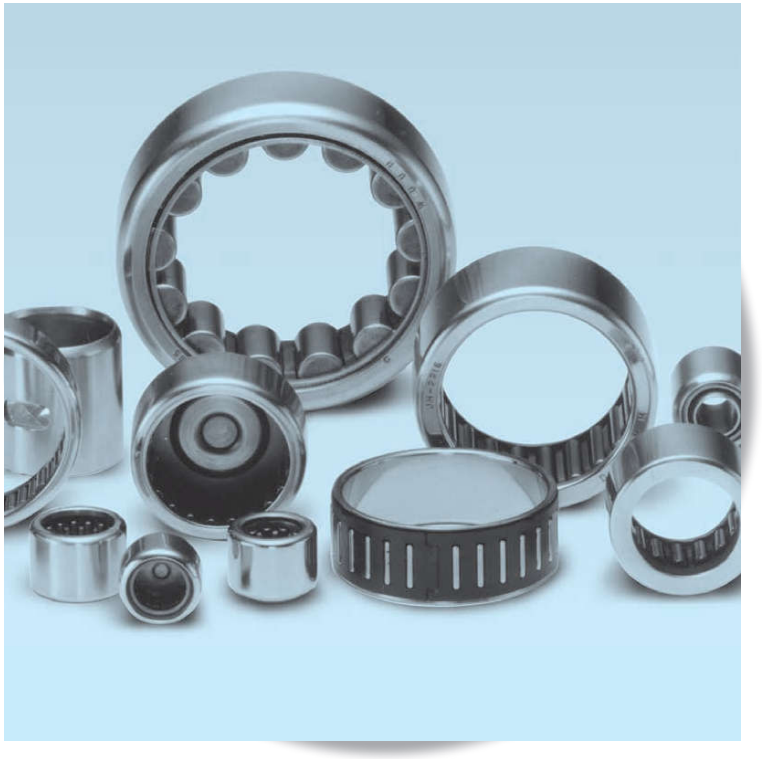
NOTES

DRAWN CUP NEEDLE ROLLER BEARINGS

Overview: Drawn cup needle roller bearings support radial loads and reduce friction between rotating components, with a drawn outer shell serving as a raceway for the rollers. The small cross section of the drawn cup bearing provides high load-carrying capability with minimum required space. Drawn cup bearings are easily installed with a press fit in the housing.

- **Catalogue range:** 3 mm – 139.7 mm (0.1181 in – 5.5000 in) bore.
- **Markets:** Transmissions, transfer cases, engines, valve trains, steering and braking systems, axle supports, outboard engines, power tools, copiers, fax machines, paper-moving equipment and appliances.
- **Features:** Available in two basic designs: full complement and caged.
- **Benefits:** Full complement bearings handle high radial load-carrying capability. Caged bearings provide high speed and maximum lubricant-retention capability.



Drawn Cup Needle Roller Bearings – Metric Nominal Dimensions

Prefix
- **HK** drawn cup bearing, caged, open ends
- **BK** drawn cup bearing, caged, closed end
- **DL** drawn cup bearing, full complement, open ends
- **DLF** drawn cup bearing, full complement, closed end

Width
12 = 12 mm

HK **10** **12** **AS1**

Needle roller complement bore diameter
10 = 10 mm

Suffix [1]
- **RS** lip contact seal on one side of the bearing
- **.2RS** lip contact seal on each side of the bearing
- **AS1** lubricating hole

[1] These suffixes only apply to the HK and BK Series bearings.

Prefix
- **BTM, BHTM, BKM, BHKM, BSM** drawn cup bearing, caged, open ends
- **BM, BHM, YM** drawn cup bearing, full complement, open ends

Width
10 = 10 mm

BTM **17** **10** **UU**

Needle roller complement bore diameter
17 = 17 mm

Suffix
- **UU** lip contact seal on each side of the bearing
- **J** bearing designed according to ISO standards

Prefix
- **BTM, BHTM, BKM, BHKM, BSM** drawn cup bearing, caged, open ends
- **BM, BHM, YM** drawn cup bearing, full complement, open ends

Width
12 = 12 mm

17 **BKM** **23** **12** **UU**

BKM **17** **23** **12** **UU**

Needle roller complement bore diameter
17 = 17 mm

Outer diameter
23 = 23 mm

Suffix
- **UU** lip contact seal on each side of the bearing
- **J** bearing designed according to ISO standards

Inner Rings – Metric Nominal Dimensions

Prefix
- **JR** inner ring
- **JRZ** inner ring without mounting chamfers
- **IM** inner ring for full complement bearings
- **IMC** inner ring with lubricating hole for full complement bearings

Outer diameter
14 = 14 mm

Suffix
- **JS1** lubricating hole
- **R6** crowned raceway (IM types)

JR **10** x **14** x **12** **JS1**

Bore diameter
10 = 10 mm

Width
12 = 12 mm

Drawn Cup Needle Roller Bearings – Inch Nominal Dimensions

Prefix
- **J, JH, JP, BT** drawn cup bearing, caged, open ends
- **MJ, MJH** drawn cup bearing, caged, closed end
- **JT** drawn cup bearing, caged, one seal, open ends
- **JTT** drawn cup bearing, caged, two seals, open ends
- **B, BH, Y** drawn cup bearing, full complement, open ends
- **GB, GBH** drawn cup bearing, full complement, open ends, extra precision
- **M, MH** drawn cup bearing, full complement, closed end

Suffix
1 closed end
blank open ends

MJH - **18** **16** **1**

Needle roller complement bore diameter
18 = $^{18}/_{16}$ = 1 $^{1}/_{8}$ in

Width
16 = $^{16}/_{16}$ = 1 in

Inner Rings (with four-digit number) Inch Nominal Dimensions

Prefix
- **IR** regular width (for use with drawn cup bearings only)
- **IRA** extended width (for use with drawn cup bearings only)

IR - **14** **16**

Bore diameter
14 = $^{14}/_{16}$ = $^{7}/_{8}$ in

Width (IR series only)
16 = $^{16}/_{16}$ = 1 in

Drawn Cup Needle Roller Bearings

DRAWN CUP NEEDLE ROLLER BEARINGS

METRIC SERIES

When a rolling bearing is needed for a compact and economic design and where it is not practical to harden and grind the housing bore, or where the housing materials are of low rigidity such as cast iron, aluminum or even plastics – drawn cup needle roller bearings should be considered.

REFERENCE STANDARDS ARE:

- **ISO 3245** – rolling bearings – needle roller bearings, drawn cup, without inner ring, boundary dimensions and tolerances.
- **ANSI/ABMA 18.1** – needle roller bearings – radial, metric design.
- **DIN 618** – needle roller bearings with cage – drawn cups with open end, drawn cup with closed end.
- **JIS B 1536** – rolling bearings – needle roller bearings – boundary dimensions and tolerances.

Before selecting specific drawn cup needle roller bearings, please review the engineering section of this catalog.

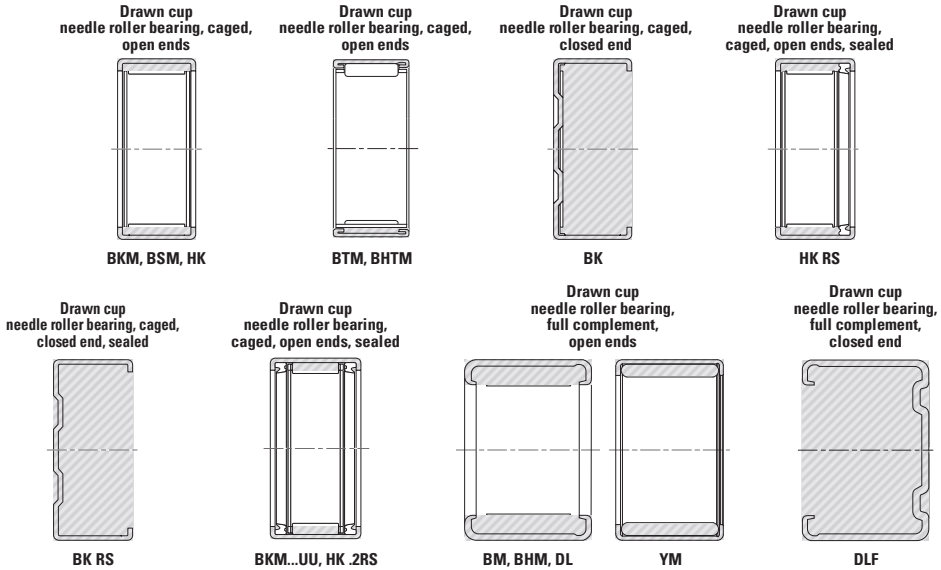


Fig. B2-1. Types of metric series drawn cup needle roller bearings

CONSTRUCTION

The prefix letters in metric series drawn cup bearing designations denote whether the bearings are made with a full complement of needle rollers or caged needle rollers. The use of a full complement of needle rollers is indicated by the prefix code letters **DL**, **BM**, **BHM**, **YM** or **DLF**, and for use of caged needle rollers by the prefix code letters **HK**, **BKM**, **BTM**, **BHTM**, **BSM** or **BK**.

The outer ring, in the form of a cup, is accurately drawn and no subsequent machining is performed. Drawn cup needle roller bearings of series **HK**, **BKM**, **BTM**, **BHTM**, **BSM**, **DL**, **BM**, **BHM** and **YM** have open ends. The **HK** and **BKM** series also are available with one seal, **HK RS**, and with two seals, **HK 2RS** and **BKM UU**. The stamped lip of a drawn cup needle roller bearing of series **HK RS** is at the seal end.

Drawn cup needle roller bearings of series **BK** and **DLF** are closed at one end. They are used for shaft-end mounting. The open end is typically not sealed.

The one-piece steel cage used in **HK**, **BKM** and **BK** series drawn cup bearings is designed to provide rigidity and minimize wear. This cage design separates the needle roller guiding and retention functions.

Drawn cup needle roller bearings also are available with two needle roller and cage assemblies. They have a lubricating hole in the outer ring. Metric series drawn cup bearings with one needle roller and cage assembly may be made available on request with a lubricating hole, indicated by suffix **AS1** and **JS1**.

SEALED BEARINGS

The HK and BKM series drawn cup bearings are offered with integral seals. The tables of dimensions on pages B-2-24 to B-2-26, indicate those sizes available with lip contact seals. The seal lip design achieves a light and constant contact with the inner raceway throughout the range of mounted bearing clearances, thereby ensuring positive sealing and low frictional drag.

Sealed drawn cup needle roller bearings are intended to retain grease or non-pressurized oil within a bearing while also preventing contaminants from entering the raceway area.

Details of shaft design for sealed bearings are given in the engineering section of this catalog.

The standard lip contact seals are compatible with common lubricating oils and petroleum based fuels; but, they are adversely affected by certain fire-resistant hydraulic fluids and most common solvents. Sealed drawn cup bearings are normally filled with a high-quality lithium soap-based general purpose grease. The seal material and grease properties limit the bearing operating temperature between -30˚ C and +100˚ C (-22˚ F and + 212˚ F).

If the operating temperature must be outside of the range for the seals mentioned here, or if the seals are exposed to unusual fluids, please consult your representative.

BEARING MOUNTING FITS AND INTERNAL CLEARANCE

Drawn cup needle roller bearings are manufactured to a degree of precision that will satisfy the radial clearance requirements of most applications. The total radial clearance for an installed drawn cup bearing results from the buildup of manufacturing tolerances of the housing bore, the inner raceway diameter and the bearing, as well as the minimum radial clearance required for the application (reference Table B2-1 on page B-2-8).

For metric series caged drawn cup needle roller bearings requiring close control of radial internal clearance, the suggested housing bore tolerance is N6 and h5 tolerance for the inner raceway diameter. When such exacting close control of radial internal clearance is not required, the user may select N7 housing bore and h6 inner raceway diameter tolerances.

For metric series full complement drawn cup bearings requiring close control of radial internal clearance, the suggested housing bore tolerance is H6 and h5 tolerance for the inner raceway diameter. When such exacting close control of radial internal clearance is not required, the user may select H7 housing bore and h6 inner raceway diameter tolerances.

TOLERANCES FOR HOUSING MATERIALS OF LOW RIGIDITY

The suggested housing bore tolerance for metric series caged drawn cup bearings used in housings made from materials of low rigidity or steel housings of small section is R6. To maintain normal radial internal clearance, the inner raceway diameter tolerance should be h5. When such exacting close control of radial internal clearance is not required, the user may select R7 housing bore and h6 inner raceway diameter tolerances.

The suggested housing bore tolerance for metric series full complement drawn cup bearings used in housings made from materials of low rigidity or steel housings of small section is M6. To maintain normal radial internal clearance, the inner raceway diameter tolerance should be h5. When such exacting close control of radial internal clearance is not required, the user may select M7 housing bore and h6 inner raceway diameter tolerances.

OUTER RING ROTATION

For metric series caged drawn cup bearing applications where the outer ring rotates with respect to the load, it is suggested that both the housing bore and the inner raceway diameter be reduced using R6 and f5 tolerance practice respectively. The user may select R7 housing bore and f6 inner raceway diameter tolerance when such exacting close control of radial internal clearance is not required.

For metric series full complement drawn cup bearings applications where the outer ring rotates with respect to the load, it is suggested that both the housing bore and the inner raceway diameter tolerance be reduced using is M6 and f5 tolerance practice respectively. The user may select M7 housing bore and f6 inner raceway diameter tolerances when such exacting close control of radial internal clearance is not required.

OSCILLATING MOTION

Metric series drawn cup needle roller bearing applications involving oscillating motion may require reduced radial internal clearances. This reduction may be accomplished by increasing the inner raceway diameter using j5 tolerance. When such exacting close control of radial clearance is not required, the user may select j6 inner raceway diameter tolerances.

Table B2-1. Metric mounting fits

Bearing type	Operating condition	Shaft fit (recommended internal radial clearances)	Housing fit (recommended internal radial clearances)
HK, BK, HKRS, HK.2RS, BTM, BHTM, BSM, BKM (caged)	One piece heavy section steel or cast iron housing	h5 (h6)	N6 (N7)
	Housing material of low rigidity	h5 (h6)	R6 (R7)
	Outer ring rotation (one piece heavy section steel or cast iron housing)	f5 (f6)	R6 (R7)
	Oscillating motion	j5 (j6)	(1)
DL, DLF, BM, BHM, YM (full complement)	One piece heavy section steel or cast iron housing	h5 (h6)	H6 (H7)
	Housing material of low rigidity	h5 (h6)	M6 (M7)
	Outer ring rotation (one piece heavy section steel or cast iron housing)	f5 (f6)	M6 (M7)
	Oscillating motion	j5 (j6)	(1)

(1) Tolerance dependent on housing design.

