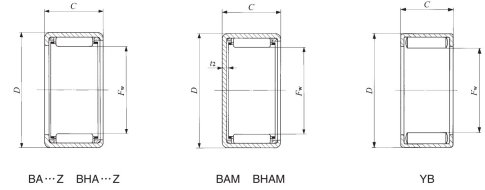




## SHELL TYPE NEEDLE ROLLER BEARINGS

Inch Series



Shaft dia. 3.969 – 9.525mm

Shaft dia. mm (inch)	Identification number									
	Standard	Mass (Ref.) g	Closed end	Mass (Ref.) g	Standard	Mass (Ref.) g	Closed end	Mass (Ref.) g	Grease retained	Mass (Ref.) g
3.969 ( $\frac{3}{32}$ )	—	—	—	—	—	—	—	—	YB 2.5 2.5	0.64
	—	—	—	—	—	—	—	—	YB 2.5 4	0.96
4.762 ( $\frac{1}{4}$ )	—	—	—	—	—	—	—	—	YB 34	1.6
6.350 ( $\frac{1}{4}$ )	BA 44 Z	2.1	—	—	—	—	—	—	—	—
	BA 45 Z	2.5	BAM 45	2.7	—	—	—	—	—	—
	BA 47 Z	3.5	BAM 47	3.7	—	—	—	—	YB 45	3.2
7.938 ( $\frac{5}{16}$ )	—	—	—	—	—	—	—	—	YB 47	4.6
	BA 55 Z	3	BAM 55	3.3	—	—	—	—	—	—
	BA 56 Z	3.6	BAM 56	3.9	—	—	—	—	—	—
	BA 57 Z	4.3	BAM 57	4.6	—	—	—	—	—	—
	BA 59 Z	5.4	BAM 59	5.7	—	—	—	—	—	—
	—	—	—	—	—	—	—	—	YB 55	3.8
	—	—	—	—	BHA 57 Z	6.3	BHAM 57	6.6	—	—
9.525 ( $\frac{3}{8}$ )	BA 65 Z	3.5	BAM 65	3.9	—	—	—	—	—	—
	BA 66 Z	4.2	BAM 66	4.6	—	—	—	—	—	—
	BA 68 Z	5.7	BAM 68	6.1	—	—	—	—	—	—
	BA 69 Z	6.3	BAM 69	6.7	—	—	—	—	—	—
	BA 610 Z	7	BAM 610	7.4	—	—	—	—	—	—
	—	—	—	—	—	—	—	—	YB 64	3.4
	—	—	—	—	—	—	—	—	YB 66	5.3
—	—	—	—	—	—	—	—	YB 68	7.2	
—	—	—	—	—	—	—	—	YB 610	9.1	
—	—	—	—	BHA 68 Z	8.2	BHAM 68	8.6	—	—	—

Note(1) Allowable rotational speed applies to oil lubrication. For grease lubrication, a maximum of 60% of this value is allowable.  
Remark Shell Type Grease Retained Full Complement Needle Roller Bearings are provided with prepacked grease. Standard type and closed end type bearings are not provided with prepacked grease, so perform proper lubrication when using these types of bearings.

Boundary dimensions mm(inch)	Standard mounting dimensions mm				Basic dynamic load rating C N	Basic static load rating C <sub>0</sub> N	Allowable rotational speed(1) rpm	Assembled inner ring
	F <sub>w</sub>	D	C	f <sub>2</sub> Max.				
3.969 ( $\frac{3}{32}$ )	7.144 ( $\frac{3}{16}$ )	3.96 (.156)	—	—	1 350	1 220	40 000	—
3.969 ( $\frac{3}{32}$ )	7.144 ( $\frac{3}{16}$ )	6.35 (.250)	—	—	2 320	2 440	40 000	—
4.762 ( $\frac{1}{4}$ )	8.731 ( $\frac{1}{2}$ )	6.35 (.250)	—	—	2 770	2 700	30 000	—
6.350 ( $\frac{1}{4}$ )	11.112 ( $\frac{3}{4}$ )	6.35 (.250)	1	—	1 770	1 390	55 000	—
6.350 ( $\frac{1}{4}$ )	11.112 ( $\frac{3}{4}$ )	7.92 (.312)	1	—	1 510	1 120	55 000	—
6.350 ( $\frac{1}{4}$ )	11.112 ( $\frac{3}{4}$ )	11.13 (.438)	1	6.350	2 650	2 310	55 000	—
6.350 ( $\frac{1}{4}$ )	11.112 ( $\frac{3}{4}$ )	7.92 (.312)	—	—	4 450	4 870	25 000	—
6.350 ( $\frac{1}{4}$ )	11.112 ( $\frac{3}{4}$ )	11.13 (.438)	—	—	6 320	7 650	25 000	—
7.938 ( $\frac{5}{16}$ )	12.700 ( $\frac{1}{2}$ )	7.92 (.312)	1	—	1 880	1 560	45 000	—
7.938 ( $\frac{5}{16}$ )	12.700 ( $\frac{1}{2}$ )	9.52 (.375)	1	—	2 620	2 390	45 000	—
7.938 ( $\frac{5}{16}$ )	12.700 ( $\frac{1}{2}$ )	11.13 (.438)	1	7.938	3 310	3 220	45 000	—
7.938 ( $\frac{5}{16}$ )	12.700 ( $\frac{1}{2}$ )	14.27 (.562)	1	—	4 190	4 360	45 000	—
7.938 ( $\frac{5}{16}$ )	12.700 ( $\frac{1}{2}$ )	7.92 (.312)	—	—	5 110	6 090	20 000	—
7.938 ( $\frac{5}{16}$ )	14.288 ( $\frac{1}{2}$ )	11.13 (.438)	1.3	7.938	4 150	3 730	45 000	—
9.525 ( $\frac{3}{8}$ )	14.288 ( $\frac{1}{2}$ )	7.92 (.312)	1	—	2 220	2 010	40 000	—
9.525 ( $\frac{3}{8}$ )	14.288 ( $\frac{1}{2}$ )	9.52 (.375)	1	—	3 090	3 080	40 000	—
9.525 ( $\frac{3}{8}$ )	14.288 ( $\frac{1}{2}$ )	12.70 (.500)	1	9.525	4 190	4 560	40 000	—
9.525 ( $\frac{3}{8}$ )	14.288 ( $\frac{1}{2}$ )	14.27 (.562)	1	—	4 940	5 630	40 000	—
9.525 ( $\frac{3}{8}$ )	14.288 ( $\frac{1}{2}$ )	15.88 (.625)	1	—	5 660	6 700	40 000	—
9.525 ( $\frac{3}{8}$ )	14.288 ( $\frac{1}{2}$ )	6.35 (.250)	—	—	4 470	5 360	16 000	—
9.525 ( $\frac{3}{8}$ )	14.288 ( $\frac{1}{2}$ )	9.52 (.375)	—	9.525	6 920	9 410	16 000	—
9.525 ( $\frac{3}{8}$ )	14.288 ( $\frac{1}{2}$ )	12.70 (.500)	—	—	9 210	13 600	16 000	—
9.525 ( $\frac{3}{8}$ )	14.288 ( $\frac{1}{2}$ )	15.88 (.625)	—	—	11 300	17 800	16 000	—
9.525 ( $\frac{3}{8}$ )	15.875 ( $\frac{1}{2}$ )	12.70 (.500)	1.3	9.525	4 880	4 740	40 000	—



## SHELL TYPE NEEDLE ROLLER BEARINGS

Inch Series



Shaft dia. 11.112 – 12.700mm

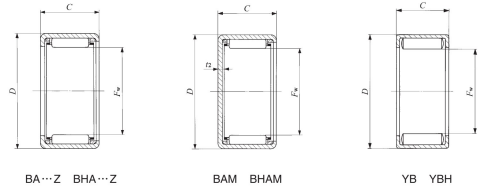
Shaft dia. mm (inch)	Identification number									
	Standard	Mass (Ref.) g	Closed end	Mass (Ref.) g	Standard	Mass (Ref.) g	Closed end	Mass (Ref.) g	Grease retained	Mass (Ref.) g
11.112 ( $\frac{7}{16}$ )	BA 76 Z	4.8	BAM 76	5.3	—	—	—	—	—	—
	BA 77 Z	5.6	BAM 77	6.2	—	—	—	—	—	—
	BA 78 Z	6.4	BAM 78	7	—	—	—	—	—	—
	BA 710 Z	7.9	BAM 710	8.5	—	—	—	—	YB 78	8.2
	—	—	—	—	BHA 78 Z	9.3	BHAM 78	10	—	—
12.700 ( $\frac{1}{2}$ )	—	—	—	—	—	—	—	—	YBH 78	10.5
	BA 85 Z	4.4	BAM 85	5.2	—	—	—	—	—	—
	BA 86 Z	5.3	BAM 86	6.1	—	—	—	—	—	—
	BA 87 Z	6.3	BAM 87	7	—	—	—	—	—	—
	BA 88 Z	7.2	BAM 88	7.9	—	—	—	—	—	—
	BA 810 Z	8.9	BAM 810	9.6	—	—	—	—	—	—
	BA 812 Z	10.6	BAM 812	11.3	—	—	—	—	—	—
	—	—	—	—	—	—	—	—	YB 84	4.3
	—	—	—	—	—	—	—	—	YB 86	6.7
	—	—	—	—	—	—	—	—	YB 87	7.9
	—	—	—	—	—	—	—	—	YB 88	9.1
	—	—	—	—	—	—	—	—	YB 810	11.5
	—	—	—	—	—	—	—	—	YB 812	13.9
	—	—	—	—	BHA 87 Z	9.1	BHAM 87	9.9	—	—
	—	—	—	—	BHA 88 Z	10.4	BHAM 88	11.3	—	—
—	—	—	—	BHA 810 Z	12.5	BHAM 810	13.3	—	—	
—	—	—	—	BHA 812 Z	15	BHAM 812	15.8	—	—	
—	—	—	—	—	—	—	—	YBH 810	16	

Note(1) Allowable rotational speed applies to oil lubrication. For grease lubrication, a maximum of 60% of this value is allowable.  
Remark Shell Type Grease Retained Full Complement Needle Roller Bearings are provided with prepacked grease. Standard type and closed end type bearings are not provided with prepacked grease, so perform proper lubrication when using these types of bearings.



