
Load with rotating outer ring Load with stationary inner ring		Inner ring: stationary Outer ring: rotation Loading direction: constant	Loose fit	Tight fit
		Inner ring: rotation Outer ring: stationary Loading direction: rotate together with inner ring		
Load in incon-sistent direction	Direction of load is inconsistent due to varying load direction or including unbal-anced load	Inner ring: rotation or stationary Outer ring: rotation or stationary Loading direction: inconsistent	Tight fit	Tight fit

Selection of fits

It is necessary to take condition of temperature and material of shaft and housing into consideration in addition to properties of load and rotation condition for selection of "fits" as mentioned above. Yet, it is common practice to determine "fits" based on reference to experience and past record because of difficulty for recognizing whole conditions. Table-21 and Table-22 show "fits" for general application and Table-23 shows "fits" for needle bearing without inner ring against shaft.

Table-21 Fits between needle bearing and housing hole

Conditions		Tolerance grade for housing
Load with stationary outer ring	Standard and heavy load	J7
	Split housing with standard load	H7
Load in inconsistent direction	Light load	J7
	Standard load	K7
	Heavy load and impact shock load	M7
Load with rotating outer ring	Light load	M7
	Standard load	N7
	Heavy load and impact shock load	P7
Light load and high rotation accuracy		K6

Table-22 Fits between needle bearing with inner ring and shaft

Conditions		Shaft diameter (mm)		Tolerance grade
		Over	Incl.	
Load with rotating inner ring or Load in inconsistent direction	Light load	—	50	j5
		50	100	k5
	Standard load	—	50	k5
		50	150	m5・m6
		150~		m6・n6
	Heavy load and impact shock load	~150		m6・n6
		150~		n6・p6
Load with stationary inner ring	Mid to low speed, light load	All dimension		g6
	Mid to low speed, standard load or heavy load			h6
	With precision rotation accuracy			h5

Remark Light load $P_r \leqq 0.06C_r$ Standard load $0.06C_r < P_r \leqq 0.12C_r$ Heavy load $P_r > 0.12C_r$
P_r: Dynamic equivalent radial load C_r: Basic dynamic load rating

Table-23 Fits between needle bearing without inner ring and shaft

Nominal diameter of inscribed circle Fw (mm)		Radial internal clearance		
		Clearance smaller than CN clearance	CN clearance	Clearance larger than CN clearance
Over	Incl.	Tolerance group grade for shaft		
-	65	k5	h5	g6
65	80	k5	h5	f6
80	160	k5	g5	f6
160	180	k5	g5	e6
180	200	j5	g5	e6
200	250	j5	f6	e6
250	315	h5	f6	e6

Remark Tight fit with housing hole smaller than k7 shall be modified with smaller shaft size in considering diameter shrink of inscribed circle of roller after assembly.

5-3 Table for shaft and housing fits

Table-24 Tolerances for shafts

Unit: µm

Nominal bearing bore diameter and nominal diameter of shaft d (mm)		Tolerance grade for shaft																															
		b12		c12		d6		e6		e7		f5		f6		g5		g6		h5		h6		h7		h8		h9		h10		h11	
Over	Incl.	high	low	high	low	high	low	high	low	high	low	high	low	high	low	high	low	high	low	high	low	high	low	high	low	high	low	high	low	high	low	high	low
—	3	-140	-240	-60	-160	-20	-26	-14	-20	-14	-24	-6	-10	-6	-12	-2	-6	-2	-8	0	-4	0	-6	0	-10	0	-14	0	-25	0	-40	0	-60
3	6	-140	-260	-70	-190	-30	-38	-20	-28	-20	-32	-10	-15	-10	-18	-4	-9	-4	-12	0	-5	0	-8	0	-12	0	-18	0	-30	0	-48	0	-75
6	10	-150	-300	-80	-230	-40	-49	-25	-34	-25	-40	-13	-19	-13	-22	-5	-11	-5	-14	0	-6	0	-9	0	-15	0	-22	0	-36	0	-58	0	-90
10	18	-150	-330	-95	-275	-50	-61	-32	-43	-32	-50	-16	-24	-16	-27	-6	-14	-6	-17	0	-8	0	-11	0	-18	0	-27	0	-43	0	-70	0	-110
18	30	-160	-370	-110	-320	-65	-78	-40	-53	-40	-61	-20	-29	-20	-33	-7	-16	-7	-20	0	-9	0	-13	0	-21	0	-33	0	-52	0	-84	0	-130
30	40	-170	-420	-120	-370	-80	-96	-50	-66	-50	-75	-25	-36	-25	-41	-9	-20	-9	-25	0	-11	0	-16	0	-25	0	-39	0	-62	0	-100	0	-160
40	50	-180	-430	-130	-380																												
50	65	-190	-490	-140	-440	-100	-119	-60	-79	-60	-90	-30	-43	-30	-49	-10	-23	-10	-29	0	-13	0	-19	0	-30	0	-46	0	-74	0	-120	0	-190
65	80	-200	-500	-150	-450																												
80	100	-220	-570	-170	-520	-120	-142	-72	-94	-72	-107	-36	-51	-36	-58	-12	-27	-12	-34	0	-15	0	-22	0	-35	0	-54	0	-87	0	-140	0	-220
100	120	-240	-590	-180	-530																												
120	140	-260	-660	-200	-600	-145	-170	-85	-110	-85	-125	-43	-61	-43	-68	-14	-32	-14	-39	0	-18	0	-25	0	-40	0	-63	0	-100	0	-160	0	-250
140	160	-280	-680	-210	-610																												
160	180	-310	-710	-230	-630																												
180	200	-340	-800	-240	-700	-170	-199	-100	-129	-100	-146	-50	-70	-50	-79	-15	-35	-15	-44	0	-20	0	-29	0	-46	0	-72	0	-115	0	-185	0	-290
200	225	-380	-840	-260	-720																												
225	250	-420	-880	-280	-740																												
250	280	-480	-1000	-300	-820	-190	-222	-110	-142	-110	-162	-56	-79	-56	-88	-17	-40	-17	-49	0	-23	0	-32	0	-52	0	-81	0	-130	0	-210	0	-320
280	315	-540	-1060	-330	-850																												

Tolerance grade for shaft																										Nominal bearing bore diameter and nominal diameter of shaft d (mm)	
h12		js5		j5		js6		j6		j7		k5		k6		m5		m6		n5		n6		p6			
high	low	high	low	high	low	high	low	high	low	high	low	high	low	high	low	high	low	high	low	high	low	high	low	high	low	Over	Incl.
0	-100	+2	-2	+2	-2	+3	-3	+4	-2	+6	-4	+4	0	+6	0	+6	+2	+8	+2	+8	+4	+10	+4	+12	+6	—	3
0	-120	+2.5	-2.5	+3	-2	+4	-4	+6	-2	+8	-4	+6	+1	+9	+1	+9	+4	+12	+4	+13	+8	+16	+8	+20	+12	3	6
0	-150	+3	-3	+4	-2	+4.5	-4.5	+7	-2	+10	-5	+7	+1	+10	+1	+12	+6	+15	+6	+16	+10	+19	+10	+24	+15	6	10
0	-180	+4	-4	+5	-3	+5.5	-5.5	+8	-3	+12	-6	+9	+1	+12	+1	+15	+7	+18	+7	+20	+12	+23	+12	+29	+18	10	18
0	-210	+4.5	-4.5	+5	-4	+6.5	-6.5	+9	-4	+13	-8	+11	+2	+15	+2	+17	+8	+21	+8	+24	+15	+28	+15	+35	+22	18	30
0	-250	+5.5	-5.5	+6	-5	+8	-8	+11	-5	+15	-10	+13	+2	+18	+2	+20	+9	+25	+9	+28	+17	+33	+17	+42	+26	30	40
																										40	50
0	-300	+6.5	-6.5	+6	-7	+9.5	-9.5	+12	-7	+18	-12	+15	+2	+21	+2	+24	+11	+30	+11	+33	+20	+39	+20	+51	+32	50	65
																										65	80
0	-350	+7.5	-7.5	+6	-9	+11	-11	+13	-9	+20	-15	+18	+3	+25	+3	+28	+13	+35	+13	+38	+23	+45	+23	+59	+37	80	100
																										100	120
0	-400	+9	-9	+7	-11	+12.5	-12.5	+14	-11	+22	-18	+21	+3	+28	+3	+33	+15	+40	+15	+45	+27	+52	+27	+68	+43	120	140
																										140	160
																										160	180
0	-460	+10	-10	+7	-13	+14.5	-14.5	+16	-13	+25	-21	+24	+4	+33	+4	+37	+17	+46	+17	+51	+31	+60	+31	+79	+50	180	200
																										200	225
																										225	250
0	-520	+11.5	-11.5	+7	-16	+16	-16	+16	-16	+26	-26	+27	+4	+36	+4	+43	+20	+52	+20	+57	+34	+66	+34	+88	+56	250	280
																										280	315

Table-25 Tolerances for holes

Unit: µm

Nominal bearing outer diameter and nominal diameter of hole D(mm)		Housing tolerances and resulting fits																											
		B12		E7		E8		E9		F6		F7		G6		G7		H6		H7		H8		H9		H10		H11	
Over	Incl.	high	low	high	low	high	low	high	low	high	low	high	low	high	low	high	low	high	low	high	low	high	low	high	low	high	low	high	low
—	3	+240	+140	+24	+14	+28	+14	+39	+14	+12	+6	+16	+6	+8	+2	+12	+2	+6	0	+10	0	+14	0	+25	0	+40	0	+60	0
3	6	+260	+140	+32	+20	+38	+20	+50	+20	+18	+10	+22	+10	+12	+4	+16	+4	+8	0	+12	0	+18	0	+30	0	+48	0	+75	0
6	10	+300	+150	+40	+25	+47	+25	+61	+25	+22	+13	+28	+13	+14	+5	+20	+5	+9	0	+15	0	+22	0	+36	0	+58	0	+90	0
10	18	+330	+150	+50	+32	+59	+32	+75	+32	+27	+16	+34	+16	+17	+6	+24	+6	+11	0	+18	0	+27	0	+43	0	+70	0	+110	0
18	30	+370	+160	+61	+40	+73	+40	+92	+40	+33	+20	+41	+20	+20	+7	+28	+7	+13	0	+21	0	+33	0	+52	0	+84	0	+130	0
30	40	+420	+170	+75	+50	+89	+50	+112	+50	+41	+25	+50	+25	+25	+9	+34	+9	+16	0	+25	0	+39	0	+62	0	+100	0	+160	0
40	50	+430	+180																										
50	65	+490	+190	+90	+60	+106	+60	+134	+60	+49	+30	+60	+30	+29	+10	+40	+10	+19	0	+30	0	+46	0	+74	0	+120	0	+190	0
65	80	+500	+200																										
80	100	+570	+220	+107	+72	+126	+72	+159	+72	+58	+36	+71	+36	+34	+12	+47	+12	+22	0	+35	0	+54	0	+87	0	+140	0	+220	0
100	120	+590	+240																										
120	140	+660	+260	+125	+85	+148	+85	+185	+85	+68	+43	+83	+43	+39	+14	+54	+14	+25	0	+40	0	+63	0	+100	0	+160	0	+250	0
140	160	+680	+280																										
160	180	+710	+310																										
180	200	+800	+340	+146	+100	+172	+100	+215	+100	+79	+50	+96	+50	+44	+15	+61	+15	+29	0	+46	0	+72	0	+115	0	+185	0	+290	0
200	225	+840	+380																										
225	250	+880	+420																										
250	280	+1000	+480	+162	+110	+191	+110	+240	+110	+88	+56	+108	+56	+49	+17	+69	+17	+32	0	+52	0	+81	0	+130	0	+210	0	+320	0
280	315	+1060	+540																										

Housing tolerances and resulting fits																														Nominal bearing outer diameter and nominal diameter of hole D (mm)	
JS6		J6		JS7		J7		K5		K6		K7		M6		M7		N6		N7		P6		P7		R7		S7			
high	low	high	low	high	low	high	low	high	low	high	low	high	low	high	low	high	low	high	low	high	low	high	low	high	low	high	low	high	low	Over	Incl.
+3	-3	+2	-4	+5	-5	+4	-6	0	-4	0	-6	0	-10	-2	-8	-2	-12	-4	-10	-4	-14	-6	-12	-6	-16	-10	-20	-14	-24	—	3
+4	-4	+5	-3	+6	-6	+6	-6	0	-5	+2	-6	+3	-9	-1	-9	0	-12	-5	-13	-4	-16	-9	-17	-8	-20	-11	-23	-15	-27	3	6
+4.5	-4.5	+5	-4	+7.5	-7.5	+8	-7	+1	-5	+2	-7	+5	-10	-3	-12	0	-15	-7	-16	-4	-19	-12	-21	-9	-24	-13	-28	-17	-32	6	10
+5.5	-5.5	+6	-5	+9	-9	+10	-8	+2	-6	+2	-9	+6	-12	-4	-15	0	-18	-9	-20	-5	-23	-15	-26	-11	-29	-16	-34	-21	-39	10	18
+6.5	-6.5	+8	-5	+10.5	-10.5	+12	-9	+1	-8	+2	-11	+6	-15	-4	-17	0	-21	-11	-24	-7	-28	-18	-31	-14	-35	-20	-41	-27	-48	18	30
+8	-8	+10	-6	+12.5	-12.5	+14	-11	+2	-9	+3	-13	+7	-18	-4	-20	0	-25	-12	-28	-8	-33	-21	-37	-17	-42	-25	-50	-34	-59	30	40
																														40	50
+9.5	-9.5	+13	-6	+15	-15	+18	-12	+3	-10	+4	-15	+9	-21	-5	-24	0	-30	-14	-33	-9	-39	-26	-45	-21	-51	-30	-60	-42	-72	50	65
																										-32	-62	-48	-78	65	80
+11	-11	+16	-6	+17.5	-17.5	+22	-13	+2	-13	+4	-18	+10	-25	-6	-28	0	-35	-16	-38	-10	-45	-30	-52	-24	-59	-38	-73	-58	-93	80	100
																										-41	-76	-66	-101	100	120
+12.5	-12.5	+18	-7	+20	-20	+26	-14	+3	-15	+4	-21	+12	-28	-8	-33	0	-40	-20	-45	-12	-52	-36	-61	-28	-68	-48	-88	-77	-117	120	140
																										-50	-90	-85	-125	140	160
																										-53	-93	-93	-133	160	180
+14.5	-14.5	+22	-7	+23	-23	+30	-16	+2	-18	+5	-24	+13	-33	-8	-37	0	-46	-22	-51	-14	-60	-41	-70	-33	-79	-60	-106	-105	-151	180	200
																										-63	-109	-113	-159	200	225
																										-67	-113	-123	-169	225	250
+16	-16	+25	-7	+26	-26	+36	-16	+3	-20	+5	-27	+16	-36	-9	-41	0	-52	-25	-57	-14	-66	-47	-79	-36	-88	-74	-126	-138	-190	250	280
																										-78	-130	-150	-202	280	315

6 Design of shaft and housing

6-1 Accuracy of fitting surface

Correct design and manufacturing of shaft or housing to which needle bearing is assembled are vital for adequate bearing performance since the needle bearing has thinner track ring compared to other types of rolling bearings. Table-26 shows dimension accuracy and geometric accuracy of "fitting" part of shaft and housing in standard application condition, surface roughness and tolerance of runout of shoulder against fitting surface.

Table-26 Accuracy of shaft and housing (recommended)

Item	Shaft	Housing
Roundness tolerance	IT3~IT4	IT4~IT5
Cylindricity tolerance	IT3~IT4	IT4~IT5
Shoulder runout tolerance	IT3	IT3~IT4
Roughness of fitting surface	0.8a	1.6a

6-2 Accuracy of track surface

Needle bearing can be directly attached to shaft or housing as track for compact bearing structure. In this case, accuracy and roughness of track surface must be equivalent to that of bearing track surface in order to ensure bearing life with high rotation accuracy. Since accuracy and roughness of shaft and housing may affect life and the cause of abnormality of the bearing.

Table-27 shows specification for accuracy and roughness of track surface.

Table-27 Accuracy of track surface (recommended)

Item	Shaft	Housing
Roundness tolerance	IT3	IT3
Cylindricity tolerance	IT3	IT3
Shoulder runout tolerance	IT3	IT3
Surface roughness	0.2a	

6-3 Material and heat treatment of track surface

Surface hardness of shaft and housing must be HRC58 to 64 in order to obtain sufficient loading capacity in the case of using them as direct track surface. Table-28 shows recommended heat treatment for their material.

Table-28 Material for track

Type of steel	Representative example	Related standards
High carbon-chromium bearing steel	SUJ2	JIS G 4805
Chronium molybdemum steel	SCM415~435	JIS G 4053
Carbon tool steel	SK85	JIS G 4401
Stainless steel	SUS440C	JIS G 4303

6-4 Skew of bearing

Skew between inner ring and outer ring generated by deflection of shaft due to external force or mounting error may result in reduction of life caused by abnormal wear or heat. While permissive amount of skew varies depending on type of bearing, load and bearing internal clearance, it is recommended to be 1/2000 or less for general application.

6-5 Mounting dimension for bearing

Dimension of shaft and housing for mounting needle bearing (Figure-8) is shown in dimension table for respective bearings.

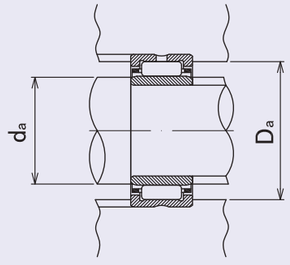


Figure-8 Mounting dimension

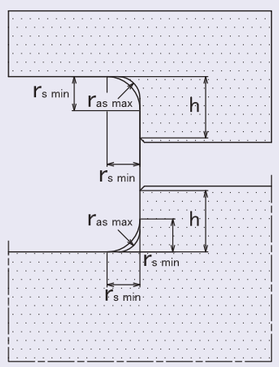
Fillet radius and height of shoulder for shaft and housing

Maximum permissive radius ($r_{as\ max}$) of fillet radius for shaft and housing to which needle bearings are assembled corresponds to minimum permissive chamfer dimension ($r_{s\ min}$) of the bearings.

Minimum value of shoulder diameter of the shaft (d_a) shall be nominal bore diameter (d) of bearing plus its shoulder height (h) multiplied by 2. Maximum value of shoulder diameter of the housing (D_a) shall be outer diameter (D) of bearing minus height of its shoulder multiplied by 2.

Table-29 Maximum permissive actual radius of corner R of shaft and housing $r_{as\ max}$ Unit: mm

$r_{s\ min}$ Minimum permissive chamfer dimension	$r_{as\ max}$ Maximum permissive actual radius of corner R of shaft and housing
0.1 0.15 0.2	0.1 0.15 0.2
0.3 0.4 0.6	0.3 0.4 0.6
1 1.1 1.5	1 1 1.5
2 2.1 2.5	2 2 2
3 4 5	2.5 3 4



Height of shoulder and corner R

Table-30 Value of tolerance class IT for reference dimension

Unit: μm

Reference dimension mm		Tolerance class					
Over	Incl.	IT2	IT3	IT4	IT5	IT6	IT7
3	6	1.5	2.5	4	5	8	12
6	10	1.5	2.5	4	6	9	15
10	18	2	3	5	8	11	18
18	30	2.5	4	6	9	13	21
30	50	2.5	4	7	11	16	25
50	80	3	5	8	13	19	30
80	120	4	6	10	15	22	35
120	180	5	8	12	18	25	40
180	250	7	10	14	20	29	46
250	315	8	12	16	23	32	52

7 Lubrication

7-1 Purpose of lubrication

Purpose of bearing lubrication is to prevent its heat-seizure by mitigating friction and abrasion of rolling surface and slipping surface. Followings are the detailed explanation.

(1) Mitigation of friction and abrasion
It prevents direct contact between track, rolling element and cage.
It also mitigates friction and abrasion as a result of slip on track surface.

(2) Removal of frictional heat
Lubricant removes abrasion heat inside of bearing or heat propagated from outside to prevent excessive heat-up of the bearing.

(3) Extension of bearing life
Separating rolling element and track by oil film results in extension of bearing life.

(4) Prevention of rust
Oil film of lubricant mitigates oxidation inside and surface of bearing to prevent corrosion.

(5) Prevention of dust
Packed grease in the case of grease lubrication prevent invasion of foreign matter.

Efficient performance of these effects requires using lubrication method suitable for the application as well as selection of proper lubricant, its adequate amount, prevention against invasion of external foreign matter and optimal sealing structure in order to avoid leakage of the lubricant.

7-2 Comparison of grease and oil lubrication

Lubrication method

Lubrication method of bearing consists of grease lubrication and oil lubrication.

Grease lubrication is so popular for broad type of bearing because of its cost efficiency due to its simple sealing structure and a long duration of operating period with single filling. However, its disadvantage is larger flow resistance than oil lubrication in light of efficiency to large cooling capability and high speed application.

Oil lubrication has advantage in large cooling capability and high speed application due to its good flow characteristics. However, it demands design with consideration to sealing structure and leakage prevention. The Table-31 compares the two lubrication methods as a guidance for lubrication method selection.

Table-31 Comparison of grease and oil lubrication

Item \ Lubrication method	Grease	Oil
Replacement of lubricant	△	○
Lubrication performance	○	◎
Cooling efficiency	×	○
Sealing structure	○	△
Power loss	△	○
Maintenance	○	△
High speed operation	×	○

7-3 Grease lubrication

Filling amount of grease

Grease shall be packed up to volume approximately one-third to one-half of internal space of bearing or housing. Excessive grease may cause degraded lubrication performance due to leakage of softened grease or oxidation as a result of increased temperature inside of bearing. This should be critical especially in high speed operation.

Figure-9 shows an example of grease replenishment plan from side way using a ring with grease hole. Arranging grease holes evenly on circumference of the ring allows simultaneous entry of replenished grease into bearing for replacing old grease with new one. However, this design also allows standing old grease in opposite side space, which needs to be removed periodically by removing the cover.

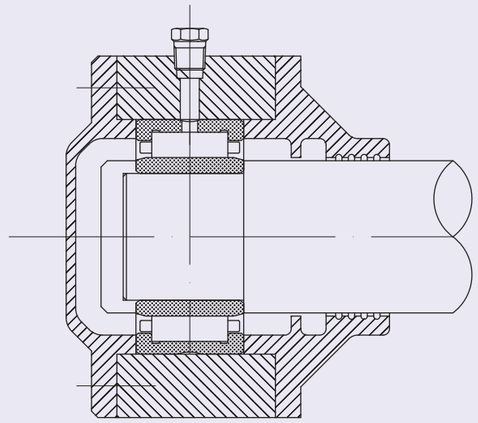


Figure-9 Grease lubrication

Lubrication grease

Grease is a semi-solid lubricant consisting of a base oil (liquid lubrication agent) and a thickener, which are combined on heating.

Table-32 Type and properties of grease (reference)

Name	Lithium grease			Sodium grease	Calcium base grease	Aluminum grease	Non-soap grease	
Thickener	Li soap			Na soap	Ca + Na soap Ca + Li soap	Al soap	Bentonite,urea,etc	
Base oil	Mineral oil	Diester oil	Silicon oil	Mineral oil	Mineral oil	Mineral oil	Mineral oil	Synthetic oil
Dropping point ℃	170~190	170~190	200~250	150~180	150~180	70~90	250 or more	250 or more
Working temperature ℃	-25~+120	-50~+120	-50~+160	-20~+120	-20~+120	-10~+80	-10~+130	-50~+200
Mechanical stability	Good	Fair	Fair	Good~Fair	Good~Fair	Fair~Poor	Fair	Fair
Pressure resistance	Fair	Fair	Poor	Fair	Good~Fair	Fair	Fair	Fair
Water resistance	Fair	Fair	Fair	Fair~Poor	Fair~Poor	Fair	Fair	Fair
Application	Most various Versatile rolling bearing grease	Superior in low temperature, friction properties	Suitable for high and low temperature Unsuitable for high load due to low oil film strength	Subject to emulsifying by mixing with water Relatively good propertis to high temperature	Superior in water resistance and mechanical stability Suitable for bearing being subjected to vibration	Superior in viscosity Suitable for bearing being subjected to vibration	Vast application from low to high temperature It includes types showing superior properties in resistance to high and low temperature, and to chemical by combination with base oil and thickener Versatile rolling bearing grease	

Remark Working temperature range is for general properties only and NOT for guarantee purpose.

1) Base oil

Mineral oil and mixed oil are used for base oil of grease.

Diester oil and silicone oil are used as mixed oil.

Lubrication performance depends on viscosity of the base oil, and generally, low viscosity base oil is suitable for low temperature environment and high speed application, and high viscosity is for high temperature and high load application.

2) Thickener

Thickener is a material to keep grease in semi-solid state. Type of thickener has impact to maximum working temperature, water resistance and mechanical stability.

Metal-soap base is popular for material of thickener. In addition, there are thickeners such as urea base thickener with high heat resistance, and natrium soap-base thickener with poor water resistance due to easiness to emulsifying by mixing with water.

3) Consistency

Consistency refers to the "softness" of grease and it is used as a guideline for showing flow characteristics. The larger the ASTM penetration No. is, the softer the grease is. Table-33 shows typical relationship between consistency of grease and its operating conditions.

Table-33 Consistency of grease and its operating conditions

NLGI Grade No.	ASTM Penetration (1/10mm)	Operating conditions
0	355~385	Centralized lubrication Oscillating application
1	310~340	
2	265~295	General application
3	220~250	General, high temperature application
4	175~205	Grease with sealed application

4) Additives

Additives are material to improve performance of grease, which include antioxidants and extreme pressure additives added as necessary. Condition to use grease for long period without any replenishment requires added antioxidants to prevent oxidation.

Also, grease in operating conditions with heavy load or impact shock shall be selected from those with extreme pressure additives added.

5) Mixing different type greases

In principle, different brands of grease must not be mixed. Mixing different type grease is subject to negative impact each other due to change of consistency and difference of additives.

Table-34 Brand of lubricant grease (reference)

Category	Brand	Manufacturer	Thickener or soap-base	Consistency	Dropping point ℃	Working temperature ℃	Remark
General purpose	Alvania Grease S1	Showa Shell Sekiyu	Lithium soap	323	180	-35~120	General purpose
	Alvania Grease S2	Showa Shell Sekiyu	Lithium soap	283	181	-25~120	General purpose
	Alvania Grease S3	Showa Shell Sekiyu	Lithium soap	242	182	-20~135	General purpose
Wide working temperature	Fomblin RT-15	Solvay Solexis	PTFE	NO.2	300 or more	-20~250	High temperature
	Fomblin Y-VAC1	Solvay Solexis	PTFE	NO.1	300 or more	-20~250	High vacuum (soft)
	Fomblin Y-VAC2	Solvay Solexis	PTFE	NO.2	300 or more	-20~250	High vacuum (normal)
	Fomblin Y-VAC3	Solvay Solexis	PTFE	NO.3	300 or more	-20~250	High vacuum (rigid)
Low temperature	Multemp PS No.2	KYODO YUSHI	Lithium soap	NO.2	190	-50~130	Low temperature
Other	LOR#101	OIL CENTER RESEARCH	PTFE	295	198	-40~188	Superior in abrasion resistance, load resistance, water resistance and chemical resistance
	HP300	Dow Corning	PTFE	280	-	-65~250	Load resistance, oil resistance, solvent resistance, chemical resistance
	BARRIERTA SUPER IS/V	NOK KLUBER	PTFE	No.2	-	-35~260	High vacuum
	BARRIERT IEL/V	NOK KLUBER	PTFE	No.2	-	-65~200	High vacuum
	ISO FLEX TOPAS NB 52	NOK KLUBER	Barium soap	No.2	240 or more	-50~150	Superior in heat resistance, load resistance, water resistance and high speed
	DEMNUM L-200	DAIKIN	PTFE	280	-	-60~300	High temperature stability
	DEMNUM L-65	DAIKIN	PTFE	280	-	-70~200	High temperature stability
	G1/3Grease	The Orelube Corporation	Non-soap grease	No.2	-	-23~180	High temperature, high load
	Shell Cassida Grease RLS2	Showa Shell Sekiyu	Aluminium complex	No.2	240 or more	-30~120	Superior in water resistance, oxidation stability and mechanical stability
	Super Lube item number 82329	Henkel	PTFE	No.2	-	-42~232	Extreme pressure, high temperature
	Castrol Micro-cote 296	Castrol	PTFE	No.2	256	-50~204	Heat stability, low volatility, shear stability, high vacuum

7-4 Oil lubrication

Oil lubrication is more suitable than grease for high speed rotation with superior cooling efficiency. It is suitable for application that requests emission of heat to outside that are generated in bearing or added to the bearing.

1) Oil bath lubrication

Oil bath lubrication is the most popular method used in medium to low speeds. Amount of oil needs to be properly controlled with oil gauge. Most proper oil amount may be with oil level at the center of the lowest needle roller of bearing. Housing design with less variation of oil level is preferable.

2) Oil drop lubrication

Oil drop lubrication is broadly used in application with high speed and medium load due to its better cooling efficiency than oil bath lubrication. Oil dripping through oiler in this method removes friction heat in a method to lubricate with oil fog filling inside of housing by hitting rotating objects such as shafts and nuts. While amount of oil varies depending on type of bearing and speed, general amount should be a couple of drops per minute.

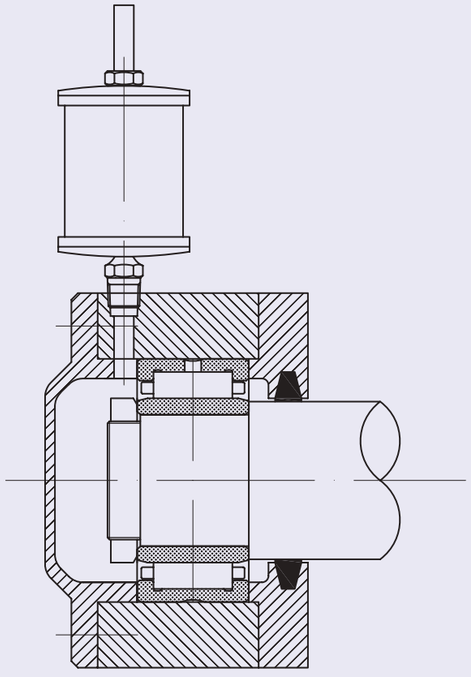


Figure-10 Oil drop lubrication

3) Oil splash lubrication

Oil splash lubrication is a method to splash oil with rotation of gear or disc. Unlike oil bath lubrication, it is applicable for relatively higher speed without having bearing in direct soak in oil.

4) Oil circulating lubrication

Oil circulating lubrication is widely used in application whose purpose is in cost efficiency for automatic lubrication with large number of lubrication spots, or is in cooling bearing. This lubrication method enables cooling or maintaining cleanness of lubricant with oil cooler and filters installed in oil circulation system. As shown in Figure-11, to make sure that lubrication oil is drained off certainly, it is important to have as much large outlet port as practical or forced outlet, setting inlet and outlet port of lubrication oil to opposite side each other to bearing.

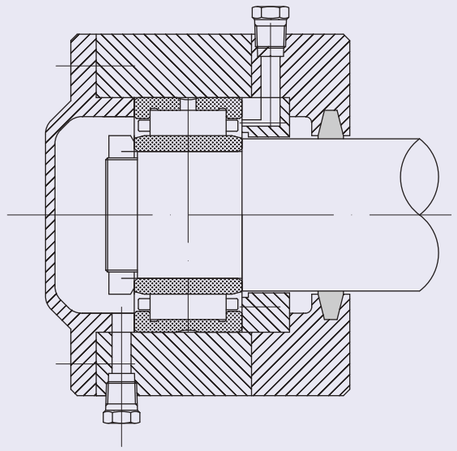


Figure-11 Circulating lubrication

Lubrication oil

Highly refined mineral oil such as spindle oil, machine oil or turbine oil, or mixed oil are used as lubrication oil for bearing. Additives such as antioxidants, extreme pressure additives or depurant are selectively used as necessary in accordance with application.

It is important to select oil with proper viscosity for operation temperature. Too low viscosity causes insufficient formation of oil film which results in abrasion or heat-seizure. Too high viscosity causes heat generation or loss of power due to viscosity resistance. In general, oil with higher viscosity is used for higher load and lower viscosity for higher speeds.

8 Bearing handling

8-1 Precaution

Bearings are an extremely precision mechanical components. Exercise great care for its handling. Followings are precautions for the handling.

1) Keep bearings and surroundings clean

Foreign matters invaded inside of bearings such as dust and dirt have harmful effect in rotation or operation life on the bearings. Take extra precaution to maintain cleanness of bearing, surrounding components, work tools, lubricants, lubrications oil and working environment.

2) Handle bearings carefully

Shocks such as caused by falling bearing may result in damage or impressions on track or rolling elements. They can be a cause of failure so that handle bearings carefully.

3) Use proper tools

Make it sure to use work tools properly for bearing type for assembling and disassembling.

4) Pay attention to rust

Although bearings are applied with anti-rust oil, handling with bare hands may cause generation of rust with perspiration from hands. Exercise care and use rubber gloves or apply mineral oil to hands when handling with bare hands.

8-2 Mounting

Preparation

Bearings should be mounted in clean and dry circumstance. Dirt on mounting tools should be removed prior to mounting work, then verify that dimension accuracy, shaft and housing roughness and geometric accuracy are within designed tolerance.

Packing of bearings should be opened just before start mounting. Fill lubrication grease without washing bearing in the case of grease lubrication. Washing is generally not required for oil lubrication as well. Still it is recommended to thoroughly wash out oil and grease when application demands high accuracy or lubricating performance is degraded by mixing lubricant and anti-rust agents.

Mounting method

1) Press fitting

In mounting bearings from small to medium sizes which don't need large forces , press fittings in room temperature are conducted widely. In this case, use pressing fixture as shown in Figure-12 to apply force evenly at side of bearing and press it in carefully. Applying high viscosity oil on fitting surface during work may reduce friction on the surface.

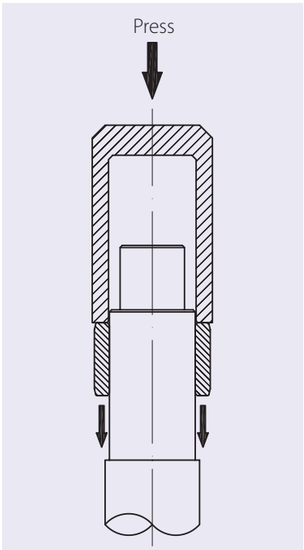


Figure-12 Press fitting of Inner ring

2) Shrink fitting

Shrink fitting is broadly used for tighter interference or mounting large size bearing. How to fit is heating housing for outer ring and inner ring for shaft respectively with pure mineral oil with less corrosivity in order to expand their inner diameter for mounting onto the shaft. Heating temperature must not exceed 120° C. During mounting, inner ring could expand toward shaft direction so that it needs to be pressed against shoulder until completion of cool down to avoid gap between the inner ring and the shoulder.

8-3 Operation inspection

Operation inspection needs to be performed in order to confirm that bearings is properly mounted. Power operation at given speed without operation inspection may result in damage of bearings or heat-seizure due to lubrication failure in the case that mounting is insufficient. Shaft or housing should be rotated by hand after bearing mounting to confirm if there is no abnormality followed by check (or inspection) in stepping increase of speed from no load, low speed operation with power up to loaded operation.

Followings are typical abnormal items and major causes that can be checked in the operation inspection.

1) Check item in operation by hand

- Fluctuation in rotation torque, Insufficient mounting
- Sticks and abnormal noise, Impression, damage, invasion of dirt or foreign matters in track surface
- Excessive torque, Insufficiently small clearance

2) Check item in operation by power

- Abnormal noise, vibration ···· Impression, invasion of dirt or foreign matters in track surface, excessive clearance
- Abnormal temperature ····· Insufficient lubrication, insufficient mounting, insufficiently small clearance

8-4 Removing

Bearing may be removed for periodical machine maintenance or repair for trouble. Bearing and other components should be carefully disassembled in the same manner as the mounting in the case of re-using disassembled bearing or researching trouble condition.

Bearings should be carried out in an appropriate manner in accordance with type of bearing and condition of fits. Structure design should take disassembling work into consideration at planning stage of construction around the bearing since it would be difficult to disassemble especially the tight fit bearing.

Removing outer ring

Installing bolts for disassembling outer ring at several locations in circumference of housing will allow removing outer ring assembled with tight fits easily by tightening-up the screws evenly as shown in Figure-13.

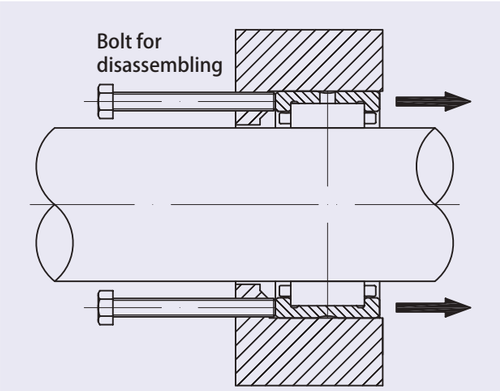


Figure-13 Disassembling outer ring

MACHINED RING NEEDLE ROLLER BEARINGS

Machined type needle roller bearings（NA、NK、NA..UU）

Type and Part Code

Type	Applicable axis diameter	Feature	Part Code
 RNA48,49,59,69	ϕ 7 ~ ϕ 175	Machined type needle roller bearings With collar outer ring Without inner ring Without seal *Double rows: RNA69 (Fw ≧ϕ 37)	**Type** RNA → Type of bearing **Dimensions** 49 10 → 49: Dimension series; 10: Bore diameter number **Suffix code** P6 → Classification symbol (Class 6) (Standard: No symbol, Class 0)
 NK	ϕ 5 ~ ϕ 110	Machined type needle roller bearings Light load type With collar outer ring Without inner ring Without seal (There are no oil holes and oil grooves if the roller set bore diameter (Fw) is 10 mm or less)	**Type** NK → Type of bearing **Dimensions** 40 ／ 20 → 40: Inscribed circle diameter; 20: Outer ring width **Suffix code** P6 → Classification symbol (Class 6) (Standard: No symbol, Class 0)
 NA48,49,59,69	ϕ 5 ~ ϕ 160	Machined type needle roller bearings With collar outer ring With inner ring Without seal *Double rows: NA69 (shaft dia. ≧ϕ 32)	**Type** NA → Type of bearing **Dimensions** 49 10 → 49: Dimension series; 10: Bore diameter number **Suffix code** C3 P6 → C3: Clearance symbol (C3 clearance) (Standard: No symbol, CN clearance); P6: Classification symbol (Class 6) (Standard: No symbol, Class 0)
 NKI	ϕ 5 ~ ϕ 100	Machined type needle roller bearings Light load type With collar outer ring With inner ring Without seal (There are no oil holes and oil grooves if the bore diameter is 8mm or less)	**Type** NKI → Type of bearing **Dimensions** 35 ／ 20 → 35: Bore diameter; 20: Outer ring width **Suffix code** C3 P6 → C3: Clearance symbol (C3 clearance) (Standard: No symbol, CN clearance); P6: Classification symbol (Class 6) (Standard: No symbol, Class 0)
 RNA49,69..UU	ϕ 14 ~ ϕ 58	Machined type needle roller bearings With collar outer ring Without inner ring With seal *Double rows: RNA69 (Fw ≧ϕ 42)	**Type** RNA → Type of bearing **Dimensions** 49 10 → 49: Dimension series; 10: Bore diameter number **Suffix code** UU P6 → UU: With Seal; P6: Classification symbol (Class 6) (Standard: No symbol, Class 0)
 NA49,69..UU	ϕ 10 ~ ϕ 50	Machined type needle roller bearings With collar outer ring With inner ring With seal *Double rows: NA69 (shaft dia. ≧ϕ 35)	**Type** NA → Type of bearing **Dimensions** 49 10 → 49: Dimension series; 10: Bore diameter number **Suffix code** UU C3 P6 → UU: With Seal; C3: Clearance symbol (C3 clearance) (Standard: No symbol, CN clearance); P6: Classification symbol (Class 6) (Standard: No symbol, Class 0)

Structure and Features

Machined type needle roller bearings offer high stiffness and bearing accuracy and are of a structure whereby the cage and needle rollers are mounted on a machined outer ring. They can also be used in light metal housing due to the high stiffness of the outer ring.

Moreover, because the needle roller diameter is relatively small, the cross-sectional height is low, meaning that large radial loads can be supported in a small envelope. This enables machinery to be smaller and lighter.

There are machined type needle roller bearings both with and without inner rings, and the shaft can also be used directly as a track surface.

Without inner ring

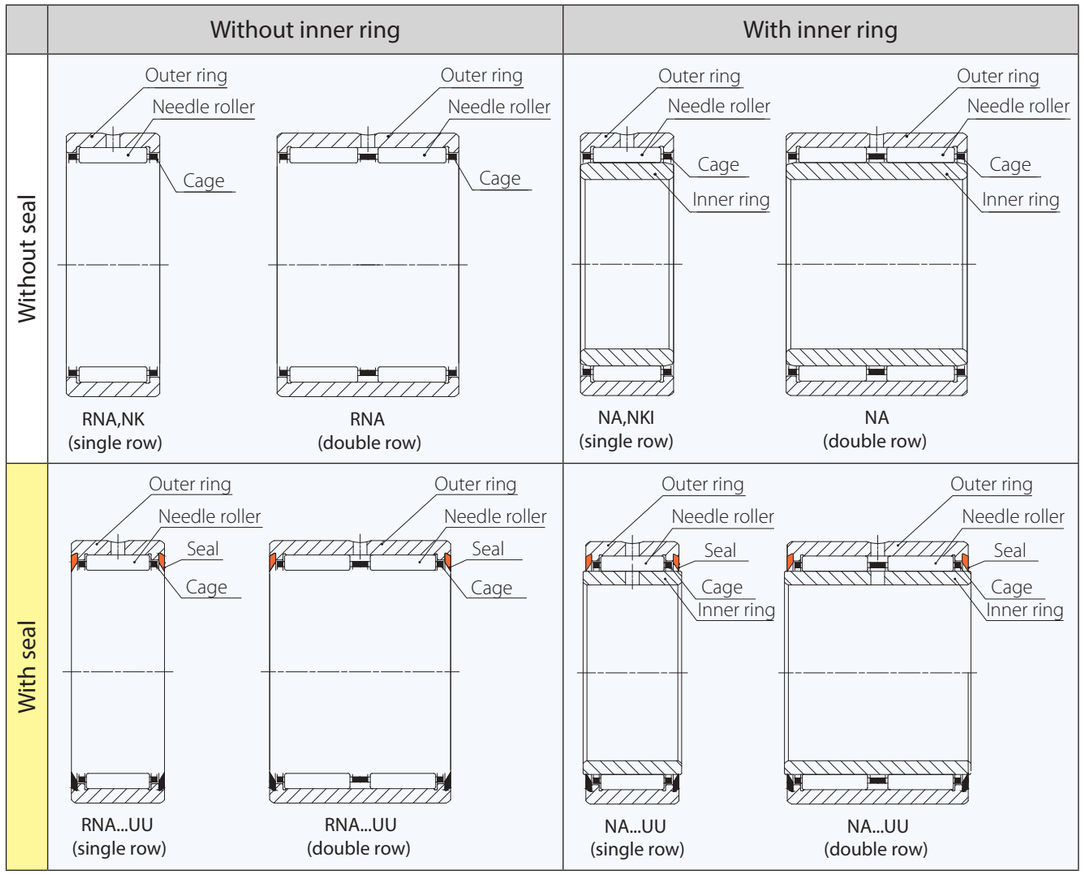
The shaft is directly used as the track surface of the machined type needle roller bearing. If using the shaft directly as a track surface, please refer to 6-2 Accuracy of track surface and 6-3 Material and heat treatment of track surface.

With inner ring

If the shaft surface cannot achieve the specified hardness, accuracy and roughness, the type with an inner ring is used. The inner ring has been tempered and polished so it is of the hardness, accuracy and roughness required for the track and can be used as is.

With seal

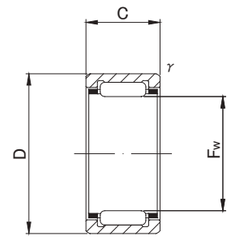
NA49UU and NA69UU have seals embedded in both ends. The synthetic rubber seals help to prevent lubricant leakage and the infiltration of external dust.



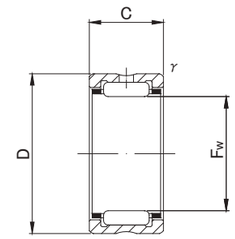
MACHINED RING NEEDLE ROLLER BEARINGS

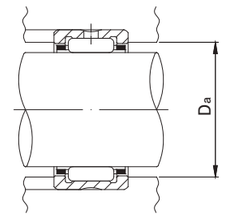
WITHOUT INNER RING

RNA49,RNA59,RNA69(Fw≦35),NK



NK(Fw ≦ 10)





RNA49,RNA59,RNA69(Fw ≦ 35),NK

RNA, NK

RNA49,RNA59,RNA69,RNA48,NK TYPE

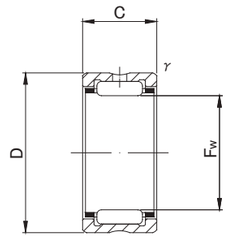
Shaft Diameter (mm)	Designation					Dimensions (mm)				Standard mounting dimensions (mm)	Basic dynamic load rating	Basic static load rating	Limiting speed *	Mass	Usable bearing designation	
	RNA 49	RNA 59	RNA 69	RNA 48	NK	Fw	D	C	*r*s min	Da MAX	Cr N	Cor N	rpm	g (approx)	INNER RING	WITH INNER RING
5	—	—	—	—	**NK5/10**	5 +0.018	10	10	0.15	6.5	2 420	1 950	40 000	3.4	—	—
	—	—	—	—	**NK5/12**	5 +0.010	10	12	0.15	6.5	3 080	2 660	40 000	4.2	—	—
6	—	—	—	—	**NK6/10**	6 +0.018	12	10	0.15	7.5	2 700	2 320	37 000	5.3	—	—
	—	—	—	—	**NK6/12**	6 +0.010	12	12	0.15	7.5	3 440	3 170	37 000	6.4	—	—
7	**RNA 495**	—	—	—	—	7	13	10	0.15	8.5	2 960	2 690	34 000	5.9	IR5710	NA495
	—	—	—	—	**NK7/10**	7 +0.022 +0.013	14	10	0.3	8.5	3 600	2 960	34 000	6.9	—	—
	—	—	—	—	**NK7/12**	7	14	12	0.3	8.5	4 610	4 050	34 000	8.3	—	—
8	**RNA 496**	—	—	—	—	8	15	10	0.15	13.8	3 900	3 400	32 000	7.3	IR6810	NA496
	—	—	—	—	**NK8/12**	8 +0.022 +0.013	15	12	0.3	13	5 100	4 700	32 000	9	IR5812	NKI 5/12
	—	—	—	—	**NK8/16**	8	15	16	0.3	13	7 100	7 300	32 000	13	IR5816	NKI 5/16
9	—	—	—	—	**NK9/12**	9	16	12	0.3	14	5 500	5 300	30 000	10	IR6912	NKI 6/12
	—	—	—	—	**NK9/16**	9 +0.022 +0.013	16	16	0.3	14	7 600	8 200	30 000	13.2	IR6916	NKI 6/16
	RNA 497	—	—	—	—	9	17	10	0.15	15.8	4 500	3 600	30 000	9.3	IR7910	NA497
10	—	—	—	—	**NK10/12**	10	17	12	0.3	15	5 900	6 000	28 000	10.7	IR71012	NKI 7/12
	—	—	—	—	**NK10/16**	10 +0.022 +0.013	17	16	0.3	15	8 200	9 200	28 000	14.3	IR71016	NKI 7/16
	RNA 498	—	—	—	—	10	19	11	0.2	17.4	6 200	5 000	28 000	12.6	IR81011	NA498
12	—	—	—	—	**NK12/12**	12	19	12	0.3	17	6 600	7 300	26 000	12.2	IR91212	NKI 9/12
	—	—	—	—	**NK12/16**	12 +0.027 +0.016	19	16	0.3	17	9 200	11 200	26 000	16.3	IR91216	NKI 9/16
	RNA 499	—	—	—	—	12	20	11	0.3	18	6 600	6 300	26 000	13.6	IR91211	NA499

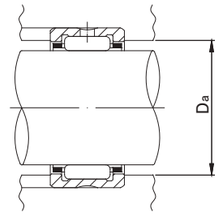
* Suitable for oil lubrication. In case of grease lubrication, down to 60% of this value.

MACHINED RING NEEDLE ROLLER BEARINGS

WITHOUT INNER RING

RNA49,RNA59,RNA69(Fw≦35),NK





RNA49,RNA59,RNA69(Fw ≦ 35),NK

RNA, NK

RNA49,RNA59,RNA69,RNA48,NK TYPE

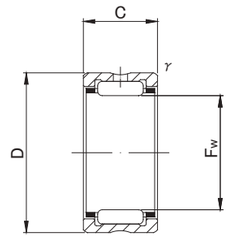
Shaft Diameter (mm)	Designation					Dimensions (mm)				Standard mounting dimensions (mm)	Basic dynamic load rating	Basic static load rating	Limiting speed *	Mass	Usable bearing designation	
	RNA 49	RNA 59	RNA 69	RNA 48	NK	Fw	D	C	r s min	Da MAX	Cr N	Cor N	rpm	g (approx)	INNER RING	WITH INNER RING
14	**RNA 4900**	—	—	—	—	14	22	13	0.3	20	9 200	10 100	24 000	16.5	IR101413	NA4900
	—	—	—	—	**NK14/16**	14 +0.027 +0.016	22	16	0.3	20	11 800	13 700	24 000	21	IR101416	NKI 10/16
	—	—	—	—	**NK14/20**	14	22	20	0.3	20	14 800	18 500	24 000	26.5	IR101420	NKI 10/20
15	—	—	—	—	**NK15/16**	15 +0.027 +0.016	23	16	0.3	21	12 400	14 900	23 000	22.5	—	—
	—	—	—	—	**NK15/20**	15	23	20	0.3	21	15 600	20 200	23 000	28	—	—
16	**RNA 4901**	—	—	—	—	16	24	13	0.3	22	9 700	11 100	23 000	18.1	IR121613	NA4901
	—	—	—	—	**NK16/16**	16 +0.027 +0.016	24	16	0.3	22	12 300	15 100	23 000	23	IR121616	NKI 12/16
	—	—	—	—	**NK16/20**	16	24	20	0.3	22	15 600	20 400	23 000	29	IR121620	NKI 12/20
	—	—	**RNA 6901**	—	—	16	24	22	0.3	22	17 100	23 000	23 000	30	IR121622	NA6901
17	—	—	—	—	**NK17/16**	17 +0.027 +0.016	25	16	0.3	23	12 800	16 300	22 000	24.5	—	—
	—	—	—	—	**NK17/20**	17	25	20	0.3	23	16 300	22 100	22 000	30.5	—	—
18	—	—	—	—	**NK18/16**	18 +0.027 +0.016	26	16	0.3	24	13 400	17 500	21 000	25.5	—	—
	—	—	—	—	**NK18/20**	18	26	20	0.3	24	17 000	23 600	21 000	32	—	—
19	—	—	—	—	**NK19/16**	19 +0.033 +0.020	27	16	0.3	25	14 000	18 700	21 000	27	IR151916	NKI 15/16
	—	—	—	—	**NK19/20**	19	27	20	0.3	25	17 700	25 300	21 000	34	IR151920	NKI 15/20
20	**RNA 4902**	—	—	—	—	20	28	13	0.3	26	10 900	13 800	20 000	21.5	IR152013	NA4902
	—	—	—	—	**NK20/16**	20	28	16	0.3	26	13 900	18 700	20 000	27.5	—	—
	—	**RNA 5902**	—	—	—	20 +0.033 +0.020	28	18	0.3	26	15 700	22 100	20 000	33	IR152018	NA5902
	—	—	—	—	**NK20/20**	20	28	20	0.3	26	17 600	25 400	20 000	35.5	—	—
	—	—	**RNA 6902**	—	—	20	28	23	0.3	26	19 300	28 700	20 000	37	IR152023	NA6902

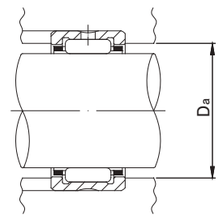
* Suitable for oil lubrication. In case of grease lubrication, down to 60% of this value.

MACHINED RING NEEDLE ROLLER BEARINGS

WITHOUT INNER RING

RNA49,RNA59,RNA69(Fw≦35),NK





RNA49,RNA59,RNA69(Fw ≦ 35),NK

RNA, NK

RNA49,RNA59,RNA69,RNA48,NK TYPE

Shaft Diameter (mm)	Designation					Dimensions (mm)				Standard mounting dimensions (mm)	Basic dynamic load rating	Basic static load rating	Limiting speed *	Mass	Usable bearing designation	
	RNA 49	RNA 59	RNA 69	RNA 48	NK	Fw	D	C	r s min	Da MAX	Cr N	Cor N	rpm	g (approx)	INNER RING	WITH INNER RING
21	—	—	—	—	NK21/16	21 +0.033 +0.020	29	16	0.3	27	14 400	20 000	19 000	29	IR172116	NKI 17/16
	—	—	—	—	NK21/20	21 +0.033 +0.020	29	20	0.3	27	18 200	27 100	19 000	36	IR172120	NKI 17/20
22	RNA 4903	—	—	—	—	22 +0.033 +0.020	30	13	0.3	28	11 800	15 600	18 000	23.5	IR172213	NA4903
	—	—	—	—	NK22/16	22 +0.033 +0.020	30	16	0.3	28	14 900	21 200	18 000	30	—	—
	—	RNA 5903	—	—	—	22 +0.033 +0.020	30	18	0.3	28	16 900	24 900	18 000	35	IR172218	NA5903
	—	—	—	—	NK22/20	22 +0.033 +0.020	30	20	0.3	28	18 900	28 700	18 000	37.5	—	—
	—	—	RNA 6903	—	—	22 +0.033 +0.020	30	23	0.3	28	20 800	32 500	18 000	40.5	IR172223	NA6903
24	—	—	—	—	NK24/16	24 +0.033 +0.020	32	16	0.3	30	15 300	22 600	17 000	32	IR202416	NKI 20/16
	—	—	—	—	NK24/20	24 +0.033 +0.020	32	20	0.3	30	19 400	30 500	17 000	40.5	IR202420	NKI 20/20
25	—	—	—	—	NK25/16	25 +0.033 +0.020	33	16	0.3	31	15 800	23 700	16 000	33.5	—	—
	—	—	—	—	NK25/20	25 +0.033 +0.020	33	20	0.3	31	20 000	32 200	16 000	42	—	—
	RNA 4904	—	—	—	—	25 +0.033 +0.020	37	17	0.3	35	21 000	25 000	16 000	55.5	IR202517	NA4904
	—	RNA 5904	—	—	—	25 +0.033 +0.020	37	23	0.3	35	29 400	38 600	16 000	84	IR202523	NA5904
	—	—	RNA 6904	—	—	25 +0.033 +0.020	37	30	0.3	35	35 400	48 800	16 000	95.5	IR202530	NA6904
26	—	—	—	—	NK26/16	26 +0.033 +0.020	34	16	0.3	32	16 300	24 900	15 000	34.5	IR222616	NKI 22/16
	—	—	—	—	NK26/20	26 +0.033 +0.020	34	20	0.3	32	20 600	33 700	15 000	43.5	IR222620	NKI 22/20
28	—	—	—	—	NK28/20	28 +0.033 +0.020	37	20	0.3	35	21 700	37 100	14 000	51.5	—	—
	—	—	—	—	NK28/30	28 +0.033 +0.020	37	30	0.3	35	31 100	58 900	14 000	83.5	—	—
	RNA 49/22	—	—	—	—	28 +0.033 +0.020	39	17	0.3	37	21 400	28 800	14 000	56.5	IR222817	NA49/22
	—	RNA 59/22	—	—	—	28 +0.033 +0.020	39	23	0.3	37	29 800	44 400	14 000	92	IR222823	NA59/22
	—	—	RNA 69/22	—	—	28 +0.033 +0.020	39	30	0.3	37	36 300	56 900	14 000	97.5	IR222830	NA69/22
29	—	—	—	—	NK29/20	29 +0.033 +0.020	38	20	0.3	36	21 600	37 200	14 000	57	IR252920	NKI 25/20
	—	—	—	—	NK29/30	29 +0.033 +0.020	38	30	0.3	36	30 900	59 000	14 000	85	IR252930	NKI 25/30

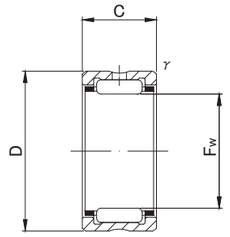
* Suitable for oil lubrication. In case of grease lubrication, down to 60% of this value.

MACHINED RING NEEDLE ROLLER BEARINGS

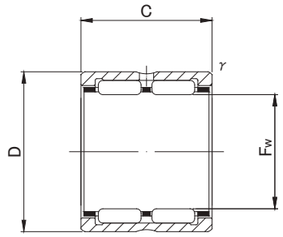
WITHOUT INNER RING

RNA49,RNA59,RNA69(Fw ≦ 35),NK

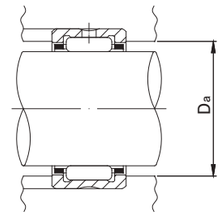
RNA69



RNA49,RNA59,RNA69(Fw ≦ 35),NK



RNA69



RNA49,RNA59,RNA69,RNA48,NK TYPE

Shaft Diameter (mm)	Designation					Dimensions (mm)				Standard mounting dimensions (mm)	Basic dynamic load rating	Basic static load rating	Limiting speed *	Mass	Usable bearing designation	
	RNA 49	RNA 59	RNA 69	RNA 48	NK	Fw	D	C	r s min	Da MAX	Cr N	Cor N	rpm	g (approx)	INNER RING	WITH INNER RING
30	—	—	—	—	NK30/20	30 +0.033 +0.020	40	20	0.3	38	25 100	40 100	13 000	64.5	—	—
	—	—	—	—	NK30/30		40	30	0.3	38	36 000	63 800	13 000	97.5	—	—
	RNA 4905	—	—	—	—		42	17	0.3	40	23 700	30 700	13 000	64	IR253017	NA4905
	—	RNA 5905	—	—	—		42	23	0.3	40	33 200	47 500	13 000	101	IR253023	NA5905
	—	—	RNA 6905	—	—		42	30	0.3	40	42 100	64 200	13 000	111	IR253030	NA6905
32	—	—	—	—	NK32/20	32 +0.041 +0.025	42	20	0.3	40	25 700	42 200	13 000	68	IR283220	NKI 28/20
	—	—	—	—	NK32/30		42	30	0.3	40	36 900	67 100	13 000	102	IR283230	NKI 28/30
	RNA 49/28	—	—	—	—		45	17	0.3	43	24 500	32 700	13 000	76.5	IR283217	NA49/28
	—	RNA 59/28	—	—	—		45	23	0.3	43	34 300	50 500	13 000	108	IR283223	NA59/28
	—	—	RNA 69/28	—	—		45	30	0.3	43	41 800	64 700	13 000	133	IR283230	NA69/28
35	—	—	—	—	NK35/20	35 +0.041 +0.025	45	20	0.3	43	27 000	46 200	11 000	73.5	IR303520	NKI 30/20
	—	—	—	—	NK35/30		45	30	0.3	43	38 600	73 500	11 000	112	IR303530	NKI 30/30
	RNA 4906	—	—	—	—		47	17	0.3	45	25 200	34 700	11 000	72.5	IR303517	NA4906
	—	RNA 5906	—	—	—		47	23	0.3	45	35 200	53 700	11 000	108	IR303523	NA5906
	—	—	RNA 6906	—	—		47	30	0.3	45	43 100	69 000	11 000	125	IR303530	NA6906
37	—	—	—	—	NK37/20	37 +0.041 +0.025	47	20	0.3	45	28 200	50 100	11 000	77.5	IR323720	NKI 32/20
	—	—	—	—	NK37/30		47	30	0.3	45	40 500	79 800	11 000	117	IR323730	NKI 32/30
38	—	—	—	—	NK38/20	38 +0.041 +0.025	48	20	0.3	46	28 100	50 200	11 000	79	—	—
	—	—	—	—	NK38/30		48	30	0.3	46	40 300	80 000	11 000	119	—	—
40	—	—	—	—	NK40/20	40 +0.041 +0.025	50	20	0.3	48	29 400	54 100	10 000	83	IR354020	NKI 35/20
	—	—	—	—	NK40/30		50	30	0.3	48	42 300	86 100	10 000	125	IR354030	NKI 35/30
	RNA 49/32	—	—	—	—		52	20	0.6	48	31 300	47 900	10 000	96	IR324020	NA49/32
	—	RNA 59/32	—	—	—		52	27	0.6	48	41 900	69 900	10 000	149	IR324027	NA59/32
	—	—	RNA 69/32	—	—		52	36	0.6	48	53 500	95 700	10 000	172	IR324036	NA69/32
42	—	—	—	—	NK42/20	42 +0.041 +0.025	52	20	0.3	50	29 900	56 200	9 500	86.5	—	—
	—	—	—	—	NK42/30		52	30	0.3	50	43 000	89 500	9 500	130	—	—
	RNA 4907	—	—	—	—		55	20	0.6	51	32 000	50 200	9 500	113	IR354220	NA4907
	—	RNA 5907	—	—	—		55	27	0.6	51	42 900	73 200	9 500	176	IR354227	NA5907
	—	—	RNA 6907	—	—		55	36	0.6	51	54 800	100 000	9 500	200	IR354236	NA6907

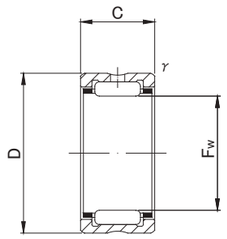
* Suitable for oil lubrication. In case of grease lubrication, down to 60% of this value.

MACHINED RING NEEDLE ROLLER BEARINGS

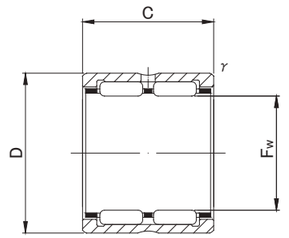
WITHOUT INNER RING

RNA49,RNA59,RNA48,NK

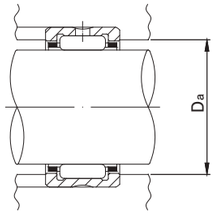
RNA69



RNA49,RNA59,RNA48,NK



RNA69



RNA49,RNA59,RNA69,RNA48,NK TYPE

Shaft Diameter (mm)	Designation					Dimensions (mm)				Standard mounting dimensions (mm)	Basic dynamic load rating	Basic static load rating	Limiting speed *	Mass	Usable bearing designation	
	RNA 49	RNA 59	RNA 69	RNA 48	NK	Fw	D	C	*r*s min	Da MAX	Cr N	Cor N	rpm	g (approx)	INNER RING	WITH INNER RING
43	—	—	—	—	**NK43/20**	43 +0.041	53	20	0.3	51	30 500	58 100	9 500	88.5	IR384320	NKI 38/20
	—	—	—	—	**NK43/30**	43 +0.025	53	30	0.3	51	43 700	92 500	9 500	133	IR384330	NKI 38/30
45	—	—	—	—	**NK45/20**	45 +0.041	55	20	0.3	53	31 100	60 100	9 000	92	IR404520	NKI 40/20
	—	—	—	—	**NK45/30**	45 +0.025	55	30	0.3	53	44 500	95 700	9 000	138	IR404530	NKI 40/30
47	—	—	—	—	**NK47/20**	47 +0.041	57	20	0.3	55	31 500	62 300	8 500	95	IR424720	NKI 42/20
	—	—	—	—	**NK47/30**	47 +0.025	57	30	0.3	55	45 200	99 000	8 500	144	IR424730	NKI 42/30
48	**RNA 4908**	—	—	—	—	48	62	22	0.6	58	41 600	67 400	8 500	152	IR404822	NA4908
	—	**RNA 5908**	—	—	—	48 +0.041 +0.025	62	30	0.6	58	58 000	103 000	8 500	225	IR404830	NA5908
	—	—	**RNA 6908**	—	—	48	62	40	0.6	58	71 300	134 400	8 500	275	IR404840	NA6908
50	—	—	—	—	**NK50/25**	50 +0.041	62	25	0.6	58	43 000	85 200	8 000	159	IR455025	NKI 45/25
	—	—	—	—	**NK50/35**	50 +0.025	62	35	0.6	58	58 100	125 500	8 000	225	IR455035	NKI 45/35
52	**RNA 4909**	—	—	—	—	52	68	22	0.6	64	43 500	73 400	7 500	197	IR455222	NA4909
	—	**RNA 5909**	—	—	—	52 +0.049 +0.030	68	30	0.6	64	60 700	112 000	7 500	232	IR455230	NA5909
	—	—	**RNA 6909**	—	—	52	68	40	0.6	64	74 600	147 100	7 500	355	IR455240	NA6909
55	—	—	—	—	**NK55/25**	55 +0.049	68	25	0.6	64	45 400	94 100	7 500	193	IR505525	NKI 50/25
	—	—	—	—	**NK55/35**	55 +0.030	68	35	0.6	64	61 300	138 300	7 500	255	IR505535	NKI 50/35

* Suitable for oil lubrication. In case of grease lubrication, down to 60% of this value.

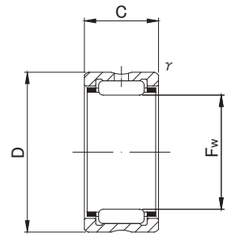
RNA, NK

MACHINED RING NEEDLE ROLLER BEARINGS

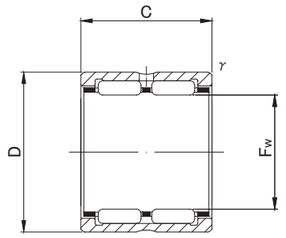
WITHOUT INNER RING

RNA49,RNA59,RNA48,NK

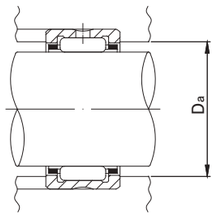
RNA69



RNA49,RNA59,RNA48,NK



RNA69



RNA49,RNA59,RNA69,RNA48,NK TYPE

Shaft Diameter (mm)	Designation					Dimensions (mm)				Standard mounting dimensions (mm)	Basic dynamic load rating	Basic static load rating	Limiting speed *	Mass	Usable bearing designation	
	RNA 49	RNA 59	RNA 69	RNA 48	NK	Fw	D	C	*r*s min	Da MAX	Cr N	Cor N	rpm	g (approx)	INNER RING	WITH INNER RING
58	**RNA 4910**	—	—	—	—	58 +0.049 +0.030	72	22	0.6	68	46 200	82 100	7 000	179	IR505822	NA4910
	—	**RNA 5910**	—	—	—	58 +0.049 +0.030	72	30	0.6	68	64 400	126 000	7 000	289	IR505830	NA5910
	—	—	**RNA 6910**	—	—	58 +0.049 +0.030	72	40	0.6	68	79 100	163 800	7 000	320	IR505840	NA6910
60	—	—	—	—	**NK60/25**	60 +0.049 +0.030	72	25	0.6	68	47 500	103 000	6 500	187	IR556025	NKI 55/25
	—	—	—	—	**NK60/35**	60 +0.049 +0.030	72	35	0.6	68	64 100	151 000	6 500	260	IR556035	NKI 55/35
63	**RNA 4911**	—	—	—	—	63 +0.049 +0.030	80	25	1	75	57 600	97 300	6 500	265	IR556325	NA4911
	—	**RNA 5911**	—	—	—	63 +0.049 +0.030	80	34	1	75	82 600	154 000	6 500	367	IR556334	NA5911
	—	—	**RNA 6911**	—	—	63 +0.049 +0.030	80	45	1	75	99 000	194 200	6 500	475	IR556345	NA6911
65	—	—	—	—	**NK65/25**	65 +0.049 +0.030	78	25	0.6	74	49 600	111 800	6 000	225	—	—
	—	—	—	—	**NK65/35**	65 +0.049 +0.030	78	35	0.6	74	67 000	164 800	6 000	315	—	—
68	—	—	—	—	**NK68/25**	68	82	25	0.6	78	54 800	116 700	6 000	250	IR606825	NKI 60/25
	—	—	—	—	**NK68/35**	68	82	35	0.6	78	72 100	165 700	6 000	350	IR606835	NKI 60/35
	RNA 4912	—	—	—	—	68 +0.049 +0.030	85	25	1	80	60 100	104 900	6 000	285	IR606825	NA4912
	—	**RNA 5912**	—	—	—	68 +0.049 +0.030	85	34	1	80	86 100	167 000	6 000	408	IR606834	NA5912
	—	—	**RNA 6912**	—	—	68 +0.049 +0.030	85	45	1	80	103 000	210 800	6 000	510	IR606845	NA6912
70	—	—	—	—	**NK70/25**	70 +0.049 +0.030	85	25	0.6	81	55 500	120 600	5 500	280	—	—
	—	—	—	—	**NK70/35**	70 +0.049 +0.030	85	35	0.6	81	73 000	170 600	5 500	395	—	—
72	**RNA 4913**	—	—	—	—	72 +0.049 +0.030	90	25	1	85	62 800	113 800	5 500	325	IR657225	NA4913
	—	**RNA 5913**	—	—	—	72 +0.049 +0.030	90	34	1	85	89 900	180 000	5 500	462	IR657234	NA5913
	—	—	**RNA 6913**	—	—	72 +0.049 +0.030	90	45	1	85	107 900	226 500	5 500	585	IR657245	NA6913

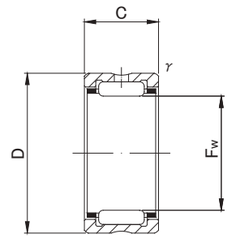
* Suitable for oil lubrication. In case of grease lubrication, down to 60% of this value.