INNER RINGS

When it becomes impractical to meet the shaft raceway design requirements (hardness, case depth, surface finish, etc.) outlined in the engineering section of this catalog, standard inner rings may be used with metric series drawn cup bearings. It is suggested that when metric series inner rings are used with metric series drawn cup bearings, they should be mounted with a loose transition fit on the shaft using g5 shaft diameter tolerance. The inner ring should be end-clamped against a shoulder. If a tight transition fit must be used (shaft diameter tolerance h5) to keep the inner ring from rotating relative to the shaft, the inner ring outer diameter, as mounted, must not exceed the raceway diameter required by the drawn cup bearing for the particular application. In case the outer diameter of the inner ring, when mounted on the shaft, exceeds the required raceway diameter for the matching drawn cup bearing, it should be ground to proper diameter while mounted on the shaft. When such exacting close control of radial internal clearance is not required the user may select g6 or h5 shaft diameter tolerances.

LOAD RATING FACTORS

DYNAMIC LOADS

Drawn cup needle roller bearings can accommodate only radial loads.

$P = F_r$

P = The maximum dynamic radial load that may be applied to a drawn cup bearing based on the dynamic load rating, C_r given in the bearing tables. This load should be $\leq C_r/3$.

STATIC LOADS

$$f_0 = \frac{C_0}{P_0}$$

f_0 = static load safety factor

C_0 = basic static load rating (kN)

P_0 = maximum applied static load (kN)

To ensure satisfactory operation of drawn cup needle roller bearings, under all types of conditions, the static load safety factor f_0 should be ≥ 3.

INSPECTION OF DRAWN CUP NEEDLE ROLLER BEARINGS

Although the bearing cup is accurately drawn from strip steel, because of its fairly thin section, it may go out-of-round during heat treatment. When the bearing is pressed into a true round housing, or ring gage of correct size and wall thickness, it becomes round and is sized properly. *For this reason, it is incorrect to inspect an unmounted drawn cup bearing by measuring the outer diameter.* The correct method for inspecting the bearing size is to:

1. Press the bearing into a ring gage of proper size.
2. Plug the bearing bore with the appropriate "go" and "no go" gages, or measure it with a tapered arbor (lathe mandrel).

- HK, BK and DL series

The "go" gage size is the minimum needle roller complement bore diameter.

The "no go" gage size is larger than the maximum needle roller complement bore diameter by 0.002 mm (0.0001 in). (Tables B2-2 and B2-3)

- BTM, BHTM, BSM, BKM, BM and YM series

The inspection gage (ring gage and plug gage) sizes are listed in Table B2-4.

NOTE

SPECIAL BEARINGS. There are bearings available with other cage designs, and materials such as reinforced engineered polymer for use where operating conditions permit.

Table B2-2. Caged bearing gage sizes

Nominal bore diameter	Ring gage(1)	Needle roller complement bore diameter	
		Max.	Min.
mm in	mm in	mm in	mm in
3.000 0.1181	**6.484** 0.2553	**3.024** 0.1191	**3.006** 0.1183
4.000 0.1575	**7.984** 0.3143	**4.028** 0.1586	**4.010** 0.1579
5.000 0.1969	**8.984** 0.3537	**5.028** 0.1980	**5.010** 0.1972
6.000 0.2362	**9.984** 0.3931	**6.028** 0.2373	**6.010** 0.2366
7.000 0.2756	**10.980** 0.4323	**7.031** 0.2768	**7.013** 0.2761
8.000 0.3150	**11.980** 0.4717	**8.031** 0.3162	**8.013** 0.3155
9.000 0.3543	**12.980** 0.5110	**9.031** 0.3555	**9.013** 0.3548
10.000 0.3937	**13.980** 0.5504	**10.031** 0.3949	**10.013** 0.3942
12.000 0.4724	**15.980** 0.6291	**12.034** 0.4738	**12.016** 0.4731
12.000 0.4724	**17.980** 0.7079	**12.034** 0.4738	**12.016** 0.4731
13.000 0.5118	**18.976** 0.7471	**13.034** 0.5131	**13.016** 0.5124
14.000 0.5512	**19.976** 0.7865	**14.034** 0.5525	**14.016** 0.5518
15.000 0.5906	**20.976** 0.8258	**15.034** 0.5919	**15.016** 0.5912
16.000 0.6299	**21.976** 0.8652	**16.034** 0.6313	**16.016** 0.6306
17.000 0.6693	**22.976** 0.9046	**17.034** 0.6706	**17.016** 0.6699
18.000 0.7087	**23.976** 0.9439	**18.034** 0.7100	**18.016** 0.7093
20.000 0.7874	**25.976** 1.0227	**20.041** 0.7890	**20.020** 0.7882
22.000 0.8661	**27.976** 1.1014	**22.041** 0.8678	**22.020** 0.8669
25.000 0.9843	**31.972** 1.2587	**25.041** 0.9859	**25.020** 0.9850
28.000 1.1024	**34.972** 1.3769	**28.041** 1.1040	**28.020** 1.1031
30.000 1.1811	**36.972** 1.4556	**30.041** 1.1827	**30.020** 1.1819
35.000 1.3780	**41.972** 1.6524	**35.050** 1.3799	**35.025** 1.3789
40.000 1.5750	**46.972** 1.8493	**40.050** 1.5768	**40.025** 1.5758
45.000 1.7717	**51.967** 2.0459	**45.050** 1.7736	**45.025** 1.7726
50.000 1.9685	**57.967** 2.2822	**50.050** 1.9705	**50.025** 1.9695
60.000 2.3622	**67.967** 2.6759	**60.060** 2.3646	**60.030** 2.3634

(1) The ring gage sizes are in accordance with ISO N6 lower limit.

Table B2-3. Full complement bearing gage sizes

Nominal bore diameter	Ring gage	Needle roller complement bore diameter	
		Max.	Min.
mm in	mm in	mm in	mm in
6.000 0.2362	**12.000** 0.4724	**6.034** 0.2376	**6.009** 0.2366
8.000 0.3150	**14.000** 0.5512	**8.034** 0.3163	**8.009** 0.3153
9.000 0.3543	**14.000** 0.5512	**9.034** 0.3557	**9.009** 0.3547
10.000 0.3937	**16.000** 0.6299	**10.034** 0.3950	**10.009** 0.3941
12.000 0.4724	**18.000** 0.7087	**10.033** 0.3950	**10.009** 0.3941
13.000 0.5118	**19.000** 0.7480	**13.033** 0.5131	**13.009** 0.5122
14.000 0.5512	**20.000** 0.7874	**14.033** 0.5525	**14.009** 0.5515
15.000 0.5906	**21.000** 0.8268	**15.033** 0.5919	**15.009** 0.5909
16.000 0.6299	**22.000** 0.8661	**16.033** 0.6312	**16.009** 0.6303
17.000 0.6693	**23.000** 0.9055	**17.033** 0.6706	**17.009** 0.6696
18.000 0.7087	**24.000** 0.9449	**18.033** 0.7100	**18.009** 0.7090
20.000 0.7874	**26.000** 1.0236	**20.033** 0.7887	**20.009** 0.7878
22.000 0.8661	**28.000** 1.1024	**22.033** 0.8674	**22.009** 0.8665
25.000 0.9843	**33.000** 1.2992	**25.039** 0.9858	**25.015** 0.9848
28.000 1.1024	**36.000** 1.4173	**28.039** 1.1039	**28.015** 1.1030
30.000 1.1811	**38.000** 1.4961	**30.039** 1.1826	**30.015** 1.1817
35.000 1.3780	**43.000** 1.6929	**35.039** 1.3795	**35.015** 1.3785
40.000 1.5748	**48.000** 1.8898	**40.039** 1.5763	**40.015** 1.5754
44.000 1.7323	**52.000** 2.0472	**44.039** 1.7338	**44.015** 1.7329
47.000 1.8504	**55.000** 2.1654	**47.039** 1.8519	**47.015** 1.8510
50.000 1.9685	**58.000** 2.2835	**50.039** 1.9700	**50.015** 1.9691
55.000 2.1654	**63.000** 2.4803	**55.039** 2.1669	**55.015** 2.1659

Table B2-4. Needle roller bearing gage sizes (metric series)

Needle roller complement bore diameter Fw nominal size	Ring gage	Plug gage	
		Go	No go
mm	mm	mm	mm
4	7.996	4.023	4.048
5	8.996	5.023	5.048
6	9.996	6.028	6.053
7	10.995	7.031	7.056
8	11.995 14.995	8.031	8.056
9	12.995 15.995	9.031	9.056
10	13.995 16.995	10.031	10.056
12	15.995 17.995 18.993	12.031	12.056
13	18.993	13.034	13.059
14	18.993 19.993 21.993	14.034	14.059
15	19.993 20.993 21.993	15.034	15.059
16	21.993 23.993	16.034	16.059
17	21.972 22.972 23.972	17.013	17.038
18	23.972 24.972	18.013	18.038
19	26.972	19.013	19.038
20	25.972 26.972	20.013	20.038
22	27.972 28.972 29.972	22.013	22.038
24	29.972 30.967 34.967	24.013	24.038
25	31.967 32.967	25.013	25.038
26	33.967	26.013	26.038
28	33.967 34.967 36.967	28.013	28.038
30	36.967 37.967 39.967	30.013	30.038
32	37.967 39.967 41.967	32.013	32.038
35	41.967 44.967	35.013	35.038
36	41.967 43.967 47.967	36.013	36.038
37	42.967 46.967	37.013	37.038
38	47.967	38.013	38.038
40	46.967 49.967	40.013	40.043
45	51.961 54.961	45.013	45.043
50	57.961 61.961	50.013	50.043
55	62.961	55.013	55.051

INSTALLATION PROCEDURES

GENERAL INSTALLATION REQUIREMENTS

- A drawn cup needle roller bearing must be pressed into its housing.
- An installation tool, similar to the ones illustrated must be used in conjunction with a standard press.
- The bearing must not be hammered into its housing, even in conjunction with the proper assembly mandrel.
- The bearing must not be pressed tightly against a shoulder in the housing.
- If it is necessary to use a shouldered housing, the depth of the housing bore must be sufficient to ensure that the housing shoulder fillet, as well as the shoulder face, clears the bearing.
- The installation tool must be coaxial with the housing bore.

INSTALLATION OF OPEN ENDS CAGED BEARINGS

It is advisable to utilize a positive stop on the press tool to locate the bearing properly in the housing. The assembly tool should have a leader or a pilot, as shown, to aid in starting the bearing true in the housing. The "O" ring shown on the drawing may be used to assist in holding the bearing on the installation tool. The bearing should be installed with the stamped end (the end with the identification markings) against the angled shoulder of the pressing tool.

A – 0.40 mm (0.016 in) less than housing bore
B – 0.08 mm (0.003 in) less than shaft diameter
C – distance bearing will be inset into housing, minimum of 0.20 mm (0.008 in)
D – pilot length should be length of bearing less 0.80 mm (0.030 in)
E – approximately ½ D

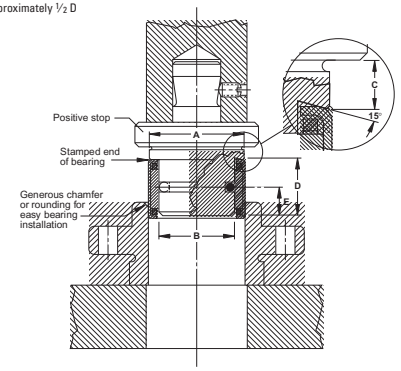


Fig. B2-2. Installation of open ends caged bearings

INSTALLATION OF CLOSED END CAGED BEARINGS

Bearing can be piloted from below for installation.

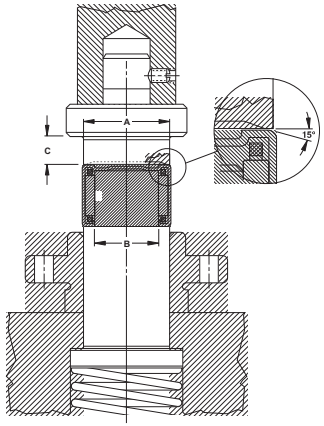


Fig. B2-3. Installation of closed end caged bearings

EXTRACTION FROM A STRAIGHT HOUSING (CAGED AND FULL COMPLEMENT BEARINGS)

Bearing can be extracted by pushing it through the housing. After extraction, the drawn cup needle roller bearing should not be reused.

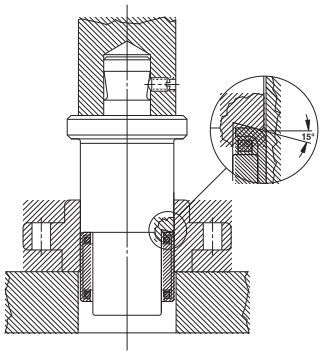


Fig. B2-4. Extraction from a straight housing

INSTALLATION OF OPEN ENDS FULL COMPLEMENT BEARINGS

It is advisable to utilize a positive stop on the press tool to locate the bearing properly in the housing. The assembly tool should have a leader or a pilot, as shown, to aid in starting the bearing true in the housing. The ball detent shown on the drawing is used to assist in aligning the rollers of a full complement bearing during installation and to hold the bearing on the installation tool. The bearing should be installed with the marked end (the end with identification markings) against the angled shoulder of the pressing tool.

A – 0.40 mm (0.016 in) less than housing bore
B – 0.08 mm (0.003 in) less than shaft diameter
C – distance bearing will be inset into housing, minimum of 0.20 mm (0.008 in)
D – pilot length should be length of bearing less 0.80 mm (0.030 in)
E – approximately 1/2 D

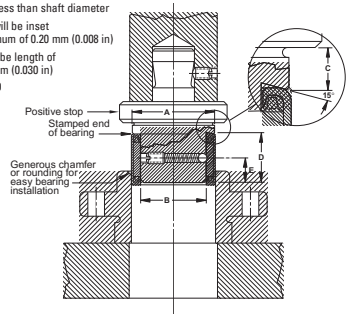


Fig. B2-5. Installation of open ends full complement bearings

INSTALLATION OF CLOSED END FULL COMPLEMENT BEARINGS

The installation tool combines all the features of the tool used to install open end bearings, but the pilot is spring loaded and is part of the press bed.

The angled shoulder of the pressing tool should bear against the closed end with the bearing held on the pilot to aid in starting the bearing true in the housing.

A – 0.40 mm (0.016 in) less than housing bore
B – 0.08 mm (0.003 in) less than shaft diameter
C – distance bearing will be inset into housing, minimum of 0.20 mm (0.008 in)

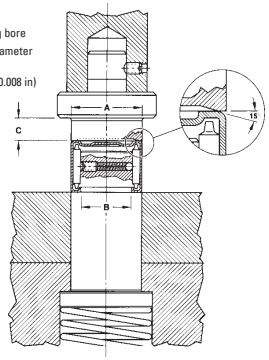


Fig. B2-6. Installation of closed end full complement bearings

EXTRACTION FROM A SHOULDERED OR DEAD END HOUSING (CAGED AND FULL COMPLEMENT BEARINGS) (with space between the bearing and the housing shoulder)

Bearings may be extracted from shouldered or dead end housings with a common bearing puller tool as shown. This type of tool is slotted in two places at right angles to form four prongs. The four puller prongs are pressed together and inserted into the space between the end of the bearing and the shoulder. The prongs are forced outward by inserting the expansion rod, and then the bearing is extracted. Do not reuse the bearing after extraction.

