



**NEEDLE ROLLER BEARINGS
STAINLESS STEEL**

NEEDLE ROLLER BEARINGS

CAT NO.1310

JNS

CAT NO.1310

**NEEDLE
ROLLER
BEARINGS**

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the best choice you ever made



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(Inquiry / Technical consultation)

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*A Specialist in
Needle Roller Bearing Manufacturing*



The JNS global sales network responding to customers requests in 11 languages, over 53 countries.



All of JNS products are made in Japan.

MANUFACTURING

JNS



Head Office

The nerve center of our information exchange network supports everything from sales to production control

Our head office collects the latest information from the four corners of the world as well as the trends in respective industries. As the nerve center of our business, it controls the transmission and reception of up-to-the-minute information. It also consolidates data accumulation and transmission functions using an integrated system that manages order reception, production, personnel, and accounting data. The head office plant, which is located on the premises, assembles cam followers and other products.



Nara Plant

An intelligent manufacturing plant coexisting with nature

The Nara Plant, our main manufacturing plant, is an intelligent factory featuring state-of-the-art production facilities and an original production management system that provide significant efficiency improvements and streamlined operation. The plant's production lines are constantly maintained so as to operate in the best possible condition. As an environment-adaptive plant located in beautiful natural surroundings, the Nara Plant promotes production in harmony with nature.



JNS supports custom manufacturing in cutting-edge industries where high precision and high performance are required.

PRODUCTS

JNS



Needle Roller Bearings

A needle roller bearing featuring high-precision rigid outer rings and retainers. Its space-saving design provides low cross-sectional height.



Combined Needle Roller Bearings

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.

Needle Roller Bearings

STAINLESS STEEL

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

Product lineups that meet cutting-edge industry needs

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.

A substantial variety of products delivered promptly

Aside from providing our customers with a stable supply of products, immediate delivery has been the standard at Nose Seiko for many years. We achieve this through our flexible and efficient production system—the result of extensive industry experience—that ensures we are always able to keep an extensive array of products on hand. Nose Seiko strives to provide optimum convenience for customers, responding to emergency orders within the shortest possible delivery time. Our customers appreciate our commitment to high standards.



Cam Followers

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.



Cam Followers

STAINLESS STEEL

A durable stainless-steel bearing that is rust- and corrosion-resistant. Used in cutting-edge technological fields for anticorrosive, clean, and vacuum applications.



Roller Followers

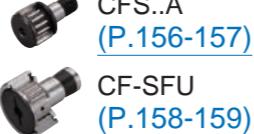
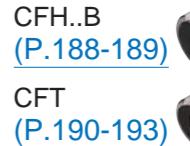
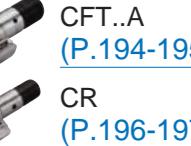
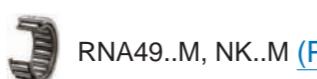
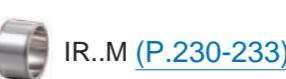
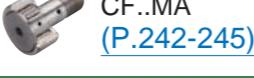
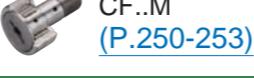
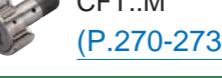
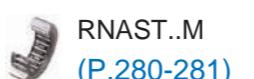
Our roller followers have a thick outer ring to support large radial loads. This bearing is designed for applications where the outer ring rotates.



Roller Followers

STAINLESS STEEL

A durable stainless-steel bearing that is rust- and corrosion-resistant. Used in cutting-edge technological fields for anticorrosive, clean, and vacuum applications.

Technical informationNEEDLE ROLLER BEARINGS [\(P.12-53\)](#)CAM FOLLOWERS [\(P.142-155\)](#)ROLLER FOLLOWERS [\(P.200-207\)](#)**NEEDLE ROLLER BEARINGS****MACHINED RING NEEDLE ROLLER BEARINGS**Type and Part Code
Structure and Features
[\(P.56-59\)](#) RNA49, RNA59,
RNA69, RNA48, NK
[\(P.60-77\)](#) NA49, NA59, NA69,
NA48, NKI
[\(P.78-87\)](#) RNA49UU,
RNA69UU, SEALED
[\(P.88-89\)](#) NA49UU, NA69UU,
SEALED
[\(P.90-91\)](#)**SEPARABLE NEEDLE ROLLER BEARINGS**Type and Part Code
Structure and Features
[\(P.94-95\)](#) RNAF(W) [\(P.96-101\)](#) NAF(W) [\(P.102-105\)](#)**COMBINED NEEDLE ROLLER BEARINGS**Type and Part Code
Structure and Features
[\(P.108-111\)](#) NKX, NKX..Z [\(P.112-113\)](#) NKXI, NKXI..Z [\(P.114-115\)](#)**INNER RINGS**Type and Part Code
Structure and Features
[\(P.118-119\)](#) IR,IRZ [\(P.120-137\)](#)**CAM FOLLOWERS**Type and Part Code
Structure and Features
[\(P.142-155\)](#)CFS..A
[\(P.156-157\)](#)CF..A
[\(P.160-163\)](#)CF-SFU
[\(P.158-159\)](#)CF..AB
[\(P.164-167\)](#)NUCF
[\(P.168-169\)](#)CF..B
[\(P.174-175\)](#)CFH..AB
[\(P.180-183\)](#)CFH..B
[\(P.188-189\)](#)CFT
[\(P.190-193\)](#)CFT..A
[\(P.194-195\)](#)CF
[\(P.170-173\)](#)CFH..A
[\(P.176-179\)](#)CFH
[\(P.184-187\)](#)CR
[\(P.196-197\)](#)**ROLLER FOLLOWERS**Type and Part Code
Structure and Features
[\(P.200-207\)](#)RNAST [\(P.208-209\)](#)NAST [\(P.210-211\)](#)NAST..ZZ [\(P.212-213\)](#)NART [\(P.214-215\)](#)NURT [\(P.216-217\)](#)**■ STAINLESS STEEL****NEEDLE ROLLER BEARINGS STAINLESS STEEL**Type and Part Code
Structure and Features
[\(P.222-223\)](#)RNA49..M, NK..M [\(P.224-227\)](#)NA49..M, NKI..M [\(P.228-229\)](#)IR..M [\(P.230-233\)](#)**CAM FOLLOWERS STAINLESS STEEL**Type and Part Code
Structure and Features
[\(P.236-239\)](#)CFS..MA
[\(P.240-241\)](#)CF..MAB
[\(P.246-249\)](#)CF..MA
[\(P.242-245\)](#)CF..M
[\(P.250-253\)](#)CF..MB
[\(P.254-255\)](#)CFH..MAB
[\(P.260-263\)](#)CFH..MB
[\(P.268-269\)](#)CFT..MA
[\(P.274-275\)](#)CFH..M
[\(P.264-267\)](#)**ROLLER FOLLOWERS STAINLESS STEEL**Type and Part Code
Structure and Features
[\(P.278-279\)](#)RNAST..M
[\(P.280-281\)](#)NAST..M
[\(P.278-279\)](#)NAST..MZZ [\(P.284-285\)](#)NART..M [\(P.286-287\)](#)

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.

L₁₀ : Basic rating life 10⁶rotation

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.

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

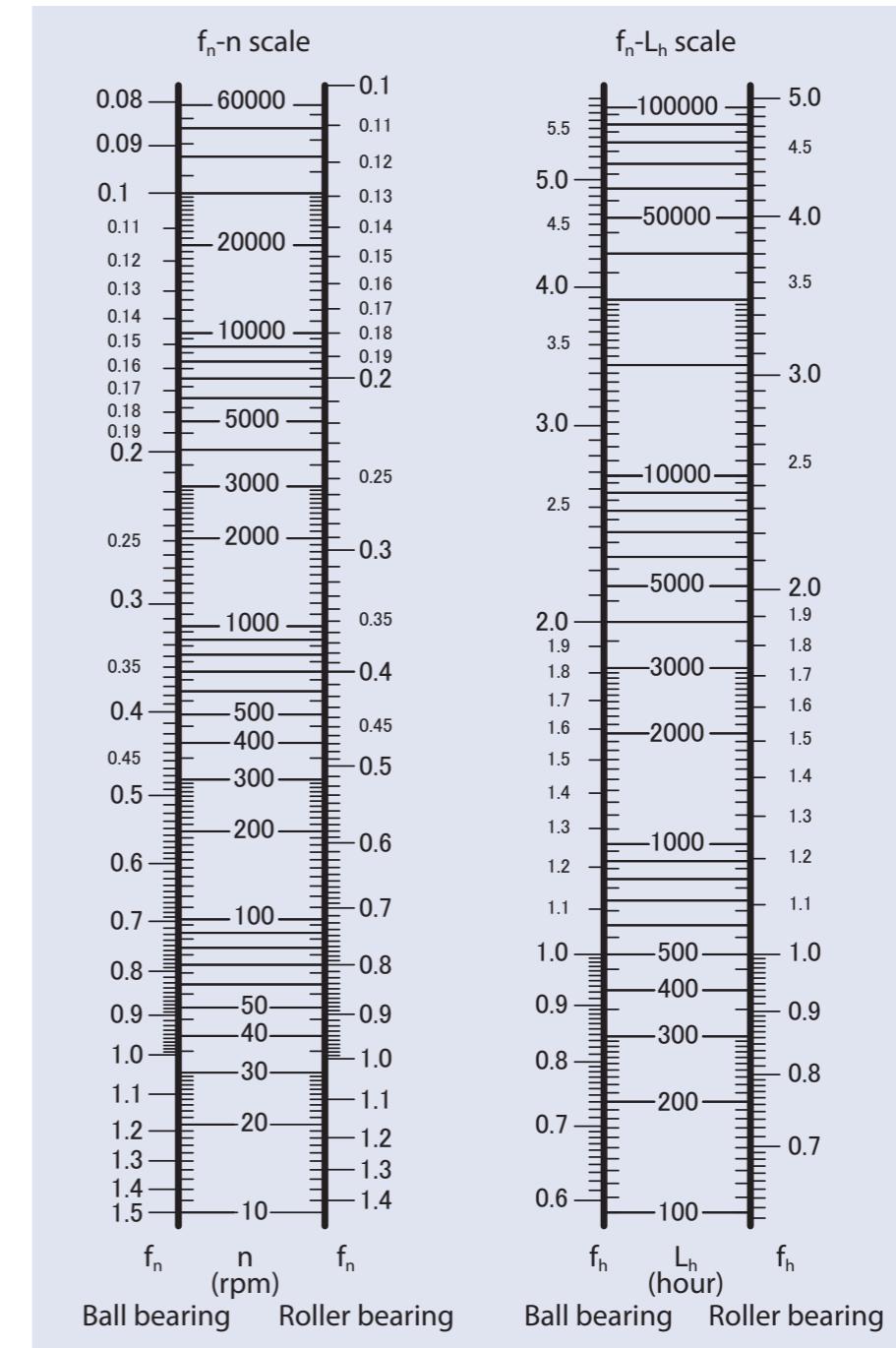
L_h : Basic rating life expressed in hour h

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.

Demand 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} : Adjustment rating life 10⁶ rotation

a₁ : Reliability factor

a₂ : Bearing special properties factor

a₃ : 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.

C₁ : Basic dynamic load rating with consideration for temperature increase N

f₁ : Temperature factor (Refer to Figure-1)

C_r : Basic dynamic load rating N

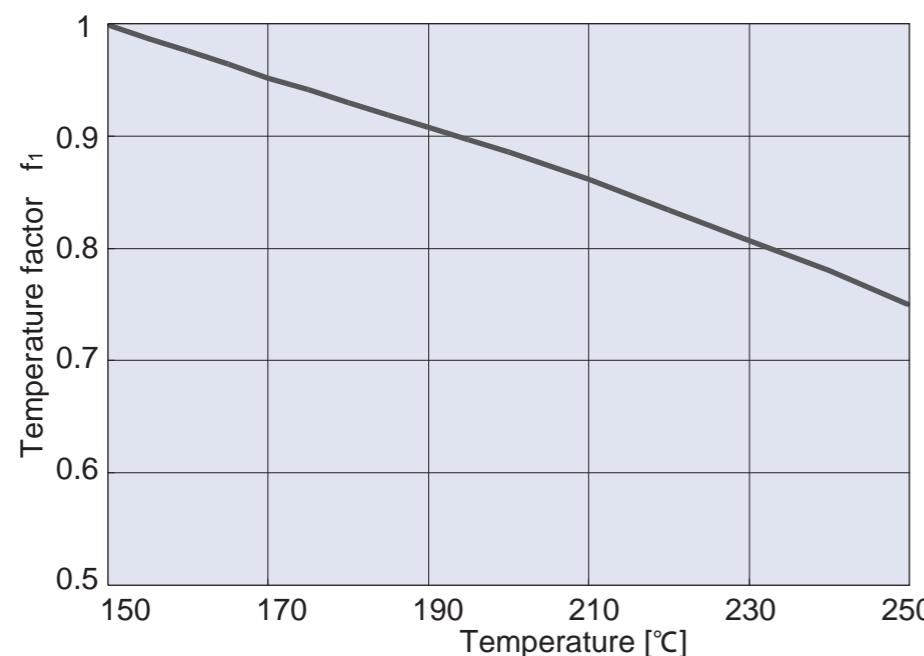


Figure-1

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.

C₂ : Basic dynamic load rating with consideration for hardness N

f₂ : Hardness factor (Refer to Figure-2)

C_r : Basic dynamic load rating N

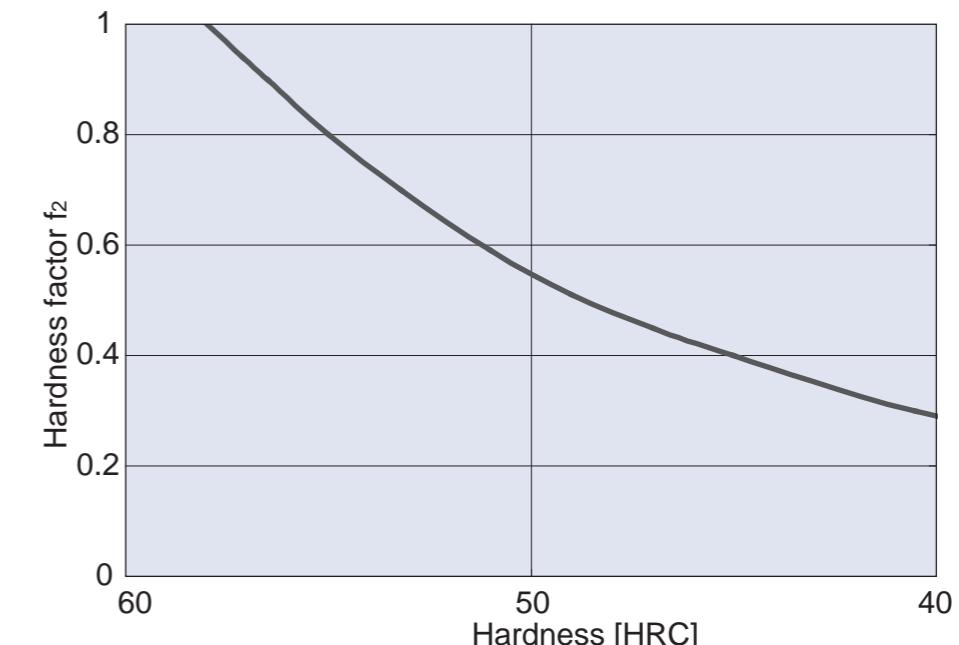


Figure-2

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

2 Bearing load

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_{or} : 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 f_s is given by the following formula (1.9). Table-3 shows its typical values.

f_s : Safety factor

C_{or} : Basic static load rating N

Table-3 Static safety factor

Operating conditions of bearing	f_s
With high rotation accuracy	≥ 3
With impact load	
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.

Permissible 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.

2-1 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 : Actual load applied to axes system N

K_c : Theoretical calculation value N

f_w : Load factor (Table-4)

Table-4 Load factor

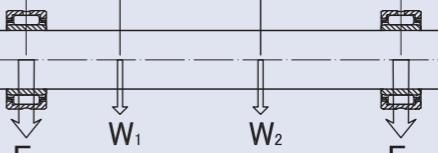
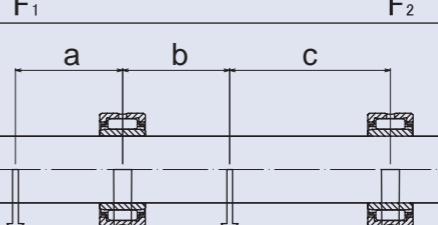
Degree of load	Examples	f_w
Smooth motion without any impacts	Air conditioner, measurement instruments, office equipment	1 ~1.2
With standard rotation	Gear box, vehicle, paper-making machine	1.2~1.5
Operation with vibration and impact shock	Rolling machine, construction machinery, crusher	1.5~3

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

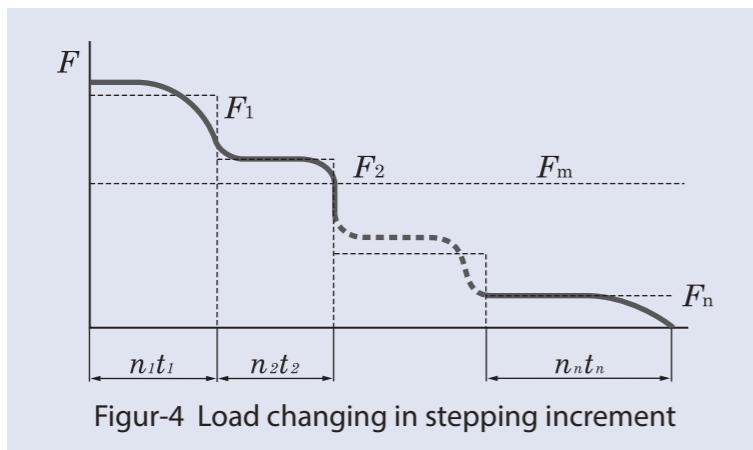
Examples	Load calculation
	$F_1 = \frac{W_1(b + c) + W_2c}{a + b + c}$ $F_2 = \frac{W_1a + W_2(a + b)}{a + b + c}$
	$F_1 = \frac{W_1(a + b + c) + W_2c}{b + c}$ $F_2 = \frac{W_2b - W_1a}{b + c}$

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.

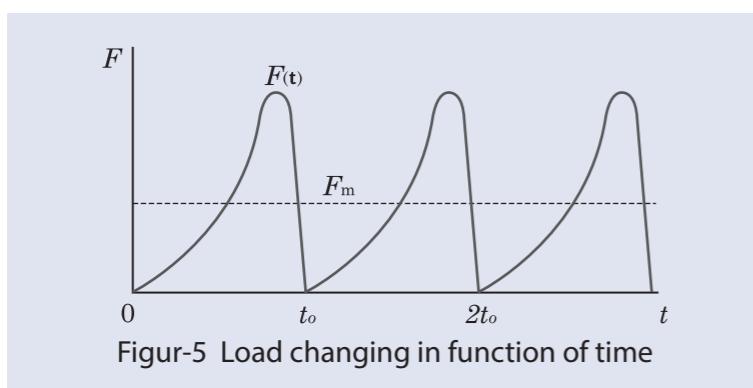
(1) Fluctuating step load

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



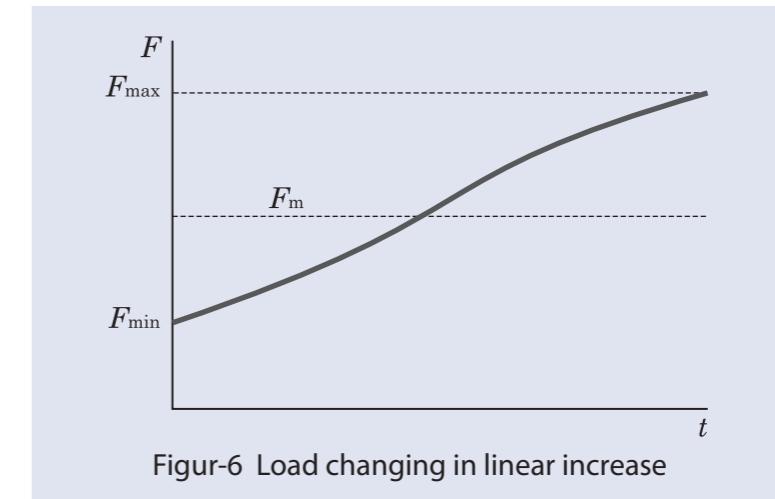
(2) Continuously fluctuating load

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 .



(3) Roughly linear load

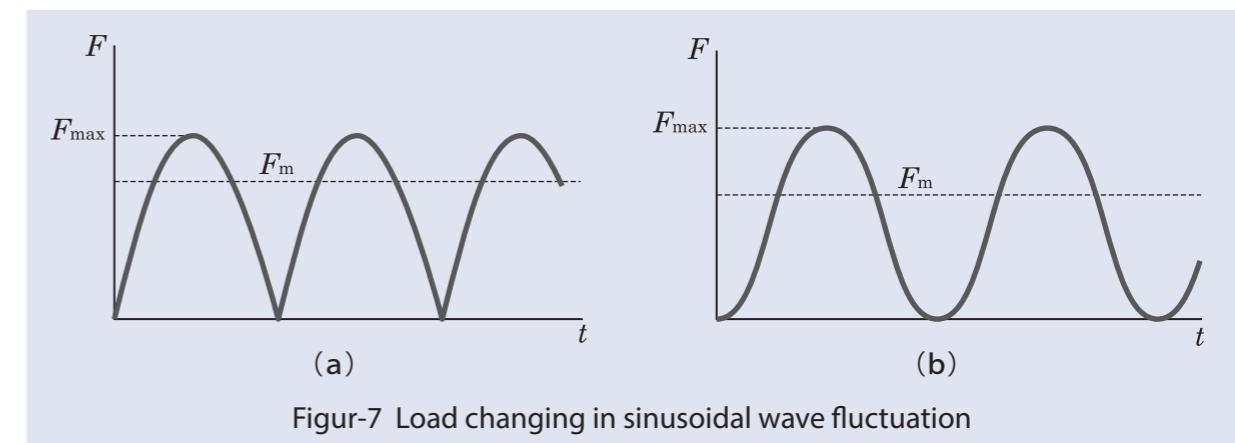
Average load F_m is approximately given by formula (2.12).



(4) Sinusoidal fluctuating load

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

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



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

d Nominal bearing bore diameter (mm)	Δ_{dmp} Deviation of mean bore diameter in a single plane				V_{dsp} Variation of bore diam- eter 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)	Unit: μm									
	0		6		5		4		0		6		5		4		0		6		5		4		5		4								
	Over	Incl.	high	low	high	low	high	low	high	low	max.	max.	max.	max.	max.	0	6	5	4	5	4	0	6	5	4	0	6	5	4	0	6	5	4		
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		
18	30	0	-10	0	-8	0	-6	0	-5	13	10	6	5	8	6	3	2.5	13	8	4	3	8	4	0	-120	0	-120	20	20	5	2.5	18	30		
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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

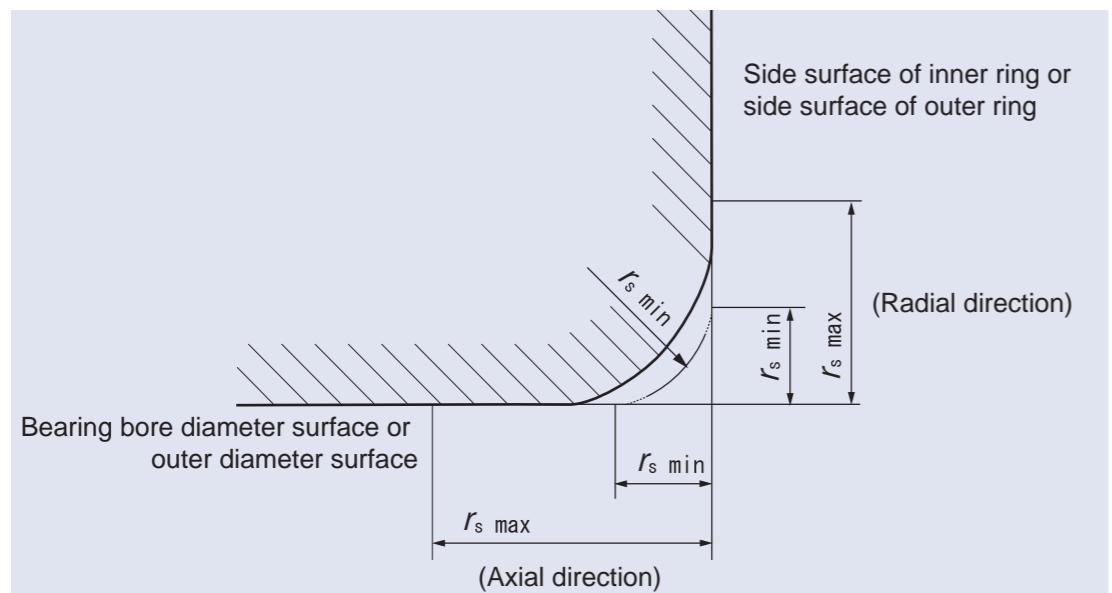
D Nominal bearing outside diameter (mm)	Δ_{Dmp} Deviation of mean outside diameter in a sin- gle plane				V_{Dsp} Variation of outside diameter in a single plane				V_{Dmp} Variation of mean outside diameter in a single plane				K_{ea} Radial runout of outer ring of assembled bearing				S_D Variation 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)	Unit: μm											
	0		6		5		4		0		6		5		4		0		6		5		4		5		4										
	Over	Incl.	high	low	high	low	high	low	high	low	max.	max.	max.	max.	max.	0	6	5	4	5	4	0	6	5	4	0	6	5	4	0	6	5	4				
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	15	8	5	3	8	4	15	8	5	3	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	15	8	5	3	8	4	15	8	5	3	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	15	9	6	4	8	4	15	9	6	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	20	10	7	5	8	4</td								

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	0.6	1
	40	—	0.8	1
0.6	—	40	1	2
	40	—	1.3	2
1	—	50	1.5	3
	50	—	1.9	3
1.1	—	120	2	3.5
	120	—	2.5	4
1.5	—	120	2.3	4
	120	—	3	5
2	—	80	3	4.5
	80	220	3.5	5
	220	—	3.8	6
2.1	—	280	4	6.5
	280	—	4.5	7
2.5	—	100	3.8	6
	100	280	4.5	6
	280	—	5	7
3	—	280	5	8
	280	—	5.5	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 bore 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.
<p>Method of measurement of bearing bore diameter</p>	

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 $d_{s\ min}$.

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.
<p>Method of measurement of bearing outer diameter</p>	

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 $D_{s\ min}$.

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 × r _s max

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		Measure- ment 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 nominal 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 $C_{s\ min}$).

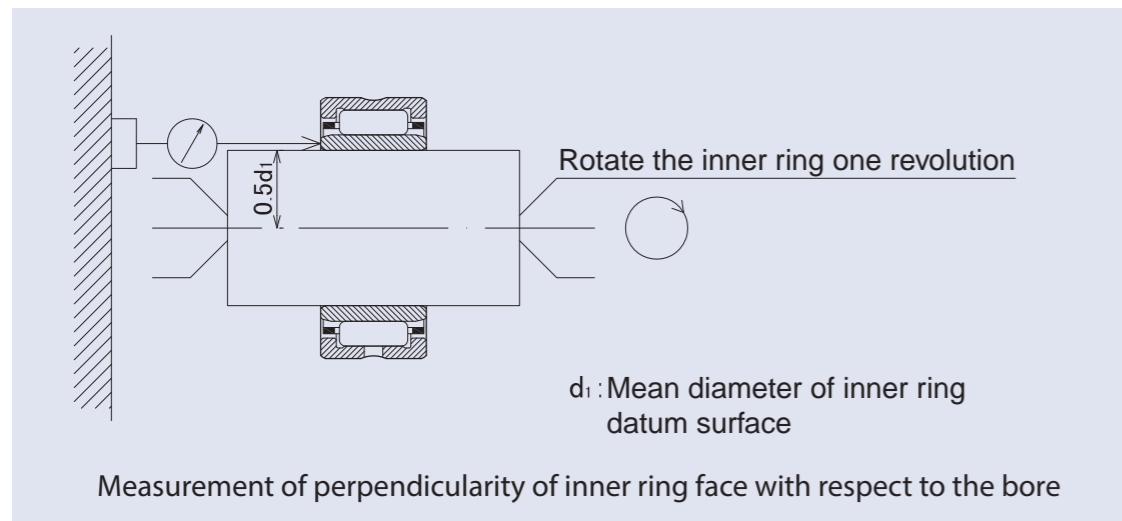
Measurement of perpendicularity of inner ring face with respect to the bore (S_d)

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.



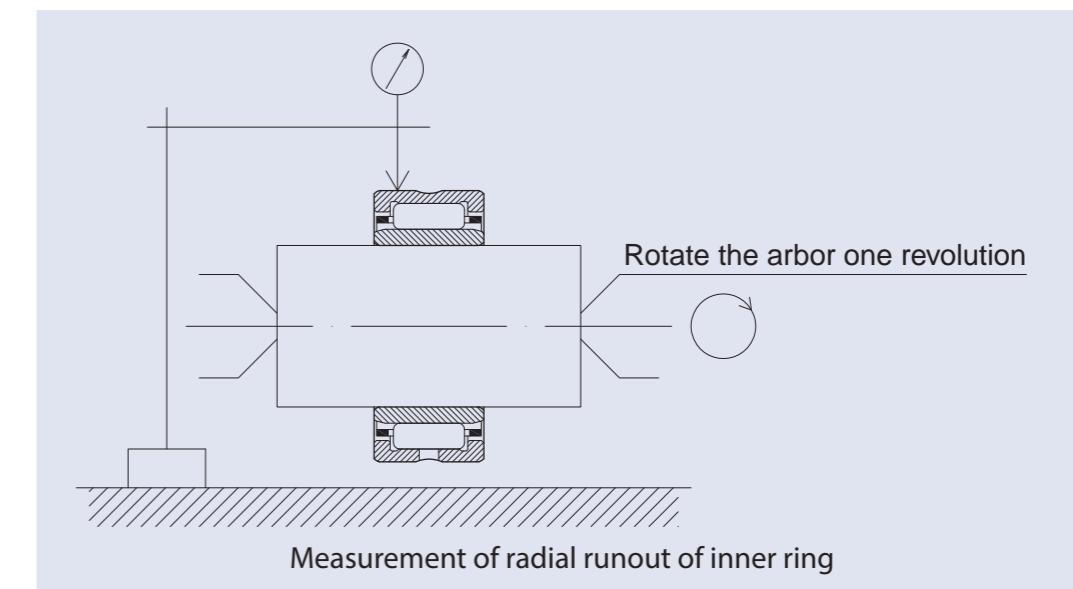
Measurement of radial runout of inner ring (K_{ia})

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.

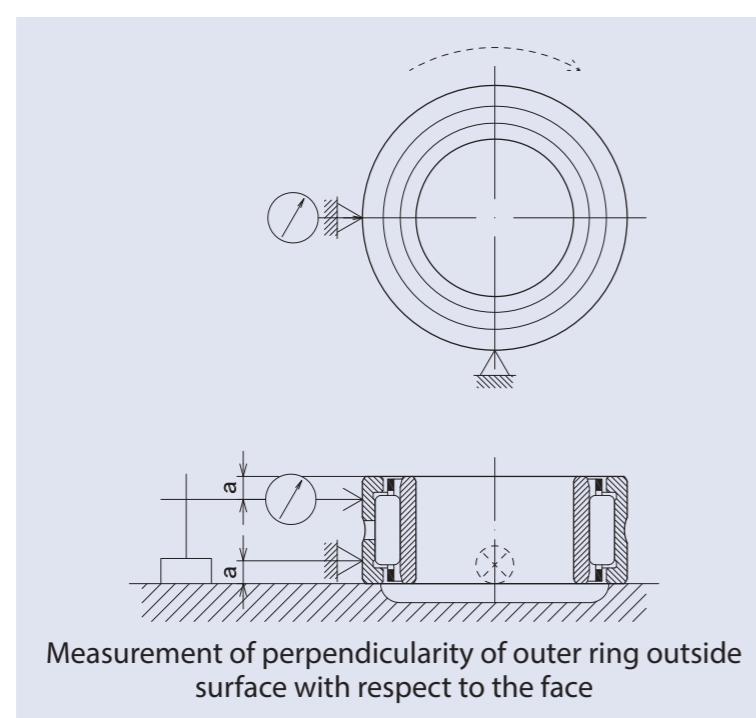


Measurement of perpendicularity of outer ring outside surface with respect to the face (S_D)

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.



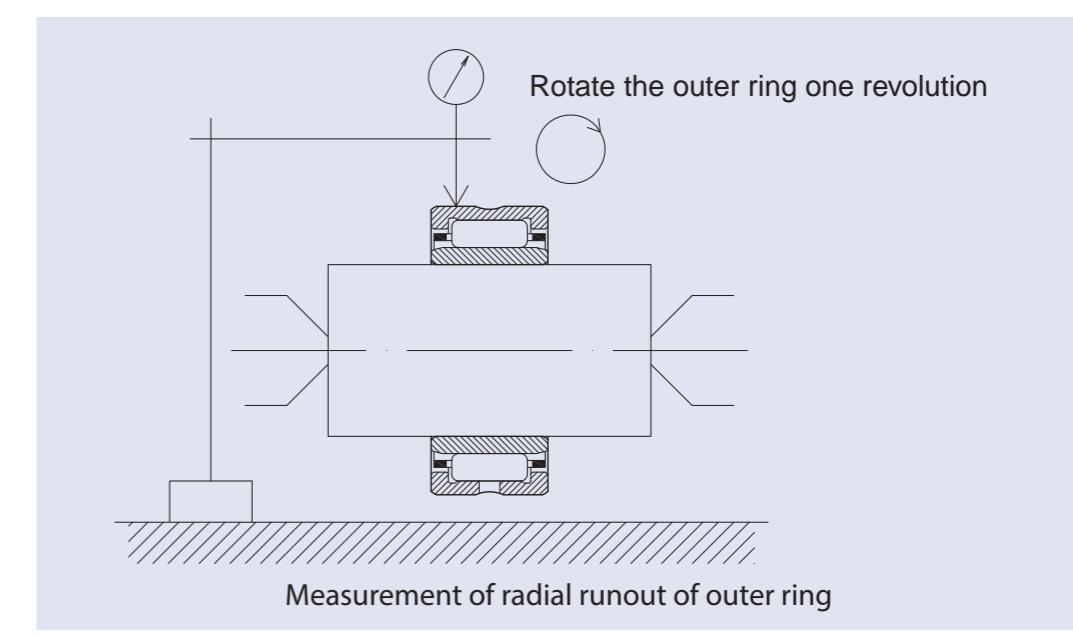
Measurement of radial runout of outer ring (K_{ea})

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.



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)	Over	Incl.	Clearance category									
			C2		CN		C3		C4		C5	
			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.

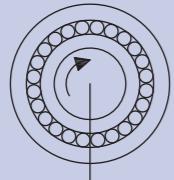
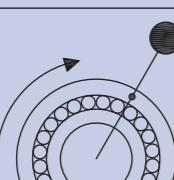
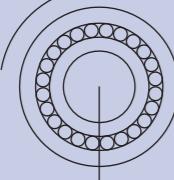
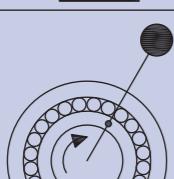
5-2 Selection of fits

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 inconsistent direction	Direction of load is inconsistent due to varying load direction or including unbalanced 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
	Standard and heavy load	Split housing with standard load	J7
Load with stationary outer ring	Light load		H7
	Standard load		J7
Load in inconsistent direction	Heavy load and impact shock load		K7
	Light load		M7
Load with rotating outer ring	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	— 100	k5
Load with stationary inner ring	Standard load		— 50	k5
	50	150	— 150	m5·m6
	Heavy load and impact shock load		150~	m6·n6
			~150	m6·n6
	Mid to low speed, light load		150~	n6·p6
	Mid to low speed, standard load or heavy load			
	With precision rotation accuracy		All dimension	g6
				h6
				h5

Remark Light load $P_r \leq 0.06C_r$, Standard load $0.06C_r < P_r \leq 0.12C_r$, 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

Nominal bearing bore diameter and nominal diameter of shaft d (mm)	Tolerance grade for shaft																		Tolerance grade for shaft																		Nominal bearing bore diameter and nominal diameter of shaft d (mm)																									
	b12		c12		d6		e6		e7		f5		f6		g5		g6		h5		h6		h7		h8		h9		h10		h11		h12		js5		j5		js6		j6		j7		k5		k6		m5		m6		n5		n6		p6					
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	high	low	high	low	high	low	high	low	high	Over	Incl.																		
—	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	0	-100	+2	-2	+2	-2	+3	-3	+4	-2	+6	-4	+4	0	+6	0	+2	+8	+2	+8	+4	+10	+4	+12	+6	—	3		
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	0	-120	+2.5	-2.5	+3	-2	+4	-4	+6	-2	+8	-4	+6	+1	+9	+1	+4	+12	+4	+13	+8	+16	+8	+20	+12	3	6		
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	0	-150	+3	-3	+4	-2	+4.5	-4.5	+7	-2	+10	-5	+7	+1	+10	+1	+12	+6	+16	+10	+19	+10	+24	+15	6	10			
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	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	
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	0	-210	+4.5	-4.5	+5	-4	+6.5	-6.5	+9	-4	+13	-8	+11	+2	+15	+2	+17	+8	+24	+15	+28	+15	+35	+22	18	30			
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	0	-250	-250	+5.5	-5.5	+6	-5	+8	-8	+11	-5	+15	-10	+13	+2	+18	+2	+20	+9	+28	+17	+33	+17	+42	+26	30	40		
40	50	-180	-430	-130	-380	-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	0	-250	-250	+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	40	50
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	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	-200	-500	-150	-450	-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	0	-300	+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	
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	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	100	120	
100	120	-240	-590	-180	-530	-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	0	-350	+8.5	-8.5	+6	-10	+11	-11	+13	-9	+20	-15	+18	+3	+25	+3	+28	+13	+35	+13	+38	+23	+45	+23	+59	+37	120	140	
120	140	-260	-660	-200	-600	-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	0	-350	+9.5	-9.5	+6	-11	+11	-11	+13	-9	+20	-15	+18	+3	+25	+3	+28	+13	+35	+13	+38	+23	+45	+23	+59	+37	140	160	
140	160	-280	-680	-210	-610	-145	-170	-85	-110	-85	-125	-43	-61	-43	-68	-14	-32	-14	-39	0	-18	0	-25	0	-40	0	-63	0																																		

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
Chromium molybdenum 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.

