Spherical Roller Bearings

Spherical Roller Bearings

LYC's spherical roller bearing consists of an outer ring with spherical raceway and an inner ring with double-raceway, one or two cages, and one group of spherical rollers. Due to the center of spherical raceway of outer ring which is coinciding with the center of bearing, this makes it have a self-aligning property. This kind of bearing can adjust angular error or deflection caused by the angle of the axle and bearing housing or axle bend.

LYC's spherical roller bearing has a high load carrying capacity for radial load and axle load in two directions. It is especially suitable for carrying heavy loads and impact loads, but this type of bearing permits a lower limiting speed.

The permissible aligning angle of the spherical roller bearing working in normal conditions is 1° ~2.5° . If bearings of this type have seals, then this function would be reduced.

The relevant data for aligning angle of different dimensions can be referred to the catalogue "bearing type selection".

Type C

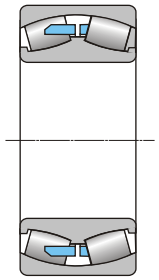
The bearings of type C are flangeless on two sides of the inner ring, two cages, and movable flange between two rows of spherical rollers. When the bearing is rotating, the middle flange can move in the axial direction. When the bearing is carrying an axial load, the load on the two rows can be adjusted. It makes the load distribution equal in order to avoid stress concentrated and single row roller loaded.

Type CA

The bearings of type CA have flanges on two sides of the inner ring, one cage, and movable spacer in the middle of two rows of the spherical rollers. When the bearing is rotating, the middle spacer can move in the axial direction. When the bearing is carrying axial load, the load on the two rows can be adjusted. The load is distributed equally to avoid stress concentration. If there is no movable flange, the cage will have this function.

Spherical Roller Bearings with Fixed Flange

Spherical roller bearings with fixed flange have flanges on the both sides of inner ring. In the middle, there is a fixed middle flange at the two sides of inner ring, and two cages. The rollers are spherical type which is the same with type C, CA, but the roller length in axial direction is not symmetrical. When the bearing rotates, the middle flange ring can not move in the axial direction, but, can allow the rollers work properly. When the bearing is carrying axial direction load, it can not adjust the load on the two rows of rollers, because this will make the single row of rollers loaded or stress concentrated. Although this kind of bearing tends to be used by type C and CA, but, in some working condition, it still has advantages like occasions where axial load is not big, and vibration load is relative heavier.



Sealed Bearings

LYC's spherical roller bearings are generally open style. Closed types with seals at both sides are also provided. This can be divided into contact and non-contact style (low friction).

The bearings with seals on double sides are filled with grease before leaving factory. The quantity of grease occupies 25%-35% of the effective space of bearing. If customers have a special requirement, other brands of grease can be supplied, or the filled quantity can be adjusted. When installing, they are not allowed to be cleaned or heated over 80℃, otherwise it is easy to damage bearings or make grease deteriorate and loss. Under the ambient temperature 30℃ ~100℃, the bearings could work in good condition. In normal working conditions, spherical roller bearings with seals do not need to be replenished with lubrication grease. However, under heavy load and high speed, or temperature over +70℃, the bearings need to be refilled with grease.

The aligning function would be reduced when spherical roller bearings are sealed.

Vibrating Machine Bearing

When spherical roller bearings are applied to vibrating machine such as vibration sieve, crusher etc. , it will make the roller and cage have higher acceleration. Accordingly when designing, we need to take special account to satisfy the working condition. LYC can provide special designed spherical roller bearings in these applications.

Split Bearing

The inner ring and outer ring advantage of LYC's split spherical roller bearing are vertically split into two parts with some angle. This kind of bearing will have almost the same performance compared with bearings with common structures, and have a large load carrying capability. This bearing is suitable for the applications where bearings cannot be axially mounted. But, due to inner and outer ring raceway having a split face, then the rotating speeds are relatively lower.

Other Design Tapered Bore

LYC's spherical roller bearing bore normally is cylindrical. But for some parts of the dimensions and specifications, tapered hole can also be provided with the taper 1:12 or 1:30 (suitable for 241, 240 dimension series). In this case, the original code should be added by K or K30 behind the bearing type. Through using the adapter sleeve to fix the bearing on the shaft, it will be very convenient to be mounted and dismounted.

Lubrication Groove and Hole

In order to lubricate easily, LYC can provide the bearing with groove and holes on outer ring, in this case, W33 should be added behind the original bearing code. If the outer ring has only one lubrication hole, W20 will be added behind.

LYC can design spherical roller bearings with other structures, such as bearings with snap ring groove on the outer ring, a single row spherical roller bearing (angle error can be 4°), and many other types etc. If customers require, then please consult LYC technical department.

LYC can also design and manufacture spherical roller bearings with special structures according to customer's requirements.

Cage

In the LYC spherical roller bearings, the cages of type C are normally pressed steel cages, fiber glass reinforced ployimide or other engineering plastics. CA type adopts a brass solid cage. Different kinds of material have different codes. See "cap" chapter.

Axial Load Carrying Capacity

Due to the special structure of the spherical roller bearing, it can take pure radial load, even pure axial load.

The spherical roller bearing with an adapter sleeve will normally be fixed to a plain shaft without a shoulder. The value of the axial load will depend upon the friction between the shaft and the adapter sleeve. If the bearing is mounted in the right way, the permissible axial load can be calculated from

$$Fa = 0.003Bd$$

where

B-Bearing width , mm

d-Bearing inner diameter, mm

Minimum Load

In order to keep bearings working in a good condition, a minimum load must be imposed on the bearings, particularly on bearings working at high speeds, high accelerations, or with load direction changing frequently, because under these working conditions, inertial force of balls and cage and lubricant friction will have bad influence on the rotation of bearings, and detrimental sliding movement may be caused.

The minimum load of a spherical roller bearing can be obtained from

$$F_{min}=0.01C_0$$

where

C_0- Basic static load rating

When bearings are started at low ambient temperatures or in the condition that the viscosity of lubricant is very high, larger a minimum load is probably needed. Usually, the weight of bearing supporting parts plus the load on the bearing have been enough to over the minimum load. If the weight cannot be up to the minimum load, then extra radial load must be imposed on this type of bearing in order to meet the requirement of minimum load.

Dimension, Tolerance, Clearance

LYC's standard spherical roller bearing dimension are according to GB/T273.3 < Rolling Bearing, Radial Bearing, and Boundary Dimension General Specification>, GB/T288 <Rolling Bearing, Spherical Roller Bearing, and Boundary Dimension> etc.

LYC's standard spherical roller bearing tolerance is according to GB/T307.1 <Rolling Bearing, Radial Bearing, and Tolerance>.

LYC's standard spherical roller bearing clearance is according to GB/T4604 <Rolling Bearing, and Radial Clearance >.

The dimension tolerance of LYC's standard spherical roller bearing is the normal grade P0 and the clearance is group 0. If customers have other special requirements on dimension, tolerance, and clearance, LYC have the ability to supply the corresponding products, including non-standard products.

Equivalent Dynamic Load

The equivalent dynamic load of the spherical roller bearing can be calculated from.

when $Fa/Fr \leqslant e$ $P = Fr + Y_1Fa$

when $Fa/Fr > e$ $P = 0.67Fr + Y_2Fa$

where

P - Equivalent dynamic load, N

Y_1, Y_2 - Axial dynamic load coefficient, have already been listed in bearing dimension table.

Equivalent Static Load

The equivalent static load of spherical roller bearing can be calculated from

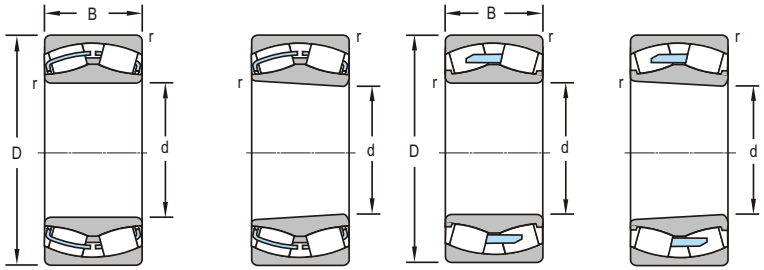
$$P_0 = Fr + Y_0Fa$$

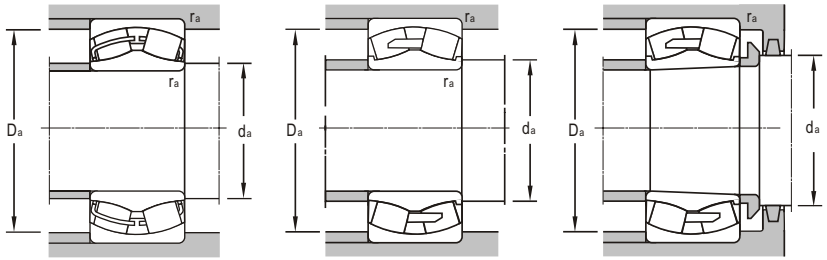
where

P_0- Equivalent static load, N

Y_0-Axial load static coefficient

Coefficient e , Y_0 , Y_1 and Y_2 are listed in bearing dimension table .

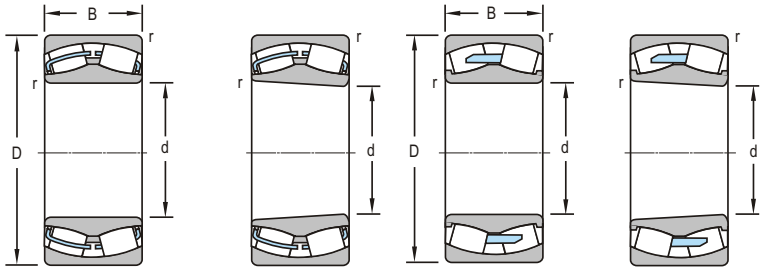


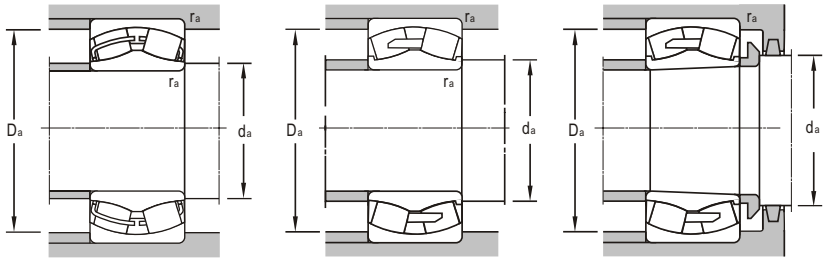


d 25～70mm

Boundary Dimensions				Basic Load Ratings		Limiting Speeds	
				Dynamic	Static	Grease	Oil
d	D	B	r_{min}	C	C_0		
mm				kN		r/min	
25	52	18	1	36.1	36.6	8500	11000
30	62	20	1	51.7	55	7500	9500
	68	20	1	51.7	55	7400	9400
35	72	23	1.1	68.9	72.5	6300	8000
40	80	23	1.1	86.9	93.9	6000	7500
	90	33	1.5	123	133	4500	5600
	90	33	1.5	121	129	4400	5500
45	85	23	1.1	86.7	101	5300	6700
	85	23	1.1	78.6	91.9	5200	6600
	100	36	1.5	141	154	3800	4800
50	90	23	1.1	90.3	97	5000	6300
	90	23	1.1	81.5	95.4	5000	6300
	110	40	2	176	193	3400	4300
	110	40	2	175	192	3300	4200
55	100	25	1.5	109	130	4500	5600
	100	25	1.5	109	130	4500	5600
	120	43	2	210	243	3200	4000
60	110	28	1.5	129	157	4000	5000
	130	46	2.1	246	288	2900	3800
	130	46	2.1	233	260	2900	3800
	130	46	2.1	233	274	2900	3800
65	120	31	1.5	144	178	3800	4800
	120	31	1.5	156	195	3800	4800
	140	33	2.1	203	242	3800	3600
	140	48	2.1	285	315	2600	3400
	140	48	2.1	285	315	2600	3400
70	125	31	1.5	163	207	3600	4500
	125	31	1.5	156	199	3500	4400
	150	35	2.1	216	276	2600	3400
	150	51	2.1	306	370	2400	3200
	150	51	2.1	311	352	2000	2800
	150	51	2.1	293	351	2000	2800

