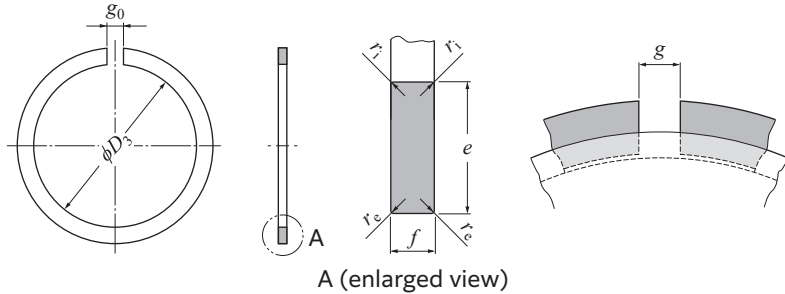


Snap Rings and Grooves for Rolling Bearings

NTN

Snap rings

For dimension series 18 and 19 bearings



A (enlarged view)

Unit: mm

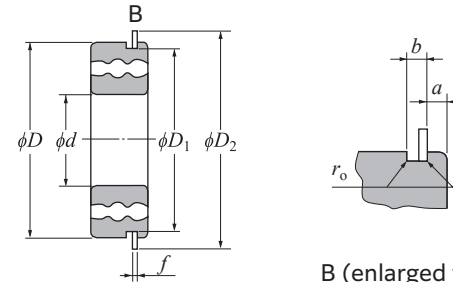
Number	Snap rings			Snap ring fitted inside groove ¹⁾			(Reference)			Bearing bore diameter series		
	Bearing outside diameter	Bore diameter	Tolerance of D_3	Snap ring outside diameter			Thickness variation			Bearing bore diameter series		
	D	D_3	Δ_{D3S}	D_{D3S}			V_f			d		
				Upper	Lower	Max.	Min.	Max.	Min.	Max.	Min.	Max.
NR1022	22	20.5	0	-0.3	2.00	1.85	0.7	0.6	24.8	2	1	0.2
NR1024	24	22.5	0	-0.3	2.00	1.85	0.7	0.6	26.8	2	1	0.2
NR1028	28	26.4	0	-0.3	2.05	1.90	0.85	0.75	30.8	3	2	0.25
NR1030	30	28.3	0	-0.3	2.05	1.90	0.85	0.75	32.8	3	2	0.25
NR1032	32	30.3	0	-0.3	2.05	1.90	0.85	0.75	34.8	3	2	0.25
NR1034	34	32.3	0	-0.3	2.05	1.90	0.85	0.75	36.8	3	2	0.25
NR1037	37	35.3	0	-0.3	2.05	1.90	0.85	0.75	39.8	3	2	0.25
NR1039	39	37.3	0	-0.3	2.05	1.90	0.85	0.75	41.8	3	2	0.25
NR1040	40	38.3	0	-0.3	2.05	1.90	0.85	0.75	42.8	3	2	0.25
NR1042	42	40.3	0	-0.4	2.05	1.90	0.85	0.75	44.8	3	2	0.25
NR1044	44	42.3	0	-0.4	2.05	1.90	0.85	0.75	46.8	4	2.5	0.25
NR1045	45	43.3	0	-0.4	2.05	1.90	0.85	0.75	47.8	4	2.5	0.25
NR1047	47	45.3	0	-0.4	2.05	1.90	0.85	0.75	49.8	4	2.5	0.25
NR1052	52	50.3	0	-0.4	2.05	1.90	0.85	0.75	54.8	4	2.5	0.25
NR1055	55	53.3	0	-0.4	2.05	1.90	0.85	0.75	57.8	4	2.5	0.25
NR1058	58	56.3	0	-0.6	2.05	1.90	0.85	0.75	60.8	4	2.5	0.25
NR1062	62	60.2	0	-0.6	2.05	1.90	0.85	0.75	64.8	4	2.5	0.25
NR1065	65	63.2	0	-0.6	2.05	1.90	0.85	0.75	67.8	4	2.5	0.25
NR1068	68	66.2	0	-0.6	2.05	1.90	0.85	0.75	70.8	5	3	0.25
NR1072	72	70.2	0	-0.6	2.05	1.90	0.85	0.75	74.8	5	3	0.25
NR1078	78	75.7	0	-0.6	3.25	3.10	1.12	1.02	82.7	5	3	0.4
NR1080	80	77.4	0	-0.6	3.25	3.10	1.12	1.02	84.4	5	3	0.4
NR1085	85	82.4	0	-0.6	3.25	3.10	1.12	1.02	89.4	5	3	0.4
NR1090	90	87.4	0	-0.6	3.25	3.10	1.12	1.02	94.4	5	3	0.4
NR1095	95	92.4	0	-0.6	3.25	3.10	1.12	1.02	99.4	5	3	0.4
NR1100	100	97.4	0	-0.6	3.25	3.10	1.12	1.02	104.4	5	3	0.4
NR1105	105	101.9	0	-0.8	4.04	3.89	1.12	1.02	110.7	5	3	0.4
NR1110	110	106.9	0	-0.8	4.04	3.89	1.12	1.02	115.7	5	3	0.4
NR1115	115	111.9	0	-0.8	4.04	3.89	1.12	1.02	120.7	5	3	0.4
NR1120	120	116.9	0	-0.8	4.04	3.89	1.12	1.02	125.7	7	4	0.4
NR1125	125	121.8	0	-0.8	4.04	3.89	1.12	1.02	130.7	7	4	0.4
NR1130	130	126.8	0	-0.8	4.04	3.89	1.12	1.02	135.7	7	4	0.4
NR1140	140	136.8	0	-1.0	4.04	3.89	1.7	1.6	145.7	7	4	0.6
NR1145	145	141.8	0	-1.0	4.04	3.89	1.7	1.6	150.7	7	4	0.6
NR1150	150	146.8	0	-1.2	4.04	3.89	1.7	1.6	155.7	7	4	0.6
NR1165	165	161	0	-1.2	4.85	4.70	1.7	1.6	171.5	7	4	0.6
NR1175	175	171	0	-1.2	4.85	4.70	1.7	1.6	181.5	10	6	0.6
NR1180	180	176	0	-1.2	4.85	4.70	1.7	1.6	186.5	10	6	0.6
NR1190	190	186	0	-1.4	4.85	4.70	1.7	1.6	196.5	10	6	0.6
NR1200	200	196	0	-1.4	4.85	4.70	1.7	1.6	206.5	10	6	0.6

