

12.9 SPHERICAL ROLLER THRUST BEARINGS

Spherical roller thrust bearings have a large number of asymmetrical spherical rollers with good adhesion to shaft and housing rings, making them suitable for capturing large axial loads as well as certain radial loads at relatively high speeds. Bearings are detachable, which can be utilized during installation. Bearings are manufactured with a pressed steel-sheet cage, which forms an integral unit with the shaft ring and spherical rollers. In addition, ZKL also manufactures bearings with a massive cage. A massive brass cage is guided by the sleeve fastened in the shaft ring bore and together also form an integral unit. The internal bearing design with massive cage requires oil lubrication. In other cases, the bearings may also be lubricated with greases – preferably with EP additives. In such cases, a sufficient amount of lubricant must be supplied into contact with the spherical roller faces and the guide flanges. Both variants of the structural design are illustrated in figure 12.9.1.

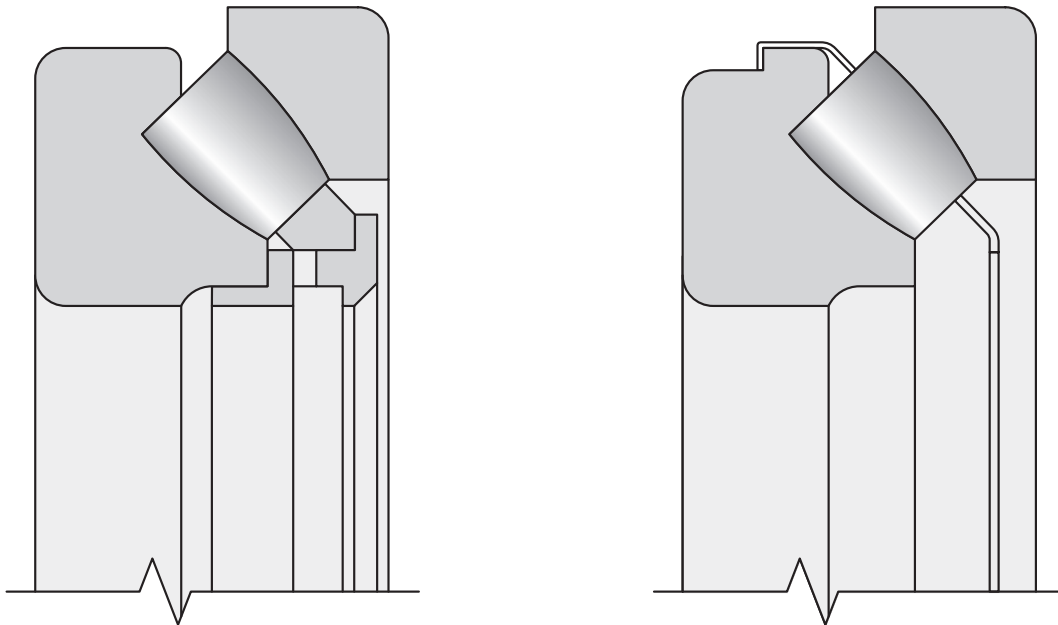


Fig. 12.9.1

Main dimensions

The main dimensions of bearings are consistent with standard ISO 104 and are listed for individual bearings in the tables of the publication.



Precision

Bearings are currently produced at a normal degree of precision P0, which is not marked. The dimensional and operational precision tolerances are listed in table 7.16.

Self-alignment ability

The spherical raceway of the bearing housing ring during regular operating conditions ($F_a \leq 0.1C_a$) enables self-alignment from the centre position without interfering with the proper bearing function by the values specified in the table.

Table 12.9.1

Bearing type	Permissible misalignment
292	2°
293	2°30'
294	3°

Loading structure

The connecting dimensions, specified in the tables of the publication, are suitable for bearings, where the load $F_a = 0.1C_a$. Bearing rings should be supported along their entire faces during greater loads, i.e. $d_a = d1$ a $D_a = D1$.

When using bearings with a sheet-metal cage, we recommend enlarging the hub bore near the cage by 20 mm to prevent any shaft onset from coming into contact with the cage (fig. 12.9.4).

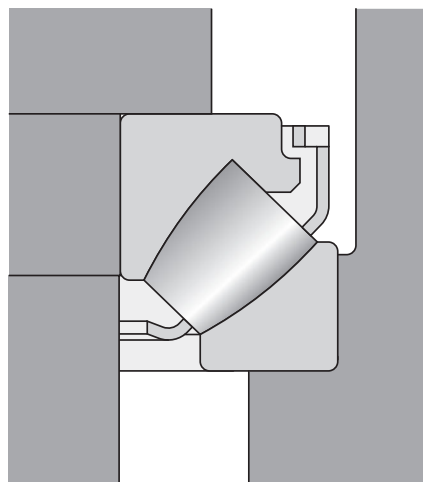
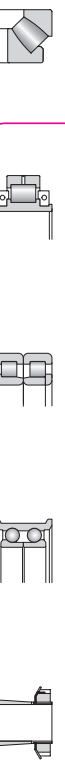


Fig. 12.9.4



Axial equivalent dynamic load

$$P_a = F_a + 1,2F_r \quad (F_r \leq 0,55F_a) \quad [\text{kN}]$$

Axial equivalent static load

$$P_{oa} = F_a + 2,7F_r \quad (F_r \leq 0,55F_a) \quad [\text{kN}]$$

The static safety coefficient for Spherical roller thrust bearings must be so ≥ 4 .