Bearing Designations				Mounting Dimensions			Calculation Factors				Mass
Present		Original									
Cylindrical Bore	Tapered Bore	Cylindrical Bore	Tapered Bore	d_{amin}	D_{amax}	r_{amax}	e	Y_1	Y_2	Y_0	
				mm							kg
22205CA/W33	**22205CAK/W33**			31	46	1	0.36	1.9	2.8	1.8	0.178
22206C/W33	**22206CK/W33**			36	56	1	0.33	2	3	2	0.281
22206X1CN	**22206X1CNK**			36	62	1	0.33	2	3	2	0.369
22207/W33	**22207K/W33**	3507Y	113507Y	42	65	1	0.35	1.9	2.9	1.8	0.477
22208C/W33	**22208CK/W33**	53508Y	153508Y	47	73	1	0.28	2.4	3.6	2.5	0.575
22308C/W33	**22308CK/W33**			49	81	1.5	0.37	1.8	2.7	1.8	1.02
22308/W33	**22308K/W33**	3608Y	113608Y	49	81	1.5	0.42	1.6	2.4	1.6	1.05
22209C/W33	**22209CK/W33**	53509Y	153509Y	52	78	1	0.27	2.5	3.7	2.5	0.618
22209/W33	**22209K/W33**	3509Y	113509Y	52	78	1	0.3	2.3	3.4	2.2	0.617
22309C/W33	**22309CK/W33**			54	91	1.5	0.37	1.8	2.7	1.8	1.37
22210C/W33	**22210CK/W33**	53510Y	153510Y	57	83	1	0.25	2.7	4	2.7	0.65
22210CA/W33	**22210CA/W33**			57	83	1	0.25	2.7	4	2.7	0.614
22310C/W33	**22310CK/W33**			64	91	2	0.38	1.7	2.6	1.7	1.83
22310/W33	**22310K/W33**	3610Y	113610Y	64	91	2	0.38	1.7	2.6	1.7	1.8
22211C/W33	**22211CK/W33**	53511Y	153511Y	66	88	1.5	0.25	2.7	4	2.7	0.88
22211CA/W33	**22211CAK/W33**			66	88	1.5	0.25	2.7	4	2.7	0.82
22311C/W33	**22311CK/W33**			66	109	2	0.37	1.8	2.7	1.8	2.38
22212C/W33	**22212CK/W33**	53512Y	153512Y	69	101	1.5	0.25	2.7	4	2.7	1.22
22312C/W33	**22312CK/W33**			72	118	2	0.36	1.9	2.8	1.8	2.95
22312/W33	**22312K/W33**	3612Y	113612Y	72	118	2	0.4	1.7	2.5	1.6	2.88
22312CA/W33	**22312CAK/W33**			72	118	2	0.37	1.8	2.7	1.8	2.96
22213C/W33	**22213CK/W33**	53513Y	153513Y	74	111	1.5	0.26	2.6	3.9	2.5	1.58
22213CA/W33	**22213CAK/W33**	53513HY	153513HY	74	111	1.5	0.27	2.5	3.7	2.5	1.52
21313		3313		77	128	2	0.25	2.7	4	2.7	2.58
22313/W33	**22313K/W33**			77	128	2	0.35	1.9	2.9	1.8	1.6
22313CA/W33	**22313CAK/W33**			77	128	2	0.35	1.9	2.9	1.8	3.54
22214C/W33	**22214CK/W33**	53514Y	153514Y	79	116	1.5	0.24	2.8	4.2	2.8	1.69
22214/W33	**22214K/W33**	3514Y	113514Y	79	116	1.5	0.27	2.5	3.7	2.5	1.64
21314		3314		82	138	2	0.25	2.7	4	2.7	3.01
22314C/W33	**22314CK/W33**	53614Y	153614Y	82	138	2	0.35	1.9	2.9	1.8	4.4
22314/W33	**22314K/W33**	3614Y	113614Y	82	138	2	0.37	1.8	2.7	1.8	4.21
22314CA/W33	**22314CAK/W33**			82	138	2	0.36	1.9	2.8	1.8	4.22

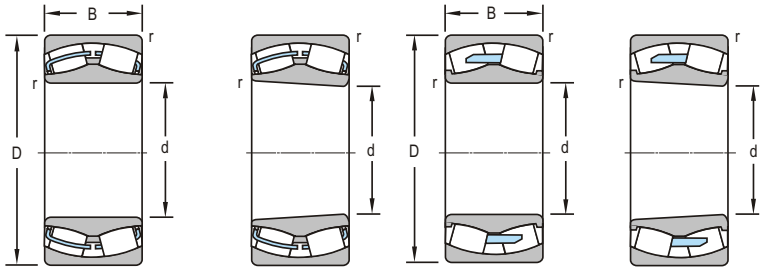


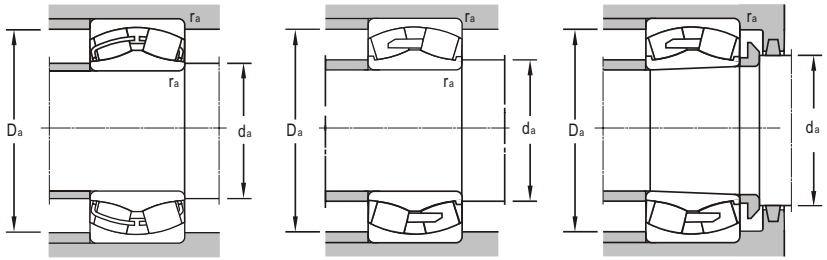


d 75～110mm

Boundary Dimensions				Basic Load Ratings		Limiting Speeds	
				Dynamic	Static	Grease	Oil
d	D	B	r_{min}	C	C_0		
mm				kN		r/min	
75	130	31	1.5	162	212	3400	4300
	130	31	1.5	155	211	3400	4300
	160	55	2.1	350	427	2200	3000
80	140	33	2	187	248	3200	4000
	140	33	2	186	252	3200	4000
	170	58	2.1	400	504	2000	2800
	170	58	2.1	388	446	2000	2800
85	150	36	2	204	262	3000	3800
	150	36	2	192	250	3000	3800
	180	60	3	392	498	1900	2600
	180	60	3	426	512	1900	2600
90	140	50	1.5	265	440	2700	3500
	160	40	2	257	340	2600	3400
	160	40	2	250	334	2600	3400
	160	52.4	2	305	434	1900	2600
	190	64	3	494	636	1800	2400
90	190	64	3	483	594	1800	2400
	190	64	3	475	583	1800	2400
95	170	43	2.1	284	380	2400	3200
	200	67	3	509	637	1700	2200
	200	67	3	509	637	1700	2200
	200	67	3	517	617	1600	2100
100	180	46	2.1	331	441	2200	3000
	180	46	2.1	331	441	2100	2900
	180	46	2.1	314	416	2100	2900
	180	60.3	2.1	420	605	1700	2200
	215	73	3	543	698	1600	2100
	215	73	3	623	792	1700	2200
	215	73	3	614	785	1600	2100
	215	73	3	614	785	1600	2100
105	175	56	2	351	564	1900	2600
	175	56	2	351	564	1900	2600
110	170	45	2	293	465	2200	3000
	170	45	2	293	465	2200	3000

