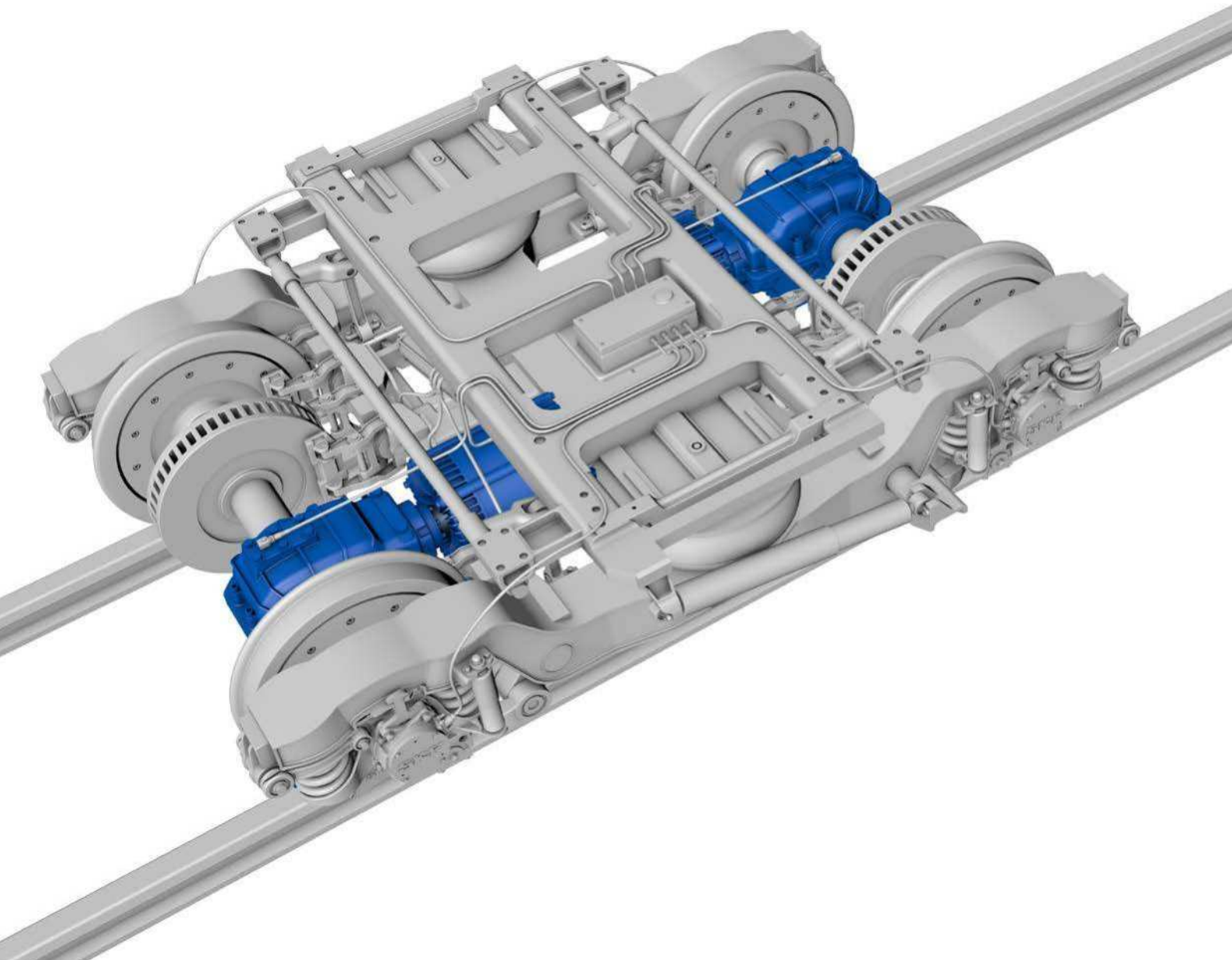


June 1, 2018

SKF®

Drive system bearings

Preferred range – selected for application specific performance and availability



Drive system bearings

SKF, as a leading global supplier, offers the broadest range of products, services and customer solutions to the railway industry. SKF has developed a wide assortment of rolling bearings and services to meet the demanding needs for railway applications.

The railway industry never stands still and improvements and performance are developed daily. Together with our customers, we are always aware of the latest trends in the market place and we are committed to staying completely up-to-date to make sure that the very latest developments are integrated into new products.

Drive systems, such as gearboxes and traction motors for railway trains, have to be powerful, environmentally friendly, cost-effective and require very low needs for maintenance. These requirements are much more stringent than those in many other industries, because of the weight of railway vehicles and the long service intervals for high speed trains.

SKF has a broad and deep knowledge of the railway world and over the years we have developed a unique range of products and solutions for drive systems.

Preferred range

With worldwide presence, SKF is fully aware of customers' needs and strives to meet the latest market demand, combining innovative technology, high quality and value in terms of cost, performance and service.

A comprehensive assortment of drive system bearings is a base for our preferred product range for gearboxes and traction motors in railway applications. Proven products in drive system applications, based on field experience, are included in the list of preferred drive system bearings.

In addition, common bearing suffixes are listed in this brochure as well.

By fulfilling market demand for availability and adequate lead time we strive to meet the expectations of our customers and become the preferred choice supplier for drive system bearings.

Summary

- Proven products for drive system applications
- Based on field experience
- Combination of customer needs and new technology
- Good availability and adequate lead time
- The first choice for drive system applications

General annotations

Other executions of bearings mentioned in the tables might be available on request. This might include different clearance classes, cage executions, notches and/or other design features. Please note that limiting speeds of bearings might vary with different cage types.

Judgement of bearing feasibility and selection of the optimal bearing execution depends on individual application conditions (such as temperatures, shock level, low load operation etc.). That's why it is highly recommended to always contact SKF engineering service when selecting bearings for new or existing applications.





Deep groove ball bearings



Cylindrical roller bearings



INSOCOAT ball bearings



INSOCOAT cylindrical roller bearing



Hybrid ball bearings



Hybrid cylindrical roller bearing



Traction motor ball bearing units



Traction motor cylindrical roller bearing units

Traction Motor Applications

Modern traction motor bearings must deliver higher output shaft speeds, the ability to handle shock loads and resist smearing, while controlling component dead weight. In addition, sensitivity to electrical discharge contributes to the unique design challenges in traction motor design. Based on decades of design and application experience spanning all types of rolling stock, SKF has developed a range of bearings specifically optimised to meet these challenges. INSOCOAT and hybrid bearings offer solutions against electrical discharges, while our comprehensive range of traction motor bearings provide a range of options to meet specific application challenges.

SKF is also well placed to meet the demands for increasing sophistication in traction motor design. Unique sensorised traction motor bearing units and retrofit sensor options offer the possibility to monitor speeds, temperatures, bearing condition and other important operational conditions.

The following pages present a comprehensive selection of bearings specifically selected and proven in traction motor applications. Other executions of bearings mentioned in the tables may be available on request and our experienced team will be delighted to discuss application requirements in detail.

