DOUBLE ROW ROLLER BEARINGS

Design

Double row cylindrical roller bearings are suitable for applications with very high radial load and high revolution frequencies. As standard, double row cylindrical roller bearings are made in two versions (NN, NNU). These bearings are separable and are manufactured in designs with lubrication groove or without it.

Double row cylindrical roller bearings feature high rigidity and are used mostly in locations of service spindles of machine tools and similar equipment.

NN design

Double row cylindrical roller bearings of NN version have two rows of rollers guided by three flanges on inner ring. The outer ring is without flanges, and therefore these flanges cannot transfer axial forces. Double row cylindrical roller bearings of NN30K version are commonly used with cylindrical bore 1:12; if pre-agreed so, they can be supplied also with cylindrical bore.

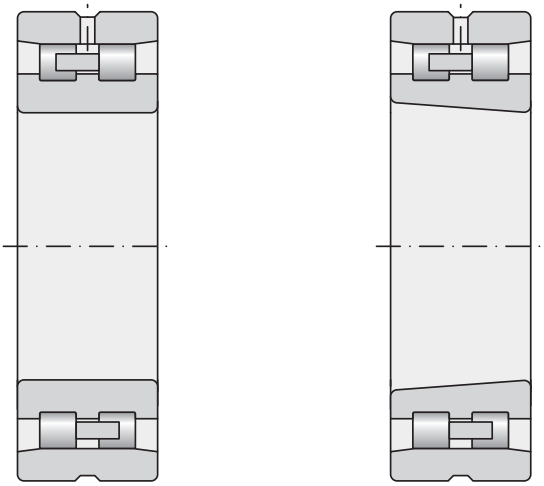


Fig. 12.4.12 (a, b)

NNU design

Double row cylindrical roller bearings of NNU49 version have three guide flanges on outer ring and smooth inner ring. Bearings can transfer radial load only. NNU4920 and NNU4924 type bearings are also supplied in tandems in compliance with technical conditions of TPF 11322. A pair coupled in this manner in location has the function of four-row cylindrical roller bearings, and suits location of rollers of rolling mills, levellers, etc. If you need tandem of different bearing dimensions, please contact the technical and consultancy services of ZKL. Double row cylindrical roller bearings in NNU design can be supplied with cylindrical or tapered bore.

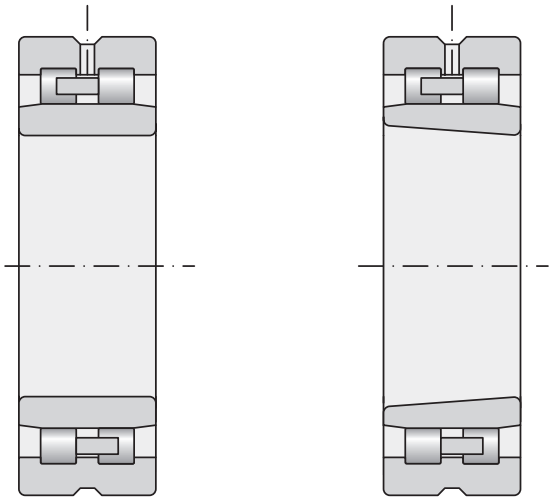


Fig. 12.4.13 (a, b)

General information

Main dimensions

The main dimensions of double row cylindrical roller bearing stated in the dimension tables comply with international dimensional plan ISO 15.

Tolerances

Double row cylindrical roller bearings are usually made in normal accuracy level P0 which is not presented. Delivery of bearings in higher accuracy levels P6, P5 and P4 has to be consulted in advance with the supplier. Tapered bore cylindrical roller bearings are only produced in high accuracy levels P5 and P4. The limit values of bearing dimension and run accuracy deviations comply with the standard ISO 492 (see chapter 7).

Radial clearance

Double row cylindrical roller bearings with cylindrical bore are made with normal radial clearance. Delivery of bearings with bigger clearance C3, C4 or C5, alternatively with smaller clearance C2, has to be consulted with the supplier. Values of radial clearances comply with the standard ISO 5753 and apply for bearings in non-assembled state. The values comply with the clearances of single row cylindrical roller bearings stated in chart 7.19.

Tapered bore cylindrical roller bearings are only produced with reduced radial clearance with mutually non--interchangeable rings C1NA and C2NA. The C1NA and C2NA symbols are combined with characters for the P5 and P4 accuracy level, e.g. P5 + C1NA is designated P51NA. Values of radial clearances comply with the standard ISO 5753 and are stated in chart 7.20.

Sliding axial movement

Double row cylindrical roller bearings are to certain extent capable of alignment of the shaft axial displacement against the body without reducing the service life of the bearing, same as single row cylindrical roller bearings (fig. 12.4.11). The values of maximum axial slide "s" are stated in the table section.

Misalignment

Misalignmnet of inner ring in double row cylindrical roller bearings with cylindrical bore against outer ring produces torque load in the bearing which leads to increased load and shortened service life of the bearing.

Cylindrical roller bearings with tapered bore are not suitable for applications in locations where mutual alignment of inner and outer bearing rings is not ensured.

Running temperatures

As standard, rings of double row cylindrical roller bearings are made for operation to 120 °C.

Upon request, roller bearings with stabilisation for operation to temperatures 200 °C can be supplied. In other cases please contact the technical and consultancy services.

Cages

Roller bearings are usually manufactured with massive brass cage guided on rolling elements which is usually not designated. Exception is NNU49 bearing with massive brass case M the design of which forms a part of the designation.

Special applications utilise massive steel cage guided on rolling elements; delivery of bearings with steel cages has to be discussed with the supplier.

Lubrication groove and holes on outer ring

All sizes of double row cylindrical roller bearings can be supplied with a groove and lubrication holes on outer ring (W33). This design allows supply of lubricant directly in the bearing between two rows of rollers which will ensure better lubrication of bearings and higher service reliability.

Minimum load

Minimum radial load recommended for double row ZKL cylindrical roller bearings is such that equals to 2 % of the dynamic load bearing capacity of the bearing.

Equivalent dynamic load of bearing

$$P = F_r$$

Equivalent static load of bearing

$$P_0 = F_r$$

Additional designations

C1NA ... Radial clearance of double row cylindrical roller bearings with tapered bore

C2NA ... Radial clearance higher than C1NA of double row cylindrical roller bearings with tapered bore

