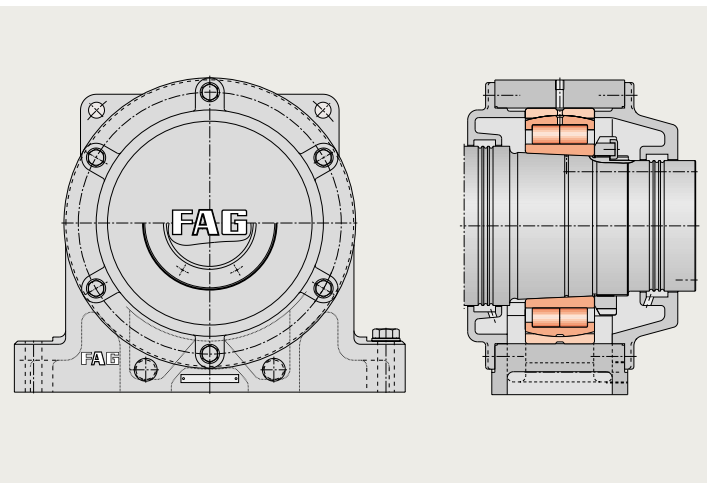
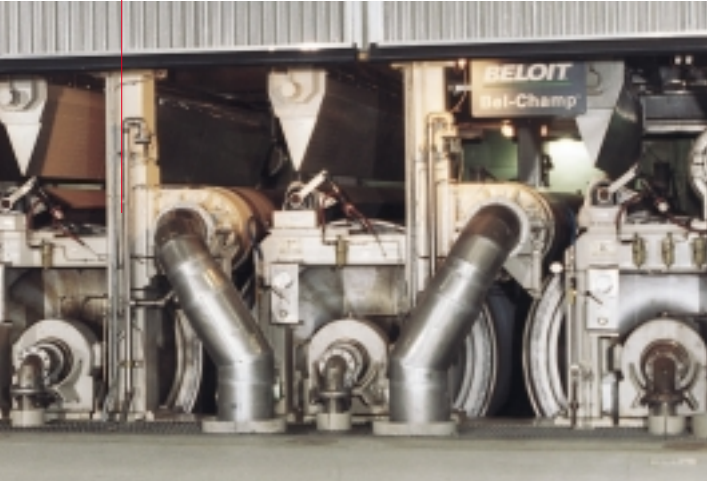


FAG SELF-ALIGNING CYLINDRICAL ROLLER BEARINGS: THE IDEAL FLOATING BEARING ARRANGEMENT



for Dryer Rolls/M.G. Cylinders and Guide Rolls of Paper Machines

Preface

The OEM and Handel company of the FAG Kugelfischer Group supplies rolling bearings, necessary accessories, and services to original equipment customers in machinery and plant construction as well as to customers in the distribution and spare parts business. Comprehensive rolling bearing know-how, competent consultation on applications, and extensive customer service for more operational reliability make FAG an indispensable partner to its customers. Research and development of our products are

based on the requirements of operation in the field. An ideal outline of requirements is best achieved through cooperation of our application engineers with the manufacturers and operators of equipment for the paper industry. It forms the basis for successful solutions both technically and economically speaking.

Production locations are found in Germany, Italy, Portugal, India, South Korea, and the USA. Sales are conducted by subsidiaries and distribution partners in almost every country in the world.



**FAG Self-Aligning Cylindrical Roller Bearings
for Dryer Rolls/M.G. Cylinders
and Guide Rolls of Paper Machines**

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Extreme operating conditions in the dryer section · The ideal floating bearing arrangement

Extreme operating conditions in the dryer section require rolling bearings with special characteristics

The rolling bearings in the dryer section of a paper machine, especially the dryer roll bearings, have to withstand extreme operating conditions. As the dryer rolls are heated by steam, the rolling bearings are subject to great thermal stress. A suitable heat treatment and heat stabilization of the rolling bearings and a good lubrication are necessary preconditions for trouble-free operation.

- Optimized lubrication by supplying oil directly into the bearing and drainage at both ends.
- Vibration reducing design of the bearing system with cylindrical roller bearings and housings which are bolted to the machine frame.
- Other bearing types of dimensional series 30, 22 and 31 can be replaced with self-aligning cylindrical roller bearings without major housing modifications.
- Stabilized up to 200 °C.
- Accommodation of radial loads from all directions.
- Symmetrical loading of the roller rows even with major axial displacements.
- The plummer block housing, which is bolted to the machine frame, can accommodate additional tilting moments, e.g. from the rope sheave and/or the steam joint.
- The bolts secure the housing in earthquake-prone areas against lifting off.

