Main Spindle Bearings

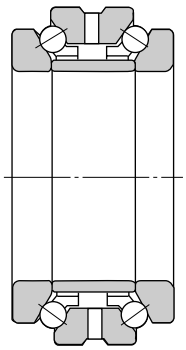
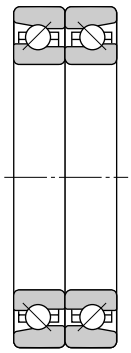
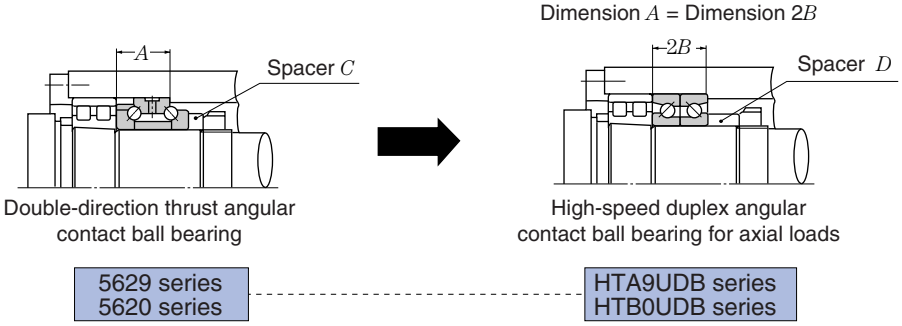
11. Angular Contact Ball Bearings for Axial Loads CONTENTS

11. Angular Contact Ball Bearings for Axial Loads

① Features and types

NTN provides a range of thrust bearings for the main spindles. This includes 5629 and 5620 series for high axial rigidity (contact angle 60˚) and HTA U(A) series high-speed duplex angular contact ball bearings for axial loads with optimized internal design (contact angle 40˚, 30˚). These bearings are used in conjunction with NN30, NN49, or NNU49 series double-row cylindrical roller bearings (matched bearings must have the same bore and outside diameter).

Table 11.1 Types of angular contact ball bearings for axial loads

	5629 and 5620 series	HTA0U (A)..DB, HTA9U (A)..DB series
Bearing type		
Initial contact angle	60˚	40˚, 30˚
Cage material	High-strength machined brass cage	Molded resin, machined phenolic, high-strength machined copper alloy cage
Features	These series can withstand axial loads in both directions. Due to a larger contact angle, rigidity in axial directions is enhanced. The structure of these bearings limits them to grease-lubricated vertical shaft applications.	These duplex angular contact ball bearing series have similar design to the double-row thrust angular contact ball bearing series, but are different in terms of their widths (see the diagrams below). Since their contact angles are lower at 40° and 30°, the series boast high-speed capability. However, their axial rigidity is less than double-row thrust angular contact ball bearings with 60° contact angle.
Interchangeability	A double-direction thrust angular contact ball bearing can be readily interchanged with a duplex angular contact ball bearing simply by replacing spacer C with spacer D; the dimensions of the shaft and housing remain unchanged. 	

② Standard cage types

Table 11.2 Standard cage of angular contact ball bearing for axial loads

Bearing series	Machined phenol cage	Machined brass cage
5629	—	562920～562964
5620	—	562005～562064
HTA9U (A)	HTA920～HTA938U	HTA940U～HTA964U
HTA0U (A)	HTA007～HTA038U	HTA040U～HTA064U

Notes: Cage types may be subjected to change without notice. For details, contact **NTN** Engineering.

③ Bearing designations

562 0 20M / GN P4

- **Tolerance class code** P5: **NTN** Class 5, P4: **NTN** Class 4
- **Internal clearance code** GN: Normal preload, GM: Medium preload
- **Bore code (refer to the dimensions tables)**
  without M: Tapered shaft small side diameter type (Ex.: 562020→ϕ100 mm bore)
  with M: Tapered shaft large side diameter type (Ex.: 562020→ϕ103 mm bore)
- **Dimension series code**
- **Bearing type**

5S - HTA 0 20 U A T2 DB / GN P4L

- **Tolerance class code** P5: JIS Class 5 P4: JIS Class 4
  L: Outer ring outside diameter tolerance for axial load
- **Internal clearance code** GN: Normal preload, GM: Medium preload
- **Duplex arrangement code** DB: back-to-back (double-row), DTBT: tandem back-to-back (four-row)
- **Cage code** No code: Standard cage, T2: Molded resin, L1: Machined brass cage
- **Contact angle code** No code: 40°, A: 30°
- **Bearing series: ULTAGE**
- **Nominal bore diameter (see the dimensions tables)**
- **Dimension series code**
- **Bearing type**
- **Material code** 5S: Material of rolling element is ceramics, No code: Bearing steel

④ Accuracy of double-direction angular contact thrust ball bearings

Table 11.3 Inner rings

Unit: μm

Nominal bore diameter d mm over	incl.	Single plane mean bore diameter deviation Δ_{dmp} or bore diameter deviation Δ_{ds} Class 5 high	low	Class 4 high	low	Face runout with bore S_d Class 5 max	Class 4 max	Axial runout S_{ia} Class 5 max	Class 4 max	Width variation VB_s Class 5 max	Class 4 max	Bearing height deviation ΔT_s Class 5 high	Class 4 low
18	30	0	− 6	0	− 5	8	4	5	3	5	2.5	0	− 300
30	50	0	− 8	0	− 6	8	4	5	3	5	3	0	− 400
50	80	0	− 9	0	− 7	8	5	6	5	6	4	0	− 500
80	120	0	−10	0	− 8	9	5	6	5	7	4	0	− 600
120	180	0	−13	0	−10	10	6	8	6	8	5	0	− 700
180	250	0	−15	0	−12	11	7	8	6	10	6	0	− 800
250	315	0	−18	0	−15	13	8	10	8	13	7	0	− 900
315	400	0	−23	0	−18	15	9	13	10	15	9	0	−1 000

Table 11.4 Outer rings

Unit: μm

Nominal bore diameter D mm over	incl.	Single plane mean outside diameter deviation Δ_{Dmp} or outside diameter deviation Δ_{Ds} Class 5 high	Class 4 low	Face runout with bore S_D Class 5 max	Class 4 max	Axial runout S_{ea} Class 5 max	Class 4 max	Width variation VC_s Class 5 max	Class 4 max
30	50	−30	−40	8	4	Identical to ΔB_s relative to d of the same bearing.		5	2.5
50	80	−40	−50	8	4			6	3
80	120	−50	−60	9	5			8	4
120	150	−60	−75	10	5			8	5
150	180	−60	−75	10	5			8	5
180	250	−75	−90	11	7			10	7
250	315	−90	−105	13	8			11	7
315	400	−110	−125	13	10			13	8
400	500	−120	−140	15	13			15	10

⑤ Accuracy of high-speed duplex angular contact ball bearings for axial loads

Table 11.5 Inner rings

Unit: μm

Nominal bore diameter d mm over	incl.	Single plane mean bore diameter deviation Δ_{dmp} Class 5 high	low	Class 4❶ high	low	Single radial plane bore diameter variation V_{dp} Diameter series 9 Class 5 max	Class 4 max	Diameter series 0 Class 5 max	Class 4 max	Mean bore diameter deviation V_{dmp} Class 5 max	Class 4 max	Face runout with bore S_d Class 5 max	Class 4 max	Axial runout S_{ia} Class 5 max	Class 4 max
18	30	0	− 6	0	− 5	6	5	5	4	3	2.5	8	4	5	3
30	50	0	− 8	0	− 6	8	6	6	5	4	3	8	4	5	3
50	80	0	− 9	0	− 7	9	7	7	5	5	3.5	8	5	6	5
80	120	0	−10	0	− 8	10	8	8	6	5	4	9	5	6	5
120	150	0	−13	0	−10	13	10	10	8	7	5	10	6	8	6
150	180	0	−13	0	−10	13	10	10	8	7	5	10	6	8	6
180	250	0	−15	0	−12	15	12	12	9	8	6	11	7	8	6
250	315	0	−18	0	−14	18	14	14	11	9	8	13	8	10	8
315	400	0	−23	0	−16	23	17	18	12	12	9	15	10	13	10

❶The tolerance of bore diameter deviation Δ_{ds} is the same as the tolerance of single plane mean bore diameter deviation Δ_{dmp}.

Unit: μm

Overall width variation of assembled bearing ΔB_s Class 5 high	Class 4 low	Width variation VB_s Class 5 max	Class 4 max	Nominal bore diameter d mm over	incl.
0	−240	5	2.5	18	30
0	−240	5	3	30	50
0	−300	6	4	50	80
0	−400	7	4	80	120
0	−500	8	5	120	150
0	−500	8	5	150	180
0	−600	10	6	180	250
0	−700	13	8	250	315
0	−800	15	10	315	400

Table 11.6 Outer rings

Unit: μm

Nominal bore diameter D mm over	incl.	Single plane mean outside diameter deviation Δ_{Dmp} and outside diameter deviation Δ_{Ds} Class 5L or Class 4L❷ high	low	Class 5 high	low	Class 4❷ high	low	Axial runout S_{ea} Class 5 All classes	Class 4 All classes	Overall width variation of assembled bearing ΔC_s All classes	Width variation VC_s Class 5 max	Class 4 max
30	50	−25	−36	0	− 7	0	− 6	8	5	Identical to B_s relative to d on the same bearing.	5	2.5
50	80	−30	−43	0	− 9	0	− 7	10	5		6	3
80	120	−36	−51	0	−10	0	− 8	11	6		8	4
120	150	−43	−61	0	−11	0	− 9	13	7		8	5
150	180	−43	−61	0	−13	0	−10	14	8		8	5
180	250	−50	−70	0	−15	0	−11	15	10		10	7
250	315	−56	−79	0	−18	0	−13	18	10		11	7
315	400	−62	−87	0	−20	0	−15	20	13		13	8
400	500	−68	−95	0	−23	—	—	23	15		15	10

❷ The tolerance of outside diameter deviation Δ_{Ds} to be applied to the Class 4 and Class 2 is same as the tolerance of the mean outside diameter deviation Δ_{dmp}. Note that the Class 4 is applicable to diameter series 0 and 2, and the Class 2 is applicable to all the diameter series.
Note: This standard is the **NTN** standard.

