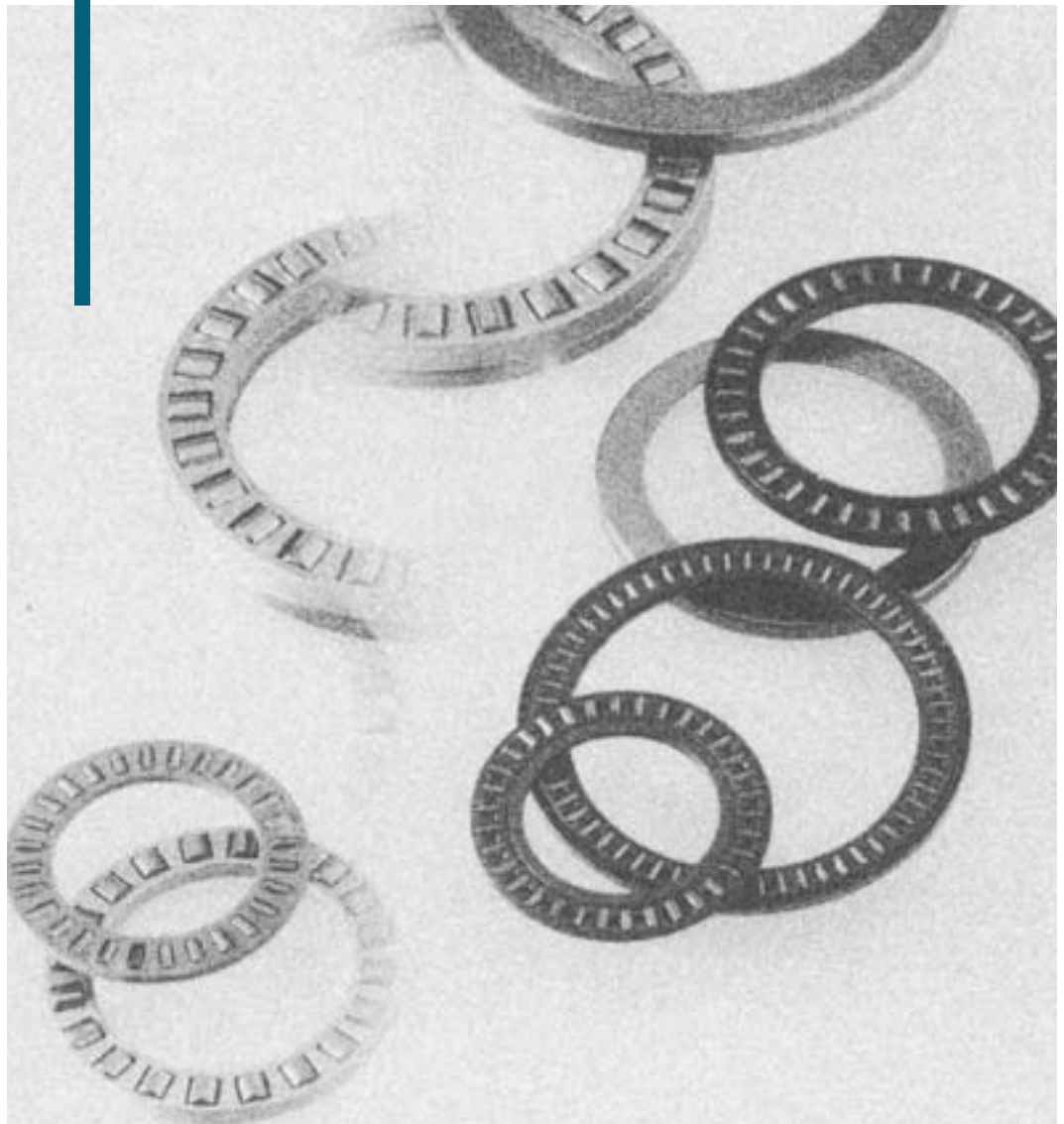


Thrust Roller Bearings



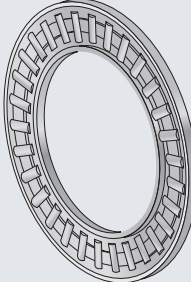
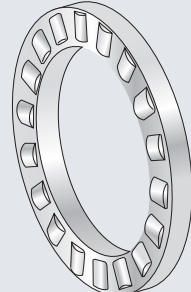
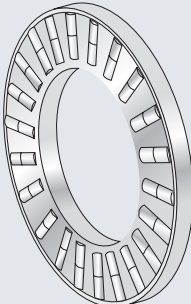
Thrust Roller Bearings

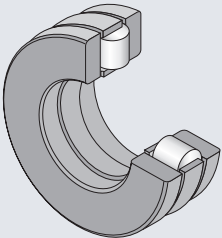
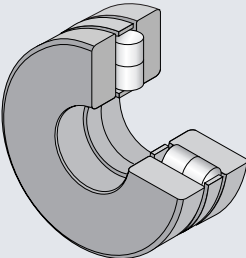
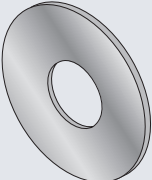
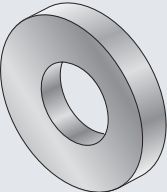
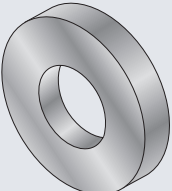
This thrust roller bearing composed of a thrust roller and cage assembly, wherein needle rollers or cylindrical rollers are configured radially in the cage, and a bearing ring of disc form is intended to support one-directional axial load.

In mounting, it is possible to use a shaft or a housing as the direct raceway surface without using the bearing

ring, whereby design of a low height and lightweight compact construction is enabled.