W33 .... Lubrication groove and holes on outer ring

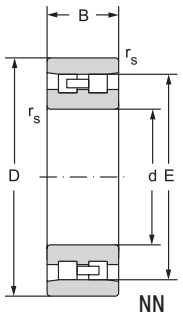




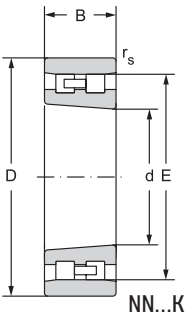




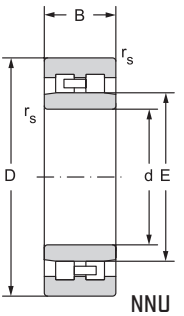


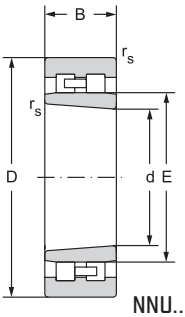
NN



NN...K



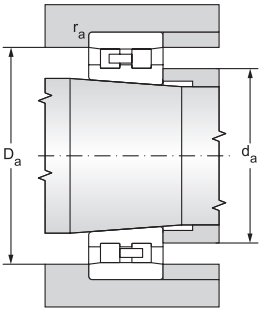
NNU



NNU...K

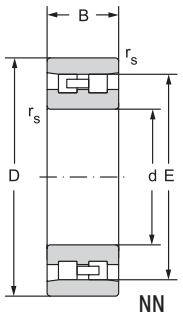
12.4.2

Main dimensions								Basic load rating		Fatique load limit
								dynamic	static	
d	D	B	r_s	r_{1s}	E	F	s[1)]	C_r	C_{or}	P_u
			min	min						
mm								kN		kN
25	47	16	1,0	1,0	41,3		1,0	21,5	23,8	2,90
	47	16	1,0	1,0	41,3		1,0	21,5	23,8	2,90
30	55	19	1,0	1,0	48,5		1,0	28,7	32,5	3,96
	55	19	1,0	1,0	48,5		1,0	28,7	32,5	3,96
35	62	20	1,0	1,0	55,0		1,0	36,9	43,8	5,34
	62	20	1,0	1,0	55,0		1,0	36,9	43,8	5,34
40	68	21	1,0	1,0	61,0		1,0	38,3	44,7	5,45
	68	21	1,0	1,0	61,0		1,0	38,3	44,7	5,45
45	75	23	1,0	1,0	67,5		1,0	44,7	53,1	6,48
	75	23	1,0	1,0	67,5		1,0	44,7	53,1	6,48
50	80	23	1,0	1,0	72,5		1,0	48,2	59,6	7,27
	80	23	1,0	1,0	72,5		1,0	48,2	59,6	7,27
55	90	26	1,1	1,1	81,0		1,2	64,3	81,0	9,88
	90	26	1,1	1,1	81,0		1,2	64,3	81,0	9,88
60	95	26	1,1	1,1	86,1		1,2	68,1	89,1	10,87
	95	26	1,1	1,1	86,1		1,2	68,1	89,1	10,87
65	100	26	1,1	1,1	91,0		1,2	70,8	98,1	11,96
	100	26	1,1	1,1	91,0		1,2	70,8	98,1	11,96
70	110	30	1,1	1,1	100,0		1,2	90,9	128,0	15,61
	110	30	1,1	1,1	100,0		1,2	90,9	128,0	15,61
75	115	30	1,1	1,1	105,0		1,2	90,9	128,0	15,61
	115	30	1,1	1,1	105,0		1,2	90,9	128,0	15,61
80	125	34	1,1	1,1	113,0		1,4	114,0	162,0	19,76
	125	34	1,1	1,1	113,0		1,4	114,0	162,0	19,76
85	130	34	1,1	1,1	118,0		1,4	119,0	178,0	21,71
	130	34	1,1	1,1	118,0		1,4	119,0	178,0	21,71
90	140	37	1,5	1,5	127,0		1,4	131,0	192,0	23,41
	140	37	1,5	1,5	127,0		1,4	131,0	192,0	23,41

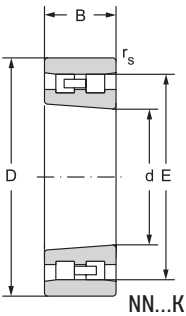


[1] Admissible axial movement

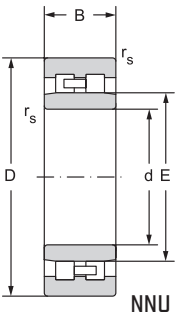
Limiting speed for lubrication with		Bearing designation	Abutment and fillet dimensions							Lubrication groove and holes		Weight
grease	oil		d	d_a	d_a	D_a	D_a	r_a	r_{1a}	a	b	~
				min	max	min	max	max	max			
min^{-1}			mm									kg
19000	22000	**NN3005**	25	29	-	42	43	1,0	1,0	3,2	4,8	0,12
19000	22000	**NN3005K**		29	-	42	43	1,0	1,0	3,2	4,8	0,12
16000	18000	**NN3006**	30	35	-	49	50	1,0	1,0	3,2	4,8	0,19
16000	18000	**NN3006K**		35	-	49	50	1,0	1,0	3,2	4,8	0,19
14000	16000	**NN3007**	35	40	-	56	57	1,0	1,0	3,2	4,8	0,25
14000	16000	**NN3007K**		40	-	56	57	1,0	1,0	3,2	4,8	0,25
12600	14000	**NN3008**	40	45	-	62	63	1,0	1,0	3,2	4,8	0,30
12600	14000	**NN3008K**		45	-	62	63	1,0	1,0	3,2	4,8	0,30
11000	12600	**NN3009**	45	50	-	69	70	1,0	1,0	3,2	4,8	0,38
11000	12600	**NN3009K**		50	-	69	70	1,0	1,0	3,2	4,8	0,38
10600	12000	**NN3010**	50	55	-	74	75	1,0	1,0	3,2	4,8	0,42
10600	12000	**NN3010K**		55	-	74	75	1,0	1,0	3,2	4,8	0,42
9400	11000	**NN3011**	55	62	-	82	84	1,0	1,0	3,2	4,8	0,62
9400	11000	**NN3011K**		62	-	82	84	1,0	1,0	3,2	4,8	0,62
8900	10000	**NN3012**	60	67	-	87	88	1,0	1,0	3,2	4,8	0,66
8900	10000	**NN3012K**		67	-	87	88	1,0	1,0	3,2	4,8	0,66
8400	9400	**NN3013**	65	72	-	92	93	1,0	1,0	3,2	4,8	0,71
8400	9400	**NN3013K**		72	-	92	93	1,0	1,0	3,2	4,8	0,71
7500	8400	**NN3014**	70	77	-	102	103	1,0	1,0	3,2	6,5	1,00
7500	8400	**NN3014K**		77	-	102	103	1,0	1,0	3,2	6,5	1,00
7100	7900	**NN3015**	75	82	-	107	108	1,0	1,0	3,2	6,5	1,10
7100	7900	**NN3015K**		82	-	107	108	1,0	1,0	3,2	6,5	1,10
6700	7500	**NN3016**	80	87	-	115	118	1,0	1,0	3,2	6,5	1,50
6700	7500	**NN3016K**		87	-	115	118	1,0	1,0	3,2	6,5	1,50
6300	7100	**NN3017**	85	92	-	120	123	1,0	1,0	3,2	6,5	1,60
6300	7100	**NN3017K**		92	-	120	123	1,0	1,0	3,2	6,5	1,60
6000	6700	**NN3018**	90	98	-	129	132	1,5	1,5	3,2	6,5	2,00
6000	6700	**NN3018K**		98	-	129	132	1,5	1,5	3,2	6,5	2,00