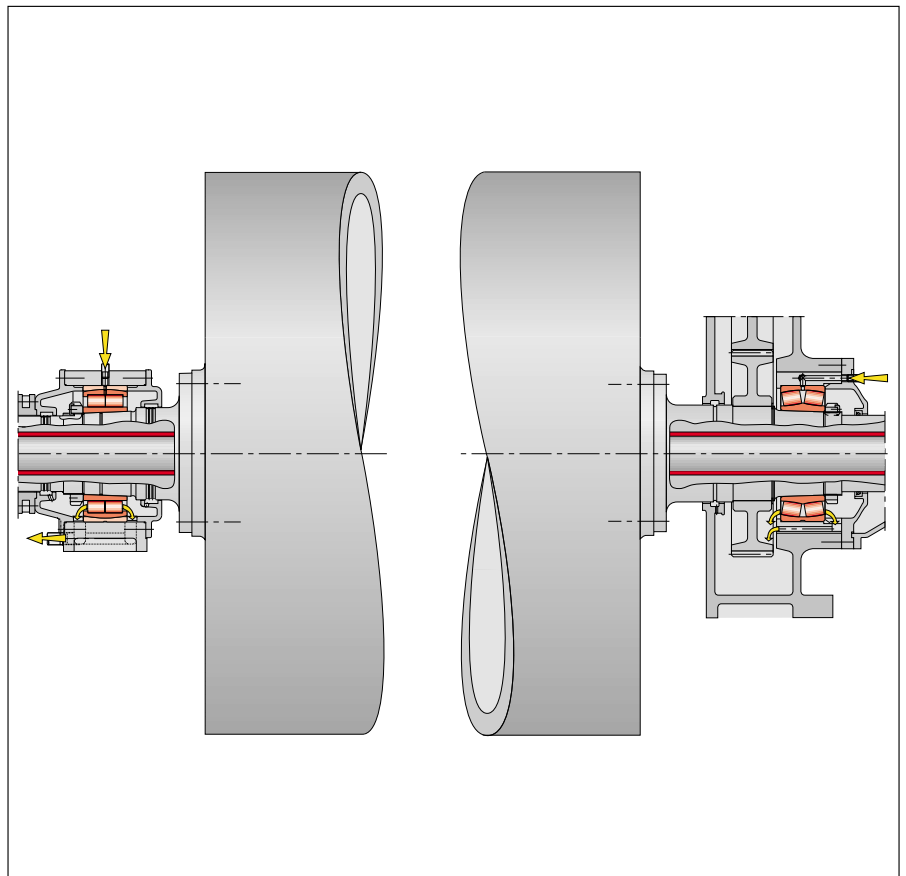
The ideal floating bearing arrangement for dryer rolls in paper making machines

Because of the considerable linear expansion of the dryer rolls (several millimeters, i.e. about 1 to 2 mm per meter of bearing distance) that result when they are heated, the floating bearing at the operator end of a paper machine is particularly important. In addition, misalignments have to be compensated for.

For many years, self-aligning cylindrical roller bearings have proved to be the ideal choice for floating bearings in normal plummer block housings (fig. 1). They offer considerable advantages over the usual floating bearing arrangements with spherical roller bearings which are mounted either into a housing within which they can be displaced or in an axially displaceable rocker block housing or with other bearing types:

- Free compensation of even major length variations of dryer rolls in the bearing between inner ring raceway and rollers. A rocker block housing is not needed.
- A spherical outer ring and a matching self-aligning plain bearing ring allow the bearing to compensate for misalignments.

1: Bearing arrangement of a dryer roll with a self-aligning cylindrical roller bearing at the operator end and a spherical roller bearing at the drive end



Conventional floating bearing arrangements · Proved locating bearing solution

Conventional floating bearing arrangements:

- Up to a useful width of approx. 5 m, a spherical roller bearing is usually used as it can be axially displaced within the housing during linear expansions of the dryer roll.
- In paper machines with useful widths of more than 5 m, a so-called rocker block housing is used in many cases. In this kind of bearing arrangement the spherical roller bearing is mounted into a plummer block housing as a locating bearing which can be freely axially displaced on three rocker blocks during linear expansions of the dryer roll.

Rolling bearings at the drive end (locating bearing end)

Spherical roller bearings are used at the drive end for supporting and guiding the dryer rolls. In older and smaller paper machines bearings of series 230 and designs EASK.M.C4 (.W209B) and K.MB.C4 (.W209B) are installed; in newer and bigger machines bearings of series 231 (same designs) are used.

2: Conventional floating bearing arrangements for dryer rolls

bearing systems	smooth axial expansion	self-aligning capability	oil supply and drainage	vibration damping	accommodation or radial loads (± 360°)	load carrying capacity depending on filling &	accommodation of tilting moments	field proven for several years	applicable for web widths > 5 m	no influence on steam joint design	nominal load rating	mounting expenditure	bearing price	system price (housing + bearing)
plummer block housing / spherical roller bearing 	--	++	++	++	++	++	++	++	--	-	+	++	++	++
rocker block housing 	++	++	++	--	--	++	--	++	++	++	+	--	++	-
plummer block housing / SACR bearing 	++	++	++	++	++	++	++	++	++	-	-	++	--	+

Design

The NU cylindrical roller bearings have two roller rows and two lips on the outer ring (fig. 3). The spherical outer ring is situated in a plain bearing ring and can compensate for misalignments of the bearing seats. In this way the self-aligning movement does not take place in the rolling contact area. The lipless inner ring allows free axial displacement within the bearing. Even after major axial displacements of the inner ring both roller rows are evenly loaded due to the symmetrical transmission of the radial load. The cylindrical roller bearing retains its full load carrying capacity in every position.

The outside dimensions of the complete cylindrical roller bearing plus the self-aligning plain bearing ring are identical with the main dimensions of the dimensional series 30, 22 and 31 (dimensional plan DIN 616). These bearings are mounted into normal plummer block housings in paper making machines (e.g. FAG series PMD) and serve as floating bearings at the operator end of the dryer roll.

The bearings for guide rolls, which are basically of the same design, have the main dimensions of the dimensional series 22, 23 and 32 and are mounted into housings of series PMF.