This type of thrust roller bearing results in slipping on raceway surface because theoretically it can't roll perfectly, but in most cases it is practically trouble-free and can rotate at comparatively high speed.

Bearing type	Cage type	Applied shaft dia (mm)	Composition of nominal number	Nominal number	Remarks
AXK 	Punched steel plate cage	$\phi 10 \sim \phi 120$	AXK 11 04 — Bore diameter code — Dimension series code — Type code	AXK1104	Possible to use in combination with AS type bearing ring.
	High tensile brass cage	$\phi 130 \sim \phi 160$			
K811 K812 	Standard type Polyamide resin cage	Type K811 $\phi 10 \sim \phi 120$	K8 11 10 T2 — Tail code — Bore diameter code — Dimension series code — Type code	K81110T2	Any bearing type with tail code T2, that is, with polyamide resin cage shall be used at allowable temperature 120°C and, under continuous running, at 100°C and less. Feel free to contact NTN for the detail of the punched steel plate cage. Possible to use in combination with GS and WS bearing rings. K811 conforms to the Dimension Series 11 specified in JIS B 1512. K812 conforms to the Dimension Series 12 specified in JIS B 1512.
		Type K812 $\phi 30 \sim \phi 80$			
	Aluminum alloy cage	Type K811 $\phi 130 \sim \phi 160$			
Type K812 $\phi 85 \sim \phi 140$					
K893 	Aluminum alloy cage	$\phi 30 \sim \phi 110$	K8 93 10 — Bore diameter code — Dimension series code — Type code	K89310	K893 conforms to the Dimension Series 93 specified in JIS B 1512.

Bearing type		Applied shaft dia (mm)	Composition of nominal number	Nominal number	Remarks
<p>811 812</p> 		$\phi 10 \sim \phi 160$	<p>8 11 10 T2</p> <ul style="list-style-type: none"> 8: Type code 11: Dimension series code 10: Bore diameter code T2: Tail code <p>[Tail code] T2: resin cage J: Punched steel plate cage</p>	8110T2	<p>Any bearing type with tail code T2, that is, with polyamide resin cage shall be used at allowable temperature 120°C and, under continuous running, at 100°C and less.</p> <p>WS and GS bearing rings are used in set.</p> <p>811 conforms to the Dimension Series 11 specified in JIS B 1512.</p> <p>812 conforms to the Dimension Series 12 specified in JIS B 1512.</p>
<p>893</p> 		$\phi 30 \sim \phi 110$	<p>8 93 10</p> <ul style="list-style-type: none"> 8: Type code 93: Dimension series code 10: Bore diameter code 	89310	<p>WS and GS bearing rings are used in set.</p> <p>893 conforms to the Dimension Series 93 specified in JIS B 1512.</p>
<p>AS</p> 	Punched steel plate cage	$\phi 10 \sim \phi 130$	<p>AS 11 04</p> <ul style="list-style-type: none"> AS: Type code 11: Dimension series code 04: Bore diameter code 	AS1104	<p>Because of its 1mm thick steel plate ring, this thrust bearing needs adequate rigidity and profile accuracy of machine parts adjacent to the bearing.</p> <p>As an individual, on occasion this thrust bearing results in slight camber, but it is flattened when specific thrust load acts thereon, having no problem in practical use.</p>
<p>WS811 WS812</p> 	Solid type bore guide	$\phi 10 \sim \phi 160$	<p>WS8 11 04</p> <ul style="list-style-type: none"> WS8: Type code 11: Dimension series code 04: Bore diameter code 	WS81104	<p>Higher rigidity and higher running accuracy than AS bearing ring .</p>
<p>GS811 GS812</p> 	Solid type outer guide	$\phi 10 \sim \phi 160$	<p>GS8 11 04</p> <ul style="list-style-type: none"> GS8: Type code 11: Dimension series code 04: Bore diameter code 	GS81104	<p>Higher rigidity and higher running accuracy than AS bearing ring .</p>

Bearing accuracy

The respective dimensional accuracy, profile accuracy and running accuracy of thrust cylindrical roller bearings 811, 812 and 893 are as shown in **Table 4.4** of Section 4 "Bearing Accuracy" (page A-28).

The thrust roller and cage assemblies (**AXK, K811, K812, K893**) are machined with dimensional tolerance E11 for the bore diameter (D_{e1}) (E12 for bearing number with T2 code) and with dimensional tolerance c12 for the outer diameter (D_e) of **Type AXK** and a13 for the diameter (D_e) of **K811, K812 and K893**.

Raceway surface requirements:

Where the plane portion of a shaft/a housing is used as the direct raceway surface of thrust roller and cage assembly, the raceway surface must meet the requirements specified as a guideline in **Table 1**.

Table 1 Raceway surface requirements

Characteristics	Specified requirements
Perpendicularity (Max)	IT6 (IT4)
Surface roughness	0.2a
Surface hardness	HRC58~64
Effective hardened layer depth	Refer to Formula (7.1) on page A-39.

Reference : The parenthesized value shall be applied for high running accuracy.

Cage guiding

The thrust roller and cage assemblies (**AXK, K811, K812 and K893**) must be guided at either the bore side (shaft side) or the outer surface side (housing side) for in-running centering.

In general, the bore-side guide of low relative speed against the cage is mostly used. It should be used particularly for high speed running. The dimensional tolerances for shaft and housing, when the cage is guided thereby, shall be h8 for shaft diameter (bore guide) and H9 for housing bore diameter (outer surface guide) respectively, which of the guide surface shall be fine-finished by grinding.