Advanced INSOCOAT layers

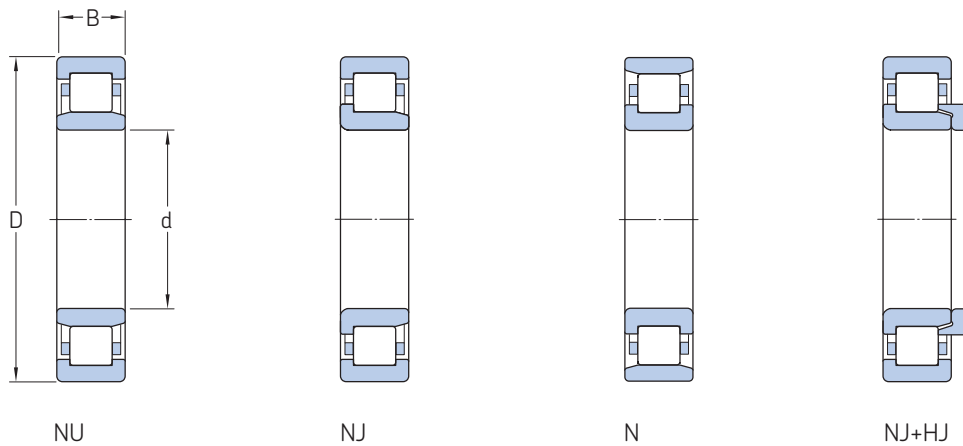
Beside our standard INSOCOAT assortment with VL0241 and VA3091 specification, advanced layers providing improved electrical insulation properties are available on request (VL0246 & VA3096)

Principle bearing types for traction motor applications

- Cylindrical roller bearings
- Electrically insulated INSOCOAT cylindrical roller bearings
- Electrically insulated INSOCOAT deep groove ball bearings
- Hybrid cylindrical roller bearings with ceramic rollers
- Hybrid deep groove ball bearings with ceramic balls
- Traction motor bearing units based on cylindrical roller bearings and deep groove ball bearings
- Sensorised traction motor bearing unit
- Regreasable traction motor bearing unit



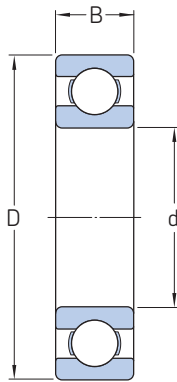
Traction motor – Cylindrical roller bearings



Principal dimensions			Dynamic load rating	Static load rating	Limiting speed	Mass	HJ angle ring available	Designation
d	D	B	C	C ₀				
mm			kN	kN	r/min	kg	—	—
50	110	27	127	112	8 000	1,31	—	NU 310 ECM/C3
60	130	31	173	160	6 700	2,18	*	NJ 312 ECM/C4VA301
65	120	23	122	118	6 700	1,20	—	NU 213 ECM/C4VA301
70	150	35	236	228	5 600	3,23	*	NJ 314 ECM/C4VA301
70	150	35	236	228	5 600	3,17	*	NU 314 ECM/C4VA301
75	160	37	280	265	5 300	3,83	*	NJ 315 ECM/C4VA301
80	170	39	300	290	5 000	4,51	*	NJ 316 ECM/C4VA301
80	140	26	160	166	5 600	1,60	*	NU 216 ECM/P64VA301
85	180	41	340	335	4 800	5,37	*	NJ 317 ECM/C4VA301
85	150	28	190	200	5 300	2,16	—	NU 217 ECM/C4VA301
90	160	30	208	220	5 000	2,79	*	NJ 218 ECM/C4VA301
90	160	40	280	315	5 000	3,64	*	NJ 2218 ECM/C4VA301
90	190	43	365	360	4 500	6,39	*	NJ 318 ECM/C4VA301
90	140	24	80,9	104	5 600	1,33	—	NU 1018 M/C4VA301
90	190	43	365	360	4 500	6,28	*	NU 318 ECM/C4VA301
95	170	32	255	265	4 800	3,38	*	NJ 219 ECM/C3VA301
95	200	45	390	390	4 300	7,11	*	NU 319 ECM/C4VA301
100	215	47	450	440	3 800	8,59	*	NJ 320 ECM/C4VA301
100	215	47	450	440	3 800	8,50	*	NU 320 ECM/C4VA301
110	240	50	530	540	3 400	11,73	*	NJ 322 ECM/C4VA301
110	170	28	128	166	4 500	2,31	—	NU 1022 M/C4VA301
110	240	50	530	540	3 400	11,54	*	NU 322 ECM/C4VA301
120	260	55	610	620	3 200	14,93	*	NJ 324 ECM/C4VA301
120	260	55	610	620	3 200	14,70	*	NU 324 ECM/C4VA301
130	200	33	165	224	3 800	3,75	—	NJ 1026 M/C4VA301
130	280	58	720	750	3 000	18,26	*	NJ 326 ECM/C4VA301
130	280	58	720	750	3 000	17,96	*	NU 326 ECM/C4VA301
140	210	33	172	245	3 600	3,92	—	NU 1028 M/C4VA301
140	300	62	780	830	2 800	22,46	*	NU 328 ECM/C4VA301
150	320	65	900	965	2 600	26,25	*	NU 330 ECM/C4VA301
150	320	65	900	965	2 600	26,68	*	NU 330 ECMRD/C5VA378
160	340	68	1 000	1 080	2 400	32,66	*	NU 332 ECM/C4VA301
170	260	42	275	400	2 800	8,17	—	NU 1034 M/C4VA301
180	280	46	336	475	2 600	10,22	—	NU 1036 M/C4VA301
180	320	86	1 100	1 430	2 400	30,20	—	NU 2236 ECMRD/C4VA301
190	400	78	1 140	1 500	2 000	48,83	—	NU 338 ECMRD/C5HVA301

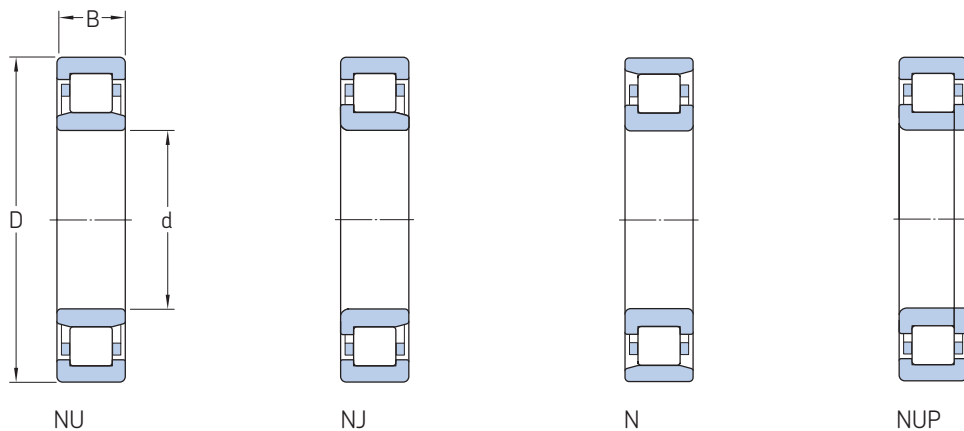
In addition to NJ series cylindrical roller bearings, appropriate HJ series angle rings with suffix VA301 can be supplied.

