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SPHERICAL ROLLER BEARINGS MINSK BEARING PLANT



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MPZ



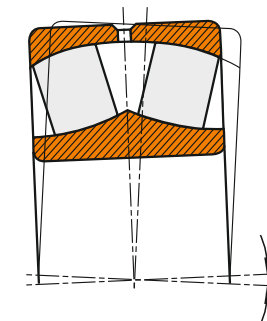
Spherical Roller Bearings

Spherical roller bearings are made for heavy-duty applications. They feature two rows of symmetrical barrel rollers which can align freely in the spherical outer ring raceway, thus compensating for shaft deflections and misalignment of the bearing seats. The close contact between the rollers and raceways yields a uniform stress distribution and a high load carrying capacity.

Spherical roller bearings with an integral centre lip on the inner ring have machined brass cages. The flange-less inner ring and a guide ring, positioned towards the outer ring and centered on the cages, one pressed steel cage being used for each row of rollers.

Alignment

Self-aligning bearings such as self-aligning ball bearings, barrel roller bearings, radial and axial spherical roller bearings, compensate for misalignment and tilting. The bearings have a hollow spherical outer ring raceway in which the inner ring together with the rolling element set can swivel out. The angle of alignment of these bearings depends on their type and size as well as load. Spherical roller bearings can compensate for misalignments of up to 0.5° out of the centre. If the loads are low, angular misalignments of up to 2° are admissible at a corresponding surrounding structure. Misalignment can occur when machining the bearing seats of a shaft or a housing particularly when the seats are not machined in one setting. Misalignment can also be expected when using single housings, such as flanged or plummer block housings. Tilting of the bearing rings due to shaft deflection as a result of the operating load also leads to misalignment.





Massive cages

Non-stainless steel massive cages are made for bearings operating in aggressive conditions. Brass massive cages are made for bearings operating in normal conditions and for bearings operating in joints with high vibration.

Tapered bore

Spherical roller bearings of most series are also available with a tapered bore (taper 1:12). Bearings with a tapered bore are usually fastened on the shaft by means of adapter sleeves or withdrawal sleeves. Bearings with a tapered bore can be mounted directly onto a tapered shaft seat. When mounting these bearings a defined radial clearance can be set.

Lubricating groove, lubricating holes

Spherical roller bearings have a lubricating groove and three lubricating holes in the outer ring to simplify lubrication. The bearings have the suffix W33.

Gage design

Main functions of the cage:

- Separation of rolling elements to keep friction and heat development at a minimum.
- Keeping rolling elements at equal distances for uniform load distribution.
- Retaining rolling elements in separable bearings in bearings which are swiveled out.
- Guiding rolling elements in the unloaded zone of the bearing.

Rolling bearing cages are subdivided into pressed cages and solid cages.

Another distinguishing feature of the cages is the type of guidance. Most cages are guided by the rolling elements and have no suffix for the type of guidance. Those guided by the inner ring have the suffix B.

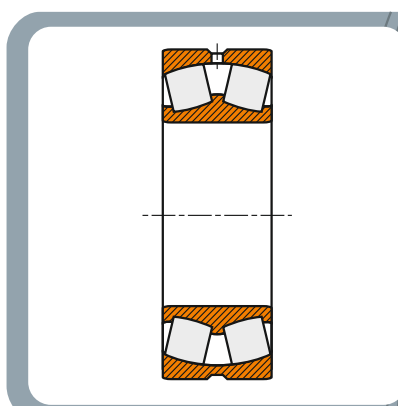
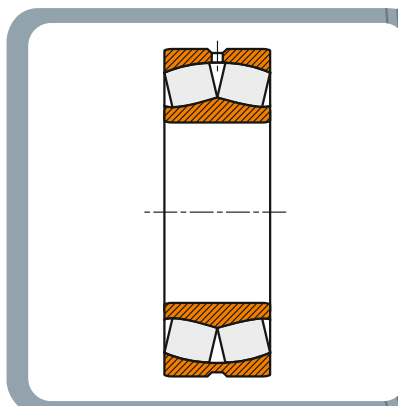
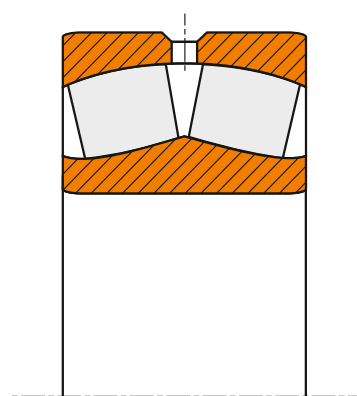
When operating conditions are normal usually the cage design is taken which serves as the standard cage.



Pressed cages

Pressed cages are usually made of sheet. When compared with machined cages of metal they are advantageous in that they are lighter in weight.

Bearings with a pressed cage have no cage suffix.



Bearing materials

The performance of a rolling bearing is highly influenced by the material which is used. The material of rings and rolling elements for rolling bearings is normally a low-alloy, through hardening chromium steel.

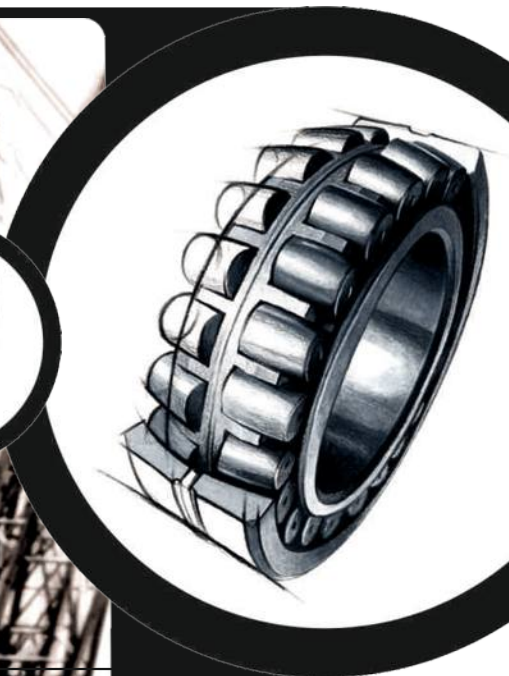
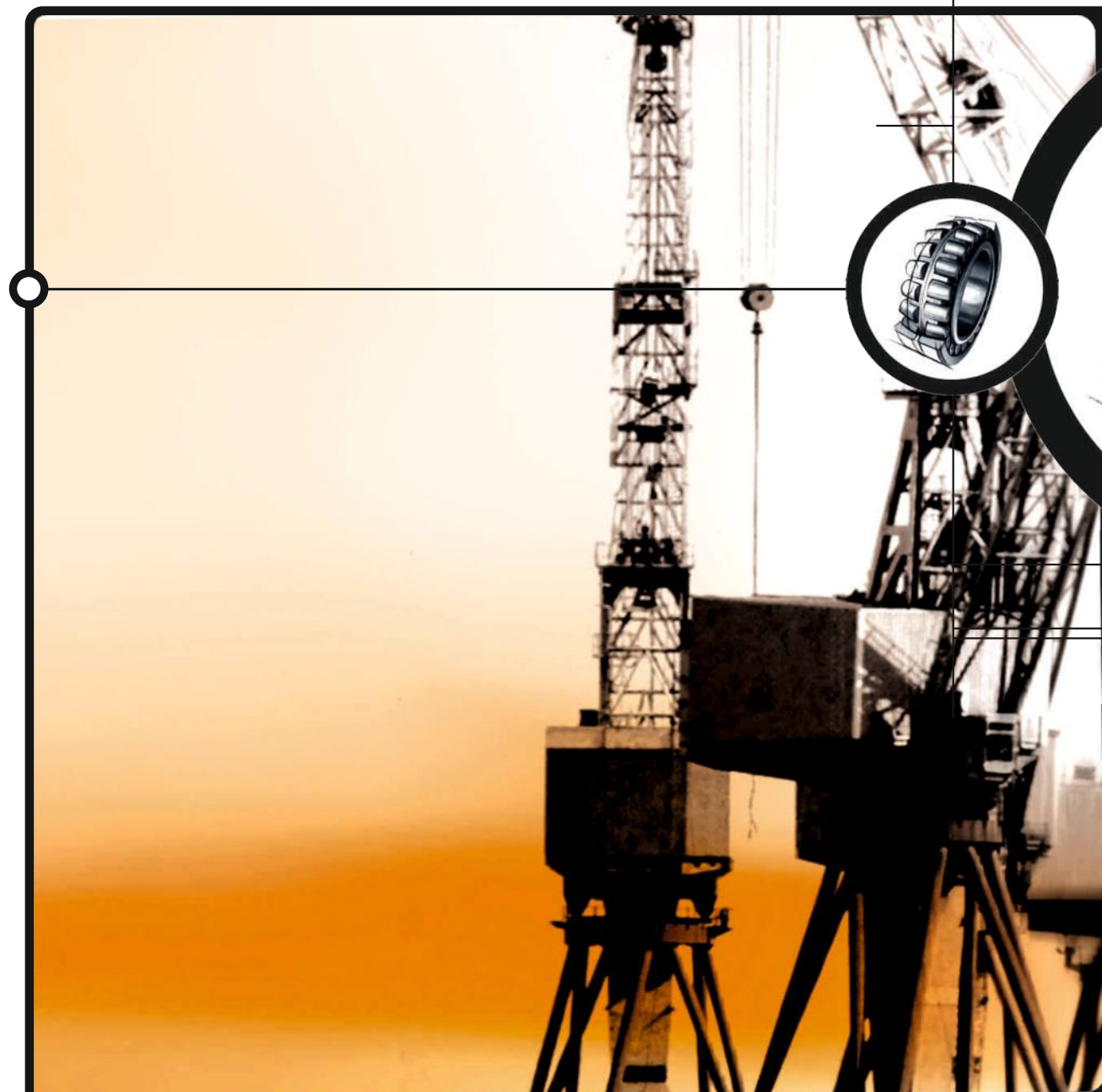


Suffixes

K	Tapered bore, taper 1:12
K30	Tapered bore, taper 1:30
MB	Machined brass cage, inner ring guided
JB	Pressed steel cage, inner ring guided
MA	Machined brass cage, outer ring guided
W33	Lubrication groove and three holes in outer ring
C2, C3, C4	Radial clearance
AC, C	Modernized internal design
F6	Stiffening parameter of accuracy of bearing parts
F61	One groove on the end face of the inner ring
F62	Two grooves on the end face of the inner ring
Ш1	Normalized vibration level
ACMB	Bearings with increased load capacity, which have modified contact of raceway with rollers, brass cage centering on inner ring
ACMA	Bearings with increased load capacity, which have modified contact of raceway with rollers, brass cage centering on outer ring
P6Ш1	Spherical Roller Bearings of the 6th class of precision level with normalized vibration level
ACM	Bearings with increased load capacity, which have modified contact of raceway with rollers, reinforced brass cage centering on inner ring
ACKM	Bearings with increased load capacity, which have modified contact of raceway with rollers, reinforced brass cage centering on inner ring with tapered mounting bore of inner ring

Rings of bearing operating at high temperature shall be heat treated to stabilize their dimensions with the following parameters:

S0	– up to 150°C
S1	– up to 200°C
S2	– up to 250°C
S3	– up to 300°C
S4	– up to 350°C
S5	– up to 400°C





Lubrication and Maintenance

Lubricating film formation

The primary task of the lubrication of rolling bearings is the avoidance of wear and premature fatigue, thus ensuring sufficiently long service life. Lubrication is also intended to promote favourable running properties such as low noise operation and slight friction. The lubricating film created between the load-transmitting parts is supposed to prevent metal-to-metal contact.