Minimal axial load

Higher rotation speeds in spherical roller thrust bearings present a risk of rolling elements sliding between the raceways due to the centrifugal forces in cases, when the axial load F_a falls below the permissible value. The following relationship is used for calculating the $F_{a \min}$ value:

when $1.8F_r < 0.0005 C_0$

$$F_{a \min} = 0,0005 C_0 + M (0,001n)^2$$

otherwise

$$F_{a \min} = 1,8F_r + M (0,001n)^2$$

$F_{a \min}$ minimal axial load [kN]

F_r radial load [kN]

C_{0a} axial static load rating [kN]

. (values are provided in the tables of the publication)

n rotating speed [min⁻¹]

M coefficient of minimum axial load

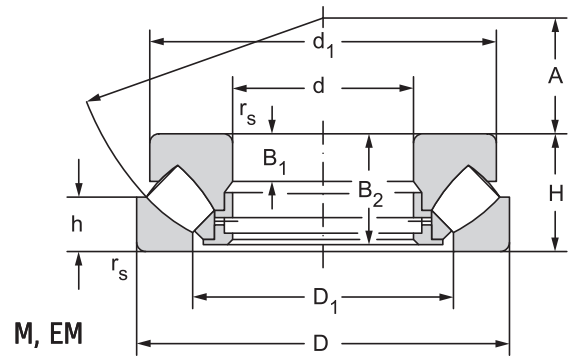
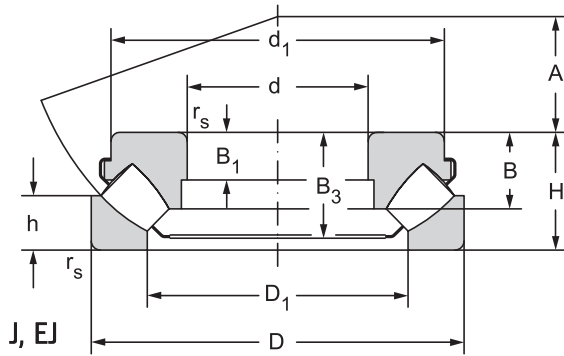
. (values are provided in the tables of the publication)

If the external axial load of the bearing is too small or if the bearing is unloaded during operation, e.g. in bearing pairs, then an axial load must be created, e.g. by the use of springs. If a radial load is simultaneously acting, the following condition must be met: $F_r \leq 0.55F_a$.



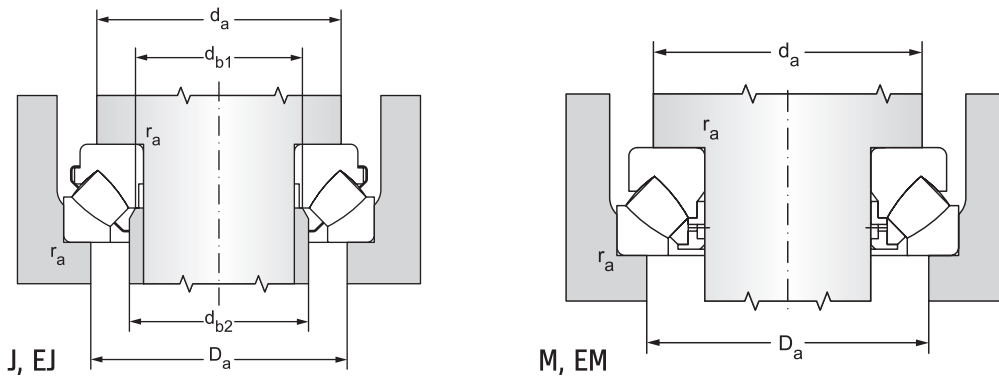
Spherical roller thrust bearings d = 50 to 1120 mm

d = 50 to 130 mm



12.9.1

Main dimensions												Basic load rating	
d	D	H	d ₁	D ₁	B	B ₁	B ₂	B ₃	h	A	r _s	dynamic	static
											min	C _a	C _{oa}
mm												kN	
50	110	36	95,0	70,0	25	13		32,0	20,5	32	1,5	299	930
60	130	42	118,0	88,0	28	15	39,5	35,5	20,0	38	1,5	287	809
	130	42	112,3	87,0	27	27		37,0	20,0	38	1,2	345	951
65	140	45	128,0	96,5	28	16	42,5	38,0	21,0	42	2,0	340	973
	140	45	122,8	93,0	29,5	16		39,0	21,0	42	2,0	417	1155
70	150	48	137,0	102,0	32	17	45,5		23,0	44	2,0	371	1070
	150	48	131,6	105,0	31	17		43,5	23,0	44	2,0	453	1280
75	160	51	146,0	109,0	34,5	18	48,0		24,0	47	2,0	429	1250
	160	51	141,8	108,0	33,5	18		47,0	24,0	47	2,0	527	1500
80	170	54	155,0	116,0	36	19	51,0		24,0	50	2,1	464	1370
	170	54	150,8	116,0	36	19		46,5	24,0	50	2,1	625	1640
85	180	58	164,0	125,0	38	21	55,0		28,0	54	2,1	527	1570
	180	58	164,0	123,0	37	21		50,0	28,0	54	2,1	713	1945
90	190	60	174,0	130,0		22	57,0		29,0	56	2,1	578	1780
	190	60	170,8	130,0		22	57,0		29,0	56	2,1	724	2172
100	170	42	150,0	128,0	26,2	15		37,3	20,5	58	1,5	449	1400
	210	67	193,0	144,5		24	64,0		32,0	62	3,0	705	2170
	210	67	189,8	144,0		24	64,0		32,0	62	2,5	891	2578
110	190	48	176,0	143,0		16	45,5		23,0	64	2,0	442	1420
	190	48	176,0	143,0	31	16		42,0	23,0	64	2,0	587	1760
	230	73	212,0	160,0		26	69,0		35,0	69	3,0	817	2600
	230	73	209,5	159,0		27			35,0	69	2,5	1053	3078
120	210	54	194,0	157,5		18	51,0		26,0	70	2,1	577	1830
	210	54	187,1	155,5	35,5	19		47,0	27,0	70	2,1	670	2100
	250	78	229,0	172,0		29	74,0		37,0	74	4,0	934	3000
	250	78	226,8	173,0		29			37,0	74	4,0	1215	3590
130	225	58	205,0	170,0	37	19	55,0		28,0	76	2,1	647	2070
	225	58	201,5	165,7		21		49,6	30,1	76	2,1	788	2950
	270	85	247,0	188,0	55,5	31	81,0		41,0	81	4,0	1090	3540
	270	85	245,0	188,0		31		74,0	41,0	81	4,0	1437	4300