Traction motor – INSOCOAT deep groove ball bearings



Principal dimensions			Dynamic load rating	Static load rating	Limiting speed	Mass	Designation
d	D	B	C	C ₀			
mm			kN	kN	r/min	kg	–
50	110	27	65	38	8 500	1,25	6310 M/C4VL0241
55	120	29	74,1	45	11 000	1,58	6311 M/C3VL0241
60	95	18	30,7	23,2	9 500	0,50	6012 M/C4VL0241
60	110	22	55,3	36	8 000	0,88	6212 M/C4VL0241
60	130	31	85,2	52	10 000	1,70	6312 M/C4VL0241
65	140	33	97,5	60	6 700	2,46	6313 M/C5S0VL0241
70	125	24	63,7	45	7 000	1,25	6214 M/C4VL0241
70	150	35	111	68	6 300	2,94	6314 M/C4VL0241
75	130	25	68,9	49	6 700	1,35	6215 M/C4VL0241
75	160	37	119	76,5	5 600	3,70	6315 M/C4HVL0241
80	125	22	49,4	40	7 000	1,02	6016 M/P65HS0VL0241
80	140	26	72,8	55	6 000	1,69	6216 M/P65HS0VL0241
80	170	39	130	86,5	5 300	4,17	6316 M/C4VL0241
80	125	22	49,4	40	9 500	1,03	BB1-7361 A
80	140	26	72,8	55	8 500	1,74	BB1-7362
85	180	41	140	96,5	5 000	4,79	6317 M/C3VL0241
90	190	43	151	108	7 000	5,97	6318 M/C3VL0241
95	200	45	159	118	4 500	6,45	6319 M/C4VL0241
100	215	47	174	140	4 300	8,06	6320 M/C3VL0241
100	180	36	127	93	7 000	3,66	6220 M/C5VL0241
105	190	36	140	104	4 500	4,48	6221 M/C4HVL0241
105	225	49	182	153	4 000	8,54	6321 M/C3VL0241
110	200	38	151	118	4 300	5,07	6222 M/C4VL0241
110	240	50	203	180	5 300	11,04	6322 M/C4VL0241
120	260	55	208	186	3 400	14,75	6324 M/C3VL0241
130	280	58	229	216	3 200	16,20	6326 M/C3VL0241
130	280	58	225	212	4 500	17,85	BB1-7009
180	320	52	229	240	3 800	18,48	6236 M/C5HS0VL0241
240	360	56	255	315	3 000	20,19	6048 M/C4S0VG2211
260	400	65	291	375	2 800	30,02	6052 M/C4S0VG2211

Traction motor – INSOCOAT cylindrical roller bearings

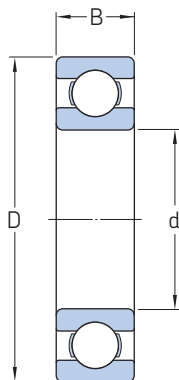


Principal dimensions			Dynamic load rating	Static load rating	Limiting speed	Mass	Designation
d	D	B	C	C ₀			
mm			kN	kN	r/min	kg	–
50	90	20	73,5	69,5	9 000	0,48	NU 210 ECM/C3HVA3091
50	110	27	127	112	8 000	1,36	NU 310 ECM/C4VA3091
55	90	26	35,8	41,5	9 000	0,50	BC1-7005 B
55	100	25	114	118	8 000	0,86	NU 2211 ECML/C4VA3091
55	100	21	97	95	8 000	0,76	NU 211 ECM/C4VA3091
60	95	18	39,1	46,5	13 000	0,46	NU 1012 MR/C4VA3091
60	110	22	108	102	7 500	0,97	NU 212 ECM/C4VA3091
60	130	31	173	160	6 700	2,16	NU 312 ECM/C4VA3091
65	100	18	38	46,5	7 500	0,50	NU 1013 M/C3VA3091
65	120	23	122	118	6 700	1,23	NU 213 ECM/C4VA3091
70	110	20	70,4	85	7 000	0,69	NU 1014 ECM/C4VA3091
70	125	24	137	137	6 300	1,37	NU 214 ECM/C4VA3091
70	150	35	236	228	5 600	3,12	NU 314 ECM/C4VA3091
75	115	20	58,3	71	6 700	0,75	NU 1015 M/C4VA3091
75	130	25	150	156	6 000	1,48	NU 215 ECM/C4HVA3091
80	125	22	64,4	78	9 500	1,05	NU 1016 MR/C4VA3091
80	140	26	160	166	5 600	1,84	NU 216 ECM/C4VA3091
80	170	39	300	290	5 000	4,61	NU 316 ECM/C4VA3091
85	130	22	68,2	86,5	6 000	1,10	NU 1017 M/C3VA3091
85	150	28	190	200	5 300	2,20	NU 217 ECM/C3VL0241
90	140	24	80,9	104	5 600	1,35	NU 1018 M/C4VA3091
90	160	30	208	220	5 000	2,75	NU 218 ECM/C3VA3091
90	160	40	280	315	5 000	3,68	NJ 2218 ECM/C4VA3091
90	190	43	365	360	4 500	6,22	NU 318 ECM/C3VL0241
95	170	32	255	265	4 800	2,84	NU 219 ECM/C4VA3091
100	180	40	251	305	4 500	4,08	BC1-7257
100	150	24	89,7	122	5 000	1,45	NU 1020 M/C3VA3091
100	215	47	450	440	3 800	8,65	NU 320 ECM/C4VA3091
100	215	47	450	440	3 800	8,74	NJ 320 ECM/P64VA3091
100	180	34	285	305	4 500	3,93	NU 220 ECM/C3VL0241
110	170	28	128	166	4 500	2,30	NU 1022 M/C3VA3091
110	200	38	335	365	4 000	5,20	NU 222 ECMR/P64VA3091
110	240	80	682	900	3 400	18,69	NU 2322 ECML/C5HVA3091
110	240	50	530	540	3 400	11,99	NU 322 ECM/C3VL0241
110	200	38	335	365	4 000	5,33	NUP 222 ECMRA/C4VA3091
110	200	38	335	365	4 000	5,49	NU 222 ECM/C3VL0241

In addition to NJ series cylindrical roller bearings, appropriate HJ series angle rings with suffix VA301 can be supplied.

