

DESIGN AND TYPES

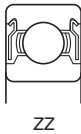
The size ranges of extra small and miniature ball bearings are shown in Table 1, and design/types and type designations are shown in Table 2. Types listed in the bearing tables are indicated by shading ■ in Table 2.

Table 1 Size Ranges of Bearings

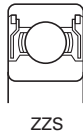
Units : mm

Series	Extra Small Ball Bearings	Miniature Ball Bearings
Metric	Outside diameter $D \geq 9$	Outside diameter $D < 9$
	Bore diameter $d < 10$	
Inch	Outside diameter $D \geq 9.525$	Outside diameter $D < 9.525$
	Bore diameter $d < 10$	

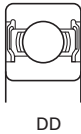
Please refer to NSK Miniature Ball Bearings (CAT. No. E126) for details.



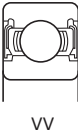
ZZ



ZZS



DD



VV

Table 2 Design/Types and Type Designations of Miniature and Extra Small Bearings

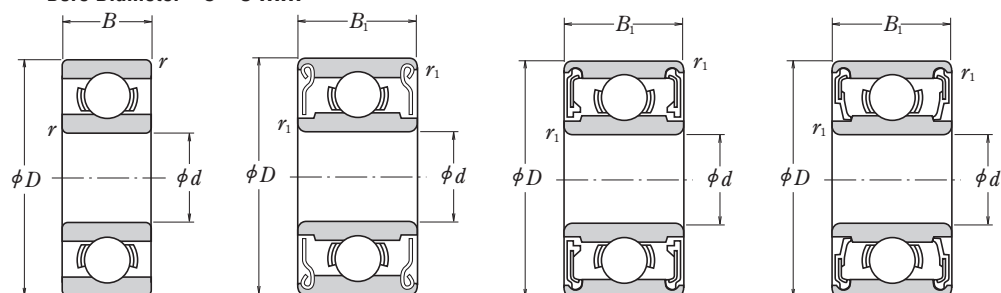
Design/Types		Type Designations				Remarks
		Metric	Inch	Special		
				Metric	Inch	
Single-Row Deep Groove Ball Bearings		6 ○ ○	R	MR	—	Shielded and sealed bearings are available.
	 Thin section	—	—	SMT	—	
	 With flange	F6 ○ ○	FR	MF	—	Shielded and sealed bearings are available.
	 Extended inner ring	—	—	—	RW	Shielded bearings are available.
	 With flange and extended inner ring	—	—	—	FRW	Shielded bearings are available.
	 For synchro motors	—	—	—	SR00X00	Shielded bearings are available.
	Pivot Ball Bearings		—	—	BCF	—
Thrust Ball Bearings		—	—	F	—	

Remark Other bearings, such as single-row angular contact ball bearings, are available.

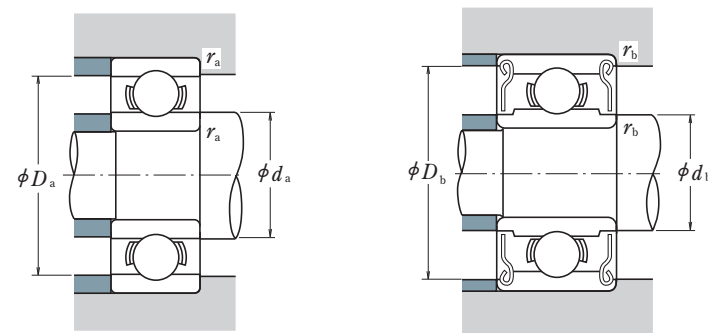
EXTRA SMALL BALL BEARINGS · MINIATURE BALL BEARINGS