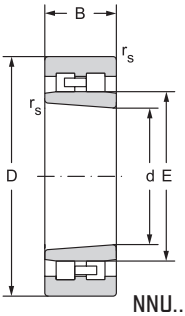
NN



NN...K



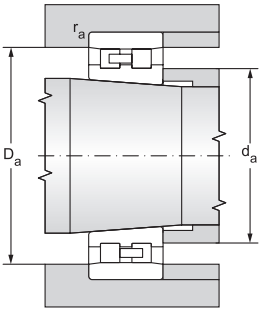
NNU



NNU...K

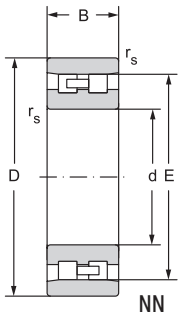
12.4.2

Main dimensions								Basic load rating		Fatique load limit
								dynamic	static	
d	D	B	r_s	r_{1s}	E	F	s[1)]	C_r	C_{or}	P_u
			min	min						
mm								kN		kN
95	145	37	1,5	1,5	132,0		1,4	139,0	207,0	25,24
	145	37	1,5	1,5	132,0		1,4	139,0	207,0	25,24
100	140	40	1,1	1,1		113,0	1,7	119,0	215,0	26,22
	140	40	1,1	1,1		113,0	1,7	119,0	215,0	26,22
	150	37	1,5	1,5	137,0		1,5	144,0	224,0	27,32
	150	37	1,5	1,5	137,0		1,5	144,0	224,0	27,32
105	145	40	1,1	1,1		117,0	1,7	161,0	315,0	23,70
	145	40	1,1	1,1		117,0	1,7	161,0	315,0	23,70
	160	41	2,0	2,0	146,0		1,5	188,0	282,0	20,85
	160	41	2,0	2,0	146,0		1,5	188,0	282,0	20,85
110	150	40	1,1	1,1		122,0	2,0	167,0	335,0	24,91
	150	40	1,1	1,1		122,0	2,0	167,0	335,0	24,91
	170	45	2,0	2,0	155,0		1,8	220,0	329,0	23,93
	170	45	2,0	2,0	155,0		1,8	220,0	329,0	23,93
120	165	40	1,1	1,1		134,5	2,2	168,0	304,0	21,99
	165	40	1,1	1,1		134,5	2,2	168,0	304,0	21,99
	180	46	2,0	2,0	165,0		2,1	228,0	355,0	25,29
	180	46	2,0	2,0	165,0		2,1	228,0	355,0	25,29
130	180	50	1,5	1,5		144,0	2,5	274,0	545,0	38,45
	180	50	1,5	1,5		144,0	2,5	274,0	545,0	38,45
	200	52	2,0	2,0	182,0		2,4	282,0	447,0	30,95
	200	52	2,0	2,0	182,0		2,4	282,0	447,0	30,95
140	190	50	1,5	1,5		154,0	2,7	283,0	585,0	40,50
	190	50	1,5	1,5		154,0	2,7	283,0	585,0	40,50
	210	53	2,0	2,0	192,0		2,8	299,0	482,0	32,79
	210	53	2,0	2,0	192,0		2,8	299,0	482,0	32,79
150	210	60	2,0	2,0		167,0	2,8	350,0	715,0	48,23
	210	60	2,0	2,0		167,0	2,8	350,0	715,0	48,23
	225	56	2,1	2,1	206,0		3,0	322,0	521,0	34,71
	225	56	2,1	2,1	206,0		3,0	322,0	521,0	34,71
160	220	60	2,0	2,0		177,0	3,3	365,0	760,0	50,44
	220	60	2,0	2,0		177,0	3,3	365,0	760,0	50,44
	240	60	2,1	2,1	219,0		3,5	375,0	660,0	43,13
	240	60	2,1	2,1	219,0		3,5	375,0	660,0	43,13

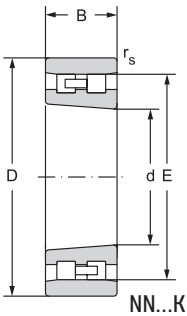


[1] Admissible axial movement

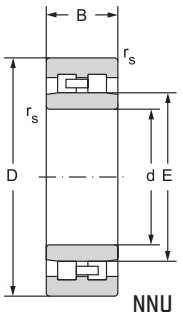
Limiting speed for lubrication with		Bearing designation	Abutment and fillet dimensions							Lubrication groove and holes		Weight
grease	oil		d	d_a	d_a	D_a	D_a	r_a	r_{1a}	a	b	~
				min	max	min	max	max	max			
min^{-1}			mm									kg
5600	6300	**NN3019**	95	103	-	134	137	1,5	1,5	3,2	6,5	2,10
5600	6300	**NN3019K**		103	-	134	137	1,5	1,5	3,2	6,5	2,10
3800	4700	**NNU4920M**	100	106	112	-	134	1,0	1,0	3,2	6,5	1,92
3800	4700	**NNU4920KM**		106	112	-	134	1,0	1,0	3,2	6,5	1,92
5300	6000	**NN3020**		108	-	139	142	1,5	1,5	3,2	6,5	2,20
5300	6000	**NN3020K**		108	-	139	142	1,5	1,5	3,2	6,5	2,20
3800	4800	**NNU4921M**	105	111,5	116	-	138,5	1,0	1,0	3,2	6,5	1,99
3800	4800	**NNU4921KM**		111,5	116	-	138,5	1,0	1,0	3,2	6,5	1,99
5000	5600	**NN3021**		114	-	148	151	2,0	2,0	3,2	6,5	2,80
5000	5600	**NN3021K**		114	-	148	151	2,0	2,0	3,2	6,5	2,80
3600	4500	**NNU4922M**	110	116,5	121	-	143,5	1,0	1,0	3,2	6,5	2,07
3600	4500	**NNU4922KM**		116,5	121	-	143,5	1,0	1,0	3,2	6,5	2,07
4700	5300	**NN3022**		119	-	157	161	2,0	2,0	3,2	6,5	3,55
4700	5300	**NN3022K**		119	-	157	161	2,0	2,0	3,2	6,5	3,55
3200	4000	**NNU4924M**	120	126	134	-	159	1,0	1,0	3,2	6,5	2,81
3200	4000	**NNU4924KM**		126	134	-	159	1,0	1,0	3,2	6,5	2,81
4500	5000	**NN3024**		129	-	167	171	2,0	2,0	3,2	6,5	3,85
4500	5000	**NN3024K**		129	-	167	171	2,0	2,0	3,2	6,5	3,85
3000	3800	**NNU4926M**	130	138	143	-	172	1,5	1,5	3,2	6,5	3,85
3000	3800	**NNU4926KM**		138	143	-	172	1,5	1,5	3,2	6,5	3,85
4000	4500	**NN3026**		139	-	184	191	2,0	2,0	4,8	9,5	5,75
4000	4500	**NN3026K**		139	-	184	191	2,0	2,0	4,8	9,5	5,75
2800	3600	**NNU4928M**	140	148	153	-	182	1,5	1,5	3,2	6,5	4,08
2800	3600	**NNU4928KM**		148	153	-	182	1,5	1,5	3,2	6,5	4,08
3800	4200	**NN3028**		150	-	194	200	2,0	2,0	4,8	9,5	6,20
3800	4200	**NN3028K**		150	-	194	200	2,0	2,0	4,8	9,5	6,20
2600	3200	**NNU4930M**	150	159	166	-	201	2,0	2,0	3,2	6,5	6,39
2600	3200	**NNU4930KM**		159	166	-	201	2,0	2,0	3,2	6,5	6,39
3500	4000	**NN3030**		162	-	208	213	2,0	2,0	4,8	9,5	7,50
3500	4000	**NN3030K**		162	-	208	213	2,0	2,0	4,8	9,5	7,50
2400	3000	**NNU4932M**	160	169	176	-	211	2,0	2,0	3,2	6,5	6,76
2400	3000	**NNU4932KM**		169	176	-	211	2,0	2,0	3,2	6,5	6,76
2400	2800	**NN3032**		171	-	222	229	2,0	2,0	4,8	9,5	9,41
2400	2800	**NN3032K**		171	-	222	229	2,0	2,0	4,8	9,5	9,41