B

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Boundary dimensions mm(inch)				Standard mounting dimensions mm				Basic dynamic load rating	Basic static load rating	Allowable rotational speed(1)	Assembled inner ring
$F_w$	D	C	$t_2$ Max.	Shaft dia. h6		Housing bore dia. J7		C	C <sub>0</sub>	rpm	
				Max.	Min.	Max.	Min.				
11.112 ( $\frac{7}{16}$ )	15.875 ( $\frac{5}{8}$ )	9.52 (.375)	1	11.112	11.101	15.885	15.867	3 290	3 470	35 000	—
11.112 ( $\frac{7}{16}$ )	15.875 ( $\frac{5}{8}$ )	11.13 (.438)	1	—	—	—	—	4 150	4 680	35 000	—
11.112 ( $\frac{7}{16}$ )	15.875 ( $\frac{5}{8}$ )	12.70 (.500)	1	—	—	—	—	4 460	5 130	35 000	—
11.112 ( $\frac{7}{16}$ )	15.875 ( $\frac{5}{8}$ )	15.88 (.625)	1	—	—	—	—	6 020	7 550	35 000	—
11.112 ( $\frac{7}{16}$ )	15.875 ( $\frac{5}{8}$ )	12.70 (.500)	—	—	—	—	—	10 100	15 900	14 000	—
11.112 ( $\frac{7}{16}$ )	17.462 ( $\frac{9}{16}$ )	12.70 (.500)	1.3	11.112	11.101	17.472	17.454	5 680	5 970	35 000	—
11.112 ( $\frac{7}{16}$ )	17.462 ( $\frac{9}{16}$ )	12.70 (.500)	—	—	—	—	—	12 500	15 800	14 000	—
12.700 ( $\frac{1}{2}$ )	17.462 ( $\frac{9}{16}$ )	7.92 (.312)	1	—	—	—	—	2 490	2 510	30 000	—
12.700 ( $\frac{1}{2}$ )	17.462 ( $\frac{9}{16}$ )	9.52 (.375)	1	—	—	—	—	3 470	3 850	30 000	—
12.700 ( $\frac{1}{2}$ )	17.462 ( $\frac{9}{16}$ )	11.13 (.438)	1	12.700	12.689	17.472	17.454	4 380	5 190	30 000	—
12.700 ( $\frac{1}{2}$ )	17.462 ( $\frac{9}{16}$ )	12.70 (.500)	1	—	—	—	—	4 710	5 700	30 000	IRB 58
12.700 ( $\frac{1}{2}$ )	17.462 ( $\frac{9}{16}$ )	15.88 (.625)	1	—	—	—	—	6 350	8 380	30 000	—
12.700 ( $\frac{1}{2}$ )	17.462 ( $\frac{9}{16}$ )	19.05 (.750)	1	—	—	—	—	7 840	11 000	30 000	—
12.700 ( $\frac{1}{2}$ )	17.462 ( $\frac{9}{16}$ )	6.35 (.250)	—	—	—	—	—	5 260	7 150	12 000	—
12.700 ( $\frac{1}{2}$ )	17.462 ( $\frac{9}{16}$ )	9.52 (.375)	—	—	—	—	—	8 150	12 600	12 000	—
12.700 ( $\frac{1}{2}$ )	17.462 ( $\frac{9}{16}$ )	11.13 (.438)	—	12.700	12.689	17.472	17.454	9 530	15 300	12 000	—
12.700 ( $\frac{1}{2}$ )	17.462 ( $\frac{9}{16}$ )	12.70 (.500)	—	—	—	—	—	10 800	18 100	12 000	IRB 58
12.700 ( $\frac{1}{2}$ )	17.462 ( $\frac{9}{16}$ )	15.88 (.625)	—	—	—	—	—	13 400	23 700	12 000	—
12.700 ( $\frac{1}{2}$ )	17.462 ( $\frac{9}{16}$ )	19.05 (.750)	—	—	—	—	—	15 800	29 300	12 000	—
12.700 ( $\frac{1}{2}$ )	19.050 ( $\frac{3}{4}$ )	11.13 (.438)	1.3	—	—	—	—	5 670	6 120	30 000	—
12.700 ( $\frac{1}{2}$ )	19.050 ( $\frac{3}{4}$ )	12.70 (.500)	1.3	—	—	—	—	6 040	6 650	30 000	IRB 58
12.700 ( $\frac{1}{2}$ )	19.050 ( $\frac{3}{4}$ )	15.88 (.625)	1.3	12.700	12.689	19.062	19.041	8 830	10 900	30 000	—
12.700 ( $\frac{1}{2}$ )	19.050 ( $\frac{3}{4}$ )	19.05 (.750)	1.3	—	—	—	—	11 100	14 500	30 000	—
12.700 ( $\frac{1}{2}$ )	19.050 ( $\frac{3}{4}$ )	15.88 (.625)	—	—	—	—	—	16 300	23 500	12 000	—



## SHELL TYPE NEEDLE ROLLER BEARINGS

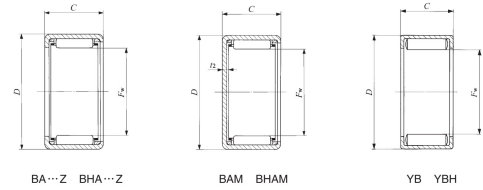
Inch Series



Shaft dia. 14.288 – 15.875mm

Shaft dia. mm (inch)	Identification number									
	Standard	Mass (Ref.) g	Closed end	Mass (Ref.) g	Standard	Mass (Ref.) g	Closed end	Mass (Ref.) g	Grease retained	Mass (Ref.) g
14.288 ( $\frac{9}{16}$ )	BA 95 Z	4.9	BAM 95	5.8	—	—	—	—	—	—
	BA 96 Z	5.9	BAM 96	6.8	—	—	—	—	—	—
	BA 97 Z	6.9	BAM 97	7.8	—	—	—	—	—	—
	BA 98 Z	7.9	BAM 98	8.9	—	—	—	—	—	—
	BA 910 Z	9.9	BAM 910	10.8	—	—	—	—	—	—
	BA 912 Z	11.7	BAM 912	12.6	—	—	—	—	—	—
	—	—	—	—	—	—	—	—	YB 98	10.1
	—	—	—	—	—	—	—	—	YB 910	12.7
	—	—	—	—	—	—	—	—	YB 912	15.4
	—	—	—	—	BHA 98 Z	11.4	BHAM 98	12.5	—	—
—	—	—	—	BHA 910 Z	13.6	BHAM 910	14.7	—	—	
—	—	—	—	BHA 912 Z	16.3	BHAM 912	17.4	—	—	
15.875 ( $\frac{5}{8}$ )	BA 105 Z	5.3	BAM 105	6.5	—	—	—	—	—	—
	BA 107 Z	7.6	BAM 107	8.7	—	—	—	—	—	—
	BA 108 Z	8.7	BAM 108	9.9	—	—	—	—	—	—
	BA 1010 Z	10.8	BAM 1010	12	—	—	—	—	—	—
	BA 1012 Z	12.9	BAM 1012	14	—	—	—	—	—	—
	BA 1014 Z	15.1	BAM 1014	16.2	—	—	—	—	—	—
	BA 1016 Z	17.3	BAM 1016	18.4	—	—	—	—	—	—
	—	—	—	—	—	—	—	—	YB 105	6.7
	—	—	—	—	—	—	—	—	YB 108	11
	—	—	—	—	—	—	—	—	YB 1012	16.9
—	—	—	—	BHA 108 Z	12.6	BHAM 108	13.9	—	—	
—	—	—	—	BHA 1010 Z	14.9	BHAM 1010	16.2	—	—	
—	—	—	—	BHA 1012 Z	18	BHAM 1012	19.3	—	—	
—	—	—	—	BHA 1016 Z	24	BHAM 1016	25	—	—	
—	—	—	—	—	—	—	—	YBH 108	15.3	

Note(1) Allowable rotational speed applies to oil lubrication. For grease lubrication, a maximum of 60% of this value is allowable.  
Remark Shell Type Grease Retained Full Complement Needle Roller Bearings are provided with prepacked grease. Standard type and closed end type bearings are not provided with prepacked grease, so perform proper lubrication when using these types of bearings.