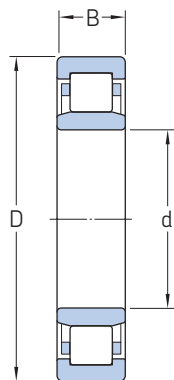
Principal dimensions			Dynamic load rating	Static load rating	Limiting speed	Mass	Designation
d	D	B	C	C ₀			
mm			kN	kN	r/min	kg	–
120	260	55	610	620	3 200	14,94	NU 324 ECM/C3VL0241
120	215	40	375	405	3 600	6,63	NUP 224 ECMRD/C4VA3091
120	215	40	390	430	3 600	6,34	NU 224 ECM/C3VL0241
130	230	40	415	155	3 400	7,01	NU 226 ECML/C4HVR6081
130	280	58	720	750	3 000	18,30	NU 326 ECM/P54VA3091
140	300	62	780	830	2 800	22,4	NU 328 ECMRA/C4VA3091
140	250	42	450	510	3 200	9,07	NU 228 ECMR/P64HVG2921
150	320	65	900	965	4 000	27,02	NU 330 ECMRD/C4VA3091
160	340	68	880	1 080	2 400	31,90	BC1-7088 A
160	290	48	585	680	2 600	14,57	NU 232 ECM/C4HVA3091
160	340	68	1 000	1 080	3 600	31,75	NU 332 ECM/C4VA3091
320	480	74	880	1430	2 200	46,20	NU 1064 MP/C3VL0241

Traction motor – Hybrid deep groove ball bearings



Principal dimensions			Dynamic load rating	Static load rating	Limiting speed	Mass	Designation
d	D	B	C	C ₀			
mm			kN	kN	r/min	kg	–
40	90	23	42,3	24	18 000	0,66	6308 M/HC5C4S0
45	100	25	55,3	31,5	16 000	0,85	6309 M/HC5C4S0
50	90	20	37,1	23,2	14 000	0,47	6210 M/HC5C4S0
50	110	27	65	38	15 000	1,2	6310 M/HC5C4S0
55	120	29	74,1	45	13 000	1,43	6311 M/HC5C4S0
60	95	18	30,7	23,2	15 000	0,51	6012 M/HC5C4S0
60	130	31	85,2	52	12 000	1,76	6312 M/HC5C4S0
60	110	22	55,3	36	11 000	0,93	6212 M/HC5C4S0
65	100	18	31,9	25	12 000	0,44	6013 M/HC5C4HS0
65	140	33	97,5	60	9 500	2,20	6313 M/HC5C4HS0
70	150	35	111	68	11 000	2,86	6314 M/HC5C4S0
70	125	24	63,7	45	10 000	1,15	6214 M/HC5C4S0
75	160	37	119	76,5	10 000	3,14	6315 M/HC5C4S0
75	130	25	68,9	49	11 000	1,25	6215 M/HC5C4HS0
80	125	22	49,4	40	11 000	0,89	6016 M/HC5P65HS0VG319
80	140	26	72,8	55	11 000	1,48	6216 M/HC5P65HS0VG319
85	150	28	87,1	64	8 000	1,85	6217 M/HC5C5S0
90	160	30	101	73,5	7 500	2,25	6218 M/HC5C4S0
100	180	34	127	93	7 000	3,40	6220 M/HC5C4HS0
130	230	40	156	132	5 300	5,05	6226 M/HC5C5S0
280	350	33	138	200	2 300	5,71	61856/HC5C3S0

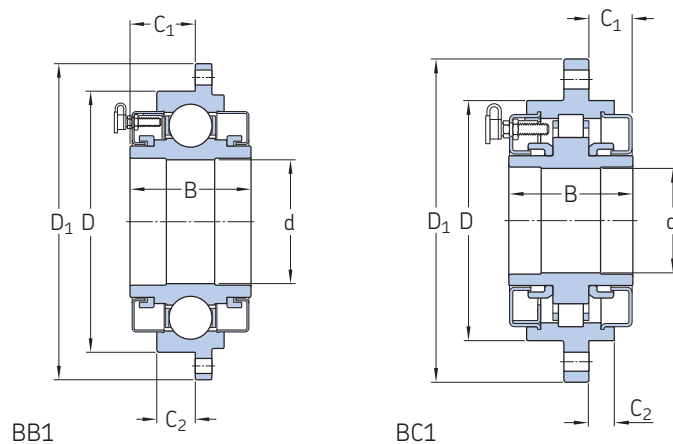
Traction motor – Hybrid cylindrical roller bearings



NU

Principal dimensions			Dynamic load rating	Static load rating	Limiting speed	Mass	Designation
d	D	B	C	C ₀			
mm			kN	kN	r/min	kg	–
35	62	14	35,8	38	16 000	0,12	NU 1007 ECPH/HC5C3
50	90	20	66	72	9 000	0,49	NU 210 ECM/HC5C3HVA301
55	90	18	59,4	73,5	8 500	0,38	NU 1011 ECMR/HC5C4
55	90	22	59,4	73,5	10 000	0,41	BC1-7384
60	95	18	37,4	44	8 000	0,42	NU 1012 MR/HC5C4H
65	100	18	38	46,5	9 500	0,47	NU 1013 M/HC5C3
70	110	20	79,2	98	7 000	0,53	NU 1014 ECMR/HC5C4
70	125	24	119	137	7 500	0,95	N 214 ECP/HC5C4VA301
70	125	24	119	137	7 500	1,18	NU 214 ECM/HC5C4VA301
75	115	20	58,3	71	6 700	0,61	NU 1015 M/HC5C4
75	130	25	132	160	6 000	1,21	NU 215 ECM/HC5C3HVA301
80	140	26	142	173	5 600	1,50	NU 216 ECM/HC5C3HVA301
80	125	22	64,4	78	7 500	0,87	NU 1016 MR/HC5C4
90	160	30	183	220	6 000	2,24	NU 218 ECM/HC5C4VA301
100	180	34	251	305	5 300	3,25	NU 220 ECM/HC5C4VA301
110	200	38	292	365	4 800	4,62	NU 222 ECM/HC5C3
120	180	28	134	183	5 000	2,2	NU 1024 M/HC5C4

