

**2.4 Bearing vibration**

The bearing vibration is defined that during the bearing rotation, all periodicity motion except some motion between the components, these motion are fixed and required by function.

Below is the vibration limit of each bearing. If you have any special requirement for bearing vibration when bearing selection, you can directly contact UBC company.

**2.4.1 The vibration limit of deep groove ball bearing in table 2-58,2-59,2-60,and 2-61**

Table 2-58 The vibration (speed) limit of single bearing μm/s

Inner diameter d/mm	V			V1			V2			V3			V4		
	LF	IF	HF	LF	IF	HF	LF	IF	HF	LF	IF	HF	LF	IF	HF
3	80	44	44	60	35	32	48	26	22	31	16	15	28	10	10
4	80	44	44	60	35	32	48	26	22	31	16	15	28	10	10
5	110	72	60	74	48	40	58	36	30	35	21	18	32	11	11
6	110	72	60	74	48	40	58	36	30	35	21	180	32	11	11
7	130	96	80	92	66	54	72	48	40	44	28	24	38	12	12
8	130	96	80	92	66	54	72	48	40	44	28	24	38	12	12
9	130	96	80	92	66	54	72	48	40	44	28	24	38	12	12
10	160	120	100	120	80	70	90	60	50	55	35	30	45	14	15
12	160	120	100	120	80	70	90	60	50	55	35	30	45	14	15
15	210	150	120	150	100	85	110	78	60	65	46	35	52	18	18
17	210	150	120	150	100	85	110	78	60	65	46	35	52	25	25
20	260	190	150	160	125	100	130	100	75	80	60	45	60	25	25
22	260	190	150	180	125	100	130	100	75	80	60	45	60	30	32
25	260	190	150	180	125	100	130	100	75	80	60	45	60	30	32
28	260	190	150	180	125	100	130	100	75	90	60	45	60	35	40
30	300	240	190	200	150	130	150	120	100	90	75	60	70	35	40
32	300	240	190	200	150	130	150	120	100	90	75	60	70	35	40
35	300	240	190	200	150	130	150	120	100	90	75	60	70	42	45
40	350	300	260	240	180	160	180	150	130	110	90	80	82	50	50
45	350	300	260	240	180	160	180	150	130	110	90	80	82	60	60
50	420	320	320	280	200	200	210	160	160	125	100	100	95	70	70
55	420	360	360	280	220	200	210	180	180	125	110	110	95	70	70
60	480	360	440	320	220	240	240	180	200	145	110	130	100	80	80

The bearing tests based on the actual speed of inner ring is 1764r/min-1818r/min

Table 2-59 The vibration (speed) limit of single bearing μm/s

Inner diameter d/mm	V			V1			V2			V3			V4		
	LF	IF	HF	LF	IF	HF	LF	IF	HF	LF	IF	HF	LF	IF	HF
65	300	260	420	180	160	240	130	100	150	105	80	105	50	50	75
70	360	310	460	200	180	280	150	120	200	110	90	135	58	58	88
75	360	310	460	200	180	280	150	120	200	110	90	135	58	58	88
80	420	360	540	240	210	320	180	120	240	130	110	160	65	65	100
85	420	360	540	240	210	320	180	150	240	130	110	160	65	65	110
90	480	420	600	290	250	370	210	180	270	145	125	180	75	75	115
95	480	420	600	290	250	370	210	180	270	145	125	180	75	75	115
100	560	490	670	340	300	420	250	215	310	170	145	200	88	88	135
105	560	490	670	340	300	420	250	215	310	170	145	200	88	88	135
110	640	570	750	400	350	480	290	260	350	190	175	225	100	100	160
120	640	570	750	400	350	480	290	260	350	190	175	225	100	100	160

