

**FAG**



**NEW:**  
Higher performance data  
for large size bearings

## Spherical Roller Bearings E1

Higher cost-effectiveness  
and operational security with X-life

**SCHAEFFLER GROUP**  
INDUSTRIAL



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# FAG spherical roller bearings E1

Higher cost-effectiveness and operational security with X-life · Advantages

## Higher cost-effectiveness and operational security with X-life

FAG spherical roller bearings have proved highly effective wherever high loads are present and there is a need to compensate for shaft deflections and/or misalignment of bearing seats.

The previous designs of spherical roller bearings were already characterised by high performance capacity. This has now been surpassed to a significant degree by FAG spherical roller bearings E1 developed in accordance with the X-life concept. In E1 bearings, the radial and axial load carrying capacity as well as the security against ring breakage has been increased, while the bearing temperature has been reduced. This has given higher operational security and also higher cost-effectiveness.

FAG spherical roller bearings E1 are now available with an outside diameter of more than 320 mm. In this range, they are used to replace bearings with a rigid central rib on the inner ring.

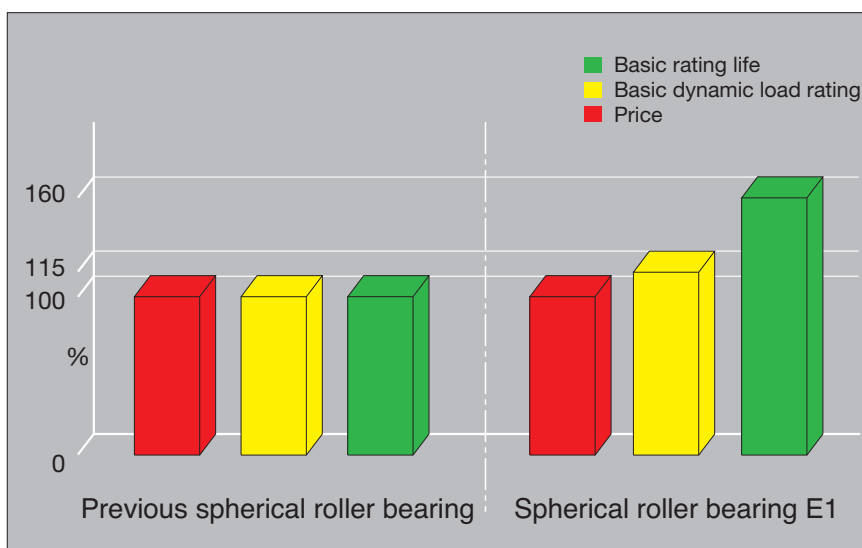
**As a result, the improved price/performance ratio of the E1 design is available for significantly wider range of applications.**

## Advantages of the E1 design

- **Higher performance bearing arrangements: longer rating life** due to basic dynamic load ratings that are considerably higher than before (see diagram),
- **higher static load safety factor** due to higher basic static load ratings.

This is made achievable by improved roller quality and optimised roller geometry. Under identical operating conditions, the lifetime of the bearing arrangements is significantly longer. Alternatively, the existing rating life can be achieved even with a considerable increase in load. In new designs, smaller bearings can achieve the performance of the previous larger bearings. Through downsizing (smaller design envelope, reduced friction, lower lubricant requirement, higher speeds), more economical bearing arrangements can be realised.

- **Lower operating costs:** Improved bearing kinematics and higher quality of the rollers and raceways give reduced friction and lower bearing temperatures. As a result, less strain is placed on the lubricant.



# FAG spherical roller bearings E1

The range

## The range

The range of FAG spherical roller bearings E1 comprises eight series. The smallest bore diameter is 20 mm, the largest outside diameter is 1 220 mm.

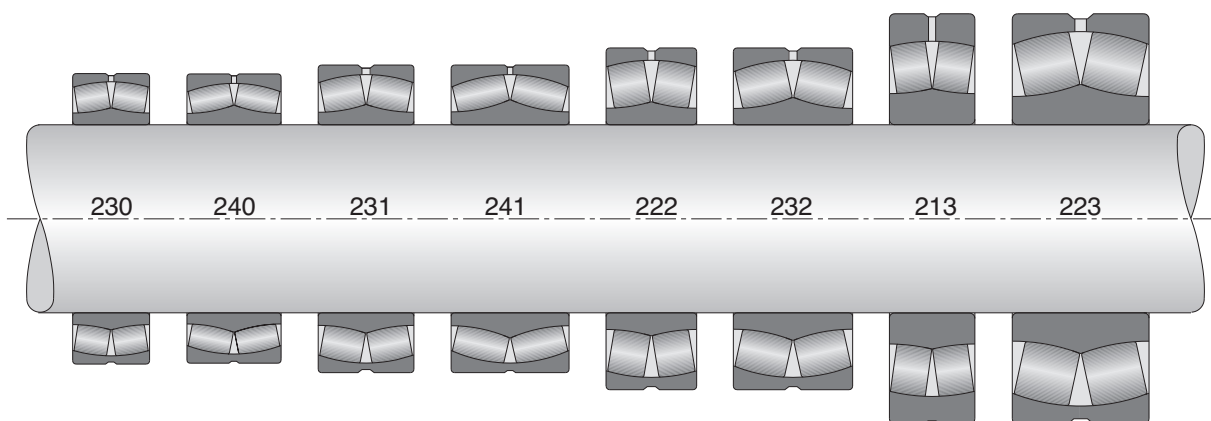
Narrow bearings with a low cross-section, for example of series 230, allow high speeds and require little mounting space.

In contrast, wide bearings with a high cross-section, for example of series 223, have a very high load carrying capacity.

We supply spherical roller bearings E1 both with a cylindrical and with a tapered bore. As a result, there are several options for locating the bearings on the shaft, see also the section Tapered bore, page 6.

For special operating conditions, we supply special designs of spherical roller bearings E1. For oscillating loads, special spherical roller bearings of series 223..-E1 with restricted dimensional tolerances and increased radial internal clearance are used. These bearings are indicated by the suffix T41A or T41D.

The range of FAG spherical roller bearings E1 (available bearing sizes: see dimension tables)



## Bore diameter

d  
mm

min.	110	120	100	110	25	90	20	40
max.	600	750	560	560	360	670	110	400

# Features of spherical roller bearings E1

Basic designs · Angular adjustment facility · Tolerances

## Features of spherical roller bearings E1

FAG spherical roller bearings E1 are bearings for the heaviest loads. They contain two rows of symmetrical barrel rollers which orient themselves freely in the concave outer ring raceway. As a result, shaft flexing and misalignment of the bearing seats are freely compensated. Spherical roller bearings E1 have a very large number of rollers with a large diameter and long length. Due to the narrow osculation between the rollers and raceways, uniform stress distribution and high load carrying capacity is achieved.

Spherical roller bearings E1 conform to DIN635-2 and are interchangeable with the previous standard designs from FAG.

## Basic designs

Up to an outside diameter of 1 220 mm, most spherical roller bearings are of the increased capacity E1 design. In contrast to other spherical roller bearings, these have no rigid central rib on the inner ring and therefore contain longer barrel rollers. As a result, bearings of the E1 design have significantly higher basic load ratings.

FAG spherical roller bearings are produced with a cylindrical or tapered bore. Spherical roller bearings with a tapered bore are located predominantly by means of adapter sleeves or withdrawal sleeves on the shaft, see page 6.

## Angular adjustment facility

Spherical roller bearings compensate for angular misalignments. The permissible adjustment angle is given for loads  $P < 0,1 \cdot C_r$ , see table.

These adjustment angles are permissible if:

- the angular deviation is constant (static angular misalignment)
- the rotating component is the inner ring.

If the rotating component is the outer ring or the inner ring undergoes tumbling motion, the angular adjustment facility is smaller. If such applications are present, please contact us.

## Tolerances

FAG spherical roller bearings of the basic design are produced with the normal tolerances for radial bearings (no suffix for tolerances).

FAG special spherical roller bearings according to the specification T41A or T41D (design for oscillating load) with a cylindrical bore have restricted tolerances for the bore and outside diameter, see following table. In bearings with a tapered bore, the reduced tolerance range applies to the outside diameter only.

Adjustment angle of spherical roller bearings E1	
Series	Adjustment angle for $P < 0,1 \cdot C_r$ °
213..-E1, 222..-E1(E1A), 230..-E1(E1A), 240..-E1(E1A), 241...-E1(E1A)	1,5
223..-E1(E1A), 231...-E1(E1A), 232..-E1(E1A)	2

Restricted tolerances to FAG specification T41A(D)					
Inner ring Nominal bearing bore diameter			Outer ring Nominal outside diameter		
		Variation $\Delta_{dmp}$			Variation $\Delta_{Dmp}$
Dimensions		Tolerance values in $\mu\text{m}$	Dimensions		Tolerance values in $\mu\text{m}$
in mm	incl.		in mm	incl.	
30	50	0 -7	80	150	-5 -13
50	80	0 -9	150	180	-5 -18
80	120	0 -12	180	315	-10 -23
120	180	0 -15	315	400	-13 -28
180	250	0 -18	400	500	-13 -30
250	315	0 -21	500	630	-15 -35

# Features of spherical roller bearings E1

## Internal clearance

### Internal clearance

In the basic design, spherical roller bearings are produced to the clearance group CN (“normal”) (without a suffix for the internal clearance).

In order to take account of the different operating and mounting conditions, we can also supply bearings with a larger radial internal clearance by arrangement.

The suffixes are C3 for a radial internal clearance larger than CN and C4 for a radial internal clearance larger than C3.

The values for the radial internal clearance of spherical roller bearings with cylindrical and tapered bores are given in Catalogue HR 1, Rolling Bearings.

Special spherical roller bearings for oscillating loads according to the specification T41A or T41D

(see also publication WL 21 100) have the increased radial internal clearance C4.

The table gives information on the reduction in radial internal clearance when mounting spherical roller bearings with a tapered bore, see also page 6. The stated values ensure a firm seat on the shaft.

Reduction in radial internal clearance in mounting of spherical roller bearings with tapered bore (solid shaft)

Nominal bearing bore diameter		Reduction in radial internal clearance		Displacement on taper 1:12				Displacement on taper 1:30				Control value for minimum radial internal clearance after mounting		
d over mm	incl.	min mm	max	Shaft min mm	max	Sleeve min	max	Shaft min mm	max	Sleeve min	max	CN min mm	C3 min	C4 min
24	30	0,015	0,02	0,3	0,35	0,3	0,4	-	-	-	-	0,015	0,02	0,035
30	40	0,02	0,025	0,35	0,4	0,35	0,45	-	-	-	-	0,015	0,025	0,04
40	50	0,025	0,03	0,4	0,45	0,45	0,5	-	-	-	-	0,02	0,03	0,05
50	65	0,03	0,04	0,45	0,6	0,5	0,7	-	-	-	-	0,025	0,035	0,055
65	80	0,04	0,05	0,6	0,75	0,7	0,85	-	-	-	-	0,025	0,04	0,07
80	100	0,045	0,06	0,7	0,9	0,75	1	1,7	2,2	1,8	2,4	0,035	0,05	0,08
100	120	0,05	0,07	0,7	1,1	0,8	1,2	1,9	2,7	2	2,8	0,05	0,065	0,1
120	140	0,065	0,09	1,1	1,4	1,2	1,5	2,7	3,5	2,8	3,6	0,055	0,08	0,11
140	160	0,075	0,1	1,2	1,6	1,3	1,7	3	4	3,1	4,2	0,055	0,09	0,13
160	180	0,08	0,11	1,3	1,7	1,4	1,9	3,2	4,2	3,3	4,6	0,06	0,1	0,15
180	200	0,09	0,13	1,4	2	1,5	2,2	3,5	4,5	3,6	5	0,07	0,1	0,16
200	225	0,1	0,14	1,6	2,2	1,7	2,4	4	5,5	4,2	5,7	0,08	0,12	0,18
225	250	0,11	0,15	1,7	2,4	1,8	2,6	4,2	6	4,6	6,2	0,09	0,13	0,2
250	280	0,12	0,17	1,9	2,6	2	2,9	4,7	6,7	4,8	6,9	0,1	0,14	0,22
280	315	0,13	0,19	2	3	2,2	3,2	5	7,5	5,2	7,7	0,11	0,15	0,24
315	355	0,15	0,21	2,4	3,4	2,6	3,6	6	8,2	6,2	8,4	0,12	0,17	0,26
355	400	0,17	0,23	2,6	3,6	2,9	3,9	6,5	9	6,8	9,2	0,13	0,19	0,29
400	450	0,2	0,26	3,1	4,1	3,4	4,4	7,7	10	8	10,4	0,13	0,2	0,31
450	500	0,21	0,28	3,3	4,4	3,6	4,8	8,2	11	8,4	11,2	0,16	0,23	0,35
500	560	0,24	0,32	3,7	5	4,1	5,4	9,2	12,5	9,6	12,8	0,17	0,25	0,36
560	630	0,26	0,35	4	5,4	4,4	5,9	10	13,5	10,4	14	0,2	0,29	0,41
630	710	0,3	0,4	4,6	6,2	5,1	6,8	11,5	15,5	12	16	0,21	0,31	0,45
710	800	0,34	0,45	5,3	7	5,8	7,6	13,3	17,5	13,6	18	0,23	0,35	0,51
800	900	0,37	0,5	5,7	7,8	6,3	8,5	14,3	19,5	14,8	20	0,27	0,39	0,57

# Features of spherical roller bearings E1

Lubrication groove · Speed suitability · Operating temperature limit · Tapered bore

## Lubrication groove, lubrication holes

In order to simplify lubrication, FAG spherical roller bearings E1 have a circumferential groove and three lubrication holes in the outer ring, except for bearings of series 213..-E1 up to a bore diameter of 35 mm.

In all bearings of the E1 design, no suffix is used for the design with a lubrication groove and lubrication holes.

## Speed suitability

The reference speed given in the bearing tables can be exceeded up to the level of the limiting speed if permitted by the operating conditions. In order to take account of special operating conditions, the thermally safe operating speed is determined (see Catalogue HR 1, Rolling Bearings).

## Operating temperature limit, heat treatment

FAG spherical roller bearings are heat treated so that they can be used up to an operating temperature of +200 °C. In the case of bearings with a polyamide cage, the operating temperature limit of the cage must be observed.

The inner rings of all spherical roller bearings of the E1 design are designed by means of FAG Isotemp hardening (bainitic hardening) for particularly high loads.