Traction motor – Traction motor bearing units



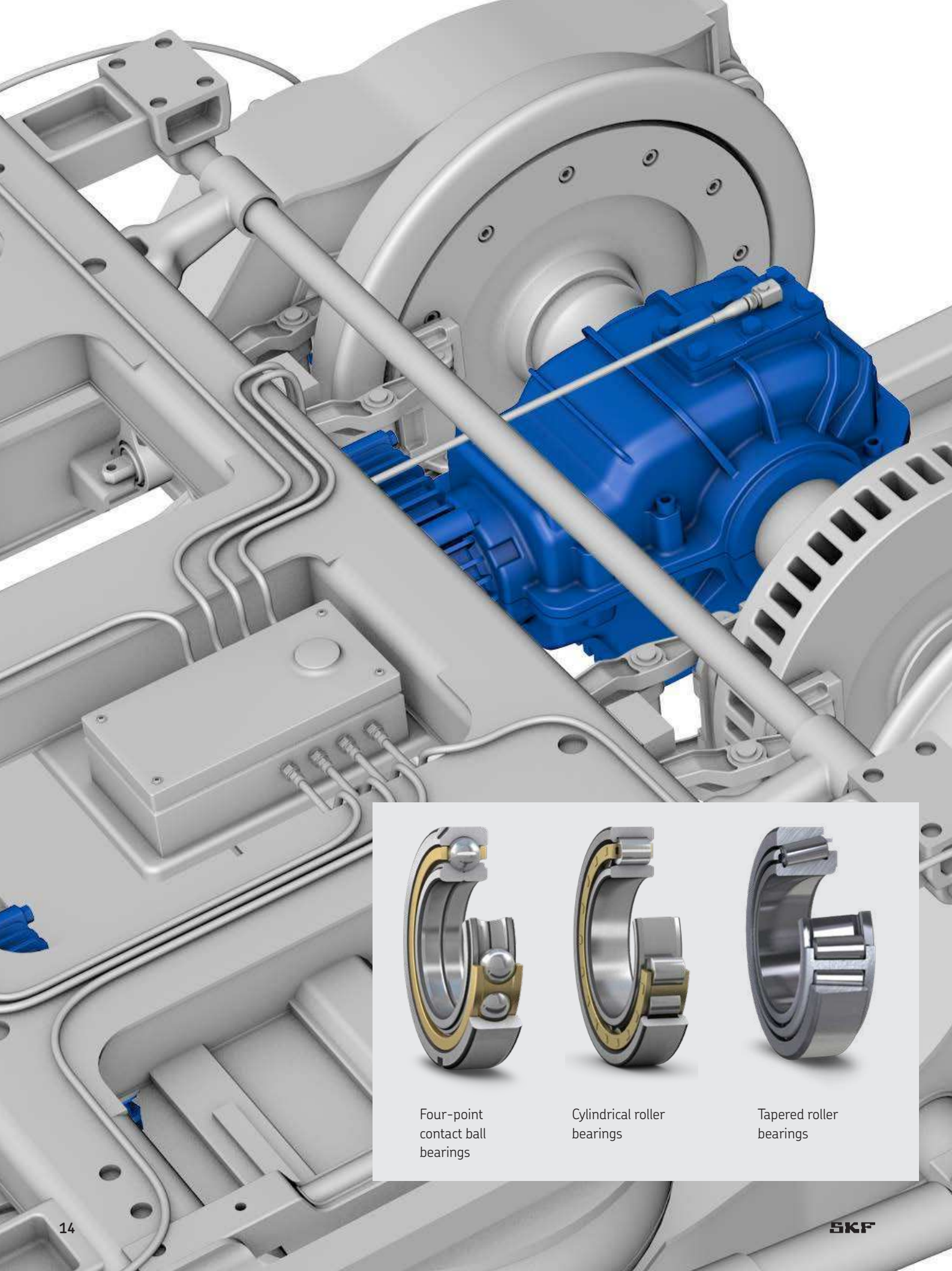
Principal dimensions

Designation

d	D	B	C ₁	C ₂	D ₁	Re-greasable	
mm						–	–
50	115	59	21	12,5	155	N	BC1-7229 DF
50	115	59	21	12,5	155	Y	BC1-7229 DC
50	115	59	21	6	155	N	BC1-7229 AA
50	115	59	21	12,5	155	Y	BC1-7229 AF
65	170	68	38,5	22	200	N	BB1-7024 AB
65	170	68	38,5	22	200	Y	BB1-7024 DD
65	170	68	38,5	22	200	N	BB1-7024 DC
70	130	59	21	12,5	170	N	BC1-7365
80	145	59	21	6	185	N	BC1-7273
80	144	60	25	10	175	N	BB1-7116
90	190	88	47,5	28	230	N	BB1-7141
90	190	88	47,5	28	230	Y	BB1-7141 B
110	180	62	22	12,5	220	N	BB1-7330
120	220	56	30	30	268	N	BC1-7292
120	220	74	54	54	262	N	BC1-7293
120	182	48	17,5	7,5	230	N	BB1-7348
208	280	46	18	15	320	N	BB1-7397
209	280	65,5	18	15	320	N	BMB 7509/ZMSTU
210	280	50	29	26	320	N	BC1-7308

Design options for traction motor bearing units:

- INSOCOAT design – electrical insulation layer
- Hybrid design – equipped with ceramic rolling elements
- Integrated sensors – detection of direction of rotation, rotational speed, absolute positioning and bearing temperature
- Regreaseable design – TMBUs in operation can be retrofitted with a regreasing device



Gearbox Applications

Modern gearbox requirements place high demands on gearbox bearing arrangements. Wide operating temperature ranges, high shock loads and increasing load carrying capacities, combined with the drive to reduce friction within the gearbox are some of the specific challenges of modern gearbox design.

The practicalities of modern train operation introduce further operational challenges; for example low load conditions in hybrid drives or when trains are operated without engagement of all drive units. SKF brings a combination of innovative products, sophisticated

design tools and decades of design experience to bear on these challenges. By working together with SKF from the early stages of gearbox design our customers gain access to our extensive application expertise to meet the challenges of current and future gearbox designs head-on together.

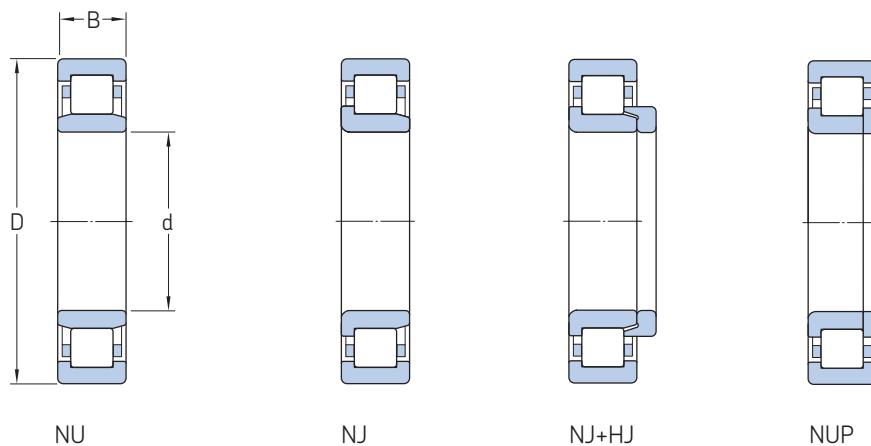
The following pages present a comprehensive range of bearings specifically selected and proven in gearbox applications. Other executions of bearings mentioned in the tables may be available on request and our experienced team will be delighted to discuss application requirements in detail.

