

High Axial Load Capacity, High speed, Long life

Spherical Roller Bearings

EXQ SERIES



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EXQ SERIES

High axial resistance load performance

Internal specifications have been optimized to greatly improve axial resistance load performance.

Low temperature rise and higher permissible rotation

Heat generation of the bearing has been reduced by stabilizing the roller movement during rotation, realizing the world's highest permissible rotation.

Long life

Long life has been realized by optimized internal specifications and using high cleanliness steel.

Service temperature of 200°C

Standardized heat stabilization treatment and service temperature up to 200°C.

High impact resistance performance (EXQ-V specifications)

The EXQ-V specifications are available, which have greatly improved impact resistance performance of a stamped steel cage by applying a special surface heat treatment.

Dimension accuracy and radial internal clearance of the EXQ-V are special specifications for vibrating applications.

Target range: see the Dimension Table.

Outer & Inner rings

- Capable of continuous operating temperatures up to 200°C by standardized heat stabilization treatment.
- Axial load carrying capability has been improved by optimizing the curvature of the raceway profile. Longer bearing life has also been achieved.

Rollers

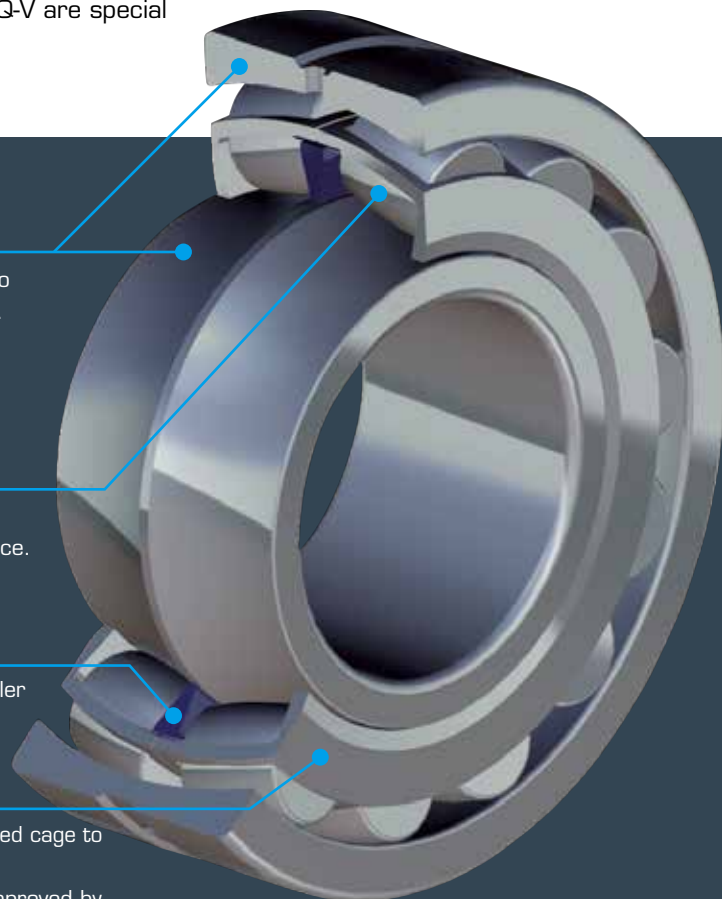
- Axial load carrying capability has been improved by optimizing the curvature of the rolling contact surface. Longer bearing life has also been achieved.

Floating guide ring

- Provided with a floating guide ring to control the roller movement.

Cages

- Provided with a high-strength, high-rigidity steel pressed cage to enclose the entire roller.
- Impact resistance performance has been greatly improved by special surface hardening treatment (EXQ-V specifications)