⑥ Basic preload

The initial internal clearance or initial preload must be selected with consideration of the lubricating method, maximum speed, and required axial rigidity. Although usage with normal preload (GN) within the allowable speed range is possible for both grease lubrication and air-oil lubrication, ask **NTN** Engineering to recommend the appropriate preload if axial rigidity is required and you want to inhibit temperature rise of the main spindle. The standard preloads are summarized in **Table 11.7**.

Table 11.7 Basic preload

Unit: : N {kgf}

Bore number	5629		5620		HTA9UDB		HTA9UADB		HTA0UDB		HTA0UADB		Bore number
	Normal GN	Medium GM	Normal GN	Medium GM	Normal GN	Medium GM	Normal GN	Medium GM	Normal GN	Medium GM	Normal GN	Medium GM	
	GN	GM	GN	GM	GN	GM	GN	GM	GN	GM	GN	GM	
05			294 {30}	685 {70}					390 {40}	685 {70}	147 {15}	294 {30}	05
06													06
07			490 {50}	785 {80}					685 {70}	1 270 {130}	294 {30}	590 {60}	07
08													08
09													09
10			980 {100}	1 670 {170}									10
11											490 {50}	885 {90}	11
12	——	——			——	——	——	——					12
13													13
14			1 470 {150}	2 450 {250}					980 {100}	1 570 {160}	590 {60}	1 470 {150}	14
15													15
16										1 960 {200}			16
17											885 {90}	1 960 {200}	17
18									1 470 {150}	2 450 {250}			18
19													19
20	1 470 {150}	2 450 {250}	1 960 {200}	3 250 {330}	980 {100}	1 670 {170}	685 {70}	1 270 {130}			980 {100}	2 450 {250}	20
21													21
22									1 960 {200}	3 450 {350}			22
24	1 960 {200}	2 940 {300}			1 270 {130}	2 450 {250}	885 {90}	1 770 {180}					24
26							980 {100}	1 960 {200}	2 940 {300}	5 400 {550}	1 470 {150}	3 450 {350}	26
28													28
30					1 960 {200}	3 450 {350}	1 270 {130}	2 450 {250}					30
32									3 900 {400}	7 350 {750}	2 450 {250}	4 900 {500}	32
34													34
36	2 450 {250}	3 900 {400}	2 450 {250}	3 900 {400}	3 450 {350}	5 900 {600}	1 770 {180}	3 450 {350}	4 900 {500}	9 300 {950}			36
38											3 450 {350}	6 850 {700}	38
40					3 900 {400}	6 850 {700}	2 450 {250}	4 900 {500}					40
44	2 940 {300}	4 400 {450}	2 940 {300}	4 400 {450}					6 850 {700}	12 700 {1 300}	3 900 {400}	7 850 {800}	44
48													48
52	3 900 {400}	5 900 {600}			4 900 {500}	8 850 {900}	——	——	8 850 {900}	15 700 {1 600}			52
56											5 900 {600}	11 800 {1 200}	56
60			3 900 {400}	5 900 {600}	5 900 {600}	11 800 {1 200}			10 800 {1 100}	17 700 {1 800}			60
64	4 900 {500}	7 350 {750}											64

⑦ Shaft and housing fits

Fits given in **Table 11.8** are recommended for angular contact ball bearings for axial loads. To maintain high accuracy, provision of interference between the shaft and the bore of inner ring is essential. The fit of the housing and bearing should be same as that for cylindrical roller bearings, since an angular contact ball bearing is normally used together with a cylindrical roller bearing.

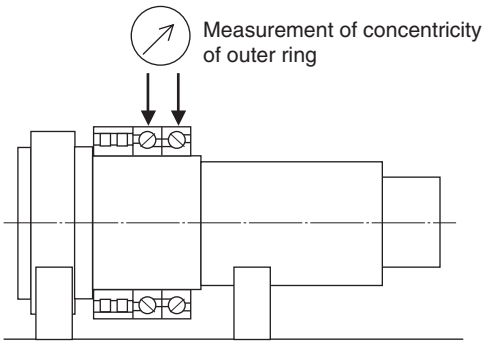


Fig. 11.1 Concentricity

■Checking concentricity of outside diameter of outer ring after bearing

Controlling concentricity of outer ring assembly is necessary for reduction of axial runout of the main spindle. Measure and control the concentricity of outer ring shown in **Fig. 11.1** and "6. Handling of Bearings, ② Mounting" in the Technical Data section.

Table 11.8 Fit to shaft Unit: μm

Nominal bore diameter d mm over	incl.	Fit of inner ring to shaft
2.5	10	0～2T
10	18	0～2T
18	30	0～2.5T
30	50	0～3T
50	80	0～3.5T
80	120	0～4T
120	180	0～5T
180	250	0～6T

Note 1: Target the median value.
2: For high-speed applications where d_{mn} value exceeds 0.75 ×10^6, the fit should be increased.For such an arrangement, consult **NTN** Engineering.
T: Tight (Interference) fit

⑧ Recommended lubrication specifications

Angular contact ball bearings for axial loads are usually used with grease lubrication or air-oil lubrication. Recommended specifications of the lubrication methods are described below.

■Grease lubrication

● Recommended brand of grease

Refer to "7. Lubrication of Bearings, ① Grease lubrication" in the Technical Data section.

● Recommended grease filling amount

d_{mn} value ≦0.65×10^6
15% of the capacity shown in the dimensions tables
dmn value ＞0.65×10^6
12% of the capacity shown in the dimensions tables

● Recommended grease filling method

Refer to "6. Handling of Bearings, ① Cleaning and filling with grease" in the Technical Data section.

Notes: High-strength machined brass cages are used for 5629/5620 series. Thus, if they are used for grease-lubricated vertical shafts, the cage on one side may hang onto the rolling elements, possibly causing seizure. Use of the HTA series with resin cages or oil lubrication (including feeding of lubricating oil) is recommended.

■Air-oil lubrication

● Recommended location of nozzle

Refer to "7. Lubrication of Bearings ② Recommended location of nozzle for air-oil lubrication" in the Technical Data section.

● Recommended specifications of nozzle

Nozzle bore diameter : From 1 to 1.5 mm
Number of nozzles: One nozzle for each bearing, depth of nozzle bore should be four to six times of nozzle bore diameter.

● Recommended specifications of air-oil

Oil type: Spindle oil
Viscosity grade: ISO VG from 10 to 32 (32 is preferable)

Table. 11.9 Air and oil amount

Bearing types	d_{mn} value (×10^6) Over	Incl.	Oil amount per shot mL	Lubrication intervals min	Oil consumption mL/h	Recommended air consumption *NL/min
HTA9 (A)		～ 1.0	0.03	8	0.23	20～40
HTA0 (A)	1.0	～ 1.2		5	0.36	
5S-HTA0 (A)						

＊NL/min (Normal liter/minute) … NL means the volume of air at 0˚C and 1 atmosphere.

⑨ Angular contact ball bearings for axial loads HTA U type

HTA U type angular contact ball bearing has a higher limiting speed with the same rigidity and loading capability as the conventional HTA series.

■Features

1. Optimized internal design to minimize the temperature rise especially at high speed range.
2. Improved molded nylon cage pocket design where the ball contacts to have higher lubrication performance under grease or air-oil lubrication.

■Bearings design

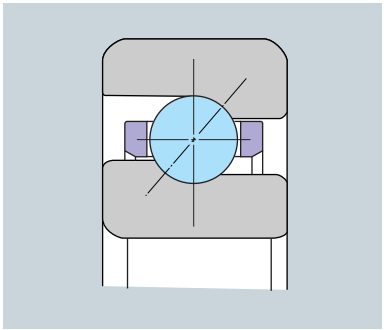
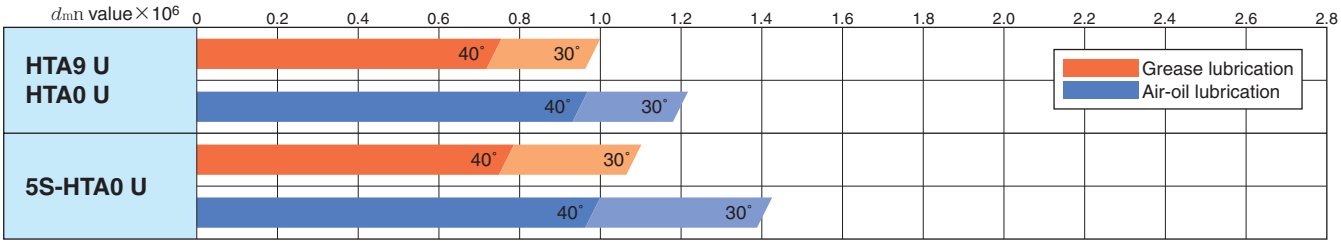


Fig. 11.2 HTA U type

■Permissible speed range



Notes) Permissible speed of each bearing (d_{mn} value) varies depending on the specifications of the machine for which the bearing is used (motor drive system, cooling system, and construction around the bearing). Consider the optimal choice referring to the above guideline and contact **NTN**.

■Axial rigidity

Axial rigidity is at the same level as the conventional design.