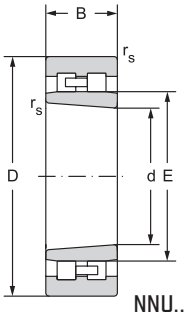
NN



NN...K



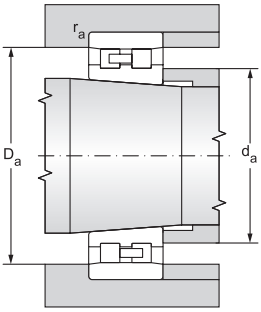
NNU



NNU...K

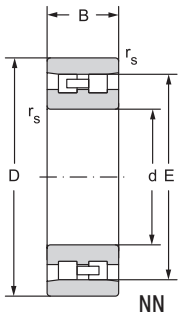
12.4.2

Main dimensions								Basic load rating		Fatique load limit
								dynamic	static	
d	D	B	r_s	r_{1s}	E	F	$s^{1)}$	C_r	C_{or}	P_u
			min	min						
mm								kN		kN
170	230	60	2,0	2,0		187,0	3,9	375,0	805,0	52,61
	230	60	2,0	2,0		187,0	3,9	375,0	805,0	52,61
	260	67	2,1	2,1	236,0		4,1	450,0	805,0	51,48
	260	67	2,1	2,1	236,0		4,1	450,0	805,0	51,48
180	250	69	2,0	2,0		200,0	4,5	480,0	1020,0	65,23
	250	69	2,0	2,0		200,0	4,5	480,0	1020,0	65,23
	280	74	2,1	2,1	255,0		4,5	565,0	995,0	62,36
	280	74	2,1	2,1	255,0		4,5	565,0	995,0	62,36
190	260	69	2,0	2,0		211,5	4,5	485,0	1060,0	66,87
	260	69	2,0	2,0		211,5	4,5	485,0	1060,0	66,87
	290	75	2,1	2,1	265,0		4,6	595,0	1080,0	66,82
	290	75	2,1	2,1	265,0		4,6	595,0	1080,0	66,82
200	280	80	2,1	2,1		223,0	5,0	570,0	1220,0	75,49
	280	80	2,1	2,1		223,0	5,0	570,0	1220,0	75,49
	310	82	2,1	2,1	282,0		5,2	655,0	1170,0	71,09
	310	82	2,1	2,1	282,0		5,2	655,0	1170,0	71,09
220	300	60	3,5	3,5	278,0		2,0	299,0	668,0	40,35
	300	80	2,1	2,1		243,0	5,0	600,0	1330,0	80,34
	300	80	2,1	2,1		243,0	5,0	600,0	1330,0	80,34
	340	90	3,0	3,0	310,0		5,4	815,0	1480,0	87,43
	340	90	3,0	3,0	310,0		5,4	815,0	1480,0	87,43
240	320	60	3,5	3,5	298,0		2,0	316,0	750,0	44,31
	320	80	2,1	2,1		263,0	5,4	625,0	1450,0	85,66
	320	80	2,1	2,1		263,0	5,4	625,0	1450,0	85,66
	360	92	3,0	3,0	330,0		5,7	855,0	1600,0	92,59
	360	92	3,0	3,0	330,0		5,7	855,0	1600,0	92,59
260	360	100	2,1	2,1		289,0	6,0	935,0	2100,0	120,33
	360	100	2,1	2,1		289,0	6,0	935,0	2100,0	120,33
	400	104	4,0	4,0	364,0		6,2	1030,0	1920,0	107,97
	400	104	4,0	4,0	364,0		6,2	1030,0	1920,0	107,97
280	380	100	2,1	2,1		309,0	6,0	960,0	2230,0	125,41
	380	100	2,1	2,1		309,0	6,0	960,0	2230,0	125,41
	420	106	4,0	4,0	384,0		6,7	1100,0	2000,0	110,50
	420	106	4,0	4,0	384,0		6,7	1100,0	2000,0	110,50

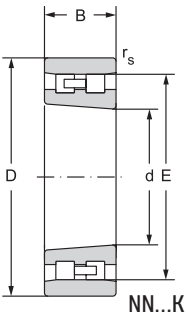


[1] Admissible axial movement

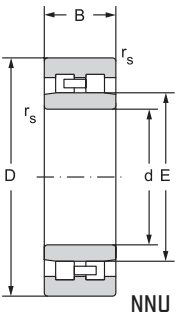
Limiting speed for lubrication with		Bearing designation	Abutment and fillet dimensions							Lubrication groove and holes		Weight
grease	oil		d	d_a	d_a	D_a	D_a	r_a	r_{1a}	a	b	~
				min	max	min	max	max	max			
min^{-1}			mm									kg
2400	2800	**NNU4934M**	170	179	186	-	221	2,0	2,0	3,2	6,5	7,12
2400	2800	**NNU4934KM**		179	186	-	221	2,0	2,0	3,2	6,5	7,12
2200	2600	**NN3034**		181	-	239	249	2,0	2,0	4,8	9,5	12,8
2200	2600	**NN3034K**		181	-	239	249	2,0	2,0	4,8	9,5	12,8
2200	2600	**NNU4936M**	180	189	199	-	241	2,0	2,0	4,8	9,5	10,4
2200	2600	**NNU4936KM**		189	199	-	241	2,0	2,0	4,8	9,5	10,4
2000	2400	**NN3036**		191	-	258	269	2,0	2,0	6,0	11,1	16,8
2000	2400	**NN3036K**		191	-	258	269	2,0	2,0	6,0	11,1	16,8
2000	2600	**NNU4938M**	190	199	211	-	251	2,0	2,0	4,8	9,5	10,9
2000	2600	**NNU4938KM**		199	211	-	251	2,0	2,0	4,8	9,5	10,9
2000	2400	**NN3038**		201	-	268	279	2,0	2,0	6,0	11,1	17,8
2000	2400	**NN3038K**		201	-	268	279	2,0	2,0	6,0	11,1	17,8
1900	2400	**NNU4940M**	200	211	222	-	269	2,0	2,0	6,0	11,1	15,3
1900	2400	**NNU4940KM**		211	222	-	269	2,0	2,0	6,0	11,1	15,3
1800	2200	**NN3040**		211	-	285	299	2,0	2,0	6,0	11,1	22,7
1800	2200	**NN3040K**		211	-	285	299	2,0	2,0	6,0	11,1	22,7
1800	2200	**NN3944**	220	-	-	-	-	4,0	4,0	-	-	12,0
1700	2200	**NNU4944M**		231	242	-	289	2,0	2,0	6,0	11,1	16,6
1700	2200	**NNU4944KM**		231	242	-	289	2,0	2,0	6,0	11,1	16,6
1700	2000	**NN3044**		233	-	313	327	2,5	2,5	7,5	13,9	29,6
1700	2000	**NN3044K**		233	-	313	327	2,5	2,5	7,5	13,9	29,6
1600	2000	**NN3948**	240	-	-	-	-	2,0	2,0	-	-	13,0
1600	2000	**NNU4948M**		251	262	-	309	2,0	2,0	6,0	11,1	18,0
1600	2000	**NNU4948KM**		251	262	-	309	2,0	2,0	6,0	11,1	18,0
1500	1800	**NN3048**		253	-	334	347	2,5	2,5	7,5	13,9	32,7
1500	1800	**NN3048K**		253	-	334	347	2,5	2,5	7,5	13,9	32,7
1400	1800	**NNU4952M**	260	271	288	-	349	2,0	2,0	7,5	13,9	31,1
1400	1800	**NNU4952KM**		271	288	-	349	2,0	2,0	7,5	13,9	31,1
1400	1700	**NN3052**		276	-	368	384	3,0	3,0	7,5	13,9	47,7
1400	1700	**NN3052K**		276	-	368	384	3,0	3,0	7,5	13,9	47,7
1300	1700	**NNU4956M**	280	291	308	-	369	2,0	2,0	7,5	13,9	33,0
1300	1700	**NNU4956KM**		291	308	-	369	2,0	2,0	7,5	13,9	33,0
1300	1600	**NN3056**		298	-	388	402	3,0	3,0	7,5	13,9	49,6
1300	1600	**NN3056K**		298	-	388	402	3,0	3,0	7,5	13,9	49,6