Bearing Designations				Mounting Dimensions			Calculation Factors				Mass
Present		Original									
Cylindrical Bore	Tapered Bore	Cylindrical Bore	Tapered Bore	d_{amin}	D_{amax}	r_{amax}	e	Y_1	Y_2	Y_0	
							mm				kg
22215C/W33	**22215 CK/W**	53515Y	153515Y	84	121	1.5	0.22	3	4.5	2.9	1.73
22215/W33	**22215K/W33**	3515Y	113515Y	84	121	1.5	0.26	2.6	3.9	2.5	1.75
22315C/W33	**22315CK/W33**			87	148	2	0.35	1.9	2.9	1.8	5.4
22216C/W33	**22216CK/W33**	53516Y	15316Y	90	130	2	0.22	3	4.5	2.9	2.23
22216/W33	**22216K/W33**	3516Y	113516Y	90	130	2	0.25	2.7	4	2.7	2.23
22316C/W33	**22316CK/W33**	53616Y	153616Y	92	158	2	0.34	2	2.9	1.9	6.59
22316/W33	**22316K/W33**	3616Y	113616Y	92	158	2	0.37	1.8	2.7	1.8	6.19
22217C/W33	**22217CK/W33**	53517Y	153517Y	95	140	2	0.23	2.9	4.4	2.8	2.8
22217/W33	**22217K/W33**	3517Y	113517Y	95	140	2	0.26	2.6	3.9	2.5	2.79
22317ZMA/W33/C4				99	166	2.5	0.33	2	3	2	7.59
22317/W33	**22317K/W33**	3617Y	113617Y	99	166	2.5	0.37	1.8	2.7	1.8	7.07
24018C	**24018CK**			100	130	1.5	0.32	2.1	3.1	2	2.97
22218C/W33	**22218CK/W33**	53518Y	153518Y	101	149	2	0.23	2.9	4.4	2.8	3.24
22218/W33	**22218K/W33**	3518Y	113518Y	101	149	2	0.27	2.5	3.7	2.5	3.11
23218C/W33	**23218CK/W33**	3053218Y	3153218Y	101	149	2	0.31	2.2	3.3	2.2	4.61
22318C/W33	**22318CK/W33**	53618Y	153618Y	104	176	2.5	0.34	2	2.9	1.9	9.12
22318CA/W33	**22318CAK/W33**	53618HY	153618HY	104	176	2.5	0.35	1.9	2.9	1.8	8.72
22318/W33	**22318K/W33**	3618Y	113618Y	104	176	2.5	0.37	1.8	2.7	1.8	8.6
22219C/W33	**22219CK/W33**			107	158	2	0.24	2.8	4.2	2.8	4.2
22319CA/W33	**22319CAK/W33**			109	186	2.5	0.35	1.9	2.9	1.8	9.95
22319ZMA/W33/C4				109	186	2.5	0.33	2	3	2	10.3
22319/W33	**22319K/W33**	3619Y	113619Y	109	186	2.5	0.38	1.7	2.6	1.7	9.93
22220C/W33	**22220CK/W33**	53520Y	153520Y	112	168	2	0.24	2.8	4.2	2.8	4.95
22220CA/W33	**22220CAK/W33**			112	168	2	0.24	2.8	4.2	2.8	4.97
22220/W33	**22220K/W33**	3520Y	113520Y	112	168	2	0.27	2.5	3.7	2.5	5.03
23220C/W33	**23220CK/W33**	3053220Y	3153220Y	112	168	2	0.33	2	3	2	6.71
22320ZCA/W33				114	201	2.5	0.35		2.9	1.8	13.2
22320C/W33	**22320CK/W33**	53620Y	153620Y	114	201	2.5	0.36	1.9	2.8	1.8	13.6
22320CA/W33	**22320CAK/W33**	53620HY	153620HY	114	201	2.5	0.35	1.9	2.9	1.8	12.4
22320/W33	**22320K/W33**	3620Y	113620Y	114	201	2.5	0.37	1.8	2.7	1.8	13
23121/W33	**23121K/W33**	3003721Y	3113721Y	115	165	2	0.32	2.1	3.1	2	6.64
23121N		3203721		115	165	2	0.32	2.1	3.1	2	6.59
23022/W33	**23022 K/W33**	3003122 Y	3113122 Y	120	160	2	0.26	2.6	3.9	2.5	4.2
23022N		3203122		120	160	2	0.26	2.6	3.9	2.5	4.18

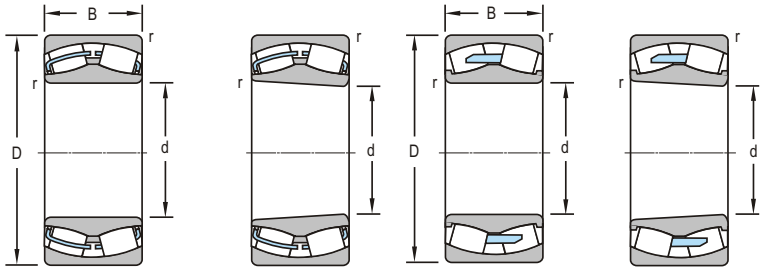


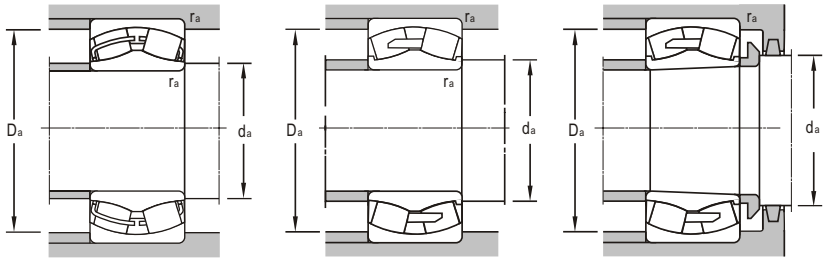


d 110～130mm

Boundary Dimensions				Basic Load Ratings		Limiting Speeds	
				Dynamic	Static	Grease	Oil
d	D	B	r_{min}	C	C_0		
mm				kN		r/min	
110	170	60	2	359	605	1700	2500
	170	60	2	359	605	1700	2500
	180	56	2	365	562	1900	2600
	180	56	2	365	562	1900	2600
	180	69	2	483	754	1600	2000
	180	69	2	435	721	1500	1800
	200	53	2.1	426	588	2000	2800
	200	53	2.1	366	531	1900	2700
	200	69.8	2.1	515	760	1600	2000
	240	80	3	629	795	1600	2000
	240	80	3	728	963	1600	2000
	240	80	3	739	982	1600	2000
	240	80	3	750	915	1500	1900
	240	92.1	3	799	998	1400	1700
120	180	46	2	315	527	1800	2500
	180	46	2	315	527	1800	2500
	180	60	2	395	686	1500	2000
	180	60	2	395	686	1600	2000
	200	62	2	410	660	1700	2300
	200	62	2	410	660	1700	2300
	200	80	2	561	919	1300	1700
	200	80	3	561	919	1300	1700
	200	80	2	589	949	1400	1800
	215	58	2.1	495	689	1900	2600
	215	58	2.1	489	656	1800	2500
	215	76	2.1	595	910	1500	1900
	260	86	3	746	954	1400	1800
	260	86	3	842	1110	1400	1800
130	200	52	2	400	655	1700	2300
	200	52	2	400	655	1700	2300
	210	64	2	499	777	1600	2200
	210	80	2	581	982	1300	1700
	210	80	2	581	982	1300	1700
	210	80	2	633	1070	1300	1700
	230	64	3	582	830	1800	2400
	230	64	3	552	786	1700	2300
	230	64	3	564	800	1700	2300
	230	80	3	700	1080	1300	1700
	280	93	4	930	1250	1300	1700

Bearing Designations				Mounting Dimensions			Calculation Factors				Mass
Present		Original									
Cylindrical Bore	Tapered Bore	Cylindrical Bore	Tapered Bore	d_{amin}	D_{amax}	r_{amax}	e	Y_1	Y_2	Y_0	
				mm							kg
24022CC/W33C4S2				119	161	2	0.33	2	3	2	5.14
24022C	24022CK30			120	160	2	0.32	2.1	3.1	2	5.18
23122/W33	23122 K/W33	3003722Y	3113722Y	120	170	2	0.32	2.1	3.1	2	6.25
23122N		3203722		120	170	2	0.32	2.1	3.1	2	6.2
24122C/W33	24122K30/W33	4053722Y	4453722Y	120	170	2	0.35	1.9	2.9	1.8	6.88
24122CA/W33	24122CAK30/W33			120	170	2	0.36	1.9	2.8	1.8	6.86
22222C/W33	22222CK/W33	53522 Y	153522 Y	122	188	2	0.25	2.7	4	2.7	7.25
22222/W33	22222K/W33	3522Y	113522Y	122	188	2	0.28	2.4	3.6	2.5	7.37
23222C/W33	23222 CK/W33	3053222Y	3153222 Y	122	188	2	0.35	1.9	2.9	1.8	9.66
22322 ZMA/W33				124	226	2.5	0.33	2	3	2	18
22322CA/C3W33YA				124	226	2.5	0.35		2.9	1.8	17.7
22322CA/W33	22322CAK/W33	53622HY	153622HY	124	226	2.5	0.35	1.9	2.9	1.8	17.5
22322/W33	22322K/W33	3622Y	113622Y	124	226	2.5	0.37	1.8	2.7	1.8	18
23322/W33	23322K/W33	3003322Y	3113322Y	124	226	2.5	0.44	1.5	2.3	1.5	23.6
23024/W33	23024K/W33	3003124Y	4453124HY	130	170	2	0.25	2.7	4	2.7	4.63
23024N		3203124		130	170	2	0.25	2.7	4	2.7	4.61
24024CA/W33	24024CAK30/W33			130	170	2	0.3	2.3	3.4	2.2	5.41
24024C/W33		4053124Y		130	170	2	0.3	2.3	3.4	2.2	5.41
23124/W33	23124K/W33	3003724Y	3113724Y	130	190	2	0.32	2.1	3.1	2	7.61
23124N		3203724		130	190	2	0.32	2.1	3.1	2	7.57
24124CA/W33	24124CAK30/W33			130	190	2	0.38	1.7	2.6	1.7	10
24124CA/C3/YB				131	189	2	0.37	1.8	2.7	1.8	10
24124C/W33	24124CK30/W33	4053724Y	4453724Y	130	190	2	0.38	1.7	2.6	1.7	10
22224C/W33	22224CK/W33	53524Y	153524Y	132	203	2	0.25	2.7	4	2.7	9.08
22224/W33	22224K/W33	3524Y	113524Y	132	203	2	0.28	2.4	3.6	2.5	9.13
23224C/W33	23224CK/W33	3053224Y	3153224Y	132	203	2	0.35	1.9	2.9	1.8	12
22324 ZMA/W33				134	246	2.5	0.35	1.9	2.9	1.8	22.6
22324C/W33	22324CK/W33	53624Y	53624HY	134	246	2.5	0.4	1.7	2.5	1.6	22.7
23026/W33	23026K/W33	3003126Y	3113126Y	140	190	2	0.26	2.6	3.9	2.5	6.8
23026N		3203126		140	190	2	0.26	2.6	3.9	2.5	6.72
23126CA/W33	23126CAK30/W33			140	200	2	0.36	1.9	2.8	1.8	9.55
24126 CA/C3W33				141	199	2	0.35		2.9	1.8	10.8
24126 CA/W33				141	199	2	0.35		2.9	1.8	10.8
24126C/W33	24126CAK30/W34	4053726Y	4453726Y	140	200	2	0.36	1.9	2.8	1.8	10.9
22226C/W33	22226CK/W33	53526Y	153626Y	144	216	2.5	0.35	1.9	2.9	1.8	11.7
22226CA/W33	22226CAK/W33			144	216	2.5	0.27	2.5	3.7	2.5	11.4
22226/W33	22226K/W33	3526Y	113526Y	144	216	2.5	0.29	2.4	3.5	2.3	11.1
23226C/W33	23226K/W33	3053226Y	3153226Y	144	216	2.5	0.33	2	3	2	14.4
22326CA/W33	22326CAK/W33	53626HY	153626HY	148	262	3	0.35	1.9	2.9	1.8	27.1