【Condition for study】

Bearing	HTA020UADB, HTA020ADB HTA020UDB, HTA020DB (ϕ100×ϕ150×22.5×2 row)
Mounted preload	[α:30˚] 880 N [α:40˚] 1470 N

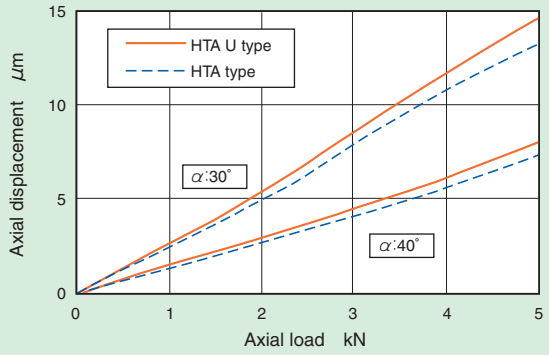


Fig. 11.3 Axial load and rigidity

■Data/Allowable axial load

By reviewing the internal structure, the allowable axial load has improved over HTA types by about 1.3 times with the contact angle of 30˚ and by about 1.2 times with the contact angle of 40˚.

【Condition for study】

Bearing	HTA020UADB, HTA020ADB HTA020UDB, HTA020DB (ϕ100×ϕ150×22.5×2 row)

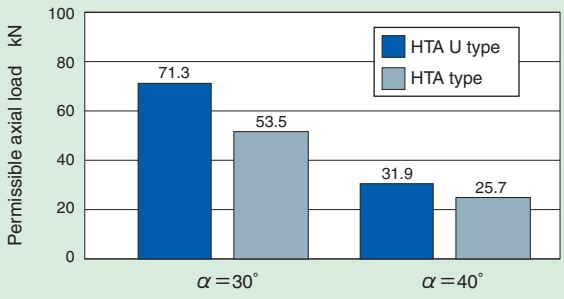


Fig. 11.4 Comparison of permissible axial load

■High speed test

d_{mn} value of 1.0 million under grease lubrication and 1.25 million under air-oil lubrication are realized by the optimized internal design. (**Fig.11.5～11.8**)

【Test condition】

Bearing [α:30˚]	HTA020UADB HTA020ADB (ϕ100×ϕ150×22.5×2 rows)
Speed	～8000 min^{-1}
Mounted preload	880 N
Lubrication	Grease
Grease type	MP-1
Jacket coating	w/, w/o

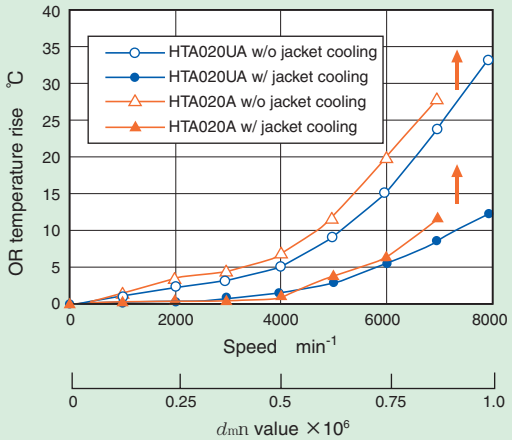


Fig. 11.5 Comparison of temperature rise (Grease, α=30˚)

【Test condition】

Bearing [α:30˚]	HTA020UADB HTA020ADB (ϕ100×ϕ150×22.5×2 rows)
Speed	～10000 min^{-1}
Mounted preload	880 N
Lubrication	Air- oil
Oil	0.03 mL/1shot Oil shot interval 5 min
Air	40 NL/min
Jacket cooling	w/, w/o

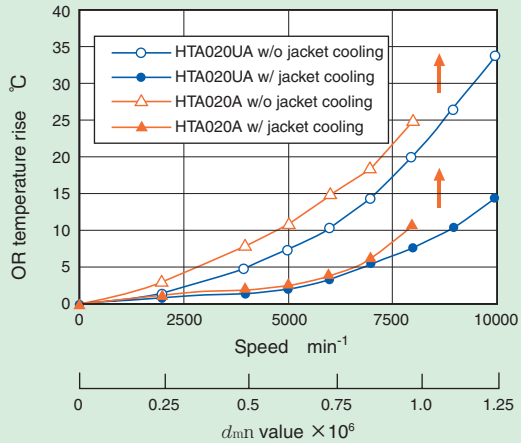


Fig. 11.6 Comparison of temperature rise (Air-oil, α=30˚)

【Test condition】

Bearing [α:40˚]	HTA020UDB HTA020DB (ϕ100×ϕ150×22.5×2 rows)
Speed	～6000 min^{-1}
Mounted preload	1470 N
Lubrication	Grease
Grease type	MP-1
Jacket coating	w/, w/o

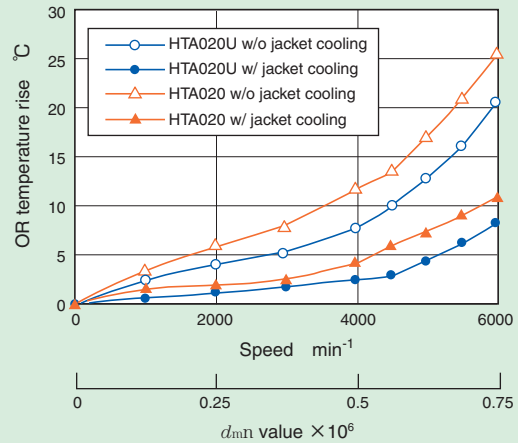


Fig. 11.7 Comparison of temperature rise (Grease, α=40˚)

【Test condition】

Bearing [α:40˚]	HTA020UDB HTA020DB (ϕ100×ϕ150×22.5×2 rows)
Speed	～7500 min^{-1}
Mounted preload	1470 N
Lubrication	Air- oil
Oil	0.03 mL/1shot Oil shot interval 5 min
Air	40 NL/min
Jacket cooling	w/, w/o

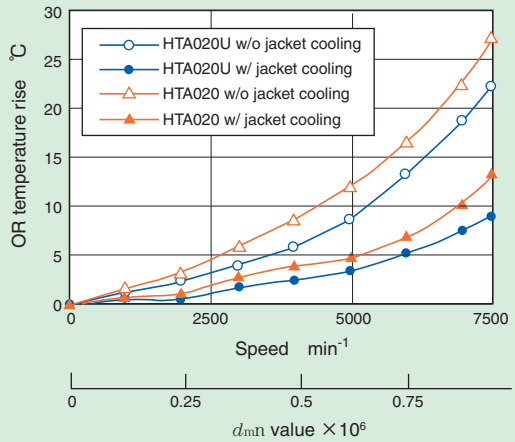
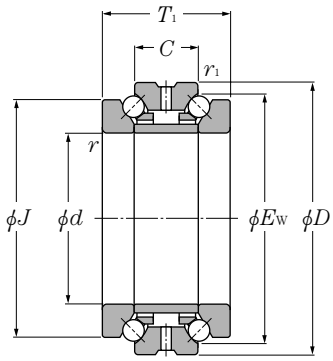


Fig. 11.8 Comparison of temperature rise (Air-oil, α=40˚)

⑩ Dimension tables for angular contact ball bearings

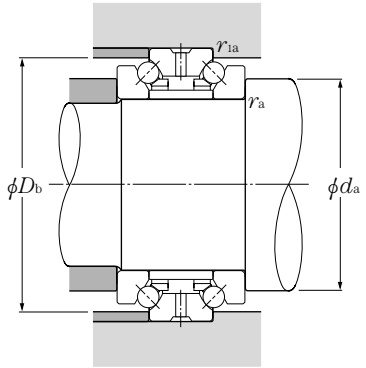
Double-direction angular contact thrust ball bearings 5629 series

Contact angle 60° d 100～320mm



Part number		Boundary dimensions							Basic load ratings				Limiting speed		Mass	
		d mm							dynamic kN	static kN	dynamic kgf	static kgf	min^{-1}		(approx.) kg	
small size	large size	small size	large size	D	T_1	C	$r_{s\,min}$ ❶	$r_{1s\,min}$ ❶	C_a	C_{oa}	C_a	C_{oa}	grease lubrication	oil lubrication	small size	large size
562920	**562920M**	100	104	140	48	24	1.1	0.6	52.0	179	5 300	18 200	3 200	4 200	2.04	1.8
562921	**562921M**	105	109	145	48	24	1.1	0.6	53.5	188	5 450	19 200	3 000	4 100	2.12	1.87
562922	**562922M**	110	114	150	48	24	1.1	0.6	54.0	193	5 500	19 700	2 900	3 900	2.21	1.95
562924	**562924M**	120	124	165	54	27	1.1	0.6	65.0	242	6 600	24 700	2 600	3 500	3.06	2.75
562926	**562926M**	130	134	180	60	30	1.5	1	75.0	284	7 650	28 900	2 400	3 200	4.11	3.7
562928	**562928M**	140	144	190	60	30	1.5	1	76.0	297	7 750	30 500	2 300	3 100	4.38	3.94
562930	**562930M**	150	155	210	72	36	2	1	107	410	10 900	41 500	2 100	2 800	6.88	6.2
562932	**562932M**	160	165	220	72	36	2	1	109	430	11 100	44 000	2 000	2 600	7.26	6.53
562934	**562934M**	170	175	230	72	36	2	1	111	450	11 300	46 000	1 900	2 500	7.64	6.88
562936	**562936M**	180	186	250	84	42	2	1	156	605	15 900	62 000	1 700	2 300	11.2	10
562938	**562938M**	190	196	260	84	42	2	1	157	625	16 000	63 500	1 700	2 200	11.7	10.5
562940	**562940M**	200	207	280	96	48	2.1	1.1	185	735	18 800	75 000	1 600	2 100	16.3	14.7
562944	**562944M**	220	227	300	96	48	2.1	1.1	190	795	19 400	81 000	1 400	1 900	17.7	16
562948	**562948M**	240	247	320	96	48	2.1	1.1	196	850	20 000	87 000	1 300	1 800	19	17
562952	**562952M**	260	269	360	120	60	2.1	1.1	261	1 130	26 600	116 000	1 200	1 600	32.9	29.6
562956	**562956M**	280	289	380	120	60	2.1	1.1	265	1 190	27 000	121 000	1 100	1 500	35	31.5
562960	**562960M**	300	310	420	144	472	3	1.1	335	1 510	34 500	154 000	1 000	1 400	55	49.5
562964	**562964M**	320	330	440	144	72	3	1.1	340	1 580	3 500	161 000	1 000	1 300	58.1	52.3

❶ Minimum allowable value for corner radius dimension r or r_1.
❷ Maximum circumscribed circle diameter of balls.