1) The snap ring must be fitted inside the groove in the radius direction free from looseness.

Snap Rings and Grooves for Rolling Bearings

NTN

Groove



B (enlarged view)

Unit: mm

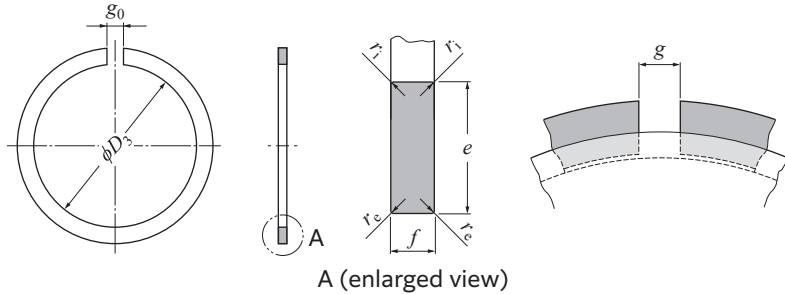
Bearing outside diameter <i>D</i>	Groove diameter		Dimension series				Groove width		Fillet radius of groove bottom <i>r</i> ₀
			18		19				
			Groove position						
	<i>D</i> ₁		<i>a</i>				<i>b</i>		
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
22	20.8	20.5	—	—	1.05	0.90	1.05	0.8	0.2
24	22.8	22.5	—	—	1.05	0.90	1.05	0.8	0.2
28	26.7	26.4	—	—	1.30	1.15	1.20	0.95	0.25
30	28.7	28.4	—	—	1.30	1.15	1.20	0.95	0.25
32	30.7	30.4	1.30	1.15	—	—	1.20	0.95	0.25
34	32.7	32.4	1.30	1.15	—	—	1.20	0.95	0.25
37	35.7	35.4	1.30	1.15	1.70	1.55	1.20	0.95	0.25
39	37.7	37.4	—	—	1.70	1.55	1.20	0.95	0.25
40	38.7	38.4	1.30	1.15	—	—	1.20	0.95	0.25
42	40.7	40.4	1.30	1.15	1.70	1.55	1.20	0.95	0.25
44	42.7	42.4	1.30	1.15	—	—	1.20	0.95	0.25
45	43.7	43.4	—	—	1.70	1.55	1.20	0.95	0.25
47	45.7	45.4	1.30	1.15	1.70	1.55	1.20	0.95	0.25
52	50.7	50.4	1.30	1.15	1.70	1.55	1.20	0.95	0.25
55	53.7	53.4	—	—	1.70	1.55	1.20	0.95	0.25
58	56.7	56.4	1.30	1.15	—	—	1.20	0.95	0.25
62	60.7	60.3	—	—	1.70	1.55	1.20	0.95	0.25
65	63.7	63.3	1.30	1.15	—	—	1.20	0.95	0.25
68	66.7	66.3	—	—	1.70	1.55	1.20	0.95	0.25
72	70.7	70.3	1.70	1.55	1.70	1.55	1.20	0.95	0.25
78	76.2	75.8	1.70	1.55	—	—	1.6	1.3	0.4
80	77.9	77.5	—	—	2.1	1.9	1.6	1.3	0.4
85	82.9	82.5	1.70	1.55	2.1	1.9	1.6	1.3	0.4
90	87.9	87.5	1.70	1.55	2.1	1.9	1.6	1.3	0.4
95	92.9	92.5	1.70	1.55	—	—	1.6	1.3	0.4
100	97.9	97.5	1.70	1.55	2.5	2.3	1.6	1.3	0.4
105	102.6	102.1	—	—	2.5	2.3	1.6	1.3	0.4
110	107.6	107.1	2.1	1.9	2.5	2.3	1.6	1.3	0.4
115	112.6	112.1	2.1	1.9	—	—	1.6	1.3	0.4
120	117.6	117.1	2.1	1.9	3.3	3.1	1.6	1.3	0.4
125	122.6	122.1	2.1	1.9	3.3	3.1	1.6	1.3	0.4
130	127.6	127.1	2.1	1.9	3.3	3.1	1.6	1.3	0.4
140	137.6	137.1	2.5	2.3	3.3	3.1	2.2	1.9	0.6
145	142.6	142.1	—	—	3.3	3.1	2.2	1.9	0.6
150	147.6	147.1	2.5	2.3	3.3	3.1	2.2	1.9	0.6
165	161.8	161.3	3.3	3.1	3.7	3.5	2.2	1.9	0.6
175	171.8	171.3	3.3	3.1	—	—	2.2	1.9	0.6
180	176.8	176.3	—	—	3.7	3.5	2.2	1.9	0.6
190	186.8	186.3	3.3	3.1	3.7	3.5	2.2	1.9	0.6
200	196.8	196.3	3.3	3.1	—	—	2.2	1.9	0.6

Snap Rings and Grooves for Rolling Bearings

NTN

Snap rings

For diameter series 0, 2, 3 and 4 bearings



A (enlarged view)