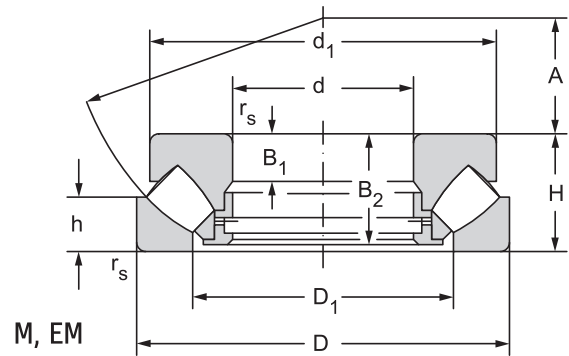
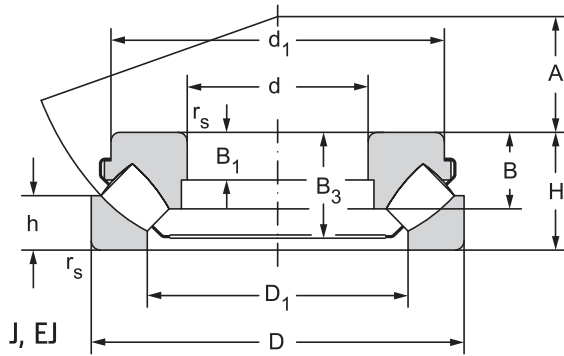


Deliveries of bearings marked * must be first consulted with the manufacturer, ** NEW FORCE

Fatigue load limit	Limiting speed for lubrication with	Bearing designation	Abutment and fillet dimensions						Weight	Minimum axial load factor
			d	d_a	d_{b1}	D_a	d_{b2}	r_a		
P_u	oil			min	max	max	max	max	-	
kN	min^{-1}		mm						kg	
110	3100	29410EJ**	50	70	55,8	90	59,5	1,5	1,67	0,11
99	2400	29412M*	60	90		109		1,5	2,60	0,08
120	2600	29412EJ**		90	67,0	117	67	1,5	2,47	0,11
120	2200	29413M*	65	100		118		2,0	3,30	0,12
140	2400	29413EJ**		100	72,0	118	72	2,0	3,26	0,17
130	2000	29414M*	70	105		126		2,0	4,00	0,14
160	2200	29414EJ**		105	77,5	126	77,5	2,0	3,98	0,2
150	2000	29415M*	75	115		134		2,0	4,90	0,2
180	2200	29415EJ**		115	82,5	134	82,5	2,0	4,90	0,28
170	1900	29416M*	80	120		141		2,0	5,80	0,23
200	2000	29416EJ**		120	88,0	141	88	2,0	5,80	0,34
190	1800	29417M*	85	130		153		2,0	6,90	0,31
240	1800	29417EJ**		130	94,0	153	94	2,0	6,67	0,47
220	1700	29418M*	90	135		161		2,0	8,10	0,4
260	1800	29418EJ**		135	99,0	161	99	2,0	8,10	0,59
170	2000	29320EJ**	100	130	107,0	147	107	1,5	3,95	0,25
260	1500	29420M*		150		178		2,5	11,8	0,59
310	1600	29420EJ**		150	110,0	175	110	3,0	10,8	0,83
150	1600	29322M*	110	145		165		2,0	5,50	0,25
190	1600	29322EJ**		145	117,0	165	117	2,0	5,40	0,39
270	1400	29422M*		165		196		2,5	14,5	0,85
320	1400	29422EJ**		165	120,5	193	129	2,5	13,5	1,2
190	1400	29324M**	120	160		184		2,0	7,60	0,42
220	1600	29324EJ**		160	128,0	181	128	2,0	7,41	0,55
300	1300	29424M*		180		212		3,0	18,1	1,1
360	1300	29424EJ**		180	132,0	209	140	3,0	17,5	1,6
210	1300	29326M**	130	170		198		2,0	9,30	0,54
300	1500	29326EJ**		175	138,0	194	143	2,0	9,08	1,1
350	1200	29426M*		195		229		3,0	22,5	1,6
430	1200	29426EJ**		195	142,5	227	153	3,0	21,6	2,3