Self-aligning cylindrical roller bearings have a bore with a taper of 1:12 so that they can be directly fastened on the tapered journal.

Due to the high operating temperatures and the resulting greater temperature difference between the inner and the outer ring, FAG produces the bearings for dryer rolls and M.G. cylinders with an increased radial clearance of C5, which approx. equals the C4 radial clearance of spherical roller bearings. The bearings for guide rolls have an increased radial clearance of C3.

3: Self-aligning cylindrical roller bearings are ideal floating bearings for dryer rolls, M.G. cylinders and guide rolls. Lubricating grooves and lubricating holes in the outer ring and in the plain bearing ring allow direct lubricant supply to the rolling contact areas.



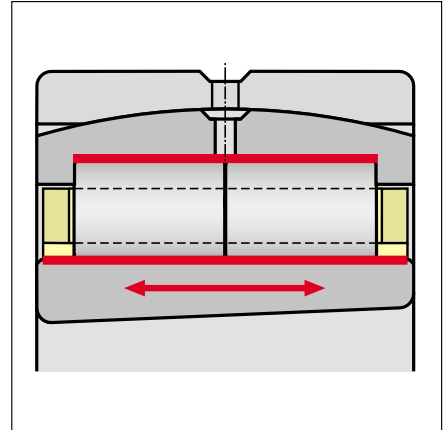
Self-aligning cylindrical roller bearings

Smooth axial expansion · Self-aligning capability · Exchangeable with standard bearings · Dimensionally stable

Smooth axial expansion

The linear expansion of a heated dryer roll is smoothly compensated for within the cylindrical roller bearing, between the raceway of the hardened and lubricated inner ring and the hardened rollers, even during the heat-up stage, with bearing distances of 10.5 m and a cylinder temperature of 180 °C (= approx. 20 mm).

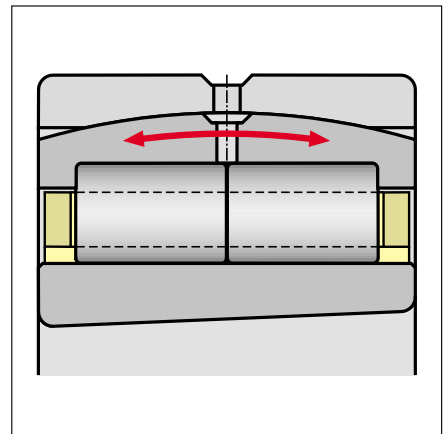
The cylindrical running areas ensure a constant bearing clearance and low-friction running in all axial positions of the inner ring. If steam is supplied (or condensate is removed) at the operator end it must be possible for the sealing system to be axially displaced within the steam joint.



Self-aligning capability

Misalignments that can result during installation, e. g. uneven machine frames, and changes of the machine frame inclination during operation, can be compensated for by the self-aligning plain bearing ring (fig. 3) without negative effects on the bearing's service life. Even with tilting angles of more than 2° the coefficient of friction is almost constant.

For this purpose the self-aligning plain bearing ring is phosphatized, and its spherical sliding surface (hollow sphere) is molybdenum-disulphide-coated. The aligning movement is also assisted during operation by the constantly supplied lubricant.



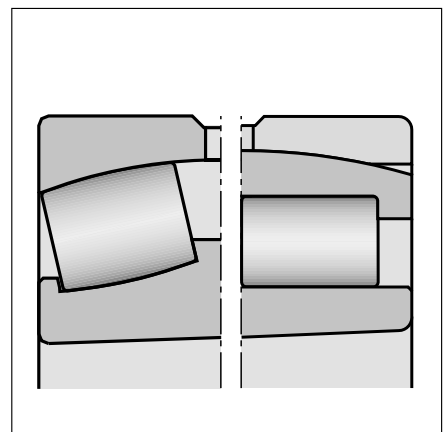
Exchangeable with standard bearings

All standard bearings of the dimensional series 22, 23, 30, 31 and 32 can be replaced with self-aligning cylindrical roller bearings without major housing modifications. Only the lubricant feed may have to be moved to the centre of the housing cover.

Therefore we recommend this floating bearing arrangement for modernizations and speed increases of paper making machines as well as for new machines.

Stabilized up to 200 °C

The rolling bearing rings are isotherm heat-treated (bainitic hardening) and dimensionally stable at operating temperatures of up to 200 °C. This heat treatment produces compressive stress in the surface zone. This has a positive effect on the bearings in the dryer section which partly run near the lower limit of the mixed friction range because of the unfavourable lubricating conditions. Inner rings of case hardening steel are suffixed W209B.



Self-aligning cylindrical roller bearings

Optimized oil supply and drainage · Low operating temperature · Vibration reducing design

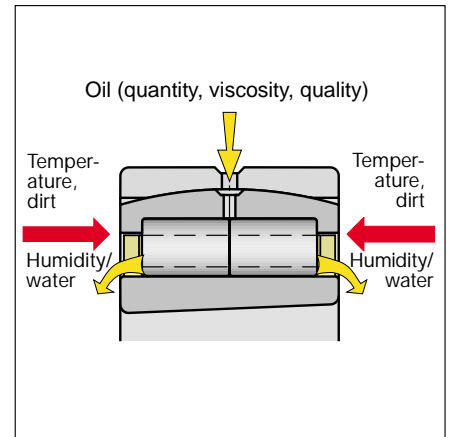
Optimized oil supply and drainage

In the self-aligning plain bearing ring, as in the outer ring of the bearing, there are a lubricating groove and lubricating holes for the best possible lubricant supply directly into the bearing and to the rolling contact areas. Due to the centrally positioned oil feed, drainage is possible on both sides of the bearing. The risk of oil retention and leakage is considerably minimized.