Boundary dimensions mm(inch)				Standard mounting dimensions mm				Basic dynamic load rating C	Basic static load rating C <sub>0</sub>	Allowable rotational speed(1) rpm	Assembled inner ring
F <sub>w</sub>	D	C	t <sub>2</sub> Max.	Shaft dia. h6 Max. Min.	Housing bore dia. J7 Max. Min.	N	N				
14.288 ( $\frac{9}{16}$ )	19.050 ( $\frac{3}{4}$ )	7.92 (.312)	1.3	14.288	14.277	19.062	19.041	2 760	2 970	30 000	—
14.288 ( $\frac{9}{16}$ )	19.050 ( $\frac{3}{4}$ )	9.52 (.375)	1.3	—	—	—	—	3 850	4 560	30 000	—
14.288 ( $\frac{9}{16}$ )	19.050 ( $\frac{3}{4}$ )	11.13 (.438)	1.3	—	—	—	—	4 860	6 140	30 000	—
14.288 ( $\frac{9}{16}$ )	19.050 ( $\frac{3}{4}$ )	12.70 (.500)	1.3	—	—	—	—	5 220	6 740	30 000	IRB 68
14.288 ( $\frac{9}{16}$ )	19.050 ( $\frac{3}{4}$ )	15.88 (.625)	1.3	—	—	—	—	7 050	9 910	30 000	—
14.288 ( $\frac{9}{16}$ )	19.050 ( $\frac{3}{4}$ )	19.05 (.750)	1.3	—	—	—	—	8 690	13 000	30 000	IRB 612
14.288 ( $\frac{9}{16}$ )	19.050 ( $\frac{3}{4}$ )	12.70 (.500)	—	—	—	—	—	11 600	20 400	11 000	IRB 68
14.288 ( $\frac{9}{16}$ )	19.050 ( $\frac{3}{4}$ )	15.88 (.625)	—	—	—	—	—	14 300	26 700	11 000	—
14.288 ( $\frac{9}{16}$ )	19.050 ( $\frac{3}{4}$ )	19.05 (.750)	—	—	—	—	—	16 800	33 000	11 000	IRB 612
14.288 ( $\frac{9}{16}$ )	20.638 ( $\frac{13}{16}$ )	12.70 (.500)	1.3	14.288	14.277	20.650	20.629	6 380	7 330	30 000	IRB 68
14.288 ( $\frac{9}{16}$ )	20.638 ( $\frac{13}{16}$ )	15.88 (.625)	1.3	—	—	—	—	9 280	11 900	30 000	—
14.288 ( $\frac{9}{16}$ )	20.638 ( $\frac{13}{16}$ )	19.05 (.750)	1.3	—	—	—	—	11 600	15 900	30 000	IRB 612
15.875 ( $\frac{5}{8}$ )	20.638 ( $\frac{13}{16}$ )	7.92 (.312)	1.3	—	—	—	—	2 870	3 220	25 000	—
15.875 ( $\frac{5}{8}$ )	20.638 ( $\frac{13}{16}$ )	11.13 (.438)	1.3	—	—	—	—	5 040	6 660	25 000	—
15.875 ( $\frac{5}{8}$ )	20.638 ( $\frac{13}{16}$ )	12.70 (.500)	1.3	—	—	—	—	5 420	7 310	25 000	IRB 68-1
15.875 ( $\frac{5}{8}$ )	20.638 ( $\frac{13}{16}$ )	15.88 (.625)	1.3	—	—	—	—	7 320	10 700	25 000	—
15.875 ( $\frac{5}{8}$ )	20.638 ( $\frac{13}{16}$ )	19.05 (.750)	1.3	15.875	15.864	20.650	20.629	9 020	14 100	25 000	IRB 612-1
15.875 ( $\frac{5}{8}$ )	20.638 ( $\frac{13}{16}$ )	22.22 (.875)	1.3	—	—	—	—	10 700	17 500	25 000	IRB 714
15.875 ( $\frac{5}{8}$ )	20.638 ( $\frac{13}{16}$ )	25.40 (1.000)	1.3	—	—	—	—	12 300	20 800	25 000	IRB 716
15.875 ( $\frac{5}{8}$ )	20.638 ( $\frac{13}{16}$ )	7.92 (.312)	—	—	—	—	—	7 580	12 200	9 500	—
15.875 ( $\frac{5}{8}$ )	20.638 ( $\frac{13}{16}$ )	12.70 (.500)	—	—	—	—	—	12 300	22 700	9 500	IRB 68-1
15.875 ( $\frac{5}{8}$ )	20.638 ( $\frac{13}{16}$ )	19.05 (.750)	—	—	—	—	—	17 800	36 600	9 500	IRB 612-1
15.875 ( $\frac{5}{8}$ )	22.225 ( $\frac{7}{8}$ )	12.70 (.500)	1.3	—	—	—	—	6 680	8 020	25 000	IRB 68-1
15.875 ( $\frac{5}{8}$ )	22.225 ( $\frac{7}{8}$ )	15.88 (.625)	1.3	—	—	—	—	10 200	13 800	25 000	—
15.875 ( $\frac{5}{8}$ )	22.225 ( $\frac{7}{8}$ )	19.05 (.750)	1.3	15.875	15.864	22.237	22.216	12 700	18 500	25 000	IRB 612-1
15.875 ( $\frac{5}{8}$ )	22.225 ( $\frac{7}{8}$ )	25.40 (1.000)	1.3	—	—	—	—	17 400	27 600	25 000	IRB 716
15.875 ( $\frac{5}{8}$ )	22.225 ( $\frac{7}{8}$ )	12.70 (.500)	—	—	—	—	—	15 000	22 400	9 500	IRB 68-1



## SHELL TYPE NEEDLE ROLLER BEARINGS

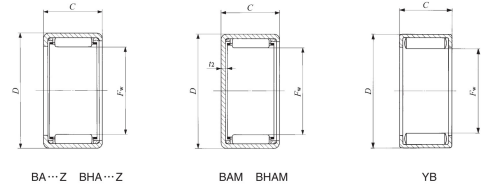
Inch Series



Shaft dia. 17.462 – 19.050mm

Shaft dia. mm (inch)	Identification number										
	Standard	Mass (Ref.) g	Closed end	Mass (Ref.) g	Standard	Mass (Ref.) g	Closed end	Mass (Ref.) g	Grease retained	Mass (Ref.) g	
17.462 ( <sup>11</sup> / <sub>16</sub> )	BA 116 Z	7	BAM 116	8.4	—	—	—	—	—	—	
	BA 118 Z	9.5	BAM 118	10.8	—	—	—	—	—	—	
	BA 1110 Z	11.8	BAM 1110	13.2	—	—	—	—	—	—	
	BA 1112 Z	14	BAM 1112	15.4	—	—	—	—	—	—	
	—	—	—	—	BHA 117 Z	11.9	BHAM 117	13.5	—	YB 1112	18.3
	—	—	—	—	BHA 118 Z	13.7	BHAM 118	15.3	—	—	—
	—	—	—	—	BHA 1110 Z	16	BHAM 1110	17.6	—	—	—
	—	—	—	—	BHA 1112 Z	19.3	BHAM 1112	21	—	—	—
19.050 ( <sup>3</sup> / <sub>4</sub> )	BA 126 Z	10	BAM 126	11.7	—	—	—	—	—	—	
	BA 128 Z	13.5	BAM 128	15.2	—	—	—	—	—	—	
	BA 1210 Z	17	BAM 1210	18.6	—	—	—	—	—	—	
	BA 1212 Z	20.5	BAM 1212	22	—	—	—	—	—	—	
	BA 1214 Z	23.5	BAM 1214	25	—	—	—	—	—	—	
	BA 1216 Z	27	BAM 1216	28.5	—	—	—	—	—	—	
	—	—	—	—	—	—	—	—	—	YB 124	8.5
	—	—	—	—	—	—	—	—	—	YB 128	17.8
	—	—	—	—	—	—	—	—	—	YB 1210	22.5
	—	—	—	—	—	—	—	—	—	YB 1212	27
	—	—	—	—	BHA 1212 Z	26.5	BHAM 1212	28.5	—	—	—

Note<sup>(1)</sup> Allowable rotational speed applies to oil lubrication. For grease lubrication, a maximum of 60% of this value is allowable.  
 Remark Shell Type Grease Retained Full Complement Needle Roller Bearings are provided with prepacked grease. Standard type and closed end type bearings are not provided with prepacked grease, so perform proper lubrication when using these types of bearings.



