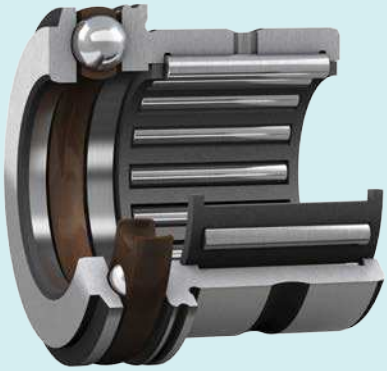

7 Needle roller bearings

Designation system

Prefixes

R	Bearing without an inner ring

Basic designation

BK	Drawn cup needle roller bearing with a closed end
HK	Drawn cup needle roller bearing with open ends
HN	Drawn cup needle roller bearing with open ends, full complement
IR	Needle roller bearing inner ring
K	Needle roller and cage assembly
LR	Needle roller bearing inner ring
NA 48, NA 49, NA 69	Needle roller bearing with machined rings, with flanges, with an inner ring
NAO	Needle roller bearing with machined rings, without flanges, with an inner ring
NK, NKS	Needle roller bearing with machined rings, with flanges, without an inner ring
NKI, NKIS	Needle roller bearing with machined rings, with flanges, with an inner ring
NKIA 59, NKIB 59	Needle roller / angular contact ball bearing
NKX	Needle roller / thrust ball bearing
NKXR	Needle roller / cylindrical roller thrust bearing
NX	Needle roller / full complement thrust ball bearing
PNA	Alignment needle roller bearing
RN	Needle roller

Suffixes

Group 1: Internal design

BF	Needle roller with flat ends
D	Deviating or modified internal design with the same boundary dimensions. Example: K 40x45x17 D (Needle roller and cage assembly with a double split cage)
DS	Single split needle roller and cage assembly
EGS	Inner ring with a non-directionally ground raceway
VGS	Inner ring with a pre-ground raceway and a machining allowance
ZW	Double row needle roller and cage assembly (double row cage)

Group 2: External design (seals, snap ring groove, etc.)

AS..	Outer ring with lubrication hole(s), the number following indicates the number of holes
ASR..	Outer ring with annular groove and lubrication hole(s), the number following indicates the number of holes
IS..	Inner ring with lubrication hole(s), the number following indicates the number of holes
ISR..	Inner ring with annular groove and lubrication hole(s), the number following indicates the number of holes
RS, .2RS	Contact seal on one or both sides, respectively • NBR or FKM or PUR for a drawn cup needle roller bearing • NBR for a machined needle roller bearing
Z	Combined needle roller bearing, factory greased thrust bearing with a cover without lubrication holes over the outside diameter

Group 3: Cage design

TN	Glass fibre reinforced PA66 cage

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Group 4					
4.1	4.2	4.3	4.4	4.5	4.6

Group 4.6: Other variants

VG052 Single split PES (polyethersulfone) cage

Group 4.5: Lubrication

SM.. Special grease, two numbers following identify the grease

Group 4.4: Stabilization

S0 Bearing or inner ring heat stabilized for operating temperatures ≤ 150 °C (*300 °F*)
S1 Bearing or inner ring heat stabilized for operating temperatures ≤ 200 °C (*390 °F*)
S2 Bearing or inner ring heat stabilized for operating temperatures ≤ 250 °C (*480 °F*)
S3 Bearing or inner ring heat stabilized for operating temperatures ≤ 300 °C (*570 °F*)

Group 4.3: Bearing sets, matched bearings

..S Matched bearings for an equal load distribution. The number preceding indicates the number of bearings, e.g. NK 50/25 TN/2S

Group 4.2: Accuracy, clearance, preload, quiet running

/SORT.. Tolerance grade of needle rollers of a needle roller and cage assembly, the numbers following identify the actual limits in µm, e.g. /SORT-2-4

CN Normal radial internal clearance; only used together with an additional letter that identifies a reduced or displaced clearance range
- H Reduced clearance range corresponding to the upper half of the actual clearance range
- L Reduced clearance range corresponding to the lower half of the actual clearance range
- M Reduced clearance range corresponding to the two middle quarters of the actual clearance range
- P Displaced clearance range comprising the upper half of the actual clearance range plus the lower half of the next larger clearance range
- R Normal clearance range in accordance with the withdrawn DIN 620-4

The above letters H, L, M and P are also used together with the clearance classes C2, C3, C4.