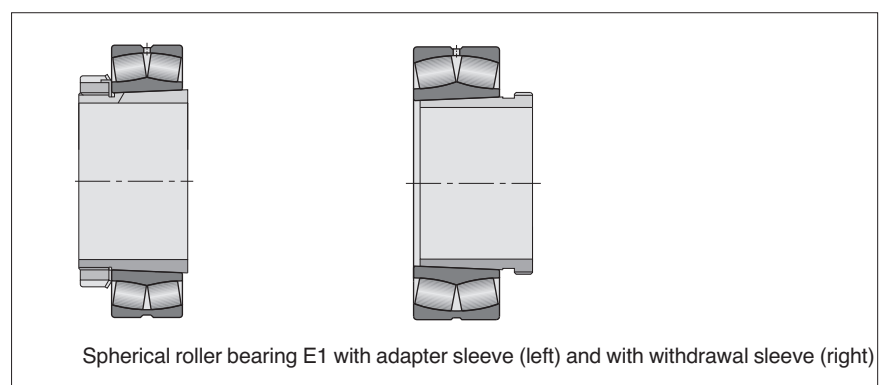
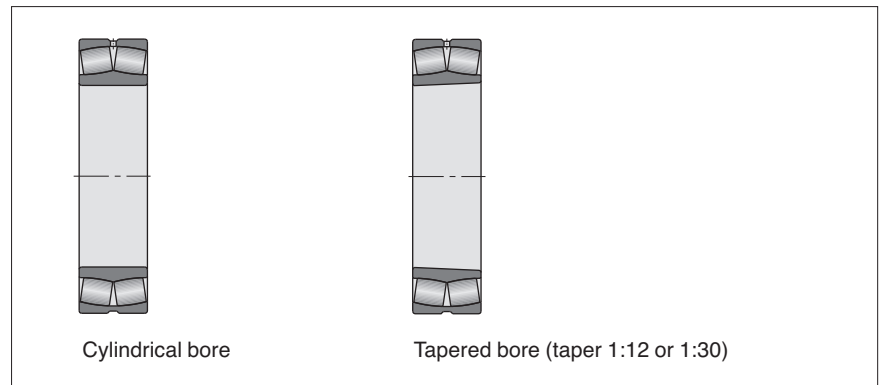
## Tapered bore

FAG spherical roller bearings of most series are also supplied with a tapered bore. The suffix K indicates a taper 1:12. Only the spherical roller bearings of series 240 and 241 have the taper 1:30 (suffix K30).

Spherical roller bearings with a tapered bore are located predominantly by means of adapter sleeves or withdrawal sleeves on the shaft.

Adapter sleeves are supplied with a locknut and retainer. The locknuts appropriate to the withdrawal sleeves must be ordered as additional items (see also Accessories, page 10).

Larger sleeves have oil feed holes and slots so that the hydraulic method can be used in mounting.





# Features of spherical roller bearings E1

## Cages

### Cages

Spherical roller bearings E1 without a cage suffix have sheet steel cages. The two cage halves are retained by a guiding ring in the outer or inner ring.

With the exception of the series 213...-E1 and 222...-E1 (bore code < 20), all sheet cages in the basic design and in the design T41A(D) are protected in particular against wear by surface hardening or coating.

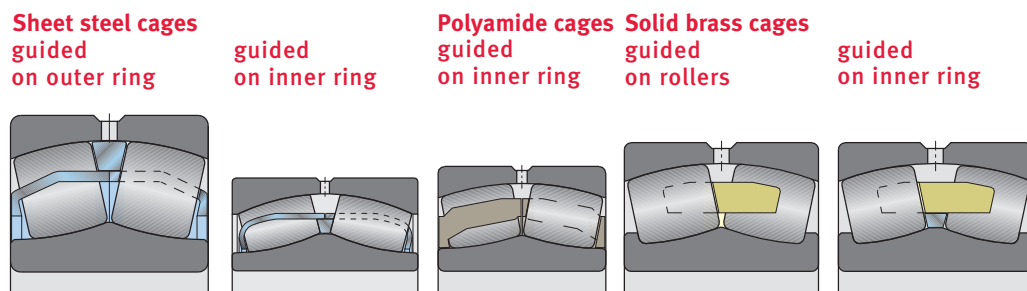
Spherical roller bearings E1A with solid brass cages are indicated by the suffix M or MB1.

Spherical roller bearings E1A with an outside diameter of more than 460 mm have single-piece solid brass cages (MB1) guided on the inner ring. Bearings with an outside diameter of > 320 mm to 460 mm are available by arrangement with the cage MB1.

Spherical roller bearings with solid cages made from glass fibre reinforced polyamide are indicated by the suffix TVPB. These cages are suitable for continuous temperatures of up to +120 °C.

The chemical resistance of polyamide to synthetic greases and lubricants with EP additives must be checked. Aged oil and additives in the oil can impair the operating life of plastic cages at high temperatures. The oil change intervals must be observed.

### Standard cages for FAG spherical roller bearings of E1 design



Cage suffix Series (design)	Sheet steel cages guided on outer ring	Sheet steel cages guided on inner ring	Polyamide cages guided on inner ring	Solid brass cages guided on rollers	Solid brass cages guided on inner ring
	Bore code		TVPB	M	MB1
213...-E1	08 to 18	–	04 to 07, 19 to 22	–	–
222...-E1	up to 36	38 to 48	–	–	–
222...-E1A	–	–	–	–	from 52
223...-E1	up to 30	32 to 44	–	–	–
223...-E1 (T41A, T41D)	up to 30 (44)	–	–	–	–
223...-E1A	–	–	–	–	from 48
230...-E1	–	44 to 60	up to 40	–	–
230...-E1A	–	–	–	up to 40	from 64
231...-E1	–	40 to 56	up to 38	–	–
231...-E1A	–	–	–	up to 38	from 60
232...-E1	–	38 to 48	up to 36	–	–
232...-E1A	–	–	–	up to 36	from 52
240...-E1	–	24 to 60	–	–	–
240...-E1A	–	–	–	–	from 64
241...-E1	–	22 to 88	–	–	–
241...-E1A	–	–	–	–	from 92

# Features of spherical roller bearings E1

Equivalent load · Minimum radial load · Axial load carrying capacity · Vertical shaft arrangement · Mounting dimensions

## Equivalent dynamic load

$$P = F_r + Y_1 \cdot F_a \quad [\text{N}]$$

for  $F_a/F_r \leq e$

$$P = 0,67 \cdot F_r + Y_2 \cdot F_a \quad [\text{N}]$$

for  $F_a/F_r > e$

The values  $Y_1$ ,  $Y_2$  and  $e$  are given in the bearing tables.

## Equivalent static load

$$P_0 = F_{0r} + Y_0 \cdot F_{0a} \quad [\text{N}]$$

The axial factor  $Y_0$  is given in the dimension tables.

## Minimum radial load

As the minimum radial load for FAG spherical roller bearings E1, we recommend:

$$P = 0,015 C_r \quad [\text{N}]$$

$C_r$  Basic dynamic load rating [N]  
See bearing tables

## Axial load carrying capacity

FAG spherical roller bearings are also suitable for high axial loads. If very high loads occur in combination with very high speeds, however, the increased friction and bearing temperature must be taken into consideration. Information on this point is available from our technical advisory service.

## Vertical shaft arrangement

If shafts with a vertical axis are supported using spherical roller bearings, particular attention must be paid to ensuring the reliable provision of lubricant. We recommend oil lubrication in such cases.

## Mounting dimensions

The bearing tables give the maximum dimension of the radius  $r_a$  and the diameters of the abutment shoulders  $D_a$ ,  $d_a$ .

In order to achieve acceptable running of the spherical roller bearings, the abutment shoulders must be no smaller than  $D_1$  and no larger than  $d_2$ .

If high axial forces are present, a support ring can be used for the mounting of spherical roller bearings with an adapter sleeve. We can provide the dimensions of the support ring by agreement.

# Features of spherical roller bearings E1

## Suffixes

Suffixes		Common combinations of suffixes:			
E1, E1A	Increased capacity design	E1-K	Increased capacity design, tapered bore (taper 1:12)	E1-K-TVPB	Increased capacity design, tapered bore (taper 1:12), solid cage made from glass fibre reinforced polyamide, guided on inner ring
K	Tapered bore, taper 1:12	E1-K30	Increased capacity design, tapered bore (taper 1:30)	E1-T41A	Increased capacity design, special design for oscillating load with restricted tolerances, radial internal clearance C4
K30	Tapered bore, taper 1:30	E1A-M	Increased capacity design, solid brass cage, guided on rollers	E1-T41D	Increased capacity design, special design for oscillating load with restricted tolerances, radial internal clearance C4, bore with thin layer chromium plating
M	Solid brass cage, guided on rollers	E1A-MB1	Increased capacity design, solid brass cage, guided on inner ring	E1-K-T41A	Increased capacity design, tapered bore (taper 1:12), special design for oscillating load with restricted tolerances, radial internal clearance C4
MB1	Solid brass cage, guided on inner ring	E1A-K-MB1	Increased capacity design, tapered bore (taper 1:12), solid brass cage, guided on inner ring		
TVPB	Solid window cage made from glass fibre reinforced polyamide, guided on inner ring	E1-TVPB	Increased capacity design, solid cage made from glass fibre reinforced polyamide, guided on inner ring		
T41A	Special design for oscillating load with restricted tolerances, radial internal clearance C4				
T41D	Special design for oscillating load with restricted tolerances, radial internal clearance C4, bore with thin layer chromium plating				

# Accessories · Products for mounting, maintenance and monitoring

## Accessories

FAG spherical roller bearings E1, in conjunction with FAG fasteners and housings as well as FAG Arcanol rolling bearing greases, form units whose components are optimally matched to each other.

FAG adapter sleeves and withdrawal sleeves greatly simplify the mounting and dismounting of spherical roller bearings with a tapered bore.

Locknuts are used to locate spherical roller bearings E1 directly on the shaft or on an adapter sleeve.

Locknuts can also be used in the mounting and dismounting of bearings on withdrawal sleeves and tapered shaft studs.

FAG housings and the associated bearings have proven successful in countless examples of machinery, plant and equipment. A large number of standard housings as well as fasteners are described in Catalogue HR 1, Rolling Bearings. In addition, we supply special housings that are designed to fulfil particular requirements.

Further information on FAG Arcanol rolling bearing greases is given in TPI 168.



FAG Arcanol rolling bearing greases

## FAG products for mounting, maintenance and monitoring

In order to ensure that the high performance capability of FAG spherical roller bearings E1 can be exploited to the full, particular attention must be paid to their mounting and dismounting, lubrication, sealing and maintenance. In those cases where a production stoppage can incur heavy costs, monitoring of rolling bearings is both advisable and cost-effective.

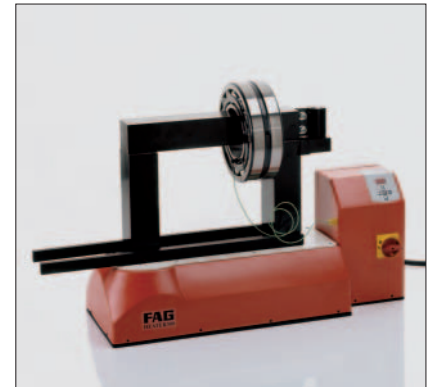
The methods used in mounting and dismounting are comprehensively described in publication WL 80 100 “Mounting of Rolling Bearings”.

Publication WL 80 250 “FAG Equipment and Services for the Mounting and Maintenance of Rolling Bearings” presents our portfolio of products, services and training in the areas of

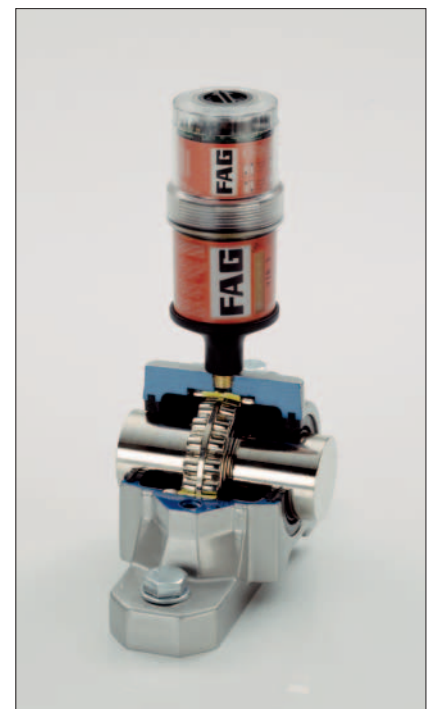
- Mounting
- Lubrication
- Condition monitoring
- Rolling bearing reconditioning
- Maintenance management.



Rolling bearing diagnosis using FAG EasyCheck



FAG induction heating device



FAG lubricator CHAMPION

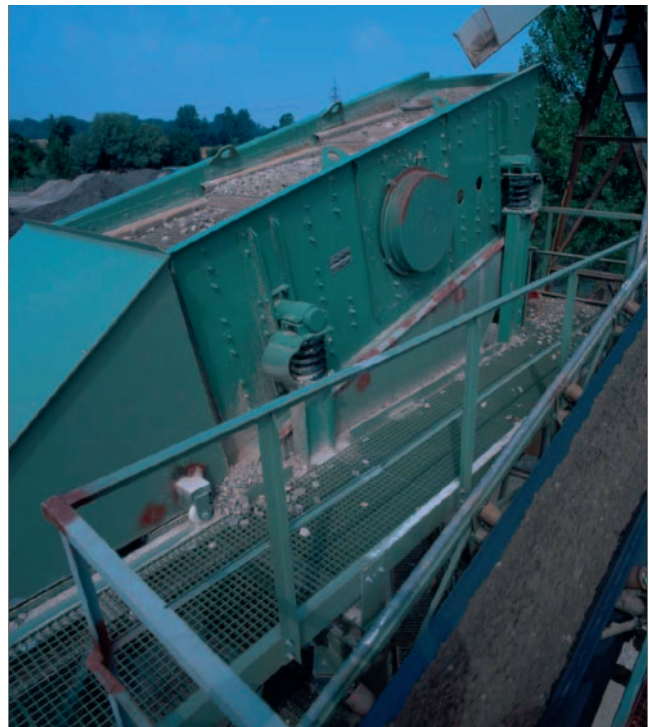
# Application examples for spherical roller bearings E1

## Vibrating screens

FAG spherical roller bearings E1 of X-life quality offer the optimum system solution for vibrating screen bearing arrangements because their particularly robust and resistant design far surpass all previous characteristic data.

