



Precision Machine Tool Bearings

Bearings selected for use in machine tools are required to have a design which will ensure high rotational speed and high accuracy.

Bearings for Machine Tool Spindles

Spindle bearings are generally classified as those that support radial load and those that support thrust loads.

Angular Contact Ball Bearings		Double-direction Thrust Angular Contact Ball Bearings	
70, 70B, 70C 72, 72B, 72C See page 166	BNH000 See page 369	TAD20 See page 373	
Cylindrical Roller Bearings		Combination Angular Contact Ball Bearings	
NN30 NN30K See page 202	N10 N10K See page 202	TAH10T See page 375	TBH10T See page 376

Fig 1. The bearings for radial load

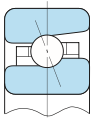
Fig 2. The bearings for axial load

**High-speed Angular Contact Ball Bearings
BNH000 Series**

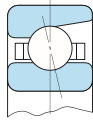
(1) High-speed Angular Contact Ball Bearings - BNH000 Series

● Feature design

BNH000 Series bearings are designed with smaller balls than Angular Contact Ball Bearings Type C. They are suitable for high-speed applications and lower heat generation and are typically used in high speed machining center spindles. (Their tolerance class is JIS (ISO) class 4 normally.)



BNH000



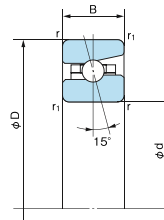
7000C

● Standard preload

Standard preload of BNH type is designed with light preload.

Bore Diameter Number	BNH000
07	78.5
08	
09	98.1
10	
11	
12	147
13	
14	
15	245
16	
17	294
18	
19	392
20	
21	490
22	
24	588
26	785
28	834
30	1080
32	1180
34	1370

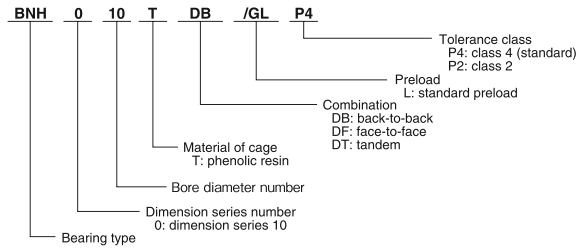
Unit: N



1N=0.102kgf

Bearing No.	Dimensions (mm)					Basic dynamic load rating Cr (N)	Basic static load rating Cor (N)	Limiting speed (min ⁻¹)	
	d	D	B	r (min)	r ₁ (min)			Grease lubrication	Oil lubrication
BNH 007	35	62	14	1	0.6	11600	9950	25000	35000
BNH 008	40	68	15	1	0.6	14800	12900	22000	32000
BNH 009	45	75	16	1	0.6	15500	14500	20000	28000
BNH 010	50	80	16	1	0.6	16100	15900	19000	26000
BNH 011	55	90	18	1	0.6	20000	20100	17000	24000
BNH 012	60	95	18	1.1	0.6	20800	21900	16000	22000
BNH 013	65	100	18	1.1	0.6	21500	23400	15000	21000
BNH 014	70	110	20	1.1	0.6	29400	31500	13000	19000
BNH 015	75	115	20	1.1	0.6	29800	32500	13000	18000
BNH 016	80	125	22	1.1	0.6	35000	39000	12000	17000
BNH 017	85	130	22	1.1	0.6	35500	40000	11000	16000
BNH 018	90	140	24	1.5	1	46500	53000	10000	15000
BNH 019	95	145	24	1.5	1	47000	55000	10000	14000
BNH 020	100	150	24	1.5	1	48000	56500	9600	14000
BNH 021	105	160	26	2	1	54500	65000	9100	13000
BNH 022	110	170	28	2	1	61000	74000	8600	12000
BNH 024	120	180	28	2	1	63000	79000	8000	11000
BNH 026	130	200	33	2	1	83500	105000	7300	10000
BNH 028	140	210	33	2	1	86000	112000	6900	9700
BNH 030	150	225	35	2.1	1	102000	132000	6400	9100
BNH 032	160	240	38	2.1	1	110000	145000	6000	8500
BNH 034	170	260	42	2.1	1	129000	173000	5600	7900

● Bearing No.

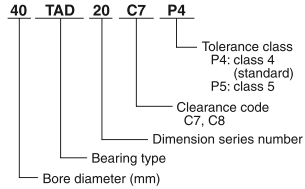


(2) Double-direction Thrust Angular Contact Ball Bearings - TAD20 Series

● Feature design

This is a double-row bearing with a one-piece outer ring. The ball assembly is arranged as a back-to-back, Angular Contact Ball Bearings with a high contact angle. This type is used as the Axial carrying Bearing in conjunction with a Double-row Cylindrical Roller Bearings.

● Bearing No.



● Tolerance

The outer ring is made with a negative tolerance for a clearance fit in the housing. This enables the associated radial bearing to carry a radial load.