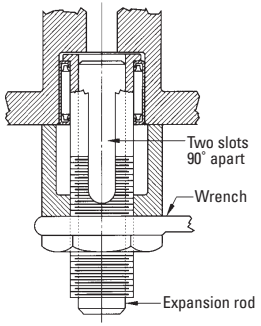


Fig. B2-7. Extraction from a shouldered or dead end housing

EXTRACTION FROM A SHOULDERED HOUSING (CAGED AND FULL COMPLEMENT BEARINGS) (with bearing pressed up close to the shoulder)

The tool to be used, as shown, is of a similar type described for a shouldered or dead end housing, but the rollers must first be removed from the bearing.

The four segment puller jaws are collapsed and slipped into the empty cup. The jaws are then forced outward into the cup bore by means of the tapered expansion rod. The jaws should bear on the lip as near as possible to the cup bore. The cup is then pressed out from the top.

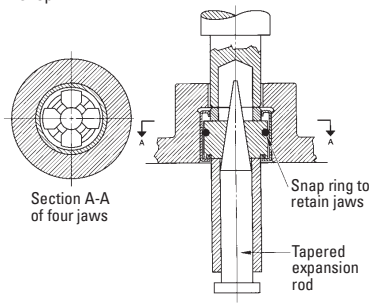


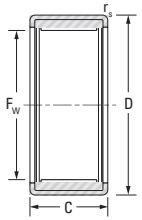
Fig. B2-8. Extraction from a shouldered housing

NOTES

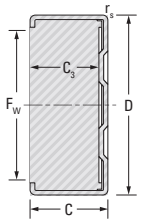
B

DRAWN CUP NEEDLE ROLLER BEARINGS CAGED, OPEN ENDS, CLOSED ONE END

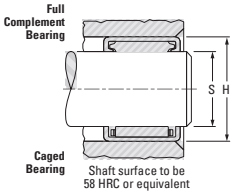
METRIC SERIES
HK, BK SERIES



HK



BK



Shaft Dia.	F_w	D	C +0 -0.3 / +0.000 -0.012	C_3 min.	r_s min.	Bearing Designation: Open Ends	Bearing Designation: Closed One End	Load Ratings: Dynamic C	Load Ratings: Static C_0	Fatigue Load Limit C_u	Speed Ratings: Grease	Speed Ratings: Oil	Approx. Wt.	Mounting Dimensions: Shaft (h5) Max.	Shaft (h5) Min.	Housing (N6) Max.	Housing (N6) Min.	Inspection gage	Mounting inner ring (pages B-2-28 to B-2-37)
mm in	mm in	mm in	mm in	mm in	mm in			kN lbf		kN	min⁻¹		kg lbs	mm in	mm in	mm in	mm in		
3 0.1181	**3** 0.1181	**6.5** 0.2559	**6** 0.236	**5.20** 0.205	**0.30** 0.012	—	BK0306	**1.20** 270	**0.78** 180	0.130	30000	46000	**0.001** 0.002	**3.000** 0.1181	**2.996** 0.118	**6.493** 0.2556	**6.484** 0.2553	Table B2-2	
	3 0.1181	**6.5** 0.2559	**6** 0.236	—	**0.30** 0.012	HK0306	—	**1.20** 270	**0.78** 180	0.130	30000	46000	**0.001** 0.002	**3.000** 0.1181	**2.996** 0.118	**6.493** 0.2556	**6.484** 0.2553	Table B2-2	
4 0.1575	**4** 0.1575	**8** 0.3150	**8** 0.315	**6.40** 0.252	**0.40** 0.016	—	BK0408	**1.88** 423	**1.38** 310	0.200	25000	39000	**0.002** 0.004	**4.000** 0.1575	**3.995** 0.1573	**7.993** 0.3147	**7.984** 0.3143	Table B2-2	
	4 0.1575	**8** 0.3150	**8** 0.315	—	**0.40** 0.016	HK0408	—	**1.88** 420	**1.38** 310	0.200	25000	39000	**0.002** 0.004	**4.000** 0.1575	**3.995** 0.1573	**7.993** 0.3147	**7.984** 0.3143	Table B2-2	
5 0.1969	**5** 0.1969	**9** 0.3543	**9** 0.354	**7.40** 0.291	**0.40** 0.016	—	BK0509	**2.52** 570	**2.07** 470	0.320	23000	36000	**0.002** 0.004	**5.000** 0.1969	**4.995** 0.1967	**8.993** 0.3541	**8.984** 0.3537	Table B2-2	
	5 0.1969	**9** 0.3543	**9** 0.354	—	**0.40** 0.016	HK0509	—	**2.52** 570	**2.07** 470	0.320	23000	36000	**0.002** 0.004	**5.000** 0.1969	**4.995** 0.1967	**8.993** 0.3541	**8.984** 0.3537	Table B2-2	
6 0.2362	**6** 0.2362	**10** 0.3937	**8** 0.315	**6.40** 0.252	**0.40** 0.016	—	BK0608	**2.34** 530	**1.95** 440	0.290	22000	33000	**0.002** 0.004	**6.000** 0.2362	**5.995** 0.236	**9.993** 0.3934	**9.984** 0.3931	Table B2-2	
	6 0.2362	**10** 0.3937	**8** 0.315	—	**0.40** 0.016	HK0608	—	**2.34** 530	**1.95** 440	0.290	22000	33000	**0.002** 0.004	**6.000** 0.2362	**5.995** 0.236	**9.993** 0.3934	**9.984** 0.3931	Table B2-2	
	6 0.2362	**10** 0.3937	**9** 0.354	**7.40** 0.291	**0.40** 0.016	—	BK0609	**3.14** 710	**2.85** 640	0.290	22000	33000	**0.003** 0.007	**6.000** 0.2362	**5.995** 0.236	**9.993** 0.3934	**9.984** 0.3931	Table B2-2	
	6 0.2362	**10** 0.3937	**9** 0.354	—	**0.40** 0.016	HK0609	—	**3.14** 710	**2.85** 640	0.290	22000	33000	**0.002** 0.004	**6.000** 0.2362	**5.995** 0.236	**9.993** 0.3934	**9.984** 0.3931	Table B2-2	
7 0.2756	**7** 0.2756	**11** 0.4331	**9** 0.354	**7.40** 0.291	**0.40** 0.016	—	BK0709	**3.23** 730	**3.05** 690	0.470	21000	32000	**0.003** 0.007	**7.000** 0.2756	**6.994** 0.2754	**10.991** 0.4327	**10.980** 0.4323	Table B2-2	
	7 0.2756	**11** 0.4331	**9** 0.354	—	**0.40** 0.016	HK0709	—	**3.23** 730	**3.05** 690	0.470	21000	32000	**0.003** 0.007	**7.000** 0.2756	**6.994** 0.2754	**10.991** 0.4327	**10.980** 0.4323	Table B2-2	
8 0.3150	**8** 0.3150	**12** 0.4724	**8** 0.315	**6.40** 0.252	**0.40** 0.016	—	BK0808	**2.90** 650	**2.73** 610	0.400	20000	31000	**0.003** 0.007	**8.000** 0.315	**7.994** 0.3147	**11.991** 0.4721	**11.980** 0.4717	Table B2-2	
	8 0.3150	**12** 0.4724	**8** 0.315	—	**0.40** 0.016	HK0808	—	**2.90** 650	**2.73** 610	0.400	20000	31000	**0.003** 0.007	**8.000** 0.315	**7.994** 0.3147	**11.991** 0.4721	**11.980** 0.4717	Table B2-2	
	8 0.3150	**12** 0.4724	**10** 0.394	**8.40** 0.331	**0.40** 0.016	—	BK0810	**3.95** 890	**4.07** 920	0.600	20000	31000	**0.004** 0.009	**8.000** 0.315	**7.994** 0.3147	**11.991** 0.4721	**11.980** 0.4717	Table B2-2	JR5x8x12
	8 0.3150	**12** 0.4724	**10** 0.394	—	**0.40** 0.016	HK0810	—	**3.95** 890	**4.07** 920	0.600	20000	31000	**0.004** 0.009	**8.000** 0.315	**7.994** 0.3147	**11.991** 0.4721	**11.980** 0.4717	Table B2-2	JR5x8x12
9 0.3543	**9** 0.3543	**13** 0.5118	**10** 0.394	**8.40** 0.331	**0.40** 0.016	—	BK0910	**4.57** 1030	**5.07** 1140	0.770	19000	30000	**0.004** 0.009	**9.000** 0.3543	**8.994** 0.3541	**12.991** 0.5115	**12.980** 0.5110	Table B2-2	JR6x9x12
	9 0.3543	**13** 0.5118	**12** 0.472	**10.40** 0.409	**0.40** 0.016	—	BK0912	**5.65** 1270	**6.65** 1490	1.00	19000	30000	**0.005** 0.011	**9.000** 0.3543	**8.994** 0.3541	**12.991** 0.5115	**12.980** 0.5110	Table B2-2	JR6x9x12
	9 0.3543	**13** 0.5118	**12** 0.472	—	**0.40** 0.016	HK0912	—	**5.65** 1270	**6.65** 1490	1.00	19000	30000	**0.005** 0.011	**9.000** 0.3543	**8.994** 0.3541	**12.991** 0.5115	**12.980** 0.5110	Table B2-2	JR6x9x12
10 0.3937	**10** 0.3937	**14** 0.5512	**10** 0.394	**8.40** 0.331	**0.40** 0.016	—	BK1010	**4.78** 1070	**5.51** 1240	0.840	19000	29000	**0.004** 0.009	**10.000** 0.3937	**9.994** 0.3935	**13.991** 0.5508	**13.980** 0.5504	Table B2-2	JR7x10x10,5
	10 0.3937	**14** 0.5512	**10** 0.394	—	**0.40** 0.016	HK1010	—	**4.78** 1070	**5.51** 1240	0.840	19000	29000	**0.004** 0.009	**10.000** 0.3937	**9.994** 0.3935	**13.991** 0.5508	**13.980** 0.5504	Table B2-2	JR7x10x10,5
	10 0.3937	**14** 0.5512	**12** 0.472	**10.40** 0.409	**0.40** 0.016	—	BK1012	**5.90** 1330	**7.23** 1630	1.10	19000	29000	**0.006** 0.013	**10.000** 0.3937	**9.994** 0.3935	**13.991** 0.5508	**13.980** 0.5504	Table B2-2	JR7x10x12
	10 0.3937	**14** 0.5512	**12** 0.472	—	**0.40** 0.016	HK1012	—	**5.90** 1330	**7.23** 1630	1.10	19000	29000	**0.005** 0.011	**10.000** 0.3937	**9.994** 0.3935	**13.991** 0.5508	**13.980** 0.5504	Table B2-2	JR7x10x12
	10 0.3937	**14** 0.5512	**15** 0.591	**13.40** 0.528	**0.40** 0.016	—	BK1015	**7.49** 1680	**9.81** 2210	1.50	19000	29000	**0.006** 0.013	**10.000** 0.3937	**9.994** 0.3935	**13.991** 0.5508	**13.980** 0.5504	Table B2-2	JR7x10x16
	10 0.3937	**14** 0.5512	**15** 0.591	—	**0.40** 0.016	HK1015	—	**7.49** 1680	**9.81** 2210	1.50	19000	29000	**0.006** 0.013	**10.000** 0.3937	**9.994** 0.3935	**13.991** 0.5508	**13.980** 0.5504	Table B2-2	JR7x10x16
12 0.4724	**12** 0.4724	**16** 0.6299	**10** 0.394	**8.40** 0.331	**0.40** 0.016	—	BK1210	**5.24** 1180	**6.55** 1470	0.890	18000	28000	**0.006** 0.013	**12.000** 0.4724	**11.992** 0.4721	**15.991** 0.6296	**15.980** 0.6291	Table B2-2	JR8x12x10,5
	12 0.4724	**16** 0.6299	**10** 0.394	—	**0.40** 0.016	HK1210	—	**5.24** 1180	**6.55** 1470	0.890	18000	28000	**0.006** 0.013	**12.000** 0.4724	**11.992** 0.4721	**15.991** 0.6296	**15.980** 0.6291	Table B2-2	JR8x12x10,5
	12 0.4724	**18** 0.7087	**12** 0.472	**9.30** 0.366	**1** 0.039	—	BK1212	**6.61** 1490	**7.29** 1640	1.10	14000	22000	**0.012** 0.026	**12.000** 0.4724	**11.992** 0.4721	**17.991** 0.7083	**17.980** 0.7079	Table B2-2	JR8x12x12,5
	12 0.4724	**18** 0.7087	**12** 0.472	—	**1** 0.039	HK1212	—	**6.61** 1490	**7.29** 1640	1.10	14000	22000	**0.01** 0.022	**12.000** 0.4724	**11.992** 0.4721	**17.991** 0.7083	**17.980** 0.7079	Table B2-2	JR8x12x12,5
13 0.5118	**13** 0.5118	**19** 0.7480	**12** 0.472	**9.30** 0.366	**1** 0.039	—	BK1312	**6.92** 1560	**7.89** 1770	1.20	14000	22000	**0.012** 0.026	**13.000** 0.5118	**12.992** 0.5115	**18.989** 0.7476	**18.976** 0.7471	Table B2-2	JR10x13x12,5
	13 0.5118	**19** 0.7480	**12** 0.472	—	**1** 0.039	HK1312	—	**6.92** 1560	**7.89** 1770	1.20	14000	22000	**0.01** 0.022	**13.000** 0.5118	**12.992** 0.5115	**18.989** 0.7476	**18.976** 0.7471	Table B2-2	JR10x13x12,5
14 0.5512	**14** 0.5512	**20** 0.7874	**12** 0.472	**9.30** 0.366	**1** 0.039	—	BK1412	**7.21** 1620	**8.50** 1910	1.30	14000	21000	**0.014** 0.031	**14.000** 0.5512	**13.992** 0.5509	**19.989** 0.7870	**19.976** 0.7865	Table B2-2	JR10x14x12
	14 0.5512	**20** 0.7874	**12** 0.472	—	**1** 0.039	HK1412	—	**7.21** 1620	**8.50** 1910	1.30	14000	21000	**0.011** 0.024	**14.000** 0.5512	**13.992** 0.5509	**19.989** 0.7870	**19.976** 0.7865	Table B2-2	JR10x14x12
15 0.5906	**15** 0.5906	**21** 0.8268	**12** 0.472	**9.30** 0.366	**1** 0.039	—	BK1512	**7.49** 1680	**9.11** 2050	1.40	14000	21000	**0.015** 0.033	**15.000** 0.5906	**14.992** 0.5902	**20.989** 0.8263	**20.976** 0.8258	Table B2-2	JR12x15x12,5
	15 0.5906	**21** 0.8268	**12** 0.472	—	**1** 0.039	HK1512	—	**7.49** 1680	**9.11** 2050	1.40	14000	21000	**0.012** 0.026	**15.000** 0.5906	**14.992** 0.5902	**20.989** 0.8263	**20.976** 0.8258	Table B2-2	JR12x15x12,5
	15 0.5906	**21** 0.8268	**16** 0.630	**13.30** 0.524	**1** 0.039	—	BK1516	**10.7** 2410	**14.4** 3240	2.20	14000	21000	**0.019** 0.042	**15.000** 0.5906	**14.992** 0.5902	**20.989** 0.8263	**20.976** 0.8258	Table B2-2	JR12x15x16,5
	15 0.5906	**21** 0.8268	**16** 0.630	—	**1** 0.039	HK1516	—	**10.7** 2410	**14.4** 3240	2.20	14000	21000	**0.018** 0.040	**15.000** 0.5906	**14.992** 0.5902	**20.989** 0.8263	**20.976** 0.8258	Table B2-2	JR12x15x16,5
	15 0.5906	**21** 0.8268	**22** 0.866	**19.30** 0.760	**1** 0.039	—	BK1522(1)	**13.5** 3030	**19.4** 4360	2.95	14000	21000	**0.022** 0.049	**15.000** 0.5906	**14.992** 0.5902	**20.989** 0.8263	**20.976** 0.8258	Table B2-2	JR12x15x22,5
	15 0.5906	**21** 0.8268	**22** 0.866	—	**1** 0.039	HK1522(1)	—	**13.5** 3030	**19.4** 4360	2.95	14000	21000	**0.024** 0.053	**15.000** 0.5906	**14.992** 0.5902	**20.989** 0.8263	**20.976** 0.8258	Table B2-2	JR12x15x22,5
16 0.6299	**16** 0.6299	**22** 0.8661	**12** 0.472	**9.30** 0.366	**1** 0.039	—	BK1612	**7.76** 1740	**9.72** 2190	1.50	14000	21000	**0.016** 0.035	**16.000** 0.6299	**15.992** 0.6296	**21.989** 0.8657	**21.976** 0.8652	Table B2-2	JR12x16x12