C2 Radial internal clearance smaller than Normal
C3 Radial internal clearance greater than Normal
C4 Radial internal clearance greater than C3
G2 Needle roller in accordance with ISO 3096 Grade 2
H.. Bearing without an inner ring and reduced inside diameter (under rollers) tolerance, the numbers following indicate the tolerance limits in µm, e.g. H+27+20
M../M.. Diameter tolerance of needle rollers, e.g. M2/M4 indicates diameter tolerance –2 to –4 µm
N/M.. Diameter tolerance of needle rollers, e.g. N/M2 indicates diameter tolerance 0 to –2 µm
P5 Dimensional and geometrical tolerances to class P5
P6 Dimensional and geometrical tolerances to class P6
P62 P6 + C2
P63 P6 + C3
P6CNR P6 + CNR

Group 4.1: Materials, heat treatment

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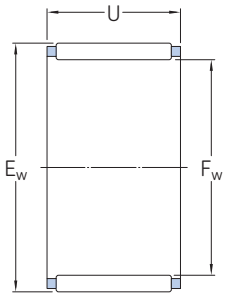
7.1 Needle roller and cage assemblies

F_w **3 – 30** mm



Principal dimensions			Basic load ratings dynamic	static	Fatigue load limit	Speed ratings Reference speed	Limiting speed	Mass	Designation	Associated radial shaft seals[1] Single lip	Double lip
F_w	E_w	U	C	C_0	P_u						
mm			kN		kN	r/min		g	–	–	
3	5	7	1,51	1,34	0,134	40 000	45 000	0,3	**K 3x5x7 TN**	–	–
	5	9	1,68	1,53	0,153	40 000	45 000	0,4	▸ **K 3x5x9 TN**	–	–
4	7	7	1,72	1,32	0,137	36 000	43 000	0,5	**K 4x7x7 TN**	–	–
	7	10	2,29	1,9	0,204	36 000	43 000	0,7	**K 4x7x10 TN**	–	–
5	8	8	2,29	2	0,212	36 000	40 000	0,7	**K 5x8x8 TN**	–	–
	8	10	2,92	2,7	0,29	36 000	40 000	0,9	▸ **K 5x8x10 TN**	–	–
6	9	8	2,55	2,36	0,25	34 000	38 000	0,8	**K 6x9x8 TN**	–	–
	9	10	3,3	3,2	0,345	34 000	38 000	1,1	**K 6x9x10 TN**	–	–
7	10	8	2,81	2,75	0,29	32 000	36 000	0,9	**K 7x10x8 TN**	–	–
	10	10	3,58	3,75	0,415	32 000	36 000	1	**K 7x10x10 TN**	–	–
8	11	10	3,8	4,25	0,465	32 000	36 000	1,2	**K 8x11x10 TN**	–	–
	11	13	5,01	5,85	0,67	32 000	36 000	1,7	**K 8x11x13 TN**	–	–
	12	10	4,84	4,75	0,54	30 000	34 000	2	**K 8x12x10 TN**	G 8x12x3	–
9	12	10	4,4	5,2	0,57	30 000	34 000	1,5	**K 9x12x10 TN**	–	–
10	13	10	4,57	5,7	0,63	28 000	32 000	1,6	▸ **K 10x13x10 TN**	–	–
	13	13	5,94	8	0,9	28 000	32 000	2,3	**K 10x13x13 TN**	–	–
	14	10	5,61	6,1	0,695	28 000	32 000	2,5	**K 10x14x10 TN**	G 10x14x3	–
	14	13	7,21	8,5	0,98	28 000	32 000	4,6	**K 10x14x13 TN**	G 10x14x3	–
	16	12	7,65	7,2	0,85	28 000	32 000	5,5	**K 10x16x12 TN**	–	–
12	15	10	4,73	6,2	0,695	26 000	30 000	2,9	**K 12x15x10 TN**	–	–
	15	13	6,16	8,65	0,98	26 000	30 000	2,3	**K 12x15x13 TN**	–	–
	16	13	7,65	9,5	1,1	26 000	30 000	3,6	**K 12x16x13 TN**	G 12x16x3	–
	17	13	9,13	10,4	1,22	26 000	30 000	4,9	**K 12x17x13 TN**	–	–
	18	12	9,52	10	1,18	26 000	30 000	6	**K 12x18x12 TN**	G 12x18x3	SD 12x18x3
14	18	10	6,93	8,65	1	24 000	28 000	4	**K 14x18x10**	–	–
	18	13	7,92	10,2	1,18	24 000	28 000	6,5	**K 14x18x13**	–	–
	18	15	9,13	12,5	1,46	24 000	28 000	5	**K 14x18x15 TN**	–	–
	18	17	10,5	14,6	1,7	24 000	28 000	8	**K 14x18x17**	–	–
15	19	13	8,25	11,2	1,29	24 000	28 000	7	▸ **K 15x19x13**	–	–
	19	17	10,8	15,6	1,86	24 000	28 000	9,5	▸ **K 15x19x17**	–	–
	21	15	13,8	16,3	2	24 000	26 000	11	**K 15x21x15**	G 15x21x3	SD 15x21x3
	21	21	18,7	24,5	3	24 000	26 000	17	**K 15x21x21**	G 15x21x3	SD 15x21x3