MACHINED RING NEEDLE ROLLER BEARINGS

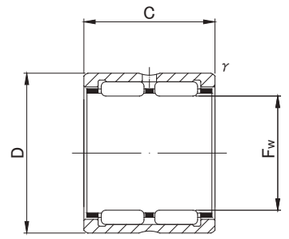
WITHOUT INNER RING

RNA49,RNA59,RNA48,NK

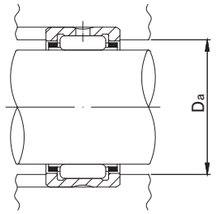
RNA69



RNA49,RNA59,RNA48,NK



RNA69



RNA49,RNA59,RNA69,RNA48,NK TYPE

Shaft Diameter (mm)	Designation					Dimensions (mm)				Standard mounting dimensions (mm)	Basic dynamic load rating	Basic static load rating	Limiting speed *	Mass	Usable bearing designation	
	RNA 49	RNA 59	RNA 69	RNA 48	NK	Fw	D	C	r s min	Da MAX	Cr N	Cor N	rpm	g (approx)	INNER RING	WITH INNER RING
73	—	—	—	—	**NK73/25**	73 +0.049	90	25	0.6	86	61 100	126 500	5 500	335	—	—
	—	—	—	—	**NK73/35**	73 +0.030	90	35	0.6	86	80 400	180 400	5 500	475	IR657335	NKI 65/35
75	—	—	—	—	**NK75/25**	75 +0.049	92	25	0.6	88	62 200	130 400	5 500	345	—	—
	—	—	—	—	**NK75/35**	75 +0.030	92	35	0.6	88	82 700	186 300	5 500	485	—	—
80	—	—	—	—	**NK80/25**	80	95	25	1	90	59 400	137 300	5 000	315	IR708025	NKI 70/25
	—	—	—	—	**NK80/35**	80	95	35	1	90	78 100	194 200	5 000	445	IR708035	NKI 70/35
	RNA 4914	—	—	—	—	80 +0.049 +0.030	100	30	1	95	83 200	157 900	5 000	495	IR708030	NA4914
	—	**RNA 5914**	—	—	—	80	100	40	1	95	112 000	232 000	5 000	706	IR708040	NA5914
	—	—	**RNA 6914**	—	—	80	100	54	1	95	133 400	310 900	5 000	910	IR708054	NA6914
85	—	—	—	—	**NK85/25**	85	105	25	1	100	76 400	145 100	4 500	435	IR758525	NKI 75/25
	RNA 4915	—	—	—	—	85	105	30	1	100	86 200	169 700	4 500	525	IR758530	NA4915
	—	—	—	—	**NK85/35**	85 +0.058 +0.036	105	35	1	100	102 000	209 900	4 500	610	IR758535	NKI 75/35
	—	**RNA 5915**	—	—	—	85	105	40	1	100	116 000	249 000	4 500	745	IR758540	NA5915
	—	—	**RNA 6915**	—	—	85	105	54	1	100	138 300	330 500	4 500	960	IR758554	NA6915
90	—	—	—	—	**NK90/25**	90	110	25	1	105	77 400	150 000	4 500	456	IR809025	NKI 80/25
	RNA 4916	—	—	—	—	90	110	30	1	105	87 400	174 600	4 500	550	IR809030	NA4916
	—	—	—	—	**NK90/35**	90 +0.058 +0.036	110	35	1	105	103 000	216 700	4 500	640	IR809035	NKI 80/35
	—	**RNA 5916**	—	—	—	90	110	40	1	105	117 000	257 000	4 500	787	IR809040	NA5916
	—	—	**RNA 6916**	—	—	90	110	54	1	105	143 200	350 100	4 500	1 010	IR809054	NA6916
95	—	—	—	—	**NK95/26**	95 +0.058	115	26	1	110	79 700	158 900	4 200	495	IR859526	NKI 85/26
	—	—	—	—	**NK95/36**	95 +0.036	115	36	1	110	106 900	230 500	4 200	690	IR859536	NKI 85/36
100	—	—	—	—	**NK100/26**	100	120	26	1	115	82 500	168 700	4 000	525	IR9010026	NKI 90/26
	RNA 4917	—	—	—	—	100	120	35	1.1	113.5	109 800	244 200	4 000	705	IR8510035	NA4917
	—	—	—	—	**NK100/36**	100 +0.058 +0.036	120	36	1	115	109 800	244 200	4 000	725	IR9010036	NKI 90/36
	—	**RNA 5917**	—	—	—	100	120	46	1.1	113.5	144 000	346 000	4 000	1 000	IR8510046	NA5917
	—	—	**RNA 6917**	—	—	100	120	63	1.1	113.5	172 600	466 800	4 000	1 300	IR8510063	NA6917

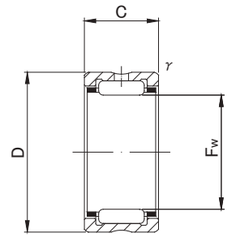
* Suitable for oil lubrication. In case of grease lubrication, down to 60% of this value.

MACHINED RING NEEDLE ROLLER BEARINGS

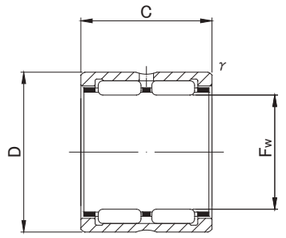
WITHOUT INNER RING

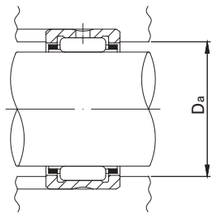
RNA49,RNA59,RNA48,NK

RNA69



RNA49,RNA59,RNA48,NK





RNA69

RNA49,RNA59,RNA69,RNA48,NK TYPE

Shaft Diameter (mm)	Designation					Dimensions (mm)				Standard mounting dimensions (mm)	Basic dynamic load rating	Basic static load rating	Limiting speed *	Mass	Usable bearing designation	
	RNA 49	RNA 59	RNA 69	RNA 48	NK	Fw	D	C	*r*s min	Da MAX	Cr N	Cor N	rpm	g (approx)	INNER RING	WITH INNER RING
105	—	—	—	—	NK105/26	105	125	26	1	120	84 700	177 500	3 800	545	IR9510526	NKI 95/26
	RNA 4918	—	—	—	—	105 +0.058 +0.036	125	35	1.1	118.5	112 800	257 900	3 800	740	IR9010535	NA4918
	—	—	—	—	NK105/36	105	125	36	1	120	112 800	257 900	3 800	760	IR9510536	NKI 95/36
	—	RNA 5918	—	—	—	105	125	46	1.1	118.5	148 000	365 000	3 800	1 040	IR9010546	NA5918
	—	—	RNA 6918	—	—	105	125	63	1.1	118.5	177 500	490 300	3 800	1 360	IR9010563	NA6918
110	—	—	—	—	NK110/30	110	130	30	1.1	123.5	105 900	239 300	3 600	660	IR10011030	NKI 100/30
	RNA 4919	—	—	—	—	110 +0.058 +0.036	130	35	1.1	123.5	116 700	270 700	3 600	770	IR9511035	NA4919
	—	—	—	—	NK110/40	110	130	40	1.1	123.5	133 400	323 600	3 600	880	IR10011040	NKI 100/40
	—	RNA 5919	—	—	—	110	130	46	1.1	123.5	152 000	384 000	3 600	1 130	IR9511046	NA5919
	—	—	RNA 6919	—	—	110	130	63	1.1	123.5	182 400	514 800	3 600	1 420	IR9511063	NA6919
115	RNA 4920	—	—	—	—	115 +0.058 +0.036	140	40	1.1	133.5	145 000	329 000	3 500	1 190	IR10011540	NA4920
120	—	—	—	RNA 4822	—	120 +0.058 +0.036	140	30	1	135	93 000	239 000	3 500	790	IR11012030	NA4822
125	RNA 4922	—	—	—	—	125 +0.068 +0.043	150	40	1.1	143.5	152 000	357 000	3 000	1 280	IR11012540	NA4922
130	—	—	—	RNA 4824	—	130 +0.068 +0.043	150	30	1	145	97 000	259 000	3 000	850	IR12013030	NA4824
135	RNA 4924	—	—	—	—	135 +0.068 +0.043	165	45	1.1	158.5	187 000	435 000	3 000	1 930	IR12013545	NA4924

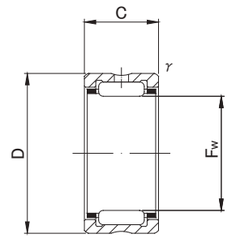
* Suitable for oil lubrication. In case of grease lubrication, down to 60% of this value.

MACHINED RING NEEDLE ROLLER BEARINGS

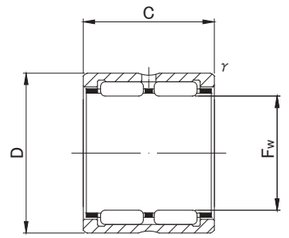
WITHOUT INNER RING

RNA49,RNA59,RNA48,NK

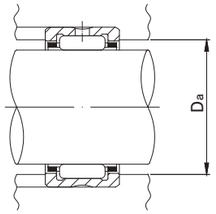
RNA69



RNA49,RNA59,RNA48,NK



RNA69



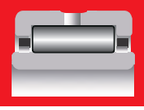
RNA49,RNA59,RNA69,RNA48,NK TYPE

Shaft Diameter (mm)	Designation					Dimensions (mm)				Standard mounting dimensions (mm)	Basic dynamic load rating	Basic static load rating	Limiting speed *	Mass	Usable bearing designation	
	RNA 49	RNA 59	RNA 69	RNA 48	NK	Fw	D	C	*r*s min	Da MAX	Cr N	Cor N	rpm	g (approx)	INNER RING	WITH INNER RING
145	—	—	—	**RNA 4826**	—	145 +0.068 +0.043	165	35	1.1	158.5	117 000	340 000	3 000	1 100	IR13014535	NA4826
150	**RNA 4926**	—	—	—	—	150 +0.068 +0.043	180	50	1.5	172	216 000	540 000	2 500	2 360	IR13015050	NA4926
155	—	—	—	**RNA 4828**	—	155 +0.068 +0.043	175	35	1.1	168.5	121 000	363 000	2 500	1 170	IR14015535	NA4828
160	**RNA 4928**	—	—	—	—	160 +0.068 +0.043	190	50	1.5	182	224 000	580 000	2 500	2 500	IR14016050	NA4928
165	—	—	—	**RNA 4830**	—	165 +0.068 +0.043	190	40	1.1	183.5	168 000	446 000	2 500	1 750	IR15016540	NA4830
175	—	—	—	**RNA 4832**	—	175 +0.068 +0.043	200	40	1.1	193.5	173 000	474 000	2 500	1 850	IR16017540	NA4832

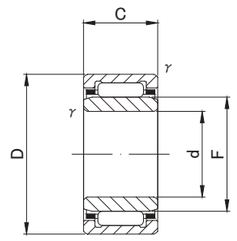
* Suitable for oil lubrication. In case of grease lubrication, down to 60% of this value.

MACHINED RING NEEDLE ROLLER BEARINGS

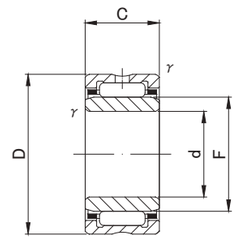
WITH INNER RING



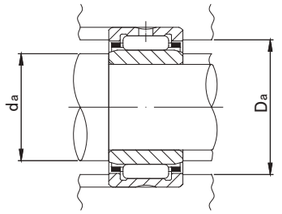
NA49,NA59,NA69(d≦30),NKI



NKI(d ≦ 8)



NA49,NA59,NA69(d ≦ 30),NKI



NA, NKI

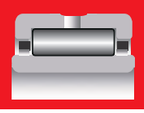
NA49,NA59,NA69,NA48,NKI TYPE

Shaft Diameter (mm)	Designation					Dimensions (mm)					Standard mounting dimensions (mm)			Basic dynamic load rating	Basic static load rating	Limiting speed*	Mass	Usable bearing designation	
	NA 49	NA 59	NA 69	NA48	NKI	d	D	C	r s min	F	da MIN	da MAX	Da MAX	Cr N	Cor N	rpm	g (approx)	OUTER RING	INNER RING
5	NA495	—	—	—	—	5 0 -0.008	13	10	0.15	7	6.2	6.7	11.8	2 960	2 690	34 000	7.3	RNA495	IR5710
	—	—	—	—	NKI 5/12	5 0 -0.008	15	12	0.3	8	7	7.7	13	5 100	4 700	32 000	11.9	NK8/12	IR5812
	—	—	—	—	NKI 5/16	5 0 -0.008	15	16	0.3	8	7	7.7	13	7 100	7 300	32 000	16.7	NK8/16	IR5816
6	NA 496	—	—	—	—	6 0 -0.008	15	10	0.15	8	7.2	7.7	13.8	3 900	3 400	32 000	9.1	RNA496	IR6810
	—	—	—	—	NKI 6/12	6 0 -0.008	16	12	0.3	9	8	8.7	14	5 500	5 300	30 000	13	NK9/12	IR6912
	—	—	—	—	NKI 6/16	6 0 -0.008	16	16	0.3	9	8	8.7	14	7 600	8 200	30 000	17.5	NK9/16	IR6916
7	NA 497	—	—	—	—	7 0 -0.008	17	10	0.15	9	8.2	8.7	15.8	4 500	3 600	30 000	11.2	RNA497	IR7910
	—	—	—	—	NKI 7/12	7 0 -0.008	17	12	0.3	10	9	9.7	15	5 900	6 000	28 000	14.3	NK10/12	IR71012
	—	—	—	—	NKI 7/16	7 0 -0.008	17	16	0.3	10	9	9.7	15	8 200	9 200	28 000	19.2	NK10/16	IR71016
8	NA 498	—	—	—	—	8 0 -0.008	19	11	0.2	10	9.2	9.7	17.4	6 200	5 000	28 000	15	RNA498	IR81011
9	—	—	—	—	NKI 9/12	9 0 -0.008	19	12	0.3	12	11	11.5	17	6 600	7 300	26 000	16.7	NK12/12	IR91212
	—	—	—	—	NKI 9/16	9 0 -0.008	19	16	0.3	12	11	11.5	17	9 200	11 200	26 000	22.5	NK12/16	IR91216
	NA 499	—	—	—	—	9 0 -0.008	20	11	0.3	12	11	11.5	18	6 600	6 300	26 000	16.7	RNA499	IR91211
10	NA 4900	—	—	—	—	10 0 -0.008	22	13	0.3	14	12	13	20	9 200	10 100	24 000	24	RNA4900	IR101413
	—	—	—	—	NKI 10/16	10 0 -0.008	22	16	0.3	14	12	13	20	11 800	13 700	24 000	30	NK14/16	IR101416
	—	—	—	—	NKI 10/20	10 0 -0.008	22	20	0.3	14	12	13	20	14 800	18 500	24 000	38	NK14/20	IR101420
12	NA 4901	—	—	—	—	12	24	13	0.3	16	14	15	22	9 700	11 100	23 000	26.5	RNA4901	IR121613
	—	—	—	—	NKI 12/16	12 0 -0.008	24	16	0.3	16	14	15	22	12 300	15 100	23 000	33.5	NK16/16	IR121616
	—	—	—	—	NKI 12/20	12 0 -0.008	24	20	0.3	16	14	15	22	15 600	20 400	23 000	42.5	NK16/20	IR121620
	—	—	NA 6901	—	—	12	24	22	0.3	16	14	15	22	17 100	23 000	23 000	44.5	RNA6901	IR121622

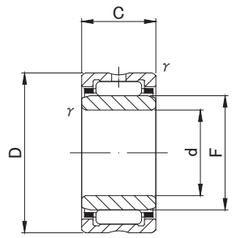
* Suitable for oil lubrication. In case of grease lubrication, down to 60% of this value.

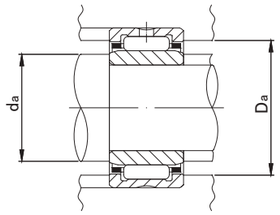
MACHINED RING NEEDLE ROLLER BEARINGS

WITH INNER RING



NA49,NA59,NA69(d≦30),NKI





NA49,NA59,NA69(d ≦ 30),NKI

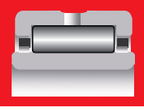
NA49,NA59,NA69,NA48,NKI TYPE

Shaft Diameter (mm)	Designation					Dimensions (mm)					Standard mounting dimensions (mm)			Basic dynamic load rating	Basic static load rating	Limiting speed*	Mass	Usable bearing designation	
	NA 49	NA 59	NA 69	NA48	NKI	d	D	C	r s min	F	da MIN	da MAX	Da MAX	Cr N	Cor N	rpm	g (approx)	OUTER RING	INNER RING
15	—	—	—	—	NKI 15/16	15	27	16	0.3	19	17	18	25	14 000	18 700	21 000	39.5	NK19/16	IR151916
	—	—	—	—	NKI 15/20	15	27	20	0.3	19	17	18	25	17 700	25 300	21 000	50	NK19/20	IR151920
	NA 4902	—	—	—	—	15	28	13	0.3	20	17	19	26	10 900	13 800	20 000	35	RNA4902	IR152013
	—	NA 5902	—	—	—	15	28	18	0.3	20	17	19	26	15 700	22 100	20 000	52	RNA5902	IR152018
	—	—	NA 6902	—	—	15	28	23	0.3	20	17	19	26	19 300	28 700	20 000	61	RNA6902	IR152023
17	—	—	—	—	NKI 17/16	17	29	16	0.3	21	19	20	27	14 400	20 000	19 000	43.5	NK21/16	IR172116
	—	—	—	—	NKI 17/20	17	29	20	0.3	21	19	20	27	18 200	27 100	19 000	54	NK21/20	IR172120
	NA 4903	—	—	—	—	17	30	13	0.3	22	19	21	28	11 800	15 600	18 000	39	RNA4903	IR172213
	—	NA 5903	—	—	—	17	30	18	0.3	22	19	21	28	16 900	24 900	18 000	56	RNA5903	IR172218
	—	—	NA 6903	—	—	17	30	23	0.3	22	19	21	28	20 800	32 500	18 000	67	RNA6903	IR172223
20	—	—	—	—	NKI 20/16	20	32	16	0.3	24	22	23	30	15 300	22 600	17 000	48.5	NK24/16	IR202416
	—	—	—	—	NKI 20/20	20	32	20	0.3	24	22	23	30	19 400	30 500	17 000	61	NK24/20	IR202420
	NA 4904	—	—	—	—	20	37	17	0.3	25	22	24	35	21 000	25 000	16 000	78.5	RNA4904	IR202517
	—	NA 5904	—	—	—	20	37	23	0.3	25	22	24	35	29 400	38 600	16 000	115	RNA5904	IR202523
	—	—	NA 6904	—	—	20	37	30	0.3	25	22	24	35	35 400	48 800	16 000	136	RNA6904	IR202530
22	—	—	—	—	NKI 22/16	22	34	16	0.3	26	24	25	32	16 300	24 900	15 000	52	NK26/16	IR222616
	—	—	—	—	NKI 22/20	22	34	20	0.3	26	24	25	32	20 600	33 700	15 000	67.5	NK26/20	IR222620
	NA 49/22	—	—	—	—	22	39	17	0.3	28	24	27	37	21 400	28 800	14 000	87	RNA49/22	IR222817
	—	NA 59/22	—	—	—	22	39	23	0.3	28	24	27	37	29 800	44 400	14 000	134	RNA59/22	IR222823
	—	—	NA 69/22	—	—	22	39	30	0.3	28	24	27	37	36 300	56 900	14 000	152	RNA69/22	IR222830
25	—	—	—	—	NKI 25/20	25	38	20	0.3	29	27	28	36	21 600	37 200	14 000	82	NK29/20	IR252920
	—	—	—	—	NKI 25/30	25	38	30	0.3	29	27	28	36	30 900	59 000	14 000	123	NK29/30	IR252930
	NA 4905	—	—	—	—	25	42	17	0.3	30	27	29	40	23 700	30 700	13 000	92.5	RNA4905	IR253017
	—	NA 5905	—	—	—	25	42	23	0.3	30	27	29	40	33 200	47 500	13 000	139	RNA5905	IR253023
	—	—	NA 6905	—	—	25	42	30	0.3	30	27	29	40	42 100	64 200	13 000	160	RNA6905	IR253030
28	—	—	—	—	NKI 28/20	28	42	20	0.3	32	30	31	40	25 700	42 200	13 000	96.5	NK32/20	IR283220
	—	—	—	—	NKI 28/30	28	42	30	0.3	32	30	31	40	36 900	67 100	13 000	145	NK32/30	IR283230
	NA 49/28	—	—	—	—	28	45	17	0.3	32	30	31	43	24 500	32 700	13 000	101	RNA49/28	IR283217
	—	NA 59/28	—	—	—	28	45	23	0.3	32	30	31	43	34 300	50 500	13 000	142	RNA59/28	IR283223
	—	—	NA 69/28	—	—	28	45	30	0.3	32	30	31	43	41 800	64 700	13 000	176	RNA69/28	IR283230
30	—	—	—	—	NKI 30/20	30	45	20	0.3	35	32	34	43	27 000	46 200	11 000	112	NK35/20	IR303520
	—	—	—	—	NKI 30/30	30	45	30	0.3	35	32	34	43	38 600	73 500	11 000	171	NK35/30	IR303530
	NA 4906	—	—	—	—	30	47	17	0.3	35	32	34	45	25 200	34 700	11 000	106	RNA4906	IR303517
	—	NA 5906	—	—	—	30	47	23	0.3	35	32	34	45	35 200	53 700	11 000	152	RNA5906	IR303523
	—	—	NA 6906	—	—	30	47	30	0.3	35	32	34	45	43 100	69 000	11 000	184	RNA6906	IR303530

* Suitable for oil lubrication. In case of grease lubrication, down to 60% of this value.

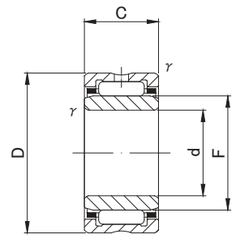
MACHINED RING NEEDLE ROLLER BEARINGS

WITH INNER RING

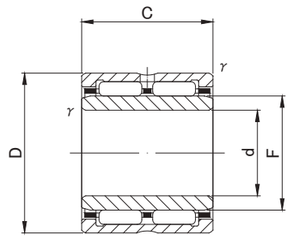


NA49,NA59,NA69(d≦30),NKI

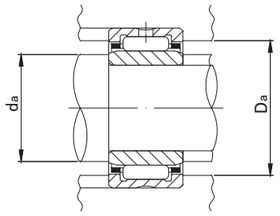
NA69



NA49,NA59,NA69(d ≦ 30),NKI



NA69



NA49,NA59,NA69,NA48,NKI TYPE

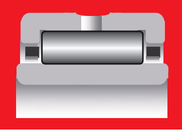
Shaft Diameter (mm)	Designation					Dimensions (mm)					Standard mounting dimensions (mm)			Basic dynamic load rating	Basic static load rating	Limiting speed*	Mass	Usable bearing designation	
	NA 49	NA 59	NA 69	NA48	NKI	d	D	C	r s min	F	da MIN	da MAX	Da MAX	Cr N	Cor N	rpm	g (approx)	OUTER RING	INNER RING
32	—	—	—	—	NKI 32/20	32	47	20	0.3	37	34	36	45	28 200	50 100	11 000	121	NK37/20	IR323720
	—	—	—	—	NKI 32/30	32	47	30	0.3	37	34	36	45	40 500	79 800	11 000	180	NK37/30	IR323730
	NA 49/32	—	—	—	—	32	52	20	0.6	40	36	39	48	31 300	47 900	10 000	165	RNA49/32	IR324020
	—	NA 59/32	—	—	—	32	52	27	0.6	40	36	39	48	41 900	69 900	10 000	241	RNA59/32	IR324027
	—	—	NA 69/32	—	—	32	52	36	0.6	40	36	39	48	53 500	95 700	10 000	295	RNA69/32	IR324036
35	—	—	—	—	NKI 35/20	35	50	20	0.3	40	37	39	48	29 400	54 100	10 000	129	NK40/20	IR354020
	—	—	—	—	NKI 35/30	35	50	30	0.3	40	37	39	48	42 300	86 100	10 000	192	NK40/30	IR354030
	NA 4907	—	—	—	—	35	55	20	0.6	42	39	41	51	32 000	50 200	9 500	178	RNA4907	IR354220
	—	NA 5907	—	—	—	35	55	27	0.6	42	39	41	51	42 900	73 200	9 500	256	RNA5907	IR354227
	—	—	NA 6907	—	—	35	55	36	0.6	42	39	41	51	54 800	100 000	9 500	320	RNA6907	IR354236
38	—	—	—	—	NKI 38/20	38	53	20	0.3	43	40	42	51	30 500	58 100	9 500	136	NK43/20	IR384320
	—	—	—	—	NKI 38/30	38	53	30	0.3	43	40	42	51	43 700	92 500	9 500	205	NK43/30	IR384330
40	—	—	—	—	NKI 40/20	40	55	20	0.3	45	42	44	53	31 100	60 100	9 000	143	NK45/20	IR404520
	—	—	—	—	NKI 40/30	40	55	30	0.3	45	42	44	53	44 500	95 700	9 000	215	NK45/30	IR404530
	NA 4908	—	—	—	—	40	62	22	0.6	48	44	47	58	41 600	67 400	8 500	245	RNA4908	IR404822
	—	NA 5908	—	—	—	40	62	30	0.6	48	44	47	58	58 000	103 000	8 500	348	RNA5908	IR404830
	—	—	NA 6908	—	—	40	62	40	0.6	48	44	47	58	71 300	134 400	8 500	440	RNA6908	IR404840
42	—	—	—	—	NKI 42/20	42	57	20	0.3	47	44	46	55	31 500	62 300	8 500	149	NK47/20	IR424720
	—	—	—	—	NKI 42/30	42	57	30	0.3	47	44	46	55	45 200	99 000	8 500	225	NK47/30	IR424730
45	—	—	—	—	NKI 45/25	45	62	25	0.6	50	49	49.5	58	43 000	85 200	8 000	230	NK50/25	IR455025
	—	—	—	—	NKI 45/35	45	62	35	0.6	50	49	49.5	58	58 100	125 500	8 000	320	NK50/35	IR455035
	NA 4909	—	—	—	—	45	68	22	0.6	52	49	51	64	43 500	73 400	7 500	285	RNA4909	IR455222
	—	NA 5909	—	—	—	45	68	30	0.6	52	49	51	64	60 700	112 000	7 500	396	RNA5909	IR455230
	—	—	NA 6909	—	—	45	68	40	0.6	52	49	51	64	74 600	147 100	7 500	520	RNA6909	IR455240
50	—	—	—	—	NKI 50/25	50	68	25	0.6	55	54	54.5	64	45 400	94 100	7 500	270	NK55/25	IR505525
	—	—	—	—	NKI 50/35	50	68	35	0.6	55	54	54.5	64	61 300	138 300	7 500	365	NK55/35	IR505535
	NA 4910	—	—	—	—	50	72	22	0.6	58	54	57	68	46 200	82 100	7 000	295	RNA4910	IR505822
	—	NA 5910	—	—	—	50	72	30	0.6	58	54	57	68	64 400	126 000	7 000	498	RNA5910	IR505830
	—	—	NA 6910	—	—	50	72	40	0.6	58	54	57	68	79 100	163 800	7 000	530	RNA6910	IR505840

Dimensions (mm): d: 0 -0.012

* Suitable for oil lubrication. In case of grease lubrication, down to 60% of this value.

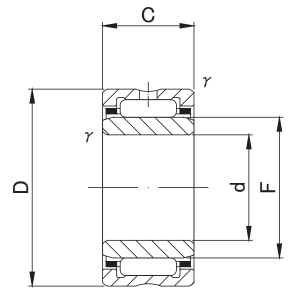
MACHINED RING NEEDLE ROLLER BEARINGS

WITH INNER RING

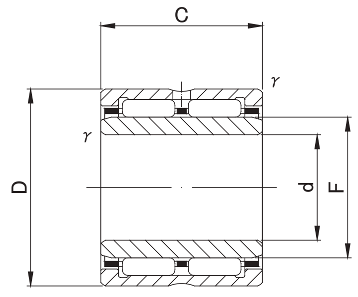


NA49,NA59,NKI

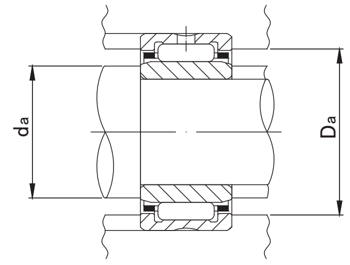
NA69



NA49,NA59,NKI



NA69



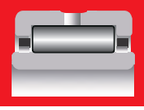
NA49,NA59,NA69,NA48,NKI TYPE

Shaft Diameter (mm)	Designation					Dimensions (mm)						Standard mounting dimensions (mm)			Basic dynamic load rating	Basic static load rating	Limiting speed*	Mass	Usable bearing designation	
	NA 49	NA 59	NA 69	NA48	NKI	d		D	C	rs min	F	da MIN	da MAX	Da MAX	Cr N	Cor N	rpm	g (approx)	OUTER RING	INNER RING
	—	—	—	—	NKI 55/25	55		72	25	0.6	60	59	59.5	68	47 500	103 000	6 500	275	NK60/25	IR556025
	—	—	—	—	NKI 55/35	55		72	35	0.6	60	59	59.5	68	64 100	151 000	6 500	380	NK60/35	IR556035
55	NA 4911	—	—	—	—	55	0 / -0.015	80	25	1	63	60	61	75	57 600	97 300	6 500	410	RNA4911	IR556325
	—	NA 5911	—	—	—	55		80	34	1	63	60	61	75	82 600	154 000	6 500	559	RNA5911	IR556334
	—	—	NA 6911	—	—	55		80	45	1	63	60	61	75	99 000	194 200	6 500	730	RNA6911	IR556345
	—	—	—	—	NKI 60/25	60		82	25	0.6	68	64	66	78	54 800	116 700	6 000	395	NK68/25	IR606825
	—	—	—	—	NKI 60/35	60		82	35	0.6	68	64	66	78	72 100	165 700	6 000	560	NK68/35	IR606835
60	NA 4912	—	—	—	—	60	0 / -0.015	85	25	1	68	64	66	80	60 100	104 900	6 000	440	RNA4912	IR606825
	—	NA 5912	—	—	—	60		85	34	1	68	65	66	80	86 100	167 000	6 000	614	RNA5912	IR606834
	—	—	NA 6912	—	—	60		85	45	1	68	65	66	80	103 000	210 800	6 000	785	RNA6912	IR606845
	NA 4913	—	—	—	—	65		90	25	1	72	70	70.5	85	62 800	113 800	5 500	470	RNA4913	IR657225
65	—	NA 5913	—	—	—	65	0 / -0.015	90	34	1	72	70	70.5	85	89 900	180 000	5 500	655	RNA5913	IR657234
	—	—	—	—	NKI 65/35	65		90	35	0.6	73	69	71	86	80 400	180 400	5 500	710	NK73/35	IR657335
	—	—	NA 6913	—	—	65		90	45	1	72	70	70.5	85	107 900	226 500	5 500	840	RNA6913	IR657245
	—	—	—	—	NKI 70/25	70		95	25	1	80	75	78	90	59 400	137 300	5 000	540	NK80/25	IR708025
	—	—	—	—	NKI 70/35	70		95	35	1	80	75	78	90	78 100	194 200	5 000	755	NK80/35	IR708035
70	NA 4914	—	—	—	—	70	0 / -0.015	100	30	1	80	75	78	95	83 200	157 900	5 000	765	RNA4914	IR708030
	—	NA 5914	—	—	—	70		100	40	1	80	75	78	95	112 000	232 000	5 000	1 060	RNA5914	IR708040
	—	—	NA 6914	—	—	70		100	54	1	80	75	78	95	133 400	310 900	5 000	1 400	RNA6914	IR708054
	—	—	—	—	NKI 75/25	75		105	25	1	85	80	83	100	76 400	145 100	4 500	675	NK85/25	IR758525
	NA 4915	—	—	—	—	75		105	30	1	85	80	83	100	86 200	169 700	4 500	810	RNA4915	IR758530
75	—	—	—	—	NKI 75/35	75	0 / -0.015	105	35	1	85	80	83	100	102 000	209 900	4 500	945	NK85/35	IR758535
	—	NA 5915	—	—	—	75		105	40	1	85	80	83	100	116 000	249 000	4 500	1 130	RNA5915	IR758540
	—	—	NA 6915	—	—	75		105	54	1	85	80	83	100	138 300	330 500	4 500	1 480	RNA6915	IR758554
	—	—	—	—	NKI 80/25	80		110	25	1	90	85	88	105	77 400	150 000	4 500	710	NK90/25	IR809025
	NA 4916	—	—	—	—	80		110	30	1	90	85	88	105	87 400	174 600	4 500	855	RNA4916	IR809030
80	—	—	—	—	NKI 80/35	80	0 / -0.015	110	35	1	90	85	88	105	103 000	216 700	4 500	995	NK90/35	IR809035
	—	NA 5916	—	—	—	80		110	40	1	90	85	88	105	117 000	257 000	4 500	1 150	RNA5916	IR809040
	—	—	NA 6916	—	—	80		110	54	1	90	85	88	105	143 200	350 100	4 500	1 560	RNA6916	IR809054
	—	—	—	—	NKI 85/26	85		115	26	1	95	90	93	110	79 700	158 900	4 200	775	NK95/26	IR859526
	—	—	—	—	NKI 85/36	85		115	36	1	95	90	93	110	106 900	230 500	4 200	1 080	NK95/36	IR859536
85	NA 4917	—	—	—	—	85	0 / -0.020	120	35	1.1	100	91.5	98	113.5	109 800	244 200	4 000	1 280	RNA4917	IR8510035
	—	NA 5917	—	—	—	85		120	46	1.1	100	91.5	98	113.5	144 000	346 000	4 000	1 760	RNA5917	IR8510046
	—	—	NA 6917	—	—	85		120	63	1.1	100	91.5	98	113.5	172 600	466 800	4 000	2 340	RNA6917	IR8510063

* Suitable for oil lubrication. In case of grease lubrication, down to 60% of this value.

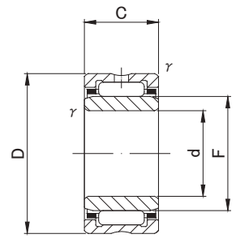
MACHINED RING NEEDLE ROLLER BEARINGS

WITH INNER RING

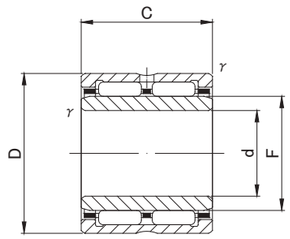


NA49,NA59,NA48,NKI

NA69



NA49,NA59,NA48,NKI



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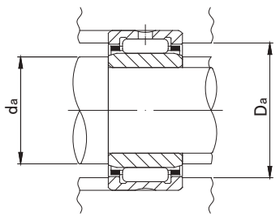


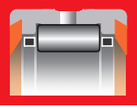
NA49,NA59,NA69,NA48,NKI TYPE

Shaft Diameter (mm)	Designation					Dimensions (mm)					Standard mounting dimensions (mm)			Basic dynamic load rating	Basic static load rating	Limiting speed*	Mass	Usable bearing designation	
	NA 49	NA 59	NA 69	NA48	NKI	d	D	C	r s min	F	da MIN	da MAX	Da MAX	Cr N	Cor N	rpm	g (approx)	OUTER RING	INNER RING
90	—	—	—	—	NKI 90/26	90	120	26	1	100	95	98	115	82 500	168 700	4 000	820	NK100/26	IR9010026
	—	—	—	—	NKI 90/36	90	120	36	1	100	95	98	115	109 800	244 200	4 000	1 140	NK100/36	IR9010036
	NA 4918	—	—	—	—	90 0 -0.020	125	35	1.1	105	96.5	103	118.5	112 800	257 900	3 800	1 350	RNA4918	IR9010535
	—	NA 5918	—	—	—	90	125	46	1.1	105	96.5	103	118.5	148 000	365 000	3 800	1 840	RNA5918	IR9010546
	—	—	NA 6918	—	—	90	125	63	1.1	105	96.5	103	118.5	177 500	490 300	3 800	2 460	RNA6918	IR9010563
95	—	—	—	—	NKI 95/26	95	125	26	1	105	100	103	120	84 700	177 500	3 800	860	NK105/26	IR9510526
	—	—	—	—	NKI 95/36	95	125	36	1	105	100	103	120	112 800	257 900	3 800	1 190	NK105/36	IR9510536
	NA 4919	—	—	—	—	95 0 -0.020	130	35	1.1	110	101.5	108	123.5	116 700	270 700	3 600	1 420	RNA4919	IR9511035
	—	NA 5919	—	—	—	95	130	46	1.1	110	101.5	108	123.5	152 000	384 000	3 600	1 980	RNA5919	IR9511046
	—	—	NA 6919	—	—	95	130	63	1.1	110	101.5	108	123.5	182 400	514 800	3 600	2 580	RNA6919	IR9511063
100	—	—	—	—	NKI 100/30	100 0 -0.020	130	30	1.1	110	106.5	108	123.5	105 900	239 300	3 600	1 040	NK110/30	IR10011030
	—	—	—	—	NKI 100/40	100	130	40	1.1	110	106.5	108	123.5	133 400	323 600	3 600	1 380	NK110/40	IR10011040
	NA 4920	—	—	—	—	100	140	40	1.1	115	106.5	113	133.5	145 000	329 000	3 500	1 960	RNA4920	IR10011540
110	—	—	—	NA 4822	—	110 0 -0.020	140	30	1	120	115	118	135	93 000	239 000	3 500	1 200	RNA4822	IR11012030
	NA 4922	—	—	—	—	110	150	40	1.1	125	116.5	123	143.5	152 000	357 000	3 000	2 120	RNA4922	IR11012540
120	—	—	—	NA 4824	—	120 0 -0.020	150	30	1	130	125	128	145	97 000	259 000	3 000	1 300	RNA4824	IR12013030
	NA 4924	—	—	—	—	120	165	45	1.1	135	126.5	133	158.5	187 000	435 000	3 000	2 960	RNA4924	IR12013545
130	—	—	—	NA 4826	—	130 0 -0.025	165	35	1.1	145	136.5	143	158.5	117 000	340 000	3 000	1 960	RNA4826	IR13014535
	NA 4926	—	—	—	—	130	180	50	1.5	150	138	148	172	216 000	540 000	2 500	4 030	RNA4926	IR13015050
140	—	—	—	NA 4828	—	140 0 -0.025	175	35	1.1	155	146.5	153	168.5	121 000	363 000	2 500	2 100	RNA4828	IR14015535
	NA 4928	—	—	—	—	140	190	50	1.5	160	148	158	182	224 000	580 000	2 500	4 290	RNA4928	IR14016050
150	—	—	—	NA 4830	—	150 0 -0.025	190	40	1.1	165	156.5	163	183.5	168 000	446 000	2 500	2 880	RNA4830	IR15016540
160	—	—	—	NA 4832	—	160 0 -0.025	200	40	1.1	175	166.5	173	193.5	173 000	474 000	2 500	3 050	RNA4832	IR16017540

* Suitable for oil lubrication. In case of grease lubrication, down to 60% of this value.

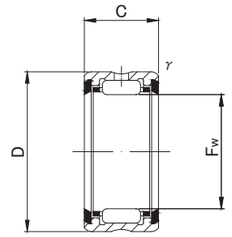
MACHINED RING NEEDLE ROLLER BEARINGS

SEALED, WITHOUT INNER RING

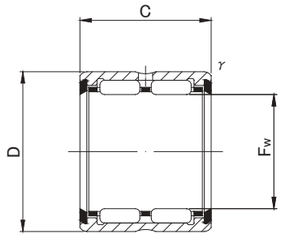


RNA49UU,RNA69UU (Fw ≦ 35)

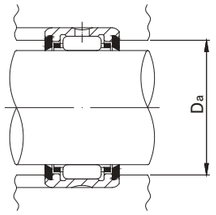
RNA69UU



RNA49UU,RNA69UU（Fw ≦ 35）



RNA69UU



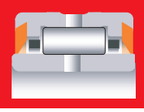
■RNA49UU,RNA69UU,SEALED TYPE

Prepacked Grease

Shaft Diameter (mm)	Designation		Dimensions (mm)				Standard mounting dimensions (mm)	Basic dynamic load rating	Basic static load rating	Limiting speed (GREASE)	Mass	Usable bearing designation	
	RNA 49UU	RNA 69UU	Fw	D	C	r s min	Da MAX	Cr N	Cor N	rpm	g (approx)	INNER RING	WITH INNER RING
14	RNA 4900UU	—	14 +0.027 +0.016	22	13	0.3	20	8 000	8 500	14 000	16	IRZ101414	NA4900UU
16	RNA 4901UU	—	16 +0.027	24	13	0.3	22	8 400	9 300	12 000	18	IRZ121614	NA4901UU
	—	RNA 6901UU	16 +0.016	24	22	0.3	22	15 600	20 400	12 000	30	IRZ121623	NA6901UU
20	RNA 4902UU	—	20 +0.033	28	13	0.3	26	9 600	11 700	9 500	22	IRZ152014	NA4902UU
	—	RNA 6902UU	20 +0.020	28	23	0.3	26	18 400	27 100	9 500	38	IRZ152024	NA6902UU
22	RNA 4903UU	—	22 +0.033	30	13	0.3	28	10 300	13 100	8 500	23	IRZ172214	NA4903UU
	—	RNA 6903UU	22 +0.020	30	23	0.3	28	19 800	30 600	8 500	40	IRZ172224	NA6903UU
25	RNA 4904UU	—	25 +0.033	37	17	0.3	35	17 900	20 500	7 500	55	IRZ202518	NA4904UU
	—	RNA 6904UU	25 +0.020	37	30	0.3	35	33 000	44 500	7 500	96	IRZ202531	NA6904UU
30	RNA 4905UU	—	30 +0.033	42	17	0.3	40	20 300	25 100	6 500	63	IRZ253018	NA4905UU
	—	RNA 6905UU	30 +0.020	42	30	0.3	40	39 200	58 600	6 500	110	IRZ253031	NA6905UU
35	RNA 4906UU	—	35 +0.041	47	17	0.3	45	21 600	28 400	5 500	71	IRZ303518	NA4906UU
	—	RNA 6906UU	35 +0.025	47	30	0.3	45	40 100	63 100	5 500	130	IRZ303531	NA6906UU
42	RNA 4907UU	—	42 +0.041	55	20	0.6	51	30 100	46 300	4 500	110	IRZ354221	NA4907UU
	—	RNA 6907UU	42 +0.025	55	36	0.6	51	51 600	92 600	4 500	200	IRZ354237	NA6907UU
48	RNA 4908UU	—	48 +0.041	62	22	0.6	58	37 200	58 300	4 000	150	IRZ404823	NA4908UU
	—	RNA 6908UU	48 +0.025	62	40	0.6	58	63 700	116 700	4 000	270	IRZ404841	NA6908UU
52	RNA 4909UU	—	52 +0.049	68	22	0.6	64	38 800	63 400	3 500	190	IRZ455223	NA4909UU
	—	RNA 6909UU	52 +0.030	68	40	0.6	64	66 700	126 500	3 500	355	IRZ455241	NA6909UU
58	RNA 4910UU	—	58 +0.049	72	22	0.6	68	41 300	71 100	3 500	180	IRZ505823	NA4910UU
	—	RNA 6910UU	58 +0.030	72	40	0.6	68	70 800	142 200	3 500	320	IRZ505841	NA6910UU

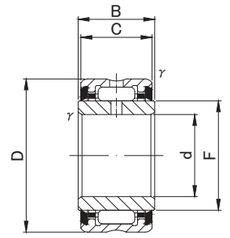
MACHINED RING NEEDLE ROLLER BEARINGS

SEALED, WITH INNER RING

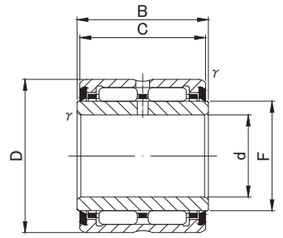


NA49UU,NA69UU(d≦30)

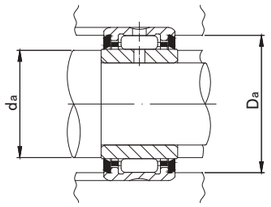
NA69UU



NA49UU,NA69UU(d ≦ 30)



NA69UU



NA49UU,NA69UU,SEALED TYPE

Prepacked Grease

Shaft Diameter (mm)	Designation		Dimensions (mm)						Standard mounting dimensions (mm)			Basic dynamic load rating	Basic static load rating	Limiting speed (GREASE)	Mass	Usable bearing designation	
									da		Da	Cr	Cor				
	NA 49UU	NA 69UU	d	D	C	B	*r*s min	F	MIN	MAX	MAX	N	N	rpm	g (approx)	OUTER RING	INNER RING
10	**NA 4900UU**	—	10 0 -0.008	22	13	14	0.3	14	12	13	20	8 000	8 500	14 000	25	RNA4900UU	IRZ101414
12	**NA 4901UU**	—	12 0 -0.008	24	13	14	0.3	16	14	15	22	8 400	9 300	12 000	28	RNA4901UU	IRZ121614
	—	**NA 6901UU**	12	24	22	23	0.3	16	14	15	22	15 600	20 400	12 000	46	RNA6901UU	IRZ121623
15	**NA 4902UU**	—	15 0 -0.008	28	13	14	0.3	20	17	19	26	9 600	11 700	9 500	36	RNA4902UU	IRZ152014
	—	**NA 6902UU**	15	28	23	24	0.3	20	17	19	26	18 400	27 100	9 500	63	RNA6902UU	IRZ152024
17	**NA 4903UU**	—	17 0 -0.008	30	13	14	0.3	22	19	21	28	10 300	13 100	8 500	40	RNA4903UU	IRZ172214
	—	**NA 6903UU**	17	30	23	24	0.3	22	19	21	28	19 800	30 600	8 500	69	RNA6903UU	IRZ172224
20	**NA 4904UU**	—	20 0 -0.010	37	17	18	0.3	25	22	24	35	17 900	20 500	7 500	78	RNA4904UU	IRZ202518
	—	**NA 6904UU**	20	37	30	31	0.3	25	22	24	35	33 000	44 500	7 500	140	RNA6904UU	IRZ202531
25	**NA 4905UU**	—	25 0 -0.010	42	17	18	0.3	30	27	29	40	20 300	25 100	6 500	93	RNA4905UU	IRZ253018
	—	**NA 6905UU**	25	42	30	31	0.3	30	27	29	40	39 200	58 600	6 500	162	RNA6905UU	IRZ253031
30	**NA 4906UU**	—	30 0 -0.010	47	17	18	0.3	35	32	34	45	21 600	28 400	5 500	106	RNA4906UU	IRZ303518
	—	**NA 6906UU**	30	47	30	31	0.3	35	32	34	45	40 100	63 100	5 500	185	RNA6906UU	IRZ303531
35	**NA 4907UU**	—	35 0 -0.012	55	20	21	0.6	42	39	41	51	30 100	46 300	4 500	179	RNA4907UU	IRZ354221
	—	**NA 6907UU**	35	55	36	37	0.6	42	39	41	51	51 600	92 600	4 500	320	RNA6907UU	IRZ354237
40	**NA 4908UU**	—	40 0 -0.012	62	22	23	0.6	48	44	47	58	37 200	58 300	4 000	245	RNA4908UU	IRZ404823
	—	**NA 6908UU**	40	62	40	41	0.6	48	44	47	58	63 700	116 700	4 000	440	RNA6908UU	IRZ404841
45	**NA 4909UU**	—	45 0 -0.012	68	22	23	0.6	52	49	51	64	38 800	63 400	3 500	290	RNA4909UU	IRZ455223
	—	**NA 6909UU**	45	68	40	41	0.6	52	49	51	64	66 700	126 500	3 500	510	RNA6909UU	IRZ455241
50	**NA 4910UU**	—	50 0 -0.012	72	22	23	0.6	58	54	57	68	41 300	71 100	3 500	300	RNA4910UU	IRZ505823
	—	**NA 6910UU**	50	72	40	41	0.6	58	54	57	68	70 800	142 200	3 500	530	RNA6910UU	IRZ505841

SEPARABLE NEEDLE ROLLER BEARINGS

Machined type needle roller bearings - Separable type (NAF)

Type and Part Code

Type	Applicable axis diameter	Feature	Part Code
 RNAF(W)	ϕ 5 ~ ϕ 100	Machined type needle roller bearings Without collar outer ring Without inner ring	**Type** RNAF → Type of bearing; W → No symbol: Single row W: Double row **Dimensions** 30 → Inscribed circle diameter; 42 → Outer diameter; 32 → Width **Suffix code** P6 → Classification symbol (Class 6) (Standard class 0 No symbol)
 NAF(W)	ϕ 6 ~ ϕ 90	Machined type needle roller bearings Without collar outer ring With inner ring	**Type** NAF → Type of bearing; W → No symbol: Single row W: Double row **Dimensions** 25 → Bore diameter; 42 → Outer diameter; 32 → Width **Suffix code** C3 → Clearance symbol (C3 clearance) (Standard: No symbol, CN clearance); P6 → Classification symbol (Class 6) (Standard class 0 No symbol)

These are semi-standard products, so please direct any enquiries to JNS.

Structure and Features

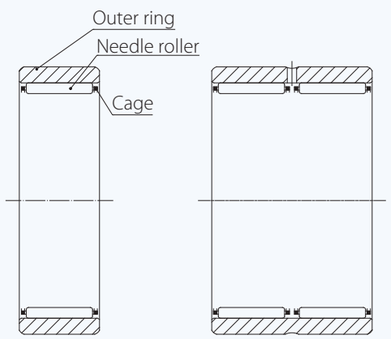
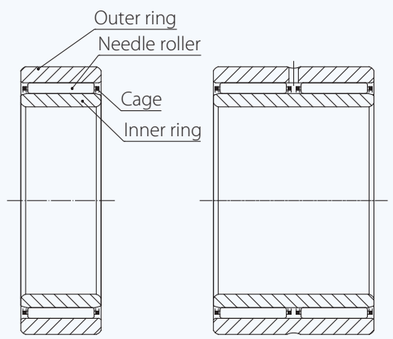
A metric bearing which features a stiff machined outer ring and a cage with either a single or a double row of needle rollers. This bearing has no collar on the inside of the outer ring therefore the cage with needle rollers can be easily separated from the outer and inner rings.

Because these bearing can be individually mounted on equipment, assembly is sometimes easier. The cage with needle rollers is not constrained by a collar therefore the configuration must be one which constrains the movement of these parts.

Also, this type of bearing is not available with a seal.

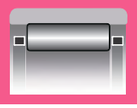
On the single row standard type, there are no oil grooves and oil holes for lubrication on the outer ring, and no oil holes on the inner ring.

On the double row standard type, there are oil grooves and oil holes for lubrication on the outer ring, but no oil holes on the inner ring.

Without Inner ring		With Inner ring	
 RNAF (single row)	RNAFW (double row)	 NAF (single row)	NAFW (double row)

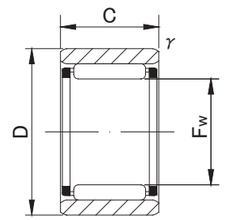
SEPARABLE NEEDLE ROLLER BEARINGS

WITHOUT INNER RING



RNAF

RNAFW



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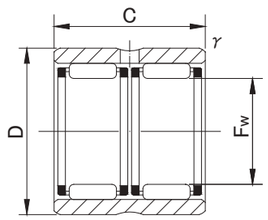

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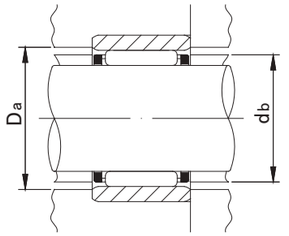
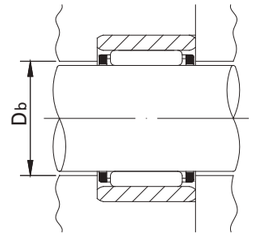




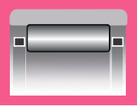
RNAF(W) TYPE

Shaft Diameter (mm)	Designation	Dimensions (mm)				Standard mounting dimensions (mm)			Basic dynamic load rating	Basic static load rating	Limiting speed*	Mass	Usable bearing designation	
	RNAF(W)	Fw	D	C	rs min	db	Da MAX	Db	Cr N	Cor N	rpm	g (approx)	INNER RING	WITH INNER RING
5	RNAF5108	5 +0.018 +0.010	10	8	0.2	6.7	8.4	5.4	2 500	2 000	40 000	3	—	—
6	RNAF6138	6 +0.018 +0.010	13	8	0.3	8.4	11	6.4	2 500	2 100	37 000	5.5	—	—
7	RNAF7148	7 +0.022 +0.013	14	8	0.3	9.4	12	7.4	2 900	2 600	34 000	6	—	—
8	RNAF81510	8 +0.022 +0.013	15	10	0.3	10.4	13	8.4	3 600	3 600	32 000	8	—	—
	RNAFW81620	8 +0.022 +0.013	16	20	0.3	10.8	14	8.4	6 200	7 200	32 000	20	—	—
10	RNAF101710	10 +0.022 +0.013	17	10	0.3	12.4	15	10.4	4 100	4 500	28 000	10	IR61010	NAF61710
	RNAF102012	10 +0.022 +0.013	20	12	0.3	13.5	18	10.4	6 000	6 000	28 000	19	IR71012	NAF72012
12	RNAF122212	12 +0.027 +0.016	22	12	0.3	17.5	20	12.4	9 000	8 400	26 000	19	IR91212	NAF92212
14	RNAF142213	14 +0.027 +0.016	22	13	0.3	17.6	20	14.6	7 800	9 400	24 000	18	IR101413	NAF102213
	RNAFW142220	14 +0.027 +0.016	22	20	0.3	17.6	20	14.6	10 800	14 200	24 000	28	IR101420	NAFW102220
	RNAF142612	14 +0.027 +0.016	26	12	0.3	19.4	24	14.6	9 800	9 700	24 000	29	IR101412	NAF102612
15	RNAF152313	15 +0.027 +0.016	23	13	0.3	18.6	21	15.6	8 200	10 200	23 000	20	—	—
	RNAFW152320	15 +0.027 +0.016	23	20	0.3	18.6	21	15.6	11 400	15 400	23 000	31	—	—
16	RNAF162413	16 +0.027 +0.016	24	13	0.3	19.6	22	16.6	8 600	11 000	23 000	21	IR121613	NAF122413
	RNAFW162420	16 +0.027 +0.016	24	20	0.3	19.6	22	16.6	11 900	16 700	23 000	32	IR121620	NAFW122420
	RNAF162812	16 +0.027 +0.016	28	12	0.3	21.4	26	16.6	10 500	10 900	23 000	32	IR121612	NAF122812
17	RNAF172513	17 +0.027 +0.016	25	13	0.3	20.6	23	17.6	9 000	11 900	22 000	22	—	—
	RNAFW172520	17 +0.027 +0.016	25	20	0.3	20.6	23	17.6	12 400	17 900	22 000	33	—	—
18	RNAF182613	18 +0.027 +0.016	26	13	0.3	21.6	24	18.6	9 300	12 700	21 000	23	—	—
	RNAFW182620	18 +0.027 +0.016	26	20	0.3	21.6	24	18.6	12 800	19 100	21 000	35	—	—
	RNAF183012	18 +0.027 +0.016	30	12	0.3	23.4	28	18.6	11 800	13 000	21 000	35	—	—
	RNAFW183024	18 +0.027 +0.016	30	24	0.3	23.4	28	18.6	20 200	26 200	21 000	70	—	—

* Suitable for oil lubrication. In case of grease lubrication, down to 50% of this value.

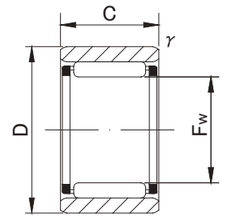
SEPARABLE NEEDLE ROLLER BEARINGS

WITHOUT INNER RING



RNAF

RNAFW



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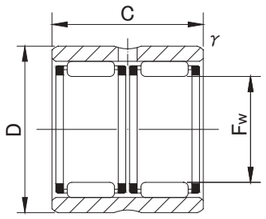

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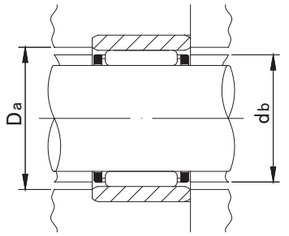
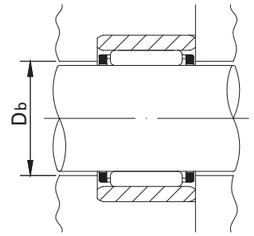




RNAF(W) TYPE

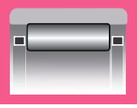
Shaft Diameter (mm)	Designation	Dimensions (mm)				Standard mounting dimensions (mm)			Basic dynamic load rating	Basic static load rating	Limiting speed*	Mass	Usable bearing designation	
	RNAF(W)	Fw	D	C	r s min	db	Da MAX	Db	Cr N	Cor N	rpm	g (approx)	INNER RING	WITH INNER RING
20	RNAF202813	20	28	13	0.3	23.6	26	20.6	9 600	13 500	20 000	25	IR152013	NAF152813
	RNAFW202826	20 +0.033 +0.020	28	26	0.3	23.6	26	20.6	16 500	27 100	20 000	50	IR152026	NAFW152826
	RNAF203212	20	32	12	0.3	25.4	30	20.6	12 400	14 300	20 000	37	IR152012	NAF153212
	RNAFW203224	20	32	24	0.3	25.4	30	20.6	21 200	28 600	20 000	75	—	—
22	RNAF223013	22	30	13	0.3	25.6	28	22.6	10 200	15 200	18 000	27	IR172213	NAF173013
	RNAFW223026	22 +0.033 +0.020	30	26	0.3	25.6	28	22.6	17 600	30 300	18 000	54	IR172226	NAFW173026
	RNAF223516	22	35	16	0.3	27.8	33	22.6	17 600	20 900	18 000	59	IR172216	NAF173516
	RNAFW223532	22	35	32	0.3	27.8	33	22.6	30 200	41 900	18 000	117	IR172232	NAFW173532
25	RNAF253517	25	35	17	0.3	29.5	33	25.6	17 300	26 600	16 000	51	IR202517	NAF203517
	RNAFW253526	25 +0.033 +0.020	35	26	0.3	29.5	33	25.6	22 500	37 200	16 000	78	IR202526	NAFW203526
	RNAF253716	25	37	16	0.3	30.4	35	25.6	19 400	24 500	16 000	57	IR202516	NAF203716
	RNAFW253732	25	37	32	0.3	30.4	35	25.6	33 200	49 000	16 000	114	IR202532	NAFW203732
28	RNAF284016	28 +0.033 +0.020	40	16	0.3	33.4	38	28.6	20 100	26 500	14 000	63	—	—
	RNAFW284032	28	40	32	0.3	33.4	38	28.6	34 400	53 000	14 000	125	—	—
30	RNAF304017	30	40	17	0.3	34.5	38	30.6	18 600	31 100	13 000	59	IR253017	NAF254017
	RNAFW304026	30 +0.033 +0.020	40	26	0.3	34.5	38	30.6	24 200	43 400	13 000	91	IR253026	NAFW254026
	RNAF304216	30	42	16	0.3	35.4	40	30.6	20 800	28 300	13 000	66	IR253016	NAF254216
	RNAFW304232	30	42	32	0.3	35.4	40	30.6	35 700	56 800	13 000	132	IR253032	NAFW254232
35	RNAF354517	35	45	17	0.3	39.5	43	35.6	20 500	36 900	11 000	68	IR303517	NAF304517
	RNAFW354526	35 +0.041 +0.025	45	26	0.3	39.5	43	35.6	26 600	51 600	11 000	103	IR303526	NAFW304526
	RNAF354716	35	47	16	0.3	40.4	45	35.6	23 000	33 800	11 000	76	IR303516	NAF304716
	RNAFW354732	35	47	32	0.3	40.4	45	35.6	39 500	67 800	11 000	151	IR303532	NAFW304732
40	RNAF405017	40	50	17	0.3	43.5	48	40.8	22 200	42 700	10 000	75	IR354017	NAF355017
	RNAFW405034	40 +0.041 +0.025	50	34	0.3	43.5	48	40.8	38 000	85 300	10 000	152	IR354034	NAFW355034
	RNAF405520	40	55	20	0.3	45.2	53	40.8	31 500	48 000	10 000	142	IR354020	NAF355520
	RNAFW405540	40	55	40	0.3	45.2	53	40.8	53 900	96 000	10 000	280	IR354040	NAFW355540
45	RNAF455517	45	55	17	0.3	48.5	53	45.8	23 200	47 200	10 000	84	IR404517	NAF405517
	RNAFW455534	45 +0.041 +0.025	55	34	0.3	48.5	53	45.8	39 900	94 200	10 000	167	IR404534	NAFW405534
	RNAF456220	45	62	20	0.3	50.9	60	45.8	33 200	53 300	9 000	185	IR404520	NAF406220
	RNAFW456240	45	62	40	0.3	50.9	60	45.8	57 000	106 900	9 000	370	IR404540	NAFW406240
50	RNAF506220	50	62	20	0.3	54.2	60	50.8	27 100	59 300	8 000	139	IR455020	NAF456220
	RNAFW506240	50 +0.041 +0.025	62	40	0.3	54.2	60	50.8	46 400	118 700	8 000	276	IR455040	NAFW456240
	RNAF506520	50	65	20	0.3	55.2	63	50.8	35 900	61 100	8 000	170	—	—
	RNAFW506540	50	65	40	0.6	55.2	61	50.8	61 500	122 600	8 000	345	—	—

* Suitable for oil lubrication. In case of grease lubrication, down to 50% of this value.

RNAF(W)

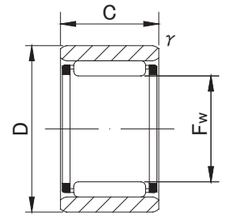
SEPARABLE NEEDLE ROLLER BEARINGS

WITHOUT INNER RING



RNAF

RNAFW



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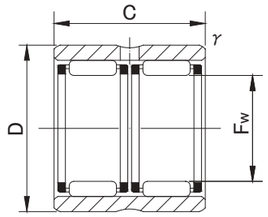

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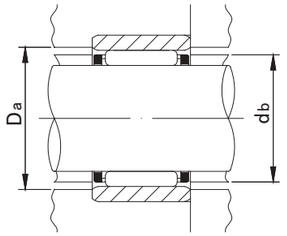
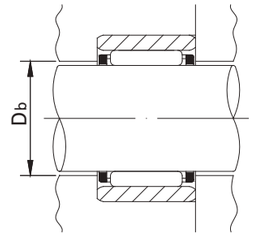




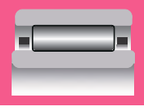
RNAF(W) TYPE

Shaft Diameter (mm)	Designation	Dimensions (mm)				Standard mounting dimensions (mm)			Basic dynamic load rating	Basic static load rating	Limiting speed*	Mass	Usable bearing designation	
	RNAF(W)	Fw	D	C	r s min	db	Da MAX	Db	Cr N	Cor N	rpm	g (approx)	INNER RING	WITH INNER RING
55	RNAF556820	55	68	20	0.6	59.5	64	55.8	28 500	66 000	7 500	167	IR505520	NAF506820
	RNAFW556840	55 +0.049 +0.030	68	40	0.6	59.5	64	55.8	48 900	132 400	7 500	330	IR505540	NAFW506840
	RNAF557220	55	72	20	0.6	60.9	68	55.8	37 400	66 400	7 500	215	IR455520	NAF457220
	RNAFW557240	55	72	40	0.6	60.9	68	55.8	64 100	132 400	7 500	435	IR455540	NAFW457240
60	RNAF607820	60 +0.049	78	20	1	66.3	73	60.8	38 900	71 700	6 500	255	IR506020	NAF507820
	RNAFW607840	60 +0.030	78	40	1	66.3	73	60.8	66 700	143 200	6 500	510	IR506040	NAFW507840
65	RNAF658530	65 +0.049	85	30	1	72	80	66	59 300	127 500	6 000	465	IR556530	NAF558530
	RNAFW658560	65 +0.030	85	60	1	72	80	66	102 000	254 000	6 000	950	IR556560	NAFW558560
70	RNAF709030	70 +0.049	90	30	1	77	85	71	61 200	135 300	5 500	500	IR607030	NAF609030
	RNAFW709060	70 +0.030	90	60	1	77	85	71	104 900	271 600	5 500	1 000	IR607060	NAFW609060
75	RNAF759530	75 +0.049	95	30	1	82	90	76	63 200	144 200	5 500	530	IR657530	NAF659530
	RNAFW759560	75 +0.030	95	60	1	82	90	76	108 900	289 300	5 500	1 050	IR657560	NAFW659560
80	RNAF8010030	80 +0.049	100	30	1	87	95	81	64 900	153 000	5 000	560	IR708030	NAF7010030
	RNAFW8010060	80 +0.030	100	60	1	87	95	81	111 800	306 000	5 000	1 120	IR708060	NAFW7010060
85	RNAF8510530	85 +0.058 +0.036	105	30	1	92	100	86	66 600	160 800	4 800	590	IR758530	NAF7510530
90	RNAF9011030	90 +0.058 +0.036	110	30	1	97	105	91	69 500	173 600	4 500	620	IR809030	NAF8011030
95	RNAF9511530	95 +0.058 +0.036	115	30	1	102	110	96	70 900	182 400	4 200	650	IR859530	NAF8511530
100	RNAF10012030	100 +0.058 +0.036	120	30	1	107	115	101	72 600	191 200	4 000	690	IR9010030	NAF9012030

* Suitable for oil lubrication. In case of grease lubrication, down to 50% of this value.

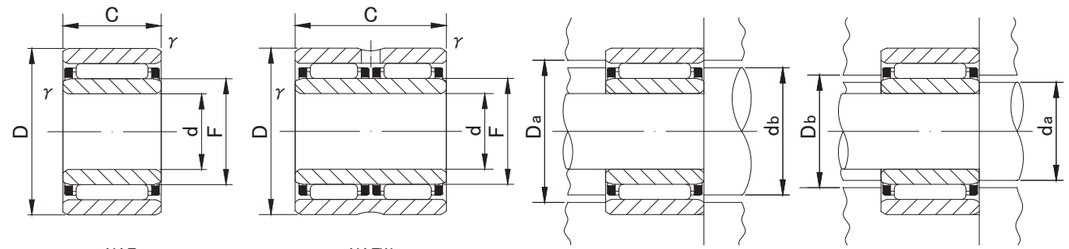
SEPARABLE NEEDLE ROLLER BEARINGS

WITH INNER RING



NAF

NAFW



NAF NAFW

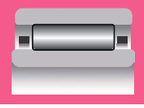
NAF(W) TYPE

Shaft Diameter (mm)	Designation	Dimensions (mm)					Standard mounting dimensions (mm)				Basic dynamic load rating	Basic static load rating	Limiting speed*	Mass	Usable bearing designation	
	NAF(W)	d	D	C	rs min	F	db	Da MAX	da MIN	da MAX	Db	Cr N	Cor N	rpm	g (approx)	OUTER RING	INNER RING
6	NAF 61710	6 0 -0.008	17	10	0.3	10	12.4	15	8	9.7	10.4	4 100	4 500	28 000	14	RNAF101710	IR61010
7	NAF 72012	7 0 -0.008	20	12	0.3	10	13.5	18	9	9.7	10.4	6 000	6 000	28 000	23	RNAF102012	IR71012
9	NAF 92212	9 0 -0.008	22	12	0.3	12	17.5	20	11	11.5	12.4	9 000	8 400	26 000	24	RNAF122212	IR91212
10	NAF 102213	10 0 -0.008	22	13	0.3	14	17.6	20	12	13	14.6	7 800	9 400	24 000	26	RNAF142213	IR101413
	NAFW 102220	10	22	20	0.3	14	17.6	20	12	13	14.6	10 800	14 200	24 000	40	RNAFW142220	IR101420
	NAF 102612	10	26	12	0.3	14	19.4	24	12	13	14.6	9 800	9 700	24 000	36	RNAF142612	IR101412
12	NAF 122413	12 0 -0.008	24	13	0.3	16	19.6	22	14	15	16.6	8 600	11 000	23 000	30	RNAF162413	IR121613
	NAFW 122420	12	24	20	0.3	16	19.6	22	14	15	16.6	11 900	16 700	23 000	45	RNAFW162420	IR121620
	NAF 122812	12	28	12	0.3	16	21.4	26	14	15	16.6	10 500	10 900	23 000	40	RNAF162812	IR121612
15	NAF 152813	15 0 -0.008	28	13	0.3	20	23.6	26	17	19	20.6	9 600	13 500	20 000	37	RNAF202813	IR152013
	NAFW 152826	15	28	26	0.3	20	23.6	26	17	19	20.6	16 500	27 100	20 000	76	RNAFW202826	IR152026
	NAF 153212	15	32	12	0.3	20	25.4	30	17	19	20.6	12 400	14 300	20 000	51	RNAF203212	IR152012
17	NAF 173013	17 0 -0.008	30	13	0.3	22	25.6	28	19	21	22.6	10 200	15 200	18 000	43	RNAF223013	IR172213
	NAFW 173026	17	30	26	0.3	22	25.6	28	19	21	22.6	17 600	30 300	18 000	85	RNAFW223026	IR172226
	NAF 173516	17	35	16	0.3	22	27.8	33	19	21	22.6	17 600	20 900	18 000	77	RNAF223516	IR172216
	NAFW 173532	17	35	32	0.3	22	27.8	33	19	21	22.6	30 200	41 900	18 000	155	RNAFW223532	IR172232
20	NAF 203517	20 0 -0.010	35	17	0.3	25	29.5	33	22	24	25.6	17 300	26 600	16 000	75	RNAF253517	IR202517
	NAFW 203526	20	35	26	0.3	25	29.5	33	22	24	25.6	22 500	37 200	16 000	114	RNAFW253526	IR202526
	NAF 203716	20	37	16	0.3	25	30.4	35	22	24	25.6	19 400	24 500	16 000	80	RNAF253716	IR202516
	NAFW 203732	20	37	32	0.3	25	30.4	35	22	24	25.6	33 200	49 000	16 000	158	RNAFW253732	IR202532
25	NAF 254017	25 0 -0.010	40	17	0.3	30	34.5	38	27	29	30.6	18 600	31 100	13 000	88	RNAF304017	IR253017
	NAFW 254026	25	40	26	0.3	30	34.5	38	27	29	30.6	24 200	43 400	13 000	136	RNAFW304026	IR253026
	NAF 254216	25	42	16	0.3	30	35.4	40	27	29	30.6	20 800	28 300	13 000	94	RNAF304216	IR253016
	NAFW 254232	25	42	32	0.3	30	35.4	40	27	29	30.6	35 700	56 800	13 000	187	RNAFW304232	IR253032
30	NAF 304517	30 0 -0.010	45	17	0.3	35	39.5	43	32	34	35.6	20 500	36 900	11 000	100	RNAF354517	IR303517
	NAFW 304526	30	45	26	0.3	35	39.5	43	32	34	35.6	26 600	51 600	11 000	155	RNAFW354526	IR303526
	NAF 304716	30	47	16	0.3	35	40.4	45	32	34	35.6	23 000	33 800	11 000	108	RNAF354716	IR303516
	NAFW 304732	30	47	32	0.3	35	40.4	45	32	34	35.6	39 500	67 800	11 000	215	RNAFW354732	IR303532

* Suitable for oil lubrication. In case of grease lubrication, down to 50% of this value.