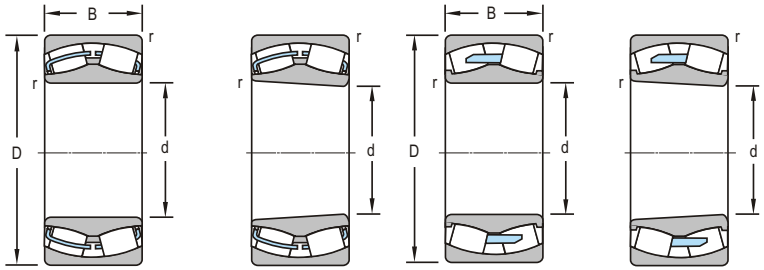


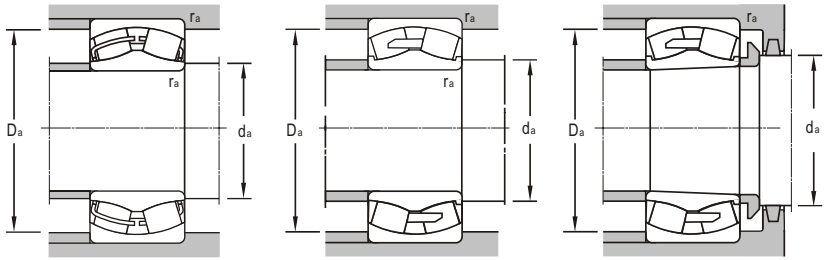


d 130～160mm

Boundary Dimensions				Basic Load Ratings		Limiting Speeds	
				Dynamic	Static	Grease	Oil
d	D	B	r_{min}	C	C_0		
mm				kN		r/min	
130	280	93	4	836	1090	1200	1600
	280	93	4	836	1090	1300	1700
140	210	53	2	395	705	1600	2100
	210	53	2	395	705	1600	2100
	210	69	2	530	910	1400	1800
	225	68	2.1	560	925	1500	1800
	225	85	2.1	620	1060	1100	1500
	225	85	2.1	649	1120	1100	1500
	250	68	3	642	931	1700	2200
	250	68	3	636	897	1500	1900
	250	68	3	662	905	1500	1900
	250	88	3	835	1300	1200	1600
	300	102	4	978	1290	1100	1500
	300	102	4	1120	1550	1100	1500
	300	102	4	1100	1420	1100	1500
150	225	56	2.1	407	725	1500	1900
	225	75	2.1	580	1060	1450	1850
	250	80	2.1	683	1170	1300	1600
	250	100	2.1	951	1570	1000	1400
	250	100	2.1	861	1420	900	1300
	270	73	3	749	1050	1600	2000
	270	73	3	736	1030	1500	1900
	270	96	3	907	1350	1100	1500
	320	108	4	1140	1580	1000	1400
	320	108	4	1210	1660	1000	1400
	320	108	4	1210	1660	1000	1400
	320	108	4	1220	1680	1000	1400
160	240	60	2.1	495	875	1500	1900
	240	60	2.1	495	875	1500	1900
	240	80	2.1	660	1220	1100	1500
	240	80	2.1	628	1140	1100	1500
	270	86	2.1	820	1200	1200	1600
	270	86	2.1	833	1290	1200	1600
	270	109	2.1	1070	1750	950	1300
	270	109	2.1	958	1590	900	1200
	290	80	3	850	1230	1400	1800
	290	80	3	876	1230	1350	1700
	290	104	3	1020	1550	900	1300

Bearing Designations				Mounting Dimensions			Calculation Factors				Mass
Present		Original									
Cylindrical Bore	Tapered Bore	Cylindrical Bore	Tapered Bore	d_{amin}	D_{amax}	r_{amax}	e	Y_1	Y_2	Y_0	
				mm							kg
22326ZMB				148	262	3	0.35	1.9	2.9	1.8	28.6
22326 ZMA/W33				147	263	3	0.35	1.9	2.9	1.8	29.1
23028/W33	**23028K/W33**	3003128Y	3113128Y	150	200	2	0.24	2.8	4.2	2.8	7.65
23028N		3203128		150	200	2	0.24	2.8	4.2	2.8	7.64
24028C/W33	**24028CK30/W33**	4053128Y	4153128Y	150	200	2	0.28	2.4	3.6	2.5	8.09
23128CA/W33	**23128CAK/W33**	3053728HY	3153728HY	152	213	2	0.28	2.4	3.6	2.5	10.4
24128CA/W33	**24128CAK30/W33**			152	213	2	0.35	1.9	2.9	1.8	12.9
24128 CC/W33/C4				152	213	2	0.35		2.9	1.8	13
22228C/W33	**22228CK/W33**	53528Y	153528Y	154	236	2.5	0.26	2.6	3.9	2.5	14.2
22228CA/W33	**22228CAK/W33**	53528HY	153528HY	154	236	2.5	0.26	2.6	3.9	2.5	14.1
22228/W33	**22228K/W33**	3528Y	113528Y	154	236	2.5	0.29	2.4	3.5	2.3	14.5
23228C/W33	**23228CK/W33**	3053228Y	3153228Y	154	236	2.5	0.35	1.9	2.9	1.8	18.8
22328 ZMA/W33				157	283	3	0.35	1.9	2.9	1.8	36.3
22328CA/W33	**22328CAK/W33**	53628HY	153628HY	158	282	3	0.35	1.9	2.9	1.8	35.9
22328/W33	**22328K/W33**	3628Y	113628Y	158	282	3	0.38	1.7	2.6	1.7	36.9
23030/W33	**23030K/W33**	3003130Y	3113130Y	162	213	2	0.25	2.7	4	2.7	8.85
24030CC/W33C4S2				161	214	2	0.3	2.3	3.4	2.2	10.4
23130CA/W33	**23130CAK/W33**	3053730HY	3153730HY	162	238	2	0.3	2.3	3.4	2.2	18.2
24130C/W33	**24130CK30/W33**	4053730Y	4453730Y	162	238	2	0.37	1.8	2.7	1.8	20.3
24130CA/W33	**24130CAK30/W33**			162	238	2	0.38	1.7	2.6	1.7	19.5
22230C/W33	**22230CK/W33**	53530Y	153530Y	164	256	2.5	0.27	2.5	3.7	2.5	17.9
22230/W33	**22230K/W33**	3530Y	113530Y	164	256	2.5	0.29	2.4	3.5	2.3	17.5
23230C/W33	**23230CK/W33**	3053230Y	3153230Y	164	256	2.5	0.35	1.9	2.9	1.8	24.3
22330 ZMA/W33				167	303	3	0.35	1.9	2.9	1.8	44.5
22330CA/C3W33YA				167	303	3	0.35	1.9	2.9	1.8	42.5
22330/W33	**22330K/W33**	3630Y	113630Y	168	302	3	0.38	1.7	2.6	1.7	42
22330CA/W33	**22330CAK/W33**	53630HY	153630HY	168	302	3	0.35	1.9	2.9	1.8	41.7
23032N		3203132		172	228	2	0.25	2.7	4	2.7	13.4
23032/W33	**23032K/W33**	3003132Y	3113132Y	172	228	2	0.25	2.7	4	2.7	13.4
24032C/W33	**24032CK30/W33**	4053132Y	4453132Y	172	228	2	0.3	2.3	3.4	2.2	12.8
24032 CA/W33				171	229	2	0.3		3.4	2.2	12.8
23132	**23132K**			172	258	2	0.32	2.1	3.1	2	20.8
23132CA/W33	**23132CAK/W33**	3053732HY	3153732HY	172	258	2	0.31	2.2	3.3	2.2	20.3
24132C/W33	**24132CK30/W33**	4053732Y	4453732HY	172	258	2	0.38	1.7	2.6	1.7	19.5
24132CA/W33				172	258	2	0.38	1.7	2.6	1.7	25.3
22232CA/W33	**22232CAK/W33**	53532HY	153532HY	174	276	2.5	0.27	2.5	3.7	2.5	22.6
22232/W33	**22232K/W33**	3532Y	113532Y	174	276	2.5	0.3	2.3	3.4	2.2	22.3
23232CA	**23232CAK**			174	276	2.5	0.35	1.9	2.9	1.8	29.8

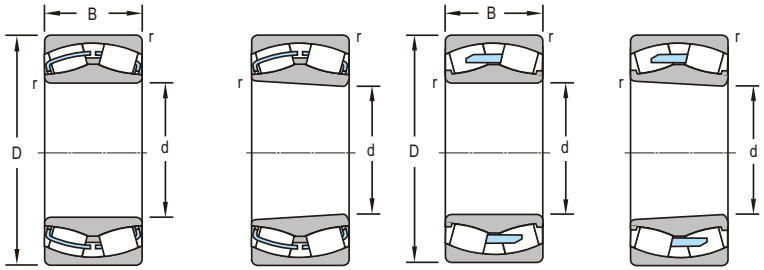


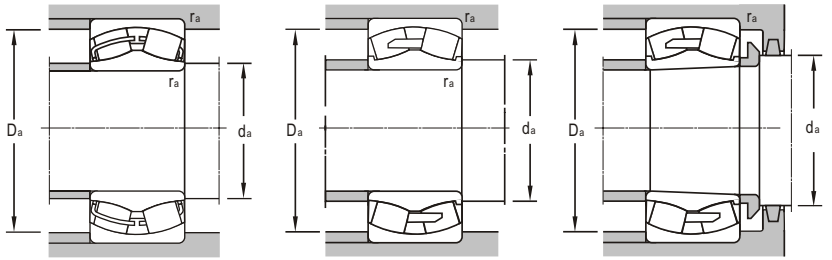


d 160～200mm

Boundary Dimensions				Basic Load Ratings		Limiting Speeds	
				Dynamic	Static	Grease	Oil
d	D	B	r_{min}	C	C_0		
mm				kN		r/min	
160	340	114	4	1340	1840	930	1200
	340	114	4	1140	1580	930	1200
170	260	67	2.1	640	1040	1400	1800
	260	67	2.1	640	1040	1400	1800
	260	90	2.1	778	1310	1000	1400
	310	86	4	981	1390	1200	1600
	310	110	4	1200	1900	950	1300
	360	120	4	1500	2140	930	1200
180	280	74	2.1	710	1210	1300	1600
	280	100	2.1	930	1610	900	1200
	280	100	2.1	917	1710	900	1200
	300	96	3	1060	1800	1100	1500
	300	96	3	987	1720	1000	1400
	300	96	3	987	1720	1000	1400
	300	96	3	987	1720	1000	1400
	300	118	3	1170	1930	900	1200
	320	86	4	995	1510	1200	1600
	320	112	4	1310	2090	900	1200
	320	112	4	1310	2090	900	1200
	380	126	4	1650	2330	900	1200
190	280	67	2.1	633	1120	1200	1500
	290	75	2.1	800	1500	1200	1500
	290	100	2.1	938	1690	950	1300
	320	104	3	1050	1760	950	1300
	320	104	3	1140	1960	950	1300
	320	128	3	1290	2250	850	1100
	340	92	4	1140	1730	1200	1600
	340	92	4	1090	1640	1200	1600
	340	120	4	1490	2380	850	1100
	400	132	5	1850	2590	850	1100
200	310	82	2.1	870	1510	1100	1400
	340	112	3	1230	2240	850	1200
	340	140	3	1530	2620	800	1000
	340	140	3	1530	2620	800	1000
	340	140	3	1660	2810	800	1000
	360	98	4	1210	1870	1100	1500
	360	128	4	1490	2370	800	1000