Unit: mm

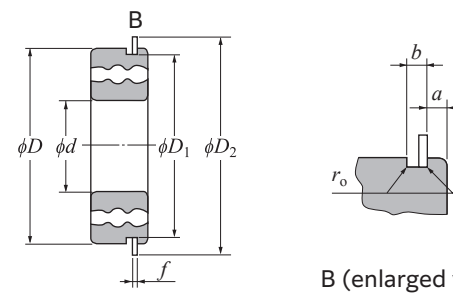
Number	Bearing outside diameter <i>D</i>	Snap rings								Snap ring fitted inside groove ⁽¹⁾ Snap ring outside diameter	(Reference)										
		Bore diameter <i>D</i> ₃	Tolerance of <i>D</i> ₃ <i>Δ</i> _{D3S}	<i>e</i>				<i>f</i>			<i>D</i> ₂ Max.	<i>g</i> Approx.	Thickness variation <i>V</i> _f				Bearing bore diameter dimension series				
				Upper	Lower	Max.	Min.	Max.	Min.				Max.	Min.	Max.	Min.	Max.	0	2	3	4
<i>D</i>	<i>D</i> ₃											<i>g</i> ₀	<i>r</i> _i Min.	<i>r</i> _e Min.	<i>V</i> _f Max.					<i>d</i>	
NR30	30	27.9	0	−0.4	3.25	3.10	1.12	1.02	34.7	3	2	0.4	0.3	0.06	—	10	9	8			
NR32	32	29.9	0	−0.4	3.25	3.10	1.12	1.02	36.7	3	2	0.4	0.3	0.06	15	12	—	9			
NR35	35	32.9	0	−0.4	3.25	3.10	1.12	1.02	39.7	3	2	0.4	0.3	0.06	17	15	10	—			
NR37	37	34.5	0	−0.4	3.25	3.10	1.12	1.02	41.3	3	2	0.4	0.3	0.06	—	—	12	10			
NR40	40	37.8	0	−0.4	3.25	3.10	1.12	1.02	44.6	3	2	0.4	0.3	0.06	—	17	—	—			
NR42	42	39.5	0	−0.5	3.25	3.10	1.12	1.02	46.3	3	2	0.4	0.3	0.06	20	—	15	12			
NR44	44	41.5	0	−0.5	3.25	3.10	1.12	1.02	48.3	3	2	0.4	0.3	0.06	22	—	—	—			
NR47	47	44.3	0	−0.5	4.04	3.89	1.12	1.02	52.7	4	2.5	0.4	0.3	0.06	25	20	17	—			
NR50	50	47.3	0	−0.5	4.04	3.89	1.12	1.02	55.7	4	2.5	0.4	0.3	0.06	—	22	—	—			
NR52	52	49.4	0	−0.5	4.04	3.89	1.12	1.02	57.9	4	2.5	0.4	0.3	0.06	28	25	20	15			
NR55	55	52.3	0	−0.5	4.04	3.89	1.12	1.02	60.7	4	2.5	0.4	0.3	0.06	30	—	—	—			
NR56	56	53.2	0	−0.6	4.04	3.89	1.12	1.02	61.7	4	2.5	0.4	0.3	0.06	—	22	—	—			
NR58	58	55.2	0	−0.6	4.04	3.89	1.12	1.02	63.7	4	2.5	0.4	0.3	0.06	32	28	—	—			
NR62	62	59.0	0	−0.6	4.04	3.89	1.7	1.6	67.7	4	2.5	0.6	0.5	0.06	35	30	25	17			
NR65	65	62.0	0	−0.6	4.04	3.89	1.7	1.6	70.7	4	2.5	0.6	0.5	0.06	—	32	—	—			