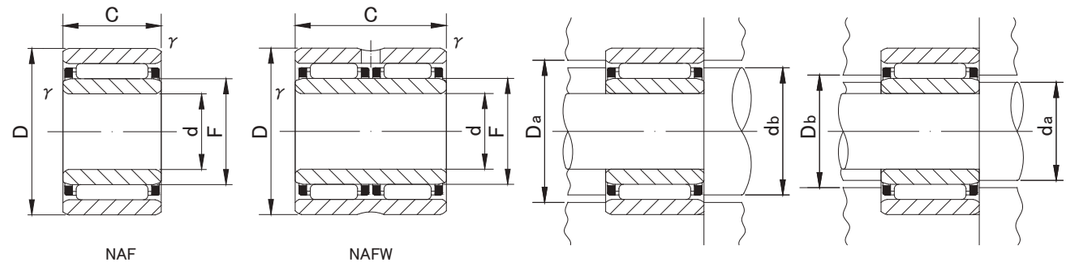
SEPARABLE NEEDLE ROLLER BEARINGS

WITH INNER RING



NAF

NAFW



NAF NAFW

NAF(W) TYPE

Shaft Diameter (mm)	Designation	Dimensions (mm)							Standard mounting dimensions (mm)			Basic dynamic load rating	Basic static load rating	Limiting speed*	Mass	Usable bearing designation	
	NAF(W)	d	D	C	*r*s min	F	db	Da MAX	da MIN	da MAX	Db	Cr N	Cor N	rpm	g (approx)	OUTER RING	INNER RING
35	NAF 355017	35	50	17	0.3	40	43.5	48	37	39	40.8	22 200	42 700	10 000	115	RNAF405017	IR354017
	NAFW 355034	35 0 -0.012	50	34	0.3	40	43.5	48	37	39	40.8	38 000	85 300	10 000	230	RNAFW405034	IR354034
	NAF 355520	35	55	20	0.3	40	45.2	53	37	39	40.8	31 500	48 000	10 000	188	RNAF405520	IR354020
	NAFW 355540	35	55	40	0.3	40	45.2	53	37	39	40.8	53 900	96 000	10 000	375	RNAFW405540	IR354040
40	NAF 405517	40	55	17	0.3	45	48.5	53	42	44	45.8	23 200	47 200	10 000	129	RNAF455517	IR404517
	NAFW 405534	40 0 -0.012	55	34	0.3	45	48.5	53	42	44	45.8	39 900	94 200	10 000	255	RNAFW455534	IR404534
	NAF 406220	40	62	20	0.3	45	50.9	60	42	44	45.8	33 200	53 300	9 000	236	RNAF456220	IR404520
	NAFW 406240	40	62	40	0.3	45	50.9	60	42	44	45.8	57 000	106 900	9 000	475	RNAFW456240	IR404540
45	NAF 456220	45	62	20	0.3	50	54.2	60	47	49	50.8	27 100	59 300	8 000	197	RNAF506220	IR455020
	NAFW 456240	45 0 -0.012	62	40	0.3	50	54.2	60	49	49.5	50.8	46 400	118 700	8 000	389	RNAFW506240	IR455040
	NAF 457220	45	72	20	0.6	55	60.9	68	49	54	55.8	37 400	66 400	7 500	340	RNAF557220	IR455520
	NAFW 457240	45	72	40	0.6	55	60.9	68	49	54	55.8	64 100	132 400	7 500	685	RNAFW557240	IR455540
50	NAF 506820	50	68	20	0.6	55	59.5	64	54	54.5	55.8	28 500	66 000	7 500	230	RNAF556820	IR505520
	NAFW 506840	50 0 -0.012	68	40	0.6	55	59.5	64	54	54.5	55.8	48 900	132 400	7 500	465	RNAFW556840	IR505540
	NAF 507820	50	78	20	1	60	66.3	73	55	59	60.8	38 900	71 700	6 500	390	RNAF607820	IR506020
	NAFW 507840	50	78	40	1	60	66.3	73	55	59	60.8	66 700	143 200	6 500	775	RNAFW607840	IR506040
55	NAF 558530	55 0 -0.015	85	30	1	65	72	80	60	63	66	59 300	127 500	6 000	680	RNAF658530	IR556530
	NAFW 558560	55	85	60	1	65	72	80	60	63	66	102 000	254 000	6 000	1 380	RNAFW658560	IR556560
60	NAF 609030	60 0 -0.015	90	30	1	70	77	85	65	68	71	61 200	135 300	5 500	740	RNAF709030	IR607030
	NAFW 609060	60	90	60	1	70	77	85	65	68	71	104 900	271 600	5 500	1 470	RNAFW709060	IR607060
65	NAF 659530	65 0 -0.015	95	30	1	75	82	90	70	73	76	63 200	144 200	5 500	800	RNAF759530	IR657530
	NAFW 659560	65	95	60	1	75	82	90	70	73	76	108 900	289 300	5 500	1 570	RNAFW759560	IR657560
70	NAF 7010030	70 0 -0.015	100	30	1	80	87	95	75	78	81	64 900	153 000	5 000	840	RNAF8010030	IR708030
	NAFW 7010060	70	100	60	1	80	87	95	75	78	81	111 800	306 000	5 000	1 670	RNAFW8010060	IR708060
75	NAF 7510530	75 0 -0.015	105	30	1	85	92	100	80	83	86	66 600	160 800	4 800	890	RNAF8510530	IR758530
80	NAF 8011030	80 0 -0.015	110	30	1	90	97	105	85	88	91	69 500	173 600	4 500	930	RNAF9011030	IR809030
85	NAF 8511530	85 0 -0.020	115	30	1	95	102	110	90	93	96	70 900	182 400	4 200	970	RNAF9511530	IR859530
90	NAF 9012030	90 0 -0.020	120	30	1	100	107	115	95	98	101	72 600	191 200	4 000	1 040	RNAF10012030	IR9010030

* Suitable for oil lubrication. In case of grease lubrication, down to 50% of this value.

COMBINED NEEDLE ROLLER BEARINGS

Combined needle roller bearings (NKX..(Z), NKXI..(Z))

Type and Part Code

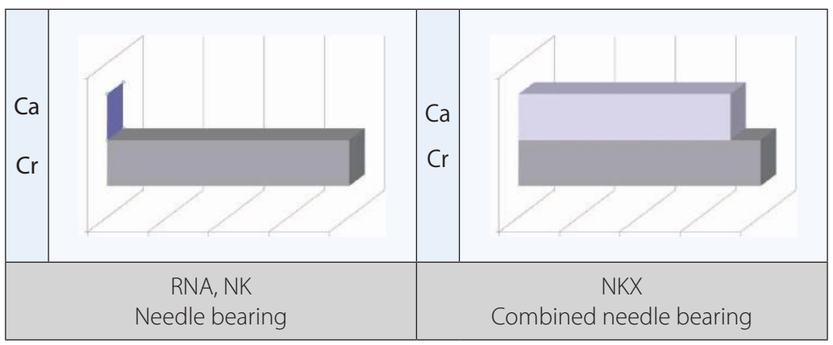
Type	Applicable axis diameter	Feature	Part Code
 NKX..(Z)	ϕ 10 ~ ϕ 70	Machined type combined bearing Radial bearing: needle bearing Thrust bearing: ball bearing With collar outer ring Without inner ring	**Type** NKX → Type of bearing **Dimensions** 30 → Inscribed circle diameter Z → Z: With dust cover No symbol: Without dust cover
 NKXI..(Z)	ϕ 7 ~ ϕ 60	Machined type combined bearing Radial bearing: needle bearing Thrust bearing: ball bearing With collar outer ring With inner ring	**Type** NKXI → Type of bearing **Dimensions** 25 → Bore diameter Z → Z: With dust cover No symbol: Without dust cover **Suffix code** C3 → Clearance symbol (C3 clearance) (Standard: No symbol, CN clearance)

Structure and Features

Combined needle roller bearings are made from a combination of radial needle bearings which support radial load and thrust ball bearings which support axial load.

Combined needle roller bearings are compact and simultaneously supports both radial and axial load. As such, it is possible to design more compact equipment as the space occupied by bearings can be kept small.

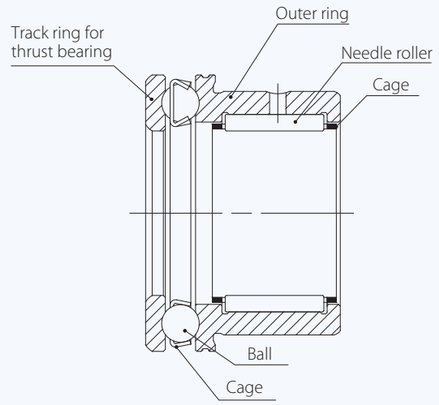
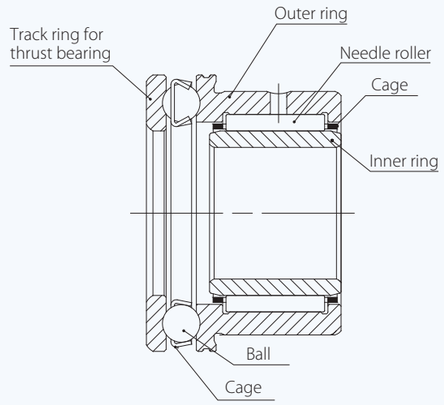
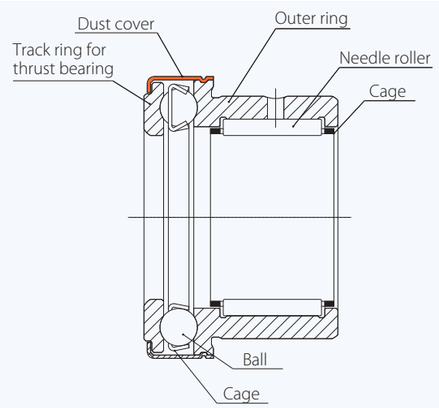
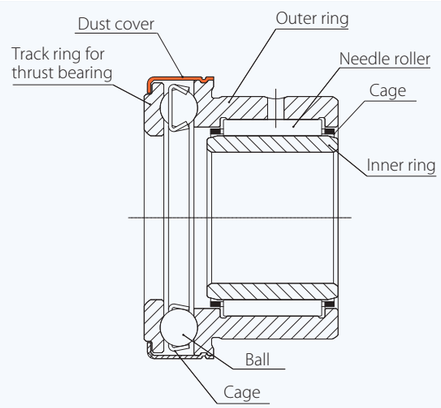
Moreover, on the type featuring a dust cover, the thrust bearing does not separate, therefore it is easy to handle and when greasing, splattering caused by centrifugal force within the thrust bearing can be prevented.



RNA, NK
Needle bearing

NKX
Combined needle bearing

Ca : Axial load
Cr : Radial load

	Without inner ring	With inner ring
Without dust cover	 Structure of type NKX	 Structure of type NKXI
With dust cover	 Structure of type NKX..Z	 Structure of type NKXI..Z

Accuracy standard

Please refer to page 22 regarding accuracies for the radial section of combined needle bearings. Table-1 indicates thrust section accuracies.

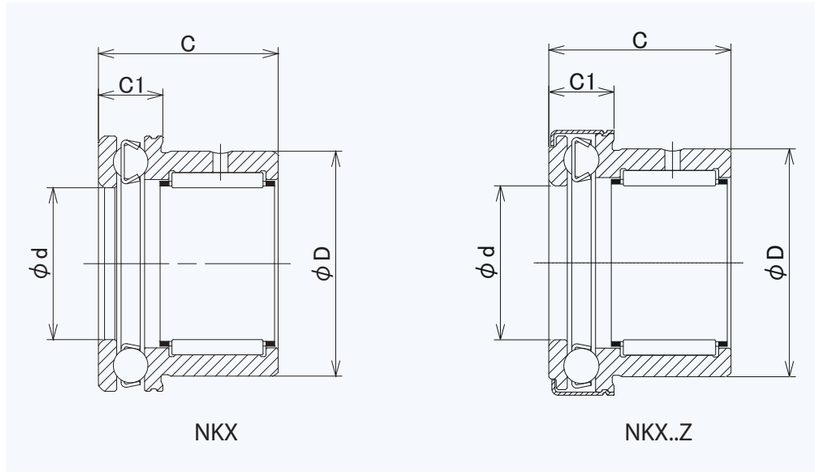
Table-1 Thrust section accuracies Unit: μm

Part code	Inner ring			Outer ring			Inner ring/Outer ring		
	Δ_{dmp} Deviation of mean bore diameter in a single plane		V_{dsp} Variation of bore diameter in a single plane	Δ_{Dmp} Deviation of mean outer diameter in a single plane		V_{Dsp} Variation of outer diameter in a single plane	*Si/Se* Variation of track thickness		
							Class 0	Class 6	Class 5
	high	low	max.	high	low	max.	max.		
NKX10 to 15(Z) NKXI7 to 12(Z)	0	-8	6	0	-11	8	10	5	3
NKX17 to 30(Z) NKXI14 to 25(Z)	0	-10	8	0	-13	10	10	5	3
NKX35 to 50(Z) NKXI30 to 45(Z)	0	-12	9	0	-16	12	10	6	3
NKX60 to 70(Z) NKXI50 to 60(Z)	0	-15	11	0	-19	14	10	7	4

Table-2 indicates the accuracies of the assembled bearings.

Table-2 Assembled bearing accuracy Unit: mm

d	D	C	C1
E8 (Fitting accuracy)	H5 (Fitting accuracy)	MAX. 0 MIN, -0.25	MAX. 0 MIN, -0.2



Radial internal clearance

Table-3 indicates the radial internal clearances of combined needle bearings with inner rings (NKXI).

Table-3 Radial internal clearances Unit: μm

Part code	Radial internal clearance	
	min.	max.
NKXI 7 to 25	20	45
NKXI 30 to 40	25	50
NKXI 45 to 50	30	60
NKXI 60	40	70
NKXI 70	40	75

Fits

Table-4 indicates the recommended fits between the combined needle bearing and shaft and housing.

Table-4 Recommended fits Unit: μm

Shaft tolerance		Housing tolerance
Without Inner ring	With Inner ring	
H5 K5	K5	K6, M6

Lubrication

Please refer to page 43 - 7 Lubrication regarding lubrication for the radial and thrust sections of combined needle bearings. For both the time with a dust cover and without, grease is pre-packed into the thrust section before factory dispatch.

Rating life

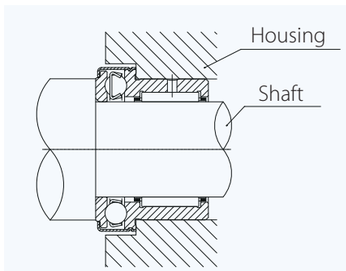
Please calculate rating life for radial needle bearings and thrust ball bearings respectively using the formula provided on page 12 - 1 Bearing Life and Load Rating. Assume that the radial needle bearing supports the radial element of load while the thrust ball bearing supports the thrust element. The overall rating life is then calculated using the respective calculation results in the below formula.

$$L = \left[\left(\frac{1}{L_a} \right)^{3/2} + \left(\frac{1}{L_r} \right)^{3/2} \right]^{-2/3} \quad \cdots\cdots\cdots\cdots \quad (0.0)$$

L : Basic rating life of combined needle bearings is 10^6 rotation 10^6 REV.
L_r : Basic rating life of radial needle bearings is 10^6 rotation 10^6 REV.
L_a : Basic rating life of thrust ball bearings is 10^6 rotation 10^6 REV.

Mounting

The below is an example of combined needle bearing mounting. The thrust section housing and its clearance must be made 0.5 mm or greater than the outer diameter of the outer ring collar (NKX(I)) and the outer diameter of the dust cover (NKX(I)..Z).

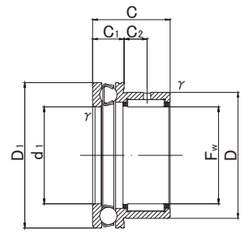


COMBINED NEEDLE ROLLER BEARINGS

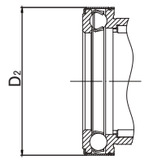
WITH AXIAL BALL BEARINGS WITHOUT INNER RINGS

NKX

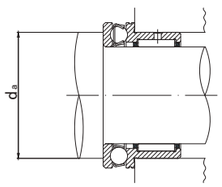
NKX..Z



NKX



NKX..Z



NKX,NKX..Z TYPE

Shaft diameter (mm)	Designation		Dimensions (mm)									Standard mounting dimensions (mm)	Basic dynamic load rating		Basic static load rating		Limiting speed (Grease)*	Mass	Usable bearing designation	
	Open type	With dust cover											Radial	Axial	Radial	Axial				
	Grease pre-packed in thrust section		Fw	D	D1	D2	C	C1	C2	r's min	d1	da MIN	Cr N		Cor N		rpm	g (approx.)	INNER RING	WITH INNER RING
10	NKX10	—	10 +0.022	19	24	—	23	9	6.5	0.3	10	18	8 200	10 000	9 200	14 000	9 500	36	IR71016	NKXI 7
	—	NKX10Z	10 +0.013	19	—	25	23	9	6.5	0.3	10	18	8 200	10 000	9 200	14 000	9 500	37.5	IR71016	NKXI 7Z
12	NKX12	—	12 +0.027	21	26	—	23	9	6.5	0.3	12	20	9 200	10 300	11 200	15 400	9 200	40.5	IR91216	NKXI 9
	—	NKX12Z	12 +0.016	21	—	27	23	9	6.5	0.3	12	20	9 200	10 300	11 200	15 400	9 200	42	IR91216	NKXI 9Z
15	NKX15	—	15 +0.027	24	28	—	23	9	6.5	0.3	15	23	12 400	10 500	14 900	16 800	8 800	44	IR121516	NKXI 12
	—	NKX15Z	15 +0.016	24	—	29	23	9	6.5	0.3	15	23	12 400	10 500	14 900	16 800	8 800	45.5	IR121516	NKXI 12Z
17	NKX17	—	17 +0.027	26	30	—	25	9	8	0.3	17	25	12 800	10 800	16 300	18 200	8 500	52	IR141717	NKXI 14
	—	NKX17Z	17 +0.016	26	—	31	25	9	8	0.3	17	25	12 800	10 800	16 300	18 200	8 500	53.5	IR141717	NKXI 14Z
20	NKX20	—	20 +0.033	30	35	—	30	10	10.5	0.3	20	29	17 600	14 200	25 400	24 700	7 500	83	IR172020	NKXI 17
	—	NKX20Z	20 +0.020	30	—	36	30	10	10.5	0.3	20	29	17 600	14 200	25 400	24 700	7 500	85.5	IR172020	NKXI 17Z
25	NKX25	—	25 +0.033	37	42	—	30	11	9.5	0.6	25	35	20 000	19 600	32 200	37 300	6 500	124.5	IR202520	NKXI 20
	—	NKX25Z	25 +0.020	37	—	43	30	11	9.5	0.6	25	35	20 000	19 600	32 200	37 300	6 500	127.5	IR202520	NKXI 20Z
30	NKX30	—	30 +0.033	42	47	—	30	11	9.5	0.6	30	40	25 100	20 400	40 100	42 200	6 200	141.5	IR253020	NKXI 25
	—	NKX30Z	30 +0.020	42	—	48	30	11	9.5	0.6	30	40	25 100	20 400	40 100	42 200	6 200	145	IR253020	NKXI 25Z
35	NKX35	—	35 +0.041	47	52	—	30	12	9	0.6	35	45	27 000	20 400	46 200	44 700	5 600	163	IR303520	NKXI 30
	—	NKX35Z	35 +0.025	47	—	53	30	12	9	0.6	35	45	27 000	20 400	46 200	44 700	5 600	167.5	IR303520	NKXI 30Z
40	NKX40	—	40 +0.041	52	60	—	32	13	10	0.6	40	52	29 400	26 900	54 100	62 900	5 000	214	IR354020	NKXI 35
	—	NKX40Z	40 +0.025	52	—	61	32	13	10	0.6	40	52	29 400	26 900	54 100	62 900	5 000	220	IR354020	NKXI 35Z
45	NKX45	—	45 +0.041	58	65	—	32	14	9	0.6	45	57	31 100	27 900	60 100	69 200	4 600	251	IR404520	NKXI 40
	—	NKX45Z	45 +0.025	58	—	66.5	32	14	9	0.6	45	57	31 100	27 900	60 100	69 200	4 600	264.5	IR404520	NKXI 40Z
50	NKX50	—	50 +0.041	62	70	—	35	14	10	0.6	50	62	43 000	28 700	85 200	75 400	4 500	277	IR455025	NKXI 45
	—	NKX50Z	50 +0.025	62	—	71.5	35	14	10	0.6	50	62	43 000	28 700	85 200	75 400	4 500	291.5	IR455025	NKXI 45Z
60	NKX60	—	60 +0.049	72	85	—	40	17	12	1	60	75	47 500	41 400	103 000	113 000	3 700	443	IR506025	NKXI 50
	—	NKX60Z	60 +0.030	72	—	86.5	40	17	12	1	60	75	47 500	41 400	103 000	113 000	3 700	465.5	IR506025	NKXI 50Z
70	NKX70	—	70 +0.049	85	95	—	40	18	11	1	70	85	55 500	43 100	120 600	127 000	3 400	577	IR607025	NKXI 60
	—	NKX70Z	70 +0.030	85	—	96.5	40	18	11	1	70	85	55 500	43 100	120 600	127 000	3 400	601	IR607025	NKXI 60Z

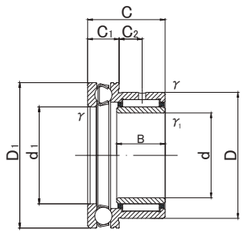
* Suitable for oil lubrication. In case of grease lubrication, down to 70% of this value.

COMBINED NEEDLE ROLLER BEARINGS

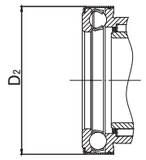
WITH AXIAL BALL BEARINGS WITH INNER RINGS


NKXI

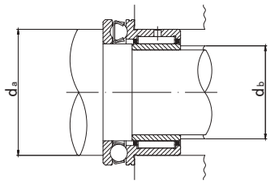

NKXI..Z



NKXI



NKXI..Z



NKXI,NKXI..Z TYPE

Shaft diameter (mm)	Designation		Dimensions (mm)											Standard mounting dimensions (mm)		Basic dynamic load rating		Basic static load rating		Limiting speed (Grease)*	Mass	Usable bearing designation	
	Open type	With dust cover														Radial		Radial					
	Grease pre-packed in thrust section		d		D	D1	D2	B	C	C1	C2	*r*s min	*r*s1 min	d1	da MIN	db	Cr N		Cor N		rpm	g (approx.)	OUTER RING	INNER RING
7	**NKXI 7**	—	7	0 -0.008	19	24	25	16	23	9	6.5	0.3	0.3	10	18	9	8 200	10 000	9 200	14 000	9 500	41	NKX10	IR71016
	—	**NKXI 7Z**	7	0 -0.008	19	24	25	16	23	9	6.5	0.3	0.3	10	18	9	8 200	10 000	9 200	14 000	9 500	42.5	NKX10Z	IR71016
9	**NKXI 9**	—	9	0 -0.008	21	26	27	16	23	9	6.5	0.3	0.3	12	20	11	9 200	10 300	11 200	15 400	9 200	46.5	NKX12	IR91216
	—	**NKXI 9Z**	9	0 -0.008	21	26	27	16	23	9	6.5	0.3	0.3	12	20	11	9 200	10 300	11 200	15 400	9 200	48	NKX12Z	IR91216
12	**NKXI 12**	—	12	0 -0.008	24	28	29	16	23	9	6.5	0.3	0.3	15	23	14	12 400	10 500	14 900	16 800	8 800	51.8	NKX15	IR121516
	—	**NKXI 12Z**	12	0 -0.008	24	28	29	16	23	9	6.5	0.3	0.3	15	23	14	12 400	10 500	14 900	16 800	8 800	53.3	NKX15Z	IR121516
14	**NKXI 14**	—	14	0 -0.008	26	30	31	17	25	9	8	0.3	0.3	17	25	16	12 800	10 800	16 300	18 200	8 500	61.5	NKX17	IR141717
	—	**NKXI 14Z**	14	0 -0.008	26	30	31	17	25	9	8	0.3	0.3	17	25	16	12 800	10 800	16 300	18 200	8 500	63	NKX17Z	IR141717
17	**NKXI 17**	—	17	0 -0.008	30	35	36	20	30	10	10.5	0.3	0.3	20	29	19	17 600	14 200	25 400	24 700	7 500	97	NKX20	IR172020
	—	**NKXI 17Z**	17	0 -0.008	30	35	36	20	30	10	10.5	0.3	0.3	20	29	19	17 600	14 200	25 400	24 700	7 500	99.5	NKX20Z	IR172020
20	**NKXI 20**	—	20	0 -0.010	37	42	43	20	30	11	9.5	0.6	0.3	25	35	24	20 000	19 600	32 200	37 300	6 500	151.5	NKX25	IR202520
	—	**NKXI 20Z**	20	0 -0.010	37	42	43	20	30	11	9.5	0.6	0.3	25	35	24	20 000	19 600	32 200	37 300	6 500	154.5	NKX25Z	IR202520
25	**NKXI 25**	—	25	0 -0.010	42	47	48	20	30	11	9.5	0.6	0.3	30	40	29	25 100	20 400	40 100	42 200	6 200	174.5	NKX30	IR253020
	—	**NKXI 25Z**	25	0 -0.010	42	47	48	20	30	11	9.5	0.6	0.3	30	40	29	25 100	20 400	40 100	42 200	6 200	178	NKX30Z	IR253020
30	**NKXI 30**	—	30	0 -0.010	47	52	53	20	30	12	9	0.6	0.3	35	45	34	27 000	20 400	46 200	44 700	5 600	201.5	NKX35	IR303520
	—	**NKXI 30Z**	30	0 -0.010	47	52	53	20	30	12	9	0.6	0.3	35	45	34	27 000	20 400	46 200	44 700	5 600	206	NKX35Z	IR303520
35	**NKXI 35**	—	35	0 -0.012	52	60	61	20	32	13	10	0.6	0.3	40	52	39	29 400	26 900	54 100	62 900	5 000	260	NKX40	IR354020
	—	**NKXI 35Z**	35	0 -0.012	52	60	61	20	32	13	10	0.6	0.3	40	52	39	29 400	26 900	54 100	62 900	5 000	266	NKX40Z	IR354020
40	**NKXI 40**	—	40	0 -0.012	58	65	66.5	20	32	14	9	0.6	0.3	45	57	44	31 100	27 900	60 100	69 200	4 600	302	NKX45	IR404520
	—	**NKXI 40Z**	40	0 -0.012	58	65	66.5	20	32	14	9	0.6	0.3	45	57	44	31 100	27 900	60 100	69 200	4 600	315.5	NKX45Z	IR404520
45	**NKXI 45**	—	45	0 -0.012	62	70	71.5	25	35	14	10	0.6	0.6	50	62	49	43 000	28 700	85 200	75 400	4 500	348	NKX50	IR455025
	—	**NKXI 45Z**	45	0 -0.012	62	70	71.5	25	35	14	10	0.6	0.6	50	62	49	43 000	28 700	85 200	75 400	4 500	362.5	NKX50Z	IR455025
50	**NKXI 50**	—	50	0 -0.012	72	85	86.5	25	40	17	12	1	1	60	75	59	47 500	41 400	103 000	113 000	3 700	606	NKX60	IR506025
	—	**NKXI 50Z**	50	0 -0.012	72	85	86.5	25	40	17	12	1	1	60	75	59	47 500	41 400	103 000	113 000	3 700	628.5	NKX60Z	IR506025
60	**NKXI 60**	—	60	0 -0.015	85	95	96.5	25	40	18	11	1	1	70	85	68	55 500	43 100	120 600	127 000	3 400	772	NKX70	IR607025
	—	**NKXI 60Z**	60	0 -0.015	85	95	96.5	25	40	18	11	1	1	70	85	68	55 500	43 100	120 600	127 000	3 400	796	NKX70Z	IR607025

* Suitable for oil lubrication. In case of grease lubrication, down to 70% of this value.

NKXI, NKXI..Z

INNER RINGS

Inner ring (IR, IRZ)

Type and Part Code

Type	Applicable axis diameter	Feature	Part Code
 IR	ϕ 5 ~ ϕ 160	Inner ring (without oil hole)	**Type** IR ↓ Type of bearing; **Dimensions** 25 ↓ Bore diameter; 30 ↓ Outer diameter; 17 ↓ Width
 IRZ	ϕ 10 ~ ϕ 50	Inner ring (with oil hole)	**Type** IRZ ↓ Type of bearing; **Dimensions** 25 ↓ Bore diameter; 30 ↓ Outer diameter; 18 ↓ Width

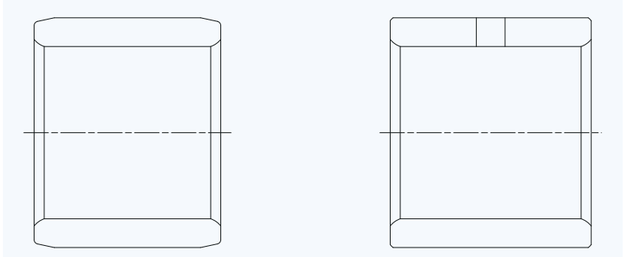
Structure and Features

For needle bearings, normally a shaft is subjected to heat treatment and is given a grinding finish before being used as a track surface, however, if the specified hardness and roughness cannot be achieved, inner rings are used.

Inner rings, after being subjected to heat treatment, are given a high accuracy grinding finish. The endfaces are chamfered to allow easy insertion into the bearing and to prevent damage to the seal. Depending on the conditions of use, there are inner rings with oil holes or without oil holes available to select from.

It is preferable to use wide inner rings in cases where there is large shaft travel in the axial direction or a seal is used on the outside of the bearing.

Inner rings can also be used as bushes.



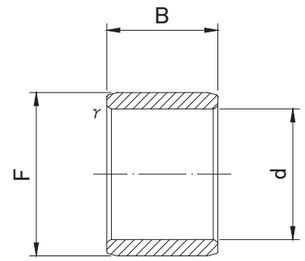
IR
IR (without oil hole)

IRZ
IRZ (with oil hole)

INNER RINGS

IR

IRZ



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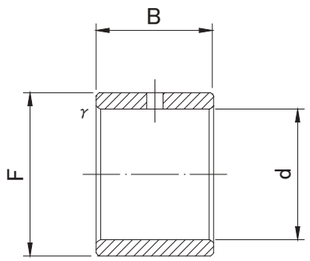
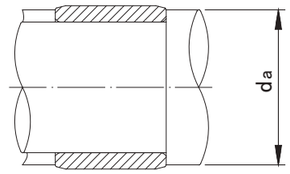


IRZ



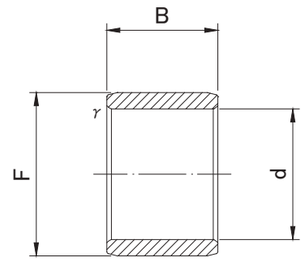
IR,IRZ TYPE

Shaft Diameter (mm)	Designation		Dimensions (mm)				Standard mounting dimensions (mm)		Mass	Usable bearing designation						
	IR	IRZ	d	F	B	*r*s min	da MIN	da MAX	g (approx)	RNA 49	RNA 59	RNA 69	RNA 48	NK	NKX(Z)	RNAF
5	IR 5710	—	5 0 -0.008	7	10	0.15	6.2	6.7	1.4	RNA 495	—	—	—	—	—	—
	IR 5812	—		8	12	0.3	7	7.7	3	—	—	—	—	NK 8/12	—	—
	IR 5816	—		8	16	0.3	7	7.7	4	—	—	—	—	NK 8/16	—	—
6	IR 6810	—	6 0 -0.008	8	10	0.15	7.2	7.7	1.7	RNA 496	—	—	—	—	—	—
	IR 6912	—		9	12	0.3	8	8.7	3.2	—	—	—	—	NK 9/12	—	—
	IR 6916	—		9	16	0.3	8	8.7	4.3	—	—	—	—	NK 9/16	—	—
	IR 61010	—	6	10	10	0.3	8	9.7	4	—	—	—	—	—	—	RNAF 101710
7	IR 7910	—	7 0 -0.008	9	10	0.15	8.2	8.7	1.9	RNA 497	—	—	—	—	—	—
	IR 71010.5	—		10	10.5	0.3	9	9.7	3.2	—	—	—	—	—	—	—
	IR 71012	—		10	12	0.3	9	9.7	3.6	—	—	—	—	NK 10/12	—	RNAF 102012
	IR 71012.5	—		10	12.5	0.3	9	9.7	3.9	—	—	—	—	—	—	—
	IR 71015.5	—		10	15.5	0.3	9	9.7	4.8	—	—	—	—	—	—	—
	IR 71016	—		10	16	0.3	9	9.7	5	—	—	—	—	NK 10/16	NKX10(Z)	—
8	IR 81011	—	8 0 -0.008	10	11	0.15	9.2	9.7	2.4	RNA 498	—	—	—	—	—	—
	IR 81210	—		12	10	0.3	10	11	4.8	—	—	—	—	—	—	—
	IR 81210.5	—		12	10.5	0.3	10	11	5.1	—	—	—	—	—	—	—
	IR 81212.5	—		12	12.5	0.3	10	11	6	—	—	—	—	—	—	—
	IR 81215.5	—		12	15.5	0.3	10	11	7.5	—	—	—	—	—	—	—
9	IR 91211	—	9 0 -0.008	12	11	0.3	11	11.5	3.1	RNA 499	—	—	—	—	—	—
	IR 91212	—		12	12	0.3	11	11.5	4.5	—	—	—	—	NK 12/12	—	RNAF 122212
	IR 91216	—		12	16	0.3	11	11.5	6	—	—	—	—	NK 12/16	NKX12(Z)	—
10	IR 101312.5	—	10 0 -0.008	13	12.5	0.3	12	12	5.2	—	—	—	—	—	—	—
	IR 101412	—		14	12	0.3	12	13	7	—	—	—	—	—	—	RNAF 142612
	IR 101412.5	—		14	12.5	0.3	12	13	7.2	—	—	—	—	—	—	—
	IR 101413	—		14	13	0.3	12	13	7.5	RNA 4900	—	—	—	—	—	RNAF 142213
	—	IRZ 101414		14	14	0.3	12	13	8	RNA 4900UU	—	—	—	—	—	—
	IR 101416	—		14	16	0.3	12	13	9	—	—	—	—	NK 14/16	—	—
	IR 101416.5	—		14	16.5	0.3	12	13	9.6	—	—	—	—	—	—	—
	IR 101420	—		14	20	0.3	12	13	11.5	—	—	—	—	NK 14/20	—	RNAFW 142220
	IR 101420.5	—		14	20.5	0.3	12	13	11.9	—	—	—	—	—	—	—
	IR 101510.5	—		15	10.5	0.3	12	14	7.9	—	—	—	—	—	—	—
	IR 101515.5	—		15	15.5	0.3	12	14	11.7	—	—	—	—	—	—	—
	IR 101520.5	—		15	20.5	0.3	12	14	15.5	—	—	—	—	—	—	—
	IR 101525.5	—		15	25.5	0.3	12	14	19.3	—	—	—	—	—	—	—

INNER RINGS

IR

IRZ



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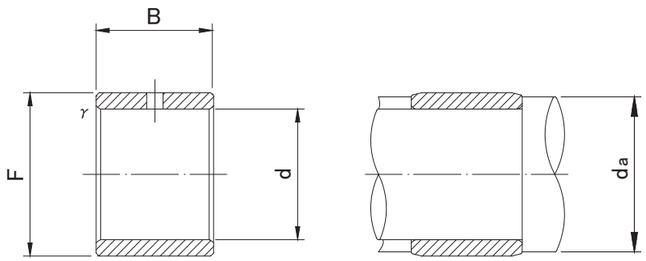


IRZ

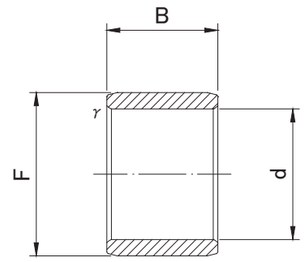
IR,IRZ TYPE

Shaft Diameter (mm)	Designation		Dimensions (mm)				Standard mounting dimensions (mm)		Mass	Usable bearing designation						
	IR	IRZ	d	F	B	*r*s min	da MIN	da MAX	g (approx)	RNA 49	RNA 59	RNA 69	RNA 48	NK	NKX(Z)	RNAF
12	IR 121512.5	—	12 0 -0.008	15	12.5	0.3	14	14	6.1	—	—	—	—	—	—	—
	IR 121516	—		15	16	0.3	14	14	7.8	—	—	—	—	—	NKX15(Z)	—
	IR 121516.5	—		15	16.5	0.3	14	14	8.1	—	—	—	—	—	—	—
	IR 121522.5	—		15	22.5	0.3	14	14	11	—	—	—	—	—	—	—
	IR 121612	—		16	12	0.3	14	15	8	—	—	—	—	—	—	RNAF 162812
	IR 121612.5	—		16	12.5	0.3	14	15	8.5	—	—	—	—	—	—	—
	IR 121613	—		16	13	0.3	14	15	8.5	RNA 4901	—	—	—	—	—	RNAF 162413
	—	IRZ 121614		16	14	0.3	14	15	9.6	RNA 4901UU	—	—	—	—	—	—
	IR 121616	—		16	16	0.3	14	15	10.5	—	—	—	—	NK 16/16	—	—
	IR 121616.5	—		16	16.5	0.3	14	15	11.2	—	—	—	—	—	—	—
	IR 121620	—		16	20	0.3	14	15	13.5	—	—	—	—	NK 16/20	—	RNAFW 162420
	IR 121620.5	—		16	20.5	0.3	14	15	13.9	—	—	—	—	—	—	—
	IR 121622	—		16	22	0.3	14	15	14.5	—	—	RNA 6901	—	—	—	—
	IR 121622.5	—		16	22.5	0.3	14	15	15.2	—	—	—	—	—	—	—
	—	IRZ 121623		16	23	0.3	14	15	15.5	—	—	RNA 6901UU	—	—	—	—
	IR 121715.5	—		17	15.5	0.3	14	16	13.6	—	—	—	—	—	—	—
	IR 121720.5	—		17	20.5	0.3	14	16	18	—	—	—	—	—	—	—
14	IR 141717	—	14 0 -0.008	17	17	0.3	16	16	9.5	—	—	—	—	—	NKX17(Z)	—
15	IR 151812.5	—	15 0 -0.008	18	12.5	0.3	17	17	7.5	—	—	—	—	—	—	—
	IR 151815.5	—		18	15.5	0.3	17	17	9.3	—	—	—	—	—	—	—
	IR 151816.5	—		18	16.5	0.3	17	17	9.9	—	—	—	—	—	—	—
	IR 151820.5	—		18	20.5	0.3	17	17	12.3	—	—	—	—	—	—	—
	IR 151825.5	—		18	25.5	0.3	17	17	15.2	—	—	—	—	—	—	—
	IR 151916	—		19	16	0.3	17	18	12.5	—	—	—	—	NK 19/16	—	—
	IR 151916.5	—		19	16.5	0.3	17	18	13.6	—	—	—	—	—	—	—
	IR 151920	—		19	20	0.3	17	18	16	—	—	—	—	NK 19/20	—	—
	IR 151920.5	—		19	20.5	0.3	17	18	12.3	—	—	—	—	—	—	—
	IR 152012	—		20	12	0.3	17	19	12	—	—	—	—	—	—	RNAF 203212
	IR 152013	—		20	13	0.3	17	19	13.5	RNA 4902	—	—	—	—	—	RNAF 202813
	—	IRZ 152014		20	14	0.3	17	19	14.5	RNA 4902UU	—	—	—	—	—	—
	IR 152015.5	—		20	15.5	0.3	17	19	16.4	—	—	—	—	—	—	—
	IR 152018	—		20	18	0.3	17	19	19	—	RNA 5902	—	—	—	—	—
	IR 152020.5	—		20	20.5	0.3	17	19	21.5	—	—	—	—	—	—	—
	IR 152023	—		20	23	0.3	17	19	24	—	—	RNA 6902	—	—	—	—
	—	IRZ 152024		20	24	0.3	17	19	25	—	—	RNA 6902UU	—	—	—	—
	IR 152026	—		20	26	0.3	17	19	28	—	—	—	—	—	—	RNAFW 202826

INNER RINGS

IR

IRZ



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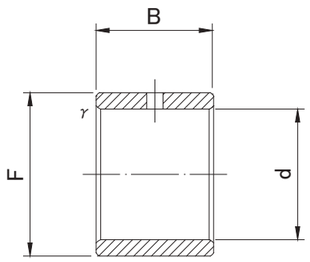

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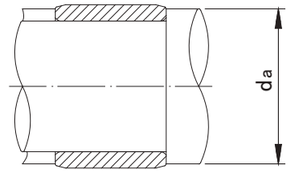

IR,IRZ TYPE

Shaft Diameter (mm)	Designation		Dimensions (mm)				Standard mounting dimensions (mm)		Mass	Usable bearing designation						
	IR	IRZ	d	F	B	*r*s min	da MIN	da MAX	g (approx)	RNA 49	RNA 59	RNA 69	RNA 48	NK	NKX(Z)	RNAF
17	**IR 172016.5**	—	17 0 -0.008	20	16.5	0.3	19	19	11.1	—	—	—	—	—	—	—
	IR 172020	—		20	20	0.3	19	19	14	—	—	—	—	—	NKX20(Z)	—
	IR 172020.5	—		20	20.5	0.3	19	19	13.7	—	—	—	—	—	—	—
	IR 172030.5	—		20	30.5	0.3	19	19	20.5	—	—	—	—	—	—	—
	IR 172116	—		21	16	0.3	19	20	14.5	—	—	—	—	NK 21/16	—	—
	IR 172120	—		21	20	0.3	19	20	18	—	—	—	—	NK 21/20	—	—
	IR 172213	—		22	13	0.3	19	21	15.5	RNA 4903	—	—	—	—	—	RNAF 223013
	—	**IRZ 172214**		22	14	0.3	19	21	16.5	RNA 4903UU	—	—	—	—	—	—
	IR 172215.5	—		22	15.5	0.3	19	21	18.3	—	—	—	—	—	—	—
	IR 172216	—		22	16	0.3	19	21	19	—	—	—	—	—	—	RNAF 223516
	IR 172216.5	—		22	16.5	0.3	19	21	19.4	—	—	—	—	—	—	—
	IR 172218	—		22	18	0.3	19	21	21	—	RNA 5903	—	—	—	—	—
	IR 172223	—		22	23	0.3	19	21	26.5	—	—	RNA 6903	—	—	—	—
	—	**IRZ 172224**		22	24	0.3	19	21	28	—	—	RNA 6903UU	—	—	—	—
	IR 172225.5	—		22	25.5	0.3	19	21	30	—	—	—	—	—	—	—
	IR 172226	—		22	26	0.3	19	21	31	—	—	—	—	—	—	RNAFW 223026
	IR 172232	—		22	32	0.3	19	21	38	—	—	—	—	—	—	RNAFW 223532
20	**IR 202416**	—	20 0 -0.010	24	16	0.3	22	23	16.5	—	—	—	—	NK 24/16	—	—
	IR 202416.5	—		24	16.5	0.3	22	23	17.5	—	—	—	—	—	—	—
	IR 202420	—		24	20	0.3	22	23	20.5	—	—	—	—	NK 24/20	—	—
	IR 202420.5	—		24	20.5	0.3	22	23	22	—	—	—	—	—	—	—
	IR 202510.5	—		25	10.5	0.3	22	24	14.3	—	—	—	—	—	—	—
	IR 202515.5	—		25	15.5	0.3	22	24	21	—	—	—	—	—	—	—
	IR 202516	—		25	16	0.3	22	24	22	—	—	—	—	—	—	RNAF 253716
	IR 202517	—		25	17	0.3	22	24	23	RNA 4904	—	—	—	—	—	RNAF 253517
	—	**IRZ 202518**		25	18	0.3	22	24	24	RNA 4904UU	—	—	—	—	—	—
	IR 202520	—		25	20	0.3	22	24	27	—	—	—	—	—	NKX25(Z)	—
	IR 202520.5	—		25	20.5	0.3	22	24	28	—	—	—	—	—	—	—
	IR 202523	—		25	23	0.3	22	24	31	—	RNA 5904	—	—	—	—	—
	IR 202525.5	—		25	25.5	0.3	22	24	34.5	—	—	—	—	—	—	—
	IR 202526	—		25	26	0.3	22	24	36	—	—	—	—	—	—	RNAFW 253526
	IR 202526.5	—		25	26.5	0.3	22	24	36	—	—	—	—	—	—	—
	IR 202530	—		25	30	0.3	22	24	40.5	—	—	RNA 6904	—	—	—	—
	—	**IRZ 202531**		25	31	0.3	22	24	41.5	—	—	RNA 6904UU	—	—	—	—
	IR 202532	—		25	32	0.3	22	24	44	—	—	—	—	—	—	RNAFW 253732

INNER RINGS

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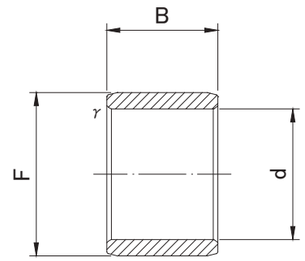

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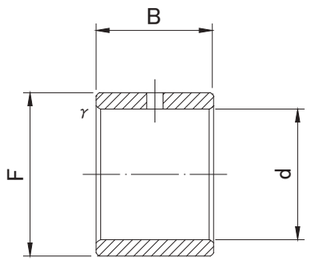

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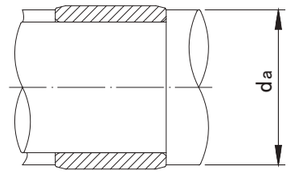

IR,IRZ TYPE

Shaft Diameter (mm)	Designation		Dimensions (mm)				Standard mounting dimensions (mm)		Mass	Usable bearing designation						
	IR	IRZ	d	F	B	*r*s min	da MIN	da MAX	g (approx)	RNA 49	RNA 59	RNA 69	RNA 48	NK	NKX(Z)	RNAF
22	**IR 222616**	—	22	26	16	0.3	24	25	17.5	—	—	—	—	NK 26/16	—	—
	IR 222620	—	22	26	20	0.3	24	25	24	—	—	—	—	NK 26/20	—	—
	IR 222817	—	22 0 -0.010	28	17	0.3	24	27	30.5	RNA 49/22	—	—	—	—	—	—
	IR 222820.5	—	22	28	20.5	0.3	24	27	37	—	—	—	—	—	—	—
	IR 222823	—	22	28	23	0.3	24	27	42	—	RNA 59/22	—	—	—	—	—
	IR 222830	—	22	28	30	0.3	24	27	55	—	—	RNA 69/22	—	—	—	—
25	**IR 252920**	—	25	29	20	0.3	27	28	25	—	—	—	—	NK 29/20	—	—
	IR 252930	—	25	29	30	0.3	27	28	38	—	—	—	—	NK 29/30	—	—
	IR 253015	—	25	30	15	0.3	27	29	24.5	—	—	—	—	—	—	—
	IR 253015.5	—	25	30	15.5	0.3	27	29	25.5	—	—	—	—	—	—	—
	IR 253016	—	25	30	16	0.3	27	29	28	—	—	—	—	—	—	RNAF 304216
	IR 253017	—	25	30	17	0.3	27	29	28.5	RNA 4905	—	—	—	—	—	RNAF 304017
	—	**IRZ 253018**	25	30	18	0.3	27	29	29.5	RNA 4905UU	—	—	—	—	—	—
	IR 253020	—	25	30	20	0.3	27	29	33	—	—	—	—	—	NKX30(Z)	—
	IR 253020.5	—	25 0	30	20.5	0.3	27	29	34	—	—	—	—	—	—	—
	IR 253023	—	25 -0.010	30	23	0.3	27	29	38	—	RNA 5905	—	—	—	—	—
	IR 253025.5	—	25	30	25.5	0.3	27	29	42.5	—	—	—	—	—	—	—
	IR 253026	—	25	30	26	0.3	27	29	44.5	—	—	—	—	—	—	RNAFW 304026
	IR 253026.5	—	25	30	26.5	0.3	27	29	44	—	—	—	—	—	—	—
	IR 253030	—	25	30	30	0.3	27	29	49	—	—	RNA 6905	—	—	—	—
	IR 253030.5	—	25	30	30.5	0.3	24	29	50.5	—	—	—	—	—	—	—
	—	**IRZ 253031**	25	30	31	0.3	27	29	51	—	—	RNA 6905UU	—	—	—	—
	IR 253032	—	25	30	32	0.3	27	29	54	—	—	—	—	—	—	RNAFW 304232
	IR 253038.5	—	25	30	38.5	0.3	27	29	64	—	—	—	—	—	—	—
28	**IR 283217**	—	28	32	17	0.3	30	31	24.5	RNA 49/28	—	—	—	—	—	—
	IR 283220	—	28	32	20	0.3	30	31	28.5	—	—	—	—	NK 32/20	—	—
	IR 283220.5	—	28 0	32	20.5	0.3	30	31	29.5	—	—	—	—	—	—	—
	IR 283223	—	28 -0.010	32	23	0.3	30	31	34	—	RNA 59/28	—	—	—	—	—
	IR 283230	—	28	32	30	0.3	30	31	43	—	—	RNA 69/28	—	NK 32/30	—	—
	IR 283230.5	—	28	32	30.5	0.3	30	31	44	—	—	—	—	—	—	—

INNER RINGS

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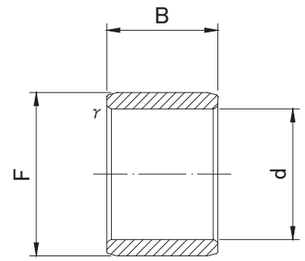

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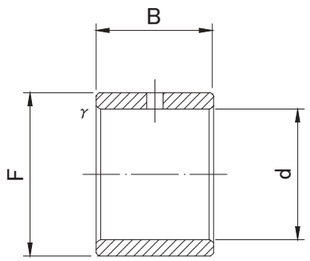

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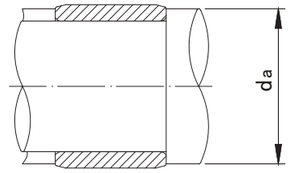

IR,IRZ TYPE

Shaft Diameter (mm)	Designation		Dimensions (mm)				Standard mounting dimensions (mm)		Mass	Usable bearing designation						
	IR	IRZ	d	F	B	*r*s min	da MIN	da MAX	g (approx)	RNA 49	RNA 59	RNA 69	RNA 48	NK	NKX(Z)	RNAF
30	IR 303516	—	30 0 -0.010	35	16	0.3	32	34	31.5	—	—	—	—	—	—	RNAF 354716
	IR 303517	—		35	17	0.3	32	34	33.5	RNA 4906	—	—	—	—	—	RNAF 354517
	—	IRZ 303518		35	18	0.3	32	34	35	RNA 4906UU	—	—	—	—	—	—
	IR 303520	—		35	20	0.3	32	34	38.5	—	—	—	—	NK 35/20	NKX35(Z)	—
	IR 303520.5	—		35	20.5	0.3	32	34	40	—	—	—	—	—	—	—
	IR 303523	—		35	23	0.3	32	34	44	—	RNA 5906	—	—	—	—	—
	IR 303525.5	—		35	25.5	0.3	32	34	51	—	—	—	—	—	—	—
	IR 303526	—		35	26	0.3	32	34	52	—	—	—	—	—	—	RNAFW 354526
	IR 303530	—		35	30	0.3	32	34	59	—	—	RNA 6906	—	NK 35/30	—	—
	IR 303530.5	—		35	30.5	0.3	32	34	60	—	—	—	—	—	—	—
	—	IRZ 303531		35	31	0.3	32	34	61	—	—	RNA 6906UU	—	—	—	—
	IR 303532	—		35	32	0.3	32	34	64	—	—	—	—	—	—	RNAFW 354732
	IR 303820	—		38	20	0.6	34	37	65	—	—	—	—	—	—	—
32	IR 323720	—	32 0 -0.012	37	20	0.3	34	36	43.5	—	—	—	—	NK 37/20	—	—
	IR 323730	—		37	30	0.3	34	36	63	—	—	—	—	NK 37/30	—	—
	IR 324020	—		40	20	0.6	36	39	69	RNA 49/32	—	—	—	—	—	—
	IR 324027	—		40	27	0.6	36	39	92	—	RNA 59/32	—	—	—	—	—
	IR 324036	—		40	36	0.6	36	39	123	—	—	RNA 69/32	—	—	—	—
35	IR 354017	—	35 0 -0.012	40	17	0.3	37	39	39	—	—	—	—	—	—	RNAF 405017
	IR 354020	—		40	20	0.3	37	39	46	—	—	—	—	NK 40/20	NKX40(Z)	RNAF 405520
	IR 354020.5	—		40	20.5	0.3	37	39	46.5	—	—	—	—	—	—	—
	IR 354025.5	—		40	25.5	0.3	37	39	46	—	—	—	—	—	—	—
	IR 354030	—		40	30	0.3	37	39	67	—	—	—	—	NK 40/30	—	—
	IR 354034	—		40	34	0.3	37	39	78	—	—	—	—	—	—	RNAFW 405034
	IR 354040	—		40	40	0.3	37	39	95	—	—	—	—	—	—	RNAFW 405540
	IR 354220	—		42	20	0.6	39	41	65	RNA 4907	—	—	—	—	—	—
	—	IRZ 354221		42	21	0.6	39	41	67	RNA 4907UU	—	—	—	—	—	—
	IR 354227	—		42	27	0.6	39	41	80	—	RNA 5907	—	—	—	—	—
	IR 354236	—		42	36	0.6	39	41	120	—	—	RNA 6907	—	—	—	—
	—	IRZ 354237		42	37	0.6	39	41	120	—	—	RNA 6907UU	—	—	—	—
38	IR 384320	—	38 0 -0.012	43	20	0.3	40	42	49.5	—	—	—	—	NK 43/20	—	—
	IR 384330	—	38	43	30	0.3	40	42	72	—	—	—	—	NK 43/30	—	—

INNER RINGS

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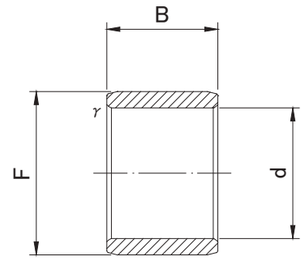

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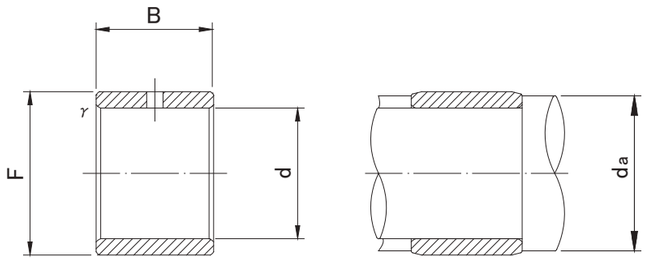

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IR,IRZ TYPE

Shaft Diameter (mm)	Designation		Dimensions (mm)				Standard mounting dimensions (mm)		Mass	Usable bearing designation						
	IR	IRZ	d	F	B	*r*s min	da MIN	da MAX	g (approx)	RNA 49	RNA 59	RNA 69	RNA 48	NK	NKX(Z)	RNAF
40	IR 404517	—	40	45	17	0.3	42	44	44.5	—	—	—	—	—	—	RNAF 455517
	IR 404520	—	40	45	20	0.3	42	44	51	—	—	—	—	NK 45/20	NKX45(Z)	RNAF 456220
	IR 404520.5	—	40	45	20.5	0.6	44	44	52.5	—	—	—	—	—	—	—
	IR 404525.5	—	40	45	25.5	0.6	44	44	65.5	—	—	—	—	—	—	—
	IR 404530	—	40	45	30	0.3	42	44	77	—	—	—	—	NK 45/30	—	—
	IR 404530.5	—	40	45	30.5	0.6	44	44	78.5	—	—	—	—	—	—	—
	IR 404534	—	40 0	45	34	0.3	42	44	88	—	—	—	—	—	—	RNAFW 455534
	IR 404540	—	40 -0.012	45	40	0.3	42	44	105	—	—	—	—	—	—	RNAFW 456240
	IR 404540.5	—	40	45	40.5	0.6	44	44	104	—	—	—	—	—	—	—
	IR 404822	—	40	48	22	0.6	44	47	93	RNA 4908	—	—	—	—	—	—
	—	IRZ 404823	40	48	23	0.6	44	47	95	RNA 4908UU	—	—	—	—	—	—
	IR 404830	—	40	48	30	0.6	44	47	123	—	RNA 5908	—	—	—	—	—
	IR 404840	—	40	48	40	0.6	44	47	165	—	—	RNA 6908	—	—	—	—
	—	IRZ 404841	40	48	41	0.6	44	47	170	—	—	RNA 6908UU	—	—	—	—
42	IR 424720	—	42 0	47	20	0.3	44	46	54	—	—	—	—	NK 47/20	—	—
	IR 424730	—	42 -0.012	47	30	0.3	44	46	81	—	—	—	—	NK 47/30	—	—
45	IR 455020	—	45	50	20	0.3	47	49	58	—	—	—	—	—	—	RNAF 506220
	IR 455025	—	45	50	25	0.6	49	49.5	71	—	—	—	—	NK 50/25	NKX50(Z)	—
	IR 455025.5	—	45	50	25.5	0.6	49	49	73	—	—	—	—	—	—	—
	IR 455030.5	—	45	50	30.5	0.6	49	49	87.5	—	—	—	—	—	—	—
	IR 455035	—	45	50	35	0.6	49	49.5	95	—	—	—	—	NK 50/35	—	—
	IR 455040	—	45	50	40	0.3	49	49.5	115	—	—	—	—	—	—	RNAFW 506240
	IR 455222	—	45 0	52	22	0.6	49	51	88	RNA 4909	—	—	—	—	—	—
	—	IRZ 455223	45 -0.012	52	23	0.6	49	51	93	RNA 4909UU	—	—	—	—	—	—
	IR 455230	—	45	52	30	0.6	49	51	123	—	RNA 5909	—	—	—	—	—
	IR 455240	—	45	52	40	0.6	49	51	165	—	—	RNA 6909	—	—	—	—
	—	IRZ 455241	45	52	41	0.6	49	51	170	—	—	RNA 6909UU	—	—	—	—
	IR 455520	—	45	55	20	0.6	49	54	120	—	—	—	—	—	—	RNAF 557220
	IR 455522	—	45	55	22	1	50	54	130	—	—	—	—	—	—	—
	IR 455540	—	45	55	40	0.6	49	54	245	—	—	—	—	—	—	RNAFW 557240

INNER RINGS

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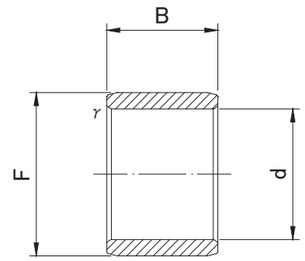

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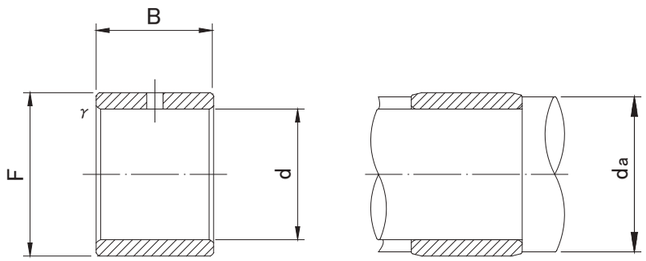

IRZ

IR,IRZ TYPE

Shaft Diameter (mm)	Designation		Dimensions (mm)				Standard mounting dimensions (mm)		Mass	Usable bearing designation						
	IR	IRZ	d	F	B	*r*s min	da MIN	da MAX	g (approx)	RNA 49	RNA 59	RNA 69	RNA 48	NK	NKX(Z)	RNAF
50	**IR 505520**	—	50 0 -0.012	55	20	0.6	54	54.5	63	—	—	—	—	—	—	RNAF 556820
	IR 505525	—		55	25	0.6	54	54.5	77	—	—	—	—	NK 55/25	—	—
	IR 505535	—		55	35	0.6	54	54.5	110	—	—	—	—	NK 55/35	—	—
	IR 505540	—		55	40	0.6	54	54.5	130	—	—	—	—	—	—	RNAFW 556840
	IR 505822	—		58	22	0.6	54	57	116	RNA 4910	—	—	—	—	—	—
	—	**IRZ 505823**		58	23	0.6	54	57	118	RNA 4910UU	—	—	—	—	—	—
	IR 505830	—		58	30	0.6	54	57	159	—	RNA 5910	—	—	—	—	—
	IR 505840	—		58	40	0.6	54	57	210	—	—	RNA 6910	—	—	—	—
	—	**IRZ 505841**		58	41	0.6	54	57	215	—	—	RNA 6910UU	—	—	—	—
	IR 506020	—		60	20	1	55	59	135	—	—	—	—	—	—	RNAF 607820
	IR 506025	—		60	25	1	55	59	163	—	—	—	—	—	NKX60(Z)	—
	IR 506040	—		60	40	1	55	59	265	—	—	—	—	—	—	RNAFW 607840
55	**IR 556025**	—	55 0 -0.015	60	25	0.6	59	59.5	88	—	—	—	—	NK 60/25	—	—
	IR 556035	—		60	35	0.6	59	59.5	120	—	—	—	—	NK 60/35	—	—
	IR 556325	—		63	25	1	60	61	145	RNA 4911	—	—	—	—	—	—
	IR 556334	—		63	34	1	60	61	192	—	RNA 5911	—	—	—	—	—
	IR 556345	—		63	45	1	60	61	255	—	—	RNA 6911	—	—	—	—
	IR 556530	—		65	30	1	60	63	220	—	—	—	—	—	—	RNAF 658530
	IR 556560	—		65	60	1	60	63	435	—	—	—	—	—	—	RNAFW 658560
60	**IR 606825**	—	60 0 -0.015	68	25	0.6	64	66	150	RNA 4912	—	—	—	NK 68/25	—	—
	IR 606834	—		68	34	1	65	66	206	—	RNA 5912	—	—	—	—	—
	IR 606835	—		68	35	0.6	64	66	210	—	—	—	—	NK 68/35	—	—
	IR 606845	—		68	45	1	65	66	275	—	—	RNA 6912	—	—	—	—
	IR 607025	—		70	25	1	65	68	195	—	—	—	—	—	NKX70(Z)	—
	IR 607030	—		70	30	1	65	68	240	—	—	—	—	—	—	RNAF 709030
	IR 607060	—		70	60	1	65	68	480	—	—	—	—	—	—	RNAFW 709060
65	**IR 657225**	—	65 0 -0.015	72	25	1	70	70.5	145	RNA 4913	—	—	—	—	—	—
	IR 657234	—		72	34	1	70	70.5	193	—	RNA 5913	—	—	—	—	—
	IR 657245	—		72	45	1	70	70.5	255	—	—	RNA 6913	—	—	—	—
	IR 657335	—		73	35	0.6	69	71	235	—	—	—	—	NK 73/35	—	—
	IR 657530	—		75	30	1	70	73	260	—	—	—	—	—	—	RNAF 759530
	IR 657560	—		75	60	1	70	73	520	—	—	—	—	—	—	RNAFW 759560

INNER RINGS

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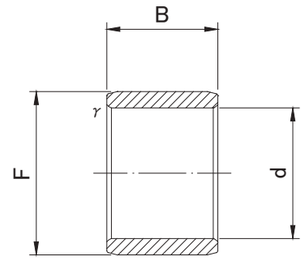

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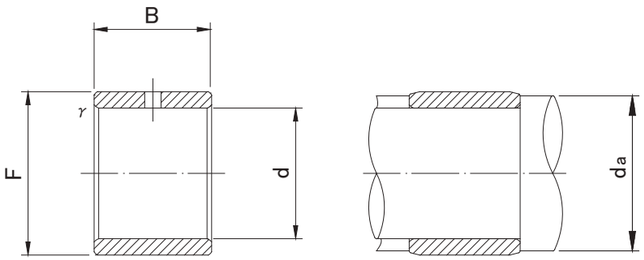

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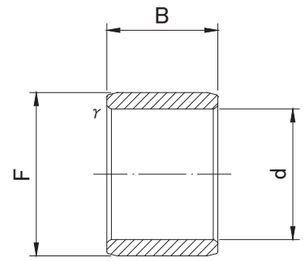
IR,IRZ TYPE

Shaft Diameter (mm)	Designation		Dimensions (mm)				Standard mounting dimensions (mm)		Mass	Usable bearing designation						
	IR	IRZ	d	F	B	*r*s min	da MIN	da MAX	g (approx)	RNA 49	RNA 59	RNA 69	RNA 48	NK	NKX(Z)	RNAF
70	**IR 708025**	—	70	80	25	1	75	78	225	—	—	—	—	NK 80/25	—	—
	IR 708030	—	70	80	30	1	75	78	275	RNA 4914	—	—	—	—	—	RNAF 8010030
	IR 708035	—	70 0 -0.015	80	35	1	75	78	310	—	—	—	—	NK 80/35	—	—
	IR 708040	—	70	80	40	1	75	78	358	—	RNA 5914	—	—	—	—	—
	IR 708054	—	70	80	54	1	75	78	490	—	—	RNA 6914	—	—	—	—
	IR 708060	—	70	80	60	1	75	78	560	—	—	—	—	—	—	RNAFW 8010060
75	**IR 758525**	—	75	85	25	1	80	83	240	—	—	—	—	NK 85/25	—	—
	IR 758530	—	75	85	30	1	80	83	290	RNA 4915	—	—	—	—	—	RNAF 8510530
	IR 758535	—	75 0 -0.015	85	35	1	80	83	335	—	—	—	—	NK 85/35	—	—
	IR 758540	—	75	85	40	1	80	83	385	—	RNA 5915	—	—	—	—	—
	IR 758554	—	75	85	54	1	80	83	520	—	—	RNA 6915	—	—	—	—
80	**IR 809025**	—	80	90	25	1	85	88	255	—	—	—	—	NK 90/25	—	—
	IR 809030	—	80	90	30	1	85	88	310	RNA 4916	—	—	—	—	—	RNAF 9011030
	IR 809035	—	80 0 -0.015	90	35	1	85	88	355	—	—	—	—	NK 90/35	—	—
	IR 809040	—	80	90	40	1	85	88	408	—	RNA 5916	—	—	—	—	—
	IR 809054	—	80	90	54	1	85	88	550	—	—	RNA 6916	—	—	—	—
85	**IR 859526**	—	85	95	26	1	90	93	280	—	—	—	—	NK 95/26	—	—
	IR 859530	—	85	95	30	1	90	93	330	—	—	—	—	—	—	RNAF 9511530
	IR 859536	—	85 0	95	36	1	90	93	390	—	—	—	—	NK 95/36	—	—
	IR 8510035	—	85 -0.020	100	35	1.1	91.5	98	575	RNA 4917	—	—	—	—	—	—
	IR 8510046	—	85	100	46	1.1	91.5	98	760	—	RNA 5917	—	—	—	—	—
	IR 8510063	—	85	100	63	1.1	91.5	98	1 040	—	—	RNA 6917	—	—	—	—
90	**IR 9010026**	—	90	100	26	1	95	98	295	—	—	—	—	NK 100/26	—	—
	IR 9010030	—	90	100	30	1	95	98	355	—	—	—	—	—	—	RNAF 10012030
	IR 9010036	—	90 0	100	36	1	95	98	415	—	—	—	—	NK 100/36	—	—
	IR 9010535	—	90 -0.020	105	35	1.1	96.5	103	610	RNA 4918	—	—	—	—	—	—
	IR 9010546	—	90	105	46	1.1	96.5	103	800	—	RNA 5918	—	—	—	—	—
	IR 9010563	—	90	105	63	1.1	96.5	103	1 100	—	—	RNA 6918	—	—	—	—
95	**IR 9510526**	—	95	105	26	1	100	103	315	—	—	—	—	NK 105/26	—	—
	IR 9510536	—	95	105	36	1	100	103	430	—	—	—	—	NK 105/36	—	—
	IR 9511035	—	95 0 -0.020	110	35	1.1	101.5	108	650	RNA 4919	—	—	—	—	—	—
	IR 9511046	—	95	110	46	1.1	101.5	108	850	—	RNA 5919	—	—	—	—	—
	IR 9511063	—	95	110	63	1.1	101.5	108	1 160	—	—	RNA 6919	—	—	—	—
100	**IR 10011030**	—	100	110	30	1.1	106.5	108	380	—	—	—	—	NK 110/30	—	—
	IR 10011040	—	100 0 -0.020	110	40	1.1	106.5	108	500	—	—	—	—	NK 110/40	—	—
	IR 10011540	—	100	115	40	1.1	106.5	113	700	RNA 4920	—	—	—	—	—	—

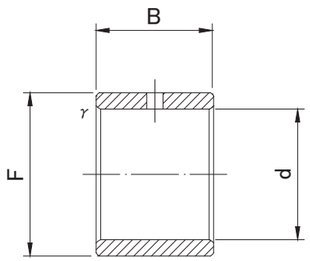
INNER RINGS

IR

IRZ



IR



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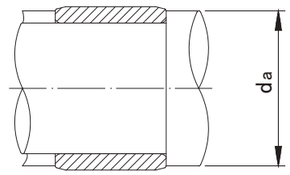


IR,IRZ TYPE

Shaft Diameter (mm)	Designation		Dimensions (mm)				Standard mounting dimensions (mm)		Mass	Usable bearing designation						
	IR	IRZ	d	F	B	*r*s min	da MIN	da MAX	g (approx)	RNA 49	RNA 59	RNA 69	RNA 48	NK	NKX(Z)	RNAF
110	IR 11012030	—	110 0 -0.020	120	30	1.0	115	118	410	—	—	—	RNA 4822	—	—	—
	IR 11012540	—	110 -0.020	125	40	1.1	116.5	123	840	RNA 4922	—	—	—	—	—	—
120	IR 12013030	—	120 0 -0.020	130	30	1.0	125	128	450	—	—	—	RNA 4824	—	—	—
	IR 12013545	—	120 -0.020	135	45	1.1	126.5	133	1 030	RNA 4924	—	—	—	—	—	—
130	IR 13014535	—	130 0 -0.025	145	35	1.1	136.5	143	860	—	—	—	RNA 4826	—	—	—
	IR 13015050	—	130 -0.025	150	50	1.5	138	148	1 670	RNA 4926	—	—	—	—	—	—
140	IR 14015535	—	140 0 -0.025	155	35	1.1	146.5	153	930	—	—	—	RNA 4828	—	—	—
	IR 14016050	—	140 -0.025	160	50	1.5	148	158	1 790	RNA 4928	—	—	—	—	—	—
150	IR 15016540	—	150 0 -0.025	165	40	1.1	156.5	163	1 130	—	—	—	RNA 4830	—	—	—
160	IR 16017540	—	160 0 -0.025	175	40	1.1	166.5	173	1 200	—	—	—	RNA 4832	—	—	—

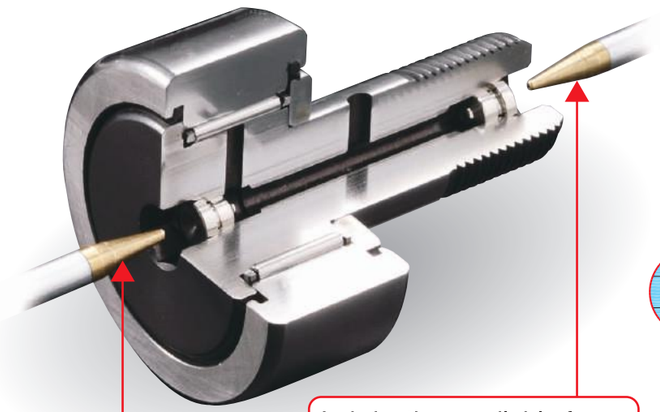
CAM FOLLOWERS

Cam follower with pre-installed grease nipple

Newly available versatile cam follower which has conquered disadvantages in traditional products!!

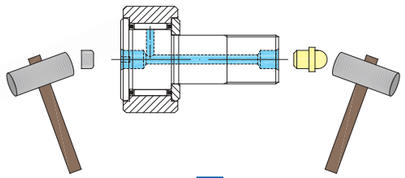
CF..AB Standard type | **CF..MAB** Stainless type | **CFH..AB** Eccentric type | **CFH..MAB** Eccentric stainless type

Ready use instantly after unpack the box thanks to pre-installed grease nipple.

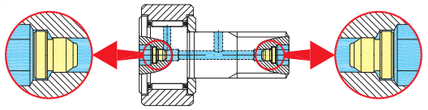


Lubrication available from both stud head side and thread side.No restriction for mounting location.

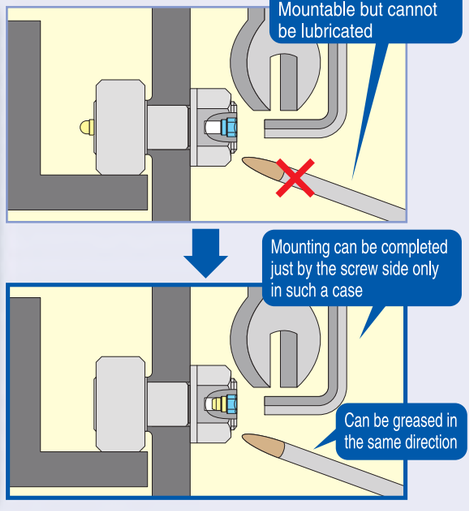
•Conventional type: Need to fit a nipple



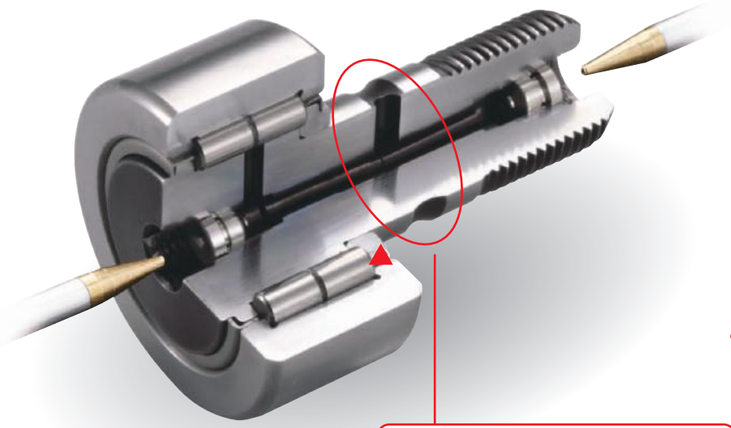
•Grease nipple fitted



No restriction for mounting location thanks to hexagon socket shape in stud head and thread side.Easy mounting and removal is available thanks to having hexagon socket shape in both side.