Bearing Designations				Mounting Dimensions			Calculation Factors				Mass
Present		Original									
Cylindrical Bore	Tapered Bore	Cylindrical Bore	Tapered Bore	d_{amin}	D_{amax}	r_{amax}	e	Y_1	Y_2	Y_0	
							mm				kg
22332/W33	**22332K/W33**	3632Y	113632Y	178	322	3	0.38	1.7	2.6	1.7	50.3
22332ZMA/W33/C4				177	323	3	0.35	1.9	2.9	1.8	53.3
23034N		3203134		182	248	2	0.26	2.6	3.9	2.5	14.6
23034/W33	**23034 K/W33**	3003134 Y	3113134	182	248	2	0.26	2.6	3.9	2.5	14.6
24034C/W33	**24034CK30/W33**	4003134Y	4113134Y	182	248	2	0.33	2	3	2	19.3
22234/W33	**22234K/W33**	3534Y	113534Y	188	292	3	0.3	2.3	3.4	2.2	27.6
23234CA/W33	**23234CAK/W33**	3053234HY	3153234HY	188	292	3	0.35	1.9	2.9	1.8	37.1
22334/W33	**22334K/W33**	3634Y	113634Y	188	342	3	0.37	1.8	2.7	1.8	59.3
23036/W33	**23036K/W33**	3003136Y	3113136Y	192	268	2	0.26	2.6	3.9	2.5	19.3
24036/W33	**24036K30/W33**	4003136Y	4403136Y	192	268	2	0.35	1.9	2.9	1.8	22.3
24036C/P69 W33				191	269	2	0.33	2	3	2	22.7
23136C/W33	**23136CK/W33**			194	286	2.5	0.3	2.3	3.4	2.2	27.2
23136/W33	**23136K/W33**	3003736 Y	3113736Y	194	286	2.5	0.32	2.1	3.1	2	26.8
23136/W33YA2		3003736KY		194	286	2.5	0.32	2.1	3.1	2	26.8
23136 N		3203736		194	286	2.5	0.32	2.1	3.1	2	26.4
24136/W33	**24136K30/W33**			194	286	2.5	0.38	1.7	2.6	1.7	33.7
22236/W33	**22236K/W33**	3536Y	113536Y	198	302	3	0.28	2.4	3.6	2.5	29.3
23236CA/W33	**23236CAK/W33**	3053236HY	3153236HY	198	302	3	0.35	1.9	2.9	1.8	39.5
23236CA/W33YA2		3053236HKY		198	302	3	0.35	1.9	2.9	1.8	39.4
22336/W33	**22336K/W33**	3636Y	113636Y	198	362	3	0.35	1.9	2.9	1.8	80.7
2638		3738		202	270	2	0.23	2.9	4.4	2.8	13.7
23038/W33	**23038 K/W33**	3003138 Y	3113138Y	202	278	2	0.26	2.6	3.9	2.5	20.3
24038C/W33	**24038CK30/W33**	4003138Y	4113138Y	202	278	2	0.31	2.2	3.3	2.2	23.9
23138/W33	**23138K/W33**			204	306	2.5	0.33	2	3	2	35.1
23138CA/W33	**23138CAK/W33**			204	306	2.5	0.31	2.2	3.3	2.2	45
24138CA	**24138CAK30/W33**			204	306	2.5	0.4	1.7	2.5	1.6	43.8
22238CA/W33	**22238 CAK/W33**	53538HY	153538HY	208	322	3	0.26	2.6	3.9	2.5	35.5
22238/W33	**22238K/W33**	3538Y	113538Y	208	322	3	0.29	2.4	3.5	2.3	35.5
23238CA/W33	**23238CAK/W33**	30532238HY	3153238HY	208	322	3	0.35	1.9	2.9	1.8	51
22338/W33	**22338K/W33**	3638Y	113638Y	210	380	4	0.25	2.7	4	2.7	79.7
23040/W33	**23040 K/W33**	3003140Y	3113140Y	212	298	2	0.26	2.6	3.9	2.5	26
23140/W33	**23140 K/W33**	3003740Y	3113740Y	214	326	2.5	0.34	2	2.9	1.9	50.5
24140CA/W33				214	326	2.5	0.4		2.5	1.6	52.3
24140CA/C3W33				214	326	2.5	0.4		2.5	1.6	52.3
24140C/W33	**24140CK30/W33**	4053740Y	4453740Y	214	326	2.5	0.4	1.7	2.5	1.6	51.9
22240/W33	**22240K/W33**	3540Y	113540Y	218	342	3	0.29	2.4	3.5	2.3	44.7
23240/W33	**23240K/W33**			218	342	3	0.36	1.9	2.8	1.8	56.8

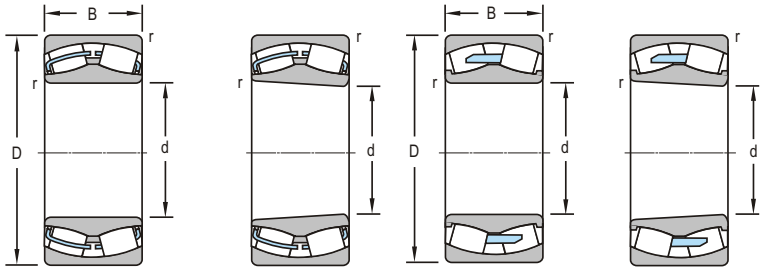


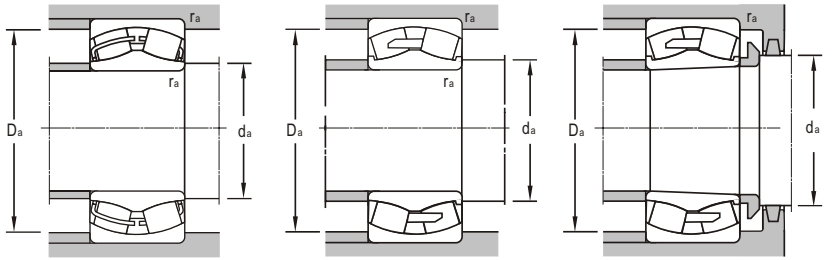


d 200～280mm

Boundary Dimensions				Basic Load Ratings		Limiting Speeds	
				Dynamic	Static	Grease	Oil
d	D	B	r_{min}	C	C_0		
mm				kN		r/min	
200	420	138	5	1900	2800	850	1100
220	320	76	3	758	1280	1000	1300
	340	90	3	1100	1750	1100	1500
	370	120	4	1530	2640	900	1200
	370	120	4	1540	2650	850	1100
	370	150	4	1870	3350	750	950
	400	108	4	1570	2430	950	1300
	400	108	4	1570	2430	950	1300
	400	144	4	1860	3100	750	950
	460	145	5	2130	3170	750	950
240	320	60	2.1	579	1220	1000	1400
	360	92	3	1160	1870	1000	1400
	360	118	3	1320	2610	800	1000
	400	128	4	1870	3000	850	1100
	400	128	4	1800	2950	850	1100
	400	160	4	1980	3710	670	850
	440	120	4	1720	2700	900	1200
	440	160	4	2280	3870	670	850
	500	155	5	2400	3600	670	850
250	365	87	3	956	1870	880	1100
260	360	75	2.1	883	1760	1000	1300
	400	104	4	1440	2570	900	1200
	400	140	4	1700	3260	700	900
	400	140	4	1700	3260	700	900
	440	144	4	2290	3510	800	1000
	440	144	4	2550	3900	800	1000
	440	180	4	2500	4560	720	900
	440	180	4	2470	4320	600	750
	440	180	4	2350	4320	600	750
	480	130	5	2160	3100	850	1100
	480	174	5	2800	4100	560	720
	490	153	4	2420	3940	760	1050
	540	165	6	2860	4430	560	720
280	380	75	2.1	911	1860	900	1200
	420	106	4	1560	2560	850	1100
	420	106	4	1540	2950	800	1000

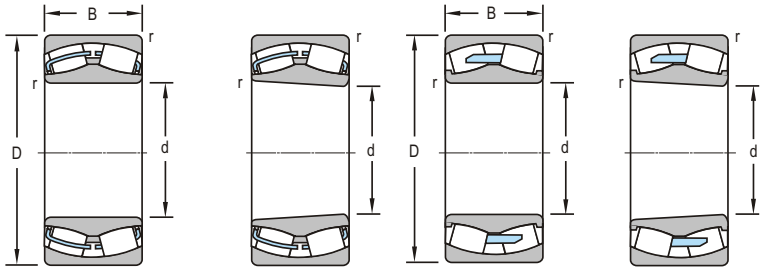
Bearing Designations				Mounting Dimensions			Calculation Factors				Mass
Present		Original									
Cylindrical Bore	Tapered Bore	Cylindrical Bore	Tapered Bore	d_{amin}	D_{amax}	r_{amax}	e	Y_1	Y_2	Y_0	
							mm				kg
22340/W33	**22340K/W33**	3640Y	113640Y	222	398	4	0.37	1.8	2.7	1.8	93.5
2644		3844		232	308	2.5	0.23	2.9	4.4	2.8	21.6
23044/W33	**23044K/W33**			233	327	2.5	0.26	2.6	3.9	2.5	30.8
23144/W33	**23144K/W33**	3003744Y	3113744Y	237	353	3	0.32	2.1	3.1	2	53.5
23144CA/W33	**23144CAK/W33**			237	353	3	0.32	2.1	3.1	2	54.2
24144C/W33	**24144CK30/W33**	4053744Y	4453744Y	237	353	3	0.4	1.7	2.5	1.6	66.1
22244/W33	**22244K/W33**	3544Y	113544Y	237	383	3	0.29	2.4	3.5	2.3	62.4
22244CA/W33	**22244CAK/W33**			237	383	3	0.27	2.5	3.7	2.5	62.4
23244/W33	**23244 K/W33**	3003244Y	3113244Y	237	383	3	0.38	1.8	2.6	1.7	94.2
22344/W33	**22344K/W33**	3644Y	113644Y	240	440	4	0.35	1.9	2.9	1.8	130
23948CA/W33				251	309	2	0.15	4.5	6.7	4.5	13.4
23048/W33	**23048 K/W33**	3003148Y	3113148Y	253	347	2.5	0.25	2.7	4	2.7	37.4
24048CA/W33	**24048CAK30/W33**			253	347	2.5	0.3	2.3	3.4	2.2	42.4
23148/W33	**23148K/W33**	3003748Y	3113748Y	257	383	3	0.33	2	3	2	75.2
23148CA/W33	**23148CAK/W33**			257	383	3	0.3	2.3	3.4	2.2	65
24148/W33	**24148K30/W33**	4003748Y	4403748Y	257	383	3	0.41	1.7	2.5	1.6	81.6
22248/W33	**22248K/W33**	3548Y	113548Y	257	423	3	0.29	2.4	3.5	2.3	85
23248/W33	**23248K/W33**	3003248Y	3113248Y	257	423	3	0.37	1.8	2.7	1.8	109
22348/W33	**22348K/W33**	3648Y	113648Y	260	480	4	0.35	1.9	2.9	1.8	154
2650		3750		264	351	2.5	0.22	3	4.5	2.9	32.2
23952CA/W33				271	349	2	0.18	3.8	5.6	3.6	23.7
23052/W33	**23052K/W33**	3003152Y	3113152Y	275	385	3	0.26	2.6	3.9	2.5	51.2
24052CA/W33	**24052CAK30/W33**			275	385	3	0.33	2	3	2	63.4
24052CA/C9W33				275	385	3	0.33	2	3	2	63.3
23152/W33	**23152K/W33**	3003752Y	3113752Y	277	423	3	0.33	2	3	2	96
23152/S1				277	423	3	0.31	2.2	2.3	2.2	96
24152/W33	**24152K30/W33**			277	423	3	0.42	1.6	2.4	1.6	112
24152CA/W33	**24152CAK30/W33**			277	423	3	0.4	1.7	2.5	1.6	108
24152C/W33	**24152CK30/W33**	4053752Y	4453752Y	277	423	3	0.4	1.7	2.5	1.6	113
22252CA/W33	**22252CAK/W33**	53552HY	153552HY	280	460	4	0.27	2.5	3.7	2.5	105
23252CA/W33	**23252CAK/W33**	3053252HY	3153252HY	280	460	4	0.37	1.8	2.7	1.8	151
2652		3752		280	460	4	0.33	2	3	2	140
22352/W33	**22352K/W33**	3652Y	113652Y	286	514	5	0.34	2	2.9	1.9	193
23956CA/W33				291	369	2	0.16	4.2	6.3	4	25
23056/W33	**23056K/W33**	3003156Y	3113156Y	295	405	3	0.25	2.7	4	2.7	61.5
23056CA/W33	**23056CAK/W33**			295	405	3	0.23	2.9	4.4	2.8	51.7