● Standard preload

Bore Diameter Number	Standard preload (N)	
	C7	C8
20TAD20	215	590
30TAD20		
35TAD20	245	
40TAD20		685
45TAD20	295	785
50TAD20	345	880
55TAD20		
60TAD20	390	980
65TAD20		
70TAD20	590	1250
75TAD20		1350
80TAD20	685	1750
85TAD20		2150
90TAD20	1050	2850
95TAD20		2950
100TAD20	1150	
105TAD20		3450
110TAD20	1450	4400
120TAD20		1650
130TAD20		1750
140TAD20		1950
150TAD20		6350
160TAD20	2750	6850
170TAD20		2950
180TAD20		8800
190TAD20	3900	
200TAD20		4100

Inner Ring and Height Tolerances

Nominal bearing bore diameter d (mm)	Single plane mean bore diameter deviation Δd_{mb}												Variation of assembled height T		Width variation of inner ring V_{rs} (Max)		Side face runout with reference to bore S_f (Max)		Side face runout with reference to recovery of assembled bearing inner ring and of assembled bearing outer ring $S_{fa, S_{fo}}$ (Max)	
	Class 5						Class 4						High	Low	Class 5	Class 4	Class 5	Class 4	Class 5	Class 4
	Over	Incl.	High	Low	High	Low	High	Low	Class 5	Class 4	Class 5	Class 4								
18	30	0	-6	0	-5	0	-300	5	2.5	8	4	5	3							
30	50	0	-8	0	-6	0	-400	5	3	8	4	5	3							
50	80	0	-9	0	-7	0	-500	6	4	8	5	6	5							
80	120	0	-10	0	-8	0	-600	7	4	9	5	6	5							
120	180	0	-13	0	-10	0	-700	8	5	10	6	8	6							
180	250	0	-15	0	-12	0	-800	10	6	11	7	8	6							

Variation and deviation of outer ring

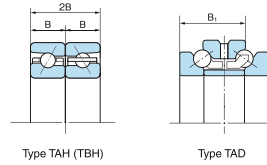
Nominal bearing bore diameter D (mm)	Single plane mean outside diameter deviation ΔD_{mb}				Width variation of inner ring V_{cs} (Max)		Outside inclination of outer ring S_o (Max)	
	Class 5 - Class 4				Class 5	Class 4	Class 5	Class 4
	Over	Incl.	High	Low				
18	30		-20	-27	5	2.5	8	4
30	50		-24	-33	6	3	8	4
50	80		-28	-38	8	4	9	5
80	120		-33	-44	8	5	10	5
120	180		-33	-46	8	5	10	5
180	250		-37	-52	10	7	11	7
250	315		-41	-59	11	7	13	8

(3) Combination Angular Contact Ball Bearings Type TAH10, TBH10

● Feature design

The ball diameter and quantity are the same as Double-direction Thrust Angular Contact Ball Bearings type TAD20. The contact angle is 30° for TAH10 type and 40° for TBH10 type. They are suitable for high-speed.

Their Duplex Combination width 2B of type DB or DF is the same as width B1 of TAD20 type. TAD20 type are interchangeable to TAH10 type or TBH10 type by changing the method of setting to shaft.



● Standard preload

Bore Diameter Number	Bearing	
	TAH	TBH
50	294	539
55		
60	392	686
65		
70		
75	588	1080
80		
85	686	1270
90		
95	1080	1860
100		
105	1180	2060
110	1370	2450
120	1470	2550
130	1860	3330
140	1960	3530
150	2450	4310
160	2650	4510
170	3040	5300

● Tolerance of outside diameter

The outside diameter of the outer ring is made with a special tolerance for a clearance fit in the housing.

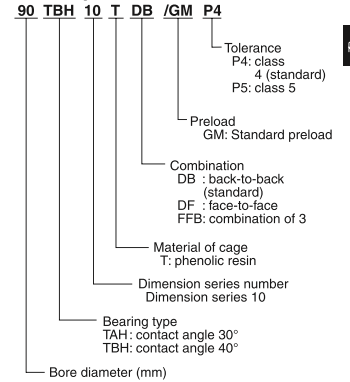
This enables the associated radial bearing to carry a radial load, like as TAD20 type.

Tolerance of outside diameter Unit: μm

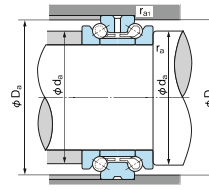
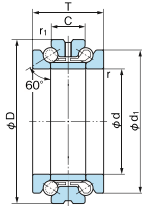
Nominal bearing outside diameter D (mm)	Outside diameter deviation ΔD_s			
	Over	Incl.	High	Low
30	50		-20	-41
50	80		-30	-49
80	120		-36	-58
120	180		-43	-68
180	250		-50	-79
250	315		-56	-88

JIS (ISO) class 4 for other tolerances

● Bearing No.