Thanks to the friction-optimised kinematics of the new X-life bearings, the very high alternating loads occurring in the vibrating screen drive system can be supported without any problems. Furthermore, the improved kinematics give a lower noise level, reduced temperatures and also improved machine efficiency. In particular, the hardened sheet steel cages now introduced in the large size bearing sector allow a longer operating life with significantly lower bearing wear.

Due to their standardised dimensions, the E1 vibrating screen bearings can be mounted and dismantled in a straightforward and professional way.



## Continuous casting machines

With the expansion of our range of X-life spherical roller bearings in the large size bearing sector, we offer the steel industry a new standard in terms of reliability, cost-effectiveness and technical performance capability.

The particularly compact bearing design with its improved basic load ratings and friction-optimised kinematics is ideally suited to the tough, aggressive conditions in steel production. Due to the new, hardened sheet steel cages in the X-life bearings, they are particularly resistant to contamination and are both robust and wear-resistant to a very high level.

The resulting increases in operating life and machine availability lead to significantly greater added value. The standardised dimensions of the E1 generation allow straightforward, professional mounting as non-locating and locating bearings as well as easy replacement of the standard bearings previously fitted.



# Application examples for spherical roller bearings E1

## Rotor bearing arrangement in wind turbines

In the wind turbine, the rotor shaft bearing arrangement is of central importance. This is directly exposed to all the forces and moments induced by the wind.

The bearing arrangement is confronted by the particular challenges of oscillating loads as well as extreme peak and minimal loads.

These difficult conditions as well as wide fluctuations in operating temperatures are managed with a high level of security by the E1 bearings.

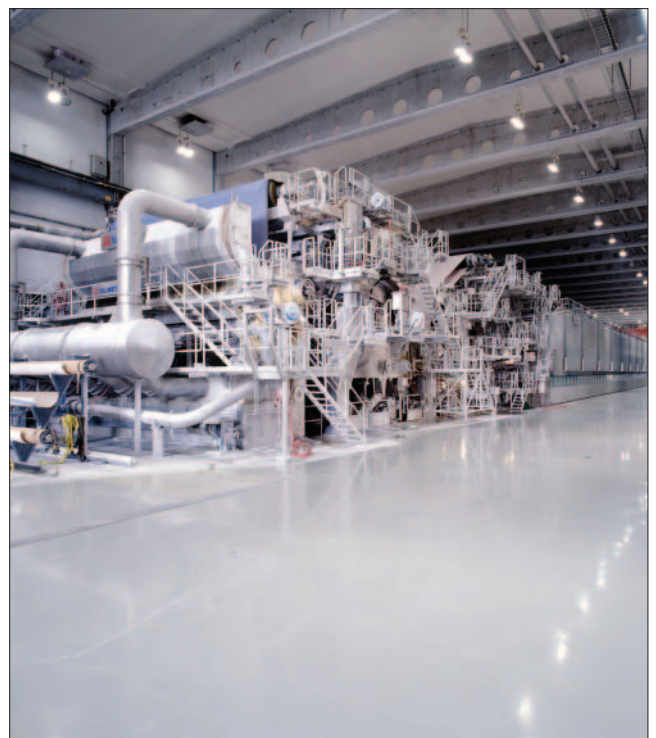
The new, extremely robust and low-friction E1 generation in the large bearing sector gives an extended operating life, significantly higher reliability and improved system efficiency. Furthermore, the optimised kinematics give a lower noise level and reduced temperatures, allowing reliable condition monitoring.



## Paper production

The advantages of spherical roller bearings E1 of X-life quality are also increasingly used in the paper processing industry. The increase in the basic rating life, which is on average 60 %, can be attributed to the increase of approximately 15 % in the basic dynamic load ratings. In addition, the higher basic static load ratings give an improvement in the static load safety factor. Under the same operating conditions, significantly longer bearing life can be achieved. Alternatively, the existing operating life can be achieved even with a considerable increase in load.

In new designs, the performance of the larger bearings previously used can now be achieved using smaller bearings. Through downsizing (smaller design envelope, reduced friction, lower lubricant requirement, higher speeds), more economical bearing arrangements can be realised. The lower operating costs are due to the better bearing kinematics, which keep both friction and bearing temperatures at a low level. In addition, this means that less strain is placed on the grease.



## Application examples for spherical roller bearings E1

### **Industrial gearboxes, example: slewing gear drives in construction machinery**

Construction machines such as hydraulic crawler excavators operate daily under extreme conditions. These include uneven ground, shock loads, contamination and moisture. Their slewing gear drives must have very high operational security, must be particularly robust and must require very little maintenance. The swivelling and rotational movement of the revolving superstructure including the driver's cabin is facilitated by one or more such drives, where the tooth set of the output pinion shaft meshes with the tooth set of a slewing ring. In order to achieve the gear ratio for swivel movement, the drive has a multi-stage planetary gearbox. The optimised FAG spherical roller bearings E1 of X-life quality are used on the output side of the pinion shaft. Since their load carrying capacity is well above standard, a high load safety factor and long rating life is achieved even under the high radial and axial loads present. The bearings are extremely robust, thus increasing system reliability.



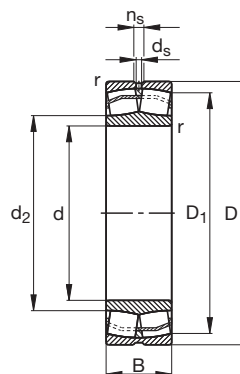
### **Marine propulsion systems**

Spherical roller bearings in marine propulsion systems are used to guide the drive shaft and support the radial forces that result from the mass and the dynamic forces of the engine and the propeller. Due to their increased basic load ratings, the FAG spherical roller bearings of the E1 design operate reliably and securely even under the immense loads that act on the drive system during acceleration, manoeuvring and deceleration of the vessel. The optimised bearing kinematics and quality of the rollers and raceways of the FAG spherical roller bearings E1 ensure reduced friction and thus make an essential contribution to achieving greater efficiency of the marine propulsion system. Since the temperatures generated are lower, less strain is placed on the lubricant. As a result, the operating and maintenance costs that are particularly high in the case of marine vessels can be minimised.

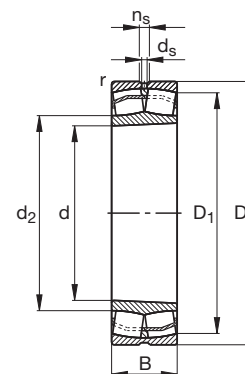


# Spherical roller bearings E1

With cylindrical and with tapered bore



Cylindrical bore  
E1(-TVPB)



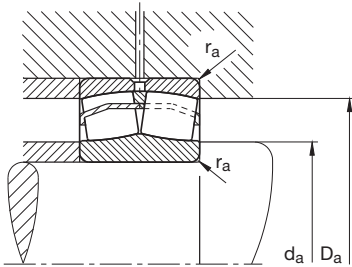
Tapered bore  
E1-K(-TVPB)

## Spherical roller bearings E1, d = 20–70 mm

Designation	X-life	Mass	Dimensions							
		m ≈ kg	d	D	B	r min.	D <sub>1</sub> ≈	d <sub>2</sub> ≈	d <sub>s</sub>	n <sub>s</sub>
21304-E1-TVPB	XL	0,16	20	52	15	1,1	43	28,9	–	–
22205-E1	XL	0,18	25	52	18	1	44,5	31,3	3,2	4,8
21305-E1-TVPB	XL	0,254	25	62	17	1,1	51	35,2	–	–
22206-E1	XL	0,275	30	62	20	1	53,7	37,9	3,2	4,8
21306-E1-TVPB	XL	0,386	30	72	19	1,1	59,9	41,5	–	–
22207-E1	XL	0,434	35	72	23	1,1	62,5	43,8	3,2	4,8
21307-E1-TVPB	XL	0,503	35	80	21	1,5	66,6	47,4	–	–
22208-E1	XL	0,528	40	80	23	1,1	70,4	48,6	3,2	4,8
21308-E1	XL	0,701	40	90	23	1,5	80,8	59,7	3,2	4,8
22308-E1	XL	1,05	40	90	33	1,5	76	52,4	3,2	4,8
22209-E1	XL	0,589	45	85	23	1,1	75,6	54,8	3,2	4,8
21309-E1	XL	0,845	45	100	25	1,5	89,8	67,3	3,2	4,8
22309-E1	XL	1,39	45	100	36	1,5	84,7	58,9	3,2	6,5
22210-E1	XL	0,622	50	90	23	1,1	80,8	59,7	3,2	4,8
21310-E1	XL	1,28	50	110	27	2	89,8	67,3	3,2	4,8
22310-E1	XL	1,9	50	110	40	2	92,6	63	3,2	6,5
22211-E1	XL	0,851	55	100	25	1,5	89,8	67,3	3,2	4,8
21311-E1	XL	1,19	55	120	29	2	98,3	71,4	3,2	6,5
22311-E1	XL	2,27	55	120	43	2	101,4	68,9	3,2	6,5
22212-E1	XL	1,12	60	110	28	1,5	98,7	71,4	3,2	6,5
21312-E1	XL	1,78	60	130	31	2,1	112,5	84,4	3,2	6,5
22312-E1	XL	2,89	60	130	46	2,1	110,1	74,8	3,2	6,5
22213-E1	XL	1,55	65	120	31	1,5	107,3	79,1	3,2	6,5
21313-E1	XL	2,42	65	140	33	2,1	126,8	94,9	3,2	6,5
22313-E1	XL	3,57	65	140	48	2,1	119,3	83,2	4,8	9,5
22214-E1	XL	1,65	70	125	31	1,5	112,5	84,4	3,2	6,5
21314-E1	XL	3	70	150	35	2,1	126,2	94,9	3,2	6,5
22314-E1	XL	4,21	70	150	51	2,1	128	86,7	4,8	9,5

Spherical roller bearings E1 are – with the exception of sizes 21304-E1-TVPB to 21306-E1-TVPB – also available with a tapered bore, e. g. 22207-E1-K.





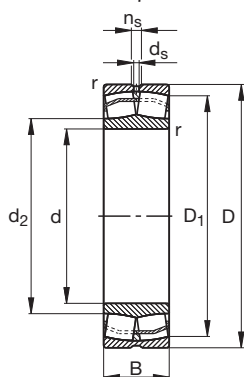
Mounting dimensions  
E1(-TVPB)

Mounting dimensions			Basic load ratings		Calculation factors				Fatigue limit load	Limiting speed	Reference speed
$d_a$	$D_a$	$r_a$	dyn.	stat.	$e$	$Y_1$	$Y_2$	$Y_0$	$C_{ur}$	$n_G$	$n_B$
min.	max.	max.	N	N					N	min <sup>-1</sup>	min <sup>-1</sup>
27	45	1	41 000	33 000	0,3	2,25	3,34	2,2	3 700	15 000	9 700
30,6	46,4	1	48 000	42 500	0,34	1,98	2,94	1,93	4 800	17 000	9 200
32	55	1	52 000	43 500	0,28	2,43	3,61	2,37	4 750	13 000	8 400
35,6	56,4	1	64 000	57 000	0,31	2,15	3,2	2,1	6 900	13 000	7 800
37	65	1	72 000	63 000	0,27	2,49	3,71	2,43	7 000	11 000	7 300
42	65	1	88 000	81 500	0,31	2,16	3,22	2,12	9 400	11 000	7 000
44	71	1,5	83 000	74 000	0,26	2,55	3,8	2,5	8 100	9 500	6 800
47	73	1	101 000	91 000	0,28	2,41	3,59	2,35	11 800	10 000	6 200
49	81	1,5	109 000	107 000	0,24	2,81	4,19	2,75	14 300	9 500	5 200
49	81	1,5	156 000	149 000	0,36	1,86	2,77	1,82	13 100	7 500	5 500
52	78	1	104 000	99 000	0,26	2,62	3,9	2,56	12 700	10 000	5 600
54	91	1,5	129 000	130 000	0,23	2,92	4,35	2,86	17 300	8 500	5 500
54	91	1,5	187 000	183 000	0,36	1,9	2,83	1,86	16 100	6 700	5 000
57	83	1	109 000	107 000	0,24	2,81	4,19	2,75	14 300	9 500	5 100
61	99	2	129 000	130 000	0,23	2,92	4,35	2,86	17 300	8 500	5 400
61	99	2	229 000	223 000	0,36	1,86	2,77	1,82	20 300	6 000	4 800
64	91	1,5	129 000	130 000	0,23	2,92	4,35	2,86	17 300	8 500	4 650
66	109	2	160 000	155 000	0,24	2,84	4,23	2,78	20 200	6 300	5 100
66	109	2	265 000	260 000	0,36	1,89	2,81	1,84	23 900	5 600	4 500
69	101	1,5	160 000	155 000	0,24	2,84	4,23	2,78	20 200	7 500	4 550
72	118	2,1	211 000	226 000	0,23	2,95	4,4	2,89	28 000	6 300	4 100
72	118	2,1	310 000	310 000	0,35	1,91	2,85	1,87	28 000	5 000	4 200
74	111	1,5	202 000	210 000	0,24	2,81	4,19	2,75	25 500	6 700	4 200
77	128	2,1	249 000	270 000	0,22	3,14	4,67	3,07	33 500	5 000	3 600
77	128	2,1	350 000	365 000	0,34	2	2,98	1,96	32 500	4 800	3 800
79	116	1,5	211 000	226 000	0,23	2,95	4,4	2,89	28 000	6 300	3 950
82	138	2,1	249 000	270 000	0,22	3,14	4,67	3,07	33 500	5 000	3 950
82	138	2,1	390 000	390 000	0,34	2	2,98	1,96	36 500	4 500	3 700

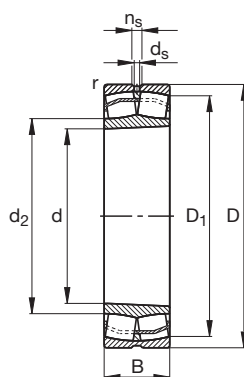
Spherical roller bearings 21304-E1-TVPB to 21307-E1-TVPB have neither a lubrication groove nor lubrication holes.  
Spherical roller bearings 223..-E1 are also available in a special design for oscillating load, e. g. 22308-E1-T41A.