Principle bearing types for gearbox designs

- Cylindrical roller bearings
- Four-point contact ball bearings
- Tapered roller bearings



Gearbox – Cylindrical roller bearings



Principal dimensions			Dynamic load rating	Static load rating	Limiting speed	Mass	HJ angle ring available	Designation
d	D	B	C	C ₀				
mm			kN	kN	r/min	kg	—	—
45	100	36	160	153	13 000	1,5	—	NJ 2309 ECML/C4
50	90	20	64	70	14 000	0,5	*	NU 210 ECML/C3HS1
50	110	27	127	112	8 000	1,3	*	NJ 310 ECML/C4H
50	110	40	186	186	12 000	1,9	—	NJ 2310 ECML/C3H
55	100	21	97	95	13 000	0,7	—	NU 211 ECML/C4
55	100	25	114	118	13 000	0,9	*	NJ 2211 ECML/C3
55	120	43	232	232	11 000	2,5	*	NJ 2311 ECML/C3
60	110	22	108	102	11 000	0,9	*	NU 212 ECML/C3
60	110	28	146	153	11 000	1,2	—	NJ 2212 ECML/C3
60	130	46	260	265	10 000	3,1	—	NJ 2312 ECML/C3H
65	120	23	122	118	10 000	1,1	*	NU 213 ECML/C3
65	140	48	285	290	9 500	3,8	*	NJ 2313 ECML/C3
70	125	24	137	137	6 300	1,3	*	NJ 214 ECN1ML/L4BC4
70	125	24	137	137	10 000	1,3	*	NU 214 ECML/C4
70	150	35	236	228	8 500	3,2	*	NJ 314 ECML/C4
70	150	35	236	228	5 600	3,1	*	NU 314 ECN1ML/C3
70	150	51	315	325	8 500	4,5	—	NJ 2314 ECML/C3H
75	130	25	150	156	9 500	1,4	*	NU 215 ECML/C4
75	130	31	186	208	9 500	1,7	—	NU 2215 ECML/C4
75	160	55	380	400	8 000	5,5	*	NJ 2315 ECML/C3
80	125	22	99	127	9 500	1,0	—	NJ 1016 ECML/C3
80	140	26	160	166	8 500	1,8	*	NJ 216 ECML/C4HS1
80	140	26	160	166	8 500	1,7	*	NU 216 ECML/C4
80	140	33	212	245	8 500	2,2	—	NJ 2216 ECML/P63H
80	140	33	212	245	8 500	2,2	—	NU 2216 ECML/P63
80	170	39	300	290	7 500	4,3	*	NU 316 ECML/C3
85	150	28	190	200	8 000	2,2	*	NU 217 ECML/C4
85	150	36	250	280	8 000	2,8	—	NJ 2217 ECML/C3
85	150	36	250	280	8 000	2,7	—	NU 2217 ECML/C4H
85	180	60	455	490	7 000	7,6	—	NJ 2317 ECML/C4
90	160	30	208	220	7 500	2,6	*	NU 218 ECML/C3
90	160	40	280	315	7 500	3,5	*	NJ 2218 ECML/C3
90	160	40	280	315	7 500	3,5	*	NU 2218 ECML/C4
90	190	43	365	360	6 700	6,0	*	NJ 318 ECML/L4BC3
90	190	64	500	540	6 700	8,9	*	NJ 2318 ECML/C3
95	170	32	255	265	4 800	3,2	*	NJ 219 ECML/C3
95	170	32	255	265	4 800	3,2	*	NU 219 ECML/C3B20
95	170	43	325	375	7 000	4,3	—	NJ 2219 ECML/L4BC4HS1
95	170	43	325	375	7 000	4,3	—	NJ 2219 ECN1ML/L4BC4H

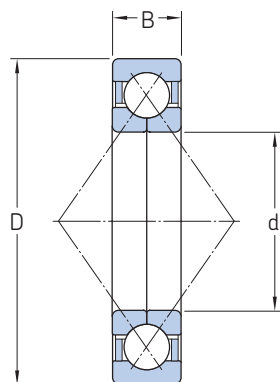
In addition to NJ series cylindrical roller bearings, appropriate HJ series angle rings can be supplied.

Principal dimensions			Dynamic load rating	Static load rating	Limiting speed	Mass	HJ angle ring available	Designation
d	D	B	C	C ₀				
mm			kN	kN	r/min	kg	—	—
100	180	34	285	305	6 700	3,9	*	NJ 220 ECML/C3H
100	180	46	380	450	6 700	5,1	*	NU 2220 ECML/C4
100	215	47	450	440	6 000	8,7	*	NJ 320 ECML/C3
100	215	73	670	735	6 000	13,3	*	NJ 2320 ECML/C4
110	200	38	335	365	6 000	5,4	*	NJ 222 ECML/C4
110	200	38	335	365	6 000	5,3	*	NU 222 ECML/C3
110	200	53	440	520	6 000	7,4	—	NU 2222 ECML/C4
120	260	55	610	620	5 000	14,8	*	NU 324 ECML/C5H
130	200	33	165	224	5 600	3,8	—	NU 1026 ML/C3
130	230	64	610	735	5 300	11,3	*	NU 2226 ECML/C3
140	250	42	450	510	4 800	9,2	*	NU 228 ECML/C3
150	225	35	198	290	5 000	5,1	—	NJ 1030 ML/C3
150	225	35	198	290	5 000	4,9	—	NU 1030 ML/C4
150	270	45	510	600	4 500	11,4	*	NU 230 ECML/C4H
160	240	38	229	325	4 800	6,0	*	NU 1032 ML/C4
170	260	42	275	400	4 300	8,2	*	NJ 1034 N1ML/C3PEX
170	310	52	695	815	3 800	17,6	*	NU 234 ECML/C3
180	320	52	720	850	3 600	18,2	*	NU 236 ECML/C3
190	340	55	800	965	3 400	21,8	*	NU 238 ECML/C3
220	340	56	495	735	3 200	18,4	*	NJ 1044 MP/C4VA327
240	360	56	523	800	3 000	19,3	—	NU 1048 ML/C3
260	400	65	627	965	2 800	29,3	*	NU 1052 ML/C3
320	400	38	369	710	2 400	10,9	—	NU 1864 ECMP/C3 ¹⁾
320	440	56	671	1 160	2 000	26,0	—	NU 1964 MA/C4VA327 ¹⁾
360	480	56	781	1 460	2 000	29,0	—	NU 1972 ECMP/C3VQ015 ¹⁾
380	480	46	561	1 120	2 000	20,0	—	NU 1876 ECMP/P63HVQ551 ¹⁾
380	480	46	561	1 120	2 000	21,5	—	NUP 1876 ECMP/P63HVE478 ¹⁾
400	500	46	572	1 180	1 900	21,5	*	NU 1880 MP/C4VQ077 ¹⁾
400	500	46	572	1 180	1 900	22,5	—	NUP 1880 MP/C4VQ077 ¹⁾

In addition to NJ series cylindrical roller bearings, appropriate HJ series angle rings can be supplied.