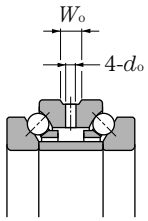


Dynamic equivalent axial load

$P_a = F_a$

Static equivalent axial load

$P_{oa} = F_a$



Dimensions of oil hole and oil groove

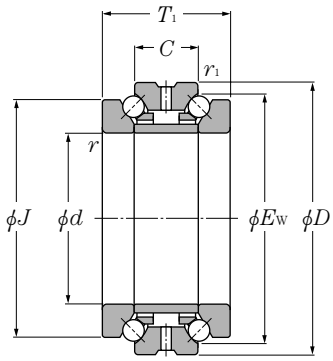
unit: mm

Nominal outer diameter D		Oil groove width	Oil hole diameter
over	incl.	W_o	d_o
150	200	8	4
200	210	12	6
210	260	12	6
260	320	14	6

Reference dimensions mm		Abutment and fillet dimensions mm				Part number	
J	E_w ❷	d_a min	D_b max	r_{as} max	r_{1as} max	small size	large size
126	129	114	134.5	1	0.6	**562920**	**562920M**
131	134	119	139.5	1	0.6	**562921**	**562921M**
136	139	124	144.5	1	0.6	**562922**	**562922M**
150	154.5	138	159.5	1	0.6	**562924**	**562924M**
163	168	150	173.5	1.5	1	**562926**	**562926M**
173	178	160	183.5	1.5	1	**562928**	**562928M**
190	196.5	174	202	2	1	**562930**	**562930M**
200	206.5	184	212	2	1	**562932**	**562932M**
210	216.5	194	222	2	1	**562934**	**562934M**
227	234	207	242	2	1	**562936**	**562936M**
237	344	217	252	2	1	**562938**	**562938M**
252	261	231	270	2	1	**562940**	**562940M**
272	281	251	290	2	1	**562944**	**562944M**
292	301	271	310	2	1	**562948**	**562948M**
328	336	299	350	2	1	**562952**	**562952M**
348	356	319	370	2	1	**562956**	**562956M**
384	391	349	410	2.5	1	**562960**	**562960M**
404	411	369	430	2.5	1	**562964**	**562964M**

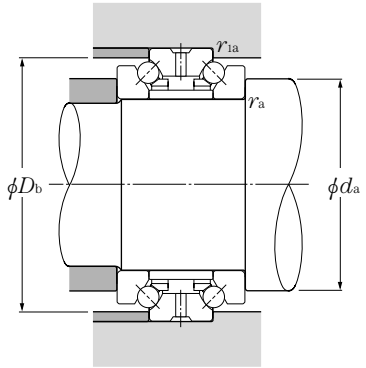
Double-direction angular contact thrust ball bearings 5620 series

Contact angle 60° d 25～320mm



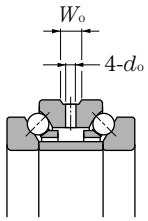
Part number		Boundary dimensions							Basic load ratings				Limiting speed		Mass (approx.)	
		d mm							dynamic kN	static kN	dynamic kgf	static kgf	min^{-1}		kg	
small size	large size	small size	large size	D	T_1	C	$r_{s\,min}$ ❶	$r_{1s\,min}$ ❶	C_a	C_{oa}	C_a	C_{oa}	grease lubrication	oil lubrication	small size	large size
562005	562005M	25	27	47	28	14	0.6	0.3	13.2	28.3	1 350	2 890	10 400	14 000	0.197	0.177
562006	562006M	30	32	55	32	16	1	0.6	14.0	32.5	1 420	3 350	8 700	11 700	0.301	0.28
562007	562007M	35	37	62	34	17	1	0.6	19.7	48.5	2 010	4 950	7 700	10 300	0.394	0.35
562008	562008M	40	42	68	36	18	1	0.6	23.8	58.5	2 430	5 950	7 000	9 400	0.482	0.44
562009	562009M	45	47	75	38	19	1	0.6	26.0	69.0	2 650	7 000	6 200	8 300	0.605	0.54
562010	562010M	50	52	80	38	19	1	0.6	26.8	74.0	2 730	7 550	5 700	7 700	0.638	0.59
562011	562011M	55	57	90	44	22	1.1	0.6	37.0	99.0	3 800	10 100	5 200	7 000	0.988	0.9
562012	562012M	60	62	95	44	22	1.1	0.6	37.5	103	3 850	10 500	4 900	6 500	1.06	0.96
562013	562013M	65	67	100	44	22	1.1	0.6	39.0	111	3 950	11 300	4 600	6 100	1.08	1
562014	562014M	70	73	110	48	24	1.1	0.6	47.5	140	4 850	14 300	4 200	5 600	1.53	1.4
562015	562015M	75	78	115	48	24	1.1	0.6	49.0	150	5 000	15 300	3 900	5 300	1.61	1.5
562016	562016M	80	83	125	54	27	1.1	0.6	57.5	178	5 850	18 200	3 700	4 900	2.2	2
562017	562017M	85	88	130	54	27	1.1	0.6	58.0	184	5 950	18 800	3 500	4 700	2.31	2.1
562018	562018M	90	93	140	60	30	1.5	1	67.5	216	6 850	22 000	3 300	4 400	3.05	2.7
562019	562019M	95	98	145	60	30	1.5	1	68.0	223	6 950	22 700	3 100	4 200	3.18	2.9
562020	562020M	100	104	150	60	30	1.5	1	68.5	229	7 000	23 400	3 000	4 000	3.32	3
562021	562021M	105	109	160	66	33	2	1	78.5	266	8 000	27 100	2 800	3 800	4.19	3.7
562022	562022M	110	114	170	72	36	2	1	96.0	315	9 750	32 500	2 700	3 600	5.35	4.9
562024	562024M	120	124	180	72	36	2	1	98.0	335	10 000	34 500	2 500	3 300	5.73	5.2
562026	562026M	130	134	200	84	42	2	1	139	460	14 200	47 000	2 300	3 100	8.58	7.6
562028	562028M	140	144	210	84	42	2	1	144	495	14 600	50 500	2 200	2 900	9.1	8.1
562030	562030M	150	155	225	90	45	2.1	1.1	147	525	15 000	53 500	2 000	2 700	11.2	10
562032	562032M	160	165	240	96	48	2.1	1.1	172	620	17 600	63 000	1 900	2 500	13.6	11.9
562034	562034M	170	175	260	108	54	2.1	1.1	202	735	20 600	75 000	1 800	2 400	18.5	16.5
562036	562036M	180	186	280	120	60	2.1	1.1	234	865	23 900	88 000	1 600	2 200	24.7	21.8
562038	562038M	190	196	290	120	60	2.1	1.1	236	890	24 100	91000	1 600	2 100	25.5	23
562040	562040M	200	207	310	132	66	2.1	1.1	271	1 030	27 700	105 000	1 500	2 000	32.7	29.7
562044	562044M	220	227	340	144	72	3	1.1	335	1 270	34 000	129 000	1 300	1 800	42.8	38.5
562048	562048M	240	247	360	144	72	3	1.1	340	1 350	35 000	137 000	1 300	1 700	45.8	41.2
562052	562052M	260	269	400	164	82	4	1.5	405	1 710	41 500	174 000	1 100	1 500	67	60.3
562056	562056M	280	289	420	164	82	4	1.5	415	1 810	42 500	185 000	1 100	1 500	71.1	64
562060	562060M	300	310	460	190	95	4	1.5	475	2 170	48 500	221 000	1 000	1 300	102	91.8
562964	562964M	320	330	480	190	95	4	1.5	480	2 230	4 900	228 000	1 000	1 300	108	97.2

❶ Minimum allowable value for corner radius dimension r or r_1. ❷ Maximum circumscribed circle diameter of balls.



Dynamic equivalent axial load
$P_a=F_a$

Static equivalent axial load
$P_{oa}=F_a$



Dimensions of oil hole and oil groove

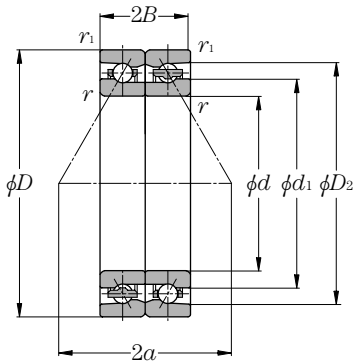
unit: mm

Nominal outer diameter D over	incl.	Oil groove width W_o	Oil hole diameter d_o
150	200	12	6
200	210	12	6
210	260	14	6
260	320	16	8