# Spherical roller bearings E1

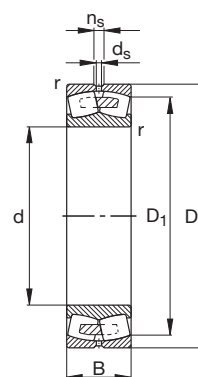
With cylindrical and with tapered bore



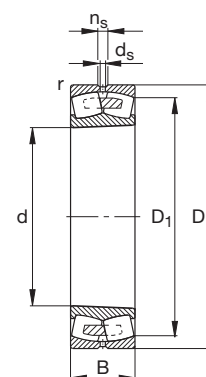
Cylindrical bore  
E1-TVPB



Tapered bore  
E1-K-TVPB



Cylindrical bore  
E1A-M



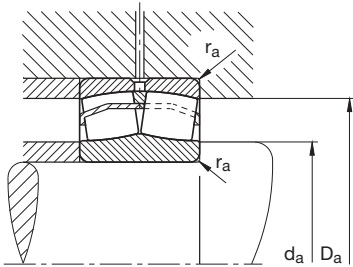
Tapered bore  
E1A-K-M



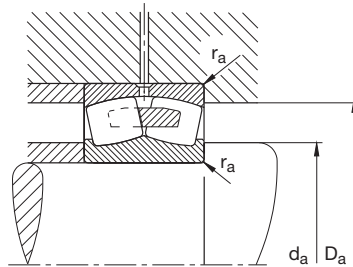
## Spherical roller bearings E1, $d = 75-100$ mm

Designation	X-life	Mass	Dimensions							
		m ≈ kg	d	D	B	r min.	D <sub>1</sub> ≈	d <sub>2</sub> ≈	d <sub>s</sub>	n <sub>s</sub>
22215-E1	XL	1,72	75	130	31	1,5	117,7	89,8	3,2	6,5
21315-E1	XL	2,86	75	160	37	2,1	135,2	99,7	3,2	6,5
22315-E1	XL	5,18	75	160	55	2,1	136,3	92,4	4,8	9,5
22216-E1	XL	2,13	80	140	33	2	126,8	94,9	3,2	6,5
21316-E1	XL	2,65	80	170	39	2,1	135,4	99,7	3,2	6,5
22316-E1	XL	6,27	80	170	58	2,1	145,1	98,3	4,8	9,5
22217-E1	XL	2,65	85	150	36	2	135,4	99,7	3,2	6,5
21317-E1	XL	5,37	85	180	41	3	143,9	106,1	4,8	9,5
22317-E1	XL	7,06	85	180	60	3	154,2	104,4	4,8	9,5
22218-E1	XL	3,43	90	160	40	2	143,9	106,1	3,2	6,5
23218-E1-TVPB	XL	4,27	90	160	52,4	2	140	104,1	3,2	6,5
21318-E1	XL	6,26	90	190	43	3	152,7	112,6	4,8	9,5
22318-E1	XL	8,51	90	190	64	3	162,5	110,2	6,3	12,2
22219-E1	XL	4,13	95	170	43	2,1	152,7	112,6	4,8	9,5
21319-E1-TVPB	XL	6,63	95	200	45	3	169,4	124,3	4,8	9,5
22319-E1	XL	9,69	95	200	67	3	171,2	116	6,3	12,2
23120-E1A-M	XL	4,37	100	165	52	2	146,3	–	3,2	6,5
23120-E1-TVPB	XL	4,22	100	165	52	2	146,3	113,9	3,2	6,5
22220-E1	XL	4,96	100	180	46	2,1	161,4	119	4,8	9,5
23220-E1A-M	XL	6,45	100	180	60,3	2,1	156,7	–	4,8	9,5
23220-E1-TVPB	XL	6,32	100	180	60,3	2,1	156,7	116,7	4,8	9,5
21320-E1-TVPB	XL	8,19	100	215	47	3	182	132	4,8	9,5
22320-E1	XL	13,1	100	215	73	3	184,7	130,2	6,3	12,2

Spherical roller bearings E1 are also available with a tapered bore, e. g. 21316-E1-K.



Mounting dimensions  
E1(-TVPB)



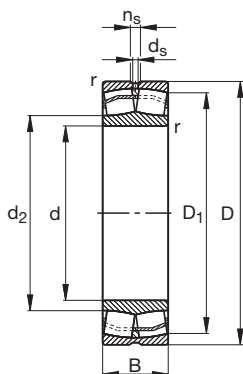
Mounting dimensions  
E1A-M

Mounting dimensions			Basic load ratings		Calculation factors				Fatigue limit load	Limiting speed	Reference speed
$d_a$	$D_a$	$r_a$	dyn.	stat.	$e$	$Y_1$	$Y_2$	$Y_0$	$C_{ur}$	$n_G$	$n_B$
min.	max.	max.	N	N					N	min <sup>-1</sup>	min <sup>-1</sup>
84	121	1,5	216 000	236 000	0,22	3,1	4,62	3,03	29 500	6 300	3 700
87	148	2,1	305 000	325 000	0,22	3,04	4,53	2,97	38 500	4 800	3 750
87	148	2,1	445 000	450 000	0,34	1,99	2,96	1,94	40 500	4 300	3 550
91	129	2	249 000	270 000	0,22	3,14	4,67	3,07	33 500	5 600	3 550
92	158	2,1	305 000	325 000	0,22	3,04	4,53	2,97	38 500	4 800	4 050
92	158	2,1	495 000	510 000	0,34	1,99	2,96	1,94	45 000	4 300	3 400
96	139	2	305 000	325 000	0,22	3,04	4,53	2,97	38 500	5 300	3 450
99	166	2,5	345 000	375 000	0,23	2,9	4,31	2,83	42 500	4 800	3 800
99	166	2,5	540 000	560 000	0,33	2,04	3,04	2	50 000	4 000	3 200
101	149	2	345 000	375 000	0,23	2,9	4,31	2,83	42 500	4 800	3 400
101	149	2	445 000	520 000	0,31	2,2	3,27	2,15	48 500	4 300	2 650
104	176	2,5	380 000	415 000	0,24	2,87	4,27	2,8	47 000	4 500	3 600
104	176	2,5	610 000	630 000	0,33	2,03	3,02	1,98	55 000	3 600	3 000
107	158	2,1	380 000	415 000	0,24	2,87	4,27	2,8	47 000	4 500	3 300
109	186	2,5	430 000	460 000	0,22	3,04	4,53	2,97	47 500	4 000	3 200
109	186	2,5	670 000	700 000	0,33	2,03	3,02	1,98	60 000	3 000	2 800
111	154	2	450 000	570 000	0,28	2,37	3,53	2,32	52 000	4 300	2 750
111	154	2	450 000	570 000	0,28	2,37	3,53	2,32	52 000	4 300	2 750
112	168	2,1	430 000	475 000	0,24	2,84	4,23	2,78	52 000	4 300	3 150
112	168	2,1	550 000	660 000	0,31	2,15	3,2	2,1	60 000	3 600	2 410
112	168	2,1	550 000	660 000	0,31	2,15	3,2	2,1	60 000	3 600	2 410
114	201	2,5	495 000	530 000	0,22	3,14	4,67	3,07	61 000	3 600	3 050
114	201	2,5	810 000	920 000	0,33	2,03	3,02	1,98	75 000	3 000	2 380

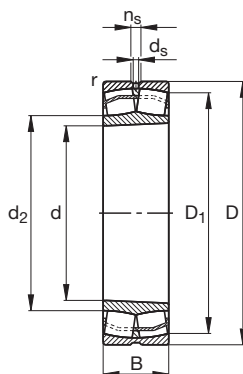
Spherical roller bearings 223.-E1 are also available in a special design for oscillating load, e. g. 22315-E1-T41A.  
Spherical roller bearings 223.-E1 are also available in a special design for oscillating load, e. g. 22320-E1-T41D.

# Spherical roller bearings E1

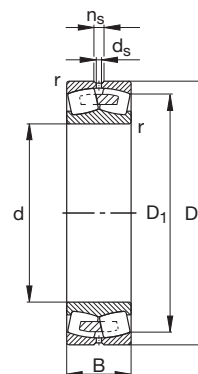
With cylindrical and with tapered bore



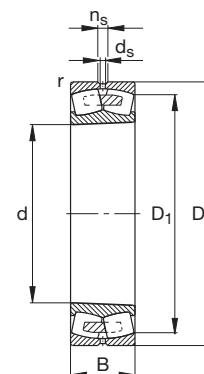
Cylindrical bore  
E1(-TVPB)



Tapered bore  
E1-K(-TVPB)



Cylindrical bore  
E1A-M



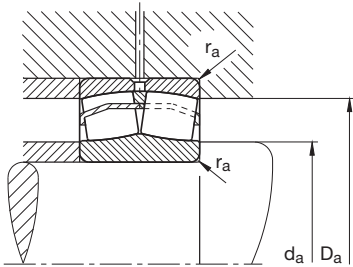
Tapered bore  
E1A-K-M



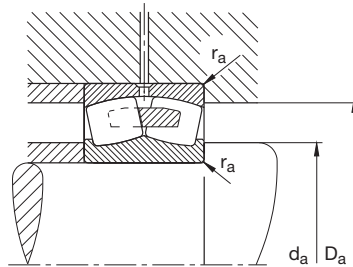
## Spherical roller bearings E1, d = 110–120 mm

Designation	X-life	Mass	Dimensions							
		m ≈ kg	d	D	B	r min.	D <sub>1</sub> ≈	d <sub>2</sub> ≈	d <sub>s</sub>	n <sub>s</sub>
23022-E1A-M	XL	3,67	110	170	45	2	154,6	–	3,2	6,5
23022-E1-TVPB	XL	3,55	110	170	45	2	154,6	123,7	3,2	6,5
23122-E1A-M	XL	5,51	110	180	56	2	160	–	4,8	9,5
23122-E1-TVPB	XL	5,31	110	180	56	2	160	124,6	4,8	9,5
24122-E1	XL	6,9	110	180	69	2	155,3	125,6	3,2	6,5
22222-E1	XL	6,99	110	200	53	2,1	178,7	129,4	4,8	9,5
23222-E1A-M	XL	9,54	110	200	69,8	2,1	172,7	–	4,8	9,5
23222-E1-TVPB	XL	9,18	110	200	69,8	2,1	172,7	129,1	4,8	9,5
21322-E1-TVPB	XL	11,1	110	240	50	3	202,5	146,4	6,3	12,2
22322-E1	XL	17,7	110	240	80	3	204,9	143,1	8	15
23024-E1A-M	XL	4,17	120	180	46	2	164,7	–	3,2	6,5
23024-E1-TVPB	XL	3,86	120	180	46	2	164,7	133	3,2	6,5
24024-E1	XL	5,4	120	180	60	2	159,8	134,4	3,2	6,5
23124-E1A-M	XL	7,7	120	200	62	2	177,4	–	4,8	9,5
23124-E1-TVPB	XL	7,39	120	200	62	2	177,4	136,2	4,8	9,5
24124-E1	XL	10,1	120	200	80	2	170,7	136,7	3,2	6,5
22224-E1	XL	8,84	120	215	58	2,1	192	141,8	6,3	12,2
23224-E1A-M	XL	12,1	120	215	76	2,1	185,5	–	4,8	9,5
23224-E1-TVPB	XL	11,5	120	215	76	2,1	185,5	139	4,8	9,5
22324-E1	XL	22,5	120	260	86	3	222,4	150,8	8	15

Spherical roller bearings E1 are also available with a tapered bore, e. g. 24122-E1-K30.



Mounting dimensions  
E1(-TVPB)



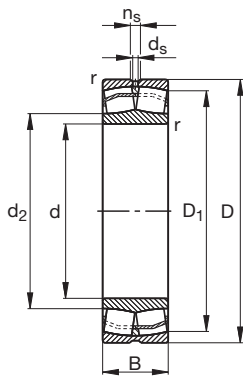
Mounting dimensions  
E1A-M

Mounting dimensions			Basic load ratings		Calculation factors				Fatigue limit load	Limiting speed	Reference speed
$d_a$	$D_a$	$r_a$	dyn.	stat.	$e$	$Y_1$	$Y_2$	$Y_0$	$C_{ur}$	$n_G$	$n_B$
min.	max.	max.	N	N					N	min <sup>-1</sup>	min <sup>-1</sup>
118,8	161,2	2	400 000	530 000	0,23	2,9	4,31	2,83	52 000	4 300	3 000
118,8	161,2	2	400 000	530 000	0,23	2,9	4,31	2,83	52 000	4 300	3 000
121	169	2	530 000	680 000	0,28	2,41	3,59	2,35	61 000	4 000	2 550
121	169	2	530 000	680 000	0,28	2,39	3,56	2,34	61 000	4 000	2 550
121	169	2	530 000	750 000	0,32	1,96	2,92	1,92	84 000	2 800	1 960
122	188	2,1	550 000	600 000	0,25	2,71	4,04	2,65	62 000	4 000	3 000
122	188	2,1	710 000	870 000	0,33	2,06	3,06	2,01	72 000	3 000	2 100
122	188	2,1	710 000	870 000	0,33	2,06	3,06	2,01	72 000	3 000	2 100
124	226	2,5	600 000	640 000	0,21	3,24	4,82	3,16	69 000	3 000	2 700
124	226	2,5	950 000	1 070 000	0,33	2,07	3,09	2,03	91 000	2 600	2 130
128,8	171,2	2	430 000	580 000	0,22	3,04	4,53	2,97	58 000	4 300	2 800
128,8	171,2	2	430 000	580 000	0,22	3,04	4,53	2,97	58 000	4 300	2 800
128,8	171,2	2	450 000	690 000	0,27	2,33	3,47	2,28	84 000	4 000	2 400
131	189	2	630 000	800 000	0,28	2,39	3,56	2,34	73 000	3 400	2 290
131	189	2	630 000	800 000	0,28	2,39	3,56	2,34	73 000	3 400	2 290
131	189	2	680 000	950 000	0,34	1,84	2,74	1,8	101 000	2 600	1 760
132	203	2,1	640 000	740 000	0,25	2,71	4,04	2,65	71 000	3 400	2 700
132	203	2	820 000	1 020 000	0,33	2,03	3,02	1,98	80 000	2 800	1 910
132	203	2	820 000	1 020 000	0,33	2,03	3,02	1,98	80 000	2 800	1 910
134	246	2,5	1 080 000	1 170 000	0,33	2,06	3,06	2,01	103 000	2 600	2 000

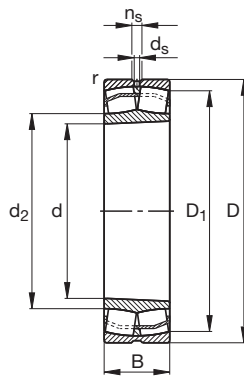
Spherical roller bearings 223...-E1 are also available in a special design for oscillating load, e. g. 22324-E1-T41D.