The bearing tests based on the actual speed of inner ring is 882r/min-909r/min

Table 2-61 The vibration acceleration (dB) limit of single bearing

Inner diameter d/mm	Diameter (0)			Diameter (2)				Diameter (3)			
	Z	Z1	Z2	Z	Z1	Z2	Z3	Z	Z1	Z2	Z3
65	49	48	46	50	49	47	47	51	50	48	43
70	50	49	47	51	50	48	43	52	51	49	44
75	51	50	48	52	51	49	44	53	52	50	45
80	52	51	49	53	52	50	45	54	53	51	46
85	53	52	50	54	53	51	46	56	55	52	47
90	54	53	52	56	55	53	48	58	57	54	49
95	56	55	54	58	57	55	50	60	59	56	51
100	58	57	56	60	59	57	52	62	61	58	53
105	60	59	58	62	61	59	54	64	63	60	55
110	62	61	60	64	63	61	56	66	65	62	57
120	64	63	62	66	65	63	58	68	67	64	59

The bearing tests based on the actual speed of driver is 1000r/min+-20r/min

Table 2-60 The vibration acceleration (dB) limit of single bearing

Inner diameter d/mm	Diameter (0)				Diameter (2)					Diameter (3)				
	Z	Z1	Z2	Z3	Z	Z1	Z2	Z3	Z4	Z	Z1	Z2	Z3	Z4
3	35	34	32	28	36	35	32	30	-	37	37	33	31	-
4	35	34	32	28	36	35	32	30	-	37	36	33	31	-
5	37	36	34	30	38	37	34	32	-	39	37	35	33	-
6	37	36	34	30	38	37	34	32	-	39	37	35	33	-
7	39	38	35	31	40	38	36	34	-	-	-	-	-	-
8	39	38	35	31	40	38	36	34	-	-	-	-	-	-
9	41	40	36	32	42	40	37	35	-	-	-	-	-	-
10	43	42	38	33	44	42	39	35	30	46	44	40	37	32
12	44	43	39	34	45	43	39	35	30	47	45	40	37	32
15	45	44	40	35	46	44	41	36	31	48	46	42	38	33
17	46	44	40	35	47	45	41	36	31	49	47	42	38	33
20	47	45	41	36	48	46	42	38	33	50	48	43	39	34
22	47	45	41	36	48	46	42	38	33	50	48	43	39	34
25	48	46	42	38	49	47	43	40	36	51	49	44	41	37
28	49	47	43	39	50	48	44	41	37	52	50	45	42	38
30	49	47	43	39	50	48	44	41	37	52	50	45	42	36
32	50	48	44	40	51	49	45	42	38	53	51	46	43	39
35	51	49	45	41	52	50	46	43	39	54	52	47	44	40
40	53	51	46	42	54	52	47	44	40	56	54	49	45	41
45	55	53	48	45	56	54	49	46	43	58	56	51	47	41
50	57	54	50	47	58	55	51	48	45	60	57	53	49	46
55	59	56	52	49	60	57	53	50	47	62	59	54	51	48
60	61	58	54	51	62	59	54	51	48	64	61	56	53	50

The bearing tests based on the actual speed of driver is 1500r/min±30r/min

**2.4.2 The table 2-62,2-63,2-64,and 2-65 is the vibration limit of deep groove ball bearing used in motor**

Table 2-62 The vibration (speed) limit of single bearing

Inner diameter d/mm	V1			V2			V3			V4			μm/s
	LF	IF	HF	LF	IF	HF	LF	IF	HF	LF	IF	HF	
3	60	35	32	48	28	22	31	16	15	28	10	10	
4	60	35	32	48	26	22	31	16	15	28	10	10	
5	74	48	40	58	36	30	35	21	18	32	11	11	
6	74	48	40	58	36	30	35	21	18	32	12	12	
7	92	66	54	72	48	40	44	28	24	38	12	12	
8	92	66	54	72	48	40	44	28	24	38	12	12	
9	92	66	54	72	48	40	44	28	24	38	12	12	
10	120	80	70	90	60	50	55	35	30	45	14	15	
12	120	80	70	90	60	50	55	35	30	45	14	15	
15	150	100	85	110	78	60	65	46	35	52	18	18	
17	150	100	85	110	78	60	65	46	35	52	25	25	
20	180	125	100	130	100	75	80	60	45	60	25	25	
22	180	125	100	130	100	75	80	60	45	60	30	32	
25	180	125	100	130	100	75	80	60	45	60	30	32	
28	180	125	100	130	100	75	80	60	45	60	35	40	
30	200	150	130	150	120	100	90	75	60	70	35	40	
32	200	150	130	150	120	100	90	75	60	70	35	40	
35	200	150	130	150	120	100	90	75	60	70	42	45	
40	240	180	160	180	150	130	110	90	80	82	50	50	
45	240	180	160	180	150	130	110	90	80	82	60	60	
50	280	200	200	210	160	160	125	100	100	95	70	70	
55	280	220	200	210	180	180	125	110	110	95	70	70	
60	320	220	240	240	180	200	145	110	130	100	80	80	