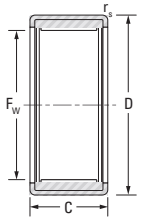
(1) Drawn cup needle roller bearings with two needle roller and cage assemblies and one lubricating hole.

Continued on next page.

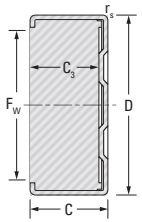
B

DRAWN CUP NEEDLE ROLLER BEARINGS CAGED, OPEN ENDS, CLOSED ONE END

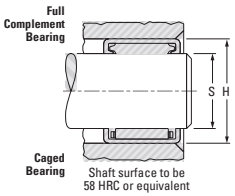
METRIC SERIES
HK, BK SERIES



HK



BK



Shaft Dia.	F_w	D	C +0 -0.3 / +0.000 -0.012	$C_{3\,min.}$	$r_{s\,min.}$	Bearing Designation: Open Ends	Bearing Designation: Closed One End	Load Ratings: Dynamic C	Load Ratings: Static C_0	Fatigue Load Limit C_u	Speed Ratings: Grease	Speed Ratings: Oil	Approx. Wt.	Mounting Dimensions: Shaft (h5) Max.	Shaft (h5) Min.	Housing (N6) Max.	Housing (N6) Min.	Inspection gage	Mounting inner ring (pages B-2-28 to B-2-37)
mm in	mm in	mm in	mm in	mm in	mm in			kN lbf		kN	min^{-1}		kg lbs	mm in	mm in	mm in	mm in		
16 0.6299	**16** 0.6299	**22** 0.8661	**12** 0.472	—	**1** 0.039	HK1612	—	**7.76** 1740	**9.72** 2190	1.50	14000	21000	**0.012** 0.026	**16.000** 0.6299	**15.992** 0.6296	**21.989** 0.8657	**21.976** 0.8652	Table B2-2	JR12x16x12
	16 0.6299	**22** 0.8661	**16** 0.630	**13.30** 0.524	**1** 0.039	—	BK1616	**11.1** 2500	**15.3** 3440	2.35	14000	21000	**0.02** 0.044	**16.000** 0.6299	**15.992** 0.6296	**21.989** 0.8657	**21.976** 0.8652	Table B2-2	JR12x16x16
	16 0.6299	**22** 0.8661	**16** 0.630	—	**1** 0.039	HK1616	—	**11.1** 2500	**15.3** 3440	2.35	14000	21000	**0.016** 0.035	**16.000** 0.6299	**15.992** 0.6296	**21.989** 0.8657	**21.976** 0.8652	Table B2-2	JR12x16x16
	16 0.6299	**22** 0.8661	**22** 0.866	**19.30** 0.760	**1** 0.039	—	BK1622(1)	**13.4** 3010	**19.5** 4380	2.95	14000	21000	**0.028** 0.062	**16.000** 0.6299	**15.992** 0.6296	**21.989** 0.8657	**21.976** 0.8652	Table B2-2	JR12x16x22
	16 0.6299	**22** 0.8661	**22** 0.866	—	**1** 0.039	HK1622(1)	—	**13.4** 3010	**19.5** 4380	2.95	14000	21000	**0.022** 0.049	**16.000** 0.6299	**15.992** 0.6296	**21.989** 0.8657	**21.976** 0.8652	Table B2-2	JR12x16x22
17 0.6693	**17** 0.6693	**23** 0.9055	**12** 0.472	**9.30** 0.366	**1** 0.039	—	BK1712	**8.12** 1830	**10.4** 2340	1.60	13000	20000	**0.018** 0.040	**17.000** 0.6693	**16.992** 0.6690	**22.989** 0.9051	**22.976** 0.9046	Table B2-2	
	17 0.6693	**23** 0.9055	**12** 0.472	—	**1** 0.039	HK1712	—	**8.12** 1830	**10.4** 2340	1.60	13000	20000	**0.013** 0.029	**17.000** 0.6693	**16.992** 0.6690	**22.989** 0.9051	**22.976** 0.9046	Table B2-2	
18 0.7087	**18** 0.7087	**24** 0.9449	**12** 0.472	**9.30** 0.366	**1** 0.039	—	BK1812	**8.41** 1890	**11.1** 2500	1.70	12000	18000	**0.017** 0.037	**18.000** 0.7087	**17.992** 0.7083	**23.989** 0.9444	**23.976** 0.9439	Table B2-2	
	18 0.7087	**24** 0.9449	**12** 0.472	—	**1** 0.039	HK1812	—	**8.41** 1890	**11.1** 2500	1.70	12000	18000	**0.015** 0.033	**18.000** 0.7087	**17.992** 0.7083	**23.989** 0.9444	**23.976** 0.9439	Table B2-2	
	18 0.7087	**24** 0.9449	**16** 0.630	**13.30** 0.524	**1** 0.039	—	BK1816	**11.6** 2610	**16.8** 3780	2.55	12000	18000	**0.022** 0.049	**18.000** 0.7087	**17.992** 0.7083	**23.989** 0.9444	**23.976** 0.9439	Table B2-2	JR15x18x16,5
	18 0.7087	**24** 0.9449	**16** 0.630	—	**1** 0.039	HK1816	—	**11.6** 2610	**16.8** 3780	2.55	12000	18000	**0.018** 0.040	**18.000** 0.7087	**17.992** 0.7083	**23.989** 0.9444	**23.976** 0.9439	Table B2-2	JR15x18x16,5
20 0.7874	**20** 0.7874	**26** 1.0236	**12** 0.472	**9.3** 0.366	**1** 0.039	—	BK2012	**8.97** 2020	**12.5** 2810	1.90	11000	16000	**0.017** 0.037	**20.000** 0.7874	**19.991** 0.7870	**25.989** 1.0232	**25.976** 1.0227	Table B2-2	JR15x20x12
	20 0.7874	**26** 1.0236	**12** 0.472	—	**1** 0.039	HK2012	—	**8.97** 2020	**12.5** 2810	1.90	11000	16000	**0.015** 0.033	**20.000** 0.7874	**19.991** 0.7870	**25.989** 1.0232	**25.976** 1.0227	Table B2-2	JR15x20x12
	20 0.7874	**26** 1.0236	**16** 0.630	**13.3** 0.524	**1** 0.039	—	BK2016	**12.4** 2790	**18.9** 4250	2.85	11000	16000	**0.024** 0.053	**20.000** 0.7874	**19.991** 0.7870	**25.989** 1.0232	**25.976** 1.0227	Table B2-2	JR17x20x16,5
	20 0.7874	**26** 1.0236	**16** 0.630	—	**1** 0.039	HK2016	—	**12.4** 2790	**18.9** 4250	2.85	11000	16000	**0.022** 0.049	**20.000** 0.7874	**19.991** 0.7870	**25.989** 1.0232	**25.976** 1.0227	Table B2-2	JR17x20x16,5
	20 0.7874	**26** 1.0236	**20** 0.787	**17.3** 0.681	**1** 0.039	—	BK2020	**15.5** 3480	**25.3** 5690	3.95	11000	16000	**0.027** 0.060	**20.000** 0.7874	**19.991** 0.7870	**25.989** 1.0232	**25.976** 1.0227	Table B2-2	JR17x20x20,5
	20 0.7874	**26** 1.0236	**20** 0.787	—	**1** 0.039	HK2020	—	**15.5** 3480	**25.3** 5690	3.95	11000	16000	**0.025** 0.055	**20.000** 0.7874	**19.991** 0.7870	**25.989** 1.0232	**25.976** 1.0227	Table B2-2	JR17x20x20,5

(1) Drawn cup needle roller bearings with two needle roller and cage assemblies and one lubricating hole.

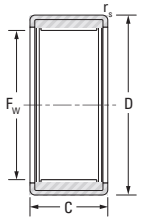
Shaft Dia.	F_w	D	C +0 -0.3 / +0.000 -0.012	$C_{3\,min.}$	$r_{s\,min.}$	Bearing Designation: Open Ends	Bearing Designation: Closed One End	Load Ratings: Dynamic C	Load Ratings: Static C_0	Fatigue Load Limit C_u	Speed Ratings: Grease	Speed Ratings: Oil	Approx. Wt.	Mounting Dimensions: Shaft (h5) Max.	Shaft (h5) Min.	Housing (N6) Max.	Housing (N6) Min.	Inspection gage	Mounting inner ring (pages B-2-28 to B-2-37)
mm in	mm in	mm in	mm in	mm in	mm in			kN lbf		kN	min^{-1}		kg lbs	mm in	mm in	mm in	mm in		
20 0.7874	**20** 0.7874	**26** 1.0236	**30** 1.181	**27.3** 1.075	**1** 0.039	—	BK2030(1)	**21.2** 4770	**37.8** 8500	5.75	11000	16000	**0.043** 0.095	**20.000** 0.7874	**19.991** 0.7870	**25.989** 1.0232	**25.976** 1.0227	Table B2-2	JR17x20x30,5
	20 0.7874	**26** 1.0236	**30** 1.181	—	**1** 0.039	HK2030(1)	—	**21.2** 4770	**37.8** 8500	5.75	11000	16000	**0.041** 0.090	**20.000** 0.7874	**19.991** 0.7870	**25.989** 1.0232	**25.976** 1.0227	Table B2-2	JR17x20x30,5
22 0.8661	**22** 0.8661	**28** 1.1024	**10** 0.394	—	**1** 0.039	HK2210	—	**7.06** 1590	**9.49** 2130	1.45	9600	15000	**0.013** 0.029	**22.000** 0.8661	**21.991** 0.8658	**27.989** 1.1019	**27.976** 1.1014	Table B2-2	
	22 0.8661	**28** 1.1024	**12** 0.472	**9.3** 0.366	**1** 0.039	—	BK2212	**9.81** 2210	**14.5** 3260	2.20	9600	15000	**0.02** 0.044	**22.000** 0.8661	**21.991** 0.8658	**27.989** 1.1019	**27.976** 1.1014	Table B2-2	JR17x22x13
	22 0.8661	**28** 1.1024	**12** 0.472	—	**1** 0.039	HK2212	—	**9.81** 2210	**14.5** 3260	2.20	9600	15000	**0.015** 0.033	**22.000** 0.8661	**21.991** 0.8658	**27.989** 1.1019	**27.976** 1.1014	Table B2-2	JR17x22x13
	22 0.8661	**28** 1.1024	**16** 0.630	**13.3** 0.524	**1** 0.039	—	BK2216	**13.1** 2940	**20.9** 4700	3.20	9600	15000	**0.027** 0.060	**22.000** 0.8661	**21.991** 0.8658	**27.989** 1.1019	**27.976** 1.1014	Table B2-2	JR17x22x16
	22 0.8661	**28** 1.1024	**16** 0.630	—	**1** 0.039	HK2216	—	**13.1** 2940	**20.9** 4700	3.20	9600	15000	**0.022** 0.049	**22.000** 0.8661	**21.991** 0.8658	**27.989** 1.1019	**27.976** 1.1014	Table B2-2	JR17x22x16
	22 0.8661	**28** 1.1024	**20** 0.787	**17.3** 0.681	**1** 0.039	—	BK2220	**15.3** 3440	**25.5** 5730	4.00	9600	15000	**0.028** 0.062	**22.000** 0.8661	**21.991** 0.8658	**27.989** 1.1019	**27.976** 1.1014	Table B2-2	JR17x22x23
	22 0.8661	**28** 1.1024	**20** 0.787	—	**1** 0.039	HK2220	—	**15.3** 3440	**25.5** 5730	4.00	9600	15000	**0.026** 0.057	**22.000** 0.8661	**21.991** 0.8658	**27.989** 1.1019	**27.976** 1.1014	Table B2-2	JR17x22x23
25 0.9843	**25** 0.9843	**32** 1.2598	**12** 0.472	**9.30** 0.366	**1** 0.039	—	BK2512	**10.9** 2450	**14.7** 3300	2.25	8500	13000	**0.025** 0.055	**25.000** 0.9843	**24.991** 0.9839	**31.988** 1.2594	**31.972** 1.2587	Table B2-2	
	25 0.9843	**32** 1.2598	**12** 0.472	—	**1** 0.039	HK2512	—	**10.9** 2450	**14.7** 3300	2.25	8500	13000	**0.021** 0.046	**25.000** 0.9843	**24.991** 0.9839	**31.988** 1.2594	**31.972** 1.2587	Table B2-2	
	25 0.9843	**32** 1.2598	**16** 0.630	**13.3** 0.524	**1** 0.039	—	BK2516	**15.6** 3510	**23.5** 5280	3.55	8500	13000	**0.031** 0.068	**25.000** 0.9843	**24.991** 0.9839	**31.988** 1.2594	**31.972** 1.2587	Table B2-2	JR20x25x17
	25 0.9843	**32** 1.2598	**16** 0.630	—	**1** 0.039	HK2516	—	**15.6** 3510	**23.5** 5280	3.55	8500	13000	**0.028** 0.062	**25.000** 0.9843	**24.991** 0.9839	**31.988** 1.2594	**31.972** 1.2587	Table B2-2	JR20x25x17
	25 0.9843	**32** 1.2598	**20** 0.787	**17.3** 0.681	**1** 0.039	—	BK2520	**20.6** 4630	**33.4** 7510	5.30	8500	13000	**0.043** 0.095	**25.000** 0.9843	**24.991** 0.9839	**31.988** 1.2594	**31.972** 1.2587	Table B2-2	JR20x25x20,5
	25 0.9843	**32** 1.2598	**20** 0.787	—	**1** 0.039	HK2520	—	**20.6** 4630	**33.4** 7510	5.30	8500	13000	**0.040** 0.088	**25.000** 0.9843	**24.991** 0.9839	**31.988** 1.2594	**31.972** 1.2587	Table B2-2	JR20x25x20,5
	25 0.9843	**32** 1.2598	**26** 1.024	**23.3** 0.917	**1** 0.039	—	BK2526	**25.7** 5780	**44.4** 9980	6.95	8500	13000	**0.051** 0.112	**25.000** 0.9843	**24.991** 0.9839	**31.988** 1.2594	**31.972** 1.2587	Table B2-2	JR20x25x26,5
	25 0.9843	**32** 1.2598	**26** 1.024	—	**1** 0.039	HK2526	—	**25.7** 5780	**44.4** 9980	6.95	8500	13000	**0.046** 0.101	**25.000** 0.9843	**24.991** 0.9839	**31.988** 1.2594	**31.972** 1.2587	Table B2-2	JR20x25x26,5
	25 0.9843	**32** 1.2598	**38** 1.496	**35.3** 1.390	**1** 0.039	—	BK2538(1)	**35.3** 7940	**66.9** 15000	10.6	8500	13000	**0.077** 0.170	**25.000** 0.9843	**24.991** 0.9839	**31.988** 1.2594	**31.972** 1.2587	Table B2-2	JR20x25x38,5
	25 0.9843	**32** 1.2598	**38** 1.496	—	**1** 0.039	HK2538(1)	—	**35.3** 7940	**66.9** 15000	10.6	8500	13000	**0.068** 0.150	**25.000** 0.9843	**24.991** 0.9839	**31.988** 1.2594	**31.972** 1.2587	Table B2-2	JR20x25x38,5
28 1.1024	**28** 1.1024	**35** 1.3780	**16** 0.630	—	**1** 0.039	HK2816	—	**17.4** 3910	**28.1** 6320	3.85	7500	12000	**0.032** 0.071	**28.000** 1.1024	**27.991** 1.1020	**34.988** 1.3775	**34.972** 1.3769	Table B2-2	JR22x28x17
	28 1.1024	**35** 1.3780	**20** 0.787	**17.3** 0.681	**1** 0.039	—	BK2820	**20.9** 4700	**35.3** 7940	5.60	7500	12000	**0.047** 0.104	**28.000** 1.1024	**27.991** 1.1020	**34.988** 1.3775	**34.972** 1.3769	Table B2-2	JR22x28x20,5
	28 1.1024	**35** 1.3780	**20** 0.787	—	**1** 0.039	HK2820	—	**20.9** 4700	**35.3** 7940	5.60	7500	12000	**0.040** 0.088	**28.000** 1.1024	**27.991** 1.1020	**34.988** 1.3775	**34.972** 1.3769	Table B2-2	JR22x28x20,5
30 1.1811	**30** 1.1811	**37** 1.4567	**12** 0.472	**9.3** 0.366	**1** 0.039	—	BK3012	**12.0** 2700	**17.7** 3980	2.90	7000	11000	**0.031** 0.068	**30.000** 1.1811	**29.991** 1.1807	**36.988** 1.4562	**36.972** 1.4556	Table B2-2	
	30 1.1811	**37** 1.4567	**12** 0.472	—	**1** 0.039	HK3012	—	**12.0** 2700	**17.7** 3980	2.70	7000	11000	**0.024** 0.053	**30.000** 1.1811	**29.991** 1.1807	**36.988** 1.4562	**36.972** 1.4556	Table B2-2	