Oil lubrication

Oil lubrication is practical when adjacent machine elements are already being supplied with oil or when heat should be dissipated by the lubricant. Heat dissipation may be required for high loads and/or high speeds or if the bearing is exposed to extraneous heat.

For oil lubrication with small quantities (throwaway lubrication), designed as drop feed lubrication, oil mist lubrication or oil-air lubrication, the churning friction and, therefore, the bearing friction is kept low.

When using air as a carrier, a direct supply and an air current which supports the sealing are possible. Direct supply to all contact areas of very fast rotating bearings and good cooling are possible by injecting larger quantities of oil.

Rolling bearing storage

During storage the bearings must not be exposed to the effects of aggressive media such as gasses, mists or aerosols of acids, alkaline solutions or salts. Direct sunlight should also be avoided because it can cause large temperature variations. The formation of condensation water is avoided under the following conditions:

- temperatures +6 to + 25 °C,
- temperature difference day/night < 8 K,
- relative air humidity < 65 %.

Mounting and dismounting

Preparation for mounting and dismounting Cleaning contaminated

Petroleum ether, petroleum, ethyl alcohol, dewatering fluids, aqueous neutral and alkaline cleaning agents can be used to clean rolling bearings. It should be remembered that petroleum, petroleum ether, ethyl alcohol and dewatering fluids are inflammable and alkaline agents are caustic.

Paint brushes, brushes or lint-free cloths should be used for cleaning. Immediately after cleaning and the evaporation of the solvent, which should be as fresh as possible, the bearings must be preserved in order to avoid corrosion.

Rolling bearings are heavy-duty machine elements with high precision. In order to fully utilize their capacity, mounting and dismounting should be taken into consideration when selecting the bearing type and design and when designing the surrounding structure. For the rolling bearings to reach a long service life, the use of suitable mounting aids as well as utmost cleanliness and care at the assembly site are essential requirements.

Mounting bearings with cylindrical bore

Blows with the hammer applied directly to the bearing rings must be avoided completely. In the case of non-separable bearings the mounting forces are applied to the ring which is to have a tight fit and which is first mounted. The rings of separable bearings however, can be mounted individually.

Bearings with a maximum bore of approximately 80 mm can be mounted cold. The use of a mechanical or hydraulic press is recommended.

Should no press be available, the bearing can be driven on with hammer and mounting sleeve.

For self-aligning bearings, misalignment of the outer ring can be avoided by means of a disk which abuts both bearing rings.

Bearings with a cylindrical bore for which tight fits on a shaft are specified and which cannot be pressed mechanically onto the shaft without great effort, are heated before mounting.

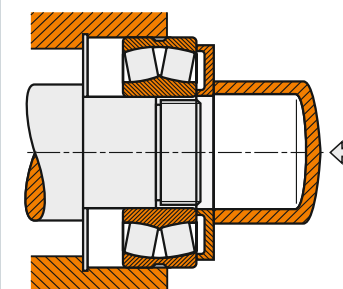
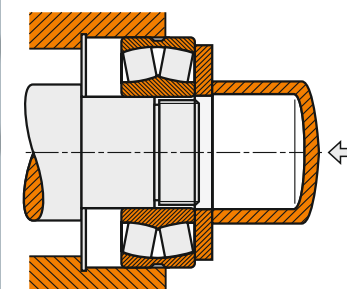
Bearings of all sizes and types can be heated in an oil bath.

The bearings are placed on a grate or hung up for them to heat uniformly.

Individual bearings can be heated provisionally on an electric heating plate. The bearing is covered with a metal sheet and turned several times.

A safe and clean method of heating rolling bearings is to use a thermostatically controlled hot air or heating cabinet. It is used mainly for small and medium-sized bearings. The heat-up times are relatively long.

Induction heating devices are particularly suitable for fast, safe and clean heating.





Mounting and dismounting

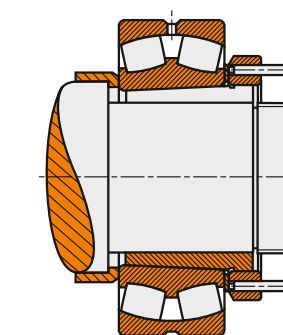
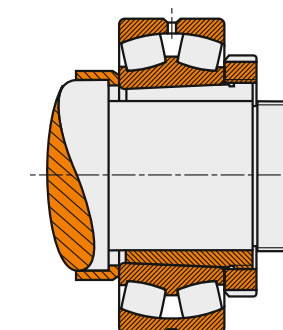
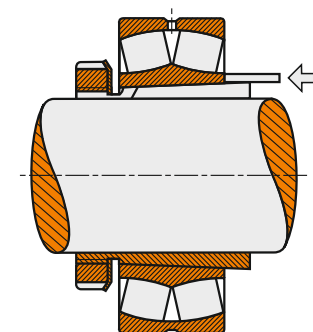
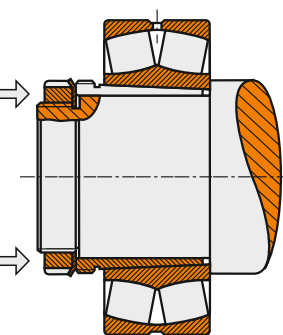
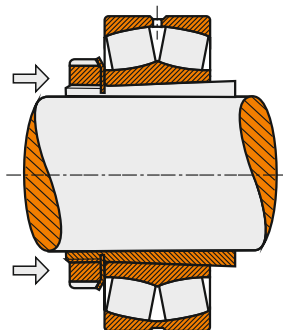
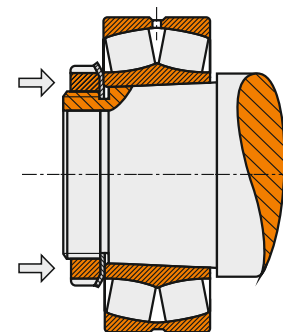
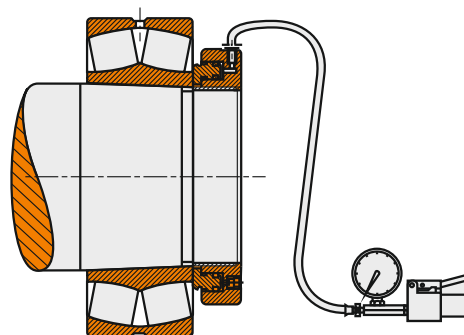
Mounting tapered bore bearings

Rolling bearings with a tapered bore are either fitted directly onto the tapered shaft seat or onto a cylindrical shaft with an adapter sleeve or a withdrawal sleeve. The resulting tight fit of the inner ring is measured by checking the radial clearance reduction due to the expansion of the inner ring or by measuring the axial drive-up distance. Small bearings (up to approx. 80 mm bore) can be pressed with a lockout onto the tapered seat of the shaft or the adapter sleeve. A hook spanner is used to tighten the nut.

It is advisable to use a hydraulic press for driving-up larger bearings or pressing them onto the sleeve.

Dismounting bearings with cylindrical bore

If the bearings are to be used again the extraction tool should be applied to the tightly fitted bearing ring. With non-separable bearings one should proceed as follows: if the outer ring is tightly fitted, the bearing and the housing are removed from the shaft and then the bearing is extracted from the housing by pressing off the outer ring.



If the inner ring is tightly fitted, the shaft with the bearing is removed from the housing and then the inner ring is pressed off.

Mechanic extractors or hydraulic presses are suitable for extracting small bearings. Dismounting is facilitated when there are extraction slots on the shaft and housing. The extraction tool can then be applied directly to the tightly-fitted ring.

Induction heating devices are chiefly used for extracting the shrunk-on inner rings of cylindrical roller bearings. Heating occurs rapidly and the rings easily loosen without much heat reaching the shaft.

The bearings can also be pressed off cylindrical seats with the aid of the hydraulic method.

Dismounting bearings with tapered bore

When the bearings are directly on the tapered seat or an adapter sleeve, the locking device of the shaft or sleeve nut is loosened first. The nut is then turned back by the amount corresponding to the drive-up distance. The inner ring is then driven off the sleeve or the shaft by means of a hammer and piece of tubing. When a press is used the adapter sleeve is supported and the bearing pressed off.

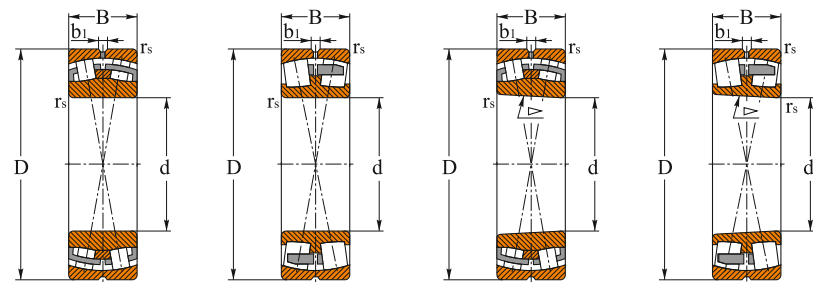
Withdrawal sleeve mounted bearings are removed by means of the extraction nut. High forces are required for large-size bearings.

The dismounting of withdrawal sleeves is much easier and more cost-effective with hydraulic nuts.

The hydraulic method is applied to facilitate the dismounting of large-size bearings.

Dismounting of large-size bearings is facilitated when the hydraulic device is applied.

Oil is injected between the mating surfaces and enables the mating parts to be moved separately without risking surface damage. Large adapter and withdrawal sleeves already have the necessary grooves and bores. The required oil pressure has to be generated with a pump. For tapered bore bearings, oil has just to be pressed between the mating surfaces. Since the press fit is released abruptly, a stop such as a nut should be provided to control the movement of the bearing.



