MOTION & CONTROL™

NSK

Needle Roller Bearings

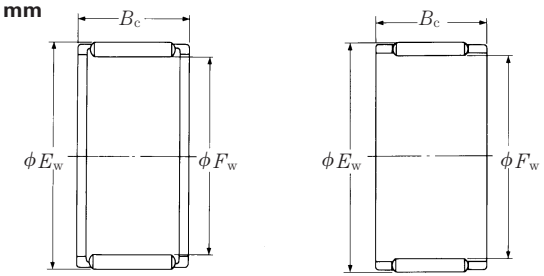
NSK NEEDLE BEARING

TECHNICAL INFORMATION		A6～	
Cage & Needle Roller Assemblies	FWJ FWF WJ; FWF---W; FBN WJC; FBN---W	B4～	
Drawn Cup Needle Roller Bearings	F, FH NFH B, BH; MF, MFH M, MH; FJ, FJL, FJH J, JH, DB; MFJ, MFJL MFJH MJ, MJH; Y YH DD; MFY; FJT, FJTT FJLT, FJLTT FJHTT; MFJT MFJLT; FJP JP	B36～	
Solid Needle Roller Bearings	RNA48 RNA49 RNA59 RNA69 HJ; RLM; RNAF; RNAFW; RNA---TT; NA48 NA49 NA59 NA69 HJ+IR; LM; NAF; NAFW; NA---TT	B88～	
Inner Rings for Needle Roller Bearings	FIR IR; IR	B128～	
Thrust Bearings	FNTA NTA; FB; FG; FH; FTRA TRA; FTRB TRB; FTRC TRC; FTRD TRD; FTRE TRE; TRF	B162～	
Cam Followers	FCR FCJ CR; FCRS FCJS CRS	B176～	
Roller Followers	FYCR FYCJ YCR; FYCRS FYCJS YCRS	B190～	
Needle Rollers	A; F; P; T; C; M	B198～	
Spherical Plain Bearings	FSF SF; FSBB SBB	B208～	
Needle Roller Bearings for Universal Joints	ZY; NSA	B220～	
Drawn Cup Roller Clutches	FC; RC; FCB; RCB	B228～	
Oil Seals for Needle Roller Bearings	VC; KC	B238～	
Example Figures and Appendices		C1～	

FWF

FBN • FBNP

Inscribed Circle Diameter 4 — 12 mm



FWF

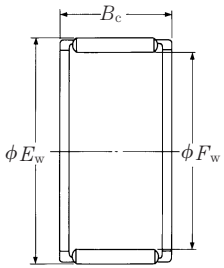
FBN, FBNP

Boundary Dimensions (mm)			Basic Load Ratings (N)		{kgf}		Limiting Speeds (min^{-1})	Bearing Numbers	Mass (g)
F_w	E_w	B_c $^{-0.2}_{-0.55}$	C_r	C_{or}	C_r	C_{or}	Oil		approx
4	7	7	1 710	1 220	175	124	120 000	＊**FBNP-477**	0.5
5	8	8	2 330	1 860	237	189	95 000	＊**FBNP-588**	1.0
6	9	8	2 200	1 780	224	182	75 000	＊**FBNP-698**	1.2
	9	10	2 980	2 630	305	268	75 000	＊**FBNP-6910**	1.5
	10	13	4 300	3 600	435	365	80 000	＊**FBNP-61013**	2.8
7	10	8	2 840	2 560	290	261	67 000	＊**FBNP-7108**	1.3
	10	10	3 650	3 550	375	360	67 000	＊**FBNP-71010**	1.6
8	11	8	3 050	2 900	310	296	56 000	＊**FBNP-8118**	1.4
	11	10	3 500	3 450	360	355	56 000	＊**FBNP-81110**	1.8
	11	13	4 750	5 150	485	525	56 000	＊**FBNP-81113**	2.6
9	12	10	3 750	3 850	380	395	50 000	＊**FBNP-91210**	2.0
	12	13	5 100	5 750	520	585	50 000	＊**FBNP-91213**	2.6
10	13	8	3 450	3 600	355	365	45 000	**FBN-10138**	2.0
	13	10	3 950	4 300	405	435	45 000	**FBN-101310**	2.2
	13	11	4 450	5 000	455	505	45 000	**FBN-101311**	2.4
	13	13	5 400	6 350	550	650	45 000	**FBN-101313**	2.9
	14	8	3 750	3 300	385	340	45 000	**FBN-10148**	2.5
	14	10	5 350	5 300	545	540	45 000	**FWF-101410**	3.1
	14	13	6 500	6 750	660	690	45 000	**FWF-101413**	4.0
	16	12	7 700	6 650	785	680	48 000	**FWF-101612**	6.0
11	14	10	3 950	4 350	400	440	40 000	**FBN-111410**	2.6
12	15	9	4 350	5 100	445	520	36 000	**FBN-12159**	2.4
	15	10	4 350	5 100	445	520	36 000	**FBN-121510**	2.6
	15	12	5 400	6 750	555	690	36 000	**FBN-121512**	3.1
	15	13	5 950	7 600	605	775	36 000	**FBN-121513**	3.4
	16	10	5 700	5 950	580	610	38 000	**FWF-121610**	3.6
	16	13	7 350	8 350	750	850	38 000	**FWF-121613**	4.6
	17	13	8 250	8 350	840	855	38 000	**FWF-121713**	6.0
	18	12	9 150	8 650	935	885	38 000	**FWF-121812**	6.9

* These bearings have polyamide cages. The maximum permissible operating temperature for these bearings is 100℃ for continued operation and 120℃ for short periods.

FWF • FWJ

Inscribed Circle Diameter 14 — 17 mm



FWF, FWJ

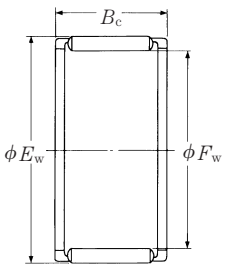
Boundary Dimensions (mm)			Basic Load Ratings (N)		{kgf}		Limiting Speeds (min^{-1})	Bearing Numbers	Mass (g)
F_w	E_w	B_c $^{-0.2}_{-0.55}$	C_r	C_{or}	C_r	C_{or}	Oil		approx
14	18	10	6 750	7 750	690	790	32 000	**FWF-141810**	4.1
	18	11	6 650	7 600	675	775	32 000	**FWF-141811**	4.5
	18	13	8 050	9 750	820	995	32 000	**FWF-141813**	5.3
	18	17	10 700	14 100	1 090	1 430	32 000	**FWF-141817**	6.9
	18	20	12 100	16 400	1 230	1 670	32 000	**FWF-141820**	10
	20	12	9 850	9 800	1 010	1 000	32 000	**FWF-142012**	7.8
	20	17	13 400	14 600	1 370	1 490	32 000	**FWF-142017**	11
15	19	10	7 050	8 400	720	855	28 000	**FWF-151910**	4.3
	19	13	8 400	10 500	860	1 070	28 000	**FWF-151913**	5.6
	19	17	11 200	15 200	1 140	1 550	28 000	**FWF-151917**	7.4
	20	13	9 950	11 300	1 010	1 150	30 000	**FWF-152013**	7.2
	21	15	12 600	13 600	1 280	1 380	30 000	**FWF-152115**	10
	21	17	13 400	14 800	1 370	1 510	30 000	**FWF-152117**	12
	21	21	16 300	18 900	1 660	1 930	30 000	**FWF-152121A**	14
16	20	10	7 350	9 000	750	920	26 000	**FWF-162010**	4.6
	20	13	8 800	11 300	895	1 150	26 000	**FWF-162013**	6.0
	20	17	11 700	16 300	1 190	1 660	26 000	**FWF-162017**	7.8
	21	13	10 500	12 300	1 070	1 250	28 000	**FWF-162113**	7.7
	21	17	13 000	16 200	1 330	1 660	28 000	**FWF-162117**	10
	21	26	20 000	28 200	2 040	2 880	28 000	**FWF-162126**	15
	21	27	20 800	29 600	2 120	3 000	28 000	**FWF-162127**	16
	22	12	10 500	10 900	1 070	1 120	28 000	**FWF-162212**	8.7
	22	13	10 900	11 500	1 120	1 180	28 000	**FWF-162213**	9.4
	22	17	14 700	16 900	1 500	1 720	28 000	**FWF-162217**	12
	22	20	17 000	20 300	1 730	2 070	28 000	**FWF-162220**	14
	22	22	18 700	22 900	1 900	2 340	28 000	**FWF-162222**	16
	22	24	20 300	25 600	2 070	2 610	28 000	**FWF-162224**	17
	24	20	20 800	22 200	2 120	2 270	30 000	**FWF-162420**	20
17	21	10	7 650	9 650	780	985	26 000	**FWF-172110**	4.8
	21	13	10 200	14 000	1 040	1 420	26 000	**FWJ-172113**	6.3
	21	15	10 800	15 000	1 100	1 530	26 000	**FWF-172115**	7.5
	21	16	11 500	16 300	1 170	1 670	26 000	**FWF-172116**	8.0
	21	17	11 500	16 300	1 170	1 670	26 000	**FWF-172117**	8.2
	22	20	15 400	20 400	1 570	2 080	26 000	**FWF-172220**	16
	23	17	15 100	17 800	1 540	1 810	26 000	**FWF-172317**	14

FWF • FWJ

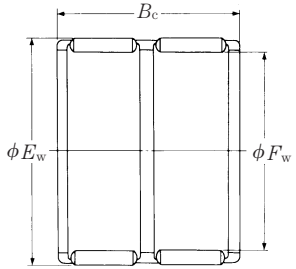
FWF···W

FBN···W

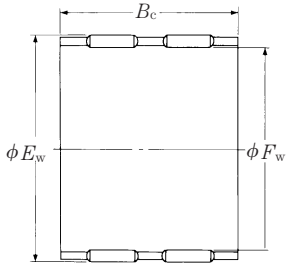
Inscribed Circle Diameter 17.57 — 21 mm



FWF, FWJ



FWF···W



FBN···W

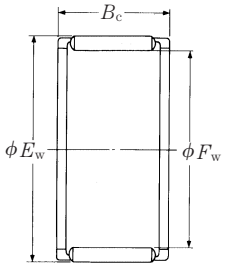
Boundary Dimensions (mm)			Basic Load Ratings (N)		{kgf}		Limiting Speeds (min^{-1})	Bearing Numbers	Mass (g)
F_w	E_w	B_c $^{-0.2}_{-0.55}$	C_r	C_{or}	C_r	C_{or}	Oil		approx
17.57	22.6	21	16 600	22 700	1 700	2 320	24 000	**FWF-172221Z**	13
	23.6	32	29 300	42 000	2 990	4 300	26 000	**FWJ-172332Z**	25
18	22	10	7 900	10 300	805	1 050	24 000	**FWF-182210**	5.1
	22	13	9 450	12 900	965	1 310	24 000	**FWF-182213**	6.6
	22	17	12 600	18 600	1 280	1 900	24 000	**FWF-182217**	8.7
	22	28	16 100	25 400	1 640	2 590	24 000	**FBN-182228W**	16
	23	20	16 600	22 900	1 690	2 340	24 000	**FWF-182320**	13
	24	12	11 700	13 000	1 190	1 320	24 000	**FWF-182412**	9.6
	24	13	12 800	14 600	1 300	1 490	24 000	**FWF-182413**	10
	24	17	17 400	21 600	1 770	2 210	24 000	**FWJ-182417**	14
	24	20	18 900	24 100	1 930	2 460	24 000	**FWF-182420**	16
	25	14	14 200	15 200	1 450	1 550	24 000	**FWF-182514**	13
	25	17	16 500	18 300	1 680	1 860	24 000	**FWF-182517**	19
	25	22	21 300	25 500	2 170	2 600	24 000	**FWF-182522**	21
19	23	13	9 900	13 900	1 010	1 420	22 000	**FWF-192313**	7.0
	23	17	12 300	18 500	1 260	1 880	22 000	**FWF-192317**	9.1
	24	28	23 800	37 000	2 420	3 750	22 000	**FWJ-192428**	19
	31	24	31 500	31 500	3 200	3 200	26 000	**FWF-193124**	45
19.1	31.1	24	31 000	30 500	3 150	3 150	24 000	**FWJ-193124Z**	46
20	24	10	8 000	10 700	815	1 090	20 000	**FWF-202410**	5.6
	24	13	9 700	13 700	990	1 400	20 000	**FWF-202413**	7.3
	24	17	12 400	18 800	1 260	1 910	20 000	**FWF-202417**	9.5
	25	40	30 000	50 500	3 050	5 150	22 000	**FWF-202540W**	29
	26	12	12 200	14 100	1 250	1 440	22 000	**FWF-202612**	10
	26	13	13 100	15 500	1 340	1 580	22 000	**FWF-202613**	11
	26	16	16 600	21 000	1 700	2 140	22 000	**FWF-202616**	14
	26	17	18 000	23 200	1 830	2 370	22 000	**FWJ-202617**	15
	26	20	19 200	25 200	1 960	2 570	22 000	**FWF-202620**	18
	26	24	23 200	32 000	2 360	3 250	22 000	**FWF-202624**	21
	28	20	19 800	21 700	2 020	2 210	22 000	**FWF-202820**	28
21	25	13	10 500	15 500	1 070	1 580	20 000	**FWF-212513**	7.6
	25	17	13 100	20 600	1 340	2 100	20 000	**FWF-212517**	10

FWF • FWJ

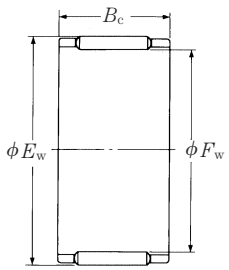
FBN

FBN···W

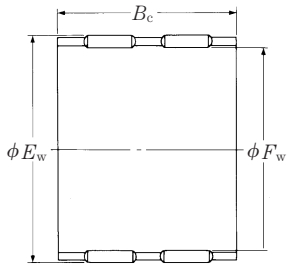
Inscribed Circle Diameter 22 — 26 mm



FWF, FWJ



FBN



FBN···W

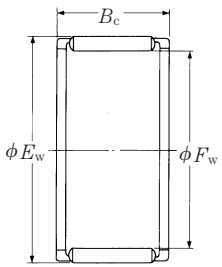
Boundary Dimensions (mm)			Basic Load Ratings (N)		{kgf}		Limiting Speeds (min^{-1})	Bearing Numbers	Mass (g)
F_w	E_w	B_c $^{-0.2}_{-0.55}$	C_r	C_{or}	C_r	C_{or}	Oil		approx
22	26	10	8 600	12 200	880	1 240	19 000	**FWF-222610**	6.1
	26	11	8 600	12 200	880	1 240	19 000	**FWF-222611**	7.2
	26	13	10 300	15 300	1 050	1 560	19 000	**FWF-222613**	7.9
	26	17	13 000	20 700	1 330	2 110	19 000	**FWF-222617**	10
	27	20	18 000	27 000	1 840	2 760	20 000	**FWF-222720**	16
	28	13	13 700	16 700	1 390	1 700	20 000	**FWF-222813**	12
	28	17	17 300	22 700	1 760	2 310	20 000	**FWF-222817**	16
	28	23	23 600	34 000	2 410	3 450	20 000	**FWF-222823**	22
	29	16	17 100	20 200	1 750	2 060	20 000	**FWF-222916**	18
	30	14	17 400	19 000	1 770	1 930	20 000	**FWF-223014**	24
23	28	24	22 400	36 000	2 280	3 700	19 000	**FWF-232824**	20
24	28	13	10 500	16 100	1 070	1 650	17 000	**FWF-242813**	8.6
	28	17	14 600	24 700	1 490	2 510	17 000	**FWF-242817**	11
	28	25	15 900	27 400	1 620	2 800	17 000	**FBN-242825W**	19
	29	13	10 700	14 100	1 090	1 430	18 000	**FBN-242913**	11
	30	17	17 900	24 300	1 830	2 480	18 000	**FWF-243017**	14
25	29	10	9 350	14 100	950	1 440	17 000	**FWF-252910**	6.9
	29	13	11 300	18 000	1 150	1 830	17 000	**FWF-252913**	8.9
	29	17	14 800	25 500	1 510	2 600	17 000	**FWF-252917**	12
	30	13	13 500	19 500	1 380	1 980	17 000	**FWF-253013**	11
	30	17	17 200	26 400	1 750	2 690	17 000	**FWF-253017**	14
	30	20	18 800	29 700	1 920	3 050	17 000	**FWF-253020**	15
	30	25	23 600	39 500	2 410	4 050	17 000	**FWF-253025**	21
	31	13	15 000	19 500	1 520	1 990	17 000	**FWF-253113**	17
	31	17	19 200	26 800	1 950	2 740	17 000	**FWF-253117**	18
	31	20	22 100	32 000	2 250	3 300	17 000	**FWF-253120**	21
	31	24	26 500	40 500	2 700	4 150	17 000	**FWF-253124**	26
	32	16	18 700	23 500	1 910	2 390	17 000	**FWF-253216**	20
	32	24	28 300	40 000	2 880	4 050	17 000	**FWF-253224**	30
	33	20	28 400	37 000	2 900	3 750	18 000	**FWJ-253320**	30
	33	24	33 000	45 000	3 400	4 600	18 000	**FWJ-253324**	36
26	30	13	10 400	16 200	1 060	1 660	16 000	**FWF-263013**	9.3
	30	17	14 400	24 900	1 470	2 540	16 000	**FWF-263017**	12
	30	24	17 900	32 500	1 820	3 350	16 000	**FBN-263024**	20

FWF • FWJ

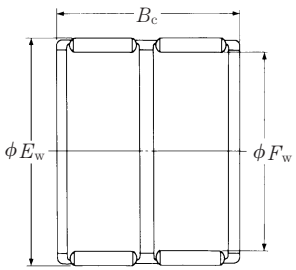
FWF···W

FBN···W

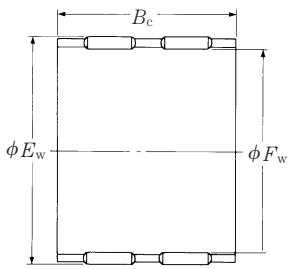
Inscribed Circle Diameter 28 — 34 mm



FWF, FWJ



FWF···W



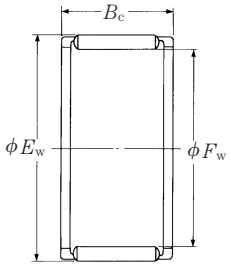
FBN···W

Boundary Dimensions (mm)			Basic Load Ratings (N)		{kgf}		Limiting Speeds (min^{-1})	Bearing Numbers	Mass (g)
F_w	E_w	B_c $^{-0.2}_{-0.55}$	C_r	C_{or}	C_r	C_{or}	Oil		approx
28	33	13	13 700	20 400	1 400	2 080	15 000	**FWF-283313**	13
	33	17	17 100	27 100	1 740	2 760	15 000	**FWF-283317**	16
	33	20	21 900	37 500	2 240	3 800	15 000	**FWJ-283320**	20
	33	26	27 100	49 000	2 760	5 000	15 000	**FWF-283326**	25
	33	27	28 100	51 500	2 860	5 250	15 000	**FWF-283327**	26
	34	17	19 900	29 100	2 020	2 970	15 000	**FWF-283417**	20
	35	20	25 200	35 500	2 570	3 650	15 000	**FWF-283520**	22
	36	20	26 200	34 000	2 670	3 450	16 000	**FWF-283620**	33
29	34	17	17 500	28 400	1 790	2 900	14 000	**FWF-293417**	17
	34	24	25 400	46 000	2 590	4 650	14 000	**FWF-293424**	24
	34	27	26 600	48 500	2 710	4 950	14 000	**FWF-293427**	27
30	35	13	14 000	21 600	1 430	2 200	14 000	**FWF-303513**	14
	35	17	18 700	31 500	1 910	3 200	14 000	**FWF-303517A**	18
	35	20	21 000	36 000	2 140	3 700	14 000	**FWF-303520**	21
	35	27	28 700	54 000	2 920	5 500	14 000	**FWF-303527**	28
	36	14	18 400	26 900	1 870	2 750	14 000	**FWF-303614**	18
	36	20	24 300	38 500	2 480	3 950	14 000	**FWF-303620**	25
	36	26	29 600	49 500	3 000	5 050	14 000	**FWF-303626**	33
	37	16	22 200	31 000	2 270	3 150	14 000	**FWF-303716**	24
	37	20	26 000	38 000	2 650	3 850	14 000	**FWF-303720**	30
	38	18	25 500	34 000	2 600	3 450	14 000	**FWF-303818**	32
	38	20	25 900	34 500	2 640	3 500	14 000	**FWF-303820**	35
	38	27	38 500	57 500	3 950	5 850	14 000	**FWF-303827**	47
	40	25	38 500	49 500	3 950	5 050	15 000	**FWF-304025**	68
32	36	29	22 300	46 500	2 270	4 750	13 000	**FBN-323629WA**	32
	37	13	15 100	24 400	1 540	2 480	13 000	**FWF-323713**	14
	37	17	18 500	31 500	1 880	3 200	13 000	**FWJ-323717**	19
	37	23	24 300	44 500	2 480	4 550	13 000	**FWJ-323723**	25
	37	27	31 500	63 000	3 250	6 400	13 000	**FWJ-323727**	30
	37	28	25 200	47 000	2 570	4 800	13 000	**FWF-323728W**	31
	38	20	24 900	40 500	2 540	4 150	13 000	**FWF-323820**	27
	38	26	33 000	59 000	3 400	6 000	13 000	**FWF-323826**	35
	39	16	22 900	33 000	2 330	3 350	13 000	**FWJ-323916**	25
	39	20	27 300	41 000	2 780	4 200	13 000	**FWF-323920**	32
	40	20	28 400	39 500	2 890	4 000	13 000	**FWF-324020**	37
34	39	23	25 100	47 500	2 560	4 850	12 000	**FWJ-343923**	27

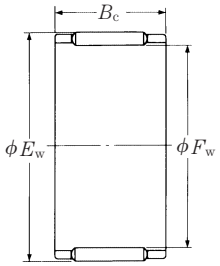
FWF • FWJ

FBN

Inscribed Circle Diameter 35 — 38.1 mm



FWF, FWJ



FBN

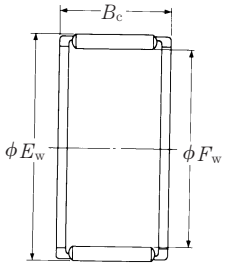
Boundary Dimensions (mm)			Basic Load Ratings (N)		{kgf}		Limiting Speeds (min^{-1})	Bearing Numbers	Mass (g)
F_w	E_w	B_c $^{-0.2}_{-0.55}$	C_r	C_{or}	C_r	C_{or}	Oil		approx
35	40	13	14 900	24 600	1 520	2 500	12 000	**FWF-354013**	16
	40	17	20 500	37 000	2 090	3 750	12 000	**FWF-354017**	20
	40	20	26 400	51 000	2 690	5 200	12 000	**FWJ-354020**	26
	40	25	27 200	53 000	2 770	5 400	12 000	**FBN-354025**	30
	40	26	27 200	53 000	2 770	5 400	12 000	**FBN-354026**	31
	40	27	31 500	64 000	3 200	6 500	12 000	**FWF-354027**	32
	40	30	34 000	71 500	3 500	7 300	12 000	**FWF-354030**	34
	40	32.7	30 500	61 000	3 100	6 250	12 000	**FBN-354032Z**	40
	42	16	22 700	33 500	2 310	3 400	12 000	**FWF-354216**	28
	42	18	25 900	39 500	2 640	4 000	12 000	**FWF-354218**	31
	42	20	30 000	47 500	3 050	4 850	12 000	**FWJ-354220**	34
	42	30	43 000	75 500	4 350	7 700	12 000	**FWF-354230**	54
	44	18	29 600	39 500	3 000	4 050	12 000	**FWF-354418**	41
36	41	26	30 000	61 000	3 050	6 250	11 000	**FWF-364126**	31
	41	30.5	32 000	66 000	3 250	6 700	11 000	**FWJ-364130Z**	37
	48	22.5	45 500	57 500	4 650	5 900	12 000	**FWF-364822Z**	72
	48	25	48 500	62 500	4 950	6 350	12 000	**FWF-364825**	80
37	42	13	16 500	28 400	1 680	2 900	11 000	**FWF-374218**	16
	42	14.5	15 400	26 000	1 570	2 650	11 000	**FWJ-374214ZA**	15
	42	17	20 300	37 000	2 070	3 800	11 000	**FWJ-374217**	21
	42	27	31 500	66 000	3 250	6 700	11 000	**FWJ-374227**	34
	42	30	35 500	77 000	3 650	7 850	11 000	**FWF-374230**	43
	44	18	26 500	41 500	2 700	4 200	11 000	**FWF-374418**	32
38	43	13	16 400	28 500	1 670	2 900	11 000	**FWF-384313**	17
	43	17	20 400	38 000	2 080	3 850	11 000	**FWF-384317**	22
	43	27	32 500	68 500	3 300	7 000	11 000	**FWF-384327**	35
	44	27	39 000	76 500	4 000	7 800	11 000	**FWJ-384427**	42
	46	20	31 500	47 000	3 200	4 800	11 000	**FWF-384620**	43
	46	32	47 500	80 500	4 850	8 200	11 000	**FWF-384632**	75
38.1	50.8	24.7	50 500	64 000	5 150	6 500	11 000	**FWJ-385024Z**	93

FWF • FWJ

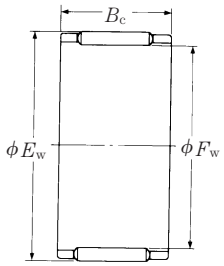
FWF···W

FBN

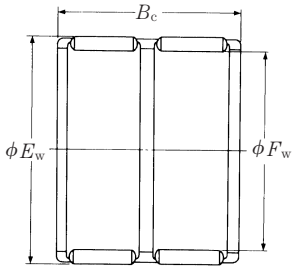
Inscribed Circle Diameter 40 — 52 mm



FWF, FWJ



FBN



FWF···W

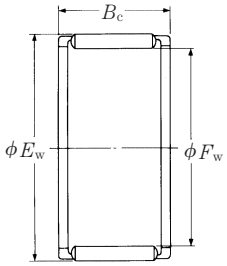
Boundary Dimensions (mm)			Basic Load Ratings (N)		{kgf}		Limiting Speeds (min^{-1})	Bearing Numbers	Mass (g)
F_w	E_w	B_c $^{-0.2}_{-0.55}$	C_r	C_{or}	C_r	C_{or}	Oil		approx
40	45	13	15 700	27 500	1 610	2 800	10 000	**FWF-404513**	18
	45	17	21 000	40 000	2 150	4 050	10 000	**FWF-404517A**	23
	45	27	32 000	68 000	3 250	6 900	10 000	**FWF-404527**	36
	45	30	35 000	77 000	3 600	7 850	10 000	**FWJ-404530**	40
	46	30	35 000	67 000	3 550	6 800	10 000	**FWF-404630**	50
	48	20	32 500	49 500	3 300	5 050	10 000	**FWF-404820**	45
	48	25	40 500	66 500	4 150	6 800	10 000	**FWF-404825**	56
	48	34	53 500	95 000	5 450	9 700	10 000	**FWF-404834**	76
42	47	17	19 600	37 000	2 000	3 750	10 000	**FBN-424717**	24
	47	27	30 500	65 000	3 100	6 600	10 000	**FBN-424727**	38
	50	20	33 000	52 500	3 400	5 350	10 000	**FWF-425020**	47
43	48	17	22 800	45 500	2 330	4 650	9 500	**FWF-434817**	25
	48	27	33 500	75 000	3 450	7 650	9 500	**FWF-434827**	39
	49	31	44 000	92 000	4 450	9 400	9 500	**FWJ-434931**	55
45	50	17	21 600	43 000	2 200	4 350	9 000	**FWF-455017**	26
	50	27	34 000	77 500	3 500	7 900	9 000	**FWF-455027**	41
	51	35	46 000	99 500	4 700	10 100	9 000	**FWJ-455135**	61
	53	20	34 000	55 000	3 450	5 600	9 500	**FWF-455320**	50
	53	25	44 000	77 000	4 500	7 850	9 500	**FWF-455325**	62
46	52	37	43 500	94 000	4 450	9 600	9 000	**FWF-465237W**	75
47	52	17	23 400	48 500	2 390	4 900	8 500	**FWF-475217**	27
	52	27	34 500	79 500	3 500	8 150	8 500	**FWF-475227**	43
	52	30	36 500	86 000	3 750	8 750	8 500	**FWF-475230**	47
	55	28	51 500	96 000	5 250	9 800	9 000	**FWF-475528**	73
48	53	23.5	30 000	67 000	3 050	6 850	8 500	**FBN-485323Z**	47
	54	20	29 800	58 500	3 050	5 950	8 500	**FWF-485420**	39
50	55	20	26 900	59 000	2 750	6 050	8 000	**FWF-505520**	37
	55	27	35 000	83 000	3 600	8 450	8 000	**FWF-505527**	50
	55	30	39 500	96 500	4 000	9 800	8 000	**FWF-505530**	56
	56	20	28 100	54 500	2 870	5 600	8 000	**FBN-505620**	51
	58	20	38 500	67 500	3 950	6 900	8 500	**FWF-505820**	61
	58	25	48 500	90 500	4 950	9 200	8 500	**FWF-505825**	77
51	56	50.8	60 000	166 000	6 100	16 900	8 000	**FWF-515650WZ**	95
52	60	24	46 000	86 000	4 700	8 750	8 000	**FWF-526024**	46

FWF

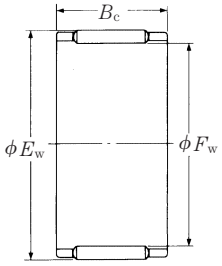
FWF…W

FBN

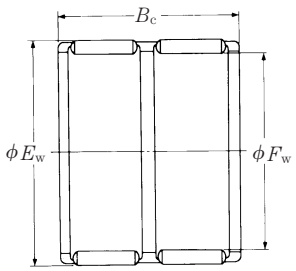
Inscribed Circle Diameter 55 — 73 mm



FWF



FBN



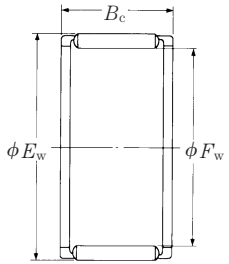
FWF…W

Boundary Dimensions (mm)			Basic Load Ratings (N)		{kgf}		Limiting Speeds (min^{-1})	Bearing Numbers	Mass (g)
F_w	E_w	B_c $^{-0.2}_{-0.55}$	C_r	C_{or}	C_r	C_{or}	Oil		approx
55	60	20	27 500	62 500	2 800	6 350	7 500	**FWF-556020**	41
	60	27	36 000	89 000	3 700	9 100	7 500	**FWF-556027**	55
	60	30	41 000	105 000	4 200	10 700	7 500	**FWF-556030**	61
	61	20	31 000	64 000	3 150	6 500	7 500	**FWF-556120**	53
	61	30	47 000	109 000	4 750	11 100	7 500	**FWF-556130**	81
	63	20	40 000	73 000	4 100	7 450	7 500	**FWF-556320**	70
	63	25	50 000	97 500	5 100	9 950	7 500	**FWF-556325**	85
56	61	30	38 500	97 500	3 950	9 950	7 100	**FWF-566130**	62
	61	33.5	41 000	105 000	4 150	10 700	7 100	**FWF-566133Z**	70
57	73	30	89 500	129 000	9 150	13 100	7 500	**FWF-577330A**	77
58	64	40	54 000	132 000	5 500	13 500	7 100	**FWF-586440W**	104
	65	26.5	45 000	95 000	4 600	9 700	7 100	**FWF-586526Z**	81
60	65	20	29 000	69 000	2 960	7 050	6 700	**FWF-606520**	44
	65	27	38 000	98 500	3 900	10 000	6 700	**FWF-606527**	62
	65	41	50 500	141 000	5 150	14 400	6 700	**FWF-606541W**	91
	66	20	33 000	71 500	3 350	7 300	6 700	**FWF-606620**	57
	66	30	50 000	122 000	5 100	12 400	6 700	**FWF-606630**	87
	67	23	41 500	86 500	4 250	8 800	6 700	**FWF-606723**	73
	68	20	41 500	78 000	4 200	7 950	6 700	**FWF-606820**	73
	68	23	47 500	94 000	4 850	9 600	6 700	**FWF-606823**	84
	68	25	52 000	105 000	5 300	10 700	6 700	**FWF-606825**	91
	68	27	51 500	103 000	5 250	10 500	6 700	**FWF-606827**	98
65	70	20	27 900	67 500	2 850	6 900	6 300	**FBN-657020**	48
	70	30	44 500	123 000	4 550	12 500	6 300	**FWF-657030**	72
	73	30	61 000	132 000	6 200	13 400	6 300	**FWF-657330**	120
68	74	20	33 000	74 000	3 350	7 550	6 000	**FBN-687420**	60
	74	30	52 000	135 000	5 300	13 700	6 000	**FWF-687430**	91
70	76	20	35 500	82 500	3 600	8 450	5 600	**FWF-707620**	62
	76	30	53 500	141 000	5 450	14 400	5 600	**FWF-707630**	93
	78	30	63 000	140 000	6 400	14 300	6 000	**FWF-707830**	125
72	78	40	60 000	163 000	6 100	16 700	5 600	**FWF-727840W**	145
	79	21	42 000	93 000	4 300	9 500	5 600	**FWF-727921**	79
73	79	20	36 000	85 500	3 650	8 700	5 600	**FBN-737920**	65
	79	30	55 000	147 000	5 600	15 000	5 600	**FWF-737930**	97

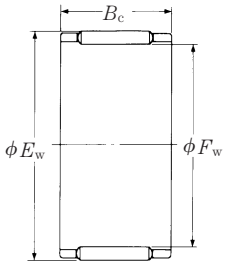
FWF

FBN

Inscribed Circle Diameter 75 — 150 mm



FWF



FBN

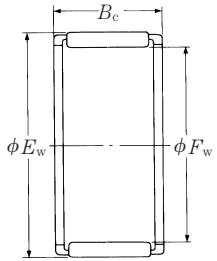
Boundary Dimensions (mm)			Basic Load Ratings (N)		{kgf}		Limiting Speeds (min^{-1})	Bearing Numbers	Mass (g)
F_w	E_w	B_c $^{-0.2}_{-0.55}$	C_r	C_{or}	C_r	C_{or}	Oil		approx
75	81	20	37 000	89 500	3 750	9 100	5 300	**FBN-758120**	66
	81	30	54 500	147 000	5 550	15 000	5 300	**FWF-758130**	100
	83	30	65 000	151 000	6 650	15 400	5 600	**FWF-758330**	135
78	85	40	76 500	207 000	7 850	21 100	5 300	**FWF-788540**	160
80	86	20	38 000	94 000	3 850	9 600	5 000	**FWF-808620**	71
	86	30	57 000	160 000	5 850	16 300	5 000	**FWF-808630**	105
	88	30	69 000	166 000	7 050	17 000	5 000	**FWF-808830**	145
85	92	30	64 000	169 000	6 500	17 200	4 800	**FWF-859230**	130
	93	25	59 000	139 000	6 050	14 200	4 800	**FWF-859325**	125
	93	30	71 000	176 000	7 250	17 900	4 800	**FWF-859330**	150
90	98	30	70 000	177 000	7 150	18 000	4 500	**FWF-909830**	160
95	103	30	69 500	177 000	7 100	18 100	4 300	**FWF-9510330**	175
100	108	30	75 500	201 000	7 700	20 500	4 000	**FWF-10010830**	185
105	113	27	69 500	183 000	7 100	18 700	3 800	**FWF-10511327**	165
	113	30	72 500	193 000	7 400	19 700	3 800	**FWF-10511330**	185
110	118	30	78 500	218 000	8 000	22 300	3 600	**FWF-11011830**	195
115	123	35	92 500	274 000	9 450	28 000	3 400	**FWF-11512335**	235
120	128	25	69 500	192 000	7 100	19 600	3 400	**FWF-12012825**	190
125	133	35	93 500	284 000	9 550	29 000	3 200	**FWF-12513335**	255
130	138	25	71 500	205 000	7 300	20 900	3 000	**FWF-13013825**	220
135	143	38	107 000	345 000	10 900	35 500	3 000	**FWF-13514338**	275
145	153	30	89 000	281 000	9 050	28 700	2 800	**FWF-14515330**	290
150	160	43	149 000	475 000	15 200	48 000	2 600	**FWF-15016043**	505

WJ

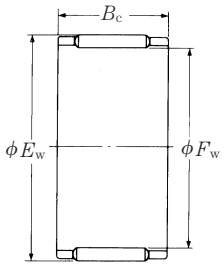
WJC

WJP

Inscribed Circle
Diameter 9.525 — 44.450 mm



WJ



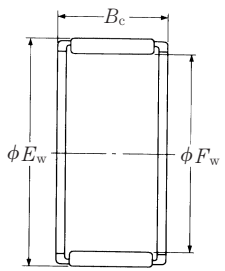
WJC, WJP

Boundary Dimensions (mm, inch) F_w		E_w		B_c $^{0}_{-0.38}$		Basic Load (N) C_r	C_{or}	Ratings {kgf} C_r	C_{or}	Limiting Speeds (min^{-1}) Oil	Bearing Numbers	Mass (g) approx
9.525	0.3750	12.700	0.5000	9.52	0.3750	3 900	4 000	400	410	45 000	**WJC-060806**	3
		12.700	0.5000	12.70	0.5000	5 450	6 150	555	625	45 000	**WJC-060808**	4
12.700	0.5000	15.875	0.6250	12.70	0.5000	6 350	8 100	645	825	34 000	**WJC-081008**	4
		15.875	0.6250	15.88	0.6250	8 000	10 900	815	1 110	34 000	**WJC-081010**	6
14.288	0.5625	17.462	0.6875	12.70	0.5000	6 900	9 350	705	955	30 000	**WJC-091108**	6
15.875	0.6250	19.050	0.7500	12.70	0.5000	7 100	10 000	725	1 020	26 000	**WJC-101208**	6
		22.225	0.8750	15.88	0.6250	15 400	17 300	1 570	1 770	28 000	**WJ-101410**	13
		22.225	0.8750	22.22	0.8750	21 100	25 900	2 150	2 640	28 000	**WJ-101414**	18
19.050	0.7500	25.400	1.0000	25.40	1.0000	26 600	36 500	2 710	3 750	22 000	**WJ-121616**	25
20.638	0.8125	26.988	1.0625	22.22	0.8750	24 600	33 500	2 510	3 450	20 000	**WJ-131714**	21
22.225	0.8750	28.575	1.1250	25.40	1.0000	29 000	42 500	2 960	4 350	20 000	**WJ-141816**	28
25.400	1.0000	33.338	1.3125	19.05	0.7500	27 800	36 000	2 830	3 700	17 000	**WJ-162112**	35
		33.338	1.3125	25.40	1.0000	36 500	51 500	3 700	5 250	17 000	**WJ-162116**	43
28.575	1.1250	38.100	1.5000	25.40	1.0000	42 000	56 500	4 300	5 750	15 000	**WJ-182416**	58
		38.100	1.5000	31.75	1.2500	51 500	73 500	5 250	7 500	15 000	**WJ-182420**	72
31.750	1.2500	41.275	1.6250	19.05	0.7500	33 000	42 500	3 350	4 350	14 000	**WJ-202612**	51
		41.275	1.6250	25.40	1.0000	44 000	61 000	4 450	6 250	14 000	**WJ-202616**	61
		41.275	1.6250	31.75	1.2500	53 500	79 500	5 500	8 100	14 000	**WJ-202620**	73
		41.275	1.6250	38.10	1.5000	63 000	98 000	6 450	10 000	14 000	**WJ-202624**	105
34.925	1.3750	44.450	1.7500	25.40	1.0000	45 500	66 000	4 650	6 700	12 000	**WJ-222816**	67
		44.450	1.7500	31.75	1.2500	55 500	85 500	5 700	8 750	12 000	**WJ-222820**	83
38.100	1.5000	47.625	1.8750	25.40	1.0000	47 000	70 500	4 800	7 200	11 000	**WJ-243016**	78
		47.625	1.8750	31.75	1.2500	57 500	91 500	5 850	9 350	11 000	**WJ-243020**	90
		47.625	1.8750	38.10	1.5000	68 000	113 000	6 900	11 500	11 000	**WJ-243024**	120
41.275	1.6250	57.150	2.2500	42.86	1.6875	96 500	130 000	9 850	13 300	11 000	***WJP-263627**	205
44.450	1.7500	53.975	2.1250	19.05	0.7500	39 000	58 000	4 000	5 950	9 500	**WJ-283412**	62
		53.975	2.1250	25.40	1.0000	51 500	83 500	5 250	8 500	9 500	**WJ-283416**	84
		53.975	2.1250	38.10	1.5000	74 500	134 000	7 600	13 700	9 500	**WJ-283424**	145

* These bearings have polyamide cages. The maximum permissible operating temperature for these bearings is 100°C for continued operation and 120°C for short periods.

WJ

Inscribed Circle Diameter 50.800 — 127.000 mm

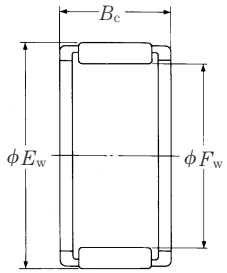


WJ

Boundary Dimensions (mm, inch) F_w		E_w		B_c $^{0}_{-0.38}$		Basic Load (N) C_r	C_{or}	Ratings {kgf} C_r	C_{or}	Limiting Speeds (min^{-1}) Oil	Bearing Numbers	Mass (g) approx
50.800	2.0000	60.325	2.3750	19.05	0.7500	42 500	67 500	4 300	6 850	8 500	**WJ-323812**	85
		60.325	2.3750	25.40	1.0000	56 000	96 500	5 700	9 850	8 500	**WJ-323816**	105
		60.325	2.3750	31.75	1.2500	68 500	126 000	7 000	12 800	8 500	**WJ-323820**	125
		60.325	2.3750	38.10	1.5000	81 000	155 000	8 250	15 800	8 500	**WJ-323824**	145
52.388	2.0625	61.912	2.4375	25.40	1.0000	57 500	101 000	5 850	10 300	8 000	**WJ-333916**	99
53.975	2.1250	63.500	2.5000	25.40	1.0000	53 000	92 000	5 400	9 400	8 000	**WJ-344016**	100
		63.500	2.5000	38.10	1.5000	78 000	151 000	7 950	15 400	8 000	**WJ-344024**	150
55.562	2.1875	65.088	2.5625	19.05	0.7500	44 000	73 500	4 500	7 500	7 500	**WJ-354112**	85
		65.088	2.5625	25.40	1.0000	58 500	105 000	5 950	10 700	7 500	**WJ-354116**	105
57.150	2.2500	66.675	2.6250	25.40	1.0000	53 500	94 000	5 450	9 600	7 500	**WJ-364216**	105
60.325	2.3750	69.850	2.7500	38.10	1.5000	81 000	165 000	8 300	16 800	7 100	**WJ-384424**	185
63.500	2.5000	73.025	2.8750	25.40	1.0000	55 500	102 000	5 650	10 400	6 700	**WJ-404616**	135
		73.025	2.8750	38.10	1.5000	82 500	171 000	8 450	17 500	6 700	**WJ-404624**	180
69.850	2.7500	79.375	3.1250	25.40	1.0000	57 500	110 000	5 850	11 200	6 000	**WJ-445016**	125
76.200	3.0000	85.725	3.3750	25.40	1.0000	59 000	118 000	6 050	12 000	5 300	**WJ-485416**	160
		85.725	3.3750	38.10	1.5000	85 000	189 000	8 700	19 200	5 300	**WJ-485424**	215
82.550	3.2500	92.075	3.6250	25.40	1.0000	61 000	126 000	6 200	12 900	5 000	**WJ-525816**	145
		92.075	3.6250	38.10	1.5000	87 500	201 000	8 950	20 500	5 000	**WJ-525824**	220
88.900	3.5000	98.425	3.8750	25.40	1.0000	62 500	134 000	6 400	13 700	4 500	**WJ-566216**	175
		101.600	4.0000	25.40	1.0000	79 000	147 000	8 050	15 000	4 500	**WJ-566416**	215
		101.600	4.0000	38.10	1.5000	113 000	234 000	11 500	23 800	4 500	**WJ-566424**	360
101.600	4.0000	114.300	4.5000	25.40	1.0000	83 000	163 000	8 450	16 600	4 000	**WJ-647216**	240
		114.300	4.5000	38.10	1.5000	119 000	259 000	12 100	26 400	4 000	**WJ-647224**	370
127.000	5.0000	152.400	6.0000	38.10	1.5000	211 000	360 000	21 500	36 500	3 400	**WJ-809624**	1 000

For Large Ends of Connecting Rods

Inscribed Circle Diameter 12 — 30 mm

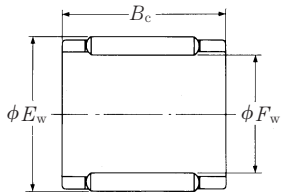


FWF···E

Boundary Dimensions (mm) F_w	E_w	B_c $^{-0.2}_{-0.4}$	Basic Load Ratings (N) C_r	C_{or}	{kgf} C_r	C_{or}	Bearing Numbers	Mass (g) approx
12	16	10	6 100	6 500	620	665	**FWF-121610-E**	4.0
14	19	10	7 800	8 050	795	820	**FWF-141910-E**	6.2
	20	12	8 900	8 600	910	880	**FWF-142012-E**	8.3
15	19	9	5 650	6 250	575	640	**FWF-15199-E**	4.1
	20	10	7 300	7 600	745	775	**FWF-152010-E**	6.0
	21	10	7 950	7 500	810	765	**FWF-152110-E**	8.5
16	21	11	8 650	9 600	880	980	**FWF-162111-E**	7.5
	22	12	9 500	9 600	965	980	**FWF-162212-E**	9.5
18	23	14	11 800	14 800	1 200	1 510	**FWF-182314-E**	10
	24	12	10 000	10 600	1 020	1 080	**FWF-182412-E**	11
20	26	12	12 200	14 100	1 250	1 440	**FWF-202612-E**	13
	26	17	16 800	21 200	1 710	2 160	**FWF-202617-E**	17
	28	18	18 100	19 400	1 840	1 970	**FWF-202818-E**	25
22	28	14	13 900	17 100	1 420	1 740	**FWF-222814-E**	14
	29	15	16 300	19 000	1 660	1 930	**FWF-222915-E**	19
	32	16	19 700	19 400	2 010	1 970	**FWF-223216-E**	31
23	31	16	17 600	19 400	1 800	1 980	**FWF-233116-E**	23
24	30	15	15 600	20 300	1 590	2 070	**FWF-243015-E**	17
	30	17	17 900	24 300	1 830	2 480	**FWF-243017-E**	19
	31	20	21 600	27 800	2 200	2 840	**FWF-243120-E**	30
25	32	16	17 700	21 900	1 810	2 230	**FWF-253216-E**	24
28	35	16	18 400	23 700	1 880	2 410	**FWF-283516-E**	25
29.75	36.75	16.5	19 600	26 000	1 990	2 650	**FWF-293616Z-E**	28
30	37	16	21 900	30 500	2 230	3 100	**FWF-303716-E**	29
	38	18	25 500	34 000	2 600	3 450	**FWF-303818-E**	35

For Small Ends of Connecting Rods

Inscribed Circle Diameter 9 — 19 mm



FBN···E

Boundary Dimensions (mm) F_w	E_w	B_c $^{-0.2}_{-0.4}$	Basic Load Ratings (N) C_r	C_{or}	{kgf} C_r	C_{or}	Bearing Numbers	Mass (g) approx
9	12	11.5	4 200	4 500	430	460	**FBN-91211Z-E**	3.5
10	14	12.7	5 900	5 950	605	610	**FBN-101412Z-E**	5.0
12	15	14.3	6 400	8 400	655	855	**FBN-121514Z-E**	4.8
	16	13	7 250	8 200	740	835	**FBN-121613-E**	6.4
	16	15.5	8 500	10 000	865	1 020	**FBN-121615Z-E**	7.0
	16	16	8 500	10 000	865	1 020	**FBN-121616-E**	7.5
14	18	12	6 950	8 050	710	820	**FBN-141812-E**	6.5
	18	16.5	9 250	11 600	945	1 180	**FBN-141816Z-E**	8.5
	18	18	10 700	14 000	1 090	1 430	**FBN-141818-E**	11.5
	18	20	9 550	12 000	975	1 230	**FBN-141820-E1**	13
15	19	18	11 300	15 300	1 150	1 560	**FBN-151918-E**	11
	21	18	12 900	13 900	1 310	1 420	**FBN-152118-E**	13
16	20	22	13 700	20 000	1 400	2 040	**FBN-162022-E**	14
	20	23.5	14 900	22 300	1 520	2 280	**FBN-162023Z-E**	15
	21	20	14 200	18 100	1 450	1 840	**FBN-162120-E**	16
17	21	23	14 800	22 500	1 510	2 290	**FBN-172123-E**	16
18	22	17	11 500	16 500	1 170	1 680	**FBN-182217-E**	12
	22	22	14 200	21 600	1 440	2 200	**FBN-182222-E**	15
	22	23.6	15 400	24 100	1 570	2 460	**FBN-182223Z-E**	16
19	23	23.7	16 000	25 800	1 630	2 630	**FBN-192323Z-E**	17

Please consult NSK when making a selection.

DRAWN CUP NEEDLE ROLLER BEARINGS

METRIC DESIGN

Pages

Open Type with Cage and Closed End Type with Cage
Inscribed Circle Diameter 10–55 mm B46–B53
Sealed Type with Cage — Inscribed Circle Diameter 8–50 mm B54–B57
Thin, Open Type with Cage — Inscribed Circle Diameter 18–82 mm B58–B59
Full Complement Open Type and Full Complement Closed End Type
Inscribed Circle Diameter 8–55 mm B60–B63

INCH DESIGN

Open Type with Cage and Closed End Type with Cage
Inscribed Circle Diameter 9.525–50.800 mm B64–B67
Full Complement Open Type and Full Complement Closed End Type
Inscribed Circle Diameter 11.112–50.800 mm B68–B75
Full Complement and Grease-Retained Roller Type
Inscribed Circle Diameter 3.969–47.625 mm B76–B79

EXTRA SMALL · MINIATURE

Metric Design Open Type with Cage and Closed End Type with Cage
Inscribed Circle Diameter 3–9 mm B80–B81
Full Complement Metric Design Open Type and Full Complement Closed End Type
Inscribed Circle Diameter 3.036–9 mm B82–B83
Inch Design Open Type with Cage and Closed End Type with Cage
Inscribed Circle Diameter 3.175–9.525 mm B84–B85
Inch Design Full Complement Open Type and Full Complement Closed End Type
Inscribed Circle Diameter 3.175–9.525 mm B86–B87

NSK drawn cup needle roller bearings (with a cage and full complement of rollers) have a unique outer ring structure. They have the following features: the thinnest outer ring among rolling bearings, high load capacity, high maximum permissive load owing to the use of carefully selected special alloy steel plates, a surface-hardened cage with high resistance to wear, high limiting speed, and ease of mounting.

DESIGN AND TYPES

NSK drawn cup needle roller bearings consist of an outer ring made of carefully selected alloy steel that is surface-hardened after precise pressing, rollers made of vacuum-degassed bearing steel that are given a grinding finish after through-hardening, and a cage that guides the rollers correctly on the pitch diameter.

The bent lip of the drawn cup, which is the outer ring, improves rigidity, holds the rollers and cage in place, and functions as a labyrinth seal to prevent foreign matter from entering and lubrication from leaking. The inside of the outer ring's bending part is hardened, and has sufficient wear resistance against the contact of the roller or cage.