Double-direction Thrust Angular Contact Ball Bearings
TAD20 Series

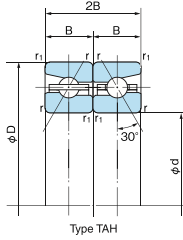


1N=0.102kgf

d	Boundary dimensions (mm)								Bearing No.		Basic dynamic load rating Ca (N)	Basic static load rating Coa (N)	Limiting speed (min ⁻¹)		Abutment and fillet dimensions (mm)				Mass (kg)	Bearing No. Standard type
	Standard type	d Large bore type ⁽¹⁾	D	d ₁	T	C	r (min)	r ₁ (min)	Standard type	Large bore type ⁽¹⁾			Grease lubrication	Oil lubrication	d _a (min)	D _a (max)	r _a (max)	r _{a1} (max)		
25	27	47	40	28	14	0.6	0.3	25TAD20	27TAD20	10700	19900	8000	10000	33	43.5	0.6	0.3	0.197	25TAD20	
30	32	55	47	32	16	1	0.6	30	32	14000	27100	7000	9000	39	51	1	0.6	0.301	30	
35	37	62	53	34	17	1	0.6	35	37	16200	33000	6200	8200	45	58	1	0.6	0.394	35	
40	42	68	58.5	36	18	1	0.6	40TAD20	42TAD20	18600	39500	5800	7800	50	64	1	0.6	0.482	40TAD20	
45	47	75	65	38	19	1	0.6	45	47	21200	47000	5500	7300	56	71	1	0.6	0.605	45	
50	52	80	70	38	19	1	0.6	50	52	22000	52000	5000	6700	61	76	1	0.6	0.656	50	
55	57	90	78	44	22	1.1	0.6	55TAD20	57TAD20	29900	71500	4500	6200	68	85	1	0.6	0.988	55TAD20	
60	62	95	83	44	22	1.1	0.6	60	62	30500	75000	4300	6000	73	90	1	0.6	1.06	60	
65	67	100	88	44	22	1.1	0.6	65	67	31500	81500	4100	5500	78	95	1	0.6	1.12	65	
70	73	110	97	48	24	1.1	0.6	70TAD20	73TAD20	37500	99000	3800	5200	85	105	1	0.6	1.53	70TAD20	
75	78	115	102	48	24	1.1	0.6	75	78	38500	107000	3600	4900	90	110	1	0.6	1.16	75	
80	83	125	110	54	27	1.1	0.6	80	83	51000	138000	3400	4500	97	119	1	0.6	2.20	80	
85	88	130	115	54	27	1.1	0.6	85TAD20	88TAD20	51500	144000	3200	4300	102	124	1	0.6	2.31	85TAD20	
90	93	140	123	60	30	1.5	1	90	93	59000	166000	3000	4000	109	132	1.5	1	3.05	90	
95	98	145	128	60	30	1.5	1	95	98	59500	173000	2900	3900	114	137	1.5	1	3.18	95	
100	103	150	133	60	30	1.5	1	100TAD20	103TAD20	60500	180000	2800	3700	119	142	1.5	1	3.32	100TAD20	
105	109	160	142	66	33	2	1	105	109	67000	199000	2600	3500	125	151	2	1	4.19	105	
110	114	170	150	72	36	2	1	110	114	81500	236000	2500	3300	132	161	2	1	5.35	110	
120	124	180	160	72	36	2	1	120TAD20	125TAD20	84000	256000	2300	3100	142	171	2	1	5.73	120TAD20	
130	135	200	177	84	42	2	1	130	135	109000	325000	2100	2800	156	190	2	1	8.58	130	
140	145	210	187	84	42	2	1	140	145	113000	355000	2000	2600	166	200	2	1	9.10	140	
150	155	225	200	90	45	2.1	1.1	150TAD20	155TAD20	123000	390000	1850	2500	178	213	2	1	11.2	150TAD20	
160	165	240	212	96	48	2.1	1.1	160	165	138000	435000	1750	2350	190	227	2	1	13.6	160	
170	176	260	230	108	54	2.1	1.1	170	176	175000	550000	1600	2150	204	246	2	1	18.5	170	
180	187	280	248	120	60	2.1	1.1	180TAD20	187TAD20	200000	640000	1500	2000	220	264	2	1	24.7	180TAD20	
190	197	290	258	120	60	2.1	1.1	190	197	203000	665000	1450	1950	230	274	2	1	25.5	190	
200	207	310	274	132	66	2.1	1.1	200	207	257000	835000	1350	1800	244	292	2	1	32.7	200	

Note: (1) Large bore type bearings are used at large bore side of cylindrical roller bearings with tapered bore NN3000K type.