W33

MBW33

KW33

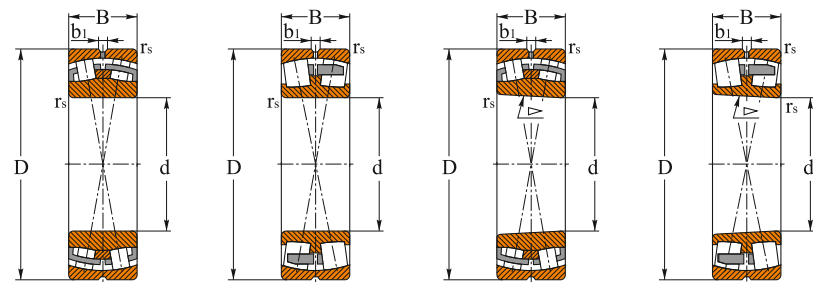
KMBW33



Spherical Roller Radial Bearings, Double-row with Cylindrical and Tapered Bore

Basic dimensions			Load capacity		Maximum rotation speed (lubrication) non-fluid liquid rpm	Designation		Mass kg	Dimensions			Design factors		
d mm	D	B	dyn. C	stat. C ₀ kN		GOST -	MPZ		b ₁	r _{min}	e	Y ₁ -	Y ₂	Y ₀
40	90	33	150	140	5800 7800	53608H	22308 W33	0,97	6,3	1,5	0,40	1,67	2,49	1,64
45	100	36	180	180	5200 6900	53609H	22309 W33	1,40	6,3	1,5	0,39	1,74	2,59	1,70
50	110	40	220	220	4600 6300	53610H	22310 W33	1,85	6,3	2,0	0,39	1,72	2,56	1,68
	110	40	220	220	4600 6300	153610H	22310 KW33	1,80	6,3	2,0	0,39	1,72	2,56	1,68
	110	40	220	220	4600 6300	6-53610Ш1	22310 P6Ш1	1,85	6,3	2,0	0,39	1,72	2,56	1,68
55	120	43	270	280	4200 5500	53611H	22311 W33	2,33	6,3	2,0	0,38	1,76	2,62	1,72
	120	43	270	280	4200 5500	153611H	22311 KW33	2,27	6,3	2,0	0,38	1,76	2,62	1,72
	120	43	270	280	4200 5500	3611H	22311 MBW33	2,31	6,3	2,0	0,38	1,76	2,62	1,72
	120	43	270	280	4200 5500	113611H	22311 KMBW33	2,28	6,3	2,0	0,38	1,76	2,62	1,72
	120	43	270	280	4200 5500									
60	110	28	150	160	5600 7400	3512AH	22212 MBW33	1,19	6,3	1,5	0,24	2,80	4,20	2,80
	110	28	150	160	5600 7400	113512AH	22212 KMBW33	1,43	6,3	1,5	0,24	2,80	4,20	2,80
	130	46	310	330	4000 5300	53612H	22312 W33	3,09	6,3	2,1	0,38	1,78	2,65	1,74
	130	46	310	330	4000 5300	153612H	22312 KW33	2,94	6,3	2,1	0,38	1,78	2,65	1,74
65	120	31	190	210	4200 6800	3513AMH	22213 ACMBW33	1,58	6,3	1,5	0,26	2,59	3,86	2,53
	120	31	190	210	4200 6800	113513AMH	22213 ACKMBW33	1,55	6,3	1,5	0,26	2,59	3,86	2,53
	140	48	330	360	3700 5000	3613AMH	22313 ACMBW33	3,63	8,0	2,1	0,37	1,80	2,69	1,76
	140	48	330	360	3700 5000	113613AMH	22313 ACKMBW33	3,47	8,0	2,1	0,37	1,80	2,69	1,76
70	125	31	200	230	4900 6600	3514MH	22214 CMBW33	1,72	6,3	1,5	0,27	2,51	3,74	2,46
	125	31	200	230	4900 6600	113514MH	22214 CKMBW33	1,68	6,3	1,5	0,27	2,51	3,74	2,46
	150	51	400	430	3400 4500	53614H	22314 W33	4,35	8,0	2,1	0,37	1,82	2,71	1,78
	150	51	400	430	3400 4500	153614H	22314 KW33	4,27	8,0	2,1	0,37	1,82	2,71	1,78
	150	51	400	430	3400 4500	3614H	22314 MBW33	4,29	8,0	3,5	0,37	1,82	2,71	1,78
	150	51	400	430	3400 4500	113614H	22314 KMBW33	4,22	8,0	2,1	0,37	1,82	2,71	1,78
	150	51	400	430	3400 4500									
75	130	31	210	240	4800 6300	3515AMH	22215 ACMBW33	1,81	6,3	1,5	0,22	3,10	4,60	3,00
	130	31	210	240	4800 6300	113515AMH	22215 ACKMBW33	1,76	6,3	1,5	0,22	3,10	4,60	3,00
	160	55	430	470	3200 4300	53615H	22315 W33	5,41	8,0	2,1	0,36	1,85	2,76	1,81
	160	55	430	470	3200 4300	153615H	22315 KW33	5,31	8,0	2,1	0,36	1,85	2,76	1,81
	160	55	430	470	3200 4300	3615H	22315 MBW33	5,27	8,0	2,1	0,38	1,78	2,65	1,74
80	140	33	236	270	3200 4000	53516HK	22216 W33	2,10	6,3	2,0	0,23	2,91	4,33	2,84
	140	33	236	270	3200 4000	153516HK	22216 KW33	2,06	6,3	2,0	0,23	2,91	4,33	2,84
	140	33	230	270	3200 4000	3516H	22216 MBW33	2,17	6,3	2,0	0,25	2,68	4,00	2,62
	140	33	230	270	3200 4000	113516H	22216 KMBW33	1,90	6,3	2,0	0,25	2,68	4,00	2,62
	170	58	490	540	2000 2800	53616H	22316 W33	6,49	8,0	2,1	0,36	1,88	2,81	1,84
	170	58	490	540	2000 2800	153616H	22316 KW33	6,31	8,0	2,1	0,36	1,88	2,81	1,84
	170	58	480	540	2000 2800	3616KH	22316 MBW33	6,20	8,0	2,1	0,36	1,88	2,80	1,84
	170	58	480	540	2000 2800	113616KH	22316 KMBW33	5,95	8,0	2,1	0,36	1,88	2,80	1,84
	170	58	480	540	2000 2800									
	170	58	480	540	2000 2800									

Basic dimensions			Load capacity		Maximum rotation speed (lubrication) non-fluid liquid rpm		Designation		Mass	Dimensions			Design factors			
d mm	D	B	dyn. C	stat. C ₀ kN			GOST -	MPZ		b ₁	r _{ann}	e	Y ₁ -	Y ₂	Y ₀	
85	150	36	285	320	4000	5600	3517H	22217 MBW33	2,70	6,3	2,0	0,26	2,65	3,94	2,59	
	150	36	285	320	4000	5600	113517H	22217 KMBW33	2,60	6,3	2,0	0,26	2,65	3,94	2,59	
	180	60	550	620	2800	3800	3617H	22317 MBW33	7,65	8	3,0	0,37	1,84	2,74	1,80	
	180	60	550	620	2800	3800	113617H	22317 KMBW33	7,60	8	3,0	0,37	1,84	2,74	1,80	
	180	60	550	620	2800	3800	3617HK1	22317 JBW33	7,24	8	3,0	0,37	1,84	2,74	1,80	
90	160	40	320	370	3700	5300	53518H	22218 W33	3,44	6,3	2,0	0,25	2,73	4,06	2,67	
	160	40	320	370	3700	5300	153518H	22218 KW33	3,37	6,3	2,0	0,25	2,73	4,06	2,67	
	160	40	290	350	3600	5200	3518H	22218 MBW33	3,48	6,3	2,0	0,27	2,53	3,77	2,48	
	160	40	290	350	3600	5200	113518H	22218 KMBW33	3,41	6,3	2,0	0,27	2,53	3,77	2,48	
	190	64	610	695	2600	3600	53618H	22318 W33	8,80	11	3,0	0,36	1,90	2,83	1,86	
	190	64	610	695	2600	3600	153618H	22318 KW33	8,60	11	3,0	0,36	1,90	2,83	1,86	
	190	64	610	695	2600	3600	3618AMH	22318 ACMBW33	8,87	11	3,0	0,37	1,83	2,72	1,78	
	190	64	610	695	2600	3600	113618AMH	22318 ACKMBW33	8,58	11	3,0	0,37	1,83	2,72	1,78	
	190	73	620	753	2400	3400	3553318HЛ	23318 MBW33	9,80	11	3,0	0,39	1,71	2,55	1,67	
	95	170	43	380	450	2400	3200	53519H	22219 W33	4,17	8	2,1	0,25	2,69	4,01	2,63
170		43	380	450	2400	3200	153519H	22219 KW33	3,97	8	2,1	0,25	2,69	4,01	2,63	
200		67	670	765	1700	2200	53619H	22319 W33	9,79	11	4,0	0,35	1,94	2,89	1,90	
200		67	670	765	1700	2200	153619H	22319 KW33	9,31	11	4,0	0,35	1,94	2,89	1,90	
100	165	52	365	480	3400	4500	3053720HЛ	23120 MBW33	4,25	6,3	2,0	0,23	2,8	4,2	2,8	
	165	52	365	480	3400	4500	3153720HЛ	23120 KMBW33	4,11	6,3	2,0	0,23	2,8	4,2	2,8	
	180	46	420	490	3300	4500	53520H	22220 W33	4,60	8	2,1	0,25	2,67	3,97	2,61	
	180	46	420	490	3300	4500	153520H	22220 KW33	4,50	8	2,1	0,25	2,67	3,97	2,61	
	180	46	420	490	3300	4500	3520H	22220 MBW33	5,00	8	2,1	0,27	2,47	3,67	2,41	
	180	46	420	490	3300	4500	113520H	22220 KMBW33	4,95	8	2,1	0,27	2,47	3,67	2,41	
	180	60,3	480	600	2400	3400	3003220H	23220 MBW33	6,93	8	2,1	0,35	1,92	2,86	1,88	
	180	60,3	480	600	2400	3400	3113220H	23220 KMBW33	6,75	8	2,1	0,35	1,92	2,86	1,88	
	215	73	815	950	2400	3000	53620H	22320 W33	13,20	11	3,0	0,35	1,91	2,85	1,87	
	215	73	815	950	2400	3000	153620H	22320 KW33	12,57	11	3,0	0,35	1,91	2,85	1,87	
	215	73	815	950	2400	3000	3620AMH	22320 ACMBW33	12,80	11	3,0	0,37	1,81	2,70	1,77	
	215	73	815	950	2400	3000	113620AMH	22320 ACKMBW33	12,70	11	3,0	0,37	1,81	2,70	1,77	
	110	170	45	300	430	3300	4200	3003122H	23022 MBW33	3,78	8	2,0	0,25	2,69	4,01	2,63
		170	45	300	430	3300	4200	3113122H	23022 KMBW33	3,66	8	2,0	0,25	2,69	4,01	2,63
180		56	430	580	2800	3600	3053722HЛ	23122 MBW33	5,7	8	2,0	0,3	2,3	3,4	2,20	
180		56	430	580	2800	3600	3153722HЛ	23122 KMBW33	5,52	8	2,0	0,3	2,3	3,4	2,20	
200		53	560	640	3000	4000	53522H	22222 W33	7,10	8	2,1	0,28	2,43	3,62	2,38	
200		53	560	640	3000	4000	153522H	22222 KW33	6,95	8	2,1	0,28	2,43	3,62	2,38	
200		53	550	630	3000	4000	3522H	22222 MBW33	7,50	8	2,1	0,28	2,39	3,55	2,38	
200		53	550	630	3000	4000	113522H	22222 KMBW33	7,35	8	2,1	0,28	2,39	3,55	2,38	
200		69,8	600	760	2200	3000	3003222AH	23222 MBW33	9,90	8	2,1	0,36	1,89	2,82	1,85	
200		69,8	600	760	2200	3000	3113222AH	23222 KMBW33	9,60	8	2,1	0,36	1,89	2,82	1,85	
240		80	940	1110	1900	2700	3622AMHK	22322 ACMBW33	19,02	14	3,0	0,37	1,83	2,72	1,79	