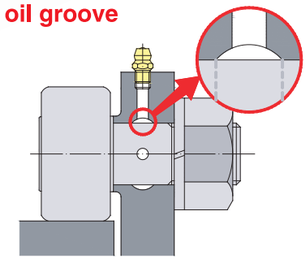


NUCF..AB Double-row cylindrical roller type | stud diameter **16 to 30mm**

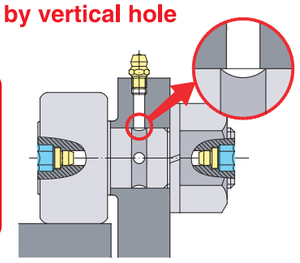


Lubrication area at the side of stud has an oil groove to eliminate bothersome groove machining process in the mounting side(NUCF type).

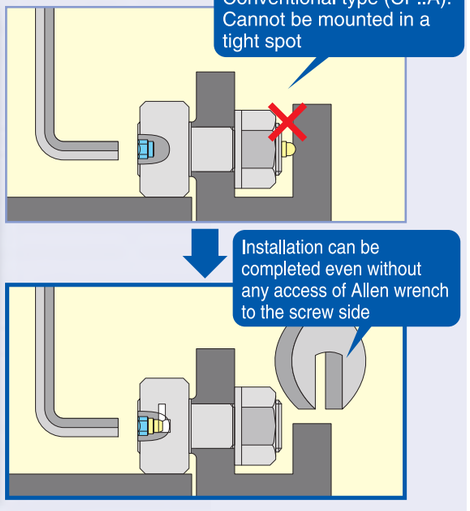
•Need to machine an internal oil groove



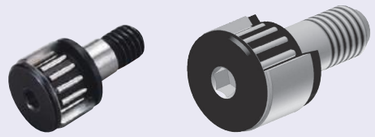
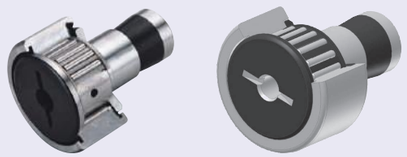
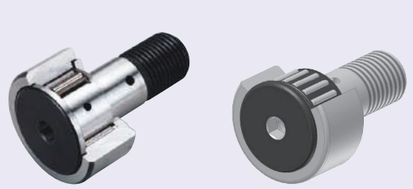
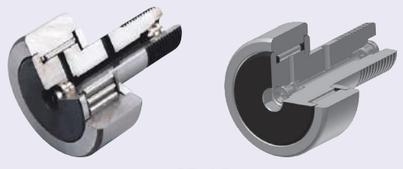
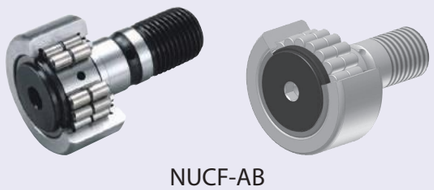
•Lubrication enabled only by vertical hole

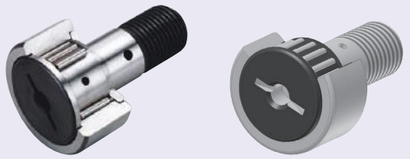
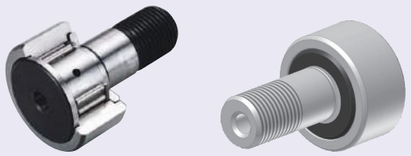
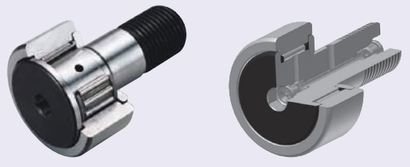
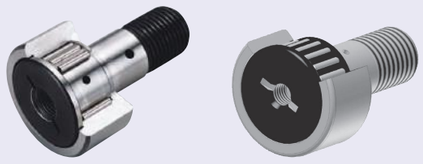
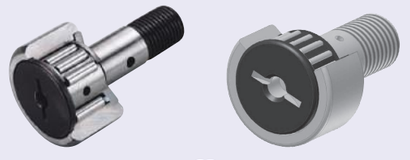


No restriction for mounting location thanks to hexagon socket shape in stud head and thread side.Easy mounting and removal is available thanks to having hexagon socket shape in both side.



Type and Part Code

Type	Applicable axis diameter	Feature	Part Code
 CFS Compact outer ring	ϕ 2.5 ~ ϕ 6	Built-in very thin needle roller. Enables compact design due to very small outer ring diameter in comparison to stud diameter.	**CFS** (Type) **6** (Stud diameter) **V** (**V**: Full complement / **None**: With cage) **A** (**A**: With hexagon socket on the stud head)
 CF-SFU Easy mounting	ϕ 6 ~ ϕ 20	A type with step on stud to allow easy mounting. Optimal for devices with limited space for stud tightening. Available with seal only.	**CF-SFU** (Type) **16** (Stud diameter) **V** (**V**: Full complement / **None**: With cage) **R** (**R**: Crowned outer ring / **None**: Cylindrical outer ring)
 CF-A Hexagon hole	ϕ 3 ~ ϕ 30	Hexagon sockets on the stud head. Easy mounting with hex-wrench. Available with hexagon sockets at the thread side mode (CF-B). (Applicable for shaft diameter 12 or more)	**CF** (Type) **16** (Stud diameter) **V** (**V**: Full complement / **None**: With cage) **UU** (**UU**: With seal / **None**: With shield) **R** (**R**: Crowned outer ring / **None**: Cylindrical outer ring) **A** (**A**: With hexagon socket on the stud head / **B**: With hexagon socket on the thread side (Applicable for shaft diameter 12 or more)) **N** (Option (Dedicated grease nipple))
 CF-AB	ϕ 10 ~ ϕ 30	Both of stud head and thread ends have hexagon holes and integrated concave grease nipples. Available for mounting with either hexagon sockets and lubrication from both sides.	**CF** (Type) **16** (Stud diameter) **V** (**V**: Full complement / **None**: With cage) **UU** (**UU**: With seal / **None**: With shield) **R** (**R**: Crowned outer ring / **None**: Cylindrical outer ring) **AB** (**AB**: With hexagon socket on both sides. (With integrated concave nipple))
 NUCF-AB	ϕ 16 ~ ϕ 30	Cam follower which allows high radial loading and moderate axial loading with integrated cylindrical roller in double rows. Integrated concave grease nipples and hexagon sockets on both sides allow mounting and lubrication from either side.	**NUCF** (Type) **16** (Stud diameter) **R** (**R**: Crowned outer ring / **None**: Cylindrical outer rings) **AB** (**AB**: With hexagon socket both sides. (With integrated concave nipple))

Type	Applicable axis diameter	Feature	Part Code
 CF	ϕ 5 ~ ϕ 30	General purpose cam follower with screwdriver groove on the stud head.	**V**: Full complement **None**: With cage **UU**: With seal **None**: With shield **CF 16 V** **UU** **R** **N** Type · Stud diameter **R**: Crowned outer ring **None**: Cylindrical outer ring Option (Dedicated grease nipple)
 CFH-A Hexagon socket, Eccentric	ϕ 5 ~ ϕ 30	Available for the same mounting hole as general type. Compact and high accuracy eccentric cam followers with integrated structure enables easy fine positioning adjustment simply by rotating stud due to eccentric stud head shifting 0.2 to 1mm from stud mounting axis.	**V**: Full complement **None**: With cage **UU**: With seal **None**: With shield **CFH 16 V** **UU** **R** **A** Type · Stud diameter **R**: Crowned outer ring **None**: Cylindrical outer ring **A**: With hexagon socket on the stud head **B**: With hexagon socket on the thread side (Applicable for shaft diameter 12 or more)
 CFH-AB	ϕ 12 ~ ϕ 30	Eccentric cam follower with integrated concave grease nipples on both sides. Available for mounting and lubrication with hexagon holes on both sides.	**V**: Full complement **None**: With cage **UU**: With seal **None**: With shield **CFH 16 V** **UU** **R** **AB** Type · Stud diameter **R**: Crowned outer ring **None**: Cylindrical outer ring **AB**: With hexagon socket on both sides (With integrated concave nipple)
 CFT Lubrication tap hole	ϕ 6 ~ ϕ 30	Cam follower with tap for piping at stud head and thread of general type. Optimal for location that requires concentrated lubrication piping.	**V**: Full complement **None**: With cage **UU**: With seal **None**: With shield **CFT 16 V** **UU** **R** **A** Stud diameter **CFT**: Standard typed **CFHT**: Eccentric type **R**: Crowned outer ring **None**: Cylindrical outer ring **A**: With hexagon socket on the stud head (Applicable shaft diameter ϕ 12 ~ ϕ 30) **B**: With hexagon socket on the thread side (Applicable shaft diameter ϕ 12 ~ ϕ 30) **None**: Standard type
 CR Inch type	ϕ 4.826 ~ ϕ 22.225	Cam followers in inch dimension.	**R**: Crowned outer ring **None**: Cylindrical outer ring **CR 16** **UU** **R** Type · Stud diameter **UU**: With seal **None**: With shield

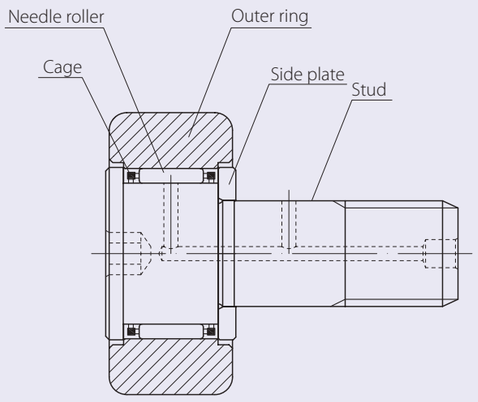
Structure and Features

Cam followers are compact and high rigid bearings with stud. It has a structure that an outer ring with built-in “roller” rolls over a track (raceway) and is utilized as guide roller for cam mechanism or linier motion. The cam follower is designed with a thick-walled outer ring in order to provide high rigidity to endure heavy load or impact load at contact portion with the track.

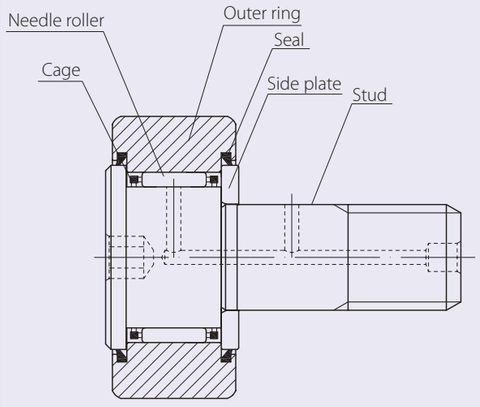
Outer rings have two shapes – crowned outer ring and cylindrical outer ring. The cylindrical outer ring is effective for heavy duty applications since it contacts with large contact area of the associated objects so that can mitigate the contact surface pressure. The crowned outer ring is suited for absorbing eccentric load since it absorbs angular misalignment due to a mount error. They have two internal structures – one with cage and one with full complement. Caged type cam followers are suited for high speed application, since the guiding feature of cage enables the rotation of "rollers" to be stable. Compared with caged type cam followers, full complement type is effective for applications with low-speed operation of heavy load due to its larger load rating. Full complement type also includes double-raw cylindrical roller type which allows moderate axial loading.

Cam followers shall be fixed by tightening hexagon nut at stud thread by holding the stud with screw driver or hex-wrench.

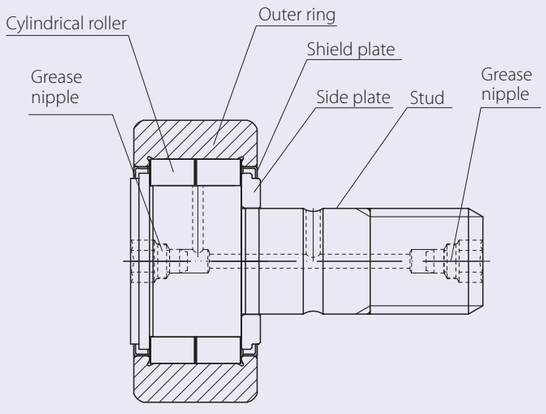
Cam followers with eccentric axis on the stud thread have an advantage to adjust the variation of mounting position within its eccentric range, without requesting high machining accuracy of mounting hole position.



CF··Structure of type A



CF··UU Structure of type A



NUCF··Structure of type AB

Accuracy standard

Accuracy of cam follower is indicated in Table-1 and Table-2 below.

Table-1 Accuracy Unit: µm

Name \ Category	Cam follower series in metric (CF--, NUCF--)		Compact type (CFS--)	Cam follower series in inch (CR--)	
	Crowned outer ring	Cylindrical outer ring	Cylindrical outer ring	Crowned outer ring	Cylindrical outer ring
Dimension tolerance of outer ring outer diameter (D)	0 -50	Refer to Table-2	Refer to Table-2	0 -50	0 -25
Dimension tolerance of stud diameter (d)	h7		h6	+25 0	
Dimension tolerance of outer ring width (C)	0 -120		0 -120	0 -130	

Table-2 Accuracy of outer ring (Metric series and compact type roller outer ring) Unit: µm

Nominal outer ring outer diameter D (mm)		Dimension tolerance of mean outside diameter in a single plane Δ_{Dmp}		Radial runout of outer ring K_{ea}
Over	Incl.	high	low	max.
6 (5 or more)	18	0	-8	15
18	30	0	-9	15
30	50	0	-11	20
50	80	0	-13	25
80	120	0	-15	35

Radial internal clearance

Table below indicates radial internal clearance of cam follower.

Table-3 Radial internal clearance Unit: μm

Part code				Radial internal clearance	
Cam follower series in metric (CF)	Compact type (CFS)	Double-row cylindrical roller cam follower (NUCF)	Inch type series (CR)	min.	max.
CF3 ～ 5	CFS2.5 ～ 5		CR8 ～ 8-1	3	17
CF6 ～ 8	CFS6		CR10 ～ 10-2	5	20
CF10 ～ 12-1			CR12 ～ 22	5	25
CF16 ～ 20-1			CR24 ～ 26	10	30
CF24 ～ 30-2				10	40
		NUCF16 ～ 24		0	25
		NUCF24-1 ～ 30-2		5	30

Fits

Cam followers require machining of mounting hole to eliminate play at fitting portion especially for the portion which is subjected to impact shock due to its application in cantilevered mounting. Table-4 indicates recommended fits between cam follower and its mounting hole.

Table-4 Dimension tolerance of stud mounting hole

Part code	Dimension tolerance of stud mounting hole
Cam follower series in metric (CF)	H7
Compact type (CFS)	H6
Double-row cylindrical roller cam follower (NUCF)	H7
Cam follower series in inch (CR)	F7

Maximum permissive load

Permissive load of cam follower is subjected to change in accordance with bending strength and shear strength of its stud in addition to standard rating load of needle bearing due to its design with stud. This load is indicated as maximum permissive load.

Track load capacity

Track load capacity means a permissive load under which the outer ring of cam follower and the mating surface are allowable to be used over a long period without causing any deformation nor compression mark. Track load capacity depicted in dimension table indicates a value for which hardness of steel mating material is assumed to be HRC40. In the case that the hardness of mating material is not HRC40, track load capacity in the dimension table shall be multiplied by value of track load factor obtained by Figure-1.

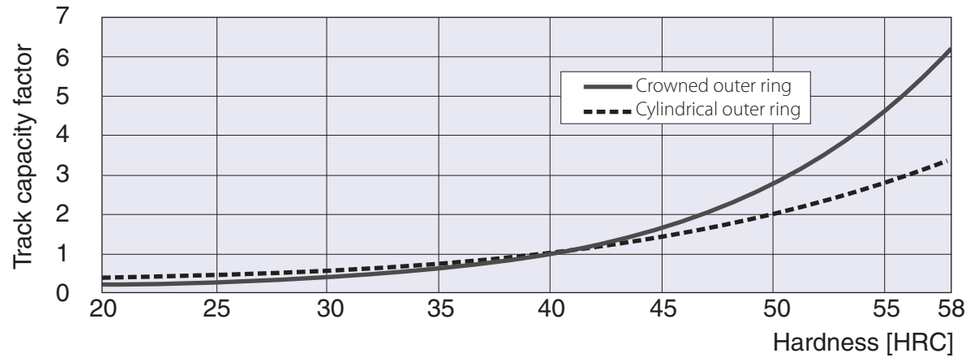


Figure-1 Track capacity factor

Lubrication

All the JNS cam followers are lubricated with pre-packed high quality lithium soap-based grease grade 2 (RoHS compliant) so that they are ready to use. For applications requiring high prevention measure against invasion of foreign matter or leakage of lubricant, products with seal(part conde--UU) which integrate special synthetic lubber with high abrasion resistance are also available.

Grease shall be packed up to volume approximately one-third to one-half of internal space of bearing. Lubrication interval varies depending on operation condition. Referential interval may be every six to twenty four months for cam followers with cages and every one to six months for full complement type with grease in the same type.

Some excessive grease may leak at the beginning of usage or immediately after re-greasing even for the products with seal. Aging operation period is recommended prior to application in which no contamination by grease is allowed in and around device. Wipe and clean any leaked extra grease after this operation.

Dedicated grease nipple shall be knocked in onto cam follower by pressing flange portion of the nipple using fixture shown in Figure-2.

Accessories

Accessories for cam follower of standard specification are shown in Table-5. Dedicated grease nipple is available upon customer request by ordering products with suffix "N" added to part code.

Also, type CF-AB and type NUCF-AB have integrated dedicated concave grease nipples installed at both sides.

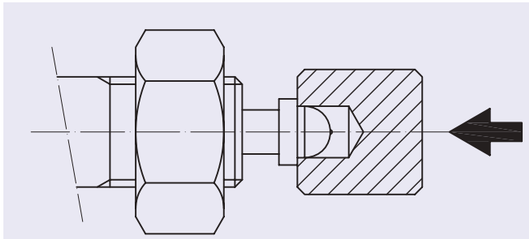


Figure-2

Example) CF 12 UUR -N
└ Dedicated grease nipple

Table-5 Accessories

Part code		Stop plug*1)	Resin plug*2)	Hexagon nuts style 2	Grease
CF CFH CR	Without seal	Attached	Attached	Attached	Packed
	With seal	Attached	Attached	Attached	Packed
CFT	Without seal	—	—	Attached	Packed
	With seal	—	—	Attached	Packed
CFS		—	—	Attached	Packed
CF-SFU		Attached	Attached	—	Packed
NUCF		—	—	Attached	Packed

*1) Stop plug is used for plugging unused lubrication hole(s).
*2) Resin plug is used for preventing leakage of grease.

DIMENSIONS OF GREASE NIPPLES

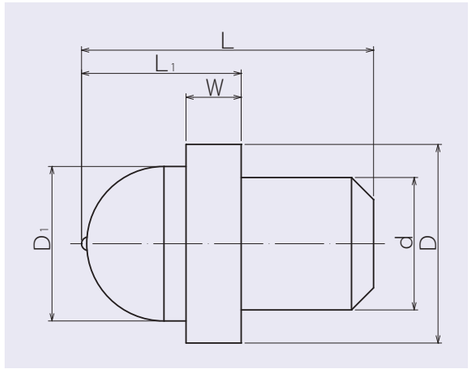


Table-6

Applicable part code	Nipple dimension					
CF, CFH	d	D	D_1	L	L_1	W
CF5	3.2	7.5	6	9	5.5	1.5
CF6 ~ CF10-1	4	7.5	6	10	5.5	1.5
CF12 ~ CF18	6	8	6	11	6	2
CF20 ~ CF30-2	8	10	6	16	7	3

Dimensions of supply nozzle for CF..AB type

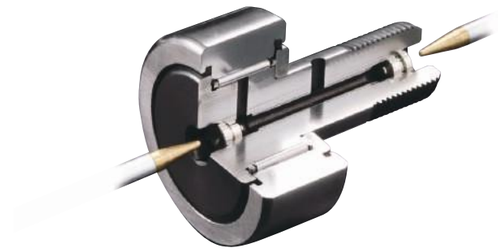
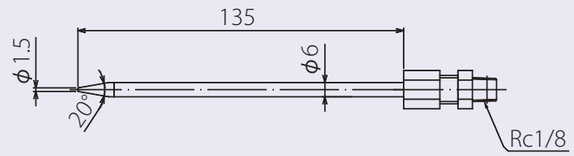
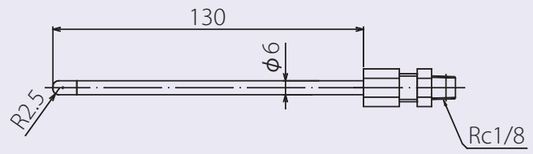


Table-7 Dimension of recommended lubrication nozzle (for CF..AB, NUCF..AB)

Type	Dimension and shape	Applied model number	
NPAB-1		CF10ABK(M10 × 1) CF10-1ABK(M10 × 1) CF12AB CF12-1AB CF16AB CF18AB	NUCF16AB NUCF18AB
NPAB-2		CF20AB CF20-1AB CF24AB CF24-1AB CF30AB CF30-1AB CF30-2AB	NUCF20AB NUCF20-1AB NUCF24AB NUCF24-1AB NUCF30AB NUCF30-2AB

Mounting

Mounting part

Hole for stud shall be perpendicular to mounting surface so as to ensure even contact between outer ring and rolling surface of mating material. Corner chamfer of hole shall be as small as around C0.5. Counter bore diameter shall be dimension f or more as described in the dimension table.

Type CF-R with crowned outer ring is recommended in the case of application with insufficient contact between outer ring and rolling surface of mating material.

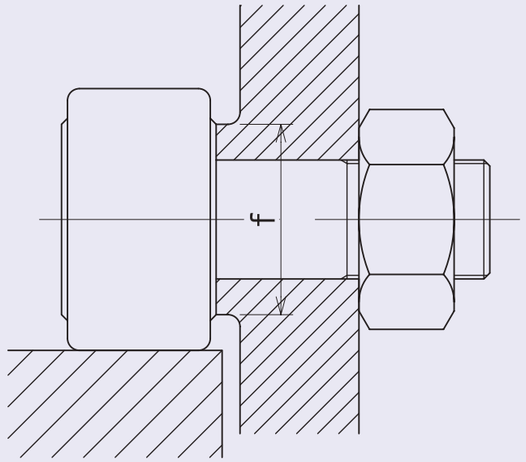


Figure-3

Mounting method

- Cam follower shall be mounted so as not to incline against direction of the motion.
- Mounting method to tighten cam follower directly to bracket by adding female thread to it without using nut as depicted in Figure-4 (A) is NOT recommended. This method may cause damage on stud due to concentration of bending stress in male thread portion in the event of loosening since it is difficult to tighten the stud sufficiently.

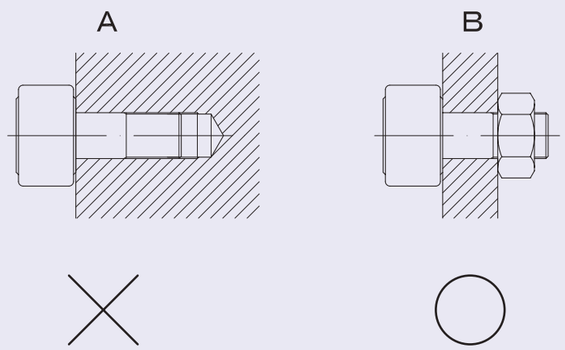


Figure-4

- For application with heavy load, lubrication hole of stud shall be located outside of loading range (on the side to receive load). Location of the lubrication hole is indicated by "JNS" marking on the side of stud flange. (Refer to Figure-5)
  Hole at the center of stud is used as stopper for tightening or lubricant supply hole for grease lubrication.

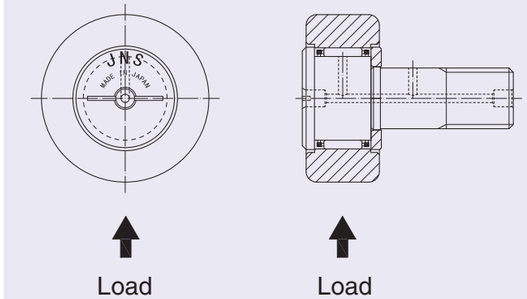


Figure-5

Precaution for using spring washer

It is important to ensure that spring washer used for mounting cam follower has no burr or sharp edge. Debris scraped from nut or mounting bracket by burr or shape edge of washer during tightening can invade stud thread and can cause insufficient tightness or damage to thread.

Tightening torque of stud

Stud of cam follower is subjected to bending stress or tensile stress by bearing load. Tightening torque shall be set not to exceed the value in the dimension table.

Using double spring washers, double thin nut of JIS B 1181 or special nut with locking feature is recommended in the case of possible loosening of mounting screw due to vibration or impact shock.

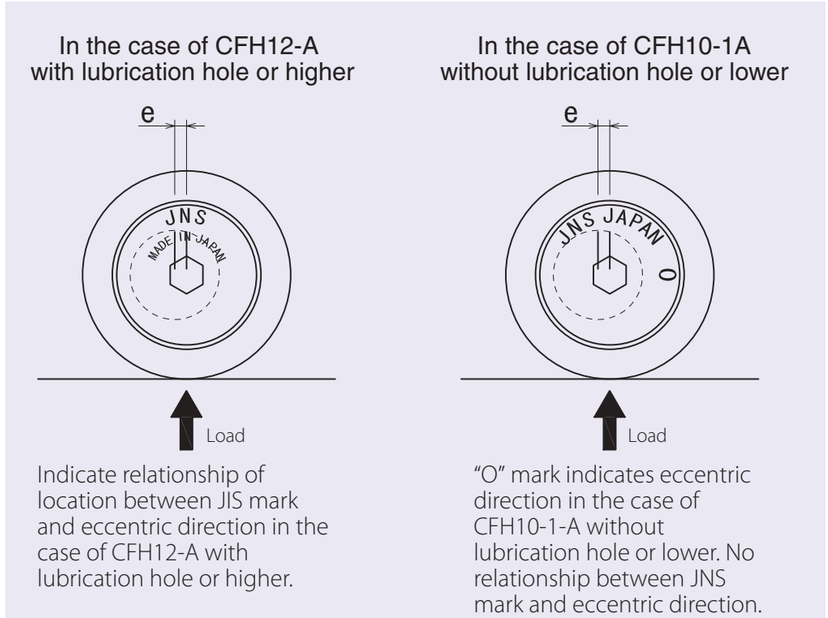
Mounting of eccentric cam follower

Adjustment of eccentric shall be performed in accordance with the following procedure.

(1) Insert stud to mounting hole and tighten nut as the stud can turn loosely. Marking of stud shall face location indicated in Figure-6 in relation to direction of load.

(2) Gap between cam follower and mating contact surface may be adjusted by turning stud using hexagon hole on the stud head.

(3) After completing adjustment, tighten nut with holding rotation of stud. Make it sure not to exceed maximum tightening torque of the nut.



Indicate relationship of location between JIS mark and eccentric direction in the case of CFH12-A with lubrication hole or higher.

"O" mark indicates eccentric direction in the case of CFH10-1-A without lubrication hole or lower. No relationship between JNS mark and eccentric direction.

Figure-6

Mounting of CF-SFU type

Refer to Figure-7 for mounting method of easy mounting of CF-SFU type.

Type CF-SFU is NOT recommended for application in the part subjected to vibration or shock impact as much as its mounting is simple. Standard cam followers with nut are recommended for application with possible vibration or shock impact.

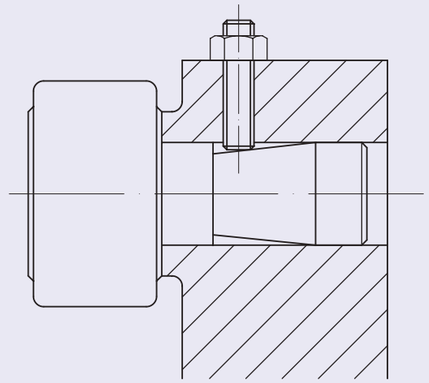
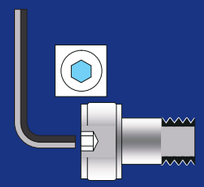


Figure-7

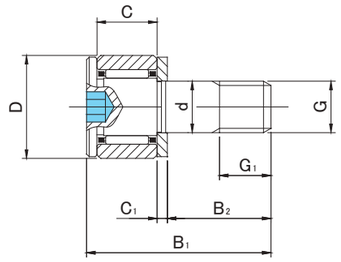
CAM FOLLOWERS

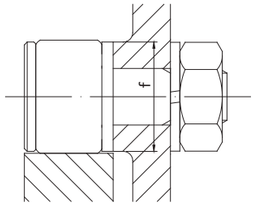
MINIATURE TYPE
HEXAGON SOCKET ON STUD HEAD



CFS..A

CFS..VA





CFS..A TYPE

Prepacked Grease

Stud diameter (mm)	h6 tolerance	Designation: Cylindrical outer ring — With cage	Designation: Cylindrical outer ring — Full roller	D	C	d	G	G1	B1	B2	C1	H	f min	Basic dynamic load rating Cr N	Basic static load rating Cor N	Largest permissible load N	Max tightening torque N·m	Mass g (approx)
2.5	0 -0.006	**CFS 2.5A**	—	**5**	3	2.5	M2.5×0.45	2.5	9.5	5	0.7	0.9	4.8	410	335	260	0.2	1
		—	**CFS 2.5VA**											1 000	1 080	260		
3	0 -0.006	**CFS 3A**	—	**6**	4	3	M3×0.5	3	11.5	6	0.7	1.5	5.8	630	610	360	0.3	2
		—	**CFS 3VA**											1 370	1 770	360		
4	0 -0.008	**CFS 4A**	—	**8**	5	4	M4×0.7	4	15	8	1	2	7.7	1 080	1 080	780	0.6	4
		—	**CFS 4VA**											2 350	3 040	780		
5	0 -0.008	**CFS 5A**	—	**10**	6	5	M5×0.8	5	18	10	1	2.5	9.6	1 570	1 860	1 420	1.3	7
		—	**CFS 5VA**											3 140	4 710	1 420		
6	0 -0.008	**CFS 6A**	—	**12**	7	6	M6×1	6	21.5	12	1.2	3	11.6	2 060	2 160	2 110	2.3	13
		—	**CFS 6VA**											4 610	6 270	2 110		

OUTER RINGS TOLERANCE (μm)

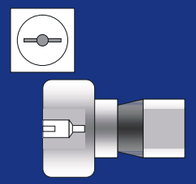
TYPE	Cylindrical outer ring
CFS2.5,CFS3,CFS4,CFS5,CFS6	0/-8

ACCESSORIES

TYPE	 NUT
All types	Attached

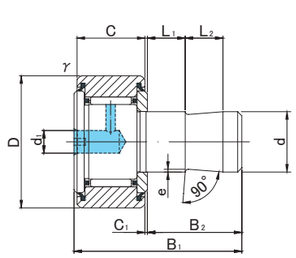
CAM FOLLOWERS

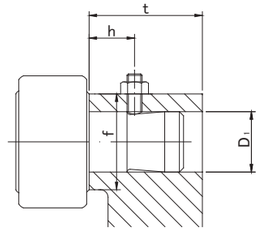
EASY MOUNTING TYPE
SCREWDRIVER SLOT HEAD



CF-SFU

CF-SFU..V





CF-SFU TYPE

Prepacked Grease

Stud diameter (mm)		Designation R500(CF6~CF18) R1000(CF20≦)		Dimensions (mm)										Mounting dimensions (mm)					Basic dynamic load rating	Basic static load rating	Largest permissible load	Limiting speed	Track load capacity		Mass
	h7 tolerance	Cylindrical outer ring	Crowned outer ring	D	C	d	B1	B2	C1	L1	L2	d1	e	rs min	D1 Tolerance		t Min	f Min	h (Ref)	Cr N	Cor N	N	rpm	Cylindrical outer ring N	Crowned outer ring N	g (approx)
6	0 -0.012	**CF-SFU-6**	**CF-SFU-6R**	**16**	11	6	32	20	0.6	5	10	4	0.3	0.3	6 +0.012 0		20	11	10	3 630	3 630	2 110	17 500	3 430	1 080	19
		CF-SFU-6V	**CF-SFU-6VR**																	6 960	8 530	2 110	8 400	3 430	1 080	
8	0 -0.015	**CF-SFU-8**	**CF-SFU-8R**	**19**	11	8	32	20	0.6	5	10	4	0.5	0.3	8 +0.015 0		20	13	10	4 310	4 710	4 710	14 000	4 020	1 370	28.5
		CF-SFU-8V	**CF-SFU-8VR**																	8 130	11 170	4 710	6 300	4 020	1 370	
10	0 -0.015	**CF-SFU-10**	**CF-SFU-10R**	**22**	12	10	33	20	0.6	5	10	4	0.5	0.3	10 +0.015 0		20	15	10	5 390	6 860	6 860	11 900	4 700	1 670	43
		CF-SFU-10V	**CF-SFU-10VR**																	9 510	14 500	7 450	5 250	4 700	1 670	
10	0 -0.015	**CF-SFU-10-1**	**CF-SFU-10-1R**	**26**	12	10	33	20	0.6	5	10	4	0.5	0.3	10 +0.015 0		20	15	10	5 390	6 860	6 860	11 900	5 490	2 060	58.5
		CF-SFU-10-1V	**CF-SFU-10-1VR**																	9 510	14 500	7 450	5 250	5 490	2 060	
12	0 -0.018	**CF-SFU-12**	**CF-SFU-12R**	**30**	14	12	35	20	0.6	5	10	6	1	0.6	12 +0.018 0		20	20	10	7 940	9 800	9 800	9 800	7 060	2 450	93
		CF-SFU-12V	**CF-SFU-12VR**																	13 430	19 700	11 270	4 200	7 060	2 450	
12	0 -0.018	**CF-SFU-12-1**	**CF-SFU-12-1R**	**32**	14	12	35	20	0.6	5	10	6	1	0.6	12 +0.018 0		20	20	10	7 940	9 800	9 800	9 800	7 450	2 740	103
		CF-SFU-12-1V	**CF-SFU-12-1VR**																	13 430	19 700	11 270	4 200	7 450	2 740	
16	0 -0.018	**CF-SFU-16**	**CF-SFU-16R**	**35**	18	16	44.5	25	0.8	10	10	6	1	0.6	16 +0.018 0		25	24	15	12 050	18 330	18 330	7 000	11 200	3 140	164
		CF-SFU-16V	**CF-SFU-16VR**																	20 680	37 630	19 800	3 150	11 200	3 140	
18	0 -0.018	**CF-SFU-18**	**CF-SFU-18R**	**40**	20	18	46.5	25	0.8	10	10	6	1	1	18 +0.018 0		25	26	15	14 700	25 200	25 200	5 950	14 400	3 720	235
		CF-SFU-18V	**CF-SFU-18VR**																	25 280	51 350	26 560	2 450	14 400	3 720	
20	0 -0.021	**CF-SFU-20**	**CF-SFU-20R**	**52**	24	20	50.5	25	0.8	10	10	8	1	1	20 +0.021 0		25	36	15	20 680	34 600	32 140	4 900	23 200	8 230	436
		CF-SFU-20V	**CF-SFU-20VR**																	33 120	64 480	32 140	2 450	23 200	8 230	
20	0 -0.021	**CF-SFU-20-1**	**CF-SFU-20-1R**	**47**	24	20	50.5	25	0.8	10	10	8	1	1	20 +0.021 0		25	36	15	20 680	34 600	32 140	4 900	21 000	7 150	361
		CF-SFU-20-1V	**CF-SFU-20-1VR**																	32 120	64 480	32 140	2 450	21 000	7 150	

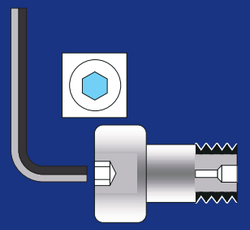
OUTER RINGS TOLERANCE (μm)

TYPE	Cylindrical outer ring	Crowned outer ring
CF6	0/-8	0/-50
CF8,CF10,CF10-1,CF12	0/-9	0/-50
CF12-1,CF16,CF18,CF20-1	0/-11	0/-50
CF20	0/-13	0/-50

ACCESSORIES

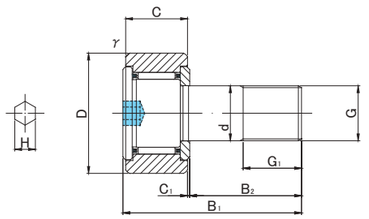
TYPE	 STOP PLUG	 RESIN PLUG
CF6/CF8/CF10/CF10-1	—	ϕ 4 Attached
CF12/CF12-1/CF16/CF18	ϕ 6 Attached	ϕ 6 Attached
CF20/CF20-1	ϕ 8 Attached	ϕ 8 Attached

CAM FOLLOWERS
HEXAGON SOCKET ON STUD HEAD

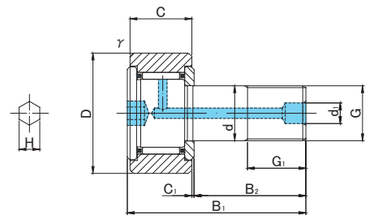


CF..A

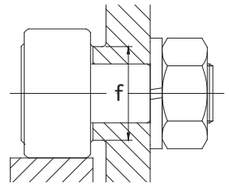
CF..VA



CF3(V)A～CF10−1(V)A



CF10(V)AK～CF10−1(V)AK



CF..A TYPE

Prepacked Grease

Stud diameter (mm)		Designation				Dimensions (mm)														Basic dynamic load rating	Basic static load rating	Largest permissible load	Limiting speed *	Track load capacity		Max tightening torque	Mass
		Cylindrical outer ring		Crowned outer ring R250(≦ CF5) R500(CF6 ～ CF10)																							
	h7 tolerance	Without seals	With seals	Without seals	With seals	D	C	d	G	G1	B1	B2	B3	C1	d1	d2	H	rs min	f min	Cr N	Cor N	N	rpm	Cylindrical outer ring N	Crowned outer ring N	N·m	g (approx)
3	0 -0.010	**CF 3A**	**CF 3UUA**	**CF 3RA**	**CF 3UURA**	**10**	7	3	M3×0.5	5	17	9	—	0.5	—	—	2	0.2	6.8	1 470	1 180	360	47 000	1 370	370	0.4	4.5
		CF 3VA	**CF 3VUUA**	**CF 3VRA**	**CF 3VUURA**															2 800	2 500	360	18 800				
4	0 -0.012	**CF 4A**	**CF 4UUA**	**CF 4RA**	**CF 4UURA**	**12**	8	4	M4×0.7	6	20	11	—	0.5	—	—	2.5	0.3	8.6	2 060	2 050	780	37 000	1 760	470	1	7.5
		CF 4VA	**CF 4VUUA**	**CF 4VRA**	**CF 4VUURA**															4 000	4 300	780	14 800				
5	0 -0.012	**CF 5A**	**CF 5UUA**	**CF 5RA**	**CF 5UURA**	**13**	9	5	M5×0.8	7.5	23	13	—	0.5	—	—	3	0.3	9.7	3 140	2 770	1 420	29 000	2 250	530	2	10.5
		CF 5VA	**CF 5VUUA**	**CF 5VRA**	**CF 5VUURA**															5 100	5 500	1 420	11 600				
6	0 -0.012	**CF 6A**	**CF 6UUA**	**CF 6RA**	**CF 6UURA**	**16**	11	6	M6×1	8	28	16	—	0.6	—	—	3	0.3	11	3 630	3 630	2 110	25 000	3 430	1 080	3	18.5
		CF 6VA	**CF 6VUUA**	**CF 6VRA**	**CF 6VUURA**															6 960	8 530	2 110	12 000				
8	0 -0.015	**CF 8A**	**CF 8UUA**	**CF 8RA**	**CF 8UURA**	**19**	11	8	M8×1.25	10	32	20	—	0.6	—	—	4	0.3	13	4 310	4 710	4 710	20 000	4 020	1 370	8	28.5
		CF 8VA	**CF 8VUUA**	**CF 8VRA**	**CF 8VUURA**															8 130	11 170	4 710	9 000				
10	0 -0.015	**CF10A**	**CF10UUA**	**CF10RA**	**CF10UURA**	**22**	12	10	M10×1.25	12	36	23	—	0.6	—	—	5	0.3	15	5 390	6 860	6 860	17 000	4 700	1 670	15	45
		CF10VA	**CF10VUUA**	**CF10VRA**	**CF10VUURA**															9 510	14 500	7 450	7 500				
10	0 -0.015	**CF10-1A**	**CF10-1UUA**	**CF10-1RA**	**CF10-1UURA**	**26**	12	10	M10×1.25	12	36	23	—	0.6	—	—	5	0.3	15	5 390	6 860	6 860	17 000	5 490	2 060	15	60
		CF10-1VA	**CF10-1VUUA**	**CF10-1VRA**	**CF10-1VUURA**															9 510	14 500	7 450	7 500				
10	0 -0.015	**CF10AK**	**CF10UUAK**	**CF10RAK**	**CF10UURAK**	**22**	12	10	M10×1	12	36	23	—	0.6	4	—	5	0.3	15	5 390	6 860	6 860	17 000	4 700	1 670	15	45
		CF10VAK	**CF10VUUAK**	**CF10VRAK**	**CF10VUURAK**															9 510	14 500	7 450	7 500				
10	0 -0.015	**CF10-1AK**	**CF10-1UUAK**	**CF10-1RAK**	**CF10-1UURAK**	**26**	12	10	M10×1	12	36	23	—	0.6	4	—	5	0.3	15	5 390	6 860	6 860	17 000	5 490	2 060	15	60
		CF10-1VAK	**CF10-1VUUAK**	**CF10-1VRAK**	**CF10-1VUURAK**															9 510	14 500	7 450	7 500				

* Without seals, suitable for grease lubrication. In case of oil lubrication, up to 130% of this value shall be permissible, and 70% of this value shall apply for types with seals.

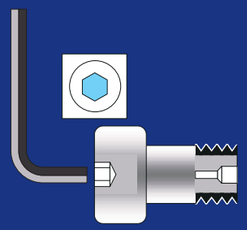
OUTER RINGS TOLERANCE (μm)

TYPE	Cylindrical outer ring	Crowned outer ring
CF3,CF4,CF5,CF6	0/-8	0/-50
CF8,CF10,CF10-1,CF12	0/-9	0/-50
CF12-1,CF16,CF18,CF20-1	0/-11	0/-50
CF20,CF24,CF24-1,CF30	0/-13	0/-50
CF30-1,CF30-2	0/-15	0/-50

ACCESSORIES

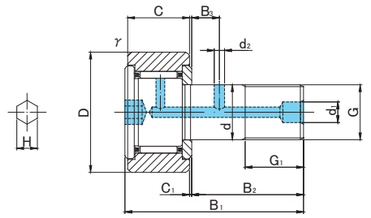
TYPE	 STOP PLUG	 RESIN PLUG	 NUT
CF3/CF4/CF5/CF6/CF8/CF10/CF10-1	—	—	Attached
CF10K/CF10-1K	ϕ 4 Attached	ϕ 4 Attached	Attached
CF12/CF12-1/CF16/CF18	ϕ 6 Attached	ϕ 6 Attached	Attached
CF20/CF20-1/CF24/CF24-1/CF30/CF30-1/CF30-2	ϕ 8 Attached	ϕ 8 Attached	Attached

CAM FOLLOWERS
HEXAGON SOCKET ON STUD HEAD

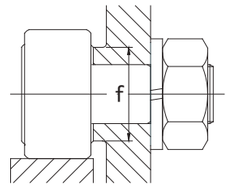


CF..A

CF..VA



CF12(V)A～CF30-2(V)A



CF..A TYPE

Prepacked Grease

Stud diameter (mm)	h7 tolerance	Designation: Cylindrical outer ring, Without seals	Designation: Cylindrical outer ring, With seals	Designation: Crowned outer ring R500(CF12～CF18) R1000(CF20≦), Without seals	Designation: Crowned outer ring R500(CF12～CF18) R1000(CF20≦), With seals	D	C	d	G	G1	B1	B2	B3	C1	d1	d2	H	rs min	f min	Basic dynamic load rating Cr N	Basic static load rating Cor N	Largest permissible load N	Limiting speed * rpm	Track load capacity: Cylindrical outer ring N	Track load capacity: Crowned outer ring N	Max tightening torque N·m	Mass g (approx)
12	0 -0.018	**CF12A**	**CF12UUA**	**CF12RA**	**CF12UURA**	**30**	14	12	M12×1.5	13	40	25	6	0.6	6	3	6	0.6	20	7 940	9 800	9 800	14 000	7 060	2 450	22	95
		CF12VA	**CF12VUUA**	**CF12VRA**	**CF12VUURA**															13 430	19 700	11 270	6 000				
12	0 -0.018	**CF12-1A**	**CF12-1UUA**	**CF12-1RA**	**CF12-1UURA**	**32**	14	12	M12×1.5	13	40	25	6	0.6	6	3	6	0.6	20	7 940	9 800	9 800	14 000	7 450	2 740	22	105
		CF12-1VA	**CF12-1VUUA**	**CF12-1VRA**	**CF12-1VUURA**															13 430	19 700	11 270	6 000				
16	0 -0.018	**CF16A**	**CF16UUA**	**CF16RA**	**CF16UURA**	**35**	18	16	M16×1.5	17	52	32.5	8	0.8	6	3	6	0.6	24	12 050	18 330	18 330	10 000	11 200	3 140	58	170
		CF16VA	**CF16VUUA**	**CF16VRA**	**CF16VUURA**															20 680	37 630	19 800	4 500				
18	0 -0.018	**CF18A**	**CF18UUA**	**CF18RA**	**CF18UURA**	**40**	20	18	M18×1.5	19	58	36.5	8	0.8	6	3	6	1	26	14 700	25 200	25 200	8 500	14 400	3 720	87	250
		CF18VA	**CF18VUUA**	**CF18VRA**	**CF18VUURA**															25 280	51 350	26 560	3 500				
20	0 -0.021	**CF20A**	**CF20UUA**	**CF20RA**	**CF20UURA**	**52**	24	20	M20×1.5	21	66	40.5	9	0.8	8	4	8	1	36	20 680	34 600	32 140	7 000	23 200	8 230	120	460
		CF20VA	**CF20VUUA**	**CF20VRA**	**CF20VUURA**															33 120	64 480	32 140	3 500				
20	0 -0.021	**CF20-1A**	**CF20-1UUA**	**CF20-1RA**	**CF20-1UURA**	**47**	24	20	M20×1.5	21	66	40.5	9	0.8	8	4	8	1	36	20 680	34 600	32 140	7 000	21 000	7 150	120	385
		CF20-1VA	**CF20-1VUUA**	**CF20-1VRA**	**CF20-1VUURA**															33 120	64 480	32 140	3 500				
24	0 -0.021	**CF24A**	**CF24UUA**	**CF24RA**	**CF24UURA**	**62**	29	24	M24×1.5	25	80	49.5	11	0.8	8	4	8	1	40	30 480	52 630	49 500	6 500	34 200	10 500	220	815
		CF24VA	**CF24VUUA**	**CF24VRA**	**CF24VUURA**															46 550	92 020	49 500	3 000				
24	0 -0.021	**CF24-1A**	**CF24-1UUA**	**CF24-1RA**	**CF24-1UURA**	**72**	29	24	M24×1.5	25	80	49.5	11	0.8	8	4	8	1	40	30 480	52 630	49 500	6 500	39 800	12 900	220	1 140
		CF24-1VA	**CF24-1VUUA**	**CF24-1VRA**	**CF24-1VUURA**															46 550	92 020	49 500	3 000				
30	0 -0.021	**CF30A**	**CF30UUA**	**CF30RA**	**CF30UURA**	**80**	35	30	M30×1.5	32	100	63	15	1	8	4	8	1	46	45 370	85 060	73 700	5 000	52 600	14 900	450	1 870
		CF30VA	**CF30VUUA**	**CF30VRA**	**CF30VUURA**															67 620	144 060	73 700	2 200				
30	0 -0.021	**CF30-1A**	**CF30-1UUA**	**CF30-1RA**	**CF30-1UURA**	**85**	35	30	M30×1.5	32	100	63	15	1	8	4	8	1	46	45 370	85 060	73 700	5 000	56 000	16 100	450	2 030
		CF30-1VA	**CF30-1VUUA**	**CF30-1VRA**	**CF30-1VUURA**															67 620	144 060	73 700	2 200				
30	0 -0.021	**CF30-2A**	**CF30-2UUA**	**CF30-2RA**	**CF30-2UURA**	**90**	35	30	M30×1.5	32	100	63	15	1	8	4	8	1	46	45 370	85 060	73 700	5 000	59 300	17 300	450	2 220
		CF30-2VA	**CF30-2VUUA**	**CF30-2VRA**	**CF30-2VUURA**															67 620	144 060	73 700	2 200				

* Without seals, suitable for grease lubrication. In case of oil lubrication, up to 130% of this value shall be permissible, and 70% of this value shall apply for types with seals.

OUTER RINGS TOLERANCE (μm)

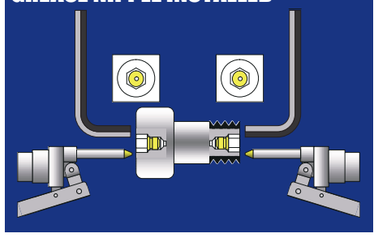
TYPE	Cylindrical outer ring	Crowned outer ring
CF3,CF4,CF5,CF6	0/-8	0/-50
CF8,CF10,CF10-1,CF12	0/-9	0/-50
CF12-1,CF16,CF18,CF20-1	0/-11	0/-50
CF20,CF24,CF24-1,CF30	0/-13	0/-50
CF30-1,CF30-2	0/-15	0/-50

ACCESSORIES

TYPE	STOP PLUG	RESIN PLUG	NUT
CF3/CF4/CF5/CF6/CF8/CF10/CF10-1	—	—	Attached
CF10K/CF10-1K	ϕ 4 Attached	ϕ 4 Attached	Attached
CF12/CF12-1/CF16/CF18	ϕ 6 Attached	ϕ 6 Attached	Attached
CF20/CF20-1/CF24/CF24-1/CF30/CF30-1/CF30-2	ϕ 8 Attached	ϕ 8 Attached	Attached

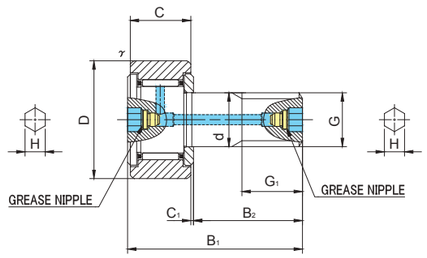
CAM FOLLOWERS

HEXAGON SOCKET ON BOTH SIDES GREASE NIPPLE INSTALLED

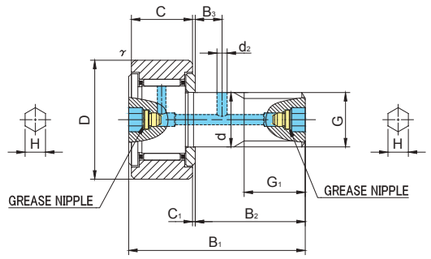


CF..AB

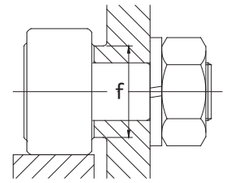
CF..VAB



CF10(V)ABK～CF10-1(V)ABK



CF12(V)AB～CF18(V)AB



CF..AB TYPE

Prepacked Grease

Stud diameter (mm)	h7 tolerance	Designation: Cylindrical outer ring, Without seals	Cylindrical outer ring, With seals	Crowned outer ring R500(CF10～CF18) R1000(CF20≦), Without seals	Crowned outer ring, With seals	D	C	d	G	G1	B1	B2	B3	C1	d2	H	rs min	f min	Basic dynamic load rating Cr N	Basic static load rating Cor N	Largest permissible load N	Limiting speed * rpm	Track load capacity: Cylindrical outer ring N	Track load capacity: Crowned outer ring N	Max tightening torque N·m	Mass g (approx)
10	0 -0.015	**CF10ABK**	**CF10UUABK**	**CF10RABK**	**CF10UURABK**	**22**	12	10	**M10×1**	12	36	23	—	0.6	—	5	0.3	15	5 390	6 860	6 860	17 000	4 700	1 670	15	45
		CF10VABK	**CF10VUUABK**	**CF10VRABK**	**CF10VUURABK**														9 510	14 500	7 450	7 500				
10	0 -0.015	**CF10-1ABK**	**CF10-1UUABK**	**CF10-1RABK**	**CF10-1UURABK**	**26**	12	10	**M10×1**	12	36	23	—	0.6	—	5	0.3	15	5 390	6 860	6 860	17 000	5 490	2 060	15	60
		CF10-1VABK	**CF10-1VUUABK**	**CF10-1VRABK**	**CF10-1VUURABK**														9 510	14 500	7 450	7 500				
12	0 -0.018	**CF12AB**	**CF12UUAB**	**CF12RAB**	**CF12UURAB**	**30**	14	12	M12×1.5	13	40	25	6	0.6	3	6	0.6	20	7 940	9 800	9 800	14 000	7 060	2 450	22	95
		CF12VAB	**CF12VUUAB**	**CF12VRAB**	**CF12VUURAB**														13 430	19 700	11 270	6 000				
12	0 -0.018	**CF12-1AB**	**CF12-1UUAB**	**CF12-1RAB**	**CF12-1UURAB**	**32**	14	12	M12×1.5	13	40	25	6	0.6	3	6	0.6	20	7 940	9 800	9 800	14 000	7 450	2 740	22	105
		CF12-1VAB	**CF12-1VUUAB**	**CF12-1VRAB**	**CF12-1VUURAB**														13 430	19 700	11 270	6 000				
16	0 -0.018	**CF16AB**	**CF16UUAB**	**CF16RAB**	**CF16UURAB**	**35**	18	16	M16×1.5	17	52	32.5	8	0.8	3	6	0.6	24	12 050	18 330	18 330	10 000	11 200	3 140	58	170
		CF16VAB	**CF16VUUAB**	**CF16VRAB**	**CF16VUURAB**														20 680	37 630	19 800	4 500				
18	0 -0.018	**CF18AB**	**CF18UUAB**	**CF18RAB**	**CF18UURAB**	**40**	20	18	M18×1.5	19	58	36.5	8	0.8	3	6	1	26	14 700	25 200	25 200	8 500	14 400	3 720	87	250
		CF18VAB	**CF18VUUAB**	**CF18VRAB**	**CF18VUURAB**														25 280	51 350	26 560	3 500				
20	0 -0.021	**CF20AB**	**CF20UUAB**	**CF20RAB**	**CF20UURAB**	**52**	24	20	M20×1.5	21	66	40.5	9	0.8	4	8	1	36	20 680	34 600	32 140	7 000	23 200	8 230	120	460
		CF20VAB	**CF20VUUAB**	**CF20VRAB**	**CF20VUURAB**														33 120	64 480	32 140	3 500				

CF..AB TYPE has oil holes (grease nipple) which are prepared in the stud head and thread side, also an oil hole is prepared in the outer surface of stud.

* Without seals, suitable for grease lubrication. In case of oil lubrication, up to 130% of this value shall be permissible, and 70% of this value shall apply for types with seals.

OUTER RINGS TOLERANCE (μm)

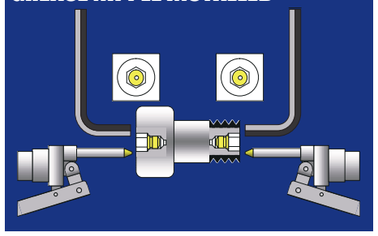
TYPE	Cylindrical outer ring	Crowned outer ring
CF10,CF10-1,CF12	0/-9	0/-50
CF12-1,CF16,CF18,CF20-1	0/-11	0/-50
CF20,CF24,CF24-1,CF30	0/-13	0/-50
CF30-1,CF30-2	0/-15	0/-50

ACCESSORIES

TYPE	 Grease Nipple	 NUT
All types	Installed	Attached

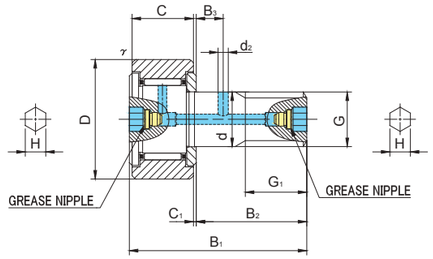
CAM FOLLOWERS

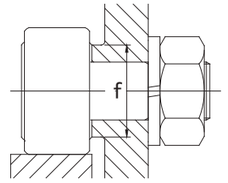
HEXAGON SOCKET ON BOTH SIDES GREASE NIPPLE INSTALLED



CF..AB

CF..VAB





CF..AB TYPE

Prepacked Grease

Stud diameter (mm)	h7 tolerance	Designation: Cylindrical outer ring, Without seals	Designation: Cylindrical outer ring, With seals	Designation: Crowned outer ring R1000(CF20 ≦), Without seals	Designation: Crowned outer ring R1000(CF20 ≦), With seals	D	C	d	G	G1	B1	B2	B3	C1	d2	H	rs min	f min	Basic dynamic load rating Cr N	Basic static load rating Cor N	Largest permissible load N	Limiting speed * rpm	Track load capacity: Cylindrical outer ring N	Track load capacity: Crowned outer ring N	Max tightening torque N·m	Mass g (approx)
20	0 -0.021	**CF20-1AB**	**CF20-1UUAB**	**CF20-1RAB**	**CF20-1UURAB**	**47**	24	20	M20×1.5	21	66	40.5	9	0.8	4	8	1	36	20 680	34 600	32 140	7 000	21 000	7 150	120	385
		CF20-1VAB	**CF20-1VUUAB**	**CF20-1VRAB**	**CF20-1VUURAB**														33 120	64 480	32 140	3 500				
24	0 -0.021	**CF24AB**	**CF24UUAB**	**CF24RAB**	**CF24UURAB**	**62**	29	24	M24×1.5	25	80	49.5	11	0.8	4	8	1	40	30 480	52 630	49 500	6 500	34 200	10 500	220	815
		CF24VAB	**CF24VUUAB**	**CF24VRAB**	**CF24VUURAB**														46 550	92 020	49 500	3 000				
24	0 -0.021	**CF24-1AB**	**CF24-1UUAB**	**CF24-1RAB**	**CF24-1UURAB**	**72**	29	24	M24×1.5	25	80	49.5	11	0.8	4	8	1	40	30 480	52 630	49 500	6 500	39 800	12 900	220	1 140
		CF24-1VAB	**CF24-1VUUAB**	**CF24-1VRAB**	**CF24-1VUURAB**														46 550	92 020	49 500	3 000				
30	0 -0.021	**CF30AB**	**CF30UUAB**	**CF30RAB**	**CF30UURAB**	**80**	35	30	M30×1.5	32	100	63	15	1	4	8	1	46	45 370	85 060	73 700	5 000	52 600	14 900	450	1 870
		CF30VAB	**CF30VUUAB**	**CF30VRAB**	**CF30VUURAB**														67 620	144 060	73 700	2 200				
30	0 -0.021	**CF30-1AB**	**CF30-1UUAB**	**CF30-1RAB**	**CF30-1UURAB**	**85**	35	30	M30×1.5	32	100	63	15	1	4	8	1	46	45 370	85 060	73 700	5 000	56 000	16 100	450	2 030
		CF30-1VAB	**CF30-1VUUAB**	**CF30-1VRAB**	**CF30-1VUURAB**														67 620	144 060	73 700	2 200				
30	0 -0.021	**CF30-2AB**	**CF30-2UUAB**	**CF30-2RAB**	**CF30-2UURAB**	**90**	35	30	M30×1.5	32	100	63	15	1	4	8	1	46	45 370	85 060	73 700	5 000	59 300	17 300	450	2 220
		CF30-2VAB	**CF30-2VUUAB**	**CF30-2VRAB**	**CF30-2VUURAB**														67 620	144 060	73 700	2 200				

CF..AB TYPE has oil holes (grease nipple) which are prepared in the stud head and thread side, also an oil hole is prepared in the outer surface of stud.

* Without seals, suitable for grease lubrication. In case of oil lubrication, up to 130% of this value shall be permissible, and 70% of this value shall apply for types with seals.

OUTER RINGS TOLERANCE (μm)

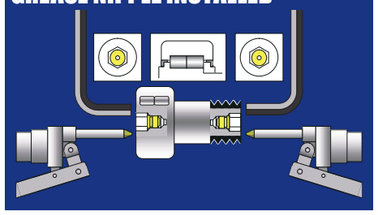
TYPE	Cylindrical outer ring	Crowned outer ring
CF10,CF10-1,CF12	0/-9	0/-50
CF12-1,CF16,CF18,CF20-1	0/-11	0/-50
CF20,CF24,CF24-1,CF30	0/-13	0/-50
CF30-1,CF30-2	0/-15	0/-50

ACCESSORIES

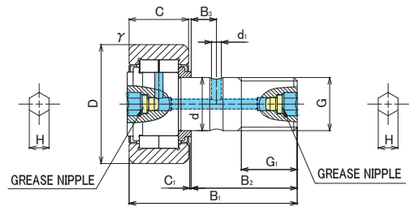
TYPE	 Grease Nipple	 NUT
All types	Installed	Attached

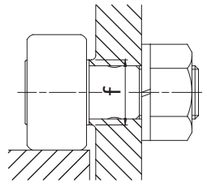
CAM FOLLOWERS

FULL COMPLEMENT DOUBLE ROW
HEXAGON SOCKET ON BOTH SIDES
GREASE NIPPLE INSTALLED



NUCF..AB





NUCF TYPE

Prepacked Grease

Stud diameter (mm)		Designation		Dimensions (mm)												Basic dynamic load rating	Basic static load rating	Largest permissible load	Limiting speed	Track load capacity		Max tightening torque	Mass
		Cylindrical outer ring	Crowned outer ring R500(NUCF16~NUCF18) R1000(NUCF20≦)																				
	h7 tolerance			D	C	d	G	G1	B1	B2	B3	C1	D2	H	rs min	f min	Cr N	Cor N	N	rpm	Cylindrical outer ring N	Crowned outer ring N	N·m	g (approx)
16	0 -0.018	**NUCF16AB**	**NUCF16RAB**	**35**	18	16	M16x1.5	17	52	32.5	7.8	0.8	3	6	0.6	20	23 400	27 200	11 900	5 200	11 200	3 140	58	167
18	0 -0.018	**NUCF18AB**	**NUCF18RAB**	**40**	20	18	M18x1.5	19	58	36.5	8	0.8	3	6	1	22	25 200	30 900	22 200	4 700	14 400	3 720	87	248
20	0 -0.021	**NUCF20AB**	**NUCF20RAB**	**52**	24	20	M20x1.5	21	66	40.5	9	0.8	4	8	1	31	43 000	58 100	25 700	3 300	23 200	8 230	120	461
	0 -0.021	**NUCF20-1AB**	**NUCF20-1RAB**	**47**	24	20	M20x1.5	21	66	40.5	9	0.8	4	8	1	27	38 900	48 900	25 300	3 800	21 000	7 150	120	390
24	0 -0.021	**NUCF24AB**	**NUCF24RAB**	**62**	28	24	M24x1.5	25	80	49.5	11	1.3	4	8	1	38	57 600	74 300	35 000	2 800	32 000	10 500	220	789
	0 -0.021	**NUCF24-1AB**	**NUCF24-1RAB**	**72**	28	24	M24x1.5	25	80	49.5	11	1.3	4	8	1.1	44	63 300	87 500	53 700	2 300	37 200	12 900	220	1 020
30	0 -0.021	**NUCF30AB**	**NUCF30RAB**	**80**	35	30	M30x1.5	32	100	63	15	1	4	8	1.1	47	94 800	135 700	73 700	2 100	52 600	14 900	450	1 630
	0 -0.021	**NUCF30-2AB**	**NUCF30-2RAB**	**90**	35	30	M30x1.5	32	100	63	15	1	4	8	1.1	47	94 800	135 700	73 700	2 100	59 300	17 300	450	1 990

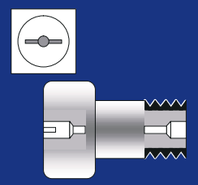
OUTER RINGS TOLERANCE (μm)

TYPE	Cylindrical outer ring	Crowned outer ring
NUCF16,NUCF18,NUCF20-1	0/-11	0/-50
NUCF20,NUCF24,NUCF24-1,NUCF30	0/-13	0/-50
NUCF30-2	0/-15	0/-50

ACCESSORIES

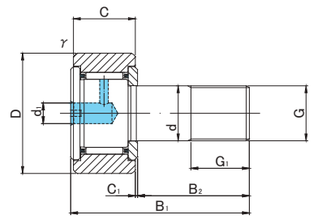
TYPE	 Grease Nipple	 NUT
All types	Installed	Attached

CAM FOLLOWERS
SCREWDRIVER SLOT HEAD

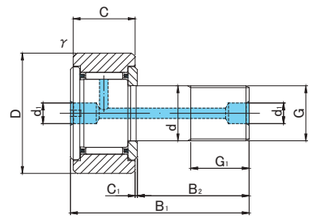


CF

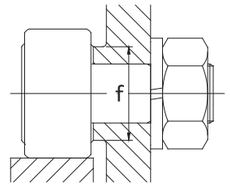
CF..V



CF5(V)～CF10-1(V)



CF10(V)K～CF10-1(V)K



CF TYPE

Prepacked Grease

Stud diameter (mm)	h7 tolerance	Designation: Cylindrical outer ring, Without seals	Cylindrical outer ring, With seals	Crowned outer ring R250(CF5) R500(CF6 ～ CF10-1), Without seals	Crowned outer ring R250(CF5) R500(CF6 ～ CF10-1), With seals	D	C	d	G	G1	B1	B2	B3	C1	d1	d2	r_s min	f min	Basic dynamic load rating Cr N	Basic static load rating Cor N	Largest permissible load N	Limiting speed * rpm	Track load capacity: Cylindrical outer ring N	Track load capacity: Crowned outer ring N	Max tightening torque N·m	Mass g (approx)
5	0 -0.012	**CF 5**	**CF 5UU**	**CF 5R**	**CF 5UUR**	**13**	9	5	M5×0.8	7.5	23	13	—	0.5	3.1	—	0.3	9.7	3 140	2 770	1 420	29 000	2 250	530	2	10.5
		CF 5V	**CF 5VUU**	**CF 5VR**	**CF 5VUUR**														5 100	5 500	1 420	11 600				
6	0 -0.012	**CF 6**	**CF 6UU**	**CF 6R**	**CF 6UUR**	**16**	11	6	M6×1	8	28	16	—	0.6	4	—	0.3	11	3 630	3 630	2 110	25 000	3 430	1 080	3	18.5
		CF 6V	**CF 6VUU**	**CF 6VR**	**CF 6VUUR**														6 960	8 530	2 110	12 000				
8	0 -0.015	**CF 8**	**CF 8UU**	**CF 8R**	**CF 8UUR**	**19**	11	8	M8×1.25	10	32	20	—	0.6	4	—	0.3	13	4 310	4 710	4 710	20 000	4 020	1 370	8	28.5
		CF 8V	**CF 8VUU**	**CF 8VR**	**CF 8VUUR**														8 130	11 170	4 710	9 000				
10	0 -0.015	**CF10**	**CF10UU**	**CF10R**	**CF10UUR**	**22**	12	10	M10×1.25	12	36	23	—	0.6	4	—	0.3	15	5 390	6 860	6 860	17 000	4 700	1 670	15	45
		CF10V	**CF10VUU**	**CF10VR**	**CF10VUUR**														9 510	14 500	7 450	7 500				
10	0 -0.015	**CF10-1**	**CF10-1UU**	**CF10-1R**	**CF10-1UUR**	**26**	12	10	M10×1.25	12	36	23	—	0.6	4	—	0.3	15	5 390	6 860	6 860	17 000	5 490	2 060	15	60
		CF10-1V	**CF10-1VUU**	**CF10-1VR**	**CF10-1VUUR**														9 510	14 500	7 450	7 500				
10	0 -0.015	**CF10K**	**CF10UUK**	**CF10RK**	**CF10UURK**	**22**	12	10	M10×1	12	36	23	—	0.6	4	—	0.3	15	5 390	6 860	6 860	17 000	4 700	1 670	15	45
		CF10VK	**CF10VUUK**	**CF10VRK**	**CF10VUURK**														9 510	14 500	7 450	7 500				
10	0 -0.015	**CF10-1K**	**CF10-1UUK**	**CF10-1RK**	**CF10-1UURK**	**26**	12	10	M10×1	12	36	23	—	0.6	4	—	0.3	15	5 390	6 860	6 860	17 000	5 490	2 060	15	60
		CF10-1VK	**CF10-1VUUK**	**CF10-1VRK**	**CF10-1VUURK**														9 510	14 500	7 450	7 500				

* Without seals, suitable for grease lubrication. In case of oil lubrication, up to 130% of this value shall be permissible, and 70% of this value shall apply for types with seals.