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Principal dimensions			Basic load ratings dynamic	static	Fatigue load limit	Speed ratings Reference speed	Limiting speed	Mass	Designation	Associated radial shaft seals[1] Single lip	Double lip
F_w	E_w	U	C	C_0	P_u						
mm			kN		kN	r/min		g	–	–	
16	20	10	7,48	10	1,16	24 000	26 000	5,5	**K 16x20x10**	–	–
	20	13	8,58	12	1,37	24 000	26 000	7,5	**K 16x20x13**	–	–
	20	17	11,2	17	2	24 000	26 000	10	**K 16x20x17**	–	–
	22	12	11	12,5	1,5	22 000	26 000	10	**K 16x22x12**	G 16x22x3	SD 16x22x3
	22	16	14,2	17,6	2,12	22 000	26 000	12	**K 16x22x16**	G 16x22x3	SD 16x22x3
	22	20	17,6	22,8	2,8	22 000	26 000	17	**K 16x22x20**	G 16x22x3	SD 16x22x3
	24	20	20,5	23,6	2,9	22 000	24 000	22	**K 16x24x20**	G 16x24x3	SD 16x24x3
17	21	10	7,81	10,8	1,22	22 000	26 000	5,5	**K 17x21x10**	–	–
18	24	12	12,1	15	1,8	20 000	24 000	12	**K 18x24x12**	G 18x24x3	SD 18x24x3
19	23	13	9,13	13,7	1,6	20 000	24 000	8	**K 19x23x13**	–	–
20	24	10	8,58	12,9	1,46	20 000	22 000	6,5	**K 20x24x10**	–	–
	24	13	9,52	14,6	1,66	20 000	22 000	9	**K 20x24x13**	–	–
	24	17	12,5	20,8	2,4	20 000	22 000	12	**K 20x24x17**	–	–
	26	17	18,3	26	3,2	19 000	22 000	16	**K 20x26x17**	G 20x26x4	SD 20x26x4
	26	20	20,1	29	3,6	19 000	22 000	19	▸ **K 20x26x20**	G 20x26x4	SD 20x26x4
	28	20	22,9	28,5	3,45	18 000	20 000	27	**K 20x28x20**	G 20x28x4	SD 20x28x4
	28	25	29,2	39	4,9	18 000	20 000	32	▸ **K 20x28x25**	G 20x28x4	SD 20x28x4
	30	30	34,1	41,5	5,2	17 000	20 000	49	**K 20x30x30**	–	–
21	25	13	9,68	15,3	1,76	19 000	22 000	9	**K 21x25x13**	–	–
22	26	10	8,8	13,7	1,56	18 000	20 000	7,5	▸ **K 22x26x10**	–	–
	26	13	10,1	16,3	1,86	18 000	20 000	9,5	**K 22x26x13**	–	–
	26	17	13,2	22,8	2,7	18 000	20 000	12	**K 22x26x17**	–	–
	28	17	18,3	27	3,25	17 000	20 000	18	**K 22x28x17**	G 22x28x4	SD 22x28x4
	29	16	19,4	25,5	3,05	17 000	19 000	16	**K 22x29x16**	–	–
	30	15	19	23,6	2,8	17 000	19 000	18	**K 22x30x15 TN**	G 22x30x4	SD 22x30x4
23	35	16	24,2	23,2	2,9	15 000	17 000	29	**K 23x35x16 TN**	–	–
24	28	10	9,35	15	1,73	17 000	19 000	8,5	**K 24x28x10**	–	–
	28	13	10,6	18	2,08	17 000	19 000	10	**K 24x28x13**	–	–
	30	17	18,7	27,5	3,4	16 000	18 000	19	**K 24x30x17**	–	–
25	29	10	9,52	15,6	1,8	16 000	18 000	8,5	**K 25x29x10**	–	–
	29	13	10,8	18,6	2,16	16 000	18 000	11	**K 25x29x13**	–	–
	30	17	17,9	30,5	3,6	16 000	18 000	16	**K 25x30x17**	–	–
	30	20	20,9	36,5	4,4	16 000	18 000	18	**K 25x30x20**	–	–
	32	16	19,8	27,5	3,35	15 000	17 000	21	**K 25x32x16**	G 25x32x4	–
	33	20	27,5	38	4,65	15 000	17 000	33	**K 25x33x20**	G 25x33x4	SD 25x33x4
	35	30	44,6	62	7,8	15 000	17 000	65	▸ **K 25x35x30**	G 25x35x4	SD 25x35x4
26	30	13	11,2	19,6	2,28	16 000	18 000	11	**K 26x30x13**	–	–
28	33	13	14,7	24,5	2,85	14 000	16 000	13	**K 28x33x13**	–	–
	33	17	19	33,5	4,05	14 000	16 000	17	**K 28x33x17**	–	–
30	35	13	15,1	25,5	3	13 000	15 000	14	**K 30x35x13**	–	–
	35	17	18,7	34	4,05	13 000	15 000	19	**K 30x35x17**	–	–
	35	27	29,2	60	7,35	13 000	15 000	30	**K 30x35x27**	–	–
	37	18	25,1	39	4,65	13 000	15 000	30	**K 30x37x18**	G 30x37x4	SD 30x37x4
	40	30	46,8	69,5	8,65	12 000	14 000	73	**K 30x40x30**	G 30x40x4	SD 30x40x4