Configuration of bearing number

22205 EX Q W33 -V C3

Clearance symbols

Internal symbols

Oil hole and groove symbols

Axial load capacity and high-speed specifications

High-load capacity specifications

Basic numbers

No symbols

-V

No symbols

W20

W33

Standard types

Vibration-resistance specifications

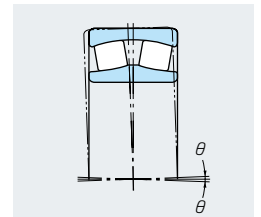
Without oil hole or groove

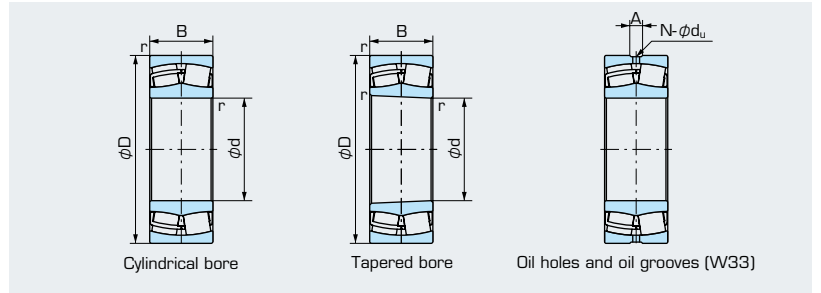
With oil hole

With oil hole and groove

Precautions for use

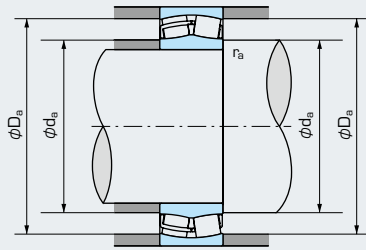
- When using under an operating condition with an axial, it is desirable to ensure $F_a/F_r \leq 0.8$.
When using under an operating condition of $F_a/F_r > 0.8$, consult NACHI.
- When using under a fluctuating load condition or at high rotating speed, consult NACHI in advance.
- If rotated under no load, skidding may occur between the roller and raceway, damaging the bearing.
To prevent this condition, a radial load of $0.015 C_r$ must be applied.
- Under general service conditions, it is permissible to operate with up to a 2° misalignment angle θ .
This can vary slightly depending on the dimension series and operating conditions. For verification of a specific operating condition, please consult NACHI.
Note also that there may be restrictions depending on the machine structure around the bearing.





Main dimensions (mm)				Bearing number		Basic dynamic load rating Cr(N)	Basic static load rating Cor(N)	Permissible rotating speed (min ⁻¹)		
d	D	B	r (min.)	Cylindrical bore ^[Note]	Tapered bore			Grease lubrication	Oil lubrication	
25	52	18.0	1.0	22205EXQ	22205EXQK	63,000	48,000	11,600	13,700	
30	62	20.0	1.0	22206EXQ	22206EXQK	84,500	65,000	9,400	11,600	
	72	19.0	1.1	21306EXQ	21306EXQK	83,000	62,500	8,800	10,000	
35	72	23.0	1.1	22207EXQ	22207EXQK	112,000	88,500	8,300	10,000	
	80	21.0	1.5	21307EXQ	21307EXQK	96,000	76,000	7,700	8,900	
40	80	23.0	1.1	22208EXQ	22208EXQK	126,000	102,000	7,400	8,900	
	90	23.0	1.5	21308EXQ	21308EXQK	119,000	95,500	6,600	7,900	
	90	33.0	1.5	22308EXQ	22308EXQK	185,000	151,000	5,800	7,000	
45	85	23.0	1.1	22209EXQ	22209EXQK	133,000	110,000	6,600	7,900	
	100	25.0	1.5	21309EXQ	21309EXQK	150,000	124,000	5,500	6,600	