With Cage

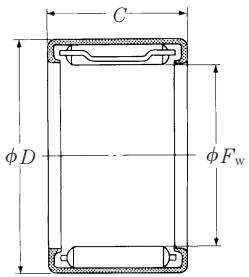
FJ • FJH (Open Type)

FJL

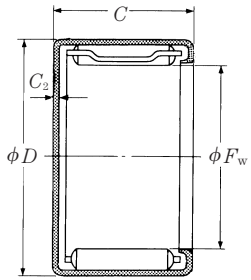
MFJ • MFJH (Closed Type)

MFJL

Inscribed Circle Diameter 10 — 16 mm



Open Type



Closed Type

Boundary Dimensions (mm)				Basic Dynamic Load Ratings (N)	{kgf}	Limiting Loads (N)	{kgf}	Limiting Speeds (min^{-1})	Bearing Numbers				Mass (g) approx		Matching Inner Rings	
									Open		Closed					
F_w	D	C $^{0}_{-0.25}$	C_2 max	C_r		P_{max}		Oil	FJ FJH	FJL	MFJ MFJH	MFJL	Open	Closed		
10	14	10	0.8	3 500	360	1 760	179	32 000	**FJ-1010**		**MFJ-1010**		3.6	4.1	**FIR-071010**	—
	14	15	—	5 550	570	3 150	325	32 000	**FJ-1015L**		—		5.4	—	**FIR-071015**	—
	16	10	1.0	4 900	500	2 100	214	34 000	**FJH-1010**		**MFJH-1010**		6.1	6.6	**FIR-071010**	—
	17	10	1.0	4 900	500	1 990	203	36 000		**FJL-1010**		**MFJL-1010**	7.0	7.8	**FIR-071010**	—
	17	12	1.0	5 700	580	2 410	246	36 000		**FJL-1012L**		**MFJL-1012L**	8.4	9.3	**FIR-071012**	—
	17	15	1.0	7 850	800	3 650	375	36 000		**FJL-1015**		**MFJL-1015**	11	12	**FIR-071015**	—
	17	20	1.0	11 200	1 140	5 750	585	36 000		**FJL-1020**		**MFJL-1020**	14	16	—	—
12	16	10	0.8	4 150	420	2 210	225	26 000	**FJ-1210**		**MFJ-1210**		4.1	4.5	**FIR-081210**	—
	18	12	1.0	6 450	655	3 050	310	28 000	**FJH-1212**		**MFJH-1212**		7.7	9.0	**FIR-081212**	—
	19	12	1.0	6 650	675	2 950	300	28 000		**FJL-1212L**		**MFJL-1212L**	9.8	11	**FIR-081212**	—
	19	15	1.0	9 200	935	4 500	455	28 000		**FJL-1215**		**MFJL-1215**	12	14	**FIR-081215**	—
	19	20	1.0	13 000	1 330	7 000	715	28 000		**FJL-1220**		**MFJL-1220**	16	19	—	—
	19	25	1.0	16 600	1 690	9 550	975	28 000		**FJL-1225L**		**MFJL-1225L**	20	24	—	—
13	19	12	1.0	6 950	710	3 400	345	26 000	**FJ-1312**		**MFJ-1312**		8.6	9.5	**FIR-101312**	—
14	20	12	1.0	6 500	665	3 250	335	24 000	**FJ-1412**		**MFJ-1412**		10	11	**FIR-101412**	—
	20	16	1.0	9 500	970	5 300	540	24 000	**FJ-1416**		**MFJ-1416**		13	14	**FIR-101416**	—
	22	16	1.1	11 600	1 180	5 700	580	24 000		**FJL-1416**		**MFJL-1416L**	17	19	**FIR-101416**	—
	22	20	1.1	15 100	1 540	8 050	820	24 000		**FJL-1420L**		**MFJL-1420L**	21	24	**FIR-101420**	—
15	21	10	—	5 850	595	2 770	283	22 000	**FJ-1510**		—		8.1	—	**FIR-101510**	—
	21	12	1.0	7 650	780	3 900	400	22 000	**FJ-1512**		**MFJ-1512**		10	11	**FIR-101512**	**FIR-121512**
	21	16	1.0	11 000	1 120	6 200	635	22 000	**FJ-1516**		**MFJ-1516**		13	14	**FIR-121516**	—
	22	10	1.0	6 450	655	2 880	294	22 000		**FJL-1510L**		**MFJL-1510L**	9.8	11	**FIR-101510**	—
	22	12	1.0	7 450	760	3 500	355	22 000		**FJL-1512L**		**MFJL-1512L**	12	13	**FIR-101512**	**FIR-121512**
	22	15	1.0	10 300	1 050	5 300	540	22 000		**FJL-1515**		**MFJL-1515**	14	16	**FIR-101515**	—
	22	20	1.0	14 700	1 500	8 300	845	22 000		**FJL-1520**		**MFJL-1520**	20	22	**FIR-101520**	—
	22	25	1.0	18 700	1 900	11 300	1 150	22 000		**FJL-1525L**		**MFJL-1525L**	24	27	**FIR-101525**	—
16	22	12	1.0	7 100	725	3 750	380	20 000	**FJ-1612**		**MFJ-1612**		11	12	**FIR-121612**	—
	22	16	1.0	10 400	1 060	6 050	620	20 000	**FJ-1616**		**MFJ-1616**		14	15	**FIR-121616**	—
	24	16	1.1	13 100	1 330	6 700	685	20 000		**FJL-1616L**		**MFJL-1616L**	19	21	**FIR-121616**	—
	24	20	1.1	17 100	1 740	9 500	970	20 000		**FJL-1620L**		**MFJL-1620L**	24	27	**FIR-121620**	—

With Cage

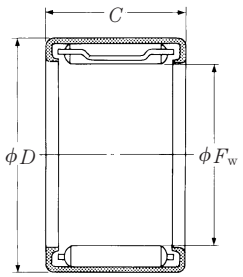
FJ (Open Type)

FJL

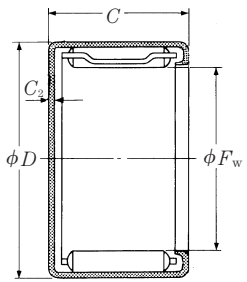
MFJ (Closed Type)

MFJL

Inscribed Circle Diameter 17 — 25 mm



Open Type



Closed Type

Boundary Dimensions (mm) F_w	D	C $^{0}_{-0.25}$	C_2 max	Basic Dynamic Load Ratings (N) C_r	{kgf}	Limiting Loads (N) P_{max}	{kgf}	Limiting Speeds (min^{-1}) Oil
17	23	12	1.0	8 450	860	4 450	455	19 000
	23	16	1.0	12 100	1 230	7 100	720	19 000
	24	15	1.0	10 800	1 110	5 700	580	20 000
	24	20	1.0	15 400	1 570	8 950	910	20 000
	24	25	1.0	19 600	2 000	12 200	1 240	20 000
18	24	12	1.0	7 650	780	4 200	430	18 000
	24	16	1.0	11 200	1 140	6 800	695	18 000
	25	13	1.0	9 300	945	4 700	480	18 000
	25	15	1.0	11 400	1 160	6 100	620	18 000
	25	17	1.0	13 300	1 360	7 500	765	18 000
	25	20	1.0	16 100	1 640	9 600	975	18 000
	25	25	1.0	20 500	2 090	13 100	1 330	18 000
20	26	12	1.0	8 150	835	4 650	475	16 000
	26	16	1.0	11 900	1 210	7 550	770	16 000
	26	20	1.0	15 300	1 560	10 500	1 070	16 000
	27	15	1.0	12 300	1 260	6 900	705	16 000
	27	20	1.0	17 500	1 790	10 900	1 110	16 000
	27	25	1.0	22 300	2 270	14 800	1 510	16 000
	27	30	1.0	26 800	2 730	18 700	1 910	16 000
22	28	12	1.0	8 650	880	5 150	525	14 000
	28	16	1.0	12 600	1 290	8 350	850	14 000
	28	20	1.0	16 200	1 660	11 500	1 180	14 000
	29	10	1.0	7 950	810	4 000	405	15 000
	29	15	1.0	12 700	1 300	7 300	745	15 000
	29	20	1.0	18 100	1 840	11 500	1 170	15 000
	29	25	1.0	23 000	2 350	15 700	1 600	15 000
	29	30	1.0	27 700	2 820	19 800	2 020	15 000
25	32	16	1.0	15 200	1 550	9 350	955	13 000
	32	20	1.0	19 800	2 020	13 100	1 340	13 000
	32	26	1.0	26 200	2 670	18 800	1 920	13 000
	33	10	1.0	8 800	895	4 300	435	13 000
	33	15	1.0	15 400	1 570	8 800	895	13 000
	33	20	1.0	21 900	2 240	13 900	1 420	13 000
	33	25	1.0	28 000	2 850	19 000	1 940	13 000
	33	30	1.0	33 500	3 450	24 100	2 460	13 000

Bearing Numbers Open FJ	Open FJL	Closed MFJ	Closed MFJL	Mass (g) approx Open	Mass (g) approx Closed	Matching Inner Rings	
FJ-1712		**MFJ-1712**		10	11	—	—
FJ-1716		**MFJ-1716**		14	16	—	—
	FJL-1715		**MFJL-1715**	16	18	**FIR-121715**	—
	FJL-1720L		**MFJL-1720L**	21	24	**FIR-121720**	—
	FJL-1725L		**MFJL-1725L**	27	30	**FIR-121725**	—
FJ-1812		**MFJ-1812**		12	14	**FIR-151812**	—
FJ-1816		**MFJ-1816**		16	18	**FIR-151816**	—
	FJL-1813		**MFJL-1813**	14	16	—	—
	FJL-1815		**MFJL-1815**	17	19	**FIR-151815**	—
	FJL-1817L		**MFJL-1817L**	20	22	—	—
	FJL-1820L		**MFJL-1820L**	22	25	**FIR-151820**	—
	FJL-1825		**MFJL-1825**	28	31	**FIR-151825**	—
FJ-2012		**MFJ-2012**		13	15	**FIR-172012**	—
FJ-2016		**MFJ-2016**		17	19	**FIR-172016**	—
FJ-2020		**MFJ-2020**		22	24	**FIR-152020**	**FIR-172020**
	FJL-2015L		**MFJL-2015**	19	21	**FIR-152015**	—
	FJL-2020		**MFJL-2020**	24	27	**FIR-152020**	**FIR-172020**
	FJL-2025L		**MFJL-2025L**	30	33	**FIR-152025**	—
	FJL-2030L		**MFJL-2030L**	37	41	**FIR-152030**	—
FJ-2212		**MFJ-2212**		14	17	**FIR-172212**	—
FJ-2216		**MFJ-2216**		19	22	**FIR-172216**	—
FJ-2220		**MFJ-2220**		23	26	**FIR-172220**	—
	FJL-2210L		**MFJL-2210L**	13	15	**FIR-172210**	—
	FJL-2215L		**MFJL-2215L**	20	22	**FIR-172215**	—
	FJL-2220L		**MFJL-2220L**	27	30	**FIR-172220**	—
	FJL-2225L		**MFJL-2225L**	33	37	**FIR-172225**	—
	FJL-2230L		**MFJL-2230L**	40	44	**FIR-172230**	—
FJ-2516		**MFJ-2516**		24	27	**FIR-202516**	—
FJ-2520		**MFJ-2520**		31	34	**FIR-202520**	—
FJ-2526		**MFJ-2526**		40	43	**FIR-202526**	—
	FJL-2510		**MFJL-2510**	17	19	**FIR-202510**	—
	FJL-2515		**MFJL-2515L**	26	29	**FIR-202515**	—
	FJL-2520		**MFJL-2520**	35	39	**FIR-202520**	—
	FJL-2525L		**MFJL-2525L**	43	48	**FIR-202525**	—
	FJL-2530		**MFJL-2530**	52	58	**FIR-202530**	—

With Cage

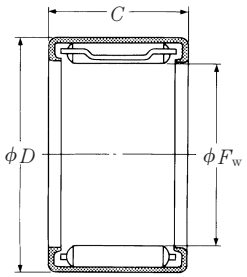
FJ (Open Type)

FJL

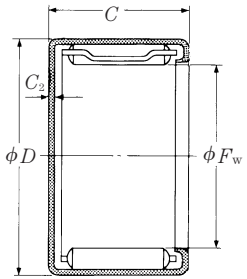
MFJ (Closed Type)

MFJL

Inscribed Circle Diameter 28 — 40 mm



Open Type



Closed Type

Boundary Dimensions (mm)				Basic Dynamic Load Ratings (N)	{kgf}	Limiting Loads (N)	{kgf}	Limiting Speeds (min^{-1})	Bearing Numbers				Mass (g) approx		Matching Inner Rings	
									Open		Closed					
F_w	D	C $^{0}_{-0.25}$	C_2 max	C_r		P_{max}		Oil	FJ	FJL	MFJ	MFJL	Open	Closed		
28	35	16	1.0	15 600	1 590	9 950	1 020	11 000	**FJ-2816**		**MFJ-2816**		27	31	**FIR-222816**	—
	35	20	1.0	20 500	2 090	14 200	1 450	11 000	**FJ-2820**		**MFJ-2820**		34	38	**FIR-222820**	—
	35	26	1.0	26 900	2 750	20 200	2 060	11 000	**FJ-2826**		**MFJ-2826**		45	49	**FIR-222826**	—
	37	20	1.0	25 400	2 590	15 500	1 580	11 000		**FJL-2820L**		**MFJL-2820L**	44	48	**FIR-222820**	—
	37	30	1.0	39 000	4 000	27 100	2 760	11 000		**FJL-2830L**		**MFJL-2830L**	65	72	**FIR-222830**	—
30	37	16	1.0	15 600	1 590	10 100	1 030	10 000	**FJ-3016L**		**MFJ-3016L**		26	31	—	—
	37	20	1.0	19 400	1 970	13 300	1 360	10 000	**FJ-3020**		**MFJ-3020**		35	39	**FIR-253020**	—
	37	26	1.0	26 000	2 660	19 500	1 990	10 000	**FJ-3026**		**MFJ-3026**		46	50	**FIR-253026**	—
	40	15	1.3	17 200	1 750	9 100	925	11 000		**FJL-3015L**		**MFJL-3015L**	49	55	**FIR-253015**	—
	40	20	1.3	25 800	2 630	15 300	1 560	11 000		**FJL-3020L**		**MFJL-3020L**	52	58	**FIR-253020**	—
	40	25	1.3	33 500	3 450	21 600	2 200	11 000		**FJL-3025L**		**MFJL-3025L**	65	72	**FIR-253025**	—
	40	30	1.3	41 000	4 200	27 800	2 840	11 000		**FJL-3030L**		**MFJL-3030L**	78	86	**FIR-253030**	—
32	42	20	1.3	26 700	2 720	16 200	1 650	10 000		**FJL-3220**		**MFJL-3220**	55	62	**FIR-283220**	—
	42	30	1.3	42 500	4 300	29 400	3 000	10 000		**FJL-3230**		**MFJL-3230**	82	91	**FIR-283230**	—
35	42	12	1.0	12 000	1 230	7 550	770	9 000	**FJ-3512**		**MFJ-3512**		24.3	30	**FIR-303512**	—
	42	16	1.0	18 100	1 850	12 800	1 300	9 000	**FJ-3516**		**MFJ-3516**		32	38	—	—
	42	20	1.0	23 600	2 410	17 900	1 830	9 000	**FJ-3520**		**MFJ-3520**		41	45	**FIR-303520**	—
	42	26	1.0	31 500	3 200	25 800	2 630	9 000	**FJ-3526**		**MFJ-3526**		54	58	**FIR-303526**	—
	45	12	1.3	13 200	1 350	6 650	680	9 000		**FJL-3512**		**MFJL-3512**	36	40	**FIR-303512**	—
	45	15	1.3	18 200	1 860	10 100	1 030	9 000		**FJL-3515**		**MFJL-3515**	44	49	**FIR-303515**	—
	45	20	1.3	27 400	2 790	17 000	1 740	9 000		**FJL-3520L**		**MFJL-3520L**	60	67	**FIR-303520**	—
	45	25	1.3	36 000	3 650	24 000	2 450	9 000		**FJL-3525L**		**MFJL-3525L**	74	82	**FIR-303525**	—
	45	30	1.3	43 500	4 450	31 000	3 150	9 000		**FJL-3530L**		**MFJL-3530L**	90	100	**FIR-303530**	—
40	47	16	1.0	18 600	1 890	13 600	1 390	7 500	**FJ-4016**		**MFJ-4016**		34	43	—	—
	47	20	1.0	23 500	2 400	18 500	1 890	7 500	**FJ-4020**		**MFJ-4020**		46	51	**FIR-354020**	—
	47	26	1.0	31 500	3 200	26 900	2 740	7 500	**FJ-4026**		**MFJ-4026**		60	65	**FIR-354026**	—
	50	15	1.3	19 900	2 030	11 600	1 180	8 000		**FJL-4015L**		**MFJL-4015L**	50	55	**FIR-354015**	—
	50	20	1.3	29 900	3 050	19 600	2 000	8 000		**FJL-4020L**		**MFJL-4020L**	67	74	**FIR-354020**	—
	50	25	1.3	39 000	3 950	27 600	2 810	8 000		**FJL-4025L**		**MFJL-4025L**	84	93	**FIR-354025**	—
	50	30	1.3	47 500	4 850	35 500	3 650	8 000		**FJL-4030L**		**MFJL-4030L**	100	110	**FIR-354030**	—

With Cage

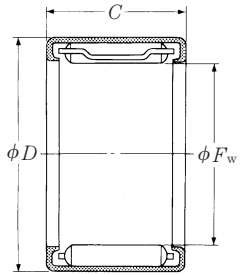
FJ (Open Type)

FJL

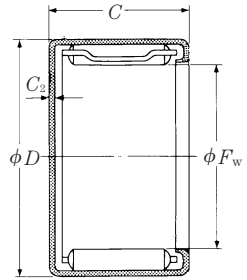
MFJ (Closed Type)

MFJL

Inscribed Circle Diameter 45 — 55 mm



Open Type

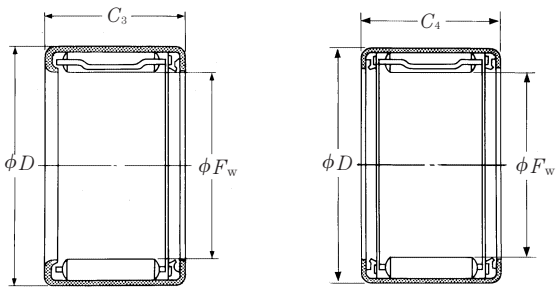


Closed Type

Boundary Dimensions (mm)				Basic Dynamic Load Ratings (N)	{kgf}	Limiting Loads (N)	{kgf}	Limiting Speeds (min^{-1})	Bearing Numbers				Mass (g) approx		Matching Inner Rings	
									Open		Closed					
F_w	D	C $^{0}_{-0.25}$	C_2 max	C_r		P_{max}		Oil	FJ	FJL	MFJ	MFJL	Open	Closed		
45	52	16	1.0	19 900	2 030	15 400	1 570	6 700	**FJ-4516**		**MFJ-4516**		39	50	—	—
	52	20	1.0	25 500	2 600	21 200	2 160	6 700	**FJ-4520**		**MFJ-4520**		53	59	**FIR-404520**	—
	52	26	1.0	34 000	3 450	30 500	3 100	6 700	**FJ-4526**		**MFJ-4526**		68	74	**FIR-404526**	—
	55	20	1.3	31 000	3 200	21 300	2 170	7 100		**FJL-4520L**		**MFJL-4520L**	74	82	**FIR-404520**	—
	55	25	1.3	40 500	4 150	30 000	3 050	7 100		**FJL-4525L**		**MFJL-4525L**	94	105	**FIR-404525**	—
	55	30	1.3	49 500	5 050	38 500	3 950	7 100		**FJL-4530L**		**MFJL-4530L**	110	125	**FIR-404530**	—
50	58	20	1.1	28 900	2 940	23 100	2 350	6 300	**FJ-5020L**		**MFJ-5020**		56	71	**FIR-455020**	—
	58	24	1.1	36 000	3 700	30 500	3 150	6 300	**FJ-5024**		**MFJ-5024**		69	84	—	—
	62	12	1.3	21 200	2 160	11 600	1 180	6 300		**FJL-5012L**		**MFJL-5012L**	60	66	**FIR-455012**	—
	62	15	1.3	24 200	2 470	13 800	1 400	6 300		**FJL-5015L**		**MFJL-5015L**	75	83	**FIR-455015**	—
	62	20	1.3	37 000	3 800	23 700	2 420	6 300		**FJL-5020L**		**MFJL-5020L**	100	110	**FIR-455020**	—
	62	25	1.3	48 500	4 950	33 500	3 450	6 300		**FJL-5025L**		**MFJL-5025L**	125	140	**FIR-455025**	—
	62	30	1.3	59 500	6 050	43 500	4 450	6 300		**FJL-5030L**		**MFJL-5030L**	150	165	**FIR-455030**	—
55	63	20	1.1	30 000	3 100	25 100	2 560	5 600	**FJ-5520**		**MFJ-5520**		60	79	—	—
	63	24	1.1	37 500	3 850	33 500	3 400	5 600	**FJ-5524**		**MFJ-5524**		72	90	—	—
	67	30	1.3	62 500	6 350	47 500	4 850	5 600		**FJL-5530L**		**MFJL-5530L**	155	180	—	—
	67	40	1.3	81 500	8 350	67 000	6 850	5 600		**FJL-5540L**		**MFJL-5540L**	195	220	—	—

Sealed Type With Cage

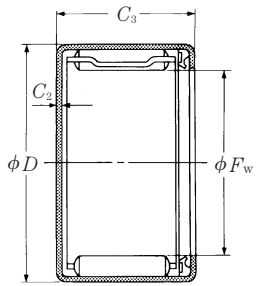
FJT (**Open Type • One-Side Sealed Type**)
FJHT
FJLT
FJTT (**Open Type • Both-Side Sealed Type**)
FJHTT
FJLTT
MFJT (Closed Type • Sealed Type)
MFJLT
Inscribed Circle Diameter 8 — 22 mm



Open Type

FJT, FJHT, FJLT

FJTT, FJHTT, FJLTT



Closed Type

Boundary Dimensions (mm) F_w	D	C_3 $^{0}_{-0.25}$	C_4 $^{0}_{-0.25}$	C_2 max	Basic Dynamic Load Ratings (N) C_r	{kgf}	Limiting Loads (N) P_{max}	{kgf}	Limiting Speeds(1) (min^{-1})	Bearing Numbers Open FJT FJHT	Open FJTT FJHTT
8	12	12	14	0.8	2 840	289	1 270	130	22 000	**FJT-812**	**FJTT-814**
	15	12	14	1.0	4 400	450	1 770	181	22 000		
10	14	12	14	0.8	3 500	360	1 760	179	19 000	**FJT-1012**	**FJTT-1014**
	17	12	14	1.0	4 900	500	1 990	203	19 000		
12	16	12	14	0.8	4 150	420	2 210	225	15 000	**FJT-1212**	**FJTT-1214**
	18	14	16	1.0	6 450	655	3 050	310	15 000	**FJHT-1214**	**FJHTT-1216**
	19	14	16	1.0	6 650	675	2 950	300	15 000		
14	20	14	16	1.0	6 500	665	3 250	335	13 000	**FJT-1414**	**FJTT-1416**
	22	19	22	1.1	11 600	1 180	5 700	580	13 000		
15	21	14	16	1.0	7 650	780	3 900	400	12 000	**FJT-1514**	**FJTT-1516**
	22	13	16	1.0	6 450	655	2 880	294	12 000		
	22	18	21	1.0	10 300	1 050	5 300	540	12 000		
16	22	14	16	1.0	7 100	725	3 750	380	11 000	**FJT-1614**	**FJTT-1616**
	22	18	20	1.0	10 400	1 060	6 050	620	11 000	**FJT-1618**	**FJTT-1620**
	24	23	26	1.1	17 100	1 740	9 500	970	11 000		
17	24	18	21	1.0	10 800	1 110	5 700	580	11 000		
18	24	14	16	1.0	7 650	780	4 200	430	10 000	**FJT-1814**	**FJTT-1816**
	25	18	21	1.0	11 400	1 160	6 100	620	10 000		
	25	20	23	1.0	13 300	1 360	7 500	765	10 000		
20	26	14	16	1.0	8 150	835	4 650	475	9 500	**FJT-2014**	**FJTT-2016**
	26	18	20	1.0	11 900	1 210	7 550	770	9 500	**FJT-2018**	**FJTT-2020**
	27	18	21	1.0	12 300	1 260	6 900	705	9 500		
	27	23	26	1.0	17 500	1 790	10 900	1 110	9 500		
22	28	14	16	1.0	8 650	880	5 150	525	8 500	**FJT-2214**	**FJTT-2216**
	28	18	20	1.0	12 600	1 290	8 350	850	8 500	**FJT-2218**	**FJTT-2220**
	29	18	21	1.0	12 700	1 300	7 300	745	8 500		
	29	23	26	1.0	18 100	1 840	11 500	1 170	8 500		

Closed MFJT	Open FJLT	Open FJLTT	Closed MFJLT	Mass (g) approx FJT FJHT FJLT	FJTT FJLTT FJHTT	MFJT MFJLT
MFJT-812				3.1	3.5	3.6
	FJLT-812	**FJLTT-814**	**MFJLT-812**	6.4	6.8	7.0
MFJT-1012				4.1	4.6	4.6
	FJLT-1012	**FJLTT-1014**	**MFJLT-1012**	7.5	8.0	8.3
MFJT-1212				5.1	6.1	5.5
MFJHT-1214				8.7	9.7	9.2
	FJLT-1214	**FJLTT-1216**	**MFJLT-1214**	11	12	12
MFJT-1414				11	13	12
	FJLT-1419	**FJLTT-1422**	**MFJLT-1419**	18	19	20
MFJT-1514				11	12	12
	FJLT-1513	**FJLTT-1516**	**MFJLT-1513**	11	12	12
	FJLT-1518	**FJLTT-1521**	**MFJLT-1518**	15	16	17
MFJT-1614				12	13	13
MFJT-1618				15	16	16
	FJLT-1623	**FJLTT-1626**	**MFJLT-1623**	25	16	28
	FJLT-1718	**FJLTT-1721**	**MFJLT-1718**	17	18	19
MFJT-1814				13	15	15
	FJLT-1818	**FJLTT-1821**	**MFJLT-1818**	18	19	20
	FJLT-1820	**FJLTT-1823**	**MFJLT-1820**	21	22	22
MFJT-2014				14	17	16
MFJT-2018				18	21	20
	FJLT-2018	**FJLTT-2021**	**MFJLT-2018**	20	22	22
	FJLT-2023	**FJLTT-2026**	**MFJLT-2023**	25	27	28
MFJT-2214				16	18	19
MFJT-2218				21	23	24
	FJLT-2218	**FJLTT-2221**	**MFJLT-2218**	22	24	24
	FJLT-2223	**FJLTT-2226**	**MFJLT-2223**	29	30	32

Note (1) This is the value when the speed at the seal contact surface is 10 m/sec under inner ring rotation.
Under outer ring rotation, the limiting speed is half this value.

Remarks Standard grease is packed in the sealed drawn cup needle roller bearings unless otherwise specified.

Sealed Type With Cage

FJT (**Open Type • One-Side Sealed Type**)

FJLT

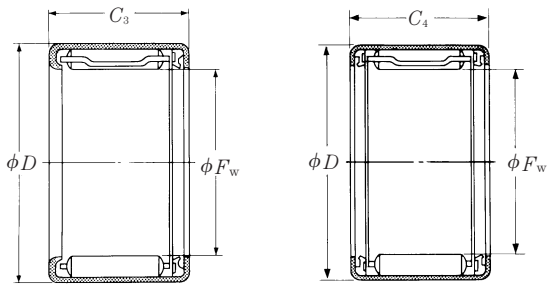
FJTT (**Open Type • Both-Side Sealed Type**)

FJLTT

MFJT (Closed Type • Sealed Type)

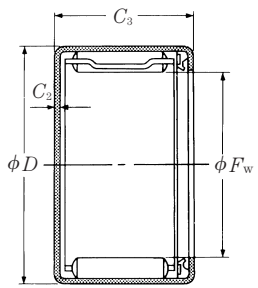
MFJLT

Inscribed Circle Diameter 25 — 50 mm



Open Type

FJT, FJLT FJTT, FJLTT



Closed Type

Boundary Dimensions (mm) F_w	D	C_3 $^{0}_{-0.25}$	C_4 $^{0}_{-0.25}$	C_2 max	Basic Dynamic Load Ratings (N) C_r	{kgf}	Limiting Loads (N) P_{max}	{kgf}	Limiting Speeds(1) (min^{-1})	Bearing Numbers Open FJT	Open FJTT
25	32	18	20	1.0	15 200	1 550	9 350	955	7 500	**FJT-2518**	**FJTT-2520**
	33	18	21	1.1	15 400	1 570	8 800	895	7 500		
	33	23	26	1.1	21 900	2 240	13 900	1 420	7 500		
28	35	18	20	1.0	15 600	1 590	9 950	1 020	6 700	**FJT-2818**	**FJTT-2820**
	37	23	26	1.0	25 400	2 590	15 500	1 580	6 700		
30	37	22	24	1.0	19 400	1 970	13 300	1 360	6 300	**FJT-3022**	**FJTT-3024**
	40	23	26	1.3	25 800	2 630	15 300	1 560	6 300		
	40	28	31	1.3	33 500	3 450	21 600	2 200	6 300		
35	42	22	24	1.0	23 600	2 410	17 900	1 830	5 300	**FJT-3522**	**FJTT-3524**
	45	18	21	1.3	18 200	1 860	10 100	1 030	5 300		
	45	28	31	1.3	36 000	3 650	24 000	2 450	5 300		
40	47	22	24	1.0	23 500	2 400	18 500	1 890	4 500	**FJT-4022**	**FJTT-4024**
	50	18	21	1.3	19 900	2 030	11 600	1 180	4 500		
	50	28	31	1.3	39 000	3 950	27 600	2 810	4 500		
45	52	22	24	1.0	25 500	2 600	21 200	2 160	4 000	**FJT-4522**	**FJTT-4524**
	55	23	26	1.3	31 000	3 200	21 300	2 170	4 000		
50	62	28	31	1.3	48 500	4 950	33 500	3 450	3 800		

Closed MFJT	Open FJLT	Open FJLTT	Closed MFJLT	Mass (g) approx FJT FJLT	FJTT FJLTT	MFJT MFJLT
MFJT-2518				28	30	31
	FJLT-2518	**FJLTT-2521**	**MFJLT-2518**	28	31	31
	FJLT-2523	**FJLTT-2526**	**MFJLT-2523**	37	39	41
MFJT-2818				29	32	33
	FJLT-2823	**FJLTT-2826**	**MFJLT-2823**	46	49	50
MFJT-3022				40	42	44
	FJLT-3023	**FJLTT-3026**	**MFJLT-3023**	55	57	60
	FJLT-3028	**FJLTT-3031**	**MFJLT-3028**	68	70	75
MFJT-3522				46	49	50
	FJLT-3518	**FJLTT-3521**	**MFJLT-3518**	47	50	52
	FJLT-3528	**FJLTT-3531**	**MFJLT-3528**	77	80	85
MFJT-4022				52	55	57
	FJLT-4018	**FJLTT-4021**	**MFJLT-4018**	54	57	59
	FJLT-4028	**FJLTT-4031**	**MFJLT-4028**	88	91	97
MFJT-4522				61	64	67
	FJLT-4523	**FJLTT-4526**	**MFJLT-4523**	78	82	86
	FJLT-5028	**FJLTT-5031**	**MFJLT-5028**	130	135	145

Note (1) This is the value when the speed at the seal contact surface is 10 m/sec under inner ring rotation. Under outer ring rotation, the limiting speed is half this value.

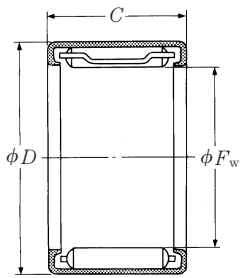
Remarks Standard grease is packed in the sealed drawn cup needle roller bearings unless otherwise specified.

With Cage

Thin Type

DB

Inscribed Circle Diameter 18 — 82 mm



Boundary Dimensions (mm)			Basic Dynamic Load Ratings		Limiting Loads		Limiting Speeds (min^{-1})	Bearing Numbers	Mass (g)
			(N)	{kgf}	(N)	{kgf}			
F_w	D	C $^{0}_{-0.25}$	C_r		P_{max}		Oil		approx
18	23	9.5	5 050	515	2 820	288	18 000	**DB501801**	7.5
33	39	26	22 500	2 300	19 500	1 980	9 500	**DB503303A**	44.4
39	45	12	6 500	665	4 200	430	8 000	**DB503901**	23
55	61	12	9 900	1 010	8 050	820	5 600	**DB505501**	35
82	88	12	9 400	955	8 400	855	3 600	**DB508201**	52

Full Complement Type

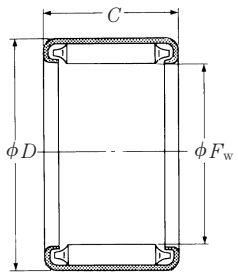
F • FH (Open Type)

NF

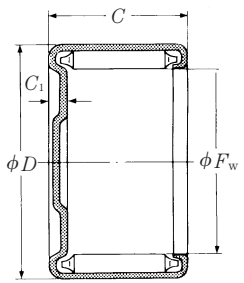
MF • MFH (Closed Type)

MNF

Inscribed Circle Diameter 8 — 20 mm



Open Type



Closed Type

Boundary Dimensions (mm) F_w	D	C $^{0}_{-0.25}$	C_1 max	Basic Dynamic Load Ratings (N) C_r	{kgf}	Limiting Loads (N) P_{max}	{kgf}	Limiting Speeds (min^{-1}) Oil
8	14	10	1.9	5 550	565	2 980	305	10 000
9	15	10	1.8	6 100	625	3 350	340	10 000
10	14	10	1.6	5 800	595	4 050	415	5 600
	16	10	1.9	6 650	680	3 700	375	9 000
12	16	10	1.6	6 450	660	4 700	480	5 000
	16	12	1.6	7 950	810	6 200	630	5 000
	18	12	1.9	9 000	920	5 700	580	7 500
13	19	12	1.9	9 550	975	6 100	625	7 100
14	20	12	2.2	9 450	965	6 350	645	6 000
	20	13	2.2	10 400	1 060	7 200	735	6 000
	20	16	2.2	13 300	1 360	9 850	1 000	6 000
	19	16	1.6	12 900	1 310	10 400	1 060	5 300
	19	20	1.6	16 100	1 640	13 800	1 410	5 300
15	21	10	1.8	8 050	820	5 000	510	6 000
	21	12	1.8	10 300	1 050	6 900	705	6 000
	21	14	1.8	12 400	1 270	8 800	895	6 000
	21	16	1.8	14 500	1 480	10 700	1 090	6 000
16	22	12	2.2	10 200	1 040	7 100	725	5 300
	22	16	2.2	14 400	1 460	11 100	1 130	5 300
17	23	12	1.8	11 300	1 150	7 750	790	5 600
	23	16	1.8	15 800	1 610	12 000	1 220	5 600
	23	20	1.8	20 200	2 060	16 300	1 670	5 600
18	24	12	2.2	10 900	1 110	7 900	805	5 000
	24	16	2.2	15 300	1 560	12 300	1 250	5 000
20	26	12	2.2	11 500	1 170	8 700	885	4 500
	26	16	2.2	16 200	1 650	13 500	1 380	4 500
	26	20	2.2	20 500	2 090	18 300	1 870	4 500

Bearing Numbers Open F, FH NF	Closed MF, MFH MNF	Mass (g) approx Open	Closed	Matching Inner Rings	
FH-810	**MFH-810**	6.0	6.3	—	—
FH-910	**MFH-910**	6.4	6.8	—	—
F-1010	**MF-1010**	4.7	5.0	**FIR-071010**	—
FH-1010	**MFH-1010**	6.9	7.3	**FIR-071010**	—
F-1210	**MF-1210**	5.5	5.4	**FIR-081210**	—
F-1212	**MF-1212**	6.6	6.8	**FIR-081212**	—
FH-1212	**MFH-1212**	10	11	**FIR-081212**	—
F-1312	**MF-1312**	11	12	**FIR-101312**	—
F-1412	**MF-1412**	12	14	**FIR-101412**	—
F-1413	**MF-1413**	13	15	**FIR-101413**	—
F-1416	**MF-1416**	18	19	—	—
NF-1416	**MNF-1416**	12	13	**FIR-101416**	—
NF-1420	**MNF-1420**	16	17	**FIR-101420**	—
F-1510	**MF-1510**	10	12	**FIR-101510**	—
F-1512	**MF-1512**	12	14	**FIR-101512**	**FIR-121512**
F-1514	**MF-1514**	15	16	—	—
F-1516	**MF-1516**	17	18	**FIR-121516**	—
F-1612	**MF-1612**	14	15	**FIR-121612**	—
F-1616	**MF-1616**	18	20	**FIR-121616**	—
F-1712	**MF-1712**	14	15	—	—
F-1716	**MF-1716**	18	20	—	—
F-1720	**MF-1720**	23	24	**FIR-121720**	—
F-1812	**MF-1812**	14	16	**FIR-151812**	—
F-1816	**MF-1816**	19	22	**FIR-151816**	—
F-2012	**MF-2012**	17	19	**FIR-172012**	—
F-2016	**MF-2016**	22	25	**FIR-172016**	—
F-2020	**MF-2020**	28	30	**FIR-152020**	**FIR-172020**

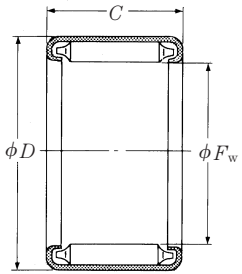
Full Complement Type

F (Open Type)

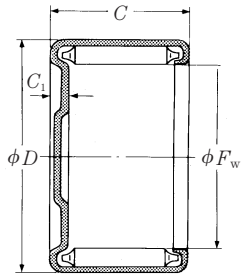
NFH

MF (Closed Type)

Inscribed Circle Diameter 22 — 55 mm



Open Type



Closed Type

Boundary Dimensions (mm) F_w	D	C $^{0}_{-0.25}$	C_1 max	Basic Dynamic Load Ratings (N) C_r	{kgf}	Limiting Loads (N) P_{max}	{kgf}	Limiting Speeds (min^{-1}) Oil
22	28	10	2.2	9 400	960	6 850	700	4 000
	28	12	2.2	12 100	1 230	9 500	970	4 000
	28	16	2.2	17 100	1 740	14 800	1 510	4 000
	28	20	2.2	21 600	2 200	20 000	2 040	4 000
24	31	25	—	31 500	3 250	28 700	2 930	4 800
25	32	16	2.5	20 200	2 060	16 200	1 650	4 500
	32	20	2.5	25 900	2 640	22 200	2 260	4 500
	32	26	2.5	34 000	3 450	31 500	3 200	4 500
28	35	12	2.5	14 800	1 510	11 200	1 150	4 000
	35	16	2.5	21 300	2 170	17 900	1 820	4 000
	35	20	2.5	27 300	2 780	24 600	2 510	4 000
	35	26	2.5	35 500	3 650	34 500	3 550	4 000
30	37	14	2.5	18 900	1 930	15 500	1 590	3 800
	37	16	2.5	22 100	2 250	18 900	1 930	3 800
	37	20	2.5	28 400	2 900	26 200	2 670	3 800
	37	26	2.5	37 000	3 800	37 000	3 750	3 800
35	42	12	2.5	16 900	1 720	14 000	1 420	3 400
	42	16	2.5	24 000	2 450	22 000	2 240	3 400
	42	20	2.5	31 000	3 150	30 000	3 100	3 400
	42	26	2.5	40 000	4 100	42 500	4 350	3 400
40	47	16	2.5	25 700	2 620	24 900	2 540	3 000
	47	20	2.5	32 500	3 350	34 000	3 450	3 000
	47	26	2.5	43 000	4 350	48 000	4 900	3 000
45	52	16	2.5	27 300	2 790	27 800	2 840	2 600
	52	20	2.5	35 000	3 550	38 500	3 900	2 600
	52	26	2.5	45 500	4 650	54 000	5 500	2 600
50	58	20	2.8	39 500	4 050	41 500	4 250	2 800
	58	24	2.8	48 000	4 900	53 000	5 400	2 800
55	63	20	2.8	41 500	4 250	45 500	4 650	2 400
	63	24	2.8	50 500	5 150	58 000	5 950	2 400

Bearing Numbers Open F, NFH	Closed MF	Mass (g) approx Open	Closed	Matching Inner Rings	
F-2210	**MF-2210**	14	17	**FIR-172210**	—
F-2212	**MF-2212**	18	21	**FIR-172212**	—
F-2216	**MF-2216**	24	27	**FIR-172216**	—
F-2220	**MF-2220**	30	33	**FIR-172220**	—
NFH-222A	—	45	—	—	—
F-2516	**MF-2516**	31	35	**FIR-202516**	—
F-2520	**MF-2520**	40	43	**FIR-202520**	—
F-2526	**MF-2526**	52	55	**FIR-202526**	—
F-2812	**MF-2812**	26	32	—	—
F-2816	**MF-2816**	35	40	**FIR-222816**	—
F-2820	**MF-2820**	44	48	**FIR-222820**	—
F-2826	**MF-2826**	57	62	**FIR-222826**	—
F-3014	**MF-3014**	30	34	—	—
F-3016	**MF-3016**	35	40	—	—
F-3020	**MF-3020**	46	51	**FIR-253020**	—
F-3026	**MF-3026**	61	66	**FIR-253026**	—
F-3512	**MF-3512**	31	38	**FIR-303512**	—
F-3516	**MF-3516**	42	49	—	—
F-3520	**MF-3520**	53	60	**FIR-303520**	—
F-3526	**MF-3526**	70	76	**FIR-303526**	—
F-4016	**MF-4016**	48	56	—	—
F-4020	**MF-4020**	60	69	**FIR-354020**	—
F-4026	**MF-4026**	79	88	**FIR-354026**	—
F-4516	**MF-4516**	53	64	—	—
F-4520	**MF-4520**	67	78	**FIR-404520**	—
F-4526	**MF-4526**	88	99	**FIR-404526**	—
F-5020	**MF-5020**	81	95	—	—
F-5024	**MF-5024**	98	110	—	—
F-5520	**MF-5520**	88	105	—	—
F-5524	**MF-5524**	105	125	—	—

With Cage

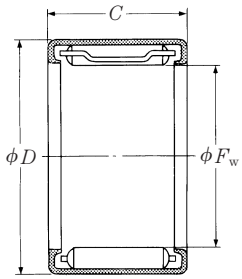
J (Open Type)

JH

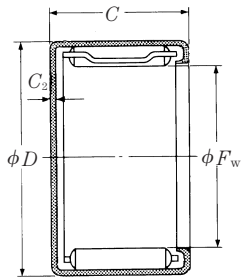
MJ (Closed Type)

MJH

Inscribed Circle Diameter 9.525 — 19.050 mm



Open Type



Closed Type

Boundary Dimensions (mm, inch) F_w		D		C $^{0}_{-0.25}$		C_2 max	Basic Dynamic Load Ratings (N) C_r	{kgf}	Limiting Loads (N) P_{max}	{kgf}	Limiting Speeds (min^{-1}) Oil	Bearing Numbers Open J	Open JH	Closed MJ	Closed MJH	Mass (g) approx Open	Closed	Matching Inner Rings	
9.525	0.3750	15.875	0.6250	12.70	0.5000	1.0	6 650	675	3 000	310	38 000		**JH-68**		**MJH-681**	8.2	8.6	—	—
11.112	0.4375	15.875	0.6250	12.70	0.5000	1.0	5 800	595	3 100	315	30 000	**J-78**		**MJ-781**		6.4	7.3	—	—
		17.462	0.6875	12.70	0.5000	1.0	7 150	730	3 300	340	30 000		**JH-78**		**MJH-781**	9.1	9.5	—	—
12.700	0.5000	17.462	0.6875	7.92	—	1.0	3 150	325	1 440	147	26 000	**J-85**		**MJ-851**		5.4	6.4	—	—
		17.462	0.6875	12.70	0.5000	1.0	6 350	650	3 500	360	26 000	**J-88**		**MJ-881**		7.3	8.2	—	—
		17.462	0.6875	19.05	0.7500	—	10 100	1 030	6 450	655	26 000	**J-812**		—		7.7	—	—	—
		19.050	0.7500	11.13	—	1.0	6 450	655	2 930	298	26 000		**JH-87**		**MJH-871**	9.5	11	—	—
		19.050	0.7500	12.70	0.5000	1.0	7 600	775	3 600	370	26 000		**JH-88**		**MJH-881**	10	13	—	—
		19.050	0.7500	19.05	0.7500	1.0	12 400	1 260	6 800	690	26 000		**JH-812**		**MJH-8121**	15	17	—	—
14.288	0.5625	19.050	0.7500	11.13	—	1.0	5 350	545	2 860	292	22 000	**J-97**		**MJ-971**		7.3	8.6	—	—
		19.050	0.7500	12.70	0.5000	1.0	6 250	640	3 500	360	22 000	**J-98**		**MJ-981**		8.2	9.5	**IR-68**	—
		19.050	0.7500	15.88	0.6250	1.0	8 200	835	5 000	510	22 000	***J-910-F**		***MJ-9101-F**		9.1	10	—	—
		20.638	0.8125	12.70	0.5000	1.0	8 050	820	3 950	400	24 000		**JH-98**		**MJH-98**	11	13	**IR-68**	—
		20.638	0.8125	19.05	0.7500	1.0	13 100	1 330	7 350	750	24 000		***JH-912-F**		***MJH-9121-F**	14	16	—	—
15.875	0.6250	20.638	0.8125	12.70	0.5000	1.0	6 750	685	3 950	405	20 000	**J-108**		**MJ-1081**		8.6	10	**IR-68-1**	—
		20.638	0.8125	15.88	0.6250	1.0	8 850	900	5 600	570	20 000	**J-1010**		**MJ-10101**		10	12	—	—
		20.638	0.8125	19.05	0.7500	1.0	11 600	1 190	8 050	820	20 000	**J-1012**		**MJ-10121**		13	14	**IR-612-1**	—
		22.225	0.8750	15.88	0.6250	1.0	11 600	1 190	6 400	655	20 000		**JH-1010**		**MJH-10101**	15	18	—	—
		22.225	0.8750	25.40	1.0000	1.0	19 900	2 030	12 800	1 300	20 000		**JH-1016**		**MJH-10161**	25	27	—	—
17.462	0.6875	22.225	0.8750	19.05	0.7500	1.0	11 500	1 170	8 050	820	18 000	**J-1112**		**MJ-11121**		16	18	—	—
		23.812	0.9375	15.88	0.6250	1.0	12 100	1 230	6 850	700	19 000		**JH-1110**		**MJH-11101**	16	18	—	—
		23.812	0.9375	19.05	0.7500	1.0	15 000	1 530	9 000	915	19 000		**JH-1112**		**MJH-11121**	17	20	—	—
19.050	0.7500	25.400	1.0000	9.52	0.3750	—	5 950	610	2 800	285	17 000	**J-126**		—		8.2	—	—	—
		25.400	1.0000	12.70	0.5000	—	10 000	1 020	5 450	555	17 000	**J-128**		—		12	—	**IR-88**	—
		25.400	1.0000	15.88	0.6250	1.0	12 600	1 280	7 250	740	17 000	**J-1210**		**MJ-12101**		16	19	—	—
		25.400	1.0000	19.05	0.7500	1.0	15 600	1 590	9 600	980	17 000	**J-1212**		**MJ-12121**		20	20	**IR-812**	—
		26.988	1.0625	19.05	0.7500	1.0	19 200	1 950	10 900	1 110	18 000		**JH-1212**		**MJH-12121**	24	26	**IR-812**	—

Remarks Sealed bearings are available upon the request.

* These bearings have polyamide cages. The maximum permissible operating temperature for these bearings is 100°C for continued operation and 120°C for short periods.

DRAWN CUP NEEDLE ROLLER BEARINGS (INCH DESIGN)

With Cage

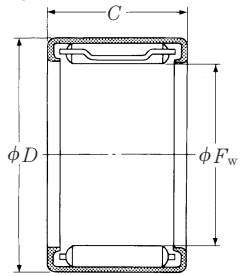
J (Open Type)

JH

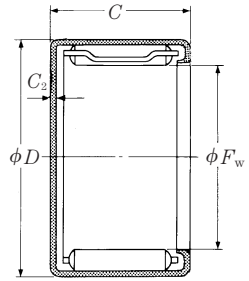
MJ (Closed Type)

MJH

Inscribed Circle Diameter 20.638 — 50.800 mm



Open Type



Closed Type

Boundary Dimensions (mm, inch) F_w		D		C $^{0}_{-0.25}$		C_2 max	Basic Dynamic Load Ratings (N) C_r	{kgf}	Limiting Loads (N) P_{max}	{kgf}
20.638	0.8125	26.988	1.0625	22.22	0.8750	—	19 400	1 980	12 900	1 320
		28.575	1.1250	19.05	0.7500	1.3	18 900	1 930	11 100	1 130
22.225	0.8750	28.575	1.1250	9.52	0.3750	—	6 600	675	3 300	335
		28.575	1.1250	12.70	0.5000	—	11 000	1 120	6 350	645
		28.575	1.1250	19.05	0.7500	—	17 900	1 830	11 900	1 210
		28.575	1.1250	25.40	1.0000	1.0	23 800	2 420	17 000	1 730
		30.162	1.1875	19.05	0.7500	1.3	18 400	1 880	11 000	1 120
		30.162	1.1875	25.40	1.0000	1.3	25 500	2 600	16 700	1 700
25.400	1.0000	31.750	1.2500	19.05	0.7500	—	18 200	1 860	12 400	1 270
		31.750	1.2500	25.40	1.0000	1.0	25 000	2 550	18 700	1 910
		33.338	1.3125	19.05	0.7500	1.3	20 800	2 120	13 000	1 330
		33.338	1.3125	25.40	1.0000	1.3	27 700	2 830	18 900	1 930
28.575	1.1250	34.925	1.3750	12.70	0.5000	1.0	11 700	1 200	7 250	740
		34.925	1.3750	19.05	0.7500	1.0	19 100	1 950	13 600	1 380
		34.925	1.3750	25.40	1.0000	1.0	26 200	2 670	20 400	2 080
		38.100	1.5000	19.05	0.7500	1.3	23 500	2 390	14 000	1 420
		38.100	1.5000	25.40	1.0000	1.3	32 000	3 250	20 700	2 110
		38.100	1.5000	28.58	1.1250	1.3	36 500	3 700	24 600	2 510
31.750	1.2500	38.100	1.5000	19.05	0.7500	1.0	19 900	2 030	14 700	1 500
		38.100	1.5000	25.40	1.0000	1.0	27 400	2 790	22 100	2 250
		41.275	1.6250	19.05	0.7500	—	24 200	2 470	14 900	1 520
		41.275	1.6250	25.40	1.0000	1.3	34 000	3 500	23 200	2 360
		41.275	1.6250	31.75	1.2500	—	42 500	4 350	31 000	3 150
34.925	1.3750	41.275	1.6250	12.70	0.5000	1.0	12 400	1 260	8 150	830
		44.450	1.7500	19.05	0.7500	1.3	26 400	2 690	16 800	1 710
		44.450	1.7500	25.40	1.0000	1.3	36 500	3 750	25 600	2 610
38.100	1.5000	47.625	1.8750	19.05	0.7500	1.3	28 500	2 900	19 000	1 930
		47.625	1.8750	25.40	1.0000	1.3	39 500	4 000	28 900	2 950
		47.625	1.8750	31.75	1.2500	1.3	49 500	5 050	39 000	3 950
41.275	1.6250	50.800	2.0000	25.40	1.0000	1.3	39 500	4 000	29 500	3 000
44.450	1.7500	53.975	2.1250	19.05	0.7500	1.3	29 700	3 050	21 000	2 140
		53.975	2.1250	25.40	1.0000	1.3	40 000	4 100	31 000	3 150
		53.975	2.1250	38.10	1.5000	1.3	60 000	6 100	52 000	5 300
47.625	1.8750	57.150	2.2500	25.40	1.0000	1.3	41 500	4 200	32 000	3 300
50.800	2.0000	60.325	2.3750	25.40	1.0000	1.3	42 500	4 350	34 500	3 500

Limiting Speeds (min^{-1}) Oil	Bearing Numbers Open J	Open JH	Closed MJ	Closed MJH	Mass (g) approx Open	Closed	Matching Inner Rings	
16 000	**J-1314**		—		25	—	—	—
16 000		**JH-1312**		**MJH-13121**	29	31	—	—
14 000	**J-146**		—		11	—	—	—
14 000	**J-148**		—		16	—	—	—
14 000	**J-1412**		—		25	—	**IR-1012**	—
14 000	**J-1416**		**MJ-14161**		33	36	**IR-1016**	—
15 000		**JH-1412**		**MJH-14121**	31	36	**IR-1012**	—
15 000		**JH-1416**		**MJH-14161**	42	47	**IR-1016**	—
12 000	**J-1612**		—		28	—	**IR-1212**	**IR-1312**
12 000	**J-1616**		**MJ-16161**		36	40	**IR-1216**	**IR-1316**
13 000		**JH-1612**		**MJH-16121**	34	40	**IR-1212**	**IR-1312**
13 000		**JH-1616**		**MJH-16161**	46	51	**IR-1216**	**IR-1316**
11 000	**J-188**		**MJ-1881**		27	30	—	—
11 000	**J-1812**		**MJ-18121**		30	35	—	—
11 000	**J-1816**		**MJ-18161**		47	51	**IR-1416**	**IR-1516**
11 000		**JH-1812**		**MJH-18121**	45	52	—	—
11 000		**JH-1816**		**MJH-18161**	62	69	**IR-1416**	**IR-1516**
11 000		**JH-1818**		**MJH-18181**	71	78	—	—
10 000	**J-2012**		**MJ-20121**		43	46	**IR-1612**	—
10 000	**J-2016**		**MJ-20161**		61	65	**IR-1616**	—
10 000		**JH-2012**		—	66	—	—	—
10 000		**JH-2016**		**MJH-20161**	70	76	**IR-1616**	—
10 000		**JH-2020**		—	75	—	—	—
9 000	**J-228**		**MJ-2281**		68	77	—	—
9 000		**JH-2212**		**MJH-22121**	53	61	**IR-1812**	—
9 000		**JH-2216**		**MJH-22161**	73	81	**IR-1816**	—
8 500	**J-2412**		**MJ-24121**		58	68	—	—
8 500	**J-2416**		**MJ-24161**		81	90	**IR-1916**	**IR-2016**
8 500	**J-2420**		**MJ-24201**		105	115	**IR-1920**	**IR-2020**
7 500	**J-2616**		**MJ-26161**		89	96	—	—
7 100	**J-2812**		**MJ-28121**		91	105	—	—
7 100	**J-2816**		**MJ-28161**		92	105	**IR-2316**	**IR-2426**
7 100	**J-2824**		**MJ-28241**		140	155	**IR-2324**	**IR-2424**
6 700	**J-3016**		**MJ-30161**		96	135	—	—
6 300	**J-3216**		**MJ-32161**		99	165	—	—

Remarks Sealed bearings are available upon the request.