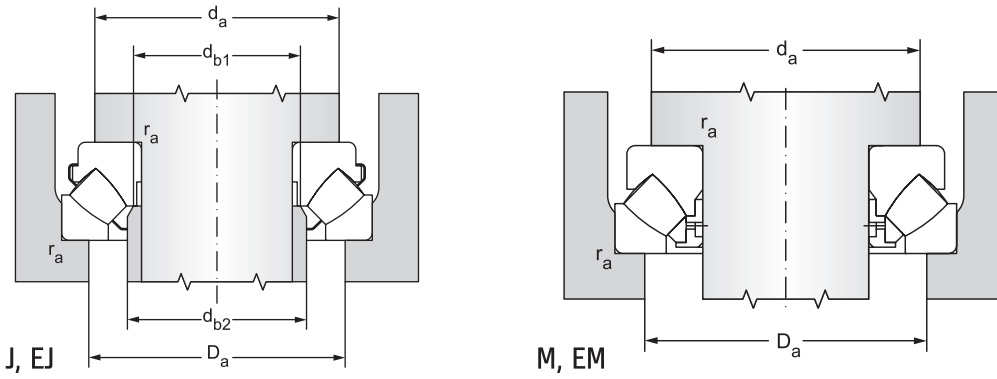
Spherical roller thrust bearings

d = 140 to 220 mm



12.9.1

Main dimensions												Basic load rating	
d	D	H	d ₁	D ₁	B	B ₁	B ₂	B ₃	h	A	r _s	dynamic	static
											min	C _a	C _{oa}
mm												kN	
140	240	60	219,0	183,0		20	57,0		29,0	82	2,1	695	2310
	240	60	214,9	178,9	38,5	22		52,4	30,0	82	2,1	876	3150
	280	85	257,0	197,5		31	81,0		41,0	86	4,0	1164	3750
	280	85	254,0	196,5	54	32		74,0	41,0	86	4,0	1554	4686
150	250	60	229,0	193,0		20	57,0		29,0	87	2,1	718	2430
	250	60	222,5	189,6	38	22		53,8	28,0	87	2,1	889	3236
	300	90	276,0	211,5		32	86,0		44,0	92	4,0	1318	4270
	300	90	273,0	209,5	58	34		79,0	44,0	92	4,0	1675	5241
160	270	67	248,0	207,0		23	64,0		32,0	92	3,0	831	2810
	270	67	243,6	202,3	42	24		58,6	33,0	92	3,0	1067	3977
	320	95	306,0	226,0		34	91,0		45,0	99	5,0	1504	4810
	320	95	282,8	221,7	60,5	35		82,0	45,5	99	5,0	1854	5930
170	280	67	258,0	215,0		23	64,0		32,0	96	3,0	858	2950
	280	67	253,6	214,6	42,2	24		60,0	32,0	96	3,0	1090	4098
	340	103	324,0	240,0		37	99,0		50,0	104	5,0	1669	5380
	340	103	301,0	236,0	65,5	36		88,0	50,0	104	5,0	2029	6230
180	300	73	277,0	231,0		25	69,0		35,0	103	3,0	1014	3530
	300	73	270,4	228,3	46	26		64,3	35,5	103	3,0	1280	4813
	360	109	342,0	255,0		39	105,0		52,0	110	5,0	1854	6010
	360	109	320,6	248,7	69,5	38		93,0	53,0	110	5,0	2297	7160
190	320	78	294,0	246,0		27	74,0		38,0	110	4,0	1120	4010
	320	78	284,4	239,5	49	28		68,0	36,0	110	4,0	1483	4840
	380	115	360,0	270,0		41	111,0		55,0	117	5,0	2019	6610
	380	115	339,2	263,0	73	41		98,0	55,5	117	5,0	2493	7750
200	280	48	264,0	233,0	32	17	45,0		24,0	108	2,1	731	3150
	340	85	325,0	261,0		29	81,0		41,0	116	4,0	1300	4740
	340	85	302,8	253,6	53,5	29		73,0	40,0	116	4,0	1669	5480
	400	122	365,0	284,0		43	117,0		59,0	122	5,0	2210	7510
	400	122	355,7	276,5	77	43		104,0	59,4	122	5,0	2791	8790
220	300	48	286,0	252,0		17	46,0		24,0	117	2,0	757	3350
	360	85	345,0	280,0		29	81,0		41,0	125	4,0	1340	4970
	360	85	324,4	273,0	55	29		74,0	41,0	125	4,0	1792	6300
	420	122	400,0	305,0		43	117,0		58,0	132	6,0	2328	7970
	420	122	375,3	296,0	77	44		103,0	58,5	132	6,0	2905	9070

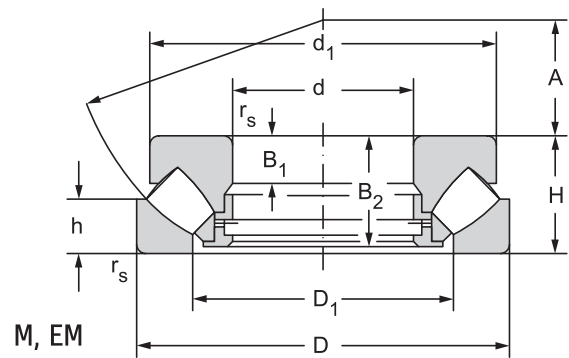
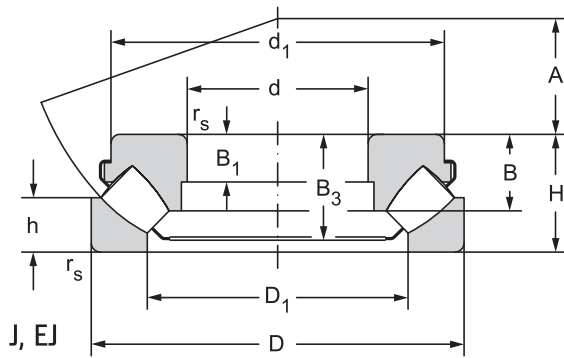