Bearing fit in bearing ring

Table 2 shows the tolerances for fitting of the thrust bearing rings (**AS, WS and GS**) on shaft or in housing.

Table 2 Bearing ring fit in shaft and housing

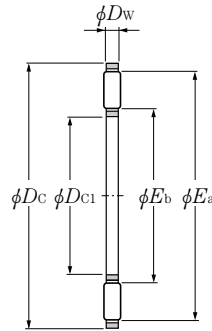
Bearing ring	Shaft	Housing
Series AS	h10	H11
Series WS	h6	—
Series GS	—	H7

Mounting related dimensions

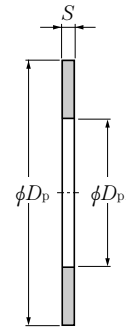
The dimensions related to fitting of **WS** and **GS** bearing rings on shaft and in housing are as described in applicable Dimensions Table.

The fitting surface of **AS** bearing ring must be flat and have the rigidity sufficient to support thrust load throughout its entire surface.

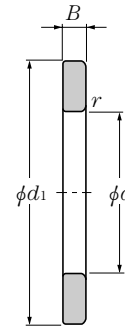
Type AXK11
Type AS11
Type WS811
Type GS811



Type AXK
 (Thrust needle roller
 and cage assy)



AS bearing ring
 (washer)



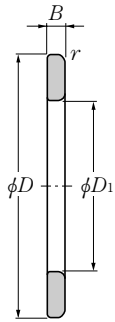
WS bearing ring
 (Inner ring)

D_{c1} 10~140mm

Boundary dimensions												Basic load ratings			
mm												dynamic	static	dynamic	static
D_{c1}	D_c	D_w	D_p	D_{p1}	S ²⁾	d	d_1	D	D_1	B	$r_{s \min}$ ¹⁾	N	N	kgf	kgf
E11	c12	$0_{-0.01}$	e13	E12	0.05		$-0.2_{-0.5}$		$+0.5_{+0.2}$			C_a	C_{oa}	C_a	C_{oa}
10	24	2	24	10	1	10	24	24	10	$2.75_{-0.060}^0$	0.3	9 150	25 300	935	2 580
12	26	2	26	12	1	12	26	26	12	$2.75_{-0.060}^0$	0.3	9 850	28 900	1 010	2 940
15	28	2	28	15	1	15	28	28	16	$2.75_{-0.060}^0$	0.3	11 300	36 000	1 150	3 700
17	30	2	30	17	1	17	30	30	18	$2.75_{-0.060}^0$	0.3	11 900	39 500	1 220	4 050
20	35	2	35	20	1	20	35	35	21	$2.75_{-0.060}^0$	0.3	13 200	46 500	1 340	4 750
25	42	2	42	25	1	25	42	42	26	$3_{-0.060}^0$	0.6	14 600	58 000	1 490	5 900
30	47	2	47	30	1	30	47	47	32	$3_{-0.060}^0$	0.6	16 300	69 500	1 660	7 100
35	52	2	52	35	1	35	52	52	37	$3.5_{-0.075}^0$	0.6	17 800	81 500	1 820	8 300
40	60	3	60	40	1	40	60	60	42	$3.5_{-0.075}^0$	0.6	27 400	110 000	2 790	11 300
45	65	3	65	45	1	45	65	65	47	$4_{-0.075}^0$	0.6	29 800	128 000	3 050	13 100
50	70	3	70	50	1	50	70	70	52	$4_{-0.075}^0$	0.6	31 500	143 000	3 250	14 500
55	78	3	78	55	1	55	78	78	57	$5_{-0.075}^0$	0.6	38 000	186 000	3 850	19 000
60	85	3	85	60	1	60	85	85	62	$4.75_{-0.075}^0$	1	44 500	234 000	4 550	23 900
65	90	3	90	65	1	65	90	90	67	$5.25_{-0.075}^0$	1	46 500	254 000	4 750	25 900
70	95	4	95	70	1	70	95	95	72	$5.25_{-0.075}^0$	1	53 500	253 000	5 500	25 800
75	100	4	100	75	1	75	100	100	77	$5.75_{-0.075}^0$	1	55 000	266 000	5 650	27 100
80	105	4	105	80	1	80	105	105	82	$5.75_{-0.075}^0$	1	56 500	279 000	5 750	28 400
85	110	4	110	85	1	85	110	110	87	$5.75_{-0.075}^0$	1	57 500	291 000	5 900	29 700
90	120	4	120	90	1	90	120	120	92	$6.5_{-0.090}^0$	1	71 000	390 000	7 250	39 500
100	135	4	135	100	1	100	135	135	102	$7_{-0.090}^0$	1	90 500	550 000	9 200	56 500
110	145	4	145	110	1	110	145	145	112	$7_{-0.090}^0$	1	93 500	590 000	9 550	60 500
120	155	4	155	120	1	120	155	155	122	$7_{-0.090}^0$	1	99 000	650 000	10 100	66 500
130	170	5	170	130	1	130	170	170	132	$9_{-0.090}^0$	1	140 000	900 000	14 300	92 000
140	180	5	180	140	1	140	178	180	142	$9.5_{-0.090}^0$	1	145 000	960 000	14 800	97 500

Note 1) Allowable minimum chamfer dimension r .

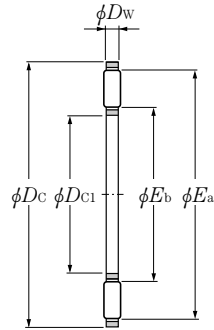
2) Subject to measured thrust load of 20kg or more.