Reference dimensions mm		Abutment and fillet dimensions mm				Part number	
J	E_w ❷	d_a min	D_b max	r_{as} max	r_{1as} max	small size	large size
40	41.3	33	44	0.6	0.3	**562005**	**562005M**
47	48.5	40	50.5	1	0.6	**562006**	**562006M**
53	55	45.5	57.5	1	0.6	**562007**	**562007M**
58.5	61	50	63.5	1	0.6	**562008**	**562008M**
65	67.5	56.5	70.5	1	0.6	**562009**	**562009M**
70	72.5	61.5	75.5	1	0.6	**562010**	**562010M**
78	81	67.5	84	1	0.6	**562011**	**562011M**
83	86.1	72.5	89	1	0.6	**562012**	**562012M**
88	91	77.5	94	1	0.6	**562013**	**562013M**
97	100	85	104	1	0.6	**562014**	**562014M**
102	105	90	109	1	0.6	**562015**	**562015M**
110	113	96.5	119	1	0.6	**562016**	**562016M**
115	118	102	124	1	0.6	**562017**	**562017M**
123	127	109	133.5	1.5	1	**562018**	**562018M**
128	132	114	138.5	1.5	1	**562019**	**562019M**
133	137	119	143.5	1.5	1	**562020**	**562020M**
142	146	127	152	2	1	**562021**	**562021M**
150	155	133	162	2	1	**562022**	**562022M**
160	165	143	172	2	1	**562024**	**562024M**
177	182	155	192	2	1	**562026**	**562026M**
187	192	165	202	2	1	**562028**	**562028M**
200	206	178	215	2	1	**562030**	**562030M**
212	219	189	230	2	1	**562032**	**562032M**
230	236	203	250	2	1	**562034**	**562034M**
248	255	219	270	2	1	**562036**	**562036M**
258	265	229	280	2	1	**562038**	**562038M**
274	282	243	300	2	1	**562040**	**562040M**
304	310	267	330	2.5	1	**562044**	**562044M**
322	330	287	350	2.5	1	**562048**	**562048M**
354	364	315	388	3	1.5	**562052**	**562052M**
374	384	335	408	3	1.5	**562056**	**562056M**
406	418	364	448	3	1.5	**562060**	**562060M**
426	438	384	468	3	1.5	**562964**	**562964M**

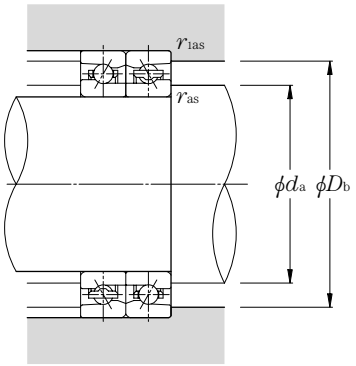
Angular contact ball bearings for axial loads (steel ball type) HTA9UA series

Contact angle 30° (d) 100～320mm



Part number	Boundary dimensions mm					Basic load ratings dynamic / static kN		dynamic / static kgf		Static thrust load capacity kN	kgf	Limiting speed min-1 grease lubrication	oil lubrication
	d	D	2B	rs min ❶	r1s min ❶	Ca	Coa	Ca	Coa				
HTA920UADB	100	140	36	1.1	0.6	40.0	109	4 050	11 100	66.0	6 750	8 300	10 400
HTA921UADB	105	145	36	1.1	0.6	41.0	115	4 150	11 700	70.0	7 150	8 000	10 000
HTA922UADB	110	150	36	1.1	0.6	41.5	118	4 200	12 000	72.0	7 350	7 700	9 600
HTA924UADB	120	165	40.5	1.1	0.6	48.0	140	4 900	14 300	87.5	8 900	7 000	8 800
HTA926UADB	130	180	45	1.5	1	57.5	173	5 850	17 600	103	10 500	6 500	8 100
HTA928UADB	140	190	45	1.5	1	57.5	177	5 850	18 000	106	10 800	6 100	7 600
HTA930UADB	150	210	54	2	1	80.5	243	8 200	24 800	143	14 600	5 600	6 900
HTA932UADB	160	220	54	2	1	82.0	255	8 350	26 100	151	15 400	5 300	6 600
HTA934UADB	170	230	54	2	1	84.0	268	8 550	27 300	159	16 200	5 000	6 300
HTA936UADB	180	250	63	2	1	127	400	12 900	41 000	239	24 400	4 700	5 800
HTA938UADB	190	260	63	2	1	129	420	13 200	43 000	252	25 700	4 400	5 600
HTA940UADB	200	280	72	2.1	1.1	152	500	15 500	51 000	305	31 000	4 200	5 200
HTA944UADB	220	300	72	2.1	1.1	156	535	15 900	54 500	330	33 500	3 800	4 800
HTA948UADB	240	320	72	2.1	1.1	160	570	16 300	58 000	350	35 500	3 600	4 500
HTA952UADB	260	360	90	2.1	1.1	210	745	21 400	76 000	460	47 000	3 200	4 000
HTA956UADB	280	380	90	2.1	1.1	216	795	22 000	81 000	490	50 000	3 000	3 800
HTA960UADB	300	420	108	3	1.1	276	1 020	28 100	104 000	610	62 000	2 800	3 500
HTA964UADB	320	440	108	3	1.1	280	1 060	28 500	108 000	635	65 000	2 600	3 300

❶ Minimum allowable value for corner radius dimension r or r_1.



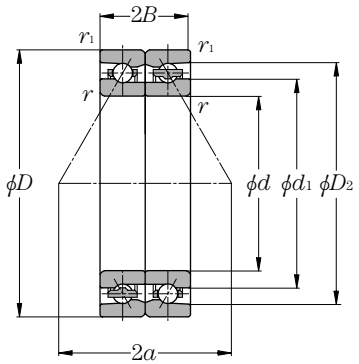
Dynamic equivalent axial load
$P_a=F_a$

Static equivalent axial load
$P_{oa}=F_a$

Load center mm $2a$	Internal free space cm³ Two row (approx.)	Mass kg Two row (approx.)	Reference dimensions d_1	Reference dimensions D_2	Abutment and fillet dimensions mm d_a min	Abutment and fillet dimensions mm D_b max	Abutment and fillet dimensions mm r_{as} max	Abutment and fillet dimensions mm r_{1as} max	Part number
87.6	24	0.81	115.3	129.1	110	134	1	0.6	**HTA920UADB**
90.5	24	0.85	120.3	134.1	115	139	1	0.6	**HTA921UADB**
93.4	26	0.88	125.3	139.1	120	144	1	0.6	**HTA922UADB**
102.9	36	1.23	137.4	152.4	130	159	1	0.6	**HTA924UADB**
112.4	50	1.65	149.4	165.8	142	172.5	1.5	1	**HTA926UADB**
118.1	53	1.75	159.4	175.8	152	182.5	1.5	1	**HTA928UADB**
131.4	85	2.74	173.1	193.3	164	202.5	2	1	**HTA930UADB**
137.1	90	2.89	183.1	203.3	174	212.5	2	1	**HTA932UADB**
142.9	94	3.05	193.1	213.0	184	222.5	2	1	**HTA934UADB**
156.2	138	4.78	206.4	231.4	194	242.5	2	1	**HTA936UADB**
162.0	144	5.00	216.4	241.0	204	252.5	2	1	**HTA938UADB**
175.2	197	7.00	230.6	258.2	217	270	2	1	**HTA940UADB**
186.7	213	7.60	250.6	278.0	237	290	2	1	**HTA944UADB**
198.3	229	8.15	270.6	297.9	257	310	2	1	**HTA948UADB**
224.7	378	14.3	298.9	331.6	277	350	2	1	**HTA952UADB**
236.3	403	15.2	318.9	351.5	297	370	2	1	**HTA956UADB**
262.7	675	23.5	347.1	385.2	320	410	2.5	1	**HTA960UADB**
274.2	715	24.8	367.1	405.1	340	430	2.5	1	**HTA964UADB**

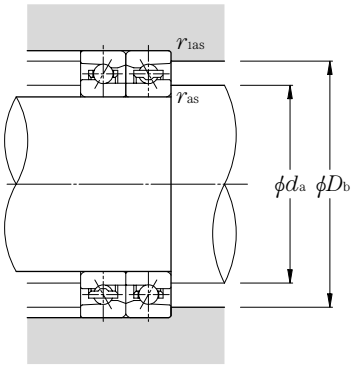
Angular contact ball bearings for axial loads (steel ball type) HTA9U series

Contact angle 40° (d) 100～320mm



Part number	Boundary dimensions mm					Basic load ratings dynamic / static kN		dynamic / static kgf		Static thrust load capacity kN	kgf	Limiting speed min-1 grease lubrication	oil lubrication
	d	D	2B	rs min ❶	r1s min ❶	Ca	Coa	Ca	Coa				
HTA920UDB	100	140	36	1.1	0.6	47.0	121	4 800	12 300	29.3	2 990	6 300	7 900
HTA921UDB	105	145	36	1.1	0.6	48.5	128	4 950	13 000	31.0	3 150	6 000	7 600
HTA922UDB	110	150	36	1.1	0.6	49.0	131	5 000	13 400	32.0	3 250	5 800	7 300
HTA924UDB	120	165	40.5	1.1	0.6	57.0	156	5 800	15 900	39.0	4 000	5 300	6 700
HTA926UDB	130	180	45	1.5	1	68.0	193	6 950	19 600	44.5	4 550	4 800	6 100
HTA928UDB	140	190	45	1.5	1	68.0	197	6 950	20 100	46.0	4 700	4 500	5 800
HTA930UDB	150	210	54	2	1	95.5	270	9 750	27 600	62.5	6 350	4 200	5 300
HTA932UDB	160	220	54	2	1	97.5	284	9 950	29 000	65.5	6 700	3 900	5 000
HTA934UDB	170	230	54	2	1	99.5	298	10 100	30 500	69.0	7 050	3 800	4 800
HTA936UDB	180	250	63	2	1	150	445	15 300	45 500	104	10 600	3 500	4 400
HTA938UDB	190	260	63	2	1	153	470	15 600	48 000	110	11 200	3 300	4 200
HTA940UDB	200	280	72	2.1	1.1	180	555	18 400	56 500	134	13 700	3 100	4 000
HTA944UDB	220	300	72	2.1	1.1	185	595	18 900	60 500	145	14 800	2 900	3 700
HTA948UDB	240	320	72	2.1	1.1	190	635	19 400	64 500	155	15 800	2 700	3 400
HTA952UDB	260	360	90	2.1	1.1	250	830	25 400	84 500	203	20 700	2 400	3 100
HTA956UDB	280	380	90	2.1	1.1	257	885	26 200	90 500	218	22 200	2 300	2 900
HTA960UDB	300	420	108	3	1.1	325	1 130	33 500	115 000	266	27 100	2 100	2 600
HTA964UDB	320	440	108	3	1.1	330	1 180	34 000	120 000	279	28 400	2 000	2 500

❶ Minimum allowable value for corner radius dimension r or r_1.