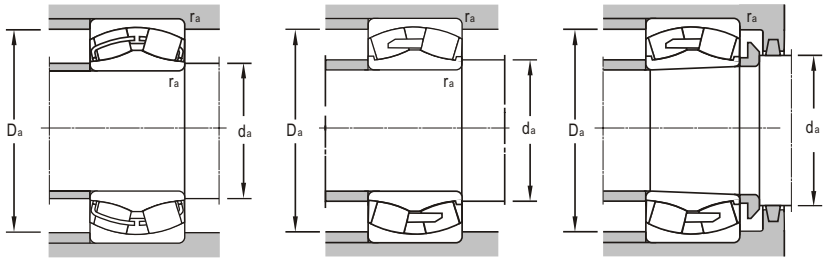




d 280～360mm

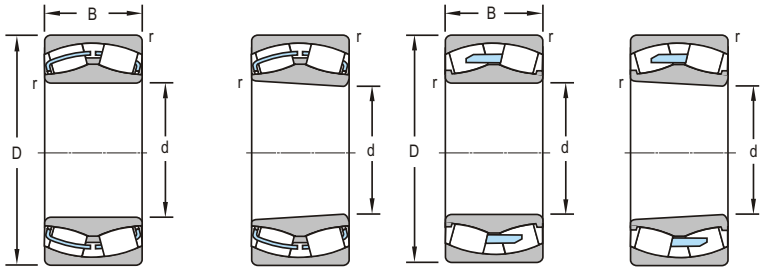
Boundary Dimensions				Basic Load Ratings		Limiting Speeds		Bearing Designations				Mounting Dimensions			Calculation Factors				Mass
				Dynamic	Static	Grease	Oil	Present		Original									
d	D	B	r_{min}	C	C_0			Cylindrical Bore	Tapered Bore	Cylindrical Bore	Tapered Bore	d_{amin}	D_{amax}	r_{amax}	e	Y_1	Y_2	Y_0	
mm				kN		r/min									mm				kg
280	420	140	4	1780	3500	670	850	**24056CA/W33**	**24056CAK30/W33**			295	405	3	0.3	2.3	3.4	2.2	71.3
	460	146	5	2070	3960	750	950	**23156/W33**	**23156K/W33**	**3003756Y**	**3113756Y**	300	440	4	0.32	2.1	3.1	2	95
	460	146	5	2380	3880	750	950	**23156CA/W33**	**23156CAK/W33**			300	440	4	0.31	2.2	3.3	2.2	96.2
	460	180	5	2360	4420	560	700	**24156 CA**				300	440	4	0.37	1.8	2.7	1.8	119
	460	180	5	2400	4500	560	700	**21456 CA/YA**				300	440	4	0.37	1.8	2.7	1.8	157
	460	180	5	2400	4590	560	700	**24156/W33**	**24156K30/W33**			300	440	4	0.37	1.8	2.7	1.8	119
	500	130	5	2110	3370	800	1000	**22256/W33**	**22256K/W33**	**3556Y**	**113556Y**	300	480	4	0.28	2.4	3.6	2.5	124
	500	176	5	2560	4350	600	750	**23256/W33**	**23256 K/W33**	**3003256Y**	**3113256Y**	300	480	4	0.37	1.8	2.7	1.8	152
	500	180	5	2360	4420	600	750	**24156/W33/YA1**				300	480	4	0.37		2.7	1.8	158
	580	175	6	3180	4970	600	750	**22356/W33**	**22356K/W33**	**3656Y**	**113656Y**	306	554	5	0.34	2	2.9	1.9	238
300	420	90	3	1260	2460	950	1300	**23960C/W33**	**23960CK/W33**			313	407	2.5	0.19	3.6	5.3	3.5	39.5
	460	118	4	1910	3170	720	920	**23060/W33**	**23060K/W33**	**3003160Y**	**3113160Y**	315	445	3	0.26	2.6	3.9	2.5	74.6
	460	118	4	2090	3370	800	1000	**23060CA/W33**	**23060CAK/W33**			315	445	3	0.24	2.8	4.2	2.8	76.6
	460	160	4	2430	4490	600	750	**24060CA/W33**	**24060CAK30/W33**	**4053160Y**	**4453160Y**	315	445	3	0.32	2.1	3.1	2	101
	500	160	5	2580	4590	670	850	**23160/W33**	**23160K/W33**	**3003760Y**	**311760Y**	320	480	4	0.32	2.1	3.1	2	133
	500	160	5	2700	4920	650	850	**23160CC/C3W33**				320	480	4	0.3	2.3	3.4	2.2	127
	500	160	5	2880	4640	670	850	**23160CA/W33**	**23160CAK/W33**			320	480	4	0.31	2.2	3.3	2.2	127
	500	200	5	3380	5940	530	670	**24160C/W33**	**24160CK30/W33**	**4053760Y**	**4453760Y**	320	480	4	0.37	1.8	2.7	1.8	159
	500	200	5	3120	5650	500	600	**24160CA/W33**	**24160CAK30/W33**			320	480	4	0.36	1.9	2.8	1.8	160
	500	200	5	3180	6100	450	550	**24160/W33**	**24160K30/W33**			320	480	4	0.39	1.7	2.6	1.7	159
	540	140	5	2480	3820	700	900	**22260/W33**	**22260K/W33**	**3560Y**	**113560Y**	320	520	4	0.28	2.4	3.6	2.5	143
320	440	90	3	1290	2430	900	1200	**23964/W33**	**23964K/W33**	**3003964Y**	**3113964Y**	333	427	2.5	0.19	3.6	5.3	3.5	45.1
	480	121	4	1850	3450	720	900	**23064/W33**	**23064K/W33**	**3003164Y**	**3113164Y**	335	465	3	0.26	2.6	3.9	2.5	80.9
	480	121	4	2020	3580	800	1000	**23064CA/W33**	**23064CAK/W33**			335	465	3	0.24	2.8	4.2	2.8	77.4
	480	160	4	2570	5060	680	850	**24064/W33**	**24064K30/W33**	**4003164Y**	**4113164Y**	335	465	3	0.32	2.1	3.1	2	103
	540	176	5	3390	5538	630	800	**23164CA/W33**	**23164CAK/W33**			340	520	4	0.31	2.2	3.3	2.2	169
	540	218	5	3470	6430	480	600	**24164/W33**	**24164K30/W33**	**4003764Y**	**4113764Y**	340	520	4	0.42	1.6	2.4	1.6	251
	580	208	5	3500	6360	500	630	**23264/W33**	**23264K/W33**	**3003264Y**	**3113264Y**	340	560	4	0.37	1.8	2.7	1.8	259
	580	218	5	3470	6430	460	580	**24164/W33/YA**				340	560	4	0.37		2.7	1.8	262
340	460	90	3	1310	2520	880	1180	**23968/W33**	**23968K/W33**	**3003968Y**	**3113968Y**	353	447	2.5	0.18	3.8	5.6	3.7	50.5
	520	133	5	2430	4350	680	880	**23068/W33**	**23068K/W33**	**3003168Y**	**3113168Y**	358	502	4	0.25	2.7	4	2.7	109
	520	180	5	2920	5580	510	650	**24068/W33**	**24068K30/W33**	**4003168Y**	**4113168Y**	358	502	4	0.33	2	3	2	160
	520	180	5	3110	5710	520	660	**24068CA/W33**	**24068CAK30/W33**			358	502	4	0.33	2	3	2	140
	580	190	5	3830	6240	600	750	**23168CA/W33**	**23168CAK/W33**			360	560	4	0.31	2.2	3.3	2.2	209
	580	243	5	4180	7720	450	560	**24168CA/W33**	**24168CAK30/W33**			360	560	4	0.39	1.7	2.6	1.7	280
360	480	90	3	1330	2710	850	1100	**23972/W33**	**23972K/W33**	**3003972Y**	**3113972Y**	373	467	2.5	0.17	4	5.9	3.9	49.1
	540	134	5	2480	4500	670	850	**23072/W33**	**23072K/W33**	**3003172 Y**	**3113732Y**	378	522	4	0.25	2.7	4	2.7	114