If a single-row cylindrical roller bearing of design N or NU is replaced with a

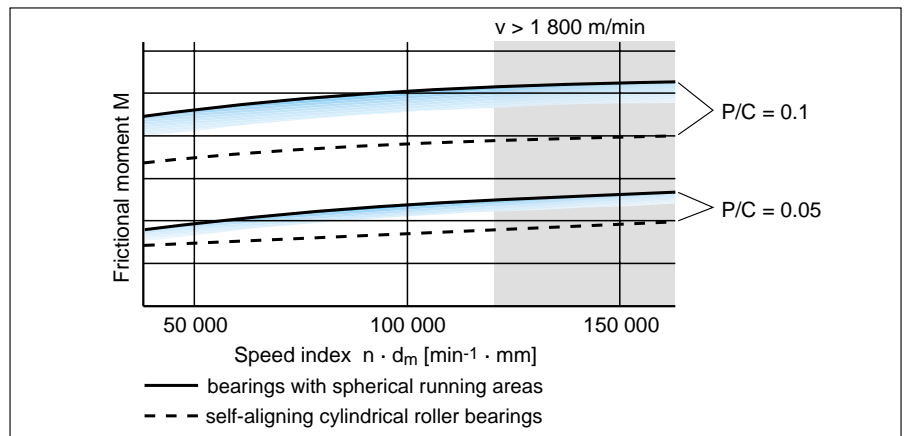
self-aligning cylindrical roller bearing, the lubricant supply is moved to the centre of the housing cover.

Because of the high operating temperatures, the bearings have to be connected to a central oil circulation system, and a high-quality mineral or synthetic oil in accordance with ISO VG 220 or 320 (for M. G. cylinders also ISO VG 460) has to be used. The plummer block bearing housings PMD for dryer rolls offered by FAG are suitable for this (see TI No. WL 13-1). FAG also supply PMF plummer block housings for guide rolls (see TI No. WL 13-2).



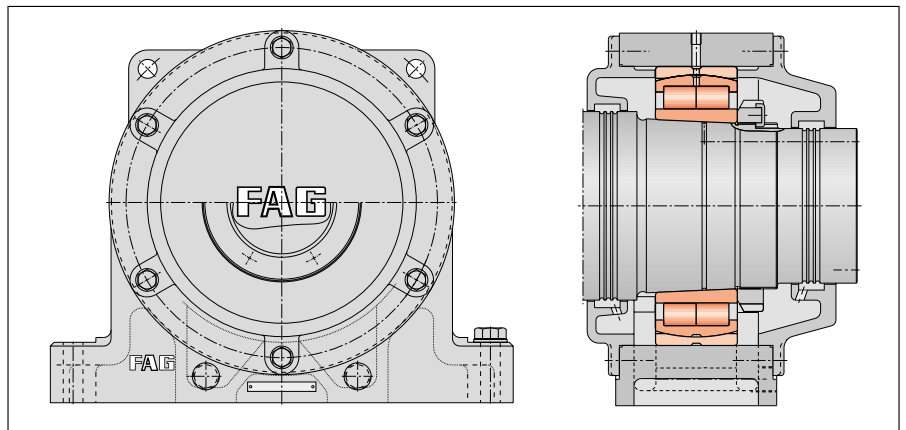
Low operating temperature

Under identical operating conditions, the operating temperature of self-aligning cylindrical roller bearings is lower than that of bearings with spherical raceways as the frictional moment is markedly lower.



Vibration reducing design

Self-aligning cylindrical roller bearings, in combination with a plummer block housing which is bolted to the machine frame, reduce vibration in the machine and thus make it possible to reach higher speeds.



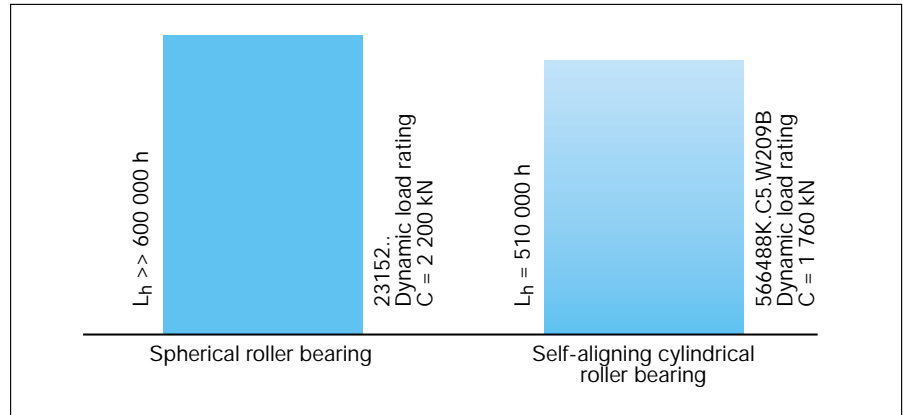
Self-aligning cylindrical roller bearings

Sufficient load rating · Simple mounting/dismounting · Conversion from rocker block housings

Sufficient load rating

The load rating is sufficient as the bearing size is rarely determined by load but in most cases by the journal diameter.