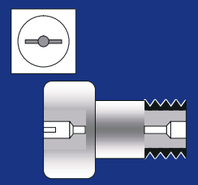
OUTER RINGS TOLERANCE

TYPE	Cylindrical outer ring	Crowned outer ring
CF5,CF6	0/-8	0/-50
CF8,CF10,CF10-1,CF12	0/-9	0/-50
CF12-1,CF16,CF18,CF20-1	0/-11	0/-50
CF20,CF24,CF24-1,CF30	0/-13	0/-50
CF30-1,CF30-2	0/-15	0/-50

ACCESSORIES

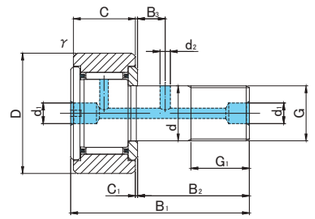
TYPE	 STOP PLUG	 RESIN PLUG	 NUT
CF5	—	—	Attached
CF6/CF8/CF10/CF10-1	—	ϕ 4 Attached	Attached
CF12/CF12-1/CF16/CF18	ϕ 6 Attached	ϕ 6 Attached	Attached
CF20/CF20-1/CF24/CF24-1/CF30/CF30-1/CF30-2	ϕ 8 Attached	ϕ 8 Attached	Attached

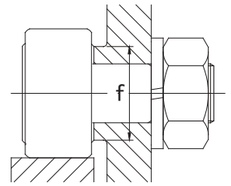
CAM FOLLOWERS
SCREWDRIVER SLOT HEAD



CF

CF..V





CF TYPE

Prepacked Grease

Stud diameter (mm)		Designation				Dimensions (mm)													Basic dynamic load rating	Basic static load rating	Largest permissible load	Limiting speed *	Track load capacity		Max tightening torque	Mass
		Cylindrical outer ring		Crowned outer ring R500(CF12 ～ CF18) R1000(CF20 ≦)																						
	h7 tolerance	Without seals	With seals	Without seals	With seals	D	C	d	G	G1	B1	B2	B3	C1	d1	d2	r_s min	f min	Cr N	Cor N	N	rpm	Cylindrical outer ring N	Crowned outer ring N	N·m	g (approx)
12	0 -0.018	**CF12**	**CF12UU**	**CF12R**	**CF12UUR**	**30**	14	12	M12×1.5	13	40	25	6	0.6	6	3	0.6	20	7 940	9 800	9 800	14 000	7 060	2 450	22	95
		CF12V	**CF12VUU**	**CF12VR**	**CF12VUUR**														13 430	19 700	11 270	6 000				
12	0 -0.018	**CF12-1**	**CF12-1UU**	**CF12-1R**	**CF12-1UUR**	**32**	14	12	M12×1.5	13	40	25	6	0.6	6	3	0.6	20	7 940	9 800	9 800	14 000	7 450	2 740	22	105
		CF12-1V	**CF12-1VUU**	**CF12-1VR**	**CF12-1VUUR**														13 430	19 700	11 270	6 000				
16	0 -0.018	**CF16**	**CF16UU**	**CF16R**	**CF16UUR**	**35**	18	16	M16×1.5	17	52	32.5	8	0.8	6	3	0.6	24	12 050	18 330	18 330	10 000	11 200	3 140	58	170
		CF16V	**CF16VUU**	**CF16VR**	**CF16VUUR**														20 680	37 630	19 800	4 500				
18	0 -0.018	**CF18**	**CF18UU**	**CF18R**	**CF18UUR**	**40**	20	18	M18×1.5	19	58	36.5	8	0.8	6	3	1	26	14 700	25 200	25 200	8 500	14 400	3 720	87	250
		CF18V	**CF18VUU**	**CF18VR**	**CF18VUUR**														25 280	51 350	26 560	3 500				
20	0 -0.021	**CF20**	**CF20UU**	**CF20R**	**CF20UUR**	**52**	24	20	M20×1.5	21	66	40.5	9	0.8	8	4	1	36	20 680	34 600	32 140	7 000	23 200	8 230	120	460
		CF20V	**CF20VUU**	**CF20VR**	**CF20VUUR**														33 120	64 480	32 140	3 500				
20	0 -0.021	**CF20-1**	**CF20-1UU**	**CF20-1R**	**CF20-1UUR**	**47**	24	20	M20×1.5	21	66	40.5	9	0.8	8	4	1	36	20 680	34 600	32 140	7 000	21 000	7 150	120	385
		CF20-1V	**CF20-1VUU**	**CF20-1VR**	**CF20-1VUUR**														33 120	64 480	32 140	3 500				
24	0 -0.021	**CF24**	**CF24UU**	**CF24R**	**CF24UUR**	**62**	29	24	M24×1.5	25	80	49.5	11	0.8	8	4	1	40	30 480	52 630	49 500	6 500	34 200	10 500	220	815
		CF24V	**CF24VUU**	**CF24VR**	**CF24VUUR**														46 550	92 020	49 500	3 000				
24	0 -0.021	**CF24-1**	**CF24-1UU**	**CF24-1R**	**CF24-1UUR**	**72**	29	24	M24×1.5	25	80	49.5	11	0.8	8	4	1	40	30 480	52 630	49 500	6 500	39 800	12 900	220	1 140
		CF24-1V	**CF24-1VUU**	**CF24-1VR**	**CF24-1VUUR**														46 550	92 020	49 500	3 000				
30	0 -0.021	**CF30**	**CF30UU**	**CF30R**	**CF30UUR**	**80**	35	30	M30×1.5	32	100	63	15	1	8	4	1	46	45 370	85 060	73 700	5 000	52 600	14 900	450	1 870
		CF30V	**CF30VUU**	**CF30VR**	**CF30VUUR**														67 620	144 060	73 700	2 200				
30	0 -0.021	**CF30-1**	**CF30-1UU**	**CF30-1R**	**CF30-1UUR**	**85**	35	30	M30×1.5	32	100	63	15	1	8	4	1	46	45 370	85 060	73 700	5 000	56 000	16 100	450	2 030
		CF30-1V	**CF30-1VUU**	**CF30-1VR**	**CF30-1VUUR**														67 620	144 060	73 700	2 200				
30	0 -0.021	**CF30-2**	**CF30-2UU**	**CF30-2R**	**CF30-2UUR**	**90**	35	30	M30×1.5	32	100	63	15	1	8	4	1	46	45 370	85 060	73 700	5 000	59 300	17 300	450	2 220
		CF30-2V	**CF30-2VUU**	**CF30-2VR**	**CF30-2VUUR**														67 620	144 060	73 700	2 200				

* Without seals, suitable for grease lubrication. In case of oil lubrication, up to 130% of this value shall be permissible, and 70% of this value shall apply for types with seals.

OUTER RINGS TOLERANCE

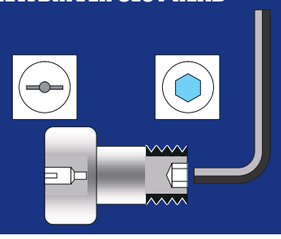
TYPE	Cylindrical outer ring	Crowned outer ring
CF5,CF6	0/-8	0/-50
CF8,CF10,CF10-1,CF12	0/-9	0/-50
CF12-1,CF16,CF18,CF20-1	0/-11	0/-50
CF20,CF24,CF24-1,CF30	0/-13	0/-50
CF30-1,CF30-2	0/-15	0/-50

ACCESSORIES

TYPE	 STOP PLUG	 RESIN PLUG	 NUT
CF5	—	—	Attached
CF6/CF8/CF10/CF10-1	—	ϕ 4 Attached	Attached
CF12/CF12-1/CF16/CF18	ϕ 6 Attached	ϕ 6 Attached	Attached
CF20/CF20-1/CF24/CF24-1/CF30/CF30-1/CF30-2	ϕ 8 Attached	ϕ 8 Attached	Attached

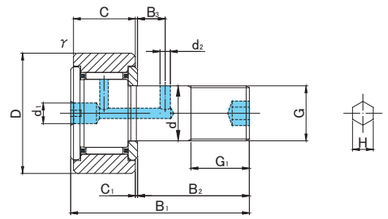
CAM FOLLOWERS

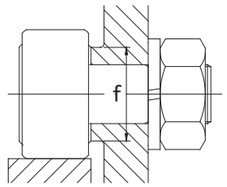
HEXAGON SOCKET ON THREAD SIDE SCREWDRIVER SLOT HEAD



CF..B

CF..VB





CF..B TYPE

Prepacked Grease

Stud diameter (mm)	h7 tolerance	Designation: Cylindrical outer ring, Without seals	Designation: Cylindrical outer ring, With seals	Designation: Crowned outer ring R500(CF12 ～ CF18) R1000(CF20 ≦), Without seals	Designation: Crowned outer ring R500(CF12 ～ CF18) R1000(CF20 ≦), With seals	D	C	d	G	G1	B1	B2	B3	C1	d1	d2	H	rs min	f min	Basic dynamic load rating Cr N	Basic static load rating Cor N	Largest permissible load N	Limiting speed * rpm	Track load capacity: Cylindrical outer ring N	Track load capacity: Crowned outer ring N	Max tightening torque N·m	Mass g (approx)
12	0 -0.018	CF12B	CF12UUB	CF12RB	CF12UURB	30	14	12	M12×1.5	13	40	25	6	0.6	6	3	6	0.6	20	7 940	9 800	9 800	14 000	7 060	2 450	22	95
		CF12VB	CF12VUUB	CF12VRB	CF12VUURB															13 430	19 700	11 270	6 000				
12	0 -0.018	CF12-1B	CF12-1UUB	CF12-1RB	CF12-1UURB	32	14	12	M12×1.5	13	40	25	6	0.6	6	3	6	0.6	20	7 940	9 800	9 800	14 000	7 450	2 740	22	105
		CF12-1VB	CF12-1VUUB	CF12-1VRB	CF12-1VUURB															13 430	19 700	11 270	6 000				
16	0 -0.018	CF16B	CF16UUB	CF16RB	CF16UURB	35	18	16	M16×1.5	17	52	32.5	8	0.8	6	3	6	0.6	24	12 050	18 330	18 330	10 000	11 200	3 140	58	170
		CF16VB	CF16VUUB	CF16VRB	CF16VUURB															20 680	37 630	19 800	4 500				
18	0 -0.018	CF18B	CF18UUB	CF18RB	CF18UURB	40	20	18	M18×1.5	19	58	36.5	8	0.8	6	3	6	1	26	14 700	25 200	25 200	8 500	14 400	3 720	87	250
		CF18VB	CF18VUUB	CF18VRB	CF18VUURB															25 280	51 350	26 560	3 500				
20	0 -0.021	CF20B	CF20UUB	CF20RB	CF20UURB	52	24	20	M20×1.5	21	66	40.5	9	0.8	8	4	8	1	36	20 680	34 600	32 140	7 000	23 200	8 230	120	460
		CF20VB	CF20VUUB	CF20VRB	CF20VUURB															33 120	64 480	32 140	3 500				
20	0 -0.021	CF20-1B	CF20-1UUB	CF20-1RB	CF20-1UURB	47	24	20	M20×1.5	21	66	40.5	9	0.8	8	4	8	1	36	20 680	34 600	32 140	7 000	21 000	7 150	120	385
		CF20-1VB	CF20-1VUUB	CF20-1VRB	CF20-1VUURB															33 120	64 480	32 140	3 500				
24	0 -0.021	CF24B	CF24UUB	CF24RB	CF24UURB	62	29	24	M24×1.5	25	80	49.5	11	0.8	8	4	8	1	40	30 480	52 630	49 500	6 500	34 200	10 500	220	815
		CF24VB	CF24VUUB	CF24VRB	CF24VUURB															46 550	92 020	49 500	3 000				
24	0 -0.021	CF24-1B	CF24-1UUB	CF24-1RB	CF24-1UURB	72	29	24	M24×1.5	25	80	49.5	11	0.8	8	4	8	1	40	30 480	52 630	49 500	6 500	39 800	12 900	220	1 140
		CF24-1VB	CF24-1VUUB	CF24-1VRB	CF24-1VUURB															46 550	92 020	49 500	3 000				
30	0 -0.021	CF30B	CF30UUB	CF30RB	CF30UURB	80	35	30	M30×1.5	32	100	63	15	1	8	4	8	1	46	45 370	85 060	73 700	5 000	52 600	14 900	450	1 870
		CF30VB	CF30VUUB	CF30VRB	CF30VUURB															67 620	144 060	73 700	2 200				
30	0 -0.021	CF30-1B	CF30-1UUB	CF30-1RB	CF30-1UURB	85	35	30	M30×1.5	32	100	63	15	1	8	4	8	1	46	45 370	85 060	73 700	5 000	56 000	16 100	450	2 030
		CF30-1VB	CF30-1VUUB	CF30-1VRB	CF30-1VUURB															67 620	144 060	73 700	2 200				
30	0 -0.021	CF30-2B	CF30-2UUB	CF30-2RB	CF30-2UURB	90	35	30	M30×1.5	32	100	63	15	1	8	4	8	1	46	45 370	85 060	73 700	5 000	59 300	17 300	450	2 220
		CF30-2VB	CF30-2VUUB	CF30-2VRB	CF30-2VUURB															67 620	144 060	73 700	2 200				

* Without seals, suitable for grease lubrication. In case of oil lubrication, up to 130% of this value shall be permissible, and 70% of this value shall apply for types with seals.

OUTER RINGS TOLERANCE (μm)

TYPE	Cylindrical outer ring	Crowned outer ring
CF12	0/-9	0/-50
CF12-1,CF16,CF18,CF20-1	0/-11	0/-50
CF20,CF24,CF24-1,CF30	0/-13	0/-50
CF30-1,CF30-2	0/-15	0/-50

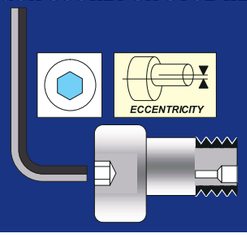
ACCESSORIES

TYPE	STOP PLUG	RESIN PLUG	NUT
CF12/CF12-1/CF16/CF18	ϕ 6 Attached	ϕ 6 Attached	Attached
CF20/CF20-1/CF24/CF24-1/CF30/CF30-1/CF30-2	ϕ 8 Attached	ϕ 8 Attached	Attached

CAM FOLLOWERS

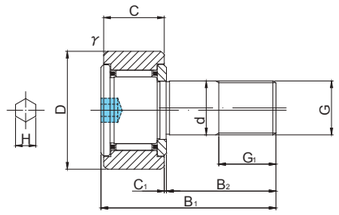
SOLID ECCENTRIC TYPE

HEXAGON SOCKET ON STUD HEAD

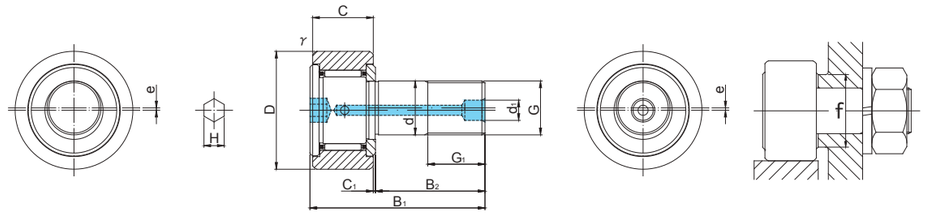


CFH..A

CFH..VA



CFH5(V)A～CFH10-1(V)A



CFH12(V)A～CFH12-1(V)A

CFH..A TYPE

Prepacked Grease

Stud diameter (mm)	h7 tolerance	Designation: Cylindrical outer ring, Without seals	Designation: Cylindrical outer ring, With seals	Designation: Crowned outer ring R250(CF5) R500(CF6 ～ CF12-1), Without seals	Designation: Crowned outer ring R250(CF5) R500(CF6 ～ CF12-1), With seals	D	C	d	G	G1	B1	B2	C1	d1	H	r_s min	e	f min	Basic dynamic load rating Cr N	Basic static load rating Cor N	Largest permissible load N	Limiting speed * rpm	Track load capacity: Cylindrical outer ring N	Track load capacity: Crowned outer ring N	Max tightening torque N·m	Mass g (approx)
5	0 -0.012	CFH 5A	CFH 5UUA	CFH 5RA	CFH 5UURA	13	9	5	M5×0.8	7.5	23	13	0.5	—	3	0.3	0.2	9.7	3 140	2 770	1 420	29 000	2 250	530	2	10.5
		CFH 5VA	CFH 5VUUA	CFH 5VRA	CFH 5VUURA														5 100	5 500	1 420	11 600				
6	0 -0.012	CFH 6A	CFH 6UUA	CFH 6RA	CFH 6UURA	16	11	6	M6×1	8	28	16	0.6	—	3	0.3	0.25	11	3 630	3 630	2 110	25 000	3 430	1 080	3	18.5
		CFH 6VA	CFH 6VUUA	CFH 6VRA	CFH 6VUURA														6 960	8 530	2 110	12 000				
8	0 -0.015	CFH 8A	CFH 8UUA	CFH 8RA	CFH 8UURA	19	11	8	M8×1.25	10	32	20	0.6	—	4	0.3	0.25	13	4 310	4 710	4 710	20 000	4 020	1 370	8	28.5
		CFH 8VA	CFH 8VUUA	CFH 8VRA	CFH 8VUURA														8 130	11 170	4 710	9 000				
10	0 -0.015	CFH10A	CFH10UUA	CFH10RA	CFH10UURA	22	12	10	M10×1.25	12	36	23	0.6	—	5	0.3	0.3	15	5 390	6 860	6 860	17 000	4 700	1 670	15	45
		CFH10VA	CFH10VUUA	CFH10VRA	CFH10VUURA														9 510	14 500	7 450	7 500				
10	0 -0.015	CFH10-1A	CFH10-1UUA	CFH10-1RA	CFH10-1UURA	26	12	10	M10×1.25	12	36	23	0.6	—	5	0.3	0.3	15	5 390	6 860	6 860	17 000	5 490	2 060	15	60
		CFH10-1VA	CFH10-1VUUA	CFH10-1VRA	CFH10-1VUURA														9 510	14 500	7 450	7 500				
12	0 -0.018	CFH12A	CFH12UUA	CFH12RA	CFH12UURA	30	14	12	M12×1.5	13	40	25	0.6	6	6	0.6	0.4	20	7 940	9 800	9 800	14 000	7 060	2 450	22	95
		CFH12VA	CFH12VUUA	CFH12VRA	CFH12VUURA														13 430	19 700	11 270	6 000				
12	0 -0.018	CFH12-1A	CFH12-1UUA	CFH12-1RA	CFH12-1UURA	32	14	12	M12×1.5	13	40	25	0.6	6	6	0.6	0.4	20	7 940	9 800	9 800	14 000	7 450	2 740	22	105
		CFH12-1VA	CFH12-1VUUA	CFH12-1VRA	CFH12-1VUURA														13 430	19 700	11 270	6 000				

* Without seals, suitable for grease lubrication. In case of oil lubrication, up to 130% of this value shall be permissible, and 70% of this value shall apply for types with seals.

OUTER RINGS TOLERANCE (μm)

TYPE	Cylindrical outer ring	Crowned outer ring
CF5,CF6	0/-8	0/-50
CF8,CF10,CF10-1,CF12	0/-9	0/-50
CF12-1,CF16,CF18,CF20-1	0/-11	0/-50
CF20,CF24,CF24-1,CF30	0/-13	0/-50
CF30-1,CF30-2	0/-15	0/-50

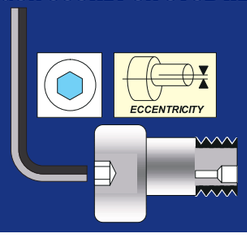
ACCESSORIES

TYPE	STOP PLUG	RESIN PLUG	NUT
CF5	—	—	Attached
CF6/CF8/CF10/CF10-1	—	—	Attached
CF12/CF12-1/CF16/CF18	ϕ 6 Attached	ϕ 6 Attached	Attached
CF20/CF20-1/CF24/CF24-1/CF30/CF30-1/CF30-2	ϕ 8 Attached	ϕ 8 Attached	Attached

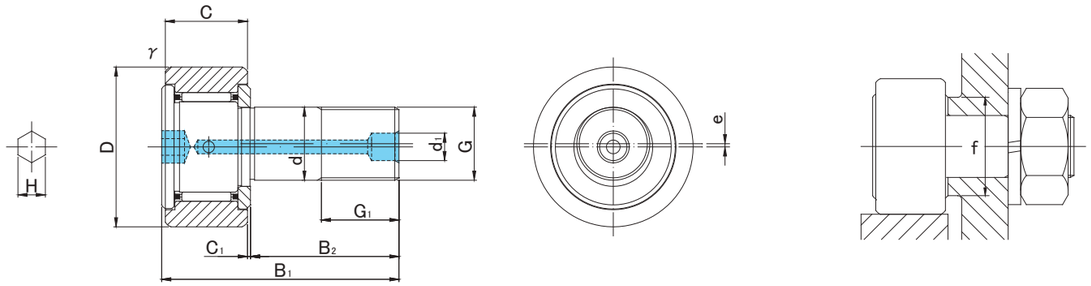
CAM FOLLOWERS

SOLID ECCENTRIC TYPE

HEXAGON SOCKET ON STUD HEAD



CFH..A　　CFH..VA



CFH..A TYPE

Prepacked Grease

Stud diameter (mm)		Designation				Dimensions (mm)													Basic dynamic load rating	Basic static load rating	Largest permissible load	Limiting speed *	Track load capacity		Max tightening torque	Mass
		Cylindrical outer ring		Crowned outer ring R250(CF5) R500(CF6～CF18) R1000(CF20≦)																						
	h7 tolerance	Without seals	With seals	Without seals	With seals	D	C	d	G	G1	B1	B2	C1	d1	H	r_s min	e	f min	Cr N	Cor N	N	rpm	Cylindrical outer ring N	Crowned outer ring N	N·m	g (approx)
16	0 -0.018	**CFH16A**	**CFH16UUA**	**CFH16RA**	**CFH16UURA**	**35**	18	16	M16×1.5	17	52	32.5	0.8	6	6	0.6	0.5	24	12 050	18 330	18 330	10 000	11 200	3 140	58	170
		CFH16VA	**CFH16VUUA**	**CFH16VRA**	**CFH16VUURA**														20 680	37 630	19 800	4 500				
18	0 -0.018	**CFH18A**	**CFH18UUA**	**CFH18RA**	**CFH18UURA**	**40**	20	18	M18×1.5	19	58	36.5	0.8	6	6	1	0.6	26	14 700	25 200	25 200	8 500	14 400	3 720	87	250
		CFH18VA	**CFH18VUUA**	**CFH18VRA**	**CFH18VUURA**														25 280	51 350	26 560	3 500				
20	0 -0.021	**CFH20A**	**CFH20UUA**	**CFH20RA**	**CFH20UURA**	**52**	24	20	M20×1.5	21	66	40.5	0.8	8	8	1	0.7	36	20 680	34 600	32 140	7 000	23 200	8 230	120	460
		CFH20VA	**CFH20VUUA**	**CFH20VRA**	**CFH20VUURA**														33 120	64 480	32 140	3 500				
20	0 -0.021	**CFH20-1A**	**CFH20-1UUA**	**CFH20-1RA**	**CFH20-1URA**	**47**	24	20	M20×1.5	21	66	40.5	0.8	8	8	1	0.7	36	20 680	34 600	32 140	7 000	21 000	7 150	120	385
		CFH20-1VA	**CFH20-1VUUA**	**CFH20-1VRA**	**CFH20-1VUURA**														33 120	64 480	32 140	3 500				
24	0 -0.021	**CFH24A**	**CFH24UUA**	**CFH24RA**	**CFH24UURA**	**62**	29	24	M24×1.5	25	80	49.5	0.8	8	8	1	0.8	40	30 480	52 630	49 500	6 500	34 200	10 500	220	815
		CFH24VA	**CFH24VUUA**	**CFH24VRA**	**CFH24VUURA**														46 550	92 020	49 500	3 000				
24	0 -0.021	**CFH24-1A**	**CFH24-1UUA**	**CFH24-1RA**	**CFH24-1URA**	**72**	29	24	M24×1.5	25	80	49.5	0.8	8	8	1	0.8	40	30 480	52 630	49 500	6 500	39 800	12 900	220	1 140
		CFH24-1VA	**CFH24-1VUUA**	**CFH24-1VRA**	**CFH24-1VUURA**														46 550	92 020	49 500	3 000				
30	0 -0.021	**CFH30A**	**CFH30UUA**	**CFH30RA**	**CFH30UURA**	**80**	35	30	M30×1.5	32	100	63	1	8	8	1	1	46	45 370	85 060	73 700	5 000	52 600	14 900	450	1 870
		CFH30VA	**CFH30VUUA**	**CFH30VRA**	**CFH30VUURA**														67 620	144 060	73 700	2 200				
30	0 -0.021	**CFH30-1A**	**CFH30-1UUA**	**CFH30-1RA**	**CFH30-1URA**	**85**	35	30	M30×1.5	32	100	63	1	8	8	1	1	46	45 370	85 060	73 700	5 000	56 000	16 100	450	2 030
		CFH30-1VA	**CFH30-1VUUA**	**CFH30-1VRA**	**CFH30-1VUURA**														67 620	144 060	73 700	2 200				
30	0 -0.021	**CFH30-2A**	**CFH30-2UUA**	**CFH30-2RA**	**CFH30-2URA**	**90**	35	30	M30×1.5	32	100	63	1	8	8	1	1	46	45 370	85 060	73 700	5 000	59 300	17 300	450	2 220
		CFH30-2VA	**CFH30-2VUUA**	**CFH30-2VRA**	**CFH30-2VUURA**														67 620	144 060	73 700	2 200				

* Without seals, suitable for grease lubrication. In case of oil lubrication, up to 130% of this value shall be permissible, and 70% of this value shall apply for types with seals.

OUTER RINGS TOLERANCE (μm)

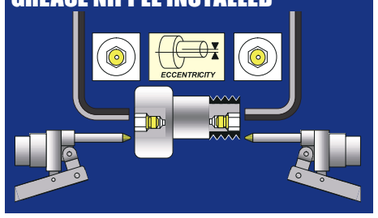
TYPE	Cylindrical outer ring	Crowned outer ring
CF5,CF6	0/-8	0/-50
CF8,CF10,CF10-1,CF12	0/-9	0/-50
CF12-1,CF16,CF18,CF20-1	0/-11	0/-50
CF20,CF24,CF24-1,CF30	0/-13	0/-50
CF30-1,CF30-2	0/-15	0/-50

ACCESSORIES

TYPE	 STOP PLUG	 RESIN PLUG	 NUT
CF5	—	—	Attached
CF6/CF8/CF10/CF10-1	—	—	Attached
CF12/CF12-1/CF16/CF18	ϕ 6 Attached	ϕ 6 Attached	Attached
CF20/CF20-1/CF24/CF24-1/CF30/CF30-1/CF30-2	ϕ 8 Attached	ϕ 8 Attached	Attached

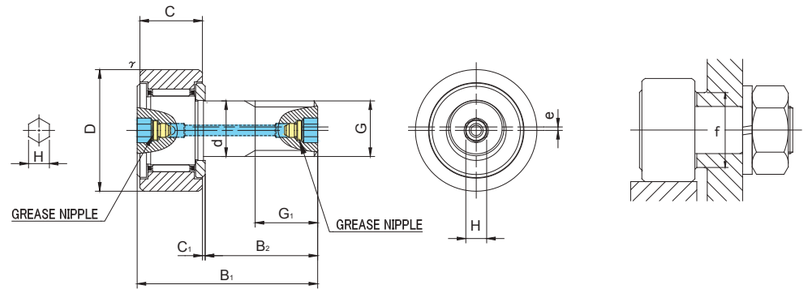
CAM FOLLOWERS

SOLID ECCENTRIC TYPE
HEXAGON SOCKET ON BOTH SIDES
GREASE NIPPLE INSTALLED



CFH..AB

CFH..VAB



CFH..AB TYPE

Prepacked Grease

Stud diameter (mm)		Designation				Dimensions (mm)												Basic dynamic load rating	Basic static load rating	Largest permissible load	Limiting speed *	Track load capacity		Max tightening torque	Mass
		Cylindrical outer ring		Crowned outer ring R500(CF10 ～ CF18) R1000(CF20 ≦)																					
	h7 tolerance	Without seals	With seals	Without seals	With seals	D	C	d	G	G1	B1	B2	C1	H	r s min	e	f min	Cr N	Cor N	N	rpm	Cylindrical outer ring N	Crowned outer ring N	N·m	g (approx)
12	0 -0.018	CFH12AB	CFH12UUAB	CFH12RAB	CFH12UURAB	30	14	12	M12×1.5	13	40	25	0.6	6	0.6	0.4	20	7 940	9 800	9 800	14 000	7 060	2 450	22	95
		CFH12VAB	CFH12VUUAB	CFH12VRAB	CFH12VUURAB													13 430	19 700	11 270	6 000				
12	0 -0.018	CFH12-1AB	CFH12-1UUAB	CFH12-1RAB	CFH12-1UURAB	32	14	12	M12×1.5	13	40	25	0.6	6	0.6	0.4	20	7 940	9 800	9 800	14 000	7 450	2 740	22	105
		CFH12-1VAB	CFH12-1VUUAB	CFH12-1VRAB	CFH12-1VUURAB													13 430	19 700	11 270	6 000				
16	0 -0.018	CFH16AB	CFH16UUAB	CFH16RAB	CFH16UURAB	35	18	16	M16×1.5	17	52	32.5	0.8	6	0.6	0.5	24	12 050	18 330	18 330	10 000	11 200	3 140	58	170
		CFH16VAB	CFH16VUUAB	CFH16VRAB	CFH16VUURAB													20 680	37 630	19 800	4 500				
18	0 -0.018	CFH18AB	CFH18UUAB	CFH18RAB	CFH18UURAB	40	20	18	M18×1.5	19	58	36.5	0.8	6	1	0.6	26	14 700	25 200	25 200	8 500	14 400	3 720	87	250
		CFH18VAB	CFH18VUUAB	CFH18VRAB	CFH18VUURAB													25 280	51 350	26 560	3 500				
20	0 -0.021	CFH20AB	CFH20UUAB	CFH20RAB	CFH20UURAB	52	24	20	M20×1.5	21	66	40.5	0.8	8	1	0.7	36	20 680	34 600	32 140	7 000	23 200	8 230	120	460
		CFH20VAB	CFH20VUUAB	CFH20VRAB	CFH20VUURAB													33 120	64 480	32 140	3 500				
20	0 -0.021	CFH20-1AB	CFH20-1UUAB	CFH20-1RAB	CFH20-1UURAB	47	24	20	M20×1.5	21	66	40.5	0.8	8	1	0.7	36	20 680	34 600	32 140	7 000	21 000	7 150	120	385
		CFH20-1VAB	CFH20-1VUUAB	CFH20-1VRAB	CFH20-1VUURAB													33 120	64 480	32 140	3 500				

CFH..AB TYPE has oil holes (grease nipple) which are prepared in the stud head and thread side, also an oil hole is prepared outer surface of stud.

* Without seals, suitable for grease lubrication. In case of oil lubrication, up to 130% of this value shall be permissible, and 70% of this value shall apply for types with seals.

OUTER RINGS TOLERANCE (μm)

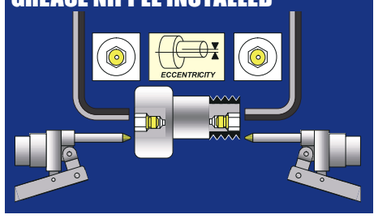
TYPE	Cylindrical outer ring	Crowned outer ring
CF12	0/-9	0/-50
CF12-1,CF16,CF18,CF20-1	0/-11	0/-50
CF20,CF24,CF24-1,CF30	0/-13	0/-50
CF30-1,CF30-2	0/-15	0/-50

ACCESSORIES

TYPE	 Grease Nipple	 NUT
All types	Installed	Attached

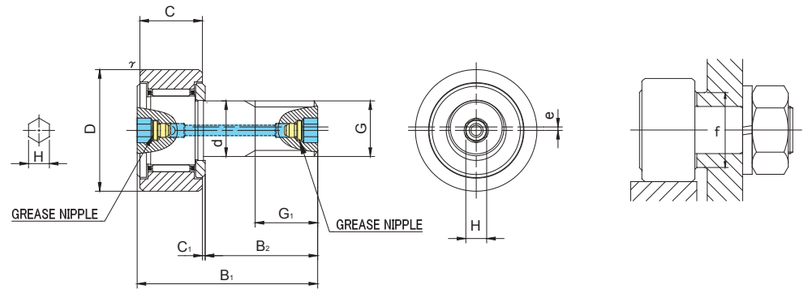
CAM FOLLOWERS

SOLID ECCENTRIC TYPE
HEXAGON SOCKET ON BOTH SIDES
GREASE NIPPLE INSTALLED



CFH..AB

CFH..VAB



CFH..AB TYPE

Prepacked Grease

Stud diameter (mm)	h7 tolerance	Designation: Cylindrical outer ring, Without seals	Designation: Cylindrical outer ring, With seals	Designation: Crowned outer ring R1000(CF24 ≦), Without seals	Designation: Crowned outer ring R1000(CF24 ≦), With seals	D	C	d	G	G1	B1	B2	C1	H	rs min	e	f min	Basic dynamic load rating Cr N	Basic static load rating Cor N	Largest permissible load N	Limiting speed * rpm	Track load capacity: Cylindrical outer ring N	Track load capacity: Crowned outer ring N	Max tightening torque N·m	Mass g (approx)
24	0 -0.021	**CFH24AB**	**CFH24UUAB**	**CFH24RAB**	**CFH24UURAB**	**62**	29	24	M24×1.5	25	80	49.5	0.8	8	1	0.8	40	30 480	52 630	49 500	6 500	34 200	10 500	220	815
		CFH24VAB	**CFH24VUUAB**	**CFH24VRAB**	**CFH24VUURAB**													46 550	92 020	49 500	3 000				
24	0 -0.021	**CFH24-1AB**	**CFH24-1UUAB**	**CFH24-1RAB**	**CFH24-1UURAB**	**72**	29	24	M24×1.5	25	80	49.5	0.8	8	1	0.8	40	30 480	52 630	49 500	6 500	39 800	12 900	220	1 140
		CFH24-1VAB	**CFH24-1VUUAB**	**CFH24-1VRAB**	**CFH24-1VUURAB**													46 550	92 020	49 500	3 000				
30	0 -0.021	**CFH30AB**	**CFH30UUAB**	**CFH30RAB**	**CFH30UURAB**	**80**	35	30	M30×1.5	32	100	63	1	8	1	1	46	45 370	85 060	73 700	5 000	52 600	14 900	450	1 870
		CFH30VAB	**CFH30VUUAB**	**CFH30VRAB**	**CFH30VUURAB**													67 620	144 060	73 700	2 200				
30	0 -0.021	**CFH30-1AB**	**CFH30-1UUAB**	**CFH30-1RAB**	**CFH30-1UURAB**	**85**	35	30	M30×1.5	32	100	63	1	8	1	1	46	45 370	85 060	73 700	5 000	56 000	16 100	450	2 030
		CFH30-1VAB	**CFH30-1VUUAB**	**CFH30-1VRAB**	**CFH30-1VUURAB**													67 620	144 060	73 700	2 200				
30	0 -0.021	**CFH30-2AB**	**CFH30-2UUAB**	**CFH30-2RAB**	**CFH30-2UURAB**	**90**	35	30	M30×1.5	32	100	63	1	8	1	1	46	45 370	85 060	73 700	5 000	59 300	17 300	450	2 220
		CFH30-2VAB	**CFH30-2VUUAB**	**CFH30-2VRAB**	**CFH30-2VUURAB**													67 620	144 060	73 700	2 200				

CFH..AB TYPE has oil holes (grease nipple) which are prepared in the stud head and thread side, also an oil hole is prepared outer surface of stud.

* Without seals, suitable for grease lubrication. In case of oil lubrication, up to 130% of this value shall be permissible, and 70% of this value shall apply for types with seals.

OUTER RINGS TOLERANCE (μm)

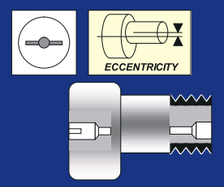
TYPE	Cylindrical outer ring	Crowned outer ring
CF12	0/-9	0/-50
CF12-1,CF16,CF18,CF20-1	0/-11	0/-50
CF20,CF24,CF24-1,CF30	0/-13	0/-50
CF30-1,CF30-2	0/-15	0/-50

ACCESSORIES

TYPE	 Grease Nipple	 NUT
All types	Installed	Attached

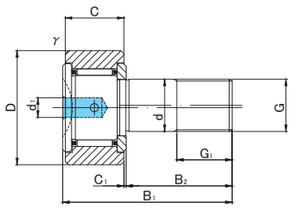
CAM FOLLOWERS

SOLID ECCENTRIC TYPE
SCREWDRIVER SLOT HEAD

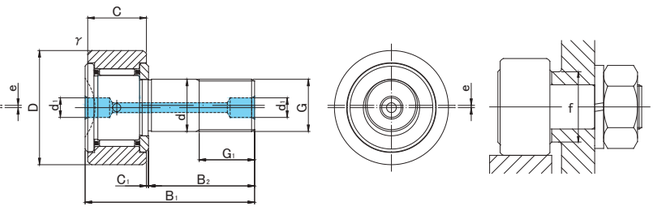


CFH

CFH..V



CFH5(V)～CFH10-1(V)



CFH12(V)～CFH16(V)

CFH TYPE

Prepacked Grease

Stud diameter (mm)		Designation				Dimensions (mm)												Basic dynamic load rating	Basic static load rating	Largest permissible load	Limiting speed *	Track load capacity		Max tightening torque	Mass
		Cylindrical outer ring		Crowned outer ring R250(CF5) R500 (CF6 ～ CF16)																					
	h7 tolerance	Without seals	With seals	Without seals	With seals	D	C	d	G	G1	B1	B2	C1	d1	r_s min	e	f min	Cr N	Cor N	N	rpm	Cylindrical outer ring N	Crowned outer ring N	N·m	g (approx)
5	0 -0.012	**CFH 5**	**CFH 5UU**	**CFH 5R**	**CFH 5UUR**	**13**	9	5	M5×0.8	7.5	23	13	0.5	3.1	0.3	0.2	9.7	3 140	2 770	1 420	29 000	2 250	530	2	10.5
		CFH 5V	**CFH 5VUU**	**CFH 5VR**	**CFH 5VUUR**													5,100	5,500	1 420	11,600				
6	0 -0.012	**CFH 6**	**CFH 6UU**	**CFH 6R**	**CFH 6UUR**	**16**	11	6	M6×1	8	28	16	0.6	4	0.3	0.25	11	3 630	3 630	2 110	25 000	3 430	1 080	3	18.5
		CFH 6V	**CFH 6VUU**	**CFH 6VR**	**CFH 6VUUR**													6 960	8 530	2 110	12 000				
8	0 -0.015	**CFH 8**	**CFH 8UU**	**CFH 8R**	**CFH 8UUR**	**19**	11	8	M8×1.25	10	32	20	0.6	4	0.3	0.25	13	4 310	4 710	4 710	20 000	4 020	1 370	8	28.5
		CFH 8V	**CFH 8VUU**	**CFH 8VR**	**CFH 8VUUR**													8 130	11 170	4 710	9 000				
10	0 -0.015	**CFH10**	**CFH10UU**	**CFH10R**	**CFH10UUR**	**22**	12	10	M10×1.25	12	36	23	0.6	4	0.3	0.3	15	5 390	6 860	6 860	17 000	4 700	1 670	15	45
		CFH10V	**CFH10VUU**	**CFH10VR**	**CFH10VUUR**													9 510	14 500	7 450	7 500				
10	0 -0.015	**CFH10-1**	**CFH10-1UU**	**CFH10-1R**	**CFH10-1UUR**	**26**	12	10	M10×1.25	12	36	23	0.6	4	0.3	0.3	15	5 390	6 860	6 860	17 000	5 490	2 060	15	60
		CFH10-1V	**CFH10-1VUU**	**CFH10-1VR**	**CFH10-1VUUR**													9 510	14 500	7 450	7 500				
12	0 -0.018	**CFH12**	**CFH12UU**	**CFH12R**	**CFH12UUR**	**30**	14	12	M12×1.5	13	40	25	0.6	6	0.6	0.4	20	7 940	9 800	9 800	14 000	7 060	2 450	22	95
		CFH12V	**CFH12VUU**	**CFH12VR**	**CFH12VUUR**													13 430	19 700	11 270	6 000				
12	0 -0.018	**CFH12-1**	**CFH12-1UU**	**CFH12-1R**	**CFH12-1UUR**	**32**	14	12	M12×1.5	13	40	25	0.6	6	0.6	0.4	20	7 940	9 800	9 800	14 000	7 450	2 740	22	105
		CFH12-1V	**CFH12-1VUU**	**CFH12-1VR**	**CFH12-1VUUR**													13 430	19 700	11 270	6 000				
16	0 -0.018	**CFH16**	**CFH16UU**	**CFH16R**	**CFH16UUR**	**35**	18	16	M16×1.5	17	52	32.5	0.8	6	0.6	0.5	24	12 050	18 330	18 330	10 000	11 200	3 140	58	170
		CFH16V	**CFH16VUU**	**CFH16VR**	**CFH16VUUR**													20 680	37 630	19 800	4 500				

* Without seals, suitable for grease lubrication. In case of oil lubrication, up to 130% of this value shall be permissible, and 70% of this value shall apply for types with seals.

OUTER RINGS TOLERANCE (μm)

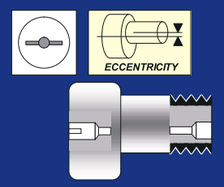
TYPE	Cylindrical outer ring	Crowned outer ring
CF5,CF6	0/-8	0/-50
CF8,CF10,CF10-1,CF12	0/-9	0/-50
CF12-1,CF16,CF18,CF20-1	0/-11	0/-50
CF20,CF24,CF24-1,CF30	0/-13	0/-50
CF30-1,CF30-2	0/-15	0/-50

ACCESSORIES

TYPE	 STOP PLUG	 RESIN PLUG	 NUT
CF5	—	—	Attached
CF6/CF8/CF10/CF10-1	—	ϕ 4 Attached	Attached
CF12/CF12-1/CF16/CF18	ϕ 6 Attached	ϕ 6 Attached	Attached
CF20/CF20-1/CF24/CF24-1/CF30/CF30-1/CF30-2	ϕ 8 Attached	ϕ 8 Attached	Attached

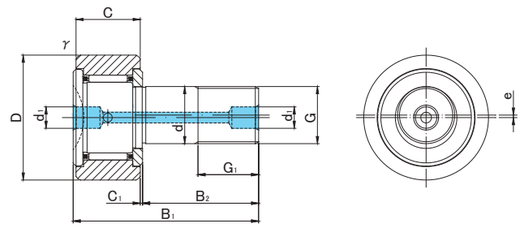
CAM FOLLOWERS

SOLID ECCENTRIC TYPE
SCREWDRIVER SLOT HEAD



CFH

CFH..V



CFH TYPE

Prepacked Grease

Stud diameter (mm)		Designation				Dimensions (mm)											Basic dynamic load rating	Basic static load rating	Largest permissible load	Limiting speed *	Track load capacity		Max tightening torque	Mass
		Cylindrical outer ring		Crowned outer ring R500(CF18) R1000(CF20 ≦)																				
	h7 tolerance	Without seals	With seals	Without seals	With seals	D	C	d	G	G1	B1	B2	C1	d1	r_s min	e	f min	Cr N	Cor N	N	rpm	Cylindrical outer ring N	Crowned outer ring N	N·m	g (approx)
18	0 -0.018	CFH18	CFH18UU	CFH18R	CFH18UUR	40	20	18	M18×1.5	19	58	36.5	0.8	6	1	0.6	26	14 700	25 200	25 200	8 500	14 400	3 720	87	250
		CFH18V	CFH18VUU	CFH18VR	CFH18VUUR													25 280	51 350	26 560	3 500				
20	0 -0.021	CFH20	CFH20UU	CFH20R	CFH20UUR	52	24	20	M20×1.5	21	66	40.5	0.8	8	1	0.7	36	20 680	34 600	32 140	7 000	23 200	8 230	120	460
		CFH20V	CFH20VUU	CFH20VR	CFH20VUUR													33 120	64 480	32 140	3 500				
20	0 -0.021	CFH20-1	CFH20-1UU	CFH20-1R	CFH20-1UUR	47	24	20	M20×1.5	21	66	40.5	0.8	8	1	0.7	36	20 680	34 600	32 140	7 000	21 000	7 150	120	385
		CFH20-1V	CFH20-1VUU	CFH20-1VR	CFH20-1VUUR													33 120	64 480	32 140	3 500				
24	0 -0.021	CFH24	CFH24UU	CFH24R	CFH24UUR	62	29	24	M24×1.5	25	80	49.5	0.8	8	1	0.8	40	30 480	52 630	49 500	6 500	34 200	10 500	220	815
		CFH24V	CFH24VUU	CFH24VR	CFH24VUUR													46 550	92 020	49 500	3 000				
24	0 -0.021	CFH24-1	CFH24-1UU	CFH24-1R	CFH24-1UUR	72	29	24	M24×1.5	25	80	49.5	0.8	8	1	0.8	40	30 480	52 630	49 500	6 500	39 800	12 900	220	1 140
		CFH24-1V	CFH24-1VUU	CFH24-1VR	CFH24-1VUUR													46 550	92 020	49 500	3 000				
30	0 -0.021	CFH30	CFH30UU	CFH30R	CFH30UUR	80	35	30	M30×1.5	32	100	63	1	8	1	1	46	45 370	85 060	73 700	5 000	52 600	14 900	450	1 870
		CFH30V	CFH30VUU	CFH30VR	CFH30VUUR													67 620	144 060	73 700	2 200				
30	0 -0.021	CFH30-1	CFH30-1UU	CFH30-1R	CFH30-1UUR	85	35	30	M30×1.5	32	100	63	1	8	1	1	46	45 370	85 060	73 700	5 000	56 000	16 100	450	2 030
		CFH30-1V	CFH30-1VUU	CFH30-1VR	CFH30-1VUUR													67 620	144 060	73 700	2 200				
30	0 -0.021	CFH30-2	CFH30-2UU	CFH30-2R	CFH30-2UUR	90	35	30	M30×1.5	32	100	63	1	8	1	1	46	45 370	85 060	73 700	5 000	59 300	17 300	450	2 220
		CFH30-2V	CFH30-2VUU	CFH30-2VR	CFH30-2VUUR													67 620	144 060	73 700	2 200				

* Without seals, suitable for grease lubrication. In case of oil lubrication, up to 130% of this value shall be permissible, and 70% of this value shall apply for types with seals.

OUTER RINGS TOLERANCE (μm)

TYPE	Cylindrical outer ring	Crowned outer ring
CF5,CF6	0/-8	0/-50
CF8,CF10,CF10-1,CF12	0/-9	0/-50
CF12-1,CF16,CF18,CF20-1	0/-11	0/-50
CF20,CF24,CF24-1,CF30	0/-13	0/-50
CF30-1,CF30-2	0/-15	0/-50

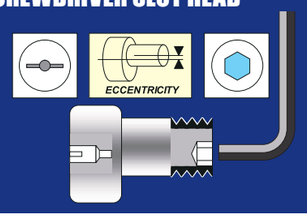
ACCESSORIES

TYPE	 STOP PLUG	 RESIN PLUG	 NUT
CF5	—	—	Attached
CF6/CF8/CF10/CF10-1	—	ϕ 4 Attached	Attached
CF12/CF12-1/CF16/CF18	ϕ 6 Attached	ϕ 6 Attached	Attached
CF20/CF20-1/CF24/CF24-1/CF30/CF30-1/CF30-2	ϕ 8 Attached	ϕ 8 Attached	Attached

CAM FOLLOWERS

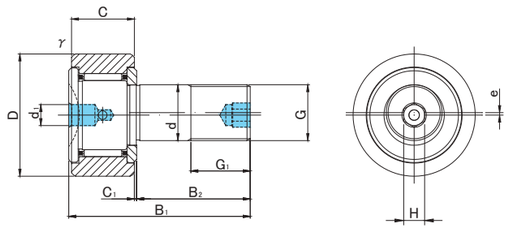
SOLID ECCENTRIC TYPE

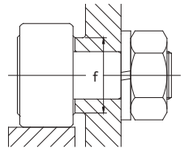
HEXAGON SOCKET ON THREAD SIDE SCREWDRIVER SLOT HEAD



CFH..B

CFH..VB





CFH..B TYPE

Prepacked Grease

Stud diameter (mm)	h7 tolerance	Designation: Cylindrical outer ring, Without seals	Cylindrical outer ring, With seals	Crowned outer ring R500(CF12 ～ CF18) R1000(CF20 ≦), Without seals	Crowned outer ring, With seals	D	C	d	G	G1	B1	B2	C1	d1	H	*r*s min	e	f min	Basic dynamic load rating Cr N	Basic static load rating Cor N	Largest permissible load N	Limiting speed * rpm	Track load capacity: Cylindrical outer ring N	Track load capacity: Crowned outer ring N	Max tightening torque N·m	Mass g (approx)
12	0 -0.018	**CFH12B**	**CFH12UUB**	**CFH12RB**	**CFH12UURB**	**30**	14	12	M12×1.5	13	40	25	0.6	6	6	0.6	0.4	20	7 940	9 800	9 800	14 000	7 060	2 450	22	95
		CFH12VB	**CFH12VUUB**	**CFH12VRB**	**CFH12VUURB**														13 430	19 700	11 270	6 000				
12	0 -0.018	**CFH12-1B**	**CFH12-1UUB**	**CFH12-1RB**	**CFH12-1UURB**	**32**	14	12	M12×1.5	13	40	25	0.6	6	6	0.6	0.4	20	7 940	9 800	9 800	14 000	7 450	2 740	22	105
		CFH12-1VB	**CFH12-1VUUB**	**CFH12-1VRB**	**CFH12-1VUURB**														13 430	19 700	11 270	6 000				
16	0 -0.018	**CFH16B**	**CFH16UUB**	**CFH16RB**	**CFH16UURB**	**35**	18	16	M16×1.5	17	52	32.5	0.8	6	6	0.6	0.5	24	12 050	18 330	18 330	10 000	11 200	3 140	58	170
		CFH16VB	**CFH16VUUB**	**CFH16VRB**	**CFH16VUURB**														20 680	37 630	19 800	4 500				
18	0 -0.018	**CFH18B**	**CFH18UUB**	**CFH18RB**	**CFH18UURB**	**40**	20	18	M18×1.5	19	58	36.5	0.8	6	6	1	0.6	26	14 700	25 200	25 200	8 500	14 400	3 720	87	250
		CFH18VB	**CFH18VUUB**	**CFH18VRB**	**CFH18VUURB**														25 280	51 350	26 560	3 500				
20	0 -0.021	**CFH20B**	**CFH20UUB**	**CFH20RB**	**CFH20UURB**	**52**	24	20	M20×1.5	21	66	40.5	0.8	8	8	1	0.7	36	20 680	34 600	32 140	7 000	23 200	8 230	120	460
		CFH20VB	**CFH20VUUB**	**CFH20VRB**	**CFH20VUURB**														33 120	64 480	32 140	3 500				
20	0 -0.021	**CFH20-1B**	**CFH20-1UUB**	**CFH20-1RB**	**CFH20-1UURB**	**47**	24	20	M20×1.5	21	66	40.5	0.8	8	8	1	0.7	36	20 680	34 600	32 140	7 000	21 000	7 150	120	385
		CFH20-1VB	**CFH20-1VUUB**	**CFH20-1VRB**	**CFH20-1VUURB**														33 120	64 480	32 140	3 500				
24	0 -0.021	**CFH24B**	**CFH24UUB**	**CFH24RB**	**CFH24UURB**	**62**	29	24	M24×1.5	25	80	49.5	0.8	8	8	1	0.8	40	30 480	52 630	49 500	6 500	34 200	10 500	220	815
		CFH24VB	**CFH24VUUB**	**CFH24VRB**	**CFH24VUURB**														46 550	92 020	49 500	3 000				
24	0 -0.021	**CFH24-1B**	**CFH24-1UUB**	**CFH24-1RB**	**CFH24-1UURB**	**72**	29	24	M24×1.5	25	80	49.5	0.8	8	8	1	0.8	40	30 480	52 630	49 500	6 500	39 800	12 900	220	1 140
		CFH24-1VB	**CFH24-1VUUB**	**CFH24-1VRB**	**CFH24-1VUURB**														46 550	92 020	49 500	3 000				
30	0 -0.021	**CFH30B**	**CFH30UUB**	**CFH30RB**	**CFH30UURB**	**80**	35	30	M30×1.5	32	100	63	1	8	8	1	1	46	45 370	85 060	73 700	5 000	52 600	14 900	450	1 870
		CFH30VB	**CFH30VUUB**	**CFH30VRB**	**CFH30VUURB**														67 620	144 060	73 700	2 200				
30	0 -0.021	**CFH30-1B**	**CFH30-1UUB**	**CFH30-1RB**	**CFH30-1UURB**	**85**	35	30	M30×1.5	32	100	63	1	8	8	1	1	46	45 370	85 060	73 700	5 000	56 000	16 100	450	2 030
		CFH30-1VB	**CFH30-1VUUB**	**CFH30-1VRB**	**CFH30-1VUURB**														67 620	144 060	73 700	2 200				
30	0 -0.021	**CFH30-2B**	**CFH30-2UUB**	**CFH30-2RB**	**CFH30-2UURB**	**90**	35	30	M30×1.5	32	100	63	1	8	8	1	1	46	45 370	85 060	73 700	5 000	59 300	17 300	450	2 220
		CFH30-2VB	**CFH30-2VUUB**	**CFH30-2VRB**	**CFH30-2VUURB**														67 620	144 060	73 700	2 200				

* Without seals, suitable for grease lubrication. In case of oil lubrication, up to 130% of this value shall be permissible, and 70% of this value shall apply for types with seals.

OUTER RINGS TOLERANCE (μm)

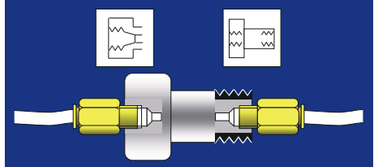
TYPE	Cylindrical outer ring	Crowned outer ring
CF12	0/-9	0/-50
CF12-1,CF16,CF18,CF20-1	0/-11	0/-50
CF20,CF24,CF24-1,CF30	0/-13	0/-50
CF30-1,CF30-2	0/-15	0/-50

ACCESSORIES

TYPE	STOP PLUG	RESIN PLUG	NUT
CF12/CF12-1/CF16/CF18	ϕ 6 Attached	ϕ 6 Attached	Attached
CF20/CF20-1/CF24/CF24-1/CF30/CF30-2	ϕ 8 Attached	ϕ 8 Attached	Attached

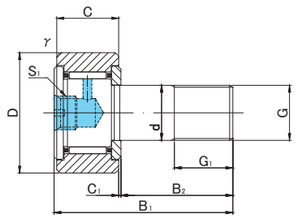
CAM FOLLOWERS

TAP HOLE FOR PIPING
SCREWDRIVER SLOT HEAD

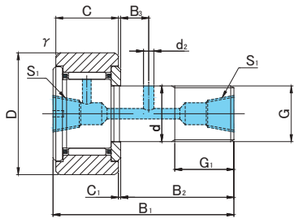


CFT

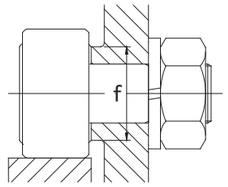
CFT..V



CFT6(V)～CFT10-1(V)



CFT12(V)～CFT18(V)



CFT TYPE

Prepacked Grease

Stud diameter (mm)		Designation				Dimensions (mm)											Basic dynamic load rating	Basic static load rating	Largest permissible load	Limiting speed *	Track load capacity		Max tightening torque	Mass
		Cylindrical outer ring		Crowned outer ring R500(CF6 ～ CF18)																				
	h7 tolerance	Without seals	With seals	Without seals	With seals	D	C	d	G	G1	B1	B2	B3	C1	S1	d2	rs min	f min	Cr N	Cor N	N	rpm	Cylindrical outer ring N	Crowned outer ring N	N·m	g (approx)
6	0 -0.012	CFT 6	CFT 6UU	CFT 6R	CFT 6UUR	16	11	6	M6×1	8	28	16	—	0.6	M6×0.75	—	0.3	11	3 630	3 630	2 110	25 000	3 430	1 080	3	18.5
		CFT 6V	CFT 6VUU	CFT 6VR	CFT 6VUUR														6 960	8 530	2 110	12 000				
8	0 -0.015	CFT 8	CFT 8UU	CFT 8R	CFT 8UUR	19	11	8	M8×1.25	10	32	20	—	0.6	M6×0.75	—	0.3	13	4 310	4 710	4 710	20 000	4 020	1 370	8	28.5
		CFT 8V	CFT 8VUU	CFT 8VR	CFT 8VUUR														8 130	11 170	4 710	9 000				
10	0 -0.015	CFT10	CFT10UU	CFT10R	CFT10UUR	22	12	10	M10×1.25	12	36	23	—	0.6	M6×0.75	—	0.3	15	5 390	6 860	6 860	17 000	4 700	1 670	15	45
		CFT10V	CFT10VUU	CFT10VR	CFT10VUUR														9 510	14 500	7 450	7 500				
10	0 -0.015	CFT10-1	CFT10-1UU	CFT10-1R	CFT10-1UUR	26	12	10	M10×1.25	12	36	23	—	0.6	M6×0.75	—	0.3	15	5 390	6 860	6 860	17 000	5 490	2 060	15	60
		CFT10-1V	CFT10-1VUU	CFT10-1VR	CFT10-1VUUR														9 510	14 500	7 450	7 500				
12	0 -0.018	CFT12	CFT12UU	CFT12R	CFT12UUR	30	14	12	M12×1.5	13	40	25	6	0.6	M6×0.75	3	0.6	20	7 940	9 800	9 800	14 000	7 060	2 450	22	95
		CFT12V	CFT12VUU	CFT12VR	CFT12VUUR														13 430	19 700	11 270	6 000				
12	0 -0.018	CFT12-1	CFT12-1UU	CFT12-1R	CFT12-1UUR	32	14	12	M12×1.5	13	40	25	6	0.6	M6×0.75	3	0.6	20	7 940	9 800	9 800	14 000	7 450	2 740	22	105
		CFT12-1V	CFT12-1VUU	CFT12-1VR	CFT12-1VUUR														13 430	19 700	11 270	6 000				
16	0 -0.018	CFT16	CFT16UU	CFT16R	CFT16UUR	35	18	16	M16×1.5	17	52	32.5	8	0.8	Rc1/8	3	0.6	24	12 050	18 330	18 330	10 000	11 200	3 140	58	170
		CFT16V	CFT16VUU	CFT16VR	CFT16VUUR														20 680	37 630	19 800	4 500				
18	0 -0.018	CFT18	CFT18UU	CFT18R	CFT18UUR	40	20	18	M18×1.5	19	58	36.5	8	0.8	Rc1/8	3	1	26	14 700	25 200	25 200	8 500	14 400	3 720	87	250
		CFT18V	CFT18VUU	CFT18VR	CFT18VUUR														25 280	51 350	26 560	3 500				

* Without seals, suitable for grease lubrication. In case of oil lubrication, up to 130% of this value shall be permissible, and 70% of this value shall apply for types with seals.

OUTER RINGS TOLERANCE (μm)

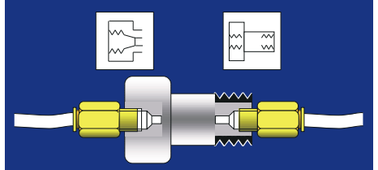
TYPE	Cylindrical outer ring	Crowned outer ring
CF6	0/-8	0/-50
CF8,CF10,CF10-1,CF12	0/-9	0/-50
CF12-1,CF16,CF18,CF20-1	0/-11	0/-50
CF20,CF24,CF24-1,CF30	0/-13	0/-50
CF30-1,CF30-2	0/-15	0/-50

ACCESSORIES

TYPE	 NUT
All types	Attached

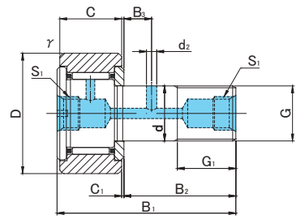
CAM FOLLOWERS

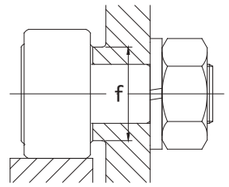
TAP HOLE FOR PIPING
SCREWDRIVER SLOT HEAD



CFT

CFT..V





CFT TYPE

Prepacked Grease

Stud diameter (mm)		Designation				Dimensions (mm)												Basic dynamic load rating	Basic static load rating	Largest permissible load	Limiting speed *	Track load capacity		Max tightening torque	Mass
		Cylindrical outer ring		Crowned outer ring R1000(CF20 ≦)																					
	h7 tolerance	Without seals	With seals	Without seals	With seals	D	C	d	G	G1	B1	B2	B3	C1	S1	d2	rs min	f min	Cr N	Cor N	N	rpm	Cylindrical outer ring N	Crowned outer ring N	N·m	g (approx)
20	0 -0.021	**CFT20**	**CFT20UU**	**CFT20R**	**CFT20UUR**	**52**	24	20	M20×1.5	21	66	40.5	9	0.8	Rc1/8	4	1	36	20 680	34 600	32 140	7 000	23 200	8 230	120	460
		CFT20V	**CFT20VUU**	**CFT20VR**	**CFT20VUUR**														33 120	64 480	32 140	3 500				
20	0 -0.021	**CFT20-1**	**CFT20-1UU**	**CFT20-1R**	**CFT20-1UUR**	**47**	24	20	M20×1.5	21	66	40.5	9	0.8	Rc1/8	4	1	36	20 680	34 600	32 140	7 000	21 000	7 150	120	385
		CFT20-1V	**CFT20-1VUU**	**CFT20-1VR**	**CFT20-1VUUR**														33 120	64 480	32 140	3 500				
24	0 -0.021	**CFT24**	**CFT24UU**	**CFT24R**	**CFT24UUR**	**62**	29	24	M24×1.5	25	80	49.5	11	0.8	Rc1/8	4	1	40	30 480	52 630	49 500	6 500	34 200	10 500	220	815
		CFT24V	**CFT24VUU**	**CFT24VR**	**CFT24VUUR**														46 550	92 020	49 500	3 000				
24	0 -0.021	**CFT24-1**	**CFT24-1UU**	**CFT24-1R**	**CFT24-1UUR**	**72**	29	24	M24×1.5	25	80	49.5	11	0.8	Rc1/8	4	1	40	30 480	52 630	49 500	6 500	39 800	12 900	220	1 140
		CFT24-1V	**CFT24-1VUU**	**CFT24-1VR**	**CFT24-1VUUR**														46 550	92 020	49 500	3 000				
30	0 -0.021	**CFT30**	**CFT30UU**	**CFT30R**	**CFT30UUR**	**80**	35	30	M30×1.5	32	100	63	15	1	Rc1/8	4	1	46	45 370	85 060	73 700	5 000	52 600	14 900	450	1 870
		CFT30V	**CFT30VUU**	**CFT30VR**	**CFT30VUUR**														67 620	144 060	73 700	2 200				
30	0 -0.021	**CFT30-1**	**CFT30-1UU**	**CFT30-1R**	**CFT30-1UUR**	**85**	35	30	M30×1.5	32	100	63	15	1	Rc1/8	4	1	46	45 370	85 060	73 700	5 000	56 000	16 100	450	2 030
		CFT30-1V	**CFT30-1VUU**	**CFT30-1VR**	**CFT30-1VUUR**														67 620	144 060	73 700	2 200				
30	0 -0.021	**CFT30-2**	**CFT30-2UU**	**CFT30-2R**	**CFT30-2UUR**	**90**	35	30	M30×1.5	32	100	63	15	1	Rc1/8	4	1	46	45 370	85 060	73 700	5 000	59 300	17 300	450	2 220
		CFT30-2V	**CFT30-2VUU**	**CFT30-2VR**	**CFT30-2VUUR**														67 620	144 060	73 700	2 200				

* Without seals, suitable for grease lubrication. In case of oil lubrication, up to 130% of this value shall be permissible, and 70% of this value shall apply for types with seals.

OUTER RINGS TOLERANCE (μm)

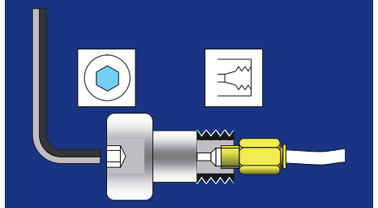
TYPE	Cylindrical outer ring	Crowned outer ring
CF6	0/-8	0/-50
CF8,CF10,CF10-1,CF12	0/-9	0/-50
CF12-1,CF16,CF18,CF20-1	0/-11	0/-50
CF20,CF24,CF24-1,CF30	0/-13	0/-50
CF30-1,CF30-2	0/-15	0/-50

ACCESSORIES

TYPE	 NUT
All types	Attached

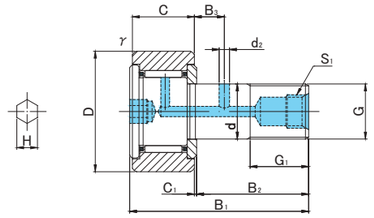
CAM FOLLOWERS

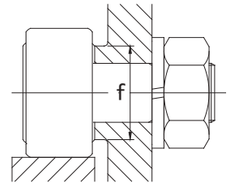
TAP HOLE FOR PIPING
HEXAGON SOCKET ON STUD HEAD



CFT..A

CFT..VA





CFT..A TYPE

Prepacked Grease

Stud diameter (mm)	h7 tolerance	Designation: Cylindrical outer ring, Without seals	Cylindrical outer ring, With seals	Crowned outer ring R500(CF12～CF18) R1000(CF20≦), Without seals	Crowned outer ring, With seals	D	C	d	G	G1	B1	B2	B3	C1	S1	d2	H	r s min	f min	Basic dynamic load rating Cr N	Basic static load rating Cor N	Largest permissible load N	Limiting speed * rpm	Track load capacity: Cylindrical outer ring N	Track load capacity: Crowned outer ring N	Max tightening torque N·m	Mass g (approx)
12	0 -0.018	CFT12A	CFT12UUA	CFT12RA	CFT12UURA	30	14	12	M12×1.5	13	40	25	6	0.6	M6×0.75	3	6	0.6	20	7 940	9 800	9 800	14 000	7 060	2 450	22	95
		CFT12VA	CFT12VUUA	CFT12VRA	CFT12VUURA															13 430	19 700	11 270	6 000				
12	0 -0.018	CFT12-1A	CFT12-1UUA	CFT12-1RA	CFT12-1UURA	32	14	12	M12×1.5	13	40	25	6	0.6	M6×0.75	3	6	0.6	20	7 940	9 800	9 800	14 000	7 450	2 740	22	105
		CFT12-1VA	CFT12-1VUUA	CFT12-1VRA	CFT12-1VUURA															13 430	19 700	11 270	6 000				
16	0 -0.018	CFT16A	CFT16UUA	CFT16RA	CFT16UURA	35	18	16	M16×1.5	17	52	32.5	8	0.8	Rc1/8	3	6	0.6	24	12 050	18 330	18 330	10 000	11 200	3 140	58	170
		CFT16VA	CFT16VUUA	CFT16VRA	CFT16VUURA															20 680	37 630	19 800	4 500				
18	0 -0.018	CFT18A	CFT18UUA	CFT18RA	CFT18UURA	40	20	18	M18×1.5	19	58	36.5	8	0.8	Rc1/8	3	6	1	26	14 700	25 200	25 200	8 500	14 400	3 720	87	250
		CFT18VA	CFT18VUUA	CFT18VRA	CFT18VUURA															25 280	51 350	26 560	3 500				
20	0 -0.021	CFT20A	CFT20UUA	CFT20RA	CFT20UURA	52	24	20	M20×1.5	21	66	40.5	9	0.8	Rc1/8	4	8	1	36	20 680	34 600	32 140	7 000	23 200	8 230	120	460
		CFT20VA	CFT20VUUA	CFT20VRA	CFT20VUURA															33 120	64 480	32 140	3 500				
20	0 -0.021	CFT20-1A	CFT20-1UUA	CFT20-1RA	CFT20-1UURA	47	24	20	M20×1.5	21	66	40.5	9	0.8	Rc1/8	4	8	1	36	20 680	34 600	32 140	7 000	21 000	7 150	120	385
		CFT20-1VA	CFT20-1VUUA	CFT20-1VRA	CFT20-1VUURA															33 120	64 480	32 140	3 500				
24	0 -0.021	CFT24A	CFT24UUA	CFT24RA	CFT24UURA	62	29	24	M24×1.5	25	80	49.5	11	0.8	Rc1/8	4	8	1	40	30 480	52 630	49 500	6 500	34 200	10 500	220	815
		CFT24VA	CFT24VUUA	CFT24VRA	CFT24VUURA															46 550	92 020	49 500	3 000				
24	0 -0.021	CFT24-1A	CFT24-1UUA	CFT24-1RA	CFT24-1UURA	72	29	24	M24×1.5	25	80	49.5	11	0.8	Rc1/8	4	8	1	40	30 480	52 630	49 500	6 500	39 800	12 900	220	1 140
		CFT24-1VA	CFT24-1VUUA	CFT24-1VRA	CFT24-1VUURA															46 550	92 020	49 500	3 000				
30	0 -0.021	CFT30A	CFT30UUA	CFT30RA	CFT30UURA	80	35	30	M30×1.5	32	100	63	15	1	Rc1/8	4	8	1	46	45 370	85 060	73 700	5 000	52 600	14 900	450	1 870
		CFT30VA	CFT30VUUA	CFT30VRA	CFT30VUURA															67 620	144 060	73 700	2 200				
30	0 -0.021	CFT30-1A	CFT30-1UUA	CFT30-1RA	CFT30-1UURA	85	35	30	M30×1.5	32	100	63	15	1	Rc1/8	4	8	1	46	45 370	85 060	73 700	5 000	56 000	16 100	450	2 030
		CFT30-1VA	CFT30-1VUUA	CFT30-1VRA	CFT30-1VUURA															67 620	144 060	73 700	2 200				
30	0 -0.021	CFT30-2A	CFT30-2UUA	CFT30-2RA	CFT30-2UURA	90	35	30	M30×1.5	32	100	63	15	1	Rc1/8	4	8	1	46	45 370	85 060	73 700	5 000	59 300	17 300	450	2 220
		CFT30-2VA	CFT30-2VUUA	CFT30-2VRA	CFT30-2VUURA															67 620	144 060	73 700	2 200				

* Without seals, suitable for grease lubrication. In case of oil lubrication, up to 130% of this value shall be permissible, and 70% of this value shall apply for types with seals.

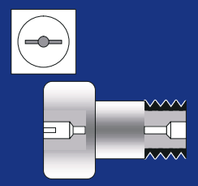
OUTER RINGS TOLERANCE

TYPE	Cylindrical outer ring	Crowned outer ring
CF12	0/-9	0/-50
CF12-1,CF16,CF18,CF20-1	0/-11	0/-50
CF20,CF24,CF24-1,CF30	0/-13	0/-50
CF30-1,CF30-2	0/-15	0/-50

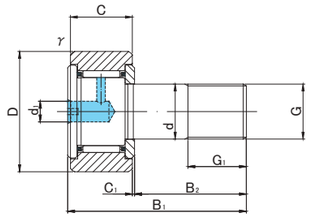
ACCESSORIES

TYPE	NUT
All types	Attached

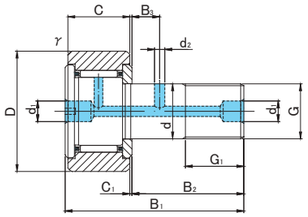
CAM FOLLOWERS
INCH DIMENSION
SCREWDRIVER SLOT HEAD



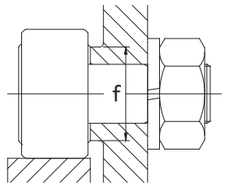
CR



CR8～CR10-1



CR12～CR36



CR TYPE

Prepacked Grease

Stud diameter d mm (inch)	Designation: Cylindrical outer ring, Without seals	Cylindrical outer ring, With seals	Crowned outer ring R250(≦CR8-1) R500(CR10≦), Without seals	Crowned outer ring R250(≦CR8-1) R500(CR10≦), With seals	Dimensions (inch/mm): D		C		d		G UNF	G1		B1		B2		B3		C1	d1		d2		r		f		Basic dynamic load rating Cr N	Basic static load rating Cor N	Limiting speed * rpm	Track load capacity: Cylindrical outer ring N	Crowned outer ring N	Max tightening torque N·m	Mass g (approx)
4.826 (-)	CR8	CR8UU	CR8R	CR8UUR	1/2	12.7	11/32	8.731	—	4.826	No.10-32	1/4	6.35	7/8	22.225	1/2	12.7	—	—	0.8	1/8	3.175	—	—	1/64	0.397	21/64	8.334	2 550	2 160	28 000	2 160	730	2	9
	CR8-1	CR8-1UU	CR8-1R	CR8-1UUR			3/8	9.525						1 1/32	26.194	5/8	15.875															2 350	730		10
6.350 (1/4)	CR10	CR10UU	CR10R	CR10UUR	5/8	15.875	13/32	10.319	1/4	6.35	1/4 - 28	5/16	7.938	1 1/16	26.988	5/8	15.875	—	—	0.8	1/8	3.175	—	—	1/64	0.397	29/64	11.509	3 630	3 630	21 000	3 230	1 180	3	19
	CR10-1	CR10-1UU	CR10-1R	CR10-1UUR			7/16	11.112						1 7/32	30.956	3/4	19.05															3 430	1 180		21
9.525 (3/8)	CR12	CR12UU	CR12R	CR12UUR	3/4	19.05	1/2	12.7	3/8	9.525	3/8 - 24	3/8	9.525	1 13/32	35.719	7/8	22.225	1/4	6.35	0.8	3/16	4.762	3/32	2.381	1/32	0.794	17/32	13.494	4 410	5 100	15 000	4 510	1 270	17	35
	CR14	CR14UU	CR14R	CR14UUR	7/8	22.225																				19/32	15.081	4 800	5 780	14 000	5 290	1 760		46
11.112 (7/16)	CR16	CR16UU	CR16R	CR16UUR	1	25.4	5/8	15.875	7/16	11.112	7/16 - 20	1/2	12.7	1 21/32	42.069	1	25.4	1/4	6.35	0.8	3/16	4.762	1/8	3.175	3/64	1.191	45/64	17.859	8 820	10 780	13 000	7 250	1 960	20	73
	CR18	CR18UU	CR18R	CR18UUR	1 1/8	28.575																			1/16	1.588	3/4	19.05	9 210	11 560	12 000	7 740	2 350		88
12.700 (1/2)	CR20	CR20UU	CR20R	CR20UUR	1 1/4	31.75	3/4	19.05	1/2	12.7	1/2 - 20	5/8	15.875	2 1/32	51.594	1 1/4	31.75	5/16	7.938	0.8	3/16	4.762	1/8	3.175	1/16	1.588	55/64	21.828	14 210	15 970	11 000	10 680	2 840	28	132
	CR22	CR22UU	CR22R	CR22UUR	1 3/8	34.925																										11 760	2 940		157
15.875 (5/8)	CR24	CR24UU	CR24R	CR24UUR	1 1/2	38.1	7/8	22.225	5/8	15.875	5/8 - 18	3/4	19.05	2 13/32	61.119	1 1/2	38.1	3/8	9.525	0.8	3/16	4.762	5/32	3.969	1/16	1.588	1 3/64	26.196	18 520	24 210	8 500	15 390	3 820	64	225
	CR26	CR26UU	CR26R	CR26UUR	1 5/8	41.275																										16 660	3 820		260
19.05 (3/4)	CR28	CR28UU	CR28R	CR28UUR	1 3/4	44.45	1	25.4	3/4	19.05	3/4 - 16	7/8	22.225	2 25/32	70.644	1 3/4	44.45	7/16	11.112	0.8	3/16	4.762	5/32	3.969	1/16	1.588	1 9/32	32.543	25 090	38 220	7 000	20 970	3 820	117	365
	CR30	CR30UU	CR30R	CR30UUR	1 7/8	47.625																										22 440	4 700		410
22.225 (7/8)	CR32	CR32UU	CR32R	CR32UUR	2	50.8	1 1/4	31.75	7/8	22.225	7/8 - 14	1	25.4	3 9/32	83.344	2	50.8	1/2	12.7	0.8	3/16	4.762	3/16	4.762	1/16	1.588	1 15/32	37.306	32 440	63 800	5 500	30 870	4 900	186	615
	CR36	CR36UU	CR36R	CR36UUR	2 1/4	57.15																										34 690	5 980		750

* Without seals, suitable for grease lubrication. In case of oil lubrication, up to 130% of this value shall be permissible, and 70% of this value shall apply for types with seals.