Continued on next page.

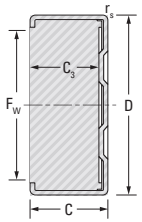
B

DRAWN CUP NEEDLE ROLLER BEARINGS CAGED, OPEN ENDS, CLOSED ONE END

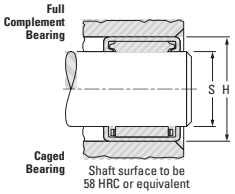
METRIC SERIES
HK, BK SERIES



HK



BK



Shaft Dia.	F_w	D	C	C_3 min.	r_s min.	Bearing Designation		Load Ratings		Fatigue Load Limit C_u	Speed Ratings		Approx. Wt.	Mounting Dimensions				Inspection gage	Mounting inner ring (pages B-2-28 to B-2-37)
								Dynamic	Static					Shaft(h5)		Housing(N6)			
			+0 +0.000 -0.3 -0.012			Open Ends	Closed One End	C	C_0		Grease	Oil		Max.	Min.	Max.	Min.		
mm in	mm in	mm in	mm in	mm in	mm in			kN lbf		kN	min^{-1}		kg lbs	mm in	mm in	mm in	mm in		
30 1.1811	**30** 1.1811	**37** 1.4567	**16** 0.630	**13.30** 0.524	**1** 0.039	—	BK3016	**16.8** 3780	**27.3** 6140	4.20	7000	11000	**0.041** 0.090	**30.000** 1.1811	**29.991** 1.1807	**36.988** 1.4562	**36.972** 1.4556	Table B2-2	JR25x30x17
	30 1.1811	**37** 1.4567	**16** 0.630	—	**1** 0.039	HK3016	—	**16.8** 3780	**27.3** 6140	4.20	7000	11000	**0.032** 0.071	**30.000** 1.1811	**29.991** 1.1807	**36.988** 1.4562	**36.972** 1.4556	Table B2-2	JR25x30x17
	30 1.1811	**37** 1.4567	**20** 0.787	**17.3** 0.681	**1** 0.039	—	BK3020	**22.4** 5040	**39.6** 8900	6.25	7000	11000	**0.053** 0.117	**30.000** 1.1811	**29.991** 1.1807	**36.988** 1.4562	**36.972** 1.4556	Table B2-2	JR25x30x20,5
	30 1.1811	**37** 1.4567	**20** 0.787	—	**1** 0.039	HK3020	—	**22.4** 5040	**39.6** 8900	6.25	7000	11000	**0.042** 0.093	**30.000** 1.1811	**29.991** 1.1807	**36.988** 1.4562	**36.972** 1.4556	Table B2-2	JR25x30x20,5
	30 1.1811	**37** 1.4567	**26** 1.024	**23.3** 0.917	**1** 0.039	—	BK3026	**27.4** 6160	**51.2** 11500	7.95	7000	11000	**0.067** 0.148	**30.000** 1.1811	**29.991** 1.1807	**36.988** 1.4562	**36.972** 1.4556	Table B2-2	JR25x30x26,5
	30 1.1811	**37** 1.4567	**26** 1.024	—	**1** 0.039	HK3026	—	**27.4** 6160	**51.2** 11500	7.95	7000	11000	**0.054** 0.119	**30.000** 1.1811	**29.991** 1.1807	**36.988** 1.4562	**36.972** 1.4556	Table B2-2	JR25x30x26,5
	30 1.1811	**37** 1.4567	**38** 1.496	**35.3** 1.390	**1** 0.039	—	BK3038(1)	**38.4** 8630	**79.2** 17800	12.5	7000	11000	**0.093** 0.205	**30.000** 1.1811	**29.991** 1.1807	**36.988** 1.4562	**36.972** 1.4556	Table B2-2	JR25x30x38,5
	30 1.1811	**37** 1.4567	**38** 1.496	—	**1** 0.039	HK3038(1)	—	**38.4** 8630	**79.2** 17800	12.5	7000	11000	**0.075** 0.165	**30.000** 1.1811	**29.991** 1.1807	**36.988** 1.4562	**36.972** 1.4556	Table B2-2	JR25x30x38,5
35 1.3780	**35** 1.3780	**42** 1.6535	**12** 0.472	—	**1** 0.039	HK3512	—	**12.3** 2770	**19.2** 4320	2.90	5900	9100	**0.028** 0.062	**35.000** 1.3780	**34.989** 1.3775	**41.988** 1.6531	**41.972** 1.6524	Table B2-2	
	35 1.3780	**42** 1.6535	**16** 0.630	—	**1** 0.039	HK3516	—	**18.7** 4200	**33.0** 7420	4.60	5900	9100	**0.037** 0.082	**35.000** 1.3780	**34.989** 1.3775	**41.988** 1.6531	**41.972** 1.6524	Table B2-2	JR30x35x17
	35 1.3780	**42** 1.6535	**20** 0.787	**17.3** 0.681	**1** 0.039	—	BK3520	**24.5** 5510	**46.8** 10520	7.40	5900	9100	**0.065** 0.143	**35.000** 1.3780	**34.989** 1.3775	**41.988** 1.6531	**41.972** 1.6524	Table B2-2	JR30x35x20,5
	35 1.3780	**42** 1.6535	**20** 0.787	—	**1** 0.039	HK3520	—	**24.5** 5510	**46.8** 10500	7.40	5900	9100	**0.049** 0.108	**35.000** 1.3780	**34.989** 1.3775	**41.988** 1.6531	**41.972** 1.6524	Table B2-2	JR30x35x20,5
40 1.5748	**40** 1.5748	**47** 1.8504	**12** 0.472	—	**1** 0.039	HK4012	—	**13.4** 3010	**22.4** 5040	3.40	5200	7900	**0.033** 0.073	**40.000** 1.5748	**39.989** 1.5744	**46.988** 1.8499	**46.972** 1.8493	Table B2-2	
	40 1.5748	**47** 1.8504	**16** 0.630	—	**1** 0.039	HK4016	—	**18.9** 4250	**34.8** 7820	5.35	5200	7900	**0.042** 0.093	**40.000** 1.5748	**39.989** 1.5744	**46.988** 1.8499	**46.972** 1.8493	Table B2-2	JR35x40x17
	40 1.5748	**47** 1.8504	**20** 0.787	**17.3** 0.681	**1** 0.039	—	BK4020	**25.1** 5640	**50.4** 11330	8.00	5200	7900	**0.070** 0.154	**40.000** 1.5748	**39.989** 1.5744	**46.988** 1.8499	**46.972** 1.8493	Table B2-2	JR35x40x20,5
	40 1.5748	**47** 1.8504	**20** 0.787	—	**1** 0.039	HK4020	—	**25.1** 5640	**50.4** 11330	8.00	5200	7900	**0.060** 0.132	**40.000** 1.5748	**39.989** 1.5744	**46.988** 1.8499	**46.972** 1.8493	Table B2-2	JR35x40x20,5
45 1.7717	**45** 1.7717	**52** 2.0472	**12** 0.472	—	**1** 0.039	HK4512	—	**14.1** 3170	**24.8** 5580	3.75	4600	7000	**0.036** 0.079	**45.000** 1.7717	**44.989** 1.7712	**51.986** 2.0467	**51.967** 2.0459	Table B2-2	

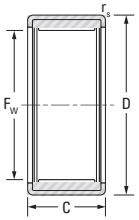
(1) Drawn cup needle roller bearings with two needle roller and cage assemblies and one lubricating hole.

Shaft Dia.	F_w	D	C	C_3 min.	r_s min.	Bearing Designation		Load Ratings		Fatigue Load Limit C_u	Speed Ratings		Approx. Wt.	Mounting Dimensions				Inspection gage	Mounting inner ring (pages B-2-28 to B-2-37)
								Dynamic	Static					Shaft(h5)		Housing(N6)			
			+0 +0.000 -0.3 -0.012			Open Ends	Closed One End	C	C_0		Grease	Oil		Max.	Min.	Max.	Min.		
mm in	mm in	mm in	mm in	mm in	mm in			kN lbf		kN	min^{-1}		kg lbs	mm in	mm in	mm in	mm in		
45 1.7717	**45** 1.7717	**52** 2.0472	**16** 0.630	—	**1** 0.039	HK4516	—	**19.8** 4450	**38.5** 8660	5.95	4600	7000	**0.048** 0.106	**45.000** 1.7717	**44.989** 1.7712	**51.986** 2.0467	**51.967** 2.0459	Table B2-2	JR40x45x17
	45 1.7717	**52** 2.0472	**20** 0.787	**17.3** 0.681	**1** 0.039	—	BK4520	**27.2** 6110	**58.2** 13100	8.80	4600	7000	**0.079** 0.174	**45.000** 1.7717	**44.989** 1.7712	**51.986** 2.0467	**51.967** 2.0459	Table B2-2	JR40x45x20,5
	45 1.7717	**52** 2.0472	**20** 0.787	—	**1** 0.039	HK4520	—	**27.2** 6110	**58.2** 13100	8.80	4600	7000	**0.059** 0.130	**45.000** 1.7717	**44.989** 1.7712	**51.986** 2.0467	**51.967** 2.0459	Table B2-2	JR40x45x20,5
50 1.9685	**50** 1.9685	**58** 2.2835	**12** 0.472	—	**1** 0.039	HK5012	—	**17.0** 3820	**28.7** 6450	4.40	4100	6300	**0.045** 0.099	**50.000** 1.9685	**49.989** 1.9681	**57.986** 2.2829	**57.967** 2.2822	Table B2-2	
	50 1.9685	**58** 2.2835	**20** 0.787	—	**1** 0.039	HK5020	—	**30.9** 6950	**62.2** 14000	8.80	4100	6300	**0.072** 0.159	**50.000** 1.9685	**49.989** 1.9681	**57.986** 2.2829	**57.967** 2.2822	Table B2-2	JR45x50x20
	50 1.9685	**58** 2.2835	**25** 0.984	—	**1** 0.039	HK5025	—	**35.5** 7980	**74.1** 16700	11.7	4100	6300	**0.092** 0.203	**50.000** 1.9685	**49.989** 1.9681	**57.986** 2.2829	**57.967** 2.2822	Table B2-2	JR45x50x25,5
55 2.1654	**55** 2.1654	**63** 2.4803	**20** 0.787	—	**1** 0.039	HK5520	—	**31.0** 6970	**64.4** 14480	10.0	3700	5700	**0.079** 0.174	**55.000** 2.1654	**54.987** 2.1648	**62.986** 2.4798	**62.967** 2.4790	Table B2-2	
60 2.3622	**60** 2.3622	**68** 2.6772	**12** 0.472	—	**1** 0.039	HK6012	—	**18.6** 6110	**34.4** 13100	5.25	3400	5200	**0.060** 0.132	**60.000** 2.3622	**59.987** 2.3617	**67.986** 2.6766	**67.967** 2.6759	Table B2-2	
	60 2.3622	**68** 2.6772	**20** 0.787	—	**1** 0.039	HK6020	—	**35.6** 8000	**79.5** 17870	10.9	3400	5200	**0.090** 0.198	**60.000** 2.3622	**59.987** 2.3617	**67.986** 2.6766	**67.967** 2.6759	Table B2-2	