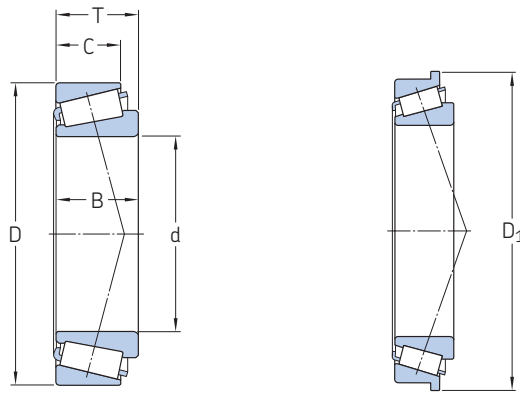
¹⁾ Suspension Tube Bearings

Gearbox – Four-point contact ball bearings



Principal dimensions			Dynamic load rating	Static load rating	Limiting speed	Mass	Designation
d	D	B	C	C ₀			
mm			kN	kN	r/min	kg	–
50	90	20	61,8	53	13 000	0,59	QJ 210 N2MA/C4S1
55	100	21	85	83	11 000	0,77	QJ 211 N2MA/C4H
60	110	22	96,5	93	10 000	0,99	QJ 212 N2MA/C4B20
65	120	23	110	112	9 500	1,20	QJ 213 N2MA/C4
70	125	24	90,4	88	5 600	1,30	BAQ-7134
70	125	24	90,4	88	5 600	1,30	BAQ-7134 A
70	125	24	120	122	9 000	1,30	QJ 214 N2MA/C4B20
70	150	35	186	166	8 000	3,15	QJ 314 N2MA/C3
75	130	25	125	132	8 500	1,45	QJ 215 N2MA/C4B20
80	140	26	146	156	8 000	1,85	QJ 216 N2MA/C4B20
85	130	22	99,5	114	8 000	1,10	QJ 1017 N2MA/C4B20
85	150	28	156	173	7 500	2,25	QJ 217 N2MA/C4
90	160	30	186	200	7 000	2,75	QJ 218 N2MA/C4B20
95	170	32	212	232	6 700	3,35	QJ 219 N2MA/C3B20
100	180	34	236	265	6 300	4,05	QJ 220 N2MA/C4B20
110	200	38	280	325	5 600	5,60	QJ 222 N2MA/C4B20
120	215	40	300	365	5 000	6,95	QJ 224 N2MA/C4B20
130	230	40	310	400	4 800	7,75	QJ 226 N2MA/C4B20
140	250	42	345	475	4 300	9,85	QJ 228 N2MA/C4B20
160	290	48	450	670	3 800	15,50	QJ 232 N2MA
180	320	52	475	765	3 400	20,50	QJ 236 N2MA/C3

Gearbox – Tapered roller bearings



Principal dimensions						Dynamic load rating	Static load rating	Limiting speed	Mass	Calculation factor			Designation
d	D	D ₁	T	B	C	C	C ₀			e	Y	Y ₀	
mm						kN	kN	r/min	kg	–	–	–	–
55	115	–	34	31	23,5	125	163	5 600	1,58	0,88	0,68	0,40	T7FC 055/S1QCL7CVE141
60	125	–	37	33,5	26	190	204	5 300	2,07	0,83	0,72	0,40	T7FC 060/S0CL7CVE141
69,85	146,05	–	41,275	41,275	31,75	241	275	4 800	3,25	0,40	1,50	0,80	BT1-1101/PEX
73,025	150,089	–	44,45	46,672	36,512	283	305	4 300	3,83	0,33	1,80	1,00	BT1-1328/S0CL7C
75	160	–	40	37	26	209	245	4 300	3,40	0,83	0,72	0,40	31315 J2/QS1CL7C
75	150	–	42	38	29	249	280	4 300	3,24	0,88	0,68	0,40	T7FC 075/S0CL7C
75	130	–	41	41	31	209	300	4 800	2,19	0,43	1,40	0,80	33215/S0QCL7C
75	160	–	40	37	26	209	245	4 300	3,39	0,83	0,72	0,40	31315 J2/QS1CL7C
75	160	–	58	55	45	416	440	4 300	5,19	0,35	1,70	0,90	32315/S0VE679
80	125	–	29	29	22	138	216	5 000	1,29	0,43	1,40	0,80	BT1-1153/S0Q
80	140	–	35,25	33	28	187	245	4 500	2,06	0,43	1,40	0,80	32216 J2/QVE141
80	170	–	42,5	39	27	224	265	4 000	4,06	0,83	0,72	0,40	31316 J1/QCL7CS1VA3C1
95	170	–	45,5	43	37	281	390	3 800	4,09	0,43	1,40	0,80	32219 J2/VE141
120	180	–	38	38	29	299	415	3 400	3,29	0,46	1,30	0,70	32024 X
130	200	–	45	45	34	314	540	3 000	4,93	0,43	1,40	0,80	32026 X/VE141
140	190	–	32	32	25	252	390	3 000	2,53	0,35	1,70	0,90	32928
146,05	193,675	–	28,575	28,575	23,02	176	360	3 200	2,29	0,37	1,60	0,90	BT1-1127
150	210	–	32	30	23	233	390	3 000	3,08	0,46	1,30	0,70	T4DB 150/VE679
152,4	203,2	–	41,275	41,275	34,925	205	480	3 000	3,71	0,35	1,70	0,90	LM 330448/410/VE679
170	230	–	32	30	23	229	390	2 800	3,33	0,46	1,30	0,70	T4DB 170/VA812
177,8	227,012	–	30,162	30,162	23,02	172	375	2 800	2,87	0,44	1,35	0,80	36990/36920 N1/VA833
177,8	227,0123	–	30,162	33,274	23,02	172	375	2 800	2,95	0,44	1,35	0,80	BT1-0410/VA833
180	250	–	45	50,5	34	330	655	2 600	6,71	0,48	1,25	0,70	BT1-0005/VE141
180	250	–	45	45	34	352	735	2 600	6,63	0,48	1,25	0,70	32936/VE141
180	280	–	50	47	40	473	815	2 200	10,67	0,30	2,00	1,10	D-41251 DJ2
189,738	282,575	–	50,8	47,7	36,56	402	695	2 200	9,66	0,43	1,40	0,80	BT1-0729
190	260	–	46	44	36,5	358	765	2 400	7,07	0,48	1,25	0,70	JM 738249/210/VE141
195	250	–	34	33	26,5	251	540	2 400	4,00	0,35	1,70	0,90	BT1-0705 A/Q
196,85	254	–	28,575	27,783	21,433	198	390	2 400	3,38	0,40	1,50	0,80	BT1-1156
198,298	282,575	300	49,212	49,212	36,512	330	695	2 200	9,67	0,50	1,20	0,70	BT1-2111 ^{2), 3)}
199,949	282,575	–	46,038	49,212	36,512	330	695	2 200	9,11	0,50	1,20	0,70	BT1-0704 A/S1VR661
199,949	282,575	–	49,212	49,212	36,512	330	695	2 200	9,67	0,50	1,20	0,70	BT1-2110 ²⁾