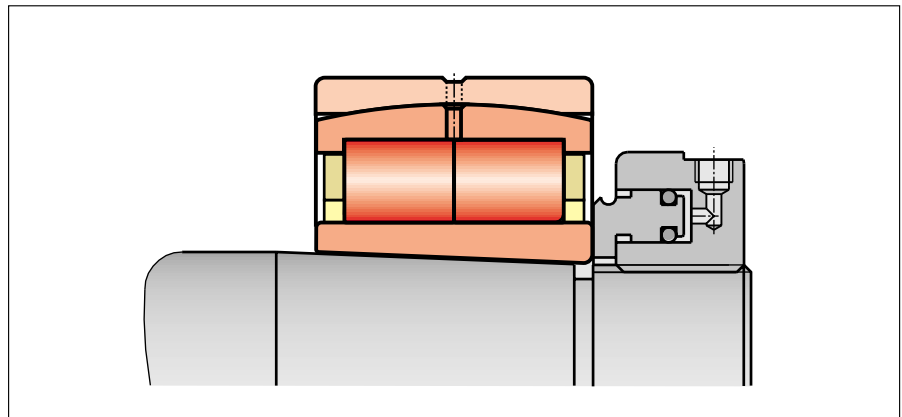
The self-aligning cylindrical roller bearings, in combination with the plummer block housing bolted to the machine frame can, in contrast to the rocker block housings, accommodate loads from all directions.



Simple mounting/dismounting

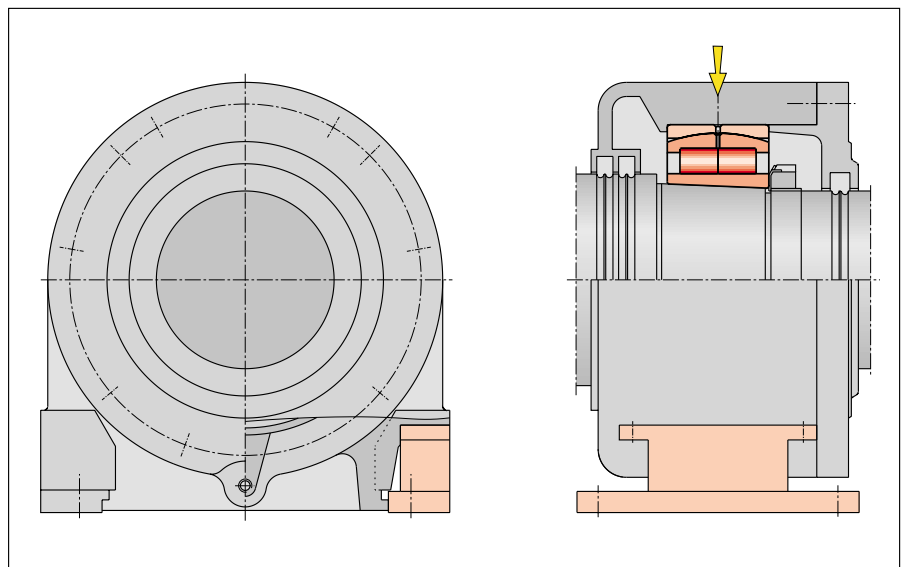
Mounting and dismounting are as simple as with spherical roller bearings. In most cases only a hydraulic nut is required, sometimes ($d > 200\text{ mm}$) also the hydraulic method. No axial offset between bearing and housing centres if mounting at room temperature.

Mounting instructions see page 9.



Conversion from rocker block housings

Rocker block housings can be replaced simply and economically by plummer block housings that are bolted to the machine frame. Oil supply and oil removal do not have to be modified. Rocker block supports, rockers and sockets are replaced by individually fitted adapters.



Bearing tables

The self-aligning cylindrical roller bearings for dryer rolls listed in the bearing tables have a tapered bore and an increased radial clearance of C5. Self-aligning cylindrical roller bearings with inner rings of case hardening steel have to be suffixed W209B. In the tables the bearings of the dimensional series 30, 22 and 31 are compared with the self-aligning cylindrical roller bearings they can be exchanged with.

The self-aligning cylindrical roller bearings for guide rolls also have a tapered bore, but the increased radial clearance of C3. The tables also list the comparable sizes of the dimensional series 22, 23 and 32.

Availability

Self-aligning cylindrical roller bearings for dryer rolls/M.G. cylinders and plunger block housings of series PMD can be supplied on request (for information on PMD housings see TI No. WL 13-1 E-D).

Bearings for guide rolls and housings of series PMF can also be supplied on request by FAG.

In the dimension tables (pages 10 to 15) the designs printed in bold-face are most readily available.

Reference list

The list contains a selection of already supplied self-aligning cylindrical roller bearings which have been successfully in operation in dryer rolls, M. G. cylinders and guide rolls all over the world for more than 15 years (page 16).

Mounting instructions for self-aligning cylindrical roller bearings

After checking the dimensional accuracy of bearing seats and adjacent parts, after cleaning the bearing seats and supply bores, the self-aligning cylindrical roller bearings are mounted in the same way as spherical roller bearings or cylindrical roller bearings with a tapered bore.

Mounting sequence:

The mounting sequence depends on the design of bearing and housing (split or non-split). The bearing is mounted onto the horizontally positioned roll.

- Take bearing from its packing and wipe the anti-corrosion oil out of the tapered bore.
- Measure the bearing clearance using a feeler gauge.
- Mount parts which must be situated behind the bearing.
- Place the bearing inner ring onto the taper and drive it up until both tapered areas are in positive contact with each other.