ACCESSORIES

TYPE	STOP PLUG	RESIN PLUG	NUT
CR8, CR8-1,CR10,CR10-1	—	—	Attached
CR12.CR14,CR16,CR18,CR20,CR22	ϕ 4.8 Attached	ϕ 4.8 Attached	Attached
CR24,CR26,CR28,CR30,CR32,CR36	ϕ 4.8 Attached	ϕ 4.8 Attached	Attached

ROLLER FOLLOWERS

Type and Part Code

Type	Applicable shaft diameter	Feature	Part Code
 RNAST (Separable type)	ϕ 7 ~ ϕ 60	NAST type without inner ring.	**RNAST** **15** **R** ↑ Type ↑ Bore diameter code ↑ **R**: Crowned outer ring, **None**: Cylindrical outer ring
 NAST (Separable type)	ϕ 6 ~ ϕ 50	Thick wall outer ring, inner ring. Separable bearing with combined needle roller with precision cage.	**NAST** **15** **R** ↑ Type ↑ Bore diameter code ↑ **R**: Crowned outer ring, **None**: Cylindrical outer ring
 NAST-ZZ (Separable type)	ϕ 6 ~ ϕ 50	Separable bearing in which labyrinth seal is formed with combined side plate at both sides of inner ring of NAST type. (NAST-ZZUU type comes with seal)	**NAST** **15** **Z Z** **U U** **R** ↑ Type ↑ Bore diameter code ↑ **Z Z**: With shield ↑ **UU**: With seal, **None**: With shield ↑ **R**: Crowned outer ring, **X**: Cylindrical outer ring
 NART-R (Non-separable type)	ϕ 5 ~ ϕ 50	Non-separable bearing with fixed side plate at inner ring. Mitigate eccentric load with spherical shape at outer diameter of outer ring (code R). (NART-UUR type comes with seal)	**NART** **15** **U U** **V** **R** ↑ Type ↑ Bore diameter code ↑ **UU**: With seal, **None**: With shield ↑ **V**: Full complement, **None**: With cage ↑ **R**: Crowned outer ring, **X**: Cylindrical outer ring

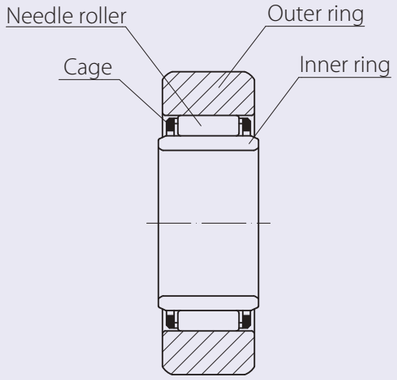
Structure and Features

Roller follower is a bearing with integrated “roller” featuring high rigidity. Its primary application is in a guide roller to have its contacting member travel in linier motion in direction of tangent using rotation of outer ring.

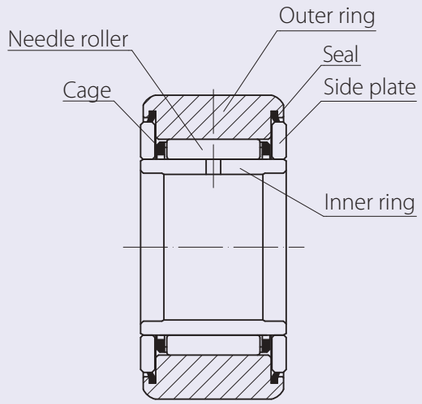
Outer ring of the roller follower is designed with thick ring in order to provide high rigidity to endure heavy load or impact load at portion to contact with the associated objects.

Type of roller follower mainly consists of separate type, which have separated inner ring and outer ring, and non-separate type, whose inner ring has fixed side plate.

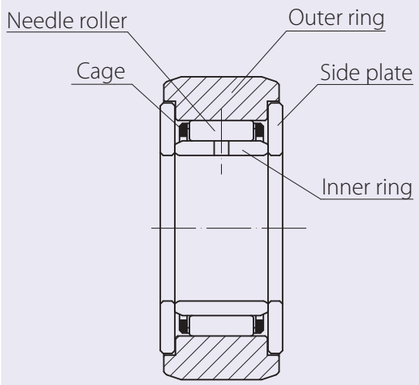
Also, various types with shapes and structures are available in accordance with application. Outer rings have two types – crowned outer ring and cylindrical outer ring. The crowned outer ring is suited for absorbing eccentric load since it absorbs angular misalignment due to a mount error. Cylindrical outer ring is effective for heavy duty since it contacts with large contact area of the associated objects so that can mitigate the contact surface pressure. They have two internal mechanism – one with cage and one with full complement. A roller follower with cage is suitable for high speed application since the guiding feature of cage enables the rotation of "rollers" to be stable. Compared with cage type, full complement type is effective for applications with low-speed operation of heavy load due to its larger load rating. Full complement type also includes double-raw cylindrical roller type which allows moderate axial loading.



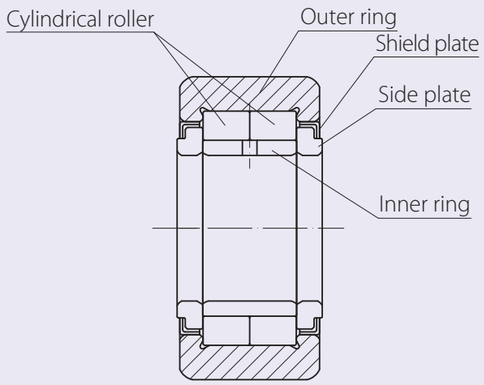
Structure of type NAST



Structure of type NART..UUR



Structure of type NAST..ZZ



Structure of type NURT

Accuracy standard

Roller followers are manufactured in accordance with the following accuracies.

Table-1 Accuracy Unit: μm

Name \ Category		Crowned outer ring	Cylindrical outer ring
Dimension tolerance of outer ring outer diameter (D)		0 -50	Refer to Table-3
Dimension tolerance of outer ring width (C)		0 -120	
Tolerance of inner ring width (B)	Separable	0 -120	
Tolerance of bearing width (B)	Non-separable	h12	—
Fw	Separable	Refer to Table-11 on page 23	

Table-2 Accuracy of inner ring Unit: μm

Nominal inner ring bore diameter d (mm)		Deviation of mean bore diameter in a single plane Δ_{dmp}		Tolerance of radial runout of inner ring
Over	Incl.	high	low	max.
2.5	10	0	-8	10
10	18	0	-8	10
18	30	0	-10	13
30	50	0	-12	15

Table-3 Accuracy of outer ring Unit: μm

Nominal outer ring bore diameter D (mm)		Deviation of mean outer diameter in a single plane Δ_{Dmp}		Tolerance of radial runout of outer ring (max.)
Over	Incl.	high	low	max.
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

Radial internal clearance

Table below indicates radial internal clearance of roller follower.

Table-4 Radial internal clearance

Unit: μm

Part code			Radial internal clearance	
Separable	Non-separable	Double row cylindrical roller	min.	max.
NAST6	NART5R ～ 6R	—	5	20
NAST8 ～ 12	NART8R ～ 12R	—	5	25
NAST15 ～ 25	NART15R ～ 25R	—	10	30
NAST30 ～ 40	NART30R ～ 40R	—	10	40
NAST45 ～ 50	NART45R ～ 50R	—	15	50
—	—	NURT15R ～ 30-1R	0	25
—	—	NURT35R ～ 40-1R	5	30
—	—	NURT45R ～ 50-1R	5	35

Fits

Table below indicates recommended fits between roller follower and its mounting shaft.

Table-5 Shaft fits

Type		Tolerance grade
Separable	Without inner ring	k5,k6
	With inner ring	g6,h6
Non-separable		
Double row cylindrical roller		

Track load capacity

Track load capacity means a permissive load under which the outer ring of cam follower and the mating surface are allowable to be used over a long period without causing any deformation nor compression mark. Track load capacity depicted in dimension table indicates a value for which hardness of contacting steel member is assumed to be HRC40. In the case that the hardness of contacting member is not HRC40, track load capacity in the dimension table shall be multiplied by value of track capacity factor obtained by Figure-1.

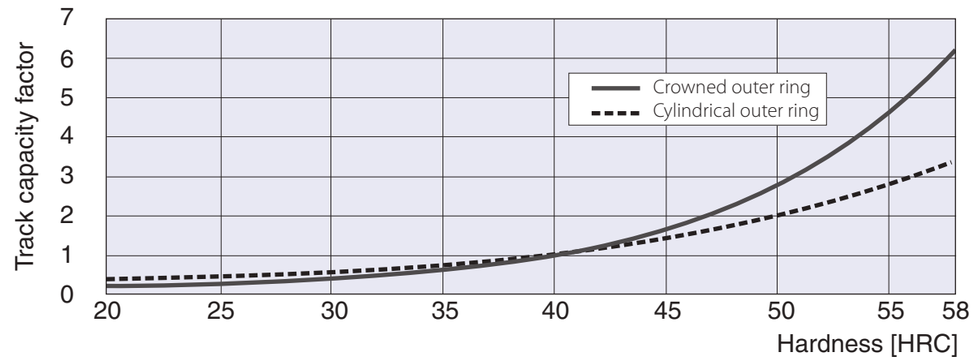


Figure-1 Track capacity factor

Lubrication

All the JNS roller followers are lubricated with pre-packed high quality lithium soap-based grease grade 2 (RoHS compliant) so that they are ready to use. For applications requiring high prevention measure against invasion of foreign matter or leakage of lubricant, products with seal (part code--UU) which integrate special synthetic lubber with high abrasion resistance are also available.

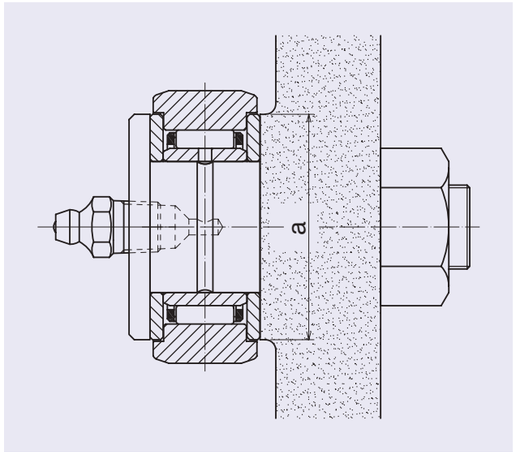
Grease shall be packed up to volume approximately one-third to one-half of internal space of bearing. Lubrication interval varies depending on operation condition. Referential interval may be every six to twenty four months for roller followers with cages and every one to six months for full complement type with grease in the same type.

Some excessive grease may leak at the beginning of usage or immediately after re-greasing even for the products with seal. Aging operation period is recommended prior to application in which no contamination by grease is allowed in and around device. Wipe and clean any leaked extra grease after this operation.

Mounting

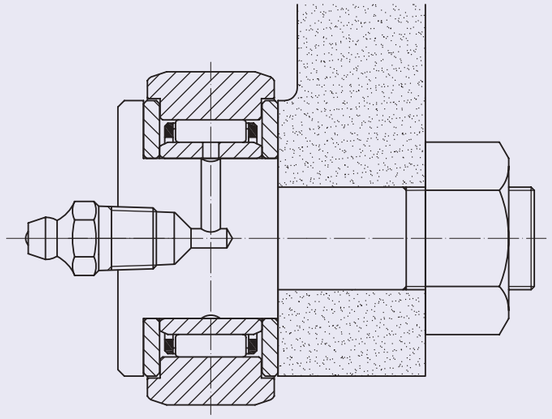
Mounting part

- Thrust load may cause damage to side plate, outer ring or roller follower since it is designed so as to support load in radial direction. It is recommended to design and assemble to avoid thrust load.
- Application with roller follower without inner ring requires heat treatment and grinding finish of shaft. Surface hardness of the shaft shall be HRC58 to 64, and surface roughness shall be R_a 0.2 μ m or less for this application.
- Side plate of non-separate type roller follower is pressed-in to fix it. Application in a manner to push the side plate shall be avoided in order to prevent risk of abnormal rotation under external force.
- Crowned outer ring is recommended in the case that contact between the outer ring and contacting member track surface is not smooth and even.
- When mounting NART, NAST-ZZ and NURT type, dimension "a" must be more than it described in dimension table in order to protect the side plate.

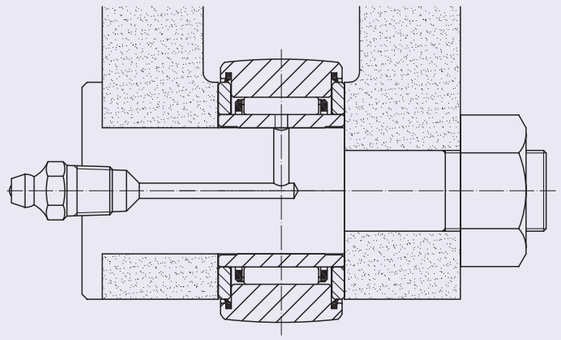


Mounting method

To prevent pre-mature failure of roller follower, lubrication hole of inner ring shall be located outside of loading range (on the side to receive load).



NAST..ZZ Example of mounting

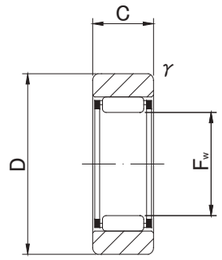


NART..UUR Example of mounting

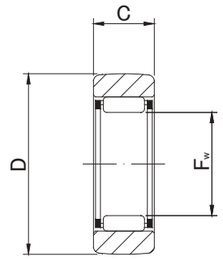
ROLLER FOLLOWERS

SEPARABLE WITHOUT INNER RING

RNAST



RNAST



RNAST..R

RNAST TYPE

Prepacked Grease

Shaft Diameter (mm)	Designation		Dimensions (mm)				Basic dynamic load rating	Basic static load rating	Track load capacity		Limiting speed *	Mass
	Cylindrical outer ring	Crowned outer ring (R500)	Fw	D	C	r's min	Cr N	Cor N	Cylindrical outer ring N	Crowned outer ring N	rpm	g (approx)
7	**RNAST 5**	**RNAST 5R**	7 +0.022 +0.013	**16**	7.8	0.3	2 740	2 390	2 350	1 080	30 000	8.9
10	**RNAST 6**	**RNAST 6R**	10 +0.027 +0.016	**19**	9.8	0.3	4 120	4 550	3 530	1 370	20 000	13.9
12	**RNAST 8**	**RNAST 8R**	12 +0.027 +0.016	**24**	9.8	0.6	5 680	5 890	4 020	1 860	17 000	23.5
14	**RNAST10**	**RNAST10R**	14 +0.027 +0.016	**30**	11.8	1	9 700	9 670	5 590	2 450	15 000	42.5
16	**RNAST12**	**RNAST12R**	16 +0.027 +0.016	**32**	11.8	1	10 400	10 900	5 980	2 740	13 000	49.5
20	**RNAST15**	**RNAST15R**	20 +0.033 +0.020	**35**	11.8	1	12 300	14 300	6 570	3 140	10 000	50
22	**RNAST17**	**RNAST17R**	22 +0.033 +0.020	**40**	15.8	1	17 400	20 900	10 900	3 720	9 500	90
25	**RNAST20**	**RNAST20R**	25 +0.033 +0.020	**47**	15.8	1	19 200	24 500	12 700	4 610	8 500	135
30	**RNAST25**	**RNAST25R**	30 +0.033 +0.020	**52**	15.8	1	20 700	28 400	14 100	5 290	7 000	152
38	**RNAST30**	**RNAST30R**	38 +0.041 +0.025	**62**	19.8	1	30 300	45 400	22 100	6 660	5 500	255
42	**RNAST35**	**RNAST35R**	42 +0.041 +0.025	**72**	19.8	1	32 200	50 600	25 700	8 130	5 000	375
50	**RNAST40**	**RNAST40R**	50 +0.041 +0.025	**80**	19.8	1.5	35 700	61 100	26 900	9 310	4 000	420
55	**RNAST45**	**RNAST45R**	55 +0.049 +0.030	**85**	19.8	1.5	37 100	66 400	28 500	10 100	4 000	460
60	**RNAST50**	**RNAST50R**	60 +0.049 +0.030	**90**	19.8	1.5	38 700	71 800	30 200	11 000	3 500	500

* Suitable for grease lubrication. In case of oil lubrication, up to 130% of this value shall be permissible.

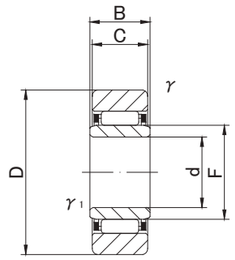
OUTER RINGS TOLERANCE (μm)

TYPE	Cylindrical outer ring	Crowned outer ring
RNAST5	0/-8	0/-50
RNAST6,RNAST8,RNAST10	0/-9	0/-50
RNAST12,RNAST15,RNAST17,RNAST20	0/-11	0/-50
RNAST25,RNAST30,RNAST35,RNAST40	0/-13	0/-50
RNAST45,RNAST50	0/-15	0/-50

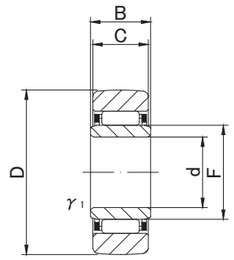
ROLLER FOLLOWERS

SEPARABLE WITH INNER RING

NAST



NAST



NAST..R

NAST TYPE

Prepacked Grease

Shaft Diameter (mm)	Designation		Dimensions (mm)							Basic dynamic load rating	Basic static load rating	Track load capacity		Limiting speed *	Mass
	Cylindrical outer ring	Crowned outer ring (R500)	d	D	B	C	rs min	r1s min	F	Cr N	Cor N	Cylindrical outer ring N	Crowned outer ring N	rpm	g (approx)
6	NAST 6	NAST 6R	6 0 -0.008	19	10	9.8	0.3	0.3	10	4 120	4 550	3 530	1 370	20 000	17.8
8	NAST 8	NAST 8R	8 0 -0.008	24	10	9.8	0.6	0.3	12	5 680	5 890	4 020	1 860	17 000	28
10	NAST10	NAST10R	10 0 -0.008	30	12	11.8	1	0.3	14	9 700	9 670	5 590	2 450	15 000	50
12	NAST12	NAST12R	12 0 -0.008	32	12	11.8	1	0.3	16	10 400	10 900	5 980	2 740	13 000	58
15	NAST15	NAST15R	15 0 -0.008	35	12	11.8	1	0.3	20	12 300	14 300	6 570	3 140	10 000	62
17	NAST17	NAST17R	17 0 -0.010	40	16	15.8	1	0.3	22	17 400	20 900	10 900	3 720	9 500	110
20	NAST20	NAST20R	20 0 -0.010	47	16	15.8	1	0.3	25	19 200	24 500	12 700	4 610	8 500	155
25	NAST25	NAST25R	25 0 -0.010	52	16	15.8	1	0.3	30	20 700	28 400	14 100	5 290	7 000	180
30	NAST30	NAST30R	30 0 -0.010	62	20	19.8	1	0.6	38	30 300	45 400	22 100	6 660	5 500	320
35	NAST35	NAST35R	35 0 -0.012	72	20	19.8	1	0.6	42	32 200	50 600	25 700	8 130	5 000	440
40	NAST40	NAST40R	40 0 -0.012	80	20	19.8	1.5	1	50	35 700	61 100	26 900	9 310	4 000	530
45	NAST45	NAST45R	45 0 -0.012	85	20	19.8	1.5	1	55	37 100	66 400	28 500	10 100	4 000	580
50	NAST50	NAST50R	50 0 -0.012	90	20	19.8	1.5	1	60	38 700	71 800	30 200	11 000	3 500	635

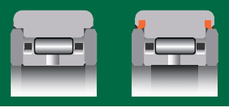
* Suitable for grease lubrication. In case of oil lubrication, up to 130% of this value shall be permissible.

OUTER RINGS TOLERANCE (Outside diameter) (μm)

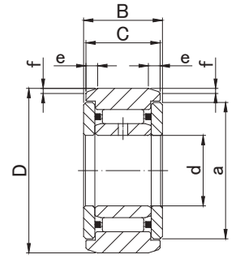
TYPE	Cylindrical outer ring	Crowned outer ring
NAST6,NAST8,NAST10	0/-9	0/-50
NAST12,NAST15,NAST17,NAST20	0/-11	0/-50
NAST25,NAST30,NAST35,NAST40	0/-13	0/-50
NAST45,NAST50	0/-15	0/-50

ROLLER FOLLOWERS

SEPARABLE WITH INNER RING WITH SHIELD



NAST..ZZ



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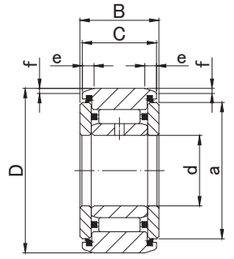
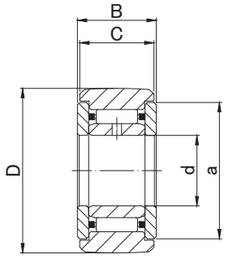
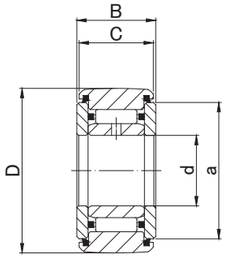


NAST..ZZUU



NAST..ZZR



NAST..ZZUUR

NAST..ZZ TYPE

Prepacked Grease

Shaft Diameter (mm)	Designation				Dimensions (mm)							Basic dynamic load rating	Basic static load rating	Track load capacity		Limiting speed *	Mass
	Cylindrical outer ring		Crowned outer ring (R500)														
	Without seals	With seals	Without seals	With seals	d	D	B	C	a	e	f	Cr N	Cor N	Cylindrical outer ring N	Crowned outer ring N	rpm	g (approx)
6	NAST 6ZZ	NAST 6ZZUU	NAST 6ZZR	NAST 6ZZUUR	6 0 -0.008	19	14	13.8	14	2.5	0.8	4 120	4 550	3 530	1 370	20 000	24.5
8	NAST 8ZZ	NAST 8ZZUU	NAST 8ZZR	NAST 8ZZUUR	8 0 -0.008	24	14	13.8	17.5	2.5	0.8	5 680	5 890	4 510	1 860	17 000	39
10	NAST10ZZ	NAST10ZZUU	NAST10ZZR	NAST10ZZUUR	10 0 -0.008	30	16	15.8	23.5	2.5	0.8	9 700	9 670	6 860	2 450	15 000	65
12	NAST12ZZ	NAST12ZZUU	NAST12ZZR	NAST12ZZUUR	12 0 -0.008	32	16	15.8	25.5	2.5	0.8	10 400	10 900	7 350	2 740	13 000	75
15	NAST15ZZ	NAST15ZZUU	NAST15ZZR	NAST15ZZUUR	15 0 -0.008	35	16	15.8	29	2.5	0.8	12 300	14 300	8 040	3 140	10 000	83
17	NAST17ZZ	NAST17ZZUU	NAST17ZZR	NAST17ZZUUR	17 0 -0.010	40	20	19.8	32.5	3	1	17 400	20 900	11 800	3 720	9 500	135
20	NAST20ZZ	NAST20ZZUU	NAST20ZZR	NAST20ZZUUR	20 0 -0.010	47	20	19.8	38	3	1	19 200	24 500	13 800	4 610	8 500	195
25	NAST25ZZ	NAST25ZZUU	NAST25ZZR	NAST25ZZUUR	25 0 -0.010	52	20	19.8	43	3	1	20 700	28 400	15 300	5 290	7 000	225
30	NAST30ZZ	NAST30ZZUU	NAST30ZZR	NAST30ZZUUR	30 0 -0.010	62	25	24.8	50.5	4	1.2	30 300	45 400	22 100	6 660	5 500	400
35	NAST35ZZ	NAST35ZZUU	NAST35ZZR	NAST35ZZUUR	35 0 -0.012	72	25	24.8	53.5	4	1.2	32 200	50 600	25 700	8 130	5 000	550
40	NAST40ZZ	NAST40ZZUU	NAST40ZZR	NAST40ZZUUR	40 0 -0.012	80	26	25.8	61.5	4	1.2	35 700	61 100	30 300	9 310	4 000	710
45	NAST45ZZ	NAST45ZZUU	NAST45ZZR	NAST45ZZUUR	45 0 -0.012	85	26	25.8	66.5	4	1.2	37 100	66 400	31 100	10 100	4 000	760
50	NAST50ZZ	NAST50ZZUU	NAST50ZZR	NAST50ZZUUR	50 0 -0.012	90	26	25.8	76	4	1.2	38 700	71 800	34 000	11 000	3 500	830

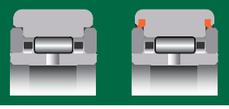
* Without seals, suitable for grease lubrication. In case of oil lubrication, up to 130% of this value shall be permissible, and 70% of this value shall apply for types with seals.

OUTER RINGS TOLERANCE (Outside diameter) (μm)

TYPE	Cylindrical outer ring	Crowned outer ring
NAST6,NAST8,NAST10	0/-9	0/-50
NAST12,NAST15,NAST17,NAST20	0/-11	0/-50
NAST25,NAST30,NAST35,NAST40	0/-13	0/-50
NAST45,NAST50	0/-15	0/-50

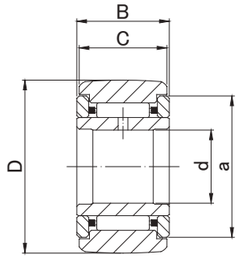
ROLLER FOLLOWERS

NON SEPARABLE WITH INNER RING

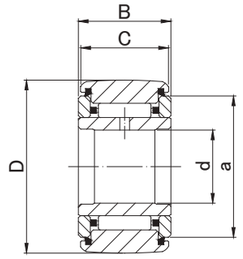


NART..R

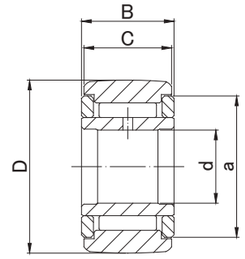
NART..VR



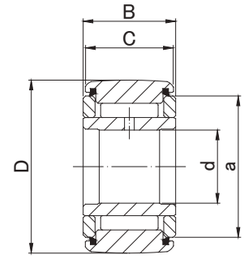
NART..R
NART..X



NART..UUR
NART..UUX



NART..VR
NART..VX



NART..UUVR
NART..UUVX

NART TYPE

Prepacked Grease

Shaft Diameter (mm)	Designation: Crowned outer ring R500(≦ NART17) R1000(NART20 ≦) Without seals	Designation: Crowned outer ring With seals	Designation: Cylindrical outer ring Without seals	Designation: Cylindrical outer ring With seals	Dimensions (mm) d	D	B	C	a	Basic dynamic load rating Cr N	Basic static load rating Cor N	Track load capacity Crowned outer ring N	Track load capacity Cylindrical outer ring N	Limiting speed * rpm	Mass g (approx)
5	**NART 5R** **NART 5VR**	**NART 5UUR** **NART 5UUVR**	**NART 5X** **NART 5VX**	**NART 5UUX** **NART 5UUVX**	5 0 -0.008	**16**	12	11	12	3 620 6 760	3 720 8 340	1 080	3 430	25 000 8 500	14.5 15.1
6	**NART 6R** **NART 6VR**	**NART 6UUR** **NART 6UUVR**	**NART 6X** **NART 6VX**	**NART 6UUX** **NART 6UUVX**	6 0 -0.008	**19**	12	11	14	4 200 7 640	4 700 10 300	1 370	4 020	20 000 7 000	20.5 21.5
8	**NART 8R** **NART 8VR**	**NART 8UUR** **NART 8UUVR**	**NART 8X** **NART 8VX**	**NART 8UUX** **NART 8UUVX**	8 0 -0.008	**24**	15	14	17.5	6 600 11 800	7 300 15 600	1 860	5 950	17 000 5 500	41.5 42.5
10	**NART10R** **NART10VR**	**NART10UUR** **NART10UUVR**	**NART10X** **NART10VX**	**NART10UUX** **NART10UUVX**	10 0 -0.008	**30**	15	14	23.5	8 600 15 600	8 300 18 100	2 450	7 060	15 000 5 000	64.5 66.5
12	**NART12R** **NART12VR**	**NART12UUR** **NART12UUVR**	**NART12X** **NART12VX**	**NART12UUX** **NART12UUVX**	12 0 -0.008	**32**	15	14	25.5	9 100 16 800	9 200 20 500	2 740	7 450	13 000 4 500	71 73
15	**NART15R** **NART15VR**	**NART15UUR** **NART15UUVR**	**NART15X** **NART15VX**	**NART15UUX** **NART15UUVX**	15 0 -0.008	**35**	19	18	29	14 400 25 100	17 600 36 400	3 140	11 200	10 000 3 500	102 106
17	**NART17R** **NART17VR**	**NART17UUR** **NART17UUVR**	**NART17X** **NART17VX**	**NART17UUX** **NART17UUVX**	17 0 -0.008	**40**	21	20	32.5	18 600 32 000	22 500 46 200	3 720	14 400	9 500 3 000	149 155
20	**NART20R** **NART20VR**	**NART20UUR** **NART20UUVR**	**NART20X** **NART20VX**	**NART20UUX** **NART20UUVX**	20 0 -0.010	**47**	25	24	38	24 100 41 700	32 700 67 300	7 150	21 000	8 000 2 500	250 255
25	**NART25R** **NART25VR**	**NART25UUR** **NART25UUVR**	**NART25X** **NART25VX**	**NART25UUX** **NART25UUVX**	25 0 -0.010	**52**	25	24	43	25 800 45 500	37 500 79 000	8 230	23 200	7 000 2 500	285 295
30	**NART30R** **NART30VR**	**NART30UUR** **NART30UUVR**	**NART30X** **NART30VX**	**NART30UUX** **NART30UUVX**	30 0 -0.010	**62**	29	28	50.5	36 200 59 800	56 900 110 400	10 500	33 000	5 500 1 800	470 485
35	**NART35R** **NART35VR**	**NART35UUR** **NART35UUVR**	**NART35X** **NART35VX**	**NART35UUX** **NART35UUVX**	35 0 -0.012	**72**	29	28	53.5	38 200 63 000	62 800 121 500	12 900	38 000	5 000 1 700	640 655
40	**NART40R** **NART40VR**	**NART40UUR** **NART40UUVR**	**NART40X** **NART40VX**	**NART40UUX** **NART40UUVX**	40 0 -0.012	**80**	32	30	61.5	46 200 76 200	84 700 164 200	14 900	44 400	4 000 1 400	845 865
45	**NART45R** **NART45VR**	**NART45UUR** **NART45UUVR**	**NART45X** **NART45VX**	**NART45UUX** **NART45UUVX**	45 0 -0.012	**85**	32	30	66.5	49 300 80 200	95 200 181 100	16 100	47 000	4 000 1 300	915 935
50	**NART50R** **NART50VR**	**NART50UUR** **NART50UUVR**	**NART50X** **NART50VX**	**NART50UUX** **NART50UUVX**	50 0 -0.012	**90**	32	30	76	51 100 84 100	102 300 198 000	17 300	50 000	3 500 1 200	980 1 010

* Without seals, suitable for grease lubrication. In case of oil lubrication, up to 130% of this value shall be permissible, and 70% of this value shall apply for types with seals.

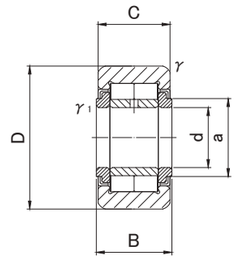
OUTER RINGS TOLERANCE (Outside diameter) (μm)

TYPE	Crowned outer ring	Cylindrical outer ring
NART5	0/-50	0/-8
NART6,NART8,NART10	0/-50	0/-9
NART12,NART15,NART17,NART20	0/-50	0/-11
NART25,NART30,NART35,NART40	0/-50	0/-13
NART45,NART50	0/-50	0/-15

ROLLER FOLLOWERS

FULL COMPLEMENT DOUBLE ROW NON SEPARABLE WITH INNER RING

NURT



NURT..R
NURT..X

NURT TYPE

Prepacked Grease

Shaft Diameter (mm)	Designation		Dimensions (mm)							Basic dynamic load rating	Basic static load rating	Track load capacity		Limiting speed	Mass
	Crowned outer ring R500(≦NURT17-1) R1000(NURT20≦)	Cylindrical outer ring	d	D	B	C	a	*r*s min	*r*1s min	Cr N	Cor N	Crowned outer ring N	Cylindrical outer ring N	rpm	g (approx)
15	**NURT15R**	**NURT15X**	15 0 -0.008	**35**	19	18	20	0.6	0.3	23 400	27 200	3 140	11 200	5 200	100
	NURT15-1R	**NURT15-1X**		**42**	19	18	20	0.6	0.3	23 400	27 200	3 930	13 900	5 200	160
17	**NURT17R**	**NURT17X**	17 0 -0.008	**40**	21	20	22	1	0.5	25 200	30 900	3 720	14 400	4 700	147
	NURT17-1R	**NURT17-1X**		**47**	21	20	22	1	0.5	25 200	30 900	4 550	17 300	4 700	222
20	**NURT20R**	**NURT20X**	20 0 -0.010	**47**	25	24	27	1	0.5	38 900	48 900	7 150	21 000	3 800	245
	NURT20-1R	**NURT20-1X**		**52**	25	24	27	1	0.5	38 900	48 900	8 230	23 200	3 800	321
25	**NURT25R**	**NURT25X**	25 0 -0.010	**52**	25	24	31	1	0.5	43 000	58 100	8 230	23 200	3 300	281
	NURT25-1R	**NURT25-1X**		**62**	25	24	31	1	0.5	43 000	58 100	10 500	27 400	3 300	450
30	**NURT30R**	**NURT30X**	30 0 -0.010	**62**	29	28	38	1	0.5	57 500	74 300	10 500	32 000	2 800	466
	NURT30-1R	**NURT30-1X**		**72**	29	28	38	1	0.5	57 500	74 300	12 900	37 200	2 800	697
35	**NURT35R**	**NURT35X**	35 0 -0.012	**72**	29	28	44	1.1	0.6	63 300	87 500	12 900	37 200	2 300	630
	NURT35-1R	**NURT35-1X**		**80**	29	28	44	1.1	0.6	63 300	87 500	14 900	41 300	2 300	840
40	**NURT40R**	**NURT40X**	40 0 -0.012	**80**	32	30	51	1.1	0.6	86 900	124 600	14 900	44 300	1 900	817
	NURT40-1R	**NURT40-1X**		**90**	32	30	51	1.1	0.6	86 900	124 600	17 300	49 800	1 900	1 130
45	**NURT45R**	**NURT45X**	45 0 -0.012	**85**	32	30	55	1.1	0.6	91 700	137 100	16 100	47 100	1 700	883
	NURT45-1R	**NURT45-1X**		**100**	32	30	55	1.1	0.6	91 700	137 100	19 840	55 400	1 700	1 400
50	**NURT50R**	**NURT50X**	50 0 -0.012	**90**	32	30	60	1.1	0.6	96 300	149 700	17 300	49 800	1 500	950
	NURT50-1R	**NURT50-1X**		**110**	32	30	60	1.1	0.6	96 300	149 700	22 530	60 900	1 500	1 690

OUTER RINGS TOLERANCE (Outside diameter) (μm)

TYPE	Crowned outer ring	Cylindrical outer ring
NURT15, NURT15-1,NURT17,NURT17-1,NURT20	0/-50	0/-11
NURT20-1,NURT25,NURT25-1,NURT30,NURT30-1,NURT35,NURT35-1,NURT40	0/-50	0/-13
NURT40-1,NURT45,NURT45-1,NURT50,NURT50-1	0/-50	0/-15

NEEDLE ROLLER BEARINGS

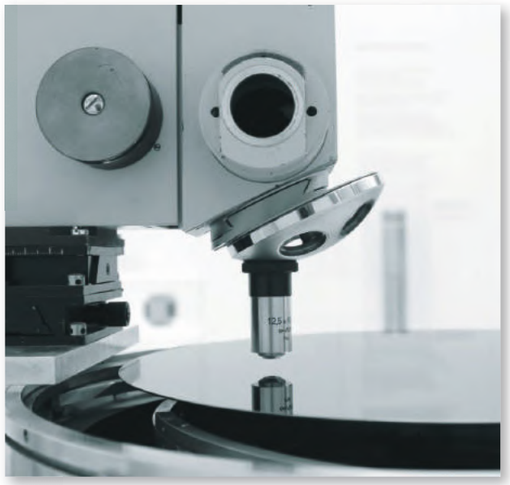
STAINLESS STEEL

Strong Point of Stainless Needle Roller Bearing

JNS manufactures stainless steel needle bearings and inner rings with excellent corrosion resistance.
These products are used in applications where a high resistance to corrosion is required such as medical devices, food machinery, packaging machinery, textile machinery and chemical machinery.
The outer ring, inner ring and rollers are made from martensite stainless steel, and after being subjected to heat treatment, receive a high accuracy grinding finish.
These products are not appropriate for use in environments with high humidity or where they could be directly exposed to water.
The mounting dimensions of JNS stainless bearings are the same as the conventional bearings. They are also compatible with the needle bearings of other manufacturers.

PHARMACEUTICALS

MEDICAL DEVICES



SEMICONDUCTORS

BOTTLING

FOODS

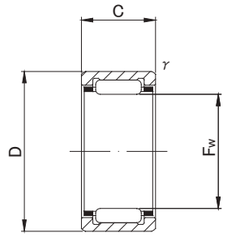
Stainless type Machined type needle roller bearings/inner ring

Type and Part Code

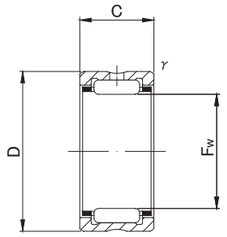
Type	Applicable axis diameter	Feature	Part Code
 RNA..M	ϕ 7 ~ ϕ 30	Stainless type Machined type needle roller bearings With collar outer ring Without inner ring Without seal	**Type** RNA → Type of bearing **Dimensions** 49 (Dimension series) 01 (Bore diameter number) M (**Stainless steel**) **Suffix code** P6 → Classification symbol (Class 6) (Standard class 0 No symbol)
 NK..M	ϕ 5 ~ ϕ 19	Stainless type Machined type needle roller bearings Light load type With collar outer ring Without inner ring Without seal (There are no oil holes or oil grooves if the roller set bore diameter (Fw) is 10 mm or less)	**Type** NK → Type of bearing **Dimensions** 18 (Inscribed circle diameter) / 20 (Outer ring width) M (**Stainless steel**) **Suffix code** P6 → Classification symbol (Class 6) (Standard class 0 No symbol)
 NA..M	ϕ 5 ~ ϕ 25	Stainless type Machined type needle roller bearings With collar outer ring With inner ring Without seal *Double rows: NA69 (shaft dia. ≧ϕ 32)	**Type** NA → Type of bearing **Dimensions** 49 (Dimension series) 01 (Bore diameter number) M (**Stainless steel**) **Suffix code** C3 → Clearance symbol (C3 clearance) (Standard: No symbol, CN clearance) P6 → Classification symbol (Class 6) (Standard class 0 No symbol)
 NKI..M	ϕ 5 ~ ϕ 15	Stainless type Machined type needle roller bearings Light load type With collar outer ring With inner ring Without seal (There are no oil holes or oil grooves if the bore diameter is 8 mm or less)	**Type** NKI → Type of bearing **Dimensions** 10 (Bore diameter) / 20 (Outer ring width) M (**Stainless steel**) **Suffix code** C3 → Clearance symbol (C3 clearance) (Standard: No symbol, CN clearance) P6 → Classification symbol (Class 6) (Standard class 0 No symbol)
 IR..M	ϕ 5 ~ ϕ 50	Stainless type Inner ring	**Type** IR → Type of bearing **Dimensions** 25 (Bore diameter) 30 (Outer diameter) 17 (Width) M (**Stainless steel**)

MACHINED RING NEEDLE ROLLER BEARINGS STAINLESS STEEL WITHOUT INNER RING

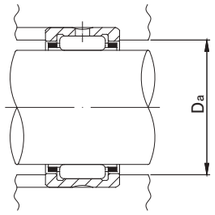
RNA49..M , NK..M



NK..M(Fw ≦ 10)



RNA49..M,NK..M



RNA49..M NK..M TYPE

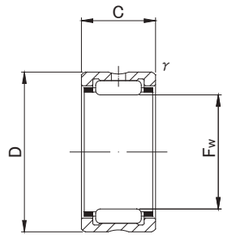
Shaft Diameter (mm)	Designation		Dimensions (mm)				Standard mounting dimensions (mm)	Basic dynamic load rating	Basic static load rating	Limiting speed *	Mass	Usable bearing designation	
	RNA49..M	NK..M	Fw	D	C	*r*s min	Da MAX	Cr N	Cor N	rpm	g (approx)	INNER RING	WITH INNER RING
5	—	NK5/10M	5 +0.018 +0.010	10	10	0.15	6.5	2 200	1 700	40 000	3.4	—	—
	—	NK5/12M	5 +0.018 +0.010	10	12	0.15	6.5	2 800	2 400	40 000	4.2	—	—
6	—	NK6/10M	6 +0.018 +0.010	12	10	0.15	7.5	2 400	2 100	37 000	5.3	—	—
	—	NK6/12M	6 +0.018 +0.010	12	12	0.15	7.5	3 100	2 900	37 000	6.4	—	—
7	RNA495M	—	7 +0.022 +0.013	13	10	0.15	8.5	2 700	2 400	34 000	5.9	—	—
	—	NK7/10M	7 +0.022 +0.013	14	10	0.3	8.5	3 300	2 700	34 000	6.9	—	—
	—	NK7/12M	7 +0.022 +0.013	14	12	0.3	8.5	4 200	3 700	34 000	8.3	—	—
8	RNA496M	—	8 +0.022 +0.013	15	10	0.15	13.8	3 500	3 100	32 000	7.3	IR6810M	NA496M
	—	NK8/12M	8 +0.022 +0.013	15	12	0.3	13	4 600	4 300	32 000	9	IR5812M	NKI 5/12M
	—	NK8/16M	8 +0.022 +0.013	15	16	0.3	13	6 500	6 700	32 000	13	IR5816M	NKI 5/16M
9	—	NK9/12M	9 +0.022 +0.013	16	12	0.3	14	5 000	4 800	30 000	10	IR6912M	NKI 6/12M
	—	NK9/16M	9 +0.022 +0.013	16	16	0.3	14	6 900	7 500	30 000	13.2	IR6916M	NKI 6/16M
	RNA497M	—	9 +0.022 +0.013	17	10	0.15	15.8	4 100	3 300	30 000	9.3	IR7910M	NA497M
10	—	NK10/12M	10 +0.022 +0.013	17	12	0.3	15	5 400	5 500	28 000	10.7	IR71012M	NKI 7/12M
	—	NK10/16M	10 +0.022 +0.013	17	16	0.3	15	7 500	8 400	28 000	14.3	IR71016M	NKI 7/16M
	RNA498M	—	10 +0.022 +0.013	19	11	0.2	17.4	5 700	4 600	28 000	12.6	IR81011M	NA498M
12	—	NK12/12M	12 +0.027 +0.016	19	12	0.3	17	6 000	6 700	26 000	12.2	IR91212M	NKI 9/12M
	—	NK12/16M	12 +0.027 +0.016	19	16	0.3	17	8 400	10 300	26 000	16.3	IR91216M	NKI 9/16M
	RNA499M	—	12 +0.027 +0.016	20	11	0.3	18	6 000	5 700	26 000	13.6	IR91211M	NA499M
14	RNA4900M	—	14 +0.027 +0.016	22	13	0.3	20	8 400	9 200	24 000	16.5	IR101413M	NA4900M
	—	NK14/16M	14 +0.027 +0.016	22	16	0.3	20	10 800	12 600	24 000	21	IR101416M	NKI 10/16M
	—	NK14/20M	14 +0.027 +0.016	22	20	0.3	20	13 600	17 000	24 000	26.5	IR101420M	NKI 10/20M
15	—	NK15/16M	15 +0.027 +0.016	23	16	0.3	21	11 400	13 700	23 000	22.5	—	—
	—	NK15/20M	15 +0.027 +0.016	23	20	0.3	21	14 300	18 500	23 000	28	—	—

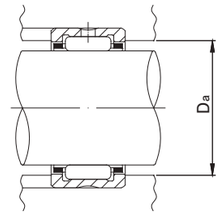
* Suitable for oil lubrication. In case of grease lubrication, down to 60% of this value.

MACHINED RING NEEDLE ROLLER BEARINGS
STAINLESS STEEL
WITHOUT INNER RING

SUS/INOX

RNA49..M , NK..M





RNA49..M,NK..M

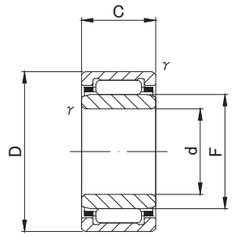
RNA49..M NK..M TYPE

Shaft Diameter (mm)	Designation		Dimensions (mm)				Standard mounting dimensions (mm)	Basic dynamic load rating	Basic static load rating	Limiting speed *	Mass	Usable bearing designation	
	RNA49..M	NK..M	Fw	D	C	*r*s min	Da MAX	Cr N	Cor N	rpm	g (approx)	INNER RING	WITH INNER RING
16	RNA4901M	—	16	24	13	0.3	22	8 900	10 200	23 000	18.1	IR121613M	NA4901M
	—	NK16/16M	16 +0.027 +0.016	24	16	0.3	22	11 300	13 800	23 000	23	IR121616M	NKI 12/16M
	—	NK16/20M	16	24	20	0.3	22	14 300	18 700	23 000	29	IR121620M	NKI 12/20M
17	—	NK17/16M	17 +0.027 +0.016	25	16	0.3	23	11 700	14 900	22 000	24.5	—	—
	—	NK17/20M	17	25	20	0.3	23	14 900	20 300	22 000	30.5	—	—
18	—	NK18/16M	18 +0.027 +0.016	26	16	0.3	24	12 300	16 100	21 000	25.5	—	—
	—	NK18/20M	18	26	20	0.3	24	15 600	21 700	21 000	32	—	—
19	—	NK19/16M	19 +0.033 +0.020	27	16	0.3	25	12 800	17 200	21 000	27	IR151916M	NKI 15/16M
	—	NK19/20M	19	27	20	0.3	25	16 200	23 200	21 000	34	IR151920M	NKI 15/20M
20	RNA4902M	—	20 +0.033 +0.020	28	13	0.3	26	10 000	12 600	20 000	21.5	IR152013M	NA4902M
22	RNA4903M	—	22 +0.033 +0.020	30	13	0.3	28	10 800	14 300	18 000	23.5	IR172213M	NA4903M
25	RNA4904M	—	25 +0.033 +0.020	37	17	0.3	35	19 300	23 000	16 000	55.5	IR202517M	NA4904M
30	RNA4905M	—	30 +0.033 +0.020	42	17	0.3	40	21 800	28 200	13 000	64	IR253017M	NA4905M

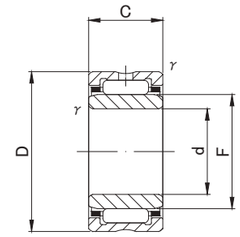
* Suitable for oil lubrication. In case of grease lubrication, down to 60% of this value.

MACHINED RING NEEDLE ROLLER BEARINGS STAINLESS STEEL WITH INNER RING

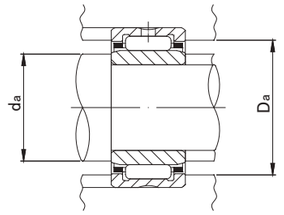
NA49..M ,NKI..M



NKI..M(d ≦ 8)



NA49..M,NKI..M



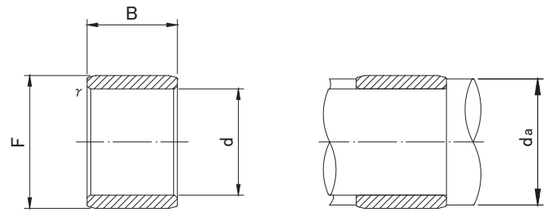
NA49..M ,NKI..M TYPE

Shaft Diameter (mm)	Designation		Dimensions (mm)					Standard mounting dimensions (mm)			Basic dynamic load rating	Basic static load rating	Limiting speed *	Mass	Usable bearing designation	
	NA49..M	NKI..M	d	D	C	*r*s min	F	da MIN	da MAX	Da MAX	Cr N	Cor N	rpm	g (approx)	OUTER RING	INNER RING
5	NA495M	—	5 0 -0.008	13	10	0.15	7	6.2	6.7	11.8	2 700	2 400	34 000	7.3	RNA495M	IR5710M
	—	NKI 5/12M	5	15	12	0.3	8	7	7.7	13	4 600	4 300	32 000	11.9	NK8/12M	IR5812M
	—	NKI 5/16M	5	15	16	0.3	8	7	7.7	13	6 500	6 700	32 000	16.7	NK8/16M	IR5816M
6	NA496M	—	6 0 -0.008	15	10	0.15	8	7.2	7.7	13.8	3 500	3 100	32 000	9.1	RNA496M	IR6810M
	—	NKI 6/12M	6	16	12	0.3	9	8	8.7	14	5 000	4 800	30 000	13	NK9/12M	IR6912M
	—	NKI 6/16M	6	16	16	0.3	9	8	8.7	14	6 900	7 500	30 000	17.5	NK9/16M	IR6916M
7	NA497M	—	7 0 -0.008	17	10	0.15	9	8.2	8.7	15.8	4 100	3 300	30 000	11.2	RNA497M	IR7910M
	—	NKI 7/12M	7	17	12	0.3	10	9	9.7	15	5 400	5 500	28 000	14.3	NK10/12M	IR71012M
	—	NKI 7/16M	7	17	16	0.3	10	9	9.7	15	7 500	8 400	28 000	19.2	NK10/16M	IR71016M
8	NA498M	—	8 0 -0.008	19	11	0.2	10	9.2	9.7	17.4	5 700	4 600	28 000	15	RNA498M	IR81011M
9	—	NKI 9/12M	9 0 -0.008	19	12	0.3	12	11	11.5	17	6 000	6 700	26 000	16.7	NK12/12M	IR91212M
	—	NKI 9/16M	9	19	16	0.3	12	11	11.5	17	8 400	10 300	26 000	22.5	NK12/16M	IR91216M
	NA499M	—	9	20	11	0.3	12	11	11.5	18	6 000	5 700	26 000	16.7	RNA499M	IR91211M
10	NA4900M	—	10 0 -0.008	22	13	0.3	14	12	13	20	8 400	9 200	24 000	24	RNA4900M	IR101413M
	—	NKI 10/16M	10	22	16	0.3	14	12	13	20	10 800	12 600	24 000	30	NK14/16M	IR101416M
	—	NKI 10/20M	10	22	20	0.3	14	12	13	20	13 600	17 000	24 000	38	NK14/20M	IR101420M
12	NA4901M	—	12 0 -0.008	24	13	0.3	16	14	15	22	8 900	10 200	23 000	26.5	RNA4901M	IR121613M
	—	NKI 12/16M	12	24	16	0.3	16	14	15	22	11 300	13 800	23 000	33.5	NK16/16M	IR121616M
	—	NKI 12/20M	12	24	20	0.3	16	14	15	22	14 300	18 700	23 000	42.5	NK16/20M	IR121620M
15	—	NKI 15/16M	15 0 -0.008	27	16	0.3	19	17	18	25	12 800	17 200	21 000	39.5	NK19/16M	IR151916M
	—	NKI 15/20M	15	27	20	0.3	19	17	18	25	16 200	23 200	21 000	50	NK19/20M	IR151920M
	NA4902M	—	15	28	13	0.3	20	17	19	26	10 000	12 600	20 000	35	RNA4902M	IR152013M
17	NA4903M	—	17 0 -0.008	30	13	0.3	22	19	21	28	10 800	14 300	18 000	39	RNA4903M	IR172213M
20	NA4904M	—	20 0 -0.010	37	17	0.3	25	22	24	35	19 300	23 000	16 000	78.5	RNA4904M	IR202517M
25	NA4905M	—	25 0 -0.010	42	17	0.3	30	27	29	40	21 800	28 200	13 000	92.5	RNA4905M	IR253017M

* Suitable for oil lubrication. In case of grease lubrication, down to 60% of this value.

INNER RINGS
STAINLESS STEEL

IR..M



IR..M

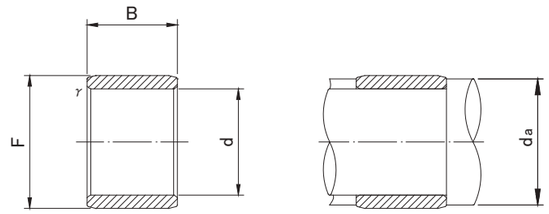
IR..M TYPE

Shaft Diameter (mm)	Designation	Dimensions (mm)				Standard mounting dimensions (mm)		Mass	Usable bearing designation	
	IR..M	d	F	B	*r*s min	da MIN	da MAX	g (approx)	RNA49..M	NK..M
5	**IR 5710M**	5 0 -0.008	7	10	0.15	6.2	6.7	1.4	RNA495M	—
	IR 5812M	5	8	12	0.3	7	7.7	3	—	NK8/12M
	IR 5816M	5	8	16	0.3	7	7.7	4	—	NK8/16M
6	**IR 6810M**	6 0 -0.008	8	10	0.15	7.2	7.7	1.7	RNA496M	—
	IR 6912M	6	9	12	0.3	8	8.7	3.2	—	NK9/12M
	IR 6916M	6	9	16	0.3	8	8.7	4.3	—	NK9/16M
	IR 61010M	6	10	10	0.3	8	9.7	4	—	—
7	**IR 7910M**	7 0 -0.008	9	10	0.15	8.2	8.7	1.9	RNA497M	—
	IR 71012M	7	10	12	0.3	9	9.7	3.6	—	NK10/12M
	IR 71016M	7	10	16	0.3	9	9.7	5	—	NK10/16M
8	**IR 81011M**	8 0 -0.008	10	11	0.15	9.2	9.7	2.4	RNA498M	—
	IR 81210M	8	12	10	0.3	10	11	4.8	—	—
9	**IR 91211M**	9 0 -0.008	12	11	0.3	11	11.5	3.1	RNA499M	—
	IR 91212M	9	12	12	0.3	11	11.5	4.5	—	NK12/12M
	IR 91216M	9	12	16	0.3	11	11.5	6	—	NK12/16M
10	**IR 101412M**	10 0 -0.008	14	12	0.3	12	13	7	—	—
	IR 101413M	10	14	13	0.3	12	13	7.5	RNA4900M	—
	IR 101416M	10	14	16	0.3	12	13	9	—	NK14/16M
	IR 101420M	10	14	20	0.3	12	13	11.5	—	NK14/20M
12	**IR 121612M**	12 0 -0.008	16	12	0.3	14	15	8	—	—
	IR 121613M	12	16	13	0.3	14	15	8.5	RNA4901M	—
	IR 121616M	12	16	16	0.3	14	15	10.5	—	NK16/16M
	IR 121620M	12	16	20	0.3	14	15	13.5	—	NK16/20M
15	**IR 151916M**	15 0 -0.008	19	16	0.3	17	18	12.5	—	NK19/16M
	IR 151920M	15	19	20	0.3	17	18	16	—	NK19/20M
	IR 152012M	15	20	12	0.3	17	19	12	—	—
	IR 152013M	15	20	13	0.3	17	19	13.5	RNA4902M	—
17	**IR 172213M**	17 0 -0.008	22	13	0.3	19	21	15.5	RNA4903M	—
	IR 172216M	17	22	16	0.3	19	21	19	—	—

IR..M

INNER RINGS
STAINLESS STEEL

IR..M



IR..M

IR..M TYPE

Shaft Diameter (mm)	Designation	Dimensions (mm)				Standard mounting dimensions (mm)		Mass	Usable bearing designation	
	IR..M	d	F	B	*r*s min	da MIN	da MAX	g (approx)	RNA49..M	NK..M
20	**IR 202516M**	20 0 -0.010	25	16	0.3	22	24	22	—	—
	IR 202517M	20	25	17	0.3	22	24	23	RNA4904M	—
25	**IR 253016M**	25 0 -0.010	30	16	0.3	27	29	28	—	—
	IR253017M	25	30	17	0.3	27	29	28.5	RNA4905M	—
30	**IR 303820M**	30 0 -0.010	38	20	0.6	34	37	65	—	—
35	**IR 354220M**	35 0 -0.012	42	20	0.6	39	41	65	—	—
50	**IR 506020M**	50 0 -0.012	60	20	1	55	59	135	—	—

IR..M

CAM FOLLOWERS

STAINLESS STEEL

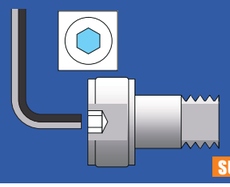
Type and Part Code

Type	Applicable axis diameter	Feature	Part Code
 CFS..MA compact outer ring	ϕ 2.5 ~ ϕ 6	Built-in very thin needle roller. Enables compact design due to very small outer ring diameter in comparison to stud diameter.	**V**: Full complement **None**: With cage CFS 6 V M A Type / Stud diameter / **Stainless steel** / **A** : With hexagon socket on the stud head
 CF..MA Hexagon hole	ϕ 3 ~ ϕ 30	Hexagon sockets on the stud head. Easy mounting with hex-wrench. Available with hexagon sockets at the thread side mode (CF-B). (Applicable for shaft diameter 12 or more)	**V**: Full complement **None**: With cage **UU**: With seal **None**: With shield Option (Dedicated grease nipple : Brass) CF 16 V M UU R A N Type / Stud diameter / **Stainless steel** **R**: Crowned outer ring **None**: Cylindrical outer ring **A** : With hexagon socket on the stud head **B** : With hexadon socket on the thread side. (Applicable for shaft diameter 12 or more)
 CF..MAB	ϕ 10 ~ ϕ 30	Both of stud head and thread ends have hexagon holes and integrated concave grease nipples. Available for mounting with either hexagon sockets and lubrication from both sides.	**V**: Full complement **None**: With cage **UU**: With seal **None**: With shield CF 16 V M UU R AB Type / Stud diameter / **Stainless steel** **R**: Crowned outer ring **None**: Cylindrical outer ring **AB**: With hexagon socket on both sides. (With integrated concave nipple : Stainless steel)
 CF..M	ϕ 5 ~ ϕ 30	General purpose cam follower with screwdriver groove on the stud head.	**V**: Full complement **None**: With cage **UU**: With seal **None**: With shield CF 16 V M UU R N Type / Stud diameter / **Stainless steel** **R**: Crowned outer ring **None**: Cylindrical outer ring Option (Dedicated grease nipple : Brass)

Type	Applicable axis diameter	Feature	Part Code
 CFH..MA Hexagon socket, Eccentric	ϕ 5 ~ ϕ 30	Available for the same mounting hole as general type. Compact and high accuracy eccentric cam followers with integrated structure enables easy fine positioning adjustment simply by rotating stud due to eccentric stud head shifting 0.2 to 1mm from stud mounting axis.	**V**: Full complement **None**: With cage **UU**: With seal **None**: With shield CFH 16 V M UU R A Type Stud diameter **Stainless steel** **R**: Crowned outer ring **None**: Cylindrical outer ring **A** : With hexagon socket on the stud head **B** : With hexadon socket on the thread side. (Applicable for shaft diameter 12 or more)
 CFH..MAB	ϕ 12 ~ ϕ 30	Eccentric cam follower with integrated concave grease nipple on both sides. Available for mounting and lubrication with hexagon holes on both sides.	**V**: Full complement **None**: With cage **UU**: With seal **None**: With shield CFH 16 V M UU R AB Type Stud diameter **Stainless steel** **R**: Crowned outer ring **None**: Cylindrical outer ring **AB**: With hexagon socket on both sides. (With integrated concave nipple : Stainless steel)
 CFT..M Lubrication tap hole	ϕ 6 ~ ϕ 30	Cam follower with tap for piping at stud head and thread of general type. Optimal for location that requires concentrated lubrication piping.	**V**: Full complement **None**: With cage **UU**: With seal **None**: With shield CFT 16 V M UU R A **CFT**: Standard type **CFHT**: Eccentric type Stud diameter **Stainless steel** **R**: Crowned outer ring **None**: Cylindrical outer ring **A** : With hexagon socket on the stud head (Applicable shaft diameter ϕ 12 ~ ϕ 30) **B** : With hexagon socket on the thread side. (Appricable shaft diameter ϕ 12 ~ ϕ 30) **None**: Standard type

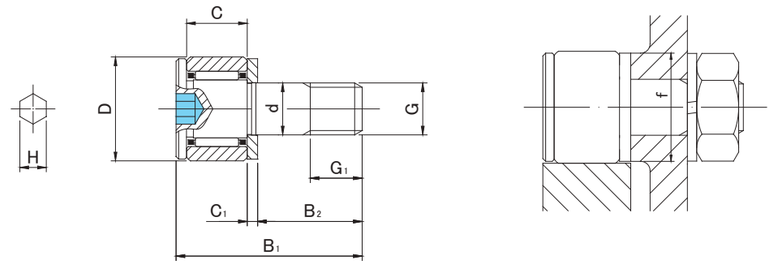
CAM FOLLOWERS STAINLESS STEEL

MINIATURE TYPE HEXAGON SOCKET ON STUD HEAD



CFS..MA

CFS..VMA



CFS..MA TYPE

Prepacked Grease

Stud diameter (mm)	h6 tolerance	Designation Cylindrical outer ring: With cage	Full roller	D	C	d	G	G1	B1	B2	C1	H	f min	Basic dynamic load rating Cr N	Basic static load rating Cor N	Largest permissible load N	Max tightening torque N·m	Mass g (approx)
2.5	0 -0.006	**CFS 2.5MA**	—	**5**	3	2.5	M2.5×0.45	2.5	9.5	5	0.7	0.9	4.8	370	300	260	0.2	1
		—	**CFS 2.5VMA**											920	990	260		
3	0 -0.006	**CFS 3MA**	—	**6**	4	3	M3×0.5	3	11.5	6	0.7	1.5	5.8	570	560	360	0.3	2
		—	**CFS 3VMA**											1 260	1 620	360		
4	0 -0.008	**CFS 4MA**	—	**8**	5	4	M4×0.7	4	15	8	1	2	7.7	990	990	780	0.6	4
		—	**CFS 4VMA**											2 160	2 790	780		
5	0 -0.008	**CFS 5MA**	—	**10**	6	5	M5×0.8	5	18	10	1	2.5	9.6	1 440	1 710	1 420	1.3	7
		—	**CFS 5VMA**											2 880	4 330	1 420		
6	0 -0.008	**CFS 6MA**	—	**12**	7	6	M6×1	6	21.5	12	1.2	3	11.6	1 890	1 980	2 110	2.3	13
		—	**CFS 6VMA**											4 240	5 760	2 110		

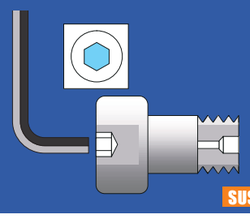
OUTER RINGS TOLERANCE (μm)

TYPE	Cylindrical outer ring
CFS2.5M,CFS3M,CFS4M,CFS5M,CFS6M	0/-8

ACCESSORIES

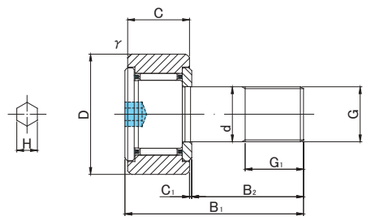
TYPE	 NUT
All types	Attached

CAM FOLLOWERS
STAINLESS STEEL
HEXAGON SOCKET ON STUD HEAD

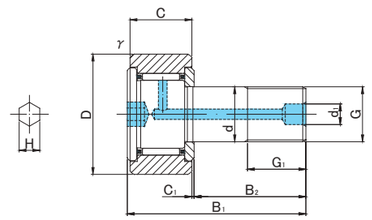


CF..MA

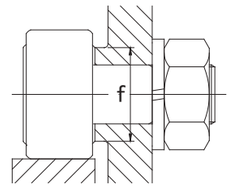
CF..VMA



CF3(V)MA～CF10-1(V)MA



CF10(V)MAK～CF10-1(V)MAK



CF..MA TYPE

Prepacked Grease

Stud diameter (mm)	h7 tolerance	Designation: Cylindrical outer ring, Without seals	Cylindrical outer ring, With seals	Crowned outer ring R250(CF3～CF5) R500(CF6～CF10-1), Without seals	Crowned outer ring, With seals	D	C	d	G	G1	B1	B2	B3	C1	d1	d2	H	rs min	f min	Basic dynamic load rating Cr N	Basic static load rating Cor N	Largest permissible load N	Limiting speed * rpm	Track load capacity: Cylindrical outer ring N	Track load capacity: Crowned outer ring N	Max tightening torque N·m	Mass g (approx)
3	0 -0.010	CF 3MA	CF 3MUUA	CF 3MRA	CF 3MUURA	10	7	3	M3×0.5	5	17	9	—	0.5	—	—	1.5	0.2	6.8	1 350	1 080	360	47 000	1 370	370	0.4	4.5
		CF 3VMA	CF 3VMUUA	CF 3VMRA	CF 3VMUURA															2 570	2 300	360	18 800				
4	0 -0.012	CF 4MA	CF 4MUUA	CF 4MRA	CF 4MUURA	12	8	4	M4×0.7	6	20	11	—	0.5	—	—	2	0.3	8.6	1 890	1 880	780	37 000	1 760	470	1	7.5
		CF 4VMA	CF 4VMUUA	CF 4VMRA	CF 4VMUURA															3 680	3 950	780	14 800				
5	0 -0.012	CF 5MA	CF 5MUUA	CF 5MRA	CF 5MUURA	13	9	5	M5×0.8	7.5	23	13	—	0.5	—	—	2.5	0.3	9.7	2 880	2 540	1 420	29 000	2 250	530	2	10.5
		CF 5VMA	CF 5VMUUA	CF 5VMRA	CF 5VMUURA															4 690	5 060	1 420	11 600				
6	0 -0.012	CF 6MA	CF 6MUUA	CF 6MRA	CF 6MUURA	16	11	6	M6×1	8	28	16	—	0.6	—	—	3	0.3	11	3 330	3 330	2 110	25 000	3 430	1 080	3	18.5
		CF 6VMA	CF 6VMUUA	CF 6VMRA	CF 6VMUURA															6 400	7 840	2 110	12 000				
8	0 -0.015	CF 8MA	CF 8MUUA	CF 8MRA	CF 8MUURA	19	11	8	M8×1.25	10	32	20	—	0.6	—	—	4	0.3	13	3 960	4 330	4 710	20 000	4 020	1 370	8	28.5
		CF 8VMA	CF 8VMUUA	CF 8VMRA	CF 8VMUURA															7 470	10 270	4 710	9 000				
10	0 -0.015	CF10MA	CF10MUUA	CF10MRA	CF10MUURA	22	12	10	M10×1.25	12	36	23	—	0.6	—	—	5	0.3	15	4 950	6 310	6 860	17 000	4 700	1 670	15	45
		CF10VMA	CF10VMUUA	CF10VMRA	CF10VMUURA															8 740	13 340	7 450	7 500				
10	0 -0.015	CF10-1MA	CF10-1MUUA	CF10-1MRA	CF10-1MUURA	26	12	10	M10×1.25	12	36	23	—	0.6	—	—	5	0.3	15	4 950	6 310	6 860	17 000	5 490	2 060	15	60
		CF10-1VMA	CF10-1VMUUA	CF10-1VMRA	CF10-1VMUURA															8 740	13 340	7 450	7 500				
10	0 -0.015	CF10MAK	CF10MUUAK	CF10MRAK	CF10MUURAK	22	12	10	M10×1	12	36	23	—	0.6	4	—	5	0.3	15	4 950	6 310	6 860	17 000	4 700	1 670	15	45
		CF10VMAK	CF10VMUUAK	CF10VMRAK	CF10VMUURAK															8 740	13 340	7 450	7 500				
10	0 -0.015	CF10-1MAK	CF10-1MUUAK	CF10-1MRAK	CF10-1MUURAK	26	12	10	M10×1	12	36	23	—	0.6	4	—	5	0.3	15	4 950	6 310	6 860	17 000	5 490	2 060	15	60
		CF10-1VMAK	CF10-1VMUUAK	CF10-1VMRAK	CF10-1VMUURAK															8 740	13 340	7 450	7 500				

* Without seals, suitable for grease lubrication. In case of oil lubrication, up to 130% of this value shall be permissible, and 70% of this value shall apply for types with seals.