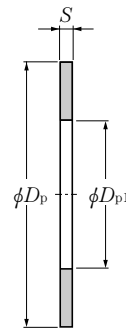
**GS bearing ring
(Outer ring)**

Limiting speeds		Bearing numbers				Reference dimensions		Mass		
grease	oil	thrust needle roller and cage assembly	washer	inner ring	outer ring	mm		kg (approx.)		
						E_b	E_a	AXK11	AS11	WS811 GS811
3 500	14 000	AXK1100	AS1100	WS81100	GS81100	12.3	21.7	0.0028	0.003	0.008
3 300	13 000	AXK1101	AS1101	WS81101	GS81101	14.3	23.7	0.003	0.0033	0.009
2 800	11 000	AXK1102	AS1102	WS81102	GS81102	17.2	26.5	0.0035	0.0035	0.01
2 500	10 000	AXK1103	AS1103	WS81103	GS81103	19.2	28.5	0.004	0.0038	0.011
2 100	8 500	AXK1104	AS1104	WS81104	GS81104	21.3	31.3	0.005	0.0051	0.014
1 800	7 000	AXK1105	AS1105	WS81105	GS81105	29.5	39.4	0.007	0.007	0.021
1 500	6 000	AXK1106	AS1106	WS81106	GS81106	34.5	44.4	0.008	0.008	0.025
1 400	5 500	AXK1107	AS1107	WS81107	GS81107	39.5	49.4	0.01	0.0091	0.033
1 200	4 700	AXK1108	AS1108	WS81108	GS81108	44.2	56.2	0.0185	0.0123	0.044
1 100	4 300	AXK1109	AS1109	WS81109	GS81109	50.5	62.4	0.0205	0.0136	0.055
1 000	3 900	AXK1110	AS1110	WS81110	GS81110	55.5	67.4	0.0235	0.0148	0.06
900	3 500	AXK1111	AS1111	WS81111	GS81111	61.0	74.9	0.0308	0.0189	0.095
800	3 200	AXK1112	AS1112	WS81112	GS81112	66.0	81.9	0.0390	0.0223	0.101
750	3 000	AXK1113	AS1113	WS81113	GS81113	71.0	86.9	0.04	0.0239	0.125
750	2 900	AXK1114	AS1114	WS81114	GS81114	75.5	91.4	0.06	0.0254	0.134
700	2 700	AXK1115	AS1115	WS81115	GS81115	80.5	96.4	0.061	0.027	0.155
650	2 600	AXK1116	AS1116	WS81116	GS81116	84.4	100.3	0.063	0.0284	0.163
600	2 400	AXK1117	AS1117	WS81117	GS81117	90.5	106.4	0.0668	0.0301	0.175
600	2 300	AXK1118	AS1118	WS81118	GS81118	96.5	116.4	0.086	0.0388	0.25
500	2 000	AXK1120	AS1120	WS81120	GS81120	107.5	131.4	0.112	0.0505	0.35
480	1 900	AXK1122	AS1122	WS81122	GS81122	115.5	139.4	0.122	0.0549	0.385
430	1 700	AXK1124	AS1124	WS81124	GS81124	125.5	149.4	0.131	0.0592	0.415
400	1 600	AXK1126	AS1126	WS81126	GS81126	136.0	164.0	0.205	0.074	0.663
380	1 500	AXK1128	AS1128	WS81128	GS81128	146.0	174.0	0.219	0.079	0.749

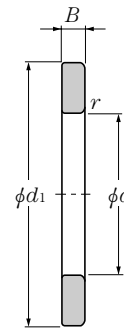
Type AXK11
Type AS11
Type WS811
Type GS811



Type AXK
(Thrust needle roller and cage assy)



AS bearing ring
(washer)

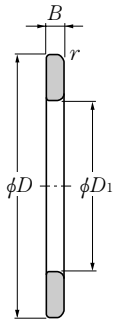


WS bearing ring
(Inner ring)

D_{c1} 150~160mm

Boundary dimensions											Basic load ratings					
mm											dynamic	static	dynamic	static		
D_{c1}	D_c	D_w	D_p	D_{p1}	S 2)	d	d_1	D	D_1	B	$r_{s \min}$ 1)	N	N	kgf	kgf	
E11	c12	$\begin{smallmatrix} 0 \\ -0.01 \end{smallmatrix}$	e13	E12	0.05		$\begin{smallmatrix} -0.2 \\ -0.5 \end{smallmatrix}$		$\begin{smallmatrix} +0.5 \\ +0.2 \end{smallmatrix}$			C_a	C_{oa}	C_a	C_{oa}	
150	190	5	190	150	1	150	188	190	152	9.5	$\begin{smallmatrix} 0 \\ -0.090 \end{smallmatrix}$	1	149 000	1 020 000	15 200	104 000
160	200	5	200	160	1	160	198	200	162	9.5	$\begin{smallmatrix} 0 \\ -0.090 \end{smallmatrix}$	1	154 000	1 070 000	15 700	110 000

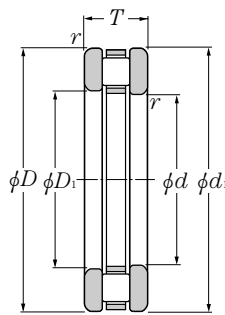
Note 1) Allowable minimum chamfer dimension r .
 2) Subject to measured thrust load of 20kg or more.