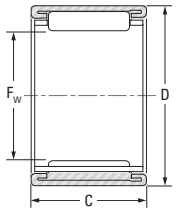
B

DRAWN CUP NEEDLE ROLLER BEARINGS CAGED, OPEN ENDS

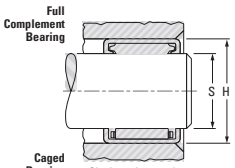
METRIC SERIES
BSM, BKM, BTM, BHTM SERIES



BSM, BKM



BTM, BHTM



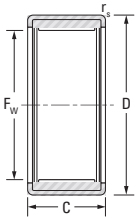
Shaft Dia.	F_w	D	C	$C_{3\,min.}$	$r_{s\,min.}$	Bearing Designation	Load Ratings		Fatigue Load Limit C_u	Speed Ratings		Approx. Wt.	Mounting Dimensions				Inspection gage	Mounting inner ring (pages B-2-28 to B-2-37)
							Dynamic	Static					Shaft(h5)		Housing(N6)			
			+0 +0.000 -0.3 -0.012			Open Ends	C	C_0		Grease	Oil		Max.	Min.	Max.	Min.		
mm in	mm in	mm in	mm in	mm in	mm in		kN lbf		kN	min^{-1}		kg lbs	mm in	mm in	mm in	mm in		
6 0.2362	6	10	9	—	—	6BTM109	2.65 600	2.40 540	0.350	23000	36000	0.003	6.000	5.995	9.993	9.984	Table B2-4	—
8 0.3150	8	12	10	—	—	8BTM1210	3.55 800	3.85 870	0.580	21000	33000	0.004	8.000	7.994	11.991	11.98	Table B2-4	—
	8	15	15	—	—	BHTM815	7.55 1700	6.55 1470	1.00	13000	20000	0.009	8.000	7.994	14.991	14.98	Table B2-4	—
9 0.3543	9	13	10	—	—	9BTM1310A	3.80 850	4.25 960	0.630	21000	32000	0.004	9.000	8.994	12.991	12.98	Table B2-4	—
9.8 0.3858	9.8	13.8	10	—	—	BTM101410A	3.75 840	4.25 960	0.640	21000	32000	0.004	9.800	9.794	13.791	13.78	Table B2-4	—
10 0.3937	10	14	10	—	—	10BTM1410	3.95 890	4.60 1030	0.690	20000	31000	0.004	10.000	9.994	13.991	13.98	Table B2-4	—
	10	17	20	—	—	BHTM1020	11.9 2680	12.6 2830	1.95	12000	19000	0.015	10.000	9.994	16.991	16.98	Table B2-4	—
12 0.4724	12	16	10	—	—	12BTM1610	4.45 1000	5.60 1260	0.860	20000	30000	0.005	12.000	11.992	15.991	15.98	Table B2-4	—
	12	18	12	—	—	12BTM1812	6.55 1470	6.70 1510	1.00	14000	21000	0.009	12.000	11.992	17.991	17.98	Table B2-4	—
13 0.5118	13	17	15	—	—	BKM131715J	5.65 1270	7.85 1760	1.20	20000	30000	0.007	13.000	12.992	16.991	16.98	Table B2-4	—
	13	19	14	—	—	BKM131914J	8.60 1930	9.95 2240	1.50	14000	21000	0.011	13.000	12.992	18.989	18.976	Table B2-4	—
	13	20	12	—	—	13BTM2012J	8.25 1860	8.40 1890	1.30	12000	18000	0.012	13.000	12.992	19.989	19.976	Table B2-4	—
	13	21	14	—	—	BKM132114BJ	10.8 2430	10.5 2360	1.60	10000	16000	0.015	13.000	12.992	20.989	20.976	Table B2-4	—
13.5 0.5315	13.5	19	12	—	—	BTM141912A	6.70 1510	7.60 1710	1.15	14000	22000	0.010	13.500	13.492	18.989	18.976	Table B2-4	—
14 0.5512	14	19	16	—	—	14BTM1916B-1	8.80 1980	11.9 2680	1.80	16000	24000	0.011	14.000	13.992	18.989	18.976	Table B2-4	—
	14	20	12	—	—	14BTM2012	6.95 1560	7.50 1690	1.15	13000	20000	0.010	14.000	13.992	19.989	19.976	Table B2-4	—
14.5 0.5709	14.5	19.5	13.5	—	—	BTM152014A	8.35 1880	10.9 2450	1.65	15000	23000	0.009	14.500	14.492	19.489	19.476	Table B2-4	—
14.975 0.5896	14.975	21	10	—	—	BTM152110JA	5.80 1300	6.25 1410	0.950	13000	20000	0.009	14.975	14.967	20.989	20.976	Table B2-4	—
15 0.5906	15	20	16	—	—	15BTM2016C-2	9.05 2030	12.6 2830	1.90	15000	23000	0.012	15.000	14.992	19.989	19.976	Table B2-4	—
	15	21	16	—	—	15BTM2116	10.8 2430	13.6 3060	2.05	12000	19000	0.014	15.000	14.992	20.989	20.976	Table B2-4	—
	15	21	22	—	—	15BTM2122	14.3 3220	19.5 4380	3.05	12000	19000	0.020	15.000	14.992	20.989	20.976	Table B2-4	—
	15	22	15	—	—	BHTM1515-1	11.9 2680	13.3 2990	2.05	10000	16000	0.015	15.000	14.992	21.989	21.976	Table B2-4	—
17 0.6693	17	21.5	15	—	—	17BTM2215	6.80 1530	9.60 2160	1.45	12000	19000	0.010	17.000	16.992	21.489	21.476	Table B2-4	—
	17	23	12	—	—	BTM172312	8.45 1900	10.2 2290	1.55	13000	20000	0.012	17.000	16.992	22.989	22.976	Table B2-4	—
	17	24	15	—	—	BHTM1715-1	12.4 2790	14.8 3330	2.25	13000	20000	0.017	17.000	16.992	23.989	23.976	Table B2-4	—
	17	24	20	—	—	BHTM1720-1	16.8 3780	21.9 4920	3.40	13000	20000	0.023	17.000	16.992	23.989	23.976	Table B2-4	—
	17	25	15	—	—	BTM172515	13.2 2970	14.9 3350	2.25	13000	20000	0.020	17.000	16.992	24.989	24.976	Table B2-4	—
18 0.7087	18	24	11.6	—	—	18BTM2412	8.75 1970	10.9 2450	1.65	12000	18000	0.012	18.000	17.992	23.989	23.976	Table B2-4	—
	18	24	16	—	—	BTM182416	12.3 2770	16.8 3780	2.55	12000	18000	0.017	18.000	17.992	23.989	23.976	Table B2-4	—
	18	25	20	—	—	BTM1820	16.7 3750	22.0 4950	3.50	12000	19000	0.024	18.000	17.992	24.989	24.976	Table B2-4	—
	18	25	20	—	—	BTM182520	16.8 3780	22.1 4970	3.45	12000	19000	0.024	18.000	17.992	24.989	24.976	Table B2-4	—
20 0.7874	20	26	16	—	—	BTM202616	13.3 2990	19.6 4410	3.00	10000	16000	0.019	20.000	19.991	25.989	25.976	Table B2-4	—
	20	27	20	—	—	BTM202720-2	19.6 4410	27.6 6200	4.35	11000	17000	0.027	20.000	19.991	26.989	26.976	Table B2-4	—
	20	27	25	—	—	BTM2025	24.3 5460	36.4 8180	5.70	11000	17000	0.033	20.000	19.991	26.989	26.976	Table B2-4	—
	20	27	30	—	—	BTM202730	28.1 6320	43.8 9850	6.80	11000	17000	0.040	20.000	19.991	26.989	26.976	Table B2-4	—
21.6 0.8504	21.6	26.645	12.4	—	—	BTM222712A	9.15 2060	13.9 3130	2.10	9800	15000	0.012	21.600	21.591	26.634	26.621	Table B2-4	—
22 0.8661	22	28	12	—	—	22BTM2812	10.0 2250	13.5 3040	2.05	9800	15000	0.014	22.000	21.991	27.989	27.976	Table B2-4	—
24 0.9449	24	30	13	—	—	BTM243013J	10.5 2360	15.7 3530	2.35	9100	14000	0.018	24.000	23.991	29.989	29.976	Table B2-4	—
25 0.9843	25	31	19	—	—	25BTM3119A	17.9 4020	30.1 6770	4.65	8500	13000	0.026	25.000	24.991	30.988	30.972	Table B2-4	—
	25	32	12	—	—	BTM2512	10.2 2290	12.8 2880	1.95	8500	13000	0.019	25.000	24.991	31.988	31.972	Table B2-4	—
	25	33	20	—	—	BHTM2520-1	21.3 4790	29.7 6680	4.60	8500	13000	0.037	25.000	24.991	32.988	32.972	Table B2-4	—

Continued on next page.

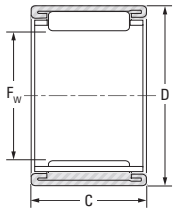
B

DRAWN CUP NEEDLE ROLLER BEARINGS CAGED, OPEN ENDS

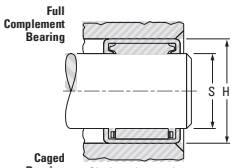
METRIC SERIES
BSM, BKM, BTM, BHTM SERIES



BSM, BKM



BTM, BHTM



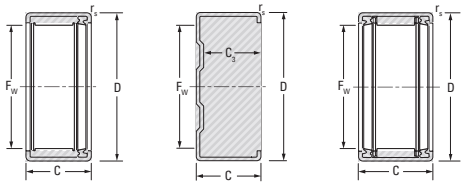
Shaft Dia.	F_w	D	C (+0 -0.3 / +0.000 -0.012)	$C_{3\,min.}$	$r_{s\,min.}$	Bearing Designation Open Ends	Load Ratings Dynamic C	Load Ratings Static C_0	Fatigue Load Limit C_u	Speed Ratings Grease	Speed Ratings Oil	Approx. Wt.	Mounting Dimensions Shaft(h5) Max.	Shaft(h5) Min.	Housing(N6) Max.	Housing(N6) Min.	Inspection gage	Mounting inner ring (pages B-2-28 to B-2-37)
mm in	mm in	mm in	mm in	mm in	mm in		kN lbf		kN	min^{-1}		kg lbs	mm in	mm in	mm in	mm in		
25 0.9843	**25**	**33**	**30**	—	—	BHTM2530-1	**31.0** 6970	**48.0** 10790	7.55	8500	13000	**0.054**	**25.000**	**24.991**	**32.988**	**32.972**	Table B2-4	—
25.8 1.0157	**25.8**	**33**	**16**	—	—	BTM263316A	**15.7** 3530	**22.4** 5040	3.40	8500	13000	**0.028**	**25.800**	**25.791**	**32.988**	**32.972**	Table B2-4	—
26 1.0236	**26**	**31.4**	**12**	—	—	BKM263112A	**9.45** 2120	**14.5** 3260	2.20	7800	12000	**0.014**	**26.000**	**25.991**	**31.388**	**31.372**	Table B2-4	—
28 1.1024	**28**	**33**	**12**	—	—	BTM283312J	**9.50** 2140	**15.8** 3550	2.40	7200	11000	**0.015**	**28.000**	**27.991**	**32.988**	**32.972**	Table B2-4	—
	28	**35**	**20**	—	—	28BTM3520	**21.1** 4740	**33.4** 7510	5.20	7800	12000	**0.035**	**28.000**	**27.991**	**34.988**	**34.972**	Table B2-4	—
	28	**36**	**20.75**	—	—	BTM283621JA	**25.3** 5690	**39.3** 8840	6.15	7800	12000	**0.044**	**28.000**	**27.991**	**35.988**	**35.972**	Table B2-4	—
	28	**37**	**20**	—	—	BTM283720	**24.2** 5440	**33.5** 7530	5.30	7800	12000	**0.046**	**28.000**	**27.991**	**36.988**	**36.972**	Table B2-4	—
	28	**37**	**30**	—	—	BHTM2830	**36.3** 8160	**56.5** 12700	8.75	7800	12000	**0.069**	**28.000**	**27.991**	**36.988**	**36.972**	Table B2-4	—
30 1.1811	**30**	**37**	**12**	—	—	BTM303712	**13.3** 2990	**18.8** 4230	2.90	7200	11000	**0.022**	**30.000**	**29.991**	**36.988**	**36.972**	Table B2-4	—
	30	**37**	**16**	—	—	30BTM3716BM	**18.8** 4230	**29.3** 6590	4.45	7200	11000	**0.030**	**30.000**	**29.991**	**36.988**	**36.972**	Table B2-4	—
	30	**37**	**20**	—	—	30BTM3720	**22.7** 5100	**40.1** 9010	6.35	7200	11000	**0.040**	**30.000**	**29.991**	**36.988**	**36.972**	Table B2-4	—
	30	**40**	**25**	—	—	BHTM3025-1	**32.7** 7350	**46.8** 10520	7.35	7200	11000	**0.069**	**30.000**	**29.991**	**39.988**	**39.972**	Table B2-4	—
	30	**40**	**30**	—	—	BHTM3030-1A	**39.2** 8810	**59.0** 13260	9.15	7200	11000	**0.083**	**30.000**	**29.991**	**39.988**	**39.972**	Table B2-4	—
31 1.2205	**31**	**39**	**17.8**	—	—	31BTM3918A	**22.9** 5150	**34.8** 7820	5.50	7200	11000	**0.039**	**31.000**	**30.989**	**38.988**	**38.972**	Table B2-4	—
32 1.2598	**32**	**38**	**11**	—	—	32BTM3811A	**5.40** 1210	**6.75** 1520	1.05	6500	10000	**0.017**	**32.000**	**31.989**	**37.988**	**37.972**	Table B2-4	—
	32	**42**	**20**	—	—	BHTM3220A	**26.1** 5870	**35.1** 7890	5.60	6500	10000	**0.058**	**32.000**	**31.989**	**41.988**	**41.972**	Table B2-4	—
	32	**42**	**30**	—	—	BHTM3230	**40.5** 9100	**61.9** 13920	9.65	6500	10000	**0.086**	**32.000**	**31.989**	**41.988**	**41.972**	Table B2-4	—