- Place hydraulic nut on the thread in starting position.
- Measure the starting position for the drive-up distance and note it down (distance between hydraulic nut face and rear bearing-face).
- Drive bearing onto the taper (drive-up distance in accordance with FAG Publ. No. WL 80 100 or WL 13 103).
- After driving the bearing up the specified distance, reduce oil pressure and remove hydraulic nut after 1 to 2 minutes.
- Mount bearing without inner ring into the housing and position housing on the journal.
- Check radial clearance reduction using a feeler gauge.
- Screw on nut and lock it.
- Mount outer housing cover with seal using the required tightening torques.
- Connect oil supply and drainage lines with the housing.

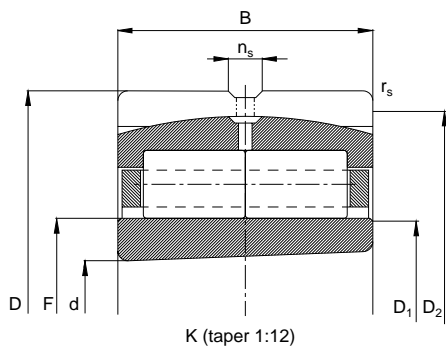
Self-aligning cylindrical roller bearings with a tapered bore for dryer rolls and M.G. cylinders

Dimensional series 30, 22

Dimensions

d	D	B	r _{smin}	n _s	F	s ¹⁾
mm						
160	240	60	2.1	6.5	179	6
170	260	67	2.1	9.5	190	6.3
180	280	74	2.1	9.5	202	7
190	290	75	2.1	9.5	213	7.3
200	310	82	2.1	12.2	225	7.3
220	340	90	3	12.2	246	8
240	360	92	3	12.2	269	8.5
260	400	104	4	15	292	9.3
280	420	106	4	15	313	9.8
300	460	118	4	15	337	9.8
320	480	121	4	15	357	10.5
340	520	133	5	15	381	11.3
360	540	134	5	17.7	403	11.5
380	560	135	5	17.7	423	11.8
400	600	148	5	17.7	449	12
420	620	150	5	17.7	469	12.5
440	650	157	6	23.5	491	13
460	680	163	6	23.5	514	13.3
480	700	165	6	23.5	536	13.8
500	720	167	6	23.5	558	14.3
530	780	185	6	23.5	592	15.5
5600	820	195	6	23.5	618	16
600	870	200	6	23.5	673	16
630	920	212	7.5	23.5	699	17.8
670	980	230	7.5	23.5	738	20
710	1030	236	7.5	23.5	780	18
170	310	86	4	12.2	198	9.5
180	320	86	4	12.2	215	8
190	340	92	4	12.2	223	8.5
220	400	108	4	15	258	10.5

¹⁾ Axial displacement from the centre position.



Load rating		Limiting speed	Code	exchangeable with	Abutment dimensions		Mass ≈ kg
dyn. C	stat. C ₀				D _{1max}	D ₂	
kN		min ⁻¹	Bearing FAG		mm		
425	830	3200	565664K.C5	..3032K...	178	229	10
530	1020	3000	565530K.C5	..3034K...	188	249	14
640	1220	2800	565665K.C5	..3036K...	200	269	18.5
640	1290	2600	565666K.C5	..3038K...	211	279	19.9
765	1530	2400	565667K.C5	..3040K...	223	299	25
915	1900	2200	565531K.C5	..3044K...	244	327	31
950	2080	1900	565668K.C5	..3048K...	267	347	36.5
1180	2500	1800	565499K.C5	..3052K...	290	385	52
1290	2850	1700	565669K.C5	..3056K...	311	405	56.5
1560	3400	1600	565670K.C5	..3060K...	334	445	76.4
1630	3650	1500	565671K.C5	..3064K...	354	465	84
2000	4250	1500	565672K.C5	..3068K...	378	502	106
2040	4650	1400	565673K.C5	..3072K...	400	522	119
2120	5000	1300	565674K.C5	..3076K...	420	542	122
2550	6000	1200	565675K.C5	..3080K...	446	582	172
2500	6100	1100	565676K.C5	..3084K...	466	602	172
2750	6800	1100	565677K.C5	..3088K...	488	627	198
3050	7500	1000	565678K.C5	..3092K...	511	657	225
3000	7800	950	565679K.C5	..3096K...	532	677	237
3050	8000	950	565680K.C5	..30/500K...	554	697	250
3900	9800	850	565681K.C5	..30/530K...	588	757	320
4400	10400	800	565682K.C5	..30/560K...	614	797	380
3750	10400	750	572367K.C5	..30/600K...	670	847	421
5100	13200	700	565684K.C5	..30/630K...	695	892	520
6200	15300	670	565685K.C5	..30/670K...	734	952	624
6700	16600	630	565686K.C5	..30/710K...	776	1002	718
865	1340	2800	804415K.C5	..2234K...	197	286	30
900	1500	2600	567601K.C5	..2236K...	209	293	32
1020	1730	2400	566170K.C5	..2238K...	222	311	39
1430	2320	1900	567498K.C5	..2244K...	257	370	64

The designs printed in bold-face are most readily available.
Order example: FAG 565499K.C5.W209B