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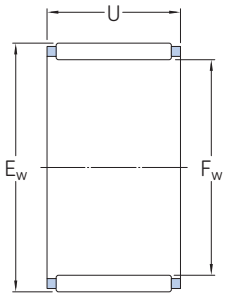
7.1 Needle roller and cage assemblies

F_w **32 – 100** mm



Principal dimensions			Basic load ratings dynamic	static	Fatigue load limit	Speed ratings Reference speed	Limiting speed	Mass	Designation	Associated radial shaft seals[1] Single lip	Double lip
F_w	E_w	U	C	C_0	P_u						
mm			kN		kN	r/min		g	–	–	
32	37	13	14,7	25,5	3	13 000	14 000	18	**K 32x37x13**	–	–
	37	17	19	35,5	4,25	13 000	14 000	19	**K 32x37x17**	–	–
	38	20	25,1	45	5,6	12 000	14 000	30	**K 32x38x20**	–	–
	40	25	35,8	58,5	7,2	12 000	14 000	49	**K 32x40x25**	–	–
35	40	13	15,4	28	3,25	12 000	13 000	19	**K 35x40x13**	–	–
	40	17	19,8	39	4,65	12 000	13 000	21	**K 35x40x17**	–	–
	40	27	23,8	49	6	12 000	13 000	39	**K 35x40x27 TN**	–	–
	42	16	23,3	37,5	4,5	11 000	13 000	34	**K 35x42x16**	G 35x42x4	SD 35x42x4
	42	18	26,4	44	5,3	11 000	13 000	34	**K 35x42x18**	G 35x42x4	SD 35x42x4
	45	20	35,2	50	6,2	11 000	12 000	56	**K 35x45x20**	G 35x45x4	SD 35x45x4
37	42	17	21,6	43	5,2	11 000	13 000	22	**K 37x42x17**	–	–
38	43	17	19,8	39	4,65	11 000	12 000	29	**K 38x43x17**	–	–
	46	32	52,3	100	12,5	10 000	12 000	76	**K 38x46x32**	–	–
40	45	17	20,5	41,5	5	10 000	12 000	31	**K 40x45x17**	–	–
	45	27	31,4	73,5	9	10 000	12 000	46	**K 40x45x27**	–	–
	48	20	34,7	58,5	7,35	10 000	11 000	49	▸ **K 40x48x20**	–	–
42	47	17	20,9	43	5,2	10 000	11 000	32	**K 42x47x17**	–	–
	50	20	33,6	57	7,1	9 500	11 000	53	**K 42x50x20**	–	–
43	48	17	20,9	43	5,2	9 500	11 000	30	**K 43x48x17**	–	–
45	50	17	21,6	46,5	5,6	9 000	10 000	34	**K 45x50x17**	–	–
	50	27	33	81,5	10	9 000	10 000	52	**K 45x50x27**	–	–