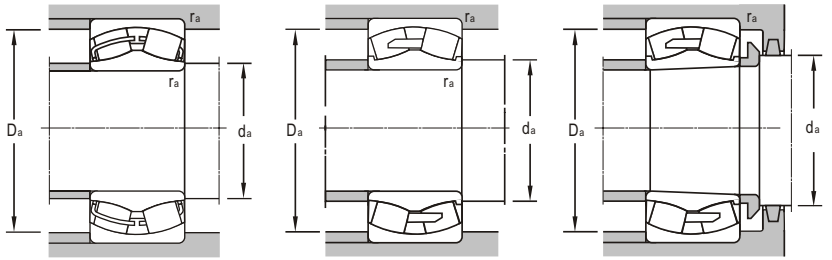




d 360～460mm

Boundary Dimensions				Basic Load Ratings		Limiting Speeds		Bearing Designations				Mounting Dimensions			Calculation Factors				Mass
				Dynamic	Static	Grease	Oil	Present		Original									
d	D	B	r_{min}	C	C_0			Cylindrical Bore	Tapered Bore	Cylindrical Bore	Tapered Bore	d_{amin}	D_{amax}	r_{amax}	e	Y_1	Y_2	Y_0	
mm				kN		r/min									mm				kg
360	540	134	5	2390	4700	600	760	**23072CA/W33**	**23072CAK/W33**	3053172HY	3153172HY	378	522	4	0.25	2.7	4	2.7	113
	540	180	5	3460	6350	500	630	**24072C/W33**	**24072CK30/W33**	4053172Y	4453172Y	378	522	4	0.31	2.2	3.3	2.2	148
	540	180	5	3200	6160	480	620	**24072CA/W33**	**24072CAK30/W33**			378	522	4	0.31	2.2	3.3	2.2	148
	600	192	5	3400	6700	560	700	**23172/W33**	**23172K/W33**	3003772Y	3113772Y	380	580	4	0.32	2.1	3.1	2	221
	600	243	5	4400	8370	430	530	**24172/W33**	**24172K30/W33**	4003772Y	4113772Y	380	580	4	0.42	1.6	2.4	1.6	273
	600	243	5	4300	8210	430	530	**24172 CAK30/W33**				380	580	4	0.42	1.6	2.4	1.6	271
	600	243	5	4670	9040	430	530	**24172C**				380	580	4	0.4	1.7	2.5	1.6	269
	650	232	6	4520	7930	420	510	**23272 CAK30/W33**				386	624	5	0.35	1.9	2.9	1.8	332
	750	224	7.5	4900	7500	450	550	**22372/W33**	**22372K/W33**			390	724	5	0.31	2.2	3.3	2.2	489
380	520	106	4	1760	3420	800	1000	**23976/W33**	**23976K/W33**	3003976Y	3113976Y	395	505	3	0.19	3.6	5.3	3.5	73.5
	560	135	5	2280	4550	630	800	**23076/W33**	**23076 K/W33**	3003176Y	3113176 Y	398	542	4	0.24	2.8	4.2	2.8	122
	560	135	5	2480	5050	630	800	**23076C**				398	542	4	0.22	3	4.6	2.8	116
	560	135	5	2610	4850	630	800	**23076CA/W33**	**23076CAK/W33**			398	542	4	0.22	3	4.5	2.9	114
	560	180	5	3240	6460	480	600	**24076/W33**	**24076K30/W33**			398	542	4	0.3	2.3	3.4	2.2	152
	620	194	5	3450	6800	400	500	**23176/W33**	**23176 K/W33**	3003776 Y	3113776 Y	400	600	4	0.34	2	2.9	1.9	243
	620	194	5	3700	7000	400	500	**23176CAQ1/W33**	**23176CAKQ1/W33**			400	600	4	0.3	2.3	3.4	2.2	230
	780	230	7.5	5340	8390	340	430	**22376/W33**	**22376K/W33**			400	760	6	0.31	2.2	3.3	2.2	538
400	590	142	5	2300	5000	700	900	**2680/W33**	**2680K/W33**			418	572	4	0.23	2.9	4.4	2.8	145
	600	148	5	2520	5450	540	670	**23080/W33**	**23080K/W33**	3003180 Y	3113180Y	420	582	4	0.25	2.7	4	2.7	165
	600	148	5	2850	5610	540	670	**23080CA/C3W33**				418	582	4	0.23		4.4	2.8	150
	650	200	6	3850	7540	380	480	**23180/W33**	**23180K/W33**	3003780 Y	3113780Y	426	624	5	0.31	2.2	3.3	2.2	238
	720	256	6	5300	10100	340	430	**23280/W33**	**23280 K/W33**	3003280Y	3113280 Y	426	694	5	0.37	1.8	2.7	1.8	530
	720	315	6	6620	10400	310	390	**24280/W33**	**24280K30/W33**			426	694	5	0.44	1.5	2.3	1.5	549
	820	243	7.5	5900	9360	360	450	**22380/W33**	**22380K/W33**	3680Y		432	788	6	0.37	1.8	2.7	1.8	650
401	720	256	6	5300	10100	340	430			3G3-316		426	694	5	0.37	1.8	2.7	1.8	515
420	620	150	5	2690	5750	450	560	**23084/W33**	**24084K30/W33**	3003184Y	3113184Y	438	602	4	0.24	2.8	4.2	2.8	158
	700	224	6	4850	9300	360	450	**23184/W33**	**23184K/W33**	3003784Y	3113784Y	446	674	5	0.32	2.1	3.1	2	402
	700	280	6	5700	11300	300	380	**24184CA/W33**	**24184CAK30/W33**			446	674	5	0.38	1.7	2.6	1.7	434
	760	272	7.5	6450	11700	320	400	**23284CA/W33**	**23284CAK/W33**	3053284HY	3153284HY	452	728	6	0.35	1.9	2.9	1.8	535
440	600	118	4	2120	4570	550	700	**23988CA/W33**				455	585	3	0.16	4.2	6.3	4	99
	650	157	6	2900	6050	430	530	**23088/W33**	**23088K/W33**	3003188Y	3113188Y	463	627	5	0.24	2.8	4.2	2.8	192
	720	226	6	4910	9600	340	430	**23188/W33**	**23188K/W33**	3003788Y	3113788Y	466	694	5	0.31	2.2	3.3	2.2	419
	720	280	6	5900	11900	280	360	**24188/W33**	**24188K30/W33**			466	694	5	0.38	1.7	2.6	1.7	443
	720	280	6	6150	12300	300	380	**24188 CAK30/C3W33**				466	694	5	0.37	1.8	2.7	1.8	446
460	680	163	6	3150	6860	400	500	**23092/W33**	**23092K/W33**	3003192Y	3113192Y	483	657	5	0.23	2.9	4.4	2.8	220
	760	240	7.5	5450	10800	320	400	**23192/W33**	**23192K/W33**			492	728	6	0.31	2.2	3.3	2.2	468
	760	300	7.5	6660	13100	260	340	**24192/W33**	**24192K30/W33**			492	728	6	0.37	1.8	2.7	1.8	539

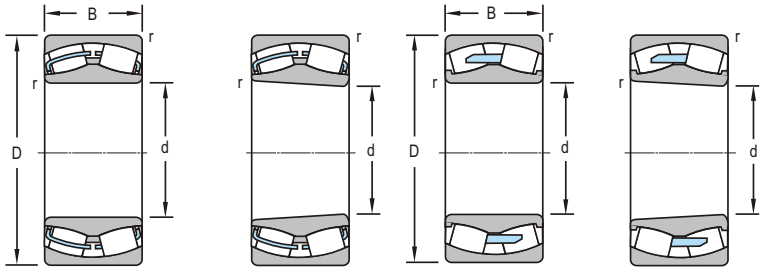


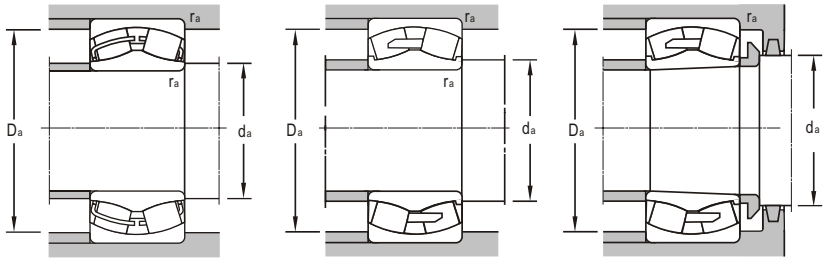


d 480～710mm

Boundary Dimensions				Basic Load Ratings		Limiting Speeds	
				Dynamic	Static	Grease	Oil
d	D	B	r_{min}	C	C_0		
mm				kN		r/min	
480	650	128	5	2280	5480	400	500
	650	128	5	2900	5700	400	500
	700	165	6	3280	6910	380	480
	700	165	6	3540	7390	380	480
	790	248	7.5	5800	11400	300	380
	870	310	7.5	7350	13800	250	320
	870	310	7.5	7580	13800	260	340
	870	310	7.5	7580	13800	260	340
494	670	128	5	2440	6060	400	500
500	670	128	5	2440	6060	400	500
	720	167	6	3500	7600	380	480
530	780	185	6	3930	8550	340	430
	780	185	6	3560	8260	340	430
	780	185	6	4440	9320	340	430
	980	355	9.5	9960	18500	240	320
560	750	140	5	3150	7220	420	580
	820	195	6	4460	10020	300	380
	820	195	6	4700	10300	320	400
	820	258	6	6160	14000	340	420
	920	280	7.5	7990	16000	240	320
	920	280	7.5	7750	15300	240	320
	920	355	7.5	9450	19500	190	260
	920	355	7.5	9450	19500	190	260
600	870	200	6	4810	11000	300	380
	980	375	7.5	10400	21300	180	240
630	920	212	7.5	5360	12200	260	340
670	900	170	6	4130	9840	260	340
	900	170	6	4260	10000	260	340
	980	230	7.5	6240	13700	240	320
	980	308	7.5	8440	19700	220	300
	1090	412	7.5	12500	26900	210	280
	1220	438	12	15500	30200	190	250
710	950	180	6	4290	10900	240	320