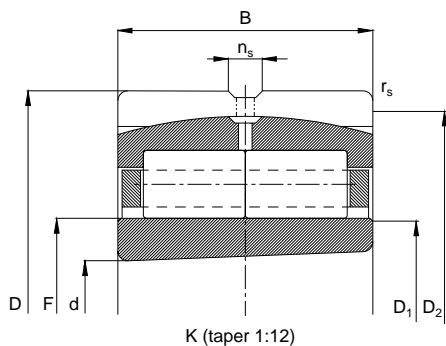
Self-aligning cylindrical roller bearings with a tapered bore for dryer rolls and M.G. cylinders

Dimensional series 31

Dimensions

d	D	B	r _{smin}	n _s	F	s ¹⁾
mm						
170	280	88	2.1	9.5	197	8.2
180	300	96	3	9.5	211	10.3
190	320	104	3	9.5	222	11.3
200	340	112	3	12.2	233	10.5
220	370	120	4	12.2	256	10
240	400	128	4	12.2	278	12.5
260	440	144	4	12.2	301	17.7
280	460	146	5	12.2	324	16.7
300	500	160	5	15	348	19
320	540	176	5	15	369	17
340	580	190	5	17.7	395	18.5
360	600	192	5	17.7	414	20.5
380	620	194	5	17.7	440	21.5
400	650	200	6	23.5	454	15
420	700	224	6	23.5	486	19.5
440	720	226	6	23.5	505	24
460	760	240	7.5	23.5	528	24
480	790	248	7.5	23.5	552	28.5
500	830	264	7.5	23.5	571	26.5
530	870	272	7.5	23.5	609	24
560	920	280	7.5	23.5	630	29
600	980	300	7.5	23.5	684	26
630	1030	315	7.5	23.5	720	36
670	1090	336	7.5	23.5	755	36.5
710	1150	345	9.5	23.5	795	41

¹⁾ Axial displacement from the centre position.



Load rating		Limiting speed	Code	exchangeable with	Abutment dimensions		Mass ≈ kg
dyn. C	stat. C ₀				D _{1max}	D ₂	
kN		min ⁻¹	FAG		mm		
815	1730	2800	567473K.C5	..3134K...	195	268	23
815	1660	2600	566486K.C5	..3136K...	209	286	29.2
980	1900	2400	580454K.C5	..3138K...	220	306	36
1140	2240	2200	566487K.C5	..3140K...	230	326	45.2
1320	2750	2000	565688K.C5	..3144K...	253	353	60.5
1460	3000	1800	566484K.C5	..3148K...	275	383	72
1760	3550	1700	566488K.C5	..3152K...	298	423	99.7
1800	3800	1600	566489K.C5	..3156K...	320	440	105
2160	4550	1600	566490K.C5	..3160K...	344	480	137
2650	5400	1500	566491K.C5	..3164K...	365	520	184
3000	6550	1400	566492K.C5	..3168K...	391	560	230
3250	6950	1300	800479K.C5	..3172K...	410	580	242
3450	7500	1200	800480K.C5	..3176K...	436	600	255
4240	8000	1100	565874K.C5	..3180K...	450	624	287
4250	9800	1000	572777K.C5	..3184K...	482	674	385
4650	10000	950	800481K.C5	..3188K...	500	694	402
5200	11400	950	800482K.C5	..3192K...	522	728	481
5500	11800	900	800483K.C5	..3196K...	546	758	535
6550	14000	850	800484K.C5	..31/500K...	565	798	635
6800	15300	800	574099K.C5	..31/530K...	603	838	710
7350	16300	750	800485K.C5	..31/560K...	624	888	818
8150	18600	700	573929K.C5	..31/600K...	678	948	988
9000	20000	670	800592K.C5	..31/630K...	714	998	1147
10200	22800	630	800593K.C5	..31/670K...	749	1058	1362
10600	24000	600	800594K.C5	..31/710K...	789	1110	1549

The designs printed in bold-face are most readily available.
Order example: FAG 566488K.C5.W209B

In design C5.W209B for dryer rolls the bearings 804415K, 567601K, 566170K and 567498K (dimensions and performance data see pages 14 and 15) are also most readily available.

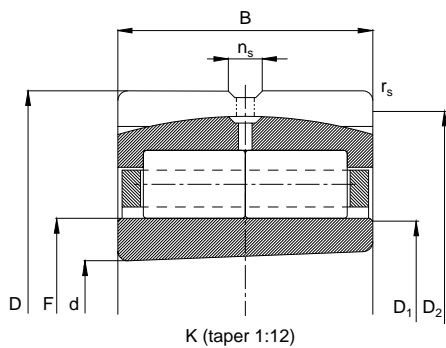
Self-aligning cylindrical roller bearings with a tapered bore for guide rolls

Dimensional series 22, 23, 32

Dimensions

d	D	B	r _{smin}	n _s	F	s ¹⁾
mm						
170	310	86	4	12.2	198	9.5
180	320	86	4	12.2	215	8
190	340	92	4	12.2	223	8.5
220	400	108	4	15	258	10.5
65	140	48	2.1	6.5	81	5.5
75	160	55	2.1	6.5	92	7
80	170	58	2.1	6.5	100.5	6
85	180	60	3	9.5	105	7
95	200	67	3	9.5	119	8.5
100	215	73	3	9.5	125	8.5
110	240	80	3	12.2	137	9
120	260	86	3	12.2	147	10
130	280	93	4	12.2	169	9.5
150	320	108	4	15	184	13
160	340	114	4	15	196	13
120	215	76	2.1	9.5	139.5	7
140	250	88	3	9.5	162.5	9
160	290	104	3	12.2	188	9
180	320	112	4	12.2	210	10.5
200	360	128	4	12.2	234	12.5
220	400	144	4	15	260	10.5
240	440	160	4	15	285	13

¹⁾ Axial displacement from the centre position.