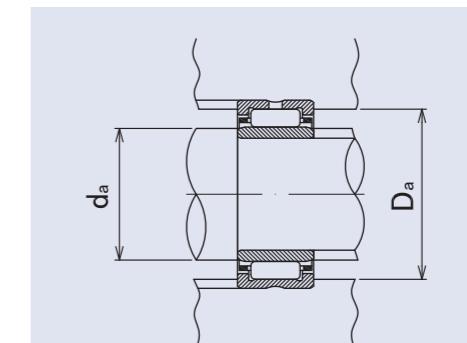


Figure-8 Mounting dimension

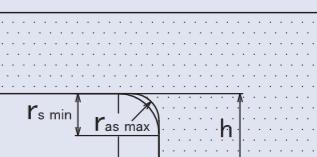
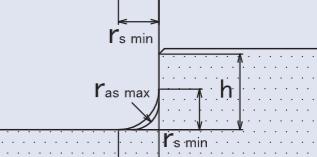
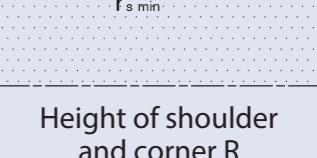
Fillet radius and height of shoulder for shaft and housing

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	Height of shoulder and corner R
0.1	0.1	
0.15	0.15	
0.2	0.2	
0.3	0.3	
0.4	0.4	
0.6	0.6	
1	1	
1.1	1	
1.5	1.5	
2	2	
2.1	2	
2.5	2	
3	2.5	
4	3	
5	4	

7 Lubrication

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

7-1 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

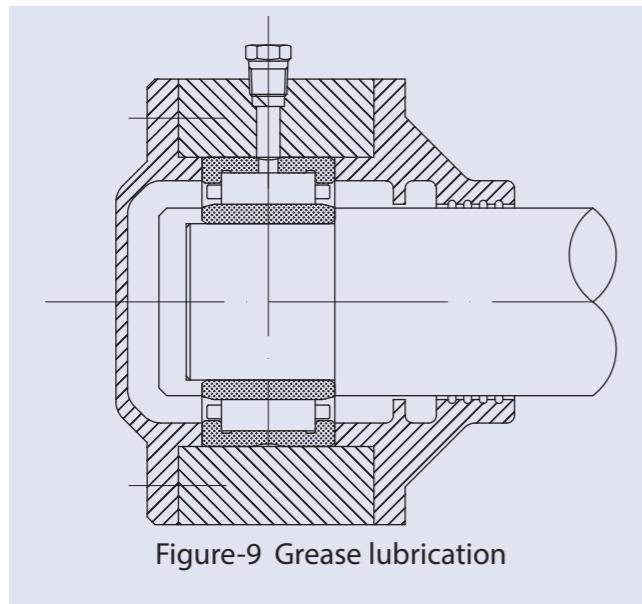
Item	Lubrication method	Grease	Oil
Replacement of lubricant	△	○	
Lubrication performance	○	◎	
Cooling efficiency	×	○	
Sealing structure	○	△	
Power loss	△	○	
Maintenance	○	△	
High speed operation	×	○	

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.



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 °C	170~190	170~190	200~250	150~180	150~180	70~90	250 or more	250 or more
Working temperature °C	-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	Subject to emulsifying by mixing with water	Superior in water resistance and mechanical stability	Superior in viscosity	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 sodium 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 °C	Working temperature °C	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 Microcote 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.

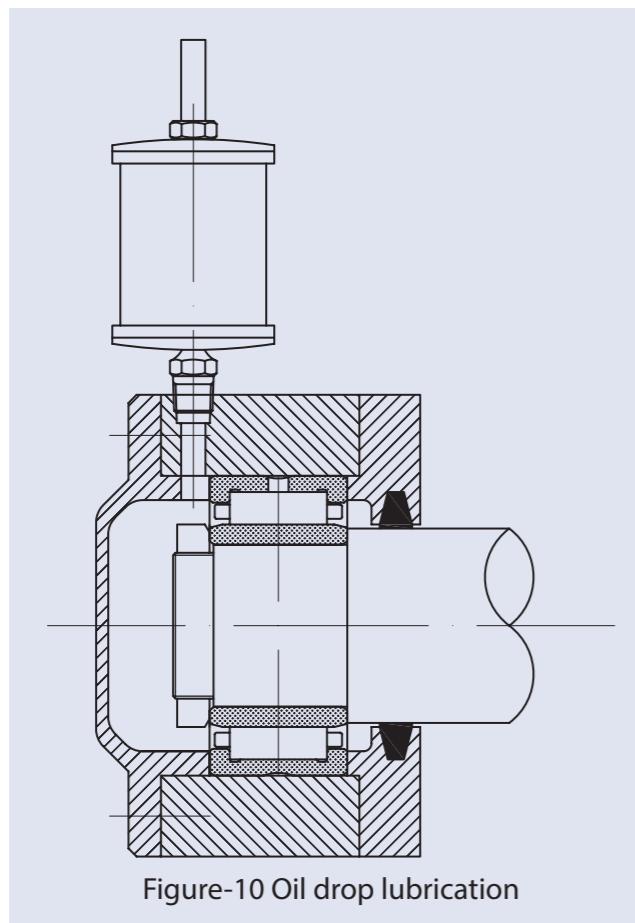


Figure-10 Oil drop lubrication

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 cleanliness 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.

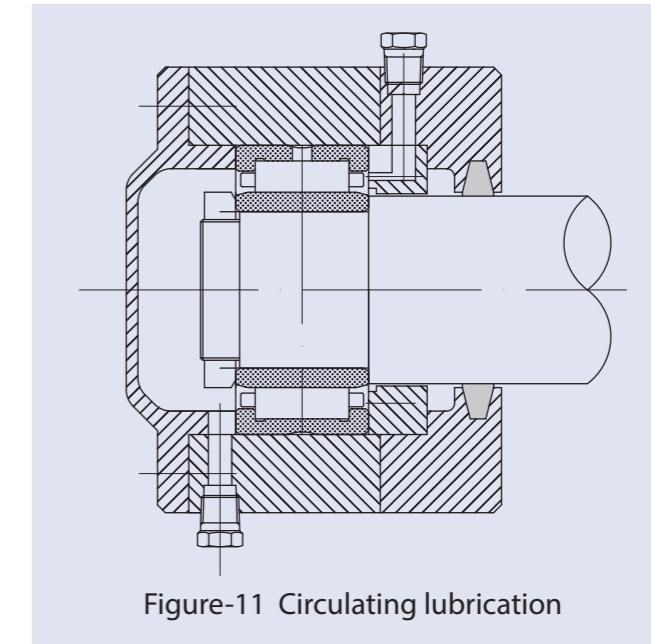


Figure-11 Circulating lubrication

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 cleanliness 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.

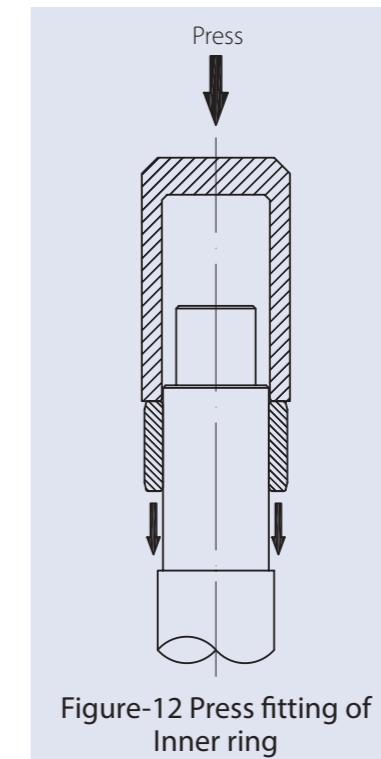


Figure-12 Press fitting of Inner ring

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 are 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

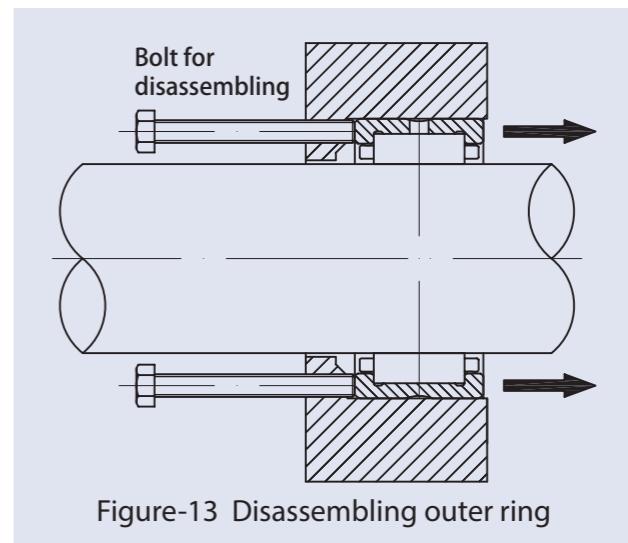


Figure-13 Disassembling outer ring

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.

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			
	$\phi 7 \sim \phi 175$	Machined type needle roller bearings With collar outer ring Without inner ring Without seal *Double rows: RNA69 ($F_w \geq \phi 37$)	Type RNA ↓ Type of bearing	Dimensions 49 10 ↓ Dimension series Bore diameter number	Suffix code P6 ↓ Classification symbol (Class 6) (Standard: No symbol, Class 0)	
	$\phi 5 \sim \phi 110$	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 (F_w) is 10 mm or less)	Type NK ↓ Type of bearing	Dimensions 40 / 20 ↓ Outer ring width Inscribed circle diameter	Suffix code P6 ↓ Classification symbol (Class 6) (Standard: No symbol, Class 0)	
	$\phi 5 \sim \phi 160$	Machined type needle roller bearings With collar outer ring With inner ring Without seal *Double rows: NA69 (shaft dia. $\geq \phi 32$)	Type NA ↓ Type of bearing	Dimensions 49 10 ↓ Dimension series Bore diameter number	Suffix code C3 P6 ↓ Classification symbol (Class 6) (Standard: No symbol, Class 0) Clearance symbol (C3 clearance) (Standard: No symbol, CN clearance)	
	$\phi 5 \sim \phi 100$	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 ↓ Bore diameter Outer ring width	Suffix code C3 P6 ↓ Classification symbol (C3 clearance) (Standard: No symbol, CN clearance)	
	$\phi 14 \sim \phi 58$	Machined type needle roller bearings With collar outer ring Without inner ring With seal *Double rows: RNA69 ($F_w \geq \phi 42$)	Type RNA ↓ Type of bearing	Dimensions 49 10 ↓ Dimension series Bore diameter number	Suffix code UU P6 ↓ Classification symbol (Class 6) (Standard: No symbol, Class 0) UU:With Seal	
	$\phi 10 \sim \phi 50$	Machined type needle roller bearings With collar outer ring With inner ring With seal *Double rows: NA69 (shaft dia. $\geq \phi 35$)	Type NA ↓ Type of bearing	Dimensions 49 10 ↓ Dimension series Bore diameter number	Suffix code UU C3 P6 ↓ Classification symbol (Class 6) (Standard: No symbol, Class 0) UU:With Seal Clearance symbol (C3 clearance) (Standard: No symbol, CN clearance)	

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

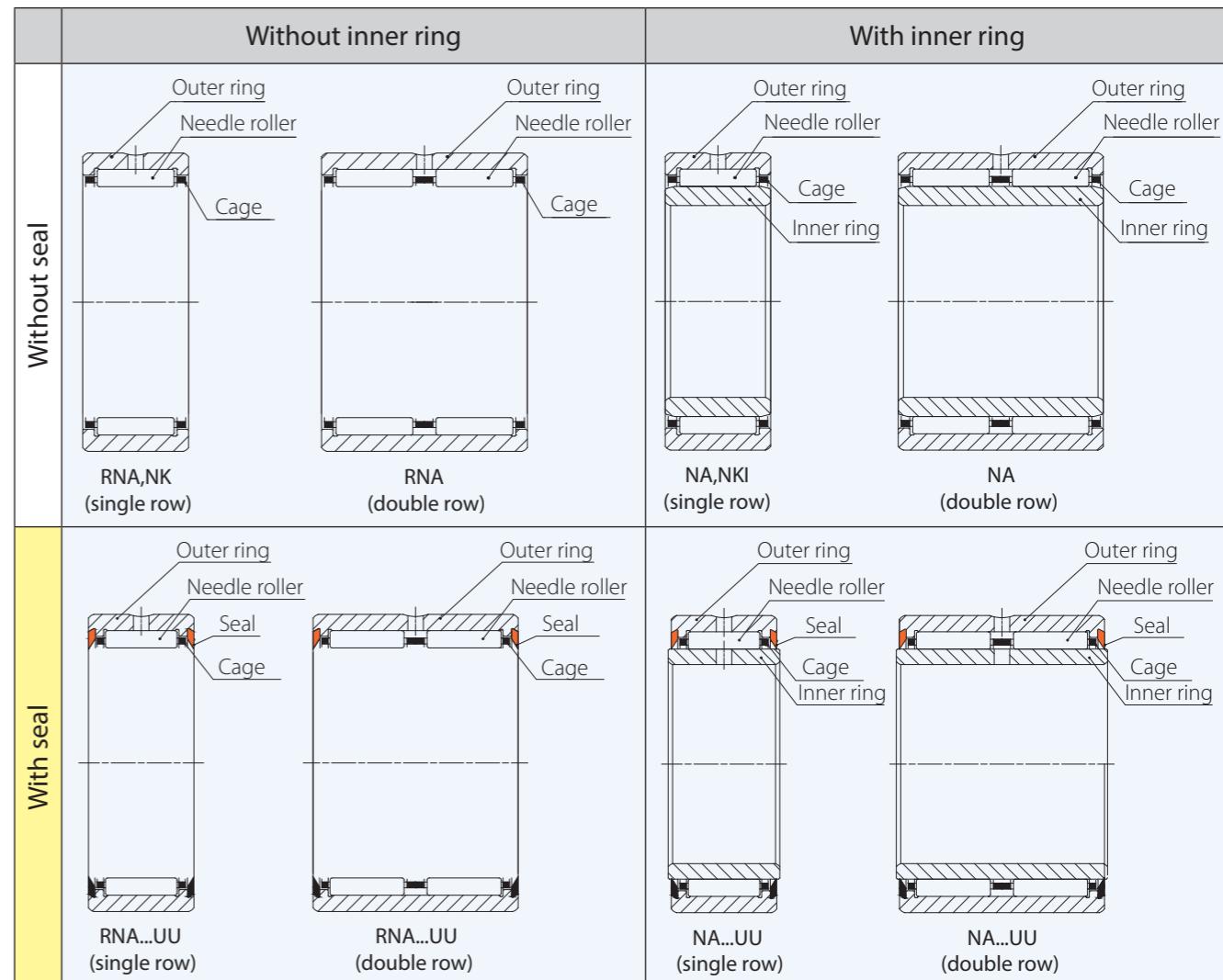
The shaft is directly used as the track surface of the machined type needle roller bearing. If using the shaft directly as a track surface, please refer to 6-2 Accuracy of track surface and 6-3 Material and heat treatment of track surface.

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.

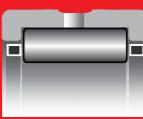
With seal

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

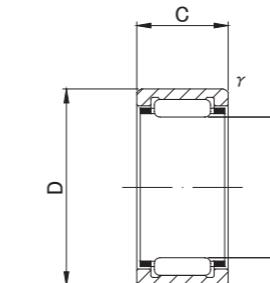
WITHOUT INNER RING



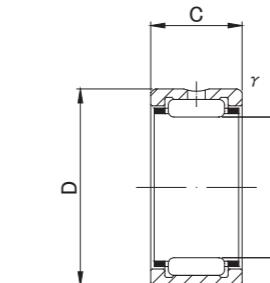
RNA, NK



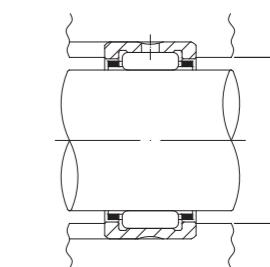
RNA49, RNA59, RNA69 ($F_w \leq 35$), NK



NK ($F_w \leq 10$)



RNA49, RNA59, RNA69 ($F_w \leq 35$), NK



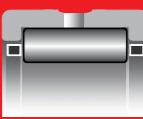
■ RNA49, RNA59, RNA69, RNA48, NK TYPE

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

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

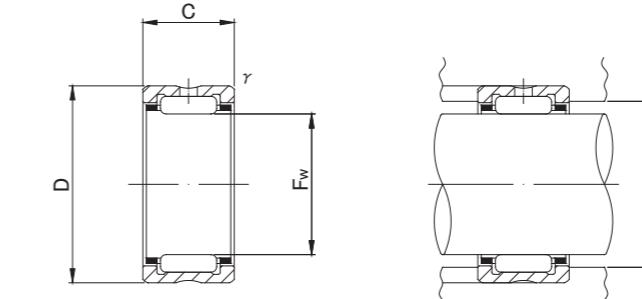
MACHINED RING NEEDLE ROLLER BEARINGS

WITHOUT INNER RING



RNA, NK

RNA49, RNA59, RNA69(Fw≤35), NK



RNA49, RNA59, RNA69(Fw ≤ 35), NK

RNA, NK

■ RNA49, RNA59, RNA69, RNA48, NK TYPE

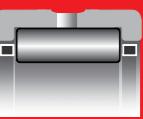
Shaft Diameter (mm)	Designation					Dimensions (mm)				Standard mounting dimensions (mm)	Basic dynamic load rating	Basic static load rating	Limiting speed *	Mass	Usable bearing designation		
	RNA 49	RNA 59	RNA 69	RNA 48	NK	Fw	D	C	I _s min						INNER RING	WITH INNER RING	
14	RNA 4900	—	—	—	NK14/16 NK14/20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

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

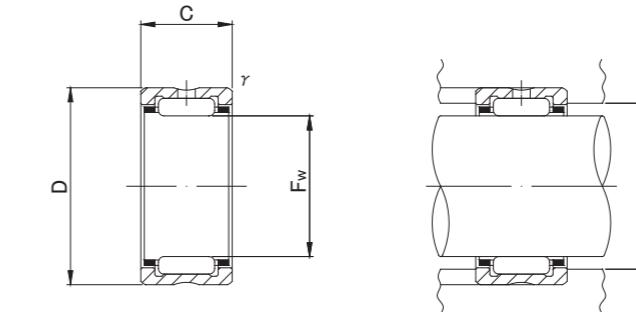
MACHINED RING NEEDLE ROLLER BEARINGS

WITHOUT INNER RING

RNA, NK



RNA49, RNA59, RNA69($F_w \leq 35$), NK



RNA49, RNA59, RNA69($F_w \leq 35$), NK

RNA, NK

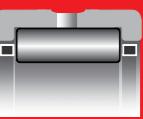
■ RNA49, RNA59, RNA69, RNA48, NK TYPE

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	F_w	D	C	r_s min						INNER RING	WITH INNER RING
21	—	—	—	—	NK21/16 NK21/20	21 +0.033 21 +0.020	29	16	0.3	27 27	14 400 18 200	20 000 27 100	19 000 19 000	29 36	IR172116 IR172120	NKI 17/16 NKI 17/20
22	RNA 4903 — — — —	— — RNA 5903 — —	— — — RNA 6903 —	— — — —	NK22/16 — — NK22/20 —	22 +0.033 22 +0.020	30 30 30 30	13 16 18 20	0.3 0.3 0.3 0.3	28 28 28 28 28	11 800 14 900 16 900 18 900 20 800	15 600 21 200 24 900 28 700 32 500	18 000 18 000 18 000 18 000 18 000	23.5 30 35 37.5 40.5	IR172213 — IR172218 — IR172223	NA4903 — NA5903 — NA6903
24	— —	— —	— —	— —	NK24/16 NK24/20	24 +0.033 24 +0.020	32 32	16 20	0.3 0.3	30 30	15 300 19 400	22 600 30 500	17 000 17 000	32 40.5	IR202416 IR202420	NKI 20/16 NKI 20/20
25	— — RNA 4904 — —	— — RNA 5904 — —	— — — RNA 6904 —	— — — —	NK25/16 NK25/20 — —	25 +0.033 25 +0.020	33 33 37 37	16 20 17 23	0.3 0.3 0.3 0.3	31 31 35 35 35	15 800 20 000 21 000 29 400 35 400	23 700 32 200 25 000 38 600 48 800	16 000 16 000 16 000 16 000 16 000	33.5 42 55.5 84 95.5	— — IR202517 IR202523 IR202530	— — NA4904 NA5904 NA6904
26	— —	— —	— —	— —	NK26/16 NK26/20	26 +0.033 26 +0.020	34 34	16 20	0.3 0.3	32 32	16 300 20 600	24 900 33 700	15 000 15 000	34.5 43.5	IR222616 IR222620	NKI 22/16 NKI 22/20
28	— — RNA 49/22 — —	— — RNA 59/22 — —	— — — RNA 69/22 —	— — — —	NK28/20 NK28/30 — —	28 +0.033 28 +0.020	37 37 39 39	20 30 17 23	0.3 0.3 0.3 0.3	35 35 37 37 37	21 700 31 100 21 400 28 800 36 300	37 100 58 900 28 800 44 400 56 900	14 000 14 000 14 000 14 000 14 000	51.5 83.5 56.5 92 97.5	— — IR222817 IR222823 IR222830	— — NA49/22 NA59/22 NA69/22
29	— —	— —	— —	— —	NK29/20 NK29/30	29 +0.033 29 +0.020	38 38	20 30	0.3 0.3	36 36	21 600 30 900	37 200 59 000	14 000 14 000	57 85	IR252920 IR252930	NKI 25/20 NKI 25/30

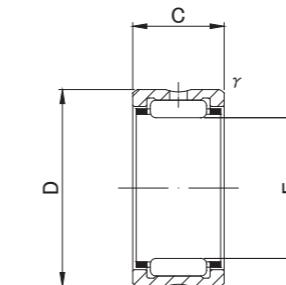
* Suitable for oil lubrication. In case of grease lubrication, down to 60% of this value.

MACHINED RING NEEDLE ROLLER BEARINGS

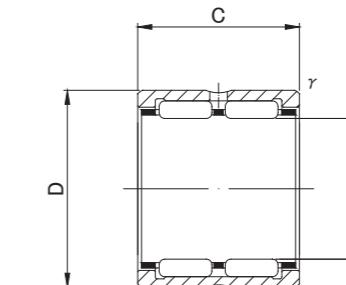
WITHOUT INNER RING



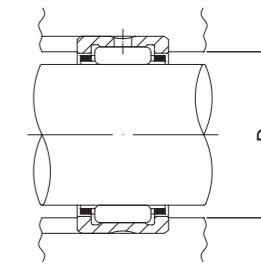
RNA49, RNA59, RNA69($F_w \leq 35$), NK RNA69



RNA49, RNA59, RNA69($F_w \leq 35$), 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	F_w	D	C	$I_s \text{ min}$						INNER RING	WITH INNER RING	
30	—	—	—	—	NK30/20	30	40	20	0.3		38	25 100	40 100	13 000	64.5	—	—
	—	—	—	—	NK30/30	30	40	30	0.3		38	36 000	63 800	13 000	97.5	—	—
	RNA 4905	—	—	—	—	30	42	17	0.3		40	23 700	30 700	13 000	64	IR253017	NA4905
	—	RNA 5905	—	—	—	30	42	23	0.3		40	33 200	47 500	13 000	101	IR253023	NA5905
	—	—	RNA 6905	—	—	30	42	30	0.3		40	42 100	64 200	13 000	111	IR253030	NA6905
32	—	—	—	—	NK32/20	32	42	20	0.3		40	25 700	42 200	13 000	68	IR283220	NKI 28/20
	—	RNA 49/28	—	—	NK32/30	32	42	30	0.3		40	36 900	67 100	13 000	102	IR283230	NKI 28/30
	—	RNA 59/28	—	—	—	32	45	17	0.3		43	24 500	32 700	13 000	76.5	IR283217	NA49/28
	—	—	RNA 69/28	—	—	32	45	23	0.3		43	34 300	50 500	13 000	108	IR283223	NA59/28
	—	—	—	—	—	32	45	30	0.3		43	41 800	64 700	13 000	133	IR283230	NA69/28
35	—	—	—	—	NK35/20	35	45	20	0.3		43	27 000	46 200	11 000	73.5	IR303520	NKI 30/20
	—	RNA 4906	—	—	NK35/30	35	45	30	0.3		43	38 600	73 500	11 000	112	IR303530	NKI 30/30
	—	RNA 5906	—	—	—	35	47	17	0.3		45	25 200	34 700	11 000	72.5	IR303517	NA4906
	—	—	RNA 6906	—	—	35	47	23	0.3		45	35 200	53 700	11 000	108	IR303523	NA5906
	—	—	—	—	—	35	47	30	0.3		45	43 100	69 000	11 000	125	IR303530	NA6906
37	—	—	—	—	NK37/20	37	47	20	0.3		45	28 200	50 100	11 000	77.5	IR323720	NKI 32/20
	—	—	—	—	NK37/30	37	47	30	0.3		45	40 500	79 800	11 000	117	IR323730	NKI 32/30
38	—	—	—	—	NK38/20	38	48	20	0.3		46	28 100	50 200	11 000	79	—	—
	—	—	—	—	NK38/30	38	48	30	0.3		46	40 300	80 000	11 000	119	—	—
40	—	—	—	—	NK40/20	40	50	20	0.3		48	29 400	54 100	10 000	83	IR354020	NKI 35/20
	—	RNA 49/32	—	—	NK40/30	40	50	30	0.3		48	42 300	86 100	10 000	125	IR354030	NKI 35/30
	—	RNA 59/32	—	—	—	40	52	20	0.6		48	31 300	47 900	10 000	96	IR324020	NA49/32
	—	—	RNA 69/32	—	—	40	52	27	0.6		48	41 900	69 900	10 000	149	IR324027	NA59/32
	—	—	—	—	—	40	52	36	0.6		48	53 500	95 700	10 000	172	IR324036	NA69/32
42	—	—	—	—	NK42/20	42	52	20	0.3		50	29 900	56 200	9 500	86.5	—	—
	—	RNA 4907	—	—	NK42/30	42	52	30	0.3		50	43 000	89 500	9 500	130	—	—
	—	RNA 5907	—	—	—	42	55	20	0.6		51	32 000	50 200	9 500	113	IR354220	NA4907
	—	—	RNA 6907	—	—	42	55	27	0.6		51	42 900	73 200	9 500	176	IR354227	NA5907
	—	—	—	—	—	42	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

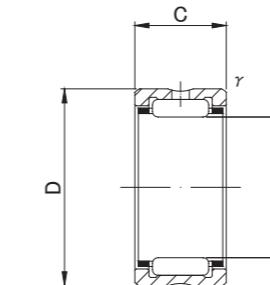
WITHOUT INNER RING



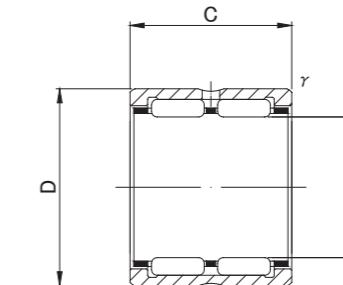
RNA49, RNA59, RNA48, NK



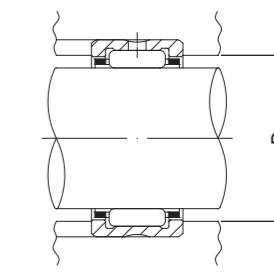
RNA69



RNA49, RNA59, RNA48, NK



RNA69



Da

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

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MACHINED RING NEEDLE ROLLER BEARINGS

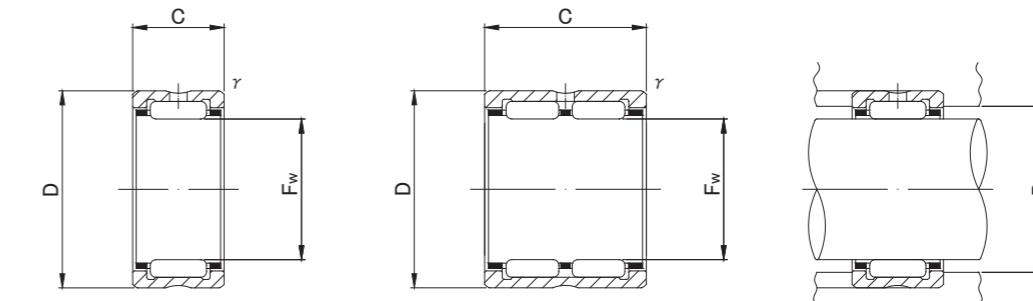
WITHOUT INNER RING



RNA, NK

RNA49, RNA59, RNA48, NK

RNA69



RNA49, RNA59, RNA48, NK

RNA69

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	I _s min						INNER RING	WITH INNER RING	
58	RNA 4910 — —	— RNA 5910 —	— RNA 6910	— —	— —	58 58 58	+0.049 +0.030	72 72 72	22 30 40	0.6 0.6 0.6	68 68 68	46 200 64 400 79 100	82 100 126 000 163 800	7 000 7 000 7 000	179 289 320	IR505822 IR505830 IR505840	NA4910 NA5910 NA6910
60	— —	— —	— —	— —	NK60/25 NK60/35	60 60	+0.049 +0.030	72 72	25 35	0.6 0.6	68 68	47 500 64 100	103 000 151 000	6 500 6 500	187 260	IR556025 IR556035	NKI 55/25 NKI 55/35
63	RNA 4911 — —	— RNA 5911 —	— RNA 6911	— —	— —	63 63 63	+0.049 +0.030	80 80 80	25 34 45	1 1 1	75 75 75	57 600 82 600 99 000	97 300 154 000 194 200	6 500 6 500 6 500	265 367 475	IR556325 IR556334 IR556345	NA4911 NA5911 NA6911
65	— —	— —	— —	— —	NK65/25 NK65/35	65 65	+0.049 +0.030	78 78	25 35	0.6 0.6	74 74	49 600 67 000	111 800 164 800	6 000 6 000	225 315	— —	— —
68	— — RNA 4912 — —	— — RNA 5912 — —	— — RNA 6912	— — —	NK68/25 NK68/35	68 68 68 68 68	— +0.049 +0.030	82 82 85 85 85	25 35 25 34 45	0.6 0.6 1 1 1	78 78 80 80 80	54 800 72 100 60 100 86 100 103 000	116 700 165 700 104 900 167 000 210 800	6 000 6 000 6 000 6 000 6 000	250 350 285 408 510	IR606825 IR606835 IR606825 IR606834 IR606845	NKI 60/25 NKI 60/35 NA4912 NA5912 NA6912
70	— —	— —	— —	— —	NK70/25 NK70/35	70 70	+0.049 +0.030	85 85	25 35	0.6 0.6	81 81	55 500 73 000	120 600 170 600	5 500 5 500	280 395	— —	— —
72	RNA 4913 — —	— RNA 5913 —	— RNA 6913	— —	— —	72 72 72	+0.049 +0.030	90 90 90	25 34 45	1 1 1	85 85 85	62 800 89 900 107 900	113 800 180 000 226 500	5 500 5 500 5 500	325 462 585	IR657225 IR657234 IR657245	NA4913 NA5913 NA6913

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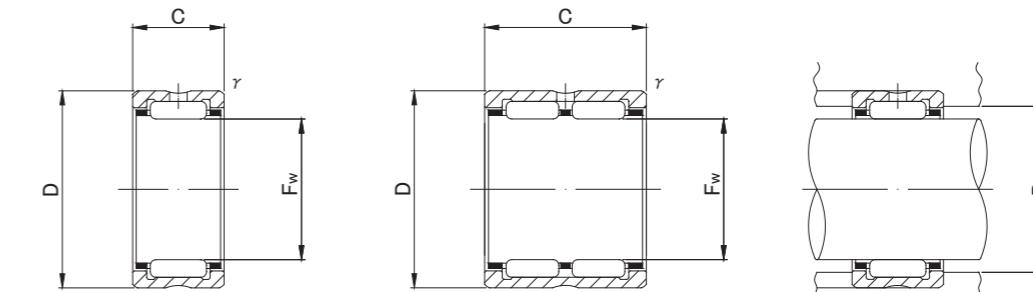
MACHINED RING NEEDLE ROLLER BEARINGS

WITHOUT INNER RING



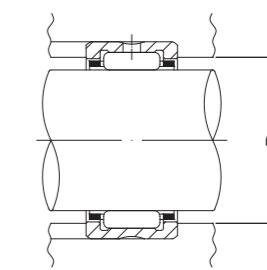
RNA49, RNA59, RNA48, NK

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

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

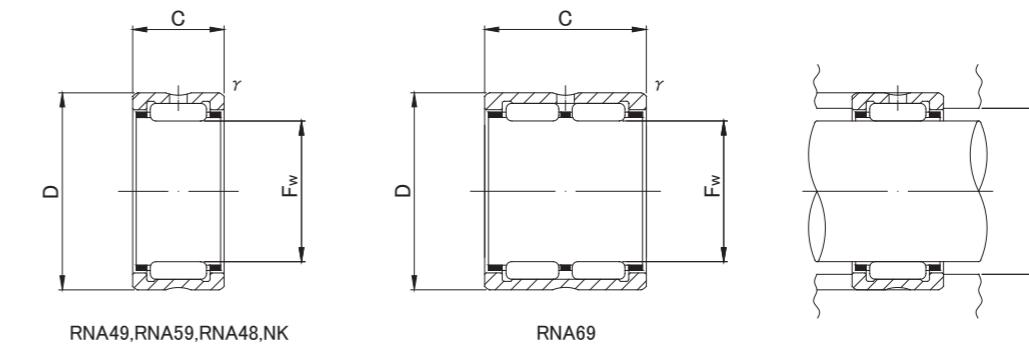
MACHINED RING NEEDLE ROLLER BEARINGS

WITHOUT INNER RING



RNA49, RNA59, RNA48, NK

RNA69



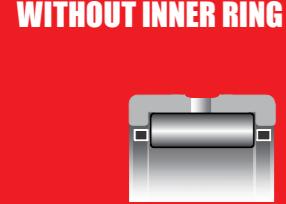
RNA49, RNA59, RNA69, RNA48, NK TYPE

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	ls min						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	125	35	1.1		118.5	112 800	257 900	3 800	740	IR9010535	NA4918
	—	—	—	—	NK105/36	105 +0.058 +0.036	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
	—	—	—	—	NK110/30	110	130	30	1.1		123.5	105 900	239 300	3 600	660	IR10011030	NKI 100/30
110	—	RNA 4919	—	—	—	—	130	35	1.1		123.5	116 700	270 700	3 600	770	IR9511035	NA4919
	—	—	RNA 5919	—	NK110/40	110 +0.058 +0.036	130	40	1.1		123.5	133 400	323 600	3 600	880	IR10011040	NKI 100/40
	—	—	—	RNA 6919	—	110	130	46	1.1		123.5	152 000	384 000	3 600	1 130	IR9511046	NA5919
	—	—	—	—	—	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

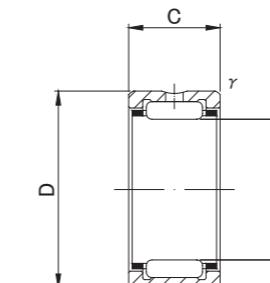
WITHOUT INNER RING



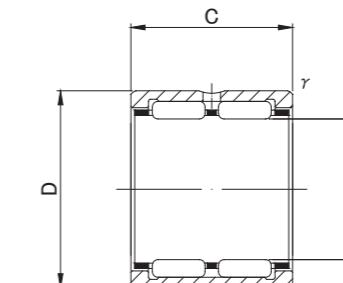
RNA49, RNA59, RNA48, NK



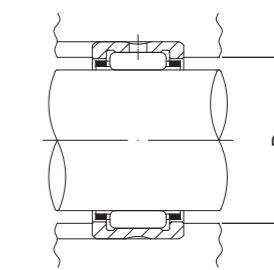
RNA69



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			
						Fw	D	C	I _s min									
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		

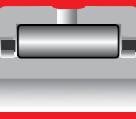
* Suitable for oil lubrication. In case of grease lubrication, down to 60% of this value.