W33

MBW33

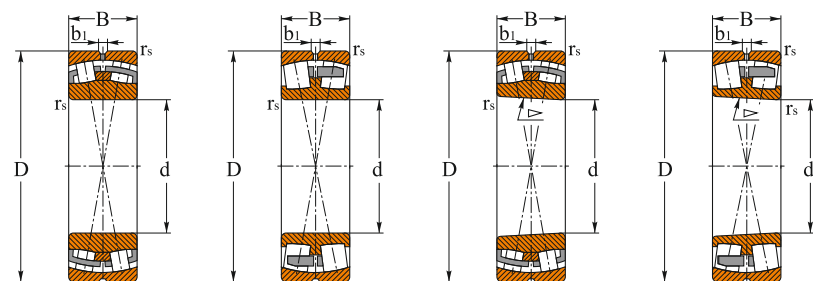
KW33

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Spherical Roller Radial Bearings, Double-row with Cylindrical and Tapered Bore

Basic dimensions			Load capacity		Maximum rotation speed		Designation		Mass		Dimensions			Design factors		
d	D	B	dyn. C	stat. C ₀ kN	(lubrication) non-fluid liquid rpm		GOST -	MPZ	kg	b ₁	r _{min}	e	Y ₁ -	Y ₂	Y ₀	
110	240	80	940	1110	1900	2700	113622AMHK	22322 ACKMW33	18,66	14	3,0	0,37	1,83	2,72	1,79	
	240	80	940	1110	1900	2700	3622AMHK1	22322 ACJBW33	18,36	14	3,0	0,37	1,83	2,72	1,79	
	240	92,1	870	1180	1600	2000	3053322H	23322 W33	20,90	14	3,0	0,39	1,73	2,58	1,70	
120	180	46	350	510	3200	4000	3003124H	23024 MBW33	4,41	8	2,0	0,26	2,61	3,89	2,55	
	180	46	350	510	3200	4000	3113124H	23024 KMBW33	4,27	8	2,0	0,26	2,61	3,89	2,55	
	180	60	430	670	2000	3400	4003124H	24024 MW33	5,45	6,3	2,0	0,29	2,3	3,4	2,8	
	215	58	630	760	2800	3700	53524H	22224 W33	8,70	11	2,1	0,27	2,51	3,74	2,45	
	215	58	630	760	2800	3700	153524H	22224 KW33	8,60	11	2,1	0,27	2,51	3,74	2,45	
	215	58	630	760	2800	3700	3524H	22224 MBW33	9,12	11	2,1	0,29	2,36	3,51	2,31	
	215	58	630	760	2800	3700	113524H	22224 KMBW33	8,50	11	2,1	0,29	2,36	3,51	2,31	
	215	76	690	940	2000	2800	3003224H	23224 MBW33	11,65	11	2,1	0,35	1,91	2,85	1,87	
	215	76	690	940	2000	2800	3113224H	23224 KMBW33	11,35	11	2,1	0,35	1,91	2,85	1,87	
	260	86	960	1120	2000	2600	3624AMH	22324 ACMBW33	23,00	14	3,0	0,37	1,82	2,71	1,78	
	260	86	960	1120	2000	2600	3624AMK1H	22324 ACJBW33	22,35	14	3,0	0,37	1,82	2,71	1,78	
	260	86	960	1120	2000	2600	113624AMH	22324 ACKMBW33	22,64	14	3,0	0,37	1,82	2,71	1,78	
130	200	52	430	630	2800	3600	3003126H	23026 MBW33	6,30	8	2,0	0,25	2,73	4,08	2,67	
	200	52	430	630	2800	3600	3113126H	23026 KMBW33	6,25	8	2,0	0,25	2,73	4,08	2,67	
	200	69	540	815	1700	2600	4053126HЛ	24026 MBW33	7,72	6,3	2,0	0,34	2,00	2,90	1,90	
	210	64	560	780	2400	3200	3053726H	23126 W33	8,79	8	2,8	0,28	2,40	3,60	2,50	
	210	64	560	780	2400	3200	3153726H	23126 KW33	8,52	8	2,8	0,28	2,40	3,60	2,50	
	230	80	780	1140	1900	2500	3053226HЛ	23226 MBW33	14,20	11	3,0	0,33	2,10	3,10	2,00	
	230	80	780	1140	1900	2500	3153226HЛ	23226 KMBW33	14,10	11	3,0	0,33	2,10	3,10	2,00	
	230	64	735	930	1800	2400	53526H	22226 W33	10,80	11	3,0	0,28	2,45	3,65	2,35	
	230	64	735	930	1800	2400	153526H	22226 KW33	10,50	11	3,0	0,28	2,45	3,65	2,35	
	230	64	735	930	2500	3500	3526H	22226 MBW33	11,10	11	3,0	0,29	2,31	3,44	2,26	
	230	64	735	930	2500	3500	113526H	22226 KMBW33	10,78	11	3,0	0,29	2,31	3,44	2,26	
	280	93	1120	1320	1700	2400	3626KH	22326 MBW33	28,58	14	4,0	0,37	1,84	2,74	1,80	
	280	93	1120	1320	1700	2400	113626KH	22326 KMBW33	28,24	14	4,0	0,37	1,84	2,74	1,80	
	280	93	1120	1320	1700	2400	3626K	22326 MB	29,09		4,0	0,37	1,84	2,74	1,80	
	140	210	53	460	680	2700	3300	3003128H	23028 MBW33	6,76	8	2,0	0,25	2,70	4,03	2,65
		210	53	460	680	2700	3300	3113128H	23028 KMBW33	6,50	8	2,0	0,25	2,70	4,03	2,65
210		69	570	900	1800	2800	4003128H	24028 MBW33	8,36	6,3	2,0	0,29	2,30	3,50	2,30	
225		68	630	920	1600	2000	3003728AMH	23128 ACMBW33	11,26	11	2,1	0,27	2,50	3,70	2,40	
225		68	630	920	1600	2000	3113728AMH	23128 ACKMBW33	10,93	11	2,1	0,27	2,50	3,70	2,40	
225		85	695	1100	1400	2200	4053728HЛ	24128 MBW33	12,32	6,3	2,1	0,34	1,90	2,90	1,80	
250		68	710	930	2400	3100	3528AMHK	22228 ACMW33	14,18	11	3,0	0,29	2,35	3,50	2,30	
250		68	710	930	2400	3100	113528AMHK	22228 ACKMW33	13,88	11	3,0	0,29	2,35	3,50	2,30	
250		88	915	1220	1600	2300	3053228HЛ	23228 MBW33	18,70	11	3,0	0,36	1,90	2,89	1,83	
250		88	915	1220	1600	2300	3153228HЛ	23228 KMBW33	18,00	11	3,0	0,36	1,90	2,89	1,83	
250		68	710	930	2400	3100	53528H	22228 W33	14,20	11	3,0	0,27	2,52	3,76	2,52	
250		68	710	930	2400	3100	153528H	22228 KW33	13,14	11	3,0	0,27	2,52	3,76	2,52	
300		102	1290	1560	1700	2200	3628AMHK	22328 ACMW33	35,58	16	4,0	0,38	1,76	2,62	1,72	
150		225	56	510	750	2400	3200	3003130HK	23030 MW33	8,22	11	2,1	0,22	2,70	4,00	2,65
		225	56	510	750	2400	3200	3113130HK	23030 KMBW33	7,97	11	2,1	0,22	2,70	4,00	2,65
		250	80	830	1200	2000	2600	3003730AH	23130 MBW33	16,30	11	2,1	0,32	2,14	3,18	2,08
	250	80	830	1200	2000	2600	3113730AH	23130 KMBW33	15,81	11	2,1	0,32	2,14	3,18	2,08	
	225	75	650	1040	1300	1700	4003130AMH	24030 ACMBW33	10,58	8	2,1	0,31	2,20	3,20	2,10	
	225	75	650	1040	1300	1700	4113130AMH	24030 ACK30MBW33	10,14	8	2,1	0,31	2,20	3,20	2,10	
	250	100	1000	1500	1400	2100	4053730HЛ	24130 MBW33	19,40	8	2,1	0,40	1,70	2,50	1,60	
	270	73	850	1010	2200	3000	53530H	22230 W33	18,25	14	3,0	0,27	2,53	3,76	2,47	
	270	73	850	1010	2200	3000	153530H	22230 KW33	17,87	14	3,0	0,27	2,53	3,76	2,47	
	270	73	850	1010	2200	3000	3530AMHK	22230 ACMW33	17,80	14	3,0	0,29	2,35	3,50	2,30	
	270	73	850	1010	2200	3000	113530AMHK	22230 ACKMW33	17,50	14	3,0	0,29	2,35	3,50	2,30	
	270	96	1080	1460	1500	2100	3003230H	23230 MBW33	23,60	14	3,0	0,36	1,87	2,81	1,84	
	270	96	1080	1460	1500	2100	3113230H	23230 KMBW33	23,10	14	3,0	0,36	1,87	2,81	1,84	
	320	108	1450	1750	1600	2000	3630AMHK	22330 ACMW33	43,10	16	4,0	0,38	1,78	2,64	1,74	
	320	108	1450	1750	1600	2000	113630AMHK	22330 ACKMW33	42,67	16	4,0	0,38	1,78	2,64	1,74	
	160	240	60	590	880	2400	3000	3003132AMH	23032 ACMBW33	9,96	11	2,1	0,25	2,71	4,04	2,65
240		60	590	880	2400	3000	3113132AMH	23032 ACKMBW33	9,68	11	2,1	0,25	2,71	4,04	2,65	
270		86	980	1350	1700	2300	3003732AMH	23132 ACMBW33	20,30	14	2,1	0,32	2,13	3,17	2,08	
270		86	980	1350	1700	2300	3113732AMH	23132 ACKMBW33	19,85	14	2,1	0,32	2,13	3,17	2,08	
240		80	750	1200	1700	2400	4003132AMH	24032 ACMBW33	12,68	8	2,1	0,3	2,2	3,3	2,20	
240		80	750	1200	1700	2400	4113132AMH	24032 ACK30MBW33	12,47	8	2,1	0,3	2,2	3,3	2,20	
290		80	1000	1300	2000	2800	3532AMHK	22232 ACMW33	23,62	14	3,0	0,29	2,29	3,40	2,24	
290		80	1000	1300	2000	2800	113532AMHK	22232 ACKMW33	23,18	14	3,0	0,29	2,29	3,40	2,24	
290		104	1220	1660	1400	2100	3053232H*	23232 MBW33*	30,20	14	3,0					



W33

MBW33

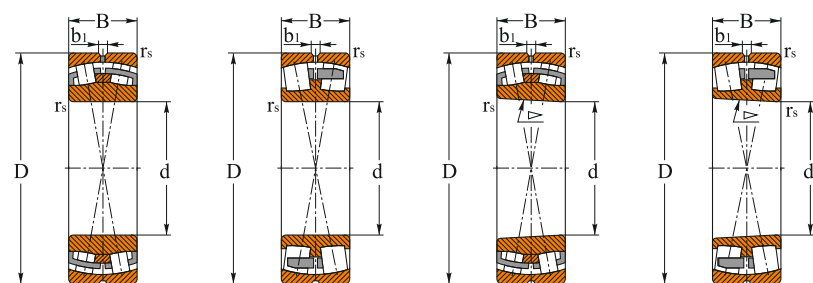
KW33

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Spherical Roller Radial Bearings, Double-row with Cylindrical and Tapered Bore