Boundary dimensions mm(inch)				Standard mounting dimensions mm				Basic dynamic load rating C	Basic static load rating C <sub>0</sub>	Allowable rotational speed <sup>(1)</sup> rpm	Assembled inner ring
F <sub>w</sub>	D	C	t <sub>2</sub> Max.	Shaft dia. h6		Housing bore dia. J7					
17.462 (11/16)	22.225 (7/8)	9.52 (.375)	1.3	17.462	17.451	22.237	22.216	4 530	5 980	25 000	IRB 86
17.462 (11/16)	22.225 (7/8)	12.70 (.500)	1.3	—	—	—	—	6 140	8 850	25 000	IRB 88
17.462 (11/16)	22.225 (7/8)	15.88 (.625)	1.3	—	—	—	—	8 280	13 000	25 000	—
17.462 (11/16)	22.225 (7/8)	19.05 (.750)	1.3	—	—	—	—	10 200	17 000	25 000	IRB 812
17.462 (11/16)	22.225 (7/8)	19.05 (.750)	—	—	—	—	—	18 700	40 300	8 500	IRB 812
17.462 (11/16)	23.812 (9/8)	11.13 (.438)	1.3	17.462	17.451	23.824	23.803	6 860	8 530	25 000	—
17.462 (11/16)	23.812 (9/8)	12.70 (.500)	1.3	—	—	—	—	7 320	9 270	25 000	IRB 88
17.462 (11/16)	23.812 (9/8)	15.88 (.625)	1.3	—	—	—	—	10 500	14 900	25 000	—
17.462 (11/16)	23.812 (9/8)	19.05 (.750)	1.3	—	—	—	—	13 200	19 900	25 000	IRB 812
19.050 (3/4)	25.400 (1)	9.52 (.375)	1.3	19.050	19.037	25.412	25.391	5 040	5 850	20 000	—
19.050 (3/4)	25.400 (1)	12.70 (.500)	1.3	—	—	—	—	6 910	8 780	20 000	IRB 88-1
19.050 (3/4)	25.400 (1)	15.88 (.625)	1.3	—	—	—	—	9 500	13 200	20 000	IRB 810-1
19.050 (3/4)	25.400 (1)	19.05 (.750)	1.3	—	—	—	—	11 900	17 700	20 000	IRB 812-1
19.050 (3/4)	25.400 (1)	22.22 (.875)	1.3	—	—	—	—	14 200	22 200	20 000	IRB 814-1
19.050 (3/4)	25.400 (1)	25.40 (1.000)	1.3	—	—	—	—	16 300	26 500	20 000	IRB 816-1
19.050 (3/4)	25.400 (1)	6.35 (.250)	—	19.050	19.037	25.412	25.391	7 820	10 200	8 000	—
19.050 (3/4)	25.400 (1)	12.70 (.500)	—	—	—	—	—	16 600	26 900	8 000	IRB 88-1
19.050 (3/4)	25.400 (1)	15.88 (.625)	—	—	—	—	—	20 500	35 300	8 000	IRB 810-1
19.050 (3/4)	25.400 (1)	19.05 (.750)	—	—	—	—	—	24 100	43 400	8 000	IRB 812-1
19.050 (3/4)	26.988 (1 1/8)	19.05 (.750)	1.3	19.050	19.037	27.000	26.979	16 600	22 600	20 000	IRB 812-1



## SHELL TYPE NEEDLE ROLLER BEARINGS

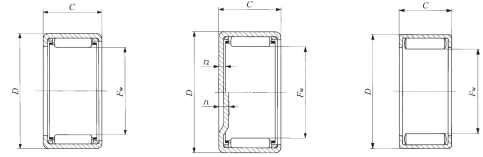
Inch Series



Shaft dia. 20.638 – 22.225mm

Shaft dia. mm (inch)	Identification number									
	Standard	Mass (Ref.) g	Closed end	Mass (Ref.) g	Standard	Mass (Ref.) g	Closed end	Mass (Ref.) g	Grease retained	Mass (Ref.) g
20.638 ( $\frac{13}{16}$ )	BA 136 Z	10.7	BAM 136	12.6	—	—	—	—	—	—
	BA 138 Z	14.5	BAM 138	16.4	—	—	—	—	—	—
	BA 1310 Z	18.2	BAM 1310	20	—	—	—	—	—	—
	BA 1312 Z	22	BAM 1312	23.5	—	—	—	—	—	—
	BA 1314 Z	25	BAM 1314	27	—	—	—	—	—	—
	BA 1316 Z	28.5	BAM 1316	30.5	—	—	—	—	—	—
	BA 1320 Z	35.5	BAM 1320	37.5	—	—	—	—	—	—
	—	—	—	—	—	—	—	—	YB 136	14.1
	—	—	—	—	—	—	—	—	YB 138	19.1
	—	—	—	—	BHA 138 Z	20	BHAM 138	22.5	—	—
	—	—	—	—	BHA 1310 Z	23.5	BHAM 1310	25.5	—	—
	—	—	—	—	BHA 1312 Z	28.5	BHAM 1312	30.5	—	—
	—	—	—	—	—	—	—	—	YB 1310	30.5
	—	—	—	—	—	—	—	—	YBH 1312	37
22.225 ( $\frac{7}{8}$ )	BA 146 Z	11.5	BAM 146	13.8	—	—	—	—	—	—
	BA 148 Z	15.6	BAM 148	17.8	—	—	—	—	—	—
	BA 1412 Z	23.5	BAM 1412	26	—	—	—	—	—	—
	BA 1414 Z	27	BAM 1414	29.5	—	—	—	—	—	—
	BA 1416 Z	31	BAM 1416	33.5	—	—	—	—	—	—
	BA 1418 Z	34.5	BAM 1418	37	—	—	—	—	—	—
	BA 1422 Z	42.5	BAM 1422	44.5	—	—	—	—	—	—
	—	—	—	—	—	—	—	—	YB 148	20.5
	—	—	—	—	—	—	—	—	YB 1412	31
	—	—	—	—	—	—	—	—	YB 1416	41.5
	—	—	—	—	BHA 1410 Z	25	BHAM 1410	27.5	—	—
	—	—	—	—	BHA 1412 Z	30	BHAM 1412	32.5	—	—
	—	—	—	—	BHA 1416 Z	39.5	BHAM 1416	42	—	—
	—	—	—	—	—	—	—	—	YB 1412	39

Note<sup>(1)</sup> Allowable rotational speed applies to oil lubrication. For grease lubrication, a maximum of 60% of this value is allowable.  
 Remark Shell Type Grease Retained Full Complement Needle Roller Bearings are provided with prepacked grease. Standard type and closed end type bearings are not provided with prepacked grease, so perform proper lubrication when using these types of bearings.



BA...Z BHA...Z

BAM BHAM  
 $t_1 (F_w \geq 22.225)$   
 $t_2 (F_w \leq 20.638)$

YB YBH

Boundary dimensions mm(inch)				Standard mounting dimensions mm				Basic dynamic load rating C	Basic static load rating C <sub>0</sub>	Allowable rotational speed <sup>(1)</sup> rpm	Assembled inner ring
$F_w$	D	C	$t_1$ $t_2$ Max.	Shaft dia. h6	Housing bore dia. J7	Max.	Min.				
20.638 ( $\frac{13}{16}$ )	26.988 (1.063)	9.52 (.375)	1.3	20.638	20.625	27.000	26.979	5 230	6 300	19 000	—
20.638 ( $\frac{13}{16}$ )	26.988 (1.063)	12.70 (.500)	1.3	—	—	—	—	7 170	9 450	19 000	IRB 98
20.638 ( $\frac{13}{16}$ )	26.988 (1.063)	15.88 (.625)	1.3	—	—	—	—	9 870	14 200	19 000	IRB 910
20.638 ( $\frac{13}{16}$ )	26.988 (1.063)	19.05 (.750)	1.3	—	—	—	—	12 400	19 000	19 000	IRB 912
20.638 ( $\frac{13}{16}$ )	26.988 (1.063)	22.22 (.875)	1.3	—	—	—	—	14 700	23 800	19 000	IRB 914
20.638 ( $\frac{13}{16}$ )	26.988 (1.063)	25.40 (1.000)	1.3	—	—	—	—	16 900	28 500	19 000	IRB 916
20.638 ( $\frac{13}{16}$ )	26.988 (1.063)	31.75 (1.250)	1.3	—	—	—	—	21 200	38 100	19 000	IRB 920
20.638 ( $\frac{13}{16}$ )	26.988 (1.063)	9.52 (.375)	—	—	—	—	—	13 000	20 100	7 500	—
20.638 ( $\frac{13}{16}$ )	26.988 (1.063)	12.70 (.500)	—	—	—	—	—	17 400	29 200	7 500	IRB 98
20.638 ( $\frac{13}{16}$ )	28.575 (1.125)	12.70 (.500)	1.3	20.638	20.625	28.587	28.566	9 500	11 200	19 000	IRB 98
20.638 ( $\frac{13}{16}$ )	28.575 (1.125)	15.88 (.625)	1.3	—	—	—	—	13 800	18 200	19 000	IRB 910
20.638 ( $\frac{13}{16}$ )	28.575 (1.125)	19.05 (.750)	1.3	—	—	—	—	17 300	24 400	19 000	IRB 912
20.638 ( $\frac{13}{16}$ )	28.575 (1.125)	15.88 (.625)	—	—	—	—	—	22 900	36 300	7 500	IRB 910
20.638 ( $\frac{13}{16}$ )	28.575 (1.125)	19.05 (.750)	—	—	—	—	—	27 200	45 300	7 500	IRB 912
22.225 ( $\frac{7}{8}$ )	28.575 (1.125)	9.52 (.375)	2.8	22.225	22.212	28.587	28.566	5 430	6 740	18 000	IRB 106
22.225 ( $\frac{7}{8}$ )	28.575 (1.125)	12.70 (.500)	2.8	—	—	—	—	7 440	10 100	18 000	IRB 108
22.225 ( $\frac{7}{8}$ )	28.575 (1.125)	15.88 (.625)	2.8	—	—	—	—	12 800	20 400	18 000	IRB 1012
22.225 ( $\frac{7}{8}$ )	28.575 (1.125)	19.05 (.750)	2.8	—	—	—	—	15 300	25 500	18 000	IRB 1014
22.225 ( $\frac{7}{8}$ )	28.575 (1.125)	22.22 (.875)	2.8	—	—	—	—	17 600	30 500	18 000	IRB 1016
22.225 ( $\frac{7}{8}$ )	28.575 (1.125)	25.40 (1.000)	2.8	—	—	—	—	19 800	35 600	18 000	—
22.225 ( $\frac{7}{8}$ )	28.575 (1.125)	28.58 (1.125)	2.8	—	—	—	—	18 100	31 400	7 000	IRB 1022
22.225 ( $\frac{7}{8}$ )	28.575 (1.125)	34.92 (1.375)	2.8	—	—	—	—	24 100	45 700	18 000	IRB 1022
22.225 ( $\frac{7}{8}$ )	28.575 (1.125)	12.70 (.500)	—	—	—	—	—	18 100	31 400	7 000	IRB 108
22.225 ( $\frac{7}{8}$ )	28.575 (1.125)	15.88 (.625)	—	—	—	—	—	26 300	50 700	7 000	IRB 1012
22.225 ( $\frac{7}{8}$ )	28.575 (1.125)	19.05 (.750)	—	—	—	—	—	33 800	70 200	7 000	IRB 1016
22.225 ( $\frac{7}{8}$ )	30.162 (1.188)	15.88 (.625)	3.4	22.225	22.212	30.176	30.151	14 300	19 500	18 000	—
22.225 ( $\frac{7}{8}$ )	30.162 (1.188)	19.05 (.750)	3.4	—	—	—	—	18 000	26 100	18 000	IRB 1012
22.225 ( $\frac{7}{8}$ )	30.162 (1.188)	25.40 (1.000)	3.4	—	—	—	—	23 600	36 900	18 000	IRB 1016
22.225 ( $\frac{7}{8}$ )	30.162 (1.188)	19.05 (.750)	—	—	—	—	—	28 200	49 000	7 000	IRB 1012