	100	36.0	1.5	22309EXQ	22309EXQK	230,000	182,000	5,000	5,900	
50	90	23.0	1.1	22210EXQ	22210EXQK	142,000	122,000	6,200	7,500	
	110	27.0	2.0	21310EXQ	21310EXQK	178,000	151,000	5,000	5,900	
	110	40.0	2.0	22310EXQ	22310EXQK	280,000	235,000	4,700	5,600	
55	100	25.0	1.5	22211EXQ	22211EXQK	171,000	144,000	5,800	7,000	
	120	29.0	2.0	21311EXQ	21311EXQK	200,000	165,000	5,000	5,900	
	120	43.0	2.0	22311EXQ	22311EXQK	325,000	263,000	4,200	5,000	
60	110	28.0	1.5	22212EXQ	22212EXQK	210,000	179,000	5,300	6,300	
	130	31.0	2.1	21312EXQ	21312EXQK	238,000	193,000	4,200	5,000	
	130	46.0	2.1	22312EXQ	22312EXQK	390,000	330,000	4,000	4,700	
65	120	31.0	1.5	22213EXQ	22213EXQK	246,000	209,000	4,700	5,600	
	140	33.0	2.1	21313EXQ	21313EXQK	270,000	232,000	4,000	4,700	
	140	48.0	2.1	22313EXQ	22313EXQK	415,000	355,000	3,500	4,200	
70	125	31.0	1.5	22214EXQ	22214EXQK	257,000	220,000	4,400	5,600	
	150	35.0	2.1	21314EXQ	21314EXQK	310,000	260,000	3,500	4,200	
	150	51.0	2.1	22314EXQ	22314EXQK	480,000	415,000	3,300	4,000	
75	130	31.0	1.5	22215EXQ	22215EXQK	265,000	234,000	4,400	5,300	
	160	37.0	2.1	21315EXQ	21315EXQK	340,000	298,000	3,500	4,200	
	160	55.0	2.1	22315EXQ	22315EXQK	550,000	475,000	3,100	3,800	
80	140	33.0	2.0	22216EXQ	22216EXQK	299,000	269,000	4,000	4,700	
	140	44.4	2.0	23216EXQ	23216EXQK	335,000	335,000	3,600	4,600	
	170	39.0	2.1	21316EXQ	21316EXQK	380,000	339,000	3,300	4,000	
	170	58.0	2.1	22316EXQ	22316EXQK	595,000	520,000	2,900	3,600	
85	150	36.0	2.0	22217EXQ	22217EXQK	355,000	320,000	3,700	4,500	
	150	49.2	2.0	23217EXQ	23217EXQK	395,000	405,000	3,500	4,300	
	180	41.0	3.0	21317EXQ	21317EXQK	415,000	372,000	3,300	4,200	
	180	60.0	3.0	22317EXQ	22317EXQK	665,000	585,000	2,600	3,400	
90	160	40.0	2.0	22218EXQ	22218EXQK	410,000	375,000	3,500	4,200	
	160	52.4	2.0	23218EXQ	23218EXQK	470,000	482,000	3,400	4,400	
	190	43.0	3.0	21318EXQ	21318EXQK	460,000	410,000	3,100	3,800	
	190	64.0	3.0	22318EXQ	22318EXQK	745,000	660,000	2,600	3,200	
95	170	43.0	2.1	22219EXQ	22219EXQK	465,000	420,000	3,300	4,000	
	170	55.6	2.1	23219EXQ	23219EXQK	500,000	510,000	3,100	3,800	
	200	45.0	3.0	21319EXQ	21319EXQK	500,000	461,000	3,000	3,600	
	200	67.0	3.0	22319EXQ	22319EXQK	815,000	725,000	2,400	3,000	