NR68	68	64.2	0	−0.6	4.85	4.70	1.7	1.6	74.6	5	3	0.6	0.5	0.06	40	—	28	—			
NR72	72	68.2	0	−0.6	4.85	4.70	1.7	1.6	78.6	5	3	0.6	0.5	0.06	—	35	30	20			
NR75	75	71.2	0	−0.6	4.85	4.70	1.7	1.6	81.6	5	3	0.6	0.5	0.06	45	—	32	—			
NR80	80	76.2	0	−0.6	4.85	4.70	1.7	1.6	86.6	5	3	0.6	0.5	0.06	50	40	35	25			
NR85	85	81.2	0	−0.6	4.85	4.70	1.7	1.6	91.6	5	3	0.6	0.5	0.06	—	45	—	—			
NR90	90	86.2	0	−0.6	4.85	4.70	2.46	2.36	96.5	5	3	0.6	0.5	0.06	55	50	40	30			
NR95	95	91.2	0	−0.6	4.85	4.70	2.46	2.36	101.6	5	3	0.6	0.5	0.06	60	—	—	—			
NR100	100	96.2	0	−0.8	4.85	4.70	2.46	2.36	106.5	5	3	0.6	0.5	0.06	65	55	45	35			
NR110	110	106.2	0	−0.8	4.85	4.70	2.46	2.36	116.6	5	3	0.6	0.5	0.06	70	60	50	40			
NR115	115	111.2	0	−0.8	4.85	4.70	2.46	2.36	121.6	5	3	0.6	0.5	0.06	75	—	—	—			
NR120	120	114.6	0	−0.8	7.21	7.06	2.82	2.72	129.7	7	4	0.6	0.5	0.06	—	65	55	45			
NR125	125	119.6	0	−0.8	7.21	7.06	2.82	2.72	134.7	7	4	0.6	0.5	0.06	80	70	—	—			
NR130	130	124.6	0	−0.8	7.21	7.06	2.82	2.72	139.7	7	4	0.6	0.5	0.06	85	75	60	50			
NR140	140	134.6	0	−1.2	7.21	7.06	2.82	2.72	149.7	7	4	0.6	0.5	0.06	90	80	65	55			
NR145	145	139.6	0	−1.2	7.21	7.06	2.82	2.72	154.7	7	4	0.6	0.5	0.06	95	—	—	—			
NR150	150	144.5	0	−1.2	7.21	7.06	2.82	2.72	159.7	7	4	0.6	0.5	0.06	100	85	70	60			
NR160	160	154.5	0	−1.2	7.21	7.06	2.82	2.72	169.7	7	4	0.6	0.5	0.06	105	90	75	65			
NR170	170	162.9	0	−1.2	9.60	9.45	3.1	3.0	182.9	10	6	0.6	0.5	0.06	110	95	80	—			
NR180	180	172.8	0	−1.2	9.60	9.45	3.1	3.0	192.9	10	6	0.6	0.5	0.06	120	100	85	70			
NR190	190	182.8	0	−1.4	9.60	9.45	3.1	3.0	202.9	10	6	0.6	0.5	0.06	—	105	90	75			
NR200	200	192.8	0	−1.4	9.60	9.45	3.1	3.0	212.9	10	6	0.6	0.5	0.06	130	110	95	80			