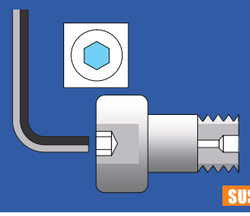
OUTER RINGS TOLERANCE (μm)

TYPE	Cylindrical outer ring	Crowned outer ring
CF3M,CF4M,CF5M,CF6M	0/-8	0/-50
CF8M,CF10M,CF10-1M,CF12M	0/-9	0/-50
CF12-1M,CF16M,CF18M,CF20-1M	0/-11	0/-50
CF20M,CF24M,CF24-1M,CF30M	0/-13	0/-50
CF30-1M,CF30-2M	0/-15	0/-50

ACCESSORIES

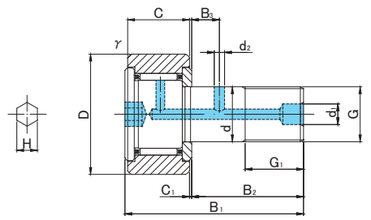
TYPE	STOP PLUG	RESIN PLUG	NUT
CF3M/CF4M/CF5M/CF6M/CF8M/CF10M/CF10-1M	—	—	Attached
CF10MK/CF10-1MK	ϕ 4 Attached	ϕ 4 Attached	Attached
CF12M/CF12-1M/CF16M/CF18M	ϕ 6 Attached	ϕ 6 Attached	Attached
CF20M/CF20-1M/CF24M/CF24-1M/CF30M/CF30-1M/CF30-2M	ϕ 8 Attached	ϕ 8 Attached	Attached

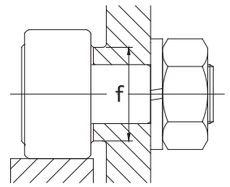
CAM FOLLOWERS
STAINLESS STEEL
HEXAGON SOCKET ON STUD HEAD



CF..MA

CF..VMA





CF..MA TYPE

Prepacked Grease

Stud diameter (mm)	h7 tolerance	Designation: Cylindrical outer ring, Without seals	Cylindrical outer ring, With seals	Crowned outer ring R500(CF12 ～ CF18) R1000(CF20 ≦), Without seals	Crowned outer ring, With seals	D	C	d	G	G1	B1	B2	B3	C1	d1	d2	H	rs min	f min	Basic dynamic load rating Cr N	Basic static load rating Cor N	Largest permissible load N	Limiting speed * rpm	Track load capacity: Cylindrical outer ring N	Track load capacity: Crowned outer ring N	Max tightening torque N·m	Mass g (approx)
12	0 -0.018	CF12MA	CF12MUUA	CF12MRA	CF12MUURA	30	14	12	M12×1.5	13	40	25	6	0.6	6	3	6	0.6	20	7 300	9 010	9 800	14 000	7 060	2 450	22	95
		CF12VMA	CF12VMUUA	CF12VMRA	CF12VMUURA															12 350	18 120	11 270	6 000				
12	0 -0.018	CF12-1MA	CF12-1MUUA	CF12-1MRA	CF12-1MUURA	32	14	12	M12×1.5	13	40	25	6	0.6	6	3	6	0.6	20	7 300	9 010	9 800	14 000	7 450	2 740	22	105
		CF12-1VMA	CF12-1VMUUA	CF12-1VMRA	CF12-1VMUURA															12 350	18 120	11 270	6 000				
16	0 -0.018	CF16MA	CF16MUUA	CF16MRA	CF16MUURA	35	18	16	M16×1.5	17	52	32.5	8	0.8	6	3	6	0.6	24	11 080	16 860	18 330	10 000	11 200	3 140	58	170
		CF16VMA	CF16VMUUA	CF16VMRA	CF16VMUURA															19 020	34 610	19 800	4 500				
18	0 -0.018	CF18MA	CF18MUUA	CF18MRA	CF18MUURA	40	20	18	M18×1.5	19	58	36.5	8	0.8	6	3	6	1	26	13 520	23 180	25 200	8 500	14 400	3 720	87	250
		CF18VMA	CF18VMUUA	CF18VMRA	CF18VMUURA															23 250	47 240	26 560	3 500				
20	0 -0.021	CF20MA	CF20MUUA	CF20MRA	CF20MUURA	52	24	20	M20×1.5	21	66	40.5	9	0.8	8	4	8	1	36	19 020	31 830	32 140	7 000	23 200	8 230	120	460
		CF20VMA	CF20VMUUA	CF20VMRA	CF20VMUURA															30 470	59 320	32 140	3 500				
20	0 -0.021	CF20-1MA	CF20-1MUUA	CF20-1MRA	CF20-1MUURA	47	24	20	M20×1.5	21	66	40.5	9	0.8	8	4	8	1	36	19 020	31 830	32 140	7 000	21 000	7 150	120	385
		CF20-1VMA	CF20-1VMUUA	CF20-1VMRA	CF20-1VMUURA															30 470	59 320	32 140	3 500				
24	0 -0.021	CF24MA	CF24MUUA	CF24MRA	CF24MUURA	62	29	24	M24×1.5	25	80	49.5	11	0.8	8	4	8	1	40	28 040	48 410	49 500	6 500	34 200	10 500	220	815
		CF24VMA	CF24VMUUA	CF24VMRA	CF24VMUURA															42 820	84 650	49 500	3 000				
24	0 -0.021	CF24-1MA	CF24-1MUUA	CF24-1MRA	CF24-1MUURA	72	29	24	M24×1.5	25	80	49.5	11	0.8	8	4	8	1	40	28 040	48 410	49 500	6 500	39 800	12 900	220	1 140
		CF24-1VMA	CF24-1VMUUA	CF24-1VMRA	CF24-1VMUURA															42 820	84 650	49 500	3 000				
30	0 -0.021	CF30MA	CF30MUUA	CF30MRA	CF30MUURA	80	35	30	M30×1.5	32	100	63	15	1	8	4	8	1	46	41 740	78 250	73 700	5 000	52 600	14 900	450	1 870
		CF30VMA	CF30VMUUA	CF30VMRA	CF30VMUURA															62 210	132 530	73 700	2 200				
30	0 -0.021	CF30-1MA	CF30-1MUUA	CF30-1MRA	CF30-1MUURA	85	35	30	M30×1.5	32	100	63	15	1	8	4	8	1	46	41 740	78 250	73 700	5 000	56 000	16 100	450	2 030
		CF30-1VMA	CF30-1VMUUA	CF30-1VMRA	CF30-1VMUURA															62 210	132 530	73 700	2 200				
30	0 -0.021	CF30-2MA	CF30-2MUUA	CF30-2MRA	CF30-2MUURA	90	35	30	M30×1.5	32	100	63	15	1	8	4	8	1	46	41 740	78 250	73 700	5 000	59 300	17 300	450	2 220
		CF30-2VMA	CF30-2VMUUA	CF30-2VMRA	CF30-2VMUURA															62 210	132 530	73 700	2 200				

* Without seals, suitable for grease lubrication. In case of oil lubrication, up to 130% of this value shall be permissible, and 70% of this value shall apply for types with seals.

OUTER RINGS TOLERANCE (μm)

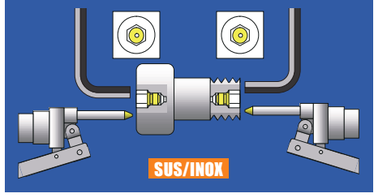
TYPE	Cylindrical outer ring	Crowned outer ring
CF3M,CF4M,CF5M,CF6M	0/-8	0/-50
CF8M,CF10M,CF10-1M,CF12M	0/-9	0/-50
CF12-1M,CF16M,CF18M,CF20-1M	0/-11	0/-50
CF20M,CF24M,CF24-1M,CF30M	0/-13	0/-50
CF30-1M,CF30-2M	0/-15	0/-50

ACCESSORIES

TYPE	STOP PLUG	RESIN PLUG	NUT
CF3M/CF4M/CF5M/CF6M/CF8M/CF10M/CF10-1M	—	—	Attached
CF10MK/CF10-1MK	ϕ 4 Attached	ϕ 4 Attached	Attached
CF12M/CF12-1M/CF16M/CF18M	ϕ 6 Attached	ϕ 6 Attached	Attached
CF20M/CF20-1M/CF24M/CF24-1M/CF30M/CF30-1M/CF30-2M	ϕ 8 Attached	ϕ 8 Attached	Attached

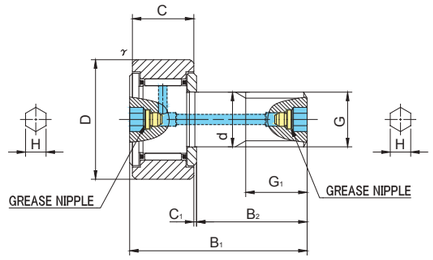
CAM FOLLOWERS STAINLESS STEEL

HEXAGON SOCKET ON BOTH SIDES
GREASE NIPPLE INSTALLED

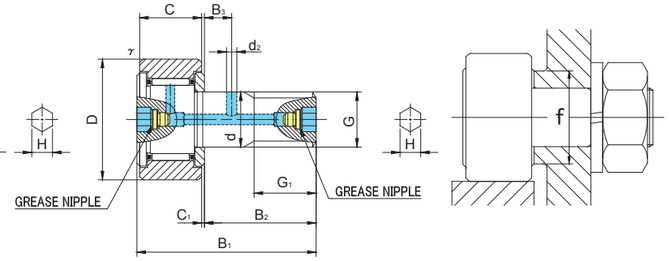


CF..MAB

CF..VMAB



CF10(V)MABK～CF10−1(V)MABK



CF12(V)MAB～CF18(V)MAB

CF..MAB TYPE

Prepacked Grease

Stud diameter (mm)		Designation				Dimensions (mm)													Basic dynamic load rating	Basic static load rating	Largest permissible load	Limiting speed *	Track load capacity		Max tightening torque	Mass
		Cylindrical outer ring		Crowned outer ring R500(CF10 ～ CF18)																						
	h7 tolerance	Without seals	With seals	Without seals	With seals	D	C	d	G	G1	B1	B2	B3	C1	d2	H	*r*s min	f min	Cr N	Cor N	N	rpm	Cylindrical outer ring N	Crowned outer ring N	N·m	g (approx)
10	0 -0.015	**CF10MABK**	**CF10MUUABK**	**CF10MRABK**	**CF10MUURABK**	**22**	12	10	**M10×1**	12	36	23	—	0.6	—	5	0.3	15	4 950	6 310	6 860	17 000	4 700	1 670	15	45
		CF10VMABK	**CF10VMUUABK**	**CF10VMRABK**	**CF10VMUURABK**														8 740	13 340	7 450	7 500				
10	0 -0.015	**CF10-1MABK**	**CF10-1MUUABK**	**CF10-1MRABK**	**CF10-1MUURABK**	**26**	12	10	**M10×1**	12	36	23	—	0.6	—	5	0.3	15	4 950	6 310	6 860	17 000	5 490	2 060	15	60
		CF10-1VMABK	**CF10-1VMUUABK**	**CF10-1VMRABK**	**CF10-1VMUURABK**														8 740	13 340	7 450	7 500				
12	0 -0.018	**CF12MAB**	**CF12MUUAB**	**CF12MRAB**	**CF12MUURAB**	**30**	14	12	M12×1.5	13	40	25	6	0.6	3	6	0.6	20	7 300	9 010	9 800	14 000	7 060	2 450	22	95
		CF12VMAB	**CF12VMUUAB**	**CF12VMRAB**	**CF12VMUURAB**														12 350	18 120	11 270	6 000				
12	0 -0.018	**CF12-1MAB**	**CF12-1MUUAB**	**CF12-1MRAB**	**CF12-1MUURAB**	**32**	14	12	M12×1.5	13	40	25	6	0.6	3	6	0.6	20	7 300	9 010	9 800	14 000	7 450	2 740	22	105
		CF12-1VMAB	**CF12-1VMUUAB**	**CF12-1VMRAB**	**CF12-1VMUURAB**														12 350	18 120	11 270	6 000				
16	0 -0.018	**CF16MAB**	**CF16MUUAB**	**CF16MRAB**	**CF16MUURAB**	**35**	18	16	M16×1.5	17	52	32.5	8	0.8	3	6	0.6	24	11 080	16 860	18 330	10 000	11 200	3 140	58	170
		CF16VMAB	**CF16VMUUAB**	**CF16VMRAB**	**CF16VMUURAB**														19 020	34 610	19 800	4 500				
18	0 -0.018	**CF18MAB**	**CF18MUUAB**	**CF18MRAB**	**CF18MUURAB**	**40**	20	18	M18×1.5	19	58	36.5	8	0.8	3	6	1	26	13 520	23 180	25 200	8 500	14 400	3 720	87	250
		CF18VMAB	**CF18VMUUAB**	**CF18VMRAB**	**CF18VMUURAB**														23 250	47 240	26 560	3 500				

CF..MAB TYPE has oil holes (grease nipple) which are prepared in the stud head and thread side, also an oil hole is prepared outer surface of stud.

* Without seals, suitable for grease lubrication. In case of oil lubrication, up to 130% of this value shall be permissible, and 70% of this value shall apply for types with seals.

OUTER RINGS TOLERANCE (μm)

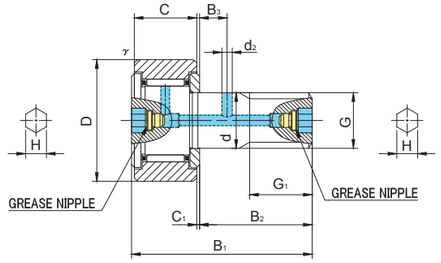
TYPE	Cylindrical outer ring	Crowned outer ring
CF10,CF10-1,CF12	0/-9	0/-50
CF12-1,CF16,CF18,CF20-1	0/-11	0/-50
CF20,CF24,CF24-1,CF30	0/-13	0/-50
CF30-1,CF30-2	0/-15	0/-50

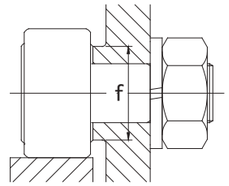
ACCESSORIES

TYPE	 Grease Nipple	 NUT
All types	Installed	Attached

CF..MAB

CF..VMAB





CF..MAB TYPE

Prepacked Grease

Stud diameter (mm)	h7 tolerance	Designation: Cylindrical outer ring, Without seals	Designation: Cylindrical outer ring, With seals	Designation: Crowned outer ring R1000(CF20 ≦), Without seals	Designation: Crowned outer ring R1000(CF20 ≦), With seals	D	C	d	G	G1	B1	B2	B3	C1	d2	H	*r*s min	f min	Basic dynamic load rating Cr N	Basic static load rating Cor N	Largest permissible load N	Limiting speed * rpm	Track load capacity: Cylindrical outer ring N	Track load capacity: Crowned outer ring N	Max tightening torque N·m	Mass g (approx)
20	0 -0.021	**CF20MAB**	**CF20MUUAB**	**CF20MRAB**	**CF20MUURAB**	**52**	24	20	M20×1.5	21	66	40.5	9	0.8	4	8	1	36	19 020	31 830	32 140	7 000	23 200	8 230	120	460
		CF20VMAB	**CF20VMUUAB**	**CF20VMRAB**	**CF20VMUURAB**														30 470	59 320	32 140	3 500				
20	0 -0.021	**CF20-1MAB**	**CF20-1MUUAB**	**CF20-1MRAB**	**CF20-1MUURAB**	**47**	24	20	M20×1.5	21	66	40.5	9	0.8	4	8	1	36	19 020	31 830	32 140	7 000	21 000	7 150	120	385
		CF20-1VMAB	**CF20-1VMUUAB**	**CF20-1VMRAB**	**CF20-1VMUURAB**														30 470	59 320	32 140	3 500				
24	0 -0.021	**CF24MAB**	**CF24MUUAB**	**CF24MRAB**	**CF24MUURAB**	**62**	29	24	M24×1.5	25	80	49.5	11	0.8	4	8	1	40	28 040	48 410	49 500	6 500	34 200	10 500	220	815
		CF24VMAB	**CF24VMUUAB**	**CF24VMRAB**	**CF24VMUURAB**														42 820	84 650	49 500	3 000				
24	0 -0.021	**CF24-1MAB**	**CF24-1MUUAB**	**CF24-1MRAB**	**CF24-1MUURAB**	**72**	29	24	M24×1.5	25	80	49.5	11	0.8	4	8	1	40	28 040	48 410	49 500	6 500	39 800	12 900	220	1 140
		CF24-1VMAB	**CF24-1VMUUAB**	**CF24-1VMRAB**	**CF24-1VMUURAB**														42 820	84 650	49 500	3 000				
30	0 -0.021	**CF30MAB**	**CF30MUUAB**	**CF30MRAB**	**CF30MUURAB**	**80**	35	30	M30×1.5	32	100	63	15	1	4	8	1	46	41 740	78 250	73 700	5 000	52 600	14 900	450	1 870
		CF30VMAB	**CF30VMUUAB**	**CF30VMRAB**	**CF30VMUURAB**														62 210	132 530	73 700	2 200				
30	0 -0.021	**CF30-1MAB**	**CF30-1MUUAB**	**CF30-1MRAB**	**CF30-1MUURAB**	**85**	35	30	M30×1.5	32	100	63	15	1	4	8	1	46	41 740	78 250	73 700	5 000	56 000	16 100	450	2 030
		CF30-1VMAB	**CF30-1VMUUAB**	**CF30-1VMRAB**	**CF30-1VMUURAB**														62 210	132 530	73 700	2 200				
30	0 -0.021	**CF30-2MAB**	**CF30-2MUUAB**	**CF30-2MRAB**	**CF30-2MUURAB**	**90**	35	30	M30×1.5	32	100	63	15	1	4	8	1	46	41 740	78 250	73 700	5 000	59 300	17 300	450	2 220
		CF30-2VMAB	**CF30-2VMUUAB**	**CF30-2VMRAB**	**CF30-2VMUURAB**														62 210	132 530	73 700	2 200				

CF..MAB TYPE has oil holes (grease nipple) which are prepared in the stud head and thread side, also an oil hole is prepared outer surface of stud.

* Without seals, suitable for grease lubrication. In case of oil lubrication, up to 130% of this value shall be permissible, and 70% of this value shall apply for types with seals.

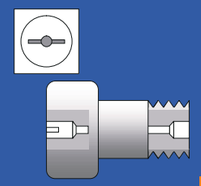
OUTER RINGS TOLERANCE (μm)

TYPE	Cylindrical outer ring	Crowned outer ring
CF10,CF10-1,CF12	0/-9	0/-50
CF12-1,CF16,CF18,CF20-1	0/-11	0/-50
CF20,CF24,CF24-1,CF30	0/-13	0/-50
CF30-1,CF30-2	0/-15	0/-50

ACCESSORIES

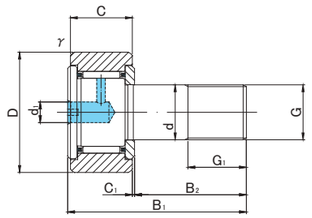
TYPE	 Grease Nipple	 NUT
All types	Installed	Attached

CAM FOLLOWERS
STAINLESS STEEL
SCREWDRIVER SLOT HEAD

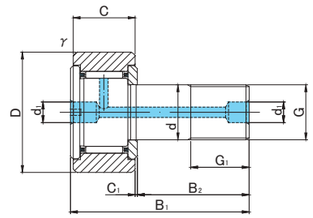



CF..M

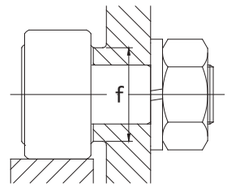

CF..VM



CF5(V)M～CF10-1(V)M



CF10(V)MK～CF10-1(V)MK



CF..M TYPE

Prepacked Grease

Stud diameter (mm)	h7 tolerance	Designation: Cylindrical outer ring, Without seals	Cylindrical outer ring, With seals	Crowned outer ring R250(CF5) R500(CF6 ～ CF10-1), Without seals	Crowned outer ring, With seals	Dimensions (mm): D	C	d	G	G1	B1	B2	B3	C1	d1	d2	r s min	f min	Basic dynamic load rating: Cr N	Basic static load rating: Cor N	Largest permissible load: N	Limiting speed * : rpm	Track load capacity: Cylindrical outer ring N	Crowned outer ring N	Max tightening torque: N·m	Mass: g (approx)
5	0 -0.012	CF 5M	CF 5MUU	CF 5MR	CF 5MUUR	13	9	5	M5×0.8	7.5	23	13	—	0.5	3.1	—	0.3	9.7	2 880	2 540	1 420	29 000	2 250	530	2	10.5
		CF 5VM	CF 5VMUU	CF 5VMR	CF 5VMUUR														4 690	5 060	1 420	11 600				
6	0 -0.012	CF 6M	CF 6MUU	CF 6MR	CF 6MUUR	16	11	6	M6×1	8	28	16	—	0.6	4	—	0.3	11	3 330	3 330	2 110	25 000	3 430	1 080	3	18.5
		CF 6VM	CF 6VMUU	CF 6VMR	CF 6VMUUR														6 400	7 840	2 110	12 000				
8	0 -0.015	CF 8M	CF 8MUU	CF 8MR	CF 8MUUR	19	11	8	M8×1.25	10	32	20	—	0.6	4	—	0.3	13	3 960	4 330	4 710	20 000	4 020	1 370	8	28.5
		CF 8VM	CF 8VMUU	CF 8VMR	CF 8VMUUR														7 470	10 270	4 710	9 000				
10	0 -0.015	CF10M	CF10MUU	CF10MR	CF10MUUR	22	12	10	M10×1.25	12	36	23	—	0.6	4	—	0.3	15	4 950	6 310	6 860	17 000	4 700	1 670	15	45
		CF10VM	CF10VMUU	CF10VMR	CF10VMUUR														8 740	13 340	7 450	7 500				
10	0 -0.015	CF10-1M	CF10-1MUU	CF10-1MR	CF10-1MUUR	26	12	10	M10×1.25	12	36	23	—	0.6	4	—	0.3	15	4 950	6 310	6 860	17 000	5 490	2 060	15	60
		CF10-1VM	CF10-1VMUU	CF10-1VMR	CF10-1VMUUR														8 740	13 340	7 450	7 500				
10	0 -0.015	CF10MK	CF10MUUK	CF10MRK	CF10MUURK	22	12	10	M10×1	12	36	23	—	0.6	4	—	0.3	15	4 950	6 310	6 860	17 000	4 700	1 670	15	45
		CF10VMK	CF10VMUUK	CF10VMRK	CF10VMUURK														8 740	13 340	7 450	7 500				
10	0 -0.015	CF10-1MK	CF10-1MUUK	CF10-1MRK	CF10-1MUURK	26	12	10	M10×1	12	36	23	—	0.6	4	—	0.3	15	4 950	6 310	6 860	17 000	5 490	2 060	15	60
		CF10-1VMK	CF10-1VMUUK	CF10-1VMRK	CF10-1VMUURK														8 740	13 340	7 450	7 500				

* Without seals, suitable for grease lubrication. In case of oil lubrication, up to 130% of this value shall be permissible, and 70% of this value shall apply for types with seals.

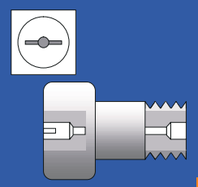
OUTER RINGS TOLERANCE (μm)

TYPE	Cylindrical outer ring	Crowned outer ring
CF5M,CF6M	0/-8	0/-50
CF8M,CF10M,CF10-1M,CF12M	0/-9	0/-50
CF12-1M,CF16M,CF18M,CF20-1M	0/-11	0/-50
CF20M,CF24M,CF24-1M,CF30M	0/-13	0/-50
CF30-1M,CF30-2M	0/-15	0/-50

ACCESSORIES

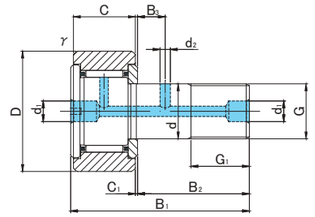
TYPE	 STOP PLUG	 RESIN PLUG	 NUT
CF5M	—	—	Attached
CF6M/CF8M/CF10M/CF10-1M	—	ϕ 4 Attached	Attached
CF10MK/CF10-1MK	ϕ 4 Attached	ϕ 4 Attached	Attached
CF12M/CF12-1M/CF16M/CF18M	ϕ 6 Attached	ϕ 6 Attached	Attached
CF20M/CF20-1M/CF24M/CF24-1M/CF30M/CF30-1M/CF30-2M	ϕ 8 Attached	ϕ 8 Attached	Attached

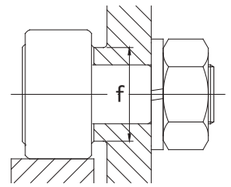
CAM FOLLOWERS STAINLESS STEEL SCREWDRIVER SLOT HEAD



CF..M

CF..VM





CF..M TYPE

Prepacked Grease

Stud diameter (mm)		Designation				Dimensions (mm)												Basic dynamic load rating	Basic static load rating	Largest permissible load	Limiting speed *	Track load capacity		Max tightening torque	Mass
		Cylindrical outer ring		Crowned outer ring R500(CF12～CF18) R1000(CF20≦)																					
	h7 tolerance	Without seals	With seals	Without seals	With seals	D	C	d	G	G1	B1	B2	B3	C1	d1	d2	*r*s min	f min	Cr N	Cor N	N	rpm	Cylindrical outer ring N	Crowned outer ring N	N·m	g (approx)
12	0 -0.018	**CF12M**	**CF12MUU**	**CF12MR**	**CF12MUUR**	**30**	14	12	M12×1.5	13	40	25	6	0.6	6	3	0.6	20	7 300	9 010	9 800	14 000	7 060	2 450	22	95
		CF12VM	**CF12VMUU**	**CF12VMR**	**CF12VMUUR**														12 350	18 120	11 270	6 000				
12	0 -0.018	**CF12-1M**	**CF12-1MUU**	**CF12-1MR**	**CF12-1MUUR**	**32**	14	12	M12×1.5	13	40	25	6	0.6	6	3	0.6	20	7 300	9 010	9 800	14 000	7 450	2 740	22	105
		CF12-1VM	**CF12-1VMUU**	**CF12-1VMR**	**CF12-1VMUUR**														12 350	18 120	11 270	6 000				
16	0 -0.018	**CF16M**	**CF16MUU**	**CF16MR**	**CF16MUUR**	**35**	18	16	M16×1.5	17	52	32.5	8	0.8	6	3	0.6	24	11 080	16 860	18 330	10 000	11 200	3 140	58	170
		CF16VM	**CF16VMUU**	**CF16VMR**	**CF16VMUUR**														19 020	34 610	19 800	4 500				
18	0 -0.018	**CF18M**	**CF18MUU**	**CF18MR**	**CF18MUUR**	**40**	20	18	M18×1.5	19	58	36.5	8	0.8	6	3	1	26	13 520	23 180	25 200	8 500	14 400	3 720	87	250
		CF18VM	**CF18VMUU**	**CF18VMR**	**CF18VMUUR**														23 250	47 240	26 560	3 500				
20	0 -0.021	**CF20M**	**CF20MUU**	**CF20MR**	**CF20MUUR**	**52**	24	20	M20×1.5	21	66	40.5	9	0.8	8	4	1	36	19 020	31 830	32 140	7 000	23 200	8 230	120	460
		CF20VM	**CF20VMUU**	**CF20VMR**	**CF20VMUUR**														30 470	59 320	32 140	3 500				
20	0 -0.021	**CF20-1M**	**CF20-1MUU**	**CF20-1MR**	**CF20-1MUUR**	**47**	24	20	M20×1.5	21	66	40.5	9	0.8	8	4	1	36	19 020	31 830	32 140	7 000	21 000	7 150	120	385
		CF20-1VM	**CF20-1VMUU**	**CF20-1VMR**	**CF20-1VMUUR**														30 470	59 320	32 140	3 500				
24	0 -0.021	**CF24M**	**CF24MUU**	**CF24MR**	**CF24MUUR**	**62**	29	24	M24×1.5	25	80	49.5	11	0.8	8	4	1	40	28 040	48 410	49 500	6 500	34 200	10 500	220	815
		CF24VM	**CF24VMUU**	**CF24VMR**	**CF24VMUUR**														42 820	84 650	49 500	3 000				
24	0 -0.021	**CF24-1M**	**CF24-1MUU**	**CF24-1MR**	**CF24-1MUUR**	**72**	29	24	M24×1.5	25	80	49.5	11	0.8	8	4	1	40	28 040	48 410	49 500	6 500	39 800	12 900	220	1 140
		CF24-1VM	**CF24-1VMUU**	**CF24-1VMR**	**CF24-1VMUUR**														42 820	84 650	49 500	3 000				
30	0 -0.021	**CF30M**	**CF30MUU**	**CF30MR**	**CF30MUUR**	**80**	35	30	M30×1.5	32	100	63	15	1	8	4	1	46	41 740	78 250	73 700	5 000	52 600	14 900	450	1 870
		CF30VM	**CF30VMUU**	**CF30VMR**	**CF30VMUUR**														62 210	132 530	73 700	2 200				
30	0 -0.021	**CF30-1M**	**CF30-1MUU**	**CF30-1MR**	**CF30-1MUUR**	**85**	35	30	M30×1.5	32	100	63	15	1	8	4	1	46	41 740	78 250	73 700	5 000	56 000	16 100	450	2 030
		CF30-1VM	**CF30-1VMUU**	**CF30-1VMR**	**CF30-1VMUUR**														62 210	132 530	73 700	2 200				
30	0 -0.021	**CF30-2M**	**CF30-2MUU**	**CF30-2MR**	**CF30-2MUUR**	**90**	35	30	M30×1.5	32	100	63	15	1	8	4	1	46	41 740	78 250	73 700	5 000	59 300	17 300	450	2 220
		CF30-2VM	**CF30-2VMUU**	**CF30-2VMR**	**CF30-2VMUUR**														62 210	132 530	73 700	2 200				

* Without seals, suitable for grease lubrication. In case of oil lubrication, up to 130% of this value shall be permissible, and 70% of this value shall apply for types with seals.

OUTER RINGS TOLERANCE (μm)

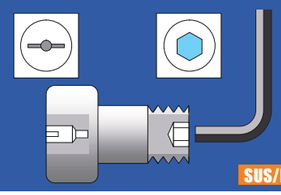
TYPE	Cylindrical outer ring	Crowned outer ring
CF5M,CF6M	0/-8	0/-50
CF8M,CF10M,CF10-1M,CF12M	0/-9	0/-50
CF12-1M,CF16M,CF18M,CF20-1M	0/-11	0/-50
CF20M,CF24M,CF24-1M,CF30M	0/-13	0/-50
CF30-1M,CF30-2M	0/-15	0/-50

ACCESSORIES

TYPE	STOP PLUG	RESIN PLUG	NUT
CF5M	—	—	Attached
CF6M/CF8M/CF10M/CF10-1M	—	ϕ 4 Attached	Attached
CF10MK/CF10-1MK	ϕ 4 Attached	ϕ 4 Attached	Attached
CF12M/CF12-1M/CF16M/CF18M	ϕ 6 Attached	ϕ 6 Attached	Attached
CF20M/CF20-1M/CF24M/CF24-1M/CF30M/CF30-1M/CF30-2M	ϕ 8 Attached	ϕ 8 Attached	Attached

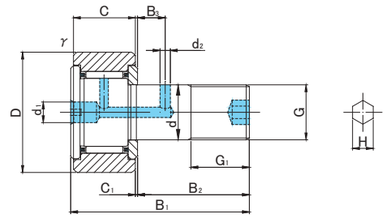
CAM FOLLOWERS STAINLESS STEEL

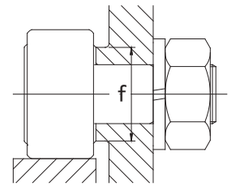
HEXAGON SOCKET ON THREAD SIDE SCREWDRIVER SLOT HEAD



CF..MB

CF..VMB





CF..MB TYPE

Prepacked Grease

Stud diameter (mm) d	h7 tolerance	Designation: Cylindrical outer ring, Without seals	Cylindrical outer ring, With seals	Crowned outer ring R500 (CF12 ～ CF18) R1000 (CF20 ≦), Without seals	Crowned outer ring, With seals	Dimensions (mm) D	C	G	G1	B1	B2	B3	C1	d1	d2	H	rs min	f min	Basic dynamic load rating Cr N	Basic static load rating Cor N	Largest permissible load N	Limiting speed * rpm	Track load capacity: Cylindrical outer ring N	Track load capacity: Crowned outer ring N	Max tightening torque N·m	Mass g (approx)
12	0 -0.018	CF12MB	CF12MUUB	CF12MRB	CF12MUURB	30	14	M12×1.5	13	40	25	6	0.6	6	3	6	0.6	20	7 300	9 010	9 800	14 000	7 060	2 450	22	95
		CF12VMB	CF12VMUUB	CF12VMRB	CF12VMUURB														12 350	18 120	11 270	6 000				
12	0 -0.018	CF12-1MB	CF12-1MUUB	CF12-1MRB	CF12-1MUURB	32	14	M12×1.5	13	40	25	6	0.6	6	3	6	0.6	20	7 300	9 010	9 800	14 000	7 450	2 740	22	105
		CF12-1VMB	CF12-1VMUUB	CF12-1VMRB	CF12-1VMUURB														12 350	18 120	11 270	6 000				
16	0 -0.018	CF16MB	CF16MUUB	CF16MRB	CF16MUURB	35	18	M16×1.5	17	52	32.5	8	0.8	6	3	6	0.6	24	11 080	16 860	18 330	10 000	11 200	3 140	58	170
		CF16VMB	CF16VMUUB	CF16VMRB	CF16VMUURB														19 020	34 610	19 800	4 500				
18	0 -0.018	CF18MB	CF18MUUB	CF18MRB	CF18MUURB	40	20	M18×1.5	19	58	36.5	8	0.8	6	3	6	1	26	13 520	23 180	25 200	8 500	14 400	3 720	87	250
		CF18VMB	CF18VMUUB	CF18VMRB	CF18VMUURB														23 250	47 240	26 560	3 500				
20	0 -0.021	CF20MB	CF20MUUB	CF20MRB	CF20MUURB	52	24	M20×1.5	21	66	40.5	9	0.8	8	4	8	1	36	19 020	31 830	32 140	7 000	23 200	8 230	120	460
		CF20VMB	CF20VMUUB	CF20VMRB	CF20VMUURB														30 470	59 320	32 140	3 500				
20	0 -0.021	CF20-1MB	CF20-1MUUB	CF20-1MRB	CF20-1MUURB	47	24	M20×1.5	21	66	40.5	9	0.8	8	4	8	1	36	19 020	31 830	32 140	7 000	21 000	7 150	120	385
		CF20-1VMB	CF20-1VMUUB	CF20-1VMRB	CF20-1VMUURB														30 470	59 320	32 140	3 500				
24	0 -0.021	CF24MB	CF24MUUB	CF24MRB	CF24MUURB	62	29	M24×1.5	25	80	49.5	11	0.8	8	4	8	1	40	28 040	48 410	49 500	6 500	34 200	10 500	220	815
		CF24VMB	CF24VMUUB	CF24VMRB	CF24VMUURB														42 820	84 650	49 500	3 000				
24	0 -0.021	CF24-1MB	CF24-1MUUB	CF24-1MRB	CF24-1MUURB	72	29	M24×1.5	25	80	49.5	11	0.8	8	4	8	1	40	28 040	48 410	49 500	6 500	39 800	12 900	220	1 140
		CF24-1VMB	CF24-1VMUUB	CF24-1VMRB	CF24-1VMUURB														42 820	84 650	49 500	3 000				
30	0 -0.021	CF30MB	CF30MUUB	CF30MRB	CF30MUURB	80	35	M30×1.5	32	100	63	15	1	8	4	8	1	46	41 740	78 250	73 700	5 000	52 600	14 900	450	1 870
		CF30VMB	CF30VMUUB	CF30VMRB	CF30VMUURB														62 210	132 530	73 700	2 200				
30	0 -0.021	CF30-1MB	CF30-1MUUB	CF30-1MRB	CF30-1MUURB	85	35	M30×1.5	32	100	63	15	1	8	4	8	1	46	41 740	78 250	73 700	5 000	56 000	16 100	450	2 030
		CF30-1VMB	CF30-1VMUUB	CF30-1VMRB	CF30-1VMUURB														62 210	132 530	73 700	2 200				
30	0 -0.021	CF30-2MB	CF30-2MUUB	CF30-2MRB	CF30-2MUURB	90	35	M30×1.5	32	100	63	15	1	8	4	8	1	46	41 740	78 250	73 700	5 000	59 300	17 300	450	2 220
		CF30-2VMB	CF30-2VMUUB	CF30-2VMRB	CF30-2VMUURB														62 210	132 530	73 700	2 200				

* Without seals, suitable for grease lubrication. In case of oil lubrication, up to 130% of this value shall be permissible, and 70% of this value shall apply for types with seals.

OUTER RINGS TOLERANCE (μm)

TYPE	Cylindrical outer ring	Crowned outer ring
CF12M	0/-9	0/-50
CF12-1M,CF16M,CF18M,CF20-1M	0/-11	0/-50
CF20M,CF24M,CF24-1M,CF30M	0/-13	0/-50
CF30-1M,CF30-2M	0/-15	0/-50

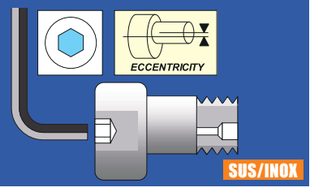
ACCESSORIES

TYPE	 STOP PLUG	 RESIN PLUG	 NUT
CF12M/CF12-1M/CF16M/CF18M	ϕ 6 Attached	ϕ 6 Attached	Attached
CF20M/CF20-1M/CF24M/CF24-1M/CF30M/CF30-1M/CF30-2M	ϕ 8 Attached	ϕ 8 Attached	Attached

CAM FOLLOWERS STAINLESS STEEL

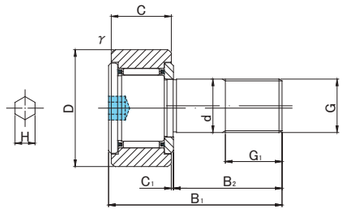
SOLID ECCENTRIC TYPE

HEXAGON SOCKET ON STUD HEAD

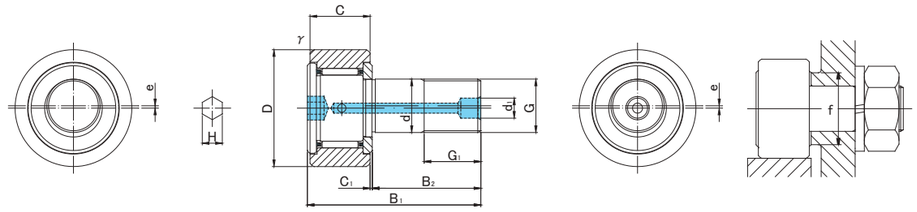


CFH..MA

CFH..VMA



CFH5(V)MA～CFH10-1(V)MA



CFH12(V)MA～CFH12-1(V)MA

CFH..MA TYPE

Prepacked Grease

Stud diameter (mm)	h7 tolerance	Designation: Cylindrical outer ring, Without seals	Designation: Cylindrical outer ring, With seals	Designation: Crowned outer ring R500(CF5 ～ CF12), Without seals	Designation: Crowned outer ring R500(CF5 ～ CF12), With seals	D	C	d	G	G1	B1	B2	C1	d1	H	r s min	e	f min	Basic dynamic load rating Cr N	Basic static load rating Cor N	Largest permissible load N	Limiting speed * rpm	Track load capacity: Cylindrical outer ring N	Track load capacity: Crowned outer ring N	Max tightening torque N·m	Mass g (approx)
5	0 -0.012	**CFH 5MA**	**CFH 5MUUA**	**CFH 5MRA**	**CFH 5MUURA**	**13**	9	5	M5×0.8	7.5	23	13	0.5	—	2.5	0.3	0.2	9.7	2 880	2 540	1 420	29 000	2 250	530	2	10.5
		CFH 5VMA	**CFH 5VMUUA**	**CFH 5VMRA**	**CFH 5VMUURA**														4 690	5 060	1 420	11 600				
6	0 -0.012	**CFH 6MA**	**CFH 6MUUA**	**CFH 6MRA**	**CFH 6MUURA**	**16**	11	6	M6×1	8	28	16	0.6	—	3	0.3	0.25	11	3 330	3 330	2 110	25 000	3 430	1 080	3	18.5
		CFH 6VMA	**CFH 6VMUUA**	**CFH 6VMRA**	**CFH 6VMUURA**														6 400	7 840	2 110	12 000				
8	0 -0.015	**CFH 8MA**	**CFH 8MUUA**	**CFH 8MRA**	**CFH 8MUURA**	**19**	11	8	M8×1.25	10	32	20	0.6	—	4	0.3	0.25	13	3 960	4 330	4 710	20 000	4 020	1 370	8	28.5
		CFH 8VMA	**CFH 8VMUUA**	**CFH 8VMRA**	**CFH 8VMUURA**														7 470	10 270	4 710	9 000				
10	0 -0.015	**CFH10MA**	**CFH10MUUA**	**CFH10MRA**	**CFH10MUURA**	**22**	12	10	M10×1.25	12	36	23	0.6	—	5	0.3	0.3	15	4 950	6 310	6 860	17 000	4 700	1 670	15	45
		CFH10VMA	**CFH10VMUUA**	**CFH10VMRA**	**CFH10VMUURA**														8 740	13 340	7 450	7 500				
10	0 -0.015	**CFH10-1MA**	**CFH10-1MUUA**	**CFH10-1MRA**	**CFH10-1MUURA**	**26**	12	10	M10×1.25	12	36	23	0.6	—	5	0.3	0.3	15	4 950	6 310	6 860	17 000	5 490	2 060	15	60
		CFH10-1VMA	**CFH10-1VMUUA**	**CFH10-1VMRA**	**CFH10-1VMUURA**														8 740	13 340	7 450	7 500				
12	0 -0.018	**CFH12MA**	**CFH12MUUA**	**CFH12MRA**	**CFH12MUURA**	**30**	14	12	M12×1.5	13	40	25	0.6	6	6	0.6	0.4	20	7 300	9 010	9 800	14 000	7 060	2 450	22	95
		CFH12VMA	**CFH12VMUUA**	**CFH12VMRA**	**CFH12VMUURA**														12 350	18 120	11 270	6 000				
12	0 -0.018	**CFH12-1MA**	**CFH12-1MUUA**	**CFH12-1MRA**	**CFH12-1MUURA**	**32**	14	12	M12×1.5	13	40	25	0.6	6	6	0.6	0.4	20	7 300	9 010	9 800	14 000	7 450	2 740	22	105
		CFH12-1VMA	**CFH12-1VMUUA**	**CFH12-1VMRA**	**CFH12-1VMUURA**														12 350	18 120	11 270	6 000				

* Without seals, suitable for grease lubrication. In case of oil lubrication, up to 130% of this value shall be permissible, and 70% of this value shall apply for types with seals.

OUTER RINGS TOLERANCE (μm)

TYPE	Cylindrical outer ring	Crowned outer ring
CF5M,CF6M	0/-8	0/-50
CF8M,CF10M,CF10-1M,CF12M	0/-9	0/-50
CF12-1M,CF16M,CF18M,CF20-1M	0/-11	0/-50
CF20M,CF24M,CF24-1M,CF30M	0/-13	0/-50
CF30-1M,CF30-2M	0/-15	0/-50

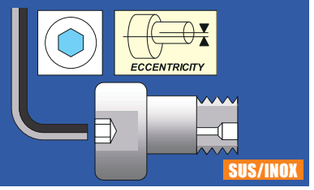
ACCESSORIES

TYPE	STOP PLUG	RESIN PLUG	NUT
CF3M/CF4M/CF5M	—	—	Attached
CF6M/CF8M/CF10M/CF10-1M	—	—	Attached
CF12M/CF12-1M/CF16M/CF18M	ϕ 6 Attached	ϕ 6 Attached	Attached
CF20M/CF20-1M/CF24M/CF24-1M/CF30M/CF30-1M/CF30-2M	ϕ 8 Attached	ϕ 8 Attached	Attached

CAM FOLLOWERS STAINLESS STEEL

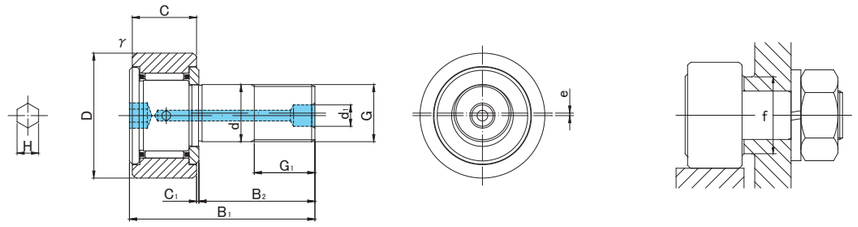
SOLID ECCENTRIC TYPE

HEXAGON SOCKET ON STUD HEAD



CFH..MA

CFH..VMA



CFH..MA TYPE

Prepacked Grease

Stud diameter (mm)	h7 tolerance	Designation: Cylindrical outer ring, Without seals	Designation: Cylindrical outer ring, With seals	Designation: Crowned outer ring R500(CF16～CF18) R1000(CF20≦), Without seals	Designation: Crowned outer ring R500(CF16～CF18) R1000(CF20≦), With seals	D	C	d	G	G1	B1	B2	C1	d1	H	r's min	e	f min	Basic dynamic load rating Cr N	Basic static load rating Cor N	Largest permissible load N	Limiting speed * rpm	Track load capacity: Cylindrical outer ring N	Track load capacity: Crowned outer ring N	Max tightening torque N·m	Mass g (approx)
16	0 -0.018	**CFH16MA**	**CFH16MUUA**	**CFH16MRA**	**CFH16MUURA**	**35**	18	16	M16×1.5	17	52	32.5	0.8	6	6	0.6	0.5	24	11 080	16 860	18 330	10 000	11 200	3 140	58	170
		CFH16VMA	**CFH16VMUUA**	**CFH16VMRA**	**CFH16VMUURA**														19 020	34 610	19 800	4 500				
18	0 -0.018	**CFH18MA**	**CFH18MUUA**	**CFH18MRA**	**CFH18MUURA**	**40**	20	18	M18×1.5	19	58	36.5	0.8	6	6	1	0.6	26	13 520	23 180	25 200	8 500	14 400	3 720	87	250
		CFH18VMA	**CFH18VMUUA**	**CFH18VMRA**	**CFH18VMUURA**														23 250	47 240	26 560	3 500				
20	0 -0.021	**CFH20MA**	**CFH20MUUA**	**CFH20MRA**	**CFH20MUURA**	**52**	24	20	M20×1.5	21	66	40.5	0.8	8	8	1	0.7	36	19 020	31 830	32 140	7 000	23 200	8 230	120	460
		CFH20VMA	**CFH20VMUUA**	**CFH20VMRA**	**CFH20VMUURA**														30 470	59 320	32 140	3 500				
20	0 -0.021	**CFH20-1MA**	**CFH20-1MUUA**	**CFH20-1MRA**	**CFH20-1MUURA**	**47**	24	20	M20×1.5	21	66	40.5	0.8	8	8	1	0.7	36	19 020	31 830	32 140	7 000	21 000	7 150	120	385
		CFH20-1VMA	**CFH20-1VMUUA**	**CFH20-1VMRA**	**CFH20-1VMUURA**														30 470	59 320	32 140	3 500				
24	0 -0.021	**CFH24MA**	**CFH24MUUA**	**CFH24MRA**	**CFH24MUURA**	**62**	29	24	M24×1.5	25	80	49.5	0.8	8	8	1	0.8	40	28 040	48 410	49 500	6 500	34 200	10 500	220	815
		CFH24VMA	**CFH24VMUUA**	**CFH24VMRA**	**CFH24VMUURA**														42 820	84 650	49 500	3 000				
24	0 -0.021	**CFH24-1MA**	**CFH24-1MUUA**	**CFH24-1MRA**	**CFH24-1MUURA**	**72**	29	24	M24×1.5	25	80	49.5	0.8	8	8	1	0.8	40	28 040	48 410	49 500	6 500	39 800	12 900	220	1 140
		CFH24-1VMA	**CFH24-1VMUUA**	**CFH24-1VMRA**	**CFH24-1VMUURA**														42 820	84 650	49 500	3 000				
30	0 -0.021	**CFH30MA**	**CFH30MUUA**	**CFH30MRA**	**CFH30MUURA**	**80**	35	30	M30×1.5	32	100	63	1	8	8	1	1	46	41 740	78 250	73 700	5 000	52 600	14 900	450	1 870
		CFH30VMA	**CFH30VMUUA**	**CFH30VMRA**	**CFH30VMUURA**														62 210	132 530	73 700	2 200				
30	0 -0.021	**CFH30-1MA**	**CFH30-1MUUA**	**CFH30-1MRA**	**CFH30-1MUURA**	**85**	35	30	M30×1.5	32	100	63	1	8	8	1	1	46	41 740	78 250	73 700	5 000	56 000	16 100	450	2 030
		CFH30-1VMA	**CFH30-1VMUUA**	**CFH30-1VMRA**	**CFH30-1VMUURA**														62 210	132 530	73 700	2 200				
30	0 -0.021	**CFH30-2MA**	**CFH30-2MUUA**	**CFH30-2MRA**	**CFH30-2MUURA**	**90**	35	30	M30×1.5	32	100	63	1	8	8	1	1	46	41 740	78 250	73 700	5 000	59 300	17 300	450	2 220
		CFH30-2VMA	**CFH30-2VMUUA**	**CFH30-2VMRA**	**CFH30-2VMUURA**														62 210	132 530	73 700	2 200				

* Without seals, suitable for grease lubrication. In case of oil lubrication, up to 130% of this value shall be permissible, and 70% of this value shall apply for types with seals.

OUTER RINGS TOLERANCE (μm)

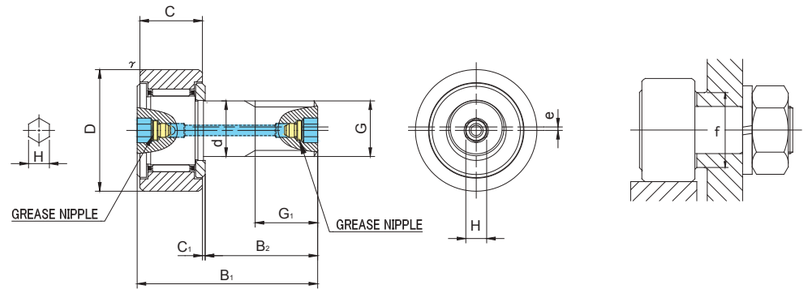
TYPE	Cylindrical outer ring	Crowned outer ring
CF5M,CF6M	0/-8	0/-50
CF8M,CF10M,CF10-1M,CF12M	0/-9	0/-50
CF12-1M,CF16M,CF18M,CF20-1M	0/-11	0/-50
CF20M,CF24M,CF24-1M,CF30M	0/-13	0/-50
CF30-1M,CF30-2M	0/-15	0/-50

ACCESSORIES

TYPE	 STOP PLUG	 RESIN PLUG	 NUT
CF3M/CF4M/CF5M	—	—	Attached
CF6M/CF8M/CF10M/CF10-1M	—	—	Attached
CF12M/CF12-1M/CF16M/CF18M	ϕ 6 Attached	ϕ 6 Attached	Attached
CF20M/CF20-1M/CF24M/CF24-1M/CF30M/CF30-1M/CF30-2M	ϕ 8 Attached	ϕ 8 Attached	Attached

CFH..MAB

CFH..VMAB



CFH..MAB TYPE

Prepacked Grease

Stud diameter (mm)		Designation				Dimensions (mm)												Basic dynamic load rating	Basic static load rating	Largest permissible load	Limiting speed *	Track load capacity		Max tightening torque	Mass
		Cylindrical outer ring		Crowned outer ring R500(CF12～CF18) R1000(CF20≦)																					
	h7 tolerance	Without seals	With seals	Without seals	With seals	D	C	d	G	G1	B1	B2	C1	H	r_s min	e	f min	Cr N	Cor N	N	rpm	Cylindrical outer ring N	Crowned outer ring N	N·m	g (approx)
12	0 -0.018	**CFH12MAB**	**CFH12MUUAB**	**CFH12MRAB**	**CFH12MUURAB**	**30**	14	12	M12×1.5	13	40	25	0.6	6	0.6	0.4	20	7 300	9 010	9 800	14 000	7 060	2 450	22	95
		CFH12VMAB	**CFH12VMUUAB**	**CFH12VMRAB**	**CFH12VMUURAB**													12 350	18 120	11 270	6 000				
12	0 -0.018	**CFH12-1MAB**	**CFH12-1MUUAB**	**CFH12-1MRAB**	**CFH12-1MUURAB**	**32**	14	12	M12×1.5	13	40	25	0.6	6	0.6	0.4	20	7 300	9 010	9 800	14 000	7 450	2 740	22	105
		CFH12-1VMAB	**CFH12-1VMUUAB**	**CFH12-1VMRAB**	**CFH12-1VMUURAB**													12 350	18 120	11 270	6 000				
16	0 -0.018	**CFH16MAB**	**CFH16MUUAB**	**CFH16MRAB**	**CFH16MUURAB**	**35**	18	16	M16×1.5	17	52	32.5	0.8	6	0.6	0.5	24	11 080	16 860	18 330	10 000	11 200	3 140	58	170
		CFH16VMAB	**CFH16VMUUAB**	**CFH16VMRAB**	**CFH16VMUURAB**													19 020	34 610	19 800	4 500				
18	0 -0.018	**CFH18MAB**	**CFH18MUUAB**	**CFH18MRAB**	**CFH18MUURAB**	**40**	20	18	M18×1.5	19	58	36.5	0.8	6	1	0.6	26	13 520	23 180	25 200	8 500	14 400	3 720	87	250
		CFH18VMAB	**CFH18VMUUAB**	**CFH18VMRAB**	**CFH18VMUURAB**													23 250	47 240	26 560	3 500				
20	0 -0.021	**CFH20MAB**	**CFH20MUUAB**	**CFH20MRAB**	**CFH20MUURAB**	**52**	24	20	M20×1.5	21	66	40.5	0.8	8	1	0.7	36	19 020	31 830	32 140	7 000	23 200	8 230	120	460
		CFH20VMAB	**CFH20VMUUAB**	**CFH20VMRAB**	**CFH20VMUURAB**													30 470	59 320	32 140	3 500				
20	0 -0.021	**CFH20-1MAB**	**CFH20-1MUUAB**	**CFH20-1MRAB**	**CFH20-1MUURAB**	**47**	24	20	M20×1.5	21	66	40.5	0.8	8	1	0.7	36	19 020	31 830	32 140	7 000	21 000	7 150	120	385
		CFH20-1VMAB	**CFH20-1VMUUAB**	**CFH20-1VMRAB**	**CFH20-1VMUURAB**													30 470	59 320	32 140	3 500				

CFH..MAB TYPE has oil holes (grease nipple) which are prepared in the stud head and thread side, also an oil hole is prepared outer surface of stud.

* Without seals, suitable for grease lubrication. In case of oil lubrication, up to 130% of this value shall be permissible, and 70% of this value shall apply for types with seals.

OUTER RINGS TOLERANCE (μm)

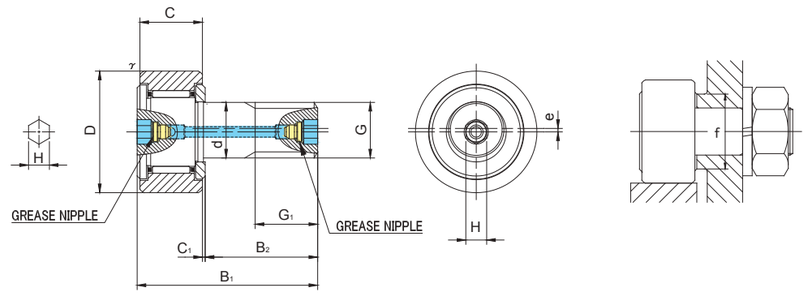
TYPE	Cylindrical outer ring	Crowned outer ring
CF12	0/-9	0/-50
CF12-1,CF16,CF18,CF20-1	0/-11	0/-50
CF20,CF24,CF24-1,CF30	0/-13	0/-50
CF30-1,CF30-2	0/-15	0/-50

ACCESSORIES

TYPE	 Grease Nipple	 NUT
All types	Installed	Attached

CFH..MAB

CFH..VMAB



CFH..MAB TYPE

Prepacked Grease

Stud diameter (mm)		Designation				Dimensions (mm)											Basic dynamic load rating	Basic static load rating	Largest permissible load	Limiting speed *	Track load capacity		Max tightening torque	Mass
		Cylindrical outer ring		Crowned outer ring R1000(CF24 ≦)																				
	h7 tolerance	Without seals	With seals	Without seals	With seals	D	C	d	G	G1	B1	B2	C1	H	rs min	e	f min	Cr N	Cor N	N	rpm	Cylindrical outer ring N	Crowned outer ring N	N·m	g (approx)
24	0 -0.021	CFH24MAB	CFH24MUUAB	CFH24MRAB	CFH24MUURAB	62	29	24	M24×1.5	25	80	49.5	0.8	8	1	0.8	40	28 040	48 410	49 500	6 500	34 200	10 500	220	815
		CFH24VMAB	CFH24VMUUAB	CFH24VMRAB	CFH24VMUURAB													42 820	84 650	49 500	3 000				
24	0 -0.021	CFH24-1MAB	CFH24-1MUUAB	CFH24-1MRAB	CFH24-1MUURAB	72	29	24	M24×1.5	25	80	49.5	0.8	8	1	0.8	40	28 040	48 410	49 500	6 500	39 800	12 900	220	1 140
		CFH24-1VMAB	CFH24-1VMUUAB	CFH24-1VMRAB	CFH24-1VMUURAB													42 820	84 650	49 500	3 000				
30	0 -0.021	CFH30MAB	CFH30MUUAB	CFH30MRAB	CFH30MUURAB	80	35	30	M30×1.5	32	100	63	1	8	1	1	46	41 740	78 250	73 700	5 000	52 600	14 900	450	1 870
		CFH30VMAB	CFH30VMUUAB	CFH30VMRAB	CFH30VMUURAB													62 210	132 530	73 700	2 200				
30	0 -0.021	CFH30-1MAB	CFH30-1MUUAB	CFH30-1MRAB	CFH30-1MUURAB	85	35	30	M30×1.5	32	100	63	1	8	1	1	46	41 740	78 250	73 700	5 000	56 000	16 100	450	2 030
		CFH30-1VMAB	CFH30-1VMUUAB	CFH30-1VMRAB	CFH30-1VMUURAB													62 210	132 530	73 700	2 200				
30	0 -0.021	CFH30-2MAB	CFH30-2MUUAB	CFH30-2MRAB	CFH30-2MUURAB	90	35	30	M30×1.5	32	100	63	1	8	1	1	46	41 740	78 250	73 700	5 000	59 300	17 300	450	2 220
		CFH30-2VMAB	CFH30-2VMUUAB	CFH30-2VMRAB	CFH30-2VMUURAB													62 210	132 530	73 700	2 200				

CFH..MAB TYPE has oil holes (grease nipple) which are prepared in the stud head and thread side, also an oil hole is prepared outer surface of stud.

* Without seals, suitable for grease lubrication. In case of oil lubrication, up to 130% of this value shall be permissible, and 70% of this value shall apply for types with seals.

OUTER RINGS TOLERANCE (μm)

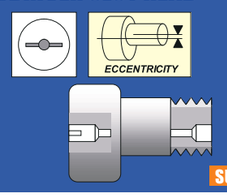
TYPE	Cylindrical outer ring	Crowned outer ring
CF12	0/-9	0/-50
CF12-1,CF16,CF18,CF20-1	0/-11	0/-50
CF20,CF24,CF24-1,CF30	0/-13	0/-50
CF30-1,CF30-2	0/-15	0/-50

ACCESSORIES

TYPE	 Grease Nipple	 NUT
All types	Installed	Attached

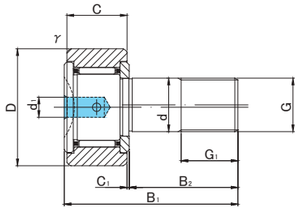
CAM FOLLOWERS STAINLESS STEEL

SOLID ECCENTRIC TYPE
SCREWDRIVER SLOT HEAD

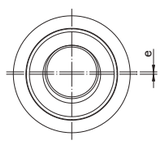


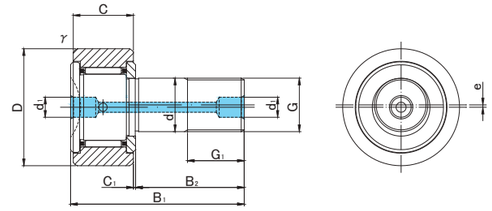
CFH..M

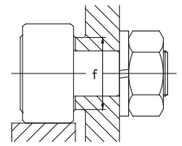
CFH..VM



CFH5(V)M～CFH10-1(V)M







CFH12(V)M～CFH18(V)M

CFH..M TYPE

Prepacked Grease

Stud diameter (mm)		Designation				Dimensions (mm)											Basic dynamic load rating	Basic static load rating	Largest permissible load	Limiting speed *	Track load capacity		Max tightening torque	Mass
		Cylindrical outer ring		Crowned outer ring R250(CF5) R500(CF6 ～ CF18)																				
	h7 tolerance	Without seals	With seals	Without seals	With seals	D	C	d	G	G1	B1	B2	C1	d1	rs min	e	f min	Cr N	Cor N	N	rpm	Cylindrical outer ring N	Crowned outer ring N	N·m	g (approx)
5	0 -0.012	CFH 5M	CFH 5MUU	CFH 5MR	CFH 5MUUR	13	9	5	M5×0.8	7.5	23	13	0.5	3.1	0.3	0.2	9.7	2 880	2 540	1 420	29 000	2 250	530	2	10.5
		CFH 5VM	CFH 5VMUU	CFH 5VMR	CFH 5VMUUR													4 690	5 060	1 420	11 600				
6	0 -0.012	CFH 6M	CFH 6MUU	CFH 6MR	CFH 6MUUR	16	11	6	M6×1	8	28	16	0.6	4	0.3	0.25	11	3 330	3 330	2 110	25 000	3 430	1 080	3	18.5
		CFH 6VM	CFH 6VMUU	CFH 6VMR	CFH 6VMUUR													6 400	7 840	2 110	12 000				
8	0 -0.015	CFH 8M	CFH 8MUU	CFH 8MR	CFH 8MUUR	19	11	8	M8×1.25	10	32	20	0.6	4	0.3	0.25	13	3 960	4 330	4 710	20 000	4 020	1 370	8	28.5
		CFH 8VM	CFH 8VMUU	CFH 8VMR	CFH 8VMUUR													7 470	10 270	4 710	9 000				
10	0 -0.015	CFH10M	CFH10MUU	CFH10MR	CFH10MUUR	22	12	10	M10×1.25	12	36	23	0.6	4	0.3	0.3	15	4 950	6 310	6 860	17 000	4 700	1 670	15	45
		CFH10VM	CFH10VMUU	CFH10VMR	CFH10VMUUR													8 740	13 340	7 450	7 500				
10	0 -0.015	CFH10-1M	CFH10-1MUU	CFH10-1MR	CFH10-1MUUR	26	12	10	M10×1.25	12	36	23	0.6	4	0.3	0.3	15	4 950	6 310	6 860	17 000	5 490	2 060	15	60
		CFH10-1VM	CFH10-1VMUU	CFH10-1VMR	CFH10-1VMUUR													8 740	13 340	7 450	7 500				
12	0 -0.018	CFH12M	CFH12MUU	CFH12MR	CFH12MUUR	30	14	12	M12×1.5	13	40	25	0.6	6	0.6	0.4	20	7 300	9 010	9 800	14 000	7 060	2 450	22	95
		CFH12VM	CFH12VMUU	CFH12VMR	CFH12VMUUR													12 350	18 120	11 270	6 000				
12	0 -0.018	CFH12-1M	CFH12-1MUU	CFH12-1MR	CFH12-1MUUR	32	14	12	M12×1.5	13	40	25	0.6	6	0.6	0.4	20	7 300	9 010	9 800	14 000	7 450	2 740	22	105
		CFH12-1VM	CFH12-1VMUU	CFH12-1VMR	CFH12-1VMUUR													12 350	18 120	11 270	6 000				
16	0 -0.018	CFH16M	CFH16MUU	CFH16MR	CFH16MUUR	35	18	16	M16×1.5	17	52	32.5	0.8	6	0.6	0.5	24	11 080	16 860	18 330	10 000	11 200	3 140	58	170
		CFH16VM	CFH16VMUU	CFH16VMR	CFH16VMUUR													19 020	34 610	19 800	4 500				
18	0 -0.018	CFH18M	CFH18MUU	CFH18MR	CFH18MUUR	40	20	18	M18×1.5	19	58	36.5	0.8	6	1	0.6	26	13 520	23 180	25 200	8 500	14 400	3 720	87	250
		CFH18VM	CFH18VMUU	CFH18VMR	CFH18VMUUR													23 250	47 240	26 560	3 500				

* Without seals, suitable for grease lubrication. In case of oil lubrication, up to 130% of this value shall be permissible, and 70% of this value shall apply for types with seals.

OUTER RINGS TOLERANCE (μm)

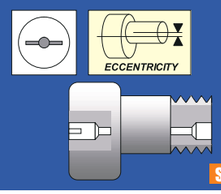
TYPE	Cylindrical outer ring	Crowned outer ring
CF5M,CF6M	0/-8	0/-50
CF8M,CF10M,CF10-1M,CF12M	0/-9	0/-50
CF12-1M,CF16M,CF18M,CF20-1M	0/-11	0/-50
CF20M,CF24M,CF24-1M,CF30M	0/-13	0/-50
CF30-1M,CF30-2M	0/-15	0/-50

ACCESSORIES

TYPE	 STOP PLUG	 RESIN PLUG	 NUT
CF5M	—	—	Attached
CF6M/CF8M/CF10M/CF10-1M	—	ϕ 4 Attached	Attached
CF12M/CF12-1M/CF16M/CF18M	ϕ 6 Attached	ϕ 6 Attached	Attached
CF20M/CF20-1M/CF24M/CF24-1M/CF30M/CF30-1M/CF30-2M	ϕ 8 Attached	ϕ 8 Attached	Attached

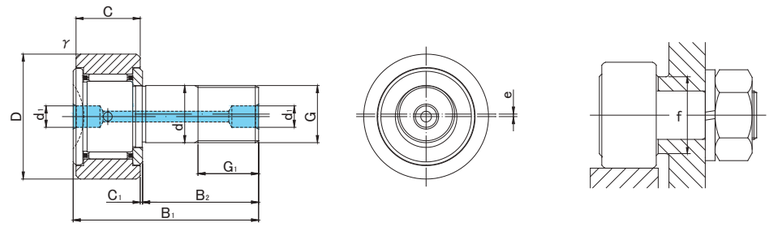
CAM FOLLOWERS STAINLESS STEEL

SOLID ECCENTRIC TYPE SCREWDRIVER SLOT HEAD



CFH..M

CFH..VM



CFH..M TYPE

Prepacked Grease

Stud diameter (mm)	h7 tolerance	Designation: Cylindrical outer ring, Without seals	Designation: Cylindrical outer ring, With seals	Designation: Crowned outer ring R1000(CF20 ≦), Without seals	Designation: Crowned outer ring R1000(CF20 ≦), With seals	D	C	d	G	G1	B1	B2	C1	d1	rs min	e	f min	Basic dynamic load rating Cr N	Basic static load rating Cor N	Largest permissible load N	Limiting speed * rpm	Track load capacity: Cylindrical outer ring N	Track load capacity: Crowned outer ring N	Max tightening torque N·m	Mass g (approx)
20	0 -0.021	CFH20M	CFH20MUU	CFH20MR	CFH20MUUR	52	24	20	M20×1.5	21	66	40.5	0.8	8	1	0.7	36	19 020	31 830	32 140	7 000	23 200	8 230	120	460
		CFH20VM	CFH20VMUU	CFH20VMR	CFH20VMUUR													30 470	59 320	32 140	3 500				
20	0 -0.021	CFH20-1M	CFH20-1MUU	CFH20-1MR	CFH20-1MUUR	47	24	20	M20×1.5	21	66	40.5	0.8	8	1	0.7	36	19 020	31 830	32 140	7 000	21 000	7 150	120	385
		CFH20-1VM	CFH20-1VMUU	CFH20-1VMR	CFH20-1VMUUR													30 470	59 320	32 140	3 500				
24	0 -0.021	CFH24M	CFH24MUU	CFH24MR	CFH24MUUR	62	29	24	M24×1.5	25	80	49.5	0.8	8	1	0.8	40	28 040	48 410	49 500	6 500	34 200	10 500	220	815
		CFH24VM	CFH24VMUU	CFH24VMR	CFH24VMUUR													42 820	84 650	49 500	3 000				
24	0 -0.021	CFH24-1M	CFH24-1MUU	CFH24-1MR	CFH24-1MUUR	72	29	24	M24×1.5	25	80	49.5	0.8	8	1	0.8	40	28 040	48 410	49 500	6 500	39 800	12 900	220	1 140
		CFH24-1VM	CFH24-1VMUU	CFH24-1VMR	CFH24-1VMUUR													42 820	84 650	49 500	3 000				
30	0 -0.021	CFH30M	CFH30MUU	CFH30MR	CFH30MUUR	80	35	30	M30×1.5	32	100	63	1	8	1	1	46	41 740	78 250	73 700	5 000	52 600	14 900	450	1 870
		CFH30VM	CFH30VMUU	CFH30VMR	CFH30VMUUR													62 210	132 530	73 700	2 200				
30	0 -0.021	CFH30-1M	CFH30-1MUU	CFH30-1MR	CFH30-1MUUR	85	35	30	M30×1.5	32	100	63	1	8	1	1	46	41 740	78 250	73 700	5 000	56 000	16 100	450	2 030
		CFH30-1VM	CFH30-1VMUU	CFH30-1VMR	CFH30-1VMUUR													62 210	132 530	73 700	2 200				
30	0 -0.021	CFH30-2M	CFH30-2MUU	CFH30-2MR	CFH30-2MUUR	90	35	30	M30×1.5	32	100	63	1	8	1	1	46	41 740	78 250	73 700	5 000	59 300	17 300	450	2 220
		CFH30-2VM	CFH30-2VMUU	CFH30-2VMR	CFH30-2VMUUR													62 210	132 530	73 700	2 200				

* Without seals, suitable for grease lubrication. In case of oil lubrication, up to 130% of this value shall be permissible, and 70% of this value shall apply for types with seals.