## SHELL TYPE NEEDLE ROLLER BEARINGS

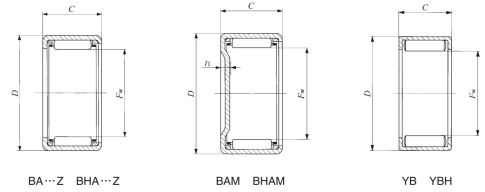
Inch Series



Shaft dia. 23.812 – 26.988mm

Shaft dia. mm (inch)	Identification number									
	Standard	Mass (Ref.) g	Closed end	Mass (Ref.) g	Standard	Mass (Ref.) g	Closed end	Mass (Ref.) g	Grease retained	Mass (Ref.) g
23.812 ( $\frac{15}{16}$ )	BA 158 Z	16.5	BAM 158	19	—	—	—	—	—	—
	BA 1510 Z	20.5	BAM 1510	23	—	—	—	—	—	—
	BA 1516 Z	33	BAM 1516	35.5	—	—	—	—	—	—
25.400 (1)	BA 166 Z	13.1	BAM 166	16	—	—	—	—	—	—
	BA 167 Z	15.4	BAM 167	18.3	—	—	—	—	—	—
	BA 168 Z	17.7	BAM 168	20.5	—	—	—	—	—	—
	BA 1610 Z	22	BAM 1610	25	—	—	—	—	—	—
	BA 1612 Z	26.5	BAM 1612	29.5	—	—	—	—	—	—
	BA 1614 Z	31	BAM 1614	33.5	—	—	—	—	—	—
	BA 1616 Z	35.5	BAM 1616	38	—	—	—	—	—	—
	BA 1620 Z	44	BAM 1620	46.5	—	—	—	—	—	—
	—	—	—	—	—	—	—	—	YB 168	23
	—	—	—	—	—	—	—	—	YB 1612	34.5
	—	—	—	—	—	—	—	—	YB 1616	46.5
	—	—	—	—	BHA 168 Z	24	BHAM 168	27	—	—
	—	—	—	—	BHA 1610 Z	28	BHAM 1610	31	—	—
	—	—	—	—	BHA 1612 Z	33.5	BHAM 1612	37	—	—
	—	—	—	—	BHA 1614 Z	39.5	BHAM 1614	42.5	—	—
	—	—	—	—	BHA 1616 Z	45	BHAM 1616	48	—	—
	—	—	—	—	BHA 1620 Z	56.5	BHAM 1620	59.5	—	—
	—	—	—	—	BHA 1624 Z	67.5	BHAM 1624	71	—	—
	—	—	—	—	—	—	—	—	YBH 168	29
	—	—	—	—	—	—	—	—	YBH 1612	44.5
—	—	—	—	—	—	—	—	YBH 1616	59.5	
26.988 ( $1\frac{1}{16}$ )	BA 1710 Z	23.5	BAM 1710	26.5	—	—	—	—	—	
	BA 1716 Z	37	BAM 1716	40.5	—	—	—	—	—	

Note<sup>(1)</sup> Allowable rotational speed applies to oil lubrication. For grease lubrication, a maximum of 60% of this value is allowable.  
Remark Shell Type Grease Retained Full Complement Needle Roller Bearings are provided with prepacked grease. Standard type and closed end type bearings are not provided with prepacked grease, so perform proper lubrication when using these types of bearings.



Boundary dimensions mm(inch)				Standard mounting dimensions mm				Basic dynamic load rating	Basic static load rating	Allowable rotational speed <sup>(1)</sup>	Assembled inner ring
$F_w$	$D$	$C$	$t_1$ Max.	Shaft dia. h6		Housing bore dia. J7		$C$	$C_0$	rpm	
				Max.	Min.	Max.	Min.				
23.812 ( $\frac{15}{16}$ )	30.162 ( $1\frac{1}{8}$ )	12.70 (.500)	2.8	23.812	23.799	30.176	30.151	8 000	11 400	16 000	—
23.812 ( $\frac{15}{16}$ )	30.162 ( $1\frac{1}{8}$ )	15.88 (.625)	2.8	—	—	—	—	11 000	17 100	16 000	IRB 1110
23.812 ( $\frac{15}{16}$ )	30.162 ( $1\frac{1}{8}$ )	25.40(1.000)	2.8	—	—	—	—	18 900	34 300	16 000	IRB 1116
25.400 (1)	31.750 ( $1\frac{1}{4}$ )	9.52 (.375)	2.8	—	—	—	—	6 010	8 020	15 000	—
25.400 (1)	31.750 ( $1\frac{1}{4}$ )	11.13 (.438)	2.8	—	—	—	—	7 720	11 100	15 000	—
25.400 (1)	31.750 ( $1\frac{1}{4}$ )	12.70 (.500)	2.8	—	—	—	—	8 240	12 000	15 000	IRB 128
25.400 (1)	31.750 ( $1\frac{1}{4}$ )	15.88 (.625)	2.8	—	—	—	—	11 300	18 100	15 000	—
25.400 (1)	31.750 ( $1\frac{1}{4}$ )	19.05 (.750)	2.8	—	—	—	—	14 200	24 300	15 000	IRB 1212
25.400 (1)	31.750 ( $1\frac{1}{4}$ )	22.22 (.875)	2.8	25.400	25.387	31.764	31.739	16 900	30 400	15 000	IRB 1214
25.400 (1)	31.750 ( $1\frac{1}{4}$ )	25.40(1.000)	2.8	—	—	—	—	19 400	36 300	15 000	IRB 1216
25.400 (1)	31.750 ( $1\frac{1}{4}$ )	31.75(1.250)	2.8	—	—	—	—	24 400	48 500	15 000	IRB 1220
25.400 (1)	31.750 ( $1\frac{1}{4}$ )	12.70 (.500)	—	—	—	—	—	19 400	36 000	6 000	IRB 128
25.400 (1)	31.750 ( $1\frac{1}{4}$ )	19.05 (.750)	—	—	—	—	—	28 200	58 000	6 000	IRB 1212
25.400 (1)	31.750 ( $1\frac{1}{4}$ )	25.40(1.000)	—	—	—	—	—	36 300	80 300	6 000	IRB 1216
25.400 (1)	33.338 ( $1\frac{1}{8}$ )	12.70 (.500)	3.4	—	—	—	—	10 200	13 100	15 000	—
25.400 (1)	33.338 ( $1\frac{1}{8}$ )	15.88 (.625)	3.4	—	—	—	—	15 300	22 100	15 000	—
25.400 (1)	33.338 ( $1\frac{1}{8}$ )	19.05 (.750)	3.4	—	—	—	—	19 300	29 700	15 000	IRB 1212
25.400 (1)	33.338 ( $1\frac{1}{8}$ )	22.22 (.875)	3.4	—	—	—	—	23 000	37 200	15 000	IRB 1214
25.400 (1)	33.338 ( $1\frac{1}{8}$ )	25.40(1.000)	3.4	25.400	25.387	33.352	33.327	26 400	44 500	15 000	IRB 1216
25.400 (1)	33.338 ( $1\frac{1}{8}$ )	31.75(1.250)	3.4	—	—	—	—	33 200	59 600	15 000	IRB 1220
25.400 (1)	33.338 ( $1\frac{1}{8}$ )	38.10(1.500)	3.4	—	—	—	—	39 400	74 400	15 000	—
25.400 (1)	33.338 ( $1\frac{1}{8}$ )	12.70 (.500)	—	—	—	—	—	20 900	34 100	6 000	IRB 128
25.400 (1)	33.338 ( $1\frac{1}{8}$ )	19.05 (.750)	—	—	—	—	—	30 700	56 100	6 000	IRB 1212
25.400 (1)	33.338 ( $1\frac{1}{8}$ )	25.40(1.000)	—	—	—	—	—	39 900	78 400	6 000	IRB 1216
26.988 ( $1\frac{1}{16}$ )	33.338 ( $1\frac{1}{8}$ )	15.88 (.625)	2.8	26.988	26.975	33.352	33.327	11 600	19 200	14 000	—
26.988 ( $1\frac{1}{16}$ )	33.338 ( $1\frac{1}{8}$ )	25.40(1.000)	2.8	—	—	—	—	20 000	38 300	14 000	—