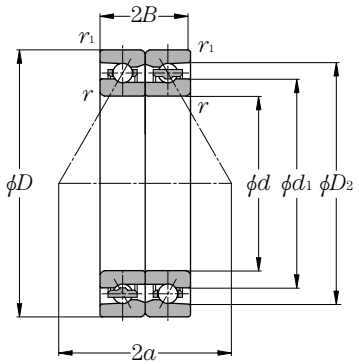
Dynamic equivalent axial load
$P_a=F_a$

Static equivalent axial load
$P_{oa}=F_a$

Load center mm $2a$	Internal free space cm³ Two row (approx.)	Mass kg Two row (approx.)	Reference dimensions d_1	Reference dimensions D_2	Abutment and fillet dimensions mm d_a min	Abutment and fillet dimensions mm D_b max	Abutment and fillet dimensions mm r_{as} max	Abutment and fillet dimensions mm r_{1as} max	Part number
119.1	24	0.81	115.3	129.0	110	134	1	0.6	**HTA920UDB**
123.3	24	0.85	120.3	134.0	115	139	1	0.6	**HTA921UDB**
127.5	26	0.88	125.3	139.0	120	144	1	0.6	**HTA922UDB**
140.3	36	1.23	137.4	152.3	130	159	1	0.6	**HTA924UDB**
153.1	50	1.65	149.4	165.7	142	172.5	1.5	1	**HTA926UDB**
161.5	53	1.75	159.4	175.7	152	182.5	1.5	1	**HTA928UDB**
178.7	85	2.74	173.1	193.2	164	202.5	2	1	**HTA930UDB**
187.1	90	2.89	183.1	203.2	174	212.5	2	1	**HTA932UDB**
195.5	94	3.05	193.1	212.9	184	222.5	2	1	**HTA934UDB**
212.7	138	4.78	206.4	231.5	194	242.5	2	1	**HTA936UDB**
221.1	144	5.00	216.4	241.2	204	252.5	2	1	**HTA938UDB**
238.3	197	7.00	230.6	258.0	217	270	2	1	**HTA940UDB**
255.1	213	7.60	250.6	277.8	237	290	2	1	**HTA944UDB**
271.8	229	8.15	270.6	297.8	257	310	2	1	**HTA948UDB**
306.2	378	14.3	298.9	331.4	277	350	2	1	**HTA952UDB**
323.0	403	15.2	318.9	350.2	297	370	2	1	**HTA956UDB**
357.3	675	23.5	347.1	385.0	320	410	2.5	1	**HTA960UDB**
374.1	715	24.8	367.1	404.1	340	430	2.5	1	**HTA964UDB**

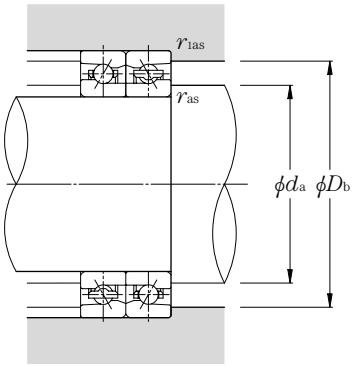
Angular contact ball bearings for axial loads (steel ball type) HTA0UA series

Contact angle 30° d 50～320mm



Part number	Boundary dimensions mm					Basic load ratings dynamic kN	static kN	dynamic kgf	static kgf	Static thrust load capacity kN	kgf	Limiting speed min^{-1} grease lubrication	oil lubrication
	d	D	$2B$	$r_{s\,min}$ ❶	$r_{1s\,min}$ ❶	C_a	C_{oa}	C_a	C_{oa}				
HTA010UADB	50	80	28.5	1	0.6	24.7	48.5	2 520	4 950	23.2	2 370	15 400	19 200
HTA011UADB	55	90	33	1.1	0.6	26.8	57.5	2 730	5 850	27.7	2 820	13 800	17 200
HTA012UADB	60	95	33	1.1	0.6	28.1	63.0	2 860	6 400	30.5	3 100	12 900	16 100
HTA013UADB	65	100	33	1.1	0.6	28.5	65.0	2 900	6 650	32.0	3 250	12 100	15 200
HTA014UADB	70	110	36	1.1	0.6	35.0	82.0	3 550	8 350	40.0	4 100	11 100	13 900
HTA015UADB	75	115	36	1.1	0.6	37.0	91.5	3 800	9 300	45.5	4 650	10 500	13 200
HTA016UADB	80	125	40.5	1.1	0.6	42.5	105	4 350	10 700	52.0	5 300	9 800	12 200
HTA017UADB	85	130	40.5	1.1	0.6	43.0	108	4 400	11 100	54.5	5 550	9 300	11 600
HTA018UADB	90	140	45	1.5	1	50.0	127	5 100	13 000	63.5	6 500	8 700	10 900
HTA019UADB	95	145	45	1.5	1	50.5	131	5 150	13 400	66.0	6 750	8 300	10 400
HTA020UADB	100	150	45	1.5	1	52.5	140	5 350	14 300	71.0	7 250	8 000	10 000
HTA021UADB	105	160	49.5	2	1	60.0	163	6 100	16 600	82.5	8 400	7 500	9 400
HTA022UADB	110	170	54	2	1	74.5	200	7 600	20 400	100	10 200	7 100	8 900
HTA024UADB	120	180	54	2	1	75.0	206	7 650	21 000	104	10 600	6 700	8 300
HTA026UADB	130	200	63	2	1	108	293	11 000	29 900	144	14 700	6 100	7 600
HTA028UADB	140	210	63	2	1	111	315	11 300	32 000	156	15 900	5 700	7 100
HTA030UADB	150	225	67.5	2.1	1.1	114	330	11 700	34 000	169	17 200	5 300	6 700
HTA032UADB	160	240	72	2.1	1.1	134	390	13 700	40 000	196	20 000	5 000	6 300
HTA034UADB	170	260	81	2.1	1.1	153	450	15 900	46 000	226	23 000	4 700	5 800
HTA036UADB	180	280	90	2.1	1.1	177	530	18 100	54 000	265	27 000	4 300	5 400
HTA038UADB	190	290	91	2.1	1.1	179	545	18 300	55 500	275	28 000	4 200	5 200
HTA040UADB	200	310	99	2.1	1.1	201	610	20 500	62 000	310	31 500	3 900	4 900
HTA044UADB	220	340	108	3	1.1	253	775	25 800	79 000	385	39 500	3 600	4 500
HTA048UADB	240	360	108	3	1.1	261	825	26 600	84 000	415	42 500	3 300	4 200
HTA052UADB	260	400	123	4	1.5	310	1040	31 500	106 000	520	53 500	3 000	3 800
HTA056UADB	280	420	123	4	1.5	315	1110	32 500	113 000	565	57 500	2 900	3 600
HTA060UADB	300	460	142.5	4	1.5	360	1330	37 000	135 000	670	68 500	2 600	3 300
HTA064UADB	320	480	142.5	4	1.5	365	1360	37 000	139 000	700	71 500	2 500	3 100

❶ Minimum allowable value for corner radius dimension r or r_1.



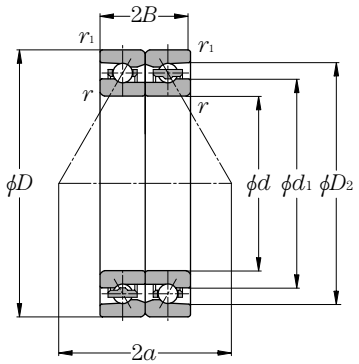
Dynamic equivalent axial load
$P_a=F_a$

Static equivalent axial load
$P_{oa}=F_a$

Load center mm	Internal free space cm³	Mass kg	Reference dimensions		Abutment and fillet dimensions mm				Part number
$2a$	Two row (approx.)	Two row (approx.)	d_1	D_2	d_a min	D_b max	r_{as} max	r_{1as} max	
52.1	9	0.24	60.7	73.2	57.5	74.0	1	0.6	**HTA010UADB**
58.6	13	0.39	68.2	80.8	65.0	84.0	1	0.6	**HTA011UADB**
61.5	13	0.41	73.2	85.8	70.0	89.0	1	0.6	**HTA012UADB**
64.4	14	0.44	78.2	90.8	75.0	94.0	1	0.6	**HTA013UADB**
70.3	18	0.61	85.3	99.1	80.0	104	1	0.6	**HTA014UADB**
73.2	19	0.65	90.3	104.1	85.0	109	1	0.6	**HTA015UADB**
79.8	26	0.88	97.4	112.5	90.0	119	1	0.6	**HTA016UADB**
82.7	28	0.93	102.4	117.5	95.0	124	1	0.6	**HTA017UADB**
89.3	38	1.22	109.4	125.9	102	132.5	1.5	1	**HTA018UADB**
92.1	39	1.27	114.4	130.9	107	137.5	1.5	1	**HTA019UADB**
95.1	39	1.34	119.5	136.0	112	142.5	1.5	1	**HTA020UADB**
101.6	49	1.74	126.5	144.3	119	152.5	2	1	**HTA021UADB**
108.3	66	2.14	133.1	153.4	124	162.5	2	1	**HTA022UADB**
114.1	67	2.32	143.3	163.5	134	172.5	2	1	**HTA024UADB**
127.3	108	3.39	156.4	181.7	144	192.5	2	1	**HTA026UADB**
133.1	114	3.60	166.4	191.7	154	202.5	2	1	**HTA028UADB**
142.6	141	4.46	178.9	204.3	167	215	2	1	**HTA030UADB**
152.1	168	5.40	190.6	218.0	177	230	2	1	**HTA032UADB**
165.3	238	7.20	204.7	235.3	187	250	2	1	**HTA034UADB**
178.5	285	10.6	218.9	251.8	197	270	2	1	**HTA036UADB**
184.3	300	11.0	228.9	261.8	207	280	2	1	**HTA038UADB**
197.5	436	13.8	243.0	277.6	217	300	2	1	**HTA040UADB**
216.6	550	18.1	266.3	306.0	240	330	2.5	1	**HTA044UADB**
228.1	650	18.9	286.3	326.8	260	350	2.5	1	**HTA048UADB**
253.0	850	28.4	314.6	360.3	283	388	3	1.5	**HTA052UADB**
264.6	900	30.2	334.6	380.2	303	408	3	1.5	**HTA056UADB**
291.8	1265	43.6	362.9	413.9	323	448	3	1.5	**HTA060UADB**
303.3	1340	45.8	382.9	433.9	343	468	3	1.5	**HTA064UADB**