(Note) The EXQ-V specifications are also available for the blue-colored bearing numbers.



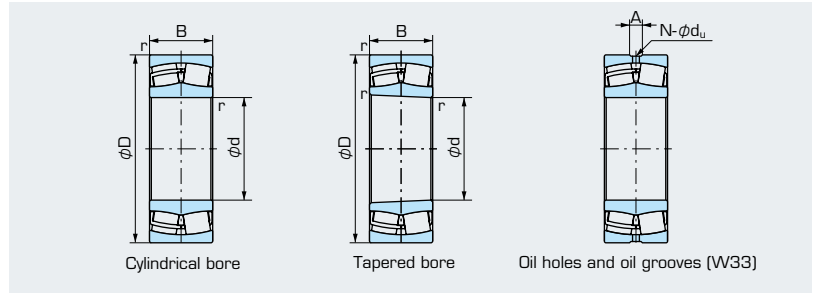
■ Dynamic equivalent radial load
 $P_r = X F_r + Y F_a$

$\frac{F_a}{F_r} \leq e$		$\frac{F_a}{F_r} > e$	
X	Y	X	Y
1	Y_1	0.67	Y_2

Values of e , Y_1 and Y_2 to be obtained from the following table.

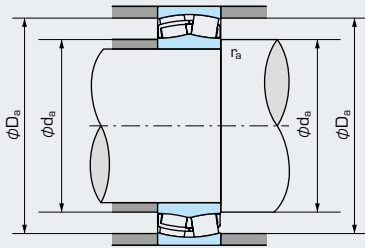
■ Static equivalent radial load
 $P_{0r} = F_r + Y_0 F_a$
 Value of Y_0 to be obtained from the following table.