MACHINED RING NEEDLE ROLLER BEARINGS

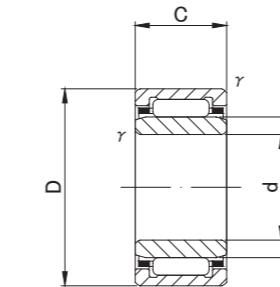
WITH INNER RING



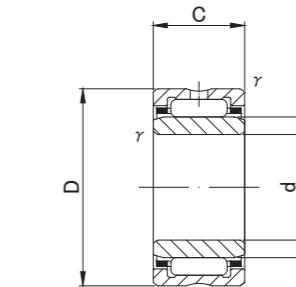
NA, NKI



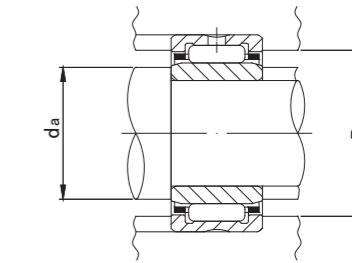
NA49,NA59,NA69($d \leq 30$),NKI



NKI($d \leq 8$)



NA49,NA59,NA69($d \leq 30$),NKI



NA49,NA59,NA69,NA48,NKI TYPE

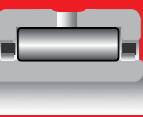
Shaft Diameter (mm)	Designation					Dimensions (mm)					Standard mounting dimensions (mm)		Basic dynamic load rating	Basic static load rating	Limiting speed*	Mass	Usable bearing designation		
	NA 49	NA 59	NA 69	NA48	NKI	d	D	C	r_s min	F	da		Cr N	Cor N	rpm	g (approx)	OUTER RING	INNER RING	
											MIN	MAX							
5	NA495	—	—	—	—	5	13	10	0.15	7	6.2	6.7	11.8	2 960	2 690	34 000	7.3	RNA495	IR5710
	—	—	—	—	—	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 5/12	5	15	16	0.3	8	7	7.7	13	7 100	7 300	32 000	16.7	NK8/16	IR5816
6	NA 496	—	—	—	—	6	15	10	0.15	8	7.2	7.7	13.8	3 900	3 400	32 000	9.1	RNA496	IR6810
	—	—	—	—	—	6 ⁰ _{-0.008}	16	12	0.3	9	8	8.7	14	5 500	5 300	30 000	13	NK9/12	IR6912
	—	—	—	—	NKI 6/12	6	16	16	0.3	9	8	8.7	14	7 600	8 200	30 000	17.5	NK9/16	IR6916
7	NA 497	—	—	—	—	7	17	10	0.15	9	8.2	8.7	15.8	4 500	3 600	30 000	11.2	RNA497	IR7910
	—	—	—	—	—	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 7/12	7	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	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	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	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	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.

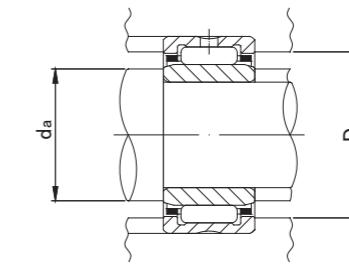
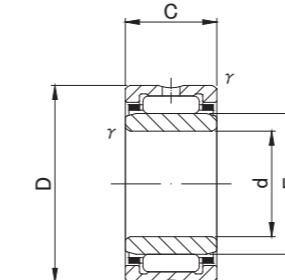
MACHINED RING NEEDLE ROLLER BEARINGS

WITH INNER RING

NA, NKI



NA49,NA59,NA69($d \leq 30$),NKI



NA49,NA59,NA69($d \leq 30$),NKI

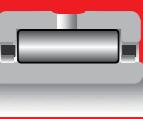
NA49,NA59,NA69,NA48,NKI TYPE

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		Cr N	Cor N	rpm	g (approx)	OUTER RING	INNER RING		
											MIN	MAX								
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	—	NA 5902	—	—	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	—	NA 5903	—	—	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	—	NA 5904	—	—	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	—	NA 59/22	—	—	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	—	NA 5905	—	—	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	—	NA 59/28	—	—	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	—	NA 5906	—	—	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	

MACHINED RING NEEDLE ROLLER BEARINGS

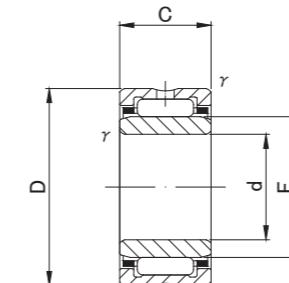
WITH INNER RING

NA, NKI

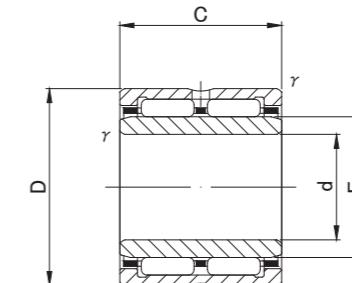


NA49,NA59,NA69($d \leq 30$),NKI

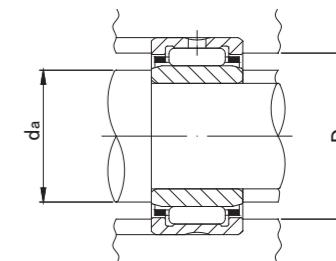
NA69



NA49,NA59,NA69($d \leq 30$),NKI



NA69



NA49,NA59,NA69,NA48,NKI TYPE

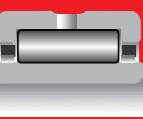
Shaft Diameter (mm)	Designation					Dimensions (mm)							Standard mounting dimensions (mm)			Basic dynamic load rating	Basic static load rating	Limiting speed*	Mass	Usable bearing designation	
	NA 49	NA 59	NA 69	NA48	NKI	d	D	C	r _s min	F	da	Da	Cr N	Cor N	rpm	g (approx)	OUTER RING	INNER RING			
											MIN	MAX									
32	—	—	—	—	NKI 32/20 NKI 32/30	32	47	20			0.3	37	34	36	45	28 200	50 100	11 000	121	NK37/20	IR323720
	—	—	—	—		32	47	30			0.3	37	34	36	45	40 500	79 800	11 000	180	NK37/30	IR323730
	NA 49/32	—	NA 59/32	—	—	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 NKI 35/30	35	50	20			0.3	40	37	39	48	29 400	54 100	10 000	129	NK40/20	IR354020
	—	—	—	—	—	35	50	30			0.3	40	37	39	48	42 300	86 100	10 000	192	NK40/30	IR354030
	NA 4907	—	NA 5907	—	—	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 NKI 38/30	38	53	20			0.3	43	40	42	51	30 500	58 100	9 500	136	NK43/20	IR384320
	—	—	—	—	—	38	53	30			0.3	43	40	42	51	43 700	92 500	9 500	205	NK43/30	IR384330
40	—	—	—	—	NKI 40/20 NKI 40/30	40	55	20			0.3	45	42	44	53	31 100	60 100	9 000	143	NK45/20	IR404520
	—	—	—	—	—	40	55	30			0.3	45	42	44	53	44 500	95 700	9 000	215	NK45/30	IR404530
	NA 4908	—	NA 5908	—	—	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 NKI 42/30	42	57	20			0.3	47	44	46	55	31 500	62 300	8 500	149	NK47/20	IR424720
	—	—	—	—	—	42	57	30			0.3	47	44	46	55	45 200	99 000	8 500	225	NK47/30	IR424730
45	—	—	—	—	NKI 45/25 NKI 45/35	45	62	25			0.6	50	49	49.5	58	43 000	85 200	8 000	230	NK50/25	IR455025
	—	—	—	—	—	45	62	35			0.6	50	49	49.5	58	58 100	125 500	8 000	320	NK50/35	IR455035
	NA 4909	—	NA 5909	—	—	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 NKI 50/35	50	68	25			0.6	55	54	54.5	64	45 400	94 100	7 500	270	NK55/25	IR505525
	—	—	—	—	—	50	68	35			0.6	55	54	54.5	64	61 300	138 300	7 500	365	NK55/35	IR505535
	NA 4910	—	NA 5910	—	—	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

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

MACHINED RING NEEDLE ROLLER BEARINGS

WITH INNER RING

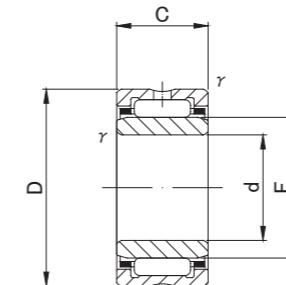
NA, NKI



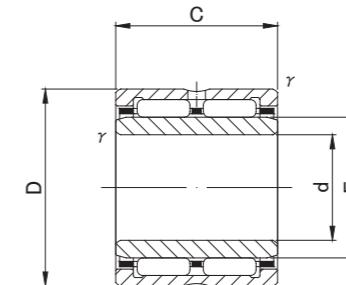
NA49,NA59,NKI



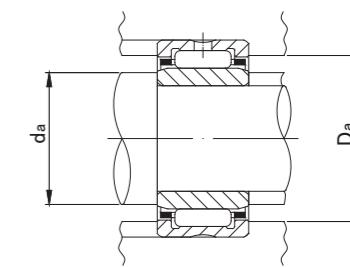
NA69



NA49,NA59,NKI



NA69



NA

NKI

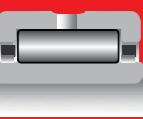
■ NA49,NA59,NA69,NA48,NKI TYPE

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		Da MAX	Cr N	Cor N	rpm	g (approx)	OUTER RING	INNER RING	
											MIN	MAX								
55	—	—	—	—	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	
	NA 4911	—	NA 5911	—	—	55	80	25	1	63	60	61	75	57 600	97 300	6 500	410	RNA4911	IR556325	
	—	—	NA 6911	—	—	55	80	34	1	63	60	61	75	82 600	154 000	6 500	559	RNA5911	IR556334	
	—	—	—	—	—	55	80	45	1	63	60	61	75	99 000	194 200	6 500	730	RNA6911	IR556345	
60	—	—	—	—	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	
	NA 4912	—	NA 5912	—	—	60	85	25	1	68	64	66	80	60 100	104 900	6 000	440	RNA4912	IR606825	
	—	—	NA 6912	—	—	60	85	34	1	68	65	66	80	86 100	167 000	6 000	614	RNA5912	IR606834	
65	NA 4913	—	NA 5913	—	—	65	90	25	1	72	70	70.5	85	62 800	113 800	5 500	470	RNA4913	IR657225	
	—	NA 5913	—	—	—	65	90	34	1	72	70	70.5	85	89 900	180 000	5 500	655	RNA5913	IR657234	
	—	—	NA 6913	—	NKI 65/35	65	90	35	0.6	73	69	71	86	80 400	180 400	5 500	710	NK73/35	IR657335	
	—	—	—	—	—	65	90	45	1	72	70	70.5	85	107 900	226 500	5 500	840	RNA6913	IR657245	
70	—	—	—	—	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	
	NA 4914	—	NA 5914	—	—	70	100	30	1	80	75	78	95	83 200	157 900	5 000	765	RNA4914	IR708030	
	—	—	NA 6914	—	—	70	100	40	1	80	75	78	95	112 000	232 000	5 000	1 060	RNA5914	IR708040	
75	—	NA 4915	—	—	NKI 75/25	75	105	25	1	85	80	83	100	76 400	145 100	4 500	675	NK85/25	IR758525	
	—	—	NA 5915	—	—	75	105	30	1	85	80	83	100	86 200	169 700	4 500	810	RNA4915	IR758530	
	—	—	NA 6915	—	NKI 75/35	75	105	35	1	85	80	83	100	102 000	209 900	4 500	945	NK85/35	IR758535	
	—	—	—	—	—	75	105	40	1	85	80	83	100	116 000	249 000	4 500	1 130	RNA5915	IR758540	
80	—	NA 4916	—	—	NKI 80/25	80	110	25	1	90	85	88	105	77 400	150 000	4 500	710	NK90/25	IR809025	
	—	—	NA 5916	—	—	80	110	30	1	90	85	88	105	87 400	174 600	4 500	855	RNA4916	IR809030	
	—	—	NA 6916	—	NKI 80/35	80	110	35	1	90	85	88	105	103 000	216 700	4 500	995	NK90/35	IR809035	
	—	—	—	—	—	80	110	40	1	90	85	88	105	117 000	257 000	4 500	1 150	RNA5916	IR809040	
85	—	NA 4917	—	—	NKI 85/26	85	115	26	1	95	90	93	110	79 700	158 900	4 200	775	NK95/26	IR859526	
	—	—	NA 5917	—	NKI 85/36	85	115	36	1	95	90	93	110	106 900	230 500	4 200	1 080	NK95/36	IR859536	
	—	—	NA 6917	—	—	85	120	35	1.1	100	91.5	98	113.5	109 800	244 200	4 000	1 280	RNA4917	IR8510035	
	—	—	—	—	—	85	120	46	1.1	100	91.5	98	113.5	144 000	346 000	4 000	1 760	RNA5917	IR8510046	
	—	—	—	—	—	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

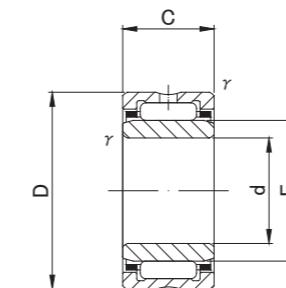
NA, NKI



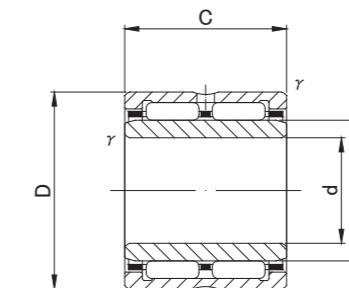
NA49,NA59,NA48,NKI



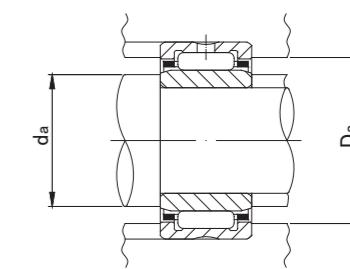
NA69



NA49,NA59,NA48,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		Cr N	Cor N	rpm	g (approx)	OUTER RING	INNER RING		
											MIN	MAX								
90	—	—	—	—	NKI 90/26 NKI 90/36	90	120	26	1	100	95	98	115	82 500	168 700	4 000	820	NK100/26	IR9010026	
	—	—	—	—	NA 4918	90	120	36	1	100	95	98	115	109 800	244 200	4 000	1 140	NK100/36	IR9010036	
	—	—	NA 5918	—	NA 6918	90	125	35	1.1	105	96.5	103	118.5	112 800	257 900	3 800	1 350	RNA4918	IR9010535	
	—	—	—	—	—	90	125	46	1.1	105	96.5	103	118.5	148 000	365 000	3 800	1 840	RNA5918	IR9010546	
	—	—	—	—	—	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 NKI 95/36	95	125	26	1	105	100	103	120	84 700	177 500	3 800	860	NK105/26	IR9510526	
	—	—	—	—	NA 4919	95	125	36	1	105	100	103	120	112 800	257 900	3 800	1 190	NK105/36	IR9510536	
	—	—	NA 5919	—	NA 6919	95	130	35	1.1	110	101.5	108	123.5	116 700	270 700	3 600	1 420	RNA4919	IR9511035	
	—	—	—	—	—	95	130	46	1.1	110	101.5	108	123.5	152 000	384 000	3 600	1 980	RNA5919	IR9511046	
	—	—	—	—	—	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 NKI 100/40	100	130	30	1.1	110	106.5	108	123.5	105 900	239 300	3 600	1 040	NK110/30	IR10011030	
	—	—	—	—	NA 4920	100	130	40	1.1	110	106.5	108	123.5	133 400	323 600	3 600	1 380	NK110/40	IR10011040	
	—	—	—	—	—	100	140	40	1.1	115	106.5	113	133.5	145 000	329 000	3 500	1 960	RNA4920	IR10011540	
110	—	NA 4922	—	—	NA 4822	—	110	140	30	1	120	115	118	135	93 000	239 000	3 500	1 200	RNA4822	IR11012030
120	—	NA 4924	—	—	NA 4824	—	110	150	40	1.1	125	116.5	123	143.5	152 000	357 000	3 000	2 120	RNA4922	IR11012540
130	—	NA 4926	—	—	NA 4826	—	120	150	30	1	130	125	128	145	97 000	259 000	3 000	1 300	RNA4824	IR12013030
140	—	NA 4928	—	—	NA 4828	—	120	165	45	1.1	135	126.5	133	158.5	187 000	435 000	3 000	2 960	RNA4924	IR12013545
150	—	—	—	—	NA 4830	—	150	190	40	1.1	165	156.5	163	183.5	168 000	446 000	2 500	2 880	RNA4830	IR15016540
160	—	—	—	—	NA 4832	—	160	200	40	1.1	175	166.5	173	193.5	173 000	474 000	2 500	3 050	RNA4832	IR16017540

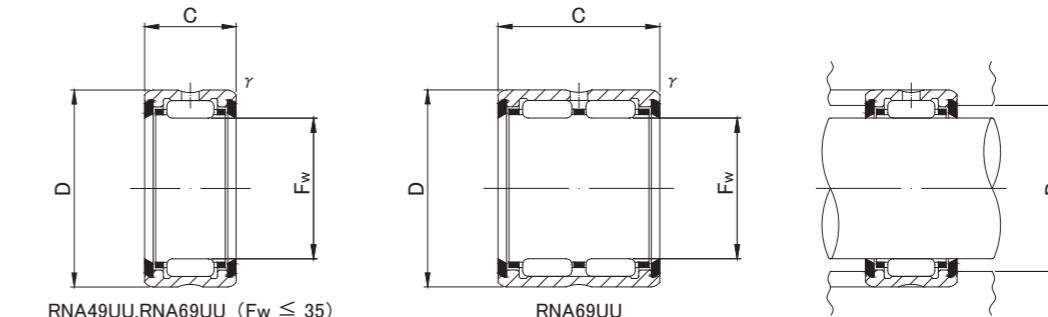
* Suitable for oil lubrication. In case of grease lubrication, down to 60% of this value.

MACHINED RING NEEDLE ROLLER BEARINGS

SEALED, WITHOUT INNER RING



RNA49UU, RNA69UU ($F_w \leq 35$)



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										INNER RING	WITH INNER RING
			F_w	D	C	μs min							
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} _{+0.016}	24	13	0.3	22	8 400 15 600	9 300 20 400	12 000 12 000	18 30	IRZ121614 IRZ121623	NA4901UU NA6901UU
20	RNA 4902UU	—	20 ^{+0.033} _{+0.020}	28	13	0.3	26	9 600 18 400	11 700 27 100	9 500 9 500	22 38	IRZ152014 IRZ152024	NA4902UU NA6902UU
22	RNA 4903UU	—	22 ^{+0.033} _{+0.020}	30	13	0.3	28	10 300 19 800	13 100 30 600	8 500 8 500	23 40	IRZ172214 IRZ172224	NA4903UU NA6903UU
25	RNA 4904UU	—	25 ^{+0.033} _{+0.020}	37	17	0.3	35	17 900 33 000	20 500 44 500	7 500 7 500	55 96	IRZ202518 IRZ202531	NA4904UU NA6904UU
30	RNA 4905UU	—	30 ^{+0.033} _{+0.020}	42	17	0.3	40	20 300 39 200	25 100 58 600	6 500 6 500	63 110	IRZ253018 IRZ253031	NA4905UU NA6905UU
35	RNA 4906UU	—	35 ^{+0.041} _{+0.025}	47	17	0.3	45	21 600 40 100	28 400 63 100	5 500 5 500	71 130	IRZ303518 IRZ303531	NA4906UU NA6906UU
42	RNA 4907UU	—	42 ^{+0.041} _{+0.025}	55	20	0.6	51	30 100 51 600	46 300 92 600	4 500 4 500	110 200	IRZ354221 IRZ354237	NA4907UU NA6907UU
48	RNA 4908UU	—	48 ^{+0.041} _{+0.025}	62	22	0.6	58	37 200 63 700	58 300 116 700	4 000 4 000	150 270	IRZ404823 IRZ404841	NA4908UU NA6908UU
52	RNA 4909UU	—	52 ^{+0.049} _{+0.030}	68	22	0.6	64	38 800 66 700	63 400 126 500	3 500 3 500	190 355	IRZ455223 IRZ455241	NA4909UU NA6909UU
58	RNA 4910UU	—	58 ^{+0.049} _{+0.030}	72	22	0.6	68	41 300 70 800	71 100 142 200	3 500 3 500	180 320	IRZ505823 IRZ505841	NA4910UU NA6910UU

MACHINED RING NEEDLE ROLLER BEARINGS

SEALED, WITH INNER RING

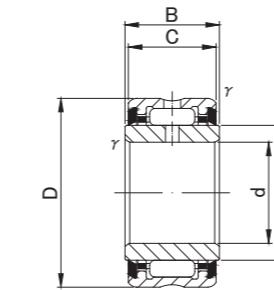


NA UU

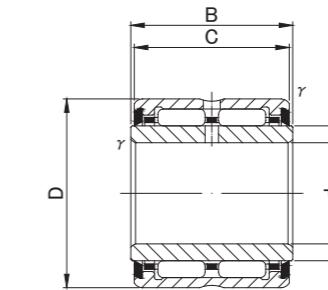


NA49UU,NA69UU($d \leq 30$)

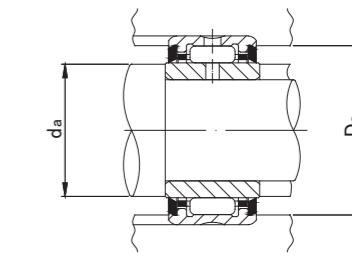
NA69UU



NA49UU,NA69UU($d \leq 30$)



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							
							d	D	C	B	f _s min	F	da	Da MAX	Cr N	Cor 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	14	15	22	8 400 15 600	9 300 20 400	12 000 12 000	28 46	RNA4901UU RNA6901UU	IRZ121614 IRZ121623
15	NA 4902UU	—	15	0 -0.008	28	13	14	0.3	20					17	17	19	26	9 600 18 400	11 700 27 100	9 500 9 500	36 63	RNA4902UU RNA6902UU	IRZ152014 IRZ152024
17	NA 4903UU	—	17	0 -0.008	30	13	14	0.3	22					19	19	21	28	10 300 19 800	13 100 30 600	8 500 8 500	40 69	RNA4903UU RNA6903UU	IRZ172214 IRZ172224
20	NA 4904UU	—	20	0 -0.010	37	17	18	0.3	25					22	22	24	35	17 900 33 000	20 500 44 500	7 500 7 500	78 140	RNA4904UU RNA6904UU	IRZ202518 IRZ202531
25	NA 4905UU	—	25	0 -0.010	42	17	18	0.3	30					27	27	29	40	20 300 39 200	25 100 58 600	6 500 6 500	93 162	RNA4905UU RNA6905UU	IRZ253018 IRZ253031
30	NA 4906UU	—	30	0 -0.010	47	17	18	0.3	35					32	32	34	45	21 600 40 100	28 400 63 100	5 500 5 500	106 185	RNA4906UU RNA6906UU	IRZ303518 IRZ303531
35	NA 4907UU	—	35	0 -0.012	55	20	21	0.6	42					39	39	41	51	30 100 51 600	46 300 92 600	4 500 4 500	179 320	RNA4907UU RNA6907UU	IRZ354221 IRZ354237
40	NA 4908UU	—	40	0 -0.012	62	22	23	0.6	48					44	44	47	58	37 200 63 700	58 300 116 700	4 000 4 000	245 440	RNA4908UU RNA6908UU	IRZ404823 IRZ404841
45	NA 4909UU	—	45	0 -0.012	68	22	23	0.6	52					49	49	51	64	38 800 66 700	63 400 126 500	3 500 3 500	290 510	RNA4909UU RNA6909UU	IRZ455223 IRZ455241
50	NA 4910UU	—	50	0 -0.012	72	22	23	0.6	58					54	54	57	68	41 300 70 800	71 100 142 200	3 500 3 500	300 530	RNA4910UU RNA6910UU	IRZ505823 IRZ505841

SEPARABLE NEEDLE ROLLER BEARINGS



Machined type needle roller bearings - Separable type (NAF)

Type and Part Code

Type	Applicable axis diameter	Feature	Part Code			
	$\phi 5 \sim \phi 100$	Machined type needle roller bearings Without collar outer ring Without inner ring	Type RNAF	W	Dimensions 30 42 32	Suffix code P6
	$\phi 6 \sim \phi 90$	Machined type needle roller bearings Without collar outer ring With inner ring	Type NAF	W	Dimensions 25 42 32	Suffix code C3 P6

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

Structure and Features

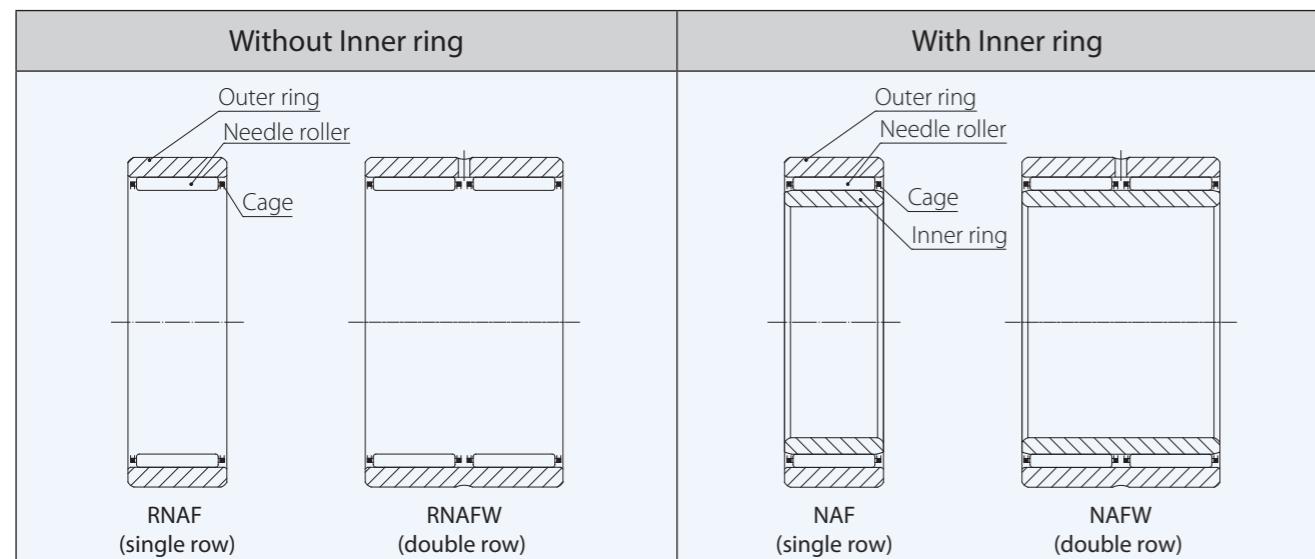
A metric bearing which features a stiff machined outer ring and a cage with either a single or a double row of needle rollers. This bearing has no collar on the inside of the outer ring therefore the cage with needle rollers can be easily separated from the outer and inner rings.

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.



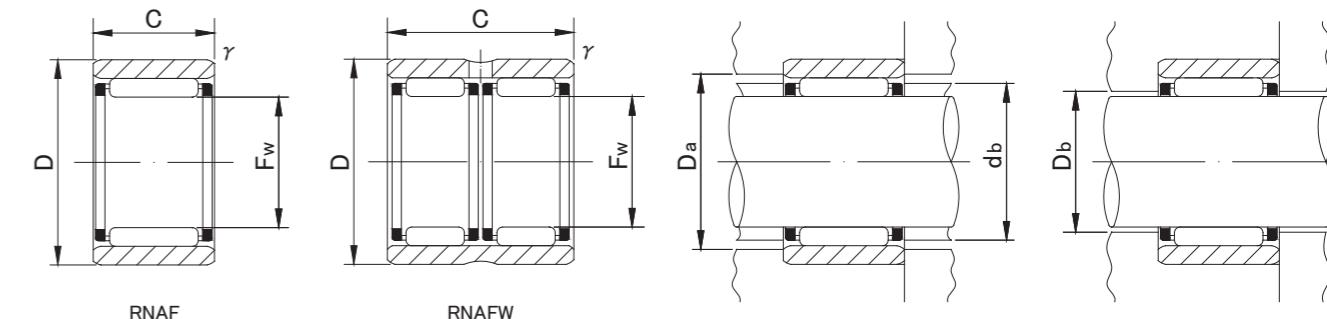
SEPARABLE NEEDLE ROLLER BEARINGS WITHOUT INNER RING



RNAF

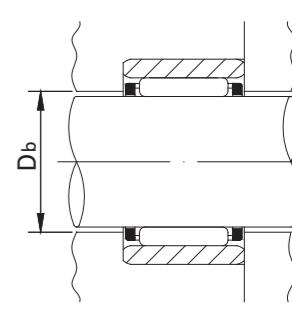
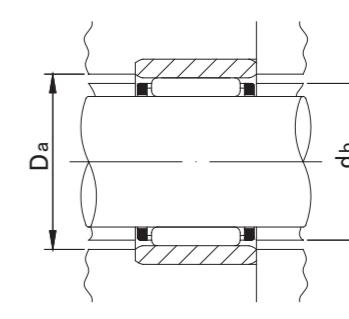


RNAFW



RNAF

RNAFW



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	
		Fw	D	C	r_s min	db	Da MAX	Db			rpm	g (approx)		
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 RNAFW81620	8 ^{+0.022} _{+0.013}	15	10	0.3	10.4	13	8.4	3 600	3 600	32 000	8	—	—
8		8 ^{+0.022} _{+0.013}	16	20	0.3	10.8	14	8.4	6 200	7 200	32 000	20	—	—
10	RNAF101710 RNAF102012	10 ^{+0.022} _{+0.013}	17	10	0.3	12.4	15	10.4	4 100	4 500	28 000	10	IR61010	NAF61710
10		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 RNAFW142220 RNAF142612	14 ^{+0.027} _{+0.016}	22	13	0.3	17.6	20	14.6	7 800	9 400	24 000	18	IR101413	NAF102213
14		14 ^{+0.027} _{+0.016}	22	20	0.3	17.6	20	14.6	10 800	14 200	24 000	28	IR101420	NAFW102220
14		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 RNAFW152320	15 ^{+0.027} _{+0.016}	23	13	0.3	18.6	21	15.6	8 200	10 200	23 000	20	—	—
15		15 ^{+0.027} _{+0.016}	23	20	0.3	18.6	21	15.6	11 400	15 400	23 000	31	—	—
16	RNAF162413 RNAFW162420 RNAF162812	16 ^{+0.027} _{+0.016}	24	13	0.3	19.6	22	16.6	8 600	11 000	23 000	21	IR121613	NAF122413
16		16 ^{+0.027} _{+0.016}	24	20	0.3	19.6	22	16.6	11 900	16 700	23 000	32	IR121620	NAFW122420
16		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 RNAFW172520	17 ^{+0.027} _{+0.016}	25	13	0.3	20.6	23	17.6	9 000	11 900	22 000	22	—	—
17		17 ^{+0.027} _{+0.016}	25	20	0.3	20.6	23	17.6	12 400	17 900	22 000	33	—	—
18	RNAF182613 RNAFW182620 RNAF183012 RNAFW183024	18 ^{+0.027} _{+0.016}	26	13	0.3	21.6	24	18.6	9 300	12 700	21 000	23	—	—
18		18 ^{+0.027} _{+0.016}	26	20	0.3	21.6	24	18.6	12 800	19 100	21 000	35	—	—
18		18 ^{+0.027} _{+0.016}	30	12	0.3	23.4	28	18.6	11 800	13 000	21 000	35	—	—
18		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.

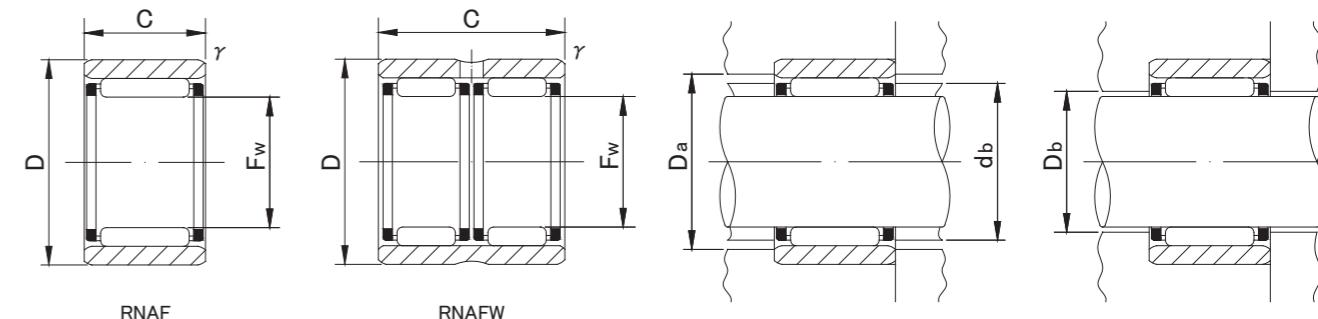
SEPARABLE NEEDLE ROLLER BEARINGS WITHOUT INNER RING



RNAF



RNAFW



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

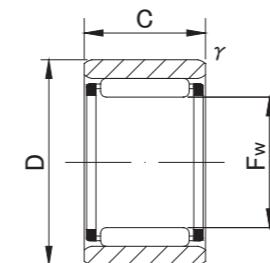
SEPARABLE NEEDLE ROLLER BEARINGS WITHOUT INNER RING



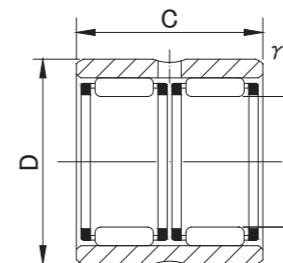
RNAF



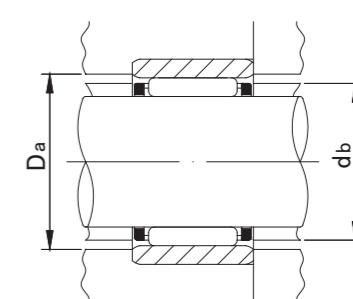
RNAFW



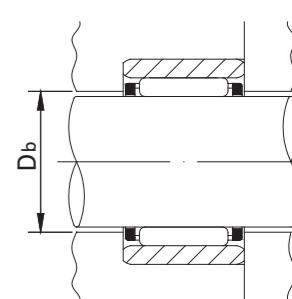
RNAF



RNAFW



INNER RING



WITH INNER RING

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	f_s min	db	Da MAX	Db						
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}	68	40	0.6	59.5	64	55.8	48 900	132 400	7 500	330	IR505540	NAFW506840
	RNAF557220	55 ^{+0.030}	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.