## SHELL TYPE NEEDLE ROLLER BEARINGS

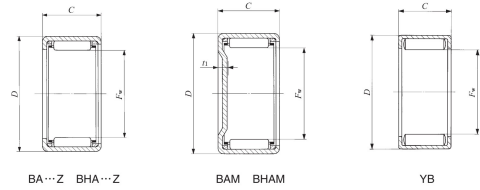
Inch Series



Shaft dia. 28.575 – 30.162mm

Shaft dia. mm (inch)	Identification number									
	Standard	Mass (Ref.) g	Closed end	Mass (Ref.) g	Standard	Mass (Ref.) g	Closed end	Mass (Ref.) g	Grease retained	Mass (Ref.) g
28.575 (1 1/8)	BA 186 Z	14.5	BAM 186	18.1	—	—	—	—	—	—
	BA 188 Z	19.5	BAM 188	23	—	—	—	—	—	—
	BA 1812 Z	29.5	BAM 1812	33	—	—	—	—	—	—
	BA 1816 Z	39	BAM 1816	42.5	—	—	—	—	—	—
	BA 1820 Z	48.5	BAM 1820	52	—	—	—	—	—	—
	—	—	—	—	—	—	—	—	YB 188	25.5
	—	—	—	—	—	—	—	—	YB 1812	38.5
	—	—	—	—	—	—	—	—	YB 1816	51.5
	—	—	—	—	BHA 1812 Z	45	BHAM 1812	49	—	—
	—	—	—	—	BHA 1816 Z	60	BHAM 1816	64	—	—
30.162 (1 3/16)	BA 1910 Z	32.5	BAM 1910	37.5	—	—	—	—	—	—
	BA 1916 Z	52	BAM 1916	57	—	—	—	—	—	—
	—	—	—	—	—	—	—	—	YB 1910	42.5
	—	—	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—	—	—

Note(1) Allowable rotational speed applies to oil lubrication. For grease lubrication, a maximum of 60% of this value is allowable.  
 Remark Shell Type Grease Retained Full Complement Needle Roller Bearings are provided with prepacked grease. Standard type and closed end type bearings are not provided with prepacked grease, so perform proper lubrication when using these types of bearings.



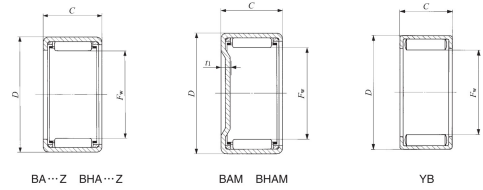
BA...Z BHA...Z BAM BHAM YB

Boundary dimensions mm(inch)				Standard mounting dimensions mm				Basic dynamic load rating	Basic static load rating	Allowable rotational speed(1)	Assembled inner ring
$F_w$	$D$	$C$	$t_1$	Shaft dia. h6		Housing bore dia. J7		$C$	$C_0$	rpm	
			Max.	Max.	Min.	Max.	Min.	N	N		
28.575 (1 1/8)	34.925 (1 3/8)	9.52 (.375)	2.8					6 330	8 910	13 000	—
28.575 (1 1/8)	34.925 (1 3/8)	12.70 (.500)	2.8					8 680	13 400	13 000	IRB 148
28.575 (1 1/8)	34.925 (1 3/8)	19.05 (.750)	2.8					15 000	26 900	13 000	IRB 1412
28.575 (1 1/8)	34.925 (1 3/8)	25.40 (1.000)	2.8					20 500	40 300	13 000	IRB 1416
28.575 (1 1/8)	34.925 (1 3/8)	31.75 (1.250)	2.8	28.575	28.562	34.939	34.914	25 700	53 900	13 000	IRB 1420
28.575 (1 1/8)	34.925 (1 3/8)	12.70 (.500)	—					20 700	40 500	5 500	IRB 148
28.575 (1 1/8)	34.925 (1 3/8)	19.05 (.750)	—					30 000	65 300	5 500	IRB 1412
28.575 (1 1/8)	34.925 (1 3/8)	25.40 (1.000)	—					38 700	90 400	5 500	IRB 1416
28.575 (1 1/8)	38.100 (1 1/2)	19.05 (.750)	3.4					22 500	32 200	13 000	IRB 1412
28.575 (1 1/8)	38.100 (1 1/2)	25.40 (1.000)	3.4					30 900	48 600	13 000	IRB 1416
28.575 (1 1/8)	38.100 (1 1/2)	28.58 (1.125)	3.4	28.575	28.562	38.114	38.089	34 900	56 600	13 000	—
28.575 (1 1/8)	38.100 (1 1/2)	31.75 (1.250)	3.4					37 100	61 100	13 000	IRB 1420
30.162 (1 3/16)	38.100 (1 1/2)	15.88 (.625)	2.8					15 000	22 500	12 000	—
30.162 (1 3/16)	38.100 (1 1/2)	25.40 (1.000)	2.8	30.162	30.146	38.114	38.089	25 800	45 300	12 000	—
30.162 (1 3/16)	38.100 (1 1/2)	15.88 (.625)	—					28 400	53 600	5 000	—



## SHELL TYPE NEEDLE ROLLER BEARINGS

Inch Series



Shaft dia. 31.750 – 33.338mm

Shaft dia. mm (inch)	Identification number									
	Standard	Mass (Ref.) g	Closed end	Mass (Ref.) g	Standard	Mass (Ref.) g	Closed end	Mass (Ref.) g	Grease retained	Mass (Ref.) g
31.750 (1 1/4)	BA 208 Z	21.5	BAM 208	26	—	—	—	—	—	—
	BA 2010 Z	27	BAM 2010	31.5	—	—	—	—	—	—
	BA 2012 Z	32.5	BAM 2012	37	—	—	—	—	—	—
	BA 2016 Z	43	BAM 2016	47.5	—	—	—	—	—	—
	BA 2020 Z	53.5	BAM 2020	58	—	—	—	—	—	—
	—	—	—	—	—	—	—	—	YB 2010	35
	—	—	—	—	—	—	—	—	YB 2012	42.5
	—	—	—	—	—	—	—	—	YB 2016	57
	—	—	—	—	—	—	—	—	YB 2018	64
	—	—	—	—	—	—	—	—	YB 2020	68
	—	—	—	—	BHA 208 Z	34.5	BHAM 208	40	—	—
	—	—	—	—	BHA 2012 Z	49.5	BHAM 2012	54.5	—	—
	—	—	—	—	BHA 2016 Z	66	BHAM 2016	71	—	—
	—	—	—	—	BHA 2020 Z	81.5	BHAM 2020	86.5	—	—
33.338 (1 5/16)	BA 218 Z	28.5	BAM 218	35	—	—	—	—	—	
	BA 2110 Z	35.5	BAM 2110	41.5	—	—	—	—	—	
	BA 2112 Z	43	BAM 2112	49	—	—	—	—	—	

Note(1) Allowable rotational speed applies to oil lubrication. For grease lubrication, a maximum of 60% of this value is allowable.  
Remark Shell Type Grease Retained Full Complement Needle Roller Bearings are provided with prepacked grease. Standard type and closed end type bearings are not provided with prepacked grease, so perform proper lubrication when using these types of bearings.

Boundary dimensions mm(inch)				Standard mounting dimensions mm				Basic dynamic load rating	Basic static load rating	Allowable rotational speed(1)	Assembled inner ring
$F_w$	$D$	$C$	$t_1$	Shaft dia. h6		Housing bore dia. J7		$C$	$C_0$	rpm	
			Max.	Max.	Min.	Max.	Min.	N	N		
31.750 (1 1/4)	38.100 (1 1/2)	12.70 (.500)	2.8	—	—	—	—	9 100	14 700	12 000	IRB 168
31.750 (1 1/4)	38.100 (1 1/2)	15.88 (.625)	2.8	—	—	—	—	12 500	22 200	12 000	IRB 1610
31.750 (1 1/4)	38.100 (1 1/2)	19.05 (.750)	2.8	31.750	31.734	38.114	38.089	15 700	29 600	12 000	IRB 1612
31.750 (1 1/4)	38.100 (1 1/2)	25.40 (1.000)	2.8	—	—	—	—	21 500	44 300	12 000	IRB 1616
31.750 (1 1/4)	38.100 (1 1/2)	31.75 (1.250)	2.8	—	—	—	—	26 900	59 200	12 000	IRB 1620
31.750 (1 1/4)	38.100 (1 1/2)	15.88 (.625)	—	—	—	—	—	27 000	59 000	4 500	IRB 1610
31.750 (1 1/4)	38.100 (1 1/2)	19.05 (.750)	—	31.750	31.734	38.114	38.089	31 800	72 500	4 500	IRB 1612
31.750 (1 1/4)	38.100 (1 1/2)	25.40 (1.000)	—	—	—	—	—	40 900	100 000	4 500	IRB 1616
31.750 (1 1/4)	38.100 (1 1/2)	28.58 (1.125)	—	—	—	—	—	45 300	114 000	4 500	—
31.750 (1 1/4)	38.100 (1 1/2)	31.75 (1.250)	—	—	—	—	—	49 400	128 000	4 500	IRB 1620
31.750 (1 1/4)	41.275 (1 5/8)	12.70 (.500)	3.4	—	—	—	—	13 700	17 600	12 000	IRB 168
31.750 (1 1/4)	41.275 (1 5/8)	19.05 (.750)	3.4	31.750	31.734	41.289	41.264	24 100	36 400	12 000	IRB 1612
31.750 (1 1/4)	41.275 (1 5/8)	25.40 (1.000)	3.4	—	—	—	—	33 200	55 000	12 000	IRB 1616
31.750 (1 1/4)	41.275 (1 5/8)	31.75 (1.250)	3.4	—	—	—	—	40 000	69 600	12 000	IRB 1620
33.338 (1 5/16)	41.275 (1 5/8)	12.70 (.500)	2.8	33.338	33.322	41.289	41.264	11 100	15 800	11 000	IRB 168-1
33.338 (1 5/16)	41.275 (1 5/8)	15.88 (.625)	2.8	—	—	—	—	15 400	23 900	11 000	IRB 1610-1
33.338 (1 5/16)	41.275 (1 5/8)	19.05 (.750)	2.8	—	—	—	—	19 300	32 100	11 000	IRB 1612-1