	Dimensions of oil holes and grooves			Mounting related dimensions (mm)			Axial load factor				Mass (kg) Cylindrical bore (Reference)	Bearing number	
	Hole diameter d_u	Groove width A	Hole count N	d_a (min.)	D_a (max.)	r_a (max.)	Constant e	Y_1	Y_2	Y_0		Cylindrical bore ^(Note)	Tapered bore
	3	5	4	30.5	46.5	1.0	0.35	1.91	2.85	1.87	0.19	22205EXQ	22205EXQK
	3	5	4	35.5	56.5	1.0	0.33	2.04	3.04	2.00	0.30	22206EXQ	22206EXQK
	3	5	4	38.0	65.0	1.0	0.27	2.49	3.71	2.43	0.43	21306EXQ	21306EXQK
	3	6	4	42.0	65.0	1.0	0.32	2.09	3.11	2.04	0.46	22207EXQ	22207EXQK
	3	5	4	44.0	71.0	1.5	0.27	2.49	3.71	2.43	0.57	21307EXQ	21307EXQK
	3	6	4	47.0	73.0	1.0	0.28	2.37	3.53	2.32	0.56	22208EXQ	22208EXQK
	3	5	4	50.0	81.0	1.5	0.26	2.55	3.80	2.50	0.78	21308EXQ	21308EXQK
	4	7	4	48.5	81.5	1.5	0.37	1.83	2.72	1.79	1.07	22308EXQ	22308EXQK
	3	6	4	52.0	78.0	1.0	0.26	2.55	3.80	2.50	0.61	22209EXQ	22209EXQK
	3	5	4	55.0	92.0	1.5	0.26	2.62	3.90	2.56	1.05	21309EXQ	21309EXQK
	4	8	4	53.5	91.5	1.5	0.37	1.83	2.72	1.79	1.41	22309EXQ	22309EXQK
	3	6	4	57.0	83.0	1.0	0.24	2.79	4.15	2.73	0.65	22210EXQ	22210EXQK
	3	5	4	61.0	101.0	2.0	0.25	2.71	4.04	2.65	1.36	21310EXQ	21310EXQK
	4	8	4	60.0	100.0	2.0	0.36	1.85	2.76	1.81	1.92	22310EXQ	22310EXQK
	3	6	4	63.5	91.5	1.5	0.24	2.84	4.23	2.78	0.88	22211EXQ	22211EXQK
	3	5	4	65.0	110.0	2.0	0.25	2.71	4.03	2.65	1.70	21311EXQ	21311EXQK
	4	8	4	65.0	110.0	2.0	0.36	1.85	2.75	1.81	2.40	22311EXQ	22311EXQK
	3	6	4	68.5	101.5	1.5	0.25	2.74	4.08	2.68	1.20	22212EXQ	22212EXQK
	3	5	4	72.0	118.0	2.0	0.24	2.78	4.14	2.72	2.10	21312EXQ	21312EXQK
	4	8	4	72.0	118.0	2.0	0.36	1.86	2.77	1.82	3.05	22312EXQ	22312EXQK
	3	6	4	73.5	111.5	1.5	0.25	2.69	4.00	2.63	1.56	22213EXQ	22213EXQK
	3	6	4	77.0	128.0	2.0	0.24	2.83	4.21	2.76	2.60	21313EXQ	21313EXQK
	4	8	4	77.0	128.0	2.0	0.34	1.98	2.94	1.93	3.67	22313EXQ	22313EXQK
	3	6	4	78.5	116.5	1.5	0.24	2.87	4.27	2.80	1.65	22214EXQ	22214EXQK
	3	6	4	82.0	138.0	2.0	0.24	2.84	4.23	2.78	3.10	21314EXQ	21314EXQK
	5	10	4	82.0	138.0	2.0	0.34	1.98	2.94	1.93	4.45	22314EXQ	22314EXQK
	3	6	4	83.5	121.5	1.5	0.22	3.07	4.58	3.00	1.74	22215EXQ	22215EXQK
	3	6	4	87.0	148.0	2.0	0.24	2.87	4.27	2.80	3.80	21315EXQ	21315EXQK
	5	10	4	87.0	148.0	2.0	0.35	1.95	2.90	1.91	5.44	22315EXQ	22315EXQK
	3	6	4	90.0	130.0	2.0	0.22	3.07	4.57	3.00	2.19	22216EXQ	22216EXQK
	4	8	4	90.0	130.0	2.0	0.29	2.35	3.50	2.30	2.95	23216EXQ	23216EXQK
	4	8	4	92.0	158.0	2.0	0.23	2.88	4.29	2.82	4.50	21316EXQ	21316EXQK
	5	10	4	92.0	158.0	2.0	0.35	1.95	2.90	1.91	6.42	22316EXQ	22316EXQK
	4	7	4	95.0	140.0	2.0	0.22	3.01	4.48	2.94	2.75	22217EXQ	22217EXQK
	4	8	4	95.0	140.0	2.0	0.30	2.25	3.34	2.20	3.78	23217EXQ	23217EXQK
	4	8	4	99.0	166.0	2.5	0.23	2.89	4.30	2.83	5.30	21317EXQ	21317EXQK
	6	11	4	99.0	166.0	2.5	0.33	2.02	3.00	1.97	7.46	22317EXQ	22317EXQK
	4	7	4	100.0	150.0	2.0	0.24	2.79	4.15	2.73	3.50	22218EXQ	22218EXQK
	5	10	4	100.0	150.0	2.0	0.32	2.14	3.19	2.09	4.57	23218EXQ	23218EXQK
	4	8	6	104.0	176.0	2.5	0.23	2.91	4.33	2.84	6.10	21318EXQ	21318EXQK
	6	11	6	104.0	176.0	2.5	0.34	2.00	2.98	1.96	8.82	22318EXQ	22318EXQK
	5	8	4	107.0	158.0	2.0	0.24	2.76	4.11	2.70	4.24	22219EXQ	22219EXQK
	5	10	4	107.0	158.0	2.0	0.30	2.25	3.34	2.20	5.46	23219EXQ	23219EXQK
	4	8	6	109.0	186.0	2.5	0.23	2.92	4.35	2.86	7.10	21319EXQ	21319EXQK
	6	12	6	109.0	186.0	2.5	0.33	2.02	3.00	1.97	10.2	22319EXQ	22319EXQK