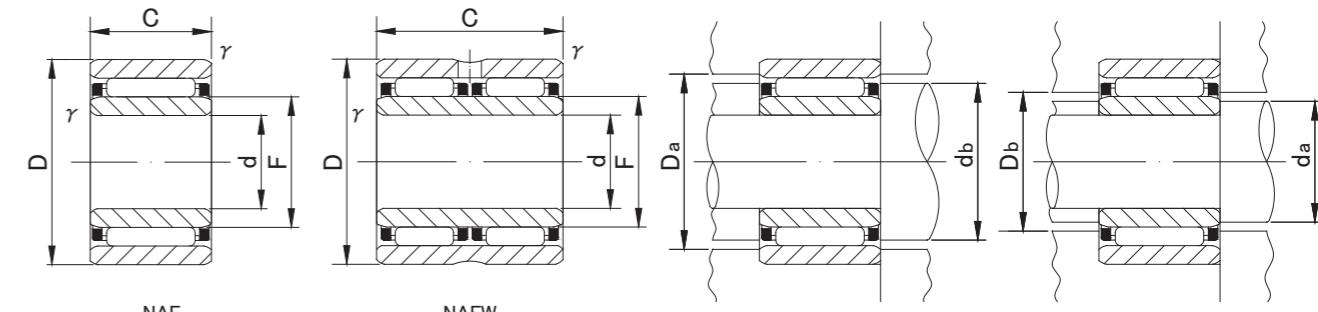
SEPARABLE NEEDLE ROLLER BEARINGS WITH INNER RING



NAF



NAFW



■ NAF(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			
										Db	Cr N	Cor N	rpm	g (approx)	OUTER RING	INNER RING			
		d	D	C	r_s min	F	db	Da MAX	MIN	MAX									
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 NAFW 102220 NAF 102612	10 ⁰ _{-0.008} 10 ⁰ _{-0.008} 10	22 22 26	13 20 12	0.3 0.3 0.3	14 14 14	17.6 17.6 19.4	20 20 24			12	13	14.6	7 800	9 400	24 000 10 800 9 800	26 40 36	RNAF142213 RNAFW142220 RNAF142612	IR101413 IR101420 IR101412
12	NAF 122413 NAFW 122420 NAF 122812	12 ⁰ _{-0.008} 12 ⁰ _{-0.008} 12	24 24 28	13 20 12	0.3 0.3 0.3	16 16 16	19.6 19.6 21.4	22 22 26			14	15	16.6	8 600	11 000	23 000 11 900 10 500	30 45 40	RNAF162413 RNAFW162420 RNAF162812	IR121613 IR121620 IR121612
15	NAF 152813 NAFW 152826 NAF 153212	15 ⁰ _{-0.008} 15 ⁰ _{-0.008} 15	28 28 32	13 26 12	0.3 0.3 0.3	20 20 20	23.6 23.6 25.4	26 26 30			17	19	20.6	9 600	13 500	20 000 16 500 12 400	37 76 51	RNAF202813 RNAFW202826 RNAF203212	IR152013 IR152026 IR152012
17	NAF 173013 NAFW 173026 NAF 173516 NAFW 173532	17 ⁰ _{-0.008} 17 ⁰ _{-0.008} 17 17	30 30 35 35	13 26 16 32	0.3 0.3 0.3 0.3	22 22 22 22	25.6 25.6 27.8 27.8	28 28 33 33			19	21	22.6	10 200	15 200	18 000 17 600 17 600 30 200	43 85 77 155	RNAF223013 RNAFW223026 RNAF223516 RNAFW223532	IR172213 IR172226 IR172216 IR172232
20	NAF 203517 NAFW 203526 NAF 203716 NAFW 203732	20 ⁰ _{-0.010} 20 ⁰ _{-0.010} 20 20	35 35 37 37	17 26 16 32	0.3 0.3 0.3 0.3	25 25 25 25	29.5 29.5 30.4 30.4	33 33 35 35			22	24	25.6	17 300	26 600	16 000 22 500 19 400 33 200	75 114 80 158	RNAF253517 RNAFW253526 RNAF253716 RNAFW253732	IR202517 IR202526 IR202516 IR202532
25	NAF 254017 NAFW 254026 NAF 254216 NAFW 254232	25 ⁰ _{-0.010} 25 ⁰ _{-0.010} 25 25	40 40 42 42	17 26 16 32	0.3 0.3 0.3 0.3	30 30 30 30	34.5 34.5 35.4 35.4	38 38 40 40			27	29	30.6	18 600	31 100	13 000 24 200 20 800 35 700	88 136 94 187	RNAF304017 RNAFW304026 RNAF304216 RNAFW304232	IR253017 IR253026 IR253016 IR253032
30	NAF 304517 NAFW 304526 NAF 304716 NAFW 304732	30 ⁰ _{-0.010} 30 ⁰ _{-0.010} 30 30	45 45 47 47	17 26 16 32	0.3 0.3 0.3 0.3	35 35 35 35	39.5 39.5 40.4 40.4	43 43 45 45			32	34	35.6	20 500	36 900	11 000 26 600 23 000 39 500	100 155 108 215	RNAF354517 RNAFW354526 RNAF354716 RNAFW354732	IR303517 IR303526 IR303516 IR303532

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

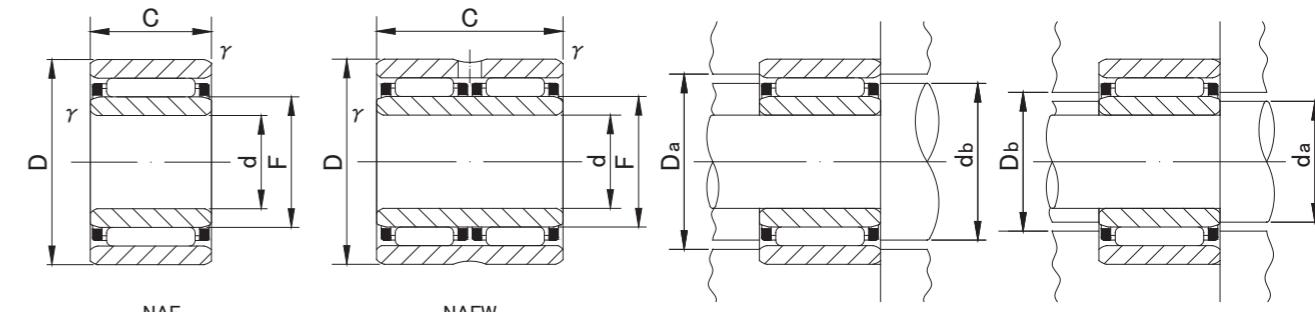
SEPARABLE NEEDLE ROLLER BEARINGS WITH INNER RING



NAF



NAFW



■ NAF(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	<i>r</i> 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	50	34	0.3	40	43.5	48			37	39	40.8	38 000	85 300	10 000	230	RNAFW405034	IR354034
	NAF 355520	35 -0.012	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	55	34	0.3	45	48.5	53			42	44	45.8	39 900	94 200	10 000	255	RNAFW455534	IR404534
	NAF 406220	40 -0.012	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	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 -0.012	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	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 -0.012	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	85	30	1	65	72	80			60	63	66	59 300	127 500	6 000	680	RNAF658530	IR556530
	NAFW 558560	55 -0.015	85	60	1	65	72	80			60	63	66	102 000	254 000	6 000	1 380	RNAFW658560	IR556560
60	NAF 609030	60 0	90	30	1	70	77	85			65	68	71	61 200	135 300	5 500	740	RNAF709030	IR607030
	NAFW 609060	60 -0.015	90	60	1	70	77	85			65	68	71	104 900	271 600	5 500	1 470	RNAFW709060	IR607060
65	NAF 659530	65 0	95	30	1	75	82	90			70	73	76	63 200	144 200	5 500	800	RNAF759530	IR657530
	NAFW 659560	65 -0.015	95	60	1	75	82	90			70	73	76	108 900	289 300	5 500	1 570	RNAFW759560	IR657560
70	NAF 7010030	70 0	100	30	1	80	87	95			75	78	81	64 900	153 000	5 000	840	RNAF8010030	IR708030
	NAFW 7010060	70 -0.015	100	60	1	80	87	95			75	78	81	111 800	306 000	5 000	1 670	RNAFW8010060	IR708060
75	NAF 7510530	75 0	105	30	1	85	92	100			80	83	86	66 600	160 800	4 800	890	RNAF8510530	IR758530
80	NAF 8011030	80 0	110	30	1	90	97	105			85	88	91	69 500	173 600	4 500	930	RNAF9011030	IR809030
85	NAF 8511530	85 0	115	30	1	95	102	110			90	93	96	70 900	182 400	4 200	970	RNAF9511530	IR859530
90	NAF 9012030	90 0	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

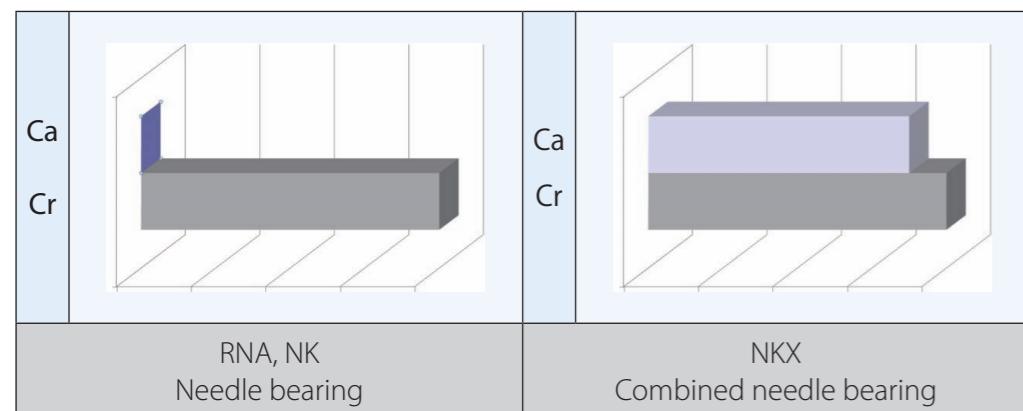
Type	Applicable axis diameter	Feature	Part Code		
NKX..(Z)	$\phi 10 \sim \phi 70$	Machined type combined bearing Radial bearing: needle bearing Thrust bearing: ball bearing With collar outer ring Without inner ring	Type NKX	Dimensions 30	Z Inscribed circle diameter Z: With dust cover No symbol: Without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

Structure and Features

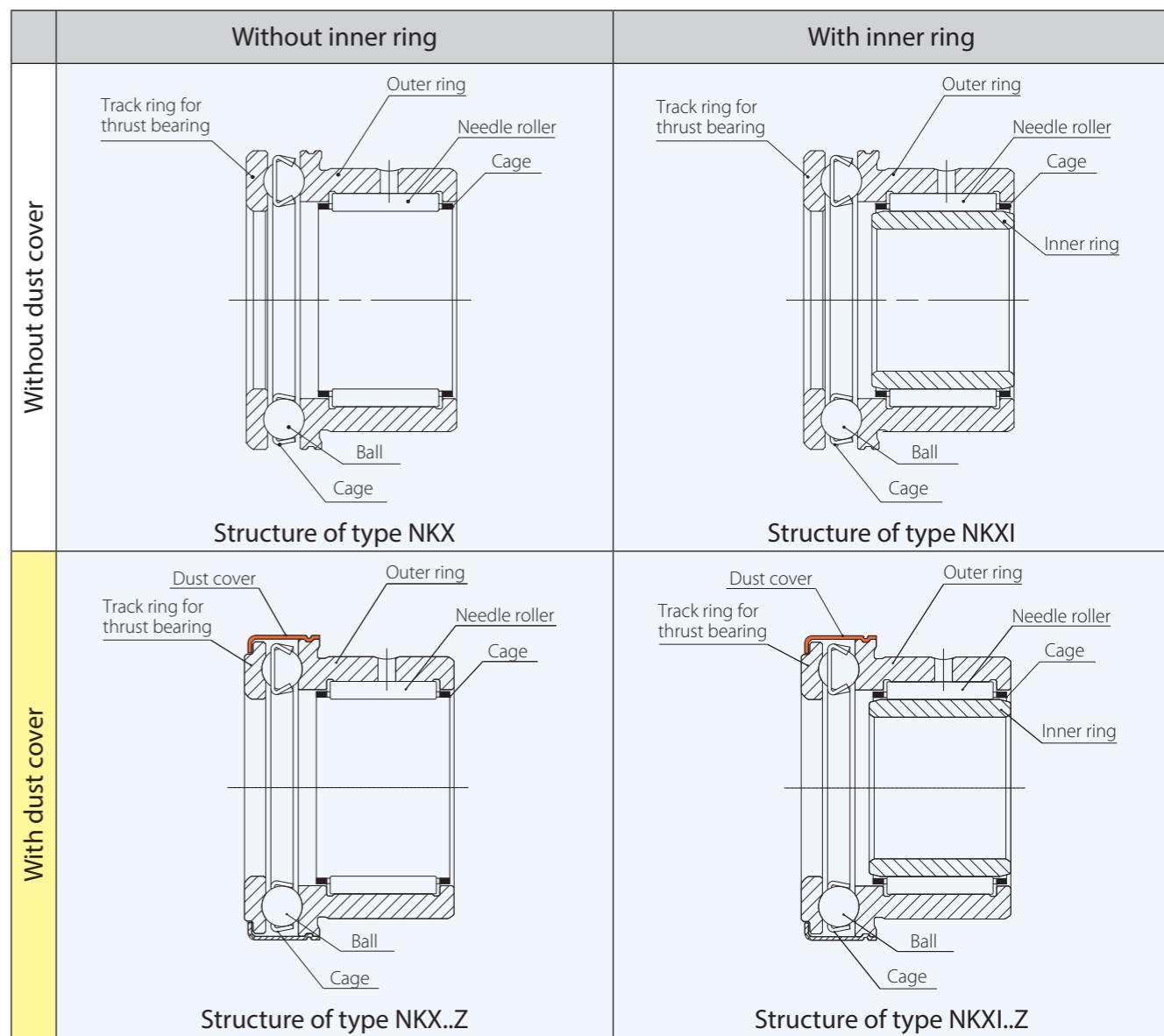
Combined needle roller bearings are made from a combination of radial needle bearings which support radial load and thrust ball bearings which support axial load.

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.



Ca : Axial load
Cr : Radial load



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

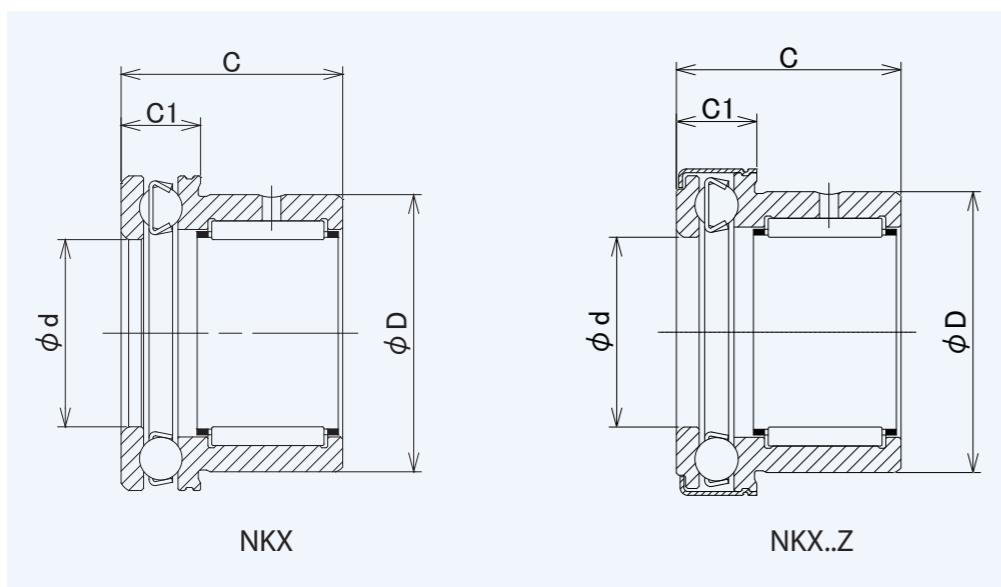
Part code	Inner ring		Outer ring		Inner ring/Outer ring					
	Δ_{dmp} Deviation of mean bore diameter in a single plane		V_{dsp} Variation of bore diameter in a single plane		Δ_{Dmp} Deviation of mean outer diameter in a single plane		V_{Dsp} Variation of outer diameter in a single plane	S_i/S_e Variation of track thickness		
	high	low	max.	high	low	max.	Class 0	Class 6	Class 5	
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

Table-4 Recommended fits Unit: μm

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

Fits

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

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.

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

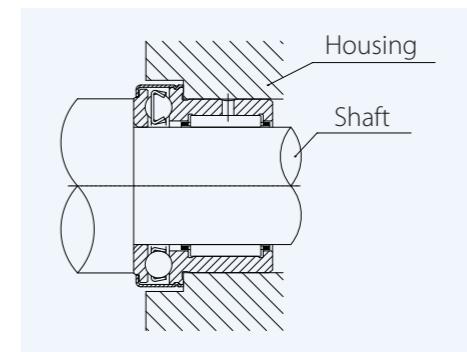
L : Basic rating life of combined needle bearings is 10^6 rotation 10^6 REV.

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



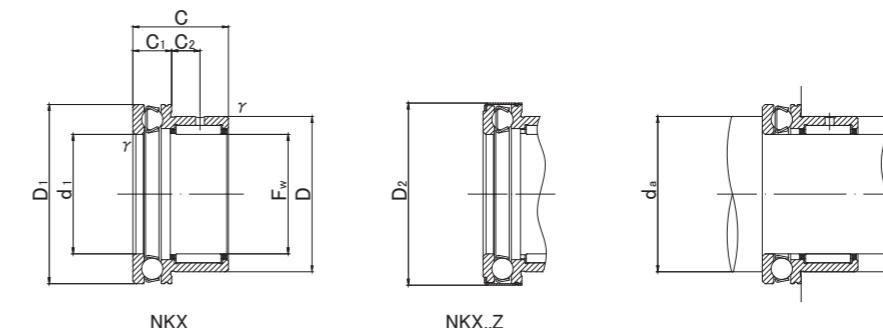
NKX NKX..Z



NKX



NKX..Z



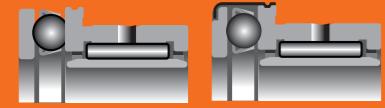
NKX,NKX..Z TYPE

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					
			F _w	D	D ₁	D ₂	C	C ₁	C ₂	r _s min		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

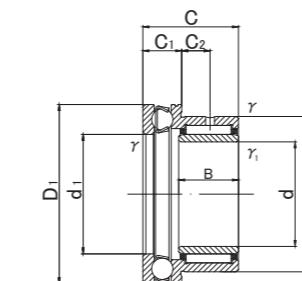
NKXI..Z



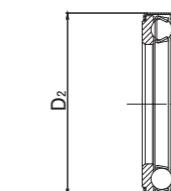
NKXI



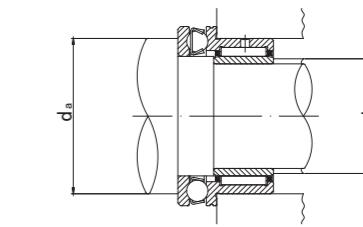
NKXI..Z



NKXI



NKXI..Z



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	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.)				
	Grease pre-packed in thrust section																						
7	NKXI 7	—	7 0	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 -0.008	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	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 -0.008	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	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 -0.008	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	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 -0.008	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	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 -0.008	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	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 -0.010	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	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 -0.010	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	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 -0.010	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	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 -0.012	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	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 -0.012	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	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 -0.012	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	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 -0.012	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	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 -0.015	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.

INNER RINGS



Inner ring (IR, IRZ)

Type and Part Code

Type	Applicable axis diameter	Feature	Part Code			
 IR	$\phi 5 \sim \phi 160$	Inner ring (without oil hole)	Type IR	Dimensions 25 30 17	Type of bearing Bore diameter Outer diameter Width	
 IRZ	$\phi 10 \sim \phi 50$	Inner ring (with oil hole)	Type IRZ	Dimensions 25 30 18	Type of bearing Bore diameter Outer diameter Width	

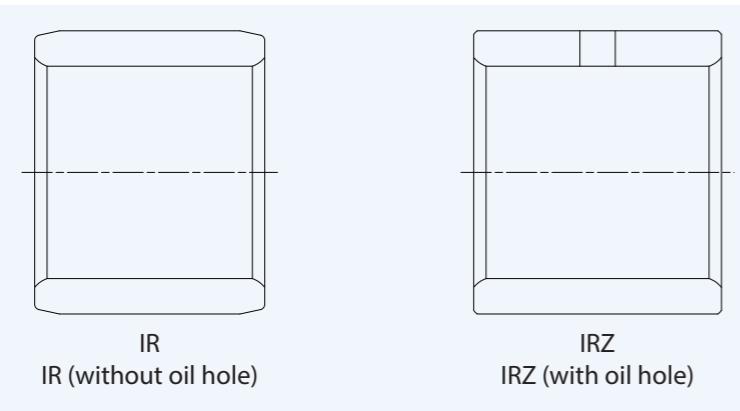
Structure and Features

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.

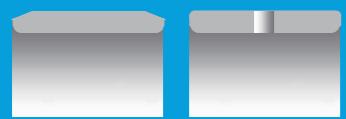
Inner rings, after being subjected to heat treatment, are given a high accuracy grinding finish. The endfaces are chamfered to allow easy insertion into the bearing and to prevent damage to the seal. Depending on the conditions of use, there are inner rings with oil holes or without oil holes available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



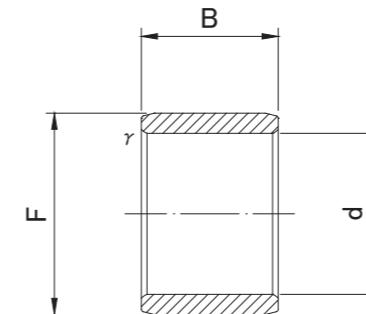
INNER RINGS



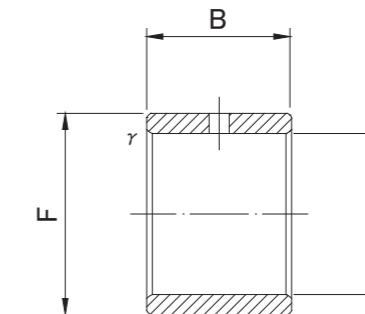
IR



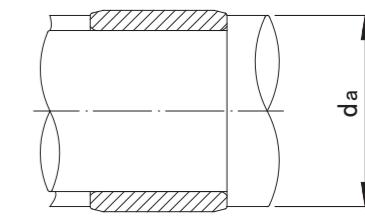
IRZ



IR



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		g (approx)	RNA 49	RNA 59	RNA 69	RNA 48	NK		
									MIN	MAX								
5	IR 5710	—	5	7	10	0.15			6.2	6.7	1.4	RNA 495	—	—	—	—	—	
	IR 5812	—	5 ⁰ -0.008	8	12	0.3			7	7.7		—	—	—	—	NK 8/12	—	
	IR 5816	—	5	8	16	0.3			7	7.7		—	—	—	—	NK 8/16	—	
6	IR 6810	—	6	8	10	0.15			7.2	7.7	1.7	RNA 496	—	—	—	—	—	—
	IR 6912	—	6 ⁰ -0.008	9	12	0.3			8	8.7		—	—	—	—	NK 9/12	—	
	IR 6916	—	6	9	16	0.3			8	8.7		—	—	—	—	NK 9/16	—	
	IR 61010	—	6	10	10	0.3			8	9.7		—	—	—	—	—	RNAF 101710	
7	IR 7910	—	7	9	10	0.15			8.2	8.7	1.9	RNA 497	—	—	—	—	—	—
	IR 71010.5	—	7	10	10.5	0.3			9	9.7		—	—	—	—	—	—	
	IR 71012	—	7 ⁰ -0.008	10	12	0.3			9	9.7		—	—	—	—	NK 10/12	RNAF 102012	
	IR 71012.5	—	7	10	12.5	0.3			9	9.7		—	—	—	—	—	—	
	IR 71015.5	—	7	10	15.5	0.3			9	9.7		—	—	—	—	—	—	
	IR 71016	—	7	10	16	0.3			9	9.7		—	—	—	—	NK 10/16	NKX10(Z)	
8	IR 81011	—	8	10	11	0.15			9.2	9.7	2.4	RNA 498	—	—	—	—	—	—
	IR 81210	—	8 ⁰ -0.008	12	10	0.3			10	11		—	—	—	—	—	—	
	IR 81210.5	—	8	12	10.5	0.3			10	11		—	—	—	—	—	—	
	IR 81212.5	—	8	12	12.5	0.3			10	11		—	—	—	—	—	—	
	IR 81215.5	—	8	12	15.5	0.3			10	11		—	—	—	—	—	—	
9	IR 91211	—	9 ⁰ -0.008	12	11	0.3			11	11.5	3.1	RNA 499	—	—	—	—	—	—
	IR 91212	—	9	12	12	0.3			11	11.5		—	—	—	—	NK 12/12	—	
	IR 91216	—	9	12	16	0.3			11	11.5		—	—	—	—	NK 12/16	RNAF 122212	
10	IR 101312.5	—	10	13	12.5	0.3			12	12	5.2	—	—	—	—	—	—	
	IR 101412	—	10	14	12	0.3			12	13		—	—	—	—	—	RNAF 142612	
	IR 101412.5	—	10	14	12.5	0.3			12	13		—	—	—	—	—	—	
	IR 101413	—	10	14	13	0.3			12	13		—	—	—	—	—	RNAF 142213	
	IRZ 101414	10	14	14	0.3	12			12	13		—	—	—	—	—	—	
	IR 101416	—	10 ⁰ -0.008	14	16	0.3			12	13		—	—	—	—	NK 14/16	—	
	IR 101416.5	—	10	14	16.5	0.3			12	13		—	—	—	—	—	—	
	IR 101420	—	10	14	20	0.3			12	13		—	—	—	—	NK 14/20	RNAFW 142220	
	IR 101420.5	—	10	14	20.5	0.3			12	13		—	—	—	—	—	—	
	IR 101510.5	—	10	15	10.5	0.3			12	14		—	—	—	—	—	—	
	IR 101515.5	—	10	15	15.5	0.3			12	14		—	—	—	—	—	—	
	IR 101520.5	—	10	15	20.5	0.3			12	14		—	—	—	—	—	—	
	IR 101525.5	—	10	15	25.5	0.3			12	14		—	—	—	—	—	—	

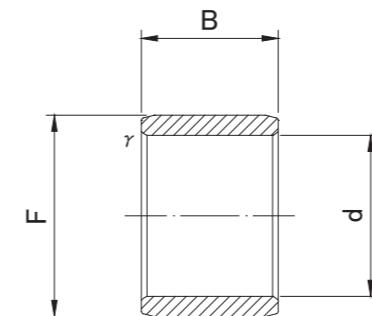
INNER RINGS



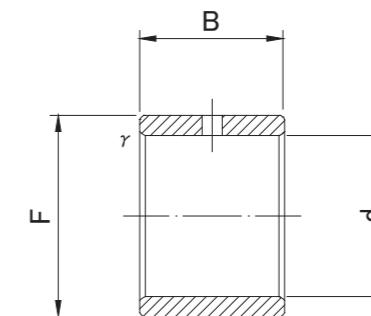
IR



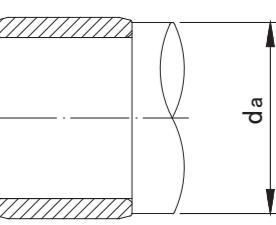
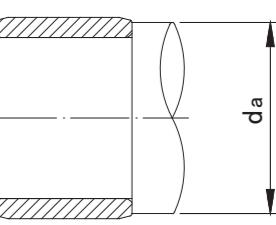
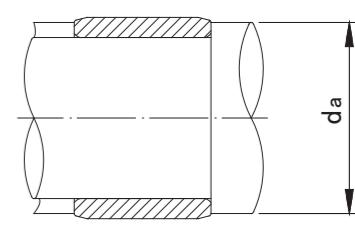
IRZ



IR



IRZ



IR,IRZ TYPE

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

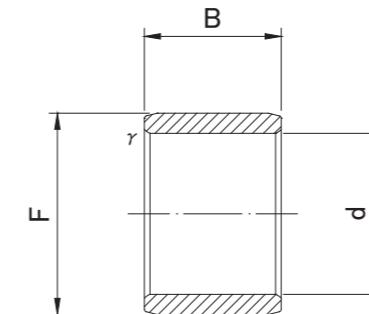
INNER RINGS



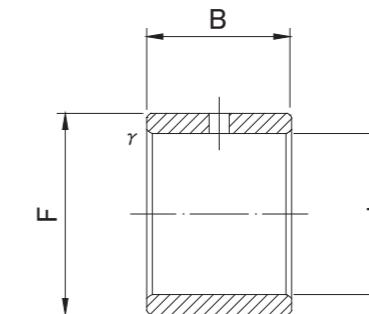
IR



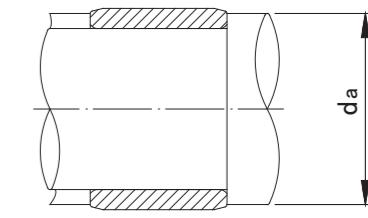
IRZ



IR



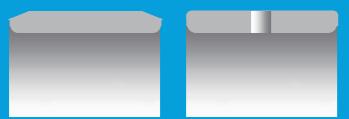
IRZ



IR,IRZ TYPE

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

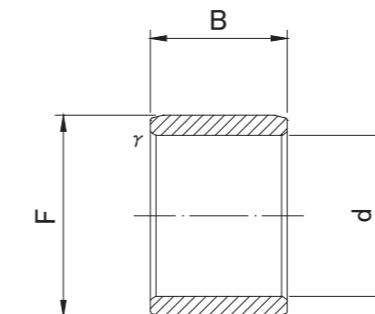
INNER RINGS



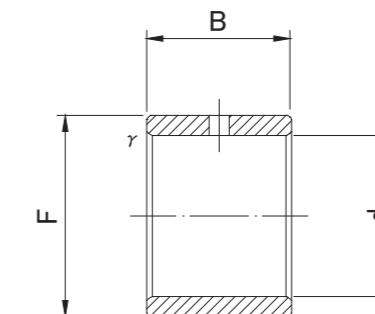
IR



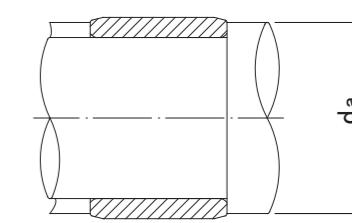
IRZ



IR



IRZ



IRZ

IR,IRZ TYPE

Shaft Diameter (mm)	Designation		Dimensions (mm)				Standard mounting dimensions (mm)	Mass 	Usable bearing designation										
									da	g (approx)	RNA 49	RNA 59	RNA 69	RNA 48	NK	NKX(Z)	RNAF		
			d	F	B	r's min			MIN	MAX									
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 ⁰ -0.010	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 -0.010	30	20.5	0.3	27	29	34	—	—	—	—	—	—	—	—		
	IR 253023	—	25 ⁰ -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	—	—	—	—	—	—	—	—		
28	IR 253031	—	25	30	31	0.3	27	29	51	—	—	RNA 6905UU	—	—	—	—	—		
	IR 253032	—	25	30	32	0.3	27	29	54	—	—	—	—	—	—	RNAFW 304232	—		
28	IR 253038.5	—	25	30	38.5	0.3	27	29	64	—	—	—	—	—	—	—	—		
	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 -0.010	32	20.5	0.3	30	31	29.5	—	—	—	—	—	—	—	—		
	IR 283223	—	28 ⁰ -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	—	—	—	—	—	—	—	—		

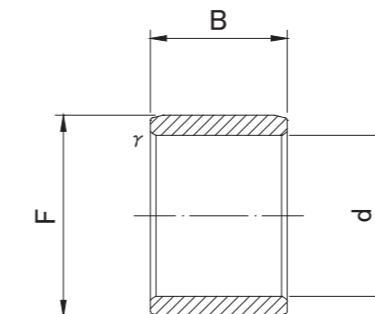
INNER RINGS



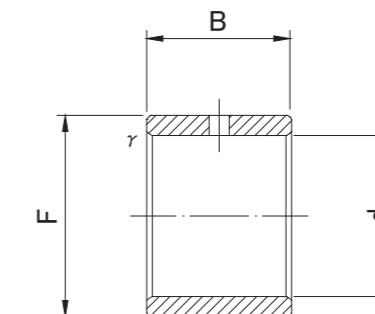
IR



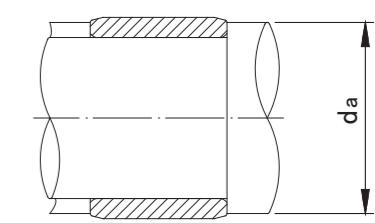
IRZ



IR



IRZ



IRZ

IR,IRZ TYPE

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

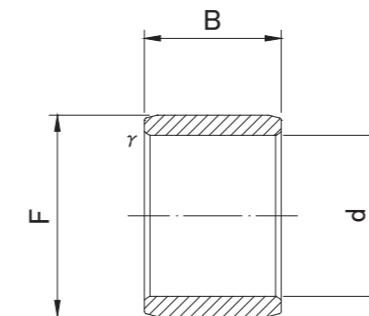
INNER RINGS



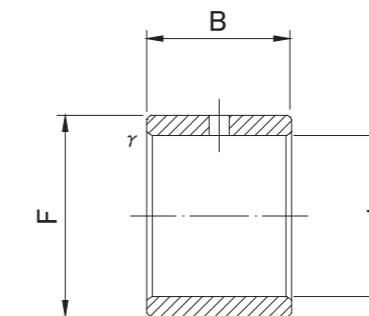
IR



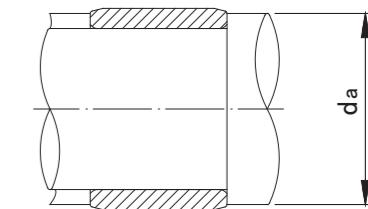
IRZ



IR



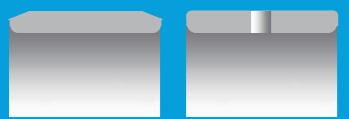
IRZ



IR,IRZ TYPE

Shaft Diameter (mm)	Designation		Dimensions (mm)				Standard mounting dimensions (mm)	Mass 	Usable bearing designation										
									da 	g (approx)	RNA 49	RNA 59	RNA 69	RNA 48	NK				
			d	F	B	r's min			MIN	MAX									
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	—	—	—	—	—	—	—	RNAFW 557240	
	IR 455540	—	45	55	40	0.6	49	54		245	—	—	—	—	—	—	—	RNAFW 557240	

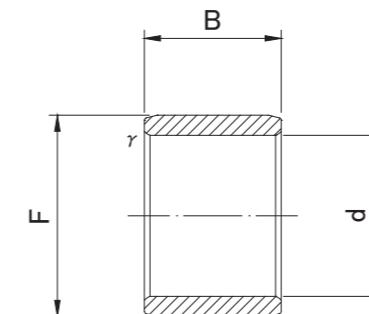
INNER RINGS



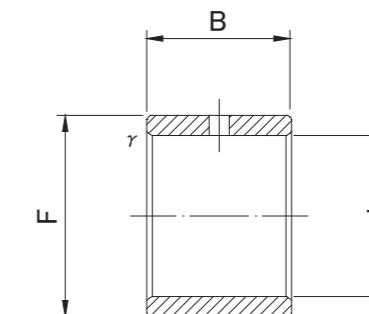
IR



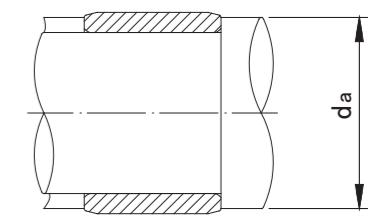
IRZ



IR



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

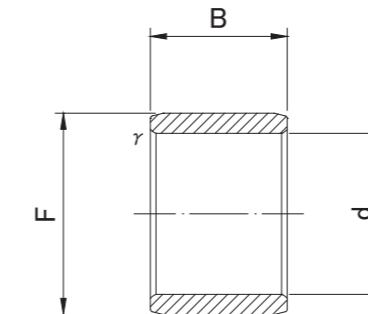
INNER RINGS



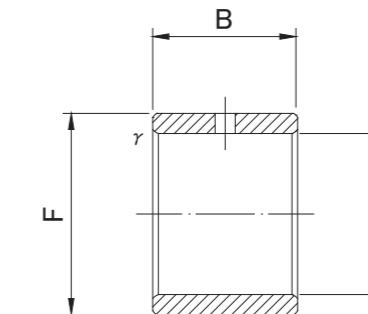
IR



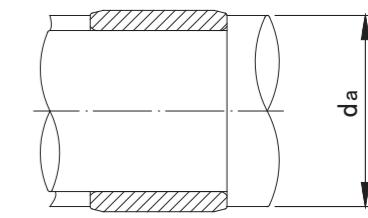
IRZ



IR



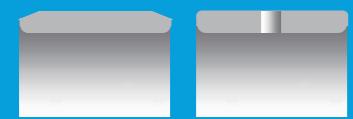
IRZ



IR,IRZ TYPE

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

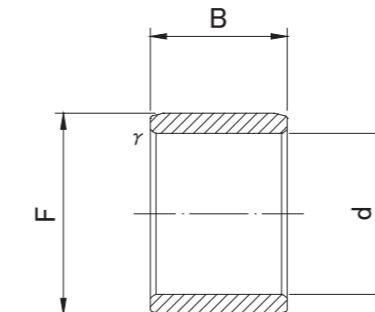
INNER RINGS



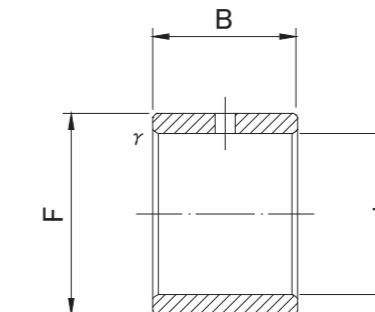
IR



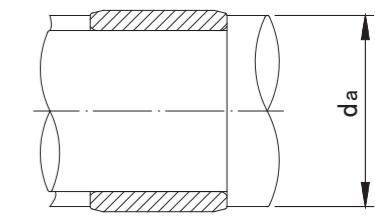
IRZ



IR



IRZ



IR,IRZ TYPE

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

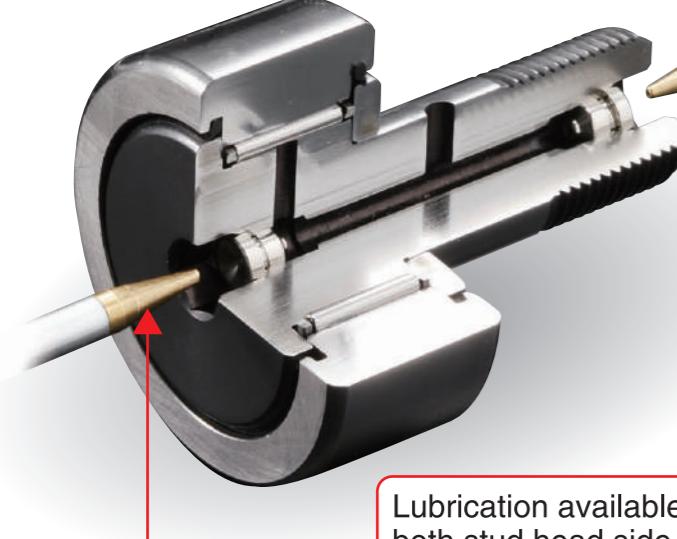
CF..AB
Standard type

CF..MAB
Stainless type

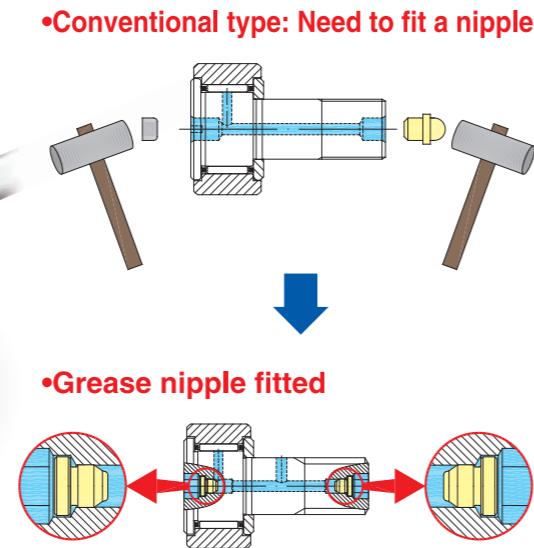
CFH..AB
Eccentric type

CFH..MAB
Eccentric stainless type

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

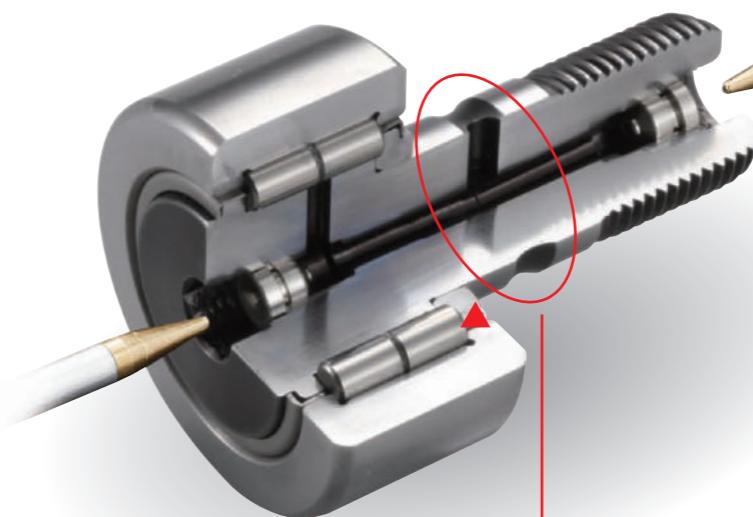


Lubrication available from both stud head side and thread side. No restriction for mounting location.