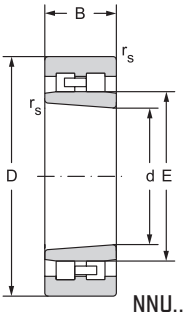
NN



NN...K



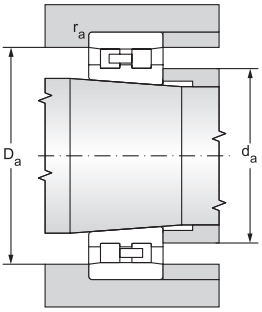
NNU



NNU...K

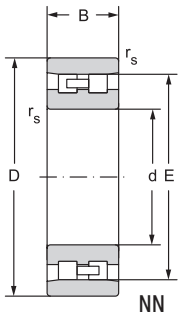
12.4.2

Main dimensions								Basic load rating		Fatique load limit
								dynamic	static	
d	D	B	r_s	r_{1s}	E	F	$s^{1)}$	C_r	C_{or}	P_u
			min	min						
mm								kN		kN
300	420	118	3,0	3,0		336,0	6,0	1230,0	2870,0	157,24
	420	118	3,0	3,0		336,0	6,0	1230,0	2870,0	157,24
	460	118	4,0	4,0	418,0		7,0	1290,0	2460,0	132,61
	460	118	4,0	4,0	418,0		7,0	1290,0	2460,0	132,61
320	440	118	3,0	3,0		356,0	7,0	1260,0	3050,0	164,41
	440	118	3,0	3,0		356,0	7,0	1260,0	3050,0	164,41
	480	121	5,0	5,0	438,0		8,0	1360,0	2510,0	133,24
	480	121	5,0	5,0	438,0		8,0	1360,0	2510,0	133,24
340	460	118	3,0	3,0		379,0	5,0	1050,0	2600,0	138,01
	460	118	3,0	3,0		379,0	5,0	1050,0	2600,0	138,01
	520	133	6,0	6,0	473,0		9,0	1680,0	3100,0	161,02
	520	133	6,0	6,0	473,0		9,0	1680,0	3100,0	161,02
	580	243	5,0	5,0		402,0	10,0	4000,0	7400,0	376,68
	580	243	5,0	5,0		402,0	10,0	4000,0	7400,0	376,68
360	480	118	3,0	3,0		399,0	5,0	1100,0	2700,0	141,24
	480	118	3,0	3,0		399,0	5,0	1100,0	2700,0	141,24
	540	134	6,0	6,0	493,0		9,0	1740,0	3350,0	171,65
	540	134	6,0	6,0	493,0		9,0	1740,0	3350,0	171,65
	600	243	5,0	5,0		422,0	5,9	4250,0	8300,0	417,13
	600	243	5,0	5,0		422,0	5,9	4250,0	8300,0	417,13
380	520	140	4,0	4,0		426,0	5,5	1350,0	3500,0	179,34
	520	140	4,0	4,0		426,0	5,5	1350,0	3500,0	179,34
	560	180	5,0	5,0		425,0	7,3	2800,0	5800,0	293,34
	560	180	5,0	5,0		425,0	7,3	2800,0	5800,0	293,34
	620	243	5,0	5,0		442,0	7,4	4200,0	8500,0	421,98
	620	243	5,0	5,0		442,0	7,4	4200,0	8500,0	421,98
400	540	140	4,0	4,0		446,0	5,5	1400,0	3650,0	184,60
	540	140	4,0	4,0		446,0	5,5	1400,0	3650,0	184,60
	600	200	5,0	5,0		449,0	7,9	3400,0	7100,0	352,48
	600	200	5,0	5,0		449,0	7,9	3400,0	7100,0	352,48
	650	250	6,0	6,0		463,0	7,5	4600,0	9500,0	464,78
	650	250	6,0	6,0		463,0	7,5	4600,0	9500,0	464,78

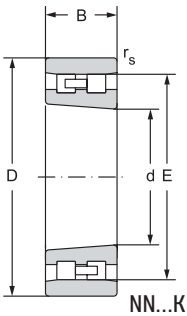


[1] Admissible axial movement

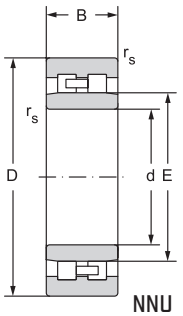
Limiting speed for lubrication with		Bearing designation	Abutment and fillet dimensions							Lubrication groove and holes		Weight
grease	oil		d	d_a	d_a	D_a	D_a	r_a	r_{1a}	a	b	~
				min	max	min	max	max	max			
min^{-1}			mm									kg
1200	1500	**NNU4960M**	300	313	335	-	407	2,5	2,5	9,0	16,7	51,9
1200	1500	**NNU4960KM**		313	335	-	407	2,5	2,5	9,0	16,7	51,9
1200	1400	**NN3060**		316	-	422	444	3,0	3,0	9,0	16,7	70,7
1200	1400	**NN3060K**		316	-	422	444	3,0	3,0	9,0	16,7	70,7
1100	1400	**NNU4964M**	320	333	355	-	427	2,5	2,5	9,0	16,7	54,9
1100	1400	**NNU4964KM**		333	355	-	427	2,5	2,5	9,0	16,7	54,9
1200	1400	**NN3064**		338	-	442	462	3,0	3,0	9,0	16,7	74,2
1200	1400	**NN3064K**		338	-	442	462	3,0	3,0	9,0	16,7	74,2
1500	1800	**NNU4968M**	340	352	378	-	448	2,5	2,5	9,0	16,7	55,6
1500	1800	**NNU4968KM**		352	378	-	448	2,5	2,5	9,0	16,7	55,6
1100	1300	**NN3068**		362	-	477	498	4,0	4,0	9,0	16,7	99,0
1100	1300	**NN3068K**		362	-	477	498	4,0	4,0	9,0	16,7	99,0
800	950	**NNU4168M**		360	392	-	560	4,0	4,0	9,0	16,7	260
800	950	**NNU4168KM**		360	392	-	560	4,0	4,0	9,0	16,7	260
1500	1800	**NNU4972M**	360	372	398	-	468	2,5	2,5	9,0	16,7	57,5
1500	1800	**NNU4972KM**		372	398	-	468	2,5	2,5	9,0	16,7	57,5
1000	1200	**NN3072**		382	-	497	518	4,0	4,0	9,0	16,7	105
1000	1200	**NN3072K**		382	-	497	518	4,0	4,0	9,0	16,7	105
750	900	**NNU4172M**		380	414	-	580	4,0	4,0	9,0	16,7	275
750	900	**NNU4172KM**		380	414	-	580	4,0	4,0	9,0	16,7	275
1400	1700	**NNU4976M**	380	395	425	-	505	3,0	3,0	9,0	16,7	86,0
1400	1700	**NNU4976KM**		395	425	-	505	3,0	3,0	9,0	16,7	86,0
850	1000	**NNU4076M**		400	417	-	540	4,0	4,0	9,0	16,7	150
850	1000	**NNU4076KM**		400	417	-	540	4,0	4,0	9,0	16,7	150
720	850	**NNU4176M**		400	434	-	600	4,0	4,0	9,0	16,7	285
720	850	**NNU4176KM**		400	434	-	600	4,0	4,0	9,0	16,7	285
1300	1600	**NNU4980M****	400	415	445	-	525	3,0	3,0	9,0	16,7	91,0
1300	1600	**NNU4980KM****		415	445	-	525	3,0	3,0	9,0	16,7	91,0
800	950	**NNU4080M****		420	440	-	580	4,0	4,0	9,0	16,7	205
800	950	**NNU4080KM****		420	440	-	580	4,0	4,0	9,0	16,7	205
680	800	**NNU4180M****		426	456	-	624	5,0	5,0	9,0	16,7	325
680	800	**NNU4180KM****		426	456	-	624	5,0	5,0	9,0	16,7	325