Deliveries of bearings marked * must be first consulted with the manufacturer, ** NEW FORCE

Fatigue load limit	Limiting speed for lubrication with	Bearing designation	Abutment and fillet dimensions						Weight	Minimum axial load factor
			d	d_a	d_{b1}	D_a	d_{b2}	r_a		
P_u	oil			min	max	max	max	max	-	
kN	min ⁻¹		mm						kg	
230	1300	29328M**	140	185		211		2,0	11,0	0,67
320	1400	29328EJ**		185	148,0	208	154	2,0	10,5	1,2
370	1200	29428M**		205		239		3,0	24,2	1,8
460	1200	29428EJ**		205	153,0	239	162	3,0	23,0	2,7
240	1200	29330M**	150	195		222		2,0	11,5	0,74
320	1400	29330EJ**		195	158,0	219	163	2,0	10,9	1,3
410	1100	29430M**		220		257		3,0	29,4	2,3
500	1100	29430EJ**		220	163,0	275	175	3,0	28,2	3,4
270	1100	29332M**	160	210		239		2,5	15,2	0,99
390	1200	29332EJ**		210	169,0	235	176	2,5	14,4	2
450	1000	29432M**		230		274		4,0	35,5	2,9
560	1000	29432EJ**		235	175,0	270	179	4,0	33,3	4,4
280	1100	29334M**	170	220		248		2,5	16,0	1,1
390	1200	29334EJ**		220	178,0	245	187,5	2,5	15,1	2,1
500	940	29434M**		245		291		4,0	43,7	3,6
570	950	29434EJ**		250	185,0	286	199	4,0	40,1	4,9
330	1000	29336M**	180	235		266		2,5	20,3	1,6
450	1100	29336EJ**		235	189,0	262	195	2,5	19,1	2,9
540	890	29436M**		260		307		4,0	52,0	4,5
650	900	29436EJ**		265	195,0	304	210	4,0	48,1	6,4
370	940	29338M*	190	250		283		3,0	24,8	2
450	1100	29338EJ**		250	199,0	280	208,5	3,0	23,3	2,9
590	840	29438M**		275		325		4,0	60,0	5,5
690	850	29438EJ**		280	206,0	321	223	4,0	55,7	7,5
300	1150	29240EM**	200	235		260		2,0	8,76	1,2
430	890	29340M*		265		300		3,0	33,0	2,8
500	950	29340EJ**		265	211,0	300	221,5	3,0	28,9	3,8
660	790	29440M*		290		343		4,0	69,0	7,1
770	800	29440EJ**		298	217,5	334	234	4,0	66,3	9,7
310	1300	29244EM**	220	285		260		2,0	9,64	1,4
440	840	29344M*		285		320		3,0	32,8	3,1
560	950	29344EJ**		285	229,0	316	237,5	3,0	31,6	5
690	750	29444M**		310		364		5,0	74,0	7,9
780	750	29444EJ**		315	238,0	355	254	5,0	69,1	10