■ Combination Angular Contact Ball Bearings
TAH10 Series

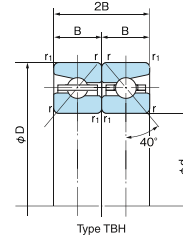


Type TAH

1N=0.102kgf

Bearing No.	Dimensions (mm)					Basic dynamic load rating Ca (N)	Basic static load rating C0a (N)	Limiting speed (min ⁻¹)	
	d	D	2B	r (min)	r ₁ (min)			Grease lubrication	Oil lubrication
50TAH10DB	50	80	28.5	1	0.6	19200	40500	9200	11000
55TAH10DB	55	90	33	1.1	0.6	23800	51000	8300	9700
60TAH10DB	60	95	33	1.1	0.6	24700	56000	7700	9000
65TAH10DB	65	100	33	1.1	0.6	25600	61000	7300	8500
70TAH10DB	70	110	36	1.1	0.6	35000	80000	6700	7800
75TAH10DB	75	115	36	1.1	0.6	35500	83500	6300	7400
80TAH10DB	80	125	40.5	1.1	0.6	41500	99500	5900	6800
85TAH10DB	85	130	40.5	1.1	0.6	42000	104000	5600	6500
90TAH10DB	90	140	45	1.5	1	55500	135000	5200	6100
95TAH10DB	95	145	45	1.5	1	56000	141000	5000	5800
100TAH10DB	100	150	45	1.5	1	57000	147000	4800	5600
105TAH10DB	105	160	49.5	2	1	64500	168000	4500	5300
110TAH10DB	110	170	54	2	1	73000	191000	4300	5000
120TAH10DB	120	180	54	2	1	75000	207000	4000	4700
130TAH10DB	130	200	63	2	1	99500	269000	3600	4200
140TAH10DB	140	210	63	2	1	103000	291000	3400	4000
150TAH10DB	150	225	67.5	2.1	1.1	121000	340000	3200	3700
160TAH10DB	160	240	72	2.1	1.1	131000	375000	3000	3500
170TAH10DB	170	260	81	2.1	1.1	154000	445000	2800	3300

■ Combination Angular Contact Ball Bearings
TBH10 Series



Type TBH

1N=0.102kgf

Bearing No.	Dimensions (mm)					Basic dynamic load rating Ca (N)	Basic static load rating C0a (N)	Limiting speed (min ⁻¹)	
	d	D	2B	r (min)	r ₁ (min)			Grease lubrication	Oil lubrication
50TBH10DB	50	80	28.5	1	0.6	22800	53000	7700	9200
55TBH10DB	55	90	33	1.1	0.6	28200	67000	6900	8300
60TBH10DB	60	95	33	1.1	0.6	29300	73000	6500	7700
65TBH10DB	65	100	33	1.1	0.6	30000	79500	6100	7300
70TBH10DB	70	110	36	1.1	0.6	41500	104000	5600	6700
75TBH10DB	75	115	36	1.1	0.6	42000	109000	5300	6300
80TBH10DB	80	125	40.5	1.1	0.6	49000	130000	4900	5900
85TBH10DB	85	130	40.5	1.1	0.6	50000	136000	4700	5600
90TBH10DB	90	140	45	1.5	1	65500	176000	4300	5200
95TBH10DB	95	145	45	1.5	1	66500	184000	4200	5000
100TBH10DB	100	150	45	1.5	1	67500	191000	4000	4800
105TBH10DB	105	160	49.5	2	1	76500	219000	3800	4500
110TBH10DB	110	170	54	2	1	86000	249000	3600	4300
120TBH10DB	120	180	54	2	1	88500	269000	3300	4000
130TBH10DB	130	200	63	2	1	118000	350000	3000	3600
140TBH10DB	140	210	63	2	1	121000	380000	2900	3400
150TBH10DB	150	225	67.5	2.1	1.1	143000	445000	2700	3200
160TBH10DB	160	240	72	2.1	1.1	155000	490000	2500	3000
170TBH10DB	170	260	81	2.1	1.1	182000	580000	2300	2800

Ball Screw Support Bearings

This type is used for supporting the ball screws that are used as actuators of high precision and high speed machines, precision measurement

equipment, robots, etc. This is a precision and high ability bearing.

● Feature design

(1) High stiffness

These bearings are designed with polyamide cages and a greater number of balls than conventional angular contact ball bearings. For these reasons, bearing stiffness is greater than conventional bearings.

(2) Easy fitting and adjustment

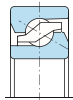
These bearings are supplied with a pre-set preload so difficult adjustment and torque measurement is eliminated.

(3) Simplified bearing mounting structure

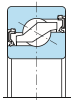
These bearings are supplied with a 60° contact angle so radial and thrust load combinations can be sustained. This results in a simplified and compact shaft and housing design.

(4) Available with seal

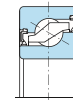
Seals come in both contact seal and non-contact seal types. It is possible to choose the type that best suits the application.