Main dimensions (mm)				Bearing number		Basic dynamic load rating Cr(N)	Basic static load rating Cor(N)	Permissible rotating speed (min ⁻¹)		
d	D	B	r (min.)	Cylindrical bore ^(Note)	Tapered bore			Grease lubrication	Oil lubrication	
100	150	37.0	1.5	23020EXQ	23020EXQK	286,000	325,000	3,000	3,900	
	165	52.0	2.0	23120EXQ	23120EXQK	450,000	500,000	2,800	3,500	
	180	46.0	2.1	22220EXQ	22220EXQK	520,000	480,000	3,100	3,800	
	180	60.3	2.1	23220EXQ	23220EXQK	595,000	629,000	3,100	3,900	
	215	47.0	3.0	21320EXQ	21320EXQK	580,000	524,000	2,600	3,500	
	215	73.0	3.0	22320EXQ	22320EXQK	975,000	875,000	2,200	2,900	
110	170	45.0	2.0	23022EXQ	23022EXQK	415,000	475,000	3,000	3,800	
	180	56.0	2.0	23122EXQ	23122EXQK	540,000	610,000	3,000	3,800	
	180	69.0	2.0	24122EXQ	24122EXQK30	633,000	743,000	3,000	3,800	
	200	53.0	2.1	22222EXQ	22222EXQK	680,000	640,000	2,900	3,400	
	200	69.8	2.1	23222EXQ	23222EXQK	750,000	793,000	2,800	3,500	
	240	50.0	3.0	21322EXQ	21322EXQK	675,000	635,000	2,300	3,000	
	240	80.0	3.0	22322EXQ	22322EXQK	1,150,000	1,040,000	2,100	2,800	
120	180	46.0	2.0	23024EXQ	23024EXQK	430,000	515,000	2,800	3,500	
	180	60.0	2.0	24024EXQ	24024EXQK30	540,000	683,000	2,800	3,600	
	200	62.0	2.0	23124EXQ	23124EXQK	675,000	720,000	2,600	3,500	
	200	80.0	2.0	24124EXQ	24124EXQK30	815,000	970,000	2,600	3,500	
	215	58.0	2.1	22224EXQ	22224EXQK	785,000	765,000	2,600	3,200	
	215	76.0	2.1	23224EXQ	23224EXQK	860,000	956,000	2,500	3,300	
	260	55.0	3.0	21324EXQ	21324EXQK	790,000	765,000	2,100	2,500	
	260	86.0	3.0	22324EXQ	22324EXQK	1,250,000	1,130,000	2,000	2,700	
130	200	52.0	2.0	23026EXQ	23026EXQK	555,000	660,000	2,600	3,200	
	200	69.0	2.0	24026EXQ	24026EXQK30	710,000	900,000	2,600	3,300	
	210	64.0	2.0	23126EXQ	23126EXQK	690,000	799,000	2,400	3,200	
	210	80.0	2.0	24126EXQ	24126EXQK30	840,000	1,030,000	2,400	3,200	
	230	64.0	3.0	22226EXQ	22226EXQK	910,000	915,000	2,400	2,800	
	230	80.0	3.0	23226EXQ	23226EXQK	980,000	1,090,000	2,300	2,900	
	280	93.0	4.0	22326EXQ	22326EXQK	1,450,000	1,340,000	1,900	2,600	
140	210	53.0	2.0	23028EXQ	23028EXQK	585,000	710,000	2,600	2,900	
	210	69.0	2.0	24028EXQ	24028EXQK30	720,000	920,000	2,400	3,200	
	225	68.0	2.1	23128EXQ	23128EXQK	790,000	940,000	2,300	3,000	
	225	85.0	2.1	24128EXQ	24128EXQK30	950,000	1,180,000	2,300	2,900	
	250	68.0	3.0	22228EXQ	22228EXQK	1,050,000	1,030,000	2,100	2,600	
	250	88.0	3.0	23228EXQ	23228EXQK	1,130,000	1,290,000	2,100	2,600	
150	225	56.0	2.1	23030EXQ	23030EXQK	640,000	790,000	2,100	2,600	
	225	75.0	2.1	24030EXQ	24030EXQK30	815,000	1,060,000	2,300	2,800	
	250	80.0	2.1	23130EXQ	23130EXQK	1,000,000	1,230,000	2,100	2,600	
	250	100.0	2.1	24130EXQ	24130EXQK30	1,230,000	1,520,000	2,100	2,600	
	270	73.0	3.0	22230EXQ	22230EXQK	1,200,000	1,200,000	2,000	2,500	
	270	96.0	3.0	23230EXQ	23230EXQK	1,340,000	1,540,000	2,000	2,500	
160	240	60.0	2.1	23032EXQ	23032EXQK	735,000	915,000	2,000	2,500	
	240	80.0	2.1	24032EXQ	24032EXQK30	950,000	1,280,000	2,100	2,600	
	270	86.0	2.1	23132EXQ	23132EXQK	1,180,000	1,430,000	2,000	2,500	
	270	109.0	2.1	24132EXQ	24132EXQK30	1,450,000	1,810,000	2,000	2,500	
170	260	67.0	2.1	23034EXQ	23034EXQK	880,000	1,080,000	1,800	2,300	
	260	90.0	2.1	24034EXQ	24034EXQK30	1,120,000	1,480,000	2,000	2,500	
	280	88.0	2.1	23134EXQ	23134EXQK	1,260,000	1,530,000	1,800	2,300	
180	280	74.0	2.1	23036EXQ	23036EXQK	1,070,000	1,330,000	1,700	2,300	