Full Complement Type

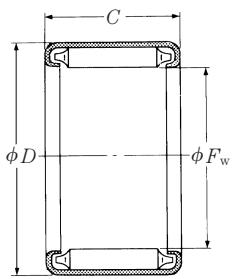
B (Open Type)

BH

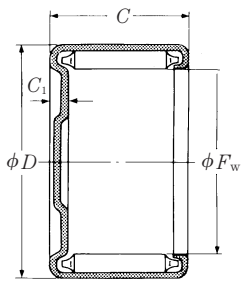
M (Closed Type)

MH

Inscribed Circle Diameter 11.112 — 15.875 mm



Open Type



Closed Type

Boundary Dimensions (mm, inch) F_w		D		C $^{0}_{-0.25}$		C_1 max	Basic Dynamic Load Ratings (N) C_r	{kgf}	Limiting Loads (N) P_{max}	{kgf}	Limiting Speeds (min⁻¹) Oil	Bearing Numbers Open B	Open BH	Closed M	Closed MH	Mass (g) approx Open	Closed	Matching Inner Rings	
11.112	0.4375	15.875	0.6250	9.52	0.3750	—	6 050	620	3 900	400	6 000	**B-76**		—		5.4	—	—	—
		15.875	0.6250	11.13	—	—	7 350	750	5 000	510	6 000	**B-77**		—		6.4	—	—	—
		15.875	0.6250	12.70	0.5000	2.0	8 600	875	6 100	625	6 000	**B-78**		**M-781**		7.3	8.2	—	—
		15.875	0.6250	15.88	0.6250	—	10 900	1 110	8 300	850	6 000	**B-710**		—		9.5	—	—	—
		17.462	0.6875	12.70	0.5000	2.3	9 850	1 000	6 000	610	8 500		**BH-78**		**MH-781**	10	11	—	—
12.700	0.5000	17.462	0.6875	7.92	—	2.0	5 100	520	3 200	325	5 300	**B-85**		**M-851**		5.4	6.4	—	—
		17.462	0.6875	9.52	0.3750	2.0	6 550	665	4 400	450	5 300	**B-86**		**M-861**		6.4	7.3	—	—
		17.462	0.6875	11.13	—	2.0	7 950	810	5 650	575	5 300	**B-87**		**M-871**		7.3	8.2	—	—
		17.462	0.6875	12.70	0.5000	2.0	9 250	945	6 900	700	5 300	**B-88**		**M-881**		8.2	9.1	—	—
		17.462	0.6875	15.88	0.6250	2.0	11 800	1 200	9 350	955	5 300	**B-810**		**M-8101**		11	12	—	—
		17.462	0.6875	19.05	0.7500	2.0	14 100	1 440	11 800	1 210	5 300	**B-812**		**M-8121**		13	14	—	—
		19.050	0.7500	11.13	—	—	9 000	920	5 400	550	7 500		**BH-87**		—	7.3	—	—	—
		19.050	0.7500	12.70	0.5000	2.3	10 700	1 090	6 700	685	7 500		**BH-88**		**MH-881**	11	13	—	—
		19.050	0.7500	15.88	0.6250	2.3	13 800	1 400	9 350	950	7 500		**BH-810**		**MH-8101**	14	16	—	—
		19.050	0.7500	19.05	0.7500	2.3	16 700	1 700	11 900	1 220	7 500		**BH-812**		**MH-8121**	18	19	—	—
14.288	0.5625	19.050	0.7500	7.92	—	2.0	5 400	550	3 550	360	5 000	**B-95**		**M-951**		5.7	7.1	—	—
		19.050	0.7500	9.52	0.3750	2.0	7 000	710	4 900	500	5 000	**B-96**		**M-961**		6.4	7.7	—	—
		19.050	0.7500	11.13	—	2.0	8 500	865	6 300	640	5 000	**B-97**		**M-971**		7.7	9.1	—	—
		19.050	0.7500	12.70	0.5000	2.0	9 900	1 010	7 650	780	5 000	**B-98**		**M-981**		9.1	10	**IR-68**	—
		19.050	0.7500	15.88	0.6250	2.0	12 500	1 280	10 400	1 060	5 000	**B-910**		**M-9101**		12	13	—	—
		19.050	0.7500	19.05	0.7500	2.0	15 100	1 540	13 200	1 340	5 000	**B-912**		**M-9121**		14	16	**IR-612**	—
		20.638	0.8125	12.70	0.5000	—	11 400	1 170	7 400	755	7 100		**BH-98**		—	12	—	**IR-68**	—
		20.638	0.8125	15.88	0.6250	—	14 800	1 510	10 300	1 050	7 100		**BH-910**		—	16	—	—	—
		20.638	0.8125	19.05	0.7500	2.3	17 900	1 830	13 200	1 350	7 100		**BH-912**		**MH-9121**	20	21	**IR-612**	—
15.875	0.6250	20.638	0.8125	7.92	—	2.0	5 750	585	3 900	395	4 500	**B-105**		**M-1051**		5.9	7.7	—	—
		20.638	0.8125	11.13	—	2.0	8 950	915	6 900	705	4 500	**B-107**		**M-1071**		8.6	11	—	—
		20.638	0.8125	12.70	0.5000	2.0	10 500	1 070	8 400	860	4 500	**B-108**		**M-1081**		10	12	**IR-68-1**	—
		20.638	0.8125	15.88	0.6250	2.0	13 300	1 350	11 400	1 170	4 500	**B-1010**		**M-10101**		13	15	—	—
		20.638	0.8125	19.05	0.7500	2.0	16 000	1 630	14 500	1 480	4 500	**B-1012**		**M-10121**		16	18	**IR-612-1**	—
		22.225	0.8750	12.70	0.5000	2.3	12 200	1 240	8 150	830	6 300		**BH-108**		**MH-1081**	13	15	**IR-68-1**	—
		22.225	0.8750	15.88	0.6250	—	15 700	1 600	11 300	1 150	6 300		**BH-1010**		—	17	—	—	—
		22.225	0.8750	19.05	0.7500	2.3	19 000	1 940	14 500	1 470	6 300		**BH-1012**		**MH-10121**	21	23	**IR-612-1**	—
		22.225	0.8750	25.40	1.0000	—	25 200	2 570	20 800	2 120	6 300		**BH-1016**		—	30	—	—	—

Full Complement Type

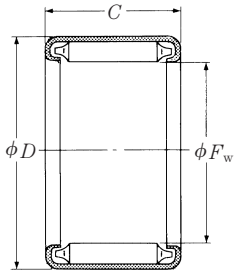
B (Open Type)

BH

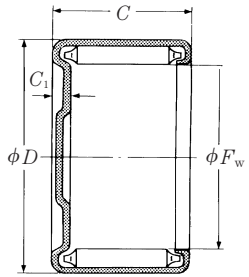
M (Closed Type)

MH

Inscribed Circle Diameter 17.462 — 23.812 mm



Open Type



Closed Type

Boundary Dimensions (mm, inch) F_w		D		C $^{0}_{-0.25}$		C_1 max	Basic Dynamic Load Ratings (N) C_r	{kgf}	Limiting Loads (N) P_{max}	{kgf}	Limiting Speeds (min^{-1}) Oil	Bearing Numbers Open B	Open BH	Closed M	Closed MH	Mass (g) approx Open	Closed	Matching Inner Rings	
17.462	0.6875	22.225	0.8750	9.52	0.3750	2.0	7 800	795	5 850	600	4 000	**B-116**		**M-1161**		10	12	—	—
		22.225	0.8750	12.70	0.5000	2.0	11 000	1 120	9 200	935	4 000	**B-118**		**M-1181**		11	14	—	—
		22.225	0.8750	15.88	0.6250	2.0	14 000	1 430	12 500	1 270	4 000	**B-1110**		**M-11101**		14	17	—	—
		22.225	0.8750	19.05	0.7500	2.0	16 800	1 710	15 800	1 610	4 000	**B-1112**		**M-11121**		17	20	—	—
		23.812	0.9375	11.13	—	—	10 800	1 100	7 100	725	6 000		**BH-117**		—	13	—	—	—
		23.812	0.9375	12.70	0.5000	—	12 800	1 310	8 850	900	6 000		**BH-118**		—	17	—	—	—
		23.812	0.9375	15.88	0.6250	2.3	16 600	1 690	12 300	1 250	6 000		**BH-1110**		**MH-11101**	20	23	—	—
		23.812	0.9375	19.05	0.7500	—	20 100	2 050	15 700	1 600	6 000		**BH-1112**		—	25	—	—	—
19.050	0.7500	25.400	1.0000	9.52	0.3750	2.3	9 150	935	5 800	595	5 300	**B-126**		**M-1261**		10	13	—	—
		25.400	1.0000	12.70	0.5000	2.3	13 500	1 370	9 550	975	5 300	**B-128**		**M-1281**		15	18	**IR-88**	—
		25.400	1.0000	15.88	0.6250	2.3	17 400	1 770	13 300	1 350	5 300	**B-1210**		**M-12101**		20	23	—	—
		25.400	1.0000	19.05	0.7500	2.3	21 100	2 150	17 000	1 730	5 300	**B-1212**		**M-12121**		25	28	**IR-812**	—
20.638	0.8125	26.988	1.0625	9.52	0.3750	—	9 600	975	6 250	635	5 000	**B-136**		—		12	—	—	—
		26.988	1.0625	12.70	0.5000	2.3	14 100	1 440	10 200	1 050	5 000	**B-138**		**M-1381**		17	20	—	—
		26.988	1.0625	22.22	0.8750	2.3	25 700	2 620	22 200	2 270	5 000	**B-1314**		**M-13141**		32	36	—	—
		26.988	1.0625	25.40	1.0000	2.3	29 200	2 980	26 200	2 670	5 000	**B-1316**		**M-13161**		37	40	—	—
		28.575	1.1250	12.70	0.5000	2.8	14 100	1 440	9 100	930	6 000		**BH-138**		**MH-1381**	22	24	—	—
		28.575	1.1250	15.88	0.6250	2.8	18 800	1 920	13 200	1 350	6 000		**BH-1310**		**MH-13101**	26	29	—	—
		28.575	1.1250	19.05	0.7500	2.8	23 200	2 360	17 300	1 760	6 000		**BH-1312**		**MH-13121**	35	37	—	—
22.225	0.8750	28.575	1.1250	9.52	0.3750	2.3	10 000	1 020	6 700	680	4 800	**B-146**		**M-1461**		13	17	—	—
		28.575	1.1250	12.70	0.5000	2.3	14 700	1 490	11 000	1 120	4 800	**B-148**		**M-1481**		18	22	—	—
		28.575	1.1250	19.05	0.7500	2.3	22 900	2 340	19 500	1 990	4 800	**B-1412**		**M-14121**		29	33	**IR-1012**	—
		28.575	1.1250	25.40	1.0000	2.3	30 500	3 100	28 000	2 860	4 800	**B-1416**		**M-14161**		40	43	**IR-1016**	—
		28.575	1.1250	28.58	1.1250	—	34 000	3 450	32 500	3 300	4 800	**B-1418**		—		50	—	—	—
		30.162	1.1875	15.88	0.6250	2.8	19 400	1 980	14 100	1 430	5 600		**BH-1410**		**MH-14101**	30	35	—	—
		30.162	1.1875	19.05	0.7500	2.8	24 000	2 440	18 400	1 880	5 600		**BH-1412**		**MH-14121**	36	41	**IR-1012**	—
		30.162	1.1875	25.40	1.0000	2.8	32 500	3 300	27 100	2 770	5 600		**BH-1416**		**MH-14161**	40	43	—	—
23.812	0.9375	30.162	1.1875	12.70	0.5000	—	15 200	1 550	11 700	1 190	4 500	**B-158**		—		20	—	—	—
		30.162	1.1875	25.40	1.0000	2.3	31 500	3 200	29 800	3 050	4 500	**B-1516**		**M-15161**		41	46	—	—

Full Complement Type

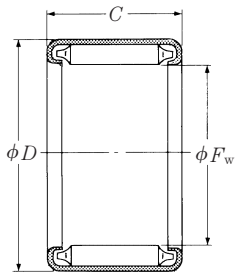
B (Open Type)

BH

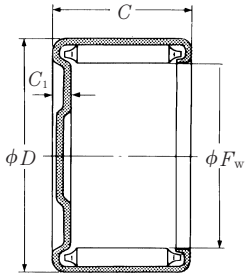
M (Closed Type)

MH

Inscribed Circle
Diameter 25.400 — 31.750 mm



Open Type



Closed Type

Boundary Dimensions (mm, inch) F_w		D		C $^{0}_{-0.25}$		C_1 max	Basic Dynamic Load Ratings (N) C_r	{kgf}	Limiting Loads (N) P_{max}	{kgf}
25.400	1.0000	31.750	1.2500	9.52	0.3750	—	10 700	1 090	7 550	770
		31.750	1.2500	11.13	—	2.3	13 300	1 350	9 950	1 010
		31.750	1.2500	12.70	0.5000	2.3	15 700	1 610	12 400	1 260
		31.750	1.2500	15.88	0.6250	2.3	20 300	2 070	17 200	1 750
		31.750	1.2500	19.05	0.7500	2.3	24 700	2 510	22 000	2 240
		31.750	1.2500	25.40	1.0000	2.3	32 500	3 350	31 500	3 250
		33.338	1.3125	12.70	0.5000	2.8	15 800	1 610	10 900	1 120
		33.338	1.3125	15.88	0.6250	—	21 000	2 140	15 900	1 620
		33.338	1.3125	19.05	0.7500	2.8	25 900	2 650	20 800	2 120
		33.338	1.3125	22.22	0.8750	—	30 500	3 100	25 700	2 620
		33.338	1.3125	25.40	1.0000	2.8	35 000	3 600	30 500	3 100
		33.338	1.3125	31.75	1.2500	—	43 500	4 450	40 500	4 100
		33.338	1.3125	38.10	1.5000	2.8	51 500	5 250	50 500	5 150
26.988	1.0625	33.338	1.3125	15.88	0.6250	2.3	21 000	2 140	18 200	1 850
28.575	1.1250	34.925	1.3750	9.52	0.3750	2.3	11 400	1 160	8 400	855
		34.925	1.3750	12.70	0.5000	2.3	16 800	1 710	13 800	1 410
		34.925	1.3750	19.05	0.7500	2.3	26 200	2 680	24 500	2 500
		34.925	1.3750	25.40	1.0000	2.3	35 000	3 550	35 500	3 600
		38.100	1.5000	19.05	0.7500	3.0	30 000	3 050	22 900	2 340
		38.100	1.5000	25.40	1.0000	3.0	41 000	4 150	34 000	3 500
		38.100	1.5000	28.58	1.1250	—	46 000	4 700	39 500	4 050
		38.100	1.5000	31.75	1.2500	3.0	51 000	5 200	45 500	4 600
30.162	1.1875	38.100	1.5000	15.88	0.6250	2.8	23 000	2 350	18 500	1 890
		38.100	1.5000	25.40	1.0000	—	38 500	3 900	35 500	3 650
31.750	1.2500	38.100	1.5000	12.70	0.5000	2.3	17 700	1 810	15 200	1 550
		38.100	1.5000	15.88	0.6250	2.3	22 900	2 330	21 100	2 150
		38.100	1.5000	19.05	0.7500	2.3	27 700	2 830	27 000	2 760
		38.100	1.5000	25.40	1.0000	2.3	37 000	3 750	39 000	3 950
		38.100	1.5000	31.75	1.2500	2.3	45 500	4 600	50 500	5 150
		41.275	1.6250	12.70	0.5000	3.0	18 400	1 880	12 500	1 280
		41.275	1.6250	19.05	0.7500	3.0	31 500	3 200	25 000	2 550
		41.275	1.6250	25.40	1.0000	3.0	43 000	4 400	37 500	3 800
		41.275	1.6250	31.75	1.2500	3.0	53 500	5 450	49 500	5 050

Limiting Speeds (min^{-1}) Oil	Bearing Numbers Open B	Open BH	Closed M	Closed MH	Mass (g) approx Open	Closed	Matching Inner Rings	
4 000	**B-166**		—		14	—	—	—
4 000	**B-167**		**M-1671**		17	22	—	—
4 000	**B-168**		**M-1681**		20	25	**IR-128**	—
4 000	**B-1610**		**M-16101**		26	31	—	—
4 000	**B-1612**		**M-16121**		32	37	**IR-1212**	**IR-1312**
4 000	**B-1616**		**M-16161**		44	49	**IR-1216**	**IR-1316**
5 000		**BH-168**		**MH-1681**	25	30	**IR-128**	—
5 000		**BH-1610**		—	33	—	—	—
5 000		**BH-1612**		**MH-16121**	40	45	**IR-1212**	**IR-1312**
5 000		**BH-1614**		—	48	—	—	—
5 000		**BH-1616**		**MH-16161**	55	60	**IR-1216**	**IR-1316**
5 000		**BH-1620**		—	70	—	**IR-1220**	—
5 000		**BH-1624**		**MH-16241**	85	91	**IR-1224**	—
4 000	**B-1710**		**M-17101**		27	32	—	—
3 800	**B-186**		**M-1861**		15	20	—	—
3 800	**B-188**		**M-1881**		23	28	—	—
3 800	**B-1812**		**M-18121**		35	40	—	—
3 800	**B-1816**		**M-18161**		48	54	**IR-1416**	**IR-1516**
5 300		**BH-1812**		**MH-18121**	55	62	—	—
5 300		**BH-1816**		**MH-18161**	75	82	**IR-1416**	**IR-1516**
5 300		**BH-1818**		—	86	—	—	—
5 300		**BH-1820**		**MH-18201**	98	105	—	—
4 300	**B-1910**		**M-19101**		35	41	—	—
4 300	**B-1916**		—		62	—	—	—
3 400	**B-208**		**M-2081**		24	31	—	—
3 400	**B-2010**		**M-20101**		32	38	—	—
3 400	**B-2012**		**M-20121**		39	45	**IR-1612**	—
3 400	**B-2016**		**M-20161**		54	60	**IR-1616**	—
3 400	**B-2020**		**M-20201**		68	74	—	—
5 000		**BH-208**		**MH-2081**	28	32	—	—
5 000		**BH-2012**		**MH-20121**	57	62	**IR-1612**	—
5 000		**BH-2016**		**MH-20161**	80	86	**IR-1616**	—
5 000		**BH-2020**		**MH-20201**	105	110	—	—

Full Complement Type

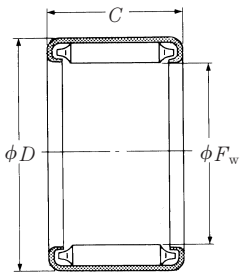
B (Open Type)

BH

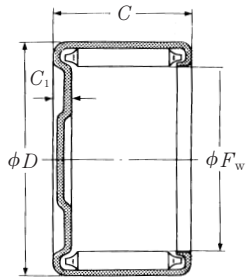
M (Closed Type)

MH

Inscribed Circle
Diameter 33.338 — 50.800 mm



Open Type



Closed Type

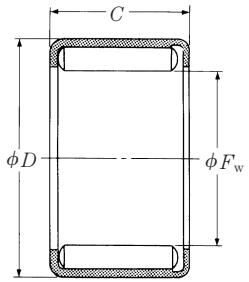
Boundary Dimensions (mm, inch) F_w		D		C $^{0}_{-0.25}$		C_1 max	Basic Dynamic Load Ratings (N) C_r	{kgf}	Limiting Loads (N) P_{max}	{kgf}	Limiting Speeds (min^{-1}) Oil	Bearing Numbers Open B	Open BH	Closed M	Closed MH	Mass (g) approx Open	Closed	Matching Inner Rings	
33.338	1.3125	41.275	1.6250	12.70	0.5000	2.8	18 300	1 860	14 000	1 430	4 000	**B-218**		**M-2181**		32	38	—	—
		41.275	1.6250	15.88	0.6250	2.8	24 400	2 490	20 300	2 070	4 000	**B-2110**		**M-21101**		40	46	—	—
34.925	1.3750	41.275	1.6250	12.70	0.5000	2.3	18 600	1 900	16 600	1 690	3 000	**B-228**		**M-2281**		27	34	—	—
		41.275	1.6250	19.05	0.7500	2.3	29 200	2 970	29 500	3 000	3 000	**B-2212**		**M-22121**		43	49	**IR-1812**	—
		41.275	1.6250	25.40	1.0000	2.3	38 500	3 950	42 500	4 350	3 000	**B-2216**		**M-22161**		58	65	**IR-1816**	—
		41.275	1.6250	31.75	1.2500	2.3	47 500	4 850	55 500	5 650	3 000	**B-2220**		**M-22201**		74	83	**IR-1820**	—
		44.450	1.7500	12.70	0.5000	—	20 100	2 050	14 100	1 440	4 500		**BH-228**		—	29	—	—	—
		44.450	1.7500	15.88	0.6250	—	27 200	2 770	20 800	2 120	4 500		**BH-2210**		—	43	—	—	—
		44.450	1.7500	19.05	0.7500	3.0	33 500	3 450	27 500	2 800	4 500		**BH-2212**		**MH-22121**	58	66	**IR-1812**	—
		44.450	1.7500	25.40	1.0000	3.0	46 000	4 700	41 000	4 150	4 500		**BH-2216**		**MH-22161**	87	95	**IR-1816**	—
		44.450	1.7500	31.75	1.2500	—	57 000	5 850	54 000	5 550	4 500		**BH-2220**		—	115	—	**IR-1820**	—
38.100	1.5000	47.625	1.8750	12.70	0.5000	3.0	20 900	2 130	15 200	1 550	4 000	**B-248**		**M-2481**		39	48	—	—
		47.625	1.8750	15.88	0.6250	3.0	38 200	2 880	22 500	2 290	4 000	**B-2410**		**M-24101**		54	63	—	—
		47.625	1.8750	19.05	0.7500	3.0	35 000	3 600	29 700	3 050	4 000	**B-2412**		**M-24121**		69	78	—	—
		47.625	1.8750	22.22	0.8750	3.0	41 500	4 250	37 000	3 750	4 000	**B-2414**		**M-24141**		81	90	—	—
		47.625	1.8750	25.40	1.0000	3.0	48 000	4 850	44 000	4 500	4 000	**B-2416**		**M-24161**		92	100	**IR-1916**	**IR-2016**
		47.625	1.8750	31.75	1.2500	3.0	59 500	6 050	58 500	6 000	4 000	**B-2420**		**M-24201**		120	130	**IR-1920**	**IR-2020**
41.275	1.6250	50.800	2.0000	12.70	0.5000	—	21 500	2 200	16 200	1 660	3 800	**B-268**		—		40	—	—	—
		50.800	2.0000	15.88	0.6250	3.0	29 200	2 980	24 000	2 450	3 800	**B-2610**		**M-26101**		57	74	—	—
		50.800	2.0000	25.40	1.0000	—	49 500	5 050	47 500	4 850	3 800	**B-2616**		—		89	—	—	—
		50.800	2.0000	31.75	1.2500	3.0	61 500	6 300	63 000	6 400	3 800	**B-2620**		**M-26201**		140	155	**IR-2220**	—
44.450	1.7500	53.975	2.1250	19.05	0.7500	3.0	37 500	3 850	34 000	3 450	3 600	**B-2812**		**M-28121**		78	92	—	—
		53.975	2.1250	25.40	1.0000	3.0	51 000	5 250	50 500	5 150	3 600	**B-2816**		**M-28161**		110	125	**IR-2316**	**IR-2416**
		53.975	2.1250	31.75	1.2500	—	64 000	6 500	67 500	6 850	3 600	**B-2820**		—		140	—	—	—
		53.975	2.1250	38.10	1.5000	3.0	76 000	7 750	84 000	8 550	3 600	**B-2824**		**M-28241**		170	190	**IR-2324**	**IR-2424**
47.625	1.8750	57.150	2.2500	12.70	0.5000	3.0	23 500	2 400	18 700	1 910	3 400	**B-308**		**M-3081**		52	73	—	—
		57.150	2.2500	19.05	0.7500	—	39 500	4 050	36 500	3 700	3 400	**B-3012**		—		82	—	—	—
		57.150	2.2500	25.40	1.0000	3.0	54 000	5 500	54 000	5 550	3 400	**B-3016**		**M-30161**		110	130	—	—
50.800	2.0000	60.325	2.3750	12.70	0.5000	3.0	24 000	2 450	19 700	2 010	3 200	**B-328**		**M-3281**		51	72	—	—
		60.325	2.3750	25.40	1.0000	3.0	55 000	5 650	57 500	5 850	3 200	**B-3216**		**M-32161**		120	140	—	—
		60.325	2.3750	31.75	1.2500	3.0	69 000	7 000	76 000	7 750	3 200	**B-3220**		**M-32201**		150	175	—	—
		60.325	2.3750	38.10	1.5000	3.0	82 000	8 350	95 000	9 700	3 200	**B-3224**		**M-32241**		185	205	—	—
		60.325	2.3750	44.45	1.7500	3.0	94 000	9 600	114 000	11 600	3 200	**B-3228**		**M-32281**		220	240	—	—

Full Complement Type (Grease-Retained Roller Type)

Y

YH

Inscribed Circle Diameter 3.969 — 20.638 mm



Boundary Dimensions (mm, inch) F_w		D		C $^{0}_{-0.25}$		Basic Dynamic Load Ratings (N) C_r	{kgf}	Limiting Loads (N) P_{max}	{kgf}	Limiting Speeds (min^{-1}) Oil	Bearing Numbers	Mass (g) approx
3.969	—	7.144	—	3.96	—	1 260	129	580	59	10 000	**Y-2 1/2 2 1/2**	0.4
		7.144	—	6.35	0.2500	2 300	235	1 260	128	10 000	**Y-2 1/2 4**	1.4
4.762	0.1875	8.731	—	6.35	0.2500	2 560	261	1 350	137	10 000	**Y-34**	2.3
6.350	0.2500	11.112	0.4375	7.92	—	4 150	420	2 300	234	10 000	**Y-45**	3.2
		11.112	0.4375	11.13	—	5 950	605	3 700	375	10 000	**Y-47**	4.5
7.938	0.3125	12.700	0.5000	7.92	—	4 750	485	2 760	281	8 000	**Y-55**	4.1
9.525	0.3750	14.288	0.5625	6.35	0.2500	4 000	410	2 250	229	7 100	**Y-64**	3.2
		14.288	0.5625	9.52	0.3750	6 500	660	4 200	425	7 100	**Y-66**	5.5
		14.288	0.5625	12.70	0.5000	8 750	890	6 100	625	7 100	**Y-68**	7.3
		14.288	0.5625	15.88	0.6250	10 800	1 100	8 050	820	7 100	**Y-610**	9.1
11.112	0.4375	15.875	0.6250	12.70	0.5000	9 550	975	7 000	715	6 000	**Y-78**	8.2
		17.462	0.6875	12.70	0.5000	11 400	1 160	7 250	740	8 500	**YH-78**	11
12.700	0.5000	17.462	0.6875	6.35	0.2500	4 700	480	2 890	295	5 300	**Y-84**	5.4
		17.462	0.6875	9.52	0.3750	7 650	780	5 350	550	5 300	**Y-86**	7.3
		17.462	0.6875	11.13	—	9 000	915	6 600	675	5 300	**Y-87**	8.2
		17.462	0.6875	12.70	0.5000	10 300	1 050	7 850	800	5 300	**Y-88**	9.1
		17.462	0.6875	15.88	0.6250	12 700	1 300	10 300	1 050	5 300	**Y-810**	11
		17.462	0.6875	19.05	0.7500	15 000	1 530	12 800	1 310	5 300	**Y-812**	14
		19.050	0.7500	15.88	0.6250	14 600	1 480	10 300	1 050	7 500	**YH-810**	16
14.288	0.5625	19.050	0.7500	12.70	0.5000	11 000	1 120	8 750	890	5 000	**Y-98**	9.5
		19.050	0.7500	15.88	0.6250	13 600	1 380	11 500	1 170	5 000	**Y-910**	12
		19.050	0.7500	19.05	0.7500	16 000	1 640	14 200	1 450	5 000	**Y-912**	15
15.875	0.6250	20.638	0.8125	7.92	—	7 050	720	5 050	515	4 500	**Y-105**	6.4
		20.638	0.8125	12.70	0.5000	11 600	1 180	9 600	980	4 500	**Y-108**	11
		20.638	0.8125	19.05	0.7500	17 000	1 730	15 700	1 600	4 500	**Y-1012**	17
		22.225	0.8750	12.70	0.5000	13 300	1 360	9 350	955	6 000	**YH-108**	15
17.462	0.6875	22.225	0.8750	19.05	0.7500	17 900	1 820	17 100	1 740	4 000	**Y-1112**	24
19.050	0.7500	25.400	1.0000	6.35	0.2500	6 250	640	3 650	370	5 300	**Y-124**	8.2
		25.400	1.0000	12.70	0.5000	10 800	1 100	7 350	750	5 300	**Y-128**	17
		25.400	1.0000	15.88	0.6250	18 600	1 890	14 700	1 500	5 300	**Y-1210**	22
		25.400	1.0000	19.05	0.7500	22 100	2 250	18 400	1 880	5 300	**Y-1212**	27
20.638	0.8125	26.988	1.0625	9.52	0.3750	11 300	1 150	7 900	805	5 000	**Y-136**	13
		26.988	1.0625	12.70	0.5000	15 500	1 580	11 900	1 210	5 000	**Y-138**	19
		28.575	1.1250	15.88	0.6250	21 300	2 170	15 500	1 580	6 000	**YH-1310**	28
		28.575	1.1250	19.05	0.7500	25 600	2 610	19 600	2 000	6 000	**YH-1312**	37

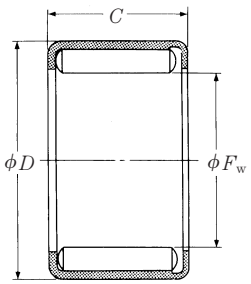
Remarks 1. In this type of bearing, a special grease holds the rollers in place until mounting.
2. Metric series bearings are available. Please consult NSK.

Full Complement Type (Grease-Retained Roller Type)

Y

YH

Inscribed Circle
Diameter 22.225 — 47.625 mm



Boundary Dimensions (mm, inch) F_w		D		C $^{0}_{-0.25}$		Basic Dynamic Load Ratings (N) C_r	{kgf}	Limiting Loads (N) P_{max}	{kgf}	Limiting Speeds (min^{-1}) Oil	Bearing Numbers	Mass (g) approx
22.225	0.8750	28.575	1.1250	12.70	0.5000	15 900	1 620	12 700	1 290	4 500	**Y-148**	20
		28.575	1.1250	19.05	0.7500	23 700	2 410	21 100	2 150	4 500	**Y-1412**	31
		28.575	1.1250	25.40	1.0000	31 000	3 150	29 600	3 000	4 500	**Y-1416**	42
		30.162	1.1875	19.05	0.7500	25 500	2 600	20 500	2 090	5 300	**YH-1412**	38
25.400	1.0000	31.750	1.2500	12.70	0.5000	17 200	1 750	14 300	1 460	4 000	**Y-168**	23
		31.750	1.2500	19.05	0.7500	25 500	2 600	23 900	2 430	4 000	**Y-1612**	35
		31.750	1.2500	25.40	1.0000	33 000	3 400	33 500	3 400	4 000	**Y-1616**	47
		33.338	1.3125	12.70	0.5000	18 800	1 920	13 800	1 400	5 000	**YH-168**	30
		33.338	1.3125	19.05	0.7500	28 600	2 920	23 600	2 410	5 000	**YH-1612**	43
		33.338	1.3125	25.40	1.0000	37 500	3 850	33 500	3 400	5 000	**YH-1616**	58
28.575	1.1250	34.925	1.3750	12.70	0.5000	18 300	1 870	16 000	1 630	3 600	**Y-188**	26
		34.925	1.3750	19.05	0.7500	27 200	2 780	26 600	2 710	3 600	**Y-1812**	38
		34.925	1.3750	25.40	1.0000	35 500	3 600	37 500	3 800	3 600	**Y-1816**	52
30.162	1.1875	38.100	1.5000	15.88	0.6250	26 500	2 700	22 200	2 260	4 300	**Y-1910**	43
31.750	1.2500	38.100	1.5000	15.88	0.6250	24 300	2 480	23 500	2 400	3 200	**Y-2010**	34
		38.100	1.5000	19.05	0.7500	28 900	2 940	29 300	2 990	3 200	**Y-2012**	42
		38.100	1.5000	25.40	1.0000	37 500	3 850	41 000	4 200	3 200	**Y-2016**	57
		38.100	1.5000	28.58	1.1250	41 500	4 250	47 000	4 800	3 200	**Y-2018**	64
		38.100	1.5000	31.75	1.2500	45 500	4 650	53 000	5 400	3 200	**Y-2020**	72
34.925	1.3750	41.275	1.6250	12.70	0.5000	20 000	2 040	19 300	1 960	2 800	**Y-228**	36
		41.275	1.6250	19.05	0.7500	29 700	3 050	32 000	3 250	2 800	**Y-2212**	47
		41.275	1.6250	31.75	1.2500	47 000	4 800	58 000	5 900	2 800	**Y-2220**	76
38.100	1.5000	47.625	1.8750	9.52	0.3750	16 900	1 730	11 600	1 190	4 000	**Y-246**	34
		47.625	1.8750	12.70	0.5000	24 700	2 520	18 900	1 930	4 000	**Y-248**	48
		47.625	1.8750	22.22	0.8750	44 500	4 550	40 500	4 150	4 000	**Y-2414**	89
		47.625	1.8750	25.40	1.0000	51 000	5 200	48 000	4 850	4 000	**Y-2416**	100
		47.625	1.8750	31.75	1.2500	62 500	6 350	62 000	6 350	4 000	**Y-2420**	125
41.275	1.6250	50.800	2.0000	15.88	0.6250	33 000	3 350	27 900	2 840	3 800	**Y-2610**	73
44.450	1.7500	53.975	2.1250	25.40	1.0000	54 500	5 550	55 000	5 600	3 600	**Y-2816**	120
47.625	1.8750	57.150	2.2500	19.05	0.7500	43 000	4 400	41 000	4 200	3 400	**Y-3012**	115

Remarks 1. In this type of bearing, a special grease holds the rollers in place until mounting.
2. Metric series bearings are available. Please consult NSK.

Miniature Bearings with Cages

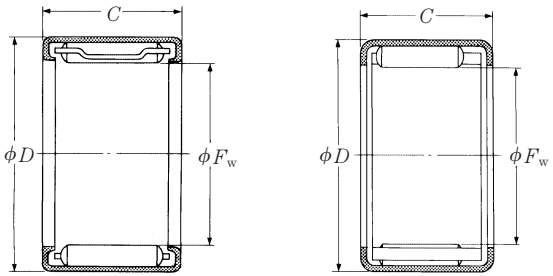
FJ • FJH • FJL (Open Type)

FJP

MFJ • MFJH (Closed Type)

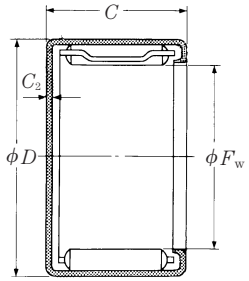
MFJL

Inscribed Circle Diameter 3 — 9 mm



Open Type

FJ, FJH, FJL FJP



Closed Type

Boundary Dimensions (mm) F_w	D	C $^{0}_{-0.25}$	C_2 max	Basic Dynamic Load Ratings (N) C_r	{kgf}	Limiting Loads (N) P_{max}	{kgf}	Limiting Speeds (min^{-1}) Oil
3	6.5	6	—	1 230	125	465	47	100 000
4	8	8	—	1 720	175	670	69	75 000
5	9	8	—	1 550	158	585	60	71 000
	9	9	0.8	1 860	190	745	76	71 000
6	10	9	0.8	2 320	237	985	101	56 000
7	11	9	0.8	2 550	260	1 110	113	48 000
8	12	8	—	2 580	263	1 150	118	40 000
	12	10	0.8	2 840	289	1 270	130	43 000
	14	10	1	4 300	435	1 770	180	45 000
	15	10	1	4 400	450	1 770	181	45 000
	15	15	1	7 100	720	3 250	330	45 000
	15	20	1	10 100	1 020	5 100	520	45 000
9	13	10	0.8	3 300	335	1 600	163	36 000
	15	10	1	4 550	465	1 910	194	40 000
	16	12	1	5 150	525	2 140	219	40 000
	16	16	1	7 800	795	3 650	370	40 000

Bearing Numbers Open: FJP, FJ FJH	Open: FJL	Closed: MFJ MFJH	Closed: MFJL	Mass (g) approx Open	Mass (g) approx Closed
***FJP-36**		—		0.9	—
***FJP-48**		—		1.3	—
FJ-58L		—		1.6	—
FJ-59		**MFJ-59**		1.7	1.9
FJ-69		**MFJ-69**		2.2	2.4
FJ-79		**MFJ-79**		2.3	2.7
FJ-88-2		—		2.3	—
FJ-810		**MFJ-810**		2.7	3.2
FJH-810		**MFJH-810**		5.2	5.5
	FJL-810		**MFJL-810L**	6.0	6.6
	FJL-815		**MFJL-815L**	8.9	9.9
	FJL-820		**MFJL-820L**	15	13
FJ-910		**MFJ-910**		3.2	3.6
FJH-910		**MFJH-910**		5.7	6.1
	FJL-912L		**MFJL-912L**	7.7	8.5
	FJL-916		**MFJL-916L**	11	12

* These bearings have polyamide cages. The maximum permissible operating temperature for these bearings is 100°C for continued operation and 120°C for short periods.

Full Complement Miniature Bearings

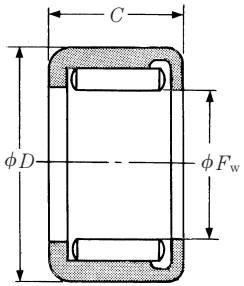
F (Open Type)

MF (Closed Type)

MFY

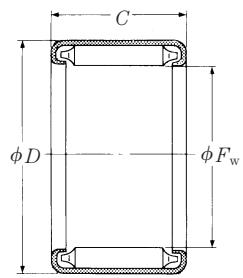
DD (Open Type • Closed Type)

Inscribed Circle Diameter 3.036 — 9 mm



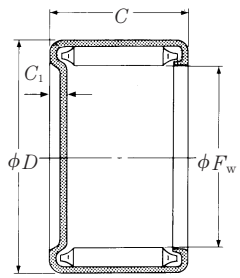
Open Type

DD



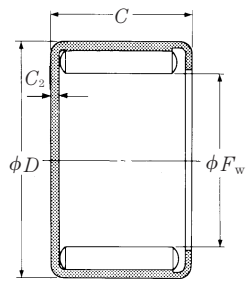
Open Type

F



Closed Type

MF



Closed Type

MFY, DD

Boundary Dimensions (mm)				Basic Dynamic Load Ratings		Limiting Loads		Limiting Speeds (min⁻¹)	Bearing Numbers		Mass (g)	
				(N)	{kgf}	(N)	{kgf}		Open	Closed		
F_w	D	C $^{0}_{-0.25}$	C_1, C_2 max	C_r		P_{max}		Oil	F, DD	MF, MFY, DD	Open	Closed (approx)
3.036	7.035	6.65	—	1 630	167	855	87	12 000	**DD500302**	—	1.4	—
	7.035	9.2	—	2 330	238	1 360	138	12 000	**DD500304**	—	2.0	—
4	8	6	0.8	2 240	229	1 150	117	12 000	—	**DD500401**	—	1.5
	8	8	1.7	2 470	252	1 300	132	12 000	**F-48**	**MF-48**	1.4	1.8
5	9	8	1.7	2 790	285	1 520	155	10 000	**F-58**	**MF-58**	1.8	2.2
	9	7	0.8	3 000	305	1 670	170	10 000	—	**MFY-57**	—	2.1
	9	9	1.7	3 250	335	1 860	190	10 000	**F-59**	**MF-59**	2.0	2.3
6	10	8	1.7	3 150	325	1 780	181	8 500	**F-68**	**MF-68**	2.1	2.7
	10	9	1.7	3 700	380	2 170	221	8 500	**F-69**	**MF-69**	2.3	2.8
7	11	7.5	0.8	4 100	420	2 480	253	7 500	—	**DD500701**	—	2.8
	11	9	1.7	4 100	420	2 480	253	7 500	**F-79**	**MF-79**	2.7	3.2
8	12	8	1.7	3 850	390	2 280	233	7 100	**F-88**	**MF-88**	2.7	3.2
	12	8	0.8	4 750	485	2 990	305	7 100	—	**MFY-88**	—	3.3
	12	10	1.7	5 000	510	3 200	325	7 100	**F-810**	**MF-810**	3.6	4.1
	12	12	1.7	6 200	635	4 200	430	7 100	**F-812**	**MF-812**	3.8	4.7
9	13	9	0.8	5 650	575	3 850	395	6 000	—	**MFY-99**	—	4.1
	13	10	1.7	5 400	550	3 650	370	6 000	**F-910**	**MF-910**	4.1	4.5

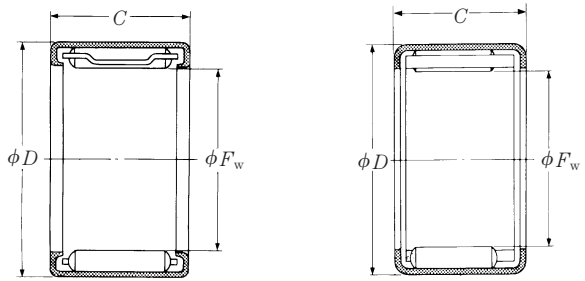
Miniature Bearings with Cages

J • JP (Open Type)

JH

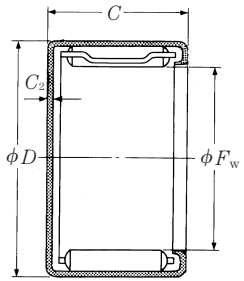
MJ • MJH (Closed Type)

Inscribed Circle
Diameter 3.175 — 9.525 mm



Open Type

J, JH JP



Closed Type

Boundary Dimensions (mm, inch) F_w		D		C $^{0}_{-0.25}$		C_2 max	Basic Dynamic Load Ratings (N) C_r	{kgf}	Limiting Loads (N) P_{max}	{kgf}	Limiting Speeds (min^{-1}) Oil	Bearing Numbers Open J, JP, JH	Closed MJ, MJH	Mass (g) approx Open	Closed
3.175	0.1250	6.350	0.2500	4.78	—	—	890	91	320	32	75 000	＊**JP-23-FV**	—	0.5	—
3.969	—	7.144	—	4.78	—	—	910	93	320	32	75 000	＊**JP-2 1/2 3-FV**	—	0.5	—
4.762	0.1875	8.731	—	4.78	—	—	1 090	111	370	38	75 000	＊**JP-33-FV**	—	0.9	—
		8.731	—	9.52	0.3750	1.0	2 290	234	970	99	75 000	**J-36**	**MJ-361**	2.3	2.7
6.350	0.2500	11.112	0.4375	6.35	0.2500	—	2 040	208	775	79	56 000	＊**JP-44-FV**	—	1.8	—
		11.112	0.4375	7.92	—	1.0	1 940	198	720	74	56 000	**J-45**	**MJ-451**	2.3	2.7
		11.112	0.4375	11.13	—	1.0	3 300	335	1 430	146	56 000	**J-47**	**MJ-471**	3.6	4.1
7.938	0.3125	12.700	0.5000	7.92	—	1.0	2 300	235	900	92	43 000	**J-55**	**MJ-551**	3.0	3.3
		12.700	0.5000	11.13	—	1.0	3 900	400	1 790	183	43 000	**J-57**	**MJ-571**	4.1	4.5
		14.288	0.5625	11.13	—	1.0	4 700	480	1 950	199	45 000	**JH-57**	**MJH-571**	5.9	6.4
9.525	0.3750	14.288	0.5625	7.92	—	1.0	2 620	267	1 080	110	36 000	**J-65**	**MJ-651**	3.2	3.6
		14.288	0.5625	12.70	0.5000	1.0	5 250	535	2 640	270	36 000	**J-68**	**MJ-681**	5.4	5.9

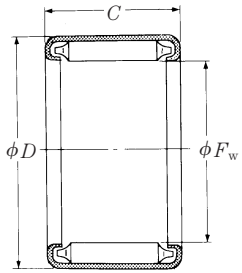
* These bearings have polyamide cages. The maximum permissible operating temperature for these bearings is 100℃ for continued operation and 120℃ for short periods.

Full Complement Miniature Bearings

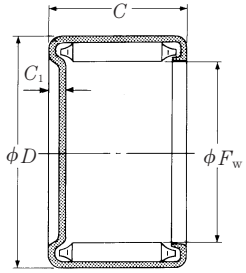
B • BH (Open Type)

M • MH (Closed Type)

Inscribed Circle
Diameter 3.175 — 9.525 mm



Open Type



Closed Type

Boundary Dimensions (mm, inch)							Basic Dynamic Load Ratings (N)	{kgf}	Limiting Loads (N)	{kgf}	Limiting Speeds (min⁻¹)	Bearing Numbers				Mass (g) approx	
F_w		D		C $^{0}_{-0.25}$		C_1 max	C_r		P_{max}		Oil	Open B	Open BH	Closed M	Closed MH	Open	Closed
3.175	0.1250	6.350	0.2500	6.35	0.2500	1.3	1 640	167	835	85	12 000	**B-24**		**M-241**		0.9	1.4
3.969	—	7.144	—	6.35	0.2500	1.3	1 930	197	1 000	102	10 000	**B-2** 1/2 **4**		**M-2** 1/2 **41**		0.9	1.4
		7.144	—	7.92	—	1.3	2 520	257	1 420	144	10 000	**B-2** 1/2 **5**		**M-2** 1/2 **51**		1.4	1.8
4.762	0.1875	8.731	—	6.35	0.2500	1.8	2 100	214	1 040	106	10 000	**B-34**		**M-341**		1.8	2.3
		8.731	—	9.52	0.3750	1.8	3 600	365	2 090	213	10 000	**B-36**		**M-361**		2.3	2.7
6.350	0.2500	11.112	0.4375	6.35	0.2500	2.0	2 490	254	1 200	122	10 000	**B-44**		**M-441**		2.3	2.7
		11.112	0.4375	7.92	—	2.0	3 350	345	1 760	180	10 000	**B-45**		**M-451**		2.7	3.2
		11.112	0.4375	9.52	0.3750	2.0	4 350	440	2 440	249	10 000	**B-46**		**MC-461**		3.4	3.9
		11.112	0.4375	11.13	—	2.0	5 250	535	3 150	320	10 000	**B-47**		**M-471**		4.1	4.5
7.938	0.3125	12.700	0.5000	7.92	—	2.0	3 850	395	2 120	216	8 000	**B-55**		**M-551**		3.6	4.1
		12.700	0.5000	9.52	0.3750	2.0	5 000	510	2 930	299	8 000	**B-56**		**M-561**		4.5	4.8
		12.700	0.5000	11.13	—	2.0	6 050	615	3 750	385	8 000	**B-57**		**M-571**		5.0	5.4
		12.700	0.5000	14.27	—	2.0	8 050	820	5 400	555	8 000	**B-59**		**M-591**		6.4	6.8
		14.288	0.5625	11.13	—	2.3	6 650	680	3 700	375	11 000		**BH-57**		**MH-571**	6.4	6.8
9.525	0.3750	14.288	0.5625	7.92	—	2.0	4 300	440	2 470	252	7 100	**B-65**		**M-651**		4.1	4.5
		14.288	0.5625	9.52	0.3750	2.0	5 550	565	3 400	350	7 100	**B-66**		**M-661**		5.0	5.4
		14.288	0.5625	11.13	—	—	6 750	690	4 400	450	7 100	**B-67**		—		5.9	—
		14.288	0.5625	12.70	0.5000	2.0	7 850	800	5 350	545	7 100	**B-68**		**M-681**		6.8	7.3
		14.288	0.5625	14.27	—	—	8 950	915	6 300	645	7 100	**B-69**		—		7.7	—
		14.288	0.5625	15.88	0.6250	2.0	10 000	1 020	7 300	740	7 100	**B-610**		**M-6101**		8.6	9.1
		15.875	0.6250	12.70	0.5000	2.3	8 950	910	5 300	540	10 000		**BH-68**		**MH-681**	9.1	9.5

SOLID NEEDLE ROLLER BEARINGS

METRIC DESIGN

			Pages
RLM · LM, RNA · NA	Inscribed Circle Diameter	8–115 mm	B 96–B109
RNA · NA	Inscribed Circle Diameter	120–490 mm	B110–B113
RNAF · NAF, RNAFW · NAFW	Inscribed Circle Diameter	10–100 mm	B114–B117
RNA···TT, NA···TT	Inscribed Circle Diameter	14–125 mm	B118–B121

INCH DESIGN

HJ, HJ+IR	Inscribed Circle Diameter	15.875–234.950 mm	B122–B127

Solid needle roller bearings are high-accuracy bearings with maximum load capacity within a limited space for various operating conditions.

Made of carefully selected vacuum-degassed bearing steel or carburizing steel, the raceway rings are finished with accurate grinding after heat treatment. The outer rings have strong integrated ribs and contain high-accuracy rollers that have the proper crowning finish. Lightweight and extremely strong, the cage guides the rollers accurately and smoothly.

DESIGN AND TYPES

Solid needle roller bearings come in various types ranging from the light to heavy load use of the metric bearings to heavy load use of inch bearings. Each type is available in series with and without an inner ring, and both series are shown in the same bearing table. Types of solid needle roller bearings are shown in **Table 1**, while the composition of bearing numbers is shown in **Table 2**.

Among NSK solid needle roller bearings, the RNA, NA49, 59, 69 and 48 series follow the international dimension system that conforms to ISO standards.

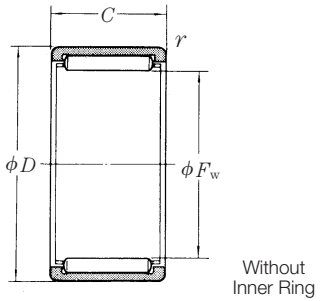
HJ, HJ + IR series of inch bearings are widely used globally and conform to the MIL standards of the U.S.A.

RLM and LM types are bearings whose section height is close to that of drawn cup needle bearings.

RLM • LM

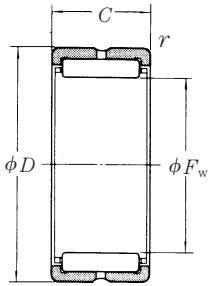
RNA • NA

Inscribed Circle Diameter 8 — 15 mm

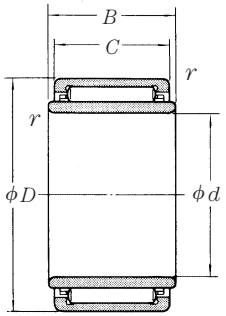


RLM

Without Inner Ring

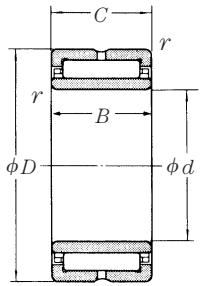


RNA



LM

With Inner Ring



NA

Boundary Dimensions (mm)				Basic Load Ratings (N)		{kgf}		Limiting Speeds (min⁻¹)
F_w	D	C	r min	C_r	C_{or}	C_r	C_{or}	Oil
8	15	10	0.15	4 300	3 800	440	390	60 000
	15	12	0.15	5 500	4 600	560	470	45 000
	15	15	0.3	6 550	5 800	670	590	45 000
	15	16	0.15	7 100	6 350	720	650	45 000
9	16	12	0.3	6 150	5 400	625	550	40 000
	16	16	0.3	7 900	7 450	805	760	40 000
	17	10	0.15	4 700	4 350	470	445	50 000
10	15	10	0.3	4 500	4 900	460	500	36 000
	17	10	0.3	5 350	4 650	545	470	36 000
	17	12	0.15	6 750	6 200	685	635	36 000
	17	15	0.3	8 050	7 800	820	795	36 000
	17	16	0.15	8 650	8 600	885	875	36 000
	19	11	0.2	6 550	6 000	670	615	48 000
12	17	12	0.3	6 150	7 650	625	780	30 000
	19	12	0.3	7 300	7 150	745	730	30 000
	19	15	0.3	8 700	8 950	885	915	30 000
	19	16	0.3	9 400	9 850	955	1 010	30 000
	19	20	0.3	12 000	13 500	1 220	1 380	30 000
	20	11	0.3	7 050	6 850	720	700	38 000
14	22	12	0.3	9 350	9 150	955	935	24 000
	22	13	0.3	9 150	9 950	930	1 010	32 000
	22	16	0.3	12 100	12 700	1 230	1 300	24 000
	22	16	0.3	11 600	13 600	1 190	1 390	32 000
	22	20	0.3	15 500	17 500	1 580	1 790	24 000
	22	22	0.3	16 300	20 900	1 660	2 130	32 000
15	20	8	0.3	4 050	4 800	415	490	24 000
	20	15	0.3	8 100	11 700	825	1 190	24 000
	20	20	0.3	11 100	17 400	1 130	1 770	24 000
	22	12	0.3	8 300	8 900	845	905	24 000
	22	15	0.3	9 900	11 100	1 010	1 140	24 000
	22	20	0.3	13 600	16 800	1 390	1 710	24 000
	23	16	0.3	12 300	14 800	1 250	1 510	24 000
	23	20	0.3	15 500	20 100	1 590	2 050	24 000

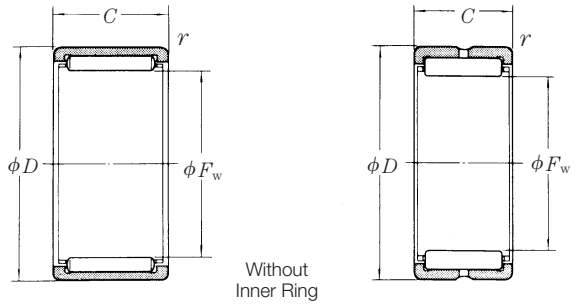
Remarks 1. For information on inner rings, refer to page B129.
2. If a full complement roller bearing is required, please contact NSK.