## SHELL TYPE NEEDLE ROLLER BEARINGS

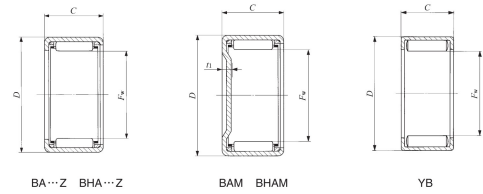
Inch Series



Shaft dia. 34.925 – 38.100mm

Shaft dia. mm (inch)	Identification number									
	Standard	Mass (Ref.) g	Closed end	Mass (Ref.) g	Standard	Mass (Ref.) g	Closed end	Mass (Ref.) g	Grease retained	Mass (Ref.) g
34.925 (1 1/8)	BA 228 Z	23.5	BAM 228	29	—	—	—	—	—	—
	BA 2212 Z	35.5	BAM 2212	41	—	—	—	—	—	—
	BA 2216 Z	47.5	BAM 2216	53	—	—	—	—	—	—
	BA 2220 Z	59	BAM 2220	64	—	—	—	—	—	—
	—	—	—	—	—	—	—	—	YB 228	30.5
	—	—	—	—	—	—	—	—	YB 2212	46
	—	—	—	—	—	—	—	—	YB 2220	77.5
	—	—	—	—	BHA 228 Z	37	BHAM 228	43	—	—
	—	—	—	—	BHA 2210 Z	44	BHAM 2210	50	—	—
	—	—	—	—	BHA 2212 Z	53	BHAM 2212	59	—	—
38.100 (1 1/2)	BA 248 Z	38.5	BAM 248	47.5	—	—	—	—	—	—
	BA 2410 Z	48.5	BAM 2410	57.5	—	—	—	—	—	—
	BA 2412 Z	58.5	BAM 2412	67.5	—	—	—	—	—	—
	BA 2414 Z	69	BAM 2414	78	—	—	—	—	—	—
	BA 2416 Z	79	BAM 2416	88	—	—	—	—	—	—
	BA 2420 Z	97.5	BAM 2420	106	—	—	—	—	—	—
	—	—	—	—	—	—	—	—	YB 246	38
	—	—	—	—	—	—	—	—	YB 248	51.5
	—	—	—	—	—	—	—	—	YB 2414	91
	—	—	—	—	—	—	—	—	YB 2416	105
—	—	—	—	—	—	—	—	YB 2420	131	

Note(1) Allowable rotational speed applies to oil lubrication. For grease lubrication, a maximum of 60% of this value is allowable.  
Remark Shell Type Grease Retained Full Complement Needle Roller Bearings are provided with prepacked grease. Standard type and closed end type bearings are not provided with prepacked grease, so perform proper lubrication when using these types of bearings.



BA...Z BHA...Z BAM BHAM YB

Boundary dimensions mm(inch)				Standard mounting dimensions mm				Basic dynamic load rating	Basic static load rating	Allowable rotational speed(1)	Assembled inner ring
$F_w$	$D$	$C$	$t_1$	Shaft dia. h6		Housing bore dia. J7		$C$	$C_0$	rpm	
			Max.	Max.	Min.	Max.	Min.	N	N		
34.925 (1 1/8)	41.275 (1 1/4)	12.70 (.500)	2.8					9 770	16 600	10 000	IRB 188
34.925 (1 1/8)	41.275 (1 1/4)	19.05 (.750)	2.8					16 900	33 500	10 000	IRB 1812
34.925 (1 1/8)	41.275 (1 1/4)	25.40 (1.000)	2.8					23 100	50 200	10 000	IRB 1816
34.925 (1 1/8)	41.275 (1 1/4)	31.75 (1.250)	2.8	34.925	34.909	41.289	41.264	28 900	67 100	10 000	IRB 1820
34.925 (1 1/8)	41.275 (1 1/4)	12.70 (.500)	—					23 000	49 500	4 500	IRB 188
34.925 (1 1/8)	41.275 (1 1/4)	19.05 (.750)	—					33 400	79 800	4 500	IRB 1812
34.925 (1 1/8)	41.275 (1 1/4)	31.75 (1.250)	—					52 000	141 000	4 500	IRB 1820
34.925 (1 1/8)	44.450 (1 3/4)	12.70 (.500)	3.4					14 100	18 800	10 000	IRB 188
34.925 (1 1/8)	44.450 (1 3/4)	15.88 (.625)	3.4					19 700	28 800	10 000	—
34.925 (1 1/8)	44.450 (1 3/4)	19.05 (.750)	3.4	34.925	34.909	44.464	44.439	24 800	38 800	10 000	IRB 1812
34.925 (1 1/8)	44.450 (1 3/4)	25.40 (1.000)	3.4					34 100	58 400	10 000	IRB 1816
34.925 (1 1/8)	44.450 (1 3/4)	31.75 (1.250)	3.4					41 200	74 200	10 000	IRB 1820
38.100 (1 1/2)	47.625 (1 7/8)	12.70 (.500)	2.8					12 900	17 900	9 000	—
38.100 (1 1/2)	47.625 (1 7/8)	15.88 (.625)	2.8					17 800	27 100	9 000	IRB 2010
38.100 (1 1/2)	47.625 (1 7/8)	19.05 (.750)	2.8					22 500	36 600	9 000	—
38.100 (1 1/2)	47.625 (1 7/8)	22.22 (.875)	2.8	38.100	38.084	47.639	47.614	26 700	45 600	9 000	IRB 2014
38.100 (1 1/2)	47.625 (1 7/8)	25.40 (1.000)	2.8					31 100	55 400	9 000	IRB 2016
38.100 (1 1/2)	47.625 (1 7/8)	31.75 (1.250)	2.8					39 000	74 200	9 000	IRB 2020
38.100 (1 1/2)	47.625 (1 7/8)	9.52 (.375)	—					21 000	34 100	4 000	—
38.100 (1 1/2)	47.625 (1 7/8)	12.70 (.500)	—					28 700	50 900	4 000	—
38.100 (1 1/2)	47.625 (1 7/8)	22.22 (.875)	—	38.100	38.084	47.639	47.614	48 900	101 000	4 000	IRB 2014
38.100 (1 1/2)	47.625 (1 7/8)	25.40 (1.000)	—					55 100	118 000	4 000	IRB 2016
38.100 (1 1/2)	47.625 (1 7/8)	31.75 (1.250)	—					66 800	151 000	4 000	IRB 2020



## SHELL TYPE NEEDLE ROLLER BEARINGS

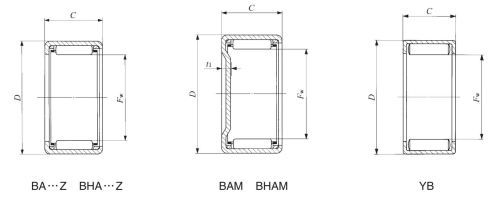
Inch Series



Shaft dia. 41.275 – 52.388mm

Shaft dia. mm (inch)	Identification number										
	Standard	Mass (Ref.) g	Closed end	Mass (Ref.) g	Standard	Mass (Ref.) g	Closed end	Mass (Ref.) g	Grease retained	Mass (Ref.) g	
41.275 (1 5/8)	BA 268 Z	41	BAM 268	51.5	—	—	—	—	—	—	
	BA 2610 Z	52	BAM 2610	62.5	—	—	—	—	—	—	
	BA 2616 Z	85	BAM 2616	95.5	—	—	—	—	—	—	
	BA 2620 Z	105	BAM 2620	115	—	—	—	—	YB 2610	69	
44.450 (1 3/4)	BA 2812 Z	67.5	BAM 2812	79.5	—	—	—	—	—	—	
	BA 2816 Z	91	BAM 2816	103	—	—	—	—	—	—	
	BA 2820 Z	112	BAM 2820	125	—	—	—	—	—	—	
	BA 2824 Z	136	BAM 2824	148	—	—	—	—	—	—	
	—	—	—	—	BHA 2824 Z	195	BHAM 2824	210	—	—	YB 2816
47.625 (1 7/8)	BA 308 Z	47.5	BAM 308	61	—	—	—	—	—	—	
	BA 3010 Z	60	BAM 3010	74	—	—	—	—	—	—	
	BA 3012 Z	72.5	BAM 3012	86.5	—	—	—	—	—	—	
	BA 3016 Z	97.5	BAM 3016	112	—	—	—	—	—	YB 3012	95
50.800 (2)	BA 328 Z	50	BAM 328	66	—	—	—	—	—	—	
	BA 3216 Z	104	BAM 3216	119	—	—	—	—	—	—	
	BA 3220 Z	128	BAM 3220	144	—	—	—	—	—	—	
	BA 3224 Z	155	BAM 3224	170	—	—	—	—	—	—	
	BAW3228Z	180	BAMW3228	196	—	—	—	—	—	—	
—	—	—	—	—	—	—	—	—	YB 3216	130	
52.388 (2 1/16)	—	—	—	—	BHA 3312 Z	104	BHAM 3312	122	—	—	
	—	—	—	—	BHA 3316 Z	139	BHAM 3316	157	—	—	
	—	—	—	—	BHA 3324 Z	205	BHAM 3324	225	—	—	

Note(1) Allowable rotational speed applies to oil lubrication. For grease lubrication, a maximum of 60% of this value is allowable.  
 Remarks 1. "W" in the identification number indicates that rolling elements are arranged in double rows.  
 2. Shell Type Grease Retained Full Complement Needle Roller Bearings are provided with prepacked grease. Standard type and closed end type bearings are not provided with prepacked grease, so perform proper lubrication when using these types of bearings.