1) Suspension Tube Bearings

2) INSOCOAT Suspension Tube Bearings

3) Flanged outer ring

Principal dimensions						Dynamic load rating C	Static load rating C ₀	Limiting speed	Mass	Calculation factor		Designation	
d	D	D ₁	T	B	C					e	Y	Y ₀	
mm						kN	kN	r/min	kg	–	–	–	–
200	270	–	37	34	27	330	600	2 400	5,47	0,48	1,25	0,70	T4DB 200/VE679
200,025	276,225	–	42,862	46,038	34,133	391	780	2 200	7,68	0,31	1,90	1,10	LM 241147/110/VE673
203,987	276,225	–	42,862	46,038	34,133	391	780	2 200	7,22	0,31	1,90	1,10	LM 241148/110/VE673
205	282,575	–	54,826	58	36,512	330	695	2 200	9,50	0,50	1,20	0,70	BT1-1260/S1VR661
206,375	282,575	–	46,038	46,038	36,512	358	780	2 200	8,34	0,50	1,20	0,70	67985/67920/4/HA4VA812
210	285	–	41	40	33	396	830	2 200	7,50	0,31	1,90	1,10	T2DC 220/210/VE679
213	285	–	41	40	33	396	830	2 200	7,19	0,31	1,90	1,10	T2DC 220/213/VE679
215,9	285,75	–	46,038	46,038	34,925	380	850	2 200	7,85	0,48	1,25	0,70	LM 742749/710/VE174
215,9	290,01	–	31,75	31,75	24	246	500	2 200	5,54	0,37	1,60	0,90	BT1-0538
216,408	285,75	–	46,038	49,212	34,925	380	850	2 200	7,90	0,48	1,25	0,70	LM 742747/710/VE679
216,5	285	–	41	40	33	396	830	2 200	6,82	0,31	1,90	1,10	BT1-0667/VE679
220	285	–	41	40	33	396	830	2 200	6,43	0,31	1,90	1,10	T2DC 220/VE679
220,662	314,325	–	61,912	66,675	49,212	644	1 320	1 800	16,08	0,33	1,80	1,00	BT1-0224¹⁾
231,775	317,5	–	47,625	52,388	36,512	473	865	2 000	10,30	0,31	1,90	1,10	LM 245848/810/VA812
231,775	300,038	–	33,338	31,75	23,812	201	390	2 000	5,11	0,40	1,50	0,80	544091/544118/VA812
231,775	300,038	–	33,338	31,75	23,812	201	390	2 000	5,11	0,40	1,50	0,80	BT1-1180/VA812
234,848	314,325	338,138	53,975	53,975	36,512	457	900	1 800	10,64	0,40	1,50	0,80	BT1-2114^{2), 3)}
235,331	336,55	–	65,088	65,088	50,8	750	1 250	1 700	17,48	0,33	1,80	1,00	BT1-1209/HA1PEX
235,331	336,55	–	65,088	65,088	50,8	644	1 250	1 700	17,27	0,33	1,80	1,00	BT1-2113²⁾
240	320	–	51	51	39	624	1 080	1 900	11,00	0,46	1,30	0,70	32948
240	320	–	42	39	30	425	815	1 900	8,48	0,46	1,30	0,70	E2.T4EB 240/VE679
254	358,775	384,175	76,28	76,28	53,975	737	1 460	1 600	22,67	0,35	1,70	0,90	BT1-0675 B^{2), 3)}
255,6	342,9	–	57,15	63,5	44,45	660	1 400	1 800	14,75	0,35	1,70	0,90	BT1-1044
255,6	342,9	–	57,15	63,5	44,45	660	1 400	1 800	14,75	0,35	1,70	0,90	M 349547/510/VG237
255,6	342,9	–	57,15	57,15	44,45	660	1 400	1 800	14,84	0,35	1,70	0,90	M 349547/510/VA8B81²⁾
257,175	358,775	–	71,438	76,2	53,975	842	1 760	1 700	21,63	0,33	1,80	1,00	BT1-1045
257,175	342,928	–	57,15	57,15	44,45	660	1 400	1 800	14,09	0,35	1,70	0,90	BT1-1135
257,175	342,9	–	57,15	57,15	44,45	660	1 400	1 800	14,08	0,35	1,70	0,90	M 349549/510/VE174
257,175	358,775	–	71,438	76,2	53,975	842	1 760	1 600	21,64	0,33	1,80	1,00	M 249747/710/VG237
257,175	358,775	–	71,438	76,2	53,975	842	1 760	1 600	21,61	0,33	1,80	1,00	M 249747/710/VA8B82²⁾
263,525	325,438	–	28,575	28,575	25,4	220	550	1 700	5,28	0,37	1,60	0,90	38880/38820/VE141
266,56	325,438	–	29,5	33,47	25,4	220	550	1 800	5,29	0,37	1,60	0,90	BT1-1128
275	360	–	50	49	40	512	1 120	1 700	12,77	0,33	1,80	1,00	BT1-1125
292,1	374,65	–	47,625	47,625	34,925	501	1 140	1 600	12,36	0,40	1,50	0,80	L 555249/210/VE174
304,825	393,745	–	50,8	50,88	38,18	528	1 220	1 500	14,90	0,35	1,70	0,90	BT1-0340

¹⁾ Suspension Tube Bearings

²⁾ INSOCOAT Suspension Tube Bearings

³⁾ Flanged outer ring

Designation prefixes and suffixes

In this list, the most current prefixes and suffixes used in the preferred product range are explained. For further information, contact the nearest SKF office.

B20	Reduced width tolerance	MR3D	Machined one-piece window-type brass cage, special design
BB1	Single row ball bearing, customized design	N	Snap ring groove in the outer ring
BC1	Single row cylindrical roller bearing, customized design	N1	One locating slot (notch) in one outer ring side face
BT1	Single row tapered roller bearing, customized design	N2	Two locating slots (notches) 180° apart in one outer ring side face
C3	Bearing internal clearance greater than Normal (CN)	N3	Snap ring groove in the outer ring, one locating slot (notch) in one outer ring side face
C4	Bearing internal clearance greater than C3	P4	Dimensional and running accuracy to ISO tolerance class 4
C4H	Bearing internal clearance greater than C3 (upper half of C4 clearance range)	P5	Dimensional and running accuracy to ISO tolerance class 5
C5	Bearing internal clearance greater than C4	P54	P5 + C4
C5H	Bearing internal clearance greater than C4 (upper half of C5 tolerance)	P6	Dimensional and running accuracy to ISO tolerance class 6
EC	Optimized internal design incorporating more and/or larger rollers and with modified roller end/flange contact	P63	P6 + C3
HC5	Rolling elements made of silicon nitride	P64	P6 + C4
J, J1, J2	Pressed window-type steel cage	P65H	P6 + C5H
L4B	Bearing rings and rollers black oxidized	PEX	SKF Explorer bearing, used only when same-sized conventional and SKF Explorer bearings are available
M	Machined brass cage, rolling element centred	Q	Optimized internal geometry and surface finish
MA	Machined brass cage, outer ring centred, used for oil lubrication	S0	Bearing rings or washers dimensionally stabilized up to +150 °C
ML, MP	Machined one-piece window-type brass cage, outer ring centred, used for oil lubrication	S1	Bearing rings or washers dimensionally stabilized up to +200 °C
MR	Machined one-piece window-type brass cage, rolling element centred	S2	Bearing rings or washers dimensionally stabilized up to +250 °C
		VA, VE, VG and VL	These suffixes followed by three or four digit numbers refer to special executions. Examples: VA301 Bearing for traction motors VL0241 Aluminium oxide coated outside surface of outer ring for electrical resistance up to 3 000 V DC

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