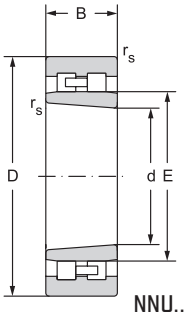
NN



NN...K



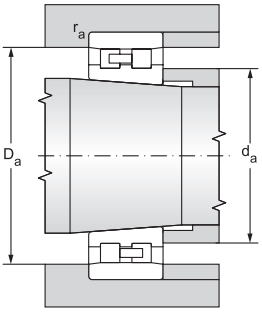
NNU



NNU...K

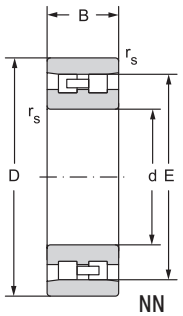
12.4.2

Main dimensions								Basic load rating		Fatique load limit
								dynamic	static	
d	D	B	r_s	r_{1s}	E	F	s[1)]	C_r	C_{or}	P_u
			min	min						
mm								kN		kN
420	560	140	4,0	4,0		466,0	5,5	1460,0	3800,0	189,80
	560	140	4,0	4,0		466,0	5,5	1460,0	3800,0	189,80
	620	200	5,0	5,0		469,0	7,8	3500,0	7500,0	367,98
	620	200	5,0	5,0		469,0	7,8	3500,0	7500,0	367,98
	700	280	6,0	6,0		497,0	12,2	5300,0	11300,0	542,24
	700	280	6,0	6,0		497,0	12,2	5300,0	11300,0	542,24
440	600	160	4,0	4,0		490,0	5,8	1950,0	5000,0	245,32
	600	160	4,0	4,0		490,0	5,8	1950,0	5000,0	245,32
	650	157	8,0	8,0	596,0		13,0	2460,0	4920,0	238,02
	650	157	8,0	8,0	596,0		13,0	2460,0	4920,0	238,02
	650	212	6,0	6,0		487,0	9,6	3800,0	8200,0	396,70
	650	212	6,0	6,0		487,0	9,6	3800,0	8200,0	396,70
	720	280	6,0	6,0		511,0	10,8	5600,0	11800,0	560,30
	720	280	6,0	6,0		511,0	10,8	5600,0	11800,0	560,30
460	620	160	4,0	4,0		510,0	5,8	2000,0	5350,0	259,54
	620	160	4,0	4,0		510,0	5,8	2000,0	5350,0	259,54
	680	218	6,0	6,0		513,0	7,7	4100,0	9300,0	443,90
	680	218	6,0	6,0		513,0	7,7	4100,0	9300,0	443,90
	760	300	7,5	7,5		537,0	12,8	6200,0	12300,0	575,27
	760	300	7,5	7,5		537,0	12,8	6200,0	12300,0	575,27
480	650	170	5,0	5,0		534,0	6,0	2200,0	6000,0	287,15
	650	170	5,0	5,0		534,0	6,0	2200,0	6000,0	287,15
	700	218	6,0	6,0		533,0	7,5	4200,0	9600,0	453,51
	700	218	6,0	6,0		533,0	7,5	4200,0	9600,0	453,51
	790	308	7,5	7,5		557,0	12,0	6500,0	12700,0	586,87
	790	308	7,5	7,5		557,0	12,0	6500,0	12700,0	586,87
500	670	170	5,0	5,0		554,0	6,0	2200,0	6000,0	284,17
	670	170	5,0	5,0		554,0	6,0	2200,0	6000,0	284,17
	720	218	6,0	6,0		553,0	7,5	4300,0	9800,0	458,35
	720	218	6,0	6,0		553,0	7,5	4300,0	9800,0	458,35
	830	325	7,5	7,5		582,0	14,0	7200,0	14500,0	660,83
	830	325	7,5	7,5		582,0	14,0	7200,0	14500,0	660,83
530	780	250	6,0	6,0		591,0	10,0	5200,0	11900,0	544,81
	780	250	6,0	6,0		591,0	10,0	5200,0	11900,0	544,81
	870	335	7,5	7,5		618,0	17,0	7500,0	15500,0	695,62
	870	335	7,5	7,5		618,0	17,0	7500,0	15500,0	695,62

