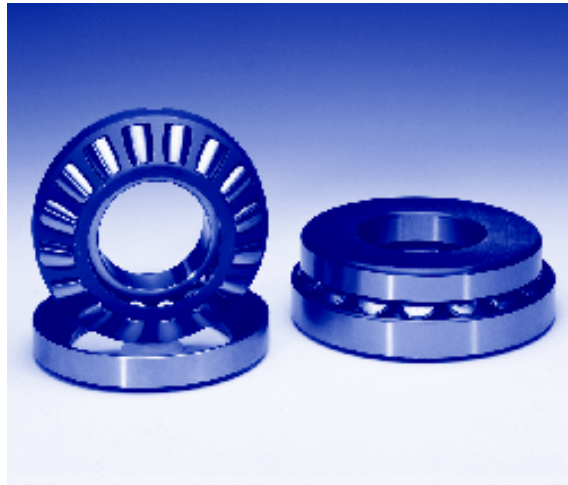
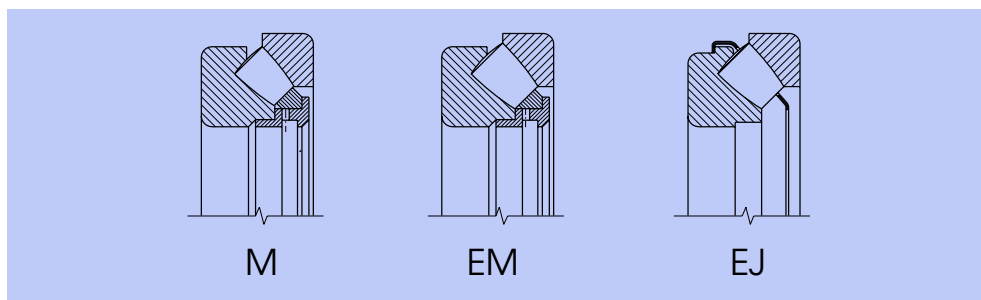


# Spherical Roller Thrust Bearing



Spherical roller thrust bearings have a great number of asymmetrical spherical rollers with a good conformity to the raceway of the shaft and housing washers and that is why they are suitable for accommodating great axial load as well as certain radial load at relatively high rotational speed. Bearings are separable which can be utilized when mounting.

The internal bearing design requires oil lubrication. An exception is created by conditions where the bearing is working at very small rotational speed.



## Boundary Dimensions

Boundary dimensions of spherical roller thrust bearings comply with the standard ISO 104 and are shown in dimension tables.

## Designation

Bearing designation of standard bearings is in the dimension tables of this publication.

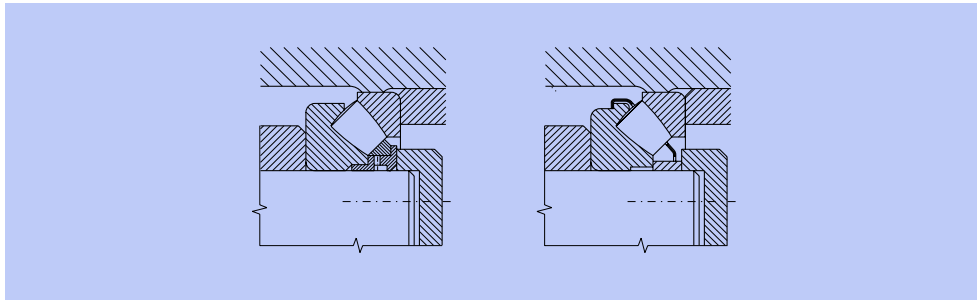
Difference from basic design is indicated by additional symbols shown in section 2.2 .

## Cage

Spherical roller thrust bearings in "M" design have brass cages guided by a steel sleeve on the shaft washer.

Bearings in "J" design have pressed steel cages guided on the shaft washer.

Bearings in "J" design are interchangeable with bearings with machined brass cage. If the bearing with machined brass cage is to be replaced in arrangement, where the shaft washer rests on the shaft on the face of steel sleeve which guides the cage by the bearing in "J" design, it is necessary to insert a spacer between the shaft washer and original shaft shoulder, as shown in the picture.



### Tolerance

Bearings are commonly produced in normal tolerance class P0 which is not indicated. Limiting values of dimension and running deviations are shown in table 20.