Open type



Contact seal



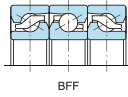
Non-contact seal

Duplex sets



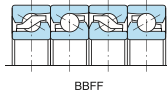
DF

Triplex sets



BFF

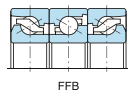
Quad sets



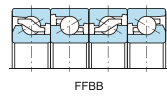
BBFF



DB



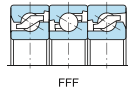
FFB



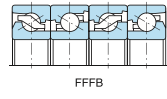
FFBB



DT



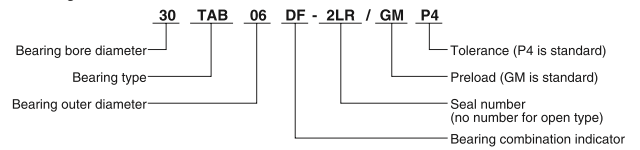
FFF



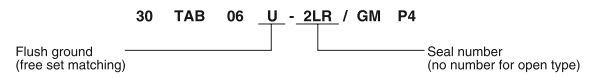
FFFB

(Sealed bearings are sealed on the outside edges only when used in combination.)

● Bearing No.



Flush ground (universal matching)



● Tolerances

Tolerances for inner ring (outer ring width/axial runout)

Unit: μm

Nominal bearing bore diameter (mm)	Single plane mean bore diameter variation $\Delta D_{mp}, \Delta D_s$	Bore diameter variation in a single radial plane V_{ϕ} (Max)				Mean bore diameter variation V_{mp} (Max)				Deviation of a single ⁽¹⁾ inner ring width (or a single outer ring width) $\Delta B_s(\Delta C_s)$				Width deviation V_{ϕ} of inner ring (Max)				Radial runout of assembled bearing inner ring K_{ϕ} (Max)				Side face runout S_{ϕ} with reference to bore (Max)				Side face runout with reference to raceway of assembled bearing inner ring S_{ϕ} and of assembled bearing outer ring S_{ϕ} (Max)			
		P5		P4		P5		P4		P5		P4		P5		P4		P5		P4		P5		P4					
		High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low				
Over	Incl.																												
10	18	0	-5	0	-4	4	3	4	3	0	-80	0	-80	5	2.5	4	2.5	7	3	4	2								
18	30	0	-6	0	-5	5	4	5	4	0	-120	0	-120	5	2.5	4	3	8	4	5	2.5								
30	50	0	-8	0	-6	6	5	6	5	0	-120	0	-120	5	3	5	4	8	4	6	2.5								
50	60	0	-9	0	-7	7	6	7	6	0	-150	0	-150	6	4	5	4	8	5	7	2.5								

Note: (1) These deviations are for single bearing. For combination bearings, multiply these values by row number.

Tolerances for outer ring

Unit: μm

Nominal bearing outside diameter (mm)	Single plane mean outside diameter variation of outer ring $\Delta D_{mp}, \Delta D_s$	Outside diameter variation in a single radial plane V_{ϕ} (Max)				Mean outside diameter variation V_{mp} (Max)				Width deviation V_{ϕ} of outer ring (Max)				Radial runout of assembled bearing outer ring K_{ϕ} (Max)				Outside inclination of outer ring S_{ϕ} (Max)						
		P5		P4		P5		P4		P5		P4		P5		P4		P5		P4				
		High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low			
Over	Incl.																							
30	50	0	-7	0	-6	5	5	4	3	5	2.5	7	5	8	4									
50	80	0	-9	0	-7	7	5	5	3.5	6	3	8	5	8	4									
80	120	0	-10	0	-8	8	6	5	4	8	4	10	6	9	5									

● Preload and Axial Spring Constant

Bearing No.	Standard Preload M (N) Combination Mounted Bearing				Axial Spring Constant (N/μm) Combination Mounted Bearing			
	DF DB	BFF FFB	BBFF FFBB	BFFF FFFB	DF DB	BFF FFB	BBFF FFBB	BFFF FFFB
15TAB04	2160	2940	4310	3430	735	1080	1470	1320
17TAB04	2160	2940	4310	3430	735	1080	1470	1320
20TAB04	2160	2940	4310	3430	735	1080	1470	1320
25TAB06	3330	4510	6670	5200	981	1470	1960	1910
30TAB06	3330	4510	6670	5200	981	1470	1960	1910
35TAB07	3920	5300	7840	6180	1230	1770	2350	2300
40TAB07	3920	5300	7840	6180	1230	1770	2350	2300
40TAB09	5200	7060	10400	8140	1320	1910	2550	2500
45TAB07	4120	5590	8240	6470	1270	1910	2550	2500
45TAB10	5980	8140	12000	9410	1470	2160	2890	2790
50TAB10	6280	8530	12600	9810	1520	2260	3040	2940
55TAB10	6280	8530	12600	9810	1520	2260	3040	2940
55TAB12	7060	9610	14100	11100	1770	2550	3480	3380
60TAB12	7060	9610	14100	11100	1770	2550	3480	3380

● Shaft and housing tolerance:

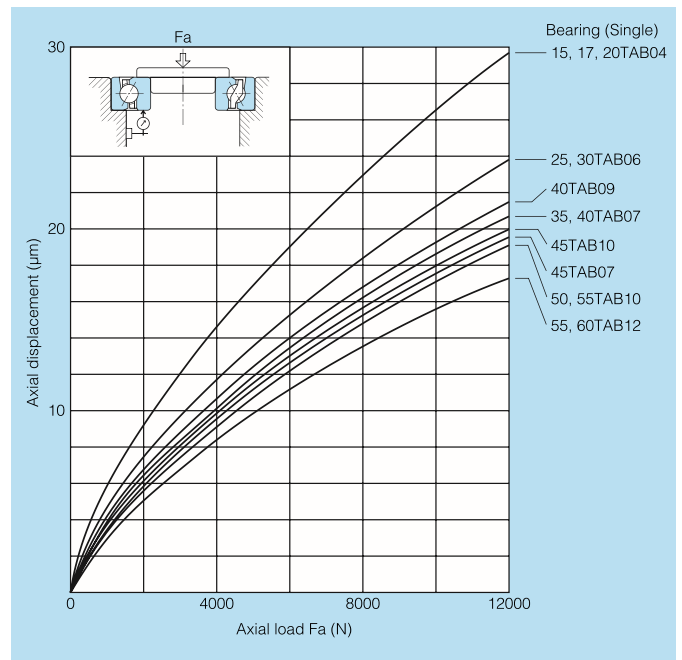
(1) For the fit, refer to the following table.

Shaft fit	h5
Housing fit	H6

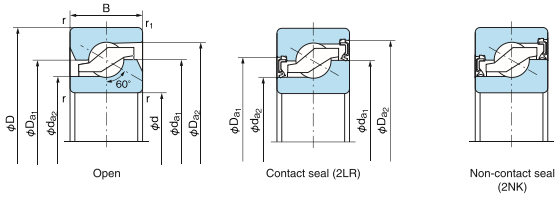
(2) For the squareness of a shoulder, refer to the following table.

Dimensions of shaft diameter and housing bore diameter (mm)		Squareness (μm)
Over	Incl.	
—	80	4
80	120	5

● Axial Load and Axial Displacement



Ball Screw Support Bearings
TAB Series



Dynamic equivalent axial load

$P_a = XFr + YFa$

Brgs loaded axial load	No. of Bearing in set								
	1	2	3	4					
Fa/Fr ≤ e	X	1.9	1.49	2.33	1.17	2.33	2.53	—	
	Y	0.54	—	0.77	0.35	—	0.89	0.35	0.26
Fa/Fr > e	X	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
	Y	1	1	1	1	1	1	1	1