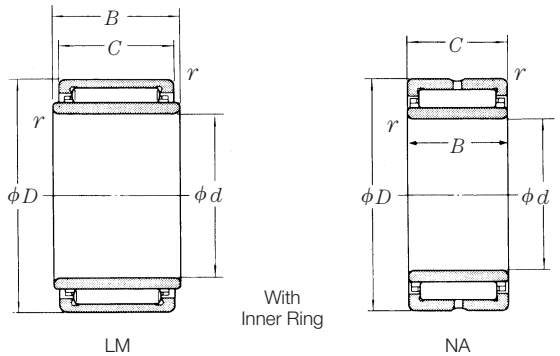
Bearing Numbers					Boundary Dimensions (mm)		Mass (kg) approx	
	Without Inner Ring			With Inner Ring				
RLM	RNA49	RNA59	RNA69	LM · NA	d	B	Without Inner Ring	With Inner Ring
	RNA496			—	—	—	0.0070	—
RLM81512-1				**LM81512-1**	5	12	0.0083	0.011
RLM815				—	—	—	0.010	—
RLM81516-1				**LM81516-1**	5	16	0.011	0.015
RLM912				**LM91612-1**	6	12	0.0092	0.013
RLM916				—	—	—	0.011	—
	RNA497			—	—	—	0.0091	—
RLM1010				—	—	—	0.0055	—
RLM101710				—	—	—	0.0082	—
RLM101712-1				**LM101712-1**	7	12	0.0097	0.014
RLM101715				—	—	—	0.012	—
RLM101716-1				**LM101716-1**	7	16	0.013	0.018
	RNA498			**NA498**	8	11	0.012	0.015
RLM1212				**LM1212**	8	12.2	0.0076	0.013
RLM121912				**LM121912**	8	12.2	0.011	0.017
RLM121915				**LM121915**	8	15.2	0.014	0.021
RLM121916-1				**LM121916-1**	9	16	0.014	0.022
RLM121920-1				—	—	—	0.018	—
	RNA499			**NA499**	9	11	0.013	0.017
RLM1412				—	—	—	0.014	—
	RNA4900			**NA4900**	10	13	0.016	0.024
RLM1416				**LM1416**	10	16.2	0.019	0.028
		RNA5900		**NA5900**	10	16	0.022	0.031
RLM1420				**LM1420**	10	20.2	0.024	0.036
			RNA6900	**NA6900**	10	22	0.027	0.040
RLM158				**LM158**	10	8.2	0.0061	0.012
RLM1515				**LM1515**	10	15.2	0.011	0.022
RLM1520				**LM1520**	10	20.2	0.015	0.030
RLM152212				**LM152212**	10	12.2	0.013	0.022
RLM152215				**LM152215**	10	15.2	0.016	0.027
RLM152220				**LM152220**	10	20.2	0.021	0.036
RLM152316-1				—	—	—	0.021	—
RLM152320-1				—	—	—	0.026	—

RLM • LM

RNA • NA

Inscribed Circle Diameter 16 — 21 mm





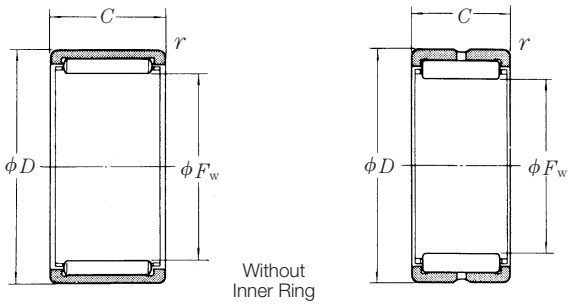
Boundary Dimensions (mm)				Basic Load Ratings (N)		{kgf}		Limiting Speeds (min⁻¹)	Bearing Numbers: Without Inner Ring			With Inner Ring	Boundary Dimensions (mm)		Mass (kg) approx	
F_w	D	C	r min	C_r	C_{or}	C_r	C_{or}	Oil	RLM	RNA49	RNA59	RNA69	LM · NA	d	B	Without Inner Ring	With Inner Ring
16	24	13	0.3	10 100	11 700	1 030	1 190	28 000		**RNA4901**			**NA4901**	12	13	0.018	0.027
	24	16	0.3	12 900	14 200	1 310	1 450	22 000	**RLM1616**				**LM1616**	12	16.2	0.021	0.032
	24	16	0.3	12 800	16 000	1 310	1 630	28 000			**RNA5901**		**NA5901**	12	16	0.024	0.035
	24	20	0.3	16 500	19 500	1 680	1 990	22 000	**RLM1620**				**LM1620**	12	20.2	0.027	0.041
	24	22	0.3	17 900	24 500	1 830	2 500	28 000				**RNA6901**	**NA6901**	12	22	0.030	0.045
17	22	10	0.3	5 850	7 950	595	810	20 000	**RLM1710**				**LM1710**	12	10.2	0.0080	0.017
	22	20	0.3	11 800	19 500	1 200	1 990	20 000	**RLM1720**				**LM1720**	12	20.2	0.016	0.034
	24	15	0.5	11 000	13 200	1 120	1 350	20 000	**RLM172415**				**LM172415**	12	15.2	0.018	0.032
	24	25	0.5	18 200	25 300	1 850	2 580	20 000	**RLM172425**				**LM172425**	12	25.2	0.030	0.052
	25	16	0.3	13 600	15 500	1 390	1 580	20 000	**RLM172516-1**				—	—	—	0.023	—
	25	20	0.3	16 200	21 900	1 650	2 230	20 000	**RLM172520-1**				—	—	—	0.029	—
18	25	15	0.5	11 500	14 300	1 170	1 450	20 000	**RLM1815**				**LM1815**	15	15.2	0.019	0.028
	25	17	0.5	13 300	17 200	1 350	1 750	20 000	**RLM1817**				**LM1817**	15	17.2	0.021	0.031
	25	20	0.5	15 800	21 500	1 610	2 190	20 000	**RLM1820**				**LM1820**	15	20.2	0.025	0.037
	25	25	0.5	19 000	27 300	1 940	2 780	20 000	**RLM1825**				**LM1825**	15	25.2	0.032	0.047
	26	13	0.3	10 500	12 700	1 070	1 290	24 000		**RNA49/14**			—	—	—	0.020	—
	26	16	0.3	12 700	16 200	1 300	1 650	20 000	**RLM182616-1**				—	—	—	0.024	—
	26	20	0.3	16 100	22 000	1 640	2 250	20 000	**RLM182620-1**				—	—	—	0.030	—
19	27	16	0.5	14 300	17 000	1 460	1 730	18 000	**RLM1916**				**LM1916**	15	16.2	0.025	0.039
	27	20	0.5	18 300	23 400	1 870	2 380	18 000	**RLM1920**				**LM1920**	15	20.2	0.031	0.048
20	27	10	0.5	7 950	9 150	810	930	18 000	**RLM2010**				**LM2010**	15	10.2	0.014	0.025
	27	15	0.5	11 900	15 400	1 220	1 570	18 000	**RLM2015**				**LM2015**	15	15.2	0.021	0.037
	27	20	0.5	16 400	23 200	1 670	2 370	18 000	**RLM2020**				**LM2020**	15	20.2	0.028	0.049
	27	20	0.5	16 400	23 200	1 670	2 370	18 000	**RLM2020**				**LM2020-1**	15	20	0.028	0.048
	27	25	0.5	19 800	29 500	2 010	3 000	18 000	**RLM2025**				**LM2025**	15	25.2	0.035	0.061
	28	13	0.3	10 800	13 600	1 100	1 390	22 000		**RNA4902**			**NA4902**	15	13	0.021	0.035
	28	16	0.3	14 400	19 700	1 470	2 010	18 000	**RLM202816-1**				—	—	—	0.026	—
	28	18	0.3	15 700	21 900	1 600	2 240	22 000			**RNA5902**		**NA5902**	15	18	0.032	0.051
	28	20	0.5	18 200	23 500	1 860	2 400	18 000	**RLM202820**				**LM202820**	15	20.2	0.033	0.055
	28	23	0.3	19 300	28 600	1 960	2 920	22 000				**RNA6902**	**NA6902**	15	23	0.039	0.064
21	29	16	0.5	14 900	18 500	1 520	1 880	17 000	**RLM2116**				**LM2116**	17	16.2	0.027	0.042
	29	20	0.5	19 100	25 400	1 950	2 590	17 000	**RLM2120**				**LM2120**	17	20.2	0.034	0.053

Remarks 1. For information on inner rings, refer to page B129.
2. If a full complement roller bearing is required, please contact NSK.

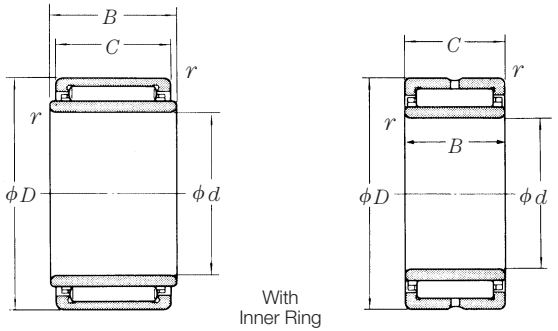
RLM • LM

RNA • NA

Inscribed Circle Diameter 22 — 29 mm



RLM RNA



LM NA

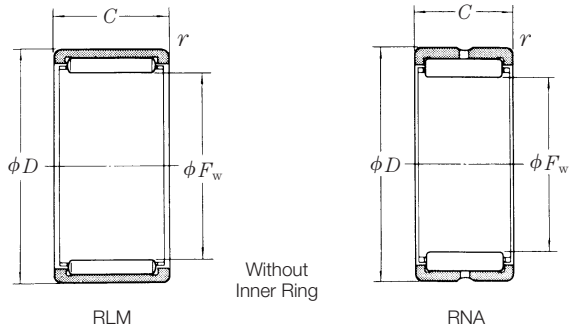
Boundary Dimensions (mm)				Basic Load Ratings (N)		{kgf}		Limiting Speeds (min⁻¹)	Bearing Numbers: Without Inner Ring			With Inner Ring	Boundary Dimensions (mm)		Mass (kg) approx	
F_w	D	C	r min	C_r	C_{or}	C_r	C_{or}	Oil	RLM	RNA49	RNA59	RNA69	LM · NA	d	B	Without Inner Ring	With Inner Ring
22	29	15	0.5	12 900	17 500	1 310	1 780	16 000	**RLM2215**				**LM2215**	17	15.2	0.023	0.041
	29	20	0.5	17 700	26 400	1 810	2 690	16 000	**RLM2220**				**LM2220**	17	20.2	0.030	0.054
	29	25	0.5	21 300	33 500	2 170	3 400	16 000	**RLM2225**				**LM2225**	17	25.2	0.038	0.068
	30	13	0.3	11 600	15 400	1 190	1 570	20 000		**RNA4903**			**NA4903**	17	13	0.023	0.038
	30	16	0.5	15 600	19 800	1 590	2 020	16 000	**RLM223016**				**LM223016**	17	16.2	0.028	0.045
	30	18	0.3	16 800	24 800	1 720	2 530	20 000			**RNA5903**		**NA5903**	17	18	0.034	0.055
	30	20	0.5	20 000	27 200	2 030	2 780	16 000	**RLM223020**				**LM223020**	17	20.2	0.035	0.060
	30	23	0.3	20 700	32 500	2 110	3 300	20 000				**RNA6903**	**NA6903**	17	23	0.041	0.068
24	31	20	0.5	18 200	28 100	1 860	2 870	15 000	**RLM2420**				**LM2420**	20	20.2	0.033	0.054
	31	28	0.5	23 700	39 500	2 420	4 000	15 000	**RLM2428**				**LM2428**	20	28.2	0.046	0.076
	32	16	0.5	16 100	21 300	1 650	2 170	15 000	**RLM243216**				**LM243216**	20	16.2	0.030	0.048
	32	20	0.5	20 700	29 200	2 110	2 980	15 000	**RLM243220**				**LM243220**	20	20.2	0.038	0.060
25	32	12	0.5	10 300	13 700	1 050	1 400	14 000	**RLM2512**				**LM2512**	20	12.2	0.020	0.036
	32	20	0.5	18 800	29 700	1 920	3 050	14 000	**RLM2520**				**LM2520**	20	20.2	0.034	0.061
	32	25	0.5	22 700	37 500	2 310	3 850	14 000	**RLM2525**				**LM2525**	20	25.2	0.042	0.076
	33	16	0.5	16 800	22 600	1 710	2 300	14 000	**RLM253316-1**				—	—	—	0.032	—
	33	20	0.5	21 500	31 000	2 190	3 150	14 000	**RLM253320**				**LM253320**	20	20.2	0.040	0.068
	33	25	0.5	25 900	39 500	2 640	4 050	14 000	**RLM253325**				**LM253325**	20	25.2	0.050	0.085
	37	17	0.3	19 700	22 900	2 010	2 340	18 000		**RNA4904**			**NA4904**	20	17	0.055	0.077
	37	23	0.3	27 800	35 500	2 830	3 650	18 000			**RNA5904**		**NA5904**	20	23	0.089	0.12
	37	30	0.3	36 500	50 500	3 700	5 150	18 000				**RNA6904**	**NA6904**	20	30	0.098	0.14
26	34	20	0.5	21 400	31 000	2 180	3 200	13 000	**RLM2620**				**LM2620**	22	16.2	0.041	0.065
28	35	20	0.5	19 900	33 000	2 030	3 350	12 000	**RLM2820**				**LM2820**	22	20.2	0.038	0.062
	35	25	0.3	23 900	42 000	2 440	4 250	12 000	**RLM2825**				**LM2825**	22	25.2	0.047	0.092
	37	20	0.5	24 200	33 500	2 460	3 450	12 000	**RLM283720**				**LM283720**	22	20.2	0.050	0.087
	37	30	0.5	34 000	52 500	3 450	5 350	12 000	**RLM283730**				**LM283730**	22	30.2	0.075	0.13
	39	17	0.3	22 400	30 500	2 290	3 150	15 000		**RNA49/22**			**NA49/22**	22	17	0.056	0.086
	39	23	0.3	28 300	41 500	2 890	4 200	15 000			**RNA59/22**		**NA59/22**	22	23	0.091	0.135
	39	30	0.3	37 000	58 500	3 800	6 000	15 000				**RNA69/22**	**NA69/22**	22	30	0.096	0.15
29	38	20	0.5	25 100	36 000	2 560	3 650	12 000	**RLM2920**				**LM2920**	25	20.2	0.052	0.079
	38	20	0.5	23 400	36 500	2 390	3 700	12 000	**RLM293820-1**				**LM293820-1**	25	20	0.052	0.078
	38	30	0.5	35 500	55 500	3 600	5 650	12 000	**RLM2930**				**LM2930**	25	30.2	0.078	0.118
	38	30	0.3	32 000	54 000	3 250	5 550	12 000	**RLM293830**				**LM293830**	25	30.2	0.078	0.117

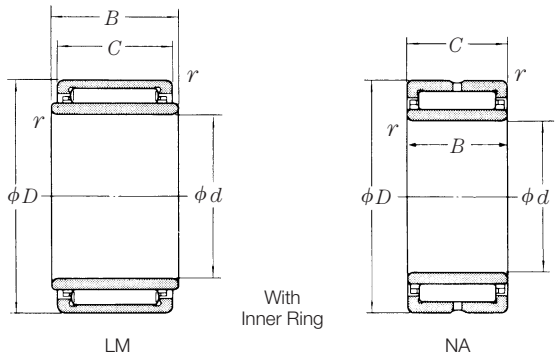
Remarks 1. For information on inner rings, refer to page B129.
2. If a full complement roller bearing is required, please contact NSK.

RLM • LM

RNA • NA

Inscribed Circle Diameter 30 — 38 mm





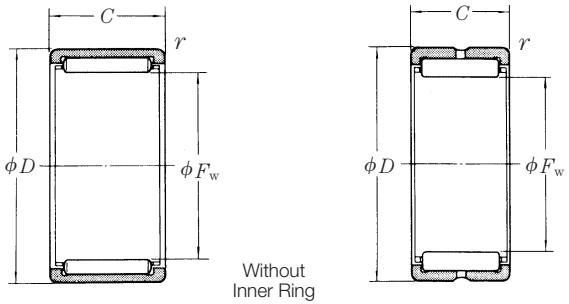
Boundary Dimensions (mm)				Basic Load Ratings (N)		{kgf}		Limiting Speeds (min⁻¹)	Bearing Numbers: Without Inner Ring			With Inner Ring	Boundary Dimensions (mm)		Mass (kg) approx	
F_w	D	C	r min	C_r	C_{or}	C_r	C_{or}	Oil	RLM	RNA49	RNA59	RNA69	LM · NA	d	B	Without Inner Ring	With Inner Ring
30	37	15	0.5	14 800	23 000	1 500	2 340	12 000	**RLM3015**				**LM3015**	25	15.2	0.030	0.055
	37	20	0.5	20 300	34 500	2 070	3 550	12 000	**RLM3020**				**LM3020**	25	20.2	0.040	0.073
	37	25	0.5	24 500	44 000	2 490	4 500	12 000	**RLM3025**				**LM3025**	25	25.2	0.050	0.092
	40	20	0.5	25 000	36 000	2 550	3 650	12 000	**RLM304020**				**LM304020**	25	20.2	0.060	0.093
	40	25	0.5	30 000	46 000	3 100	4 650	12 000	**RLM304025**				**LM304025**	25	25.2	0.075	0.12
	40	30	0.5	35 000	56 000	3 600	5 700	12 000	**RLM304030**				**LM304030**	25	30.2	0.090	0.14
	42	17	0.3	21 400	26 800	2 180	2 740	14 000		**RNA4905**			**NA4905**	25	17	0.063	0.091
	42	23	0.3	30 000	41 500	3 100	4 250	14 000			**RNA5905**		**NA5905**	25	23	0.10	0.14
	42	30	0.3	39 500	59 000	4 050	6 050	14 000				**RNA6905**	**NA6905**	25	30	0.11	0.16
32	42	20	0.5	25 800	38 000	2 630	3 900	11 000	**RLM3220**				**LM3220**	28	20.2	0.064	0.090
	42	30	0.5	36 500	59 000	3 700	6 050	11 000	**RLM3230**				**LM3230**	28	30.2	0.096	0.14
	45	17	0.3	22 200	28 700	2 270	2 930	13 000		**RNA49/28**			**NA49/28**	28	17	0.076	0.099
	45	23	0.3	31 500	44 500	3 200	4 550	13 000			**RNA59/28**		**NA59/28**	28	23	0.11	0.145
	45	30	0.3	41 000	63 500	4 200	6 450	13 000				**RNA69/28**	**NA69/28**	28	30	0.13	0.175
35	42	20	0.5	22 300	41 000	2 270	4 200	10 000	**RLM3520**				**LM3520**	30	20.2	0.046	0.085
	42	30	0.5	31 000	63 500	3 200	6 450	10 000	**RLM3530**				**LM3530**	30	30.2	0.070	0.13
	45	20	0.5	27 500	42 500	2 800	4 350	10 000	**RLM354520**				**LM354520**	30	20.2	0.069	0.11
	45	25	0.5	33 000	54 500	3 400	5 550	10 000	**RLM354525**				**LM354525**	30	25.2	0.086	0.135
	45	30	0.5	38 500	66 000	3 950	6 750	10 000	**RLM354530**				**LM354530**	30	30.2	0.10	0.16
	47	17	0.3	23 900	32 500	2 430	3 300	12 000		**RNA4906**			**NA4906**	30	17	0.072	0.105
	47	23	0.3	33 500	50 500	3 450	5 150	12 000			**RNA5906**		**NA5906**	30	23	0.11	0.15
	47	30	0.3	44 000	71 500	4 500	7 300	12 000				**RNA6906**	**NA6906**	30	30	0.13	0.19
37	47	20	0.6	28 200	45 000	2 880	4 550	9 500	**RLM3720**				**LM3720**	32	20.3	0.072	0.115
	47	30	0.6	39 500	69 500	4 050	7 100	9 500	**RLM3730**				**LM3730**	32	30.3	0.11	0.175
	47	30	0.6	39 500	69 500	4 050	7 100	9 500	**RLM374730-1**				**LM374730-1**	32	30	0.11	0.17
38	48	15	0.6	20 900	30 500	2 130	3 150	9 000	**RLM3815**				**LM3815**	32	15.3	0.056	0.094
	48	20	0.6	29 000	47 000	2 960	4 800	9 000	**RLM3820**				**LM3820**	32	20.3	0.074	0.125
	48	25	0.6	35 000	60 000	3 600	6 100	9 000	**RLM3825**				**LM3825**	32	25.3	0.093	0.16
	48	30	0.6	41 000	73 000	4 150	7 450	9 000	**RLM3830**				**LM3830**	32	30.3	0.11	0.195

Remarks 1. For information on inner rings, refer to page B129.
2. If a full complement roller bearing is required, please contact NSK.

RLM • LM

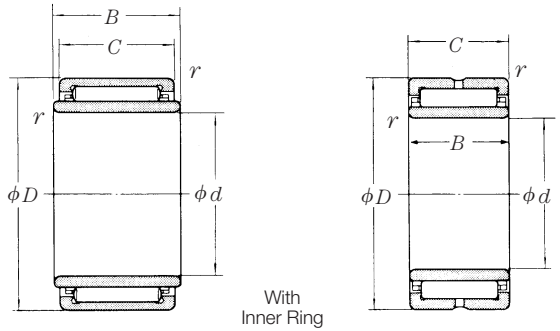
RNA • NA

Inscribed Circle Diameter 40 — 50 mm



Without Inner Ring

RLM RNA



With Inner Ring

LM NA

Boundary Dimensions (mm)				Basic Load Ratings (N)		{kgf}		Limiting Speeds (min⁻¹)
F_w	D	C	r min	C_r	C_{or}	C_r	C_{or}	Oil
40	50	15	0.6	21 400	32 000	2 180	3 300	9 000
	50	20	0.6	29 700	49 000	3 050	5 000	9 000
	50	20	0.6	29 700	49 000	3 050	5 000	9 000
	50	25	0.6	36 000	62 500	3 650	6 400	9 000
	50	30	0.6	42 000	76 500	4 250	7 800	9 000
	52	20	0.6	29 900	45 000	3 050	4 600	10 000
	52	27	0.6	40 500	66 000	4 100	6 750	10 000
	52	36	0.6	56 000	101 000	5 700	10 300	10 000
42	52	20	0.3	32 000	54 500	3 250	5 600	8 500
	52	30	0.3	44 500	84 500	4 550	8 600	8 500
	55	20	0.6	30 500	47 500	3 100	4 800	10 000
	55	27	0.6	41 500	69 500	4 200	7 100	10 000
	55	36	0.6	57 500	106 000	5 850	10 900	10 000
43	53	20	0.3	32 000	55 000	3 250	5 600	8 000
	53	30	0.3	44 500	84 500	4 550	8 600	8 000
45	55	20	0.6	31 000	53 500	3 150	5 500	8 000
	55	25	0.6	37 500	68 500	3 800	7 000	8 000
	55	30	0.6	43 500	83 500	4 450	8 500	8 000
	58	20	0.6	34 000	56 000	3 500	5 700	9 500
47	57	20	0.3	33 000	59 500	3 350	6 050	7 500
	57	30	0.3	46 500	91 500	4 700	9 350	7 500
48	62	22	0.6	39 000	61 500	3 950	6 300	9 000
	62	30	0.6	54 500	95 000	5 550	9 700	9 000
	62	40	0.6	72 000	137 000	7 350	13 900	9 000
50	60	20	0.6	33 000	60 500	3 350	6 150	7 100
	60	30	0.6	46 500	94 000	4 750	9 550	7 100
	62	20	0.6	35 500	60 500	3 600	6 150	7 100
	62	25	0.6	43 000	77 500	4 400	7 900	7 100
	62	25	0.6	43 000	77 500	4 400	7 900	7 100
	62	30	0.6	50 000	94 500	5 100	9 600	7 100
	62	35	0.6	66 500	136 000	6 800	13 900	7 100
	65	22	0.6	43 000	72 000	4 400	7 300	8 500

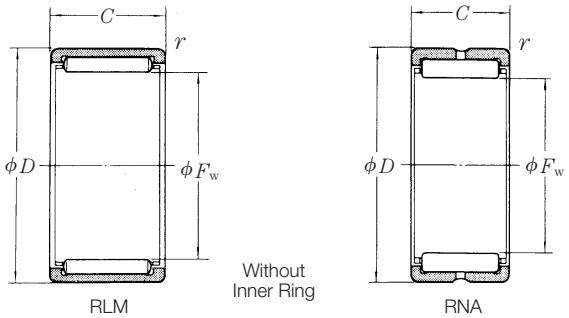
Remarks 1. For information on inner rings, refer to page B129.
2. If a full complement roller bearing is required, please contact NSK.

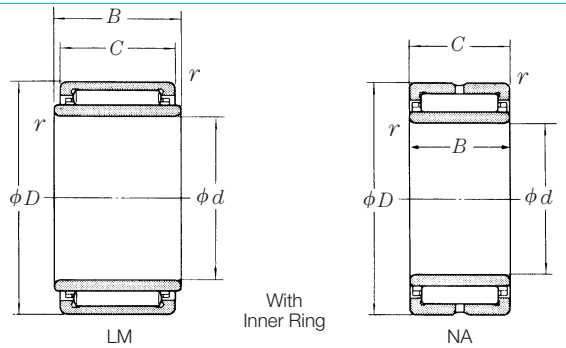
Bearing Numbers					Boundary Dimensions (mm)		Mass (kg) approx	
Without Inner Ring				With Inner Ring				
RLM	RNA49	RNA59	RNA69	LM · NA	d	B	Without Inner Ring	With Inner Ring
RLM4015				**LM4015**	35	15.3	0.058	0.092
RLM4020				**LM4020**	35	20.3	0.078	0.125
RLM405020-1				**LM405020-1**	35	20	0.125	0.125
RLM4025				**LM4025**	35	25.3	0.097	0.155
RLM4030				**LM4030**	35	30.3	0.12	0.19
	RNA49/32			**NA49/32**	32	20	0.092	0.16
		RNA59/32		**NA59/32**	32	27	0.15	0.24
			RNA69/32	**NA69/32**	32	36	0.17	0.29
RLM425220-1				—	—	—	0.081	—
RLM425230-1				—	—	—	0.12	—
	RNA4907			**NA4907**	35	20	0.11	0.17
		RNA5907		**NA5907**	35	27	0.175	0.25
			RNA6907	**NA6907**	35	36	0.20	0.315
RLM435320-1				**LM435320-1**	38	20	0.082	0.132
RLM435330-1				**LM435330-1**	38	30	0.125	0.199
RLM4520				**LM4520**	40	20.3	0.086	0.14
RLM4525				**LM4525**	40	25.3	0.11	0.17
RLM4530				**LM4530**	40	30.3	0.13	0.21
	RNA49/38			—	—	—	0.12	—
RLM475720-1				**LM475720-1**	42	20	0.089	0.12
RLM475730-1				**LM475730-1**	42	30	0.14	0.22
	RNA4908			**NA4908**	40	22	0.15	0.24
		RNA5908		**NA5908**	40	30	0.23	0.355
			RNA6908	**NA6908**	40	40	0.265	0.435
RLM5020				**LM5020**	42	20.3	0.098	0.19
RLM5030				**LM5030**	42	30.3	0.15	0.28
RLM506220				**LM506220**	42	20.3	0.12	0.21
RLM506225				**LM506225**	42	25.3	0.155	0.265
RLM506225				**LM506225-1**	45	25	0.155	0.22
RLM506230				**LM506230**	42	30.3	0.18	0.315
RLM506235-1				**LM506235-1**	45	35	0.21	0.31
	RNA49/42			—	—	—	0.17	—

RLM • LM

RNA • NA

Inscribed Circle Diameter 52 — 73 mm





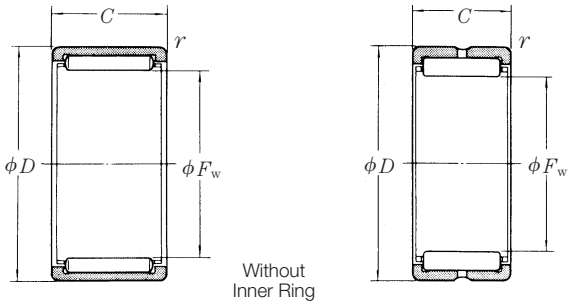
Boundary Dimensions (mm)				Basic Load Ratings (N)		{kgf}		Limiting Speeds (min^{-1})	Bearing Numbers: Without Inner Ring				With Inner Ring	Boundary Dimensions (mm)		Mass (kg) approx	
F_w	D	C	r min	C_r	C_{or}	C_r	C_{or}	Oil	RLM	RNA49	RNA59	RNA69	LM · NA	d	B	Without Inner Ring	With Inner Ring
52	68	22	0.6	41 000	67 500	4 150	6 900	8 000		**RNA4909**			**NA4909**	45	22	0.19	0.28
	68	30	0.6	57 000	104 000	5 800	10 600	8 000			**RNA5909**		**NA5909**	45	30	0.27	0.39
	68	40	0.6	76 000	149 000	7 750	15 200	8 000				**RNA6909**	**NA6909**	45	40	0.335	0.495
55	65	30	0.6	49 000	104 000	5 000	10 600	6 300	**RLM5530**				**LM5530**	45	30.3	0.16	0.34
	65	40	0.6	64 000	146 000	6 550	14 900	6 300	**RLM5540**				**LM5540**	45	40.3	0.215	0.46
	67	20	0.6	38 000	68 000	3 850	6 900	6 300	**RLM556720**				**LM556720**	45	20.3	0.13	0.25
	67	25	0.6	46 000	87 000	4 700	8 850	6 300	**RLM556725**				**LM556725**	45	25.3	0.165	0.32
	68	25	0.5	48 000	92 500	4 900	9 450	6 300	**RLM556825-1**				**LM556825-1**	50	25	0.18	0.27
	68	35	0.3	63 500	132 000	6 500	13 500	6 300	**RLM556835-1**				**LM556835-1**	50	35	0.25	0.37
	70	22	0.6	45 000	78 000	4 600	7 950	7 500		**RNA49/48**			—	—	—	0.18	—
58	72	22	0.6	42 500	73 500	4 350	7 500	7 100		**RNA4910**			**NA4910**	50	22	0.18	0.295
	72	30	0.6	59 500	113 000	6 050	11 500	7 100			**RNA5910**		**NA5910**	50	30	0.25	0.405
	72	40	0.6	79 000	163 000	8 050	16 600	7 100				**RNA6910**	**NA6910**	50	40	0.32	0.53
60	70	40	0.6	66 000	156 000	6 750	15 900	6 000	**RLM6040**				**LM6040**	50	40.3	0.235	0.505
	72	25	0.3	50 000	99 500	5 100	10 100	6 000	**RLM607225**				**LM607225-1**	55	25	0.175	0.26
	72	30	0.6	58 000	120 000	5 900	12 300	6 000	**RLM607230**				**LM607230**	50	30.3	0.21	0.41
	72	35	0.3	65 500	142 000	6 700	14 400	6 000	**RLM607235-1**				**LM607235-1**	55	35	0.245	0.37
	72	40	0.6	73 000	162 000	7 450	16 600	6 000	**RLM607240**				**LM607240**	50	40.3	0.28	0.545
	75	22	0.6	48 000	87 500	4 900	8 900	7 100		**RNA49/52**			—	—	—	0.20	—
63	80	25	1	53 500	87 500	5 450	8 950	6 700		**RNA4911**			**NA4911**	55	25	0.26	0.40
	80	34	1	73 500	133 000	7 500	13 600	6 700			**RNA5911**		**NA5911**	55	34	0.37	0.56
	80	45	1	93 500	181 000	9 550	18 500	6 700				**RNA6911**	**NA6911**	55	45	0.475	0.73
65	78	35	0.6	67 500	151 000	6 900	15 400	5 300	**RLM657835-1**				—	—	—	0.29	—
	82	25	1	60 500	105 000	6 200	10 700	6 300		**RNA49/58**			—	—	—	0.27	—
68	82	25	0.6	56 500	112 000	5 750	11 500	5 000	**RLM688225-1**				**LM688225-1**	60	25	0.23	0.39
	82	35	0.6	78 000	169 000	7 950	17 300	5 000	**RLM688235-1**				**LM688235-1**	60	35	0.325	0.54
	85	25	1	56 000	95 500	5 700	9 750	6 300		**RNA4912**			**NA4912**	60	25	0.28	0.435
	85	34	1	77 500	145 000	7 900	14 800	6 300			**RNA5912**		**NA5912**	60	34	0.415	0.625
	85	45	1	98 000	197 000	10 000	20 100	6 300				**RNA6912**	**NA6912**	60	45	0.485	0.76
70	88	25	1	63 000	113 000	6 450	11 500	6 000		**RNA49/62**			—	—	—	0.31	—
72	90	25	1	58 500	103 000	5 950	10 500	5 600		**RNA4913**			**NA4913**	65	25	0.32	0.465
	90	34	1	81 000	157 000	8 250	16 000	5 600			**RNA5913**		**NA5913**	65	34	0.48	0.675
	90	45	1	103 000	213 000	10 500	21 800	5 600				**RNA6913**	**NA6913**	65	45	0.53	0.79
73	90	25	1	64 500	117 000	6 550	12 000	4 800	**RLM739025-1**				—	—	—	0.305	—
	90	35	1	88 500	177 000	9 000	18 000	4 800	**RLM739035-1**				**LM739035-1**	65	35	0.43	0.67

Remarks 1. For information on inner rings, refer to page B129.
2. If a full complement roller bearing is required, please contact NSK.

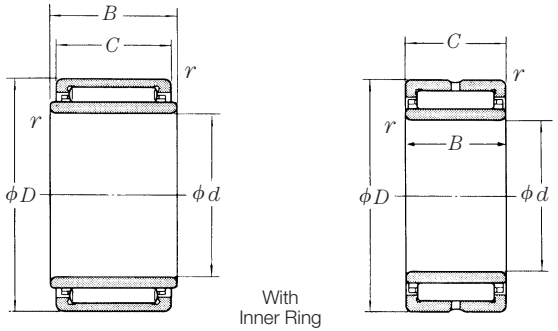
RLM • LM

RNA • NA

Inscribed Circle Diameter 75 — 115 mm



RLM RNA



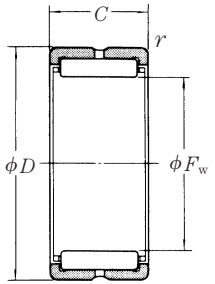
LM NA

Boundary Dimensions (mm)				Basic Load Ratings (N)		{kgf}		Limiting Speeds (min⁻¹)	Bearing Numbers					Boundary Dimensions (mm)		Mass (kg) approx	
									Without Inner Ring				With Inner Ring				
F_w	D	C	r min	C_r	C_{or}	C_r	C_{or}	Oil	RLM	RNA49	RNA59	RNA69	LM · NA	d	B	Without Inner Ring	With Inner Ring
75	92	25	1	64 000	118 000	6 550	12 000	4 800	**RLM759225-1**				—	—	—	0.315	—
	92	35	1	88 000	177 000	8 950	18 100	4 800	**RLM759235-1**				—	—	—	0.44	—
	95	30	1	83 500	148 000	8 550	15 100	5 600		**RNA49/68**			—	—	—	0.46	—
80	95	25	1	62 500	125 000	6 400	12 800	4 500	**RLM809525-1**				**LM809525-1**	70	25	0.29	0.52
	95	35	1	86 000	189 000	8 800	19 200	4 500	**RLM809535-1**				**LM809535-1**	70	35	0.405	0.73
	100	30	1	80 500	143 000	8 200	14 600	5 300		**RNA4914**			**NA4914**	70	30	0.47	0.74
	100	40	1	107 000	206 000	10 900	21 000	5 300			**RNA5914**		**NA5914**	70	40	0.69	1.05
	100	54	1	143 000	298 000	14 500	30 500	5 300				**RNA6914**	**NA6914**	70	54	0.89	1.4
85	105	25	1	79 000	143 000	8 100	14 600	4 000	**RLM8510525-1**				**LM8510525-1**	75	25	0.42	0.67
	105	30	1	84 000	155 000	8 600	15 800	5 000		**RNA4915**			**NA4915**	75	30	0.50	0.79
	105	35	1	109 000	215 000	11 100	21 900	4 000	**RLM8510535-1**				**LM8510535-1**	75	35	0.59	0.93
	105	40	1	112 000	222 000	11 400	22 700	5 000			**RNA5915**		**NA5915**	75	40	0.735	1.1
	105	54	1	149 000	325 000	15 200	33 000	5 000				**RNA6915**	**NA6915**	75	54	0.96	1.5
90	110	25	1	82 500	154 000	8 400	15 700	4 000	**RLM9011025-1**				**LM9011025-1**	80	25	0.44	0.70
	110	30	1	87 500	166 000	8 950	17 000	4 500		**RNA4916**			**NA4916**	80	30	0.53	0.835
	110	40	1	116 000	239 000	11 900	24 400	4 500			**RNA5916**		**NA5916**	80	40	0.75	1.15
	110	54	1	155 000	345 000	15 900	35 500	4 500				**RNA6916**	**NA6916**	80	54	0.99	1.55
95	115	26	1	85 500	164 000	8 700	16 700	3 600	**RLM9511526-1**				**LM9511526-1**	85	26	0.48	0.75
	115	30	1	95 500	189 000	9 750	19 300	4 300		**RNA49/82**			—	—	—	0.57	—
100	120	26	1	86 000	168 000	8 750	17 100	3 600	**RLM10012026-1**				**LM10012026-1**	90	26	0.505	0.81
	120	35	1.1	104 000	214 000	10 600	21 800	4 000		**RNA4917**			**NA4917**	85	35	0.68	1.25
	120	46	1.1	138 000	310 000	14 100	31 500	4 000			**RNA5917**		**NA5917**	85	46	0.99	1.75
	120	63	1.1	174 000	415 000	17 800	42 500	4 000				**RNA6917**	**NA6917**	85	63	1.2	2.25
105	125	35	1.1	108 000	228 000	11 000	23 300	4 000		**RNA4918**			**NA4918**	90	35	0.72	1.35
	125	46	1.1	143 000	330 000	14 600	33 500	4 000			**RNA5918**		**NA5918**	90	46	1.05	1.85
	125	63	1.1	181 000	445 000	18 400	45 000	4 000				**RNA6918**	**NA6918**	90	63	1.35	2.45
110	130	30	1	101 000	213 000	10 300	21 800	3 200	**RLM11013030-1**				—	—	—	0.635	—
	130	35	1.1	111 000	242 000	11 400	24 700	3 800		**RNA4919**			**NA4919**	95	35	0.74	1.4
	130	40	1	134 000	305 000	13 700	31 500	3 200	**RLM11013040-1**				—	—	—	0.85	—
	130	46	1.1	148 000	350 000	15 100	35 500	3 800			**RNA5919**		**NA5919**	95	46	1.15	2.0
	130	63	1.1	187 000	470 000	19 100	48 000	3 800				**RNA6919**	**NA6919**	95	63	1.5	2.65
115	140	40	1.1	144 000	295 000	14 700	30 000	3 600		**RNA4920**			**NA4920**	100	40	1.15	1.95
	140	54	1.1	193 000	430 000	19 700	43 500	3 600			**RNA5920**		**NA5920**	100	54	1.8	2.85

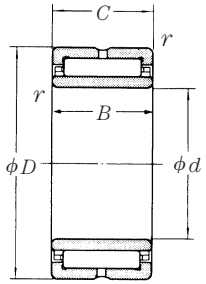
Remarks 1. For information on inner rings, refer to page B129.
2. If a full complement roller bearing is required, please contact NSK.

RNA • NA

Inscribed Circle Diameter 120 — 265 mm



RNA



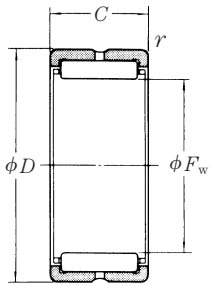
NA

Boundary Dimensions (mm)				Basic Load Ratings (N)		{kgf}		Limiting Speeds (min^{-1})	Bearing Numbers				Boundary Dimensions (mm)	Mass (kg) approx	
									Without Inner Ring			With Inner Ring			
F_w	D	B, C	r min	C_r	C_{or}	C_r	C_{or}	Oil	RNA48	RNA49	RNA59	NA	d	Without Inner Ring	With Inner Ring
120	140	30	1	99 500	214 000	10 100	21 900	3 400	**RNA4822**			**NA4822**	110	0.67	1.1
125	150	40	1.1	149 000	315 000	15 200	32 500	3 200		**RNA4922**		**NA4922**	110	1.25	2.1
	150	54	1.1	200 000	460 000	20 300	47 000	3 200			**RNA5922**	**NA5922**	110	1.95	3.05
130	150	30	1	105 000	238 000	10 700	24 300	3 200	**RNA4824**			**NA4824**	120	0.71	1.15
135	165	45	1.1	192 000	395 000	19 600	40 500	3 000		**RNA4924**		**NA4924**	120	1.9	2.9
	165	60	1.1	253 000	565 000	25 800	58 000	3 000			**RNA5924**	**NA5924**	120	2.7	4.05
145	165	35	1.1	127 000	315 000	12 900	32 000	2 800	**RNA4826**			**NA4826**	130	0.92	1.8
150	180	50	1.5	228 000	515 000	23 200	52 500	2 800		**RNA4926**		**NA4926**	130	2.3	4.0
	180	67	1.5	299 000	725 000	30 500	74 000	2 800			**RNA5926**	**NA5926**	130	3.3	5.55
155	175	35	1.1	133 000	340 000	13 600	35 000	2 600	**RNA4828**			**NA4828**	140	0.98	1.9
160	190	50	1.5	235 000	545 000	24 000	55 500	2 600		**RNA4928**		**NA4928**	140	2.45	4.25
	190	67	1.5	310 000	775 000	31 500	79 000	2 600			**RNA5928**	**NA5928**	140	3.55	6.0
165	190	40	1.1	180 000	440 000	18 300	45 000	2 400	**RNA4830**			**NA4830**	150	1.6	2.75
170	210	60	2	315 000	645 000	32 000	66 000	2 400		**RNA4930**		**NA4930**	150	3.9	6.25
175	200	40	1.1	184 000	465 000	18 700	47 000	2 200	**RNA4832**			**NA4832**	160	1.75	2.95
180	220	60	2	325 000	695 000	33 500	71 000	2 200		**RNA4932**		**NA4932**	160	4.1	6.6
185	215	45	1.1	224 000	540 000	22 900	55 000	2 200	**RNA4834**			**NA4834**	170	2.55	4.0
190	230	60	2	340 000	745 000	34 500	76 000	2 200		**RNA4934**		**NA4934**	170	4.3	6.95
195	225	45	1.1	230 000	565 000	23 500	58 000	2 000	**RNA4836**			**NA4836**	180	2.65	4.2
205	250	69	2	400 000	940 000	41 000	96 000	2 000		**RNA4936**		**NA4936**	180	6.2	10
210	240	50	1.5	268 000	705 000	27 300	72 000	1 900	**RNA4838**			**NA4838**	190	3.2	5.6
215	260	69	2	415 000	1 000 000	42 000	102 000	1 900		**RNA4938**		**NA4938**	190	6.45	10.5
220	250	50	1.5	274 000	740 000	27 900	75 500	1 800	**RNA4840**			**NA4840**	200	3.35	5.9
225	280	80	2.1	525 000	1 140 000	53 500	116 000	1 900		**RNA4940**		**NA4940**	200	9.7	15
240	270	50	1.5	286 000	805 000	29 100	82 000	1 700	**RNA4844**			**NA4844**	220	3.65	6.45
245	300	80	2.1	545 000	1 230 000	55 500	125 000	1 700		**RNA4944**		**NA4944**	220	10	15.5
265	300	60	2	375 000	1 070 000	38 500	109 000	1 500	**RNA4848**			**NA4848**	240	5.45	10
	320	80	2.1	590 000	1 400 000	60 500	142 000	1 600		**RNA4948**		**NA4948**	240	11.5	17.5

Remarks 1. For information on inner rings, refer to page B129.
2. If a full complement roller bearing is required, please contact NSK.

RNA • NA

Inscribed Circle Diameter 285 — 490 mm



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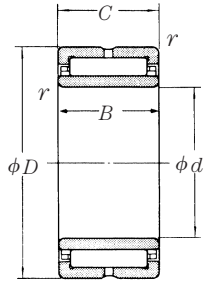


NA

Boundary Dimensions (mm)				Basic Load Ratings (N)		{kgf}		Limiting Speeds (min^{-1})	Bearing Numbers				Boundary Dimensions (mm)	Mass (kg) approx	
									Without Inner Ring			With Inner Ring			
F_w	D	B, C	r min	C_r	C_{or}	C_r	C_{or}	Oil	RNA48	RNA49	RNA59	NA	d	Without Inner Ring	With Inner Ring
285	320	60	2	395 000	1 160 000	40 000	118 000	1 400	**RNA4852**			**NA4852**	260	5.9	11
290	360	100	2.1	870 000	1 910 000	88 500	194 000	1 400		**RNA4952**		**NA4952**	260	19.5	29.5
305	350	69	2	510 000	1 390 000	52 000	142 000	1 300	**RNA4856**			**NA4856**	280	9.5	15.5
310	380	100	2.1	905 000	2 050 000	92 500	209 000	1 300		**RNA4956**		**NA4956**	280	20.5	31
330	380	80	2.1	660 000	1 810 000	67 500	185 000	1 200	**RNA4860**			**NA4860**	300	13	22
340	420	118	3	1 150 000	2 630 000	117 000	269 000	1 200		**RNA4960**		**NA4960**	300	30	48.5
350	400	80	2.1	675 000	1 900 000	69 000	194 000	1 100	**RNA4864**			**NA4864**	320	13.5	23.5
360	440	118	3	1 190 000	2 820 000	122 000	288 000	1 100		**RNA4964**		**NA4964**	320	32	51.5
370	420	80	2.1	690 000	1 990 000	70 500	203 000	1 100	**RNA4868**			**NA4868**	340	14	24.5
380	460	118	3	1 240 000	3 000 000	126 000	305 000	1 100		**RNA4968**		**NA4968**	340	33.5	54
390	440	80	2.1	705 000	2 080 000	72 000	212 000	1 000	**RNA4872**			**NA4872**	360	15	26
400	480	118	3	1 280 000	3 200 000	130 000	325 000	1 000		**RNA4972**		**NA4972**	360	35.5	57
415	480	100	2.1	1 030 000	2 940 000	105 000	299 000	1 000	**RNA4876**			**NA4876**	380	25.5	42.5
430	520	140	4	1 550 000	3 750 000	158 000	385 000	950		**RNA4976**		**NA4976**	380	50.5	85.5
450	540	140	4	1 600 000	4 000 000	164 000	410 000	900		**RNA4980**		**NA4980**	400	52.5	89
470	560	140	4	1 660 000	4 250 000	170 000	435 000	900		**RNA4984**		**NA4984**	420	54.5	92.5
490	600	160	4	1 980 000	4 750 000	202 000	485 000	850		**RNA4988**		**NA4988**	440	81.5	125

Remarks 1. For information on inner rings, refer to page B129.
2. If a full complement roller bearing is required, please contact NSK.

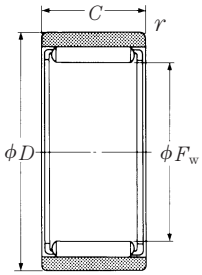
RNAF (**Single-Row, Without Inner Ring**)

RNAFW (**Double-Row, Without Inner Ring**)

NAF (**Single-Row, With Inner Ring**)

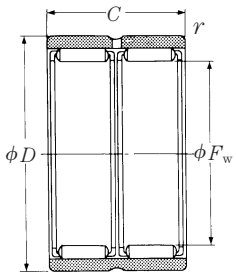
NAFW (**Double-Row, With Inner Ring**)

Inscribed Circle Diameter 10 — 30 mm

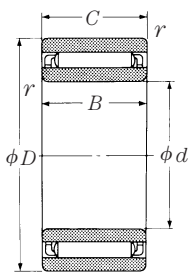


RNAF

Without Inner Ring

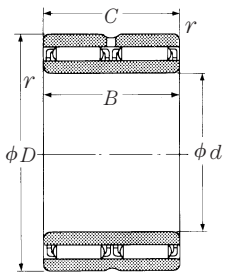


RNAFW



NAF

With Inner Ring



NAFW

Boundary Dimensions (mm)				Basic Load Ratings (N)		{kgf}		Limiting Speeds (min⁻¹)	Bearing Numbers	Boundary Dimensions (mm)		Bearing Numbers	Mass (kg) approx	
F_w	D	C	r min	C_r	C_{or}	C_r	C_{or}	Oil	Without Inner Ring	d	B	With Inner Ring	Without Inner Ring	With Inner Ring
10	17	10	0.3	3 950	4 300	405	435	45 000	**RNAF 101710**	—	—	—	0.010	—
	20	12	0.3	7 700	6 650	785	680	48 000	**RNAF 102012**	—	—	—	0.018	—
12	22	12	0.3	9 150	8 650	935	885	38 000	**RNAF 122212**	—	—	—	0.021	—
14	22	13	0.3	8 050	9 750	820	995	32 000	**RNAF 142213**	10	13	**NAF 102213**	0.019	0.027
	22	20	0.3	11 400	15 200	1 160	1 550	32 000	**RNAFW 142220**	10	20	**NAFW 102220**	0.030	0.042
	26	12	0.3	9 850	9 800	1 010	1 000	32 000	**RNAF 142612**	10	12	**NAF 102612**	0.027	0.034
15	23	13	0.3	8 400	10 500	860	1 070	28 000	**RNAF 152313**	—	—	—	0.021	—
	23	20	0.3	12 100	16 800	1 230	1 710	28 000	**RNAFW 152320**	—	—	—	0.032	—
16	24	13	0.3	8 800	11 300	895	1 150	26 000	**RNAF 162413**	12	13	**NAF 122413**	0.022	0.031
	24	20	0.3	12 600	18 000	1 290	1 840	26 000	**RNAFW 162420**	12	20	**NAFW 122420**	0.034	0.048
	28	12	0.3	10 500	10 900	1 070	1 120	28 000	**RNAF 162812**	12	12	**NAF 122812**	0.032	0.040
17	25	13	0.3	10 200	14 000	1 040	1 420	26 000	**RNAF 172513**	—	—	—	0.022	—
	25	20	0.3	13 100	19 300	1 340	1 970	26 000	**RNAFW 172520**	—	—	—	0.035	—
18	26	13	0.3	9 450	12 900	965	1 310	24 000	**RNAF 182613**	—	—	—	0.024	—
	26	20	0.3	13 600	20 500	1 380	2 090	24 000	**RNAFW 182620**	—	—	—	0.037	—
	30	12	0.3	11 700	13 000	1 190	1 320	24 000	**RNAF 183012**	—	—	—	0.036	—
	30	24	0.3	20 100	26 000	2 050	2 650	24 000	**RNAFW 183024**	—	—	—	0.072	—
20	28	13	0.3	9 700	13 700	990	1 400	20 000	**RNAF 202813**	15	13	**NAF 152813**	0.026	0.040
	28	26	0.3	16 600	27 500	1 690	2 800	20 000	**RNAFW 202826**	15	26	**NAFW 152826**	0.051	0.079
	32	12	0.3	12 200	14 100	1 250	1 440	22 000	**RNAF 203212**	15	12	**NAF 153212**	0.038	0.050
	32	24	0.3	20 900	28 200	2 140	2 880	22 000	**RNAFW 203224**	—	—	—	0.076	—
22	30	13	0.3	10 300	15 300	1 050	1 560	19 000	**RNAF 223013**	17	13	**NAF 173013**	0.028	0.044
	30	26	0.3	17 600	30 500	1 800	3 100	19 000	**RNAFW 223026**	17	26	**NAFW 173026**	0.056	0.087
	35	16	0.3	16 600	19 500	1 700	1 980	20 000	**RNAF 223516**	17	16	**NAF 173516**	0.061	0.080
	35	32	0.3	29 400	40 500	2 990	4 100	20 000	**RNAFW 223532**	17	32	**NAFW 173532**	0.12	0.16
25	35	17	0.3	14 800	25 500	1 510	2 600	17 000	**RNAF 253517**	20	17	**NAF 203517**	0.054	0.077
	35	26	0.3	19 400	36 000	1 970	3 650	17 000	**RNAFW 253526**	20	26	**NAFW 203526**	0.080	0.115
	37	16	0.3	18 700	23 500	1 910	2 390	17 000	**RNAF 253716**	20	16	**NAF 203716**	0.060	0.082
	37	32	0.3	32 000	47 000	3 250	4 800	17 000	**RNAFW 253732**	20	32	**NAFW 203732**	0.12	0.16
28	40	16	0.3	20 200	26 800	2 060	2 730	15 000	**RNAF 284016**	—	—	—	0.067	—
	40	32	0.3	34 500	53 500	3 550	5 450	15 000	**RNAFW 284032**	—	—	—	0.13	—
30	40	17	0.3	18 700	31 500	1 910	3 200	14 000	**RNAF 304017**	25	17	**NAF 254017**	0.064	0.092
	40	26	0.3	24 000	43 000	2 450	4 400	14 000	**RNAFW 304026**	25	26	**NAFW 254026**	0.096	0.14
	42	16	0.3	22 200	31 000	2 270	3 150	14 000	**RNAF 304216**	25	16	**NAF 254216**	0.069	0.095
	42	32	0.3	38 000	62 000	3 900	6 300	14 000	**RNAFW 304232**	25	32	**NAFW 254232**	0.14	0.19

Remarks For information on inner rings, refer to page B129.

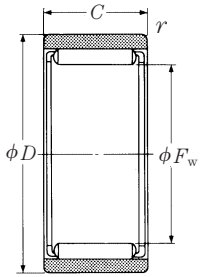
RNAF (Single-Row, Without Inner Ring)

RNAFW (Double-Row, Without Inner Ring)

NAF (Single-Row, With Inner Ring)

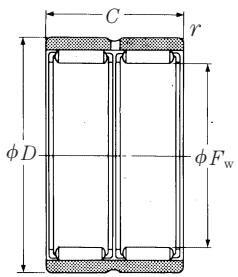
NAFW (Double-Row, With Inner Ring)

Inscribed Circle Diameter 35 — 100 mm

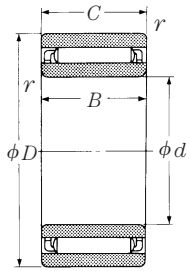


RNAF

Without Inner Ring

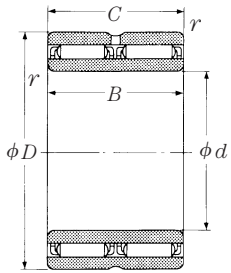


RNAFW



NAF

With Inner Ring



NAFW

Boundary Dimensions (mm)				Basic Load Ratings (N)		{kgf}		Limiting Speeds (min⁻¹)
F_w	D	C	r min	C_r	C_{or}	C_r	C_{or}	Oil
35	45	13	0.3	14 900	24 600	1 520	2 500	12 000
	45	17	0.3	20 500	37 000	2 090	3 750	12 000
	45	26	0.3	25 600	49 000	2 610	5 000	12 000
	47	16	0.3	22 700	33 500	2 310	3 400	12 000
	47	32	0.3	39 000	66 500	3 950	6 800	12 000
40	50	17	0.3	21 000	40 000	2 150	4 050	10 000
	50	34	0.3	36 000	80 000	3 700	8 150	10 000
	55	20	0.3	32 500	49 500	3 300	5 050	10 000
	55	40	0.3	55 500	99 500	5 650	10 100	10 000
45	55	17	0.3	21 600	43 000	2 200	4 350	9 000
	55	34	0.3	37 000	85 500	3 800	8 750	9 000
	62	20	0.3	34 000	55 000	3 450	5 600	9 500
	62	40	0.3	58 000	110 000	5 950	11 200	9 500
50	62	20	0.3	26 900	59 000	2 750	6 050	8 000
	62	40	0.3	46 000	118 000	4 700	12 100	8 000
	65	20	0.3	38 500	67 500	3 950	6 900	8 500
	65	40	0.6	66 000	135 000	6 750	13 800	8 500
55	68	20	0.6	27 500	62 500	2 800	6 350	7 500
	68	40	0.6	47 000	125 000	4 800	12 700	7 500
	72	20	0.6	40 000	73 000	4 100	7 450	7 500
	72	40	0.6	68 500	146 000	7 000	14 900	7 500
60	78	20	1	41 500	78 000	4 200	7 950	6 700
	78	40	1	71 000	156 000	7 250	15 900	6 700
65	85	30	1	61 000	132 000	6 200	13 400	6 300
	85	60	1	104 000	263 000	10 600	26 800	6 300
70	90	30	1	63 000	140 000	6 400	14 300	6 000
	90	60	1	108 000	281 000	11 000	28 600	6 000
75	95	30	1	65 000	151 000	6 650	15 400	5 600
	95	60	1	112 000	300 000	11 400	31 000	5 600
80	100	30	1	69 000	166 000	7 050	17 000	5 000
	100	60	1	119 000	335 000	12 100	34 000	5 000
85	105	30	1	71 000	176 000	7 250	17 900	4 800
90	110	30	1	70 000	177 000	7 150	18 000	4 500
95	115	30	1	69 500	177 000	7 100	18 100	4 300
100	120	30	1	75 500	201 000	7 700	20 500	4 000

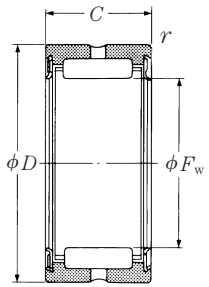
Remarks For information on inner rings, refer to page B129.