# Spherical roller bearings E1

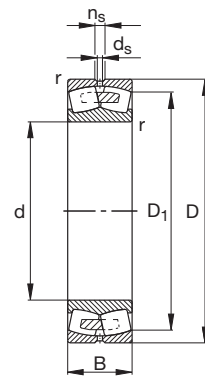
With cylindrical and with tapered bore



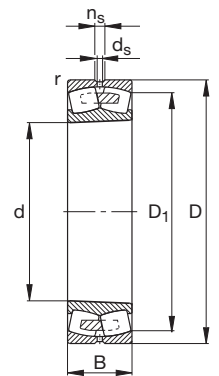
Cylindrical bore  
E1-TVPB



Tapered bore  
E1-K-TVPB



Cylindrical bore  
E1A-M



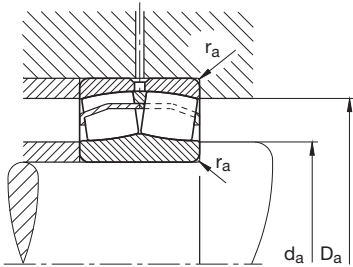
Tapered bore  
E1A-K-M



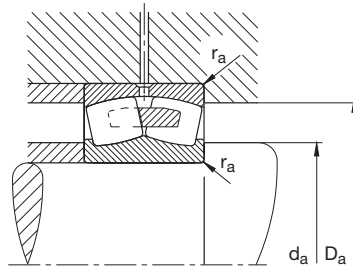
## Spherical roller bearings E1, d = 130–140 mm

Designation	X-life	Mass	Dimensions							
		m ≈ kg	d	D	B	r	D <sub>1</sub>	d <sub>2</sub>	d <sub>s</sub>	n <sub>s</sub>
						min.	≈	≈		
23026-E1A-M	XL	5,96	130	200	52	2	182,3	–	4,8	9,5
23026-E1-TVPB	XL	5,61	130	200	52	2	182,3	145,9	4,8	9,5
24026-E1	XL	8	130	200	69	2	176,1	146,2	3,2	6,5
23126-E1A-M	XL	8,45	130	210	64	2	187,3	–	4,8	9,5
23126-E1-TVPB	XL	8,11	130	210	64	2	187,3	146	4,8	9,5
24126-E1	XL	10,8	130	210	80	2	181,5	148,4	3,2	6,5
22226-E1	XL	11,3	130	230	64	3	205	151,7	6,3	12,2
23226-E1A-M	XL	14	130	230	80	3	199,3	–	4,8	9,5
23226-E1-TVPB	XL	13,4	130	230	80	3	199,3	150	4,8	9,5
22326-E1	XL	28	130	280	93	4	239,5	162,2	9,5	17,7
23028-E1A-M	XL	6,45	140	210	53	2	192,3	–	4,8	9,5
23028-E1-TVPB	XL	6,04	140	210	53	2	192,3	155,4	4,8	9,5
24028-E1	XL	8,5	140	210	69	2	186,8	157,1	3,2	6,5
23128-E1A-M	XL	10,4	140	225	68	2,1	201	–	4,8	9,5
23128-E1-TVPB	XL	9,81	140	225	68	2,1	201	157,1	4,8	9,5
24128-E1	XL	13,1	140	225	85	2,1	194,8	158,9	4,8	9,5
22228-E1	XL	14,2	140	250	68	3	223,4	164,9	6,3	12,2
23228-E1A-M	XL	18,3	140	250	88	3	216	–	6,3	12,2
23228-E1-TVPB	XL	17,7	140	250	88	3	216	162	6,3	12,2
22328-E1	XL	35,1	140	300	102	4	255,7	173,5	9,5	17,7

Spherical roller bearings E1 are also available with a tapered bore, e. g. 23126-E1A-K-M.



Mounting dimensions  
E1(-TVPB)



Mounting dimensions  
E1A-M

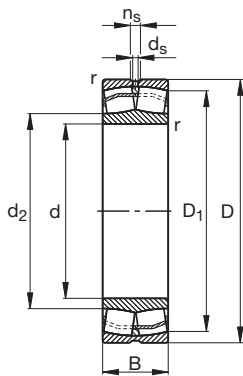
Mounting dimensions			Basic load ratings		Calculation factors				Fatigue limit load	Limiting speed	Reference speed
$d_a$	$D_a$	$r_a$	dyn.	stat.	$e$	$Y_1$	$Y_2$	$Y_0$	$C_{ur}$	$n_G$	$n_B$
min.	max.	max.	N	N					N	min <sup>-1</sup>	min <sup>-1</sup>
138,8	191,2	2	540 000	730 000	0,23	2,95	4,4	2,89	70 000	3 600	2 600
138,8	191,2	2	540 000	730 000	0,23	2,95	4,4	2,89	70 000	3 600	2 600
138,8	191,2	2	570 000	860 000	0,28	2,21	3,29	2,16	101 000	3 000	2 130
141	199	2	680 000	890 000	0,28	2,45	3,64	2,39	79 000	3 000	2 110
141	199	2	680 000	890 000	0,28	2,45	3,64	2,39	79 000	3 000	2 110
141	199	2	710 000	1 050 000	0,32	1,98	2,94	1,93	110 000	2 600	1 590
144	216	2,5	760 000	890 000	0,26	2,62	3,9	2,56	79 000	3 000	2 500
144	216	2,5	910 000	1 150 000	0,33	2,07	3,09	2,03	89 000	2 600	1 740
144	216	2,5	910 000	1 150 000	0,33	2,07	3,09	2,03	89 000	2 600	1 740
147	263	3	1 250 000	1 370 000	0,33	2,06	3,06	2,01	117 000	2 400	1 820
148,8	201,2	2	570 000	800 000	0,22	3,07	4,57	3	76 000	3 600	2 390
148,8	201,2	2	570 000	800 000	0,22	3,07	4,57	3	76 000	3 600	2 390
148,8	201,2	2	590 000	930 000	0,27	2,37	3,53	2,32	109 000	3 400	1 950
152	213	2,1	760 000	1 010 000	0,27	2,49	3,71	2,43	88 000	2 800	1 930
152	213	2,1	760 000	1 010 000	0,27	2,49	3,71	2,43	88 000	2 800	1 930
152	213	2,1	800 000	1 190 000	0,32	1,99	2,96	1,94	124 000	2 400	1 430
154	236	2,5	870 000	1 040 000	0,25	2,67	3,97	2,61	97 000	2 400	2 250
154	236	2,5	1 090 000	1 400 000	0,33	2,04	3,04	2	113 000	2 400	1 550
154	236	2,5	1 090 000	1 400 000	0,33	2,04	3,04	2	113 000	2 400	1 550
157	283	3	1 460 000	1 630 000	0,34	2	2,98	1,96	132 000	2 200	1 660

Spherical roller bearings E1 are also available with a tapered bore, e. g. 24026-E1-K30.

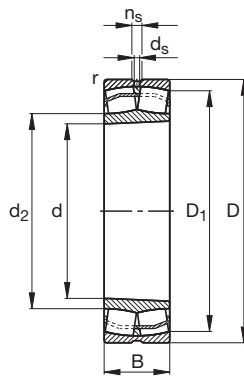
Spherical roller bearings 223..-E1 are also available in a special design for oscillating load, e. g. 22328-E1-T41D.

# Spherical roller bearings E1

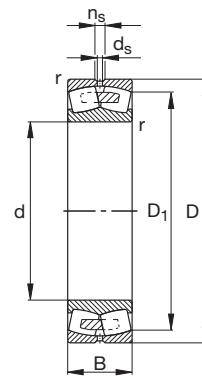
With cylindrical and with tapered bore



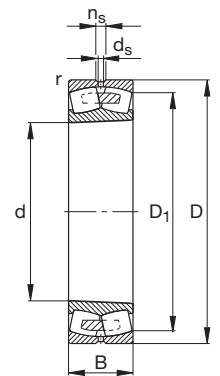
Cylindrical bore  
E1(-TVPB)



Tapered bore  
E1-K(-TVPB)



Cylindrical bore  
E1A-M



Tapered bore  
E1A-K-M

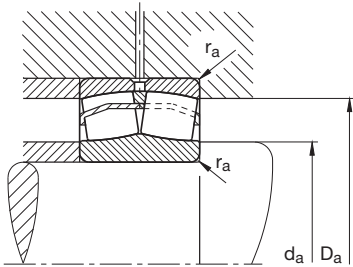


## Spherical roller bearings E1, d = 150–160 mm

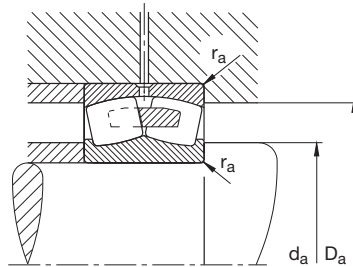
Designation	X-life	Mass	Dimensions							
		m ≈ kg	d	D	B	r	D <sub>1</sub>	d <sub>2</sub>	d <sub>s</sub>	n <sub>s</sub>
						min.	≈	≈		
23030-E1A-M	XL	7,83	150	225	56	2,1	206,3	–	4,8	9,5
23030-E1-TVPB	XL	7,63	150	225	56	2,1	206,3	166,6	4,8	9,5
24030-E1	XL	10,6	150	225	75	2,1	199,7	168,1	3,2	6,5
23130-E1A-M	XL	16,2	150	250	80	2,1	220,8	–	6,3	12,2
23130-E1-TVPB	XL	15	150	250	80	2,1	220,8	170,2	6,3	12,2
24130-E1	XL	19,8	150	250	100	2,1	213,0	170,4	4,8	9,5
22230-E1	XL	18,2	150	270	73	3	240,8	177,9	8	15
23230-E1A-M	XL	23,7	150	270	96	3	232,6	–	6,3	12,2
23230-E1-TVPB	XL	22,9	150	270	96	3	232,6	174	6,3	12,2
22330-E1	XL	42,2	150	320	108	4	273,2	185,3	9,5	17,7
23032-E1A-M	XL	9,71	160	240	60	2,1	219,9	–	6,3	12,2
23032-E1-TVPB	XL	8,97	160	240	60	2,1	219,9	177,5	6,3	12,2
24032-E1	XL	12,9	160	240	80	2,1	212,9	179,2	4,8	9,5
23132-E1A-M	XL	20	160	270	86	2,1	238,3	–	8	15
23132-E1-TVPB	XL	19,1	160	270	86	2,1	238,3	183,2	8	15
24132-E1	XL	25,6	160	270	109	2,1	228,9	183,6	4,8	9,5
22232-E1	XL	23,3	160	290	80	3	258,2	190,9	8	15
23232-E1A-M	XL	29,8	160	290	104	3	249,3	–	8	15
23232-E1-TVPB	XL	28,6	160	290	104	3	249,3	186,7	8	15
22332-E1	XL	49,3	160	340	114	4	286,7	201,1	9,5	17,7

Spherical roller bearings E1 are also available with a tapered bore, e. g. 23130-E1A-K-M.





Mounting dimensions  
E1(-TVPB)



Mounting dimensions  
E1A-M

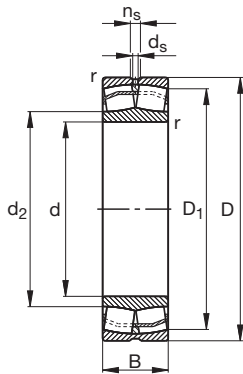
Mounting dimensions			Basic load ratings		Calculation factors				Fatigue limit load	Limiting speed	Reference speed
$d_a$	$D_a$	$r_a$	dyn.	stat.	$e$	$Y_1$	$Y_2$	$Y_0$	$C_{ur}$	$n_G$	$n_B$
min.	max.	max.	N	N					N	min <sup>-1</sup>	min <sup>-1</sup>
160,2	214,8	2,1	630 000	880 000	0,22	3,1	4,62	3,03	85 000	3 400	2 210
160,2	214,8	2,1	630 000	880 000	0,22	3,1	4,62	3,03	85 000	3 400	2 210
160,2	214,8	2,1	680 000	1 090 000	0,27	2,32	3,45	2,26	123 000	2 800	1 790
162	238	2,1	1 000 000	1 330 000	0,29	2,32	3,45	2,26	143 000	2 600	1 720
162	238	2,1	1 000 000	1 330 000	0,29	2,32	3,45	2,26	143 000	2 600	1 720
162	238	2,1	1 050 000	1 520 000	0,34	1,83	2,72	1,79	149 000	2 200	1 270
164	256	2,5	1 010 000	1 210 000	0,25	2,69	4	2,63	111 000	2 600	2 050
164	256	2,5	1 280 000	1 660 000	0,33	2,02	3	1,97	129 000	2 200	1 400
164	256	2,5	1 280 000	1 660 000	0,33	2,02	3	1,97	129 000	2 200	1 400
167	303	3	1 640 000	1 850 000	0,33	2,02	3	1,97	148 000	2 000	1 520
170,2	229,8	2,1	720 000	1 010 000	0,22	3,1	4,62	3,03	94 000	2 800	2 060
170,2	229,8	2,1	720 000	1 010 000	0,22	3,1	4,62	3,03	94 000	2 800	2 060
170,2	229,8	2,1	770 000	1 240 000	0,27	2,32	3,45	2,26	137 000	2 600	1 660
172	258	2,1	1 160 000	1 550 000	0,29	2,32	3,45	2,26	164 000	2 400	1 560
172	258	2,1	1 160 000	1 550 000	0,29	2,32	3,45	2,26	164 000	2 400	1 560
172	258	2,1	1 220 000	1 800 000	0,35	1,8	2,69	1,76	168 000	1 800	1 140
174	276	2,5	1 150 000	1 400 000	0,26	2,64	3,93	2,58	125 000	2 600	1 900
174	276	2,5	1 460 000	1 910 000	0,34	2	2,98	1,96	146 000	2 200	1 280
174	276	2,5	1 460 000	1 910 000	0,34	2	2,98	1,96	146 000	2 200	1 280
177	323	3	1 680 000	1 990 000	0,35	1,94	2,88	1,89	158 000	2 100	1 460

Spherical roller bearings E1 are also available with a tapered bore, e. g. 24030-E1-K30.