Basic dimensions			Load capacity		Maximum rotation speed		Designation		Mass		Dimensions			Design factors		
					(lubrication)											
d	D	B	dyn.	stat.	non-fluid liquid		GOST	MPZ	kg	b ₁	r _{min}	e	Y ₁	Y ₂	Y ₀	
mm			C	C ₀	rpm		-						-			
170	360	120	1760	2160	1400	1800	3634AMHK	22334 ACMW33	59,80	16	4,0	0,37	1,81	2,69	1,77	
	360	120	1760	2160	1400	1800	113634AMHK	22334 ACKMW33	58,60	16	4,0	0,37	1,81	2,69	1,77	
180	280	74	830	1240	1900	2700	3003136H	23036 MBW33	15,79	14	2,1	0,26	2,56	3,81	2,50	
	280	74	830	1240	1900	2700	3113136H	23036 KMBW33	15,49	14	2,1	0,26	2,56	3,81	2,50	
	280	100	1080	1790	950	1300	4553136HЛ	24036 MBW33	23,30	8	2,1	0,37	1,80	2,70	1,80	
	320	112	1480	2130	1200	1900	3053236H	23236 MBW33	39,50	14	4,0	0,35	1,90	2,90	1,80	
	320	112	1480	2130	1200	1900	3153236H	23236 KMBW33	38,30	14	4,0	0,35	1,90	2,90	1,80	
	300	96	1090	1800	1500	2100	3053736HЛ	23136 MBW33	27,90	16	3,0	0,32	2,12	3,25	2,00	
	300	96	1090	1800	1500	2100	3153736HЛ	23136 KMBW33	27,00	16	3,0	0,32	2,12	3,25	2,00	
	320	86	1180	1570	1800	2700	3536AMHK	22236 ACMW33	30,47	16	4,0	0,28	2,37	3,56	2,32	
	320	86	1180	1570	1800	2700	113536AMHK	22236 ACKMW33	29,79	16	4,0	0,28	2,37	3,56	2,32	
	380	126	2000	2450	1300	1600	3636AMHK	22336 ACMW33	71,04	22	4,0	0,37	1,83	2,71	1,78	
	380	126	2000	2450	1300	1600	113636AMHK	22336 ACKMW33	69,54	22	4,0	0,37	1,83	2,71	1,78	
190	280	67	610	1165	950	1300	3738	3738	15,00		2,1	0,25	2,74	4,09	2,69	
	290	75	870	1350	1900	2400	3053138HЛ	23038 MBW33	18,00	14	2,1	0,25	2,69	4,00	2,68	
	290	75	870	1350	1900	2400	3153138HЛ	23038 KMBW33	17,40	14	2,1	0,25	2,69	4,00	2,68	
	340	120	1600	2400	1300	1800	3053238HЛ	23238 MBW33	46,60	16	4,0	0,36	1,89	2,81	1,85	
	340	120	1600	2400	1300	1800	3153238HЛ	23238 KMBW33	45,20	16	4,0	0,36	1,89	2,81	1,85	
	320	104	1370	2080	1500	1900	3053738H	23138 MBW33	33,12	16	3,0	0,33	2,07	3,09	2,03	
	320	104	1370	2080	1500	1900	3153738H	23138 KMBW33	33,02	16	3,0	0,33	2,07	3,09	2,03	
	340	92	1270	1700	1700	2300	3538HK	22238 MW33	36,40	16	4,0	0,29	2,33	3,46	2,27	
	340	92	1270	1700	1700	2300	113538HK	22238 KMW33	36,10	16	4,0	0,29	2,33	3,46	2,27	
	340	92	1270	1700	1700	2300	3538*	3538*	36,83		4,0	0,29	2,33	3,46	2,27	
	400	132	2120	2660	1200	1800	3638*	3638*	82,90		5,0	0,36	1,85	2,75	1,81	
	400	132	2120	2660	1200	1800	3638HK	22338 MW33	82,70	22	5,0	0,36	1,85	2,75	1,81	
	400	132	2120	2660	1200	1800	113638HK	22338 KMW33	80,90	22	5,0	0,36	1,85	2,75	1,81	
	200	310	82	1000	1520	1800	2100	3003140H	23040 MBW33	22,50	14	2,1	0,27	2,53	3,76	2,46
		310	82	1000	1520	1800	2100	3113140H	23040 KMBW33	21,80	14	2,1	0,27	2,53	3,76	2,46
310		82	1600	2350	1800	2100	3003740H	23140 MBW33	44,54	16	3,0	0,32	2,14	3,18	2,09	
310		109	1200	2100	1300	1900	4003140AMH	24040 ACMBW33	30,00	11	2,1	0,24	2,80	4,20	2,80	
340		112	1600	2350	1400	1800	3113740HЛ	23140 KMBW33	43,24	16	3,0	0,32	2,14	3,18	2,09	
360		128	1800	2700	850	1100	3053240H	23240 MBW33	56,30	16,7	4,0	0,37	1,80	2,69	1,76	
360		128	1800	2700	850	1100	3153240H	23240 KMBW33	54,60	16,7	4,0	0,37	1,80	2,69	1,76	
360		98	1460	2000	1600	2100	3540AMH	22240 ACMBW33	44,40	16	4,0	0,29	2,31	3,44	2,26	
360		98	1460	2000	1600	2100	113540AMH	22240 ACKMBW33	43,50	16	4,0	0,29	2,31	3,44	2,26	
420		138	2320	2900	1200	1500	3640AMHK	22340 ACMW33	93,80	22	5,0	0,36	1,87	2,78	1,83	
420		138	2320	2900	1200	1500	113640AMHK	22340 ACKMW33	90,00	22	5,0	0,36	1,87	2,78	1,83	
220		300	60	546	1000	1800	2100	3053944HЛ	23944 MBW33	13,0	11	2,1	0,16	4,20	6,30	4,00
		340	90	1220	1860	1600	2000	3003144HK	23044 MW33	31,16	14	3,0	0,26	2,60	3,87	2,54
	340	90	1220	1860	1600	2000	3113144HK	23044 KMW33	29,95	14	3,0	0,26	2,60	3,87	2,54	
	370	120	1800	2760	1300	1600	3003744H	23144 MBW33	54,70	16	4,0	0,34	1,80	2,69	1,77	
	370	120	1800	2760	1300	1600	3113744H	23144 KMBW33	52,00	16	4,0	0,34	1,80	2,69	1,77	
	220	370	120	1800	2760	1300	1600	3003744H	23144 MBW33	54,70	16	4,0	0,34	1,80	2,69	1,77
		370	120	1800	2760	1300	1600	3113744H	23144 KMBW33	52,00	16	4,0	0,34	1,80	2,69	1,77
		370	120	1800	2760	1300	1600	3113744H	23144 KMBW33	52,00	16	4,0	0,34	1,80	2,69	1,77
370		120	1800	2760	1300	1600	3113744H	23144 KMBW33	52,00	16	4,0	0,34	1,80	2,69	1,77	

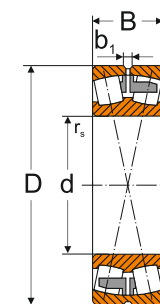


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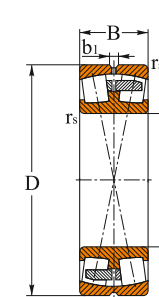
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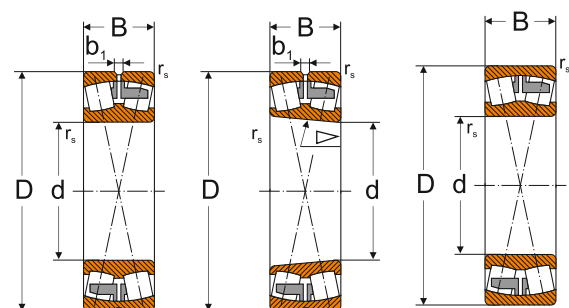
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Spherical Roller Radial Bearings, Double-row with Cylindrical and Tapered Bore

Super Precision Spherical Roller Radial Bearings Double-row with Cylindrical and Tapered Bore

Basic dimensions			Load capacity		Maximum rotation speed (lubrication) non-fluid liquid rpm		Designation		Mass	Dimensions			Design factors		
d mm	D	B	dyn. C	stat. C ₀ kN			GOST -	MPZ	kg	b ₁	r _{ann}	e	Y ₁ -	Y ₂	Y ₀
300	460	118	2100	3480	1100	1500	3113160AMH	23060 ACKMBW33	71,56	22	4,0	0,25	2,64	3,93	2,58
	500	160	3200	5150	940	1100	3003760HK	23160 MW33	127,60	22	5,0	0,36	1,90	2,83	1,86
	500	160	3200	5150	940	1100	3113760HK	23160 KMW33	123,60	22	5,0	0,36	1,90	2,83	1,86
320	480	121	2250	3750	1000	1300	3003164AMHK	23064 ACMW33	80,51	16	4,0	0,26	2,55	3,08	2,50
	480	121	2250	3750	1000	1300	3113164AMHK	23064 ACKMW33	78,26	16	4,0	0,26	2,55	3,08	2,50
	580	150	3600	5000	940	1250	3564AMH	22264 ACMBW33	180,10	22	5,0	0,27	2,55	3,80	2,55
	580	150	3600	5000	940	1250	113564AMH	22264 ACKMBW33	175,70	22	5,0	0,27	2,55	3,80	2,55
	580	208	4400	6900	700	980	3003264AMHK	23264 ACMW33	249,10	22	5,0	0,37	1,81	2,69	1,80
	580	208	4400	6900	700	980	3113264AMHK	23264 ACKMW33	241,80	22	5,0	0,37	1,81	2,69	1,80
340	520	133	2650	4580	950	1150	3003168AMHK	23068 ACMW33	108,30	22	5,0	0,26	2,55	3,08	2,50
	520	133	2650	4580	950	1150	3113168AMHK	23068 ACKMW33	105,22	22	5,0	0,26	2,55	3,08	2,50
360	540	134	2750	4850	930	1170	3003172H	23072 MBW33	112,90	22	5,0	0,26	2,60	3,87	2,54
	540	134	2750	4850	930	1170	3113172H	23072 KMBW33	109,90	22	5,0	0,26	2,60	3,87	2,54
380	620	194	4400	7100	500	1000	3053776H	23176 MBW33	239,0	22	5,0	0,3	2,20	3,40	2,20
	620	194	4400	7100	500	1000	3153776H	23176 KMBW33	236,5	22	5,0	0,3	2,20	3,40	2,20
400	600	148	3250	5700	850	1100	3003180AMH	23080 ACMBW33	153,14	22	5,0	0,25	2,69	4,00	2,68
	650	200	4650	7800	520	950	3003780AMHK	23180 ACMW33	267,32	22	6,0	0,31	2,17	3,24	2,12
	820	243	7500	10400	420	620	3680AMHX	22380 ACMBHA1W33	635,00	22	7,5	0,32	2,12	3,15	2,11
460	680	163	3900	7200	540	930	3003192AMH	23092 ACMBW33	208,20	22	6,0	0,23	2,95	4,39	2,89
530	780	185	5100	9700	430	750	30031/530	230/530 MB	312,31	-	6,0	0,22	3,03	4,51	2,98
600	980	300	9550	19300	300	400	30037/600	231/600 MB	880,85	-	7,5	0,30	2,26	3,37	2,21