Bearing Numbers	Boundary Dimensions (mm)		Bearing Numbers	Mass (kg) approx	
Without Inner Ring	d	B	With Inner Ring	Without Inner Ring	With Inner Ring
RNAF 354513	30	13	**NAF 304513**	0.053	0.078
RNAF 354517	30	17	**NAF 304517**	0.073	0.105
RNAFW 354526	30	26	**NAFW 304526**	0.105	0.155
RNAF 354716	30	16	**NAF 304716**	0.078	0.11
RNAFW 354732	30	32	**NAFW 304732**	0.16	0.22
RNAF 405017	35	17	**NAF 355017**	0.084	0.12
RNAFW 405034	35	34	**NAFW 355034**	0.165	0.24
RNAF 405520	35	20	**NAF 355520**	0.15	0.195
RNAFW 405540	35	40	**NAFW 355540**	0.295	0.385
RNAF 455517	40	17	**NAF 405517**	0.092	0.135
RNAFW 455534	40	34	**NAFW 405534**	0.18	0.265
RNAF 456220	40	20	**NAF 406220**	0.165	0.215
RNAFW 456240	40	40	**NAFW 406240**	0.325	0.43
RNAF 506220	45	20	**NAF 456220**	0.14	0.195
RNAFW 506240	45	40	**NAFW 456240**	0.28	0.395
RNAF 506520	—	—	—	0.175	—
RNAFW 506540	—	—	—	0.36	—
RNAF 556820	50	20	**NAF 506820**	0.165	0.23
RNAFW 556840	50	40	**NAFW 506840**	0.34	0.465
RNAF 557220	45	20	**NAF 457220**	0.225	0.345
RNAFW 557240	45	40	**NAFW 457240**	0.455	0.695
RNAF 607820	50	20	**NAF 507820**	0.265	0.40
RNAFW 607840	50	40	**NAFW 507840**	0.535	0.80
RNAF 658530	55	30	**NAF 558530**	0.495	0.71
RNAFW 658560	55	60	**NAFW 558560**	0.99	1.4
RNAF 709030	60	30	**NAF 609030**	0.53	0.765
RNAFW 709060	60	60	**NAFW 609060**	1.05	1.5
RNAF 759530	65	30	**NAF 659530**	0.575	0.825
RNAFW 759560	65	60	**NAFW 659560**	1.15	1.65
RNAF 8010030	70	30	**NAF 7010030**	0.60	0.87
RNAFW 8010060	70	60	**NAFW 7010060**	1.2	1.7
RNAF 8510530	75	30	**NAF 7510530**	0.625	0.915
RNAF 9011030	80	30	**NAF 8011030**	0.665	0.97
RNAF 9511530	85	30	**NAF 8511530**	0.695	1.0
RNAF 10012030	90	30	**NAF 9012030**	0.73	1.05

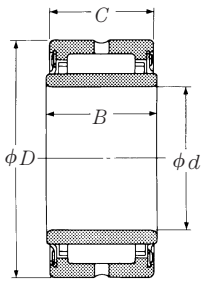
RNA···TT (Sealed, Without Inner Ring)

NA···TT (Sealed, With Inner Ring)

Inscribed Circle Diameter 14 — 52 mm



RNA···TT



NA···TT

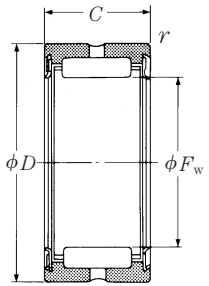
Boundary Dimensions (mm)				Basic Load Ratings (N)		{kgf}		Limiting Speeds (min⁻¹)	Bearing Numbers		Boundary Dimensions (mm)		Mass (kg) approx	
F_w	D	C	r min	C_r	C_{or}	C_r	C_{or}	Grease	Without Inner Ring	With Inner Ring	d	B	Without Inner Ring	With Inner Ring
14	22	13	0.3	7 350	7 500	750	765	13 000	**RNA4900TT**	**NA4900TT**	10	14	0.016	0.025
16	24	13	0.3	8 100	8 850	825	900	11 000	**RNA4901TT**	**NA4901TT**	12	14	0.018	0.028
	24	22	0.3	15 400	20 300	1 580	2 070	11 000	**RNA6901TT**	**NA6901TT**	12	23	0.030	0.046
18	26	13	0.3	8 400	9 600	860	975	10 000	**RNA49/14TT**	—	—	—	0.020	—
20	28	13	0.3	8 700	10 300	890	1 050	9 500	**RNA4902TT**	**NA4902TT**	15	14	0.021	0.036
	28	23	0.3	17 500	25 300	1 780	2 580	9 500	**RNA6902TT**	**NA6902TT**	15	24	0.039	0.065
22	30	13	0.3	9 350	11 600	955	1 190	8 500	**RNA4903TT**	**NA4903TT**	17	14	0.023	0.039
	30	23	0.3	18 800	28 500	1 920	2 910	8 500	**RNA6903TT**	**NA6903TT**	17	24	0.041	0.069
25	37	17	0.3	16 800	18 700	1 710	1 910	7 500	**RNA4904TT**	**NA4904TT**	20	18	0.055	0.078
	37	30	0.3	33 000	44 000	3 350	4 500	7 500	**RNA6904TT**	**NA6904TT**	20	31	0.098	0.14
28	39	17	0.3	17 800	22 900	1 820	2 330	6 700	**RNA49/22TT**	**NA49/22TT**	22	18	0.056	0.088
	39	30	0.3	33 500	51 500	3 400	5 250	6 700	**RNA69/22TT**	**NA69/22TT**	22	31	0.096	0.15
30	42	17	0.3	19 900	24 600	2 030	2 510	6 300	**RNA4905TT**	**NA4905TT**	25	18	0.063	0.093
	42	30	0.3	30 000	41 500	3 100	4 250	6 300	**RNA6905TT**	**NA6905TT**	25	31	0.11	0.165
32	45	17	0.3	18 900	23 400	1 930	2 390	5 600	**RNA49/28TT**	**NA49/28TT**	28	18	0.076	0.10
	45	30	0.3	37 000	55 500	3 750	5 650	5 600	**RNA69/28TT**	**NA69/28TT**	28	31	0.13	0.18
35	47	17	0.3	20 400	26 400	2 080	2 690	5 300	**RNA4906TT**	**NA4906TT**	30	18	0.072	0.105
	47	30	0.3	40 000	62 500	4 050	6 350	5 300	**RNA6906TT**	**NA6906TT**	30	31	0.13	0.19
40	52	20	0.6	28 000	41 500	2 860	4 250	4 500	**RNA49/32TT**	**NA49/32TT**	32	21	0.092	0.165
	52	36	0.6	51 500	91 000	5 250	9 250	4 500	**RNA69/32TT**	**NA69/32TT**	32	37	0.17	0.295
42	55	20	0.6	29 700	45 500	3 050	4 650	4 500	**RNA4907TT**	**NA4907TT**	35	21	0.11	0.175
	55	36	0.6	53 000	95 500	5 400	9 700	4 500	**RNA6907TT**	**NA6907TT**	35	37	0.20	0.32
45	58	20	0.6	30 500	47 500	3 100	4 850	4 000	**RNA49/38TT**	—	—	—	0.12	—
48	62	22	0.6	34 500	53 500	3 550	5 450	3 800	**RNA4908TT**	**NA4908TT**	40	23	0.15	0.245
	62	40	0.6	67 000	124 000	6 800	12 700	3 800	**RNA6908TT**	**NA6908TT**	40	41	0.265	0.44
50	65	22	0.6	36 500	58 000	3 750	5 950	3 800	**RNA49/42TT**	—	—	—	0.17	—
52	68	22	0.6	36 500	58 500	3 700	5 950	3 600	**RNA4909TT**	**NA4909TT**	45	23	0.19	0.285
	68	40	0.6	70 500	136 000	7 150	13 800	3 600	**RNA6909TT**	**NA6909TT**	45	41	0.335	0.50

Remarks 1. For information on inner rings, refer to page B129.
2. Standard greaes is packed in sealed solid bearings unless otherwise specified.

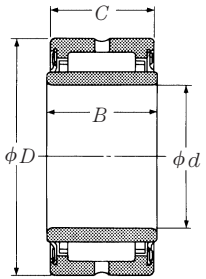
RNA···TT (**Sealed, Without Inner Ring**)

NA···TT (**Sealed, With Inner Ring**)

Inscribed Circle Diameter 55 — 125 mm



RNA···TT



NA···TT

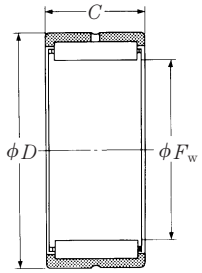
Boundary Dimensions (mm)				Basic Load Ratings (N)		{kgf}		Limiting Speeds (min⁻¹)	Bearing Numbers		Boundary Dimensions (mm)		Mass (kg) approx	
F_w	D	C	r min	C_r	C_{or}	C_r	C_{or}	Grease	Without Inner Ring	With Inner Ring	d	B	Without Inner Ring	With Inner Ring
55	70	22	0.6	38 500	63 500	3 900	6 450	3 400	**RNA49/48TT**	—	—	—	0.18	—
58	72	22	0.6	38 000	63 500	3 850	6 500	3 200	**RNA4910TT**	**NA4910TT**	50	23	0.18	0.30
	72	40	0.6	73 000	148 000	7 450	15 100	3 200	**RNA6910TT**	**NA6910TT**	50	41	0.32	0.535
63	80	25	1	47 500	76 000	4 850	7 750	3 000	**RNA4911TT**	**NA4911TT**	55	26	0.26	0.405
	80	45	1	90 000	172 000	9 200	17 500	3 000	**RNA6911TT**	**NA6911TT**	55	46	0.475	0.735
68	85	25	1	50 000	82 500	5 100	8 450	2 800	**RNA4912TT**	**NA4912TT**	60	26	0.28	0.44
	85	45	1	94 500	187 000	9 600	19 100	2 800	**RNA6912TT**	**NA6912TT**	60	46	0.485	0.765
72	90	25	1	52 500	89 500	5 350	9 100	2 600	**RNA4913TT**	**NA4913TT**	65	26	0.32	0.47
	90	45	1	99 000	203 000	10 100	20 700	2 600	**RNA6913TT**	**NA6913TT**	65	46	0.53	0.795
80	100	30	1	70 000	120 000	7 150	12 200	2 200	**RNA4914TT**	**NA4914TT**	70	31	0.47	0.75
	100	54	1	130 000	264 000	13 200	26 900	2 200	**RNA6914TT**	**NA6914TT**	70	55	0.89	1.4
85	105	30	1	77 000	139 000	7 850	14 100	2 200	**RNA4915TT**	**NA4915TT**	75	31	0.50	0.80
	105	54	1	136 000	286 000	13 800	29 100	2 200	**RNA6915TT**	**NA6915TT**	75	55	0.96	1.5
90	110	30	1	76 500	139 000	7 800	14 200	2 000	**RNA4916TT**	**NA4916TT**	80	31	0.53	0.845
	110	54	1	141 000	305 000	14 400	31 500	2 000	**RNA6916TT**	**NA6916TT**	80	55	0.99	1.55
100	120	35	1.1	94 500	189 000	9 600	19 300	1 900	**RNA4917TT**	**NA4917TT**	85	36	0.68	1.25
	120	63	1.1	167 000	395 000	17 100	40 000	1 900	**RNA6917TT**	**NA6917TT**	85	64	1.2	2.25
105	125	35	1.1	98 000	201 000	10 000	20 500	1 800	**RNA4918TT**	**NA4918TT**	90	36	0.72	1.35
	125	63	1.1	173 000	420 000	17 700	43 000	1 800	**RNA6918TT**	**NA6918TT**	90	64	1.35	2.45
110	130	35	1.1	101 000	214 000	10 300	21 800	1 700	**RNA4919TT**	**NA4919TT**	95	36	0.74	1.4
	130	63	1.1	181 000	450 000	18 500	46 000	1 700	**RNA6919TT**	**NA6919TT**	95	64	1.5	2.65
115	140	40	1.1	131 000	261 000	13 400	26 600	1 600	**RNA4920TT**	**NA4920TT**	100	41	1.15	1.95
125	150	40	1.1	136 000	279 000	13 800	28 500	1 500	**RNA4922TT**	**NA4922TT**	110	41	1.25	2.1

Remarks 1. For information on inner rings, refer to page B129.
2. Standard greaes is packed in sealed solid bearings unless otherwise specified.

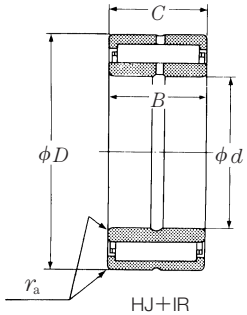
HJ (Single-Row, Without Inner Ring)

HJ + IR (Single-Row, With Inner Ring)

Inscribed Circle Diameter 15.875 — 44.450 mm



HJ



HJ+IR

* Fillet Radius of Shaft, Housing

Boundary Dimensions (mm, inch) F_w		D		C		Basic Load Ratings (N) C_r	C_{or}	{kgf} C_r	C_{or}	Limiting Speeds (min^{-1}) Oil
15.875	0.6250	28.575	1.1250	19.05	0.7500	18 600	19 400	1 890	1 980	30 000
19.050	0.7500	31.750	1.2500	19.05	0.7500	19 800	21 900	2 020	2 230	24 000
		31.750	1.2500	25.40	1.0000	26 800	32 000	2 730	3 300	24 000
22.225	0.8750	34.925	1.3750	19.05	0.7500	22 100	26 200	2 260	2 670	20 000
		34.925	1.3750	25.40	1.0000	29 900	38 500	3 050	3 950	20 000
25.400	1.0000	38.100	1.5000	19.05	0.7500	24 200	30 500	2 470	3 100	17 000
		38.100	1.5000	25.40	1.0000	32 500	45 000	3 350	4 600	17 000
28.575	1.1250	41.275	1.6250	25.40	1.0000	35 500	51 500	3 600	5 250	15 000
		41.275	1.6250	31.75	1.2500	44 000	68 000	4 500	6 950	15 000
31.750	1.2500	44.450	1.7500	25.40	1.0000	36 500	55 000	3 700	5 600	13 000
		44.450	1.7500	31.75	1.2500	45 500	72 500	4 600	7 400	13 000
34.925	1.3750	47.625	1.8750	25.40	1.0000	38 500	61 000	3 950	6 250	12 000
		47.625	1.8750	31.75	1.2500	48 000	81 000	4 900	8 250	12 000
38.100	1.5000	52.388	2.0625	25.40	1.0000	46 000	68 500	4 650	7 000	11 000
		52.388	2.0625	31.75	1.2500	57 000	91 000	5 850	9 300	11 000
41.275	1.6250	55.562	2.1875	25.40	1.0000	47 000	72 500	4 800	7 400	10 000
		55.562	2.1875	31.75	1.2500	58 500	96 500	6 000	9 850	10 000
44.450	1.7500	58.738	2.3125	25.40	1.0000	48 000	76 500	4 900	7 800	9 500
		58.738	2.3125	31.75	1.2500	60 000	102 000	6 150	10 400	9 500

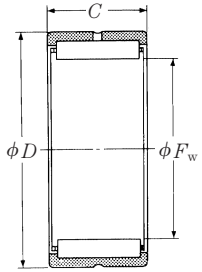
Remarks
1. For bearings with inner rings, the inner ring number is written separately from the Bearing number.
   Example: HJ-202816 + IR-162016
2. If a full complement roller bearing is required, please contact NSK.

Bearing Numbers Without Inner Ring	Boundary Dimensions (mm, inch) d		B		Matching Inner Rings	* (mm) r_a max	Mass (kg) approx Without Inner Ring	With Inner Ring
HJ-101812	9.525	0.3750	19.05	0.7500	**IR-061012**	0.6	0.050	0.068
HJ-122012	12.700	0.5000	19.05	0.7500	**IR-081212**	1	0.054	0.081
HJ-122016	12.700	0.5000	25.40	1.0000	**IR-081216**	1	0.073	0.11
HJ-142212	15.875	0.6250	19.05	0.7500	**IR-101412**	1	0.064	0.090
	17.462	0.6875	19.05	0.7500	**IR-111412**	1	0.064	0.087
HJ-142216	15.875	0.6250	25.40	1.0000	**IR-101416**	1	0.082	0.115
HJ-162412	19.050	0.7500	19.05	0.7500	**IR-121612**	1	0.068	0.10
HJ-162416	19.050	0.7500	25.40	1.0000	**IR-121616**	1	0.091	0.135
	20.638	0.8125	25.40	1.0000	**IR-131616**	1	0.091	0.125
HJ-182616	22.225	0.8750	25.40	1.0000	**IR-141816**	1	0.10	0.15
	23.812	0.9375	25.40	1.0000	**IR-151816**	1	0.10	0.14
HJ-182620	22.225	0.8750	31.75	1.2500	**IR-141820**	1	0.13	0.195
	23.812	0.9375	31.75	1.2500	**IR-151820**	1	0.13	0.18
HJ-202816	25.400	1.0000	25.40	1.0000	**IR-162016**	1	0.11	0.17
HJ-202820	25.400	1.0000	31.75	1.2500	**IR-162020**	1	0.14	0.215
HJ-223016	28.575	1.1250	25.40	1.0000	**IR-182216**	1	0.12	0.185
HJ-223020	28.575	1.1250	31.75	1.2500	**IR-182220**	1	0.155	0.23
HJ-243316	31.750	1.2500	25.40	1.0000	**IR-202416**	1.5	0.155	0.23
HJ-243320	30.162	1.1875	31.75	1.2500	**IR-192420**	1.5	0.195	0.30
	31.750	1.2500	31.75	1.2500	**IR-202420**	1.5	0.195	0.285
HJ-263516	33.338	1.3125	25.40	1.0000	**IR-212616**	1.5	0.16	0.255
HJ-263520	33.338	1.3125	31.75	1.2500	**IR-212620**	1.5	0.20	0.32
	34.925	1.3750	31.75	1.2500	**IR-222620**	1.5	0.20	0.30
HJ-283716	36.512	1.4375	25.40	1.0000	**IR-232816**	1.5	0.17	0.27
	38.100	1.5000	25.40	1.0000	**IR-242816**	1.5	0.17	0.265
HJ-283720	34.925	1.3750	31.75	1.2500	**IR-222820**	1.5	0.215	0.36
	36.512	1.4375	31.75	1.2500	**IR-232820**	1.5	0.215	0.34
	38.100	1.5000	31.75	1.2500	**IR-242820**	1.5	0.215	0.315

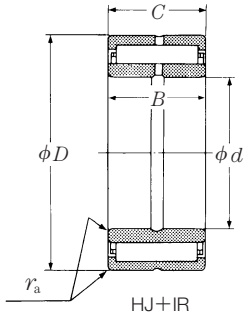
HJ (Single-Row, Without Inner Ring)

HJ + IR (Single-Row, With Inner Ring)

Inscribed Circle Diameter 47.625 — 101.600 mm



HJ



HJ+IR

* Fillet Radius of Shaft, Housing

Boundary Dimensions (mm, inch) F_w		D		C		Basic Load Ratings (N) C_r	C_{or}	{kgf} C_r	C_{or}	Limiting Speeds (min^{-1}) Oil
47.625	1.8750	61.912	2.4375	31.75	1.2500	63 500	112 000	6 500	11 400	9 000
50.800	2.0000	65.088	2.5625	25.40	1.0000	52 000	88 000	5 300	9 000	8 500
		65.088	2.5625	31.75	1.2500	65 000	117 000	6 600	12 000	8 500
57.150	2.2500	76.200	3.0000	38.10	1.5000	89 000	161 000	9 100	16 400	7 500
		76.200	3.0000	44.45	1.7500	103 000	194 000	10 500	19 800	7 500
63.500	2.5000	82.550	3.2500	38.10	1.5000	96 000	183 000	9 800	18 700	6 700
		82.550	3.2500	44.45	1.7500	111 000	221 000	11 300	22 600	6 700
69.850	2.7500	88.900	3.5000	25.40	1.0000	66 000	116 000	6 700	11 800	6 000
		88.900	3.5000	38.10	1.5000	100 000	199 000	10 200	20 300	6 000
		88.900	3.5000	44.45	1.7500	116 000	240 000	11 800	24 500	6 000
76.200	3.0000	95.250	3.7500	38.10	1.5000	106 000	221 000	10 800	22 600	5 600
		95.250	3.7500	44.45	1.7500	123 000	268 000	12 600	27 300	5 600
82.550	3.2500	107.950	4.2500	44.45	1.7500	161 000	300 000	16 400	30 500	5 000
		107.950	4.2500	50.80	2.0000	182 000	350 000	18 600	36 000	5 000
88.900	3.5000	114.300	4.5000	50.80	2.0000	186 000	370 000	18 900	37 500	4 800
95.250	3.7500	120.650	4.7500	50.80	2.0000	194 000	400 000	19 800	40 500	4 500
101.600	4.0000	127.000	5.0000	50.80	2.0000	202 000	430 000	20 600	43 500	4 000

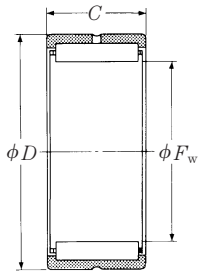
Remarks 1. For bearings with inner rings, the inner ring number is written separately from the Bearing number.
Example: HJ-202816 + IR-162016
2. If a full complement roller bearing is required, please contact NSK.

Bearing Numbers Without Inner Ring	Boundary Dimensions (mm, inch) d		B		Matching Inner Rings	* (mm) r_a max	Mass (kg) approx Without Inner Ring	With Inner Ring
HJ-303920	39.688	1.5625	31.75	1.2500	**IR-253020**	1.5	0.225	0.36
HJ-324116	42.862	1.6875	25.40	1.0000	**IR-273216**	1.5	0.185	0.305
HJ-324120	38.100	1.5000	31.75	1.2500	**IR-243220**	1.5	0.235	0.455
	39.688	1.5625	31.75	1.2500	**IR-253220**	1.5	0.235	0.43
	41.275	1.6250	31.75	1.2500	**IR-263220**	1.5	0.235	0.405
	42.862	1.6875	31.75	1.2500	**IR-273220**	1.5	0.235	0.38
HJ-364824	44.450	1.7500	38.10	1.5000	**IR-283624**	1.5	0.45	0.755
HJ-364828	44.450	1.7500	44.45	1.7500	**IR-283628**	1.5	0.525	0.88
HJ-405224	49.212	1.9375	38.10	1.5000	**IR-314024**	2	0.525	0.90
	50.800	2.0000	38.10	1.5000	**IR-324024**	2	0.525	0.865
HJ-405228	49.212	1.9375	44.45	1.7500	**IR-314028**	2	0.575	1.0
	50.800	2.0000	44.45	1.7500	**IR-324028**	2	0.575	0.975
HJ-445616	—	—	—	—	—	2	0.485	—
HJ-445624	57.150	2.2500	38.10	1.5000	**IR-364424**	2	0.595	0.97
HJ-445628	55.562	2.1875	44.45	1.7500	**IR-354428**	2	0.65	1.15
	57.150	2.2500	44.45	1.7500	**IR-364428**	2	0.65	1.1
HJ-486024	63.500	2.5000	38.10	1.5000	**IR-404824**	2	0.61	1.05
HJ-486028	60.325	2.3750	44.45	1.7500	**IR-384828**	2	0.68	1.25
	63.500	2.5000	44.45	1.7500	**IR-404828**	2	0.68	1.15
HJ-526828	69.850	2.7500	44.45	1.7500	**IR-445228**	2	1.05	1.55
HJ-526832	69.850	2.7500	50.80	2.0000	**IR-445232**	2	1.2	1.8
HJ-567232	74.612	2.9375	50.80	2.0000	**IR-475632**	2	1.2	1.95
	76.200	3.0000	50.80	2.0000	**IR-485632**	2	1.2	1.9
HJ-607632	79.375	3.1250	50.80	2.0000	**IR-506032**	2.5	1.3	2.2
	82.550	3.2500	50.80	2.0000	**IR-526032**	2.5	1.3	2.0
HJ-648032	82.550	3.2500	50.80	2.0000	**IR-526432**	2.5	1.4	2.5
	85.725	3.3750	50.80	2.0000	**IR-546432**	2.5	1.4	2.3
	88.900	3.5000	50.80	2.0000	**IR-566432**	2.5	1.4	2.15

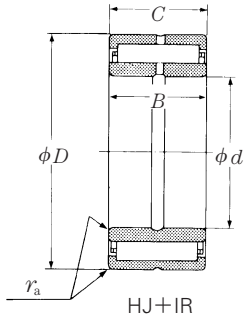
HJ (Single-Row, Without Inner Ring)

HJ + IR (Single-Row, With Inner Ring)

Inscribed Circle Diameter 107.950 — 234.950 mm



HJ



HJ+IR

* Fillet Radius of Shaft, Housing

Bearing Numbers	Boundary Dimensions (mm, inch)						Basic Load Ratings (N)		{kgf}		Limiting Speeds (min⁻¹)	Matching Inner Rings	* (mm)	Mass (kg) approx	
Without Inner Ring	F_w		D		C		C_r	C_{or}	C_r	C_{or}	Oil		r_a max	Without Inner Ring	With Inner Ring
107.950	4.2500	133.350	5.2500	50.80	2.0000	205 000	445 000	20 900	45 500	3 800					
114.300	4.5000	152.400	6.0000	57.15	2.2500	290 000	525 000	29 600	53 500	3 800					
		152.400	6.0000	63.50	2.5000	325 000	600 000	33 000	61 500	3 800					
127.000	5.0000	165.100	6.5000	50.80	2.0000	279 000	515 000	28 400	52 500	3 400					
		165.100	6.5000	57.15	2.2500	315 000	600 000	32 000	61 000	3 400					
		165.100	6.5000	63.50	2.5000	350 000	685 000	35 500	70 000	3 400					
139.700	5.5000	177.800	7.0000	63.50	2.5000	350 000	715 000	36 000	73 000	3 000					
		177.800	7.0000	76.20	3.0000	415 000	890 000	42 500	91 000	3 000					
146.050	5.7500	184.150	7.2500	76.20	3.0000	425 000	925 000	43 500	94 500	2 800					
152.400	6.0000	190.500	7.5000	63.50	2.5000	375 000	795 000	38 000	81 500	2 800					
		190.500	7.5000	76.20	3.0000	445 000	995 000	45 000	101 000	2 800					
165.100	6.5000	203.200	8.0000	63.50	2.5000	385 000	855 000	39 500	87 000	2 400					
		203.200	8.0000	76.20	3.0000	460 000	1 060 000	46 500	109 000	2 400					
184.150	7.2500	231.775	9.1250	76.20	3.0000	535 000	1 140 000	54 500	117 000	2 200					
196.850	7.7500	244.475	9.6250	76.20	3.0000	555 000	1 230 000	56 500	125 000	2 000					
209.550	8.2500	257.175	10.1250	76.20	3.0000	575 000	1 310 000	58 500	133 000	2 000					
222.250	8.7500	269.875	10.6250	76.20	3.0000	590 000	1 390 000	60 500	142 000	1 900					
234.950	9.2500	282.575	11.1250	76.20	3.0000	610 000	1 470 000	62 000	150 000	1 800					
HJ-688432		88.900	3.5000	50.80	2.0000						**IR-566832**	2.5	1.5	2.65	
		95.250	3.7500	50.80	2.0000						**IR-606832**	2.5	1.5	2.5	
HJ-729636		95.250	3.7500	57.15	2.2500						**IR-607236**	2.5	2.75	4.15	
HJ-729640		95.250	3.7500	63.50	2.5000						**IR-607240**	2.5	3.05	4.6	
HJ-8010432		—	—	—	—						—	2.5	2.4	—	
HJ-8010436		101.600	4.0000	57.15	2.2500						**IR-648036**	2.5	2.9	4.95	
		107.950	4.2500	57.15	2.2500						**IR-688036**	2.5	2.9	4.45	
HJ-8010440		101.600	4.0000	63.50	2.5000						**IR-648040**	2.5	3.3	5.55	
HJ-8811240		114.300	4.5000	63.50	2.5000						**IR-728840**	2.5	3.6	6.1	
HJ-8811248		114.300	4.5000	76.20	3.0000						**IR-728848**	2.5	4.25	7.2	
HJ-9211648		120.650	4.7500	76.20	3.0000						**IR-769248**	3	4.55	7.7	
HJ-9612040		127.000	5.0000	63.50	2.5000						**IR-809640**	3	3.9	6.65	
HJ-9612048		127.000	5.0000	76.20	3.0000						**IR-809648**	3	4.75	8.1	
HJ-10412840		139.700	5.5000	63.50	2.5000						**IR-8810440**	3	4.15	7.2	
HJ-10412848		139.700	5.5000	76.20	3.0000						**IR-8810448**	3	4.75	8.4	
HJ-11614648		152.400	6.0000	76.20	3.0000						**IR-9611648**	3	7.1	12	
HJ-12415448		165.100	6.5000	76.20	3.0000						**IR-10412448**	3	7.5	13	
HJ-13216248		177.800	7.0000	76.20	3.0000						**IR-11213248**	3	7.95	13.5	
HJ-14017048		190.500	7.5000	76.20	3.0000						**IR-12014048**	4	8.35	14.5	
HJ-14817848		203.200	8.0000	76.20	3.0000						**IR-12814048**	4	8.6	15	

Remarks 1. For bearings with inner rings, the inner ring number is written separately from the Bearing number.
Example: HJ-202816 + IR-162016
2. If a full complement roller bearing is required, please contact NSK.

INNER RINGS FOR NEEDLE ROLLER BEARINGS

DRAWN CUP TYPE

			Pages
Metric Design (FIR)	Bore Diameter	7–45 mm	B130–B135
Inch Design (IR)	Bore Diameter	9.525–38.100 mm	B136–B137

SOLID TYPE

Metric Design (FIR)	Bore Diameter	5–220 mm	B138–B151
Metric Design (FIR)	Bore Diameter	8–50 mm	B152–B155
Inch Design (IR)	Bore Diameter	9.525–203.200 mm	B156–B161

For use when shafts cannot be finished with proper accuracy and hardness, NSK produces inner rings that are made from carefully selected bearing steel and finished with heat treatment and grinding work.

TYPE

The various types of inner rings for needle roller bearings are shown in **Table 1**.

ACCURACY

Dimensional accuracy of the inner rings of NSK needle roller bearings conforms with ISO (refer to pages A26 and A27). Tolerances for inch inner rings are shown in the dimensional table for drawn cup bearings, and in **Table 3** on page B92 for solid bearings.

Table 1 Types of Inner Ring

Code	Details
FIR	Metric needle bearing combination
IR	Inch needle bearing combination

MOUNTING

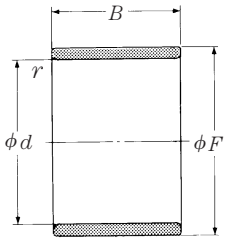
The inner ring is mounted with the unmarked side placed onto the shaft shoulder.

Fitting tolerance for the drawn cup needle bearing shaft should be h6 or js6 (j6). When requesting a tight fit for the inner ring, please consult NSK.

Each shaft fitting tolerance for the inner ring for solid needle bearings is shown in **Table 5.2** on page A33.

FIR

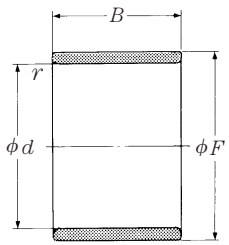
Bore Diameter 7 — 15 mm



Boundary Dimensions (mm)				Inner Ring Numbers	Mass (g)	Matching Drawn Cup Needle Roller Bearings		
d	F h5	B	r min		approx	F	FJ	FJL
7	10	10.5	0.3	**FIR-071010**	3.3	FH-1010	FJ-1010	FJL-1010
	10	12.5	0.3	**FIR-071012**	3.9	—	—	FJL-1012L
	10	12.5	0.3	**FIR-071015**	4.8	—	FJ-1015	FJL-1015
8	12	10.5	0.3	**FIR-081210**	5.1	—	FJ-1210	—
	12	12.5	0.3	**FIR-081212**	6.1	FJ-1212	FJH-1212	FJL-1212L
	12	15.5	0.3	**FIR-081215**	7.6	—	—	FJL-1215
10	13	12.5	0.3	**FIR-101312**	5.3	F-1312	FJ-1312	—
	14	12.5	0.3	**FIR-101412**	7.3	F-1412	FJ-1412	—
	14	13.5	0.3	**FIR-101413**	7.9	F-1413	—	—
	14	16.5	0.3	**FIR-101416**	9.7	—	—	FJL-1416L
	14	20.5	0.3	**FIR-101420**	12	—	—	FJL-1420L
	15	10.5	0.3	**FIR-101510**	8.0	—	—	FJL-1510L
	15	12.5	0.3	**FIR-101512**	9.5	F-1512	FJ-1512	FJL-1512L
	15	15.5	0.3	**FIR-101515**	12	—	—	FJL-1515
	15	20.5	0.3	**FIR-101520**	16	—	—	FJL-1520
	15	25.5	0.3	**FIR-101525**	19	—	—	FJL-1525L
12	15	12.5	0.3	**FIR-121512**	6.2	F-1512	FJ-1512	FJL-1512L
	15	16.5	0.3	**FIR-121516**	8.2	F-1516	FJ-1516	—
	16	12.5	0.3	**FIR-121612**	8.6	F-1612	FJ-1612	—
	16	16.5	0.3	**FIR-121616**	11	F-1616	FJ-1616	FJL-1616L
	16	20.5	0.3	**FIR-121620**	14	—	—	FJL-1620L
	17	15.5	0.3	**FIR-121715**	14	—	—	FJL-1715
	17	20.5	0.3	**FIR-121720**	18	—	—	FJL-1720L
	17	25.5	0.3	**FIR-121725**	23	—	—	FJL-1725L
15	18	12.5	0.3	**FIR-151812**	7.6	F-1812	FJ-1812	—
	18	15.5	0.3	**FIR-151815**	9.4	—	—	FJL-1815
	18	16.5	0.3	**FIR-151816**	10	F-1816	FJ-1816	—
	18	20.5	0.3	**FIR-151820**	12	—	—	FJL-1820L
	18	25.5	0.3	**FIR-151825**	15	—	—	FJL-1825
	20	15.5	0.3	**FIR-152015**	17	—	—	FJL-2015
	20	20.5	0.3	**FIR-152020**	22	F-2020	FJ-2020	FJL-2020
	20	25.5	0.3	**FIR-152025**	27	—	—	FJL-2025L
	20	30.5	0.3	**FIR-152030**	33	—	—	FJL-2030L

FIR

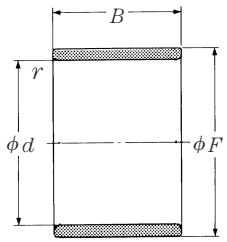
Bore Diameter 17 — 30 mm



Boundary Dimensions (mm)				Inner Ring Numbers	Mass (g)	Matching Drawn Cup Needle Roller Bearings		
d	F h5	B	r min		approx	F	FJ	FJL
17	20	12.5	0.3	**FIR-172012**	8.5	F-2012	FJ-2012	—
	20	16.5	0.3	**FIR-172016**	11	F-2016	FJ-2016	—
	20	20.5	0.3	**FIR-172020**	14	F-2020	FJ-2020	FJL-2020
	22	10.5	0.3	**FIR-172210**	12	F-2210	—	FJL-2210L
	22	12.5	0.3	**FIR-172212**	15	F-2212	FJ-2212	—
	22	15.5	0.3	**FIR-172215**	18	—	—	FJL-2215L
	22	16.5	0.3	**FIR-172216**	20	F-2216	FJ-2216	—
	22	20.5	0.3	**FIR-172220**	24	F-2220	FJ-2220	FJL-2220L
	22	25.5	0.3	**FIR-172225**	30	—	—	FJL-2225L
	22	30.5	0.3	**FIR-172230**	36	—	—	FJL-2230L
20	25	10.5	0.3	**FIR-202510**	14	—	—	FJL-2510
	25	15.5	0.3	**FIR-202515**	21	—	—	FJL-2515L
	25	16.5	0.3	**FIR-202516**	23	F-2516	FJ-2516	—
	25	20.5	0.3	**FIR-202520**	28	F-2520	FJ-2520	FJL-2520
	25	25.5	0.3	**FIR-202525**	35	—	—	FJL-2525L
	25	26.5	0.3	**FIR-202526**	36	F-2526	FJ-2526	—
	25	30.5	0.3	**FIR-202530**	42	—	—	FJL-2530
22	28	16.5	0.3	**FIR-222816**	30	F-2816	FJ-2816	—
	28	20.5	0.3	**FIR-222820**	38	F-2820	FJ-2820	FJL-2820L
	28	26.5	0.3	**FIR-222826**	49	F-2826	FJ-2826	—
	28	30.5	0.3	**FIR-222830**	56	—	—	FJL-2830L
25	30	15.5	0.3	**FIR-253015**	26	—	—	FJL-3015L
	30	20.5	0.3	**FIR-253020**	34	F-3020	FJ-3020	FJL-3020L
	30	25.5	0.3	**FIR-253026**	43	—	—	FJL-3025L
	30	26.5	0.3	**FIR-253026**	44	F-3026	FJ-3026	—
	30	30.5	0.3	**FIR-253030**	51	—	—	FJL-3030L
28	32	20.5	0.3	**FIR-283220**	30	—	—	FJL-3220
	32	30.5	0.3	**FIR-283230**	45	—	—	FJL-3230
30	35	12.5	0.6	**FIR-303512**	25	F-3512	FJ-3512	FJL-3512
	35	15.5	0.6	**FIR-303515**	31	—	—	FJL-3515
	35	20.5	0.6	**FIR-303520**	41	F-3520	FJ-3520	FJL-3520L
	35	25.5	0.6	**FIR-303525**	51	—	—	FJL-3525L
	35	26.5	0.6	**FIR-303526**	53	F-3526	FJ-3526	—
	35	30.5	0.6	**FIR-303530**	61	—	—	FJL-3530L

FIR

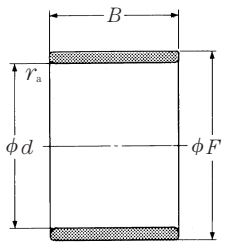
Bore Diameter 35 — 45 mm



Boundary Dimensions (mm)				Inner Ring Numbers	Mass (g)	Matching Drawn Cup Needle Roller Bearings		
d	F h5	B	r min		approx	F	FJ	FJL
35	40	15.5	0.6	**FIR-354015**	36	—	—	FJL-4015L
	40	20.5	0.6	**FIR-354020**	47	F-4020	FJ-4020	FJL-4020L
	40	25.5	0.6	**FIR-354025**	58	—	—	FJL-4025L
	40	26.5	0.6	**FIR-354026**	61	F-4026	FJ-4026	—
	40	30.5	0.6	**FIR-354030**	70	—	—	FJL-4030L
40	45	20.5	0.6	**FIR-404520**	53	F-4520	FJ-4520	FJL-4520L
	45	25.5	0.6	**FIR-404525**	66	—	—	FJL-4525L
	45	26.5	0.6	**FIR-404526**	67	F-4526	FJ-4526	—
	45	30.5	0.6	**FIR-404530**	79	—	—	FJL-4530L
45	50	12.5	0.6	**FIR-455012**	36	—	—	FJL-5012L
	50	15.5	0.6	**FIR-455015**	45	—	—	FJL-5015L
	50	20.5	0.6	**FIR-455020**	59	—	FJ-5020	FJL-5020L
	50	25.5	0.6	**FIR-455025**	74	—	—	FJL-5025L
	50	30.5	0.6	**FIR-455030**	89	—	—	FJL-5030L

IR

Bore Diameter 9.525 — 38.100 mm

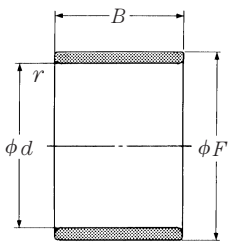


Boundary Dimensions (mm, inch) d $^{0}_{-0.013}$		F $^{0}_{-0.013}$		B $^{0}_{-0.25}$	Inner Ring Numbers	Mass (g) approx	Fillet Radius of Shaft (mm) r_a max	Matching Drawn Cup Needle Roller Bearings B	BH	J	JH
9.525	0.3750	14.288	0.5625	13.08	**IR-68**	9.1	0.6	B-98	BH-98	J-98	JH-98
		15.875	0.6250	13.08	**IR-68-1**	13	0.6	B-108	BH-108	J-108	—
		14.288	0.5625	19.43	**IR-612**	13	0.6	B-912	BH-912	—	—
		15.875	0.6250	19.43	**IR-612-1**	19	0.6	B-1012	BH-1012	J-1012	—
12.700	0.5000	19.050	0.7500	13.08	**IR-88**	16	1.0	B-128	—	J-128	—
		19.050	0.7500	19.43	**IR-812**	24	1.0	B-1212	—	J-1212	JH-1212
15.875	0.6250	22.225	0.8750	19.43	**IR-1012**	29	1.0	B-1412	BH-1412	J-1412	JH-1412
		22.225	0.8750	25.78	**IR-1016**	38	1.0	B-1416	—	J-1416	JH-1416
19.050	0.7500	25.400	1.0000	13.08	**IR-128**	23	1.0	B-168	BH-168	—	—
		25.400	1.0000	19.43	**IR-1212**	34	1.0	B-1612	BH-1612	J-1612	JH-1612
		25.400	1.0000	25.78	**IR-1216**	44	1.0	B-1616	BH-1616	J-1616	JH-1616
		25.400	1.0000	32.13	**IR-1220**	55	1.0	—	BH-1620	—	—
		25.400	1.0000	38.48	**IR-1224**	66	1.0	—	BH-1624	—	—
20.638	0.8125	25.400	1.0000	19.43	**IR-1312**	26	1.0	B-1612	BH-1612	J-1612	JH-1612
		25.400	1.0000	25.78	**IR-1316**	35	1.0	B-1616	BH-1616	J-1616	JH-1616
22.225	0.8750	28.575	1.1250	25.78	**IR-1416**	51	1.0	B-1816	BH-1816	J-1816	JH-1816
23.812	0.9375	28.575	1.1250	25.78	**IR-1516**	39	1.0	B-1816	BH-1816	J-1816	JH-1816
25.400	1.0000	31.750	1.1250	19.42	**IR-1612**	43	1.0	B-2012	BH-2012	J-2012	—
		31.750	1.1250	25.78	**IR-1616**	57	1.0	B-2016	BH-2016	J-2016	JH-2016
28.575	1.1250	34.925	1.3750	19.43	**IR-1812**	48	1.0	B-2212	BH-2212	—	JH-2212
		34.925	1.3750	25.78	**IR-1816**	64	1.0	B-2216	BH-2216	—	JH-2216
		34.925	1.3750	32.13	**IR-1820**	79	1.0	B-2220	BH-2220	—	—
30.162	1.1875	38.100	1.5000	25.78	**IR-1916**	85	1.0	B-2416	—	J-2416	—
		38.100	1.5000	32.13	**IR-1920**	105	1.0	B-2420	—	J-2420	—
31.750	1.2500	38.100	1.5000	25.78	**IR-2016**	70	1.5	B-2416	—	J-2416	—
		38.100	1.5000	32.13	**IR-2020**	87	1.5	B-2420	—	J-2420	—
34.925	1.3750	41.275	1.6250	32.13	**IR-2220**	95	1.5	B-2620	—	—	—
36.512	1.4375	44.450	1.7500	25.78	**IR-2316**	100	1.5	B-2816	—	J-2816	—
		44.450	1.7500	38.48	**IR-2324**	150	1.5	B-2824	—	J-2824	—
38.100	1.5000	44.450	1.7500	25.78	**IR-2416**	83	1.5	B-2816	—	J-2816	—
		44.450	1.7500	38.48	**IR-2424**	125	1.5	B-2824	—	J-2824	—

Remarks Inner rings can be used with Y and YH types (pages B76~B79).

FIR

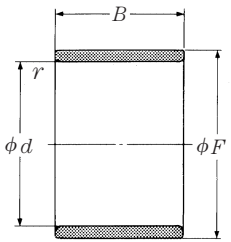
Bore Diameter 5 — 15 mm



Boundary Dimensions (mm)				Inner Ring Numbers	Mass (kg)	Matching Solid Needle Roller Bearings			
d	F	B	r min		approx	RLM	RNA	RNAF	RNAFW
5	8	12	0.15	**FIR-5812-1**	0.003	RLM81512-1			
	8	16	0.15	**FIR-5816-1**	0.004	RLM81516-1			
7	10	12	0.15	**FIR-71012-1**	0.004	RLM101712-1			
	10	16	0.15	**FIR-71016-1**	0.005	RLM101716-1			
9	12	16	0.3	**FIR-91216-1**	0.006	RLM121916-1			
10	14	12	0.3	**FIR-101412-1**	0.007			RNAF142612	
	14	13	0.3	**FIR-101413-1**	0.008		RNA4900	RNAF142213	
	14	14	0.3	**FIR-101414-1**	0.008		RNA4900TT		
	14	16	0.3	**FIR-101416-1**	0.009		RNA5900		
	14	20	0.3	**FIR-101420-1**	0.012				RNAFW142220
	14	22	0.3	**FIR-101422-1**	0.013		RNA6900		
12	16	12	0.3	**FIR-121612-1**	0.008			RNAF162812	
	16	13	0.3	**FIR-121613-1**	0.009		RNA4901	RNAF162413	
	16	14	0.3	**FIR-121614-1**	0.010		RNA4901TT		
	16	16	0.3	**FIR-121616-1**	0.011		RNA5901		
	16	20	0.3	**FIR-121620-1**	0.014				RNAFW162420
	16	22	0.3	**FIR-121622-1**	0.015		RNA6901		
	16	23	0.3	**FIR-121623-1**	0.016		RNA6901TT		
15	20	12	0.3	**FIR-152012-1**	0.013			RNAF203212	
	20	13	0.3	**FIR-152013-1**	0.014		RNA4902	RNAF202813	
	20	14	0.3	**FIR-152014-1**	0.015		RNA4902TT		
	20	18	0.3	**FIR-152018-1**	0.019		RNA5902		
	20	23	0.3	**FIR-152023-1**	0.025		RNA5902		
	20	24	0.3	**FIR-152024-1**	0.026		RNA6902TT		
	20	26	0.3	**FIR-152026-1**	0.028				RNAFW202826

FIR

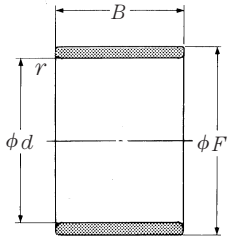
Bore Diameter 17 — 25 mm



Boundary Dimensions (mm)				Inner Ring Numbers	Mass (kg)	Matching Solid Needle Roller Bearings			
d	F	B	r min		approx	RLM	RNA	RNAF	RNAFW
17	22	13	0.3	**FIR-172213-1**	0.016		RNA4903	RNAF223013	
	22	14	0.3	**FIR-172214-1**	0.017		RNA4903TT		
	22	16	0.3	**FIR-172216-1**	0.019			RNAF223516	
	22	18	0.3	**FIR-172218-1**	0.022		RNA5903		
	22	23	0.3	**FIR-172223-1**	0.027		RNA6903		
	22	24	0.3	**FIR-172224-1**	0.029		RNA6903TT		
	22	26	0.3	**FIR-172226-1**	0.031				RNAFW223026
	22	32	0.3	**FIR-172232-1**	0.038				RNAFW223532
20	25	16	0.3	**FIR-202516-1**	0.022			RNAF253716	
	25	17	0.3	**FIR-202517-1**	0.023		RNA4904	RNAF253517	
	25	18	0.3	**FIR-202518-1**	0.025		RNA4904TT		
	25	23	0.3	**FIR-202523-1**	0.032		RNA5904		
	25	26	0.3	**FIR-202526-1**	0.036				RNAFW253526
	25	30	0.3	**FIR-202530-1**	0.041		RNA6904		
	25	31	0.3	**FIR-202531-1**	0.043		RNA6904TT		
	25	32	0.3	**FIR-202532-1**	0.044				RNAFW253732
22	28	17	0.3	**FIR-222817-1**	0.031		RNA49/22		
	28	18	0.3	**FIR-222818-1**	0.033		RNA49/22TT		
	28	23	0.3	**FIR-222823-1**	0.042		RNA59/22		
	28	30	0.3	**FIR-222830-1**	0.055		RNA69/22		
	28	31	0.3	**FIR-222831-1**	0.057		RNA69/22TT		
25	29	20	0.3	**FIR-252920-1**	0.026	RLM293820-1			
	30	16	0.3	**FIR-253016-1**	0.027			RNAF304216	
	30	17	0.3	**FIR-253017-1**	0.029		RNA4905	RNAF304017	
	30	18	0.3	**FIR-253018-1**	0.030		RNA4905TT		
	30	23	0.3	**FIR-253023-1**	0.039		RNA5905		
	30	26	0.3	**FIR-253026-1**	0.044				RNAFW304026
	30	30	0.3	**FIR-253030-1**	0.051		RNA6905		
	30	31	0.3	**FIR-253031-1**	0.052		RNA6905TT		
	30	32	0.3	**FIR-253032-1**	0.054				RNAFW304232

FIR

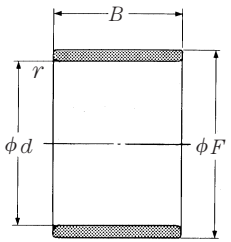
Bore Diameter 28 — 38 mm



Boundary Dimensions (mm)				Inner Ring Numbers	Mass (kg)	Matching Solid Needle Roller Bearings			
d	F	B	r min		approx	RLM	RNA	RNAF	RNAFW
28	32	17	0.3	**FIR-283217-1**	0.025		RNA49/28		
	32	18	0.3	**FIR-283218-1**	0.026		RNA49/28TT		
	32	23	0.3	**FIR-283223-1**	0.034		RNA59/28		
	32	30	0.3	**FIR-283230-1**	0.044		RNA69/28		
	32	31	0.3	**FIR-283231-1**	0.046		RNA69/28TT		
30	35	13	0.3	**FIR-303513-1**	0.026			RNAF354513	
	35	16	0.3	**FIR-303516-1**	0.032			RNAF354716	
	35	17	0.3	**FIR-303517-1**	0.034		RNA4906	RNAF354517	
	35	18	0.3	**FIR-303518-1**	0.036		RNA4906TT		
	35	23	0.3	**FIR-303523-1**	0.046		RNA5906		
	35	26	0.3	**FIR-303526-1**	0.052				RNAFW354526
	35	30	0.3	**FIR-303530-1**	0.060		RNA6906		
	35	31	0.3	**FIR-303531-1**	0.062		RNA6906TT		
	35	32	0.3	**FIR-303532-1**	0.064				RNAFW354732
32	37	30	0.3	**FIR-323730-1**	0.063	RLM374730-1			
	40	20	0.6	**FIR-324020-1**	0.071		RNA49/32		
	40	21	0.6	**FIR-324021-1**	0.074		RNA49/32TT		
	40	27	0.6	**FIR-324027-1**	0.095		RNA59/32		
	40	36	0.6	**FIR-324036-1**	0.127		RNA69/32		
	40	37	0.6	**FIR-324037-1**	0.131		RNA69/32TT		
35	40	17	0.3	**FIR-354017-1**	0.039			RNAF405017	
	40	20	0.3	**FIR-354020-1**	0.046			RNAF405520	
	40	34	0.3	**FIR-354034-1**	0.078				RNAFW405034
	40	40	0.3	**FIR-354040-1**	0.092				RNAFW405540
	42	20	0.6	**FIR-354220-1**	0.066		RNA4907		
	42	21	0.6	**FIR-354221-1**	0.069		RNA4907TT		
	42	27	0.6	**FIR-354227-1**	0.089		RNA5907		
	42	36	0.6	**FIR-354236-1**	0.119		RNA6907		
	42	37	0.6	**FIR-354237-1**	0.122		RNA6907TT		
38	43	20	0.3	**FIR-384320-1**	0.050	RLM435320-1			
	43	30	0.3	**FIR-384330-1**	0.074	RLM435330-1			

FIR

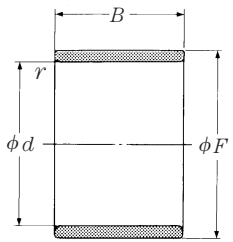
Bore Diameter 40 — 50 mm



Boundary Dimensions (mm)				Inner Ring Numbers	Mass (kg)	Matching Solid Needle Roller Bearings			
d	F	B	r min		approx	RLM	RNA	RNAF	RNAFW
40	45	17	0.3	**FIR-404517-1**	0.044			RNAF455517	
	45	20	0.3	**FIR-404520-1**	0.052			RNAF456220	
	45	34	0.3	**FIR-404534-1**	0.089				RNAFW455534
	45	40	0.3	**FIR-404540-1**	0.104				RNAFW456240
	48	22	0.6	**FIR-404822-1**	0.095		RNA4908		
	48	23	0.6	**FIR-404823-1**	0.099		RNA4908TT		
	48	30	0.6	**FIR-404830-1**	0.129		RNA5908		
	48	40	0.6	**FIR-404840-1**	0.173		RNA6908		
	48	41	0.6	**FIR-404841-1**	0.177		RNA6908TT		
42	47	20	0.3	**FIR-424720-1**	0.055	RLM475720-1			
	47	30	0.3	**FIR-424730-1**	0.082	RLM475730-1			
45	50	20	0.3	**FIR-455020-1**	0.058			RNAF506220	
	50	25	0.3	**FIR-455025-1**	0.073	RLM506225			
	50	35	0.6	**FIR-455035-1**	0.102	RLM506235-1			
	50	40	0.3	**FIR-455040-1**	0.116				RNAFW506240
	52	22	0.6	**FIR-455222-1**	0.092		RNA4909		
	52	23	0.6	**FIR-455223-1**	0.096		RNA4909TT		
	52	30	0.6	**FIR-455230-1**	0.125		RNA5909		
	52	40	0.6	**FIR-455240-1**	0.166		RNA6909		
	52	41	0.6	**FIR-455241-1**	0.171		RNA6909TT		
	55	40	0.6	**FIR-455540-1**	0.245				RNAFW557240
50	55	20	0.6	**FIR-505520-1**	0.064			RNAF556820	
	55	25	0.5	**FIR-505525-1**	0.080	RLM556825-1			
	55	35	0.3	**FIR-505535-1**	0.113	RLM556835-1			
	55	40	0.6	**FIR-505540-1**	0.129				RNAFW556840
	58	22	0.6	**FIR-505822-1**	0.116		RNA4910		
	58	23	0.6	**FIR-505823-1**	0.122		RNA4910TT		
	58	30	0.6	**FIR-505830-1**	0.159		RNA5910		
	58	40	0.6	**FIR-505840-1**	0.212		RNA6910		
	58	41	0.6	**FIR-505841-1**	0.217		RNA6910TT		
	60	20	1	**FIR-506020-1**	0.135			RNAF607820	
	60	40	1	**FIR-506040-1**	0.270				RNAFW607840