### Misalignment

Spherical raceway of the bearing housing washer enables, at common operation conditions ( $P_a \leq 0.1C_a$ ) misalignment from the central position without damaging the correct bearing function of values according to the table below.

Bearing Type	Permissible Misalignment
292	2°
293	2°30'
294	3°

### Arrangement Design

Abutment and fillet dimensions shown in the dimension tables of this publication are suitable for bearings where the load  $P_a \leq 0.1C_a$ . At higher load it is suitable to support bearing washers along the face surface, i.e.  $d_a = d_1$  and  $D_a = D_1$ .

### Assembly

To ensure proper function of bearing in arrangement its assembly in the position with the vertical axis of rotation is appropriate. In case that it is not possible to comply with this principle, we recommend consulting with TKS.

### Axial Equivalent Dynamic Load

$$P_a = F_a + 1.2F_r \quad (F_r \leq 0.55F_a) \quad [\text{kN}]$$

### Minimum Axial Load

At higher rotational speed by spherical roller thrust bearings arises the danger of rolling element sliding. A potential problem exist in the use of spherical roller thrust bearings at higher rotational speed. the danger arises from the possibility of the rolling element sliding between raceways due to centrifugal forces acting in such cases when the axial load  $F_a$  drops under minimum value. For calculation of minimum value  $F_{a \min}$  following relation is used:

$$\frac{C_{oa}}{2000} \leq F_{a \min} = 1,8 F_r + M \cdot \left(\frac{n_{\max}}{1000}\right)^2 \quad [\text{kN}]$$

- $F_{a \min}$  - minimum axial load [kN]
- $F_r$  - radial bearing load [kN]
- $C_{oa}$  - axial basic static load rating [kN]  
(values are in dimension tables)
- $n_{\max}$  - maximum rotational speed [min<sup>-1</sup>]
- $M$  - minimum axial load factor  
(values are in dimension tables)



If the external axial bearing load is too small, or if the bearing is relieved in operation, e.g. in a bearing pair, it is necessary to create axial load, e.g. with springs. If also radial load acts simultaneously, following condition must be fulfilled:

$$F_r \leq 0.55F_a$$

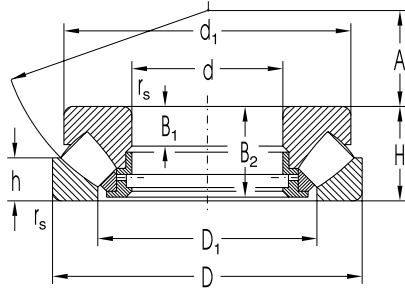
### Axial Equivalent Static Load

$$P_{0a} = F_a + 2.7F_r \quad (F_r \leq 0.55F_a) \quad [\text{kN}]$$

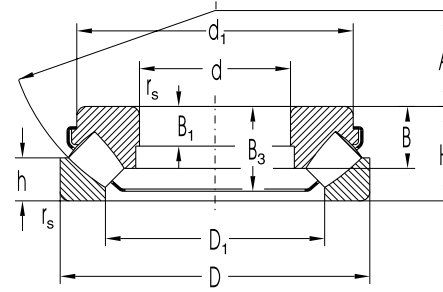
Static safety factor for spherical roller thrust bearings must be  $s_0 \geq 4$ .