Load rating		Limiting speed	Code	exchangeable with	Abutment dimensions		Mass ≈ kg
dyn. C	stat. C ₀				D _{1max}	D ₂	
kN		min ⁻¹	Bearing FAG		mm		
865	1340	2800	804415K.C3	..2234K...	197	286	30
900	1500	2600	567601K.C3	..2236K...	209	293	32
1020	1730	2400	566170K.C3	..2238K...	222	311	39
1430	2320	1900	567498K.C3	..2244K...	257	370	64
220	290	6000	566290K.C3	..2313K...	82	126	3.9
270	345	5300	803186K.C3	..2315K...	74	145	5.6
320	455	5000	804203K.C3	..2316K...	99.5	153	6.9
360	480	4500	803723K.C3	..2317K...	104	163	7.8
425	610	4000	566293K.C3	..2319K...	118	180	10.8
520	735	3800	803158K.C3	..2320K...	124	193	14.2
640	880	3600	567445K.C3	..2322K...	136	216	19
735	1020	3400	566296K.C3	..2324K...	146	231	24
830	1340	3200	804305K.C3	..2326K...	168	251	31
1100	1560	2800	804272K.C3	..2330K...	183	288	46
1220	1830	2600	548428K.C3	..2332K...	195	307	55
520	865	3600	804459K.C3	..3224K...	138.5	195	12.7
695	1200	3200	804460K.C3	..3228K...	161.5	226	19.8
915	1660	3000	804461K.C3	..3232K...	187	262	32
1120	2000	2600	803792K.C3	..3236K...	209	290	41
1370	2550	2200	804462K.C3	..3240K...	233	323	61
1830	3450	1900	804463K.C3	..3244K...	259	360	86
2120	4150	1800	804464K.C3	..3248K...	284	393	117

Reference list

Self-aligning cylindrical roller bearing (code if newly supplied) FAG	Equivalent bearing size	location	used in
544444K.C5 (566047K.C5)	..3940K...	Hot air rolls	Germany, Denmark
546147K.C5 (565531K.C5)	..3044K...	Dryer rolls	Germany
547536K.C5 (565665K.C5)	..3036K...	Dryer rolls	Germany
547538K.C5 (565667K.C5)	..3040K...	Dryer rolls	Germany
547539K.C5 (565531K.C5)	..3044K...	Dryer rolls	USA
547541K.C5 (565499K.C5) *	..3052K...	Dryer rolls	Germany, USA, Canada
547554K.C5 (565681K.C5)	..30/530K...	M. G. cylinders	Austria
547555K.C5 (565682K.C5)	..30/560K...	M. G. cylinders	Germany
547556K.C5 (572367K.C5)	..30/600K...	M. G. cylinders	Germany
565499K.C5	..3052K...	Dryer rolls	Germany, Canada, Columbia, USA
565530K.C5	..3034K...	Dryer rolls	Finland
565531K.C5 *	..3044K...	Dryer rolls	Ecuador, Germany, Canada, Croatia, Austria, Yugoslavia, USA, South Afrika, New Zealand, France, Belgium
565665K.C5 *	..3036K...	Dryer rolls	Germany, Indonesia, Australia
565666K.C5 *	..3038K...	Dryer rolls	Germany, Columbia, Finland, Mexico
565667K.C5 *	..3040K...	Dryer rolls	Germany, New Zealand, Slovenia, Spain, Croatia, Austria, Canada, South Africa
565668K.C5 *	..3048K...	Dryer rolls	Austria, Canada
565671K.C5	..3064K...	M. G. cylinders	Germany
565672K.C5	..3068K...	M. G. cylinders	Germany
565684K.C5	..30/630K...	M. G. cylinders	Slovenia
565754K.C5	..3956K...	Dryer rolls	Canada, Columbia, South Africa, Russia
566047K.C5	..3940K...	Dryer rolls	Great Britain, Slovenia, Canada
566487K.C5 *	..3140K...	Dryer rolls	Germany, Austria
566488K.C5 *	..3152K...	Dryer rolls	Canada
566491K.C5	..3164K...	M. G. cylinders	USA, Canada
568629.C5	..3144K (abnormal)	Dryer rolls	Canada, USA
572367K.C5	..30/600K...	M. G. cylinders	Germany, Belgium
574099K.C5	..31/530K...	M. G. cylinders	Taiwan, Italy
547340K.C3 (566290K.C3)	..2313K...	Guide rolls	Germany
547341K.C3 (803186K.C3)	..2315K...	Guide rolls	Germany
547342K.C3 (803723K.C3)	..2317K...	Guide rolls	Germany
547343K.C3 (566293K.C3)	..2319K...	Guide rolls	Germany, Austria
547345K.C3 (567445K.C3)	..2322K...	Guide rolls	Germany
547346K.C3 (566296K.C3)	..2324K...	Guide rolls	Germany
547347K.C3 (804305K.C3)	..2326K...	Guide rolls	Germany
566170K.C5 *	..2238K...	Guide rolls	Canada
803186K.C3	..2315K...	Guide rolls	Austria, Germany

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