FIR

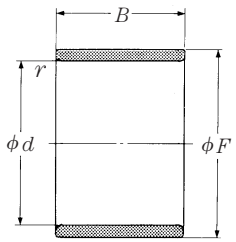
Bore Diameter 55 — 70 mm



Boundary Dimensions (mm)				Inner Ring Numbers	Mass (kg)	Matching Solid Needle Roller Bearings			
d	F	B	r min		approx	RLM	RNA	RNAF	RNAFW
55	60	25	0.3	**FIR-556025-1**	0.088	RLM607225			
	60	35	0.3	**FIR-556035-1**	0.123	RLM607235-1			
	63	25	1	**FIR-556325-1**	0.145		RNA4911		
	63	26	1	**FIR-556326-1**	0.150		RNA4911TT		
	63	34	1	**FIR-556334-1**	0.197		RNA5911		
	63	45	1	**FIR-556345-1**	0.260		RNA6911		
	63	46	1	**FIR-556346-1**	0.266		RNA6911TT		
	65	30	1	**FIR-556530-1**	0.221			RNAF658530	
	65	60	1	**FIR-556560-1**	0.441				RNAFW658560
60	68	25	1	**FIR-606825-1A**	0.157	RLM688225-1	RNA4912		
	68	26	1	**FIR-606826-1**	0.163		RNA4912TT		
	68	34	1	**FIR-606834-1**	0.213		RNA5912		
	68	35	0.6	**FIR-606835-1**	0.220	RLM688235-1			
	68	45	1	**FIR-606845-1**	0.282		RNA6912		
	68	46	1	**FIR-606846-1**	0.289		RNA6912TT		
	70	30	1	**FIR-607030-1**	0.239			RNAF709030	
	70	60	1	**FIR-607060-1**	0.478				RNAFW709060
65	72	25	1	**FIR-657225-1**	0.147		RNA4913		
	72	26	1	**FIR-657226-1**	0.153		RNA4913TT		
	72	34	1	**FIR-657234-1**	0.200		RNA5913		
	72	45	1	**FIR-657245-1**	0.264		RNA6913		
	72	46	1	**FIR-657246-1**	0.270		RNA6913TT		
	73	35	1	**FIR-657335-1**	0.237	RLM739035-1			
	75	30	1	**FIR-657530-1**	0.257			RNAF759530	
	75	60	1	**FIR-657560-1**	0.515				RNAFW759560
70	80	25	1	**FIR-708025-1**	0.230	RLM809525-1			
	80	30	1	**FIR-708030-1**	0.276		RNA4914	RNAF8010030	
	80	31	1	**FIR-708031-1**	0.285		RNA4914TT		
	80	35	1	**FIR-708035-1**	0.322	RLM809535-1			
	80	40	1	**FIR-708040-1**	0.368		RNA5914		
	80	54	1	**FIR-708054-1**	0.496		RNA6914		
	80	55	1	**FIR-708055-1**	0.505		RNA6914TT		
	80	60	1	**FIR-708060-1**	0.551				RNAFW8010060

FIR

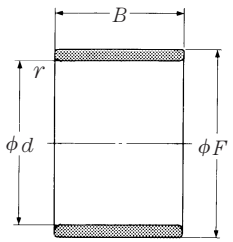
Bore Diameter 75 — 100 mm



Boundary Dimensions (mm)				Inner Ring Numbers	Mass (kg)	Matching Solid Needle Roller Bearings			
d	F	B	r min		approx	RLM	RNA	RNAF	RNAFW
75	85	25	1	**FIR-758525-1**	0.245	RLM8510525-1			
	85	30	1	**FIR-758530-1**	0.294		RNA4915	RNAF8510530	
	85	31	1	**FIR-758531-1**	0.304		RNA4915TT		
	85	35	1	**FIR-758535-1**	0.343	RLM8510535-1			
	85	40	1	**FIR-758540-1**	0.392		RNA5915		
	85	54	1	**FIR-758554-1**	0.529		RNA6915		
	85	55	1	**FIR-758555-1**	0.539		RNA6915TT		
80	90	25	1	**FIR-809025-1**	0.260	RLM9011025-1			
	90	30	1	**FIR-809030-1**	0.312		RNA4916	RNAF9011030	
	90	31	1	**FIR-809031-1**	0.323		RNA4916TT		
	90	40	1	**FIR-809040-1**	0.417		RNA5916		
	90	54	1	**FIR-809054-1**	0.562		RNA6916		
	90	55	1	**FIR-809055-1**	0.573		RNA6916TT		
85	95	26	1	**FIR-859526-1**	0.287	RLM9511526-1			
	95	30	1	**FIR-859530-1**	0.331			RNAF9511530	
	100	35	1.1	**FIR-8510035-1**	0.595		RNA4917		
	100	36	1.1	**FIR-8510036-1**	0.612		RNA4917TT		
	100	46	1.1	**FIR-8510046-1**	0.782		RNA5917		
	100	63	1.1	**FIR-8510063-1**	1.071		RNA6917		
	100	64	1.1	**FIR-8510064-1**	1.088		RNA6917TT		
90	100	26	1	**FIR-9010026-1**	0.303	RLM10012026-1			
	100	30	1	**FIR-9010030-1**	0.349			RNAF10012030	
	105	35	1.1	**FIR-9010535-1**	0.627		RNA4918		
	105	36	1.1	**FIR-9010536-1**	0.645		RNA4918TT		
	105	46	1.1	**FIR-9010546-1**	0.824		RNA5918		
	105	63	1.1	**FIR-9010563-1**	1.129		RNA6918		
95	110	35	1.1	**FIR-9511035-1**	0.659		RNA4919		
	110	36	1.1	**FIR-9511036-1**	0.678		RNA4919TT		
	110	46	1.1	**FIR-9511046-1**	0.867		RNA5919		
	110	63	1.1	**FIR-9511063-1**	1.187		RNA6919		
	110	64	1.1	**FIR-9511064-1**	1.206		RNA6919TT		
100	115	40	1.1	**FIR-10011540-1**	0.790		RNA4920		
	115	41	1.1	**FIR-10011541-1**	0.810		RNA4920TT		
	115	54	1.1	**FIR-10011554-1**	1.067		RNA5920		

FIR

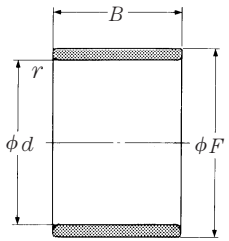
Bore Diameter 110 — 220 mm



Boundary Dimensions (mm)				Inner Ring Numbers	Mass (kg)	Matching Solid Needle Roller Bearings			
d	F	B	r min		approx	RLM	RNA	RNAF	RNAFW
110	120	30	1	**FIR-11012030-1**	0.423		RNA4822		
	125	40	1.1	**FIR-11012540-1**	0.864		RNA4922		
	125	41	1.1	**FIR-11012541-1**	0.885		RNA4922TT		
	125	54	1.1	**FIR-11012554-1**	1.166		RNA5922		
120	130	30	1	**FIR-12013030-1**	0.459		RNA4824		
	135	45	1.1	**FIR-12013545-1**	1.054		RNA4924		
	135	60	1.1	**FIR-12013560-1**	1.406		RNA5924		
130	145	35	1.1	**FIR-13014535-1**	0.884		RNA4826		
	150	50	1.5	**FIR-13015050-1**	1.715		RNA4926		
	150	67	1.5	**FIR-13015067-1**	2.298		RNA5926		
140	155	35	1.1	**FIR-14015535-1**	0.949		RNA4828		
	160	50	1.5	**FIR-14016050-1**	1.838		RNA4928		
	160	67	1.5	**FIR-14016067-1**	2.463		RNA5928		
150	165	40	1.1	**FIR-15016540-1**	1.158		RNA4830		
	170	60	2	**FIR-15017060-1**	2.352		RNA4930		
160	175	40	1.1	**FIR-16017540-1**	1.231		RNA4832		
	180	60	2	**FIR-16018060-1**	2.499		RNA4932		
170	185	45	1.1	**FIR-17018545-1**	1.468		RNA4834		
	190	60	2	**FIR-17019060-1**	2.646		RNA4934		
180	195	45	1.1	**FIR-18019545-1**	1.551		RNA4836		
	205	69	2	**FIR-18020569-1**	4.068		RNA4936		
190	210	50	1.5	**FIR-19021050-1**	2.450		RNA4838		
	215	69	2	**FIR-19021569-1**	4.280		RNA4938		
200	220	50	1.5	**FIR-20022050-1**	2.573		RNA4840		
	225	80	2.1	**FIR-20022580-1**	5.207		RNA4940		
220	240	50	1.5	**FIR-22024050-1**	2.818		RNA4844		
	245	80	2.1	**FIR-22024580-1**	5.697		RNA4944		

FIR

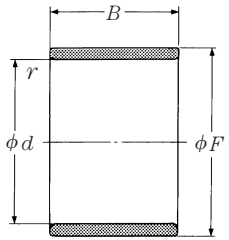
Bore Diameter 8 — 20 mm



Boundary Dimensions (mm)				Inner Ring Numbers	Mass (g)	Matching Solid Needle Roller Bearings RLM	
d	F	B	r min		approx		
8	12	12.2	0.3	**FIR-81212-2**	5.9	RLM1212	RLM121912
	12	15.2	0.3	**FIR-81215-2**	7.4		RLM121915
10	14	16.2	0.3	**FIR-101416-2**	9.5	RLM1416	
	14	20.2	0.3	**FIR-101420-2**	11.9	RLM1420	
	15	8.2	0.3	**FIR-10158-2**	6.2	RLM158	
	15	12.2	0.3	**FIR-101512-2**	9.3		RLM152212
	15	15.2	0.3	**FIR-101515-2**	11.6	RLM1515	RLM152215
	15	20.2	0.3	**FIR-101520-2**	15.5	RLM1520	RLM152220
12	16	16.2	0.3	**FIR-121616-2**	11.1	RLM1616	
	16	20.2	0.3	**FIR-121620-2**	13.9	RLM1620	
	17	10.2	0.3	**FIR-121710-2**	9.0	RLM1710	
	17	15.2	0.5	**FIR-121715-2**	13.5		RLM172415
	17	20.2	0.5	**FIR-121720-2**	17.9	RLM1720	
	17	25.2	0.5	**FIR-121725-2**	22.4		RLM172425
15	18	15.2	0.5	**FIR-151815-2**	9.2	RLM1815	
	18	17.2	0.5	**FIR-151817-2**	10.4	RLM1817	
	18	20.2	0.5	**FIR-151820-2**	12.3	RLM1820	
	18	25.2	0.5	**FIR-151825-2**	15.3	RLM1825	
	19	16.2	0.5	**FIR-151916-2**	13.5	RLM1916	
	19	20.2	0.5	**FIR-151920-2**	16.8	RLM1920	
	20	10.2	0.5	**FIR-152010-2**	10.9	RLM2010	
	20	15.2	0.5	**FIR-152015-2**	16.3	RLM2015	
	20	20.2	0.5	**FIR-152020-2**	21.7	RLM2020	RLM202820
	20	25.2	0.5	**FIR-152025-2**	27	RLM2025	
17	21	16.2	0.5	**FIR-172116-2**	15.1	RLM2116	
	21	20.2	0.5	**FIR-172120-2**	18.8	RLM2120	
	22	25.2	0.5	**FIR-172215-2**	18.2	RLM2215	
	22	16.2	0.5	**FIR-172216-2**	19.4		RLM223016
	22	20.2	0.5	**FIR-172220-2**	24.1	RLM2220	RLM223020
	22	25.2	0.5	**FIR-172225-2**	30.1	RLM2225	
20	24	16.2	0.5	**FIR-202416-2**	17.5		RLM243216
	24	20.2	0.5	**FIR-202420-2**	21.8	RLM2420	
	24	28.2	0.5	**FIR-202428-2**	30.4	RLM2428	
	25	12.2	0.5	**FIR-202512-2**	16.8	RLM2512	
	25	20.2	0.5	**FIR-202520-2**	27.8	RLM2520	RLM253320
	25	25.2	0.5	**FIR-202525-2**	34.7	RLM2525	RLM253325

FIR

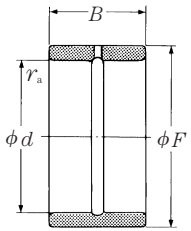
Bore Diameter 22 — 50 mm



Boundary Dimensions (mm)				Inner Ring Numbers	Mass (g)	Matching Solid Needle Roller Bearings RLM	
d	F	B	r min		approx		
22	26	20.2	0.5	**FIR-222620-2**	23.8	RLM2620	
	28	20.2	0.5	**FIR-222820-2**	37.1	RLM2820	RLM283720
	28	25.2	0.5	**FIR-222825-2**	46.3	RLM2825	
	28	30.2	0.5	**FIR-222830-2**	55.5		RLM283730
25	29	20.2	0.5	**FIR-252920-2**	26.7	RLM2920	
	29	30.2	0.5	**FIR-252930-2**	40	RLM2930	
	30	15.2	0.5	**FIR-253015-2**	25.6	RLM3015	
	30	20.2	0.5	**FIR-253020-2**	34	RLM3020	RLM304020
	30	25.2	0.5	**FIR-253025-2**	42.5	RLM3025	RLM304025
28	32	20.2	0.5	**FIR-283220-2**	29.7	RLM3220	
	32	30.2	0.5	**FIR-283230-2**	44.4	RLM3230	
30	35	20.2	0.5	**FIR-303520-2**	40.2	RLM3520	RLM354520
	35	25.2	0.5	**FIR-303525-2**	50.2		RLM354525
	35	30.2	0.5	**FIR-303530-2**	60.1	RLM3530	RLM354530
32	37	20.3	0.6	**FIR-323720-2**	42.9	RLM3720	
	37	30.3	0.6	**FIR-323730-2**	64	RLM3730	
	38	15.3	0.6	**FIR-323815-2**	39.4	RLM3815	
	38	20.3	0.6	**FIR-323820-2**	52.2	RLM3820	
	38	25.3	0.6	**FIR-323825-2**	65.1	RLM3825	
	38	30.3	0.6	**FIR-323830-2**	78	RLM3830	
35	40	15.3	0.6	**FIR-354015-2**	35.1	RLM4015	
	40	20.3	0.6	**FIR-354020-2**	46.6	RLM4020	
	40	25.3	0.6	**FIR-354025-2**	58.1	RLM4025	
	40	30.3	0.6	**FIR-354030-2**	69.6	RLM4030	
40	45	20.3	0.6	**FIR-404520-2**	52.9	RLM4520	
	45	25.3	0.6	**FIR-404525-2**	65.9	RLM4525	
	45	30.3	0.6	**FIR-404530-2**	78.9	RLM4530	
42	50	20.3	0.6	**FIR-425020-2**	91.5	RLM5020	RLM506220
	50	25.3	0.6	**FIR-425025-2**	114		RLM506225
	50	30.3	0.6	**FIR-425030-2**	137	RLM5030	RLM506230
45	55	30.3	0.6	**FIR-455530-2**	186	RLM5530	
	55	40.3	0.6	**FIR-455540-2**	247	RLM5540	
50	60	30.3	0.6	**FIR-506030-2**	204		RLM607230
	60	40.3	0.6	**FIR-506040-2**	272	RLM6040	RLM607240

IR

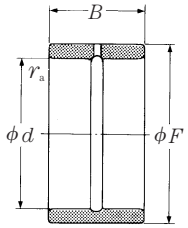
Bore Diameter 9.525 — 39.688 mm



Boundary Dimensions (mm, inch) d		F		B	Inner Ring Numbers	Mass (kg) approx	Fillet Radius of Shaft (mm) r_a max	Matching Solid Needle Roller Bearings HJ
9.525	0.3750	15.875	0.6250	19.05	**IR-061012**	0.018	0.6	HJ-101812
12.700	0.5000	19.050	0.7500	19.05	**IR-081212**	0.027	1	HJ-122012
		19.050	0.7500	25.40	**IR-081216**	0.037	1	HJ-122016
15.875	0.6250	22.225	0.8750	19.05	**IR-101412**	0.026	1	HJ-142212
		22.225	0.8750	25.40	**IR-101416**	0.033	1	HJ-142216
17.462	0.6875	22.225	0.8750	19.05	**IR-111412**	0.023	1	HJ-142212
19.050	0.7500	25.400	1.0000	19.05	**IR-121612**	0.032	1	HJ-162412
		25.400	1.0000	25.40	**IR-121616**	0.044	1	HJ-162416
20.638	0.8125	25.400	1.0000	25.40	**IR-131616**	0.034	1	HJ-162416
22.225	0.8750	28.575	1.1250	25.40	**IR-141816**	0.050	1	HJ-182616
		28.575	1.1250	31.75	**IR-141820**	0.065	1	HJ-182620
23.812	0.9375	28.575	1.1250	25.40	**IR-151816**	0.040	1	HJ-182616
		28.575	1.1250	31.75	**IR-151820**	0.050	1	HJ-182620
25.400	1.0000	31.750	1.2500	25.40	**IR-162016**	0.060	1	HJ-202816
		31.750	1.2500	31.75	**IR-162020**	0.075	1	HJ-202820
28.575	1.1250	34.925	1.3750	25.40	**IR-182216**	0.065	1	HJ-223016
		34.925	1.3750	31.75	**IR-182220**	0.075	1	HJ-223020
30.162	1.1875	38.100	1.5000	31.75	**IR-192420**	0.105	1.5	HJ-243320
31.750	1.2500	38.100	1.5000	25.40	**IR-202416**	0.075	1.5	HJ-243316
		38.100	1.5000	31.75	**IR-202420**	0.090	1.5	HJ-243320
33.338	1.3125	41.275	1.6250	25.40	**IR-212616**	0.095	1.5	HJ-263516
		41.275	1.6250	31.75	**IR-212620**	0.12	1.5	HJ-263520
34.925	1.3750	41.275	1.6250	31.75	**IR-222620**	0.10	1.5	HJ-263520
		44.450	1.7500	31.75	**IR-222820**	0.145	1.5	HJ-283720
36.512	1.4375	44.450	1.7500	25.40	**IR-232816**	0.10	1.5	HJ-283716
		44.450	1.7500	31.75	**IR-232820**	0.125	1.5	HJ-283720
38.100	1.5000	44.450	1.7500	25.40	**IR-242816**	0.095	1.5	HJ-283716
		44.450	1.7500	31.75	**IR-242820**	0.10	1.5	HJ-283720
		50.800	2.0000	31.75	**IR-243220**	0.22	1.5	HJ-324120
39.688	1.5625	47.625	1.8750	31.75	**IR-253020**	0.135	1.5	HJ-303920
		50.800	2.0000	31.75	**IR-253220**	0.195	1.5	HJ-324120

IR

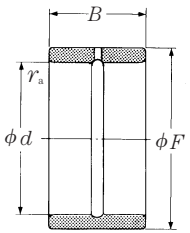
Bore Diameter 41.275 — 107.950 mm



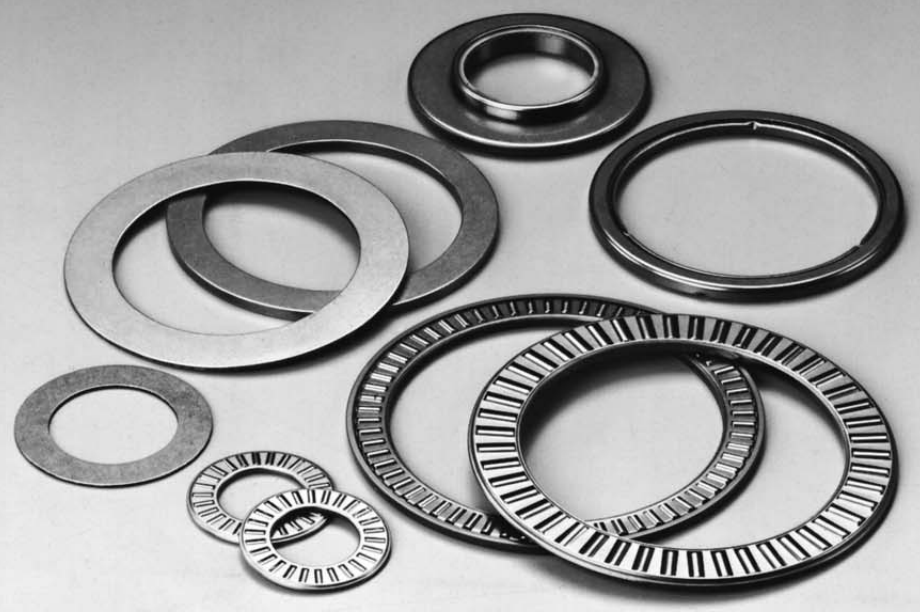
Boundary Dimensions (mm, inch) d		F		B	Inner Ring Numbers	Mass (kg) approx	Fillet Radius of Shaft (mm) r_a max	Matching Solid Needle Roller Bearings HJ
41.275	1.6250	50.800	2.0000	31.75	**IR-263220**	0.17	1.5	HJ-324120
42.862	1.6875	50.800	2.0000	25.40	**IR-273216**	0.12	1.5	HJ-324116
		50.800	2.0000	31.75	**IR-273220**	0.145	1.5	HJ-324120
44.450	1.7500	57.150	2.2500	38.10	**IR-283624**	0.305	1.5	HJ-364824
		57.150	2.2500	44.45	**IR-283628**	0.355	1.5	HJ-364828
49.212	1.9375	63.500	2.5000	38.10	**IR-314024**	0.375	2	HJ-405224
		63.500	2.5000	44.45	**IR-314028**	0.425	2	HJ-405228
50.800	2.0000	63.500	2.5000	38.10	**IR-324024**	0.34	2	HJ-405224
		63.500	2.5000	44.45	**IR-324028**	0.40	2	HJ-405228
55.562	2.1875	69.850	2.7500	44.45	**IR-354428**	0.50	2	HJ-445628
57.150	2.2500	69.850	2.7500	38.10	**IR-364424**	0.375	2	HJ-445624
		69.850	2.7500	45.45	**IR-364428**	0.45	2	HJ-445628
60.325	2.3750	76.200	3.0000	44.45	**IR-384828**	0.57	2	HJ-486028
63.500	2.5000	76.200	3.0000	38.10	**IR-404824**	0.44	2	HJ-486024
		76.200	3.0000	44.45	**IR-404828**	0.47	2	HJ-486028
69.850	2.7500	82.550	3.2500	44.45	**IR-445228**	0.50	2	HJ-526828
		82.550	3.2500	50.80	**IR-445232**	0.60	2	HJ-526832
74.612	2.9375	88.900	3.5000	50.80	**IR-475632**	0.75	2	HJ-567232
76.200	3.0000	88.900	3.5000	50.80	**IR-485632**	0.70	2	HJ-567232
79.375	3.1250	95.250	3.7500	50.80	**IR-506032**	0.90	2.5	HJ-607632
82.550	3.2500	95.250	3.7500	50.80	**IR-526032**	0.70	2.5	HJ-607632
		101.600	4.0000	50.80	**IR-526432**	1.1	2.5	HJ-648032
85.725	3.3750	101.600	4.0000	50.80	**IR-546432**	0.90	2.5	HJ-648032
88.900	3.5000	101.600	4.0000	50.80	**IR-566432**	0.75	2.5	HJ-648032
		107.950	4.2500	50.80	**IR-566832**	1.15	2.5	HJ-688432
95.250	3.7500	107.950	4.2500	50.80	**IR-606832**	1.0	2.5	HJ-688432
		114.300	4.5000	57.15	**IR-607236**	1.4	2.5	HJ-729636
		114.300	4.5000	63.50	**IR-607240**	1.55	2.5	HJ-729640
101.600	4.0000	127.000	5.0000	57.15	**IR-648036**	2.05	2.5	HJ-8010436
		127.000	5.0000	63.50	**IR-648040**	2.25	2.5	HJ-8010440
107.950	4.2500	127.000	5.0000	57.15	**IR-688036**	1.55	2.5	HJ-8010436

IR

Bore Diameter 114.300 — 203.200 mm



Boundary Dimensions (mm, inch) d		F		B	Inner Ring Numbers	Mass (kg) approx	Fillet Radius of Shaft (mm) r_a max	Matching Solid Needle Roller Bearings HJ
114.300	4.5000	139.700	5.5000	63.50	**IR-728840**	2.5	2.5	HJ-8811240
		139.700	5.5000	76.20	**IR-728848**	2.95	2.5	HJ-8811248
120.650	4.7500	146.050	5.7500	76.20	**IR-769248**	3.15	3	HJ-9211648
127.000	5.0000	152.400	6.0000	63.50	**IR-809640**	2.75	3	HJ-9612040
		152.400	6.0000	76.20	**IR-809648**	3.35	3	HJ-9612048
139.700	5.5000	165.100	6.5000	63.50	**IR-8810440**	3.05	3	HJ-10412840
		165.100	6.5000	76.20	**IR-8810448**	3.65	3	HJ-10412848
152.400	6.0000	184.150	7.2500	76.20	**IR-9611648**	4.9	3	HJ-11614648
165.100	6.5000	196.850	7.7500	76.20	**IR-10412448**	5.5	3	HJ-12415448
177.800	7.0000	209.550	8.2500	76.20	**IR-11213248**	5.55	3	HJ-13216248
190.500	7.5000	222.250	8.7500	76.20	**IR-12014048**	6.15	4	HJ-14017048
203.200	8.0000	234.950	9.2500	76.20	**IR-12814848**	6.4	4	HJ-14817848



THRUST BEARINGS

CAGE & NEEDLE ROLLER ASSEMBLIES FOR THRUST NEEDLE BEARINGS

			Pages
Metric Design	Bore Diameter	10–100 mm	B168–B169
Inch Design	Bore Diameter	6.350–104.775 mm	B170–B171

THRUST NEEDLE BEARINGS WITH INTEGRATED RACEWAY WASHERS

Metric Design (FB)	Bore Diameter	20–55 mm	B172–B173
Metric Design (FH, FG)	Bore Diameter	22.6–43 mm	B174–B175

Thrust needle bearings type comes in metric and inch designs.

The cage & Needle roller assembly for the thrust needle bearing is a cage that has two pieces joined together (refer to **Fig. 1**), to which surface hardening is applied after the precision press processing of a steel plate, and in which high accuracy rollers are incorporated, in order to achieve rigidity and wear resistance. Many rollers are retained securely in the cage, taking large axial load, and yet rotating smoothly. Mounting space is so small that it is easy to replace a conventional sliding thrust washer. Different thicknesses of various types of thrust raceway washers are available in this cage & Needle roller assembly, which allows selection of the appropriate thickness suited for bearing peripheral mounting conditions.

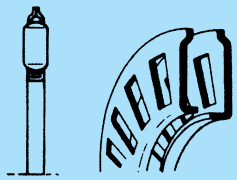


Fig. 1

Type

Several types of thrust bearings are shown in **Table 1**.

For inch bearings, the dimension number is expressed in integers in units of 1/16 inch.

Raceway washers are available for use when the raceway surface cannot be hardened by heat treatment and ground to the proper finish.

Types of raceway washers used for cage & Needle roller assemblies in thrust needle bearings are shown in **Table 2**.

Table 1 Bearing Types

Code		Description
Metric	FNTA	Cage & Needle roller assemblies for thrust needle bearings
	FB, FG, FH	Thrust needle bearings with integrated raceway washers
Inch	NTA, NTC	Cage & Needle roller assemblies for thrust needle bearings

The composition of bearing numbers is as follows:

(Example) FNTA-2035

- 2035: Outside Diameter (mm)
- 20: Bore Diameter (mm)
- FNTA: Type Code

Table 2 Raceway Washers of Thrust Needle Bearings

Units: mm

Metric		Inch	
Type	Thickness	Type	Thickness
FTRA	1.0	TRA	0.8
FTRB	1.5	TRB	1.6
FTRC	2.0	TRC	2.4
FTRD	2.5	TRD	3.2
FTRE	3.0	TRE	4.0
—	—	TRF	4.8

Other than the rings shown in **Table 2**, raceway washers with flanges at the bore or outside are also available.

Accuracy

Thrust Needle Bearings

NSK metric FNTA cage & Needle roller assemblies conform with ISO criteria, and the fitting tolerance of the cage born diameter is E11 and that of the outside diameter is c12.

The dimensional tolerances for inch NTA cage & Needle roller assemblies, and metric and inch thrust raceway washers are shown in the dimensional table. The accuracy class of the rollers is Class 3 of ISO.

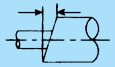
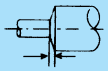
Application

Thrust Needle Bearings

When using FNTA and NTA cage & Needle roller assemblies, using the gear side as a raceway ring saves bearing space (refer to **Fig. 2**).

In general, the accuracy, surface roughness, and hardness of the raceway components should satisfy the specifications shown in **Table 3**.

Table 3 Specifications of Thrust Bearing Raceway Surface

Squareness A	0.5/1000 (mm/mm)	
Squareness B	1.0/1000 (mm/mm)	
Roughness, (1) Ra	0.4	—
Hardness, (2)	HRC 58 to 64 (HRC60 to 64 is favorable)	—

Notes (1) Refer to Section **5.2** on page A34 for details.
(2) Refer to Section **5.3** on page A35 for details.

When a cage & Needle roller assembly cannot be used by itself, a thrust raceway washer should be employed. The raceway washer should be selected after considering washer support face and the volume of the load. The thrust raceway washer should be set to prevent sliding between the contact surfaces.

When the area supporting the raceway washer is sufficiently large, a thin raceway washer, such as the FTRA and TRA types, can be used. It should be noted that even if the washers of the FTRA and TRA types are warped, an axial load of more than approximately 196 N {20 kgf} will flatten them.

When the support face of the shaft or housing is small (refer to **Fig. 3**). FTRE and TRD types, which are thick-wall raceway washers, or any of the other thicker types should be used. In any case, to bring out the full performance of the bearing, the squareness of the support face should be ensured and sufficient space is needed in the support face.

For squareness of the raceway washer support face, the values shown in **Table 3** are applied. Please consult NSK regarding shape and accuracy.

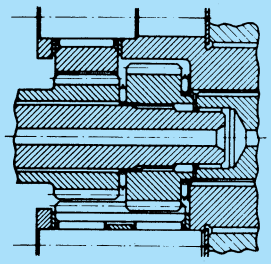


Fig. 2

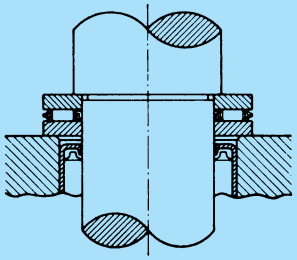


Fig. 3

Bearing Guide

The cages used in FNTA and NTA cage & Needle roller assemblies are guided by the shaft along their extended cage bore.

Bore diameter tolerance is smaller than that for the outside diameter, and as relative speed at the guide face is slow, the bore guiding method is effective. When the outside of the cage is guided, it is necessary for the housing guide surface to be hardened, at least on its surface, to protect it from wear.

Fitting

Recommended fittings for thrust needle bearings is shown in **Table 4**.

Table 4 Recommended Fitting for Thrust Bearing

Units: mm

Classification	Type	Cage or Raceway Washer Guide	Fitting Class or Tolerance	
			Shaft	Housing Bore
Thrust Needle Bearing Cage & Needle Roller Assembly	FNTA	Bore	h8	D_c+over 1.0
		Outside	—	H10
	NTA NTC	Bore	0 −0.075	D_c+over 1.0
		Outside	—	H10
Thrust Needle Bearing Raceway Washer	FTRA — FTRE	Bore	h8	D_c+over 1.0
		Outside	—	H10
	TRA — TRF	Bore	0 −0.075	D_c+over 1.0
		Outside	—	H10

Remarks D_c in the table to the bore and outside surface of the cage.
Please consult NSK regarding fitting of bearing types other than those shown in **Table 4**.

Thrust Needle Bearings

FNTA (Thrust Cage & Needle Roller Assemblies)

FTRA (Thrust Bearing Rings s = 1.0)

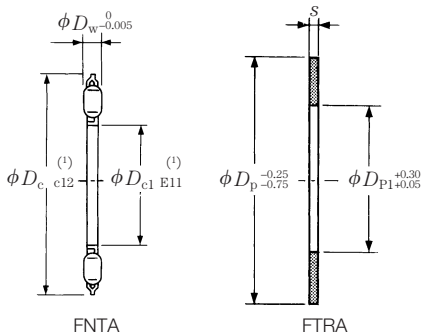
FTRB (s = 1.5)

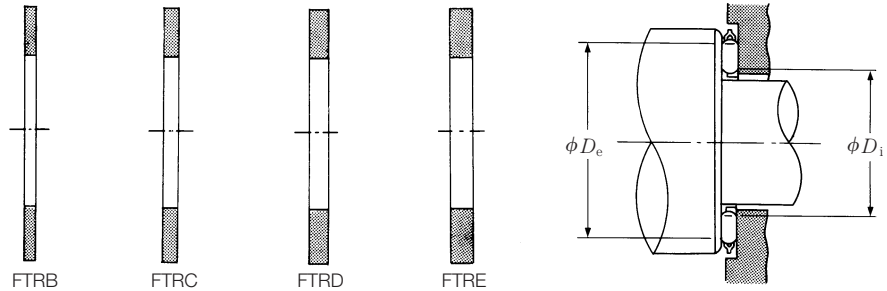
FTRC (s = 2.0)

FTRD (s = 2.5)

FTRE (s = 3.0)

Bore Diameter 10 — 100 mm





Boundary Dimensions (mm) D_{C1}, D_{P1}	D_C, D_P	D_W	Basic Load Ratings (N) C_a	C_{oa}	{kgf} C_a	C_{oa}	Limiting Speeds (min^{-1}) Oil	Bearing Numbers
10	24	2	7 750	23 000	790	2 350	17 000	**FNTA-1024**
12	26	2	8 350	26 300	855	2 680	16 000	**FNTA-1226**
13	26	2	8 050	25 400	825	2 590	16 000	**FNTA-1326**
15	28	2	7 950	25 800	810	2 630	15 000	**FNTA-1528**
16	29	2	8 200	27 100	835	2 770	14 000	**FNTA-1629**
17	30	2	8 400	28 400	855	2 900	14 000	**FNTA-1730**
18	31	2	8 600	29 700	875	3 050	13 000	**FNTA-1831**
20	35	2	11 900	47 000	1 220	4 800	12 000	**FNTA-2035**
25	42	2	14 800	66 000	1 510	6 750	9 500	**FNTA-2542**
30	47	2	16 500	79 000	1 680	8 100	8 500	**FNTA-3047**
35	52	2	17 300	88 000	1 770	8 950	8 000	**FNTA-3552**
40	60	3	26 900	122 000	2 740	12 400	6 700	**FNTA-4060**
45	65	3	28 700	137 000	2 930	14 000	6 300	**FNTA-4565**
50	70	3	30 500	152 000	3 100	15 500	5 600	**FNTA-5070**
55	78	3	37 000	201 000	3 750	20 500	5 300	**FNTA-5578**
60	85	3	43 000	252 000	4 400	25 700	4 800	**FNTA-6085**
65	90	3	45 500	274 000	4 600	28 000	4 500	**FNTA-6590**
70	95	4	59 000	320 000	6 000	33 000	4 300	**FNTA-7095**
75	100	4	60 000	335 000	6 150	34 500	4 000	**FNTA-75100**
80	105	4	63 000	365 000	6 450	37 500	3 800	**FNTA-80105**
85	110	4	64 500	380 000	6 550	39 000	3 600	**FNTA-85110**
90	120	4	80 000	515 000	8 150	52 500	3 400	**FNTA-90120**
100	135	4	98 500	695 000	10 000	71 000	3 000	**FNTA-100135**

Note (1) For tolerance classes c12 and E11, please refer to pages C58 and C60, respectively.

Matching Bearing Rings $s=1.0^{+0.05}$	$s=1.5^{0}_{-0.08}$	$s=2.0^{0}_{-0.08}$	$s=2.5^{0}_{-0.08}$	$s=3.0^{0}_{-0.08}$	Roller Contact Surfaces (mm) D_e min	D_i max	Mass approx (g) FNTA	FTRA
* **FTRA-1024**	**FTRB-1024**	**FTRC-1024**	—	—	22	11.5	2.3	2.9
FTRA-1226	**FTRB-1226**	**FTRC-1226**	—	—	24	13.5	3.4	3.3
FTRA-1326	**FTRB-1326**	**FTRC-1326**	—	—	24	14.5	3.3	3.1
FTRA-1528	**FTRB-1528**	**FTRC-1528**	**FTRD-1528**	**FTRE-1528**	26	16.5	3.5	3.5
FTRA-1629	**FTRB-1629**	**FTRC-1629**	**FTRD-1629**	**FTRE-1629**	27	17.5	3.7	3.6
FTRA-1730	**FTRB-1730**	**FTRC-1730**	**FTRD-1730**	**FTRE-1730**	28	18.5	3.8	3.8
FTRA-1831	**FTRB-1831**	**FTRC-1831**	**FTRD-1831**	**FTRE-1831**	29	19.5	4.0	3.9
FTRA-2035	**FTRB-2035**	**FTRC-2035**	**FTRD-2035**	**FTRE-2035**	33	21.5	5.4	5.1
FTRA-2542	**FTRB-2542**	**FTRC-2542**	**FTRD-2542**	**FTRE-2542**	40	26.5	7.7	7.0
FTRA-3047	**FTRB-3047**	**FTRC-3047**	**FTRD-3047**	**FTRE-3047**	45	31.5	8.9	7.9
FTRA-3552	**FTRB-3552**	**FTRC-3552**	**FTRD-3552**	**FTRE-3552**	50.5	36.5	9.7	9.1
FTRA-4060	**FTRB-4060**	**FTRC-4060**	**FTRD-4060**	**FTRE-4060**	57	42	18	12
FTRA-4565	**FTRB-4565**	**FTRC-4565**	**FTRD-4565**	**FTRE-4565**	62	47	20	13
FTRA-5070	**FTRB-5070**	**FTRC-5070**	**FTRD-5070**	**FTRE-5070**	67	51.5	22	15
FTRA-5578	**FTRB-5578**	**FTRC-5578**	**FTRD-5578**	**FTRE-5578**	75	57	29	19
FTRA-6085	**FTRB-6085**	**FTRC-6085**	**FTRD-6085**	**FTRE-6085**	82	61.5	35	22
FTRA-6590	**FTRB-6590**	**FTRC-6590**	**FTRD-6590**	**FTRE-6590**	87.5	66.5	38	24
FTRA-7095	**FTRB-7095**	**FTRC-7095**	**FTRD-7095**	**FTRE-7095**	92.5	71.5	52	25
FTRA-75100	**FTRB-75100**	**FTRC-75100**	**FTRD-75100**	**FTRE-75100**	97.5	76.5	54	27
FTRA-80105	**FTRB-80105**	**FTRC-80105**	**FTRD-80105**	**FTRE-80105**	102.5	81.5	58	28
FTRA-85110	**FTRB-85110**	**FTRC-85110**	**FTRD-85110**	**FTRE-85110**	107.5	86.5	63	30
FTRA-90120	**FTRB-90120**	**FTRC-90120**	**FTRD-90120**	**FTRE-90120**	117.5	91.5	80	38
FTRA-100135	**FTRB-100135**	**FTRC-100135**	**FTRD-100135**	**FTRE-100135**	132.5	101.5	105	50

* The tolerance of this bearing's bore diameter is +0.025 to +0.175 mm and its outside diameter tolerance is −0.040 to −0.370 mm.

Thrust Needle Bearings

NTA (Thrust Cage & Needle Roller Assemblies)

NTC

TRA (Thrust Bearing Rings s = 0.8)

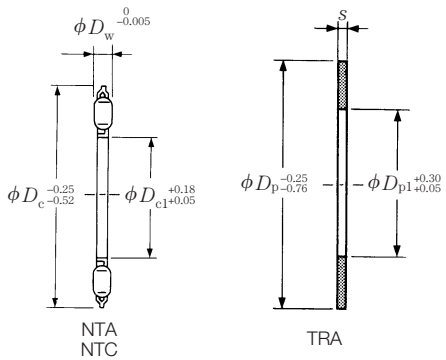
TRB (s = 1.6)

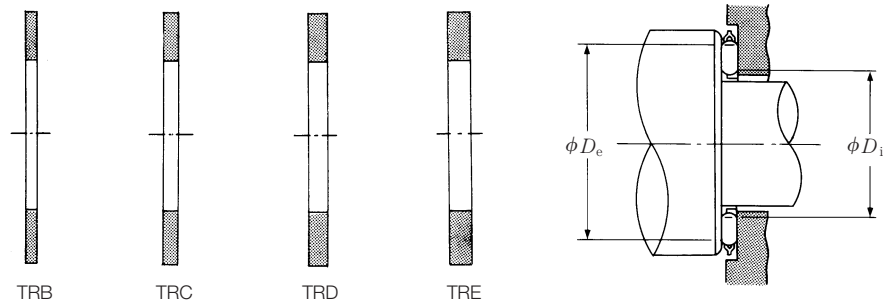
TRC (s = 2.4)

TRD (s = 3.2)

TRE (s = 4.0)

Bore Diameter 6.350 — 104.775 mm





Boundary Dimensions (mm, inch)						Basic Load Ratings (N)		{kgf}		Limiting Speeds (min^{-1})
D_{C1}, D_{P1}		D_C, D_P		D_W		C_a	C_{oa}	C_a	C_{oa}	Oil
6.350	0.2500	17.450	—	1.984	—	4 400	9 900	450	1 010	24 000
7.925	—	19.050	0.7500	1.984	—	4 950	12 100	505	1 230	22 000
9.525	0.3750	20.625	—	1.984	—	5 200	13 200	530	1 350	20 000
12.700	0.5000	23.800	—	1.984	—	6 150	17 600	625	1 790	18 000
14.275	—	25.400	1.0000	1.984	—	6 600	19 800	670	2 020	17 000
15.875	0.6250	28.575	1.1250	1.984	—	8 100	26 600	825	2 720	15 000
19.050	0.7500	31.750	1.2500	1.984	—	9 000	32 000	915	3 250	13 000
22.225	0.8750	36.500	—	1.984	—	11 600	46 500	1 180	4 750	11 000
		42.850	—	1.984	—	16 300	74 500	1 660	7 600	9 500
25.400	1.0000	39.675	—	1.984	—	12 000	50 000	1 220	5 100	10 000
28.575	1.1250	44.450	1.7500	1.984	—	14 800	68 000	1 510	6 950	9 000
31.750	1.2500	49.200	—	1.984	—	17 700	88 500	1 800	9 050	8 000
34.925	1.3750	52.375	—	1.984	—	18 700	98 000	1 910	10 000	7 500
38.100	1.5000	55.550	—	1.984	—	20 400	112 000	2 080	11 400	7 500
44.450	1.7500	63.500	2.5000	1.984	—	20 400	117 000	2 080	11 900	6 700
50.800	2.0000	69.850	2.7500	1.984	—	21 100	126 000	2 150	12 800	6 000
53.975	2.1250	73.025	2.8750	1.984	—	21 400	131 000	2 190	13 300	5 600
57.150	2.2500	76.200	3.0000	1.984	—	21 800	135 000	2 220	13 800	5 300
		79.375	3.1250	3.175	0.1250	33 500	172 000	3 450	17 500	5 000
63.500	2.5000	82.550	3.2500	1.984	—	22 400	145 000	2 290	14 700	5 000
69.850	2.7500	92.075	3.6250	3.175	0.1250	42 500	248 000	4 350	25 300	4 500
76.200	3.0000	95.250	3.7500	1.984	—	23 700	163 000	2 410	16 600	4 300
82.550	3.2500	104.775	4.1250	3.175	0.1250	46 000	287 000	4 700	29 200	3 800
95.250	3.7500	117.475	4.6250	3.175	0.1250	50 000	335 000	5 100	34 000	3 400
104.775	4.1250	128.575	—	3.175	0.1250	57 000	405 000	5 800	41 000	3 200

Bearing Numbers	Matching Bearing Rings					Roller Contact Surfaces (mm)		Mass (g) approx	
	$s=0.8\,^{+0.01}_{-0.04}$	$s=1.6\,^{0}_{-0.08}$	$s=2.4\,^{+0.01}_{-0.07}$	$s=3.2\,^{0}_{-0.08}$	$s=4.0\,^{-0.01}_{-0.09}$	D_e min	D_i max	NTA	TRA
NTA-411	**TRA-411**	**TRB-411**	**TRC-411**	—	—	16	7.5	1.4	1.4
NTA-512	**TRA-512**	**TRB-512**	—	—	—	17.5	9	1.8	1.4
NTA-613	**TRA-613**	**TRB-613**	**TRC-613**	—	—	19	10.5	1.8	1.4
NTA-815	**TRA-815**	**TRB-815**	**TRC-815**	—	—	22	14	2.3	1.8
NTA-916	**TRA-916**	**TRB-916**	**TRC-916**	—	—	23.5	15.5	2.7	2.3
NTA-1018	**TRA-1018**	**TRB-1018**	**TRC-1018**	**TRD-1018**	**TRE-1018**	27	17	3.2	2.7
NTA-1220	**TRA-1220**	**TRB-1220**	**TRC-1220**	**TRD-1220**	**TRE-1220**	30	20	4.1	3.2
NTA-1423	**TRA-1423**	**TRB-1423**	**TRC-1423**	**TRD-1423**	—	34.5	23.5	5.0	4.1
NTC-1427	—	**TRB-1427**	**TRC-1427**	**TRD-1427**	—	41	25	9.1	—
NTA-1625	**TRA-1625**	**TRB-1625**	**TRC-1625**	**TRD-1625**	**TRE-1625**	38	26.5	5.9	4.5
NTA-1828	**TRA-1828**	**TRB-1828**	**TRC-1828**	**TRD-1828**	—	42.5	29.5	8.6	5.9
NTA-2031	**TRA-2031**	**TRB-2031**	**TRC-2031**	**TRD-2031**	—	47.5	33	9.5	6.8
NTA-2233	**TRA-2233**	**TRB-2233**	**TRC-2233**	**TRD-2233**	**TRE-2233**	50.5	36	10	7.3
NTA-2435	**TRA-2435**	**TRB-2435**	**TRC-2435**	**TRD-2435**	—	53.5	39	11	7.7
NTA-2840	**TRA-2840**	**TRB-2840**	**TRC-2840**	**TRD-2840**	—	60	45.5	14	9.5
NTA-3244	**TRA-3244**	**TRB-3244**	**TRC-3244**	**TRD-3244**	—	66.5	52	15	11
NTA-3446	**TRA-3446**	**TRB-3446**	**TRC-3446**	**TRD-3446**	—	69.5	55	16	12
NTA-3648	**TRA-3648**	**TRB-3648**	**TRC-3648**	**TRD-3648**	—	72.5	58.5	17	12
NTA-3650 (1)	—	—	—	—	—	76.5	58.5	29	—
NTA-4052	**TRA-4052** (2)	**TRB-4052** (2)	**TRC-4052** (2)	**TRD-4052** (2)	—	79	64.5	19	14
NTA-4458 (1)	**TRA-4458** (2)	**TRB-4458** (2)	**TRC-4458** (2)	**TRD-4458** (2)	—	89	71.5	37	18
NTA-4860	**TRA-4860** (2)	**TRB-4860** (2)	—	**TRD-4860** (2)	—	92	77.5	22	16
NTA-5266 (1)	**TRA-5266** (2)	—	—	**TRD-5266** (2)	—	102	84	42	20
NTA-6074 (1)	**TRA-6074** (2)	**TRB-6074** (2)	**TRC-6074** (2)	**TRD-6074** (2)	—	114.5	97	50	23
NTA-6681 (1)	**TRA-6681** (2)	—	**TRC-6681** (2)	**TRD-6681** (2)	—	125.5	106.5	62	27

Notes (1) Tolerance of cage bore diameter is +0.05 to +0.25mm, and tolerance of cage outside diameter is −0.25 to −0.64mm.

(2) Tolerance of bearing ring bore diameter is +0.05 to −0.43mm.

Thrust Needle Bearings

FB (With Integrated Raceway Washers)

FTRA (Thrust Bearing Rings s = 1.0)

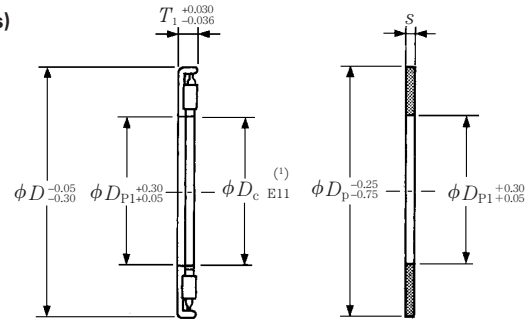
FTRB (s = 1.5)

FTRC (s = 2.0)

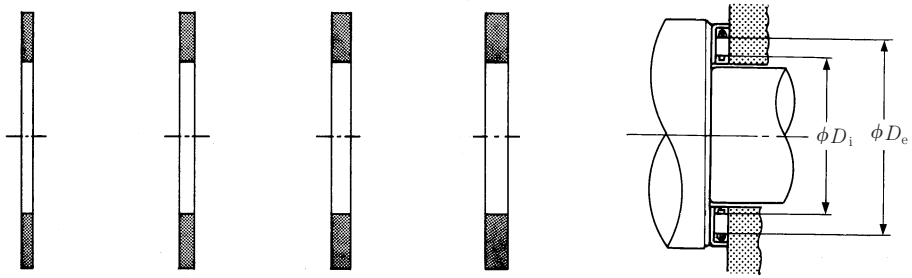
FTRD (s = 2.5)

FTRE (s = 3.0)

Bore Diameter 20 — 55 mm



FB FTRA



FTRB FTRC FTRD FTRE

Boundary Dimensions (mm)			Basic Load Ratings (N)		{kgf}		Limiting Speeds (min^{-1})	Bearing Numbers	Matching Bearing Rings					Roller Contact Surfaces (mm)		Mass (g)
D_C, D_{P1}	D_C, D_P	T_1	C_a	C_{oa}	C_a	C_{oa}	Oil		$s=1.0^{+0.05}$	$s=1.5^{0}_{-0.08}$	$s=2.0^{0}_{-0.08}$	$s=2.5^{0}_{-0.08}$	$s=3.0^{0}_{-0.08}$	D_e min	D_i max	approx
20	35	2.8	9 450	34 500	965	3 550	13 000	**FB502002**	**FTRA-2035**	**FTRB-2035**	**FTRC-2035**	**FTRD-2035**	**FTRE-2035**	31	21	13
30	47	2.8	12 700	56 500	1 300	5 750	9 000	**FB503002**	**FTRA-3047**	**FTRB-3047**	**FTRC-3047**	**FTRD-3047**	**FTRE-3047**	43	31	16
35	53	2.8	15 600	77 000	1 590	7 850	8 000	**FB503503**	**FTRA-3553**	**FTRB-3553**	**FTRC-3553**	**FTRD-3553**	**FTRE-3553**	48.5	36.5	19
40	60	2.8	20 200	112 000	2 060	11 400	7 100	**FB504001**	**FTRA-4060**	**FTRB-4060**	**FTRC-4060**	**FTRD-4060**	**FTRE-4060**	55	41	25
45	65	2.8	20 400	117 000	2 080	11 900	6 300	**FB504501**	**FTRA-4565**	**FTRB-4565**	**FTRC-4565**	**FTRD-4565**	**FTRE-4565**	60.5	46	27
50	70	2.8	21 200	126 000	2 160	12 800	6 000	**FB505002**	**FTRA-5070**	**FTRB-5070**	**FTRC-5070**	**FTRD-5070**	**FTRE-5070**	65.5	51	30
55	75	2.8	22 500	140 000	2 290	14 300	5 600	**FB505501**	**FTRA-5575**	**FTRB-5575**	**FTRC-5575**	**FTRD-5575**	**FTRE-5575**	70.5	56	32

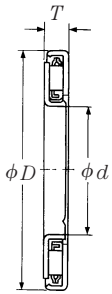
Note (1) For tolerance classes E11, please refer to pages C60.

Thrust Needle Bearings

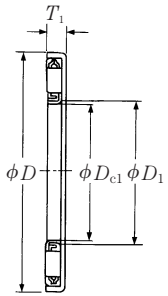
FH (With Integrated Raceway Washers)

FG

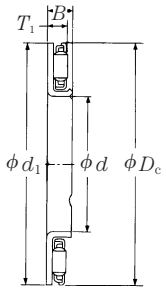
Bore Diameter 22.6 — 43 mm



Example 1



Example 2



Example 3

Boundary Dimensions (mm)						Basic Load Ratings (N)		{kgf}		Limiting Speeds (min^{-1}) Oil	Bearing Numbers	Example	Mass (g) approx
d, D_1	D_{c1}	D, d_1	D_c	T, T_1	B	C_a	C_{oa}	C_a	C_{oa}				
22.6	—	38.7	—	3.894	—	10 100	40 000	1 030	4 100	11 000	**FH502201A**	1	16.5
27.7	—	45.9	—	3.604	—	15 300	71 000	1 560	7 250	9 000	**FH502702A**	1	20.2
36	—	53	—	3.8	—	13 700	66 000	1 400	6 700	8 000	**FH503604-1**	1	24.1
39.35	—	54.02	—	3.604	—	11 400	52 500	1 160	5 350	7 500	**FH503901A**	1	20.5
48.8	—	70	—	4	—	20 300	120 000	2 070	12 200	6 000	**FH504801**	1	42.4
58.5	—	78	—	4	—	20 400	125 000	2 080	12 800	5 300	**FH505802**	1	44.6
64.4	—	78.1	—	4	—	10 200	52 500	1 040	5 350	5 300	**FH506401**	1	32.7
26.2	28.575	46.32	—	3.81	—	19 800	74 500	2 020	7 600	9 000	**FG502602**	2	20.2
30	30	47	—	2.824	—	12 700	56 500	1 300	5 750	9 000	**FG503006**	2	14.8
35	35	53	—	2.824	—	15 600	77 000	1 590	7 850	8 000	**FG503502**	2	18.2
38.5	38	57.3	—	2.81	—	15 600	78 000	1 590	7 950	7 500	**FG503804**	2	20.9
42	42	61.98	—	3.81	—	24 700	110 000	2 520	11 200	6 700	**FG504201**	2	31.7
45	45	64	—	2.8	—	20 400	117 000	2 080	11 900	6 300	**FG504501**	2	23.2
48.4	48.4	68.48	—	3.81	—	25 000	117 000	2 550	11 900	6 000	**FG504801**	2	35.5
52	52	72.1	—	2.81	—	21 000	126 000	2 140	12 800	5 600	**FG505203**	2	28.1
58	58	78	—	2.8	—	23 300	149 000	2 380	15 200	5 300	**FG505801**	2	31.8
19	—	45	45	2.794	3.43	13 200	60 000	1 340	6 100	9 000	**FG501903**	3	19.8
28	—	52.5	52	2.81	3.43	17 200	88 000	1 760	8 950	7 500	**FG502801**	3	23
30.5	—	48	48	2.794	3.43	13 400	63 000	1 370	6 450	8 500	**FG503002**	3	16.3
33.5	—	47.8	48	2.794	3.43	13 400	63 000	1 370	6 450	8 500	**FG503301**	3	14.1
43	—	60	60.05	2.8	3.43	16 900	91 500	1 720	9 350	6 700	**FG504302**	3	20.9

CAM FOLLOWERS (STUD TYPE TRACK ROLLERS)

			Pages
Metric Design	Outside Diameter	10－90 mm	B182–B185
Inch Design	Outside Diameter	12.700－152.400 mm	B186–B189

Cam followers, which are equipped with a thick-wall outer ring, crowned rollers, and a stud with a hardened raceway surface, are especially tough and can sustain shock loads.