Shaft Dia.	F_w	D	C (+0 -0.3 / +0.000 -0.012)	$C_{3\,min.}$	$r_{s\,min.}$	Bearing Designation Open Ends	Load Ratings Dynamic C	Load Ratings Static C_0	Fatigue Load Limit C_u	Speed Ratings Grease	Speed Ratings Oil	Approx. Wt.	Mounting Dimensions Shaft(h5) Max.	Shaft(h5) Min.	Housing(N6) Max.	Housing(N6) Min.	Inspection gage	Mounting inner ring (pages B-2-28 to B-2-37)
mm in	mm in	mm in	mm in	mm in	mm in		kN lbf		kN	min^{-1}		kg lbs	mm in	mm in	mm in	mm in		
33.5 1.3189	**33.5**	**40**	**17**	—	—	BTM344017A	**18.5** 4160	**33.5** 7530	5.25	6200	9500	**0.034**	**33.500**	**33.489**	**39.988**	**39.972**	Table B2-4	—
35 1.3780	**35**	**42**	**16**	—	—	BTM3516	**20.3** 4560	**34.7** 7800	5.35	6000	9200	**0.035**	**35.000**	**34.989**	**41.988**	**41.972**	Table B2-4	—
	35	**45**	**20**	—	—	BHTM3520	**28.8** 6470	**41.7** 9370	6.60	6100	9400	**0.065**	**35.000**	**34.989**	**44.988**	**44.972**	Table B2-4	—
	35	**45**	**30**	—	—	BHTM3530	**43.8** 9850	**71.5** 16070	11.2	6100	9400	**0.096**	**35.000**	**34.989**	**44.988**	**44.972**	Table B2-4	—
37 1.4567	**37**	**43**	**12**	—	—	37BTM4312A	**8.80** 1980	**13.6** 3060	2.05	5600	8600	**0.022**	**37.000**	**36.989**	**42.988**	**42.972**	Table B2-4	—
38 1.4961	**38**	**45**	**12**	—	—	BTM384512A	**14.2** 3190	**23.3** 5240	3.55	5500	8400	**0.029**	**38.000**	**37.989**	**44.988**	**44.972**	Table B2-4	—
	38	**48**	**30**	—	—	BTM3830PL	**45.6** 10250	**76.5** 17200	11.9	5600	8600	**0.102**	**38.000**	**37.989**	**47.988**	**47.972**	Table B2-4	—
40 1.5748	**40**	**51**	**30**	—	—	40BTM5130J	**48.6** 10930	**77.5** 17420	12.1	5400	8300	**0.112**	**40.000**	**39.989**	**50.986**	**50.967**	Table B2-4	—
41.5 1.6339	**41.5**	**46.5**	**8.5**	—	—	BTM424709AJ	**7.75** 1740	**13.9** 3120	2.10	4900	7500	**0.015**	**41.500**	**41.489**	**46.488**	**46.472**	Table B2-4	—
42 1.6535	**42**	**53**	**30**	—	—	BTM425330J	**51.0** 11470	**85.0** 19110	13.3	5100	7800	**0.121**	**42.000**	**41.989**	**52.986**	**52.967**	Table B2-4	—
43.52 1.7134	**43.52**	**48.52**	**14**	—	—	44BTM4914A	**13.3** 2990	**29.0** 6520	4.35	4700	7200	**0.027**	**43.520**	**43.509**	**48.508**	**48.492**	Table B2-4	—
45 1.7717	**45**	**52**	**12**	—	—	45BTM5212A	**15.2** 3420	**27.3** 6140	4.15	4600	7000	**0.034**	**45.000**	**44.989**	**51.986**	**51.967**	Table B2-4	—
48 1.8898	**48**	**56**	**30**	—	—	BTM485630J	**45.4** 10210	**100** 22480	15.6	4300	6600	**0.103**	**48.000**	**47.989**	**55.986**	**55.967**	Table B2-4	—
50 1.9685	**50**	**58**	**20**	—	—	50BTM5820J	**31.7** 7130	**61.9** 13920	9.65	4200	6400	**0.068**	**50.000**	**49.989**	**57.986**	**57.967**	Table B2-4	—
	50	**62**	**25**	—	—	BTM5025	**49.3** 11080	**79.5** 17870	12.7	4200	6500	**0.125**	**50.000**	**49.989**	**61.986**	**61.967**	Table B2-4	—
55 2.1654	**55**	**63**	**20**	—	—	55BTM6320	**32.5** 7310	**66.0** 14840	10.3	3700	5700	**0.073**	**55.000**	**54.987**	**62.986**	**62.967**	Table B2-4	—
55.254 2.1754	**55.254**	**60.3**	**14**	—	—	BSM5514BJ-2	**16.7** 3750	**41.0** 9220	6.30	3600	5600	**0.035**	**55.254**	**55.241**	**60.286**	**60.267**	Table B2-4	—
64 2.5197	**64**	**73.178**	**21.1**	—	—	64BTM7321A	**40.3** 9060	**84.9** 19090	13.5	3200	4900	**0.110**	**64.000**	**63.987**	**73.164**	**73.145**	Table B2-4	—

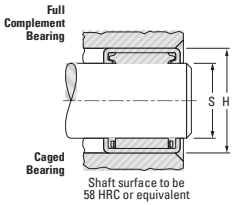
B

DRAWN CUP NEEDLE ROLLER BEARINGS SEALED

METRIC SERIES HK RS, BK RS, HK.2RS SERIES



HK RS BK RS HK.2RS

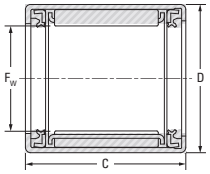


Shaft Dia.	F_w	D	C +0 -0.3 (+0.000 -0.012)	C_3 min.	r_s min.	Bearing Designation: Open Ends	Bearing Designation: Closed One End	Load Ratings: Dynamic C	Load Ratings: Static C_0	Fatigue Load Limit C_u	Speed Rating: Grease	Approx. Wt.	Mounting Dimensions: Shaft (h5) Max.	Shaft (h5) Min.	Housing (N6) Max.	Housing (N6) Min.	Inspection gage	Mounting inner ring (pages B-2-28 to B-2-37)
mm in	mm in	mm in	mm in	mm in	mm in			kN lbf		kN	min^{-1}	kg lbs	mm in	mm in	mm in	mm in		
8 0.3150	**8** 0.3150	**12** 0.4724	**10** 0.394	—	**0.4** 0.016	HK0810RS	—	**2.90** 650	**2.73** 610	0.400	20000	**0.004** 0.009	**8.000** 0.3150	**7.994** 0.3147	**11.991** 0.4721	**11.980** 0.4717	Table B2-2	
10 0.3937	**10** 0.3937	**14** 0.5512	**12** 0.472	—	**0.4** 0.016	HK1012RS	—	**4.78** 1070	**5.51** 1240	0.840	19000	**0.006** 0.013	**10.000** 0.3937	**9.994** 0.3935	**13.991** 0.5508	**13.980** 0.5504	Table B2-2	
12 0.4724	**12** 0.4724	**18** 0.7087	**14** 0.551	—	**1** 0.039	HK1214RS	—	**6.61** 1490	**7.29** 1640	1.10	14000	**0.013** 0.029	**12.000** 0.4724	**11.992** 0.4721	**17.991** 0.7083	**17.980** 0.7079	Table B2-2	
	12 0.4724	**18** 0.7087	**16** 0.630	—	**1** 0.039	HK1216.2RS	—	**6.87** 1540	**7.65** 1720	1.15	14000	**0.016** 0.035	**12.000** 0.4724	**11.992** 0.4721	**17.991** 0.7083	**17.980** 0.7079	Table B2-2	
14 0.5512	**14** 0.5512	**20** 0.7874	**14** 0.551	**11.6** 0.457	**1** 0.039	—	BK1414RS	**7.17** 1610	**8.41** 1890	1.30	14000	**0.014** 0.031	**14.000** 0.5512	**13.992** 0.5509	**19.989** 0.7870	**19.976** 0.7865	Table B2-2	
	14 0.5512	**20** 0.7874	**14** 0.551	—	**1** 0.039	HK1414RS	—	**7.17** 1610	**8.41** 1890	1.30	14000	**0.015** 0.033	**14.000** 0.5512	**13.992** 0.5509	**19.989** 0.7870	**19.976** 0.7865	Table B2-2	JR10x14x16
	14 0.5512	**20** 0.7874	**16** 0.630	—	**1** 0.039	HK1416.2RS	—	**7.17** 1610	**8.41** 1890	1.30	14000	**0.014** 0.031	**14.000** 0.5512	**13.992** 0.5509	**19.989** 0.7870	**19.976** 0.7865	Table B2-2	JR10x14x20
15 0.5906	**15** 0.5906	**21** 0.8268	**14** 0.551	**11.3** 0.445	**1** 0.039	—	BK1514RS	**7.87** 1770	**9.69** 2180	1.45	13000	**0.017** 0.037	**15.000** 0.5906	**14.992** 0.5902	**20.989** 0.8263	**20.976** 0.8258	Table B2-2	JR12x15x16,5
	15 0.5906	**21** 0.8268	**14** 0.551	—	**1** 0.039	HK1514RS	—	**7.87** 1770	**9.69** 2180	1.45	13000	**0.016** 0.035	**15.000** 0.5906	**14.992** 0.5902	**20.989** 0.8263	**20.976** 0.8258	Table B2-2	JR12x15x16,5
	15 0.5906	**21** 0.8268	**16** 0.630	—	**1** 0.039	HK1516.2RS	—	**7.87** 1770	**9.69** 2180	1.45	13000	**0.019** 0.042	**15.000** 0.5906	**14.992** 0.5902	**20.989** 0.8263	**20.976** 0.8258	Table B2-2	JR12x15x16,5
16 0.6299	**16** 0.6299	**22** 0.8661	**14** 0.551	—	**1** 0.039	HK1614RS	—	**7.76** 1740	**9.76** 2190	1.50	12000	**0.014** 0.031	**16.000** 0.6299	**15.992** 0.6296	**21.989** 0.8657	**21.976** 0.8652	Table B2-2	JR12x16x16
	16 0.6299	**22** 0.8661	**16** 0.630	—	**1** 0.039	HK1616.2RS	—	**7.82** 1760	**9.76** 2190	1.50	12000	**0.015** 0.033	**16.000** 0.6299	**15.992** 0.6296	**21.989** 0.8657	**21.976** 0.8652	Table B2-2	JR12x16x20
18 0.7087	**18** 0.7087	**24** 0.9449	**14** 0.551	—	**1** 0.039	HK1814RS	—	**8.41** 1890	**11.10** 2500	1.70	11000	**0.018** 0.040	**18.000** 0.7087	**17.992** 0.7083	**23.989** 0.9444	**23.976** 0.9439	Table B2-2	JR15x18x16,5
	18 0.7087	**24** 0.9449	**16** 0.630	—	**1** 0.039	HK1816.2RS	—	**8.41** 1890	**11.10** 2500	1.70	11000	**0.017** 0.037	**18.000** 0.7087	**17.992** 0.7083	**23.989** 0.9444	**23.976** 0.9439	Table B2-2	JR15x18x16,5
20 0.7874	**20** 0.7874	**26** 1.0236	**16** 0.630	—	**1** 0.039	HK2016.2RS	—	**8.97** 2020	**12.50** 2810	1.90	9700	**0.023** 0.051	**20.000** 0.7874	**19.991** 0.7870	**25.989** 1.0232	**25.976** 1.0227	Table B2-2	JR17x20x16,5
	20 0.7874	**26** 1.0236	**18** 0.709	—	**1** 0.039	HK2018RS	—	**12.40** 2790	**18.90** 4250	2.85	9700	**0.025** 0.055	**20.000** 0.7874	**19.991** 0.7870	**25.989** 1.0232	**25.976** 1.0227	Table B2-2	JR17x20x20,5
	20 0.7874	**26** 1.0236	**20** 0.787	—	**1** 0.039	HK2020.2RS	—	**12.40** 2790	**18.90** 4250	2.85	9700	**0.028** 0.062	**20.000** 0.7874	**19.991** 0.7870	**25.989** 1.0232	**25.976** 1.0227	Table B2-2	JR17x20x20,5