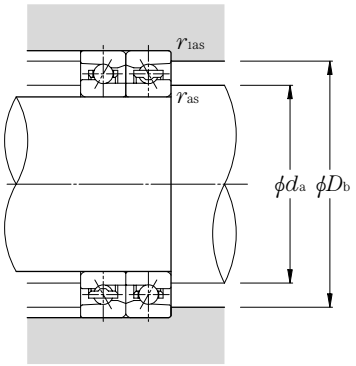
Angular contact ball bearings for axial loads (steel ball type) HTA0U series

Contact angle 40° d 50～320mm



Part number	Boundary dimensions mm					Basic load ratings dynamic kN	static kN	dynamic kgf	static kgf	Static thrust load capacity kN	kgf	Limiting speed min^{-1} grease lubrication	oil lubrication
	d	D	$2B$	$r_{s\,min}$ ❶	$r_{1s\,min}$ ❶	C_a	C_{oa}	C_a	C_{oa}				
HTA010UDB	50	80	28.5	1	0.6	29.6	55.5	3 000	5 650	12.3	1 250	11 500	14 600
HTA011UDB	55	90	33	1.1	0.6	32.0	64.0	3 250	6 500	14.3	1 460	10 300	13 100
HTA012UDB	60	95	33	1.1	0.6	33.5	69.5	3 400	7 100	15.7	1 600	9 700	12 300
HTA013UDB	65	100	33	1.1	0.6	34.0	72.0	3 450	7 350	16.4	1 670	9 100	11 500
HTA014UDB	70	110	36	1.1	0.6	41.5	91.0	4 250	9 300	21.5	2 190	8 300	10 600
HTA015UDB	75	115	36	1.1	0.6	44.0	101.0	4 500	10 300	24.0	2 450	7 900	10 000
HTA016UDB	80	125	40.5	1.1	0.6	50.5	117	5 150	11 900	28.4	2 900	7 300	9 300
HTA017UDB	85	130	40.5	1.1	0.6	51.0	120	5 200	12 300	29.4	3 000	7 000	8 800
HTA018UDB	90	140	45	1.5	1	59.5	141	6 050	14 400	32.0	3 250	6 500	8 300
HTA019UDB	95	145	45	1.5	1	60.0	146	6 100	14 900	33.5	3 400	6 300	7 900
HTA020UDB	100	150	45	1.5	1	62.0	156	6 350	15 900	35.5	3 600	6 000	7 600
HTA021UDB	105	160	49.5	2	1	71.0	181	7 250	18 400	42.5	4 350	5 700	7 200
HTA022UDB	110	170	54	2	1	88.5	222	9 000	22 700	50.0	5 100	5 400	6 800
HTA024UDB	120	180	54	2	1	89.0	228	9 050	23 300	52.0	5 300	5 000	6 300
HTA026UDB	130	200	63	2	1	128	325	13 000	33 000	74.0	7 550	4 500	5 800
HTA028UDB	140	210	63	2	1	132	345	13 500	35 500	79.5	8 100	4 300	5 400
HTA030UDB	150	225	67.5	2.1	1.1	136	370	13 800	37 500	85.0	8 650	4 000	5 200
HTA032UDB	160	240	72	2.1	1.1	159	435	16 200	44 000	103	10 500	3 800	4 800
HTA034UDB	170	260	81	2.1	1.1	182	500	18 600	51 000	116	11 800	3 500	4 400
HTA036UDB	180	280	90	2.1	1.1	211	585	21 500	60 000	140	14 300	3 300	4 100
HTA038UDB	190	290	91	2.1	1.1	214	605	21 800	61 500	145	14 800	3 100	4 000
HTA040UDB	200	310	99	2.1	1.1	240	680	24 400	69 000	159	16 200	2 900	3 700
HTA044UDB	220	340	108	3	1.1	300	860	30 500	87 500	201	20 500	2 700	3 400
HTA048UDB	240	360	108	3	1.1	310	915	31 500	93 000	216	22 000	2 500	3 200
HTA052UDB	260	400	123	4	1.5	365	1160	37 500	118 000	275	28 000	2 300	2 900
HTA056UDB	280	420	123	4	1.5	375	1230	38 500	125 000	293	29 900	2 100	2 700
HTA060UDB	300	460	142.5	4	1.5	430	1470	44 000	150 000	355	36 000	2 000	2 500
HTA064UDB	320	480	142.5	4	1.5	435	1520	44 000	155 000	365	37 000	1 900	2 400

❶ Minimum allowable value for corner radius dimension r or r_1.



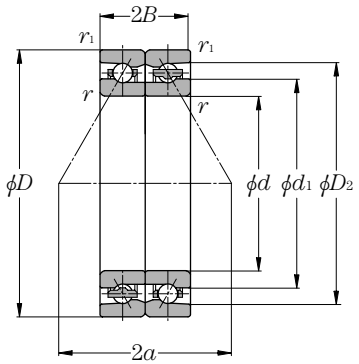
Dynamic equivalent axial load
$P_a = F_a$

Static equivalent axial load
$P_{oa} = F_a$

Load center mm $2a$	Internal free space cm³ Two row (approx.)	Mass kg Two row (approx.)	Reference dimensions d_1	Reference dimensions D_2	Abutment and fillet dimensions mm d_a min	Abutment and fillet dimensions mm D_b max	Abutment and fillet dimensions mm r_{as} max	Abutment and fillet dimensions mm r_{1as} max	Part number
69.2	9	0.24	60.7	73.1	57.5	74.0	1	0.6	**HTA010UDB**
77.7	13	0.39	68.2	80.7	65.0	84.0	1	0.6	**HTA011UDB**
81.9	13	0.41	73.2	85.7	70.0	89.0	1	0.6	**HTA012UDB**
86.1	14	0.44	78.2	90.7	75.0	94.0	1	0.6	**HTA013UDB**
94.0	18	0.61	85.3	99.0	80.0	104	1	0.6	**HTA014UDB**
98.2	19	0.65	90.3	104.0	85.0	109	1	0.6	**HTA015UDB**
106.7	26	0.88	97.4	112.4	90.0	119	1	0.6	**HTA016UDB**
110.9	28	0.93	102.4	117.4	95.0	124	1	0.6	**HTA017UDB**
119.5	38	1.22	109.4	125.8	102	132.5	1.5	1	**HTA018UDB**
123.7	39	1.27	114.4	130.8	107	137.5	1.5	1	**HTA019UDB**
128.0	39	1.34	119.5	135.9	112	142.5	1.5	1	**HTA020UDB**
136.5	49	1.74	126.5	144.2	119	152.5	2	1	**HTA021UDB**
145.1	66	2.14	133.1	153.3	124	162.5	2	1	**HTA022UDB**
153.6	67	2.32	143.3	163.4	134	172.5	2	1	**HTA024UDB**
170.8	108	3.39	156.4	181.6	144	192.5	2	1	**HTA026UDB**
179.2	114	3.60	166.4	191.6	154	202.5	2	1	**HTA028UDB**
191.9	141	4.46	178.9	204.2	167	215	2	1	**HTA030UDB**
204.7	168	5.40	190.6	218.4	177	230	2	1	**HTA032UDB**
221.9	238	7.20	204.7	235.2	187	250	2	1	**HTA034UDB**
239.1	285	10.6	218.9	251.0	197	270	2	1	**HTA036UDB**
247.4	300	11.0	228.9	261.7	207	280	2	1	**HTA038UDB**
264.6	436	13.8	243.0	277.6	217	300	2	1	**HTA040UDB**
290.3	550	18.1	266.3	306.6	240	330	2.5	1	**HTA044UDB**
307.0	650	18.9	286.3	326.6	260	350	2.5	1	**HTA048UDB**
339.9	850	28.4	314.6	360.1	283	388	3	1.5	**HTA052UDB**
356.7	900	30.2	334.6	380.0	303	408	3	1.5	**HTA056UDB**
391.7	1265	43.6	362.9	413.7	323	448	3	1.5	**HTA060UDB**
408.5	1340	45.8	382.9	433.7	343	468	3	1.5	**HTA064UDB**

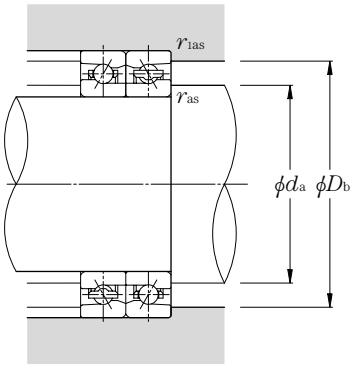
Angular contact ball bearings for axial loads (ceramic ball type) 5S-HTA0UA series