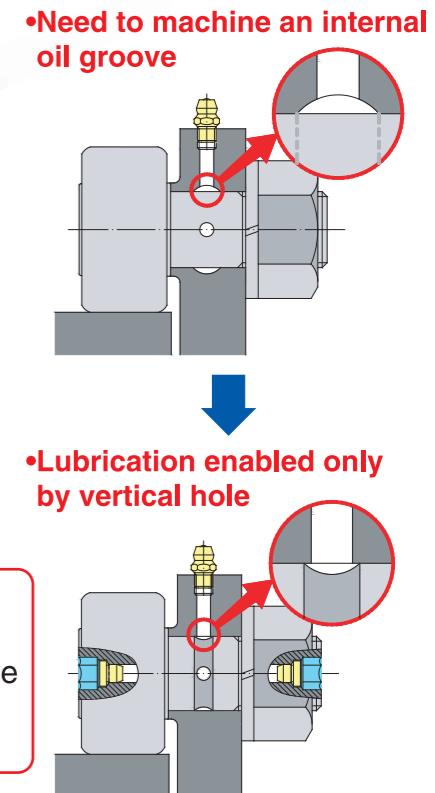


NUCF..AB Double-row cylindrical roller type

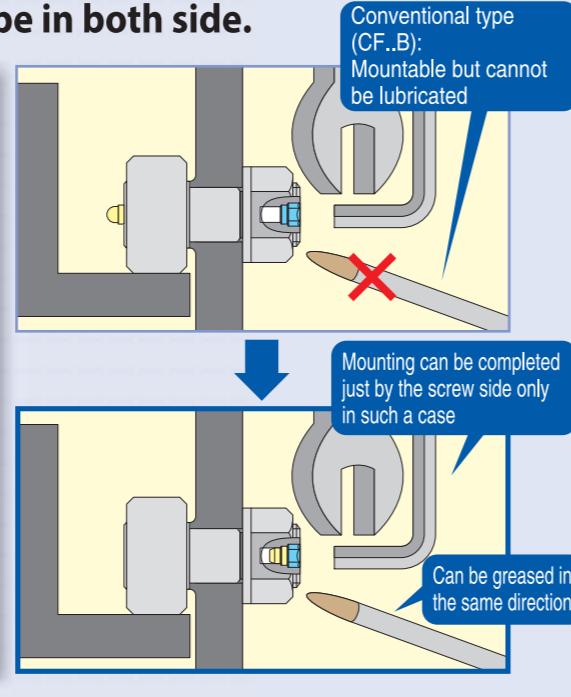
stud diameter
16 to 30mm



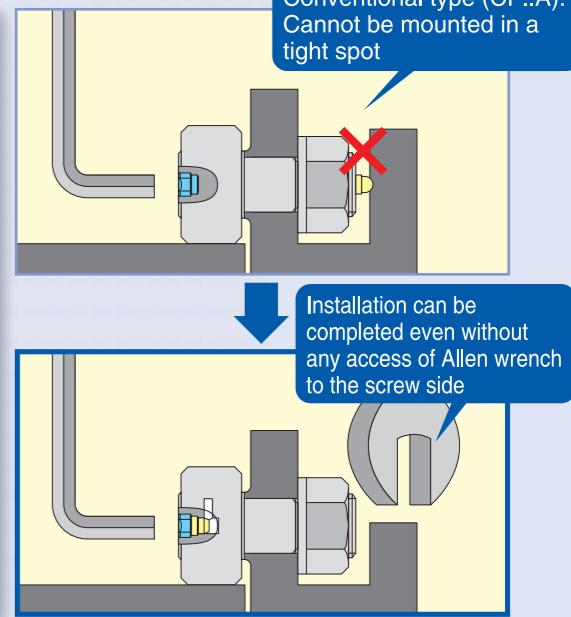
Lubrication area at the side of stud has an oil groove to eliminate bothersome groove machining process in the mounting side(NUCF type).



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.

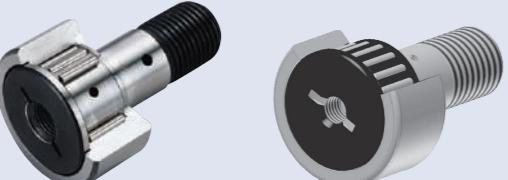


No restriction for mounting location thanks to hexagon socket shape in stud head and thread side. Easy mounting and removal is available thanks to having hexagon socket shape in both side.



Type and Part Code

Type	Applicable axis diameter	Feature	Part Code
 CFS Compact outer ring	$\phi 2.5 \sim \phi 6$	Built-in very thin needle roller. Enables compact design due to very small outer ring diameter in comparison to stud diameter.	CFS 6 V A Type Stud diameter V A A: With hexagon socket on the stud head V: Full complement None: With cage
 CF-SFU Easy mounting	$\phi 6 \sim \phi 20$	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 16 V R Type Stud diameter V R V: Full complement None: With cage R: Crowned outer ring None: Cylindrical outer ring
 CF-A Hexagon hole	$\phi 3 \sim \phi 30$	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 16 V UU R A N Type Stud diameter V UU R A N V: Full complement None: With cage UU: With seal None: With shield 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) N: Option (Dedicated grease nipple)
 CF-AB	$\phi 10 \sim \phi 30$	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 16 V UU R AB Type Stud diameter V UU R AB V: Full complement None: With cage UU: With seal None: With shield R: Crowned outer ring None: Cylindrical outer ring AB: With hexagon socket on both sides. (With integrated concave nipple)
 NUCF-AB	$\phi 16 \sim \phi 30$	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 16 R AB Type Stud diameter R AB AB: With hexagon socket both sides. (With integrated concave nipple) R: Crowned outer ring None: Cylindrical outer rings

Type	Applicable axis diameter	Feature	Part Code				
 CF	$\phi 5 \sim \phi 30$	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 ↑ Type ↑ Stud diameter ↓	U ↓ U R ↑	R: Crowned outer ring None: Cylindrical outer ring
 CFH-A Hexagon socket, Eccentric	$\phi 5 \sim \phi 30$	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 ↑ Type ↑ Stud diameter ↓	U ↓ U R ↓ A ↑	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	$\phi 12 \sim \phi 30$	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 ↑ Type ↑ Stud diameter ↓	U ↓ U R ↓ AB ↑	R: Crowned outer ring None: Cylindrical outer ring AB: With hexagon socket on both sides (With integrated concave nipple)
 CFT Lubrication tap hole	$\phi 6 \sim \phi 30$	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 ↑ Stud diameter ↓ CFT: Standard typed CFHT: Eccentric type	U ↓ U R ↓ A ↑	R: Crowned outer ring None: Cylindrical outer ring A: With hexagon socket on the stud head (Applicable shaft diameter $\phi 12 \sim \phi 30$) B: With hexagon socket on the thread side (Applicable shaft diameter $\phi 12 \sim \phi 30$) None: Standard type
 CR Inch type	$\phi 4.826 \sim \phi 22.225$	Cam followers in inch dimension.	CR 16 UU ↑ Type ↑ Stud diameter ↓ UU: With seal None: With shield	R: Crowned outer ring None: Cylindrical outer ring	R ↓		

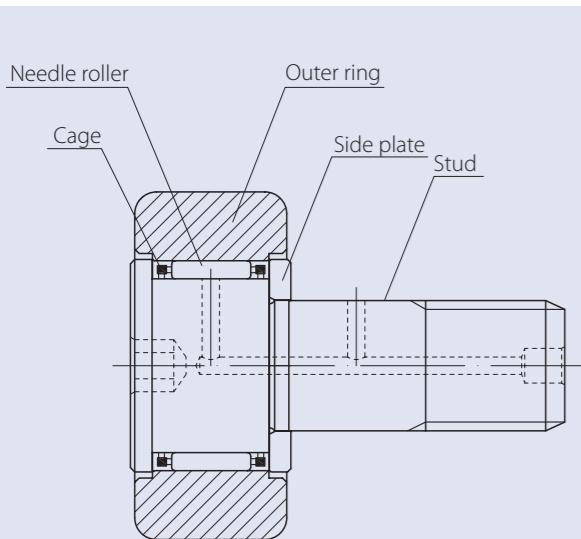
Structure and Features

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 liner 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.

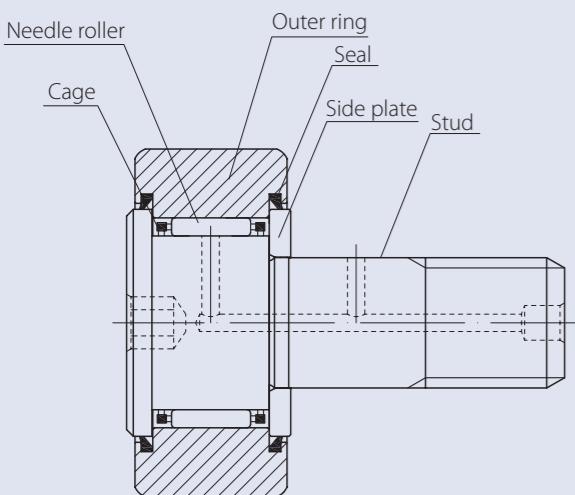
Outer rings have two shapes – crowned outer ring and cylindrical outer ring. The cylindrical outer ring is effective for heavy duty applications since it contacts with large contact area of the associated objects so that can mitigate the contact surface pressure. The crowned outer ring is suited for 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-row 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.

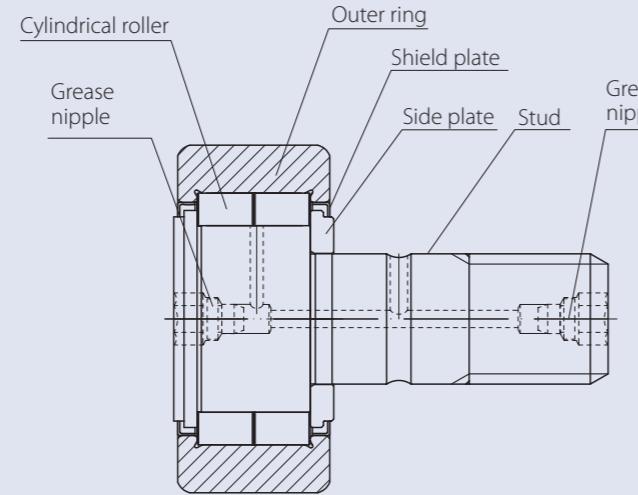
Cam followers with eccentric axis on the stud thread have an advantage to adjust the variation of mounting position within its eccentric range, without requesting high machining accuracy of mounting hole position.



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.	
6 (5 or more)	18	0	-8
18	30	0	-9
30	50	0	-11
50	80	0	-13
80	120	0	-15

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 CF6 ~ 8 CF10 ~ 12-1 CF16 ~ 20-1 CF24 ~ 30-2	CFS2.5 ~ 5 CFS6 NUCF16 ~ 24 NUCF24-1 ~ 30-2		CR8 ~ 8-1	3	17
			CR10 ~ 10-2	5	20
			CR12 ~ 22	5	25
			CR24 ~ 26	10	30
				10	40
				0	25
				5	30

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.

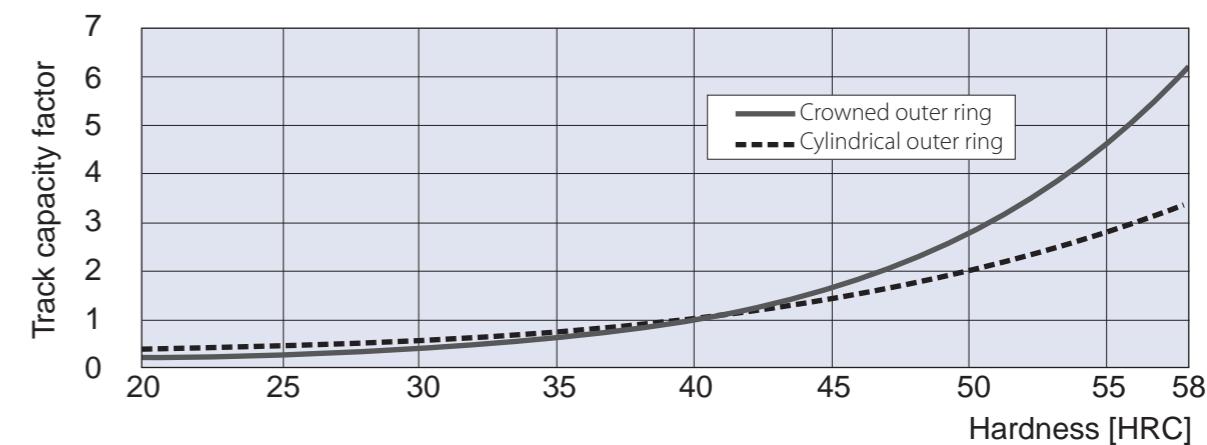


Figure-1 Track capacity factor

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

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 rubber 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.

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.

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.

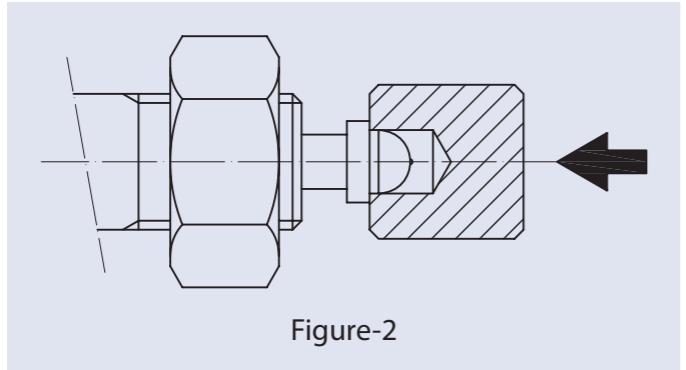


Figure-2

Example) CF 12 UUR -N

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

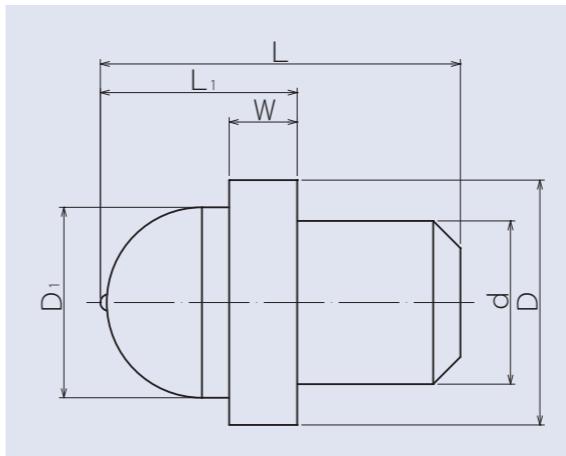


Table-6

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

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
NPAB-2		CF20AB CF20-1AB CF24AB CF24-1AB CF30AB CF30-1AB CF30-2AB

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.

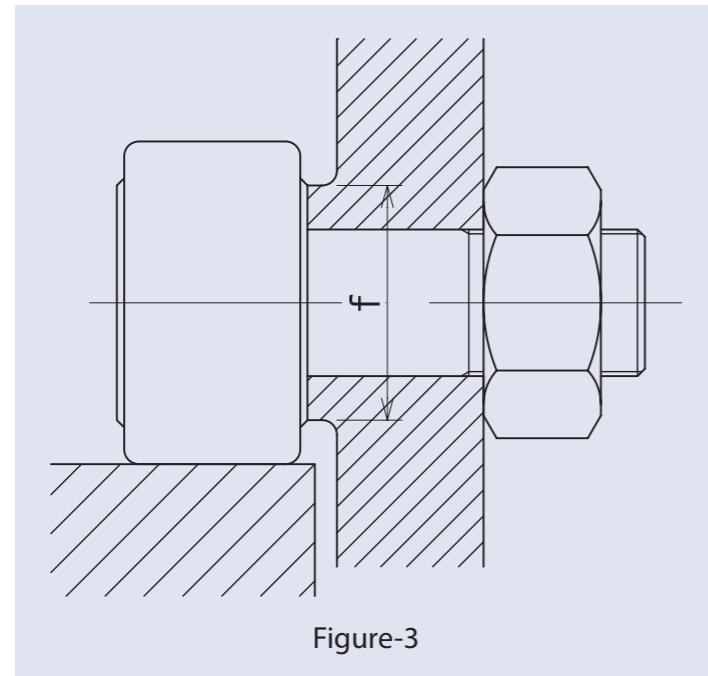


Figure-3

- 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.

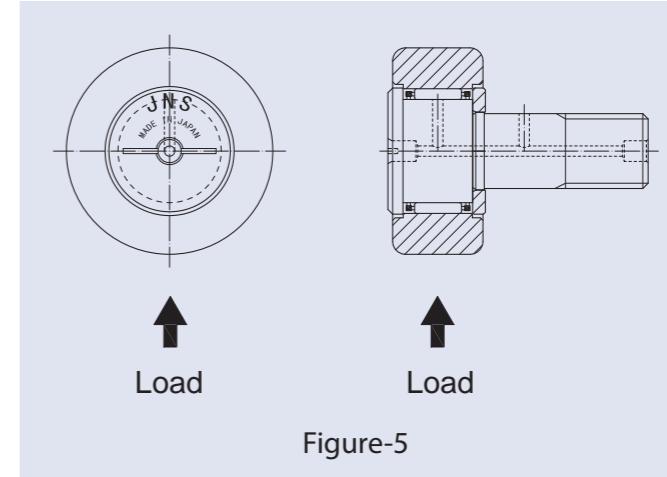


Figure-5

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.

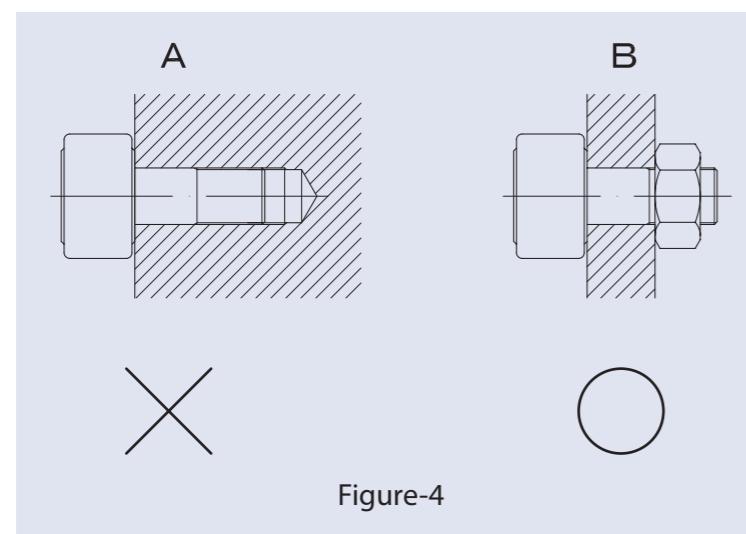


Figure-4

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

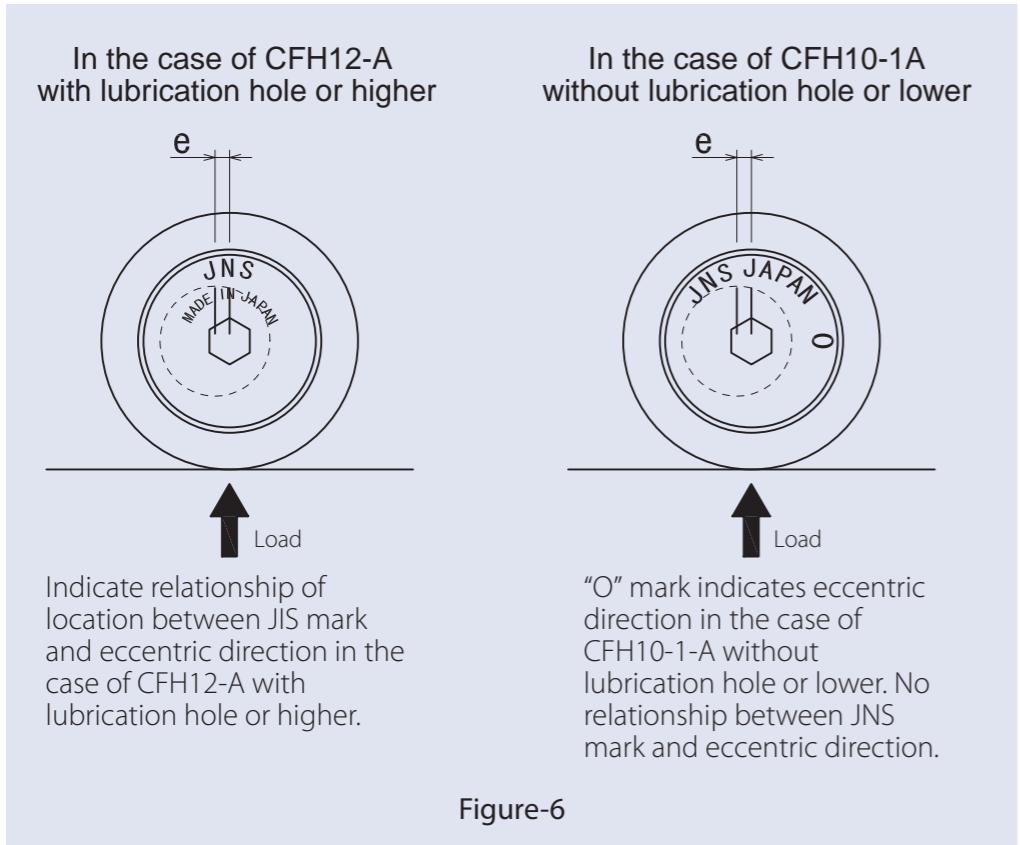
Stud of cam follower is subjected to bending stress or tensile stress by bearing load. Tightening torque shall be set not to exceed the value in the dimension table.

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.

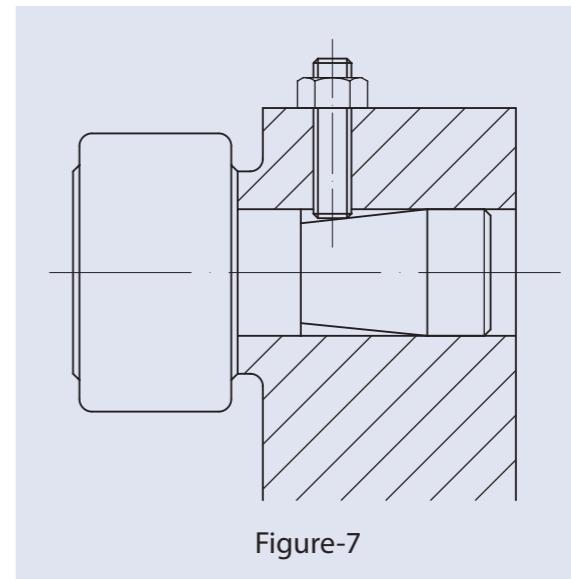
- (1) Insert stud to mounting hole and tighten nut as the stud can turn loosely. Marking of stud shall face location indicated in Figure-6 in relation to direction of load.
- (2) Gap between cam follower and mating contact surface may be adjusted by turning stud using hexagon hole on the stud head.
- (3) After completing adjustment, tighten nut with holding rotation of stud. Make it sure not to exceed maximum tightening torque of the nut.



Mounting of CF-SFU type

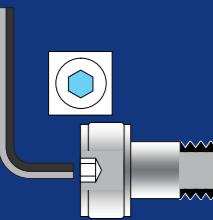
Refer to Figure-7 for mounting method of easy mounting of CF-SFU type.

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.



CAM FOLLOWERS

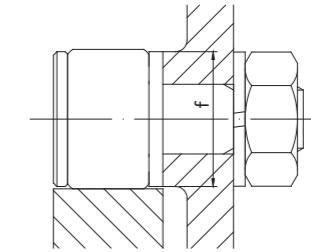
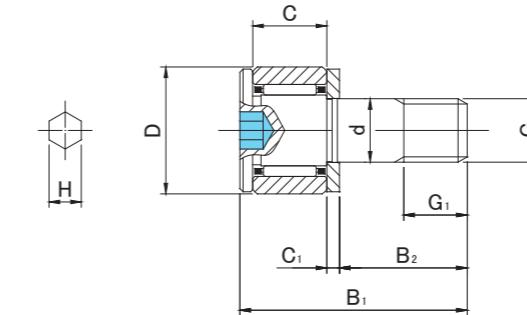
MINIATURE TYPE
HEXAGON SOCKET ON STUD HEAD



CFS..A



CFS..VA



CFS..A TYPE

Prepacked Grease

Stud diameter (mm)	Designation			Dimensions (mm)									Basic dynamic load rating	Basic static load rating	Largest permissible load	Max tightening torque	Mass	
	Cylindrical outer ring	With cage	Full roller	D	C	d	G	G1	B1	B2	C1	H						
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)

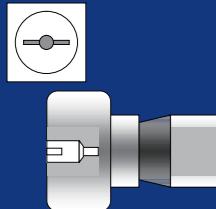
TYPE	Cylindrical outer ring
CFS2.5,CFS3,CFS4,CFS5,CFS6	0/-8

ACCESSORIES

TYPE	NUT
All types	Attached

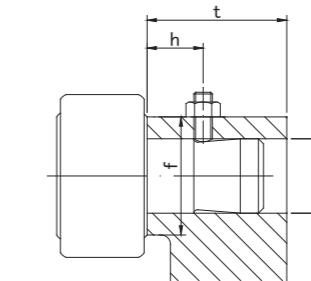
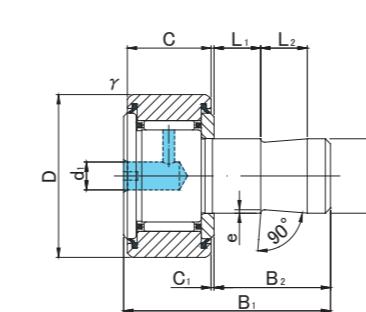
CAM FOLLOWERS

EASY MOUNTING TYPE
SCREWDRIVER SLOT HEAD



CF-SFU

CF-SFU..V



CF-SFU TYPE

Prepacked Grease

Stud diameter (mm)	Designation		Dimensions (mm)											Mounting dimensions (mm)					Basic dynamic load rating	Basic static load rating	Largest permissible load	Limiting speed	Track load capacity		Mass							
	R500(CF6~CF18) R1000(CF20≤)		Cylindrical outer ring	Crowned outer ring	D	C	d	B1	B2	C1	L1	L2	d1	e	r _s min	D1 Tolerance	t Min	f Min	h (Ref)													
	With seals	With seals																														
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)

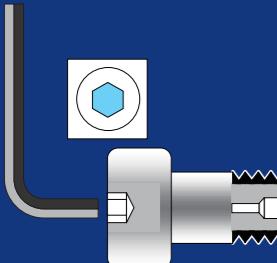
TYPE	Cylindrical outer ring	Crowned outer ring
CF6	0/-8	0/-50
CF8,CF10,CF10-1,CF12	0/-9	0/-50
CF12-1,CF16,CF18,CF20-1	0/-11	0/-50
CF20	0/-13	0/-50

ACCESSORIES

||
||
||

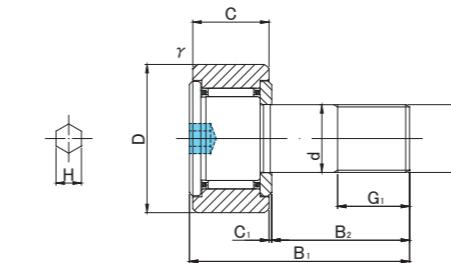
CAM FOLLOWERS

HEXAGON SOCKET ON STUD HEAD

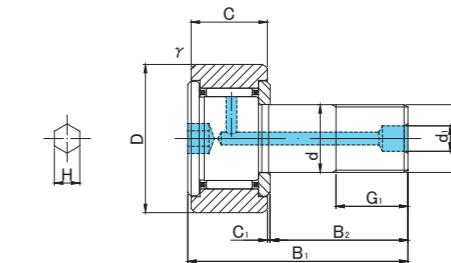


CF..A

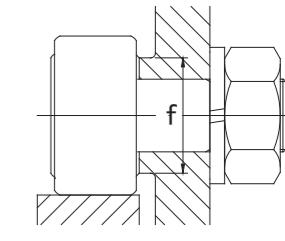
CF..VA



CF3(V)A~CF10-1(V)A



CF10(V)AK~CF10-1(V)AK



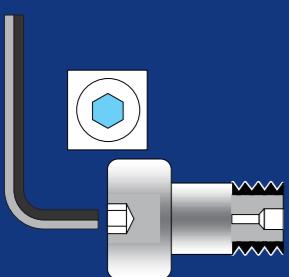
CF..A TYPE

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 (\leq CF5) R500(CF6 ~ CF10)		D	C	d	G	G1	B1	B2	B3	C1	d1	d2	H	r _s min	f min	Cr N	Cor N	N	rpm	Cylindrical outer ring N	Crowned outer ring N			
	h7 tolerance	Without seals	With seals	Without seals	With seals	D	C	d	G	G1	B1	B2	B3	C1	d1	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)
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																		

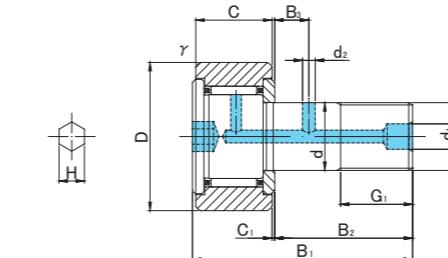
CAM FOLLOWERS

HEXAGON SOCKET ON STUD HEAD

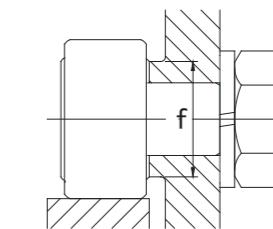


CF..A

CF..VA



CF12(V)A~CF30-2(V)A



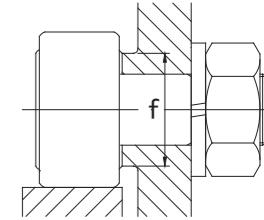
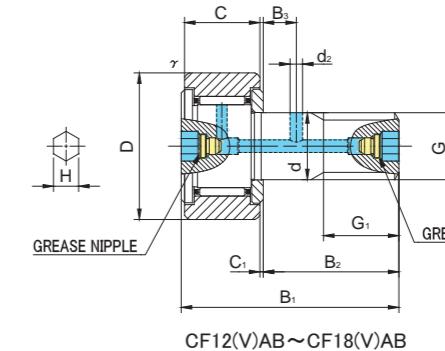
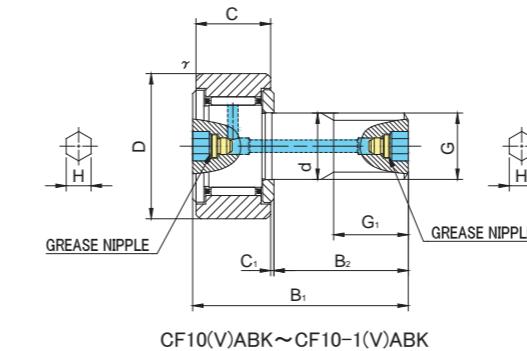
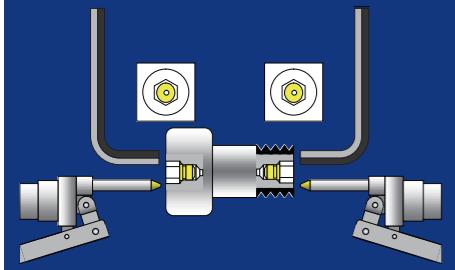
Prepacked Grease

CF..A TYPE

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 ≤)		D	C	d	G	G1	B1	B2	B3	C1	d1	d2	H	r _s min	f min	Cr N	Cor N	N	rpm	Cylindrical outer ring N	Crowned outer ring N			
	h7 tolerance	Without seals	With seals	Without seals	With seals	D	C	d	G	G1	B1	B2	B3	C1	d1	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)
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														

CAM FOLLOWERS

HEXAGON SOCKET ON BOTH SIDES
GREASE NIPPLE INSTALLED



CF..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 ≤)		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)	
	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	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.

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

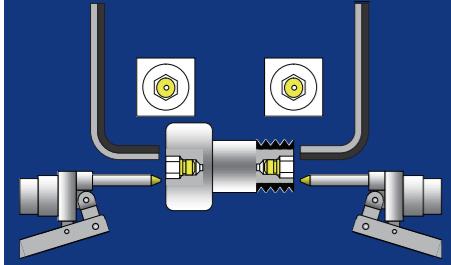
* Without seals, suitable for grease lubrication. In case of oil lubrication, up to 130% of this value shall be permissible, and 70% of this value shall apply for types with seals.

ACCESSORIES

TYPE	Grease Nipple	NUT
All types	Installed	Attached

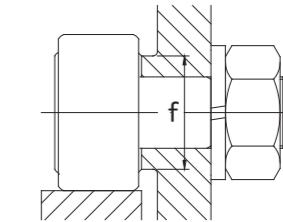
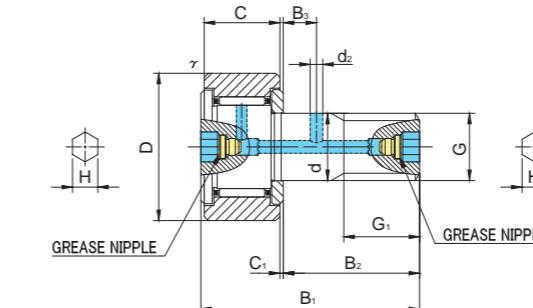
CAM FOLLOWERS

HEXAGON SOCKET ON BOTH SIDES
GREASE NIPPLE INSTALLED



CF..AB

CF..VAB



CF..AB TYPE

Prepacked Grease

Stud diameter (mm)	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 ≤)		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			
	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)
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.