Basic dimensions			Load capacity		Maximum rotation speed (lubrication) non-fluid liquid rpm		Designation		Mass	Dimensions			Design factors		
d mm	D	B	dyn. C	stat. C ₀ kN			GOST -	MPZ	kg	b ₁	r _{ann}	e	Y ₁ -	Y ₂	Y ₀
75	160	55	430	470	3500	4700	113615YH	22315 KMBF6W33	5,21	8	2,1	0,38	1,78	2,65	1,74
	180	46	420	490	3600	4900	3520YHK5	22220 MAF6W33	5,21	8	2,1	0,27	2,47	3,67	2,41
100	215	73	670	870	2400	3000	3620HKY	3620 HKY	13,00	11	3,0	0,37	1,81	2,70	1,77
	240	80	940	1110	2000	2900	3622AMHYK5	22322 ACMAF6W33	19,62	14	3,0	0,37	1,83	2,72	1,79
110	240	80	940	1110	2000	2900	3622AMHY	22322 ACMF6W33	19,02	14	3,0	0,37	1,83	2,72	1,79
	215	58	630	760	3000	4000	3524YHK5	22224 MAF6W33	9,23	11	2,1	0,29	2,36	3,51	2,31
120	260	86	960	1120	2200	2800	3624AMHY	22324 ACMBF6W33	23,00	14	3,0	0,37	1,82	2,71	1,78
	260	86	960	1120	2200	2800	3624AMHY2	22324 ACMBF62W33	23,00	14	3,0	0,37	1,82	2,71	1,78
	300	102	1290	1560	1700	2200	3628AMHYK	22328 ACMF6W33	35,58	16	4,0	0,38	1,76	2,62	1,72
150	270	73	850	1010	2400	3300	3530AMHYK	22230 ACMF6W33	17,80	14	3,0	0,29	2,35	3,50	2,30
	320	108	1450	1750	1700	2200	3630AMHYK	22330 ACMF6W33	43,10	16	4,0	0,38	1,78	2,64	1,74
	320	108	1450	1750	1700	2200	3630AMHYK5	22330 ACMAF6W33	44,64	16	4,0	0,38	1,78	2,64	1,74
160	340	114	1600	1960	1600	2000	3632AMHYK	22332 ACMF6W33	51,24	6	4,0	0,38	1,80	2,69	1,76
180	320	86	1180	1570	1900	2900	3536AMHYK	22236 ACMF6W33	30,47	16	4,0	0,28	2,37	3,56	2,32
	380	126	2000	2450	1400	1700	3636AMHYK	22336 ACMF6W33	71,04	22	4,0	0,37	1,83	2,71	1,78
	380	126	2000	2450	1400	1700	3636AMHYK5	22336 ACMAF6W33	73,86	22	4,0	0,37	1,83	2,71	1,78
200	420	138	2320	2900	1300	1600	3640AMHY2K	22340 ACMF62W33	93,80	22	5,0	0,36	1,87	2,78	1,83
220	400	108	1760	2400	1800	2000	3544AMHY	22244 ACMBF6W33	60,20	16	4,0	0,28	2,42	3,60	2,37
260	540	165	3550	4590	900	1100	3652AMHY2K	22352 ACMF62W33	192,42	22	6,0	0,33	2,01	3,00	1,97
280	500	130	2680	3740	1200	1400	3556AHY	22256 MBF6W33	120,70	22	5,0	0,28	2,39	3,56	2,34
320	580	150	3600	5000	1000	1350	3564AMHY	22264 ACMBF6W33	180,10	22	5,0	0,27	2,55	3,80	2,55
400	650	200	4650	7800	570	1000	3003780AMHY2	23180 ACMF62W33	267,32	22	6,0	0,31	2,17	3,24	2,12
	820	243	7500	10400	460	680	3680AMXHY1	22380 ACMBHA1F61W33	634,85	22	7,5	0,32	2,12	3,15	2,11
	820	243	7500	10400	460	680	3680AMXHY2	22380 ACMBHA1F62W33	634,70	22	7,5	0,32	2,12	3,15	2,11



MAW33

KMAW33

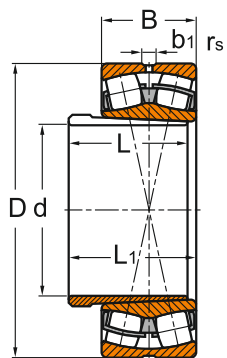
MA



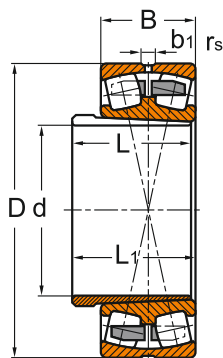
Spherical Roller Radial Bearings for vibratory applications with Cylindrical and Tapered Bore

Basic dimensions			Load capacity		Maximum rotation speed (lubrication) non-fluid liquid rpm		Designation		Mass	Dimensions			Design factors		
d mm	D	B	dyn. C	stat. C ₀ kN			GOST -	MPZ	kg	b ₁	r _{min}	e	Y ₁	Y ₂	Y ₀
25	52	20,6	43	41	8500	11000	3553205	23205 MA	0,20	1,0	0,41	1,64	2,44	1,60	
35	72	23	86	85	9000	12000	553507	22207 MA	0,45	1,1	0,33	2,03	3,03	1,99	
40	80	23	89	90	5300	6800	553508	22208 MA	0,57	1,1	0,29	2,20	3,41	2,24	
	80	23	95	90	5300	6800	553508A	22208 AMA	0,57	1,1	0,28	2,30	3,50	2,30	
45	85	23	102	98	7500	10000	553509	22209 MA	0,64	1,1	0,25	2,60	3,90	2,50	
	100	25	125	127	6300	8500	553309	553309 MA	1,05	1,5	0,23	2,98	4,45	2,92	
50	90	23	104	106	7000	9500	553510	22210 MA	0,68	6,3	1,1	0,25	2,60	3,97	2,60
	110	40	178	209	4800	6300	553610H	22310 MAW33	1,84		2,0	0,37	1,80	2,70	1,80
55	100	25	110	125	6300	8500	553511	22211 MA	0,91	6,3	1,5	0,23	2,98	4,45	2,92
	120	43	270	280	4200	5500	3611HK5	22311MAW33	2,38		2,0	0,38	1,76	2,62	1,72
60	110	28	150	180	5600	7400	3512HK5	22212 MAW33	1,21	6,3	1,5	0,24	2,80	4,20	2,80
	110	28	156	180	5600	7400	553512	22212 MA	1,21	-	1,5	0,26	2,61	3,89	2,55
	130	46	310	330	4800	6300	553612H	22312 MAW33	3,05	6,3	2,1	0,38	1,78	2,65	1,74
65	140	48	330	360	3700	5000	3613AMHK5	22313 ACMAW33	3,71	8	2,1	0,37	1,80	2,69	1,76
70	150	51	311	380	2400	3200	3614HK5	22314 MAW33	4,53	8	2,1	0,37	1,82	2,71	1,78
75	160	55	430	470	3200	4300	3615HK5	22315 MAW33	5,57	8	2,1	0,38	1,78	2,65	1,74
80	140	33	230	270	3200	4000	3516HK5	22216 MAW33	2,32	6,3	2,0	0,25	2,68	4,00	2,62
	170	58	480	540	2000	2800	3616HK5	22316 MAW33	6,66	8	2,1	0,36	1,88	2,80	1,84
90	190	64	610	695	2600	3600	3618AMHK5	22318 ACMAW33	9,08	11	3,0	0,37	1,83	2,72	1,78
100	180	46	420	490	3300	4500	3520HK5	22220 MAW33	5,21	8	2,1	0,27	2,47	3,67	2,41
	215	73	815	950	2400	3000	3620AMHK5	22320 ACMAW33	13,41	11	3,0	0,37	1,81	2,70	1,77
110	240	80	940	1110	1900	2700	3622AMHK5	22322 ACMAW33	19,62	14	3,0	0,37	1,83	2,72	1,79
	240	80	940	1110	1900	2700	113622AMHK5	22322 ACKMAW33	19,26	14	3,0	0,37	1,83	2,72	1,79
120	215	58	630	760	2800	3700	3524HK5	22224 MAW33	9,23	14	3,0	0,37	1,82	2,71	1,78
	260	86	960	1120	2000	2600	3624AMHK5	22324 ACMAW33	24,13	14	3,0	0,37	1,82	2,71	1,78
	260	86	960	1120	2000	2600	113624AMHK5	22324 ACKMAW33	23,78	14	3,0	0,37	1,82	2,71	1,78
130	230	64	735	930	2500	3500	3526HK5	22226 MAW33	11,54	11	3,0	0,29	2,31	3,44	2,26
	230	64	735	930	2500	3500	113526HK5	22226 KMAW33	11,30	11	3,0	0,29	2,31	3,44	2,26
	280	93	1110	1320	1700	2400	3626HK5	22326 MAW33	29,60	14	4,0	0,37	1,84	2,74	1,80

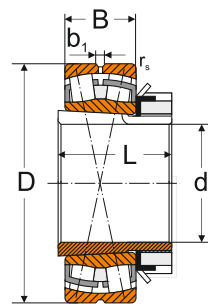
Basic dimensions			Load capacity		Maximum rotation speed (lubrication) non-fluid liquid rpm		Designation		Mass	Dimensions			Design factors		
d mm	D	B	dyn. C	stat. C ₀ kN			GOST -	MPZ	kg	b ₁	r _{min}	e	Y ₁	Y ₂	Y ₀
140	300	102	1290	1560	1700	2200	3628AMHK5	22328 ACMAW33	36,10	16	4,0	0,38	1,76	2,62	1,72
	300	102	1290	1560	1700	2200	113628AMHK5	22328 ACKMAW33	35,73	16	4,0	0,38	1,76	2,62	1,72
150	270	73	850	1110	2200	3000	3530AMHK5	22230 ACMAW33	18,24	14	3,0	0,29	2,35	3,50	2,30
	320	108	1450	1760	1600	2000	3630AMHK5	22330 ACMAW33	44,64	16	4,0	0,38	1,78	2,64	1,74
160	340	114	1600	1960	1500	1900	3632AMHK5	22332 ACMAW33	52,60	16	4,0	0,38	1,80	2,69	1,76
170	260	67	735	1200	2500	2800	3003134HK5	23034 MAW33	13,20	11	2,1	0,23	3,00	4,40	2,90
	360	120	1760	2160	1400	1800	3634AMHK5	22334 ACMAW33	61,50	16	4,0	0,37	1,81	2,69	1,77
	360	120	1760	2160	1400	1800	113634AMHK5	22334 ACKMAW33	59,00	16	4,0	0,37	1,81	2,69	1,77
180	380	126	2000	2450	1300	1600	3636AMHK5	22336 ACMAW33	71,04	22	4,0	0,37	1,83	2,71	1,78
190	400	132	2120	2660	1200	1800	3638HK5	22338 MAW33	86,60	22	5,0	0,36	1,85	2,75	1,81
	400	132	2120	2675	1200	1800	113638HK5	22338 KMAW33	84,80	22	5,0	0,36	1,85	2,75	1,81
200	420	138	2320	2900	1200	1500	3640AMHK5	22340 ACMAW33	94,50	22	5,0	0,36	1,87	2,78	1,83
220	460	145	2700	3450	1000	1400	3644AMHK5	22344 ACMAW33	125,76	22	5,0	0,35	1,95	2,90	1,91
260	540	165	3550	4590	850	1000	3652AMHK5	22352 ACMAW33	199,40	22	6,0	0,33	2,01	3,00	1,97
	540	165	3550	4590	850	1000	113652AMHK5	22352 ACKMAW33	199,00	22	6,0	0,33	2,01	3,00	1,97
280	500	130	2680	3740	1100	1300	3556AHK5	22256 MAW33	112,40	22	5,0	0,28	2,39	3,56	2,34
	580	175	4000	5280	750	1000	3656AMHK5	22356 ACMAW33	240,95	22	6,0	0,33	2,03	3,02	2,02
	580	175	4000	5280	750	1000	113656AMHK5	22356 ACKMAW33	236,00	22	6,0	0,33	2,03	3,02	2,02
380	620	194	4400	7100	500	1000	3053776HK5	23176 MAW33	242,90	22	5,0	0,30	2,20	3,40	2,20