Metric Series

Bore Diameter 5 – 9 mm



Open

Shielded
ZZ · ZZ1Non-Contact
Sealed
VVContact
Sealed
DD

Boundary Dimensions (mm)						Basic Load Ratings (N)		Limiting Speeds (min ⁻¹) GreaseOil			Bearing Designations			Abutment and Fillet Dimensions (mm)						Mass (g)		
d	D	B	B ₁	r ⁽¹⁾ min.	r ₁ ⁽¹⁾ min.	C _r	C _{0r}	Open Z · ZZ V · VV	D · DD	Open Z	Open	Shielded	Sealed	d _a min.	d _b max.	D _a max.	D _b min.	r _a max.	r _b max.	approx. OpenShielded		
5	8	2	—	0.1	—	340	120	53 000	—	63 000	MR 85	—	—	5.8	—	7.2	—	0.1	—	0.26	—	
	8	—	2.5	—	0.1	305	131	53 000	—	63 000	—	MR 85 ZZ	—	—	—	5.8	—	7.4	—	0.1	—	0.34
	9	2.5	3	0.15	0.15	475	168	50 000	—	60 000	MR 95	MR 95 ZZ1	—	—	6.2	6.0	7.8	8.2	0.15	0.15	0.50	0.58
	10	3	4	0.15	0.15	475	168	50 000	—	60 000	MR 105	MR 105 ZZ	—	—	6.2	6.0	8.8	8.4	0.15	0.15	0.95	1.29
	11	—	4	—	0.15	790	276	48 000	—	56 000	—	MR 115 ZZ	VV	—	—	6.3	—	9.8	—	0.15	—	1.49
	11	3	5	0.15	0.15	790	281	45 000	—	53 000	685	685 ZZ	—	—	6.2	6.2	9.8	9.9	0.15	0.15	1.2	1.96
	13	4	4	0.2	0.2	1 190	430	43 000	40 000	50 000	695	695 ZZ1	VV DD	6.6	6.6	11.4	11.2	0.2	0.2	2.45	2.5	
	14	5	5	0.2	0.2	1 460	505	40 000	38 000	50 000	605	605 ZZ	— DD	6.6	6.9	12.4	12.2	0.2	0.2	3.54	3.48	
	16	5	5	0.3	0.3	1 910	670	36 000	32 000	43 000	625	625 ZZ1	VV DD	7.0	7.5	14.0	13.8	0.3	0.3	4.95	4.86	
	19	6	6	0.3	0.3	2 570	885	32 000	30 000	40 000	635	635 ZZ1	VV DD	7.0	8.5	17.0	16.5	0.3	0.3	8.56	8.34	
	6	10	2.5	3	0.15	0.1	545	218	45 000	—	53 000	MR 106	MR 106 ZZ1	—	—	7.2	7.0	8.8	9.3	0.15	0.1	0.56
12		3	4	0.2	0.15	790	292	43 000	40 000	50 000	MR 126	MR 126 ZZ	— DD	7.6	7.2	10.4	10.9	0.2	0.15	1.27	1.74	
13		3.5	5	0.15	0.15	1 190	440	40 000	38 000	50 000	686 A	686 AZZ1	VV DD	7.2	7.4	11.8	11.7	0.15	0.15	1.91	2.69	
15		5	5	0.2	0.2	1 910	670	40 000	36 000	45 000	696	696 ZZ1	VV DD	7.6	7.9	13.4	13.3	0.2	0.2	3.88	3.72	
17		6	6	0.3	0.3	2 490	835	38 000	34 000	45 000	606	606 ZZ	VV DD	8.0	8.2	15.0	14.8	0.3	0.3	5.97	6.08	
19		6	6	0.3	0.3	2 570	885	32 000	30 000	40 000	626	626 ZZ1	VV DD	8.0	8.5	17.0	16.5	0.3	0.3	8.15	7.94	
22		7	7	0.3	0.3	3 650	1 370	30 000	28 000	36 000	636	636 ZZ1	VV DD	8.0	10.5	20.0	19.0	0.3	0.3	14	14	
11		2.5	3	0.15	0.1	500	201	43 000	—	50 000	MR 117	MR 117 ZZ	—	—	8.2	8.0	9.8	10.5	0.15	0.1	0.62	0.72