Contact angle 30° d 50～130mm



Part number	Boundary dimensions mm					Basic load ratings dynamic kN	static kN	dynamic kgf	static kgf	Static thrust load capacity kN	kgf	Limiting speed min^{-1} grease lubrication	oil lubrication
	d	D	$2B$	$r_{s\,min}$ ❶	$r_{1s\,min}$ ❶	C_a	C_{oa}	C_a	C_{oa}				
5S-HTA010UADB	50	80	28.5	1	0.6	24.7	33.5	2 520	3 400	15.7	1 600	17 300	22 200
5S-HTA011UADB	55	90	33	1.1	0.6	26.8	40.0	2 730	4 050	18.6	1 900	15 500	19 900
5S-HTA012UADB	60	95	33	1.1	0.6	28.1	43.5	2 860	4 450	20.5	2 090	14 500	18 600
5S-HTA013UADB	65	100	33	1.1	0.6	28.5	45.0	2 900	4 600	21.6	2 200	13 600	17 500
5S-HTA014UADB	70	110	36	1.1	0.6	35.0	57.0	3 550	5 800	27.2	2 770	12 500	16 000
5S-HTA015UADB	75	115	36	1.1	0.6	37.0	63.5	3 800	6 450	30.5	3 150	11 800	15 200
5S-HTA016UADB	80	125	40.5	1.1	0.6	42.5	73.0	4 350	7 400	35.0	3 600	11 000	14 100
5S-HTA017UADB	85	130	40.5	1.1	0.6	43.0	75.0	4 400	7 650	36.5	3 750	10 500	13 400
5S-HTA018UADB	90	140	45	1.5	1	49.5	88.5	5 050	9 000	43.0	4 400	9 800	12 500
5S-HTA019UADB	95	145	45	1.5	1	50.5	91.0	5 150	9 300	44.5	4 550	9 400	12 000
5S-HTA020UADB	100	150	45	1.5	1	52.5	97.0	5 350	9 900	48.0	4 900	9 000	11 500
5S-HTA021UADB	105	160	49.5	2	1	60.0	113	6 100	11 500	55.5	5 650	8 500	10 900
5S-HTA022UADB	110	170	54	2	1	74.0	139	7 550	14 100	67.0	6 850	8 000	10 300
5S-HTA024UADB	120	180	54	2	1	75.0	143	7 650	14 500	70.0	7 150	7 500	9 600
5S-HTA026UADB	130	200	63	2	1	108	203	11 000	20 700	97.0	9 900	6 800	8 700

❶ Minimum allowable value for corner radius dimension r or r_1.



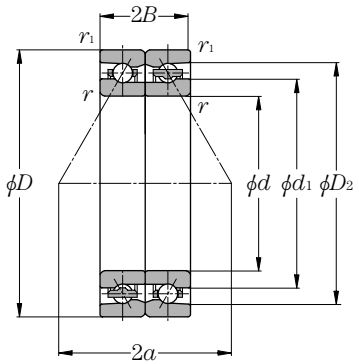
Dynamic equivalent axial load
$P_a=F_a$

Static equivalent axial load
$P_{oa}=F_a$

Load center mm $2a$	Internal free space cm³ Two row (approx.)	Mass kg Two row (approx.)	Reference dimensions d_1	Reference dimensions D_2	Abutment and fillet dimensions mm d_a min	Abutment and fillet dimensions mm D_b max	Abutment and fillet dimensions mm r_{as} max	Abutment and fillet dimensions mm r_{1as} max	Part number
52.1	9	0.22	60.7	73.2	57.5	74.0	1	0.6	**5S-HTA010UADB**
58.6	13	0.36	68.2	80.8	65.0	84.0	1	0.6	**5S-HTA011UADB**
61.5	13	0.39	73.2	85.8	70.0	89.0	1	0.6	**5S-HTA012UADB**
64.4	14	0.41	78.2	90.8	75.0	94.0	1	0.6	**5S-HTA013UADB**
70.3	18	0.57	85.3	99.1	80.0	104	1	0.6	**5S-HTA014UADB**
73.2	19	0.60	90.3	104.1	85.0	109	1	0.6	**5S-HTA015UADB**
79.8	26	0.83	97.4	112.5	90.0	119	1	0.6	**5S-HTA016UADB**
82.7	28	0.87	102.4	117.5	95.0	124	1	0.6	**5S-HTA017UADB**
89.3	38	1.15	109.4	125.9	102	132.5	1.5	1	**5S-HTA018UADB**
92.1	39	1.20	114.4	130.9	107	137.5	1.5	1	**5S-HTA019UADB**
95.1	39	1.26	119.5	136.0	112	142.5	1.5	1	**5S-HTA020UADB**
101.6	49	1.64	126.5	144.3	119	152.5	2	1	**5S-HTA021UADB**
108.3	66	2.00	133.1	153.4	124	162.5	2	1	**5S-HTA022UADB**
114.1	67	2.17	143.3	163.5	134	172.5	2	1	**5S-HTA024UADB**
127.3	108	3.13	156.4	181.7	144	192.5	2	1	**5S-HTA026UADB**

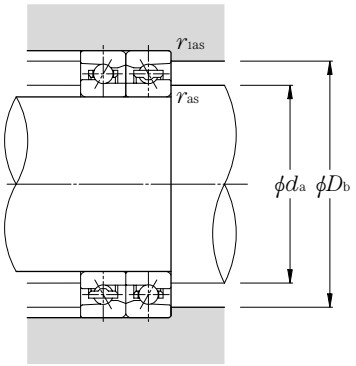
Angular contact ball bearings for axial loads (ceramic ball type) 5S-HTA0U series

Contact angle 40° d 50～130mm



Part number	Boundary dimensions mm					Basic load ratings dynamic kN	static kN	dynamic kgf	static kgf	Static thrust load capacity kN	kgf	Limiting speed min^{-1} grease lubrication	oil lubrication
	d	D	$2B$	$r_{s\,min}$ ❶	$r_{1s\,min}$ ❶	C_a	C_{oa}	C_a	C_{oa}				
5S-HTA010UDB	50	80	28.5	1	0.6	29.6	38.5	3 000	3 900	14.6	1 490	12 200	15 400
5S-HTA011UDB	55	90	33	1.1	0.6	32.0	44.5	3 250	4 500	17.1	1 740	10 900	13 800
5S-HTA012UDB	60	95	33	1.1	0.6	33.5	48.0	3 400	4 900	18.7	1 910	10 200	12 900
5S-HTA013UDB	65	100	33	1.1	0.6	34.0	50.0	3 450	5 100	19.6	2 000	9 600	12 100
5S-HTA014UDB	70	110	36	1.1	0.6	41.5	63.0	4 250	6 450	25.6	2 610	8 800	11 100
5S-HTA015UDB	75	115	36	1.1	0.6	44.0	70.5	4 500	7 150	28.7	2 930	8 300	10 500
5S-HTA016UDB	80	125	40.5	1.1	0.6	50.5	81.0	5 150	8 250	34.0	3 450	7 700	9 800
5S-HTA017UDB	85	130	40.5	1.1	0.6	51.0	83.5	5 200	8 500	35.0	3 600	7 300	9 300
5S-HTA018UDB	90	140	45	1.5	1	59.5	98.0	6 050	10 000	38.0	3 900	6 900	8 700
5S-HTA019UDB	95	145	45	1.5	1	60.0	101	6 100	10 300	39.5	4 050	6 600	8 300
5S-HTA020UDB	100	150	45	1.5	1	62.0	108	6 350	11 000	42.5	4 300	6 300	8 000
5S-HTA021UDB	105	160	49.5	2	1	71.0	125	7 250	12 800	50.5	5 150	6 000	7 500
5S-HTA022UDB	110	170	54	2	1	88.5	154	9 000	15 700	59.5	6 100	5 600	7 100
5S-HTA024UDB	120	180	54	2	1	89.0	158	9 050	16 100	61.5	6 300	5 300	6 700
5S-HTA026UDB	130	200	63	2	1	128	225	13 000	23 000	88.0	9 000	4 800	6 100

❶ Minimum allowable value for corner radius dimension r or r_1.



Dynamic equivalent axial load
$P_a=F_a$

Static equivalent axial load
$P_{oa}=F_a$

Load center mm $2a$	Internal free space cm³ Two row (approx.)	Mass kg Two row (approx.)	Reference dimensions d_1	Reference dimensions D_2	Abutment and fillet dimensions mm d_a min	Abutment and fillet dimensions mm D_b max	Abutment and fillet dimensions mm r_{as} max	Abutment and fillet dimensions mm r_{1as} max	Part number
69.2	9	0.22	60.7	73.1	57.5	74.0	1	0.6	**5S-HTA010UDB**
77.7	13	0.36	68.2	80.7	65.0	84.0	1	0.6	**5S-HTA011UDB**
81.9	13	0.39	73.2	85.7	70.0	89.0	1	0.6	**5S-HTA012UDB**
86.1	14	0.41	78.2	90.7	75.0	94.0	1	0.6	**5S-HTA013UDB**
94.0	18	0.57	85.3	99.0	80.0	104	1	0.6	**5S-HTA014UDB**
98.2	19	0.60	90.3	104.0	85.0	109	1	0.6	**5S-HTA015UDB**
106.7	26	0.83	97.4	112.4	90.0	119	1	0.6	**5S-HTA016UDB**
110.9	28	0.87	102.4	117.4	95.0	124	1	0.6	**5S-HTA017UDB**
119.5	38	1.15	109.4	125.8	102	132.5	1.5	1	**5S-HTA018UDB**
123.7	39	1.20	114.4	130.8	107	137.5	1.5	1	**5S-HTA019UDB**
128.0	39	1.26	119.5	135.9	112	142.5	1.5	1	**5S-HTA020UDB**
136.5	49	1.64	126.5	144.2	119	152.5	2	1	**5S-HTA021UDB**
145.1	66	2.00	133.1	153.3	124	162.5	2	1	**5S-HTA022UDB**
153.6	67	2.17	143.3	163.4	134	172.5	2	1	**5S-HTA024UDB**
170.8	108	3.13	156.4	181.6	144	192.5	2	1	**5S-HTA026UDB**