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

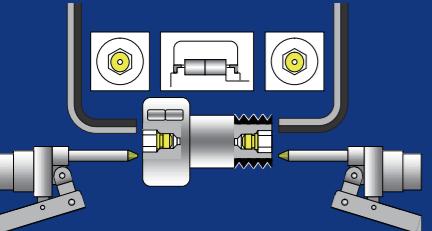
* Without seals, suitable for grease lubrication. In case of oil lubrication, up to 130% of this value shall be permissible, and 70% of this value shall apply for types with seals.

ACCESSORIES

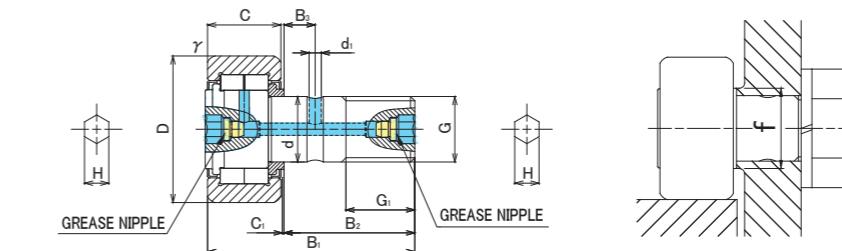
TYPE	Grease Nipple	NUT
All types	Installed	Attached

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≤)	D	C	d	G	G1	B1	B2	B3	C1	D2	H	r _s min	f min	Cr N	Cor N	N	rpm					
	h7 tolerance																							
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)

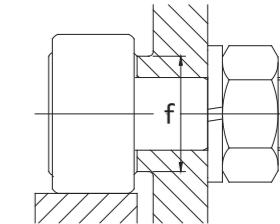
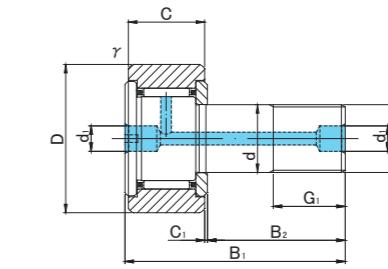
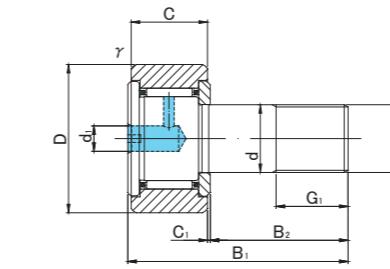
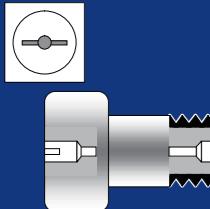
TYPE	Cylindrical outer ring	Crowned outer ring
NUCF16,NUCF18,NUCF20-1	0/-11	0/-50
NUCF20,NUCF24,NUCF24-1,NUCF30	0/-13	0/-50
NUCF30-2	0/-15	0/-50

ACCESSORIES

TYPE	Grease Nipple	NUT
All types	Installed	Attached

CAM FOLLOWERS

SCREWDRIVER SLOT HEAD



CF 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 ~ CF10-1)		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			
	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)
5	0 -0.012	CF 5	CF 5UU	CF 5R	CF 5UUR	13	9	5	M5x0.8	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	M6x1	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	M8x1.25	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	M10x1.25	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	M10x1.25	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	CF10UK	CF10RK	CF10UURK	22	12	10	M10x1	12	36	23	—	0.6	4	—	0.3	15	5 390	6 860	6 860	17 000	4 700	1 670	15	45
		CF10VK	CF10VUK	CF10VRK	CF10VUURK														9 510	14 500	7 450	7 500				
10	0 -0.015	CF10-1K	CF10-1UU	CF10-1RK	CF10-1UURK	26	12	10	M10x1	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	CF10-1VUU	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

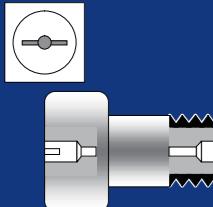
TYPE	Cylindrical outer ring	Crowned outer ring
CF5,CF6	0/-8	0/-50
CF8,CF10,CF10-1,CF12	0/-9	0/-50
CF12-1,CF16,CF18,CF20-1	0/-11	0/-50
CF20,CF24,CF24-1,CF30	0/-13	0/-50
CF30-1,CF30-2	0/-15	0/-50

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

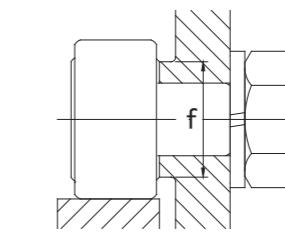
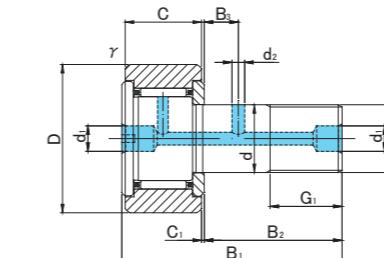
CAM FOLLOWERS

SCREWDRIVER SLOT HEAD



CF

CF..V



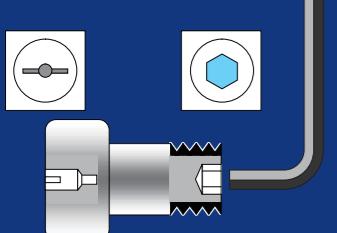
CF TYPE

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	M12x1.5	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	M12x1.5	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	M16x1.5	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	M18x1.5	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	M20x1.5	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	M20x1.5	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	M24x1.5	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	M24x1.5	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	M30x1.5	32																

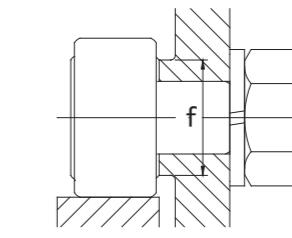
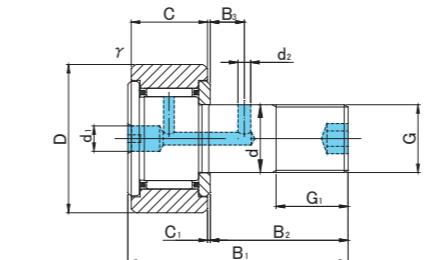
CAM FOLLOWERS

HEXAGON SOCKET ON THREAD SIDE
SCREWDRIVER SLOT HEAD



CF..B

CF..VB



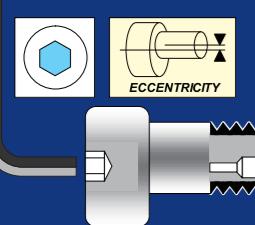
Prepacked Grease

CF..B TYPE

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 ≤)		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			
	Without seals	With seals	Without seals	With seals																							
12	0 -0.018	CF12B	CF12UUB	CF12RB	CF12URB	30	14	12	M12x1.5	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																							
12	0 -0.018	CF12-1B	CF12-1UUB	CF12-1RB	CF12-1URB	32	14	12	M12x1.5	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																							
16	0 -0.018	CF16B	CF16UUB	CF16RB	CF16URB	35	18	16	M16x1.5	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																							
18	0 -0.018	CF18B	CF18UUB	CF18RB	CF18URB	40	20	18	M18x1.5	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																							
20	0 -0.021	CF20B	CF20UUB	CF20RB	CF20URB	52	24	20	M20x1.5	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																							
20	0 -0.021	CF20-1B	CF20-1UUB	CF20-1RB	CF20-1URB	47	24	20	M20x1.5	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																							
24	0 -0.021	CF24B	CF24UUB	CF24RB	CF24URB	62	29	24	M24x1.5	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																							
24	0 -0.021	CF24-1B	CF24-1UUB	CF24-1RB	CF24-1URB	72	29	24	M24x1.5	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																							
30	0 -0.021	CF30B	CF30UUB	CF30RB	CF30URB	80	35	30	M30x1.5	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

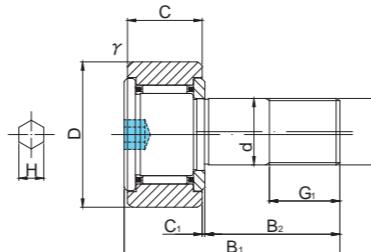
CAM FOLLOWERS

SOLID ECCENTRIC TYPE HEXAGON SOCKET ON STUD HEAD

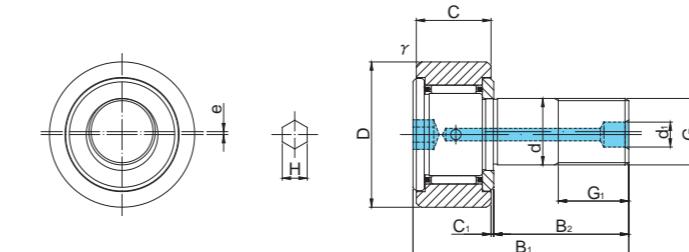


CFH..A

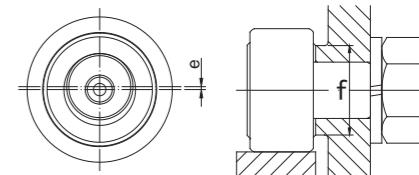
CFH..VA



CFH5(V)A~CFH10-1(V)A



CFH12(V)A~CFH12-1(V)A



CFH12-1(V)A

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 ~ CF12-1)		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)	
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	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	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)

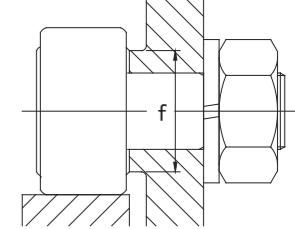
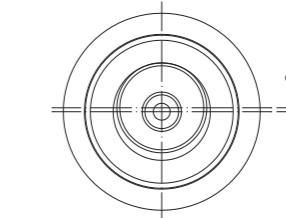
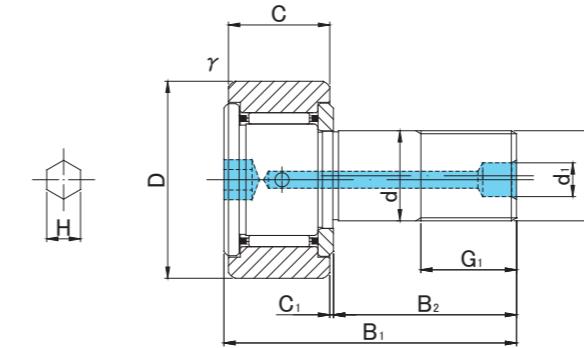
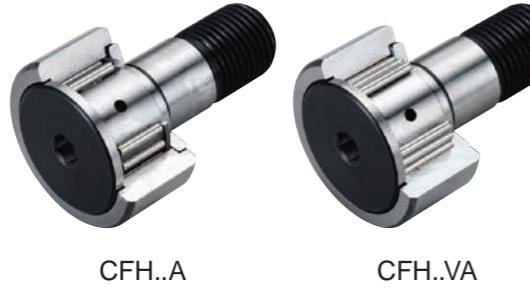
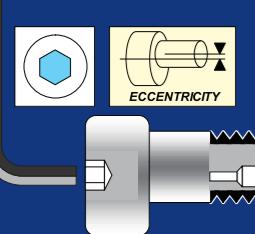
TYPE	Cylindrical outer ring	Crowned outer ring
CF5,CF6	0/-8	0/-50
CF8,CF10,CF10-1,CF12	0/-9	0/-50
CF12-1,CF16,CF18,CF20-1	0/-11	0/-50
CF20,CF24,CF24-1,CF30	0/-13	0/-50
CF30-1,CF30-2	0/-15	0/-50

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 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	CFH16UUAA	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	CFH18UUAA	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	CFH20UUAA	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	CFH20-1UUAA	CFH20-1RA	CFH20-1UURA	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	CFH24UUAA	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	CFH24-1UUAA	CFH24-1RA	CFH24-1UURA	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	CFH30UUAA	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	CFH30-1UUAA	CFH30-1RA	CFH30-1UURA	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	CFH30-2UUAA	CFH30-2RA	CFH30-2UURA	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 (μ m)

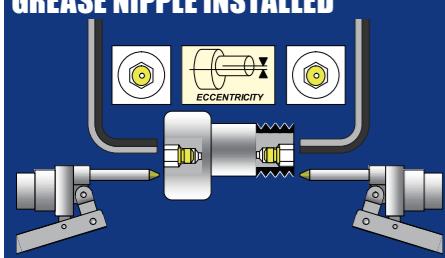
TYPE	Cylindrical outer ring	Crowned outer ring
CF5,CF6	0/-8	0/-50
CF8,CF10,CF10-1,CF12	0/-9	0/-50
CF12-1,CF16,CF18,CF20-1	0/-11	0/-50
CF20,CF24,CF24-1,CF30	0/-13	0/-50
CF30-1 CF30-2	0/-15	0/-50

ACCESSORIES

ACCESSORIES	TYPE			
CF5	—	—	—	Attached
CF6/CF8/CF10/CF10-1	—	—	—	Attached
CF12/CF12-1/CF16/CF18	ø 6 Attached	ø 6 Attached	ø 6 Attached	Attached
CF20/CF20-1/CF24/CF24-1/CF30/CF30-1/CF30-2	ø 8 Attached	ø 8 Attached	ø 8 Attached	Attached

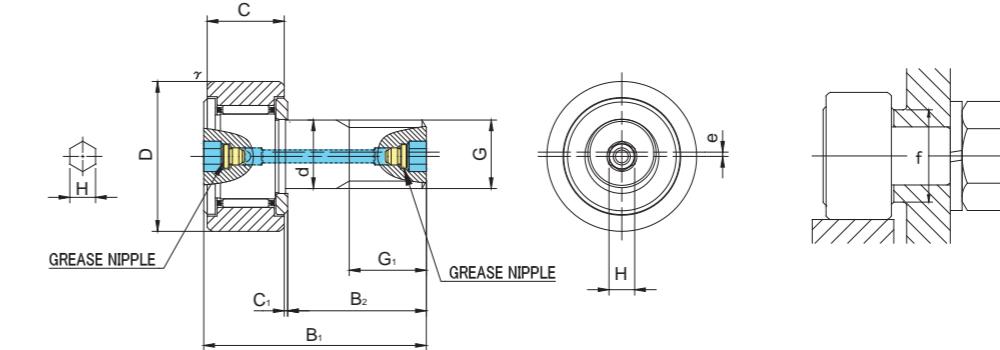
CAM FOLLOWERS

**SOLID ECCENTRIC TYPE
HEXAGON SOCKET ON BOTH SIDES
GREASE NIPPLE INSTALLED**



CFH..AB

CFH..VAB



Prepacked Grease

CFH..AB TYPE

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 ≤)		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			
	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																				
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																				
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																				
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																				
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																				
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																				

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)

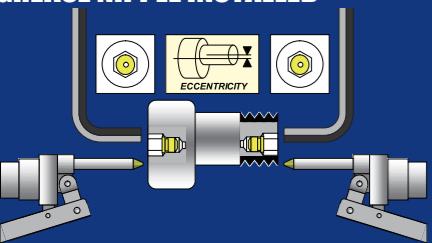
TYPE	Cylindrical outer ring	Crowned outer ring
CF12	0/-9	0/-50
CF12-1,CF16,CF18,CF20-1	0/-11	0/-50
CF20,CF24,CF24-1,CF30	0/-13	0/-50
CF30-1,CF30-2	0/-15	0/-50

ACCESSORIES

TYPE	Grease Nipple Installed	NUT Attached
All types		

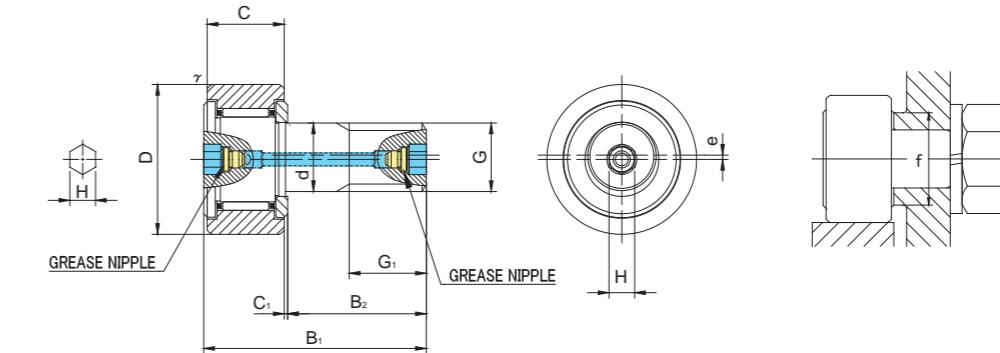
CAM FOLLOWERS

**SOLID ECCENTRIC TYPE
HEXAGON SOCKET ON BOTH SIDES
GREASE NIPPLE INSTALLED**



CFH..AB

CFH..VAB



Prepacked Grease

CFH..AB TYPE

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 ≤)		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			
	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)
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																				
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																				
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																				
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																				
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																				

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)

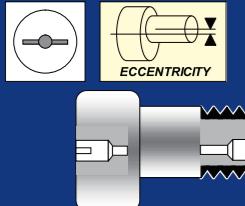
TYPE	Cylindrical outer ring	Crowned outer ring
CF12	0/-9	0/-50
CF12-1,CF16,CF18,CF20-1	0/-11	0/-50
CF20,CF24,CF24-1,CF30	0/-13	0/-50
CF30-1,CF30-2	0/-15	0/-50

ACCESSORIES

TYPE	Grease Nipple	NUT
All types	Installed	Attached

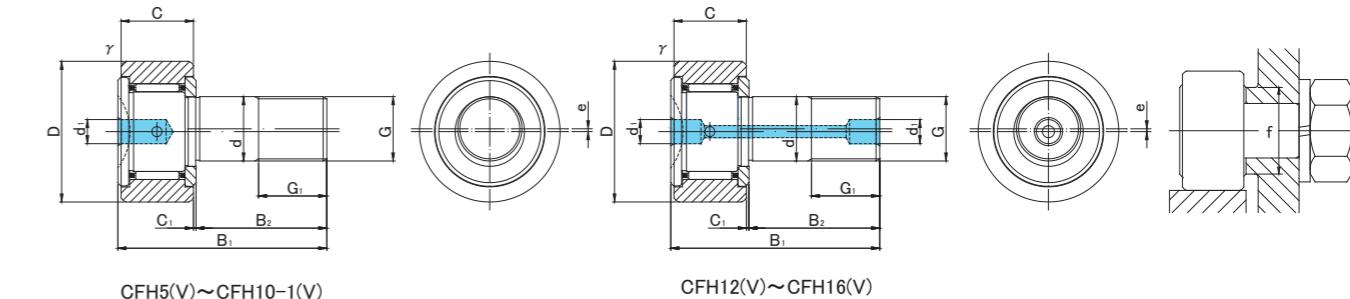
CAM FOLLOWERS

**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)		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)	
	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

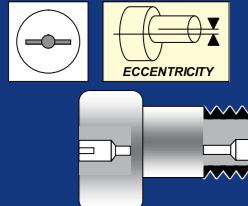
ACCESSORIES

TYPE	STOP PLUG
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CAM FOLLOWERS

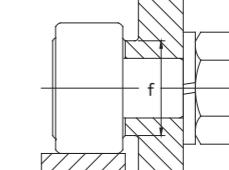
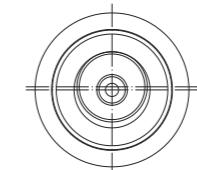
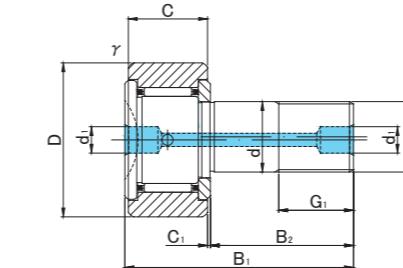
SOLID ECCENTRIC TYPE

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 ≤)		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)	
	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)

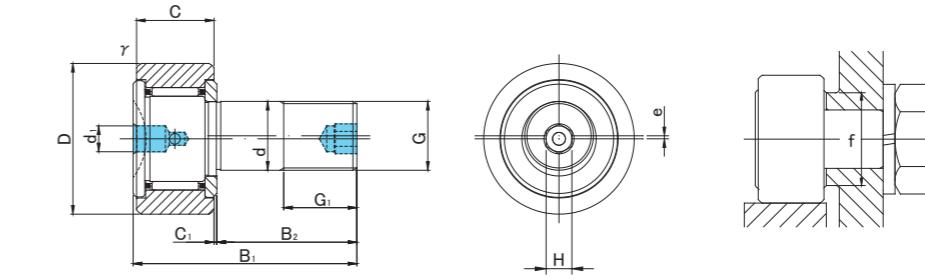
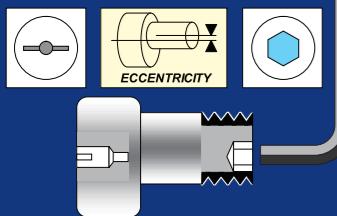
TYPE	Cylindrical outer ring	Crowned outer ring
CF5,CF6	0/-8	0/-50
CF8,CF10,CF10-1,CF12	0/-9	0/-50
CF12-1,CF16,CF18,CF20-1	0/-11	0/-50
CF20,CF24,CF24-1,CF30	0/-13	0/-50
CF30-1,CF30-2	0/-15	0/-50

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



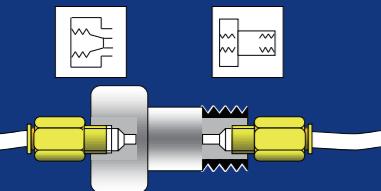
CFH..B TYPE

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 ≤)		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			
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																						
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																						
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																						
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																						
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																						
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																						
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																						
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																						
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																						
30	0 -0.021	CFH30-1B	CFH30-1UUB	CFH30-1RB	CFH30-1UURB	85	35	30</																		

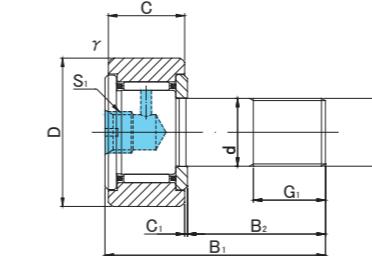
CAM FOLLOWERS

TAP HOLE FOR PIPING
SCREWDRIVER SLOT HEAD

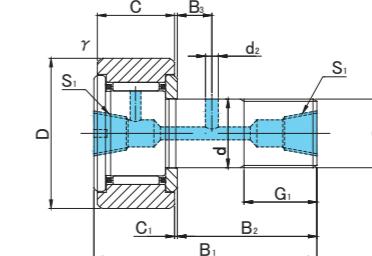


CFT

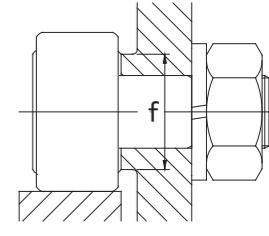
CFT.V



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)		D	C	d	G	G1	B1	B2	B3	C1	S1	d2	r _s min	f min									
	h7 tolerance	Without seals	With seals	Without seals	With seals	D	C	d	G	G1	B1	B2	B3	C1	S1	d2	r _s min	f min	Cr N	Cor N	N	rpm	Cylindrical outer ring N	Crowned outer ring N	g (approx)	
6	0 -0.012	CFT 6	CFT 6UU	CFT 6R	CFT 6UUR	16	11	6	M6x1	8	28	16	—	0.6	M6x0.75	—	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	M8x1.25	10	32	20	—	0.6	M6x0.75	—	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	M10x1.25	12	36	23	—	0.6	M6x0.75	—	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	M10x1.25	12	36	23	—	0.6	M6x0.75	—	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	M12x1.5	13	40	25	6	0.6	M6x0.75	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	M12x1.5	13	40	25	6	0.6	M6x0.75	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	M16x1.5	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	M18x1.5	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				

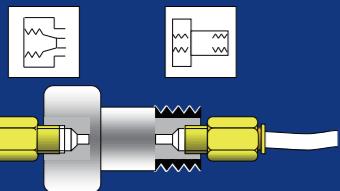
* Without seals, suitable for grease lubrication. In case of oil lubrication, up to 130% of this value shall be permissible, and 70% of this value shall apply for types with seals.

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

CAM FOLLOWERS

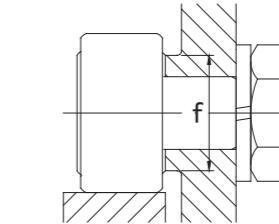
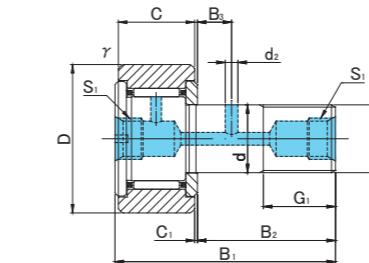
TAP HOLE FOR PIPING
SCREWDRIVER SLOT HEAD



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 \leq)		D	C	d	G	G1	B1	B2	B3	C1	S1	d2	r _s min	f min											
	Without seals	With seals	Without seals	With seals																								
20	0 -0.021	CFT20	CFT20UU	CFT20R	CFT20UUR	52	24	20	M20x1.5	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																							
20	0 -0.021	CFT20-1	CFT20-1UU	CFT20-1R	CFT20-1UUR	47	24	20	M20x1.5	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																							
24	0 -0.021	CFT24	CFT24UU	CFT24R	CFT24UUR	62	29	24	M24x1.5	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																							
24	0 -0.021	CFT24-1	CFT24-1UU	CFT24-1R	CFT24-1UUR	72	29	24	M24x1.5	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																							
30	0 -0.021	CFT30	CFT30UU	CFT30R	CFT30UUR	80	35	30	M30x1.5	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																							
30	0 -0.021	CFT30-1	CFT30-1UU	CFT30-1R	CFT30-1UUR	85	35	30	M30x1.5	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																							
30	0 -0.021	CFT30-2	CFT30-2UU	CFT30-2R	CFT30-2UUR	90	35	30	M30x1.5	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																							

* 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)

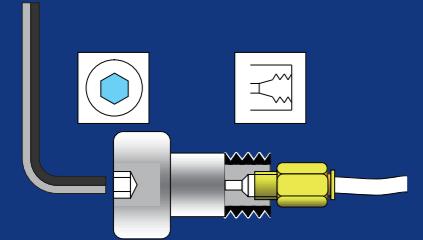
TYPE	Cylindrical outer ring	Crowned outer ring
CF6	0/-8	0/-50
CF8,CF10,CF10-1,CF12	0/-9	0/-50
CF12-1,CF16,CF18,CF20-1	0/-11	0/-50
CF20,CF24,CF24-1,CF30	0/-13	0/-50
CF30-1,CF30-2	0/-15	0/-50

ACCESSORIES

TYPE	NUT
All types	Attached

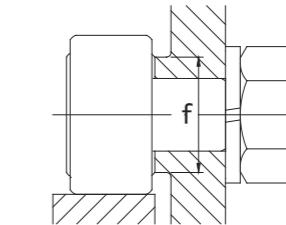
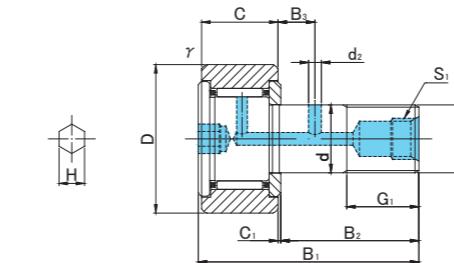
CAM FOLLOWERS

TAP HOLE FOR PIPING
HEXAGON SOCKET ON STUD HEAD



CFT..A

CFT..VA



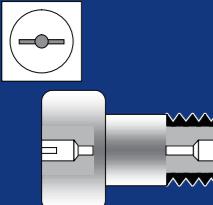
CFT..A TYPE

Prepacked Grease

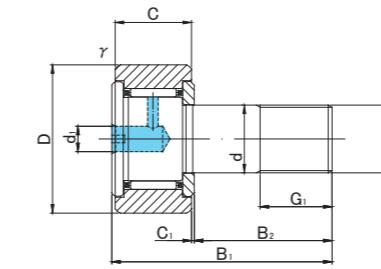
Stud diameter (mm)	Designation				Dimensions (mm)										Basic dynamic load rating	Basic static load rating	Largest permissible load	Limiting speed *	Track load capacity	Max tightening torque	Mass						
	Cylindrical outer ring		Crowned outer ring R500(CF12 ~ CF18) R1000(CF20 ≤)																								
	h7 tolerance	Without seals	With seals	Without seals	With seals	D	C	d	G	G1	B1	B2	B3	C1	S1	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)
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	CFT12-1UUAA	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	CFT20-1UUAA	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	CFT24-1UUAA	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	CFT30-1UUAA	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	CFT30-1V																								

CAM FOLLOWERS

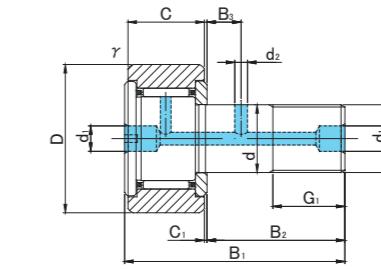
INCH DIMENSION SCREWDRIVER SLOT HEAD



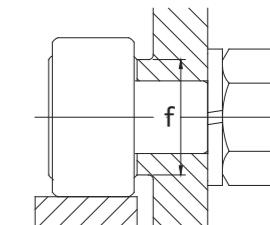
CR



CR8~CR10



CR12~CR



CR TYPE

Prepacked Grease

Stud diameter	Designation				Dimensions (inch/mm)																			Basic dynamic load rating	Basic static load rating	Limiting speed *	Track load capacity		Max tightening torque	Mass									
	Cylindrical outer ring		Crowned outer ring R250 (\leq CR8-1) R500 (CR10 \leq)																		Basic static load rating	Limiting speed *	Track load capacity																
d mm (inch)	Without seals	With seals	Without seals	With seals	D	C	d	G UNF	G1	B1			B2		B3		C1	d1	d2	r	f	Cr N	Cor N	rpm	Cylindrical outer ring N	Crowned outer ring N	N·m	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			2 160	28 000	2 160	730	9								
	CR8-1	CR8-1UU	CR8-1R	CR8-1UUR			3/8	9.525						1 1/32	26.194			5/8	15.875	—		—	1/64	0.397	21/64	8.334	2 550	2 350	730										
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			29/64	11.509	3 630	3 630	21 000	3 230	1 180	19					
	CR10-1	CR10-1UU	CR10-1R	CR10-1UUR			7/16	11.112						1 7/32	30.956			3/4	19.05	—		—	1/64	0.397	29/64	11.509	3 630	3 430	1 180										
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	
	CR14	CR14UU	CR14R	CR14UUR	7/8	22.225												19/32	15.081			4 800	5 780	14 000	5 290	1 760	35	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	73			
	CR18	CR18UU	CR18R	CR18UUR	11/8	28.575												1/16	1.588			3/4	19.05	9 210	11 560	12 000	7 740	2 350	20	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	3/64	1.191	45/64	17.859	8 820	10 780	13 000	7 250	1 960	132			
	CR22	CR22UU	CR22R	CR22UUR	13/8	34.925												1/16	1.588			3/4	19.05	9 210	11 560	12 000	7 740	2 350	28	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 1/32	51.594			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	225			
	CR26	CR26UU	CR26R	CR26UUR	1 5/8	41.275												2 1/32	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
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			
	CR30	CR30UU	CR30R	CR30UUR	1 7/8	47.625												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
22.225 (7/8)	CR32	CR32UU	CR32R	CR32UUR	2	50.8	11/4	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			
	CR36	CR36UU	CR36R	CR36UUR	2 1/4	57.15												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

- * 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			
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)	$\phi 7 \sim \phi 60$	NAST type without inner ring.	RNAST 15 R Type Bore diameter code R: Crowned outer ring None : Cylindrical outer ring
 NAST (Separable type)	$\phi 6 \sim \phi 50$	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)	$\phi 6 \sim \phi 50$	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 ZZ UU R Type Bore diameter code ZZ: With shield UU : With seal R: Crowned outer ring None : With shield X: Cylindrical outer ring
 NART-R (Non-separable type)	$\phi 5 \sim \phi 50$	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 UU V R Type Bore diameter code UU: With seal V: Full complement R: Crowned outer ring None : With shield X: Cylindrical outer ring None : With cage

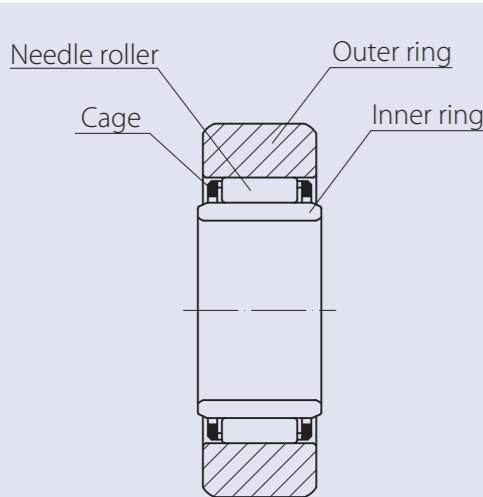
Structure and Features

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 linear motion in direction of tangent using rotation of outer ring.

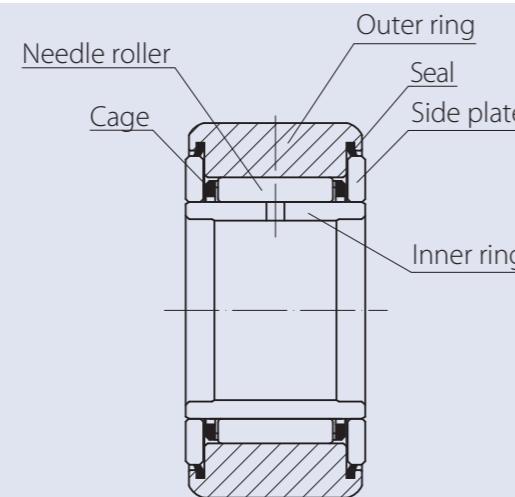
Outer ring of the roller follower is designed with thick ring in order to provide high rigidity to endure heavy load or impact load at portion to contact with the associated objects.

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.

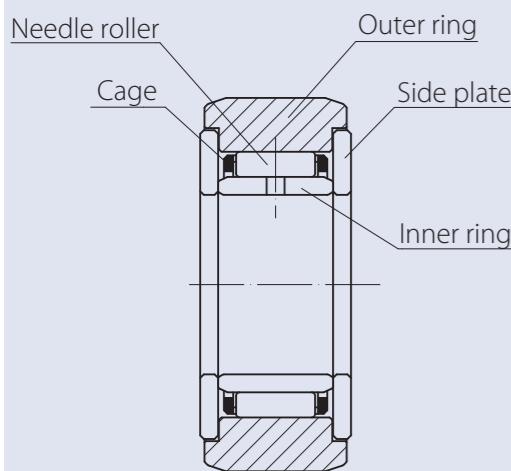
Also, various types with shapes and structures are available in accordance with application. Outer rings have two types – crowned outer ring and cylindrical outer ring. The crowned outer ring is suited for absorbing eccentric load since it absorbs angular misalignment due to a mount error. Cylindrical 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-row cylindrical roller type which allows moderate axial loading.



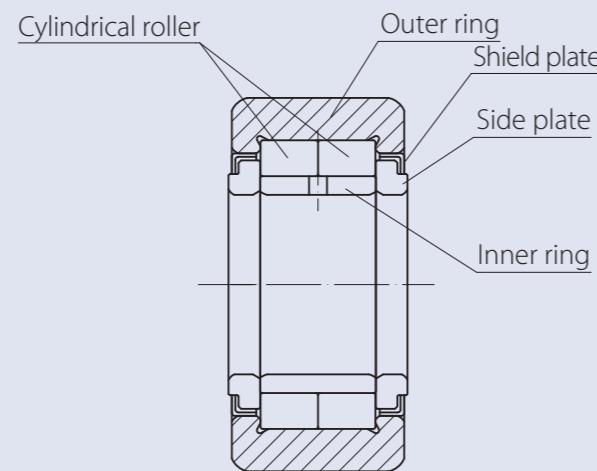
Structure of type NAST



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.	
2.5	10	0	-8
10	18	0	-8
18	30	0	-10
30	50	0	-12

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.	
6	18	0	-8
18	30	0	-9
30	50	0	-11
50	80	0	-13
80	120	0	-15

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

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.