Table 2-63 The vibration (speed) limit of single bearing μm/s

Inner diameter d/mm	V1			V2			V3			V4		
	LF	IF	HF	LF	IF	HF	LF	IF	HF	LF	IF	HF
65	180	160	240	130	100	150	105	80	105	50	50	75
70	200	180	280	150	120	200	110	90	135	58	58	88
75	200	180	280	180	120	200	110	90	135	58	58	88
80	240	210	320	180	120	240	130	110	160	65	65	100
85	240	210	320	180	150	240	130	110	160	65	65	100
90	290	250	370	210	180	270	140	125	180	75	75	115
95	290	250	370	210	180	270	145	125	180	75	75	115
100	340	300	420	250	215	310	170	145	200	88	88	135
105	340	300	420	250	215	310	170	145	200	88	88	135
110	400	350	480	290	260	350	190	175	225	100	100	160
120	400	350	480	290	260	350	190	175	225	100	100	160

Note: The speed in this table for bearing vibration measurement is different from table 2-62

Table 2-64 The vibration (Acceleration) limit of single bearing dB

Inner diameter d/mm	Diameter (0)			Diameter (2)				Diameter (3)			
	Z1	Z2	Z3	Z1	Z2	Z3	Z4	Z1	Z2	Z3	Z4
3	34	32	28	35	32	30	-	36	33	31	-
4	34	32	28	35	32	30	-	36	33	31	-
5	36	34	30	37	34	32	-	37	35	33	-
6	35	34	30	37	34	32	-	37	35	33	-
7	38	35	31	38	36	34	-	-	-	-	-
8	38	35	31	38	36	34	-	-	-	-	-
9	40	36	32	40	37	35	-	-	-	-	-
10	42	38	33	42	39	35	30	44	40	37	32
12	43	39	34	43	39	35	30	45	40	37	32
15	44	40	35	44	41	36	31	46	42	38	33
17	44	40	35	45	41	36	31	47	42	38	33
20	45	41	36	48	42	38	33	48	43	39	34
22	45	41	36	46	42	38	33	48	43	39	34
25	46	42	38	47	43	40	36	49	44	41	37
28	47	43	39	48	44	41	37	50	45	42	38
30	47	43	39	48	44	41	37	50	45	42	38
32	48	44	40	49	45	42	38	51	46	43	39
35	49	445	41	50	46	43	39	52	47	44	40
40	51	46	42	50	47	44	40	54	49	45	41
45	53	48	45	54	49	46	43	56	51	47	44
50	54	50	47	55	51	48	45	57	53	49	46
55	56	52	49	57	53	50	47	59	54	51	48
60	58	54	51	59	54	51	48	61	56	53	50

Table 2-65 The vibration (Acceleration) limit of single bearing dB

Inner diameter d/mm	Diameter (0)		Diameter (2)			Diameter (3)		
	Z1	Z2	Z1	Z2	Z3	Z1	Z2	Z3
65	48	46	49	47	42	50	48	43
70	49	47	50	48	43	51	49	44
75	50	48	51	49	44	52	50	45
80	51	49	52	50	45	53	51	46
85	52	50	53	51	46	55	52	47
90	56	52	55	53	48	57	54	49
95	55	54	57	55	50	59	56	51
100	57	56	59	57	52	61	58	53
105	59	58	61	59	54	63	60	55
110	61	60	63	61	56	65	62	57
120	63	62	65	63	58	67	64	59

Note: The speed in this table for bearing vibration measurement is different from table 2-64.