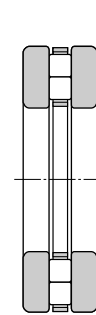
**GS bearing ring
(Outer ring)**

Limiting speeds		Bearing numbers				Reference dimensions		Mass		
grease	r/min	thrust needle roller and cage assembly	washer	inner ring	outer ring	mm		kg (approx.)		
	oil					E_b	E_a	AXK11	AS11	WS811 GS811
350	1 400	AXK1130	AS1130	WS81130	GS81130	156.0	184.2	0.232	0.084	0.796
330	1 300	AXK1132	AS1132	WS81132	GS81132	166.0	194.2	0.246	0.089	0.842

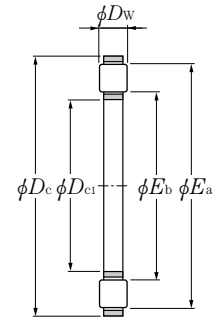
Type 811
Type 812
Type 893



**Type 811
Type 812
(Bearing)**



**Type 893
(Bearing)**



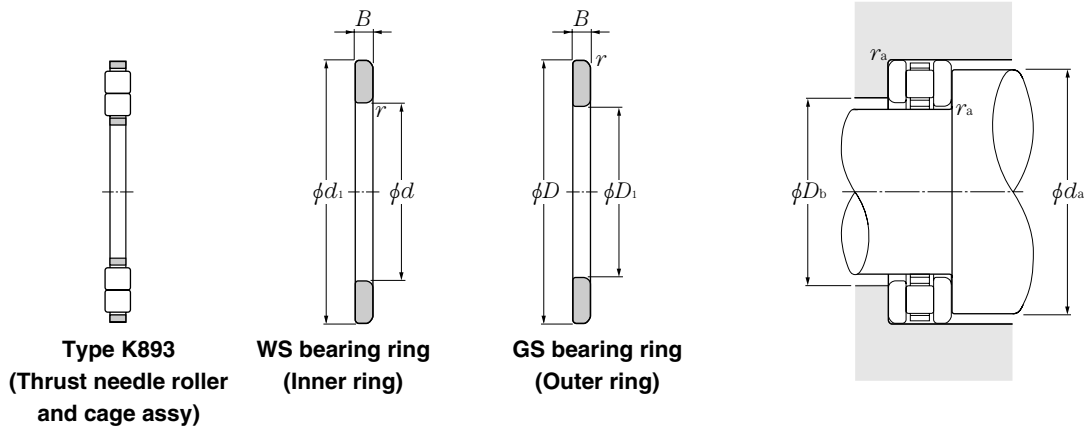
**Type K811, type K812
(Thrust needle roller
and cage assy)**

d 10~60mm

Boundary dimensions										Basic load ratings				Limiting speeds		
d	D	d_1 -0.2 -0.5	D_1 +0.5 +0.2	mm						$r_{s \min}^{1)}$	dynamic C_a	static N C_{oa}	dynamic kgf C_a	static C_{oa}	r/min	
				T	$D_{c1}^{2)}$ E11	D_c a13	D_w 0 -0.010	B h11	grease						oil	
10	24	24	10	9	10	24	3.5	2.75	0.3	10 800	21 500	1 110	2 190	3 400	13 000	
12	26	26	12	9	12	26	3.5	2.75	0.3	11 500	23 900	1 170	2 430	3 000	12 000	
15	28	28	16	9	15	28	3.5	2.75	0.3	12 900	28 600	1 310	2 920	2 800	11 000	
17	30	30	18	9	17	30	3.5	2.75	0.3	13 400	31 000	1 370	3 150	2 500	10 000	
20	35	35	21	10	20	35	4.5	2.75	0.3	20 200	46 500	2 060	4 700	2 100	8 500	
25	42	42	26	11	25	42	5	3	0.6	27 300	68 000	2 780	6 900	1 800	7 000	
30	47	47	32	11	30	47	5	3	0.6	27 800	72 500	2 840	7 400	1 500	6 000	
	52	52	32	16	30	52	7.5	4.25	0.6	53 000	129 000	5 450	13 100	1 500	6 000	
	60	60	32	18	30	60	5.5	6.25	1	54 000	166 000	5 500	16 900	1 300	5 000	
35	52	52	37	12	35	52	5	3.5	0.6	31 000	87 000	3 150	8 900	1 400	5 500	
	62	62	37	18	35	62	7.5	5.25	1	54 500	139 000	5 550	14 200	1 200	4 900	
	68	68	37	20	35	68	6	7	1	66 000	214 000	6 750	21 800	1 200	4 600	
40	60	60	42	13	40	60	6	3.5	0.6	43 000	121 000	4 350	12 400	1 200	4 800	
	68	68	42	19	40	68	9	5	1	74 500	190 000	7 600	19 400	1 100	4 400	
	78	78	42	22	40	78	7	7.5	1	85 000	277 000	8 700	28 300	1 000	4 000	
45	65	65	47	14	45	65	6	4	0.6	45 500	135 000	4 650	13 800	1 100	4 400	
	73	73	47	20	45	73	9	5.5	1	82 000	222 000	8 350	22 600	1 000	4 100	
	85	85	47	24	45	85	7.5	8.25	1	102 000	345 000	10 400	35 000	900	3 600	
50	70	70	52	14	50	70	6	4	0.6	48 000	150 000	4 900	15 300	1 000	4 000	
	78	78	52	22	50	78	9	6.5	1	85 000	238 000	8 650	24 200	950	3 800	
	95	95	52	27	50	95	8	9.5	1.1	125 000	445 000	12 700	45 000	800	3 200	
55	78	78	57	16	55	78	6	5	0.6	62 500	215 000	6 350	21 900	900	3 600	
	90	90	57	25	55	90	11	7	1	121 000	340 000	12 300	34 500	830	3 300	
	105	105	57	30	55	105	9	10.5	1.1	158 000	570 000	16 100	58 000	730	2 900	
60	85	85	62	17	60	85	7.5	4.75	1	69 000	215 000	7 000	21 900	830	3 300	
	95	95	62	26	60	95	11	7.5	1	125 000	365 000	12 800	37 000	780	3 100	
	110	110	62	30	60	110	9	10.5	1.1	162 000	600 000	16 500	61 500	680	2 700	

Note 1) Allowable minimum chamfer dimension r .