**Spherical Roller Thrust Bearings**  
d = 50 to 160 mm

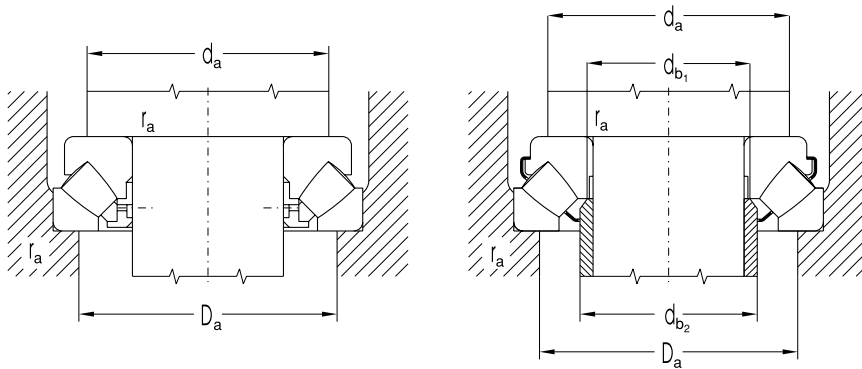


M, EM



EJ

Dimensions												Basic Load Dynamic C <sub>a</sub>	Rating Static C <sub>0a</sub>	Fatigue load limit P <sub>u</sub>
d	D	H	d <sub>1</sub>	D <sub>1</sub>	B	B <sub>1</sub>	B <sub>2</sub>	B <sub>3</sub>	h	A	r <sub>s</sub> min			
mm												kN		kN
50	110	36	95,0	70,0	25,0	13		32,0	20,5	32	1,5	290	930	113,41
60	130	42	118,0	88,0	28,0	15	39,5	35,5	20,0	38	1,5	287	809	98,66
	130	42	118,0	87,0	27,0	27		37,0	20,0	38	1,2	382	1004	122,44
65	140	45	128,0	96,5	28,0	16	42,5	38,0	21,0	42	2,0	340	973	117,78
	140	45	128,0	93,0	29,5	16		39,0	21,0	42	2,0	434	1155	139,81
70	150	48	137,0	102,0	32,0	17	45,5		23,0	44	2,0	371	1070	126,81
	150	48	131,6	105,0	31,0	17		43,5	23,0	44	2,0	440	1280	150,28
75	160	51	146,0	109,0	34,5	18	48,0		24,0	47	2,0	429	1250	145,24
	160	51	146,0	108,0	33,5	18		47,0	24,0	47	2,0	524	1465	170,22
80	170	54	155,0	116,0	36,0	19	51,0		24,0	50	2,1	464	1370	156,25
	170	54	155,0	116,0	36,0	19		46,5	24,0	50	2,1	570	1430	163,10
85	180	58	164,0	125,0	38,0	21	55,0		28,0	54	2,1	527	1570	175,96
	180	58	164,0	123,0	37,0	21		50,0	28,0	54	2,0	692	1945	217,99
90	190	60	174,0	130,0		22	57,0		29,0	56	2,1	578	1780	196,23
	190	60	174,0	130,0		22	57,0		29,0	56	2,1	703	2172	239,45
100	170	42	150,0	128,0	26,2	15		37,3	20,5	58	1,5	436	1400	156,03
	210	67	193,0	144,5		24	64,0		32,0	62	3,0	705	2170	232,03
	210	67	193,0	144,0		24	64,0		32,0	62	2,5	865	2578	275,66
110	190	48	176,0	143,0		16	45,5		23,0	64	2,0	442	1420	153,34
	190	48	176,0	143,0	31,0	16		42,0	23,0	64	2,0	570	1760	190,05
	230	73	212,0	160,0		26	69,0		35,0	69	3,0	817	2600	270,41
	230	73	209,5	159,0		27			35,0	69	2,5	1022	3078	320,13
120	210	54	187,1	155,5	35,5	19		47,0	27,0	70	2,1	680	2500	262,35
	210	54	194,0	157,5		18	51,0		26,0	70	2,1	560	1830	192,04
	250	78	229,0	172,0		29	74,0		37,0	74	4,0	934	3000	304,20
	250	78	226,8	173,0		29			37,0	74	4,0	1180	3590	364,02
130	225	58	205,0	170,0	37,0	19	55,0		28,0	76	2,1	628	2070	212,52
	225	58	201,5	165,7		21	49,6		30,1	76	2,1	765	2950	302,86
	270	85	247,0	188,0	55,5	31	81,0		41,0	81	4,0	1090	3540	350,66
	270	85	245,0	188,0		31		74,0	41,0	81	4,0	1395	4300	425,94
140	240	60	219,0	183,0		20	57,0		29,0	82	2,1	675	2310	232,37
	240	60	214,9	178,9	38,5	22	-	52,4	30,0	82	2,1	850	3150	316,86
	280	85	257,0	197,5		31	81,0		41,0	86	4,0	1130	3750	366,06
	280	85	254,0	196,5	54,0	32		74,0	41,0	86	4,0	1509	4686	457,43
150	250	60	229,0	193,0		20	57,0		29,0	87	2,1	697	2430	240,70
	250	60	222,5	189,6	38,0	22	-	53,8	28,0	87	2,1	863	3236	320,54
	300	90	276,0	211,5		32	86,0		44,0	92	4,0	1280	4270	408,28
	300	90	273,0	209,5	58,0	34		79,0	44,0	92	4,0	1626	5241	501,12
160	270	67	243,6	202,3	42,0	24	-	58,6	33,0	92	3,0	1036	3977	385,49
	270	67	248,0	207,0		23	64,0		32,0	92	3,0	807	2810	272,37
	320	95	282,8	221,7	60,5	35	-	82,0	45,5	99	5,0	1800	6550	614,28