	53	28	49,5	98	12,2	9 000	10 000	81	**K 45x53x28**	–	–
47	52	17	22,4	49	6	9 000	10 000	35	**K 47x52x17**	–	–
50	55	20	25,5	60	7,2	8 500	9 500	43	▸ **K 50x55x20**	–	–
	55	30	37,4	98	12	8 500	9 500	65	**K 50x55x30**	–	–
	57	18	31,9	64	7,8	8 000	9 000	47	**K 50x57x18**	–	–
	58	25	41,8	81,5	10,2	8 000	9 000	90	**K 50x58x25**	G 50x58x4	SD 50x58x4
55	60	20	27	67	8,15	7 500	8 500	40	**K 55x60x20**	–	–
	60	30	39,6	108	13,4	7 500	8 500	71	**K 55x60x30**	–	–
	62	18	34,1	71	8,5	7 500	8 500	52	**K 55x62x18**	–	–
	63	32	59,4	129	16,3	7 500	8 500	102	**K 55x63x32**	G 55x63x5	–

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Principal dimensions			Basic load ratings dynamic	static	Fatigue load limit	Speed ratings Reference speed	Limiting speed	Mass	Designation	Associated radial shaft seals[1] Single lip	Double lip
F_w	E_w	U	C	C_0	P_u						
mm			kN		kN	r/min		g	–	–	
60	65	20	28,1	72	8,8	7 000	8 000	52	**K 60x65x20**	–	–
	68	25	51,2	112	14	6 700	7 500	89	**K 60x68x25**	–	–
65	73	30	53,9	125	15,6	6 300	7 000	141	▸ **K 65x73x30**	–	–
70	76	20	34,1	86,5	10,6	6 000	6 700	71	**K 70x76x20**	–	–
	78	30	57,2	137	17	6 000	6 700	148	**K 70x78x30**	G 70x78x5	–
75	83	23	47,3	110	13,7	5 300	6 300	124	**K 75x83x23**	–	–
80	88	30	68,2	176	22	5 000	6 000	138	**K 80x88x30**	–	–
85	92	20	42,9	108	13,2	4 800	5 600	102	**K 85x92x20**	–	–
90	97	20	42,9	114	13,7	4 500	5 300	109	**K 90x97x20**	–	–
	98	30	64,4	173	21,6	4 500	5 300	172	**K 90x98x30**	–	–
95	103	30	66	180	22,8	4 300	5 000	165	**K 95x103x30**	–	–
100	108	27	55	143	17,6	4 000	4 800	185	**K 100x108x27**	–	–

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