13		3	4	0.2	0.15	595	276	40 000	—	48 000	MR 137	MR 137 ZZ	—	—	8.6	9.0	11.4	11.6	0.2	0.15	1.58	2.02
14		3.5	5	0.15	0.15	1 290	510	40 000	34 000	45 000	687	687 ZZ1	VV DD	8.2	8.5	12.8	12.7	0.15	0.15	2.13	2.97	
17		5	5	0.3	0.3	1 770	710	36 000	28 000	43 000	697	697 ZZ1	VV DD	9.0	10.2	15.0	14.8	0.3	0.3	5.26	5.12	
19	6	6	0.3	0.3	2 570	885	36 000	32 000	43 000	607	607 ZZ1	VV DD	9.0	9.1	17.0	16.5	0.3	0.3	7.67	7.51		
22	7	7	0.3	0.3	3 650	1 370	30 000	28 000	36 000	627	627 ZZ1	VV DD	9.0	10.5	20.0	19.0	0.3	0.3	12.7	12.9		
26	9	9	0.3	0.3	5 050	1 970	28 000	22 000	34 000	637	637 ZZ1	VV DD	9.0	12.8	24.0	22.8	0.3	0.3	24	25		
8	12	2.5	3.5	0.15	0.1	600	274	40 000	—	48 000	MR 128	MR 128 ZZ1	—	—	9.2	9.0	10.8	11.3	0.15	0.1	0.71	0.97
	14	3.5	4	0.2	0.15	900	385	38 000	32 000	45 000	MR 148	MR 148 ZZ	VV DD	9.6	9.2	12.4	12.8	0.2	0.15	1.86	2.16	
	16	4	5	0.2	0.2	1 770	710	36 000	28 000	43 000	688 A	688 AZZ1	VV DD	9.6	10.2	14.4	14.2	0.2	0.2	3.12	4.02	
	19	6	6	0.3	0.3	2 460	910	36 000	28 000	43 000	698	698 ZZ1	VV DD	10.0	10.0	17.0	16.5	0.3	0.3	7.23	7.18	
	22	7	7	0.3	0.3	3 650	1 370	34 000	28 000	40 000	608	608 ZZ1	VV DD	10.0	10.5	20.0	19.0	0.3	0.3	12.1	12.2	
	24	8	8	0.3	0.3	3 700	1 430	28 000	24 000	34 000	628	628 ZZ	VV DD	10.0	12.0	22.0	20.5	0.3	0.3	17.2	17.4	
	28	9	9	0.3	0.3	5 050	1 970	28 000	22 000	34 000	638	638 ZZ1	VV DD	10.0	12.8	26.0	22.8	0.3	0.3	28.3	28.6	
	17	4	5	0.2	0.2	1 460	665	36 000	24 000	43 000	689	689 ZZ1	VV DD	10.6	11.5	15.4	15.2	0.2	0.2	3.53	4.43	
	20	6	6	0.3	0.3	1 890	840	34 000	24 000	40 000	699	699 ZZ1	VV DD	11.0	12.0	18.0	17.2	0.3	0.3	8.45	8.33	
	24	7	7	0.3	0.3	3 700	1 430	32 000	24 000	38 000	609	609 ZZ1	VV DD	11.0	12.0	22.8	20.5	0.3	0.3	14.5	14.7	
	26	8	8	(0.6)	(0.6)	5 050	1 970	28 000	22 000	34 000	629	629 ZZ	VV DD	11.0	12.8	24.0	22.8	0.3	0.3	19.5	19.3	
30	10	10	0.6	0.6	5 600	2 390	24 000	—	30 000	639	639 ZZ	VV	13.0	16.1	26.0	25.6	0.6	0.6	36.5	36		

Note (1) Values in parentheses are not based on ISO 15.

Remarks 1. When using sealed or shielded bearings with a rotating outer ring, please contact NSK.

2. Bearings with snap rings are also available, please contact NSK for details.