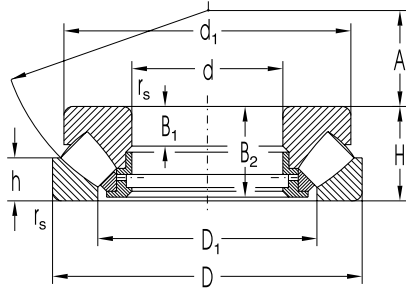


Limiting Speed for Lubrication with Oil	Bearing Designation	Abutment and Fillet Dimensions						Weight	Minimum Axial Load Factor
		d	d <sub>a</sub> min	d <sub>b1</sub> max	D <sub>a</sub> max	d <sub>b2</sub> min	r <sub>a</sub> max		
min <sup>-1</sup>		mm						kg	M
3100	29410EJ	50	70	55,8	90	59,5	1,50	1,67	0,110
2400	29412M*	60	90		109		1,50	2,60	0,082
2600	29412EJ		90	67,0	117	67,0	1,50	2,47	0,130
2200	29413M*	65	100		118		2,00	3,30	0,120
2400	29413EJ		100	72,0	118	72,0	2,00	3,26	0,140
2000	29414M*	70	105		126		2,00	4,00	0,140
2200	29414EJ		105	77,5	126	77,5	2,00	3,98	0,160
2000	29415M*	75	115		134		2,00	4,90	0,200
2200	29415EJ		115	82,5	134	82,5	2,00	4,90	0,180
1900	29416M*	80	120		141		2,00	5,80	0,230
2000	29416EJ		120	88,0	141	88,0	2,00	5,80	0,260
1800	29417M*	85	130		153		2,00	6,90	0,310
1800	29417EJ		130	94,0	153	94,0	2,00	6,67	0,240
1700	29418M*	90	135		161		2,00	8,10	0,400
1800	29418EJ		135	99,0	161	99,0	2,00	8,10	0,400
2000	29320EJ	100	130	107,0	147	107,0	1,50	3,95	0,580
1500	29420M*		150		178		2,50	11,80	0,590
1600	29420EJ		150	110,0	175	110,0	3,00	10,80	0,590
1600	29322M*	110	145		165		2,00	5,50	0,250
1600	29322EJ		145	117,0	165	117,0	2,00	5,40	0,390
1400	29422M*		165		196		2,50	14,50	0,850
1400	29422EJ		165	120,5	193	129,0	2,50	13,50	0,850
1600	29324EJ		160	128,0	181	128,0	2,00	7,41	0,780
1400	29324M	120	160		184		2,00	7,60	0,420
1300	29424M*		180		212		3,00	18,10	0,910
1300	29424EJ		180	132,0	209	140,0	3,00	17,50	0,910
1300	29326M	130	170		198		2,00	9,30	0,540
1500	29326EJ		175	138,0	194	143,0	2,00	9,08	1,100
1200	29426M*		195		229		3,00	22,50	1,600
1200	29426EJ		195	142,5	227	153,0	3,00	21,60	1,600
1300	29328M	140	185		211		2,00	11,00	0,670
1400	29328EJ		185	148,0	208	154,0	2,00	10,50	1,200
1200	29428M		205		239		3,00	24,20	1,800
1200	29428EJ		205	153,0	239	162,0	3,00	23,00	1,800
1200	29330M	150	195		222		2,00	11,50	0,740
1400	29330EJ		195	158,0	219	163,0	2,00	10,90	1,300
1100	29430M		220		257		3,00	29,40	2,300
1100	29430EJ		220	163,0	275	175,0	3,00	28,20	2,300
1200	29332EJ		210	169,0	235	176,0	2,50	14,40	2,000
1100	29332M	160	210		239		2,50	15,20	0,990
1000	29432EJ		235	175,0	270	179,0	4,00	33,30	5,400

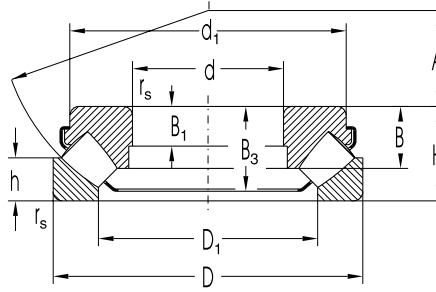
Deliveries of bearings marked with \* must be agreed with the producer.