1) The snap ring must be fitted inside the groove in the radius direction free from looseness.

Snap Rings and Grooves for Rolling Bearings

NTN

Groove



B (enlarged view)

Unit: mm

Bearing outside diameter <i>D</i>	Groove diameter		Dimension series				Groove width		Fillet radius of groove bottom <i>r_o</i>
			0	2, 3, 4					
	Groove position								
	<i>D</i> ₁	<i>a</i>	<i>b</i>	<i>r_o</i>					
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
30	28.17	27.91	—	—	2.06	1.90	1.65	1.35	0.4
32	30.15	29.90	2.06	1.90	2.06	1.90	1.65	1.35	0.4
35	33.17	32.92	2.06	1.90	2.06	1.90	1.65	1.35	0.4
37	34.77	34.52	—	—	2.06	1.90	1.65	1.35	0.4
40	38.10	37.85	—	—	2.06	1.90	1.65	1.35	0.4
42	39.75	39.50	2.06	1.90	2.06	1.90	1.65	1.35	0.4
44	41.75	41.50	2.06	1.90	—	—	1.65	1.35	0.4
47	44.60	44.35	2.06	1.90	2.46	2.31	1.65	1.35	0.4
50	47.60	47.35	—	—	2.46	2.31	1.65	1.35	0.4
52	49.73	49.48	2.06	1.90	2.46	2.31	1.65	1.35	0.4
55	52.60	52.35	2.08	1.88	—	—	1.65	1.35	0.4
56	53.60	53.35	—	—	2.46	2.31	1.65	1.35	0.4
58	55.60	55.35	2.08	1.88	2.46	2.31	1.65	1.35	0.4
62	59.61	59.11	2.08	1.88	3.28	3.07	2.2	1.9	0.6
65	62.60	62.10	—	—	3.28	3.07	2.2	1.9	0.6
68	64.82	64.31	2.49	2.29	3.28	3.07	2.2	1.9	0.6
72	68.81	68.30	—	—	3.28	3.07	2.2	1.9	0.6
75	71.83	71.32	2.49	2.29	3.28	3.07	2.2	1.9	0.6
80	76.81	76.30	2.49	2.29	3.28	3.07	2.2	1.9	0.6
85	81.81	81.31	—	—	3.28	3.07	2.2	1.9	0.6
90	86.79	86.28	2.87	2.67	3.28	3.07	3.0	2.7	0.6
95	91.82	91.31	2.87	2.67	—	—	3.0	2.7	0.6
100	96.80	96.29	2.87	2.67	3.28	3.07	3.0	2.7	0.6
110	106.81	106.30	2.87	2.67	3.28	3.07	3.0	2.7	0.6
115	111.81	111.30	2.87	2.67	—	—	3.0	2.7	0.6
120	115.21	114.71	—	—	4.06	3.86	3.4	3.1	0.6
125	120.22	119.71	2.87	2.67	4.06	3.86	3.4	3.1	0.6
130	125.22	124.71	2.87	2.67	4.06	3.86	3.4	3.1	0.6
140	135.23	134.72	3.71	3.45	4.90	4.65	3.4	3.1	0.6
145	140.23	139.73	3.71	3.45	—	—	3.4	3.1	0.6
150	145.24	144.73	3.71	3.45	4.90	4.65	3.4	3.1	0.6
160	155.22	154.71	3.71	3.45	4.90	4.65	3.4	3.1	0.6
170	163.65	163.14	3.71	3.45	5.69	5.44	3.8	3.5	0.6
180	173.66	173.15	3.71	3.45	5.69	5.44	3.8	3.5	0.6
190	183.64	183.13	—	—	5.69	5.44	3.8	3.5	0.6
200	193.65	193.14	5.69	5.44	5.69	5.44	3.8	3.5	0.6