e=2.17

1N=0.102kgf

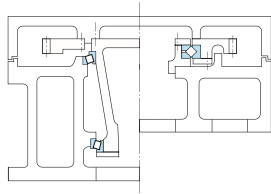
Boundary dimensions (mm)					Bearing No.	Basic dynamic load rating (F) Ca (N)	Axial limiting load (F) Coa (N)	Limiting speed (min ⁻¹) Grease lubrication Oil lubrication	Starting torque (N·cm) Grease lubrication	Reference Dimensions (mm)				Mass (kg) (Reference)	Bearing No.	
d	D	B	r (min)	r ₁ (min)						d _{a1}	d _{a2}	D _{a1}	D _{a2}			
15	47	15	1 ⁽¹⁾	0.6	15TAB04DF(DB)	25900	32000	6300	8000	15	33.7	26.8	33.5	41	0.14	15TAB04DF(DB)
	47	15	1 ⁽¹⁾	0.6	15TAB04DF(DB)-2NK	25900	32000	6300	—	—	33.7	26.8	35	41.9	0.14	15TAB04DF(DB)-2NK
17	47	15	1 ⁽¹⁾	0.6	15TAB04DF(DB)-2LR	25900	32000	6300	—	—	33.7	26.8	35	41.9	0.14	15TAB04DF(DB)-2LR
	47	15	1	0.6	17TAB04DF(DB)	25900	32000	6300	8000	15	33.7	26.8	33.5	41	0.13	17TAB04DF(DB)
20	47	15	1	0.6	17TAB04DF(DB)-2NK	25900	32000	6300	—	—	33.7	26.8	35	41.9	0.13	17TAB04DF(DB)-2NK
	47	15	1	0.6	17TAB04DF(DB)-2LR	25900	32000	6300	—	—	33.7	26.8	35	41.9	0.13	17TAB04DF(DB)-2LR
25	47	15	1	0.6	20TAB04DF(DB)	25900	32000	6300	8000	15	33.7	26.8	33.5	41	0.12	20TAB04DF(DB)
	47	15	1	0.6	20TAB04DF(DB)-2NK	25900	32000	6300	—	—	33.7	26.8	35	41.9	0.12	20TAB04DF(DB)-2NK
30	47	15	1	0.6	20TAB04DF(DB)-2LR	25900	32000	6300	—	—	33.7	26.8	35	41.9	0.12	20TAB04DF(DB)-2LR
	62	15	1	0.6	25TAB06DF(DB)	29900	46400	4650	6000	20	46.2	39.7	46	53.4	0.24	25TAB06DF(DB)
35	62	15	1	0.6	25TAB06DF(DB)-2NK	29900	46400	4650	—	—	46.2	39.7	47.5	54.9	0.24	25TAB06DF(DB)-2NK
	62	15	1	0.6	25TAB06DF(DB)-2LR	29900	46400	4650	—	—	46.2	39.7	47.5	54.9	0.24	25TAB06DF(DB)-2LR
40	62	15	1	0.6	30TAB06DF(DB)	29900	46400	4650	6000	20	46.2	39.7	46	53.4	0.21	30TAB06DF(DB)
	62	15	1	0.6	30TAB06DF(DB)-2NK	29900	46400	4650	—	—	46.2	39.7	47.5	54.9	0.21	30TAB06DF(DB)-2NK
45	62	15	1	0.6	30TAB06DF(DB)-2LR	29900	46400	4650	—	—	46.2	39.7	47.5	54.9	0.21	30TAB06DF(DB)-2LR
	72	15	1	0.6	35TAB07DF(DB)	32500	54300	3750	5000	25	56.2	49.7	56	63.4	0.29	35TAB07DF(DB)
50	72	15	1	0.6	35TAB07DF(DB)-2NK	32500	54300	3750	—	—	56.2	49.7	57.5	64.9	0.29	35TAB07DF(DB)-2NK
	72	15	1	0.6	35TAB07DF(DB)-2LR	32500	54300	3750	—	—	56.2	49.7	57.5	64.9	0.29	35TAB07DF(DB)-2LR
55	72	15	1	0.6	40TAB07DF(DB)	32500	54300	3750	5000	25	56.2	49.7	56	63.4	0.26	40TAB07DF(DB)
	72	15	1	0.6	40TAB07DF(DB)-2NK	32500	54300	3750	—	—	56.2	49.7	57.5	64.9	0.26	40TAB07DF(DB)-2NK
60	72	15	1	0.6	40TAB07DF(DB)-2LR	32500	54300	3750	—	—	56.2	49.7	57.5	64.9	0.26	40TAB07DF(DB)-2LR
	90	20	1	0.6	40TAB09DF(DB)	65000	101000	3150	4000	30	67.2	57.2	67	78.4	0.62	40TAB09DF(DB)
65	90	20	1	0.6	40TAB09DF(DB)-2NK	65000	101000	3150	—	—	67.2	57.2	68.5	79.9	0.62	40TAB09DF(DB)-2NK
	90	20	1	0.6	40TAB09DF(DB)-2LR	65000	101000	3150	—	—	67.2	57.2	68.5	79.9	0.62	40TAB09DF(DB)-2LR
70	75	15	1	0.6	45TAB07DF(DB)	33500	59500	3400	4500	50	61.7	55.2	61.5	68.9	0.25	45TAB07DF(DB)
	100	20	1	0.6	45TAB10DF(DB)	69000	113000	2850	3500	60	74.2	64.2	74	85.4	0.79	45TAB10DF(DB)
75	100	20	1	0.6	50TAB10DF(DB)	69500	119000	2700	3500	65	78.2	68.2	78	89.4	0.72	50TAB10DF(DB)
	120	20	1	0.6	55TAB10DF(DB)	69500	119000	2700	3500	65	78.2	68.2	78	89.4	0.95	55TAB10DF(DB)
80	120	20	1	0.6	55TAB12DF(DB)	73000	137000	2300	3000	70	92.2	82.2	92	103.4	1.15	55TAB12DF(DB)
	120	20	1	0.6	60TAB12DF(DB)	73000	137000	2300	3000	70	92.2	82.2	92	103.4	1.08	60TAB12DF(DB)

Notes: (1) r (min) = 0.6 for inner ring
 (2) When bearing sets carry axial load with two or three rows, the numbers should be multiplied by 1.64 or 2.16.
 (3) When bearing sets carry axial load with two or three rows, the numbers should be multiplied by 2 or 3.

Bearings for Turntable Applications

Cross Tapered Roller Bearings

This bearing type is designed with two inner rings and one outer ring. The rolling elements (Tapered rollers) are arranged with their surfaces contact the ring raceways in an alternating pattern.



Example of mounting of Tapered Roller Bearings and Cross Tapered Roller Bearing

• Feature design

- (1) This type can sustain radial, overturning moment and bi-directional axial loads.
- (2) Change in size due to thermal growth does not affect this type of bearing. Preload is stable over the entire temperature operating range.
- (3) Light weight, compact, easy to assemble.