**Spherical Roller Thrust Bearings**  
**d = 160 to 320 mm**

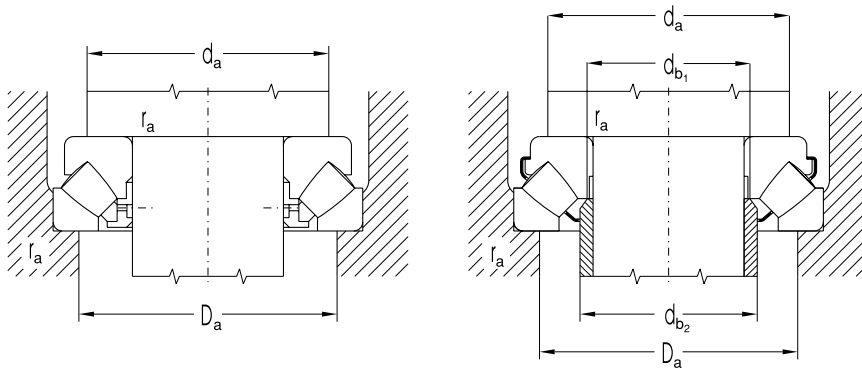


M, EM



EJ

Dimensions												Basic Load Dynamic C <sub>a</sub>	Rating Static C <sub>0a</sub>	Fatigue load limit P <sub>u</sub>
d	D	H	d <sub>1</sub>	D <sub>1</sub>	B	B <sub>1</sub>	B <sub>2</sub>	B <sub>3</sub>	h	A	r <sub>s</sub> min			
mm												kN		kN
160	320	95	306,0	226,0		34	91,0		45,0	99	5,0	1460	4810	451,09
170	280	67	253,6	214,6	42,2	24	-	60,0	32,0	96	3,0	1058	4098	391,84
	280	67	258,0	215,0		23	64,0		32,0	96	3,0	833	2950	282,07
	340	103	324,0	240,0		37	99,0		50,0	104	5,0	1620	5380	495,46
180	300	73	270,4	228,3	46,0	26	-	64,3	35,5	103	3,0	1243	4813	451,38
	300	73	277,0	231,0		25	69,0		35,0	103	3,0	984	3530	331,05
	360	109	342,0	255,0		39	105,0		52,0	110	5,0	1800	6010	544,07
190	320	78	294,0	246,0		27	74,0		38,0	110	4,0	1120	4010	369,29
	320	78	284,4	239,5	49,0	28		68,0	36,0	110	4,0	1440	4840	445,73
	380	115	360,0	270,0		41	111,0		55,0	117	5,0	1960	6610	588,75
200	280	48	264,0	233,0	32,0	17	45,0		24,0	108	2,1	710	3150	295,42
	340	85	325,0	261,0		29	81,0		41,0	116	4,0	1300	4740	429,10
	340	85	302,8	253,6	53,5	29		73,0	40,0	116	4,0	1620	5480	496,09
	400	122	365,0	284,0		43	117,0		59,0	122	5,0	2210	7510	658,70
220	300	48	286,0	252,0		17	46,0		24,0	117	2,0	735	3350	306,72
	360	85	345,0	280,0		29	81,0		41,0	125	4,0	1340	4970	440,38
	360	85	324,4	273,0	55,0	29		74,0	41,0	125	4,0	1740	6300	558,22
	420	122	400,0	305,0		43	117,0		58,0	132	6,0	2260	7970	685,65
240	340	60	330,0	283,0		19	57,0		30,0	130	2,1	770	3450	305,69
	380	85	365,0	300,0		29	81,0		41,0	135	4,0	1340	5190	450,76
	380	85	343,7	294,8	54,0	29		75,0	40,5	135	4,0	1790	6490	563,67
	440	122	420,0	321,0		43	117,0		59,0	142	6,0	2340	8420	711,30
260	360	60	350,0	302,0		19	57,0		30,0	139	2,1	801	3650	317,01
	420	95	405,0	325,0		32	91,0		45,0	148	5,0	1780	6820	576,14
	420	95	380,3	320,4	61,0	32		84,0	46,0	148	5,0	2240	8310	702,01
	480	132	460,0	346,0		48	127,0		64,0	154	6,0	2730	9870	812,91
280	380	60	370,0	323,0		19	57,0		30,0	150	2,1	847	3950	336,69
	440	95	423,0	345,0		32	91,0		46,0	158	5,0	1780	7100	589,59
	440	95	401,7	342,1	62,0	32		84,0	45,0	158	5,0	2310	8490	705,02
	520	145	495,0	380,0		52	140,0		68,0	166	6,0	3230	11840	952,62
	520	145	468,9	370,0	95,0	52		125,0	70,0	166	6,0	4470	15750	1267,21
	520	145	489,2	370,0		55		125,0	70,0	175	6,0	4510	16460	1305,09
300	420	73	405,0	355,0		21	69,0		38,0	162	3,0	1030	4670	387,80
	480	109	460,0	375,0		37	105,0		50,0	168	5,0	2180	8500	689,11
	480	109	431,9	366,7	70,0	36		95,0	51,0	168	5,0	2650	11000	891,78
	540	145	515,0	398,0		52	140,0		70,0	175	6,0	3220	11850	939,57
	540	145	489,2	370,0	95,0	55		125,0	70,0	175	6,0	4510	16460	1305,09
	580	155	555,0	430,0		55	149,0		75,0	191	7,5	3890	14690	1140,89
320	580	155	525,6	422,0	102,0	55		134,0	74,5	191	7,5	5010	21200	1646,49
	440	73	430,0	375,0		21	69,0		38,0	172	3,0	1070	4930	402,81
	500	109	482,0	395,0		37	105,0		53,0	180	5,0	2180	8850	706,80
	500	109	456,1	387,0	78,0	37		95,0	53,0	180	5,0	2850	10920	872,11