(Note) The EXQ-V specifications are also available for the blue-colored bearing numbers.



■ Dynamic equivalent radial load
 $P_r = X F_r + Y F_a$

$\frac{F_a}{F_r} \leq e$		$\frac{F_a}{F_r} > e$	
X	Y	X	Y
1	Y_1	0.67	Y_2

Values of e , Y_1 and Y_2 to be obtained from the following table.

■ Static equivalent radial load
 $P_0 = F_r + Y_0 F_a$

Value of Y_0 to be obtained from the following table.

	Dimensions of oil holes and grooves			Mounting related dimensions (mm)			Axial load factor				Mass (kg) Cylindrical bore (Reference)	Bearing number	
	Hole diameter du	Groove width A	Hole count N	da (min.)	Da (max.)	ra (max.)	Constant e	Y_1	Y_2	Y_0		Cylindrical bore ^(Note)	Tapered bore
	4	7	4	117.0	141.0	1.5	0.22	3.01	4.48	2.94	2.33	23020EXQ	23020EXQK
	5	9	4	110.0	155.0	2.0	0.29	2.33	3.47	2.28	4.49	23120EXQ	23120EXQK
	5	8	4	112.0	168.0	2.0	0.25	2.74	4.08	2.68	5.10	22220EXQ	22220EXQK
	5	10	4	112.0	168.0	2.0	0.32	2.09	3.11	2.04	6.76	23220EXQ	23220EXQK
	4	8	6	114.0	201.0	2.5	0.22	3.02	4.49	2.95	8.70	21320EXQ	21320EXQK
	6	12	6	114.0	201.0	2.5	0.35	1.95	2.90	1.91	13.1	22320EXQ	22320EXQK
	5	9	4	120.0	160.0	2.0	0.24	2.48	4.23	2.78	3.84	23022EXQ	23022EXQK
	5	9	4	120.0	170.0	2.0	0.29	2.36	3.51	2.31	5.70	23122EXQ	23122EXQK
	6	11	4	120.0	170.0	2.0	0.37	1.84	2.74	1.80	6.89	24122EXQ	24122EXQK30
	5	10	6	122.0	188.0	2.0	0.26	2.64	3.93	2.58	7.36	22222EXQ	22222EXQK
	6	11	6	122.0	188.0	2.0	0.34	1.99	2.96	1.94	9.60	23222EXQ	23222EXQK
	4	8	6	124.0	226.0	2.5	0.21	3.19	4.75	3.12	11.6	21322EXQ	21322EXQK
	6	12	6	124.0	226.0	2.5	0.33	2.03	3.02	1.98	18.1	22322EXQ	22322EXQK
	5	9	4	130.0	170.0	2.0	0.23	2.95	4.40	2.89	4.20	23024EXQ	23024EXQK
	5	9	4	130.0	170.0	2.0	0.30	2.23	3.32	2.18	5.36	24024EXQ	24024EXQK30
	5	9	6	130.0	190.0	2.0	0.29	2.34	3.49	2.29	7.90	23124EXQ	23124EXQK
	6	11	6	130.0	190.0	2.0	0.38	1.78	2.65	1.74	10.1	24124EXQ	24124EXQK30
	5	10	6	132.0	203.0	2.0	0.26	2.60	3.87	2.54	9.28	22224EXQ	22224EXQK
	6	13	6	132.0	203.0	2.0	0.34	1.97	2.94	1.93	12.0	23224EXQ	23224EXQK
	5	12	6	134.0	246.0	2.5	0.21	3.17	4.72	3.10	15.3	21324EXQ	21324EXQK
	8	15	6	134.0	246.0	2.5	0.33	2.03	3.02	1.98	22.6	22324EXQ	22324EXQK
	5	10	6	140.0	190.0	2.0	0.24	2.87	4.27	2.80	6.14	23026EXQ	23026EXQK
	6	11	6	140.0	190.0	2.0	0.32	2.14	3.18	2.09	7.93	24026EXQ	24026EXQK30
	5	9	6	140.0	200.0	2.0	0.28	2.42	3.61	2.37	8.60	23126EXQ	23126EXQK
	6	11	6	140.0	200.0	2.0	0.36	1.90	2.83	1.86	10.7	24126EXQ	24126EXQK30
	5	10	6	144.0	216.0	2.5	0.26	2.55	3.80	2.50	11.6	22226EXQ	22226EXQK
	6	13	6	144.0	216.0	2.5	0.33	2.05	3.05	2.00	14.2	23226EXQ	23226EXQK
	8	17	6	148.0	262.0	3.0	0.33	2.03	3.02	1.98	28.4	22326EXQ	22326EXQK
	5	10	6	150.0	200.0	2.0	0.23	2.98	4.44	2.91	6.61	23028EXQ	23028EXQK
	6	11	6	150.0	200.0	2.0	0.30	2.28	3.39	2.23	8.40	24028EXQ	24028EXQK30
	6	11	6	152.0	213.0	2.0	0.28	2.45	3.65	2.40	10.5	23128EXQ	23128EXQK
	8	14	6	152.0	213.0	2.0	0.36	1.87	2.79	1.83	13.0	24128EXQ	24128EXQK30
	6	12	6	154.0	236.0	2.5	0.26	2.60	3.87	2.54	13.9	22228EXQ	22228EXQK
	8	15	6	154.0	236.0	2.5	0.34	1.99	2.96	1.95	18.8	23228EXQ	23228EXQK
	5	11	6	162.0	213.0	2.0	0.22	3.04	4.53	2.97	8.01	23030EXQ	23030EXQK
	6	11	6	162.0	213.0	2.0	0.30	2.23	3.32	2.18	10.5	24030EXQ	24030EXQK30
	6	13	6	162.0	238.0	2.0	0.30	2.24	3.34	2.19	16.2	23130EXQ	23130EXQK
	8	14	6	162.0	238.0	2.0	0.38	1.77	2.64	1.73	19.6	24130EXQ	24130EXQK30
	6	14	6	164.0	256.0	2.5	0.25	2.69	4.00	2.63	18.9	22230EXQ	22230EXQK
	8	15	6	164.0	256.0	2.5	0.34	1.96	2.93	1.92	24.2	23230EXQ	23230EXQK
	5	11	6	172.0	228.0	2.0	0.22	3.01	4.48	2.94	9.74	23032EXQ	23032EXQK
	6	11	6	172.0	228.0	2.0	0.30	2.24	3.34	2.19	12.7	24032EXQ	24032EXQK30
	8	16	6	172.0	258.0	2.0	0.30	2.22	3.30	2.17	20.5	23132EXQ	23132EXQK
	10	17	6	172.0	258.0	2.0	0.39	1.74	2.59	1.70	25.5	24132EXQ	24132EXQK30
	6	13	6	182.0	248.0	2.0	0.23	2.90	4.31	2.83	13.1	23034EXQ	23034EXQK
	8	14	6	182.0	248.0	2.0	0.32	2.11	3.15	2.07	17.3	24034EXQ	24034EXQK30
	8	16	6	182.0	268.0	2.0	0.29	2.30	3.43	2.25	21.6	23134EXQ	23134EXQK
	8	15	6	192.0	268.0	2.0	0.24	2.84	4.23	2.78	17.4	23036EXQ	23036EXQK