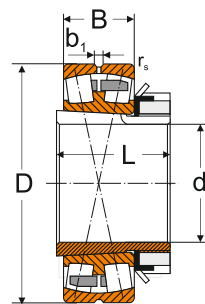
KW33



KMBW33



KW33



KMBW33

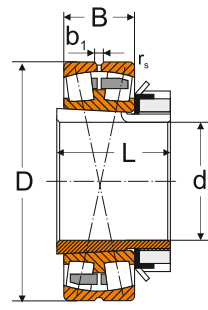
Spherical roller bearings double row
on withdrawal sleeve

Spherical Roller Radial Bearings, Double-row
with adapter sleeve

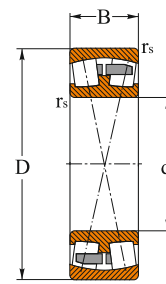
Basic dimensions			Load capacity		Maximum rotation speed		Designation			Mass	Dimensions					Design factors		
d mm	D	B	dyn. C	stat. C ₀ kN	non-fluid liquid rpm	fluid liquid rpm	GOST	MPZ	Sleeve	kg	b ₁	L	L ₁	r _{min}	e	Y ₁	Y ₂	Y ₀
50	120	43	270	280	4200	5500	753610H	22311 KW33	AH2311X	2,53	6,3	54	57	2,0	0,38	1,76	2,62	1,72
65	150	51	400	430	3400	4500	753613H	22314 KW33	AH2314X	4,88	8	64	68	2,1	0,37	1,82	2,71	1,78
	160	55	430	470	3200	4300	953613H	22315 KW33	953613.05	5,98	8	68	72	2,1	0,36	1,85	2,76	1,81
	160	55	430	470	3200	4300	73613	22315 KW33	953613.05	6,12	-	68	71,5	2,1	0,38	1,78	2,65	1,74
70	160	55	430	470	3200	4300	73614	22315 KMB	AH2315X	5,76	-	68	72	2,1	0,38	1,78	2,65	1,74
	160	55	430	470	3200	4300	753614H	22315 KW33	AH2315X	5,67	8	68	72	2,1	0,36	1,85	2,76	1,81
75	170	58	490	540	2000	2800	73615	22316 KMB	AH2316X	7,15	-	71	75	2,1	0,36	1,88	2,80	1,84
	190	64	610	695	2600	3600	73617AMH	22318 ACKMBW33	AH2318X	9,36	11	79	83	3,0	0,37	1,83	2,72	1,78
85	190	64	610	695	2600	3600	753617H	22318 KW33	AH2318X	9,33	11	79	83	3,0	0,36	1,90	2,83	1,86
	215	73	815	950	2400	3000	73619AMH	22320 ACKMBW33	AH2320X	13,75	11	90	94	3,0	0,37	1,81	2,70	1,77
95	215	73	815	950	2400	3000	753619H	22320 KW33	AH2320X	13,47	11	90	94	3,0	0,35	1,91	2,85	1,87
115	260	86	960	1120	2000	2600	73623AMH	22324 ACKMBW33	AH2324X	24,32	14	105	109	3,0	0,37	1,82	2,71	1,78
	280	93	923	1290	1300	1170	93624	93624*	93624.05	29,40	-	115	119	4,0	0,37	1,84	2,74	1,80
120	280	93	923	1290	1300	1170	73624	73624*	73624.05	29,40	-	115	119	4,0	0,37	1,84	2,74	1,80
	280	93	923	1290	1300	1170	73727	73727*	73727.05	29,10	-	115	119	5,0	0,37	1,84	2,74	1,80
135	280	93	923	1290	1300	1170	73727	73727*	73727.05	29,10	-	115	119	5,0	0,37	1,84	2,74	1,80
140	300	102	1290	1560	1700	2200	93627AMHK	22328 ACKMW33	AH2328X	37,37	16	125	130	4,0	0,38	1,76	2,62	1,72
160	280	88	1040	1540	1800	2400	3753732HЛ	23134 KMBW33	AH3134	24,50	16	104	109	2,1	0,31	2,16	3,22	2,11
170	380	126	2000	2400	1300	1600	73634AMHK	22336 ACKMW33	AH2336	75,37	22	154	160	4,0	0,37	0,83	2,71	1,78
180	340	92	1089	1669	1200	1600	73536*	73536*	73536.05	41,10	-	112	117	4,0	0,29	2,33	3,46	2,27
	380	126	1685	2580	800	1100	73736	73736	73736.05	73,14	-	154	162	4,0	0,34	1,99	2,96	1,95
	400	132	2120	2660	1200	1800	73636*	73636*	73636.05	86,50	-	160	167	5,0	0,36	1,85	2,75	1,81
	400	132	2120	2660	1200	1800	73636*	73636*	73636.05	86,50	-	160	167	5,0	0,36	1,85	2,75	1,81
190	420	138	2320	2900	1200	1500	73638AMHK	22340 ACKMW33	AH2340	96,96	22	170	177	5,0	0,36	1,87	2,78	1,83
220	440	120	2000	3000	1300	1700	73544AMHK	22248 ACKMW33	AH2248	92,66	22	144	150	4,0	0,27	2,50	3,70	2,50
280	460	160	2331	4667	600	700	4073156H	24060 K30MBW33	AH3160	124,10	14	192	200	4,0	0,32	2,02	3,04	2,03
	500	200	3214	6106	360	450	4073756H	24160 K30MBW33	AH2248	183,80	16	224	232	5,0	0,41	1,72	2,48	1,59

*Bearings for railway applications

Basic dimensions			Load capacity		Maximum rotation speed		Designation			Mass	Dimensions				Design factors		
d mm	D	B	dyn. C	stat. C ₀ kN	(lubrication) non-fluid liquid rpm		GOST -	MPZ	Sleeve	kg	b ₁	L	r _{min}	e -	Y ₁	Y ₂	Y ₀
50	120	43	270	280	4200	5500	353610H	22311 KW33	H2311	3,50	6,3	59	2,0	0,38	1,76	2,62	1,72
60	120	31	190	230	4200	6800	13512AMH	22213 ACKMBW33	H313	2,23	6,3	50	1,5	0,26	2,59	3,86	2,53
65	160	55	430	470	3200	4300	353613H	22315 KW33	H2315	6,15	8	73	2,1	0,36	1,85	2,76	1,81
	160	55	430	470	3200	4300	13613H	22315 KMBW33	H2315	6,16	8	73	2,1	0,30	1,78	2,65	1,74
70	140	33	236	270	3200	4000	13514H	22216 KMBW33	H316	3,20	6,3	59	2,0	0,25	2,68	4,00	2,62
	140	33	236	270	3200	4000	353514H	22216 KW33	H316	3,08	6,3	59	2,0	0,23	2,91	4,33	2,84
	170	58	490	540	2000	2800	13614KH	22316 KMBW33	H2316	7,38	8	78	2,1	0,36	1,88	2,80	1,84
	170	58	490	540	2000	2800	353614H	22316 KW33	H2316	7,46	8	78	2,1	0,36	1,88	2,81	1,84
80	160	40	320	370	3700	5300	13516H	22218 KMBW33	H318	4,77	6,3	65	2,0	0,27	2,53	3,77	2,48
	160	40	290	350	3600	5200	353516H	22218 KW33	H318	4,73	6,3	65	2,0	0,25	2,73	4,06	2,67
	190	64	610	695	2600	3600	353616H	22318 KW33	H2318	9,98	11	86	3,0	0,26	1,90	2,83	1,86
90	180	46	420	490	3300	4500	13518H	22220 KMBW33	H320	6,61	8	71	2,1	0,27	2,47	3,67	2,41
	180	46	420	490	3300	4500	353518H	22220 KW33	H320	6,19	8	71	2,1	0,25	2,67	3,97	2,61
	215	73	815	950	2400	3000	13618AMH	22320 ACKMBW33	H2320	14,91	11	97	3,0	0,37	1,81	2,70	1,77
	215	73	815	950	2400	3000	353618H	22320 KW33	H2320	14,70	11	97	3,0	0,35	1,91	2,85	1,87
100	200	53	560	640	3000	4000	13520H	22222 KMBW33	H322	9,53	8	77	2,1	0,28	2,39	3,55	2,38
	200	53	550	630	3000	4000	353520H	22222 KW33	H322	9,15	8	77	2,1	0,28	2,43	3,62	2,38
	240	80	940	1110	1900	2700	13620AMHK	22322 ACKMW33	H2322	21,4	11	105	3,0	0,37	1,83	2,72	1,79
110	215	58	630	760	2800	3700	13522H	22224 KMBW33	H3124	11,20	11	88	2,1	0,29	2,36	3,51	2,31
	215	58	630	760	2800	3700	353522H	22224 KW33	H3124	11,30	11	88	2,1	0,27	2,51	3,74	2,45
	215	76	690	940	2000	2800	3013222H	23224 KMBW33	H2324	15,7	11	112	2,1	0,35	1,91	2,85	1,87
	260	86	960	1120	2000	2600	13622AMH	22324 ACKMBW33	H2324	25,83	14	112	3,0	0,37	1,82	2,71	1,78
115	230	64	735	930	2500	3500	13523H	22226 KMBW33	H3126	14,17	11	92	3,0	0,29	2,31	3,44	2,26
	230	64	735	930	2500	3500	353523H	22226 KW33	H3126	14,70	11	92	3,0	0,28	2,45	3,65	2,35
125	210	53	460	680	2700	3300	3013125H	23028 KMBW33	H3028	10,53	8	82	2,0	0,25	2,70	4,03	2,65
	250	68	710	930	2400	3100	13525AMHK	22228 ACKMW33	H3128	18,22	11	97	3,0	0,29	2,35	3,50	2,30
	250	68	710	930	2400	3100	353525H	22228 KW33	H3128	18,34	11	97	3,0	0,27	2,52	3,76	2,52
140	290	80	1000	1300	2000	2800	13528AMHK	22232 ACKMW33	H3132	30,46	14	119	3,0	0,29	2,29	3,40	2,24
	290	80	1000	1300	2000	2800	353528H	22232 KW33	H3132	30,60	14	119	3,0	0,27	2,52	3,76	2,52
150	280	88	1040	1540	1800	2400	3353730HЛ	23134 KMBW33	H3134	29,50	16	122	2,1	0,31	2,16	3,22	2,11
	310	86	1120	1450	1900	2500	13530AMH	22234 ACKMBW33	H3134	34,90	16	122	4,0	0,30	2,27	3,37	2,21
	310	110	1400	2120	1300	2120	3013230H	23234 KMBW33	H2334	46,00	16	154	4,0	0,33	2,00	3,00	2,00
	360	120	1760	2160	1400	1800	13630AMHK	22334 ACKMW33	H2334	68,80	16	154	4,0	0,37	1,81	2,69	1,77
160	320	86	1180	1570	1800	2700	13532AMHK	22236 ACKMW33	H3136	39,30	16	131	4,0	0,28	2,37	3,56	2,32
	380	126	2000	2450	1300	1600	13632AMHK	22336 ACKMW33	H2336	80,89	22	161	5,0	0,37	1,83	2,71	1,78
170	340	92	1270	1700	1700	2300	13534HK	22238 KMW33	H3138	46,90	16	141	4,0	0,29	2,33	3,46	2,27
	400	132	2120	2660	1200	1800	13634HK	22338 KMW33	H2338	91,98	22	169	5,0	0,36	1,85	2,75	1,81
180	360	98	1460	2000	1600	2100	13536AMH	22240 ACKMBW33	H3140	55,60	16	150	4,0	0,29	2,31	3,44	2,26
	420	138	2320	2900	1200	1500	13636AMHK	22340 ACKMW33	H2340	106,20	22	176	5,0	0,36	1,87	2,78	1,83
190	420	138	2320	2900	1200	1500	13638AMHK	22340 ACKMW33	13638A.05	105,26	22	176	5,0	0,36	1,87	2,78	1,83