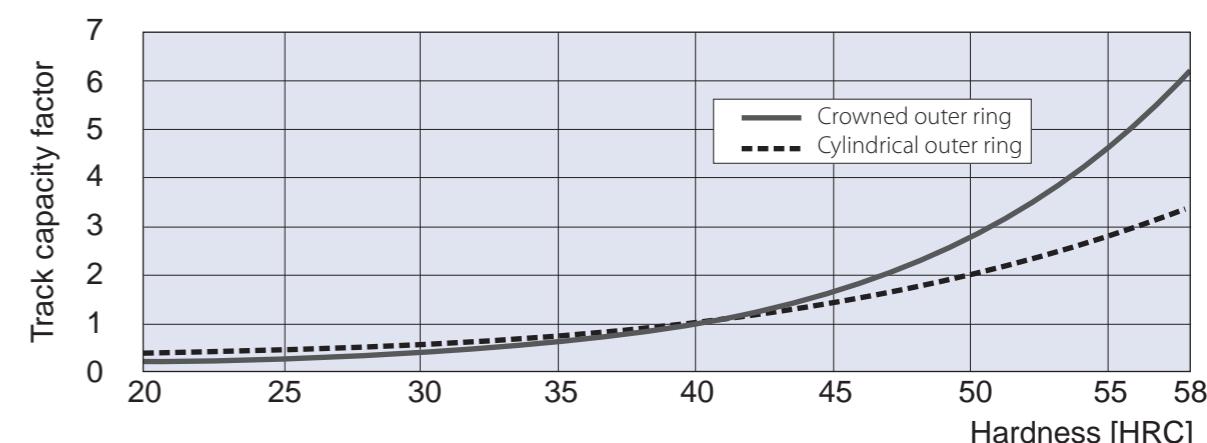


Figure-1 Track capacity factor

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		

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 rubber with high abrasion resistance are also available.

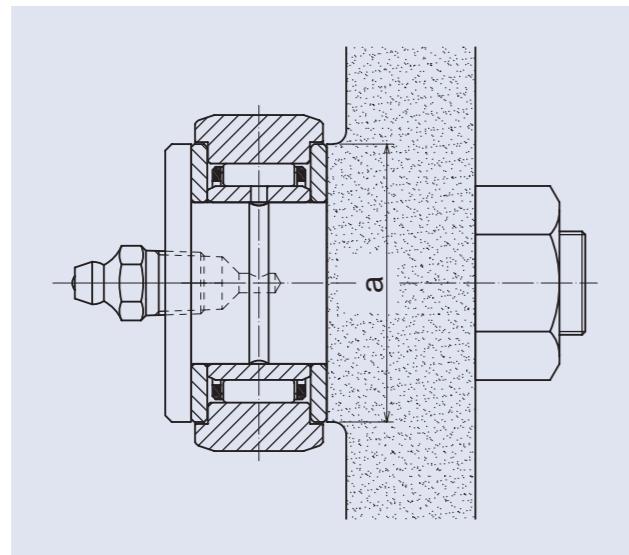
Grease shall be packed up to volume approximately one-third to one-half of internal space of bearing. Lubrication interval varies depending on operation condition. Referential interval may be every six to twenty four months for roller followers with cages and every one to six months for full complement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

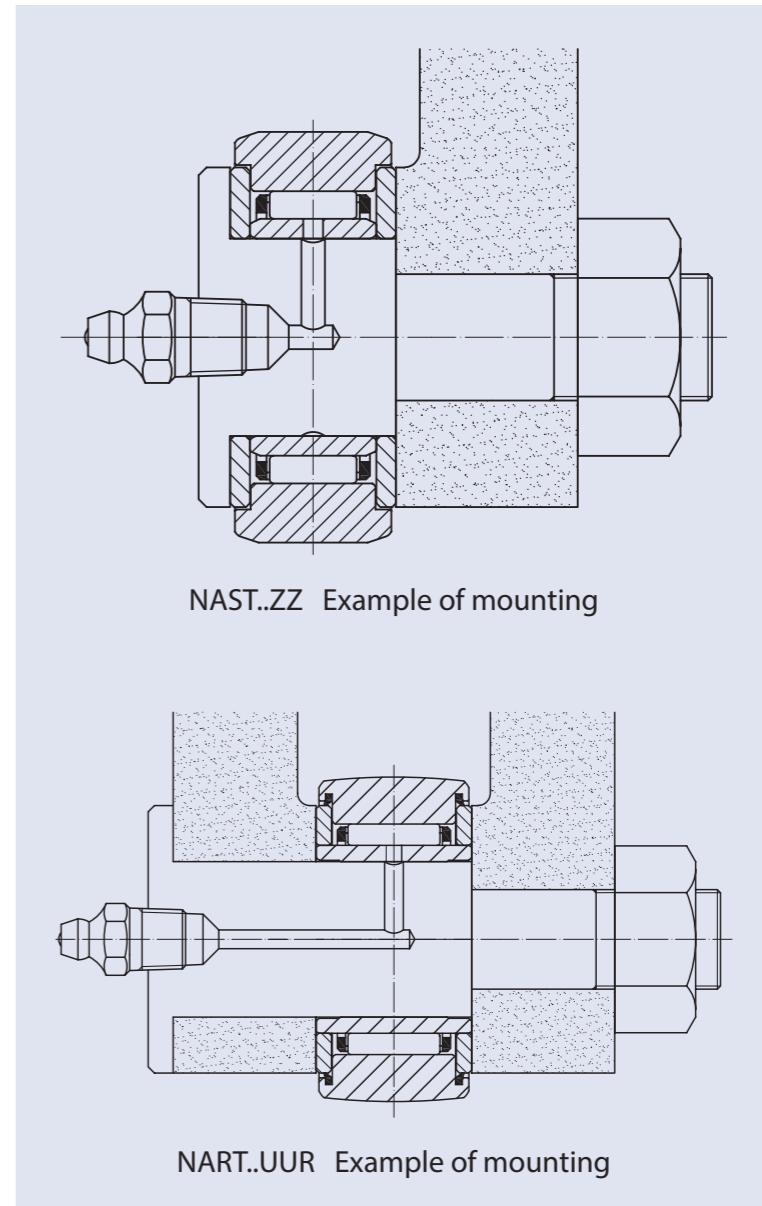
Mounting part

- 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).

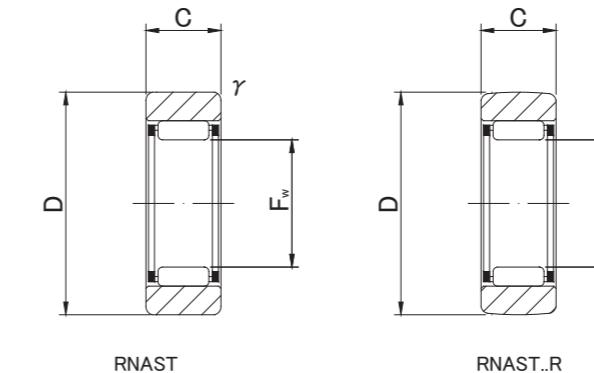


ROLLER FOLLOWERS

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)							Cr N	Cor N	Cylindrical outer ring N	Crowned outer ring N	
			Fw	D	C	r _s min						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)

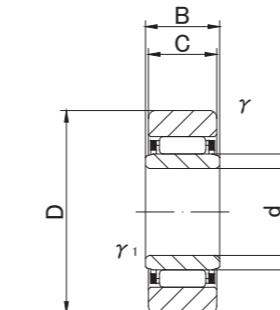
TYPE	Cylindrical outer ring	Crowned outer ring
RNAST5	0/-8	0/-50
RNAST6,RNAST8,RNAST10	0/-9	0/-50
RNAST12,RNAST15,RNAST17,RNAST20	0/-11	0/-50
RNAST25,RNAST30,RNAST35,RNAST40	0/-13	0/-50
RNAST45,RNAST50	0/-15	0/-50

ROLLER FOLLOWERS

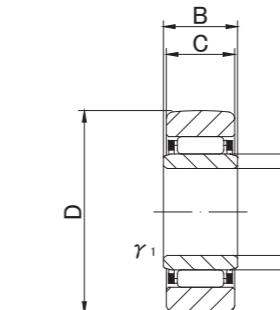
SEPARABLE
WITH INNER RING



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	r's min	r's max	F			Cylindrical outer ring N	Crowned outer ring N			
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

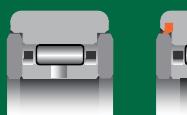
* Suitable for grease lubrication. In case of oil lubrication, up to 130% of this value shall be permissible.

OUTER RINGS TOLERANCE (Outside diameter) (μm)

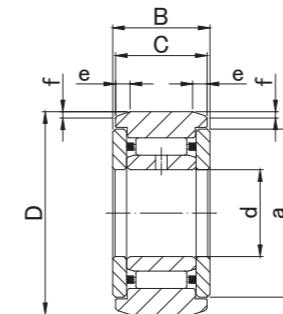
TYPE	Cylindrical outer ring	Crowned outer ring
NAST6,NAST8,NAST10	0/-9	0/-50
NAST12,NAST15,NAST17,NAST20	0/-11	0/-50
NAST25,NAST30,NAST35,NAST40	0/-13	0/-50
NAST45,NAST50	0/-15	0/-50

ROLLER FOLLOWERS

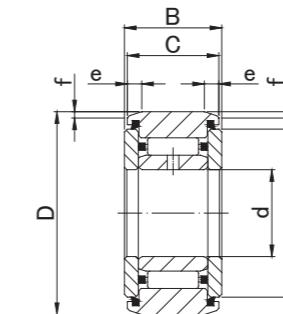
SEPARABLE
WITH INNER RING
WITH SHIELD



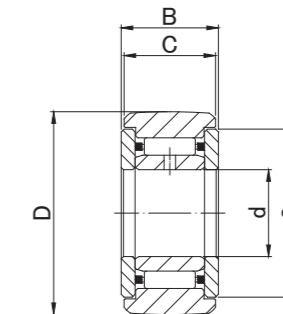
NAST..ZZ



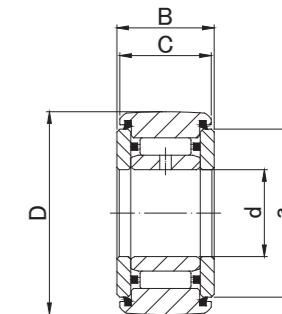
NAST..ZZ



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)		d	D	B	C	a	e	f			Cylindrical outer ring N	Crowned outer ring N						
	Without seals	With seals	Without seals	With seals																	
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		

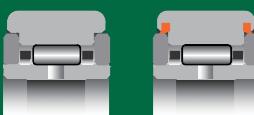
* Without seals, suitable for grease lubrication. In case of oil lubrication, up to 130% of this value shall be permissible, and 70% of this value shall apply for types with seals.

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

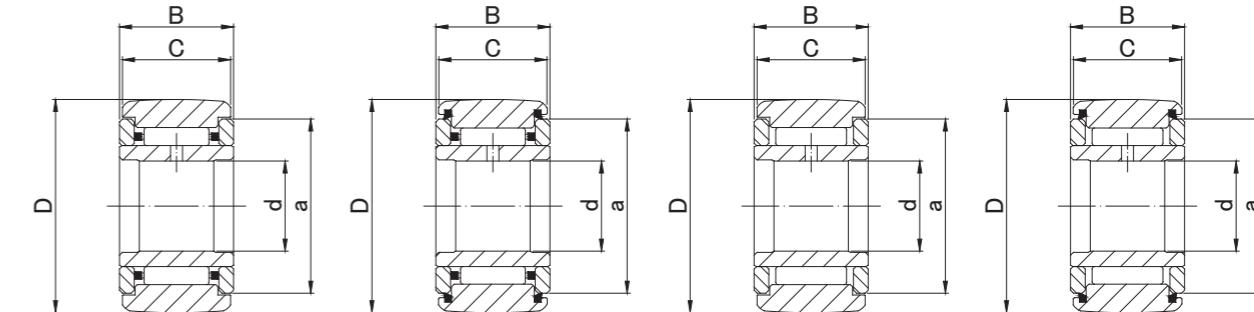
ROLLER FOLLOWERS

NON SEPARABLE WITH INNER RING



NART..R

NART..VR

NART.R
NART.XNART.UUR
NART.UUXNART.VR
NART.VXNART.UUVR
NART.UUVX

NART 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(≤ NART17) R1000(NART20 ≤)		Cylindrical outer ring		d	D	B	C	a	Cr N	Cor N	Crowned outer ring N	Cylindrical outer ring N			
	Without seals	With seals	Without seals	With seals												
5	NART 5R NART 5VR	NART 5UUR NART 5UUVR	NART 5X NART 5VX	NART 5UUX NART 5UVX	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 6UVX	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 8UVX	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 NART10UVX	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 NART12UVX	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 NART15UVX	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 NART17UVX	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 NART20UVX	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 NART25UVX	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 NART30UVX	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 NART35UVX	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 NART40UVX	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 NART45UVX	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 NART50UVX	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	

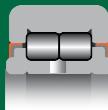
* Without seals, suitable for grease lubrication. In case of oil lubrication, up to 130% of this value shall be permissible, and 70% of this value shall apply for types with seals.

OUTER RINGS TOLERANCE (Outside diameter) (μm)

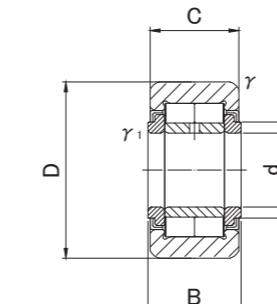
TYPE	Crowned outer ring	Cylindrical outer ring
NART5	0/-50	0/-8
NART6,NART8,NART10	0/-50	0/-9
NART12,NART15,NART17,NART20	0/-50	0/-11
NART25,NART30,NART35,NART40	0/-50	0/-13
NART45,NART50	0/-50	0/-15

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 (\leq NURT17-1) R1000 (NURT20 \leq)	Cylindrical outer ring	d	D	B	C	a	r _s min	r _{1s} min			Crowned outer ring N	Cylindrical outer ring N				
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.



MEDICAL DEVICES



SEMICONDUCTORS

PHARMACEUTICALS



BOTTLING



FOODS

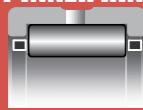


Stainless type Machined type needle roller bearings/inner ring

Type and Part Code

Type	Applicable axis diameter	Feature	Part Code			
	$\phi 7 \sim \phi 30$	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	Stainless steel ↓ Classification symbol (Class 6) (Standard class 0 No symbol)
	$\phi 5 \sim \phi 19$	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 $18 / 20$ ↓ Inscribed circle diameter	M ↓ Outer ring width	Stainless steel ↓ Classification symbol (Class 6) (Standard class 0 No symbol)
	$\phi 5 \sim \phi 25$	Stainless type Machined type needle roller bearings With collar outer ring With inner ring Without seal *Double rows: NA69 (shaft dia. $\geq \phi 32$)	Type NA ↓ Type of bearing	Dimensions 49 ↓ Dimension series	01 ↓ Bore diameter number	Stainless steel ↓ Classification symbol (Class 6) (Standard class 0 No symbol) Clearance symbol (C3 clearance) (Standard: No symbol, CN clearance)
	$\phi 5 \sim \phi 15$	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 $10 / 20$ ↓ Bore diameter	M ↓ Outer ring width	Stainless steel ↓ Classification symbol (Class 6) (Standard class 0 No symbol) Clearance symbol (C3 clearance) (Standard: No symbol, CN clearance)
	$\phi 5 \sim \phi 50$	Stainless type Inner ring	Type IR ↓ Type of bearing	Dimensions 25 ↓ Bore diameter	30 ↓ Width	17 ↓ Outer diameter
						Stainless steel ↓ Classification symbol (Class 6) (Standard class 0 No symbol)

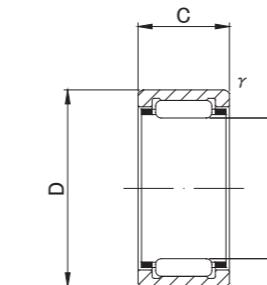
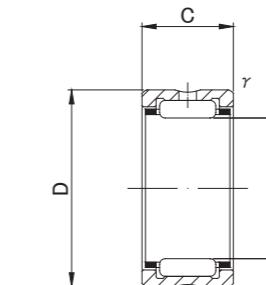
**MACHINED RING
NEEDLE ROLLER
BEARINGS
STAINLESS STEEL
WITHOUT INNER RING**



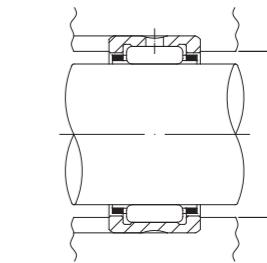
SUS/INOX



RNA49..M , NK..M

NK..M($F_w \leq 10$)

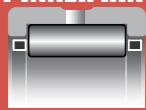
RNA49..M,NK..M

**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 NK5/12M	5 +0.018 5 +0.010	10 10	10 12	0.15 0.15		6.5 6.5	2 200 2 800	1 700 2 400	40 000 40 000	3.4 4.2	—	—
6	—	NK6/10M NK6/12M	6 +0.018 6 +0.010	12 12	10 12	0.15 0.15		7.5 7.5	2 400 3 100	2 100 2 900	37 000 37 000	5.3 6.4	—	—
7	RNA495M — —	NK7/10M NK7/12M	7 +0.022 7 +0.013 7	13 14 14	10 10 12	0.15 0.3 0.3		8.5 8.5 8.5	2 700 3 300 4 200	2 400 3 400 3 700	34 000 34 000 34 000	5.9 6.9 8.3	—	—
8	RNA496M — —	— NK8/12M NK8/16M	8 +0.022 8 +0.013 8	15 15 15	10 12 16	0.15 0.3 0.3		13.8 13 13	3 500 4 600 6 500	3 100 4 300 6 700	32 000 32 000 32 000	7.3 9 13	IR6810M IR5812M IR5816M	NA496M NKI 5/12M NKI 5/16M
9	— — RNA497M	NK9/12M NK9/16M —	9 +0.022 9 +0.013 9	16 16 17	12 16 10	0.3 0.3 0.15		14 14 15.8	5 000 6 900 4 100	4 800 7 500 3 300	30 000 30 000 30 000	10 13.2 9.3	IR6912M IR6916M IR7910M	NKI 6/12M NKI 6/16M NA497M
10	— — RNA498M	NK10/12M NK10/16M —	10 +0.022 10 +0.013 10	17 17 19	12 16 11	0.3 0.3 0.2		15 15 17.4	5 400 7 500 5 700	5 500 8 400 4 600	28 000 28 000 28 000	10.7 14.3 12.6	IR71012M IR71016M IR81011M	NKI 7/12M NKI 7/16M NA498M
12	— — RNA499M	NK12/12M NK12/16M —	12 +0.027 12 +0.016 12	19 19 20	12 16 11	0.3 0.3 0.3		17 17 18	6 000 8 400 6 000	6 700 10 300 5 700	26 000 26 000 26 000	12.2 16.3 13.6	IR91212M IR91216M IR91211M	NKI 9/12M NKI 9/16M NA499M
14	RNA4900M — —	— NK14/16M NK14/20M	14 +0.027 14 +0.016 14	22 22 22	13 16 20	0.3 0.3 0.3		20 20 20	8 400 10 800 13 600	9 200 12 600 17 000	24 000 24 000 24 000	16.5 21 26.5	IR101413M IR101416M IR101420M	NA4900M NKI 10/16M NKI 10/20M
15	— —	NK15/16M NK15/20M	15 +0.027 15 +0.016	23 23	16 20	0.3 0.3		21 21	11 400 14 300	13 700 18 500	23 000 23 000	22.5 28	—	—

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

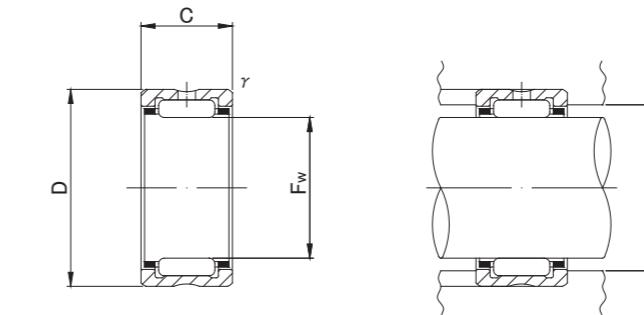
**MACHINED RING
NEEDLE ROLLER
BEARINGS
STAINLESS STEEL
WITHOUT INNER RING**



SUS/INOX



RNA49..M , NK..M



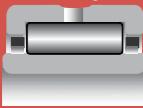
RNA49..M.NK..M

RNA49..M NK..M TYPE

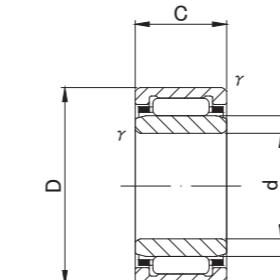
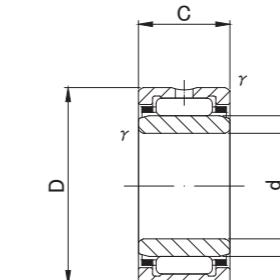
Shaft Diameter (mm)	Designation		Dimensions (mm)				Standard mounting dimensions (mm)	Basic dynamic load rating	Basic static load rating	Limiting speed *	Mass	Usable bearing designation	
	RNA49..M	NK..M	Fw	D	C	rs min						INNER RING	WITH INNER RING
16	RNA4901M — —	— NK16/16M NK16/20M	16 +0.027 16 +0.016 16	24 24 24	13 16 20	0.3 0.3 0.3	22 22 22	8 900 11 300 14 300	10 200 13 800 18 700	23 000 23 000 23 000	18.1 23 29	IR121613M IR121616M IR121620M	NA4901M NKI 12/16M NKI 12/20M
17	— —	NK17/16M NK17/20M	17 +0.027 17 +0.016	25 25	16 20	0.3 0.3	23 23	11 700 14 900	14 900 20 300	22 000 22 000	24.5 30.5	— —	— —
18	— —	NK18/16M NK18/20M	18 +0.027 18 +0.016	26 26	16 20	0.3 0.3	24 24	12 300 15 600	16 100 21 700	21 000 21 000	25.5 32	— —	— —
19	— —	NK19/16M NK19/20M	19 +0.033 19 +0.020	27 27	16 20	0.3 0.3	25 25	12 800 16 200	17 200 23 200	21 000 21 000	27 34	IR151916M IR151920M	NKI 15/16M 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.

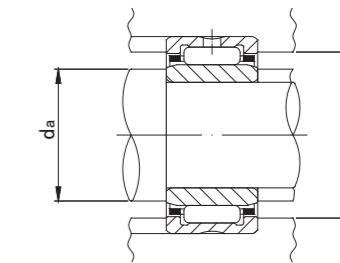
**MACHINED RING
NEEDLE ROLLER
BEARINGS
STAINLESS STEEL
WITH INNER RING**



NA49..M ,NKI..M

NKI..M($d \leq 8$)

NA49..M,NKI..M



■ NA49..M ,NKI..M TYPE

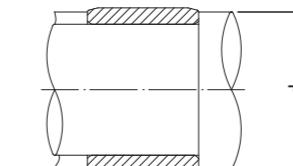
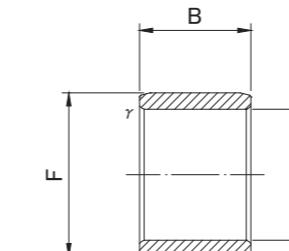
Shaft Diameter (mm)	Designation		Dimensions (mm)					Standard mounting dimensions (mm)		Basic dynamic load rating	Basic static load rating	Limiting speed *	Mass	Usable bearing designation				
	NA49..M	NKI..M	d	D	C	r _s min	F	da		Cr N	Cor N	rpm	g (approx)	OUTER RING	INNER RING			
								MIN	MAX									
5	NA495M	—	5 0	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 -0.008	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	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 -0.008	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	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 -0.008	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	19	12	0.3	12			11	11.5	17	6 000	6 700	26 000	16.7	NK12/12M	IR91212M
	—	NKI 9/16M	9 -0.008	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	22	13	0.3	14			12	13	20	8 400	9 200	24 000	24	RNA4900M	IR101413M
	—	NKI 10/16M	10 -0.008	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	24	13	0.3	16			14	15	22	8 900	10 200	23 000	26.5	RNA4901M	IR121613M
	—	NKI 12/16M	12 -0.008	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	27	16	0.3	19			17	18	25	12 800	17 200	21 000	39.5	NK19/16M	IR151916M
	—	NKI 15/20M	15 -0.008	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**


SUS/INOX

IR..M



IR..M

IR..M TYPE

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

IR..M

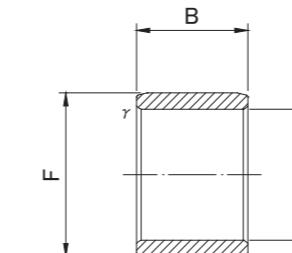
IR..M

**INNER RINGS
STAINLESS STEEL**

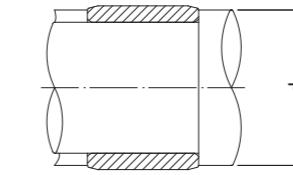

SUS/INOX



IR..M



IR..M


IR..M TYPE

Shaft Diameter (mm)	Designation	Dimensions (mm)				Standard mounting dimensions (mm)	Mass	Usable bearing designation	
		d	F	B	r _{s min}			g (approx)	RNA49..M
20	IR 202516M IR 202517M	20 ⁰ 20 ^{-0.010}	25 25	16 17	0.3 0.3	22 22	24 24	22 23	— RNA4904M
25	IR 253016M IR 253017M	25 ⁰ 25 ^{-0.010}	30 30	16 17	0.3 0.3	27 27	29 29	28 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



IR..M



CAM FOLLOWERS

STAINLESS
STEEL



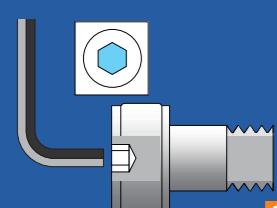
Type and Part Code

Type	Applicable axis diameter	Feature	Part Code							
 CFS..MA compact outer ring	$\phi 2.5 \sim \phi 6$	Built-in very thin needle roller. Enables compact design due to very small outer ring diameter in comparison to stud diameter.	CFS	6	V	M		A		
			Type	Stud diameter	Stainless steel					
					V: Full complement None: With cage					
 CF..MA Hexagon hole	$\phi 3 \sim \phi 30$	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	16	V	M	UU	R	A	N
			Type	Stud diameter	Stainless steel		UU: With seal None: With shield			Option (Dedicated grease nipple : Brass)
					V: Full complement None: With cage					
 CF..MAB	$\phi 10 \sim \phi 30$	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	16	V	M	UU	R	AB	
			Type	Stud diameter	Stainless steel		UU: With seal None: With shield			
					V: Full complement None: With cage					
 CF.M	$\phi 5 \sim \phi 30$	General purpose cam follower with screwdriver groove on the stud head.	CF	16	V	M	UU	R		N
			Type	Stud diameter	Stainless steel		UU: With seal None: With shield			Option
					V: Full complement None: With cage					(Dedicated grease nipple : Brass)

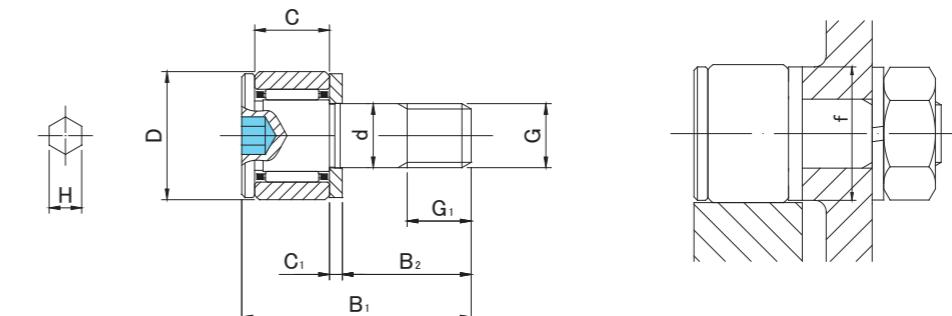
Type	Applicable axis diameter	Feature	Part Code						
 CFH..MA Hexagon socket, Eccentric	$\phi 5 \sim \phi 30$	Available for the same mounting hole as general type. Compact and high accuracy eccentric cam followers with integrated structure enables easy fine positioning adjustment simply by rotating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

CAM FOLLOWERS STAINLESS STEEL

MINIATURE TYPE
HEXAGON SOCKET ON STUD HEAD



SUS/INOX



CFS..MA TYPE

Prepacked Grease

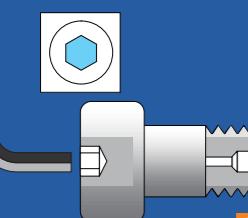
Stud diameter (mm)	Designation		Dimensions (mm)										Basic dynamic load rating	Basic static load rating	Largest permissible load	Max tightening torque	Mass	
	Cylindrical outer ring	Full roller	D	C	d	G	G1	B1	B2	C1	H	f min	Cr N	Cor N	N	N·m	g (approx)	
2.5	0 -0.006	CFS 2.5MA	—	5	3	2.5	M2.5×0.45	2.5	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

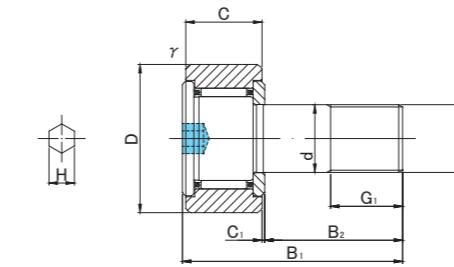
**CAM FOLLOWERS
STAINLESS STEEL
HEXAGON SOCKET ON STUD HEAD**


SUS/INOX

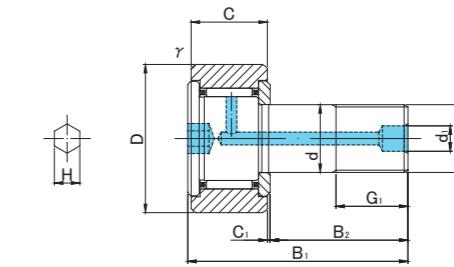


CF..MA

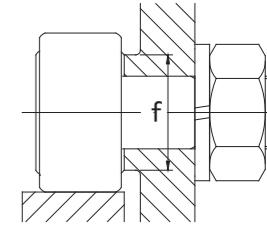
CF..VMA



CF3(V)MA~CF10-1(V)MA

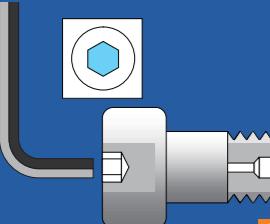


CF10(V)MAK~CF10-1(V)MAK

**CF..MA TYPE**

Prepacked Grease

Stud diameter (mm)	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(CF3 ~ CF5) R500(CF6 ~ CF10-1)		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			
	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 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	CF10-MUUAK	CF10MRAK	CF10-MUURAK	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	CF10-1VMUAK	CF10-1VMRAK	CF10-1VMUURAK															4 950	6 310	6 860	17 000				
10	0 -0.015	CF10-1MAK	CF10-1MUUAK	CF10-1MRAK	CF10-1MUURAK	26																					

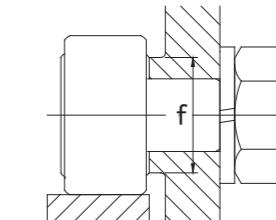
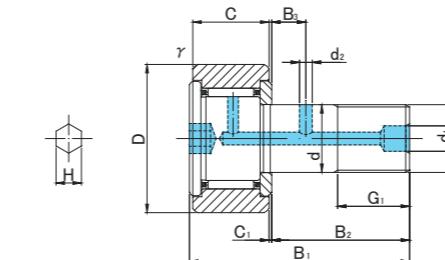
**CAM FOLLOWERS
STAINLESS STEEL
HEXAGON SOCKET ON STUD HEAD**


SUS/INOX



CF..MA

CF..VMA

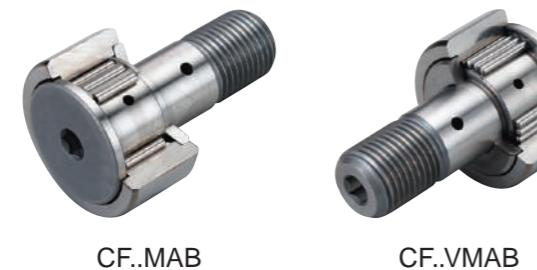
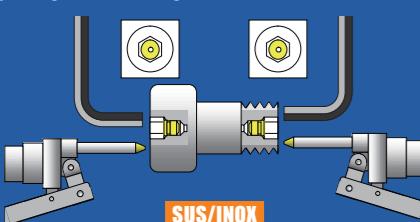
**CF..MA TYPE**

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 ≤)		D	C	d	G	G1	B1	B2	B3	C1	d1	d2	H	r _s min	f min	Cr N	Cor N	N	rpm	Cylindrical outer ring N	Crowned outer ring N			
	h7 tolerance	Without seals	With seals	Without seals	With seals	D	C	d	G	G1	B1	B2	B3	C1	d1	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)
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		

CAM FOLLOWERS STAINLESS STEEL

HEXAGON SOCKET ON BOTH SIDES
GREASE NIPPLE INSTALLED



CF..MAB TYPE

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)		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)

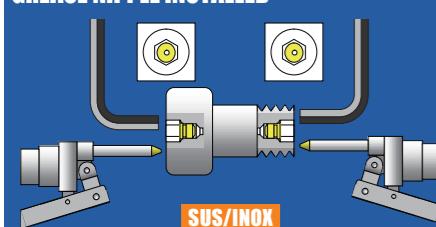
TYPE	Cylindrical outer ring	Crowned outer ring
CF10,CF10-1,CF12	0/-9	0/-50
CF12-1,CF16,CF18,CF20-1	0/-11	0/-50
CF20,CF24,CF24-1,CF30	0/-13	0/-50
CF30-1,CF30-2	0/-15	0/-50

ACCESSORIES

TYPE	Grease Nipple	NUT
All types	Installed	Attached

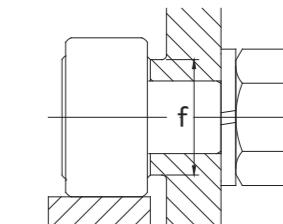
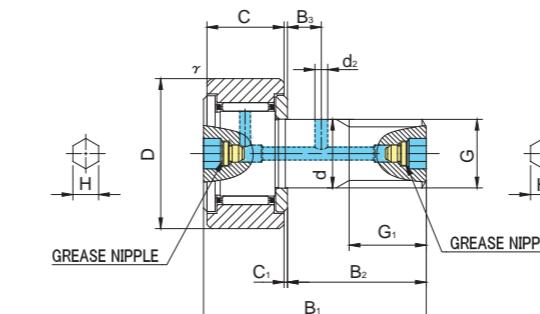
CAM FOLLOWERS STAINLESS STEEL

HEXAGON SOCKET ON BOTH SIDES
GREASE NIPPLE INSTALLED



CF..MAB

CF..VMAB



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 R1000(CF20 ≤)		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)	
20	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)
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.

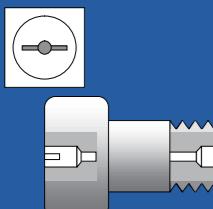
* Without seals, suitable for grease lubrication. In case of oil lubrication, up to 130% of this value shall be permissible, and 70% of this value shall apply for types with seals.

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

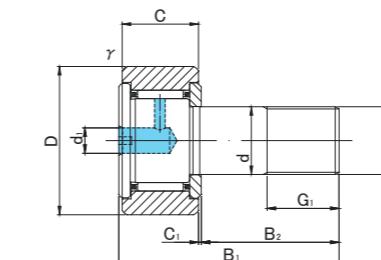
**CAM FOLLOWERS
STAINLESS STEEL
SCREWDRIVER SLOT HEAD**


SUS/INOX

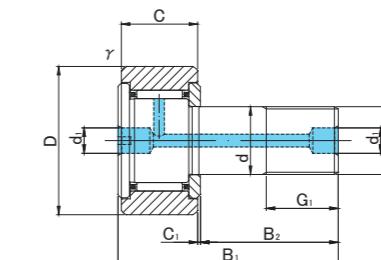


CF..M

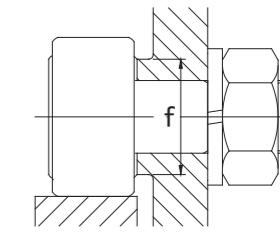
CF..VM



CF5(V)M~CF10-1(V)M



CF10(V)MK~CF10-1(V)MK

**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 ~ CF10-1)		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)	
	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)
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	CF10VMUU	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	CF10-1VMUU	CF10-1VMRK	CF10-1VMUURK														8 740	13 340	7 450	7 500				

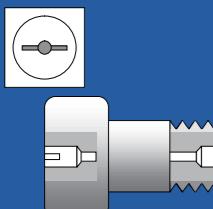
* Without seals, suitable for grease lubrication. In case of oil lubrication, up to 130% of this value shall be permissible, and 70% of this value shall apply for types with seals.