Types

Cam followers are available in the standard types shown in **Table 1**. These standard bearings have a screwdriver slot built into the stud head, while the outer ring has a cylindrical outside surface.

Bearings of the following unique specifications are available for manufacture upon request:

1. Hexagonal socket of the stud head (refer to the Bearing Table)
2. Eccentric bush fixed to the stud to make it an eccentric stud (refer to the Bearing Table)
3. An outer ring with a spherical outside surface (refer to page B179)

These specifications are indicated in the bearing number. Please use the Formulation of Bearing Numbers as indicated on the following page when placing orders.

In addition to the above, products with their exposed surfaces treated with a black oxide layer to enhance corrosion resistance, as well as products of special shapes and specifications, can also be manufactured. Please contact NSK for further details.

Table 1 Bearing Types

Code		Details
Metric	FCR	Full complement, without seal
	FCRS	Full complement, with seal, with thrust washer
	FCJ	With Cage, without seal
	FCJS	With Cage, with seal, with thrust washer
Inch	CR	Full complement
	CRS	Full complement, with seal, with thrust washer

Formulation of Bearing Numbers

Metric

FCR / FCRS / FCJ / FCJS — **B** **E** **16** **R**

- R: Omitted: Outer ring has a cylindrical outside surface.
  - R: R: Outer ring has a spherical outside surface.
- 16: Outside diameter of outer ring in mm
- E: Omitted: Without bush
  - E: E: With eccentric bush
- B: Omitted: Stud head with screwdriver slot
  - B: B: Stud head with hexagonal socket

(Example) **FCRE-16** Full complement, with screwdriver slot, with eccentric bush, outside diameter of outer ring is 16 mm

FCJSB-16 With cage, with seal/thrust washer, with hexagonal socket, outside diameter of outer ring is 16 mm

FCRSBE-16R Full complement, with seal/thrust washer, with hexagonal socket, with eccentric bush, outside diameter of outer ring is 16 mm and the outer ring has a spherical outside surface

Inch

CR / CRS — **B** **C** **E** **8**

- 8: Outside diameter of outer ring in 1/16-inch units
  (Example)
  8=8/16 =1/2"
  16=16/16=1"
  32=32/16=2"
  36=36/16=2 1/4"
- E: Omitted: Without bush
  - E: E: With eccentric bush
- C: Omitted: Outer ring has a cylindrical outside surface.
  - C: C: Outer ring has a spherical outside surface.
- B: Omitted: Stud head with screw driver slot
  - B: B: Stud head with hexagonal socket

(Example) **CRE-8** Full complement, with screwdriver slot, with eccentric bush, outside diameter of outer ring is 12.700 mm (8/16 inch)

CRSB-8 Full complement, with seal/thrust washer, with hexagonal socket, outside diameter of outer ring is 12.700 mm (8/16 inch)

CRSBCE-8 Full complement, with seal/thrust washer, with hexagonal socket, with eccentric bush, outside diameter of outer ring is 12.700 mm (8/16 inch) and the outer ring has a spherical outside surface

Spherical Radius of Outer Ring Outside

Spherical radii for metric bearings are shown in **Table 2** and for inch bearings in **Table 3**.

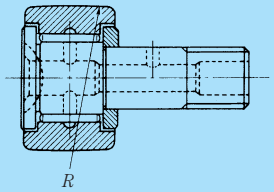


Table 2 Spherical Radius, R, of Metric Bearings

Units: mm

Bearing Number	R
All Bearing Numbers	500

Table 3 Spherical Radius, R, of Inch Bearings

Units: mm

Bearing Number (1)	R	Bearing Number (1)	R	Bearing Number (1)	R
CRC-8	150	CRC-20	360	CRC-40	760
CRC-8-1	180	CRC-22	360	CRC-44	760
CRC-10	180	CRC-24	500	CRC-48	760
CRC-10-1	200	CRC-26	500	CRC-52	760
CRC-12	250	CRC-28	500	CRC-56	760
CRC-14	250	CRC-30	500	CRC-64	760
CRC-16	300	CRC-32	600	CRC-80	1200
CRC-18	300	CRC-36	600	CRC-96	1400

Note (1) This uses CRC bearings as an example. However, since dimension series are the same, the R dimensions shown in the above table should also be applied to CRSC bearings.

Accuracy

NSK cam followers are manufactured with the dimensional tolerances shown in **Table 4**. Running accuracy is subject to ISO Class 0 and is always applied to the bearing before surface treatment.

Table 4 Cam Follower Dimensional Tolerances

Units: μm

Type		Stud Diameter Deviation, Δ_{dmp}, or Fitting Tolerance	Single Plane Mean Outside Diameter Deviation. Δ_{Dmp}		Deviation of Outer Ring Width C, Δ_{Cs}
			Cylindrical Outside	Spherical Outside	
Metric	FCR, FCRS, FCJ, FCJS	h7	According to ISO Class 0	0 −50	According to ISO Class 0
Inch	CR, CRS	+25 0	0 −25	0 −50	0 −130

Accessories

NSK cam followers include a sealing plug but the nut, washer and grease nipple are available as accessories. When ordering, please add the part code shown in **Table 5** after the bearing number.

Table 5 Part Code of Accessories

Type	Sealing Plug	Grease	Nut	Washer	Nipple
FCR, FCJ, CR	Included	Not pre-packed	I	N	Z
FCRS, FCJS, CRS	Included	pre-packed			

[Example] FCR-16 + I N Z

- Z — Nipple
- N — Washer
- I — Nut

Applications

Fitting

The recommended fittings for the mounting area of cam follower studs are shown in **Table 6**. Since cam followers use cantilever mounting, the fitting for the stud and mounting hole should be assembled with as little play as possible. In case there is interference in the fitting of the stud and mounting hole, the center of the stud end should be inserted with a press. The side plate should be securely fixed onto the plane surface square to the center axis, without play. In order to get a sufficient support face for the side plate, the dimension of the shoulder should be larger than the value of F shown in the bearing table. Play in the mounting part should be avoided because it would not only cause inclination to the stud but also create considerable deflection when a load is imposed. The load would also be unevenly imposed on the rollers due to edge contact between the outer ring and track (on which the outer ring runs).

Table 6 Recommended Fitting for Stud Mounting Part

Type		Fitting Tolerance of Mounting Hole
Metric	FCR, FCJ, FCRS, FCJS	JS7 (J7)
Inch	CR, CRS	F7

Maximum Permissible Load

The maximum radial load that the cam follower can carry is determined by the bearing strength and shear strength of the stud rather than the load rating for needle bearings. This value is given in the bearing table as the maximum permissible load.

The cam follower can deliver a performance of the maximum strength of stud by mounting securely to the side plate so as to minimize overhang. It is necessary, therefore, to minimize chamfering at the corner of the stud mounting hole and avoid burrs.

Permissible Track Load

The permissible load of the track is determined by compression strength or hardness. The permissible load of the track shown in the bearing table is the value of a track made of steel with a hardness of HRC40.

Table 7 indicates the permissible load coefficient of the track for each hardness.

The permissible load of the track for each hardness can be obtained by multiplying the permissible load of the track shown in the bearing table by the permissible load coefficient of the track corresponding to each hardness.

Table 7 Permissible Load Coefficient of Track

Hardness (HRC)	Coefficient
20	0.4
25	0.5
30	0.6
35	0.8
40	1.0
45	1.4
50	1.9
55	2.6
58	3.2

Maximum Clamp Torque

Since the stud of the cam follower receives bending stress and tensile stress from the bearing load, the screw clamp torque should not exceed the value shown in the bearing table. The clamp torque (maximum) in the bearing table is the value when the thread is lubricated and the value when dry should be approximately doubled.

Pre-packed Grease

The cam follower with a seal is pre-lubricated with lithium soap-based grease and the working temperature range is -10 to +110˚C.

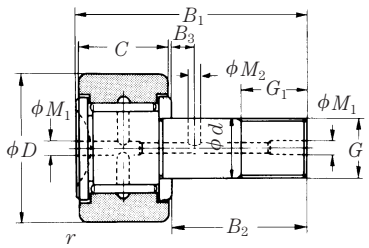
FCR (Full Complement)

FCRS (Full Complement, Sealed, With Thrust Washer)

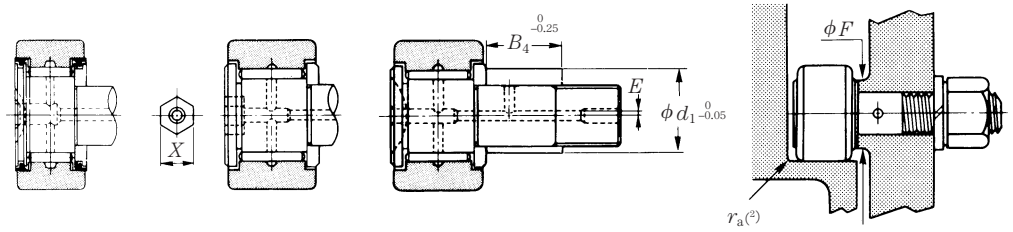
FCJ (With Cage)

FCJS (Sealed, With Cage and Thrust Washer)

Outside Diameter 10 — 62 mm



FCR



FCRS FCRB FCRE

*1 Dimensions of Hexagonal Socked (width across flats) (3)
*2 Shoulder Dimensions

Boundary Dimensions (mm) D	C	d	Screw G	Dimensions (mm) G_1	B_1	B_2	B_3	M_2	M_1	r min	Bearing Numbers FCR FCJ	FCRS FCJS
10	7	3	M3X0.5	5	17	9	—	—	—	0.3	**FCJB-10**	
12	8	4	M4X0.7	6	20	11	—	—	—	0.3	**FCJ-12**	
	8	4	M4X0.7	6	20	11	—	—	—	0.3	**FCJB-12**	
16	11	6	M6X1.0	8	28	16	—	—	4(1)	0.3	**FCR-16**	**FCRS-16**
	11	6	M6X1.0	8	28	16	—	—	4(1)	0.3	**FCJ-16**	**FCJS-16**
19	11	8	M8X1.25	10	32	20	—	—	4(1)	0.3	**FCR-19**	**FCRS-19**
	11	8	M8X1.25	10	32	20	—	—	4(1)	0.3	**FCJ-19**	**FCJS-19**
22	12	10	M10X1.25	12	36	23	—	—	4(1)	0.3	**FCR-22**	**FCRS-22**
	12	10	M10X1.25	12	36	23	—	—	4(1)	0.3	**FCJ-22**	**FCJS-22**
26	12	10	M10X1.25	12	36	23	—	—	4(1)	0.3	**FCR-26**	**FCRS-26**
	12	10	M10X1.25	12	36	23	—	—	4(1)	0.3	**FCJ-26**	**FCJS-26**
30	14	12	M12X1.5	13	40	25	6	3	6	0.6	**FCR-30**	**FCRS-30**
	14	12	M12X1.5	13	40	25	6	3	6	0.6	**FCJ-30**	**FCJS-30**
32	14	12	M12X1.5	13	40	25	6	3	6	0.6	**FCR-32**	**FCRS-32**
	14	12	M12X1.5	13	40	25	6	3	6	0.6	**FCJ-32**	**FCJS-32**
35	18	16	M16X1.5	17	52	32.5	8	3	6	0.6	**FCR-35**	**FCRS-35**
	18	16	M16X1.5	17	52	32.5	8	3	6	0.6	**FCJ-35**	**FCJS-35**
40	20	18	M18X1.5	19	58	36.5	8	3	6	1	**FCR-40**	**FCRS-40**
	20	18	M18X1.5	19	58	36.5	8	3	6	1	**FCJ-40**	**FCJS-40**
47	24	20	M20X1.5	21	66	40.5	9	4	8	1	**FCR-47**	**FCRS-47**
	24	20	M20X1.5	21	66	40.5	9	4	8	1	**FCJ-47**	**FCJS-47**
52	24	20	M20X1.5	21	66	40.5	9	4	8	1	**FCR-52**	**FCRS-52**
	24	20	M20X1.5	21	66	40.5	9	4	8	1	**FCJ-52**	**FCJS-52**
62	29	24	M24X1.5	25	80	49.5	11	4	8	1	**FCR-62**	**FCRS-62**
	29	24	M24X1.5	25	80	49.5	11	4	8	1	**FCJ-62**	**FCJS-62**

Basic Dynamic Load Ratings (N) C_r	{kgf}	Limiting Loads (N) P_{max}	{kgf}	Limiting Track Loads (N)	{kgf}	Mass (kg) approx	*1 (mm) X	Eccentric Bush Dimensions (mm) (4) B_4	d_1	E	*2 (mm) F min	Tightening Torque (5) (N·cm) max	{kgf·cm} max
1 390	142	590	60	1 320	135	0.005	2.5	—	—	—	7.5	28	2.9
1 970	201	1 050	107	1 860	190	0.008	—	—	—	—	9	64	6.5
1 970	201	1 050	107	1 860	190	0.008	2.5	—	—	—	9	64	6.5
5 800	590	2 360	240	3 350	340	0.020	4	8	9	0.5	11	226	23
2 830	288	2 360	240	3 350	340	0.018	4	8	9	0.5	11	226	23
6 600	670	4 200	425	4 150	425	0.031	4	10	11	0.5	13	550	56
3 450	355	4 200	425	4 150	425	0.030	4	10	11	0.5	13	550	56
8 550	875	6 550	665	5 300	540	0.047	5	11	13	0.5	15	1 060	108
4 350	445	6 550	665	5 300	540	0.045	5	11	13	0.5	15	1 060	108
8 550	875	6 550	665	6 000	610	0.060	5	11	13	0.5	15	1 060	108
4 350	445	6 550	665	6 000	610	0.058	5	11	13	0.5	15	1 060	108
12 500	1 280	9 250	945	7 800	795	0.088	6	12	17	1	20	1 450	148
7 200	735	9 250	945	7 800	795	0.086	6	12	17	1	20	1 450	148
12 500	1 280	9 250	945	8 050	820	0.099	6	12	17	1	20	1 450	148
7 200	735	9 250	945	8 050	820	0.096	6	12	17	1	20	1 450	148
18 600	1 900	17 000	1 740	11 800	1 200	0.17	10	15.5	22	1	24	4 000	410
9 700	990	17 000	1 740	11 800	1 200	0.165	10	15.5	22	1	24	4 000	410
20 500	2 090	21 700	2 220	14 300	1 460	0.25	10	17.5	24	1	26	5 950	605
10 300	1 050	21 700	2 220	14 300	1 460	0.24	10	17.5	24	1	26	5 950	605
28 200	2 880	26 400	2 690	20 800	2 120	0.39	12	19.5	27	1	31	8 450	860
19 200	1 950	26 400	2 690	20 800	2 120	0.38	12	19.5	27	1	31	8 450	860
28 200	2 880	26 400	2 690	22 900	2 340	0.47	12	19.5	27	1	31	8 450	860
19 200	1 950	26 400	2 690	22 900	2 340	0.455	12	19.5	27	1	31	8 450	860
40 000	4 100	38 500	3 950	34 000	3 450	0.80	14	24.5	34	1	45	15 200	1 550
24 900	2 540	38 500	3 950	34 000	3 450	0.79	14	24.5	34	1	45	15 200	1 550

Note (1) Only the head of the stud has an oil hole.
Remarks Standard grease is packed in sealed cam followers, but not in cam followers without seals.

Notes (2) Should not be greater than $r_{(min)}$.
(3) Applicable to FCRB only.
(4) Applicable to FCRE only.
(5) These values are for when the screw is oiled; they should be approximately doubled when the screw is dry.

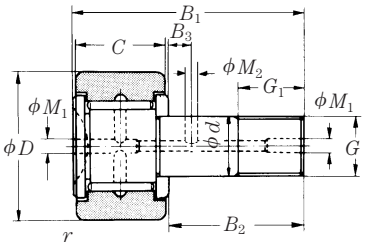
FCR **(Full Complement)**

FCRS **(Full Complement, Sealed, With Thrust Washer)**

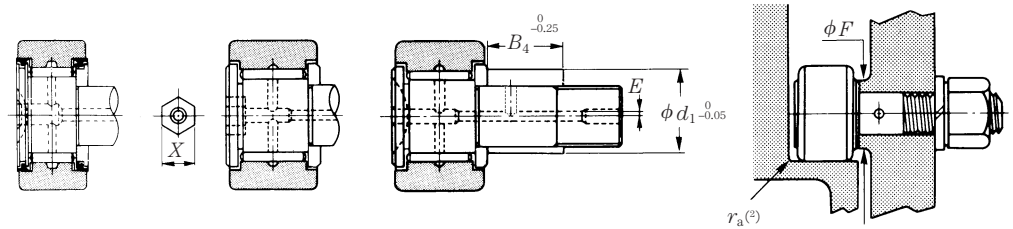
FCJ **(With Cage)**

FCJS **(Sealed, With Cage and Thrust Washer)**

Outside Diameter 72 — 90 mm



FCR



FCRS FCRB FCRE

*1 Dimensions of Hexagonal Socked (width across flats) (3)
*2 Shoulder Dimensions

Boundary Dimensions (mm) D	C	d	Screw G	Dimensions (mm) G_1	B_1	B_2	B_3	M_2	M_1	r min	Bearing Numbers FCR FCJ	FCRS FCJS
72	29	24	M24X1.5	25	80	49.5	11	4	8	1	**FCR-72**	**FCRS-72**
	29	24	M24X1.5	25	80	49.5	11	4	8	1	**FCJ-72**	**FCJS-72**
80	35	30	M30X1.5	32	100	63	15	4	8	1	**FCR-80**	**FCRS-80**
	35	30	M30X1.5	32	100	63	15	4	8	1	**FCJ-80**	**FCJS-80**
85	35	30	M30X1.5	32	100	63	15	4	8	1	**FCR-85**	**FCRS-85**
	35	30	M30X1.5	32	100	63	15	4	8	1	**FCJ-85**	**FCJS-85**
90	35	30	M30X1.5	32	100	63	15	4	8	1	**FCR-90**	**FCRS-90**
	35	30	M30X1.5	32	100	63	15	4	8	1	**FCJ-90**	**FCJS-90**

Remarks Standard grease is packed in sealed cam followers, but not in cam followers without seals.

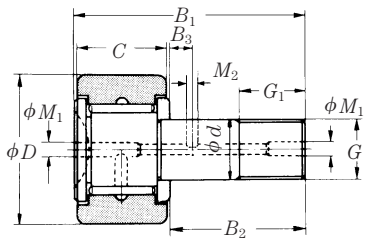
Basic Dynamic Load Ratings (N) C_r	{kgf}	Limiting Loads (N) P_{max}	{kgf}	Limiting Track Loads (N)	{kgf}	Mass (kg) approx	*1 (mm) X	Eccentric Bush Dimensions (mm) (4) B_4	d_1	E	*2 (mm) F min	Tightening Torque (5) (N·cm) max	{kgf·cm} max
40 000	4 100	38 500	3 950	38 000	3 860	1.05	14	24.5	34	1	45	15 200	1 550
24 900	2 540	38 500	3 950	38 000	3 860	1.05	14	24.5	34	1	45	15 200	1 550
60 500	6 200	61 000	6 200	52 000	5 300	1.55	17	31	40	1.5	52	30 500	3 120
39 000	4 000	61 000	6 200	52 000	5 300	1.55	17	31	40	1.5	52	30 500	3 120
60 500	6 200	61 000	6 200	55 500	5 650	1.75	17	31	40	1.5	52	30 500	3 120
39 000	4 000	61 000	6 200	55 500	5 650	1.75	17	31	40	1.5	52	30 500	3 120
60 500	6 200	61 000	6 200	59 000	6 000	1.95	17	31	40	1.5	52	30 500	3 120
39 000	4 000	61 000	6 200	59 000	6 000	1.95	17	31	40	1.5	52	30 500	3 120

Notes (2) Should not be greater than $r_{(min)}$.
(3) Applicable to FCRB only.
(4) Applicable to FCRE only.
(5) These values are for when the screw is oiled; they should be approximately doubled when the screw is dry.

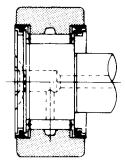
CR **(Full Complement)**

CRS **(Full Complement, Sealed, With Thrust Washer)**

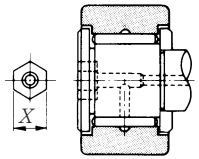
Outside Diameter 12.700 — 152.4 mm



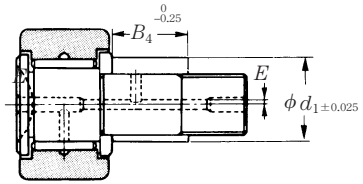
CR



CRS



CRB



CRE

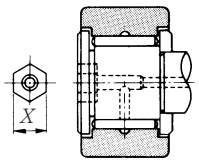
Boundary Dimensions (mm, inch)					Dimensions (mm)						
D		C	d		Screw UNF G	G_1	B_1	B_2	B_3	M_2	M_1
12.700	0.5000	8.74	4.826	—	10-32	6.4	22.8	12.70	—	—	3.2 (3)
		9.52	4.826	—	10-32	6.4	26.8	15.88	—	—	3.2 (3)
15.875	0.6250	10.31	6.350	0.2500	1/4-28	7.9	27.3	15.88	—	—	3.2 (3)
		11.13	6.350	0.2500	1/4-28	7.9	31.3	19.05	—	—	3.2 (3)
19.050	0.7500	12.70	9.525	0.3750	3/8-24	9.5	36.1	22.22	6.35	2.4	4.8
22.225	0.8750	12.70	9.525	0.3750	3/8-24	9.5	36.1	22.22	6.35	2.4	4.8
25.400	1.0000	15.88	11.112	0.4375	7/16-20	12.7	42.4	25.40	6.35	3.2	4.8
28.575	1.1250	15.88	11.112	0.4375	7/16-20	12.7	42.4	25.40	6.35	3.2	4.8
31.750	1.2500	19.05	12.700	0.5000	1/2-20	15.9	52.2	31.75	7.94	3.2	4.8
34.925	1.3750	19.05	12.700	0.5000	1/2-20	15.9	52.2	31.75	7.94	3.2	4.8
38.100	1.5000	22.22	15.875	0.6250	5/8-18	19.0	61.6	38.10	9.52	4.0	4.8
41.275	1.6250	22.22	15.875	0.6250	5/8-18	19.0	61.6	38.10	9.52	4.0	4.8
44.450	1.7500	25.40	19.050	0.7500	3/4-16	22.2	71.2	44.45	11.11	4.0	4.8
47.625	1.8750	25.40	19.050	0.7500	3/4-16	22.2	71.2	44.45	11.11	4.0	4.8
50.800	2.0000	31.75	22.225	0.8750	7/8-14	25.4	83.9	50.80	12.70	4.8	4.8
57.150	2.2500	31.75	22.225	0.8750	7/8-14	25.4	83.9	50.80	12.70	4.8	4.8
63.500	2.5000	38.10	25.400	1.0000	1-14 (1)	28.6	96.9	57.15	14.29	4.8	4.8
69.850	2.7500	38.10	25.400	1.0000	1-14 (1)	28.6	96.9	57.15	14.29	4.8	4.8
76.200	3.0000	44.45	31.750	1.2500	1 1/4-12	31.8	109.6	63.50	15.88	4.8	6.4
82.550	3.2500	44.45	31.750	1.2500	1 1/4-12	31.8	109.6	63.50	15.88	4.8	6.4
88.900	3.5000	50.80	34.925	1.3750	1 3/8-12	34.9	122.3	69.85	17.46	4.8	6.4
101.600	4.0000	57.15	38.100	1.5000	1 1/2-12	38.1	147.7	88.90	19.05	4.8	6.4
127.000	5.0000	69.85	50.800	2.0000	2-12 (2)	65.1	200.9	128.59	22.22	4.8	6.4
152.400	6.0000	82.55	63.500	2.5000	2 1/2-12 (2)	76.2	237.5	152.40	25.40	4.8	6.4

Notes (1) USN screws are used in place of UNF screws.
(2) UN screws are used in place of UNF screws.
(3) Only the head of the stud has an oil hole.

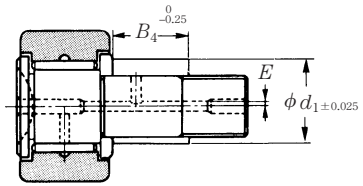
Remarks Standard grease is packed in sealed cam followers, but not in cam followers without seals.

Bearing Numbers		Basic Dynamic Load Ratings		Limiting Loads		Limiting Track Loads	
CR	CRS	(N)	{kgf}	(N)	{kgf}	(N)	{kgf}
		C_r		P_{max}			
CR-8	**CRS-8**	3 800	385	1 340	136	2 050	209
CR-8-1	**CRS-8-1**	4 200	430	1 340	136	2 260	230
CR-10	**CRS-10**	5 350	545	2 640	269	2 920	298
CR-10-1	**CRS-10-1**	5 800	595	2 640	269	3 200	325
CR-12	**CRS-12**	8 850	900	5 900	600	4 550	465
CR-14	**CRS-14**	8 850	900	5 900	600	5 150	525
CR-16	**CRS-16**	11 200	1 140	6 950	710	6 550	670
CR-18	**CRS-18**	11 200	1 140	6 950	710	7 450	760
CR-20	**CRS-20**	18 500	1 890	9 600	975	10 400	1 060
CR-22	**CRS-22**	18 500	1 890	9 600	975	11 500	1 170
CR-24	**CRS-24**	21 700	2 220	15 900	1 620	15 000	1 530
CR-26	**CRS-26**	21 700	2 220	15 900	1 620	16 300	1 660
CR-28	**CRS-28**	27 700	2 830	23 600	2 400	20 000	2 040
CR-30	**CRS-30**	27 700	2 830	23 600	2 400	21 500	2 190
CR-32	**CRS-32**	41 500	4 250	32 500	3 350	29 100	2 970
CR-36	**CRS-36**	41 500	4 250	32 500	3 350	33 000	3 350
CR-40	**CRS-40**	52 500	5 350	43 000	4 400	41 000	4 200
CR-44	**CRS-44**	52 500	5 350	43 000	4 400	45 500	4 650
CR-48	**CRS-48**	76 000	7 750	67 000	6 850	60 000	6 100
CR-52	**CRS-52**	76 000	7 750	67 000	6 850	64 500	6 600
CR-56	**CRS-56**	99 000	10 100	81 500	8 350	81 500	8 300
CR-64	**CRS-64**	126 000	12 800	98 000	9 950	107 000	10 900
CRB-80	**CRSB-80**	198 000	20 200	176 000	18 000	154 000	15 700
CRB-96	**CRSB-96**	283 000	28 800	277 000	28 200	226 000	23 000

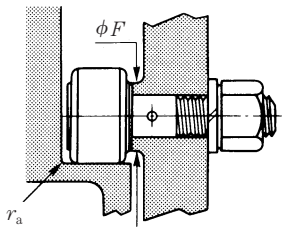
Abutment and fillet dimensions, and tightening torque are shown on the next page.



CRB



CRE



*1 Dimensions of Hexagonal Socked (width across flats) (4)

Boundary Dimensions CR	Boundary Dimensions CRS	Mass (kg) approx	*1 (mm) X	Eccentric Bush Dimensions (mm) (5) B_4	d_1	E
CR-8	**CRS-8**	0.010	3.18	—	—	—
CR-8-1	**CRS-8-1**	0.010	3.18	9.52	6.350	0.25
CR-10	**CRS-10**	0.019	3.18	—	—	—
CR-10-1	**CRS-10-1**	0.020	3.18	11.10	9.525	0.38
CR-12	**CRS-12**	0.034	4.76	12.70	12.700	0.38
CR-14	**CRS-14**	0.044	4.76	12.70	12.700	0.38
CR-16	**CRS-16**	0.073	6.35	12.70	15.875	0.76
CR-18	**CRS-18**	0.089	6.35	12.70	15.875	0.76
CR-20	**CRS-20**	0.135	6.35	15.88	17.450	0.76
CR-22	**CRS-22**	0.16	6.35	15.88	17.450	0.76
CR-24	**CRS-24**	0.24	7.94	19.05	22.225	0.76
CR-26	**CRS-26**	0.275	7.94	19.05	22.225	0.76
CR-28	**CRS-28**	0.385	7.94	22.22	25.400	0.76
CR-30	**CRS-30**	0.43	7.94	22.22	25.400	0.76
CR-32	**CRS-32**	0.62	11.11	25.40	30.150	0.76
CR-36	**CRS-36**	0.755	11.11	25.40	30.150	0.76
CR-40	**CRS-40**	1.15	12.70	28.58	34.925	0.76
CR-44	**CRS-44**	1.35	12.70	28.58	34.925	0.76
CR-48	**CRS-48**	1.9	15.88	31.75	44.450	1.52
CR-52	**CRS-52**	2.2	15.88	31.75	44.450	1.52
CR-56	**CRS-56**	2.9	15.88	34.92	46.025	1.52
CR-64	**CRS-64**	4.3	19.05	50.80	50.800	1.52
CRB-80	**CRSB-80**	8.7	22.22	—	—	—
CRB-96	**CRSB-96**	15	25.40	—	—	—

Notes (4) Applicable to CRB only.
(5) Applicable to CRE only.

*2 Fillet Radius of Housing

Shoulder Dimensions (mm) F min	*2 (mm) r_a min	Tightening Torque (6) (N·cm) max	{kgf·cm} max
7.5	0.25	90	9.2
7.5	0.25	90	9.2
9.1	0.4	226	23
9.1	0.4	226	23
12.7	0.4	630	64
12.7	0.4	630	64
15.1	0.8	1 700	173
15.1	0.8	1 700	173
19.0	0.8	2 310	236
19.0	0.8	2 310	236
22.6	0.8	4 400	450
22.6	0.8	4 400	450
26.6	1	8 500	865
26.6	1	8 500	865
30.6	1.3	10 200	1040
30.6	1.3	10 200	1040
34.9	2.3	15 300	1560
34.9	2.3	15 300	1560
44.4	2.3	23 100	2360
44.4	2.3	23 100	2360
48.8	2.3	28 200	2880
57.9	2.3	34 000	3450
82.6	4	34 000	3450
99.2	4	34 000	3450

Notes (6) These values are for when the screw is oiled; they should be approximately doubled when the screw is dry.

ROLLER FOLLOWERS (YOKE TYPE TRACK ROLLERS)

			Pages
Metric Design	Bore Diameter	5–50 mm	B194–B195
Inch Design	Bore Diameter	6.350–57.150 mm	B196–B197

The roller follower with a thick-wall outer ring and crowned roller has a large load capacity which enables it to carry shock loads. Handling is easy since it it non-separating and applications such as track rollers, cams and rocker arms are wide.

Types

NSK roller rollowers are available in the types shown in **Table 1**. All of the bearings in **Table 1** have a cylindrical outside. Bearings of the following specifications are available and can be manufactured upon request:

1. Outer ring with a spherical exterior
In this case, your order should be placed in the following manner:
(1) For metric bearings, **R** should be added to the end of bearing number.
Examples: **FYCR-5R**, **FYCJ-5R**
FYCRS-5R, **FYCJS-5R**
(2) For inch bearings, **C** should be added to the end of the bearing type code.
Examples: **YCRC-12**
YCRSC-12
Spherical radius of outer ring is shown in page B193.
2. Exposed surface treated with a black oxide layer
In addition to the above, products of special shape and specifications are available and can be manufactured upon order. Please contact NSK for further details.

Table 1 Bearing Types

Type		Details
Metric	FYCR	Full complement
	FYCRS	With seal, full complement, with thrust washer
	FYCJ	With cage
	FYCJS	With seal, with cage, with thrust washer
Inch	YCR	Full complement
	YCRS	With seal, full complement, with thrust washer

Accuracy

NSK metric roller followers are manufactured in compliance with ISO Class 0 (refer to pages A26 and A27), and inch followers in compliance with the tolerances shown in **Table 2**. Running accuracy complies with ISO Class 0 in both cases.

The deviations for the above apply to the bearings before surface treatment.

Table 2 Tolerances for Inch Bearings

Units: μm

Nominal Bore Diameter, d (mm)		Single Plane Mean Bore Diameter Deviation, Δ_{dmp}		Single Plane Mean Outside Diameter Deviation, Δ_{Dmp}				Outer Ring Width Deviation, Δ_{Cs}		Overall Inner Ring Width Deviation, Δ_{Bs}	
				Cylindrical Outside Surface		Spherical Outside Surface (1)					
over	incl	high	low	high	low	high	low	high	low	high	low
—	19.05	+5	−10	0	−25	0	−50	0	−130	+130	−256
19.05	57.15	+2	−13	0	−25	0	−50	0	−130	+130	−250

Note (1) Metric bearings have the same dimension tolerance.

Applications

Fitting

Roller followers are generally used with a transition or loose fit for the shaft because their outer ring rotates. With heavy loads, however, it is recommended to harden the shaft and use it with a tight fit. In order to prevent the bearing from moving in the axial direction, both ends of the inner ring should be securely fixed to the plane surface, square to the center axis. In order to sufficiently support the side plate, the dimension of the shoulder should be larger than the value of F in the bearing table.

Recommended fittings are shown in **Table 3**.

Table 3 Recommended Shaft Fittings

Load	Fitting Tolerance of Shaft
Light Load/Normal Load	g6 or h6
Heavy Load	k6

Permissible Track Load

Permissible track load values are the same as those for cam followers. Please refer to the explanation on permissible track load on page B181.

Pre-Packed Grease

Roller followers with seals are pre-lubricated with lithium soap-based grease and the working temperature range is -10 to +110°C.

Spherical Radius of Outer Ring Outside

Spherical radii for metric bearings are shown in **Table 4** and for inch bearings in **Table 5**.

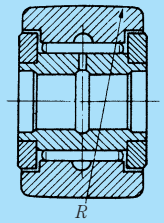


Table 4 Spherical Radius, R, of Metric Bearing Outside

Units: mm

Bearing Number	R
All Bearing Numbers	500

Table 5 Spherical Radius, R, of Inch Bearing Outside

Units: mm

Bearing Number (1)	R	Bearing Number (1)	R
YCRC-12	250	YCRC-32	600
YCRC-14	250	YCRC-36	600
YCRC-16	300	YCRC-40	760
YCRC-18	300	YCRC-44	760
YCRC-20	360	YCRC-48	760
YCRC-22	360	YCRC-52	760
YCRC-24	500	YCRC-56	760
YCRC-26	500	YCRC-64	760
YCRC-28	500	YCRC-80	1200
YCRC-30	500	YCRC-96	1400

Note (1) While YCRC bearing numbers are listed here, the values of R also apply to YCRSC bearings.

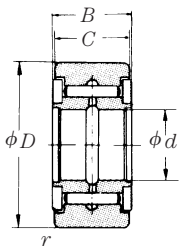
FYCR **(Full Complement)**

FYCRS **(Full Complement, Sealed, With Thrust Washer)**

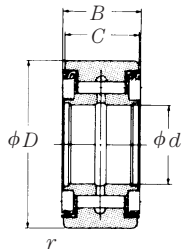
FYCJ **(With Cage)**

FYCJS **(Sealed, With Cage and Thrust Washer)**

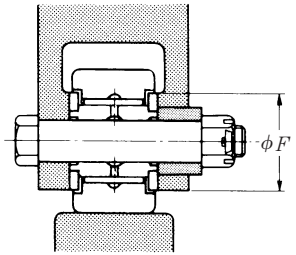
Bore Diameter 5 — 50 mm



FYCR



FYCRS



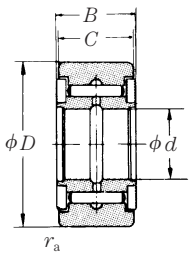
Boundary Dimensions (mm)					Basic Load Ratings (N)		{kgf}		Limiting Track Loads (N)	{kgf}	Bearing Numbers		Mass (kg)	Shoulder Dimensions (mm)
d	D	C	B $^{0}_{-0.38}$	r min	C_r	C_{or}	C_r	C_{or}			FYCR FYCJ	FYCRS FYCJS	approx	F min
5	16	11	12	0.3	5 800	8 000	590	815	3 350	340	**FYCR-5**	**FYCRS-5**	0.016	10
	16	11	12	0.3	2 830	2 620	288	267	3 350	340	**FYCJ-5**	**FYCJS-5**	0.014	10
6	19	11	12	0.3	6 550	9 900	665	1 010	4 150	425	**FYCR-6**	**FYCRS-6**	0.022	12
	19	11	12	0.3	3 450	3 600	355	365	4 150	425	**FYCJ-6**	**FYCJS-6**	0.020	12
8	24	14	15	0.3	10 100	15 000	1 030	1 530	6 500	665	**FYCR-8**	**FYCRS-8**	0.044	14
	24	14	15	0.3	5 700	6 000	580	610	6 500	665	**FYCJ-8**	**FYCJS-8**	0.042	14
10	30	14	15	0.6	11 700	18 500	1 190	1 890	7 800	795	**FYCR-10**	**FYCRS-10**	0.069	17
	30	14	15	0.6	6 950	8 200	705	835	7 800	795	**FYCJ-10**	**FYCJS-10**	0.067	17
12	32	14	15	0.6	12 600	21 000	1 280	2 140	8 050	820	**FYCR-12**	**FYCRS-12**	0.076	19
	32	14	15	0.6	7 650	9 650	780	985	8 050	820	**FYCJ-12**	**FYCJS-12**	0.074	19
15	35	18	19	0.6	18 700	29 300	1 910	2 990	11 800	1 200	**FYCR-15**	**FYCRS-15**	0.105	23
	35	18	19	0.6	12 200	14 100	1 250	1 440	11 800	1 200	**FYCJ-15**	**FYCJS-15**	0.097	23
17	40	20	21	1	21 100	35 000	2 160	3 600	14 300	1 460	**FYCR-17**	**FYCRS-17**	0.145	25
	40	20	21	1	13 700	16 700	1 390	1 700	14 300	1 460	**FYCJ-17**	**FYCJS-17**	0.14	25
20	47	24	25	1	28 900	50 000	2 940	5 100	20 800	2 120	**FYCR-20**	**FYCRS-20**	0.255	29
	47	24	25	1	18 200	22 600	1 850	2 310	20 800	2 120	**FYCJ-20**	**FYCJS-20**	0.245	29
25	52	24	25	1	32 500	60 000	3 300	6 100	22 900	2 340	**FYCR-25**	**FYCRS-25**	0.285	34
	52	24	25	1	22 200	31 000	2 270	3 150	22 900	2 340	**FYCJ-25**	**FYCJS-25**	0.275	34
30	62	28	29	1	47 500	96 000	4 800	9 800	33 000	3 350	**FYCR-30**	**FYCRS-30**	0.48	51
	62	28	29	1	31 500	47 000	3 200	4 800	33 000	3 350	**FYCJ-30**	**FYCJS-30**	0.47	51
35	72	28	29	1	49 500	106 000	5 050	10 800	36 500	3 700	**FYCR-35**	**FYCRS-35**	0.64	58
	72	28	29	1	33 000	52 500	3 400	5 350	36 500	3 700	**FYCJ-35**	**FYCJS-35**	0.635	58
40	80	30	32	1	54 500	126 000	5 600	12 800	43 500	4 450	**FYCR-40**	**FYCRS-40**	0.88	66
	80	30	32	1	38 500	67 500	3 950	6 900	43 500	4 450	**FYCJ-40**	**FYCJS-40**	0.865	66
45	85	30	32	1	57 500	139 000	5 850	14 100	46 500	4 750	**FYCR-45**	**FYCRS-45**	0.93	72
	85	30	32	1	40 000	73 000	4 100	7 450	46 500	4 750	**FYCJ-45**	**FYCJS-45**	0.91	72
50	90	30	32	1	60 500	152 000	6 150	15 500	49 500	5 050	**FYCR-50**	**FYCRS-50**	0.995	76
	90	30	32	1	41 500	78 000	4 200	7 950	49 500	5 050	**FYCJ-50**	**FYCJS-50**	0.965	76

Remarks Standard grease is packed in sealed cam followers, but not in cam followers without seals.

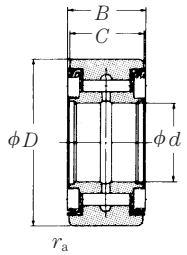
YCR (Full Complement)

YCRS (Full Complement, Sealed, With Thrust Washer)

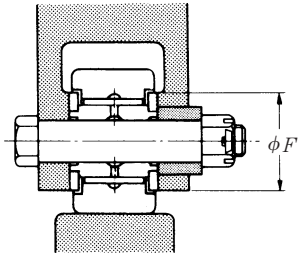
Bore Diameter 6.350 — 57.150 mm



YCR

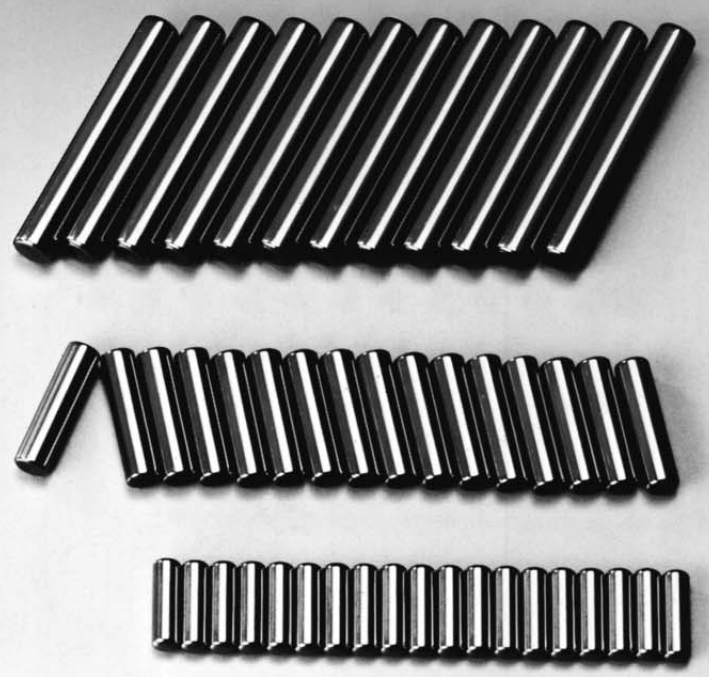


YCRS



Boundary Dimensions (mm, inch)							Basic Load (N)		Ratings {kgf}		Bearing Numbers		Limiting Track Loads (N)	{kgf}	Mass (kg)	Shoulder Dimensions (mm)	Fillet Radius (mm)
d		D		C		B	C_r	C_{or}	C_r	C_{or}	YCR	YCRS			approx	F min	r_a max
6.350	0.2500	19.050	0.7500	12.70	0.5000	14.29	8 850	14 400	900	1 470	**YCR-12**	**YCRS-12**	4 550	465	0.027	12.7	0.4
		22.225	0.8750	12.70	0.5000	14.29	8 850	14 400	900	1 470	**YCR-14**	**YCRS-14**	5 150	525	0.036	12.7	0.4
7.938	0.3125	25.400	1.0000	15.88	0.6250	17.46	11 200	20 800	1 140	2 120	**YCR-16**	**YCRS-16**	6 550	670	0.068	15.1	0.8
		28.575	1.1250	15.88	0.6250	17.46	11 200	20 800	1 140	2 120	**YCR-18**	**YCRS-18**	7 450	760	0.077	15.1	0.8
9.525	0.3750	31.750	1.2500	19.05	0.7500	20.64	18 500	32 000	1 890	3 250	**YCR-20**	**YCRS-20**	10 400	1 060	0.11	19.0	0.8
		34.925	1.3750	19.05	0.7500	20.64	18 500	32 000	1 890	3 250	**YCR-22**	**YCRS-22**	11 500	1 170	0.135	19.0	0.8
11.112	0.4375	38.100	1.5000	22.22	0.8750	23.81	21 700	42 000	2 220	4 250	**YCR-24**	**YCRS-24**	15 000	1 530	0.185	22.6	0.8
		41.275	1.6250	22.22	0.8750	23.81	21 700	42 000	2 220	4 250	**YCR-26**	**YCRS-26**	16 300	1 660	0.225	22.6	0.8
12.700	0.5000	44.450	1.7500	25.40	1.0000	26.99	27 700	60 000	2 830	6 150	**YCR-28**	**YCRS-28**	20 000	2 040	0.29	26.6	1.1
		47.625	1.8750	25.40	1.0000	26.99	27 700	60 000	2 830	6 150	**YCR-30**	**YCRS-30**	21 500	2 190	0.365	26.6	1.1
15.875	0.6250	50.800	2.0000	31.75	1.2500	33.34	41 500	85 500	4 250	8 750	**YCR-32**	**YCRS-32**	29 100	2 970	0.475	30.6	1.3
		57.150	2.2500	31.75	1.2500	33.34	41 500	85 500	4 250	8 750	**YCR-36**	**YCRS-36**	33 000	3 350	0.60	30.6	1.3
19.050	0.7500	63.500	2.5000	38.10	1.5000	39.69	52 500	118 000	5 350	12 000	**YCR-40**	**YCRS-40**	41 000	4 200	0.815	34.9	2.3
		69.850	2.7500	38.10	1.5000	39.69	52 500	118 000	5 350	12 000	**YCR-44**	**YCRS-44**	45 500	4 650	1.0	34.9	2.3
25.400	1.0000	76.200	3.0000	44.45	1.7500	46.04	76 000	172 000	7 750	17 600	**YCR-48**	**YCRS-48**	60 000	6 100	1.4	44.4	2.3
		82.550	3.2500	44.45	1.7500	46.04	76 000	172 000	7 750	17 600	**YCR-52**	**YCRS-52**	64 500	6 600	1.65	44.4	2.3
28.575	1.1250	88.900	3.5000	50.80	2.0000	52.39	99 000	228 000	10 100	23 300	**YCR-56**	**YCRS-56**	81 500	8 300	2.25	48.8	2.3
31.750	1.2500	101.600	4.0000	57.15	2.2500	58.74	126 000	285 000	12 800	29 100	**YCR-64**	**YCRS-64**	107 000	10 900	3.2	57.9	2.3
44.450	1.7500	127.000	5.0000	69.85	2.7500	73.02	198 000	435 000	20 200	44 500	**YCR-80**	**YCRS-80**	154 000	15 700	6.0	82.6	4.1
57.150	2.2500	152.400	6.0000	82.55	3.2500	85.72	283 000	645 000	28 800	65 500	**YCR-96**	**YCRS-96**	226 000	23 000	9.95	99.2	4.1

Remarks Standard grease is packed in sealed cam followers, but not in cam followers without seals.



NEEDLE ROLLERS

			Pages
Metric Design	Roller Diameter	1−5 mm	B200
Inch Design	Roller Diameter	0.792−6.350 mm	B207

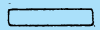
NSK needle rollers are made of carefully selected degassed bearing steel and given a precise grinding finish after heat treatment. Provided with the following characteristics, they have a wide range of applications, including gears, small engines and universal joints:

(1) Most economical when applied as a full complement bearing
(2) Very high load capacity
(3) Smaller mounting space
(4) Rollers with special crowning

Types

Needle rollers come in the types shown in **Table 1**.

Table 1 Needle Roller End Face Shapes and Codes

End Face Shape	Type	Code	Details
	Rounded	A	General
	Flat	F	General and large effective length
	Conical	T	Suitable for roller to be held in shaft or housing
	Trunnion	C	Suitable for roller to be held in shaft or housing
	Crank Pin	P	Suitable for large fillet radius, R, at the shoulder of mounting area
	Stepped	M	Suitable for roller to be held in shaft or housing

Accuracy

NSK metric needle rollers are manufactured in compliance with ISO. Dimensions are shown in **Table 2** and dimension accuracy in **Table 3**, **4** and **5**.

Inch needle rollers are manufactured with a standard diameter tolerance of 0 to −5μm. Needle rollers with a diameter tolerance of 0 to −3μm and 0 to −2μm are also available and manufactured upon request. Please consult NSK for further details.

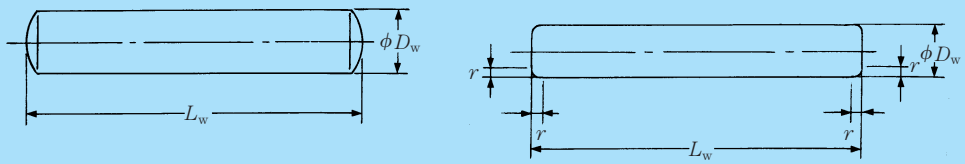


Table 2 Nominal Size and Dimension of Needle Rollers

Units: mm

Nominal Size	D_w	L_w	r (1) (min)	Mass (kg) (Reference) per 1,000 pieces
1 × 5.8	1	5.8	0.1	0.035
1 × 6.8	1	6.8	0.1	0.042
1 × 7.8	1	7.8	0.1	0.048
1 × 9.8	1	9.8	0.1	0.060
1.5 × 5.8	1.5	5.8	0.1	0.080
1.5 × 6.8	1.5	6.8	0.1	0.093
1.5 × 7.8	1.5	7.8	0.1	0.105
1.5 × 9.8	1.5	9.8	0.1	0.135
1.5 × 11.8	1.5	11.8	0.1	0.160
1.5 × 13.8	1.5	13.8	0.1	0.190
2 × 6.8	2	6.8	0.1	0.165
2 × 7.8	2	7.8	0.1	0.190
2 × 9.8	2	9.8	0.1	0.240
2 × 11.8	2	11.8	0.1	0.290
2 × 13.8	2	13.8	0.1	0.335
2 × 15.8	2	15.8	0.1	0.385
2 × 17.8	2	17.8	0.1	0.435
2 × 19.8	2	19.8	0.1	0.485
2.5 × 7.8	2.5	7.8	0.1	0.300
2.5 × 9.8	2.5	9.8	0.1	0.375
2.5 × 11.8	2.5	11.8	0.1	0.450
2.5 × 13.8	2.5	13.8	0.1	0.525
2.5 × 15.8	2.5	15.8	0.1	0.605
2.5 × 17.8	2.5	17.8	0.1	0.680
2.5 × 19.8	2.5	19.8	0.1	0.755
2.5 × 21.8	2.5	21.8	0.1	0.835
2.5 × 23.8	2.5	23.8	0.1	0.910
3 × 9.8	3	9.8	0.1	0.540
3 × 11.8	3	11.8	0.1	0.650
3 × 13.8	3	13.8	0.1	0.760
3 × 15.8	3	15.8	0.1	0.870
3 × 17.8	3	17.8	0.1	0.980
3 × 19.8	3	19.8	0.1	1.10
3 × 21.8	3	21.8	0.1	1.20
3 × 23.8	3	23.8	0.1	1.30
3 × 25.8	3	25.8	0.1	1.40
3 × 27.8	3	27.8	0.1	1.55
3 × 29.8	3	29.8	0.1	1.65
3.5 × 11.8	3.5	11.8	0.1	0.885
3.5 × 13.8	3.5	13.8	0.1	1.05
3.5 × 15.8	3.5	15.8	0.1	1.20
3.5 × 17.8	3.5	17.8	0.1	1.35

Units: mm

Nominal Size	D_w	L_w	r (1) (min)	Mass (kg) (Reference) per 1,000 pieces
3.5 × 19.8	3.5	19.8	0.1	1.50
3.5 × 21.8	3.5	21.8	0.1	1.65
3.5 × 23.8	3.5	23.8	0.1	1.80
3.5 × 25.8	3.5	25.8	0.1	1.95
3.5 × 27.8	3.5	27.8	0.1	2.10
3.5 × 29.8	3.5	29.8	0.1	2.25
3.5 × 31.8	3.5	31.8	0.1	2.40
3.5 × 34.8	3.5	34.8	0.1	2.60
4 × 13.8	4	13.8	0.1	1.35
4 × 15.8	4	15.8	0.1	1.55
4 × 17.8	4	17.8	0.1	1.75
4 × 19.8	4	19.8	0.1	1.95
4 × 21.8	4	21.8	0.1	2.15
4 × 23.8	4	23.8	0.1	2.35
4 × 25.8	4	25.8	0.1	2.55
4 × 27.8	4	27.8	0.1	2.70
4 × 29.8	4	29.8	0.1	2.90
4 × 31.8	4	31.8	0.1	3.10
4 × 34.8	4	34.8	0.1	3.40
4 × 37.8	4	37.8	0.1	3.70
4 × 39.8	4	39.8	0.1	3.90
4.5 × 17.8	4.5	17.8	0.1	2.20
4.5 × 19.8	4.5	19.8	0.1	2.45
4.5 × 21.8	4.5	21.8	0.1	2.70
4.5 × 23.8	4.5	23.8	0.1	2.95
4.5 × 25.8	4.5	25.8	0.1	3.20
4.5 × 29.8	4.5	29.8	0.1	3.70
4.5 × 31.8	4.5	31.8	0.1	3.95
4.5 × 34.8	4.5	34.8	0.1	4.30
4.5 × 37.8	4.5	37.8	0.1	4.70
4.5 × 39.8	4.5	39.8	0.1	4.90
5 × 19.8	5	19.8	0.1	3.00
5 × 21.8	5	21.8	0.1	3.35
5 × 23.8	5	23.8	0.1	3.65
5 × 25.8	5	25.8	0.1	3.95
5 × 27.8	5	27.8	0.1	4.25
5 × 29.8	5	29.8	0.1	4.55
5 × 31.8	5	31.8	0.1	4.85
5 × 34.8	5	34.8	0.1	5.30
5 × 37.8	5	37.8	0.1	5.75
5 × 39.8	5	39.8	0.1	6.10
5 × 49.8	5	49.8	0.1	7.60

Note (1) Suitable for rollers with a flat end face.

Remarks 1. The figure shows the end faces with round and flat surfaces.

2. The minimum dimension and the maximum dimension of the fillet radius R of the end faces of the round surface are $\frac{D_w}{2}$ and $\frac{L_w}{2}$, respectively.