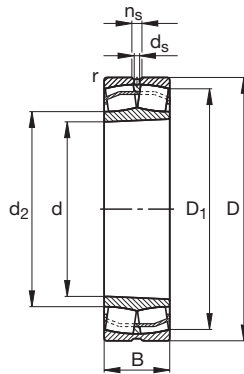
Spherical roller bearings 223..-E1 are also available in a special design for oscillating load, e. g. 22330-E1-T41D.

# Spherical roller bearings E1

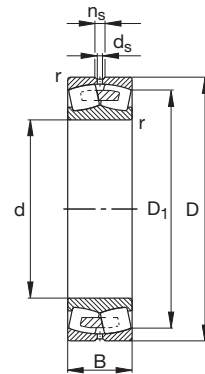
With cylindrical and with tapered bore



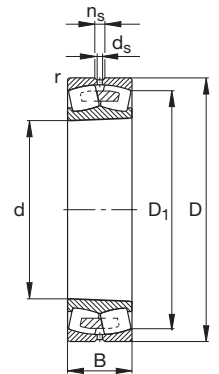
Cylindrical bore  
E1(-TVPB)



Tapered bore  
E1-K(-TVPB)



Cylindrical bore  
E1A-M



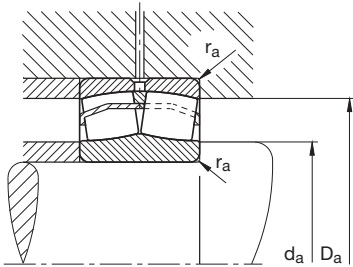
Tapered bore  
E1A-K-M



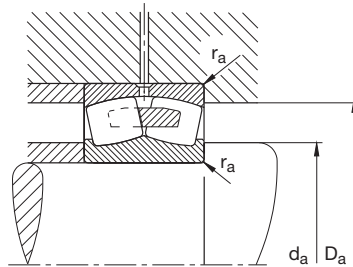
## Spherical roller bearings E1, d = 170–180 mm

Designation	X-life	Mass	Dimensions							
		m ≈ kg	d	D	B	r min.	D <sub>1</sub> ≈	d <sub>2</sub> ≈	d <sub>s</sub>	n <sub>s</sub>
23034-E1A-M	XL	13	170	260	67	2,1	237,2	–	6,3	12,2
23034-E1-TVPB	XL	12,3	170	260	67	2,1	237,2	189,8	6,3	12,2
24034-E1	XL	17,5	170	260	90	2,1	228,8	190	4,8	9,5
23134-E1A-M	XL	22,1	170	280	88	2,1	248,1	–	8	15
23134-E1-TVPB	XL	20,7	170	280	88	2,1	248,1	193,4	8	15
24134-E1	XL	26,8	170	280	109	2,1	240,0	194,2	4,8	9,5
22234-E1	XL	27,8	170	310	86	4	275,4	199,8	9,5	17,7
23234-E1A-M	XL	36,5	170	310	110	4	267,4	–	8	15
23234-E1-TVPB	XL	34,9	170	310	110	4	267,4	199,8	8	15
22334-E1	XL	57,9	170	360	120	4	303,7	213,1	9,5	17,7
23036-E1A-M	XL	16,8	180	280	74	2,1	254,3	–	8	15
23036-E1-TVPB	XL	15,9	180	280	74	2,1	254,3	201,8	8	15
24036-E1	XL	23,1	180	280	100	2,1	244,6	201,7	4,8	9,5
23136-E1A-M	XL	26,1	180	300	96	3	264,8	–	8	15
23136-E1-TVPB	XL	27,3	180	300	96	3	264,8	204,1	8	15
24136-E1	XL	33,6	180	300	118	3	256,2	204,9	6,3	12,2
22236-E1	XL	29,2	180	320	86	4	285,9	211,3	9,5	17,7
23236-E1A-M	XL	38,5	180	320	112	4	277,3	–	8	15
23236-E1-TVPB	XL	37,2	180	320	112	4	277,3	210,6	8	15
22336-E1	XL	67,7	180	380	126	4	320,8	224,9	12,5	23,5

Spherical roller bearings E1 are also available with a tapered bore, e. g. 23234-E1A-K-M.



Mounting dimensions  
E1(-TVPB)



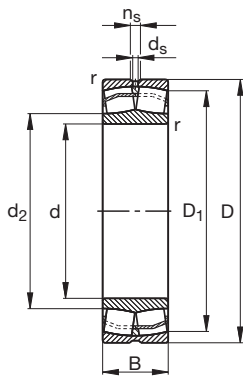
Mounting dimensions  
E1A-M

Mounting dimensions			Basic load ratings		Calculation factors				Fatigue limit load	Limiting speed	Reference speed
$d_a$	$D_a$	$r_a$	dyn.	stat.	$e$	$Y_1$	$Y_2$	$Y_0$	$C_{ur}$	$n_G$	$n_B$
min.	max.	max.	N	N					N	min <sup>-1</sup>	min <sup>-1</sup>
180,2	249,8	2,1	880 000	1 230 000	0,23	2,98	4,44	2,92	146 000	2 600	1 890
180,2	249,8	2,1	870 000	1 230 000	0,23	2,98	4,44	2,92	146 000	2 600	1 890
180,2	249,8	2,1	940 000	1 480 000	0,31	2,2	3,27	2,15	159 000	2 400	1 540
182	268	2,1	1 220 000	1 690 000	0,28	2,37	3,53	2,32	174 000	2 400	1 460
182	268	2,1	1 220 000	1 690 000	0,28	2,37	3,53	2,32	174 000	2 400	1 460
182	268	2,1	1 260 000	1 900 000	0,36	1,9	2,83	1,86	179 000	1 800	1 060
187	293	3	1 320 000	1 570 000	0,26	2,6	3,87	2,54	140 000	2 400	1 780
187	293	3	1 640 000	2 170 000	0,33	2,03	3,02	1,98	163 000	2 000	1 160
187	293	3	1 640 000	2 170 000	0,33	2,03	3,02	1,98	163 000	2 000	1 160
187	343	3	1 870 000	2 220 000	0,35	1,95	2,9	1,91	174 000	2 100	1 350
190,2	269,8	2,1	1 040 000	1 450 000	0,23	2,9	4,31	2,83	170 000	2 600	1 760
190,2	269,8	2,1	1 040 000	1 450 000	0,23	2,9	4,31	2,83	170 000	2 600	1 760
190,2	269,8	2,1	1 130 000	1 770 000	0,3	2,1	3,13	2,06	181 000	2 200	1 420
194	286	2,5	1 420 000	1 950 000	0,29	2,32	3,45	2,26	196 000	2 200	1 350
194	286	2,5	1 420 000	1 950 000	0,29	2,32	3,45	2,26	196 000	2 200	1 350
194	286	2,5	1 460 000	2 170 000	0,34	1,86	2,77	1,82	203 000	1 700	980
197	303	3	1 360 000	1 680 000	0,25	2,71	4,04	2,65	148 000	2 400	1 670
197	303	3	1 710 000	2 340 000	0,33	2,07	3,09	2,03	173 000	2 000	1 090
197	303	3	1 710 000	2 340 000	0,33	2,07	3,09	2,03	173 000	2 000	1 090
197	363	3	2 060 000	2 460 000	0,34	1,96	2,92	1,92	191 000	1 960	1 250

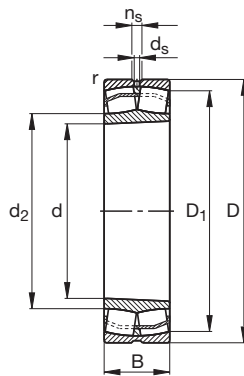
Spherical roller bearings E1 are also available with a tapered bore, e. g. 23136-E1-K-TVPB.  
Spherical roller bearings E1 are also available with a tapered bore, e. g. 24136-E1-K30.

# Spherical roller bearings E1

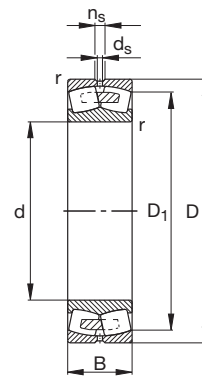
With cylindrical and with tapered bore



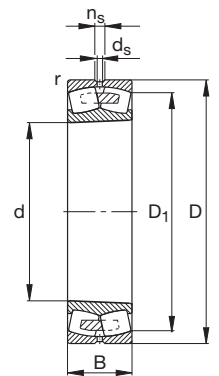
Cylindrical bore  
E1(-TVPB)



Tapered bore  
E1-K(-TVPB)



Cylindrical bore  
E1A-M



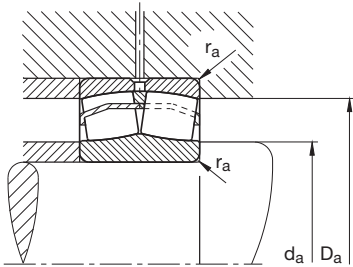
Tapered bore  
E1A-K-M



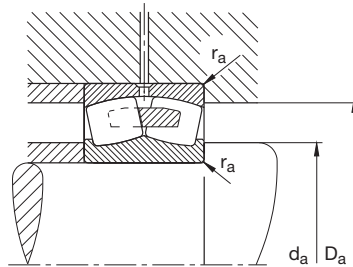
## Spherical roller bearings E1, $d = 190-220$ mm

Designation	X-life	Mass	Dimensions							
		m ≈ kg	d	D	B	r	D <sub>1</sub>	d <sub>2</sub>	d <sub>s</sub>	n <sub>s</sub>
						min.	≈	≈		
23038-E1A-M	XL	18,3	190	290	75	2,1	264,5	-	8	15
23038-E1-TVPB	XL	17,2	190	290	75	2,1	264,5	211,9	8	15
24038-E1	XL	24,1	190	290	100	2,1	255,5	212	4,8	9,5
23138-E1A-M	XL	33,9	190	320	104	3	281,6	-	8	15
23138-E1-TVPB	XL	32	190	320	104	3	281,6	217	8	15
24138-E1	XL	42,1	190	320	128	3	271,6	217,5	6,3	12,2
22238-E1	XL	35,7	190	340	92	4	295,2	225,2	9,5	17,7
23238-E1	XL	46,6	190	340	120	4	289	222,4	9,5	17,7
22338-E1	XL	78,2	190	400	132	5	338	236,7	12,5	23,5
23040-E1A-M	XL	22,8	200	310	82	2,1	281,6	-	8	15
23040-E1-TVPB	XL	21,5	200	310	82	2,1	281,6	223,4	8	15
24040-E1	XL	30,7	200	310	109	2,1	271,6	223,7	6,3	12,2
23140-E1	XL	41,1	200	340	112	3	295,7	230,4	9,5	17,7
24140-E1	XL	51,3	200	340	140	3	287,9	227	6,3	12,2
22240-E1	XL	42,8	200	360	98	4	311,9	238,2	9,5	17,7
23240-E1	XL	56,1	200	360	128	4	305,3	235	9,5	17,7
22340-E1	XL	89,8	200	420	138	5	354,9	248,8	12,5	23,5
23044-E1	XL	29,4	220	340	90	3	304,3	248,8	8	15
24044-E1	XL	39	220	340	118	3	297,5	245	6,3	12,2
23144-E1	XL	51,8	220	370	120	4	322,8	254,7	9,5	17,7
24144-E1	XL	63,9	220	370	150	4	314,3	247,6	6,3	12,2
22244-E1	XL	58,6	220	400	108	4	346,6	260,1	9,5	17,7
23244-E1	XL	78,2	220	400	144	4	338	255,8	9,5	17,7
22344-E1	XL	113	220	460	145	5	391,1	273,4	12,5	23,5

Spherical roller bearings E1 are also available with a tapered bore, e. g. 24038-E1-K30.



Mounting dimensions  
E1(-TVPB)



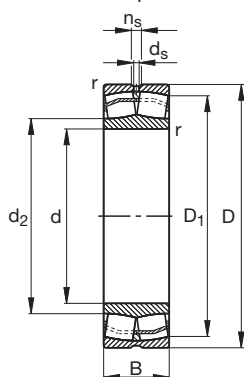
Mounting dimensions  
E1A-M

Mounting dimensions			Basic load ratings		Calculation factors				Fatigue limit load	Limiting speed	Reference speed
$d_a$	$D_a$	$r_a$	dyn.	stat.	$e$	$Y_1$	$Y_2$	$Y_0$	$C_{ur}$	$n_G$	$n_B$
min.	max.	max.	N	N					N	min <sup>-1</sup>	min <sup>-1</sup>
200,2	279,8	2,1	1 080 000	1 550 000	0,23	2,98	4,44	2,92	180 000	2 400	1 660
200,2	279,8	2,1	1 080 000	1 550 000	0,23	2,98	4,44	2,92	180 000	2 400	1 660
200,2	279,8	2,1	1 160 000	1 860 000	0,29	2,2	3,27	2,15	192 000	2 200	1 330
204	306	2,5	1 610 000	2 220 000	0,3	2,28	3,39	2,23	218 000	2 000	1 260
204	306	2,5	1 610 000	2 220 000	0,3	2,28	3,39	2,23	218 000	2 000	1 260
204	306	2,5	1 680 000	2 550 000	0,35	1,82	2,7	1,78	226 000	1 400	880
207	323	3	1 360 000	1 760 000	0,26	2,6	3,87	2,54	159 000	2 380	1 640
207	323	3	1 740 000	2 400 000	0,34	1,98	2,94	1,93	200 000	2 100	1 090
210	380	4	2 260 000	2 700 000	0,34	1,96	2,92	1,92	208 000	1 820	1 170
210,2	299,8	2,1	1 270 000	1 800 000	0,23	2,9	4,31	2,83	203 000	2 400	1 550
210,2	299,8	2,1	1 270 000	1 800 000	0,23	2,9	4,31	2,83	203 000	2 400	1 550
210,2	299,8	2,1	1 350 000	2 150 000	0,3	2,13	3,17	2,08	216 000	2 000	1 240
214	326	2,5	1 610 000	2 270 000	0,32	2,1	3,13	2,06	188 000	2 100	1 250
214	326	2,5	1 880 000	2 800 000	0,39	1,71	2,54	1,67	250 000	1 330	850
217	343	3	1 520 000	1 990 000	0,26	2,57	3,83	2,52	175 000	2 240	1 530
217	343	3	1 940 000	2 700 000	0,35	1,95	2,9	1,91	220 000	1 960	1 010
220	400	4	2 440 000	2 950 000	0,34	1,98	2,94	1,93	226 000	1 820	1 100
232	328	2,5	1 260 000	1 900 000	0,24	2,81	4,19	2,75	177 000	2 240	1 470
232	328	2,5	1 620 000	2 600 000	0,32	2,1	3,13	2,06	255 000	1 680	1 100
237	353	3	1 860 000	2 700 000	0,31	2,15	3,2	2,10	217 000	1 960	1 100
237	353	3	2 190 000	3 250 000	0,39	1,74	2,59	1,70	290 000	1 260	760
237	383	3	1 840 000	2 360 000	0,26	2,57	3,83	2,52	210 000	2 100	1 360
237	383	3	2 380 000	3 300 000	0,36	1,9	2,83	1,86	265 000	1 680	890
240	440	4	2 800 000	3 400 000	0,33	2,06	3,06	2,01	265 000	1 680	970

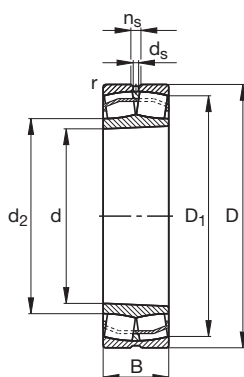
Spherical roller bearings E1 are also available with a tapered bore, e. g. 23040-E1-K-TVPB.