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

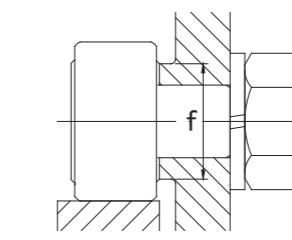
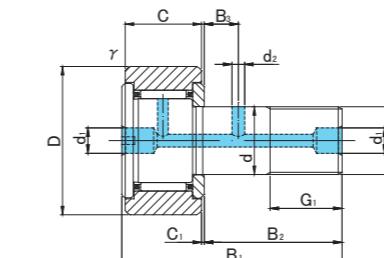
TYPE	STOP PLUG	RESIN PLUG	NUT
CF5M	—	—	Attached
CF6M/CF8M/CF10M/CF10-1M	—	φ 4 Attached	Attached
CF10MK/CF10-1MK	φ 4 Attached	φ 4 Attached	Attached
CF12M/CF12-1M/CF16M/CF18M	φ 6 Attached	φ 6 Attached	Attached
CF20M/CF20-1M/CF24M/CF24-1M/CF30M/CF30-1M/CF30-2M	φ 8 Attached	φ 8 Attached	Attached

**CAM FOLLOWERS
STAINLESS STEEL
SCREWDRIVER SLOT HEAD**


CF..M

CF..VM

SUS/INOX

**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 ≤)																										
									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 CF12VM	CF12MUU CF12VMUU	CF12MR CF12VMR	CF12MUUR CF12VMUUR	30	14	12	M12×1.5	13	40	25				6	0.6	6	3	0.6	20	7 300 12 350	9 010 18 120	9 800 11 270	14 000 6 000	7 060	2 450	22	95
12	0 -0.018	CF12-1M CF12-1VM	CF12-1MUU CF12-1VMUU	CF12-1MR CF12-1VMR	CF12-1MUUR CF12-1VMUUR	32	14	12	M12×1.5	13	40	25				6	0.6	6	3	0.6	20	7 300 12 350	9 010 18 120	9 800 11 270	14 000 6 000	7 450	2 740	22	105
16	0 -0.018	CF16M CF16VM	CF16MUU CF16VMUU	CF16MR CF16VMR	CF16MUUR CF16VMUUR	35	18	16	M16×1.5	17	52	32.5				8	0.8	6	3	0.6	24	11 080 19 020	16 860 34 610	18 330 19 800	10 000 4 500	11 200	3 140	58	170
18	0 -0.018	CF18M CF18VM	CF18MUU CF18VMUU	CF18MR CF18VMR	CF18MUUR CF18VMUUR	40	20	18	M18×1.5	19	58	36.5				8	0.8	6	3	1	26	13 520 23 250	23 180 47 240	25 200 26 560	8 500 3 500	14 400	3 720	87	250
20	0 -0.021	CF20M CF20VM	CF20MUU CF20VMUU	CF20MR CF20VMR	CF20MUUR CF20VMUUR	52	24	20	M20×1.5	21	66	40.5				9	0.8	8	4	1	36	19 020 30 470	31 830 59 320	32 140 32 140	7 000 3 500	23 200	8 230	120	460
20	0 -0.021	CF20-1M CF20-1VM	CF20-1MUU CF20-1VMUU	CF20-1MR CF20-1VMR	CF20-1MUUR CF20-1VMUUR	47	24	20	M20×1.5	21	66	40.5				9	0.8	8	4	1	36	19 020 30 470	31 830 59 320	32 140 32 140	7 000 3 500	21 000	7 150	120	385
24	0 -0.021	CF24M CF24VM	CF24MUU CF24VMUU	CF24MR CF24VMR	CF24MUUR CF24VMUUR	62	29	24	M24×1.5	25	80	49.5				11	0.8	8	4	1	40	28 040 42 820	48 410 84 650	49 500 49 500	6 500 3 000	34 200	10 500	220	815
24	0 -0.021	CF24-1M CF24-1VM	CF24-1MUU CF24-1VMUU	CF24-1MR CF24-1VMR	CF24-1MUUR CF24-1VMUUR	72	29	24	M24×1.5	25	80	49.5				11	0.8	8	4	1	40	28 040 42 820	48 410 84 650	49 500 49 500	6 500 3 000	39 800	12 900	220	1 140
30	0 -0.021	CF30M CF30VM	CF30MUU CF30VMUU	CF30MR CF30VMR	CF30MUUR CF30VMUUR	80	35	30	M30×1.5	32	100	63				15	1	8	4	1	46	41 740 62 210	78 250 132 530	73 700 73 700	5 000 2 200	52 600	14 900	450	1 870
30	0 -0.021	CF30-1M CF30-1VM	CF30-1MUU CF30-1VMUU	CF30-1MR CF30-1VMR	CF30-1MUUR CF30-1VMUUR	85	35	30	M30×1.5	32	100	63				15	1	8	4	1	46	41 740 62 210	78 250 132 530	73 700 73 700	5 000 2 200	56 000	16 100	450	2 030
30	0 -0.021	CF30-2M CF30-2VM	CF30-2MUU CF30-2VMUU	CF30-2MR CF30-2VMR	CF30-2MUUR CF30-2VMUUR	90	35	30	M30×1.5	32	100	63				15	1	8	4	1	46	41 740 62 210	78 250 132 530	73 700 73 700	5 000 2 200	59 300	17 300	450	2 220

* 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)

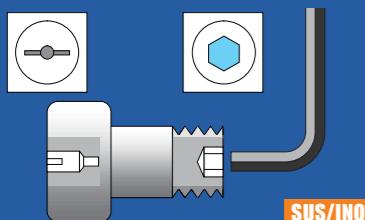
TYPE	Cylindrical outer ring	Crowned outer ring
CF5M,CF6M	0/-8	0/-50
CF8M,CF10M,CF10-1M,CF12M	0/-9	0/-50
CF12-1M,CF16M,CF18M,CF20-1M	0/-11	0/-50
CF20M,CF24M,CF24-1M,CF30M	0/-13	0/-50
CF30-1M,CF30-2M	0/-15	0/-50

ACCESSORIES

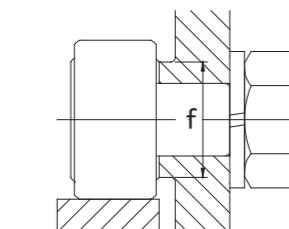
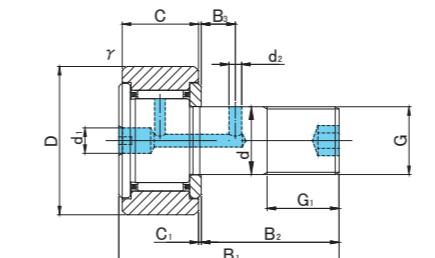
TYPE	STOP PLUG	RESIN PLUG	NUT
CF5M	—	—	Attached
CF6M/CF8M/CF10M/CF10-1M	—	φ 4 Attached	Attached
CF10MK/CF10-1MK	φ 4 Attached	φ 4 Attached	Attached
CF12M/CF12-1M/CF16M/CF18M	φ 6 Attached	φ 6 Attached	Attached
CF20M/CF20-1M/CF24M/CF24-1M/CF30M/CF30-1M/CF30-2M	φ 8 Attached	φ 8 Attached	Attached

CAM FOLLOWERS STAINLESS STEEL

HEXAGON SOCKET ON THREAD SIDE
SCREWDRIVER SLOT HEAD



SUS/INOX



CF..MB 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 ≤)		D	C	G	G1	B1	B2	B3	C1	d1	d2	H	r _s min	f min	Cr N	Cor N	N	rpm					
	CF12MB	CF12MUUB	CF12MRB	CF12MUURB																						
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															

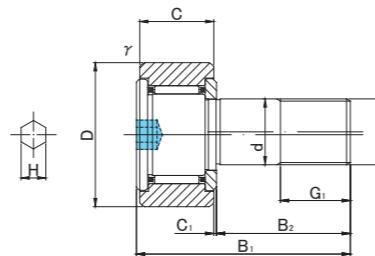
**CAM FOLLOWERS
STAINLESS STEEL
SOLID ECCENTRIC TYPE
HEXAGON SOCKET ON STUD HEAD**

SUS/INOX

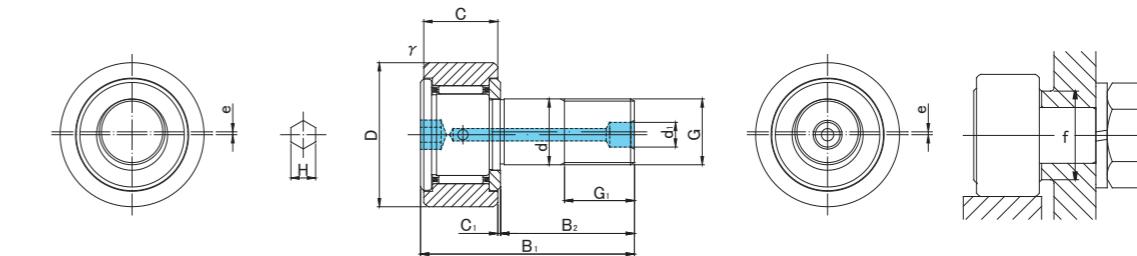


CFH..MA

CFH..VMA



CFH5(V)MA~CFH10-1(V)MA



CFH12(V)MA~CFH12-1(V)MA

CFH..MA TYPE

Prepacked Grease

Stud diameter (mm)	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(CF5 ~ CF12)		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			
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)	
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)

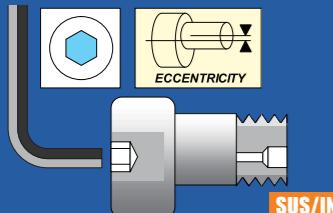
TYPE	Cylindrical outer ring	Crowned outer ring
CF5M,CF6M	0/-8	0/-50
CF8M,CF10M,CF10-1M,CF12M	0/-9	0/-50
CF12-1M,CF16M,CF18M,CF20-1M	0/-11	0/-50
CF20M,CF24M,CF24-1M,CF30M	0/-13	0/-50
CF30-1M,CF30-2M	0/-15	0/-50

ACCESSORIES

TYPE	STOP PLUG	RESIN PLUG	NUT
CF3M/CF4M/CF5M	—	—	Attached
CF6M/CF8M/CF10M/CF10-1M	—	—	Attached
CF12M/CF12-			

CAM FOLLOWERS STAINLESS STEEL

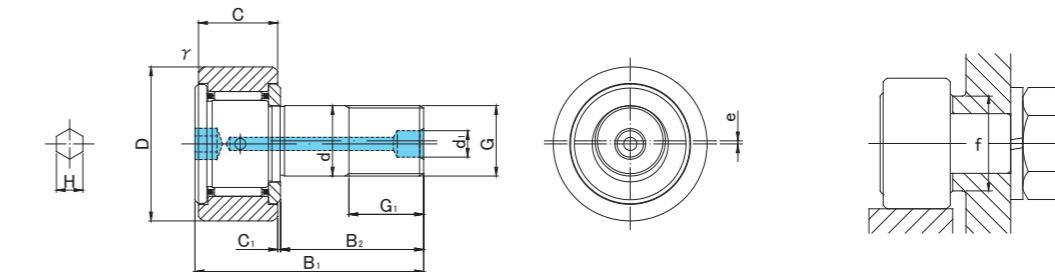
SOLID ECCENTRIC TYPE HEXAGON SOCKET ON STUD HEAD



The image shows two views of a precision machined metal component. The left view shows a threaded shaft extending from a hub with a gear-like profile. The right view shows a similar assembly with a different hub design, featuring a central bore and a stepped shaft. Both parts are made of a polished metal, likely stainless steel.

CFH..M

CFH..VM



CFH..MA TYPE

Prepacked Grease

* 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 without seals.

0% OUTER RINGS TOLERANCE (%)

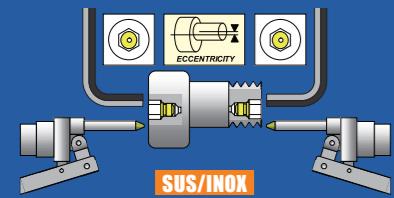
TYPE	Cylindrical outer ring	Crown outer ring
CF5M,CF6M	0/-8	0/-5
CF8M,CF10M,CF10-1M,CF12M	0/-9	0/-5
CF12-1M,CF16M,CF18M,CF20-1M	0/-11	0/-5
CF20M,CF24M,CF24-1M,CF30M	0/-13	0/-5
CF30-1M,CF30-2M	0/-15	0/-5

ACCESSORIES

TYPE			
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

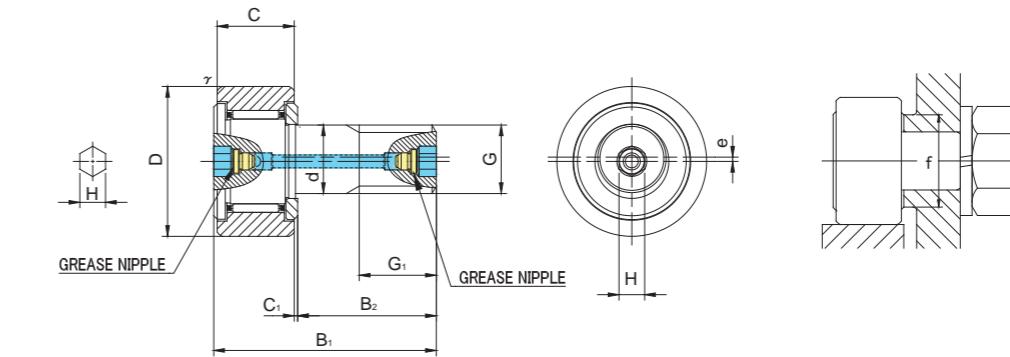
CAM FOLLOWERS STAINLESS STEEL

SOLID ECCENTRIC TYPE
HEXAGON SOCKET ON BOTH SIDES
GREASE NIPPLE INSTALLED



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 ≤)		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)	
	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)

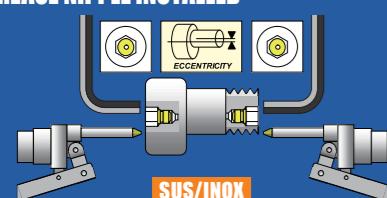
TYPE	Cylindrical outer ring	Crowned outer ring
CF12	0/-9	0/-50
CF12-1,CF16,CF18,CF20-1	0/-11	0/-50
CF20,CF24,CF24-1,CF30	0/-13	0/-50
CF30-1,CF30-2	0/-15	0/-50

ACCESSORIES

TYPE	Grease Nipple	NUT
All types	Installed	Attached

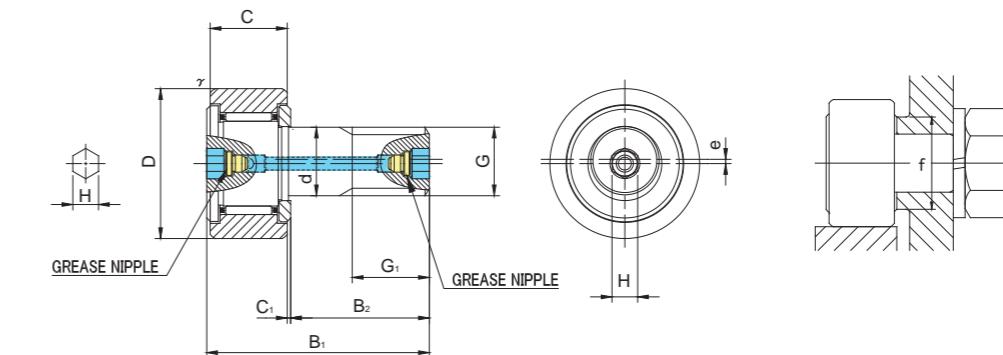
CAM FOLLOWERS STAINLESS STEEL

SOLID ECCENTRIC TYPE
HEXAGON SOCKET ON BOTH SIDES
GREASE NIPPLE INSTALLED



CFH..MAB

CFH..VMAB



Prepacked Grease

CFH..MAB TYPE

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 ≤)		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			
	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	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																				
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																				
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																				
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																				
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																				

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)

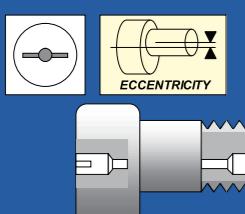
TYPE	Cylindrical outer ring	Crowned outer ring
CF12	0/-9	0/-50
CF12-1,CF16,CF18,CF20-1	0/-11	0/-50
CF20,CF24,CF24-1,CF30	0/-13	0/-50
CF30-1,CF30-2	0/-15	0/-50

ACCESSORIES

TYPE	Grease Nipple	NUT
All types	Installed	Attached

CAM FOLLOWERS STAINLESS STEEL

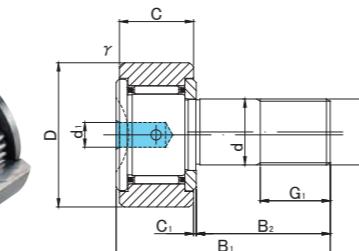
SOLID ECCENTRIC TYPE
SCREWDRIVER SLOT HEAD



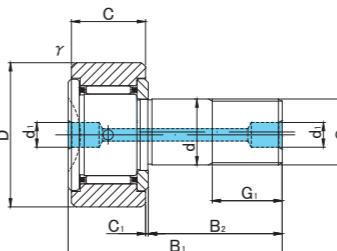
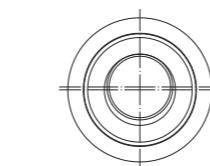
CFH..M



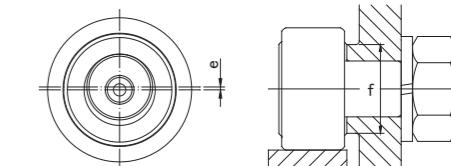
CFH..VM



CFH5(V)M~CFH10-1(V)M



CFH12(V)M~CFH18(V)M



CFH12(V)M~CFH18(V)M

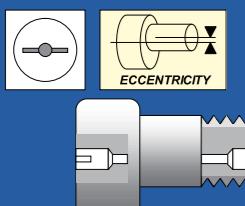
CFH..M TYPE

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)		D	C	d	G	G1	B1	B2	C1	d1	r _s min	e	f min			N	rpm	Cylindrical outer ring N	Crowned outer ring N			
	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 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										

CAM FOLLOWERS STAINLESS STEEL

SOLID ECCENTRIC TYPE
SCREWDRIVER SLOT HEAD

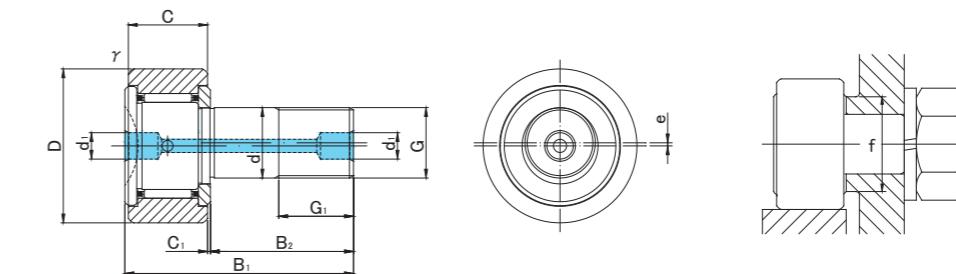


SUS/INOX



CFH..M

CFH..VM



Prepacked Grease

CFH..M TYPE

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 ≤)		D	C	d	G	G1	B1	B2	C1	d1	r _s min	e	f min														
	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)					
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

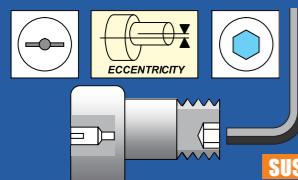
ACCESSORIES

TYPE	STOP PLUG	RESIN PLUG	NUT
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CAM FOLLOWERS

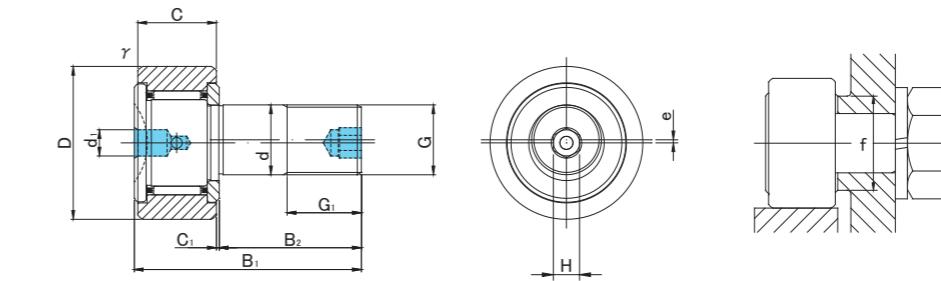
STAINLESS STEEL

SOLID ECCENTRIC TYPE
HEXAGON SOCKET ON THREAD SIDE
SCREWDRIVER SLOT HEAD



CFH..MB

CFH..VMB



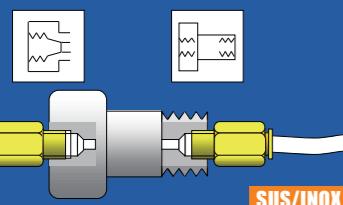
CFH..MB TYPE

Prepacked Grease

Stud diameter (mm)	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 ≤)		D	C	d	G	G1	B1	B2	C1	d1	H	r _s min	e	f min									
	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)
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														

CAM FOLLOWERS STAINLESS STEEL

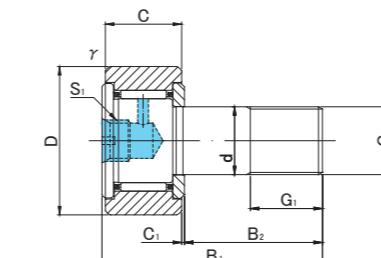
TAP HOLE FOR PIPING
SCREWDRIVER SLOT HEAD



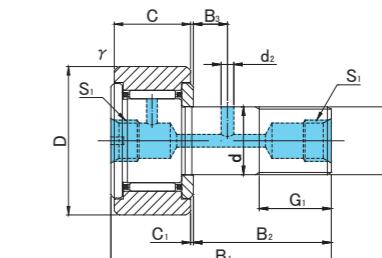
CFT..M

CFT..VM

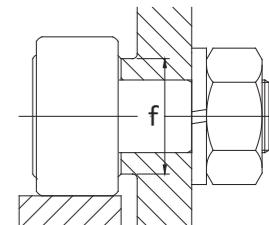
SUS/INOX



CFT6(V)M ~ CFT10-1(V)M



CFT12(V)M ~ CFT18(V)M



Prepacked Grease

CFT..M TYPE

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)		D	C	d	G	G1	B1	B2	B3	C1	S1	d2	r _s min	f min	Cr N	Cor N	rpm	Cylindrical outer ring N	Crowned outer ring N	N·m	g (approx)		
	h7 tolerance	Without seals	With seals	Without seals	With seals	D	C	d	G	G1	B1	B2	B3	C1	S1	d2	r _s min	f min	Cr N	Cor N	rpm	Cylindrical outer ring N	Crowned outer ring N	N·m	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				

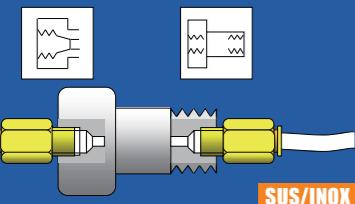
* Without seals, suitable for grease lubrication. In case of oil lubrication, up to 130% of this value shall be permissible, and 70% of this value shall apply for types with seals.

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		

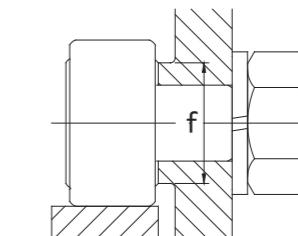
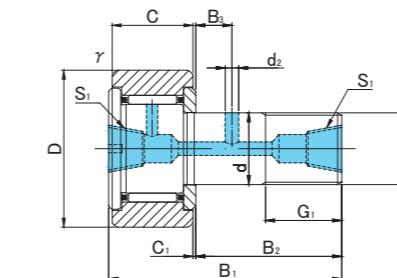
CAM FOLLOWERS STAINLESS STEEL

TAP HOLE FOR PIPING
SCREWDRIVER SLOT HEAD



CFT..M

CFT..VM



CFT..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 R1000(CF20 \leq)		D	C	d	G	G1	B1	B2	B3	C1	S1	d2	r _s min	f min	Cr N	Cor N	rpm	Cylindrical outer ring N	Crowned outer ring N				
		h7 tolerance	Without seals	With seals	Without seals	With seals	D	C	d	G	G1	B1	B2	B3										g (approx)		
20	0 -0.021	CFT20M	CFT20MUU	CFT20MR	CFT20MUUR	52	24	20	M20x1.5	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	M20x1.5	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	M24x1.5	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	M24x1.5	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	M30x1.5	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	M30x1.5	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	M30x1.5	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)

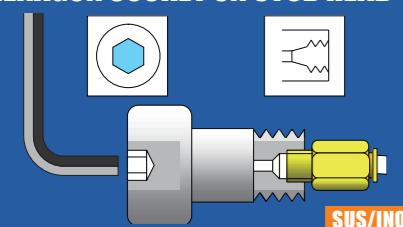
TYPE	Cylindrical outer ring	Crowned outer ring
CF6M	0/-8	0/-50
CF8M, CF10M, CF10-1M, CF12M	0/-9	0/-50
CF12-1M, CF16M, CF18M, CF20-1M	0/-11	0/-50
CF20M, CF24M, CF24-1M, CF30M	0/-13	0/-50
CF30-1M, CF30-2M	0/-15	0/-50

ACCESSORIES

TYPE	NUT
All types	Attached

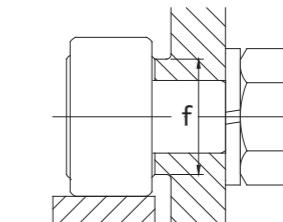
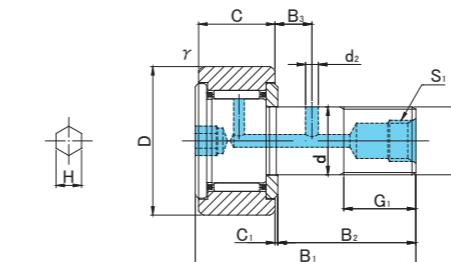
CAM FOLLOWERS STAINLESS STEEL

TAP HOLE FOR PIPING
HEXAGON SOCKET ON STUD HEAD



CFT..MA

CFT..VMA



CFT..MA 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 ≤)		D	C	d	G	G1	B1	B2	B3	C1	S1	d2	H	rs min	f min	Cr N	Cor N	N	rpm	Cylindrical outer ring N	Crowned outer ring N			
	Without seals	With seals	Without seals	With seals																							
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	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																						
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																						
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																						
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																						
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																						
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																						
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																						
30	0 -0.021	CFT30MA	CFT30MUUA	CFT30MRA	CFT30MUURA	80	35	30	M30×1.5	32	100	63	15	1	Rc1/8	4	8	1									

ROLLER FOLLOWERS

STAINLESS
STEEL



Type and Part Code

Type	Applicable axis diameter	Feature	Part Code					
 RNAST..M (Separable type)	$\phi 7 \sim \phi 60$	NAST type without inner ring.	RNAST	15	M	R		
			Type	Bore diameter code			Stainless steel	R: Crowned outer ring None: Cylindrical outer rings
 NAST..M (Separable type)	$\phi 6 \sim \phi 50$	Thick wall outer ring, inner ring. Separable bearing with combined needle roller with precision cage.	NAST	15	M	R		
			Type	Bore diameter code			Stainless steel	R: Crowned outer ring None: Cylindrical outer rings
 NAST..MZZ (Separable type)	$\phi 6 \sim \phi 50$	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	Stainless steel	ZZ : With shield	UU : With seal None : With shield	R : Crowned outer ring X : Cylindrical outer ring
 NART..MR (Non-separable type)	$\phi 5 \sim \phi 50$	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	Stainless steel	UU : With seal None : With shield	V : Full complement None : With cage	R : Crowned outer ring X : Cylindrical outer ring

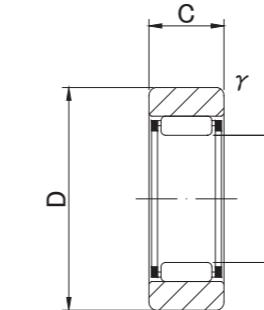
**ROLLER FOLLOWERS
STAINLESS STEEL
SEPARABLE
WITHOUT INNER RING**



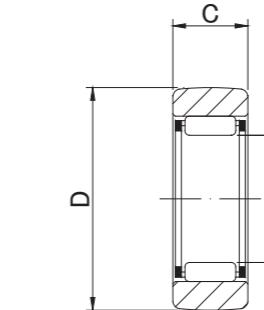
SUS/INOX



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)							Cylindrical outer ring N	Crowned outer ring N		
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.

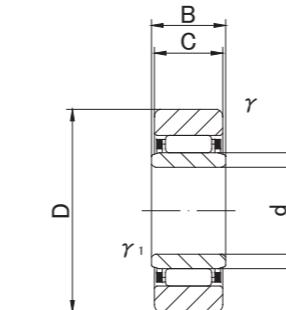
OUTER RINGS TOLERANCE

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

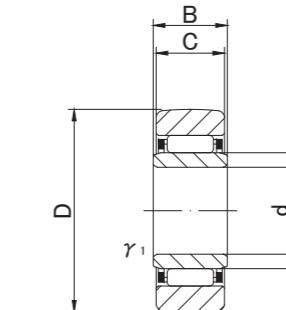
**ROLLER FOLLOWERS
STAINLESS STEEL
SEPARABLE
WITH INNER RING**



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)										Cylindrical outer ring N	Crowned outer ring N			
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)

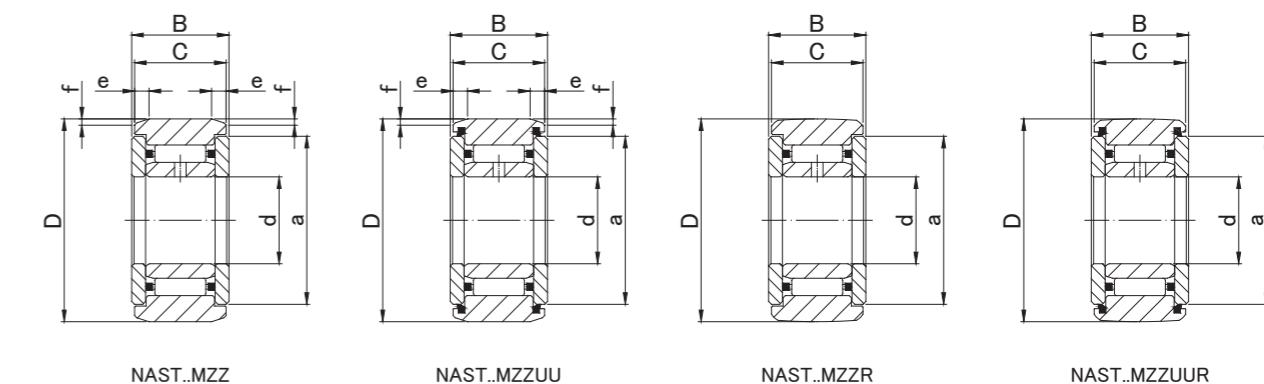
TYPE	Cylindrical outer ring	Crowned outer ring
NAST6M,NAST8M,NAST10M	0/-9	0/-50
NAST12M,NAST15M,NAST17M,NAST20M	0/-11	0/-50
NAST25M,NAST30M,NAST35M,NAST40M	0/-13	0/-50
NAST45M,NAST50M	0/-15	0/-50



ROLLER FOLLOWERS
STAINLESS STEEL
SEPARABLE
WITH INNER RING
WITH SHIELD



NAST..MZZ



STAINLESS STEEL

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)		d	D	B	C	a	e	f			Cylindrical outer ring N	Crowned outer ring N						
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)

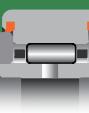
TYPE	Cylindrical outer ring	Crowned outer ring
NAST6M,NAST8M,NAST10M	0/-9	0/-50
NAST12M,NAST15M,NAST17M,NAST20M	0/-11	0/-50
NAST25M,NAST30M,NAST35M,NAST40M	0/-13	0/-50
NAST45M,NAST50M	0/-15	0/-50

NAST..MZZ

NAST..MZZ

ROLLER FOLLOWERS STAINLESS STEEL

NON SEPARABLE WITH INNER RING



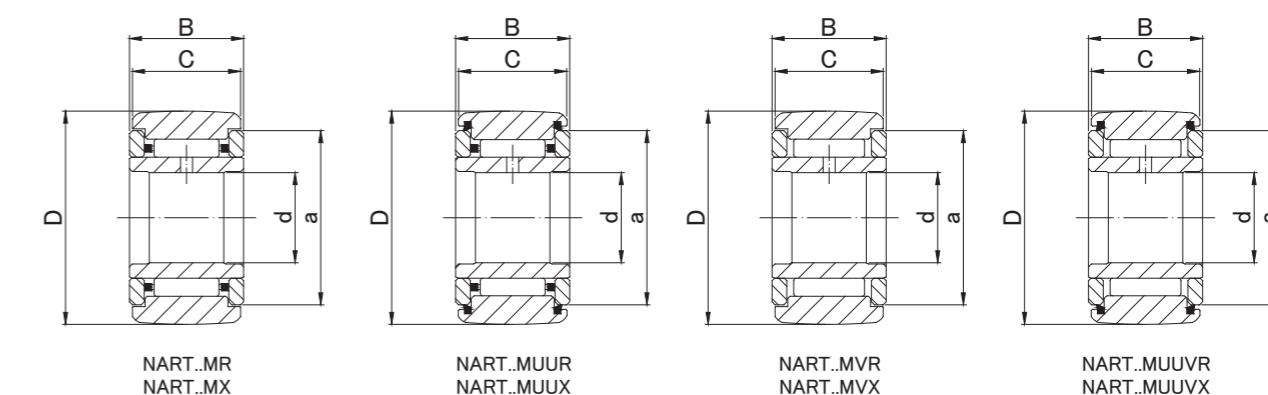
SUS/INOX

SUS/INOX



NART..MR

NART..VMR



STAINLESS STEEL

NART.. M 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(≤ NART17R) R1000(NART20R ≤)		Cylindrical outer ring									Crown	Cylindrical		
	Without seals	With seals	Without seals	With seals	d	D	B	C	a	Cr N	Cor N	O-Ring	Ring		
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

NART.. M

NART.. M

[Reference material]

Shaft dimensional allowance

Unit: μm

Nominal bearing bore diameter and nominal diameter of shaft d (mm)	Tolerance grade for shaft																		Tolerance grade for shaft																		Nominal bearing bore diameter and nominal diameter of shaft d (mm)																								
	b12	c12	d6	e6	e7	f5	f6	g5	g6	h5	h6	h7	h8	h9	h10	h11	h12	js5	j5	js6	j6	j7	k5	k6	m5	m6	n5	n6	p6																																
Over	Incl.	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	-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	0	-100	+2	-2	+2	-2	+3	-3	+4	-2	+6	-4	+4	0	+6	+2	+8	+2	+8	+4	+10	+4	+12	+6	—	3		
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	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
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	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
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	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
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	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
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	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	-180	-430	-130	-380	-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	0	-250	+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
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	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	-200	-500	-150	-450	-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	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
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	0	-400	+9	-9	+7	-11	+12.5	-12.5	+14	-11	+22	-18	+21	+3	+28	+3	+35	+13	+38	+23	+45	+23	+59	+37	80	100		
100	120	-240	-590	-180	-530	-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	0	-400	+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	200	225
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	0	-400	+9	-9	+7	-11	+12.5	-12.5	+14	-11	+22	-18	+21	+3	+28	+3	+35	+13	+38	+23	+45	+23	+59	+37	120	140		
140	160	-280	-680	-210	-610	-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	0	-400	+9	-9	+7	-11	+12.5	-12.5	+14	-11	+22	-18	+21	+3	+28	+3	+35	+13	+38	+23	+45	+23	+59	+37	140	160		
160	180	-310	-710	-230	-630	-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	0	-400	+9	-9	+7	-11	+12.5	-12.5	+14	-11	+22	-18	+21	+3	+28	+3	+35	+13	+38	+23	+45	+23	+59	+37	160	180		
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	-1																																

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

Rockwell hardness C scale (HRC)	Vickers hardness (HV)	Brinell 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 (HRD) 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

Rockwell hardness C scale (HRC)	Vickers hardness (HV)	Brinell 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 (HRD) Load 100kgf Diamond conical penetrator	15-N scale Load : 15kgf	30-N scale Load : 30kgf	45-N scale Load : 45kgf			
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	—	—					

Approximate conversion values against Vickers hardness of steel materials 1)

Vickers hardness (HV)	Brinell hardness 10 mm ball, load 3000 kgf		Rockwell hardness 3)				Rockwell special hardness special brake indenter			Shore hardness (HS)	Tensile strength kgf/mm ² 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 identer	D-scale Load 100 kgf brale identer	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

Vickers hardness (HV)	Brinell hardness 10 mm ball, load 3000 kgf		Rockwell hardness 3)				Rockwell special hardness special brake indenter				Shore hardness (HS)	Tensile strength kgf/mm ² 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 identer	D-scale Load 100 kgf brale identer	15-N scale Load 15 kgf	30-N scale Load 30 kgf	45-N scale load 45 kgf				
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</td								



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