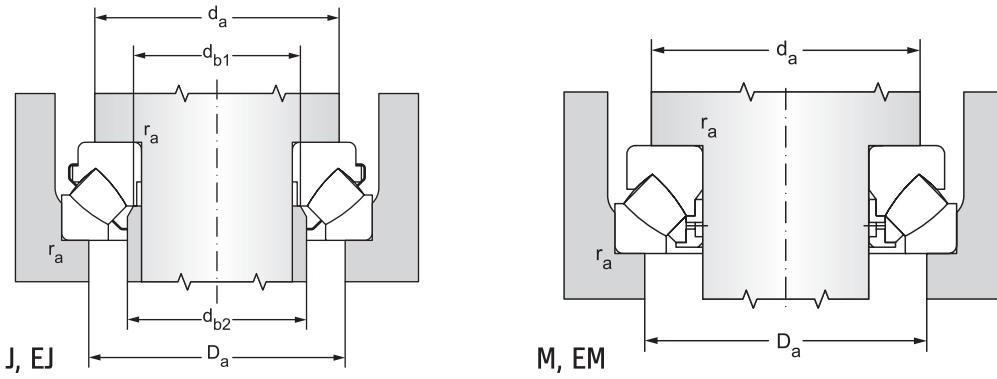
Spherical roller thrust bearings

d = 240 to 380 mm



12.9.1

Main dimensions												Basic load rating	
d	D	H	d ₁	D ₁	B	B ₁	B ₂	B ₃	h	A	r _s	dynamic	static
											min	C _a	C _{oa}
mm												kN	
240	340	60	330,0	283,0		19	57,0		30,0	130	2,1	793	3450
	380	85	365,0	300,0		29	81,0		41,0	135	4,0	1340	5190
	380	85	343,7	294,8	54	29		75,0	40,5	135	4,0	1844	6490
	440	122	420,0	321,0		43	117,0		59,0	142	6,0	2410	8420
	440	122	393,0	320,0	76	44		103,0	59,0	142	6,0	3039	9770
260	360	60	350,0	302,0		19	57,0		30,0	139	2,1	825	3650
	420	95	405,0	325,0		32	91,0		45,0	148	5,0	1780	6820
	420	95	380,3	320,4	61	32		84,0	46,0	148	5,0	2307	8310
	480	132	460,0	346,0		48	127,0		64,0	154	6,0	2812	9870
	480	132	430,7	344	86	48		117	63	154	6	3667	12080
280	380	60	370,0	323,0		19	57,0		30,0	150	2,1	872	3950
	440	95	423,0	345,0		32	91,0		46,0	158	5,0	1780	7100
	440	95	401,7	342,1	62	32		84,0	45,0	158	5,0	2276	8490
	520	145	495,0	380,0		52	140,0		68,0	166	6,0	3327	11840
	520	145	468,9	370,8	95	52		125,0	70,0	166	6,0	4604	15750
300	420	73	405,0	355,0		21	69,0		38,0	162	3,0	1061	4670
	480	109	460,0	375,0		37	105,0		50,0	168	5,0	2180	8500
	480	109	431,9	366,7	70	36		95,0	51,0	168	5,0	2730	11000
	540	145	515,0	398,0		52	140,0		70,0	175	6,0	3317	11850
	540	145	489,2	370,0	95	55		128,0	70,0	175	6,0	4645	16460
320	440	73	430,0	375,0		21	69,0		38,0	172	3,0	1102	4930
	500	109	482,0	395,0		37	105,0		53,0	180	5,0	2180	8850
	500	109	456,1	387,0	78	37		95,0	53,0	180	5,0	2936	10920
	580	155	555,0	430,0		55	149,0		75,0	191	7,5	4007	14690
	580	155	525,6	421,8	102	55		134,0	74,5	191	7,5	5160	21200
340	460	73	436,0	389,5		21	69,0		37,0	183	3,0	1442	6600
	540	122	520,0	424,0		41	117,0		59,0	192	5,0	2719	10550
	620	170	590,0	452,0		61	164,0		82,0	201	7,5	4481	16410
	620	170	561,8	442,2	112	54		146,0	84,0	201	7,5	5995	25080
360	500	85	485,0	420,0		25	81,0		44,0	194	4,0	1442	6600
	560	122	540,0	444,0		41	117,0		59,0	202	5,0	2730	11030
380	520	85	505,0	440,0		27	81,0		42,0	202	4,0	1597	7510
	670	175	622,0	504,0		63	168,0		85,0	222	7,5	4841	19100

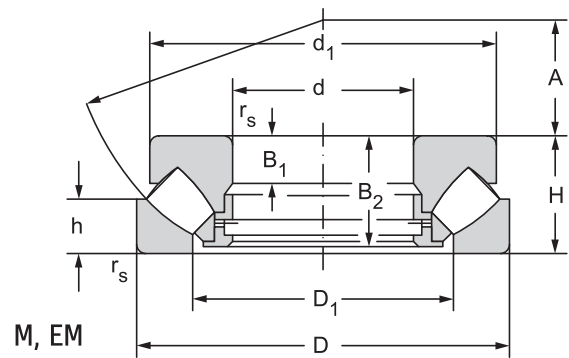
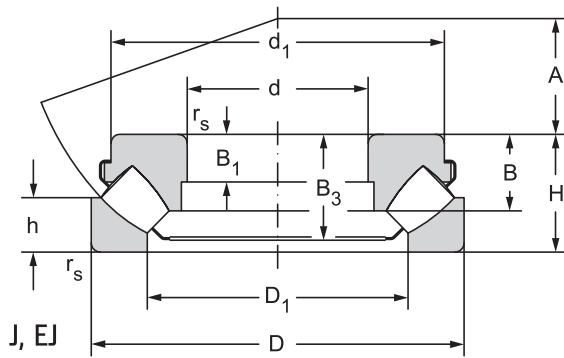


Deliveries of bearings marked * must be first consulted with the manufacturer, ** NEW FORCE

Fatigue load limit	Limiting speed for lubrication with	Bearing designation	Abutment and fillet dimensions						Weight	Minimum axial load factor
			d	d_a	d_{b1}	D_a	d_{b2}	r_a		
P_u	oil			min	max	max	max	max	-	
kN	min ⁻¹		mm						kg	
310	890	29248M**	240	285		311		2,0	16,7	1,5
450	790	29348M*		300		340		3,0	35,3	3,4
560	900	29348EJ**		305	249,0	336	256	3,0	33,4	5,3
710	750	29448M**		330		383		5,0	79,0	8,9
830	750	29448EJ**		335	258,0	377	276	5,0	73,5	12
320	890	29252M**	260	305		331		2,0	18,5	1,7
580	750	29352M*		330		374		3,0	48,5	5,8
700	800	29352EJ**		335	272,0	370	283,2	4,0	46,9	8,6
810	670	29452M**		360		419		5,0	105	12
990	670	29452EJ**		406	278	378	296	5	96,1	18
340	840	29256M**	280	325		351		2,0	19,5	2
590	710	29356M*		350		394		4,0	52,5	6,3
710	800	29356EJ**		355	293,0	390	302	4,0	49,5	9
950	630	29456M*		390		453		5,0	132	18
1 300	630	29456EJ**		395	298,0	446	316,5	5,0	127	31
390	750	29260M**	300	355		386		2,5	30,5	2,7
690	630	29360M*		380		429		4,0	74,0	9
890	700	29360EJ**		385	312,0	423	325,8	4,0	68,7	15
940	600	29460M*		410		471		5,0	140	18
1 300	600	29460EJ**		415	318,0	465	339	5,0	133	34
400	710	29264M**	320	375		406		2,5	32,9	3
710	630	29364M*		400		449		4,0	77,0	9,8
870	670	29364EJ**		405	332,0	442	336	4,0	72,1	15
1 100	560	29464M*		435		507		6,0	175	27
1 600	560	29464EJ**		450	342,0	500	364	6,0	164	56
530	850	29268EM**	340	400		422		2,5	33,0	5,4
820	560	29368M**		430		484		4,0	103	14
1 300	500	29468M**		465		451		6,0	218	34
1 900	380	29468EJ**		475	358,0	530	364	6,0	211	79
520	630	29272M**	360	420		461		3,0	51,8	5,4
850	560	29372M**		450		504		4,0	107	15
580	600	29276M**	380	440		480		3,0	52,8	7,1
1 400	470	29476EM**		504		570		6,0	263	46