2) The dimensional tolerance for a bearing with a T2 suffix is E12.



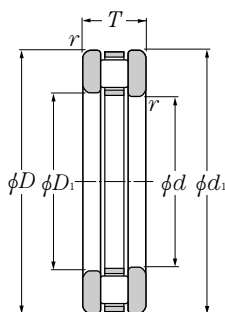
Type K893
(Thrust needle roller
and cage assy)

WS bearing ring
(Inner ring)

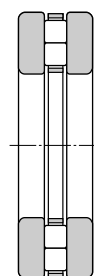
GS bearing ring
(Outer ring)

Bearing numbers				Reference dimensions mm		Abutment dimensions mm			Mass kg		
bearing	thrust cylindrical roller and cage assembly	inner ring	outer ring	E_b	E_a	d_a min	D_b max	r_{as} max	811	K811	WS
									812	K812	
									893	K893	GS
81100T2	K81100T2	WS81100	GS81100	13.5	21.3	21	14	0.3	0.0195	0.0035	0.008
81101T2	K81101T2	WS81101	GS81101	15.5	23.3	23	16	0.3	0.022	0.004	0.009
81102T2	K81102T2	WS81102	GS81102	17.2	25.0	25	18	0.3	0.026	0.006	0.010
81103T2	K81103T2	WS81103	GS81103	19.2	27.0	27	20	0.3	0.030	0.008	0.011
81104T2	K81104T2	WS81104	GS81104	22.4	32.3	32	23	0.3	0.040	0.012	0.014
81105T2	K81105T2	WS81105	GS81105	27.6	38.7	39	28	0.6	0.060	0.018	0.021
81106T2	K81106T2	WS81106	GS81106	33.1	43.9	44	33	0.6	0.070	0.020	0.025
81206T2	K81206T2	WS81206	GS81206	32.8	49.0	48	33	0.6	0.140	0.050	0.045
89306	K89306	WS89306	GS89306	34.0	56.4	56	34	1	0.250	0.046	0.100
81107T2	K81107T2	WS81107	GS81107	38.0	48.9	49	38	0.6	0.090	0.024	0.033
81207T2	K81207T2	WS81207	GS81207	39.8	56.0	56	41	1	0.235	0.065	0.085
89307	K89307	WS89307	GS89307	40.0	64.4	64	40	1	0.360	0.064	0.150
81108T2	K81108T2	WS81108	GS81108	43.2	56.4	56	44	0.6	0.135	0.035	0.044
81208T2	K81208T2	WS81208	GS81208	43.7	62.9	63	44	1	0.265	0.085	0.090
89308	K89308	WS89308	GS89308	46.0	74.4	74	46	1	0.520	0.100	0.210
81109T2	K81109T2	WS81109	GS81109	48.4	61.6	61	49	0.6	0.150	0.040	0.055
81209T2	K81209T2	WS81209	GS81209	48.8	68.0	68	49	1	0.310	0.100	0.105
89309	K89309	WS89309	GS89309	50.9	81.3	81	51	1	0.670	0.140	0.270
81110T2	K81110T2	WS81110	GS81110	53.2	66.4	66	54	0.6	0.165	0.045	0.060
81210T2	K81210T2	WS81210	GS81210	53.7	73.1	73	54	1	0.385	0.105	0.140
89310	K89310	WS89310	GS89310	58.0	90.4	90	58	1	0.940	0.180	0.380
81111T2	K81111T2	WS81111	GS81111	57.8	75.2	75	58	0.6	0.250	0.060	0.095
81211T2	K81211T2	WS81211	GS81211	60.1	83.4	83	61	1	0.610	0.190	0.210
89311	K89311	WS89311	GS89311	63.9	100.3	100	64	1	1.270	0.240	0.520
81112T2	K81112T2	WS81112	GS81112	63.7	80.1	80	65	1	0.285	0.083	0.101
81212T2	K81212T2	WS81212	GS81212	64.9	88.4	88	66	1	0.660	0.200	0.230
89312	K89312	WS89312	GS89312	68.9	105.3	105	69	1	1.350	0.250	0.550