MAW33



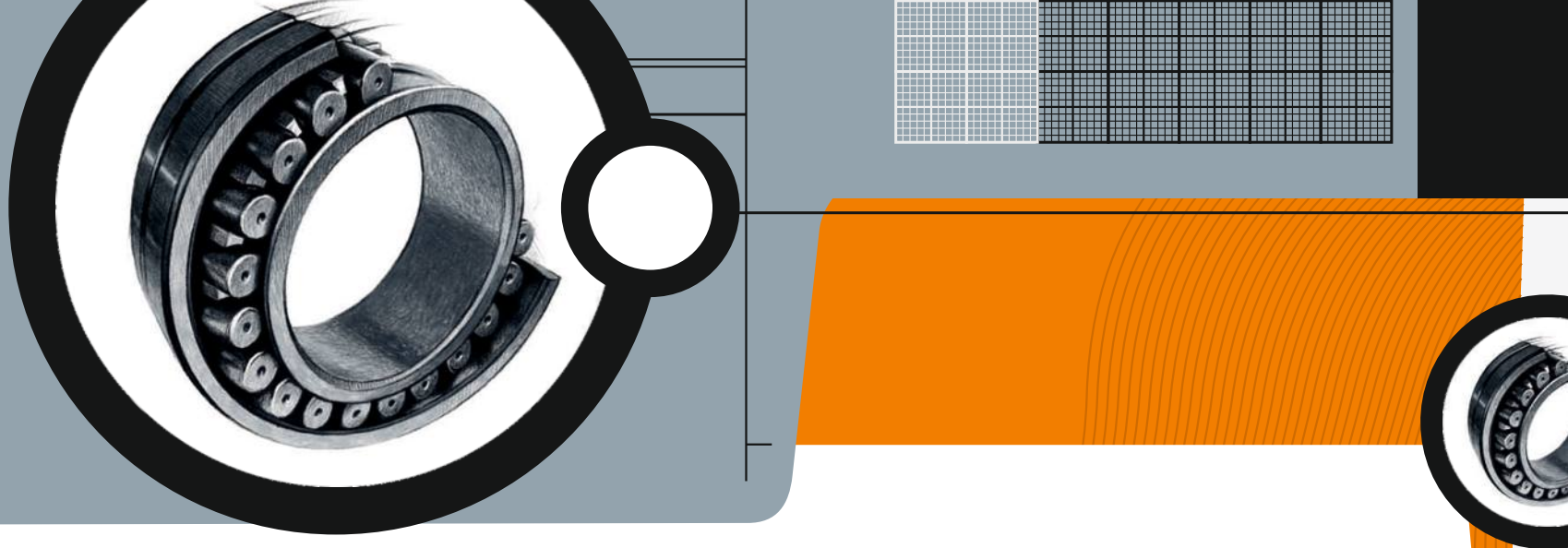
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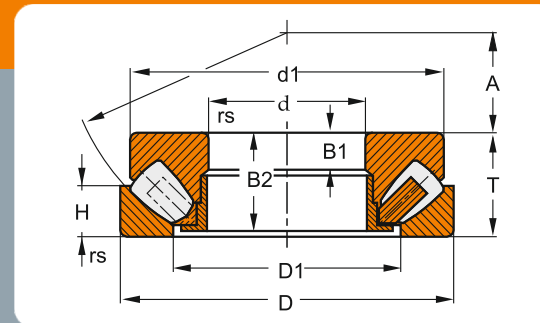


Spherical Roller Bearings for vibratory applications with adapter sleeve

Stainless steel spherical roller bearings

Basic dimensions			Load capacity		Maximum rotation speed		Designation			Mass	Dimensions			Design factors				Basic dimensions			Load capacity		Maximum rotation speed		Designation			Mass	Dimensions			Design factors				
d	D	B	dyn. C	stat. C ₀	(lubrication) non-fluid liquid rpm		GOST -	MPZ	Sleeve	kg	b ₁	L	r _{min}	e -	Y ₁	Y ₂	Y ₀	d	D	B	dyn. C	stat. C ₀	(lubrication) non-fluid liquid rpm		GOST -	MPZ	kg	r _{min}	e	Y ₁	Y ₂ -	Y ₀				
100	240	80	940	1110	1900	2700	13620AMHK5	22322 ACKMAW33	H2322	22,0	14	105	3,0	0,37	1,83	2,72	1,79	40	90	33,0	121	128	4300	5300	3608kO	V22308S4	1,03	2,5	0,42	1,61	2,40	1,58				
140	340	114	1600	1960	1500	1900	13628AMHK5	22332 ACKMAW33	H2332	60,90	16	147	4,0	0,38	1,80	2,69	1,76	80	140	33	191	293	3200	4000	3516kOT	V22216S5	2,23	2,0	0,25	2,68	4,00	2,62				
150	360	120	1760	2160	1400	1800	13630AMHK5	22334 ACKMAW33	H2334	70,10	16	154	4,0	0,37	1,81	2,69	1,77	90	160	40	246	329	3600	5200	3518kOT	V22218S5	3,52	2,0	0,27	2,53	3,77	2,48				
160	380	126	2000	2450	1300	1800	13632AMHK5	22336 ACKMAW33	H2336	81,77	22	161	4,0	0,37	1,83	2,71	1,78	90	190	64	535	695	2600	3600	3618AMkOT	V22318ACS5	8,87	3,0	0,37	1,83	2,72	1,78				
170	400	132	2120	2660	1200	1600	13634HK5	22338 KMAW33	H2338	95,80	22	169	5,0	0,36	1,85	2,75	1,81	110	240	80	751	943	1900	2700	3622AMkOT	V22322ACS5	19,07	3,0	0,37	1,83	2,72	1,79				
180	420	138	2320	2900	1200	1500	13636AMHK5	22340 ACKMAW33	H2340	105,62	22	176	5,0	0,36	1,87	2,78	1,83	130	230	64	570	809	2500	3500	3526kOT	V22226S5	11,16	3,0	0,29	2,31	3,44	2,26				
240	540	165	3550	4590	850	1000	13648AMHK5	22352 ACKMAW33	H2352X	222,90	22	211	6,0	0,33	2,01	3,00	1,97	180	380	126	2000	2450	1300	1600	3636AMkOT	V22336ACS5	70,92	4,0	0,37	1,83	2,71	1,78				
																		200	420	138	2320	2900	1200	1500	3640AMkOT	V22340ACS5	93,40	5,0	0,36	1,87	2,78	1,83				
																		260	540	165	3550	4590	850	1000	3652AMkOT	V22352ACS5	189,70	6,0	0,33	2,01	3,00	1,97				





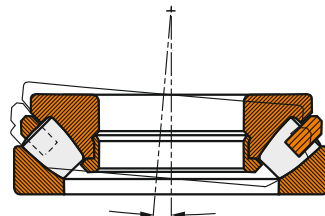
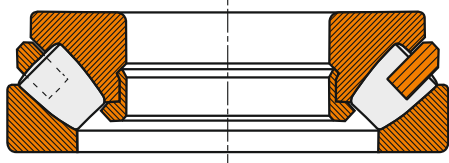
Spherical Roller Thrust Bearings

Spherical Roller Angular Contact Trust Bearings

Spherical roller thrust bearings can accommodate heavy axial loads; they are suitable for relatively high speeds. The raceways which are inclined towards the bearing axis allow the bearings to accommodate radial loads as well. Spherical roller thrust bearings have asymmetrical barrel rollers and compensate for misalignment.

Alignment

The spherical housing washer raceway makes spherical roller thrust bearings self-aligning and thus allows them to compensate for misalignments and shaft deflections.



Cages

Bearings with a machined brass cage.

Minimum axial load

At high speeds bearing kinematics is impaired by the inertia forces of the rollers if the axial load does not reach a certain minimum. If the external load and the weight of the supported machine elements are lower than the minimum load, the bearings have to be preloaded, e.g. by means of springs.

Abutment dimensions

The bearing washers should closely fit the shaft and housing shoulder; they must not be allowed to foul the shoulder fillet radius.

Basic dimensions			Load capacity		Maximum rotation speed (lubrication) non-fluid liquid rpm	Designation		Mass kg	Dimensions						
d mm	D	T	dyn. C	stat. C ₀ kN		GOST	MPZ		d _i	D _i	B ₁	B ₂	h	r _{amin}	A
60	130	42	312	814	2300	9039412K2	29412	2,47	118	80	22,0	-	20	1,8	60,272
70	150	48	411	1035	2200	9039414	29414	4,31	142	102	17,0	45,5	23	2,3	44
75	160	51	507	1290	2000	9039415	29415	5,24	152	109	18,0	48,0	24	2,0	47
80	170	54	511	1400	2000	9039416	29416	6,24	162	117	19,0	51,0	26	2,5	50
85	180	58	588	1650	1800	9039417	29417	7,45	170	125	21,0	55,0	28	2,5	54
100	210	67	784	2300	1600	9039420	29420	10,90	200	146	24,0	64,0	32	3,0	62
130	270	85	1390	4060	1200	9039426M	29426M	22,30	246	183	35,5	61,0	41	5,0	81
170	340	103	1784	6000	950	9039434	29434	45,50	324	243	37,0	99,0	50	4,7	104
180	360	109	2038	6700	850	9039436	29436	53,90	342	255	39,0	105,0	52	4,7	110



NOTES