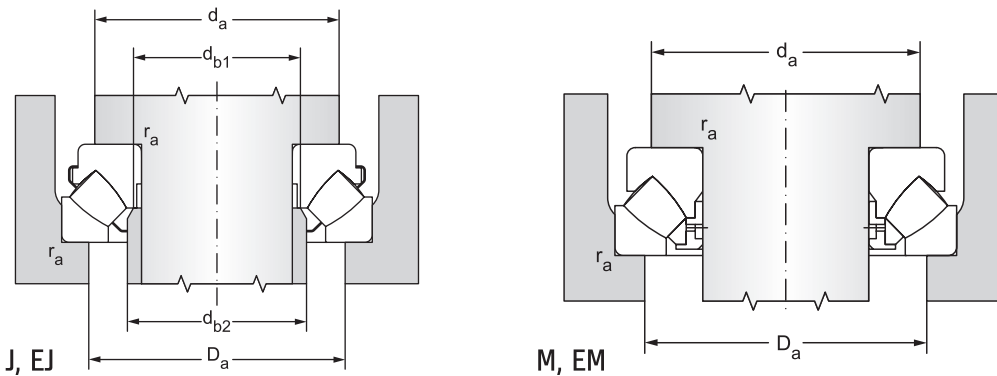
Spherical roller thrust bearings

d = 400 to 750 mm



12.9.1

Main dimensions											Basic load rating		
d	D	H	d ₁	D ₁	B	B ₁	B ₂	B ₃	h	A	r _s	dynamic	static
											min	C _a	C _{oa}
mm											kN		
400	540	85	526,0	460,0		27	81,0		42,0	212	4,0	1648	7900
	620	132	596,0	494,0		44	127,0		64,0	225	6,0	3389	14120
	710	185	680,0	530,0		67	178,0		89,0	236	7,5	7014	26500
420	580	95	553,0	484,2		30	91,0		46,0	225	5,0	2369	11230
	650	140	626,0	520,0		48	135,0		68,0	235	6,0	3512	14700
	730	185	663,0	540,0		67	175,0		90,0	244	7,5	7056	31020
440	680	145	655,0	546,0		49	140,0		70,0	245	6,0	3976	16850
	780	206	745,0	576,0		74	199,0		100,0	260	9,5	6468	24650
	780	206	718	554		77	199		101	257	9,5	8250	33270
480	650	103	635,0	554,0	61	33	99,0		55,0	259	6,0	1978	11000
	850	224	772,0	611,6		81	214,0		108,0	280	9,5	9935	44398
500	670	103	654,0	574,0		33	99,0		55,0	268	5,0	2472	12120
	750	150	725,0	611,0		51	144,0		74,0	280	6,0	4347	18660
	870	224	801,0	625,6		81	218,0		110,0	290	9,5	10326	48568
530	800	160	772,0	648,0		54	154,0		76,0	295	7,5	5284	22730
600	800	122	760,0	680,0		44	117,0		60,0	321	5,0	3832	19060
	900	180	850,0	731,0		64	171,0		87,0	335	7,5	7004	31500
630	850	132	820,0	724,0		42	127,0		67,0	338	6,0	4378	22500
	950	190	880	743		68	183		92	359	9,5	8940	38700
	1090	280	995	796		107	270		137	365	12	15244	63200
670	900	140	858,0	762,0		50	130,0		73,0	361	6,0	4635	23280
	1150	290	1045	844		110	280		141	387	15	16274	69300
710	1060	212	985	835		74	205		103	405	9,5	10506	46400
	1220	308	1110,0	899,0		118	298,0		149,0	415	15,0	18128	76500
750	1000	150	950	838		52	144		74	409	6	6448	31600
	1120	224	1086	890		76	216		109	415	9,5	9909	45800
	1280	315	1170	942		122	305		153	436	15	19776	86600

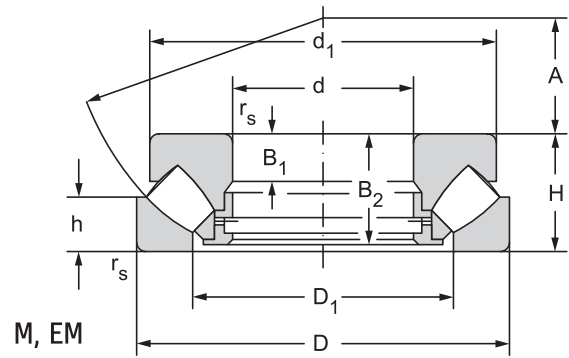
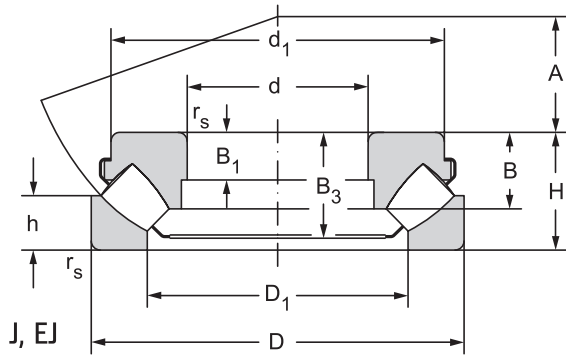