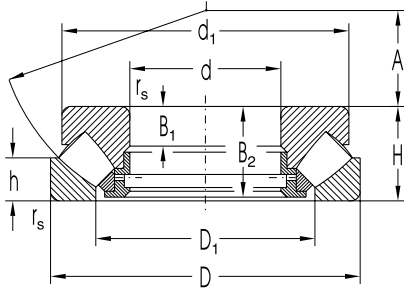
Limiting Speed for Lubrication with Oil	Bearing Designation	Abutment and Fillet Dimensions						Weight	Minimum Axial Load Factor
		d	d <sub>a</sub> min	d <sub>b1</sub> max	D <sub>a</sub> max	d <sub>b2</sub> min	r <sub>a</sub> max		
min <sup>-1</sup>		mm						kg	M
1000	<b>29432M</b>	160	230		274		4,00	35,50	2,900
1200	<b>29334EJ</b>	170	220	178,0	245	188,0	2,50	15,10	2,100
1100	<b>29334M</b>		220		248		2,50	16,00	1,100
940	<b>29434M</b>		245		291		4,00	43,70	3,600
1100	<b>29336EJ</b>	180	235	189,0	262	195,0	2,50	19,10	2,900
1000	<b>29336M</b>		235		266		2,50	20,30	1,600
890	<b>29436M</b>		260		307		4,00	52,00	4,500
940	<b>29338M*</b>	190	250		283		3,00	24,80	2,000
1100	<b>29338EJ</b>		250	199,0	280	208,5	3,00	23,30	2,900
840	<b>29438M</b>		275		325		4,00	60,00	5,500
1150	<b>29240EM</b>	200	235		260		2,00	8,76	1,400
890	<b>29340M*</b>		265		300		3,00	33,00	2,800
950	<b>29340EJ</b>		265	211,0	300	221,5	3,00	28,90	3,100
790	<b>29440M</b>		290		343		4,00	69,00	7,100
1300	<b>29244EM</b>	220	285		260		2,00	9,64	1,400
840	<b>29344M*</b>		285		320		3,00	32,80	3,100
950	<b>29344EJ</b>		285	229,0	316	237,5	3,00	31,60	5,000
750	<b>29444M</b>		310		364		5,00	74,00	7,900
890	<b>29248M</b>	240	285		311		2,00	16,70	1,500
790	<b>29348M*</b>		300		340		3,00	35,30	3,400
900	<b>29348EJ</b>		305	249,0	336	256,0	3,00	33,40	5,300
750	<b>29448M</b>		330		383		5,00	79,00	8,900
890	<b>29252M</b>	260	305		331		2,00	18,50	1,700
750	<b>29352M*</b>		330		374		3,00	48,50	5,800
800	<b>29352EJ</b>		335	272,0	370	283,2	4,00	46,90	8,600
670	<b>29452M</b>		360		419		5,00	105,00	12,000
840	<b>29256M</b>	280	325		351		2,00	19,50	2,000
710	<b>29356M*</b>		350		394		4,00	52,50	6,300
800	<b>29356EJ</b>		355	293,0	390	302,0	4,00	49,50	9,000
630	<b>29456M*</b>		390		453		5,00	132,00	18,000
630	<b>29456EJ</b>		395	298,0	446	316,5	5,00	127,00	31,000
750	<b>29260M</b>	300	355		386		2,50	30,50	2,700
630	<b>29360M*</b>		380		429		4,00	74,00	9,000
700	<b>29360EJ</b>		385	312,0	423	325,8	4,00	68,70	15,000
600	<b>29460M*</b>		410		471		5,00	140,00	18,000
600	<b>29460EJ</b>		415	318,0	465	339,0	5,00	133,00	34,000
710	<b>29264M</b>	320	375		406		2,50	32,90	3,000
630	<b>29364M*</b>		400		449		4,00	77,00	9,800
670	<b>29364EJ</b>		405	332,0	442	336,0	4,00	72,10	15,000
560	<b>29464M*</b>		435		507		6,00	175,00	27,000
560	<b>29464EJ</b>		450	342,0	500	364,0	6,00	164,00	56,000