Table 3 Tolerances of Chamfer Dimension of Needle Rollers

Units: mm

D_w over	D_w incl	r (min)	r (max)
—	1	0.1	0.4
1	3	0.1	0.6
3	5	0.1	0.9

Remarks To be applied to the roller with a flat end face.

Table 4 Tolerances of Dimension and Shape of Needle Rollers

Units: μm

Class	Mean Diameter Tolerance high	Mean Diameter Tolerance low	Diameter Variation in Single Plane, (1) ΔD_{WP} max	Deformation, (1) ΔR max	Variation Within Gauge Lot Diameter, (1) VD_{WL} max	Length Deviation, (2) ΔL_{WS}
2	0	−5	1	1	2	h13
3	0	−5	1.5	1.5	3	h13
5	0	−5	2	2.5	5	h13

Notes (1) To be applied at the center of a roller's length.

(2) According to L_w division. h13 is shown in **Table 5** .

Remarks For the overall length of the roller, any actual measured diameter shall not exceed the actual maximum diameter at the center of the length of the roller by more than the following values :

Class 2: 0.5 μm
Class 3: 0.8 μm
Class 5: 1 μm

Table 5 Dimension Tolerance of Length

Units: mm

Basic Design over	Basic Design incl	h13 high	h13 low
3	6	0	−0.18
6	10	0	−0.22
10	18	0	−0.27
18	30	0	−0.33
30	50	0	−0.39

Applications

When a needle roller is applied as a full complement bearing, past performance generally demonstrates that the application of 35 rollers or less at a ratio of roller length, L_w, to roller diameter, D_w, of $4 \leqq L_w/D_w \leqq 8$ produces good results. However, with combinations other than the above, many application results have been obtained. In general, good performance can be produced by applying fewer rollers with a larger roller diameter for normal rotation, and more rollers with smaller roller diameter for oscillation.

Needle Roller Design Guidelines

A standard needle roller is used as a full complement bearing. It is possible to easily obtain the approximate shaft diameter and housing bore diameter for each value of roller diameter and number of rollers from the graphs in **Fig. 1** to **Fig. 4** (B204－B206). For detailed design, shaft diameter and housing bore diameter can be obtained in accordance with the design standard shown in **Table 6**. For these calculations, the recommended radial internal clearance, Δ_r, and circumference clearance, Δ_c, for each application condition are shown in **Table 7** and **Table 8** and the Kordal coefficient, $K = 1/\sin(180^\circ/Z)$, in **Table 9**. For each shaft and housing bore tolerance class, H6 and h5 are recommended.

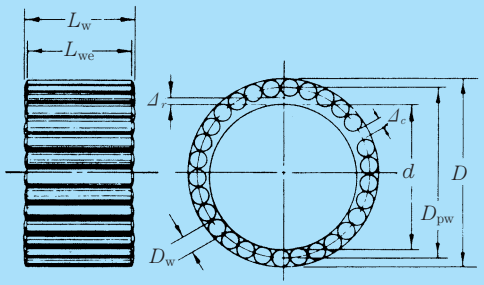


Table 6 Design Standards

Code	Details	Calculation Equation
Z	Number of rollers	
K	Kordal coefficient	$K=1/\sin\frac{180^\circ}{Z}$ (refer to Table 9)
Δ_c	Circumference clearance (min)	According to Table 7 and Table 8
Δ_r	Radial internal clearance (min)	According to Table 7 and Table 8
D_{pw}	Roller pitch diameter	$D_{pw}=KD_w+\Delta_c/\pi=D-D_w=d+\Delta_r+D_w$
D	Housing bore diameter (min)	$D=D_{pw}+D_w=(K+1)D_w+\Delta_c/\pi=d+\Delta_r+2D_w$
d	Shaft diameter (max)	$d=D_{pw}-D_w-\Delta_r=(K-1)D_w+\Delta_c/\pi-\Delta_r=D-2D_w-\Delta_r$
D_w	Roller diameter (max)	$D_w=D_{pw}-d-\Delta_r=\frac{D_{pw}-\Delta_c/\pi}{K}=\frac{d+\Delta_r-\Delta_c/\pi}{(K-1)}=D-D_{pw}=\frac{D-\Delta_c/\pi}{(K+1)}$
L_{we}	Roller effective length	In case of round surface roller, $L_{we}\fallingdotseq L_w-\left(\frac{D_w}{2}\sim\frac{D_w}{4}\right)$
L_w	Roller length (max)	

Table 7 Minimum Clearance under Normal Rotational Condition

Units: mm

Nominal Shaft Diameter over	Nominal Shaft Diameter incl	Circumference Clearance, Δ_c	Radial Internal Clearance, Δ_r
	3	0.08	0.006
3	6	0.08	0.008
6	10	0.08	0.009
10	18	0.08	0.011
18	30	0.08	0.013
30	50	0.16	0.016
50	80	0.16	0.019
80	120	0.16	0.022

Table 8 Minimum Clearance under Application Conditions

Units: mm

Application Part	Circumference Clearance, Δ_c	Radial Internal Clearance, Δ_r
Universal Joint	Value in **Table 7**	(Value in **Table 7**) × 1/2
Pilot	Value in **Table 7**	(Value in **Table 7**) × 3
Counter Shaft	(Value in **Table 7**) × 2	(Value in **Table 7**) × 2
Planetary Gear	0.21	0.015

Table 9 Value of K

Z	K	Z	K	Z	K
6	2.00000	26	8.29623	46	14.65365
7	2.30477	27	8.61379	47	14.97171
8	2.61313	28	8.93141	48	15.28979
9	2.92380	29	9.24907	49	15.60788
10	3.23607	30	9.56677	50	15.92597
11	3.54947	31	9.88452	51	16.24408
12	3.86370	32	10.20230	52	16.56219
13	4.17858	33	10.52011	53	16.88031
14	4.49395	34	10.83795	54	17.19844
15	4.80973	35	11.15582	55	17.51657
16	5.12583	36	11.47371	56	17.83471
17	5.44219	37	11.79163	57	18.15286
18	5.75877	38	12.10957	58	18.47101
19	6.07553	39	12.42752	59	18.78916
20	6.39245	40	12.74550	60	19.10732
21	6.70951	41	13.06349		
22	7.02667	42	13.38149		
23	7.34394	43	13.69951		
24	7.66130	44	14.01754		
25	7.97873	45	14.33559		

Assembly of Rollers by Keystone

When it is necessary to hold the rollers with the keystone method during the process of installing them in the housing, whether or not the rollers are securely held can be checked by the following equation:

D_w (min) $\times$ Y $>$ D (max)

where,
D_w (min) : Minimum roller diameter dimension
D (max) : Maximum housing bore dimension
Y : Keystone constant (refer to **Table 10**)

Table 10 Keystone Constant

Z	K	Z	K
8	3.67633	17	6.45365
9	3.97094	18	6.76893
10	4.27277	19	7.08461
11	4.57895	20	7.40061
12	4.88797	21	7.71688
13	5.19892	22	8.03337
14	5.51128	23	8.35005
15	5.82467	24	8.66689
16	6.13885	25	8.98387

Specifications of Shaft and Housing

As needle rollers are applied directly to the shaft and housing bore, it is necessary to have the shaft and housing bore conform to uniform specifications. For these specifications, please refer to the section on cage and roller assemblies on page B7.

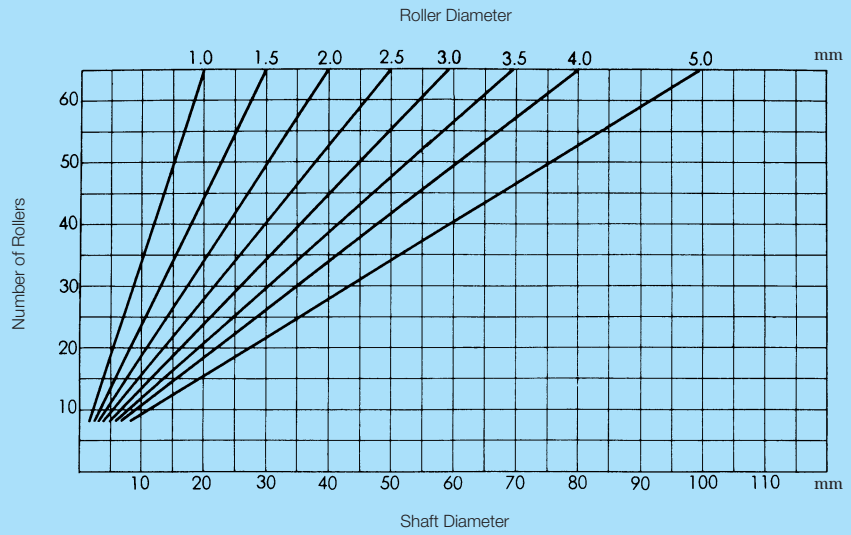


Fig. 1 Roller Number and Shaft Diameter for Standard Metric Roller Diameter

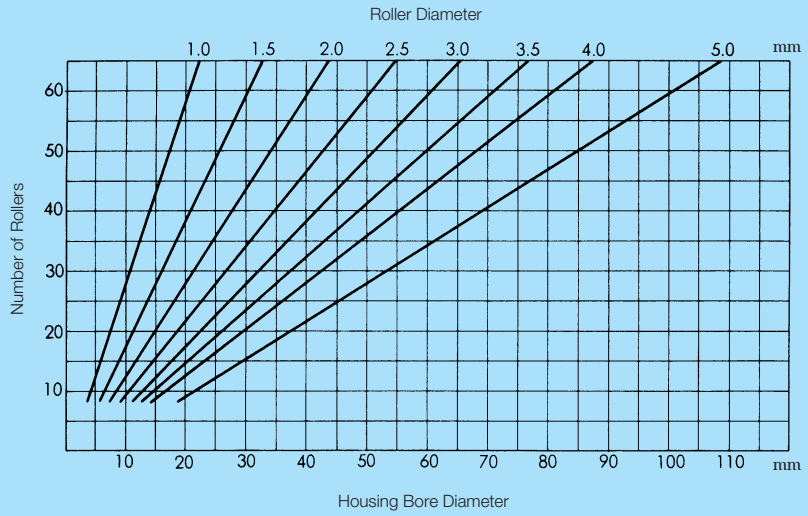


Fig. 2 Number of Rollers and Housing Bore Diameter for Standard Metric Roller Diameter

Product Number of Rollers

Note Product number is shown with nominal size, roller end type code, accuracy class, and special code, as necessary.

(Example) 2 × 9.8 A G3 R

Nominal Size

Roller End Type Code (refer to **Table 1**)

Accuracy Class
G5: Class 5
G3: Class 3
G2: Class 2

Special Code
R: Crowning

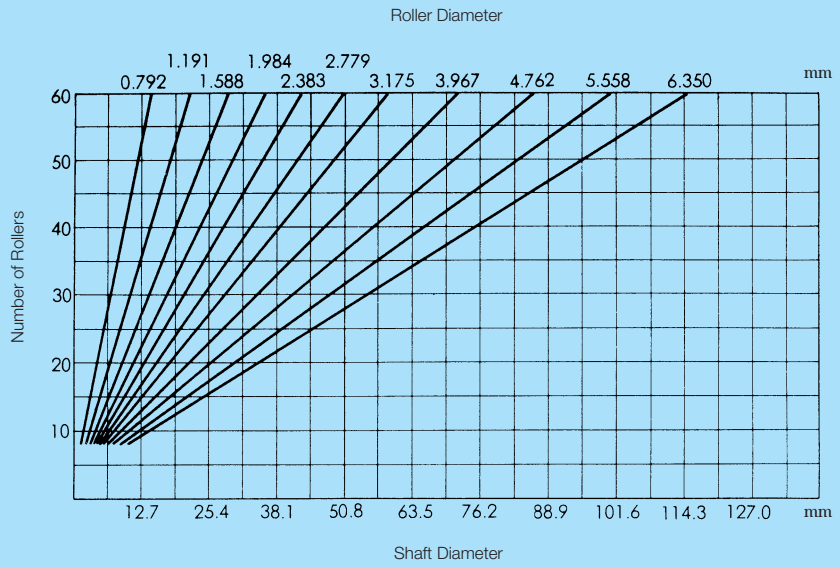


Fig. 3 Number of Rollers and Shaft Diameter for Standard Inch Roller Diameter

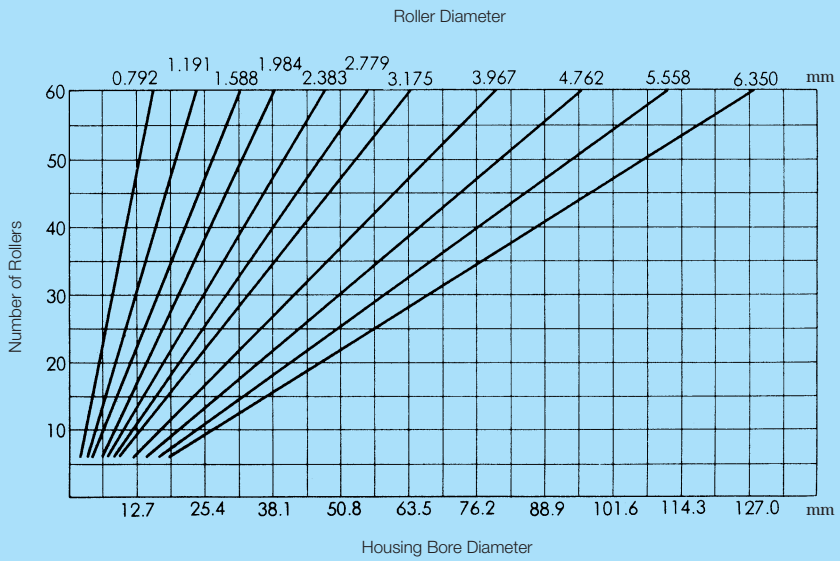


Fig. 4 Number of Rollers and Housing Bore Diameter for Standard Inch Roller Diameter

Table 11 Nominal Size and Dimension of Inch Needle Rollers

Specification (mm) Diameter, D_w	Specification (mm) Length, L_w	Product Number	Mass per 1,000 pieces, kg (approx)
0.792	3.05	**Q-8266**	0.012
	4.06	**Q-8267**	0.016
	4.83	**Q-8100**	0.019
	5.59	**Q-8268**	0.021
	6.35	**Q-8101**	0.024
	7.11	**Q-8269**	0.027
	7.87	**Q-8102**	0.030
1.191	4.06	**Q-8271**	0.035
	4.83	**Q-8272**	0.042
	5.59	**Q-8273**	0.048
	6.35	**Q-8103**	0.055
	7.11	**Q-8274**	0.062
	7.87	**Q-8104**	0.068
	9.65	**Q-8105**	0.084
	11.18	**Q-8106**	0.097
1.588	6.35	**Q-8276**	0.098
	7.11	**Q-8277**	0.110
	7.87	**S-1414-Q**	0.120
	9.65	**Q-8107**	0.150
	11.18	**Q-8108**	0.170
	12.70	**Q-1821**	0.195
	14.22	**Q-8109**	0.220
	15.75	**H-368-Q**	0.245
	19.05	**Q-8284**	0.295
1.984	7.87	**Q-8286**	0.190
	9.65	**Q-8287**	0.230
	11.18	**Q-8110**	0.270
	12.70	**Q-8111**	0.305
	14.22	**Q-8112**	0.340
	15.75	**Q-8049**	0.380
	19.05	**Q-8114**	0.460
	22.35	**Q-8289**	0.540
2.283	9.65	**Q-8290**	0.335
	11.18	**Q-8291**	0.390
	12.70	**Q-8292**	0.440
	14.22	**Q-8115**	0.495
	15.75	**Q-8116**	0.545
	19.05	**H-230-Q**	0.660
	22.35	**Q-8037**	0.775
	25.40	**Q-8294**	0.880
2.779	11.18	**Q-8296**	0.530
	12.70	**Q-8297**	0.600
	14.22	**Q-8298**	0.670
	15.75	**Q-8118**	0.745
	19.05	**Q-8119**	0.900
	22.35	**Q-8120**	1.05
	25.40	**Q-8121**	1.20
	28.45	**Q-8303**	1.35
3.175	12.70	**M-484-Q**	0.780
	14.22	**Q-8304**	0.875
	15.75	**Q-8371**	0.970
	19.05	**C-407-Q**	1.15
	22.35	**Q-8122**	1.40
	25.40	**B-1316-Q**	1.55
	28.45	**Q-8123**	1.75
	31.75	**C-437-Q**	1.95
	35.05	**Q-8310**	2.15
3.967	15.75	**Q-8254**	1.50
	19.05	**Q-8314**	1.85
	22.35	**Q-8315**	2.15
	25.40	**Q-8124**	2.45
	28.45	**Q-8316**	2.75
	31.75	**E-151-Q**	3.05
	35.05	**Q-8317**	3.35
	38.10	**R-315-Q**	3.65
4.762	19.05	**Q-8320**	2.66
	22.35	**Q-8321**	3.11
	25.40	**C-436-Q**	3.55
	28.45	**Q-8322**	3.99
	31.75	**G-529-Q**	4.44
	35.05	**Q-8323**	4.88
	38.10	**P-377-Q**	5.33
	44.45	**C-951-Q**	6.11
5.558	22.35	**Q-8328**	4.20
	25.40	**Q-8125**	4.80
	28.45	**Q-8329**	5.35
	31.75	**Q-8126**	6.00
	35.05	**Q-8330**	6.60
	38.10	**Q-8127**	7.20
	44.45	**Q-8332**	8.40
	50.80	**Q-8334**	9.60
6.350	25.40	**C-435-Q**	6.25
	28.45	**Q-8336**	7.00
	31.75	**O-197-Q**	7.80
	35.05	**Q-8337**	8.65
	38.10	**F-236-Q**	9.40
	44.45	**C-434-Q**	11.0
	50.80	**W-430-Q**	12.5
	57.15	**G-613-Q**	14.0
	63.50	**Q-8340**	15.5

Remarks 1. Rollers in the table are manufactured with the following tolerances：
Mean value of roller diameters: 0 to −0.005 mm
Roller length： 0 to −0.5 mm
2. All roller end faces in the table have a rounded end.

Please consult NSK for selection.

SPHERICAL PLAIN BEARINGS

			Pages
Metric Design	Bore Diameter	12−160 mm	B214−B217
Inch Design	Bore Diameter	12.700−152.400 mm	B218−B219

Spherical plain bearings are self-aligning. They are designed to carry heavy radial loads and combinations of radial and axial loads and to adjust the inclination of the inner ring and outer ring.

They are widely used in industrial and construction machinery and equipment that is characterized by low-speed oscillation and operation.

Design and Types

The simple structure consists of an inner ring with a spherical outside surface of the same diameter mounted to a single or double-cut split outer ring with a ground, spherical bore surface. Both inner and outer rings are made of high-carbon chromium bearing steel, fully hardened to HRC55 or more, and given a precise grinding finish. All the surfaces of the inner and outer rings are given phosphate surface treatment and covered with a coating of molybdenum disulfide.

The bearing codes and the details are shown in **Table 1**. Bearing numbers are formulated as follows. (Please note that inch bearings have their own bearing number formula that differs from metric bearings.)

(Example) 20 FSF 32

- 32 — Outside Diameter (mm)
- FSF — Code
- 20 — Bore Diameter (mm)

Although the bearing table shows FSF and SF bearings with single-cut outer ring, FSBB and SBB types with a double-cut split outer ring are also available.

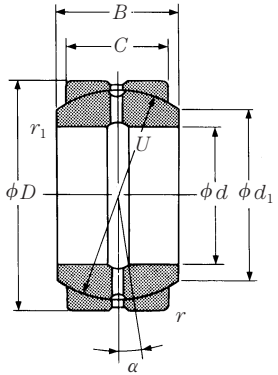
Special spherical plain bearings, e.g., thrust spherical plain bearings, extended inner ring spherical plain bearings and spherical plain bearings made of special materials are also available. Please contact NSK for further details.

Table 1 Bearing Types

Code		Details
Metric	FSF	Outer ring, single-cut
	FSFTT	Outer ring, single-cut with seal
	FSBB	Outer ring, double-cut split After the inner ring is mounted, it is fitted with a snap ring.
Inch	SF	Outer ring, single-cut
	SF ... TT	Outer ring, single-cut with seal
	SBB	Outer ring, double-cut split After the inner ring is mounted, it is fitted with a snap ring.

FSF

Bore Diameter 12 — 65 mm

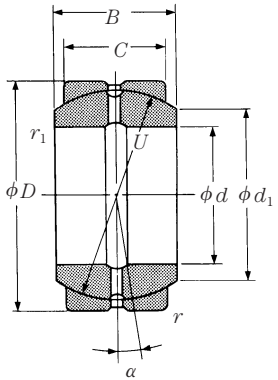


Boundary Dimensions (mm)							Load Capacities			
							Dynamic Loads (N)	{kgf}	Limiting Loads (N)	{kgf}
d	D	C	B	r min	r_1 min	U	C_d		C_s	
12	22	7	10	0.3	0.3	18	7 350	750	31 000	3 150
	22	9	11	0.3	0.3	18	7 550	770	37 000	3 750
15	26	9	12	0.3	0.3	22	11 700	1 200	46 500	4 750
	26	11	13	0.3	0.3	22	12 600	1 290	54 000	5 500
17	30	10	14	0.3	0.3	25	16 200	1 650	56 500	5 750
20	32	14	16	0.3	0.3	28	21 100	2 150	89 000	9 050
	35	12	16	0.3	0.3	29	21 900	2 240	73 500	7 500
22	37	16	19	0.3	0.3	32	28 800	2 930	114 000	11 600
25	42	16	20	0.3	0.3	35.5	35 000	3 550	114 000	11 700
	42	18	21	0.3	0.3	36	37 500	3 800	133 000	13 500
30	47	18	22	0.3	0.3	40.7	47 500	4 850	156 000	15 900
	50	23	27	0.6	0.6	45	57 500	5 850	224 000	22 800
35	55	20	25	0.6	0.3	47	64 500	6 550	199 000	20 200
	55	26	30	0.6	0.6	50	73 500	7 500	286 000	29 100
40	62	22	28	0.6	0.3	53	83 500	8 550	243 000	24 800
	62	28	33	0.6	0.6	55	95 500	9 750	325 000	33 500
45	68	25	32	0.6	0.3	60	106 000	10 800	330 000	34 000
	72	31	36	0.6	0.6	62	116 000	11 800	385 000	39 500
50	75	28	35	0.6	0.3	66	129 000	13 100	400 000	41 000
	80	36	42	0.6	0.6	72	151 000	15 400	565 000	57 500
55	90	40	47	0.6	0.6	80	185 000	18 900	670 000	68 000
60	90	36	44	1	0.3	80	197 000	20 100	615 000	62 500
	100	45	53	0.6	0.6	90	229 000	23 400	875 000	89 000
65	105	47	55	0.6	0.6	94	259 000	26 400	940 000	96 000

Bearing Numbers	Limiting Inclination Angles (°) α	Mass (kg) approx	Inner Ring Side Face Diameters (mm) d_1 approx
12FSF22	11.5	0.017	14.9
12FSF22-1	8.5	0.019	14.2
15FSF26	9.5	0.032	18.4
15FSF26-1	7	0.035	17.7
17FSF30	11	0.049	20.7
20FSF32	5.5	0.053	22.9
20FSF35	9.5	0.065	24.1
22FSF37	7	0.085	25.7
25FSF42	8	0.11	29.3
25FSF42-1	6	0.13	29.2
30FSF47	7	0.155	34.2
30FSF50	6.5	0.235	36
35FSF55	7.5	0.235	39.7
35FSF55-1	6	0.305	40
40FSF62	7.5	0.33	45
40FSF62-1	6.5	0.395	44
45FSF68	8	0.43	50.7
45FSF72	6	0.615	50.4
50FSF75	7	0.575	55.9
50FSF80	6	0.90	58.4
55FSF90	6	1.25	64.7
60FSF90	7	1.1	66.8
60FSF100	6.5	1.7	72.7
65FSF105	6	2.05	76

FSF

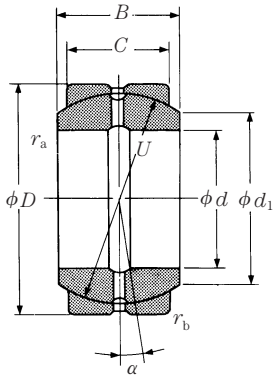
Bore Diameter 70 — 160 mm



Boundary Dimensions (mm)							Load Capacities				Bearing Numbers	Limiting Inclination Angles (°)	Mass (kg)	Inner Ring Side Face Diameters (mm)
							Dynamic Loads (N)	{kgf}	Limiting Loads (N)	{kgf}				
d	D	C	B	r min	r_1 min	U	C_d		C_s			α	approx	d_1 approx
70	105	40	49	1	0.3	92	256 000	26 100	775 000	79 500	**70FSF105**	6.5	1.55	78
	110	50	58	0.6	0.6	100	293 000	29 800	1 110 000	113 000	**70FSF110**	5.5	2.2	81
75	120	55	64	0.6	0.6	110	345 000	35 500	1 380 000	140 000	**75FSF120**	5.5	3.0	89
80	120	45	55	1	0.3	105	330 000	33 500	1 000 000	102 000	**80FSF120**	6.5	2.3	89
	130	60	70	0.6	0.6	120	410 000	42 000	1 660 000	169 000	**80FSF130**	6	4.0	97
85	135	63	74	0.6	0.6	125	455 000	46 500	1 810 000	185 000	**85FSF135**	6	4.25	101
90	130	50	60	1.1	1	115	385 000	39 000	1 220 000	125 000	**90FSF130**	6	2.7	98
	140	65	76	0.6	0.6	130	500 000	51 000	1 970 000	201 000	**90FSF140**	6	4.7	105
95	150	70	82	0.6	0.6	140	575 000	58 500	2 260 000	230 000	**95FSF150**	6	6.05	113
100	150	55	70	1.1	1	130	510 000	52 000	1 460 000	149 000	**100FSF150**	7.5	4.4	110
	160	75	88	1	1	150	640 000	65 500	2 580 000	263 000	**100FSF160**	6	7.4	121
110	160	55	70	1.1	1	140	560 000	57 000	1 660 000	169 000	**110FSF160**	7	4.8	121
	170	80	93	1	1	160	750 000	76 000	2 980 000	305 000	**110FSF170**	5.5	8.55	130
115	180	85	98	1	1	165	815 000	83 500	2 880 000	294 000	**115FSF180**	5.5	10.5	133
120	180	70	85	1.1	1	155	745 000	76 000	1 970 000	201 000	**120FSF180**	6.5	7.8	130
	190	90	105	1	1	175	925 000	94 500	3 250 000	330 000	**120FSF190**	6	12.5	140
130	200	95	110	1	1	185	1 040 000	106 000	3 600 000	370 000	**130FSF200**	5.5	14	149
140	210	70	90	2	1	180	920 000	94 000	2 610 000	266 000	**140FSF210**	7	11	156
150	220	105	120	1	1	205	1 330 000	136 000	4 300 000	440 000	**150FSF220**	5	17	166
160	230	80	105	2	1	200	1 250 000	128 000	3 250 000	330 000	**160FSF230**	8	14	170

SF

Bore Diameter 12.700 — 152.400 mm



Boundary Dimensions (mm, inch)							Load Dynamic Loads (N)	{kgf}	Capacities Limiting Loads (N)	{kgf}	Bearing Numbers	Limiting Inclination Angles (°)	Mass (kg)	Inner Ring Side Face Diameters (mm)	Fillet Radii (mm)	
d		D		C	B	U	C_d		C_s			α	approx	d_1 approx	Shaft(1) r_a max	Housing(1) r_b max
12.700	0.5000	22.225	0.8750	9.52	11.10	18.26	12 000	1 220	37 000	3 800	**5SF8**	7	0.020	14.3	—	0.6
15.875	0.6250	26.988	1.0625	11.91	13.89	22.83	18 700	1 910	58 000	5 900	**6SF10**	6.5	0.036	17.8	—	0.8
19.050	0.7500	31.750	1.2500	14.27	16.66	27.43	27 000	2 750	83 000	8 500	**7SF12**	6.5	0.057	21.4	—	0.8
22.225	0.8750	36.512	1.4375	16.66	19.43	31.95	36 500	3 750	113 000	11 600	**8SF14**	6.5	0.088	25.0	—	0.8
25.400	1.0000	41.275	1.6250	19.05	22.22	36.50	48 000	4 900	148 000	15 100	**10SF16**	6.5	0.125	28.6	—	0.8
31.750	1.2500	50.800	2.0000	23.80	27.76	45.59	74 500	7 600	231 000	23 600	**12SF20**	6.5	0.235	35.7	—	0.8
34.925	1.3750	55.562	2.1875	26.19	30.15	49.20	89 500	9 100	273 000	27 800	**13SF22**	6	0.35	38.9	—	0.8
38.100	1.5000	61.912	2.4375	28.58	33.32	54.74	108 000	11 000	335 000	34 000	**15SF24**	6.5	0.425	43.3	—	0.8
44.450	1.7500	71.438	2.8125	33.32	38.89	63.88	147 000	15 000	455 000	46 500	**17SF28**	6.5	0.65	50.0	—	0.8
50.800	2.0000	80.962	3.1875	38.10	44.45	73.02	192 000	19 600	590 000	60 500	**20SF32**	6.5	0.94	57.2	—	0.8
57.150	2.2500	90.488	3.5625	42.85	50.01	82.17	243 000	24 800	750 000	76 500	**22SF36**	6.5	1.3	65.1	—	0.8
63.500	2.5000	100.012	3.9375	47.62	55.55	91.19	300 000	30 500	925 000	94 500	**25SF40**	6.5	1.85	72.2	—	0.8
69.850	2.7500	111.125	4.3750	52.37	61.11	100.33	365 000	37 000	1 200 000	114 000	**27SF44**	6.5	2.45	79.4	0.6	0.8
76.200	3.0000	120.650	4.7500	57.15	66.68	109.52	430 000	44 000	1 330 000	136 000	**30SF48**	6	3.1	86.5	0.6	0.8
82.550	3.2500	130.175	5.1250	61.90	72.24	118.74	505 000	51 500	1 570 000	160 000	**32SF52**	6	3.9	94.1	0.6	0.8
88.900	3.5000	139.700	5.5000	66.68	77.77	128.02	585 000	60 000	1 820 000	186 000	**35SF56**	6	4.85	100.8	0.6	0.8
95.250	3.7500	149.225	5.8750	71.42	83.34	136.91	675 000	69 000	2 080 000	212 000	**37SF60**	6	5.9	108.0	0.6	0.8
101.600	4.0000	158.750	6.2500	76.20	88.90	146.05	770 000	78 500	2 370 000	242 000	**40SF64**	6	7.1	115.8	0.6	0.8
107.950	4.2500	168.275	6.6250	80.95	94.46	155.58	865 000	88 500	2 680 000	274 000	**42SF68**	6	8.45	122.9	0.8	1.1
114.300	4.5000	177.800	7.0000	85.72	100.00	164.46	970 000	99 000	2 990 000	305 000	**45SF72**	6	9.95	130.0	0.8	1.1
120.650	4.7500	187.325	7.3750	90.47	105.56	173.36	1 080 000	110 000	3 350 000	340 000	**47SF76**	6	11.5	137.4	0.8	1.1
127.000	5.0000	196.850	7.7500	95.25	111.12	182.63	1 200 000	122 000	3 700 000	380 000	**50SF80**	6	13.5	144.5	0.8	1.1
152.400	6.0000	222.250	8.7500	104.78	120.65	207.16	1 560 000	159 000	4 650 000	475 000	**60SF96**	5.5	17.5	167.4	0.8	1.1

Note (1) For bearings 5SF8 through 25SF40 inclusive, the shaft is undercut so there is no fillet radius r_a.

NEEDLE ROLLER BEARINGS FOR UNIVERSAL JOINTS

			Pages
Drawn Cup Type	Inscribed Circle Diameter	10–21.3 mm	B224–B225
Solid Type	Inscribed Circle Diameter	12.170–32.600 mm	B226–B227

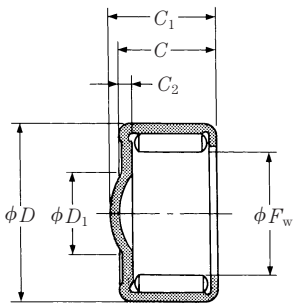
Needle roller bearings for universal joints are available as drawn cup and solid. The drawn cup needle bearing has a large load capacity in spite of its small cross-sectional height. Since the material for the drawn cup (outer ring) is a special alloy steel sheet developed by the bearing performs well regarding fatigue and shock resistance. If this drawn cup needle bearing is applied, an economical universal joint with a large torque capacity can be designed.

A method for fixing a drawn cup needle bearing to the yoke hole is the tightening method (staking method). In some cases, the method of fixation with a rose washer is adopted. In any case, mounting is carried out using dedicated assembly equipment.

As the universal joint uses solid needle bearings in many cases and has demonstrated a high shock resistance, the bearing is particularly well-suited for use in universal joints in medium and large trucks.

ZY

Inscribed Circle Diameter 10 — 21.3 mm

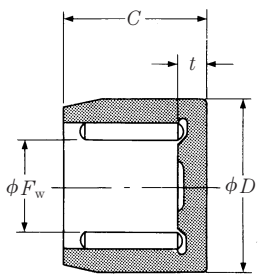


Boundary Dimensions (mm)						Basic Dynamic Load Ratings		Limiting Loads	
						(N)	{kgf}	(N)	{kgf}
F_w	D	C	C_1	C_2	D_1	C_r		P_{max}	
10	16	8.95	10.15	1.30	11	6 600	675	3 750	380
	15	9.35	9.35	1.75	6	5 850	600	3 900	395
12	18	9.95	10.50	1.30	7.5	8 300	845	5 350	550
14	20	11.85	12.09	2.25	8.1	9 850	1 000	6 800	695
16	22	12.97	13.35	2.37	8	11 900	1 210	8 850	900
18	24	13.85	14.35	2.25	9.68	13 400	1 370	10 600	1 080
21.3	29	15.80	15.80	3.00	10.68	17 900	1 820	14 000	1 430

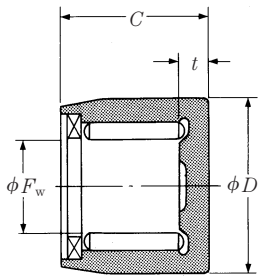
Bearing Numbers	Mass (g) approx	Ring Gage Dimensions (mm)	Plug Gage Dimensions (mm)	
			Go End	No-Go End
ZY-108	6.9	16.016	10.014	10.036
ZY-109	6.6	15.016	10.011	10.026
ZY-1210	10	18.020	12.073	12.095
ZY-1411	12	20.020	14.009	14.035
ZY-1612	14	22.020	16.009	16.035
ZY-1813	17	24.620	18.009	18.035
ZY-2115	37	29.002	21.316	21.337

NSA

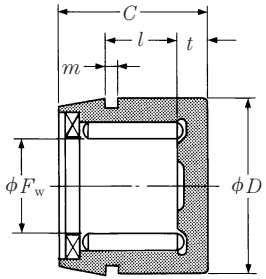
Inscribed Circle Diameter 12.170 — 32.600 mm



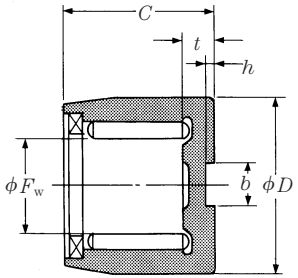
Example 1



Example 2



Example 3



Example 4

Boundary Dimensions (mm)			Dimensions (mm)					Basic Load (N)		Ratings {kgf}		Bearing Numbers	Example	Mass (g)
F_w	D	C	t	l	m	b	h	C_r	C_{or}	C_r	C_{or}			approx
12.170	20.5	16	2	—	—	—	—	11 800	18 400	1 200	1 870	**NSA02001**	2	24
14.270	26	16	4	—	—	—	—	12 200	17 400	1 240	1 770	**NSA02601**	2	40
14.724	23.813	15	2	—	—	—	—	13 400	20 000	1 360	2 040	**NSA02424**	1	28
14.800	25	16.8	3.3	8.5	2.5	—	—	11 200	18 200	1 140	1 860	**NSA024A**	3	38
17.000	29	17.5	3.5	9.5	2	—	—	16 900	24 900	1 730	2 530	**NSA02901**	3	54
17.780	28	18.5	3.5	10	2	—	—	14 600	27 100	1 490	2 760	**NSA02803**	3	49
18.460	29	17.5	3.5	9.5	2	—	—	14 900	28 000	1 520	2 860	**NSA02903**	3	54
21.941	33	21.2	4	—	—	—	—	21 400	38 500	2 180	3 950	**NSA03301**	2	80
23.020	35	23	4	—	—	—	—	23 800	47 000	2 430	4 800	**NSA03501**	2	90
26.995	40	25.5	4	—	—	—	—	28 600	62 500	2 920	6 400	**NSA04002**	2	135
28.600	42	30	6	—	—	18	2	35 500	73 500	3 600	7 500	**NSA04204**	4	165
30.517	46	31.5	7	—	—	25	3	38 000	83 500	3 900	8 500	**NSA04604**	4	205
32.600	48	33.2	6	—	—	24	2	43 500	89 500	4 450	9 100	**NSA04803**	4	225

DRAWN CUP ROLLER CLUTCHES

			Pages
FC, FLC, RC	Shaft Diameter	4−30 mm	B234−B235
FCB, FCBN, RCB	Shaft Diameter	4−30 mm	B236−B237

Drawn cup roller clutches are very compact one-way clutches with a unique drawn cup outer ring. In spite of their lightweight and small section height, torque capacity is high. Operation is accurate and the friction torque when overrunning is small. Mounting is as eazy as drawn cup needle bearings.

Design and Types

Drawn cup roller clutches are composed of an outer ring, which forms the cam face on the drawn cup bore surface by precise deep drawing, as well as rollers, a cage and a spring.

The types of drawn cup roller clutches are shown in **Table 1** and the states of engagement and overruns are shown in **Fig. 1** and **Fig. 2**.

The metric FCP series for low-torque transmissions and plastic housings are available. Please consult NSK for further details.

Table 1 Types of Drawn Cup Roller Clutches

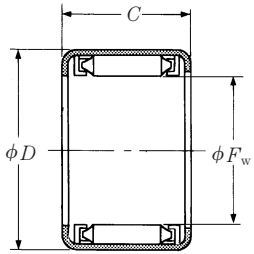
Type	Code	Details
Metric	FC	For torque transmissions only, containing stainless steel spring
	FCL	For torque transmissions only, containing stainless steel spring
	FCB	For torque transmissions and imposing of radial load, containing stainless steel spring
	FCBN	Narrow width type. For torque transmission and imposing of radial load, containing stainless steel spring
Inch	RC	For torque transmission only, containing plastic spring
	RCB	For torque transmission and imposing of radial load, containing plastic spring
	RC-FS	For torque transmission only, containing a stainless steel spring
	RCB-FS	For torque transmission and imposing of radial load, and containing a stainless steel spring

Remarks Drawn cup metric roller clutches have a standard structure of a spring pushing multiple rollers. In addition, the K type with a structure of a spring pushing a single roller is available for low torque (K is attached to the end of the product number).

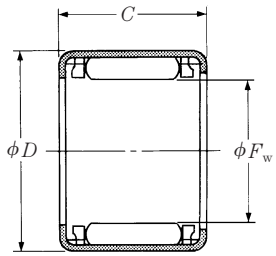
FC・FCL

RC

Shaft Diameter 4 — 30 mm



FC



RC

Boundary Dimensions (mm) F_w		D		C $^{0}_{-0.25}$		Torque Capacities (N·m)	{kgf·m}
4		8		6		0.31	0.032
6		10		12		2.45	0.250
		10		12		1.96	0.200
6.350	0.2500	11.112	0.4375	12.70	0.5000	1.96	0.200
		11.112	0.4375	12.70	0.5000	1.96	0.200
8		12		12		3.24	0.330
		14		12		4.02	0.410
9.525	0.3750	15.875	0.6250	12.70	0.5000	5.10	0.520
		15.875	0.6250	12.70	0.5000	5.10	0.520
10		14		12		4.41	0.450
		16		12		5.30	0.540
12		18		16		13.24	1.350
12.700	0.5000	19.050	0.7500	12.70	0.5000	8.34	0.850
		19.050	0.7500	12.70	0.5000	8.34	0.850
14		20		16		14.22	1.450
15.875	0.6250	22.225	0.8750	15.88	0.6250	16.18	1.650
		22.225	0.8750	15.88	0.6250	16.18	1.650
16		22		16		20.59	2.100
19.050	0.7500	25.400	1.0000	15.88	0.6250	22.06	2.250
		25.400	1.0000	15.88	0.6250	22.06	2.250
20		26		16		30.89	3.150
25		32		20		68.65	7.000
25.400	1.0000	33.338	1.3125	15.88	0.6250	46.58	4.750
		33.338	1.3125	15.88	0.6250	46.58	4.750
30		37		20		95.12	9.700

Roller Clutch Numbers: Metric Design	Inch design	Mass (g) approx	Minimum Outside Diameters of Housing (mm)	Matching Support Needle Roller Bearing Numbers: Full Complement	With Cage
FC-4K (1)	—	0.90	12	F-48	—
FC-6	—	4.1	14	F-68	FJ-69
FC-6K (1)	—	2.7	14	F-68	FJ-69
—	**RC-040708**	3.6	16	B-45	J-45
—	**RC-040708-FS** (2)	3.6	16	B-45	J-45
FCL-8K (1)	—	3.3	18	F-810	FJ-810
FC-8	—	6.8	20	FH-810	FJH-810
—	**RC-061008**	7.7	22	BH-68	JH-68
—	**RC-061008-FS** (2)	7.7	22	BH-68	JH-68
FCL-10K (1)	—	3.9	23	F-1010	FJ-1010
FC-10	—	9.1	25	FH-1010	FJH-1010
FC-12	—	12	27	FH-1212	FJH-1212
—	**RC-081208**	9.1	28	BH-88	JH-88
—	**RC-081208-FS** (2)	9.1	28	BH-88	JH-88
FC-14K (1)	—	16	29	F-1412	FJ-1412
—	**RC-101410**	14	30	BH-108	JH-108
—	**RC-101410-FS** (2)	14	30	BH-108	JH-108
FC-16	—	18	31	F-1612	FJ-1612
—	**RC-121610**	15	36	B-1210	J-1210
—	**RC-121610-FS** (2)	15	36	B-1210	J-1210
FC-20	—	21	38	F-2012	FJ-2012
FC-25	—	34	46	F-2516	FJ-2516
—	**RC-162110**	26	48	BH-168	JH-1612
—	**RC-162110-FSS** (2)	26	48	BH-168	JH-1612
FC-30	—	42	51	F-3020	FJ-3020

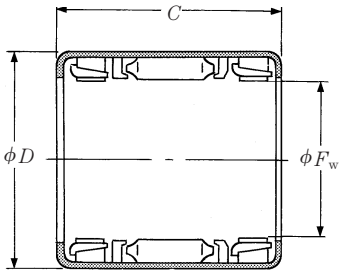
Notes (1) The suffix K indicates low-torque products.
(2) Even if the suffix FS is not marked on the product, it can be distinguished from others because its cage is always red.

Remarks For stock availability, please contact NSK.
Please consult NSK when making a selection.

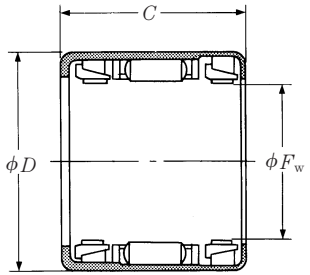
FCB・FCBN

RCB

Shaft Diameter 4 — 30 mm



FCB



RCB

Boundary Dimensions (mm, inch) F_w		D		C $^{0}_{-0.25}$		Torque Capacities (N·m)	{kgf·m}
4		10		9		0.19	0.019
6		12		10		0.56	0.057
8		14		20		4.02	0.410
9.525	0.3750	15.875	0.6250	22.22	0.8750	5.10	0.520
		15.875	0.6250	22.22	0.8750	5.10	0.520
10		16		20		5.30	0.540
12		18		26		13.24	1.350
12.700	0.5000	19.050	0.7500	22.22	0.8750	8.34	0.850
		19.050	0.7500	22.22	0.8750	8.34	0.850
15.875	0.6250	22.225	0.8750	25.40	1.0000	16.18	1.650
		22.225	0.8750	25.40	1.0000	16.18	1.650
16		22		26		20.59	2.100
19.050	0.7500	25.400	1.0000	25.40	1.0000	22.06	2.250
		25.400	1.0000	25.40	1.0000	22.06	2.250
20		26		26		30.89	3.150
25		32		30		68.65	7.000
25.400	1.0000	33.338	1.3125	27.00	—	46.58	4.750
		33.338	1.3125	27.00	—	46.58	4.750
30		37		30		95.12	9.700

Roller Clutch Numbers Metric Design	Inch design	Basic Dynamic Load Ratings (N) C_r	{kgf}	Limiting Loads (N) P_{max}	{kgf}	Mass (g) approx	Minimum Outside Diameters of Housing (mm)
FCBN-4K (1)	—	1 190	121	540	55	2.7	16
FCBN-6K (1)	—	1 630	166	735	75	3.8	18
FCB-8	—	2 430	248	1 200	122	11	20
—	**RCB-061014**	3 700	375	2 010	205	14	22
—	**RCB-061014-FS** (2)	3 700	375	2 010	205	14	22
FCB-10	—	2 820	288	1 450	148	13	25
FCB-12	—	3 800	390	2 240	228	18	27
—	**RCB-081214**	4 400	450	2 580	263	16	28
—	**RCB-081214-FS** (2)	4 400	450	2 580	263	16	28
—	**RCB-101416**	4 900	500	3 050	310	23	30
—	**RCB-101416-FS** (2)	4 900	500	3 050	310	23	30
FCB-16	—	4 100	420	2 670	272	24	31
—	**RCB-121616**	5 550	565	3 700	375	26	36
—	**RCB-121616-FS** (2)	5 550	565	3 700	375	26	36
FCB-20	—	5 100	520	3 550	360	28	38
FCB-25	—	6 850	700	4 700	480	48	46
—	**RCB-162117**	9 750	995	6 750	690	45	48
—	**RCB-162117-FS** (2)	9 750	995	6 750	690	45	48
FCB-30	—	7 000	715	5 250	535	54	51

Notes (1) The suffix K indicates low-torque products.
(2) Even if the suffix FS is not marked on the product, it can be distinguished from others because its cage is always red.

Remarks For stock availability, please contact NSK.
Please consult NSK when making a selection.

OIL SEALS FOR NEEDLE BEARINGS

Pages

Single-Lip Synthetic Rubber Seals B242

Double-Lip Synthetic Rubber Seals B242

Needle roller bearing oil seals are manufactured to meet the section height of drawn cup needle bearings. It is possible, therefore, to mount them onto the side face of a needle bearing without specially machining the housing bore.

The oil seals of VC and KC bearings serve as packing because their outside circumferences are rubber and facilitate easy mounting.

Types

The types of needle roller bearing oil seals are shown in **Table 1**.

Table 1 Types of Oil Seals

Type	Details	
VC	Synthetic rubber	Single lip
KC	Synthetic rubber	Double lip

Accuracy

The dimensional tolerance of oil seals complies with ISO6194 (JIS B 2402). The outside diameter and the width tolerances are shown in **Table 2** and **Table 3**, respectively.

Table 2 Outside Diameter Tolerance

Units: mm

Nominal Outside Diameter		Tolerance	
over	incl	high	low
—	30	+0.30	+0.10
30	120	+0.35	+0.10

Table 3 Width Tolerance

Units: mm

Nominal Width		Width Tolerance	
over	incl	high	low
–	6	+0.2	−0.2

APPLICATIONS

Mounting

When single-lip VC bearings are mounted, the lip should be bent inward to prevent lubricant leakage and outward to prevent entry of foreign matter.

Double-lip KC bearings, which have good sealing properties and high resistance to foreign particles, emphasize the prevention of entry of foreign matter and are provided with sufficient interference, so the main lip should be bent outward.

As wear and heat are easily generated if there is no oil film between the seal lip and the shaft, a coating of oil must be applied to the seal when mounting.

When press fitting the seal into the housing as prescribed, any shock that may cause deformation to the seal should be avoided. It is recommended to use a press-fitting jig that is capable of equally pushing the whole back face of the seal (**Fig. 1**).

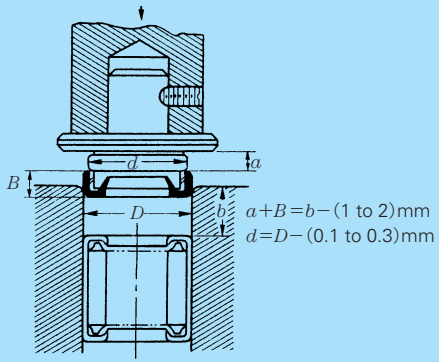


Fig. 1

Mounting on Shaft

If there is no slope in the shaft end or there is a key way or screw thread, the lip can be protected from any damage or peeling by using a bush as shown in **Fig. 2**, since the bore diameter of the seal is less than the shaft diameter.

Coating grease onto the lip can make mounting easier and protect it. It is recommended that the shaft end to which the seal is mounted should be chamfered at about 30 degrees.

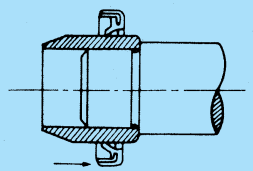


Fig. 2

Limiting Speed

Limiting speed, which varies depending on the eccentricity of the shaft in contact and roughness of the finished face, is generally 10 m/sec for VC and 6 m/sec for KC bearings. In the case of outer ring rotation, it should be harf of the above values. The maximum operating temperature is about 120˚C for short periods of operation.

A typical example of oil seal mounting is shown in **Fig. 3**.

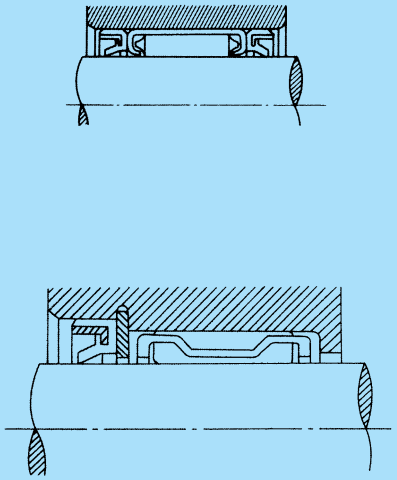
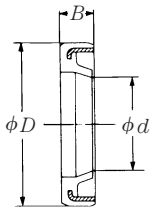
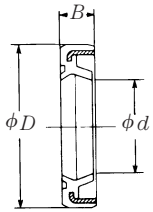


Fig. 3 Typical Examples of Oil Seal Mounting



VC



KC

Boundary Dimensions (mm)			Oil Seal Numbers	
d	*D*	*B*	VC	KC
4	8	2.5	**VC-4825**	—
5	9	2.5	**VC-5925**	—
6	10	2.5	**VC-61025**	—
7	11	2.5	**VC-71125**	—
8	12	2.5	**VC-81225**	—
	15	3	**VC-8153**	—
9	13	2.5	**VC-91325**	—
	16	3	**VC-9163**	—
10	14	2.5	**VC-101425**	—
	17	3	**VC-10173**	—
12	16	2.5	**VC-121625**	—
	18	3	**VC-12183**	—
	19	3	**VC-12193**	—
13	19	3	**VC-13193**	—
14	20	3	**VC-14203**	**KC-14203**
	22	3	**VC-14223**	**KC-14223**
15	21	3	**VC-15213**	**KC-15213**
	22	3	**VC-15223**	**KC-15223**
16	22	3	**VC-16223**	**KC-16223**
	24	3	**VC-16243**	**KC-16243**
17	23	3	**VC-17233**	**KC-17233**
	24	3	**VC-17243**	**KC-17243**
18	24	3	**VC-18243**	**KC-18243**
	25	3	**VC-18253**	**KC-18253**
20	26	4	**VC-20264**	**KC-20264**
	27	4	**VC-20274**	**KC-20274**
22	28	4	**VC-22284**	**KC-22284**
	29	4	**VC-22294**	**KC-22294**
25	32	4	**VC-25324**	**KC-25324**
	33	4	**VC-25334**	**KC-25334**
28	35	4	**VC-28354**	**KC-28354**
	37	4	**VC-28374**	**KC-28374**
30	37	4	**VC-30374**	**KC-30374**
	40	4	**VC-30404**	**KC-30404**
32	42	4	**VC-32424**	**KC-32424**
35	42	4	**VC-35424**	**KC-35424**
	45	4	**VC-35454**	**KC-35454**
40	47	4	**VC-40474**	**KC-40474**
	50	4	**VC-40504**	**KC-40504**
45	52	4	**VC-45524**	**KC-45524**
	55	4	**VC-45554**	**KC-45554**
50	62	4	**VC-50624**	**KC-50624**

Please consult NSK when making a selection.

EXAMPLE FIGURES

APPENDICES

FIGURES

Page

- MOTOR VEHICLES ..... C 2
- CONSTRUCTION AND CARGO HANDLING EQUIPMENT ..... C 9
- AGRICULTURAL MACHINERY C19
- MACHINE TOOLS C20
- BUSINESS MACHINES C26
- ELECTRIC AND PNEUMATIC EQUIPMENT C30
- TWO-STROKE ENGINES C39
- HYDRAULIC MACHINES C41
- OTHERS C44

APPENDICES

APPENDIX 1 CONVERSION TABLE FROM SI (INTERNATIONAL UNITS) SYSTEM C48
APPENDIX 2 N-kgf CONVERSION TABLE C50
APPENDIX 3 kg-lb CONVERSION TABLE C51
APPENDIX 4 °C-°F CONVERSION TABLE C52
APPENDIX 5 VISCOSITY CONVERSION TABLE C53
APPENDIX 6 inch-mm CONVERSION TABLE C54
APPENDIX 7 HARDNESS CONVERSION TABLE (REFERENCE) C56
APPENDIX 8 PHYSICAL AND MECHANICAL PROPERTIES OF MATERIALS C57
APPENDIX 9 TOLERANCES FOR SHAFT DIAMETERS C58
APPENDIX 10 TOLERANCES FOR HOUSING BORE DIAMETERS C60
APPENDIX 11 VALUES OF STANDARD TOLERANCE GRADES IT C62
APPENDIX 12 SPEED FACTOR f_n C64
APPENDIX 13 FATIGUE LIFE FACTOR f_h AND FATIGUE LIFE $L \cdot L_h$ C65
APPENDIX 14 BOUNDARY DIMENSIONS OF RADIAL BEARINGS C66
APPENDIX 15 BOUNDARY DIMENSIONS OF THRUST BEARINGS C67