Boundary dimensions mm(inch)				Standard mounting dimensions mm				Basic dynamic load rating C	Basic static load rating C <sub>0</sub>	Allowable rotational speed(1) rpm	Assembled inner ring
F <sub>w</sub>	D	C	t <sub>1</sub>	Shaft dia. h6		Housing bore dia. J7					
Max.	Max.	Max.	Max.	Max.	Min.	Max.	Min.	N	N		
41.275 (1 5/8)	50.800 (2)	12.70 (.500)	2.8	41.275	41.259	50.818	50.788	13 700	19 800	8 000	—
41.275 (1 5/8)	50.800 (2)	15.88 (.625)	2.8					18 900	30 000	8 000	IRB 2210
41.275 (1 5/8)	50.800 (2)	25.40(1.000)	2.8					33 000	61 400	8 000	—
41.275 (1 5/8)	50.800 (2)	31.75(1.250)	2.8					41 400	82 100	8 000	IRB 2220
41.275 (1 5/8)	50.800 (2)	15.88 (.625)	—	—	—	—	—	37 000	71 700	3 500	IRB 2210
44.450 (1 3/4)	53.975 (2 1/8)	19.05 (.750)	2.8	44.450	44.434	53.993	53.963	25 200	44 500	7 500	IRB 2412
44.450 (1 3/4)	53.975 (2 1/8)	25.40(1.000)	2.8					34 800	67 400	7 500	IRB 2416
44.450 (1 3/4)	53.975 (2 1/8)	31.75(1.250)	2.8					43 600	90 200	7 500	—
44.450 (1 3/4)	53.975 (2 1/8)	38.10(1.500)	2.8					52 000	113 000	7 500	IRB 2424
44.450 (1 3/4)	53.975 (2 1/8)	25.40(1.000)	—	—	—	—	—	59 500	136 000	3 500	IRB 2416
44.450 (1 3/4)	57.150 (2 1/4)	38.10(1.500)	3.4	44.450	44.434	57.168	57.138	72 200	135 000	7 500	IRB 2424
47.625 (1 7/8)	57.150 (2 1/4)	12.70 (.500)	2.8	47.625	47.609	57.168	57.138	14 700	22 800	7 000	IRB 248-1
47.625 (1 7/8)	57.150 (2 1/4)	15.88 (.625)	2.8					20 300	34 500	7 000	IRB 2410-1
47.625 (1 7/8)	57.150 (2 1/4)	19.05 (.750)	2.8					25 700	46 700	7 000	—
47.625 (1 7/8)	57.150 (2 1/4)	25.40(1.000)	2.8					35 400	70 600	7 000	—
47.625 (1 7/8)	57.150 (2 1/4)	19.05 (.750)	—	—	—	—	—	47 800	105 000	3 000	—
50.800 (2)	60.325 (2 3/8)	12.70 (.500)	2.8	50.800	50.781	60.343	60.313	15 400	24 700	6 000	—
50.800 (2)	60.325 (2 3/8)	25.40(1.000)	2.8					37 100	76 500	6 000	IRB 2616
50.800 (2)	60.325 (2 3/8)	31.75(1.250)	2.8					46 600	102 000	6 000	IRB 2720
50.800 (2)	60.325 (2 3/8)	38.10(1.500)	2.8					55 500	128 000	6 000	—
50.800 (2)	60.325 (2 3/8)	44.45(1.750)	2.8					57 900	136 000	6 000	IRB 2628
50.800 (2)	60.325 (2 3/8)	25.40(1.000)	—					64 100	156 000	2 500	IRB 2616
52.388 (2 1/16)	64.294 (2 5/8)	19.05 (.750)	3.4	52.388	52.369	64.312	64.282	36 400	62 100	6 000	—
52.388 (2 1/16)	64.294 (2 5/8)	25.40(1.000)	3.4					50 600	94 700	6 000	—
52.388 (2 1/16)	64.294 (2 5/8)	38.10(1.500)	3.4					73 900	154 000	6 000	—



## SHELL TYPE NEEDLE ROLLER BEARINGS

Inch Series

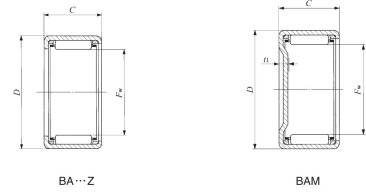


Shaft dia. 53.975 – 69.850mm

Shaft dia. mm (inch)	Identification number									
	Standard	Mass (Ref.) g	Closed end	Mass (Ref.) g	Standard	Mass (Ref.) g	Closed end	Mass (Ref.) g	Grease retained	Mass (Ref.) g
53.975 (2 1/8)	BA 348 Z	53	BAM 348	70.5	—	—	—	—	—	—
	BA 3416 Z	109	BAM 3416	127	—	—	—	—	—	—
	BA 3424 Z	162	BAM 3424	180	—	—	—	—	—	—
57.150 (2 1/4)	BA 3612 Z	85.5	BAM 3612	105	—	—	—	—	—	—
	BA 3616 Z	115	BAM 3616	135	—	—	—	—	—	—
	BA 3620 Z	143	BAM 3620	163	—	—	—	—	—	—
	BA 3624 Z	172	BAM 3624	192	—	—	—	—	—	—
66.675 (2 5/8)	BA 4216 Z	133	BAM 4216	161	—	—	—	—	—	—
69.850 (2 3/4)	BA 4410 Z	85.5	BAM 4410	115	—	—	—	—	—	—
	BA 4412 Z	103	BAM 4412	133	—	—	—	—	—	—
	BA 4416 Z	139	BAM 4416	169	—	—	—	—	—	—
	BA 4420 Z	173	BAM 4420	205	—	—	—	—	—	—

Note<sup>(1)</sup> Allowable rotational speed applies to oil lubrication. For grease lubrication, a maximum of 60% of this value is allowable.  
 Remark Shell Type Grease Retained Full Complement Needle Roller Bearings are provided with prepacked grease. Standard type and closed end type bearings are not provided with prepacked grease, so perform proper lubrication when using these types of bearings.

B47



Boundary dimensions mm(inch)				Standard mounting dimensions mm				Basic dynamic load rating	Basic static load rating	Allowable rotational speed <sup>(1)</sup>	Assembled inner ring
F <sub>w</sub>	D	C	t <sub>1</sub> Max.	Shaft dia. h6		Housing bore dia. J7		C	C <sub>0</sub>	rpm	
				Max.	Min.	Max.	Min.	N	N		
53.975 (2 1/8)	63.500 (2 1/2)	12.70 (.500)	2.8	53.975	53.956	63.518	63.488	16 100	26 600	5 500	—
53.975 (2 1/8)	63.500 (2 1/2)	25.40 (1.000)	2.8	—	—	—	—	38 700	82 500	5 500	IRB 3016
53.975 (2 1/8)	63.500 (2 1/2)	38.10 (1.500)	2.8	—	—	—	—	57 900	138 000	5 500	IRB 3024
57.150 (2 1/4)	66.675 (2 5/8)	19.05 (.750)	2.8	57.150	57.131	66.693	66.663	28 500	56 700	5 000	—
57.150 (2 1/4)	66.675 (2 5/8)	25.40 (1.000)	2.8	—	—	—	—	39 300	85 700	5 000	—
57.150 (2 1/4)	66.675 (2 5/8)	31.75 (1.250)	2.8	—	—	—	—	49 400	115 000	5 000	—
57.150 (2 1/4)	66.675 (2 5/8)	38.10 (1.500)	2.8	—	—	—	—	58 800	144 000	5 000	—
66.675 (2 5/8)	76.200 (3)	25.40 (1.000)	2.8	66.675	66.656	76.218	76.188	42 000	97 900	4 000	IRB 3616
69.850 (2 3/4)	79.375 (3 1/8)	15.88 (.625)	2.8	—	—	—	—	25 000	50 800	3 500	—
69.850 (2 3/4)	79.375 (3 1/8)	19.05 (.750)	2.8	—	—	—	—	31 500	68 700	3 500	—
69.850 (2 3/4)	79.375 (3 1/8)	25.40 (1.000)	2.8	69.850	69.831	79.393	79.363	43 500	104 000	3 500	IRB 4016
69.850 (2 3/4)	79.375 (3 1/8)	31.75 (1.250)	2.8	—	—	—	—	54 600	139 000	3 500	IRB 4020

1N=0.102kgf=0.2248lbs.  
1mm=0.03937inch

B48