Deliveries of bearings marked with \* must be agreed with the producer.

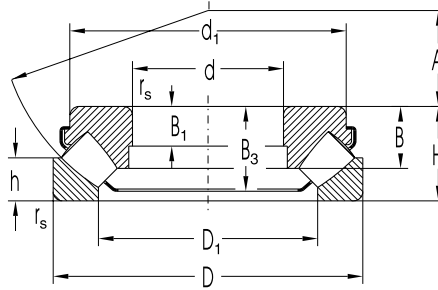




**Spherical Roller Thrust Bearings**  
**d = 340 to 800 mm**

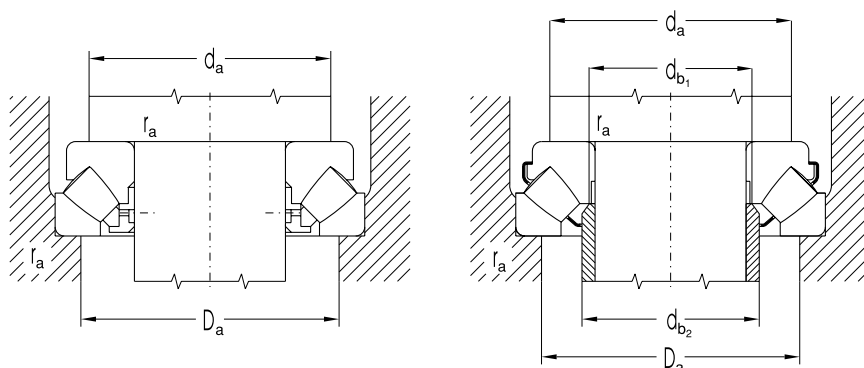


M, EM



EJ

Dimensions												Basic Load Dynamic $C_a$	Rating Static $C_{oa}$	Fatigue load limit $P_u$
d	D	H	d <sub>1</sub>	D <sub>1</sub>	B	B <sub>1</sub>	B <sub>2</sub>	B <sub>3</sub>	h	A	r <sub>s</sub> min			
mm												kN		kN
340	460	73	436,0	389,5	-	21	69,0	-	37,0	183	3,0	1400	6600	531,02
	540	122	520,0	424,0		41	117,0		59,0	192	5,0	2640	10550	824,90
	620	170	561,8	442,2	112,0	54	-	146,0	84,0	201	7,5	5820	25080	1910,47
360	620	170	590,0	452,0		61	164,0		82,0	201	7,5	4350	16410	1250,04
	500	85	485,0	420,0		25	81,0		44,0	194	4,0	1400	6600	519,62
	560	122	540,0	444,0		41	117,0		59,0	202	5,0	2650	11030	851,01
380	520	85	505,0	440,0		27	81,0		42,0	202	4,0	1550	7510	583,26
	670	175	622,0	504,0		63	168,0		85,0	222	7,5	4700	19100	1416,35
400	540	85	526,0	460,0		27	81,0		42,0	212	4,0	1600	7900	605,60
	620	132	596,0	494,0		44	127,0		64,0	225	6,0	3290	14120	1056,21
	710	185	680,0	530,0		67	178,0		89,0	236	7,5	6810	26500	1932,61
420	580	95	553,0	484,2	-	30	91,0		46,0	225	5,0	2300	11230	845,04
	650	140	626,0	520,0		48	135,0		68,0	235	6,0	3410	14700	1083,92
	730	185	663,0	540,0		67	175,0		90,0	244	7,5	6850	31020	2238,35
440	680	145	655,0	546,0		49	140,0		70,0	245	6,0	3860	16850	1225,55
	780	206	745,0	576,0		74	199,0		100,0	260	9,5	6280	24650	1747,45
	850	224	772,0	611,6		81	214,0		108,0	280	9,5	9646	44398	3066,92
500	670	103	654,0	574,0		33	99,0		55,0	268	5,0	2400	12120	870,05
	750	150	725,0	611,0		51	144,0		74,0	280	6,0	4220	18660	1313,21
	870	224	801,0	625,6	-	81	218,0		110,0	290	9,5	10025	48568	3325,29
530	800	160	772,0	648,0		54	154,0		76,0	295	7,5	5130	22730	1570,14
600	800	122	760,0	680,0		44	117,0		60,0	321	5,0	3720	19060	1296,52
	900	180	850,0	731,0		64	171,0		87,0	335	7,5	6800	31500	2098,84