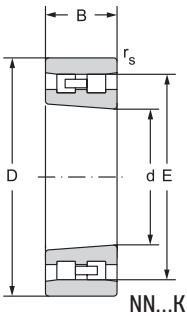


[1] Admissible axial movement

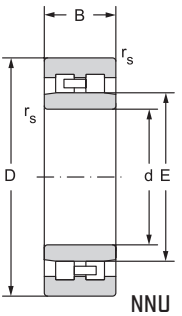
Limiting speed for lubrication with		Bearing designation	Abutment and fillet dimensions							Lubrication groove and holes		Weight
grease	oil		d	d_a	d_a	D_a	D_a	r_a	r_{1a}	a	b	~
				min	max	min	max	max	max			
min^{-1}			mm									kg
1300	1600	**NNU4984M****	420	435	465	-	545	3,0	3,0	9,0	16,7	94,0
1300	1600	**NNU4984KM****		435	465	-	545	3,0	3,0	9,0	16,7	94,0
750	900	**NNU4084M****		440	460	-	600	4,0	4,0	9,0	16,7	185
750	900	**NNU4084KM****		440	460	-	600	4,0	4,0	9,0	16,7	185
630	750	**NNU4184M****		446	480	-	674	5,0	5,0	9,0	16,7	440
630	750	**NNU4184KM****		446	480	-	674	5,0	5,0	9,0	16,7	440
1200	1500	**NNU4988M****	440	455	489	-	585	3,0	3,0	9,0	16,7	131
1200	1500	**NNU4988KM****		455	489	-	585	3,0	3,0	9,0	16,7	131
750	890	**NN3088****		468	-	602	622	5,0	5,0	12,0	22,3	169
750	890	**NN3088K****		468	-	602	622	5,0	5,0	12,0	22,3	169
720	850	**NNU4088M****		466	477	-	624	5,0	5,0	9,0	16,7	215
720	850	**NNU4088KM****		466	477	-	624	5,0	5,0	9,0	16,7	215
590	700	**NNU4188M****		466	500	-	694	5,0	5,0	12,0	22,3	450
590	700	**NNU4188KM****		466	500	-	694	5,0	5,0	12,0	22,3	450
1100	1400	**NNU4992M****	460	475	509	-	605	3,0	3,0	9,0	16,7	134
1100	1400	**NNU4992KM****		475	509	-	605	3,0	3,0	9,0	16,7	134
680	800	**NNU4092M****		486	503	-	654	5,0	5,0	12,0	22,3	240
680	800	**NNU4092KM****		486	503	-	654	5,0	5,0	12,0	22,3	240
570	670	**NNU4192M****		493	526	-	727	6,0	6,0	12,0	22,3	535
570	670	**NNU4192KM****		493	526	-	727	6,0	6,0	12,0	22,3	535
1100	1400	**NNU4996M****	480	497	533	-	633	4,0	4,0	9,0	16,7	160
1100	1400	**NNU4996KM****		497	533	-	633	4,0	4,0	9,0	16,7	160
630	750	**NNU4096M****		506	523	-	674	5,0	5,0	12,0	22,3	275
630	750	**NNU4096KM****		506	523	-	674	5,0	5,0	12,0	22,3	275
530	630	**NNU4196M****		513	545	-	757	6,0	6,0	12,0	22,3	590
530	630	**NNU4196KM****		513	545	-	757	6,0	6,0	12,0	22,3	590
1000	1300	**NNU49/500M****	500	517	553	-	653	4,0	4,0	9,0	16,7	162
1000	1300	**NNU49/500M****		517	553	-	653	4,0	4,0	9,0	16,7	162
630	750	**NNU40/500M****		526	543	-	694	5,0	5,0	12,0	22,3	285
630	750	**NNU40/500KM****		526	543	-	694	5,0	5,0	12,0	22,3	285
510	600	**NNU41/500M****		533	568	-	797	6,0	6,0	12,0	22,3	710
510	600	**NNU41/500KM****		533	568	-	797	6,0	6,0	12,0	22,3	710
570	670	**NNU40/530M****	530	556	580	-	754	5,0	5,0	12,0	22,3	420
570	670	**NNU40/530KM****		556	580	-	754	5,0	5,0	12,0	22,3	420
470	560	**NNU41/530M****		563	604	-	837	6,0	6,0	12,0	22,3	790
470	560	**NNU41/530KM****		563	604	-	837	6,0	6,0	12,0	22,3	790



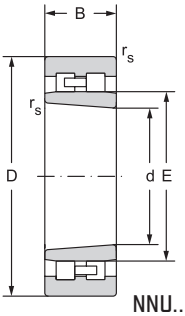
NN



NN...K



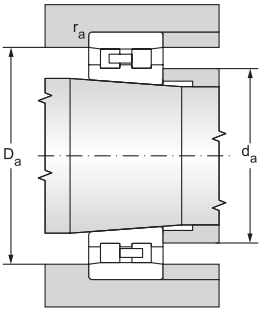
NNU



NNU...K

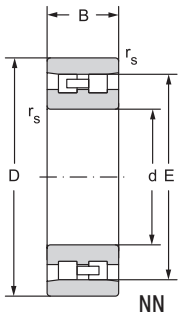
12.4.2

Main dimensions								Basic load rating		Fatique load limit
								dynamic	static	
d	D	B	r_s	r_{1s}	E	F	s[1)]	C_r	C_{or}	P_u
			min	min						
mm								kN		kN
560	820	258	6,0	6,0		626,0	12,5	5600,0	12500,0	563,41
	820	258	6,0	6,0		626,0	12,5	5600,0	12500,0	563,41
	920	355	7,5	7,5		653,0	16,5	8500,0	18000,0	794,46
	920	355	7,5	7,5		653,0	16,5	8500,0	18000,0	794,46
600	870	272	6,0	6,0		664,0	9,2	6400,0	15100,0	667,82
	870	272	6,0	6,0		664,0	9,2	6400,0	15100,0	667,82
	980	375	7,5	7,5		699,0	18,0	9500,0	20500,0	887,23
	980	375	7,5	7,5		699,0	18,0	9500,0	20500,0	887,23
630	850	218	8,0	8,0		704,0	5,0	3910,0	10200,0	450,19
	850	218	8,0	8,0		704,0	5,0	3910,0	10200,0	450,19
	920	290	7,5	7,5		699,0	10,0	7400,0	17200,0	748,70
	920	290	7,5	7,5		699,0	10,0	7400,0	17200,0	748,70
	1030	400	7,5	7,5		734,0	19,5	10400,0	23300,0	993,57
	1030	400	7,5	7,5		734,0	19,5	10400,0	23300,0	993,57
670	980	308	7,5	7,5		744,0	11,5	8100,0	19100,0	815,95
	980	308	7,5	7,5		744,0	11,5	8100,0	19100,0	815,95
	1090	412	7,5	7,5		774,0	19,0	11900,0	25000,0	1 047,52
	1090	412	7,5	7,5		774,0	19,0	11900,0	25000,0	1 047,52
710	1030	315	7,5	7,5		784,0	10,5	9000,0	21000,0	882,94
	1030	315	7,5	7,5		784,0	10,5	9000,0	21000,0	882,94
	1150	438	9,5	9,5		820,0	20,0	13000,0	28000,0	1 153,93
	1150	438	9,5	9,5		820,0	20,0	13000,0	28000,0	1 153,93
750	1090	335	7,5	7,5		830,0	13,5	9900,0	23500,0	971,63
	1090	335	7,5	7,5		830,0	13,5	9900,0	23500,0	971,63
	1220	475	9,5	9,5		871,0	19,0	15500,0	34900,0	1 413,72
	1220	475	9,5	9,5		871,0	19,0	15500,0	34900,0	1 413,72
800	1150	345	7,5	7,5		885,0	16,0	10300,0	25500,0	1 036,11
	1150	345	7,5	7,5		885,0	16,0	10300,0	25500,0	1 036,11
	1280	475	9,5	9,5		921,0	18,5	15900,0	36000,0	1 434,70
	1280	475	9,5	9,5		921,0	18,5	15900,0	36000,0	1 434,70
850	1220	365	7,5	7,5		940,0	18,0	11200,0	28000,0	1 117,49
	1220	365	7,5	7,5		940,0	18,0	11200,0	28000,0	1 117,49
	1360	500	12,0	6,0		976,0	21,5	19000,0	44000,0	1 721,92
	1360	500	12,0	12,0		976,0	21,5	19000,0	44000,0	1 721,92