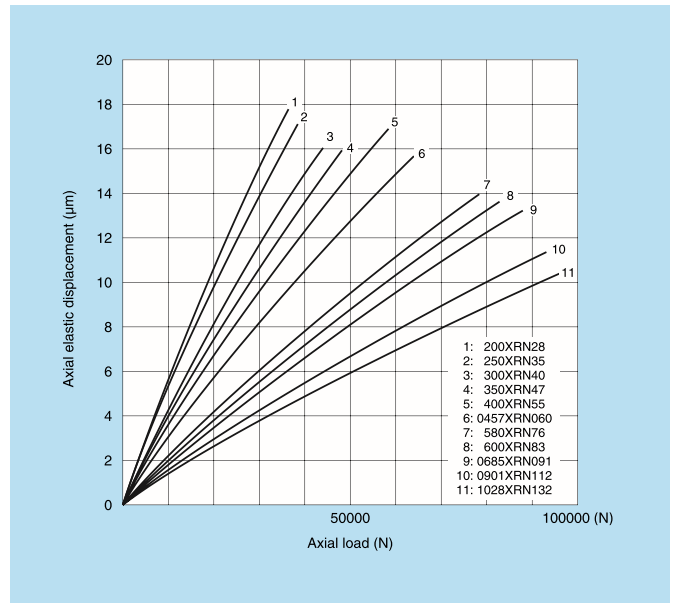
• Applications

- (1) Worktable of machining centers or vertical grinding machines
- (2) Work-spindle of lathes or grinding machines
- (3) The indexing mechanisms of large milling machines or drilling machines
- (4) Turntable mechanism of parabolic antenna

• Tolerances

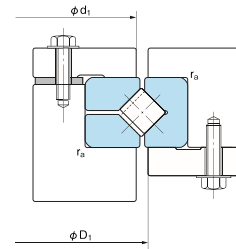
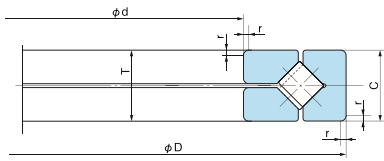
Bearing No.	Single plane mean bore diameter deviation Δd_{mp}		Single plane mean outside diameter deviation ΔD_{mp}		Variation of assembled height T		Outer ring runout Max (μm)	
	High	Low	High	Low	High	Low	Radial runout	Sideface runout
200XRN28	0	-15	0	-18	+350	-250	7	7
250XRN35	0	-10	0	-13	+350	-250	9	9
300XRN40	0	-13	0	-15	+350	-250	7	7
350XRN47	0	-13	0	-15	+350	-250	9	9
400XRN55	0	-13	0	-18	+350	-250	9	9
0457XRN060	+25	0	+25	0	+380	-380	9	9
580XRN76	+25	0	+38	0	+406	-406	10	10
600XRN83	+38	0	+38	0	+406	-406	12	12
0685XRN091	+38	0	+38	0	+508	-508	12	12
0901XRN112	+51	0	+51	0	+508	-508	14	14
1028XRN132	+76	0	+76	0	+760	-760	16	16

• Axial Load and Axial Displacement



Cross Tapered Roller Bearings

Bore Diameter: 200~1028.7mm



1N=0.102kgf

Bearing No.	Boundary dimensions (mm)				Basic dynamic load rating Ca (N)	Basic static load rating Coa (N)	Limiting speed (min ⁻¹)		Abutment and fillet dimensions (mm)			Bearing No.
	d	D	T (C)	r			Grease lubrication	Oil lubrication	d ₁ (min)	D ₁ (max)	fa (max)	
200XRN28 ()	200	280	30	1.5	144000	520000	480	950	235	249	1	*200XRN28 (*)
250XRN35 ()	250	350	40	3	170000	680000	400	800	302	312	1.5	*250XRN35 (*)
300XRN40 ()	300	400	38	3	268000	985000	330	650	345	369	2.5	*300XRN40 (*)
350XRN47 ()	350	470	50	3	284000	1230000	280	560	410	424	1.5	*350XRN47 (*)
400XRN55 ()	400	550	60	3.5	365000	1900000	250	500	475	492	1.5	*400XRN55 (*)
0457XRN060	457.2	609.6	63.5	3.3	370000	1670000	220	440	535	554	2	0457XRN060
580XRN76	580	760	80	6.4	830000	3800000	170	340	667	691	4	580XRN76
600XRN83	600	830	80	3.3	1030000	4600000	160	320	708	738	2	600XRN83
0685XRN091	685.8	914.4	79.375	3.3	1090000	5000000	140	280	807	834	2	0685XRN091
0901XRN112	901.7	1117.6	82.55	3.3	1090000	5650000	110	220	1013	1037	2	0901XRN112
1028XRN132	1028.7	1327.15	114.3	3.3	1830000	9300000	90	180	1184	1221	2	1028XRN132

Note: (*) Inner and outer diameters for bearings marked with * have minus (-) deviation.
 Remark: This table is for bearings used in longitudinal rotating applications (such as tables).