630	850	132	820,0	724,0		42	127,0		67,0	338	6,0	4250	22500	1505,22
670	900	140	858,0	762,0		50	130,0		73,0	361	6,0	4500	23280	1530,06
710	1220	308	1110,0	899,0		118	298,0		149,0	415	15,0	17600	76500	4725,95
800	1360	335	1300,0	1040,0		120	324,0		162,0	462	15,0	16340	72360	4321,73



Limiting Speed for Lubrication with Oil	Bearing Designation	Abutment and Fillet Dimensions						Weight ~	Minimum Axial Load Factor M
		d	$d_{a \text{ min}}$	$d_{b1 \text{ max}}$	$D_{a \text{ max}}$	$d_{b2 \text{ min}}$	$r_{a \text{ max}}$		
$\text{min}^{-1}$		mm						kg	
850	<b>29268EM</b>	340	400	-	422	-	2,50	33,00	5,400
560	<b>29368M</b>		430		484		4,00	103,00	14,000
380	<b>29468EJ</b>		475	358,0	530	364,0	6,00	211,00	79,000
500	<b>29468M</b>		465		451		6,00	218,00	34,000
630	<b>29272M</b>	360	420		461		3,00	51,80	5,400
560	<b>29372M</b>		450		504		4,00	107,00	15,000
600	<b>29276M</b>	380	440		480		3,00	52,80	7,100
470	<b>29476EM</b>		504		570		6,00	263,00	46,000
600	<b>29280M</b>	400		460	500	3,0		55,30	7,800
500	<b>29380M</b>			498	557	5,0		150,00	25,000
450	<b>29480EM</b>			550	615	6,0		306,00	88,000
700	<b>29284EM</b>	420	500	-	525	-	4,00	73,00	16,000
450	<b>29384M</b>			523	585	5,0		170,00	27,000
430	<b>29484EM</b>			592	684	8,0		308,00	63,000
450	<b>29388M</b>	440		548	614	5,0		190,00	35,000
400	<b>29488M</b>			592	684	8,0		407,00	76,000
340	<b>29496EM</b>			660	735	8,0		518,00	82,000
470	<b>292/500M</b>	500		578	622	4,0		101,00	18,000
400	<b>293/500M</b>			613	680	5,0		220,00	44,000
340	<b>294/500EM</b>		685	-	755	-	8,00	548,00	290,000
380	<b>293/530M</b>	530		651	724	6,0		286,00	65,000
450	<b>292/600EM</b>	600	700		725		4	160,0	45,0
330	<b>293/600EM</b>	600		735	815	6,0		390,00	120,000
350	<b>292/630M</b>	630		730	789	5,0		211,00	63,000
380	<b>292/670EM</b>	670	790		815		5	237,0	68,0
220	<b>T 294/710</b>	710	970		1050		12	1420,0	730,0
220	<b>294/800M</b>	800		1055	1200	12,0		2010,00	650,000