# Spherical roller bearings E1

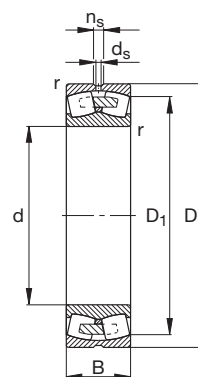
With cylindrical and with tapered bore



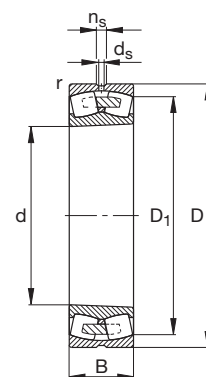
Cylindrical bore  
E1



Tapered bore  
E1-K(30)



Cylindrical bore  
E1A-MB1



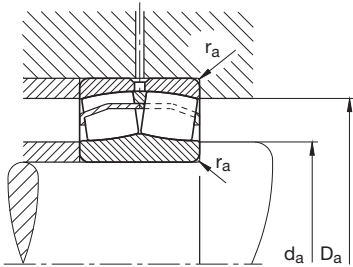
Tapered bore  
E1A-K(30)-MB1



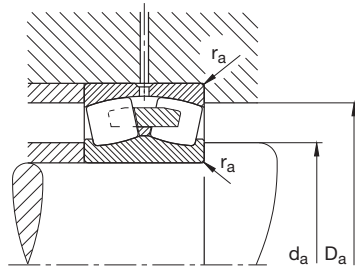
## Spherical roller bearings E1, $d = 240-300$ mm

Designation	X-life	Mass	Dimensions							
		m ≈ kg	d	D	B	r min.	D <sub>1</sub> ≈	d <sub>2</sub> ≈	d <sub>s</sub>	n <sub>s</sub>
23048-E1	XL	32,2	240	360	92	3	324,6	269,5	8	15
24048-E1	XL	42,2	240	360	118	3	319	268,5	6,3	12,2
23148-E1	XL	63,6	240	400	128	4	349,8	275,9	9,5	17,7
24148-E1	XL	79,3	240	400	160	4	338,9	267,3	6,3	12,2
22248-E1	XL	78,9	240	440	120	4	380,4	285,6	12,5	23,5
23248-E1	XL	106	240	440	160	4	370,8	280,8	12,5	23,5
22348-E1A-MB1	XL	148	240	500	155	5	425,9	–	12,5	23,5
23052-E1	XL	46,9	260	400	104	4	358,7	295,5	9,5	17,7
24052-E1	XL	63,6	260	400	140	4	350	288,3	6,3	12,2
23152-E1	XL	89,2	260	440	144	4	382,6	301,6	9,5	17,7
24152-E1	XL	111	260	440	180	4	369,9	292,2	8	15
22252-E1A-MB1	XL	105	260	480	130	5	415,1	–	12,5	23,5
23252-E1A-MB1	XL	139	260	480	174	5	404,3	–	12,5	23,5
22352-E1A-MB1	XL	184	260	540	165	6	460,6	–	12,5	23,5
23056-E1	XL	50,4	280	420	106	4	378,9	314,3	9,5	17,7
24056-E1	XL	67,7	280	420	140	4	371,5	310,3	6,3	12,2
23156-E1	XL	95,4	280	460	146	5	403,1	321,4	9,5	17,7
24156-E1	XL	117	280	460	180	5	391,8	312,8	8	15
22256-E1A-MB1	XL	110	280	500	130	5	436	–	12,5	23,5
23256-E1A-MB1	XL	148	280	500	176	5	425,4	–	12,5	23,5
22356-E1A-MB1	XL	225	280	580	175	6	495,5	–	12,5	23,5
23060-E1	XL	69,7	300	460	118	4	413	339,9	9,5	17,7
24060-E1	XL	95,8	300	460	160	4	403	334,8	8	15
23160-E1A-MB1	XL	127	300	500	160	5	436,6	–	9,5	17,7
24160-E1	XL	155	300	500	200	5	422,8	–	8	15
22260-E1A-MB1	XL	140	300	540	140	5	470,5	–	12,5	23,5
23260-E1A-MB1	XL	191	300	540	192	5	458	–	12,5	23,5

Spherical roller bearings E1 are also available with a tapered bore, e. g. 22252-E1A-K-MB1.



Mounting dimensions  
E1



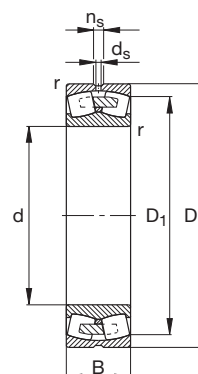
Mounting dimensions  
E1A-MB1

Mounting dimensions			Basic load ratings		Calculation factors				Fatigue limit load	Limiting speed	Reference speed
$d_a$	$D_a$	$r_a$	dyn.	stat.	$e$	$Y_1$	$Y_2$	$Y_0$	$C_{ur}$	$n_G$	$n_B$
min.	max.	max.	N	N					N	min <sup>-1</sup>	min <sup>-1</sup>
252	348	2,5	1 350 000	2 120 000	0,23	2,98	4,44	2,92	194 000	2 240	1 330
252	348	2,5	1 670 000	2 850 000	0,3	2,28	3,39	2,23	275 000	1 680	990
257	383	3	2 130 000	3 150 000	0,31	2,18	3,24	2,13	248 000	1 820	980
257	383	3	2 600 000	3 900 000	0,39	1,71	2,54	1,67	335 000	1 050	660
257	423	3	2 230 000	2 900 000	0,26	2,55	3,8	2,50	247 000	1 960	1 210
257	423	3	2 850 000	4 000 000	0,36	1,87	2,79	1,83	310 000	1 400	780
260	480	4	3 200 000	4 050 000	0,32	2,12	3,15	2,07	305 000	1 400	850
275	385	3	1 670 000	2 600 000	0,23	2,9	4,31	2,83	233 000	2 100	1 200
275	385	3	2 210 000	3 650 000	0,32	2,09	3,11	2,04	335 000	1 330	890
277	423	3	2 600 000	3 900 000	0,32	2,12	3,15	2,07	290 000	1 540	870
277	423	3	3 150 000	4 900 000	0,4	1,67	2,49	1,63	390 000	940	570
280	460	4	2 600 000	3 450 000	0,26	2,57	3,83	2,52	290 000	1 680	1 080
280	460	4	3 350 000	4 750 000	0,36	1,87	2,79	1,83	360 000	1 330	690
286	514	5	3 650 000	4 650 000	0,31	2,15	3,2	2,1	350 000	1 330	770
295	405	3	1 780 000	2 850 000	0,22	3,01	4,48	2,94	255 000	1 960	1 100
295	405	3	2 290 000	3 950 000	0,3	2,23	3,32	2,18	360 000	1 330	810
300	440	4	2 750 000	4 200 000	0,31	2,21	3,29	2,16	315 000	1 400	810
300	440	4	3 300 000	5 200 000	0,38	1,76	2,62	1,72	425 000	940	520
300	480	4	2 750 000	3 700 000	0,25	2,71	4,04	2,65	310 000	1 680	1 000
300	480	4	3 550 000	5 200 000	0,34	1,96	2,92	1,92	385 000	1 330	630
306	554	5	4 150 000	5 300 000	0,31	2,18	3,24	2,13	395 000	1 260	690
315	445	3	2 160 000	3 450 000	0,23	2,92	4,35	2,86	295 000	1 820	1 000
315	445	3	2 850 000	4 900 000	0,32	2,12	3,15	2,07	425 000	1 120	730
320	480	4	3 250 000	4 950 000	0,31	2,18	3,24	2,13	365 000	1 330	730
320	480	4	3 950 000	6 400 000	0,39	1,72	2,56	1,68	485 000	780	455
320	520	4	3 100 000	4 250 000	0,25	2,71	4,04	2,65	355 000	1 540	920
320	520	4	4 100 000	6 100 000	0,35	1,92	2,86	1,88	440 000	1 190	570

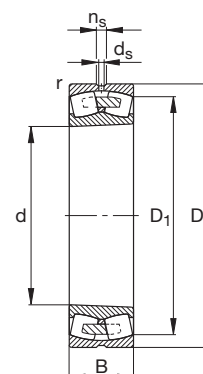
Spherical roller bearings E1 are also available with a tapered bore, e. g. 24152-E1-K30.  
Spherical roller bearings E1 are also available with a tapered bore, e. g. 23156-E1-K.

# Spherical roller bearings E1

With cylindrical and with tapered bore



Cylindrical bore  
E1A-MB1



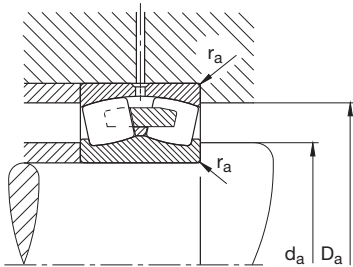
Tapered bore  
E1A-K(30)-MB1

## Spherical roller bearings E1, d = 320–400 mm

Designation	X-life	Mass	Dimensions						
		m ≈ kg	d	D	B	r min.	D <sub>1</sub> ≈	d <sub>s</sub>	n <sub>s</sub>
23064-E1A-MB1	XL	77,1	320	480	121	4	433	9,5	17,7
24064-E1A-MB1	XL	101	320	480	160	4	424,6	8	15
23164-E1A-MB1	XL	166	320	540	176	5	469,3	12,5	23,5
24164-E1	XL	199	320	540	218	5	455,2	9,5	17,7
22264-E1A-MB1	XL	172	320	580	150	5	505,1	12,5	23,5
23264-E1A-MB1	XL	241	320	580	208	5	490,7	12,5	23,5
23068-E1A-MB1	XL	102	340	520	133	5	467,1	12,5	23,5
24068-E1A-MB1	XL	138	340	520	180	5	456,1	9,5	17,7
23168-E1A-MB1	XL	208	340	580	190	5	502,6	12,5	23,5
24168-E1	XL	257	340	580	243	5	484,1	9,5	17,7
23268-E1A-MB1	XL	298	340	620	224	6	523,5	12,5	23,5
23072-E1A-MB1	XL	108	360	540	134	5	487,6	12,5	23,5
24072-E1A-MB1	XL	144	360	540	180	5	477,6	9,5	17,7
23172-E1A-MB1	XL	219	360	600	192	5	523,3	12,5	23,5
24172-E1	XL	270	360	600	243	5	505,9	9,5	17,7
22272-E1A-MB1	XL	248	360	650	170	6	566	12,5	23,5
23272-E1A-MB1	XL	339	360	650	232	6	550,8	12,5	23,5
23076-E1A-MB1	XL	114	380	560	135	5	508,1	12,5	23,5
24076-E1A-MB1	XL	152	380	560	180	5	499	9,5	17,7
23176-E1A-MB1	XL	232	380	620	194	5	543,6	12,5	23,5
24176-E1	XL	283	380	620	243	5	527,6	9,5	17,7
23276-E1A-MB1	XL	380	380	680	240	6	578,1	12,5	23,5
23080-E1A-MB1	XL	147	400	600	148	5	541,9	12,5	23,5
24080-E1A-MB1	XL	197	400	600	200	5	530,7	12,5	23,5
23180-E1A-MB1	XL	260	400	650	200	6	571,4	12,5	23,5
24180-E1	XL	320	400	650	250	6	555,8	12,5	23,5
23280-E1A-MB1	XL	459	400	720	256	6	610,9	12,5	23,5
22380-E1A-MB1	XL	620	400	820	243	7,5	700,9	12,5	23,5

Spherical roller bearings E1 are also available with a tapered bore, e. g. 23168-E1A-K-MB1.