Deliveries of bearings marked * must be first consulted with the manufacturer, ** NEW FORCE

Fatigue load limit	Limiting speed for lubrication with	Bearing designation	Abutment and fillet dimensions						Weight	Minimum axial load factor
			d	d _a	d _{b1}	D _a	d _{b2}	r _a		
P _u	oil			min	max	max	max	max	-	
kN	min ⁻¹		mm						kg	
610	600	29280M**	400		460,0	500	3		55,3	7,8
1 100	500	29380M**			498,0	557	5		150	25
1 900	450	29480EM**			550,0	615	6		306	88
850	700	29284EM**	420	500		525		4	73,0	16
1 100	450	29384M**			523,0	585	5		170	27
2 200	430	29484EM**			592,0	684	8		308	120
1 200	450	29388M**	440		548,0	614	5		190	35
1 700	400	29488M**			592,0	684	8		407	76
2 400	380	T29488EM**		612		662		8	412	140
800	500	29296M**	480		558,0	603	4		96,5	15
3 100	340	29496EM**			660,0	735	8		518	250
870	470	292/500M**	500		578,0	622	4		101	18
1 300	400	293/500M**			613,0	680	5		220	44
3 300	340	294/500EM**		685		755		8	548	290
1 600	380	293/530M**	530		651,0	724	6		286	65
1 300	450	292/600EM**	600	700		725		4	160	45
2 100	330	293/600EM**			735,0	815	6		390	120
1 500	350	292/630M**	630		730,0	789	5		211	63
2500	320	293/630EM**		795		860		8	488	190
4000	260	294/630EM**		860		950		10	1108	500
1 500	380	292/670EM**	670	790		815		5	237	68
4300	240	294/670EM**		905		1000		12	1269	600
2900	280	293/710EM**	710	890		960		8	665	270
4 700	220	T 294/710EM**		970		1050		12	1420	730
2000	325	292/750EM**	750	880		925		5	327	120
2800	260	293/750EM**		935		1000		8	775	260
5200	200	274/750EF**		1015		1120		12	1660	940

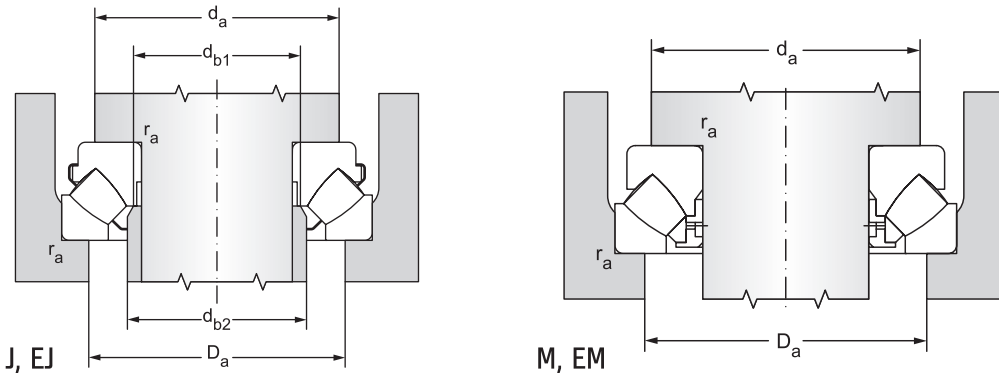
Spherical roller thrust bearings

d = 800 to 1120 mm



12.9.1

Main dimensions											Basic load rating		
d	D	H	d ₁	D ₁	B	B ₁	B ₂	B ₃	h	A	r _s min	dynamic C _a	static C _{oa}
mm											kN		
800	1060	155	1010	890		52	149		77	434	7,5	6942	35200
	1180	230	1146	943		78	222		111	440	9,5	10506	49900
	1360	335	1300,0	1040,0		120	324,0		162,0	462	15,0	16830	72360
	1360	335	1250	1010		122	324		165	462	15	21321	94800
850	1120	160	1060	945		47	154		82	455	7,5	7117	36700
950	1250	180	1185	1056		58	174		88	507	7,5	8755	46400
1000	1460	276	1365	1165		100	267		137	561	12	18334	88100
1060	1400	206	1325	1183		66	199		100	566	9,5	11124	59600
1120	1460	206	1385	1243		70	199		97	601	9,5	11948	63100



Deliveries of bearings marked * must be first consulted with the manufacturer, ** NEW FORCE

Fatigue load limit	Limiting speed for lubrication with	Bearing designation	Abutment and fillet dimensions						Weight	Minimum axial load factor
			d	d_a	d_{b1}	D_a	d_{b2}	r_a		
P_u	oil			min	max	max	max	max	-	
kN	min^{-1}		mm						kg	
2200	320	292/800EM**	800	935		980		6	383	150
3000	240	293/800EM**		995		1060		8	871	310
4 300	220	294/800M **			1055,0	1200	12		2010	650
5600	190	294/800EF**		1080		1185		12	2039	1100
2200	300	292/850EM**	850	980		1030		6	428	170
2700	260	292/950EM**	950	1095		1155		6	604	270
5000	180	293/1000EF**	1000	1245		1330		10	1560	970
3400	220	292/1060EF**	1060	1225		1290		8	866	440
3500	220	292/1120EF**	1120	1300		1365		8	906	500