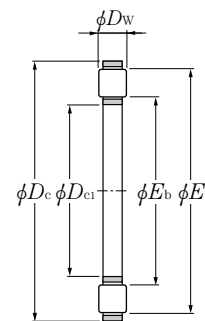
Type 811
Type 812
Type 893



**Type 811
Type 812
(Bearing)**



**Type 893
(Bearing)**

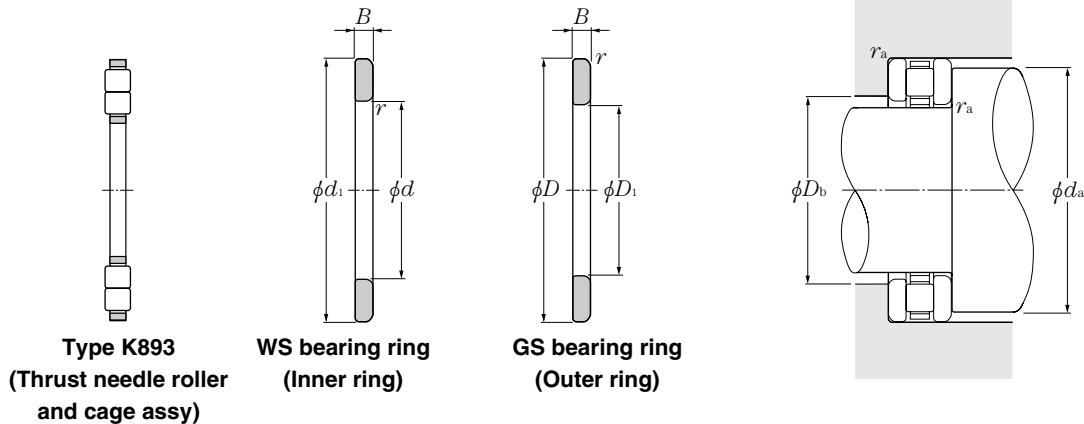


**Type K811, type K812
(Thrust needle roller
and cage assy)**

d 65~130mm

Boundary dimensions										Basic load ratings				Limiting speeds		
d	D	d ₁ -0.2 -0.5	D ₁ +0.5 +0.2	mm						r _{s min} ¹⁾	dynamic N	static N	dynamic kgf	static kgf	r/min	
				T	D _{c1} E11	D _c a13	D _w 0 -0.010	B h11	grease						oil	
65	90	90	67	18	65	90	7.5	5.25	1	73 000	236 000	7 400	24 100	780	3 100	
	100	100	67	27	65	100	11	8	1	130 000	385 000	13 200	39 500	730	2 900	
	115	115	67	30	65	115	9	10.5	1.1	166 000	635 000	17 000	64 500	650	2 600	
70	95	95	72	18	70	95	7.5	5.25	1	76 500	257 000	7 800	26 200	730	2 900	
	105	105	72	27	70	105	11	8	1	134 000	410 000	13 700	42 000	680	2 700	
	125	125	72	34	70	125	10	12	1.1	205 000	790 000	20 900	81 000	600	2 400	
75	100	100	77	19	75	100	7.5	5.75	1	78 000	268 000	7 950	27 300	680	2 700	
	110	110	77	27	75	110	11	8	1	138 000	435 000	14 100	44 500	650	2 600	
	135	135	77	36	75	135	11	12.5	1.5	239 000	920 000	24 400	94 000	550	2 200	
80	105	105	82	19	80	105	7.5	5.75	1	79 500	279 000	8 100	28 400	650	2 600	
	115	115	82	28	80	115	11	8.5	1	142 000	460 000	14 500	47 000	630	2 500	
	140	140	82	36	80	140	11	12.5	1.5	246 000	970 000	25 100	98 500	530	2 100	
85	110	110	87	19	85	110	7.5	5.75	1	83 000	300 000	8 450	30 500	630	2 500	
	125	125	88	31	85	125	12	9.5	1	169 000	550 000	17 200	56 500	580	2 300	
	150	150	88	39	85	150	12	13.5	1.5	281 000	1 100 000	28 600	113 000	500	2 000	
90	120	120	92	22	90	120	9	6.5	1	112 000	395 000	11 400	40 500	580	2 300	
	135	135	93	35	90	135	14	10.5	1.1	213 000	680 000	21 700	69 500	530	2 100	
	155	155	93	39	90	155	12	13.5	1.5	289 000	1 160 000	29 500	118 000	480	1 900	
100	135	135	102	25	100	135	11	7	1	158 000	555 000	16 100	57 000	500	2 000	
	150	150	103	38	100	150	15	11.5	1.1	243 000	795 000	24 800	81 000	480	1 900	
	170	170	103	42	100	170	13	14.5	1.5	335 000	1 370 000	34 500	140 000	430	1 700	
110	145	145	112	25	110	145	11	7	1	165 000	605 000	16 800	61 500	480	1 900	
	160	160	113	38	110	160	15	11.5	1.1	259 000	885 000	26 400	90 000	450	1 800	
	190	190	113	48	110	190	15	16.5	2	430 000	1 770 000	44 000	180 000	400	1 600	
120	155	155	122	25	120	155	11	7	1	172 000	655 000	17 500	66 500	450	1 800	
	170	170	123	39	120	170	15	12	1.1	264 000	930 000	26 900	94 500	430	1 700	
130	170	170	132	30	130	170	12	9	1	197 000	755 000	20 100	77 000	400	1 600	
	190	187	133	45	130	190	19	13	1.5	360 000	1 210 000	36 500	123 000	380	1 500	

Note 1) Allowable minimum chamfer dimension r'.
2) The dimensional tolerance for a bearing with a T2 suffix is E12.



Type K893
(Thrust needle roller
and cage assy)

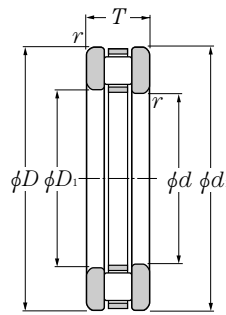
WS bearing ring
(Inner ring)

GS bearing ring
(Outer ring)