Bearing Designations				Mounting Dimensions			Calculation Factors				Mass
Present		Original									
Cylindrical Bore	Tapered Bore	Cylindrical Bore	Tapered Bore	d_{amin}	D_{amax}	r_{amax}	e	Y_1	Y_2	Y_0	
				mm							kg
23996/W33	23996K/W33	3003996Y	3113996Y	498	632	4	0.18	3.8	5.6	3.7	161
23996 CAF1/W33				498	632	4	0.18	3.8	5.6	3.6	125
23096/W33	23096K/W33	3003196Y	3113196Y	503	677	5	0.24	2.8	4.2	2.8	231
23096CAK/P53/W33				503	677	5	0.21		4.8	3.2	210
23196CA/W33	23196CAK/W33			512	758	6	0.3	2.3	3.4	2.2	492
23296/W33	23296K/W33	3003296Y	3113296Y	512	838	6	0.39	1.7	2.6	1.7	837
23296CA/W33	23296CAK/W33			512	838	6	0.36	1.9	2.8	1.8	857
23296CA/W33				512	838	6	0.35	1.9	2.9	1.8	881
239/494/W33	239/494K/W33			512	652	4	0.18	3.8	5.6	3.7	135
239/500/W33	239/500K/W33	30039/500Y	31139/500Y	518	652	4	0.18	3.8	5.6	3.7	130
230/500/W33	230/500K/W33	30031/500Y	31131/500Y	523	697	5	0.23	2.9	4.4	2.8	238
230/530/W33	230/530K/W33	30031/530Y	31131/530Y	553	757	5	0.23	2.9	4.4	2.8	313
230/530 D-1				553	757	5	0.23	2.9	4.4	2.8	317
230/530CAK/W33 YB				553	757	5	0.22		4.6	2.8	300
232/530CA/W33	232/530CAK30/W33			622	888	6	0.36	1.9	2.8	1.8	1210
239/560CA/W33				578	732	4	0.16		6.3	4	168
230/560/W33	230/560K/W33	30031/560Y	31131/560T	583	797	5	0.23	2.9	4.4	2.8	365
230/560CA/W33	230/560CAK/W33			583	797	5	0.22	3	4.5	2.9	354
240/560 CA/W33				583	797	5	0.28	2.4	3.6	2.5	472
231/560/W33	231/560K/W33	30037/560Y	31137/560Y	592	888	6	0.3	2.3	3.4	2.2	757
231/560CA/C4W33S2				592	888	6	0.3	2.3	3.4	2.2	762
241/560CA/W33	241/560CAK30/W33			592	888	6	0.37	1.8	2.7	1.8	985
241/560 CA-1/W33				592	888	6	0.37	1.8	2.7	1.8	947
230/600/W33	230/600K/W33	30031/600Y	31131/600Y	623	847	5	0.22	3	4.5	2.9	393
241/600/W33	241/600K30/W33	40037/600Y	41137/600Y	632	948	6	0.37	1.8	2.7	1.8	1079
230/630/W33	230/630K/W33	30031/630Y	31131/630Y	658	892	6	0.23	2.9	4.4	2.8	509
239/670/W33	239/670K/W33	30039/670Y	31139/670Y	693	877	5	0.18	3.8	5.6	3.7	317
239/670 CAF1/W33				693	877	6	0.17	4	5.9	4	308
230/670/W33	230/670K/W33	30031/670Y	31131/670Y	698	952	6	0.23	2.9	4.4	2.8	655
240/670CA/C4W33S2				698	952	6	0.28	2.4	3.6	2.5	806
241/670CAK30/C3W33				702	1058	6	0.37		2.7	1.8	1507
232/670CAK30/C3W33				718	1172	10	0.35	1.9	2.9	1.8	2275
239/710/W33	239/710K/W33	30039/710Y	31139/710Y	732	927	5	0.18	3.8	5.6	3.7	387

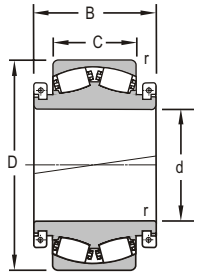


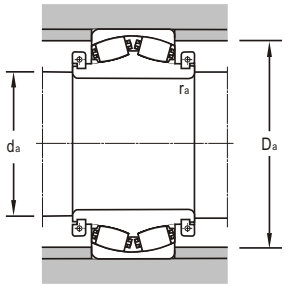


d 710～1440mm

Boundary Dimensions				Basic Load Ratings		Limiting Speeds	
				Dynamic	Static	Grease	Oil
d	D	B	r_{min}	C	C_0		
mm				kN		r/min	
710	1030	236	7.5	6530	15130	220	300
	1030	315	7.5	8890	20700	210	290
	1150	438	9.5	13700	29940	150	190
750	1090	250	7.5	7890	17600	200	280
	1090	335	7.5	9340	22300	190	240
	1090	335	7.5	9340	22300	180	260
	1360	475	15	18500	35700	150	210
800	1060	258	6	7170	19030	200	280
	1150	258	7.5	8630	20000	190	260
	1150	345	7.5	10000	25700	170	220
850	1030	136	5	3640	10300	170	210
	1120	200	6	6010	15300	190	260
	1120	200	6	6100	15800	190	260
	1220	272	7.5	9050	21100	180	240
	1220	365	7.5	10000	26000	160	200
	1220	365	7.5	10000	26000	160	200
	1220	365	7.5	11700	28900	160	200
900	1270	365	7.5	12200	31100	160	200
	1280	375	7.5	12200	31100	150	190
1000	1420	308	7.5	12000	29000	190	250
	1420	412	7.5	15000	40000	120	160
	1580	580	12	24500	56700	110	150
1120	1580	345	12	14400	34800	90	120
	1580	462	9.5	18500	48000	100	140
1180	1540	272	7.5	10400	27700	100	140
	1660	355	9.5	15500	38400	90	120
1200	1500	280	7.5	10000	29700	80	120
1250	1750	500	9.5	20000	52600	80	105
1320	1850	530	7.5	23900	64400	70	90
1440	1760	315	7.5	12000	39200	75	95

Bearing Designations				Mounting Dimensions			Calculation Factors				Mass
Present		Original									
Cylindrical Bore	Tapered Bore	Cylindrical Bore	Tapered Bore	d_{amin}	D_{amax}	r_{amax}	e	Y_1	Y_2	Y_0	
				mm							kg
230/710/W33	**230/710K/W33**	30031/710Y	31131/710Y	738	1002	6	0.23	2.9	4.4	2.8	742
240/710CA				738	1002	6	0.27		3.7	2.5	890
241/710/W33	**241/710K30/W33**	40037/710Y	41137/710Y	750	1110	8	0.38	1.7	2.6	1.7	1802
230/750/W33	**230/750K/W33**			778	1062	6	0.22	3	4.5	2.9	855
240/750/W33				782	1058	6	0.28	2.4	3.6	2.5	1060
FD-240/750/W33				778	1062	6	0.28		3.6	2.5	1060
232/750CAK30F1/C3W33				808	1302	12	0.35	1.9	2.9	1.8	3043
249/800/W33	**249/800K30/W33**	40039/800Y	41139/800Y	823	1037	5	0.22	3	4.5	2.9	638
230/800/W33	**230/800K/W33**	30031/800Y	31131/800Y	828	1122	6	0.21	3.2	4.8	3.1	986
240/800/W33	**240/800K30/W33**	40031/800Y	41131/800Y	828	1122	6	0.29	2.4	3.5	3.3	1246
238/850CA/C4W33S2				868	1012	4	0.11	6.1	9.1	6.3	232
FD-239/850CA/W33				876	1097	5	0.16		6.2	4.1	549
239/850/W33	**239/850K/W33**	30039/850Y	31139/850Y	873	1097	5	0.16	4.2	6.2	4.1	531
230/850/W33	**230/850K/W33**			878	1192	6	0.21	3.2	4.8	3.1	1069
240/850/W33	**240/850K30/W33**	40031/850Y	41131/850Y	878	1192	6	0.28	2.4	3.6	2.5	1398
240/850/YA		40031/850Y1		878	1192	6	0.28	2.4	3.6	2.5	1396
240/850CA/C4W33S2				878	1192	6	0.27	2.5	3.7	2.5	1430
26/900/C3W33XYA3				928	1242	6	0.27	2.5	3.7	2.5	1703
240/900/W33	**240/900K30/W33**	40031/900Y	41131/900Y	928	1252	6	0.27	2.5	3.7	2.5	1783
230/1000CA/W33C4				1028	1392	6	0.19		5.3	3.6	1609
240/1000/W33	**240/1000K30/W33**	40031/1000Y	41131/1000Y	1028	1392	6	0.27	2.5	3.7	2.5	2117
241/1000CAK30/W33				1048	1532	10	0.35		2.9	1.8	4290
230/1120CA/C4 YB				1160	1540	10	0.19		3.5	2.3	2155
240/1120 CA/W33				1159	1541	8	0.26	2.6	3.9	2.5	2908
239/1180 CA/W33				1214	1506	6	0.16	4.2	6.3	4	1360
230/1180/W33	**230/1180K/W33**			1210	1630	8	0.2	3.4	5.1	3.3	2480
539/1200CA/W33C3				1236	1464	6	0.162		6.2	4.1	1150
240/1250CA/C4 YB				1290	1710	8	0.26		3.8	2.5	3854
240/1320CAF/C3W33				1360	1810	6	0.26		3.8	2.5	4504
239/1440F3/C3W33				1480	1720	6	0.15		6.6	4.3	1597





d 300～1320mm

Boundary Dimensions					Basic Load Ratings	
					Dynamic	Static
d	D	C	B	r_{min}	C	C_0
	mm				kN	
300	500	160	240	5	2710	4940
480	870		310	7.5	7090	13300
530	780	185	288	6	3580	9110
560	820	195	300	6	4060	10600
630	920	212	330	7.5	5650	13100
710	1030	180	370	6	5070	12300
750	1090	310	310	7.5	7670	17000
	1090	250	310	7.5	7670	17000
800	1200	295	450	7.5	10100	22100
850	1220	365	660	7.5	10700	27800
	1220	365	540	7.5	9320	27800
	1220		365	7.5	10700	26000
900	1270	365	470	7.5	11100	33400
950	1360	300	420	7.5	10900	25500
1180	1540		500	9.5	12900	36000
1320	1850		666	10X45°	21900	57200
	1850		815	12	21900	57200

Bearing Designations		Calculation Factors				Mass
Present	Original	e	Y_1	Y_2	Y_0	
		mm				kg
23160D/W33X		0.32	2.1	3.1	2	150
23296D/W33		0.35		2.9	1.8	821
230/530D		0.23	2.9	4.4	2.8	415
230/560D/W33		0.23	2.9	4.4	2.8	478
230/630D/W33X		0.23	2.9	4.4	2.8	679
239/710X1D/C4W33X		0.17	4	5.9	3.9	718
26/750D/C4		0.22	3	4.5	2.9	920
230/750D/W33X		0.22	3	4.5	2.9	847
26/800D/W33X		0.23	2.9	4.4	2.8	1676
240/850D/W33		0.28	2.4	3.6	2.5	1944
240/850D-1/W33		0.28	2.4	3.6	2.5	1790
240/850D-5/W333X		0.28		3.6	2.5	1394
26/900D/C3W33X		0.27	2.5	3.7	2.5	1908
230/950D/W33X		0.2	3.4	5.1	3.3	1770
249/1180D/C3W33X		0.2		5	3.3	2246
240/1320D/C3W33X-1		0.26		3.8	2.5	5240
240/1320D/C3W33X		0.26	2.6	3.8	2.5	6021