**2.4.3 The vibration limit of tapered roller bearings in table 2-66 to 2-67**

Table 2-66 The vibration (speed) limit of single bearing μm/s

Inner diameter d/mm	V			V1			V2			V3		
	LF	IF	HF	LF	IF	HF	LF	IF	HF	LF	IF	HF
15	310	500	500	220	360	360	150	220	220	100	100	100
17	330	550	550	240	400	400	170	240	240	110	110	110
20	330	550	550	240	400	400	170	240	240	110	110	110
25	360	590	600	280	440	450	210	280	280	120	140	130
30	360	590	600	280	440	450	210	280	280	120	140	130
35	400	640	670	320	480	500	250	320	300	150	180	160
40	440	690	740	360	530	560	280	350	320	170	210	190
45	440	690	740	360	530	560	280	350	320	170	210	190
50	480	750	810	400	600	620	320	400	360	220	260	240
55	480	750	840	400	600	680	320	400	360	220	260	240
60	530	850	1000	450	680	760	370	460	420	300	330	300

The bearing tests based on the actual speed of inner ring is 1764r/min-1818r/min

Table 2-67 The vibration (acceleration) limit of single bearing

dB

Inner diameter d/mm	30200, 32200 Series			30300, 32300 Series		
	Z	Z1	Z2	Z	Z1	Z2
15	-	-	-	56	54	50
17	56	54	50	58	56	52
20	57	55	51	61	58	53
25	58	56	52	64	61	56
30	59	56	52	67	64	59
35	61	58	53	68	65	60
40	63	60	55	69	66	61
45	65	62	57	69	66	61
50	67	64	59	71	68	63
55	69	66	61	74	71	66
60	71	68	63	77	74	69

The bearing tests based on the actual speed of driver is 1500r/min±30r/min

Table 2-69 The vibration (speed) limit of single bearing

µm/s

Inner diameter d/mm	V			V1			V2			V3		
	LF	IF	HF	LF	IF	HF	LF	IF	HF	LF	IF	HF
65	420	500	500	310	360	380	240	230	230	170	120	120
70	470	560	560	350	430	430	290	270	270	200	140	140
75	470	560	560	350	430	430	290	270	270	200	140	140
80	530	630	630	410	500	500	330	300	300	230	160	160
85	530	630	630	410	500	500	330	300	300	230	160	160
90	610	710	710	460	570	570	370	350	350	260	180	180
95	610	710	710	460	570	570	370	350	350	260	180	180
100	690	800	800	540	650	650	430	400	400	300	210	210
105	690	800	800	540	650	650	430	400	400	300	210	210
110	780	920	920	630	740	740	500	470	470	350	240	240
120	780	920	920	630	740	740	500	470	470	350	240	240

**2.4.4 The vibration limit of cylindrical roller bearings in table 2-68 to 2-69**

Table 2-68 The vibration (speed) limit of single bearing

µm/s

Inner diameter d/mm	V			V1			V2			V3		
	LF	IF	HF	LF	IF	HF	LF	IF	HF	LF	IF	HF
15	340	420	420	260	310	310	200	190	190	140	100	100
17	370	460	460	290	350	350	230	220	220	160	110	110
20	370	460	460	290	350	350	230	220	220	160	110	110
25	420	530	530	330	400	400	260	260	260	180	130	130
30	420	530	530	330	400	400	260	260	260	180	130	130
35	490	610	610	380	470	470	300	300	300	210	150	150
40	490	610	610	380	470	470	300	300	300	210	150	150
45	570	690	690	430	540	540	340	340	340	240	170	170
50	570	690	690	430	540	540	340	340	340	240	170	170
55	650	780	780	500	610	610	380	380	380	280	190	190
60	650	780	780	500	610	610	380	380	380	280	190	190

The bearing tests based on the actual speed of inner ring is 1764r/min-1818r/min