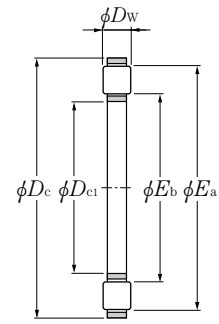
Bearing numbers				Reference dimensions mm		Abutment dimensions mm			Mass kg		
bearing	thrust cylindrical roller and cage assembly	inner ring	outer ring	E_b	E_a	d_a min	D_b max	r_{as} max	811	K811	WS
									812	K812	
89313	K89313	WS89313	GS89313	73.9	110.3	110	74	1	893	K893	GS
81113T2	K81113T2	WS81113	GS81113	68.8	85.2	85	70	1	0.340	0.090	0.125
81213T2	K81213T2	WS81213	GS81213	69.9	93.3	93	71	1	0.775	0.215	0.280
81114T2	K81114T2	WS81114	GS81114	73.7	90.1	90	74	1	0.365	0.097	0.135
81214T2	K81214T2	WS81214	GS81214	75.0	98.4	98	76	1	0.815	0.225	0.295
89314	K89314	WS89314	GS89314	79.8	120.2	120	80	1	1.930	0.340	0.800
81115T2	K81115T2	WS81115	GS81115	78.7	95.1	95	80	1	0.425	0.115	0.155
81215T2	K81215T2	WS81215	GS81215	80.1	103.7	103	81	1	0.860	0.240	0.310
89315	K89315	WS89315	GS89315	84.7	129.2	129	85	1.5	2.410	0.470	0.970
81116T2	K81116T2	WS81116	GS81116	83.7	100.1	100	85	1	0.445	0.119	0.165
81216T2	K81216T2	WS81216	GS81216	84.8	108.4	106	86	1	0.950	0.250	0.350
89316	K89316	WS89316	GS89316	89.8	134.2	134	90	1.5	2.530	0.490	1.020
81117T2	K81117T2	WS81117	GS81117	88.7	105.3	105	89	1	0.475	0.125	0.175
81217	K81217	WS81217	GS81217	92.2	116.9	116	92	1	1.280	0.300	0.490
89317	K89317	WS89317	GS89317	95.8	144.2	144	96	1.5	3.140	0.590	1.280
81118T2	K81118T2	WS81118	GS81118	94.7	114.3	114	95	1	0.670	0.170	0.250
81218J	K81218J	WS81218	GS81218	97.9	126.7	126	97	1	1.820	0.540	0.640
89318	K89318	WS89318	GS89318	100.8	149.2	149	101	1.5	3.280	0.620	1.330
81120T2	K81120T2	WS81120	GS81120	105.1	128.7	128	106	1	1.000	0.300	0.350
81220	K81220	WS81220	GS81220	109.2	140.0	139	109	1	2.240	0.620	0.810
89320	K89320	WS89320	GS89320	110.6	163.0	163	110	1.5	4.190	0.810	1.690
81122T2	K81122T2	WS81122	GS81122	115.0	138.8	138	116	1	1.100	0.325	0.385
81222	K81222	WS81222	GS81222	119.2	150.0	149	119	1	2.450	0.685	0.880
89322	K89322	WS89322	GS89322	122.5	183.0	183	122	2	6.030	1.150	2.440
81124T2	K81124T2	WS81124	GS81124	125.0	148.8	148	126	1	1.170	0.340	0.415
81224	K81224	WS81224	GS81224	129.2	160.0	159	129	1	2.690	0.730	0.980
81126	K81126	WS81126	GS81126	137.7	162.4	162	137	1	1.740	0.415	0.663
81226	K81226	WS81226	GS81226	140.1	179.0	173	140	1.5	4.200	1.140	1.530

Type 811

Type 812



**Type 811
Type 812
(Bearing)**

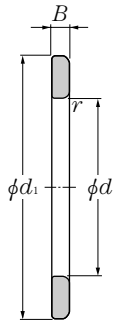


**Type K811, type K812
(Thrust needle roller
and cage assy)**

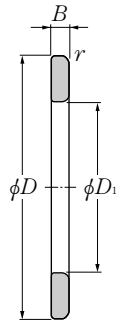
d 140~160mm

d	Boundary dimensions									Basic load ratings				Limiting speeds	
	D	d_1 -0.2 -0.5	D_1 +0.5 +0.2	T	D_{c1} E11	D_c a13	D_w 0 -0.010	B h11	r_s (min ¹)	dynamic	static	dynamic	static	r/min	
										mm					
140	180	178	142	31	140	180	12	9.5	1	206 000	815 000	21 000	83 000	380	1 500
	200	197	143	46	140	200	19	13.5	1.5	370 000	1 280 000	38 000	130 000	350	1 400
150	190	188	152	31	150	190	12	9.5	1	214 000	870 000	21 800	89 000	350	1 400
160	200	198	162	31	160	200	12	9.5	1	221 000	930 000	22 600	95 000	330	1 300

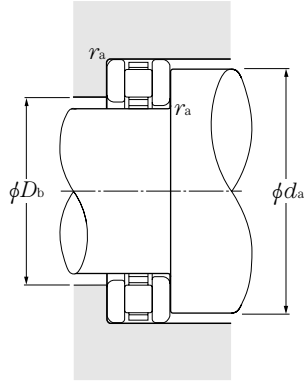
Note 1) Allowable minimum chamfer dimension r' .



**WS bearing ring
(Inner ring)**



**GS bearing ring
(Outer ring)**



Bearing numbers				Reference dimensions mm		Abutment dimensions mm			Mass kg		
bearing	thrust cylindrical roller and cage assembly	inner ring	outer ring	E_b	E_a	d_a min	D_b max	r_{as} max	811	K811	WS
									812	K812	GS
									893	K893	
81128	K81128	WS81128	GS81128	147.8	172.5	172	147	1	1.950	0.450	0.750
81228	K81228	WS81228	GS81228	150.1	189.0	188	150	1.5	4.570	1.200	1.690
81130	K81130	WS81130	GS81130	157.7	182.4	182	157	1	2.070	0.470	0.800
81132	K81132	WS81132	GS81132	167.8	192.5	192	167	1	2.190	0.500	0.840