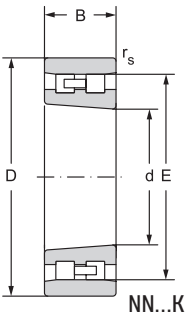


[1] Admissible axial movement

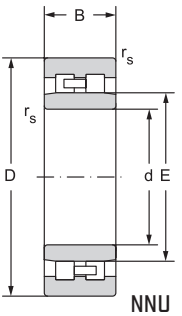
Limiting speed for lubrication with		Bearing designation	Abutment and fillet dimensions							Lubrication groove and holes		Weight
grease	oil		d	d_a	d_a	D_a	D_a	r_a	r_{1a}	a	b	~
				min	max	min	max	max	max			
min^{-1}			mm									kg
530	630	**NNU40/560M****	560	586	615	-	794	5,0	5,0	12,0	22,3	475
530	630	**NNU40/560KM****		586	615	-	794	5,0	5,0	12,0	22,3	475
450	530	**NNU41/560M****		593	638	-	887	6,0	6,0	12,0	22,3	930
450	530	**NNU41/560KM****		593	638	-	887	6,0	6,0	12,0	22,3	930
510	600	**NNU40/600M****	600	626	653	-	844	5,0	5,0	12,0	22,3	530
510	600	**NNU40/600KM****		626	653	-	844	5,0	5,0	12,0	22,3	530
400	480	**NNU41/600M****		634	682	-	946	6,0	6,0	12,0	22,3	1100
400	480	**NNU41/600KM****		634	682	-	946	6,0	6,0	12,0	22,3	1100
470	600	**NNU49/630M****	630	664	694	-	818	6,0	6,0	12,0	22,3	363
470	600	**NNU49/630KM****		664	694	-	818	6,0	6,0	12,0	22,3	363
470	560	**NNU40/630M****		664	688	-	886	6,0	6,0	12,0	22,3	635
470	560	**NNU40/630KM****		664	688	-	886	6,0	6,0	12,0	22,3	635
380	450	**NNU41/630M****		664	716	-	996	6,0	6,0	12,0	22,3	1330
380	450	**NNU41/630KM****		664	716	-	996	6,0	6,0	12,0	22,3	1330
420	500	**NNU40/670M****	670	704	733	-	946	6,0	6,0	12,0	22,3	765
420	500	**NNU40/670KM****		704	733	-	946	6,0	6,0	12,0	22,3	765
360	430	**NNU41/670M****		704	756	-	1056	6,0	6,0	12,0	22,3	1500
360	430	**NNU41/670KM****		704	756	-	1056	6,0	6,0	12,0	22,3	1500
400	480	**NNU40/710M****	710	744	772	-	996	6,0	6,0	12,0	22,3	850
400	480	**NNU40/710KM****		744	772	-	996	6,0	6,0	12,0	22,3	850
320	380	**NNU41/710M****		750	800	-	1110	8,0	8,0	12,0	22,3	1790
320	380	**NNU41/710KM****		750	800	-	1110	8,0	8,0	12,0	22,3	1790
360	430	**NNU40/750M****	750	784	816	-	1056	6,0	6,0	12,0	22,3	930
360	430	**NNU40/750KM****		784	816	-	1056	6,0	6,0	12,0	22,3	930
320	380	**NNU41/750M****		790	850	-	1180	8,0	8,0	12,0	22,3	2230
320	380	**NNU41/750KM****		790	850	-	1180	8,0	8,0	12,0	22,3	2230
340	400	**NNU40/800M****	800	833	871	-	1117	6,0	6,0	12,0	22,3	1140
340	400	**NNU40/800KM****		833	871	-	1117	6,0	6,0	12,0	22,3	1140
270	320	**NNU41/800M****		840	900	-	1240	8,0	8,0	12,0	22,3	2390
270	320	**NNU41/800KM****		840	900	-	1240	8,0	8,0	12,0	22,3	2390
300	360	**NNU40/850M****	850	883	923	-	1187	6,0	6,0	12,0	22,3	1340
300	360	**NNU40/850KM****		883	923	-	1187	6,0	6,0	12,0	22,3	1340
250	300	**NNU41/850M****		897	935	-	1334	10,0	5,0	12,0	22,3	2900
250	300	**NNU41/850KM****		897	935	-	1334	10,0	10,0	12,0	22,3	2900



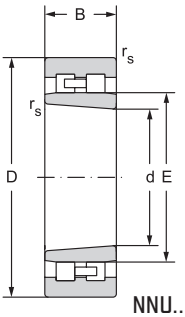
NN



NN...K



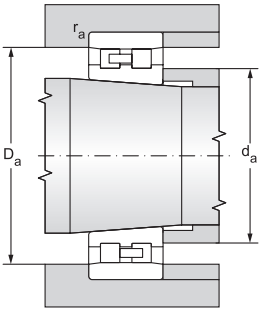
NNU



NNU...K

12.4.2

Main dimensions								Basic load rating		Fatique load limit
								dynamic	static	
d	D	B	r_s	r_{1s}	E	F	s[1)]	C_r	C_{or}	P_u
			min	min						
mm								kN		kN
900	1280	375	7,5	7,5		990,0	17,0	12000,0	30800,0	1 210,29
	1280	375	7,5	7,5		990,0	17,0	12000,0	30800,0	1 210,29
	1420	515	12,0	6,0		1032,0	27,5	21400,0	47000,0	1 812,71
	1420	515	12,0	12,0		1032,0	27,5	21400,0	47000,0	1 812,71
950	1360	412	7,5	7,5		1050,0	20,0	13700,0	34800,0	1 343,92
	1360	412	7,5	7,5		1050,0	20,0	13700,0	34800,0	1 343,92
	1500	545	12,0	6,0		1092,0	22,5	24800,0	56000,0	2 124,79
	1500	545	12,0	12,0		1092,0	22,5	24800,0	56000,0	2 124,79
1000	1320	315	7,5	7,5	1238,0		9,5	8200,0	25000,0	964,21
	1320	315	7,5	7,5	1238,0		9,5	8200,0	25000,0	964,21
	1420	412	7,5	7,5		1101,0	19,5	15000,0	37100,0	1 412,88
	1420	412	7,5	7,5		1101,0	19,5	15000,0	37100,0	1 412,88
	1580	580	12,0	6,0		1154,0	28,0	26900,0	60800,0	2 271,41
	1580	580	12,0	12,0		1154,0	28,0	26900,0	60800,0	2 271,41



[1] Admissible axial movement

Limiting speed for lubrication with		Bearing designation	Abutment and fillet dimensions							Lubrication groove and holes		Weight
grease	oil		d	d_a	d_a	D_a	D_a	r_a	r_{1a}	a	b	~
				min	max	min	max	max	max			
min^{-1}			mm									kg
280	340	**NNU40/900M****	900	933	963	-	1257	6,0	6,0	12,0	22,3	1500
280	340	**NNU40/900KM****		933	963	-	1257	6,0	6,0	12,0	22,3	1500
230	280	**NNU41/900M****		947	1008	-	1394	10,0	5,0	12,0	22,3	3180
230	280	**NNU41/900KM****		947	1008	-	1394	10,0	10,0	12,0	22,3	3180
270	320	**NNU40/950M****	950	983	1033	-	1327	6,0	6,0	12,0	22,3	1900
270	320	**NNU40/950KM****		983	1033	-	1327	6,0	6,0	12,0	22,3	1900
220	260	**NNU41/950M****		997	1068	-	1474	10,0	5,0	12,0	22,3	3830
220	260	**NNU41/950KM****		997	1068	-	1474	10,0	10,0	12,0	22,3	3830
280	340	**NN49/1000M****	1000	1033	-	1249	1287	6,0	6,0	12,0	22,3	1200
280	340	**NN49/1000KM****		1033	-	1249	1287	6,0	6,0	12,0	22,3	1200
250	300	**NNU40/1000M****		1033	1084	-	1387	6,0	6,0	12,0	22,3	2000
250	300	**NNU40/1000KM****		1033	1084	-	1387	6,0	6,0	12,0	22,3	2000
200	240	**NNU41/1000M****		1047	1128	-	1474	10,0	5,0	12,0	22,3	4270
200	240	**NNU41/1000KM****		1047	1128	-	1474	10,0	10,0	12,0	22,3	4270