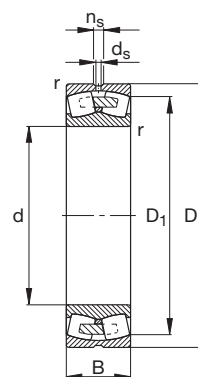
Mounting dimensions

Mounting dimensions			Basic load ratings		Calculation factors				Fatigue limit load	Limiting speed	Reference speed
$d_a$	$D_a$	$r_a$	dyn.	stat.	$e$	$Y_1$	$Y_2$	$Y_0$	$C_{ur}$	$n_G$	$n_B$
min.	max.	max.	N	N					N	min <sup>-1</sup>	min <sup>-1</sup>
335	465	3	2 300 000	3 750 000	0,22	3,01	4,48	2,94	320 000	1 680	930
335	465	3	2 950 000	5 200 000	0,3	2,23	3,32	2,18	455 000	1 120	680
340	520	4	3 800 000	5 900 000	0,32	2,13	3,17	2,08	415 000	1 260	660
340	520	4	4 600 000	7 300 000	0,4	1,69	2,52	1,65	560 000	740	415
340	560	4	3 550 000	4 700 000	0,25	2,71	4,04	2,65	395 000	1 400	850
340	560	4	4 650 000	7 000 000	0,35	1,91	2,85	1,87	495 000	1 120	520
358	502	4	2 700 000	4 400 000	0,23	2,92	4,35	2,86	365 000	1 540	860
358	502	4	3 550 000	6 200 000	0,32	2,12	3,15	2,07	520 000	980	620
360	560	4	4 350 000	6 600 000	0,32	2,1	3,13	2,06	465 000	1 120	610
360	560	4	5 400 000	8 500 000	0,42	1,61	2,4	1,58	630 000	630	380
366	594	5	5 300 000	7 900 000	0,36	1,85	2,76	1,81	570 000	1 050	480
378	522	4	2 800 000	4 650 000	0,22	3,04	4,53	2,97	390 000	1 400	800
378	522	4	3 650 000	6 600 000	0,3	2,23	3,32	2,18	560 000	980	580
380	580	4	4 550 000	7 100 000	0,31	2,18	3,24	2,13	495 000	1 120	570
380	580	4	5 600 000	9 100 000	0,4	1,69	2,52	1,65	670 000	630	350
386	624	5	4 450 000	6 200 000	0,25	2,69	4	2,63	485 000	1 260	720
386	624	5	5 700 000	8 900 000	0,36	1,9	2,83	1,86	610 000	980	435
398	542	4	2 900 000	5 000 000	0,21	3,17	4,72	3,10	410 000	1 400	750
398	542	4	3 750 000	7 000 000	0,29	2,33	3,47	2,28	590 000	980	540
400	600	4	4 700 000	7 600 000	0,3	2,25	3,34	2,20	530 000	1 050	530
400	600	4	5 800 000	9 700 000	0,38	1,76	2,62	1,72	710 000	670	325
406	654	5	6 200 000	9 600 000	0,35	1,92	2,86	1,88	670 000	940	410
418	582	4	3 400 000	5 700 000	0,22	3,07	4,57	3,00	465 000	1 330	700
418	582	4	4 500 000	8 100 000	0,3	2,23	3,32	2,18	670 000	880	500
426	624	5	5 000 000	8 100 000	0,29	2,3	3,42	2,25	570 000	1 050	500
426	624	5	6 200 000	10 600 000	0,37	1,82	2,7	1,78	760 000	630	300
426	694	5	7 000 000	10 900 000	0,36	1,9	2,83	1,86	730 000	880	375
432	788	6	7 800 000	10 500 000	0,31	2,21	3,29	2,16	710 000	880	420

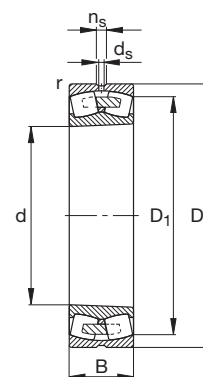
Spherical roller bearings E1 are also available with a tapered bore, e. g. 24072-E1A-K-MB1.  
Spherical roller bearings E1 are also available with a tapered bore, e. g. 23080-E1A-K-MB1.

# Spherical roller bearings E1

With cylindrical and with tapered bore



Cylindrical bore  
E1A-MB1

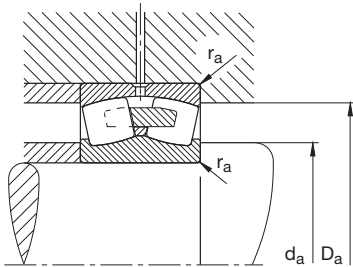


Tapered bore  
E1A-K(30)-MB1

## Spherical roller bearings E1, d = 420–500 mm

Designation	X-life	Mass	Dimensions						
		m ≈ kg	d	D	B	r min.	D <sub>1</sub> ≈	d <sub>s</sub>	n <sub>s</sub>
23084-E1A-MB1	XL	156	420	620	150	5	562,1	12,5	23,5
24084-E1A-MB1	XL	206	420	620	200	5	552,1	12,5	23,5
23184-E1A-MB1	XL	349	420	700	224	6	609,8	12,5	23,5
24184-E1	XL	427	420	700	280	6	591,5	12,5	23,5
23284-E1A-MB1	XL	546	420	760	272	7,5	643,4	12,5	23,5
23088-E1A-MB1	XL	180	440	650	157	6	589,3	12,5	23,5
24088-E1A-MB1	XL	240	440	650	212	6	578	12,5	23,5
23188-E1A-MB1	XL	366	440	720	226	6	630,2	12,5	23,5
24188-E1	XL	442	440	720	280	6	613,7	12,5	23,5
23288-E1A-MB1	XL	602	440	790	280	7,5	670,7	12,5	23,5
23092-E1A-MB1	XL	205	460	680	163	6	616,7	12,5	23,5
24092-E1A-MB1	XL	271	460	680	218	6	605,7	12,5	23,5
23192-E1A-MB1	XL	440	460	760	240	7,5	663,4	12,5	23,5
24192-E1A-MB1	XL	534	460	760	300	7,5	644,6	12,5	23,5
23292-E1A-MB1	XL	708	460	830	296	7,5	703,5	12,5	23,5
23096-E1A-MB1	XL	215	480	700	165	6	636,9	12,5	23,5
24096-E1A-MB1	XL	281	480	700	218	6	627,2	12,5	23,5
23196-E1A-MB1	XL	489	480	790	248	7,5	690,4	12,5	23,5
24196-E1A-MB1	XL	591	480	790	308	7,5	671,8	12,5	23,5
23296-E1A-MB1	XL	819	480	870	310	7,5	737,1	12,5	23,5
230/500-E1A-MB1	XL	225	500	720	167	6	657,1	12,5	23,5
240/500-E1A-MB1	XL	291	500	720	218	6	648,2	12,5	23,5
231/500-E1A-MB1	XL	582	500	830	264	7,5	723,1	12,5	23,5
241/500-E1A-MB1	XL	697	500	830	325	7,5	704,1	12,5	23,5

Spherical roller bearings E1 are also available with a tapered bore, e. g. 23088-E1A-K-MB1.



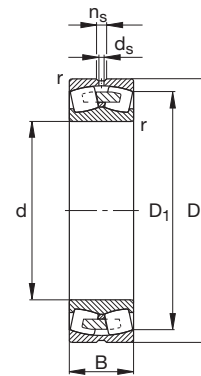
Mounting dimensions

Mounting dimensions			Basic load ratings		Calculation factors				Fatigue limit load	Limiting speed	Reference speed
$d_a$	$D_a$	$r_a$	dyn.	stat.	$e$	$Y_1$	$Y_2$	$Y_0$	$C_{ur}$	$n_G$	$n_B$
min.	max.	max.	N	N					N	min <sup>-1</sup>	min <sup>-1</sup>
438	602	4	3 550 000	6 200 000	0,22	3,14	4,67	3,07	495 000	1 260	660
438	602	4	4 600 000	8 500 000	0,29	2,32	3,45	2,26	700 000	880	470
446	674	5	6 000 000	9 600 000	0,31	2,18	3,24	2,13	650 000	940	460
446	674	5	7 400 000	12 600 000	0,39	1,72	2,56	1,68	870 000	560	270
452	728	6	7 800 000	12 300 000	0,36	1,89	2,81	1,84	800 000	840	345
463	627	5	3 850 000	6 800 000	0,22	3,14	4,67	3,07	540 000	1 190	620
463	627	5	5 100 000	9 500 000	0,29	2,3	3,42	2,25	760 000	840	440
466	694	5	6 200 000	10 200 000	0,3	2,25	3,34	2,20	680 000	940	435
466	694	5	7 600 000	12 900 000	0,38	1,78	2,65	1,74	910 000	560	260
472	758	6	8 300 000	13 200 000	0,35	1,91	2,85	1,87	860 000	840	325
483	657	5	4 200 000	7 400 000	0,21	3,17	4,72	3,10	580 000	1 190	590
483	657	5	5 500 000	10 200 000	0,29	2,33	3,47	2,28	820 000	780	415
492	728	6	6 900 000	11 500 000	0,31	2,21	3,29	2,16	740 000	880	400
492	728	6	8 600 000	14 700 000	0,39	1,75	2,61	1,71	1 000 000	500	239
492	798	6	9 200 000	14 700 000	0,36	1,9	2,83	1,86	940 000	780	300
503	677	5	4 350 000	7 800 000	0,21	3,24	4,82	3,16	610 000	1 120	560
503	677	5	5 600 000	10 700 000	0,28	2,43	3,61	2,37	860 000	780	390
512	758	6	7 400 000	12 400 000	0,3	2,23	3,32	2,18	790 000	840	380
512	758	6	9 100 000	15 700 000	0,38	1,77	2,64	1,73	1 070 000	500	226
512	838	6	10 000 000	16 200 000	0,36	1,9	2,83	1,86	1 010 000	740	280
523	697	5	4 450 000	8 200 000	0,2	3,31	4,92	3,23	640 000	1 120	530
523	697	5	5 700 000	11 100 000	0,27	2,51	3,74	2,45	900 000	780	375
532	798	6	8 300 000	13 900 000	0,31	2,2	3,27	2,15	860 000	780	355
532	798	6	10 100 000	17 400 000	0,38	1,76	2,62	1,72	1 160 000	475	209

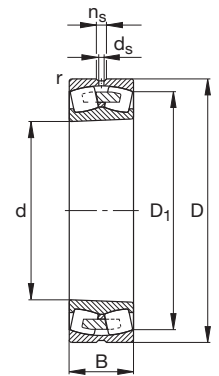
Spherical roller bearings E1 are also available with a tapered bore, e. g. 240/500-E1A-K30-MB1.  
Spherical roller bearings E1 are also available with a tapered bore, e. g. 231/500-E1A-K-MB1.

# Spherical roller bearings E1

With cylindrical and with tapered bore



Cylindrical bore  
E1A-MB1

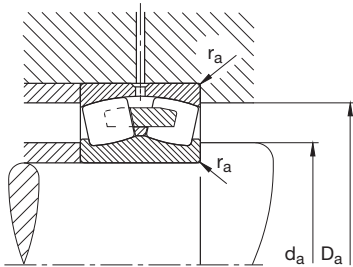


Tapered bore  
E1A-K(30)-MB1

## Spherical roller bearings E1, d = 530–750 mm

Designation	X-life	Mass	Dimensions						
		m ≈ kg	d	D	B	r min.	D <sub>1</sub> ≈	d <sub>s</sub>	n <sub>s</sub>
230/530-E1A-MB1	XL	304	530	780	185	6	708,2	12,5	23,5
240/530-E1A-MB1	XL	406	530	780	250	6	695,6	12,5	23,5
231/530-E1A-MB1	XL	648	530	870	272	7,5	760,5	12,5	23,5
241/530-E1A-MB1	XL	784	530	870	335	7,5	741,6	12,5	23,5
230/560-E1A-MB1	XL	353	560	820	195	6	745	12,5	23,5
240/560-E1A-MB1	XL	461	560	820	258	6	733,8	12,5	23,5
231/560-E1A-MB1	XL	746	560	920	280	7,5	806,6	12,5	23,5
241/560-E1A-MB1	XL	921	560	920	355	7,5	790,4	12,5	23,5
232/560-E1A-MB1	XL	1 360	560	1 030	365	9,5	872,1	12,5	23,5
230/600-E1A-MB1	XL	399	600	870	200	6	793,3	12,5	23,5
240/600-E1A-MB1	XL	539	600	870	272	6	779,9	12,5	23,5
232/600-E1A-MB1	XL	1 610	600	1 090	388	9,5	923,6	12,5	23,5
240/630-E1A-MB1	XL	649	630	920	290	7,5	823,3	12,5	23,5
240/670-E1A-MB1	XL	786	670	980	308	7,5	876,9	12,5	23,5
232/670-E1A-MB1	XL	2 290	670	1 220	438	12	1 032	12,5	23,5
240/750-E1A-MB1	XL	1 050	750	1 090	335	7,5	978,6	12,5	23,5

Spherical roller bearings E1 are also available with a tapered bore, e. g. 230/560-E1A-K-MB1.



Mounting dimensions

Mounting dimensions			Basic load ratings		Calculation factors				Fatigue limit load	Limiting speed	Reference speed
$d_a$	$D_a$	$r_a$	dyn.	stat.	$e$	$Y_1$	$Y_2$	$Y_0$	$C_{ur}$	$n_G$	$n_B$
min.	max.	max.	N	N					N	min <sup>-1</sup>	min <sup>-1</sup>
553	757	5	5 300 000	9 600 000	0,21	3,2	4,77	3,13	730 000	980	490
553	757	5	7 000 000	13 500 000	0,29	2,33	3,47	2,28	1 040 000	700	340
562	838	6	8 900 000	15 000 000	0,3	2,25	3,34	2,20	940 000	780	330
562	838	6	10 800 000	19 300 000	0,37	1,8	2,69	1,76	1 260 000	475	191
583	797	5	5 800 000	10 800 000	0,21	3,2	4,77	3,13	800 000	980	455
583	797	5	7 500 000	14 600 000	0,28	2,39	3,56	2,34	1 130 000	670	315
592	888	6	9 700 000	16 400 000	0,29	2,32	3,45	2,26	1 030 000	740	305
592	888	6	12 100 000	21 200 000	0,37	1,8	2,69	1,76	1 410 000	450	177
600	990	8	13 600 000	21 800 000	0,36	1,89	2,81	1,84	1 350 000	630	223
623	847	5	6 300 000	11 500 000	0,2	3,31	4,92	3,23	880 000	940	425
623	847	5	8 300 000	16 600 000	0,28	2,41	3,59	2,35	1 250 000	630	290
640	1 050	8	15 200 000	25 500 000	0,36	1,9	2,83	1,86	1 490 000	600	198
658	892	6	9 400 000	18 600 000	0,28	2,39	3,56	2,34	1 380 000	600	265
698	952	6	10 500 000	21 100 000	0,28	2,39	3,56	2,34	1 530 000	530	244
718	1 172	10	19 000 000	32 500 000	0,36	1,87	2,79	1,83	1 810 000	530	165
778	1 062	6	12 600 000	25 500 000	0,28	2,45	3,64	2,39	1 840 000	500	209

Spherical roller bearings E1 are also available with a tapered bore, e. g. 241/530-E1A-K30-MB1.  
 Spherical roller bearings E1 are also available with a tapered bore, e. g. 240/750-E1A-K30-MB1.

## Notes



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