EXQ series versus conventional EX series performance comparison

Temperature increase test vs. Axial load

Test bearing

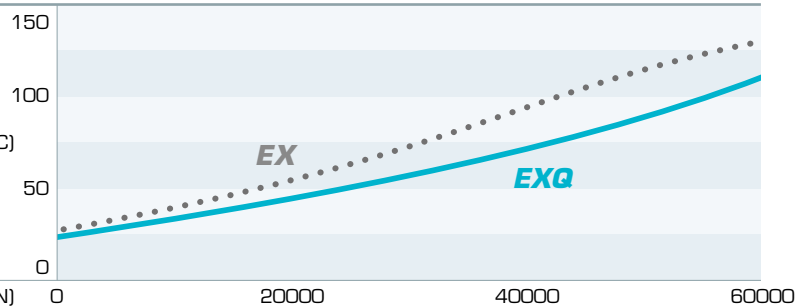
22312EXQ and 22312EX

Test condition

Radial load	58500N
Axial load	0~58500N
Rotating speed	2100rpm
Lubrication amount	0.6L/min

Temperature rise value (°C)

Axial load Fa (N)



Temperature rise test vs. Rotating speed

Test bearing

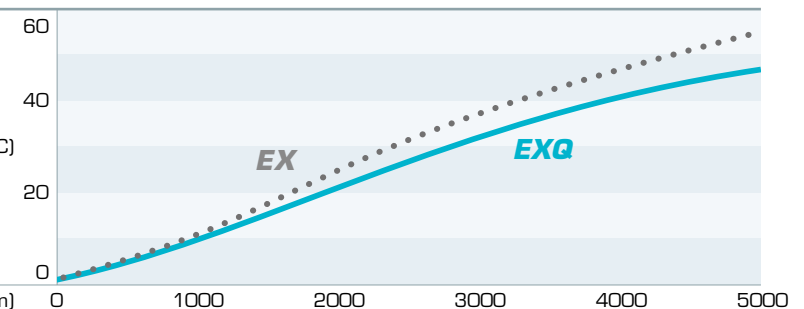
22312EXQ and 22312EX

Test condition

Radial load	11700N
Axial load	4200N
Rotating speed	500~5000rpm
Lubrication amount	0.6L/min

Temperature rise value (°C)

Rotating speed N (rpm)



Impact resistance test

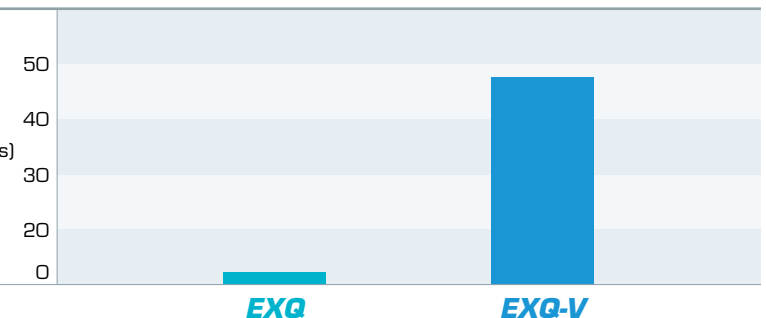
Test bearing

22312EXQ-V and 22312EXQ

Test condition

Vibration cycle	119cpm
Vibration acceleration	200G
Temperature	20°C

Impact frequency (10⁴ times)



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