OUTER RINGS TOLERANCE (μm)

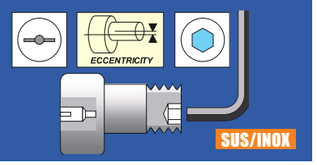
TYPE	Cylindrical outer ring	Crowned outer ring
CF5M,CF6M	0/-8	0/-50
CF8M,CF10M,CF10-1M,CF12M	0/-9	0/-50
CF12-1M,CF16M,CF18M,CF20-1M	0/-11	0/-50
CF20M,CF24M,CF24-1M,CF30M	0/-13	0/-50
CF30-1M,CF30-2M	0/-15	0/-50

ACCESSORIES

TYPE	STOP PLUG	RESIN PLUG	NUT
CF5M	—	—	Attached
CF6M/CF8M/CF10M/CF10-1M	—	ϕ 4 Attached	Attached
CF12M/CF12-1M/CF16M/CF18M	ϕ 6 Attached	ϕ 6 Attached	Attached
CF20M/CF20-1M/CF24M/CF24-1M/CF30M/CF30-1M/CF30-2M	ϕ 8 Attached	ϕ 8 Attached	Attached

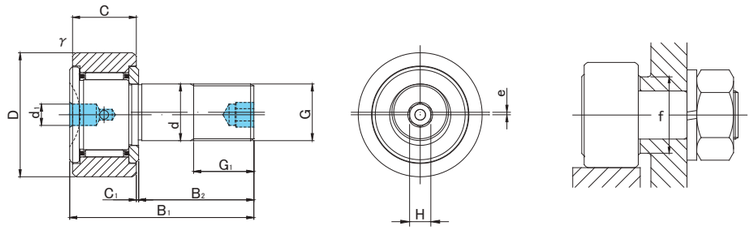
CAM FOLLOWERS STAINLESS STEEL

SOLID ECCENTRIC TYPE
HEXAGON SOCKET ON THREAD SIDE
SCREWDRIVER SLOT HEAD



CFH..MB

CFH..VMB



CFH..MB TYPE

Prepacked Grease

Stud diameter (mm)	h7 tolerance	Designation: Cylindrical outer ring, Without seals	Cylindrical outer ring, With seals	Crowned outer ring R500(CF12 ～ CF18) R1000(CF20 ≦), Without seals	Crowned outer ring, With seals	D	C	d	G	G1	B1	B2	C1	d1	H	*r*s min	e	f min	Basic dynamic load rating Cr N	Basic static load rating Cor N	Largest permissible load N	Limiting speed * rpm	Track load capacity: Cylindrical outer ring N	Track load capacity: Crowned outer ring N	Max tightening torque N·m	Mass g (approx)
12	0 -0.018	**CFH12MB**	**CFH12MUUB**	**CFH12MRB**	**CFH12MUURB**	**30**	14	12	M12×1.5	13	40	25	0.6	6	6	0.6	0.4	20	7 300	9 010	9 800	14 000	7 060	2 450	22	95
		CFH12VMB	**CFH12VMUUB**	**CFH12VMRB**	**CFH12VMUURB**														12 350	18 120	11 270	6 000				
12	0 -0.018	**CFH12-1MB**	**CFH12-1MUUB**	**CFH12-1MRB**	**CFH12-1MUURB**	**32**	14	12	M12×1.5	13	40	25	0.6	6	6	0.6	0.4	20	7 300	9 010	9 800	14 000	7 450	2 740	22	105
		CFH12-1VMB	**CFH12-1VMUUB**	**CFH12-1VMRB**	**CFH12-1VMUURB**														12 350	18 120	11 270	6 000				
16	0 -0.018	**CFH16MB**	**CFH16MUUB**	**CFH16MRB**	**CFH16MUURB**	**35**	18	16	M16×1.5	17	52	32.5	0.8	6	6	0.6	0.5	24	11 080	16 860	18 330	10 000	11 200	3 140	58	170
		CFH16VMB	**CFH16VMUUB**	**CFH16VMRB**	**CFH16VMUURB**														19 020	34 610	19 800	4 500				
18	0 -0.018	**CFH18MB**	**CFH18MUUB**	**CFH18MRB**	**CFH18MUURB**	**40**	20	18	M18×1.5	19	58	36.5	0.8	6	6	1	0.6	26	13 520	23 180	25 200	8 500	14 400	3 720	87	250
		CFH18VMB	**CFH18VMUUB**	**CFH18VMRB**	**CFH18VMUURB**														23 250	47 240	26 560	3 500				
20	0 -0.021	**CFH20MB**	**CFH20MUUB**	**CFH20MRB**	**CFH20MUURB**	**52**	24	20	M20×1.5	21	66	40.5	0.8	8	8	1	0.7	36	19 020	31 830	32 140	7 000	23 200	8 230	120	460
		CFH20VMB	**CFH20VMUUB**	**CFH20VMRB**	**CFH20VMUURB**														30 470	59 320	32 140	3 500				
20	0 -0.021	**CFH20-1MB**	**CFH20-1MUUB**	**CFH20-1MRB**	**CFH20-1MUURB**	**47**	24	20	M20×1.5	21	66	40.5	0.8	8	8	1	0.7	36	19 020	31 830	32 140	7 000	21 000	7 150	120	385
		CFH20-1VMB	**CFH20-1VMUUB**	**CFH20-1VMRB**	**CFH20-1VMUURB**														30 470	59 320	32 140	3 500				
24	0 -0.021	**CFH24MB**	**CFH24MUUB**	**CFH24MRB**	**CFH24MUURB**	**62**	29	24	M24×1.5	25	80	49.5	0.8	8	8	1	0.8	40	28 040	48 410	49 500	6 500	34 200	10 500	220	815
		CFH24VMB	**CFH24VMUUB**	**CFH24VMRB**	**CFH24VMUURB**														42 820	84 650	49 500	3 000				
24	0 -0.021	**CFH24-1MB**	**CFH24-1MUUB**	**CFH24-1MRB**	**CFH24-1MUURB**	**72**	29	24	M24×1.5	25	80	49.5	0.8	8	8	1	0.8	40	28 040	48 410	49 500	6 500	39 800	12 900	220	1 140
		CFH24-1VMB	**CFH24-1VMUUB**	**CFH24-1VMRB**	**CFH24-1VMUURB**														42 820	84 650	49 500	3 000				
30	0 -0.021	**CFH30MB**	**CFH30MUUB**	**CFH30MRB**	**CFH30MUURB**	**80**	35	30	M30×1.5	32	100	63	1	8	8	1	1	46	41 740	78 250	73 700	5 000	52 600	14 900	450	1 870
		CFH30VMB	**CFH30VMUUB**	**CFH30VMRB**	**CFH30VMUURB**														62 210	132 530	73 700	2 200				
30	0 -0.021	**CFH30-1MB**	**CFH30-1MUUB**	**CFH30-1MRB**	**CFH30-1MUURB**	**85**	35	30	M30×1.5	32	100	63	1	8	8	1	1	46	41 740	78 250	73 700	5 000	56 000	16 100	450	2 030
		CFH30-1VMB	**CFH30-1VMUUB**	**CFH30-1VMRB**	**CFH30-1VMUURB**														62 210	132 530	73 700	2 200				
30	0 -0.021	**CFH30-2MB**	**CFH30-2MUUB**	**CFH30-2MRB**	**CFH30-2MUURB**	**90**	35	30	M30×1.5	32	100	63	1	8	8	1	1	46	41 740	78 250	73 700	5 000	59 300	17 300	450	2 220
		CFH30-2VMB	**CFH30-2VMUUB**	**CFH30-2VMRB**	**CFH30-2VMUURB**														62 210	132 530	73 700	2 200				

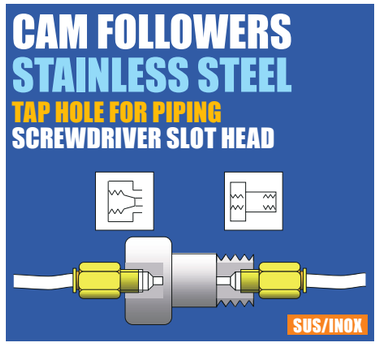
* Without seals, suitable for grease lubrication. In case of oil lubrication, up to 130% of this value shall be permissible, and 70% of this value shall apply for types with seals.

OUTER RINGS TOLERANCE (μm)

TYPE	Cylindrical outer ring	Crowned outer ring
CF12M	0/-9	0/-50
CF12-1M,CF16M,CF18M,CF20-1M	0/-11	0/-50
CF20M,CF24M,CF24-1M,CF30M	0/-13	0/-50
CF30-1M,CF30-2M	0/-15	0/-50

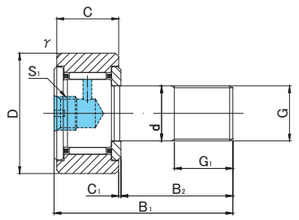
ACCESSORIES

TYPE	STOP PLUG	RESIN PLUG	NUT
CF12M/CF12-1M/CF16M/CF18M	ϕ 6 Attached	ϕ 6 Attached	Attached
CF20M/CF20-1M/CF24M/CF24-1M/CF30M/CF30-1M/CF30-2M	ϕ 8 Attached	ϕ 8 Attached	Attached

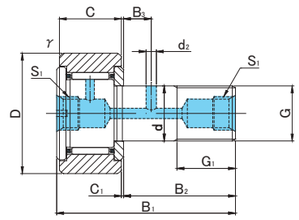



CFT..M

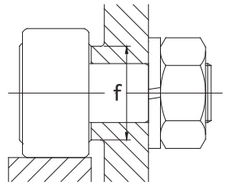

CFT..VM



CFT6(V)M～CFT10-1(V)M



CFT12(V)M～CFT18(V)M



CFT..M TYPE

Prepacked Grease

Stud diameter (mm)	h7 tolerance	Designation: Cylindrical outer ring, Without seals	Cylindrical outer ring, With seals	Crowned outer ring R500(CF6 ～ CF18), Without seals	Crowned outer ring R500(CF6 ～ CF18), With seals	D	C	d	G	G1	B1	B2	B3	C1	S1	d2	rs min	f min	Basic dynamic load rating Cr N	Basic static load rating Cor N	Largest permissible load N	Limiting speed * rpm	Track load capacity: Cylindrical outer ring N	Track load capacity: Crowned outer ring N	Max tightening torque N·m	Mass g (approx)
6	0 -0.012	CFT 6M	CFT 6MUU	CFT 6MR	CFT 6MUUR	16	11	6	M6×1	8	28	16	—	0.6	M6×0.75	—	0.3	11	3 330	3 330	2 110	25 000	3 430	1 080	3	18.5
		CFT 6VM	CFT 6VMUU	CFT 6VMR	CFT 6VMUUR														6 400	7 840	2 110	12 000				
8	0 -0.015	CFT 8M	CFT 8MUU	CFT 8MR	CFT 8MUUR	19	11	8	M8×1.25	10	32	20	—	0.6	M6×0.75	—	0.3	13	3 960	4 330	4 710	20 000	4 020	1 370	8	28.5
		CFT 8VM	CFT 8VMUU	CFT 8VMR	CFT 8VMUUR														7 470	10 270	4 710	9 000				
10	0 -0.015	CFT10M	CFT10MUU	CFT10MR	CFT10MUUR	22	12	10	M10×1.25	12	36	23	—	0.6	M6×0.75	—	0.3	15	4 950	6 310	6 860	17 000	4 700	1 670	15	45
		CFT10VM	CFT10VMUU	CFT10VMR	CFT10VMUUR														8 740	13 340	7 450	7 500				
10	0 -0.015	CFT10-1M	CFT10-1MUU	CFT10-1MR	CFT10-1MUUR	26	12	10	M10×1.25	12	36	23	—	0.6	M6×0.75	—	0.3	15	4 950	6 310	6 860	17 000	5 490	2 060	15	60
		CFT10-1VM	CFT10-1VMUU	CFT10-1VMR	CFT10-1VMUUR														8 740	13 340	7 450	7 500				
12	0 -0.018	CFT12M	CFT12MUU	CFT12MR	CFT12MUUR	30	14	12	M12×1.5	13	40	25	6	0.6	M6×0.75	3	0.6	20	7 300	9 010	7 840	14 000	7 060	2 450	22	95
		CFT12VM	CFT12VMUU	CFT12VMR	CFT12VMUUR														12 350	18 120	9 010	6 000				
12	0 -0.018	CFT12-1M	CFT12-1MUU	CFT12-1MR	CFT12-1MUUR	32	14	12	M12×1.5	13	40	25	6	0.6	M6×0.75	3	0.6	20	7 300	9 010	7 840	14 000	7 450	2 740	22	105
		CFT12-1VM	CFT12-1VMUU	CFT12-1VMR	CFT12-1VMUUR														12 350	18 120	9 010	6 000				
16	0 -0.018	CFT16M	CFT16MUU	CFT16MR	CFT16MUUR	35	18	16	M16×1.5	17	52	32.5	8	0.8	Rc1/8	3	0.6	24	11 080	16 860	14 660	10 000	11 200	3 140	58	170
		CFT16VM	CFT16VMUU	CFT16VMR	CFT16VMUUR														19 020	34 610	15 840	4 500				
18	0 -0.018	CFT18M	CFT18MUU	CFT18MR	CFT18MUUR	40	20	18	M18×1.5	19	58	36.5	8	0.8	Rc1/8	3	1	26	13 520	23 180	20 160	8 500	14 400	3 720	87	250
		CFT18VM	CFT18VMUU	CFT18VMR	CFT18VMUUR														23 250	47 240	21 240	3 500				

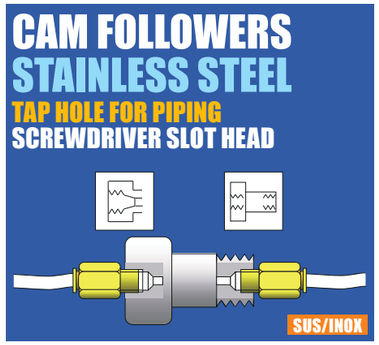
* Without seals, suitable for grease lubrication. In case of oil lubrication, up to 130% of this value shall be permissible, and 70% of this value shall apply for types with seals.

OUTER RINGS TOLERANCE (μm)

TYPE	Cylindrical outer ring	Crowned outer ring
CF6M	0/-8	0/-50
CF8M,CF10M,CF10-1M,CF12M	0/-9	0/-50
CF12-1M,CF16M,CF18M,CF20-1M	0/-11	0/-50
CF20M,CF24M,CF24-1M,CF30M	0/-13	0/-50
CF30-1M,CF30-2M	0/-15	0/-50

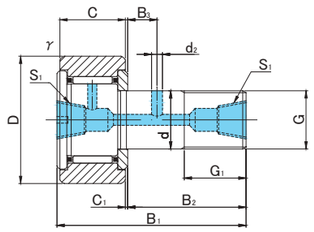
ACCESSORIES

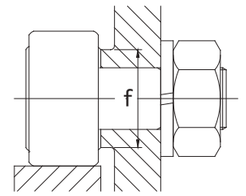
TYPE	 NUT
All types	Attached



CFT..M

CFT..VM





CFT..M TYPE

Prepacked Grease

Stud diameter (mm)	h7 tolerance	Designation: Cylindrical outer ring, Without seals	Cylindrical outer ring, With seals	Crowned outer ring R1000(CF20 ≦), Without seals	Crowned outer ring, With seals	D	C	d	G	G1	B1	B2	B3	C1	S1	d2	rs min	f min	Basic dynamic load rating Cr N	Basic static load rating Cor N	Largest permissible load N	Limiting speed * rpm	Track load capacity: Cylindrical outer ring N	Track load capacity: Crowned outer ring N	Max tightening torque N·m	Mass g (approx)
20	0 -0.021	**CFT20M**	**CFT20MUU**	**CFT20MR**	**CFT20MUUR**	**52**	24	20	M20×1.5	21	66	40.5	9	0.8	Rc1/8	4	1	36	19 020	31 830	25 710	7 000	23 200	8 230	120	460
		CFT20VM	**CFT20VMUU**	**CFT20VMR**	**CFT20VMUUR**														30 470	59 320	25 710	3 500				
20	0 -0.021	**CFT20-1M**	**CFT20-1MUU**	**CFT20-1MR**	**CFT20-1MUUR**	**47**	24	20	M20×1.5	21	66	40.5	9	0.8	Rc1/8	4	1	36	19 020	31 830	25 710	7 000	21 000	7 150	120	385
		CFT20-1VM	**CFT20-1VMUU**	**CFT20-1VMR**	**CFT20-1VMUUR**														30 470	59 320	25 710	3 500				
24	0 -0.021	**CFT24M**	**CFT24MUU**	**CFT24MR**	**CFT24MUUR**	**62**	29	24	M24×1.5	25	80	49.5	11	0.8	Rc1/8	4	1	40	28 040	48 410	39 600	6 500	34 200	10 500	220	815
		CFT24VM	**CFT24VMUU**	**CFT24VMR**	**CFT24VMUUR**														42 820	84 650	39 600	3 000				
24	0 -0.021	**CFT24-1M**	**CFT24-1MUU**	**CFT24-1MR**	**CFT24-1MUUR**	**72**	29	24	M24×1.5	25	80	49.5	11	0.8	Rc1/8	4	1	40	28 040	48 410	39 600	6 500	39 800	12 900	220	1 140
		CFT24-1VM	**CFT24-1VMUU**	**CFT24-1VMR**	**CFT24-1VMUUR**														42 820	84 650	39 600	3 000				
30	0 -0.021	**CFT30M**	**CFT30MUU**	**CFT30MR**	**CFT30MUUR**	**80**	35	30	M30×1.5	32	100	63	15	1	Rc1/8	4	1	46	41 740	78 250	58 960	5 000	52 600	14 900	450	1 870
		CFT30VM	**CFT30VMUU**	**CFT30VMR**	**CFT30VMUUR**														62 210	132 530	58 960	2 200				
30	0 -0.021	**CFT30-1M**	**CFT30-1MUU**	**CFT30-1MR**	**CFT30-1MUUR**	**85**	35	30	M30×1.5	32	100	63	15	1	Rc1/8	4	1	46	41 740	78 250	58 960	5 000	56 000	16 100	450	2 030
		CFT30-1VM	**CFT30-1VMUU**	**CFT30-1VMR**	**CFT30-1VMUUR**														62 210	132 530	58 960	2 200				
30	0 -0.021	**CFT30-2M**	**CFT30-2MUU**	**CFT30-2MR**	**CFT30-2MUUR**	**90**	35	30	M30×1.5	32	100	63	15	1	Rc1/8	4	1	46	41 740	78 250	58 960	5 000	59 300	17 300	450	2 220
		CFT30-2VM	**CFT30-2VMUU**	**CFT30-2VMR**	**CFT30-2VMUUR**														62 210	132 530	58 960	2 200				

* Without seals, suitable for grease lubrication. In case of oil lubrication, up to 130% of this value shall be permissible, and 70% of this value shall apply for types with seals.

OUTER RINGS TOLERANCE (μm)

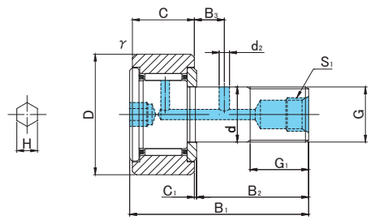
TYPE	Cylindrical outer ring	Crowned outer ring
CF6M	0/-8	0/-50
CF8M,CF10M,CF10-1M,CF12M	0/-9	0/-50
CF12-1M,CF16M,CF18M,CF20-1M	0/-11	0/-50
CF20M,CF24M,CF24-1M,CF30M	0/-13	0/-50
CF30-1M,CF30-2M	0/-15	0/-50

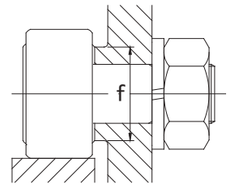
ACCESSORIES

TYPE	 NUT
All types	Attached

CFT..MA

CFT..VMA





CFT..MA TYPE

Prepacked Grease

Stud diameter (mm)	h7 tolerance	Designation: Cylindrical outer ring, Without seals	Designation: Cylindrical outer ring, With seals	Designation: Crowned outer ring R500(CF12 ～ CF18) R1000(CF20 ≦), Without seals	Designation: Crowned outer ring R500(CF12 ～ CF18) R1000(CF20 ≦), With seals	D	C	d	G	G1	B1	B2	B3	C1	S1	d2	H	rs min	f min	Basic dynamic load rating Cr N	Basic static load rating Cor N	Largest permissible load N	Limiting speed * rpm	Track load capacity: Cylindrical outer ring N	Track load capacity: Crowned outer ring N	Max tightening torque N·m	Mass g (approx)
12	0 -0.018	CFT12MA	CFT12MUUA	CFT12MRA	CFT12MUURA	30	14	12	M12×1.5	13	40	25	6	0.6	M6×0.75	3	6	0.6	20	7 300	9 010	7 840	14 000	7 060	2 450	22	95
		CFT12VMA	CFT12VMUUA	CFT12VMRA	CFT12VMUURA															12 350	18 120	9 010	6 000				
12	0 -0.018	CFT12-1MA	CFT12-1MUUA	CFT12-1MRA	CFT12-1MUURA	32	14	12	M12×1.5	13	40	25	6	0.6	M6×0.75	3	6	0.6	20	7 300	9 010	7 840	14 000	7 450	2 740	22	105
		CFT12-1VMA	CFT12-1VMUUA	CFT12-1VMRA	CFT12-1VMUURA															12 350	18 120	9 010	6 000				
16	0 -0.018	CFT16MA	CFT16MUUA	CFT16MRA	CFT16MUURA	35	18	16	M16×1.5	17	52	32.5	8	0.8	Rc1/8	3	6	0.6	24	11 080	16 860	14 660	10 000	11 200	3 140	58	170
		CFT16VMA	CFT16VMUUA	CFT16VMRA	CFT16VMUURA															19 020	34 610	15 840	4 500				
18	0 -0.018	CFT18MA	CFT18MUUA	CFT18MRA	CFT18MUURA	40	20	18	M18×1.5	19	58	36.5	8	0.8	Rc1/8	3	6	1	26	13 520	23 180	20 160	8 500	14 400	3 720	87	250
		CFT18VMA	CFT18VMUUA	CFT18VMRA	CFT18VMUURA															23 250	47 240	21 240	3 500				
20	0 -0.021	CFT20MA	CFT20MUUA	CFT20MRA	CFT20MUURA	52	24	20	M20×1.5	21	66	40.5	9	0.8	Rc1/8	4	8	1	36	19 020	31 830	25 710	7 000	23 200	8 230	120	460
		CFT20VMA	CFT20VMUUA	CFT20VMRA	CFT20VMUURA															30 470	59 320	25 710	3 500				
20	0 -0.021	CFT20-1MA	CFT20-1MUUA	CFT20-1MRA	CFT20-1MUURA	47	24	20	M20×1.5	21	66	40.5	9	0.8	Rc1/8	4	8	1	36	19 020	31 830	25 710	7 000	21 000	7 150	120	385
		CFT20-1VMA	CFT20-1VMUUA	CFT20-1VMRA	CFT20-1VMUURA															30 470	59 320	25 710	3 500				
24	0 -0.021	CFT24MA	CFT24MUUA	CFT24MRA	CFT24MUURA	62	29	24	M24×1.5	25	80	49.5	11	0.8	Rc1/8	4	8	1	40	28 040	48 410	39 600	6 500	34 200	10 500	220	815
		CFT24VMA	CFT24VMUUA	CFT24VMRA	CFT24VMUURA															42 820	84 650	39 600	3 000				
24	0 -0.021	CFT24-1MA	CFT24-1MUUA	CFT24-1MRA	CFT24-1MUURA	72	29	24	M24×1.5	25	80	49.5	11	0.8	Rc1/8	4	8	1	40	28 040	48 410	39 600	6 500	39 800	12 900	220	1 140
		CFT24-1VMA	CFT24-1VMUUA	CFT24-1VMRA	CFT24-1VMUURA															42 820	84 650	39 600	3 000				
30	0 -0.021	CFT30MA	CFT30MUUA	CFT30MRA	CFT30MUURA	80	35	30	M30×1.5	32	100	63	15	1	Rc1/8	4	8	1	46	41 740	78 250	58 960	5 000	52 600	14 900	450	1 870
		CFT30VMA	CFT30VMUUA	CFT30VMRA	CFT30VMUURA															62 210	132 530	58 960	2 200				
30	0 -0.021	CFT30-1MA	CFT30-1MUUA	CFT30-1MRA	CFT30-1MUURA	85	35	30	M30×1.5	32	100	63	15	1	Rc1/8	4	8	1	46	41 740	78 250	58 960	5 000	56 000	16 100	450	2 030
		CFT30-1VMA	CFT30-1VMUUA	CFT30-1VMRA	CFT30-1VMUURA															62 210	132 530	58 960	2 200				
30	0 -0.021	CFT30-2MA	CFT30-2MUUA	CFT30-2MRA	CFT30-2MUURA	90	35	30	M30×1.5	32	100	63	15	1	Rc1/8	4	8	1	46	41 740	78 250	58 960	5 000	59 300	17 300	450	2 220
		CFT30-2VMA	CFT30-2VMUUA	CFT30-2VMRA	CFT30-2VMUURA															62 210	132 530	58 960	2 200				

* Without seals, suitable for grease lubrication. In case of oil lubrication, up to 130% of this value shall be permissible, and 70% of this value shall apply for types with seals.

OUTER RINGS TOLERANCE (μm)

TYPE	Cylindrical outer ring	Crowned outer ring
CF12M	0/-9	0/-50
CF12-1M,CF16M,CF18M,CF20-1M	0/-11	0/-50
CF20M,CF24M,CF24-1M,CF30M	0/-13	0/-50
CF30-1M,CF30-2M	0/-15	0/-50

ACCESSORIES

TYPE	 NUT
All types	Attached

ROLLER FOLLOWERS

STAINLESS STEEL

Type and Part Code

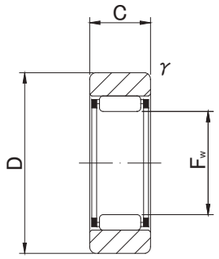
Type	Applicable axis diameter	Feature	Part Code
 RNAST..M (Separable type)	ϕ 7 ~ ϕ 60	NAST type without inner ring.	**RNAST** **15** **M** **R** ↑ Type ↑ Bore diameter code **M**: **Stainless steel** **R**: Crowned outer ring **None**: Cylindrical outer rings
 NAST..M (Separable type)	ϕ 6 ~ ϕ 50	Thick wall outer ring, inner ring. Separable bearing with combined needle roller with precision cage.	**NAST** **15** **M** **R** ↑ Type ↑ Bore diameter code **M**: **Stainless steel** **R**: Crowned outer ring **None**: Cylindrical outer rings
 NAST..MZZ (Separable type)	ϕ 6 ~ ϕ 50	Separable bearing in which labyrinth seal is formed with combined side plate at both sides of inner ring of NAST type. (NAST-ZZUU type comes with seal)	**NAST** **15** **M** **ZZ** **UU** **R** ↑ Type ↑ Bore diameter code **M**: **Stainless steel** **ZZ**: With shield **UU**: With seal **None** : With shield **R**: Crowned outer ring **X**: Cylindrical outer ring
 NART..MR (Non-separable type)	ϕ 5 ~ ϕ 50	Non-separable bearing with fixed side plate at inner ring. Mitigate eccentric load with spherical shape at outer diameter of outer ring (code R). (NART-UUR type comes with seal)	**NART** **15** **M** **UU** **V** **R** ↑ Type ↑ Bore diameter code **M**: **Stainless steel** **UU**: With seal **None** : With shield **V**: Full complement **None** : With cage **R**: Crowned outer ring **X**: Cylindrical outer ring

ROLLER FOLLOWERS STAINLESS STEEL

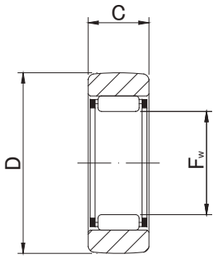
SEPARABLE WITHOUT INNER RING

SUS/INOX

RNAST..M



RNAST..M



RNAST..MR

RNAST..M TYPE

Prepacked Grease

Shaft Diameter (mm)	Designation		Dimensions (mm)				Basic dynamic load rating	Basic static load rating	Track load capacity		Limiting speed *	Mass
	Cylindrical outer ring	Crowned outer ring (R500)	Fw	D	C	r s min	Cr N	Cor N	Cylindrical outer ring N	Crowned outer ring N	rpm	g (approx)
7	**RNAST 5M**	**RNAST 5MR**	7 +0.022 +0.013	**16**	7.8	0.3	2 520	2 190	2 350	1 080	30 000	8.9
10	**RNAST 6M**	**RNAST 6MR**	10 +0.027 +0.016	**19**	9.8	0.3	3 790	4 180	3 530	1 370	20 000	13.9
12	**RNAST 8M**	**RNAST 8MR**	12 +0.027 +0.016	**24**	9.8	0.6	5 220	5 410	4 020	1 860	17 000	23.5
14	**RNAST10M**	**RNAST10MR**	14 +0.027 +0.016	**30**	11.8	1	8 920	8 890	5 590	2 450	15 000	42.5
16	**RNAST12M**	**RNAST12MR**	16 +0.027 +0.016	**32**	11.8	1	9 560	10 020	5 980	2 740	13 000	49.5
20	**RNAST15M**	**RNAST15MR**	20 +0.033 +0.020	**35**	11.8	1	11 310	13 150	6 570	3 140	10 000	50
22	**RNAST17M**	**RNAST17MR**	22 +0.033 +0.020	**40**	15.8	1	16 000	19 220	10 900	3 720	9 500	90
25	**RNAST20M**	**RNAST20MR**	25 +0.033 +0.020	**47**	15.8	1	17 660	22 540	12 700	4 610	8 500	135
30	**RNAST25M**	**RNAST25MR**	30 +0.033 +0.020	**52**	15.8	1	19 040	26 120	14 100	5 290	7 000	152
38	**RNAST30M**	**RNAST30MR**	38 +0.041 +0.025	**62**	19.8	1	27 870	41 760	22 100	6 660	5 500	255
42	**RNAST35M**	**RNAST35MR**	42 +0.041 +0.025	**72**	19.8	1	29 620	46 550	25 700	8 130	5 000	375
50	**RNAST40M**	**RNAST40MR**	50 +0.041 +0.025	**80**	19.8	1.5	32 840	56 210	26 900	9 310	4 000	420
55	**RNAST45M**	**RNAST45MR**	55 +0.049 +0.030	**85**	19.8	1.5	34 130	61 080	28 500	10 100	4 000	460
60	**RNAST50M**	**RNAST50MR**	60 +0.049 +0.030	**90**	19.8	1.5	35 600	66 050	30 200	11 000	3 500	500

* Suitable for grease lubrication. In case of oil lubrication, up to 130% of this value shall be permissible.

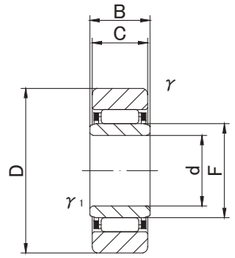
OUTER RINGS TOLERANCE

TYPE	Cylindrical outer ring	Crowned outer ring
RNAST5M	0/-8	0/-50
RNAST6M,RNAST8M,RNAST10M	0/-9	0/-50
RNAST12M,RNAST15M,RNAST17M,RNAST20M	0/-11	0/-50
RNAST25M,RNAST30M,RNAST35M,RNAST40M	0/-13	0/-50
RNAST45M,RNAST50M	0/-15	0/-50

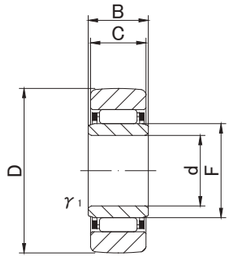
ROLLER FOLLOWERS STAINLESS STEEL

SEPARABLE WITH INNER RING

NAST..M



NAST..M



NAST..MR

NAST..M TYPE

Prepacked Grease

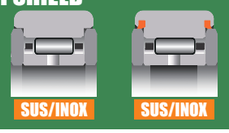
Shaft Diameter (mm)	Designation		Dimensions (mm)							Basic dynamic load rating	Basic static load rating	Track load capacity		Limiting speed *	Mass
	Cylindrical outer ring	Crowned outer ring (R500)	d	D	B	C	r_s min	r_{1s} min	F	Cr N	Cor N	Cylindrical outer ring N	Crowned outer ring N	rpm	g (approx)
6	NAST 6M	NAST 6MR	6 0 -0.008	19	10	9.8	0.3	0.3	10	3 790	4 180	3 530	1 370	20 000	17.8
8	NAST 8M	NAST 8MR	8 0 -0.008	24	10	9.8	0.6	0.3	12	5 220	5 410	4 020	1 860	17 000	28
10	NAST10M	NAST10MR	10 0 -0.008	30	12	11.8	1	0.3	14	8 920	8 890	5 590	2 450	15 000	50
12	NAST12M	NAST12MR	12 0 -0.008	32	12	11.8	1	0.3	16	9 560	10 020	5 980	2 740	13 000	58
15	NAST15M	NAST15MR	15 0 -0.008	35	12	11.8	1	0.3	20	11 310	13 150	6 570	3 140	10 000	62
17	NAST17M	NAST17MR	17 0 -0.010	40	16	15.8	1	0.3	22	16 000	19 220	10 900	3 720	9 500	110
20	NAST20M	NAST20MR	20 0 -0.010	47	16	15.8	1	0.3	25	17 660	22 540	12 700	4 610	8 500	155
25	NAST25M	NAST25MR	25 0 -0.010	52	16	15.8	1	0.3	30	19 040	26 120	14 100	5 290	7 000	180
30	NAST30M	NAST30MR	30 0 -0.010	62	20	19.8	1	0.6	38	27 870	41 760	22 100	6 660	5 500	320
35	NAST35M	NAST35MR	35 0 -0.012	72	20	19.8	1	0.6	42	29 620	46 550	25 700	8 130	5 000	440
40	NAST40M	NAST40MR	40 0 -0.012	80	20	19.8	1.5	1	50	32 840	56 210	26 900	9 310	4 000	530
45	NAST45M	NAST45MR	45 0 -0.012	85	20	19.8	1.5	1	55	34 130	61 080	28 500	10 100	4 000	580
50	NAST50M	NAST50MR	50 0 -0.012	90	20	19.8	1.5	1	60	35 600	66 050	30 200	11 000	3 500	635

* Suitable for grease lubrication. In case of oil lubrication, up to 130% of this value shall be permissible.

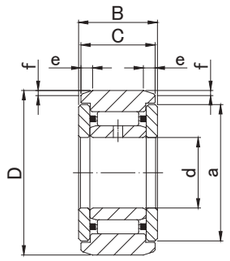
OUTER RINGS TOLERANCE (Outside diameter) (μm)

TYPE	Cylindrical outer ring	Crowned outer ring
NAST6M,NAST8M,NAST10M	0/-9	0/-50
NAST12M,NAST15M,NAST17M,NAST20M	0/-11	0/-50
NAST25M,NAST30M,NAST35M,NAST40M	0/-13	0/-50
NAST45M,NAST50M	0/-15	0/-50

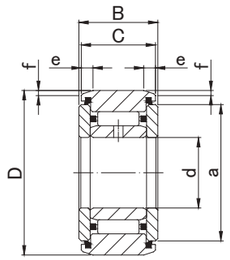
ROLLER FOLLOWERS
STAINLESS STEEL
SEPARABLE
WITH INNER RING
WITH SHIELD



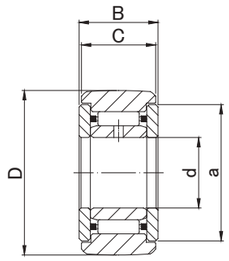
NAST..MZZ



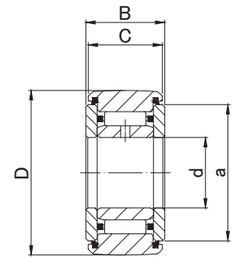
NAST..MZZ



NAST..MZZUU



NAST..MZZR



NAST..MZZUUR

NAST..MZZ TYPE

Prepacked Grease

Shaft Diameter (mm)	Designation				Dimensions (mm)							Basic dynamic load rating	Basic static load rating	Track load capacity		Limiting speed *	Mass
	Cylindrical outer ring		Crowned outer ring (R500)														
	Without seals	With seals	Without seals	With seals	d	D	B	C	a	e	f	Cr N	Cor N	Cylindrical outer ring N	Crowned outer ring N	rpm	g (approx)
6	NAST 6MZZ	NAST 6MZZUU	NAST 6MZZR	NAST 6MZZUUR	6 0 -0.008	19	14	13.8	14	2.5	0.8	3 790	4 180	3 530	1 370	20 000	24.5
8	NAST 8MZZ	NAST 8MZZUU	NAST 8MZZR	NAST 8MZZUUR	8 0 -0.008	24	14	13.8	17.5	2.5	0.8	5 220	5 410	4 510	1 860	17 000	39
10	NAST10MZZ	NAST10MZZUU	NAST10MZZR	NAST10MZZUUR	10 0 -0.008	30	16	15.8	23.5	2.5	0.8	8 920	8 890	6 860	2 450	15 000	65
12	NAST12MZZ	NAST12MZZUU	NAST12MZZR	NAST12MZZUUR	12 0 -0.008	32	16	15.8	25.5	2.5	0.8	9 560	10 020	7 350	2 740	13 000	75
15	NAST15MZZ	NAST15MZZUU	NAST15MZZR	NAST15MZZUUR	15 0 -0.008	35	16	15.8	29	2.5	0.8	11 310	13 150	8 040	3 140	10 000	83
17	NAST17MZZ	NAST17MZZUU	NAST17MZZR	NAST17MZZUUR	17 0 -0.010	40	20	19.8	32.5	3	1	16 000	19 220	11 800	3 720	9 500	135
20	NAST20MZZ	NAST20MZZUU	NAST20MZZR	NAST20MZZUUR	20 0 -0.010	47	20	19.8	38	3	1	17 660	22 540	13 800	4 610	8 500	195
25	NAST25MZZ	NAST25MZZUU	NAST25MZZR	NAST25MZZUUR	25 0 -0.010	52	20	19.8	43	3	1	19 040	26 120	15 300	5 290	7 000	225
30	NAST30MZZ	NAST30MZZUU	NAST30MZZR	NAST30MZZUUR	30 0 -0.010	62	25	24.8	50.5	4	1.2	27 870	41 760	22 100	6 660	5 500	400
35	NAST35MZZ	NAST35MZZUU	NAST35MZZR	NAST35MZZUUR	35 0 -0.012	72	25	24.8	53.5	4	1.2	29 620	46 550	25 700	8 130	5 000	550
40	NAST40MZZ	NAST40MZZUU	NAST40MZZR	NAST40MZZUUR	40 0 -0.012	80	26	25.8	61.5	4	1.2	32 840	56 210	30 300	9 310	4 000	710
45	NAST45MZZ	NAST45MZZUU	NAST45MZZR	NAST45MZZUUR	45 0 -0.012	85	26	25.8	66.5	4	1.2	34 130	61 080	31 100	10 100	4 000	760
50	NAST50MZZ	NAST50MZZUU	NAST50MZZR	NAST50MZZUUR	50 0 -0.012	90	26	25.8	76	4	1.2	35 600	66 050	34 000	11 000	3 500	830

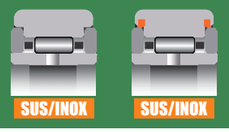
* Without seals, suitable for grease lubrication. In case of oil lubrication, up to 130% of this value shall be permissible, and 70% of this value shall apply for types with seals.

OUTER RINGS TOLERANCE (Outside diameter) (μm)

TYPE	Cylindrical outer ring	Crowned outer ring
NAST6M,NAST8M,NAST10M	0/-9	0/-50
NAST12M,NAST15M,NAST17M,NAST20M	0/-11	0/-50
NAST25M,NAST30M,NAST35M,NAST40M	0/-13	0/-50
NAST45M,NAST50M	0/-15	0/-50

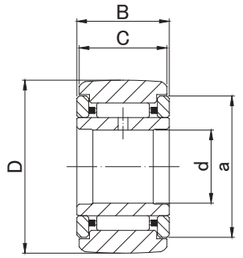
ROLLER FOLLOWERS STAINLESS STEEL

NON SEPARABLE WITH INNER RING

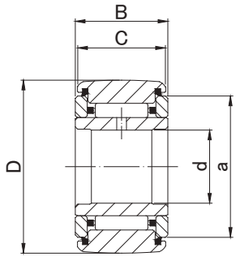


NART..MR

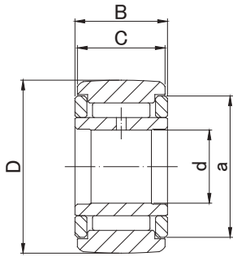
NART..VMR



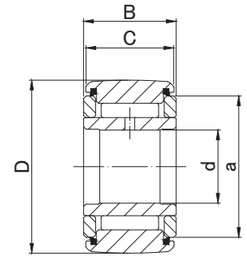
NART..MR
NART..MX



NART..MUUR
NART..MUUX



NART..MVR
NART..MVX



NART..MUUVR
NART..MUUVX

NART.. M TYPE

Prepacked Grease

Shaft Diameter (mm)	Designation: Crowned outer ring R500(≦ NART17R) R1000(NART20R ≦) Without seals	Designation: Crowned outer ring With seals	Designation: Cylindrical outer ring Without seals	Designation: Cylindrical outer ring With seals	d	D	B	C	a	Basic dynamic load rating Cr N	Basic static load rating Cor N	Track load capacity Crowned outer ring N	Track load capacity Cylindrical outer ring N	Limiting speed * rpm	Mass g (approx)
5	**NART 5MR** **NART 5MVR**	**NART 5MUUR** **NART 5MUUVR**	**NART 5MX** **NART 5MVX**	**NART 5MUUX** **NART 5MUUVX**	5 0 -0.008	**16**	12	11	12	3 330 6 210	3 420 7 670	1 080 1 080	3 430 3 430	25 000 8 500	14.5 15.1
6	**NART 6MR** **NART 6MVR**	**NART 6MUUR** **NART 6MUUVR**	**NART 6MX** **NART 6MVX**	**NART 6MUUX** **NART 6MUUVX**	6 0 -0.008	**19**	12	11	14	3 860 7 020	4 320 9 470	1 370 1 370	4 020 4 020	20 000 7 000	20.5 21.5
8	**NART 8MR** **NART 8MVR**	**NART 8MUUR** **NART 8MUUVR**	**NART 8MX** **NART 8MVX**	**NART 8MUUX** **NART 8MUUVX**	8 0 -0.008	**24**	15	14	17.5	6 070 10 850	6 710 14 350	1 860 1 860	5 950 5 950	17 000 5 500	41.5 42.5
10	**NART10MR** **NART10MVR**	**NART10MUUR** **NART10MUUVR**	**NART10MX** **NART10MVX**	**NART10MUUX** **NART10MUUVX**	10 0 -0.008	**30**	15	14	23.5	7 910 14 350	7 630 16 650	2 450 2 450	7 060 7 060	15 000 5 000	64.5 66.5
12	**NART12MR** **NART12MVR**	**NART12MUUR** **NART12MUUVR**	**NART12MX** **NART12MVX**	**NART12MUUX** **NART12MUUVX**	12 0 -0.008	**32**	15	14	25.5	8 370 15 450	8 460 18 860	2 740 2 740	7 450 7 450	13 000 4 500	71 73
15	**NART15MR** **NART15MVR**	**NART15MUUR** **NART15MUUVR**	**NART15MX** **NART15MVX**	**NART15MUUX** **NART15MUUVX**	15 0 -0.008	**35**	19	18	29	13 240 23 090	16 190 33 480	3 140 3 140	11 200 11 200	10 000 3 500	102 106
17	**NART17MR** **NART17MVR**	**NART17MUUR** **NART17MUUVR**	**NART17MX** **NART17MVX**	**NART17MUUX** **NART17MUUVX**	17 0 -0.008	**40**	21	20	32.5	17 110 29 440	20 700 42 500	3 720 3 720	14 400 14 400	9 500 3 000	149 155
20	**NART20MR** **NART20MVR**	**NART20MUUR** **NART20MUUVR**	**NART20MX** **NART20MVX**	**NART20MUUX** **NART20MUUVX**	20 0 -0.010	**47**	25	24	38	22 170 38 360	30 080 61 910	7 150 7 150	21 000 21 000	8 000 2 500	250 255
25	**NART25MR** **NART25MVR**	**NART25MUUR** **NART25MUUVR**	**NART25MX** **NART25MVX**	**NART25MUUX** **NART25MUUVX**	25 0 -0.010	**52**	25	24	43	23 730 41 860	34 500 72 680	8 230 8 230	23 200 23 200	7 000 2 500	285 295
30	**NART30MR** **NART30MVR**	**NART30MUUR** **NART30MUUVR**	**NART30MX** **NART30MVX**	**NART30MUUX** **NART30MUUVX**	30 0 -0.010	**62**	29	28	50.5	33 300 55 010	52 340 101 560	10 500 10 500	33 000 33 000	5 500 1 800	470 485
35	**NART35MR** **NART35MVR**	**NART35MUUR** **NART35MUUVR**	**NART35MX** **NART35MVX**	**NART35MUUX** **NART35MUUVX**	35 0 -0.012	**72**	29	28	53.5	35 140 57 960	57 770 111 780	12 900 12 900	38 000 38 000	5 000 1 700	640 655
40	**NART40MR** **NART40MVR**	**NART40MUUR** **NART40MUUVR**	**NART40MX** **NART40MVX**	**NART40MUUX** **NART40MUUVX**	40 0 -0.012	**80**	32	30	61.5	42 500 70 100	77 920 151 060	14 900 14 900	44 400 44 000	4 000 1 400	845 865
45	**NART45MR** **NART45MVR**	**NART45MUUR** **NART45MUUVR**	**NART45MX** **NART45MVX**	**NART45MUUX** **NART45MUUVX**	45 0 -0.012	**85**	32	30	66.5	45 350 73 780	87 580 166 610	16 100 16 100	47 000 47 000	4 000 1 300	915 935
50	**NART50MR** **NART50MVR**	**NART50MUUR** **NART50MUUVR**	**NART50MX** **NART50MVX**	**NART50MUUX** **NART50MUUVX**	50 0 -0.012	**90**	32	30	76	47 010 77 370	94 110 182 160	17 300 17 300	50 000 50 000	3 500 1 200	980 1 010

* Without seals, suitable for grease lubrication. In case of oil lubrication, up to 130% of this value shall be permissible, and 70% of this value shall apply for types with seals.

OUTER RINGS TOLERANCE (Outside diameter) (μm)

TYPE	Crowned outer ring	Cylindrical outer ring
NART5M	0/-50	0/-8
NART6M,NART8M,NART10M	0/-50	0/-9
NART12M,NART15M,NART17M,NART20M	0/-50	0/-11
NART25M,NART30M,NART35M,NART40M	0/-50	0/-13
NART45M,NART50M	0/-50	0/-15

[Reference material]

Shaft dimensional allowance

Unit: μm

Nominal bearing bore diameter and nominal diameter of shaft d (mm)		Tolerance grade for shaft																															
		b12		c12		d6		e6		e7		f5		f6		g5		g6		h5		h6		h7		h8		h9		h10		h11	
Over	Incl.	high	low	high	low	high	low	high	low	high	low	high	low	high	low	high	low	high	low	high	low	high	low	high	low	high	low	high	low	high	low	high	low
—	3	-140	-240	-60	-160	-20	-26	-14	-20	-14	-24	-6	-10	-6	-12	-2	-6	-2	-8	0	-4	0	-6	0	-10	0	-14	0	-25	0	-40	0	-60
3	6	-140	-260	-70	-190	-30	-38	-20	-28	-20	-32	-10	-15	-10	-18	-4	-9	-4	-12	0	-5	0	-8	0	-12	0	-18	0	-30	0	-48	0	-75
6	10	-150	-300	-80	-230	-40	-49	-25	-34	-25	-40	-13	-19	-13	-22	-5	-11	-5	-14	0	-6	0	-9	0	-15	0	-22	0	-36	0	-58	0	-90
10	18	-150	-330	-95	-275	-50	-61	-32	-43	-32	-50	-16	-24	-16	-27	-6	-14	-6	-17	0	-8	0	-11	0	-18	0	-27	0	-43	0	-70	0	-110
18	30	-160	-370	-110	-320	-65	-78	-40	-53	-40	-61	-20	-29	-20	-33	-7	-16	-7	-20	0	-9	0	-13	0	-21	0	-33	0	-52	0	-84	0	-130
30	40	-170	-420	-120	-370	-80	-96	-50	-66	-50	-75	-25	-36	-25	-41	-9	-20	-9	-25	0	-11	0	-16	0	-25	0	-39	0	-62	0	-100	0	-160
40	50	-180	-430	-130	-380																												
50	65	-190	-490	-140	-440	-100	-119	-60	-79	-60	-90	-30	-43	-30	-49	-10	-23	-10	-29	0	-13	0	-19	0	-30	0	-46	0	-74	0	-120	0	-190
65	80	-200	-500	-150	-450																												
80	100	-220	-570	-170	-520	-120	-142	-72	-94	-72	-107	-36	-51	-36	-58	-12	-27	-12	-34	0	-15	0	-22	0	-35	0	-54	0	-87	0	-140	0	-220
100	120	-240	-590	-180	-530																												
120	140	-260	-660	-200	-600	-145	-170	-85	-110	-85	-125	-43	-61	-43	-68	-14	-32	-14	-39	0	-18	0	-25	0	-40	0	-63	0	-100	0	-160	0	-250
140	160	-280	-680	-210	-610																												
160	180	-310	-710	-230	-630																												
180	200	-340	-800	-240	-700	-170	-199	-100	-129	-100	-146	-50	-70	-50	-79	-15	-35	-15	-44	0	-20	0	-29	0	-46	0	-72	0	-115	0	-185	0	-290
200	225	-380	-840	-260	-720																												
225	250	-420	-880	-280	-740																												
250	280	-480	-1000	-300	-820	-190	-222	-110	-142	-110	-162	-56	-79	-56	-88	-17	-40	-17	-49	0	-23	0	-32	0	-52	0	-81	0	-130	0	-210	0	-320
280	315	-540	-1060	-330	-850																												

Tolerance grade for shaft																										Nominal bearing bore diameter and nominal diameter of shaft d (mm)	
h12		js5		j5		js6		j6		j7		k5		k6		m5		m6		n5		n6		p6			
high	low	high	low	high	low	high	low	high	low	high	low	high	low	high	low	high	low	high	low	high	low	high	low	high	low	Over	Incl.
0	-100	+2	-2	+2	-2	+3	-3	+4	-2	+6	-4	+4	0	+6	0	+6	+2	+8	+2	+8	+4	+10	+4	+12	+6	—	3
0	-120	+2.5	-2.5	+3	-2	+4	-4	+6	-2	+8	-4	+6	+1	+9	+1	+9	+4	+12	+4	+13	+8	+16	+8	+20	+12	3	6
0	-150	+3	-3	+4	-2	+4.5	-4.5	+7	-2	+10	-5	+7	+1	+10	+1	+12	+6	+15	+6	+16	+10	+19	+10	+24	+15	6	10
0	-180	+4	-4	+5	-3	+5.5	-5.5	+8	-3	+12	-6	+9	+1	+12	+1	+15	+7	+18	+7	+20	+12	+23	+12	+29	+18	10	18
0	-210	+4.5	-4.5	+5	-4	+6.5	-6.5	+9	-4	+13	-8	+11	+2	+15	+2	+17	+8	+21	+8	+24	+15	+28	+15	+35	+22	18	30
0	-250	+5.5	-5.5	+6	-5	+8	-8	+11	-5	+15	-10	+13	+2	+18	+2	+20	+9	+25	+9	+28	+17	+33	+17	+42	+26	30	40
																										40	50
0	-300	+6.5	-6.5	+6	-7	+9.5	-9.5	+12	-7	+18	-12	+15	+2	+21	+2	+24	+11	+30	+11	+33	+20	+39	+20	+51	+32	50	65
																										65	80
0	-350	+7.5	-7.5	+6	-9	+11	-11	+13	-9	+20	-15	+18	+3	+25	+3	+28	+13	+35	+13	+38	+23	+45	+23	+59	+37	80	100
																										100	120
0	-400	+9	-9	+7	-11	+12.5	-12.5	+14	-11	+22	-18	+21	+3	+28	+3	+33	+15	+40	+15	+45	+27	+52	+27	+68	+43	120	140
																										140	160
																										160	180
0	-460	+10	-10	+7	-13	+14.5	-14.5	+16	-13	+25	-21	+24	+4	+33	+4	+37	+17	+46	+17	+51	+31	+60	+31	+79	+50	180	200
																										200	225
																										225	250
0	-520	+11.5	-11.5	+7	-16	+16	-16	+16	-16	+26	-26	+27	+4	+36	+4	+43	+20	+52	+20	+57	+34	+66	+34	+88	+56	250	280
																										280	315

[Reference material]

Housing hole dimensional allowance

Unit: μm

Nominal bearing outer diameter and nominal hole diameter D(mm)		Hole tolerance area class																															
		B12		E7		E8		E9		F6		F7		G6		G7		H6		H7		H8		H9		H10		H11		JS6		J6	
Over	Incl.	high	low	high	low	high	low	high	low	high	low	high	low	high	low	high	low	high	low	high	low	high	low	high	low	high	low	high	low	high	low	high	low
—	3	+240	+140	+24	+14	+28	+14	+39	+14	+12	+6	+16	+6	+8	+2	+12	+2	+6	0	+10	0	+14	0	+25	0	+40	0	+60	0	+3	-3	+2	-4
3	6	+260	+140	+32	+20	+38	+20	+50	+20	+18	+10	+22	+10	+12	+4	+16	+4	+8	0	+12	0	+18	0	+30	0	+48	0	+75	0	+4	-4	+5	-3
6	10	+300	+150	+40	+25	+47	+25	+61	+25	+22	+13	+28	+13	+14	+5	+20	+5	+9	0	+15	0	+22	0	+36	0	+58	0	+90	0	+4.5	-4.5	+5	-4
10	18	+330	+150	+50	+32	+59	+32	+75	+32	+27	+16	+34	+16	+17	+6	+24	+6	+11	0	+18	0	+27	0	+43	0	+70	0	+110	0	+5.5	-5.5	+6	-5
18	30	+370	+160	+61	+40	+73	+40	+92	+40	+33	+20	+41	+20	+20	+7	+28	+7	+13	0	+21	0	+33	0	+52	0	+84	0	+130	0	+6.5	-6.5	+8	-5
30	40	+420	+170	+75	+50	+89	+50	+112	+50	+41	+25	+50	+25	+25	+9	+34	+9	+16	0	+25	0	+39	0	+62	0	+100	0	+160	0	+8	-8	+10	-6
40	50	+430	+180																														
50	65	+490	+190	+90	+60	+106	+60	+134	+60	+49	+30	+60	+30	+29	+10	+40	+10	+19	0	+30	0	+46	0	+74	0	+120	0	+190	0	+9.5	-9.5	+13	-6
65	80	+500	+200																														
80	100	+570	+220	+107	+72	+126	+72	+159	+72	+58	+36	+71	+36	+34	+12	+47	+12	+22	0	+35	0	+54	0	+87	0	+140	0	+220	0	+11	-11	+16	-6
100	120	+590	+240																														
120	140	+660	+260	+125	+85	+148	+85	+185	+85	+68	+43	+83	+43	+39	+14	+54	+14	+25	0	+40	0	+63	0	+100	0	+160	0	+250	0	+12.5	-12.5	+18	-7
140	160	+680	+280																														
160	180	+710	+310																														
180	200	+800	+340	+146	+100	+172	+100	+215	+100	+79	+50	+96	+50	+44	+15	+61	+15	+29	0	+46	0	+72	0	+115	0	+185	0	+290	0	+14.5	-14.5	+22	-7
200	225	+840	+380																														
225	250	+880	+420																														
250	280	+1000	+480	+162	+110	+191	+110	+240	+110	+88	+56	+108	+56	+49	+17	+69	+17	+32	0	+52	0	+81	0	+130	0	+210	0	+320	0	+16	-16	+25	-7
280	315	+1060	+540																														

Hole tolerance area class																										Nominal bearing outer diameter and nominal hole diameter D(mm)	
JS7		J7		K5		K6		K7		M6		M7		N6		N7		P6		P7		R7		S7			
high	low	high	low	high	low	high	low	high	low	high	low	high	low	high	low	high	low	high	low	high	low	high	low	high	low	Over	Incl.
+5	-5	+4	-6	0	-4	0	-6	0	-10	-2	-8	-2	-12	-4	-10	-4	-14	-6	-12	-6	-16	-10	-20	-14	-24	—	3
+6	-6	+6	-6	0	-5	+2	-6	+3	-9	-1	-9	0	-12	-5	-13	-4	-16	-9	-17	-8	-20	-11	-23	-15	-27	3	6
+7.5	-7.5	+8	-7	+1	-5	+2	-7	+5	-10	-3	-12	0	-15	-7	-16	-4	-19	-12	-21	-9	-24	-13	-28	-17	-32	6	10
+9	-9	+10	-8	+2	-6	+2	-9	+6	-12	-4	-15	0	-18	-9	-20	-5	-23	-15	-26	-11	-29	-16	-34	-21	-39	10	18
+10.5	-10.5	+12	-9	+1	-8	+2	-11	+6	-15	-4	-17	0	-21	-11	-24	-7	-28	-18	-31	-14	-35	-20	-41	-27	-48	18	30
+12.5	-12.5	+14	-11	+2	-9	+3	-13	+7	-18	-4	-20	0	-25	-12	-28	-8	-33	-21	-37	-17	-42	-25	-50	-34	-59	30	40
																										40	50
+15	-15	+18	-12	+3	-10	+4	-15	+9	-21	-5	-24	0	-30	-14	-33	-9	-39	-26	-45	-21	-51	-30	-60	-42	-72	50	65
																						-32	-62	-48	-78	65	80
+17.5	-17.5	+22	-13	+2	-13	+4	-18	+10	-25	-6	-28	0	-35	-16	-38	-10	-45	-30	-52	-24	-59	-38	-73	-58	-93	80	100
																						-41	-76	-66	-101	100	120
+20	-20	+26	-14	+3	-15	+4	-21	+12	-28	-8	-33	0	-40	-20	-45	-12	-52	-36	-61	-28	-68	-48	-88	-77	-117	120	140
																						-50	-90	-85	-125	140	160
																						-53	-93	-93	-133	160	180
+23	-23	+30	-16	+2	-18	+5	-24	+13	-33	-8	-37	0	-46	-22	-51	-14	-60	-41	-70	-33	-79	-60	-106	-105	-151	180	200
																						-63	-109	-113	-159	200	225
																						-67	-113	-123	-169	225	250
+26	-26	+36	-16	+3	-20	+5	-27	+16	-36	-9	-41	0	-52	-25	-57	-14	-66	-47	-79	-36	-88	-74	-126	-138	-190	250	280
																						-78	-130	-150	-202	280	315

Approximate conversion values against Rockwell C hardness of steel materials 1)

Rockwell hardness C scale (HRC)	Vickers hardness (HV)	Brinnel hardness (HB) 10mm in dia. load 3000 kgf		Rockwell hardness 3)			Rockwell superficial hardness Diamond conical penetrator			Shore hardness (HS)	Tensile strength (Approximate value) Mpa (kgf/mm^2) 2)	Rockwell hardness C scale 3) (HRC)
		Standard ball	Tungsten carbite ball	A scale (HRA) Load 60kgf Diamond conical penetrator	B scale (HRB) Load 100kgf Ball of 1.6mm (1/16') dia.	D scale (HRB) Load 100kgf Diamond conical penetrator	15-N scale Load : 15kgf	30-N scale Load : 30kgf	45-N scale Load : 45kgf			
68	940	–	–	85.6	–	76.9	93.2	84.4	75.4	97	–	68
67	900	–	–	85.0	–	76.1	92.9	83.6	74.2	95	–	67
66	865	–	–	84.5	–	75.4	92.5	82.8	73.3	92	–	66
65	832	–	(739)	83.9	–	74.5	92.2	81.9	72.0	91	–	65
64	800	–	(722)	83.4	–	73.8	91.8	81.1	71.0	88	–	64
63	772	–	(705)	82.8	–	73.0	91.4	80.1	69.9	87	–	63
62	746	–	(688)	82.3	–	72.2	91.1	79.3	68.8	85	–	62
61	720	–	(670)	81.8	–	71.5	90.7	78.4	67.7	83	–	61
60	697	–	(654)	81.2	–	70.7	90.2	77.5	66.6	81	–	60
59	674	–	(634)	80.7	–	69.9	89.8	76.6	65.5	80	–	59
58	653	–	615	80.1	–	69.2	89.3	75.7	64.3	78	–	58
57	633	–	595	79.6	–	68.5	88.9	74.8	63.2	76	–	57
56	613	–	577	79.0	–	67.7	88.3	73.9	62.0	75	–	56
55	595	–	560	78.5	–	66.9	87.9	73.0	60.9	74	2075 (212)	55
54	577	–	543	78.0	–	66.1	87.4	72.0	59.8	72	2015 (205)	54
53	560	–	525	77.4	–	65.4	86.9	71.2	58.6	71	1950 (199)	53
52	544	(500)	512	76.8	–	64.6	86.4	70.2	57.4	69	1880 (192)	52
51	528	(487)	496	76.3	–	63.8	85.9	69.4	56.1	68	1820 (186)	51
50	513	(475)	481	75.9	–	63.1	85.5	68.5	55.0	67	1760 (179)	50
49	498	(464)	469	75.2	–	62.1	85.0	67.6	53.8	66	1695 (173)	49
48	484	451	455	74.7	–	61.4	84.5	66.7	52.5	64	1635 (167)	48
47	471	442	443	74.1	–	60.8	83.9	65.8	51.4	63	1580 (161)	47
46	458	432	432	73.6	–	60.0	83.5	64.8	50.3	62	1530 (156)	46
45	446	421	421	73.1	–	59.2	83.0	64.0	49.0	60	1480 (151)	45
44	434	409	409	72.5	–	58.5	82.5	63.1	47.8	58	1435 (146)	44
43	423	400	400	72.0	–	57.7	82.0	62.2	46.7	57	1385 (141)	43
42	412	390	390	71.5	–	56.9	81.5	61.3	45.5	56	1340 (136)	42
41	402	381	381	70.9	–	56.2	80.9	60.4	44.3	55	1295 (132)	41
40	392	371	371	70.4	–	55.4	80.4	59.5	43.1	54	1250 (127)	40
39	382	362	362	69.9	–	54.6	79.9	58.6	41.9	52	1215 (124)	39
38	372	353	353	69.4	–	53.8	79.4	57.7	40.8	51	1180 (120)	38
37	363	344	344	68.9	–	53.1	78.8	56.8	39.6	50	1160 (118)	37
36	354	336	336	68.4	(109.0)	52.3	78.3	55.9	38.4	49	1115 (114)	36
35	345	327	327	67.9	(108.5)	51.5	77.7	55.0	37.2	48	1080 (110)	35
34	336	319	319	67.4	(108.0)	50.8	77.2	54.2	36.1	47	1055 (108)	34
33	327	311	311	66.8	(107.5)	50.0	76.6	53.3	34.9	46	1025 (105)	33
32	318	301	301	66.3	(107.0)	49.2	76.1	52.1	33.7	44	1000 (102)	32
31	310	294	294	65.8	(106.0)	48.4	75.6	51.3	32.5	43	980 (100)	31
30	302	286	286	65.3	(105.5)	47.7	75.0	50.4	31.3	42	950 (97)	30
29	294	279	279	64.7	(104.5)	47.0	74.5	49.5	30.1	41	930 (95)	29
28	286	271	271	64.3	(104.0)	46.1	73.9	48.6	28.9	41	910 (93)	28
27	279	264	264	63.8	(103.0)	45.2	73.3	47.7	27.8	40	880 (90)	27
26	272	258	258	63.3	(102.5)	44.6	72.8	46.8	26.7	38	860 (88)	26
25	266	253	253	62.8	(101.5)	43.8	72.2	45.9	25.5	38	840 (86)	25
24	260	247	247	62.4	(101.0)	43.1	71.6	45.0	24.3	37	825 (84)	24
23	254	243	243	62.0	100.0	42.1	71.0	44.0	23.1	36	805 (82)	23
22	248	237	237	61.5	99.0	41.6	70.5	43.2	22.0	35	785 (80)	22
21	243	231	231	61.0	98.5	40.9	69.9	42.3	20.7	35	770 (79)	21
20	238	226	226	60.5	97.8	40.1	69.4	41.5	19.6	34	760 (77)	20
(18)	230	219	219	–	96.7	–	–	–	–	33	730 (75)	(18)
(16)	222	212	212	–	95.5	–	–	–	–	32	705 (72)	(16)
(14)	213	203	203	–	93.9	–	–	–	–	31	675 (69)	(14)
(12)	204	194	194	–	92.3	–	–	–	–	29	650 (66)	(12)
(10)	196	187	187	–	90.7	–	–	–	–	28	620 (63)	(10)
(8)	188	179	179	–	89.5	–	–	–	–	27	600 (61)	(8)
(6)	180	171	171	–	87.1	–	–	–	–	26	580 (59)	(6)
(4)	173	165	165	–	85.5	–	–	–	–	25	550 (56)	(4)
(2)	166	158	158	–	83.5	–	–	–	–	24	530 (54)	(2)
(0)	160	152	152	–	81.7	–	–	–	–	24	515 (53)	(0)

Note: 1) ▭ are based on Table 1 of ASTM E 140(adjusted by SAE, ASM and ASTM in collaboration).
2) The values and units in parentheses[ ] have been converted from psi based on conversion tables of JIS Z 8413 and Z 8438.1MPa=1N/mm^2
3) The figures in parentheses( ) are less frequently used values and are for reference only.

Approximate conversion values against Vickers hardness of steel materials 1)

Vickers hardness (HV)	Brinnel hardness 10 mm ball, load 3000 kgf		Rockwell hardness 3)				Rockwell special hardness special brake indenter			Shore hardness (HS)	Tensile strength kgf/mm² Approx. value 2)	Vickers hardness Load 50kgf
	Standard ball	Tungsten carbite ball	A scale Load 60 kgf brale identer	B scale Load 100 kgf dia. 1/16in. Ball	C-scale Load 150 kgf brale indenter	D-scale Load 100 kgf brale indenter	15-N scale Load 15 kgf	30-N scale Load 30 kgf	45-N scale load 45 kgf			
940	–	–	85.6	–	68.0	76.9	93.2	84.4	75.4	97	–	940
920	–	–	85.3	–	67.5	76.5	93.0	84.0	74.8	96	–	920
900	–	–	85.0	–	67.0	76.1	92.9	83.6	74.2	95	–	900
880	–	(767)	84.7	–	66.4	75.7	92.7	83.1	73.6	93	–	880
860	–	(757)	84.4	–	65.9	75.3	92.5	82.7	73.1	92	–	860
840	–	(745)	84.1	–	65.3	74.8	92.3	82.2	72.2	91	–	840
820	–	(733)	83.8	–	64.7	74.3	92.1	81.7	71.8	90	–	820
800	–	(722)	83.4	–	64.0	73.8	91.8	81.1	71.0	88	–	800
780	–	(710)	83.0	–	63.3	73.3	91.5	80.4	70.2	87	–	780
760	–	(698)	82.6	–	62.5	72.6	91.2	79.7	69.4	86	–	760
740	–	(684)	82.2	–	61.8	72.1	91.0	79.1	68.6	84	–	740
720	–	(670)	81.8	–	61.0	71.5	90.7	78.4	67.7	83	–	720
700	–	(656)	81.3	–	60.1	70.8	90.3	77.6	66.7	81	–	700
690	–	(647)	81.1	–	59.7	70.5	90.1	77.2	66.2	–	–	690
680	–	(638)	80.8	–	59.2	70.1	89.8	76.8	65.7	80	–	680
670	–	630	80.6	–	58.8	69.8	89.7	76.4	65.3	–	–	670
660	–	620	80.3	–	58.3	69.4	89.5	75.9	64.7	79	–	660
650	–	611	80.0	–	57.8	69.0	89.2	75.5	64.1	–	–	650
640	–	601	79.8	–	57.3	68.7	89.0	75.1	63.5	77	–	640
630	–	591	79.5	–	56.8	68.3	88.8	74.6	63.0	–	–	630
620	–	582	79.2	–	56.3	67.9	88.5	74.2	62.4	75	–	620
610	–	573	78.9	–	55.7	67.5	88.2	73.6	61.7	–	–	610
600	–	564	78.6	–	55.2	67.0	88.0	73.2	61.2	74	–	600
590	–	554	78.4	–	54.7	66.7	87.8	72.7	60.5	–	210	590
580	–	545	78.0	–	54.1	66.2	87.5	72.1	59.9	72	206	580
570	–	535	77.8	–	53.6	65.8	87.2	71.7	59.3	–	202	570
560	–	525	77.4	–	53.0	65.4	86.9	71.2	58.6	71	199	560
550	(505)	517	77.0	–	52.3	64.8	86.6	70.5	57.8	–	194	550
540	(496)	507	76.7	–	51.7	64.4	86.3	70.0	57.0	69	190	540
530	(488)	497	76.4	–	51.1	63.9	86.0	69.5	56.2	–	186	530
520	(480)	488	76.1	–	50.5	63.5	85.7	69.0	55.6	67	183	520
510	(473)	479	75.7	–	49.8	62.9	85.4	68.3	54.7	–	179	510
500	(465)	471	75.3	–	49.1	62.2	85.0	67.7	53.9	66	174	500
490	(456)	460	74.9	–	48.4	61.6	84.7	67.1	53.1	–	169	490
480	448	452	74.5	–	47.7	61.3	84.3	66.4	52.2	64	165	480
470	441	442	74.1	–	46.9	60.7	83.9	65.7	51.3	–	160	470
460	433	433	73.6	–	46.1	60.1	83.6	64.9	50.4	62	156	460
450	425	425	73.3	–	45.3	59.4	83.2	64.3	49.4	–	153	450
440	415	415	72.8	–	44.5	58.8	82.8	63.5	48.4	59	149	440
430	405	405	72.3	–	43.6	58.2	82.3	62.7	47.4	–	144	430
420	397	397	71.8	–	42.7	57.5	81.8	61.9	46.4	57	140	420
410	388	388	71.4	–	41.8	56.8	81.4	61.1	45.3	–	136	410
400	379	379	70.8	–	40.8	56.0	81.0	60.2	44.1	55	131	400
390	369	369	70.3	–	39.8	55.2	80.3	59.3	42.9	–	127	390
380	360	360	69.8	(110.0)	38.8	54.4	79.8	58.4	41.7	52	123	380
370	350	350	69.2	–	37.7	53.6	79.2	57.4	40.4	–	120	370
360	341	341	68.7	(109.0)	36.6	52.8	78.6	56.4	39.1	50	115	360
350	331	331	68.1	–	35.5	51.9	78.0	55.4	37.8	–	112	350
340	322	322	67.6	(108.0)	34.4	51.1	77.4	54.4	36.5	47	109	340
330	313	313	67.0	–	33.3	50.2	76.8	53.6	35.2	–	105	330
320	303	303	66.4	(107.0)	32.2	49.4	76.2	52.3	33.9	45	103	320
310	294	294	65.8	–	31.0	48.4	75.6	51.3	32.5	–	100	310
300	284	284	65.2	(105.5)	29.8	47.5	74.9	50.2	31.1	42	97	300
295	280	280	64.8	–	29.2	47.1	74.6	49.7	30.4	–	96	295
290	275	275	64.5	(104.5)	28.5	46.5	74.2	49.0	29.5	41	94	290
285	270	270	64.2	–	27.8	46.0	73.8	48.4	28.7	–	92	285
280	265	265	63.8	(103.5)	27.1	45.3	73.4	47.8	27.9	40	91	280
275	261	261	63.5	–	26.4	44.9	73.0	47.2	27.1	–	89	275
270	256	256	63.1	(102.0)	25.6	44.3	72.6	46.4	26.2	38	87	270
265	252	252	62.7	–	24.8	43.7	72.1	45.7	25.2	–	86	265
260	247	247	62.4	(101.0)	24.0	43.1	71.6	45.0	24.3	37	84	260
255	243	243	62.0	–	23.1	42.2	71.1	44.2	23.2	–	82	255
250	238	238	61.6	99.5	22.2	41.7	70.6	43.4	22.2	36	81	250
245	233	233	61.2	–	21.3	41.1	70.1	42.5	21.1	–	79	245
240	228	228	60.7	98.1	20.3	40.3	69.6	41.7	19.9	34	78	240
230	219	219	–	96.7	(18.0)	–	–	–	–	33	75	230
220	209	209	–	95.0	(15.7)	–	–	–	–	32	71	220
210	200	200	–	93.4	(13.4)	–	–	–	–	30	68	210
200	190	190	–	91.5	(11.0)	–	–	–	–	29	65	200
190	181	181	–	89.5	(8.5)	–	–	–	–	28	62	190
180	171	171	–	87.1	(6.0)	–	–	–	–	26	59	180
170	162	162	–	85.0	(3.0)	–	–	–	–	25	56	170
160	152	152	–	81.7	(0.0)	–	–	–	–	24	53	160
150	143	143	–	78.7	–	–	–	–	–	22	50	150
140	133	133	–	75.0	–	–	–	–	–	21	46	140
130	124	124	–	71.2	–	–	–	–	–	20	44	130
120	114	114	–	66.7	–	–	–	–	–	–	40	120
110	105	105	–	62.3	–	–	–	–	–	–	–	110
100	95	95	–	56.2	–	–	–	–	–	–	–	100
95	90	90	–	52.0	–	–	–	–	–	–	–	95
90	86	86	–	48.0	–	–	–	–	–	–	–	90
85	81	81	–	41.0	–	–	–	–	–	–	–	85

Note: 1) ▭ are based on Table 1 of ASTM E 140(adjusted by SAE, ASM and ASTM in collaboration).
2) 1MPa=1N/mm²
3) The figures in parentheses are less frequently used values and are for reference only.

JNS

A Specialist in
Needle Roller Bearing Manufacturing

The JNS corporate philosophy
Good products start from good human resources

Our corporate philosophy is that “good products start from good human resources.” With this in mind, we are actively promoting initiatives to train employees who can contribute to society, through our manufacturing activities. We strive to foster energetic young employees with flexible ideas. We are now promoting the construction of an organization that can put the right person in the right place using management principles that develop individual potential as much as possible. In doing so, we hope to create an environment in which all our employees can make their dreams come true.

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