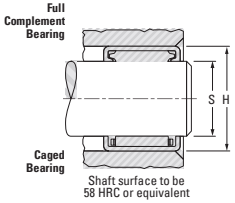
Shaft Dia.	F_w	D	C +0 -0.3 (+0.000 -0.012)	C_3 min.	r_s min.	Bearing Designation: Open Ends	Bearing Designation: Closed One End	Load Ratings: Dynamic C	Load Ratings: Static C_0	Fatigue Load Limit C_u	Speed Rating: Grease	Approx. Wt.	Mounting Dimensions: Shaft (h5) Max.	Shaft (h5) Min.	Housing (N6) Max.	Housing (N6) Min.	Inspection gage	Mounting inner ring (pages B-2-28 to B-2-37)
mm in	mm in	mm in	mm in	mm in	mm in			kN lbf		kN	min^{-1}	kg lbs	mm in	mm in	mm in	mm in		
22 0.8661	**22** 0.8661	**28** 1.1024	**16** 0.630	—	**1** 0.039	HK2216.2RS	—	**9.81** 2210	**14.50** 3260	2.20	8800	**0.025** 0.055	**22.000** 0.8661	**21.991** 0.8658	**27.989** 1.1019	**27.976** 1.1014	Table B2-2	
	22 0.8661	**28** 1.1024	**18** 0.709	—	**1** 0.039	HK2218RS	—	**13.10** 2950	**20.90** 4700	3.20	8800	**0.027** 0.060	**22.000** 0.8661	**21.991** 0.8658	**27.989** 1.1019	**27.976** 1.1014	Table B2-2	JR17x22x23
	22 0.8661	**28** 1.1024	**20** 0.787	—	**1** 0.039	HK2220.2RS	—	**13.10** 2950	**20.90** 4700	3.20	8800	**0.026** 0.057	**22.000** 0.8661	**21.991** 0.8658	**27.989** 1.1019	**27.976** 1.1014	Table B2-2	JR17x22x23
25 0.9843	**25** 0.9843	**32** 1.2598	**16** 0.630	—	**1** 0.039	HK2516.2RS	—	**11.10** 2500	**15.10** 3390	2.30	7800	**0.030** 0.066	**25.000** 0.9843	**24.991** 0.9839	**31.988** 1.2594	**31.972** 1.2587	Table B2-2	JR20x25x17
	25 0.9843	**32** 1.2598	**18** 0.709	—	**1** 0.039	HK2518RS	—	**15.6** 3510	**24.60** 5530	3.80	7800	**0.034** 0.075	**25.000** 0.9843	**24.991** 0.9839	**31.988** 1.2594	**31.972** 1.2587	Table B2-2	JR20x25x20,5
	25 0.9843	**32** 1.2598	**20** 0.787	—	**1** 0.039	HK2520.2RS	—	**16.20** 3640	**24.60** 5530	3.80	7800	**0.033** 0.073	**25.000** 0.9843	**24.991** 0.9839	**31.988** 1.2594	**31.972** 1.2587	Table B2-2	JR20x25x20,5
	25 0.9843	**32** 1.2598	**22** 0.866	—	**1** 0.039	HK2522RS	—	**20.60** 4630	**33.40** 7510	5.30	7800	**0.042** 0.093	**25.000** 0.9843	**24.991** 0.9839	**31.988** 1.2594	**31.972** 1.2587	Table B2-2	JR20x25x26
	25 0.9843	**32** 1.2598	**24** 0.945	—	**1** 0.039	HK2524.2RS	—	**20.6** 4630	**33.4** 7510	5.30	7800	**0.047** 0.104	**25.000** 0.9843	**24.991** 0.9839	**31.988** 1.2594	**31.972** 1.2587	Table B2-2	JR20x25x26
28 1.1024	**28** 1.1024	**35** 1.3780	**20** 0.787	—	**1** 0.039	HK2820.2RS	—	**15.9** 3570	**24.9** 5600	3.85	6900	**0.042** 0.093	**28.000** 1.1024	**27.991** 1.1020	**34.988** 1.3775	**34.972** 1.3769	Table B2-2	JR22x28x20,5
30 1.1811	**30** 1.1811	**37** 1.4567	**16** 0.63	—	**1** 0.039	HK3016.2RS	—	**11.6** 2610	**16.8** 3780	2.55	6500	**0.030** 0.066	**30.000** 1.1811	**29.991** 1.1807	**36.988** 1.4562	**36.972** 1.4556	Table B2-2	JR25x30x17
	30 1.1811	**37** 1.4567	**18** 0.709	—	**1** 0.039	HK3018RS	—	**16.8** 3780	**27.3** 6140	4.20	6500	**0.042** 0.093	**30.000** 1.1811	**29.991** 1.1807	**36.988** 1.4562	**36.972** 1.4556	Table B2-2	JR25x30x20,5
	30 1.1811	**37** 1.4567	**20** 0.787	—	**1** 0.039	HK3020.2RS	—	**16.8** 3780	**27.3** 6140	4.20	6500	**0.040** 0.088	**30.000** 1.1811	**29.991** 1.1807	**36.988** 1.4562	**36.972** 1.4556	Table B2-2	JR25x30x20,5
	30 1.1811	**37** 1.4567	**22** 0.866	—	**1** 0.039	HK3022RS	—	**22.4** 5040	**39.6** 8900	6.25	6500	**0.051** 0.112	**30.000** 1.1811	**29.991** 1.1807	**36.988** 1.4562	**36.972** 1.4556	Table B2-2	JR25x30x26
	30 1.1811	**37** 1.4567	**24** 0.945	—	**1** 0.039	HK3024.2RS	—	**22.4** 5040	**39.6** 8900	6.25	6500	**0.057** 0.126	**30.000** 1.1811	**29.991** 1.1807	**36.988** 1.4562	**36.972** 1.4556	Table B2-2	JR25x30x26
35 1.3780	**35** 1.3780	**42** 1.6535	**16** 0.630	—	**1** 0.039	HK3516.2RS	—	**13.4** 3010	**21.4** 4810	3.25	5500	**0.047** 0.104	**35.000** 1.3780	**34.989** 1.3775	**41.988** 1.6531	**41.972** 1.6524	Table B2-2	JR30x35x17
	35 1.3780	**42** 1.6535	**18** 0.709	—	**1** 0.039	HK3518RS	—	**17.4** 3910	**29.9** 6720	4.60	5500	**0.054** 0.119	**35.000** 1.3780	**34.989** 1.3775	**41.988** 1.6531	**41.972** 1.6524	Table B2-2	JR30x35x20,5
	35 1.3780	**42** 1.6535	**20** 0.787	—	**1** 0.039	HK3520.2RS	—	**17.4** 3910	**29.9** 6720	4.60	5500	**0.044** 0.097	**35.000** 1.3780	**34.989** 1.3775	**41.988** 1.6531	**41.972** 1.6524	Table B2-2	JR30x35x20,5
40 1.5748	**40** 1.5748	**47** 1.8504	**16** 0.630	—	**1** 0.039	HK4016.2RS	—	**13.4** 3010	**22.4** 5040	3.40	4900	**0.037** 0.082	**40.000** 1.5748	**39.989** 1.5744	**46.988** 1.8499	**46.972** 1.8493	Table B2-2	JR35x40x20
	40 1.5748	**47** 1.8504	**18** 0.709	—	**1** 0.039	HK4018RS	—	**18.9** 4250	**34.8** 7820	5.35	4900	**0.057** 0.126	**40.000** 1.5748	**39.989** 1.5744	**46.988** 1.8499	**46.972** 1.8493	Table B2-2	JR35x40x20,5
	40 1.5748	**47** 1.8504	**20** 0.787	—	**1** 0.039	HK4020.2RS	—	**18.9** 4250	**34.8** 7820	5.35	4900	**0.053** 0.117	**40.000** 1.5748	**39.989** 1.5744	**46.988** 1.8499	**46.972** 1.8493	Table B2-2	JR35x40x20,5
45 1.7717	**45** 1.7717	**52** 2.0472	**18** 0.709	—	**1** 0.039	HK4518RS	—	**19.8** 4450	**38.5** 8660	5.95	4300	**0.064** 0.141	**45.000** 1.7717	**44.989** 1.7712	**51.986** 2.0467	**51.967** 2.0459	Table B2-2	JR40x45x20,5
	45 1.7717	**52** 2.0472	**20** 0.787	—	**1** 0.039	HK4520.2RS	—	**19.8** 4450	**38.5** 8660	5.95	4300	**0.055** 0.121	**45.000** 1.7717	**44.989** 1.7712	**51.986** 2.0467	**51.967** 2.0459	Table B2-2	JR40x45x20,5
50 1.9685	**50** 1.9685	**58** 2.2835	**22** 0.866	—	**1** 0.039	HK5022RS	—	**28.8** 6470	**56.6** 12700	8.80	3900	**0.097** 0.214	**50.000** 1.9685	**49.989** 1.9681	**57.986** 2.2829	**57.967** 2.2822	Table B2-2	JR45x50x25,5
	50 1.9685	**58** 2.2835	**24** 0.945	—	**1** 0.039	HK5024.2RS	—	**28.8** 6470	**56.6** 12700	8.80	3900	**0.083** 0.183	**50.000** 1.9685	**49.989** 1.9681	**57.986** 2.2829	**57.967** 2.2822	Table B2-2	JR45x50x25,5

DRAWN CUP NEEDLE ROLLER BEARINGS SEALED

METRIC SERIES
BKM UU, BHKM UU SERIES



BKM UU, BHKM UU



Shaft Dia.	F_w	D	C	$C_{3\,min.}$	$r_{s\,min.}$	Bearing Designation	Load Ratings		Fatigue Load Limit C_u	Speed Rating	Approx. Wt.	Mounting Dimensions				Inspection gage	Mounting inner ring (pages B-2-28 to B-2-37)
							Dynamic	Static				Shaft (h5)		Housing (N6)			
						Open Ends	C	C_0		Grease		Max.	Min.	Max.	Min.		
mm in	mm in	mm in	mm in	mm in	mm in		kN lbf		kN	min^{-1}	kg lbs	mm in	mm in	mm in	mm in		
17 0.6693	17	24	26	—	—	BHKM1726JUU	17.6 3960	23.3 5240	3.65	13000	0.029	17.000	16.992	23.989	23.976	Table B2-4	—
20 0.7874	20	27	26	—	—	BKM2026JUU	20.5 4610	29.2 6560	4.60	11000	0.033	20.000	19.991	26.989	26.976	Table B2-4	—
	20	27	30	—	—	BKM2030JUU	24.3 5460	36.4 8180	5.70	11000	0.038	20.000	19.991	26.989	26.976	Table B2-4	—
	20	27	35	—	—	BKM2035JUU	28.9 6500	45.4 10210	7.05	11000	0.045	20.000	19.991	26.989	26.976	Table B2-4	—

INNER RINGS

METRIC SERIES

When it is impractical to meet the shaft raceway design requirements (hardness, surface finish, case depth, etc.) outlined in the engineering section of this catalog, standard inner rings may be used.

Inner rings are made of rolling bearing steel and after hardening, their bores, raceways and end surfaces are ground. Metric series inner rings may be used to provide inner raceway surfaces for metric series radial needle roller and cage assemblies, metric series needle roller bearings and metric series drawn cup needle roller bearings. The extended inner rings are suitable for use with bearings containing lip contact seals and for applications in which axial movement may be present.

CONSTRUCTION

Metric series inner rings are available in four basic designs and differ only by the chamfers at the ends of the raceway surfaces, the lubricant access holes and the raceway profile. Inner rings of series JR have chamfers to assist in bearing installation but are without lubricating holes. Inner rings of series JR.JS1 and IMC have bearing installation chamfers and lubricating holes (bore diameters 5 to 180 mm [0.1969 in to 7.0866 in]). Inner rings of series JRZ.JS1 are without installation chamfers, allowing for maximum possible raceway contact.

DIMENSIONAL ACCURACY

The tolerances of size, form, and runout for metric series inner rings meet the requirements of ISO normal tolerance class for radial bearings (see the engineering section). Most metric series inner rings are produced with outside diameter raceway tolerance in accordance with h5 which, in most cases, is suitable for combining the metric series needle roller bearings to give the normal clearance class, and for use with drawn cup bearings. Other raceway tolerances may also be found on inner rings for combining with needle roller bearings to give one of the clearance requirements.

MOUNTING OF INNER RINGS

Inner rings may be mounted on the shaft with either a loose transition fit or an interference fit. These fits used in conjunction with the proper fit of the bearing outer ring, will provide the correct operating clearances for most applications.

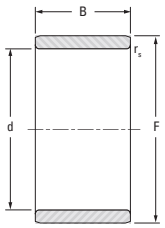
Regardless of the fit of the inner ring on the shaft, the inner ring should be axially located by shaft shoulders or other positive means. The shaft shoulder diameter adjacent to the inner ring must not exceed the inner ring outside diameter (per suggestions on pages B-4-9 and B-4-10 of the metric series needle roller bearing section).

When metric series inner rings are to be used with the metric series needle roller bearings, appropriate shaft tolerances should be selected from Table B4-4 on page B-4-9 in the metric series needle roll bearing section. When Metric series inner rings are to be used with drawn cup bearings the suggested shaft tolerances are given in the "Inner ring" discussion on page B-2-8 of the "metric series drawn cup needle roller bearings" section of this catalog.

INCH SERIES INNER RINGS

Inch series inner rings for use with inch series drawn cup bearings are tabulated on page B-2-74 of this catalog.

INNER RINGS



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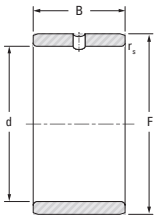
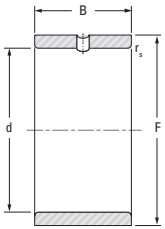


JR.JS1

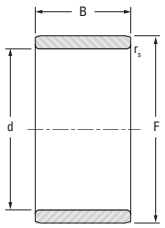


JRZ.JS1

Shaft Dia.	d	F (1)	B	$r_{s\,min.}$	Inner Ring Designation	Approx. Wt.
mm in	**mm** in	**mm** in	**mm** in	**mm** in		**kg** lbs
5 0.1969	**5** 0.1969	**8** 0.3150	**8** 0.3150	**0.3** 0.01	JR5x8x8JS1	**0.002** 0.004
	5 0.1969	**8** 0.3150	**12** 0.4724	**0.3** 0.01	JR5x8x12	**0.003** 0.007
	5 0.1969	**8** 0.3150	**16** 0.630	**0.3** 0.01	JR5x8x16	**0.004** 0.009
6 0.2362	**6** 0.2362	**9** 0.3543	**8** 0.315	**0.3** 0.01	JR6x9x8JS1	**0.002** 0.004
	6 0.2362	**9** 0.3543	**12** 0.4724	**0.3** 0.01	JR6x9x12	**0.003** 0.007
	6 0.2362	**9** 0.3543	**16** 0.630	**0.3** 0.01	JR6x9x16	**0.004** 0.009
	6 0.2362	**10** 0.3937	**10** 0.394	**0.3** 0.01	JR6x10x10	**0.004** 0.009
	6 0.2362	**10** 0.3937	**10** 0.394	**0.3** 0.01	JR6x10x10JS1	**0.004** 0.009
	6 0.2362	**10** 0.3937	**12** 0.4724	**0.3** 0.01	JRZ6x10x12JS1	**0.005** 0.011
7 0.2756	**7** 0.2756	**10** 0.3937	**10.5** 0.413	**0.3** 0.01	JR7x10x10,5	**0.003** 0.007
	7 0.2756	**10** 0.3937	**12** 0.4724	**0.3** 0.01	JR7x10x12	**0.004** 0.009
	7 0.2756	**10** 0.3937	**16** 0.630	**0.3** 0.01	JR7x10x16	**0.005** 0.011
8 0.3150	**8** 0.3150	**12** 0.4724	**10** 0.394	**0.3** 0.01	JR8x12x10	**0.005** 0.011
	8 0.3150	**12** 0.4724	**10** 0.394	**0.3** 0.01	JR8x12x10JS1	**0.005** 0.011
	8 0.3150	**12** 0.4724	**10.5** 0.413	**0.3** 0.01	JR8x12x10,5	**0.005** 0.011
	8 0.3150	**12** 0.4724	**12** 0.472	**0.3** 0.01	JRZ8xl2x12JS1	**0.006** 0.013
	8 0.3150	**12** 0.4724	**12.5** 0.492	**0.3** 0.01	JR8x12x12,5	**0.006** 0.013
	8 0.3150	**12** 0.4724	**16** 0.630	**0.3** 0.01	IM 8 12 16 P	**0.007** 0.016
9 0.3543	**9** 0.3543	**12** 0.4724	**12** 0.4724	**0.3** 0.01	JR9x12x12	**0.005** 0.011
	9 0.3543	**12** 0.4724	**16** 0.630	**0.3** 0.01	JR9x12x16	**0.006** 0.013
10 0.3937	**10** 0.3937	**13** 0.5118	**12.5** 0.492	**0.3** 0.01	JR10x13x12,5	**0.005** 0.011
	10 0.3937	**14** 0.5512	**11** 0.433	**0.3** 0.01	JR10x14x11JS1	**0.007** 0.015
	10 0.3937	**14** 0.5512	**12** 0.4724	**0.3** 0.01	JR10x14x12	**0.007** 0.015
	10 0.3937	**14** 0.5512	**12** 0.4724	**0.3** 0.01	JR10x14x12JS1	**0.007** 0.015

(1) Inner rings for metric full complement needle roller bearings are produced with outside diameter tolerance g5.

INNER RINGS



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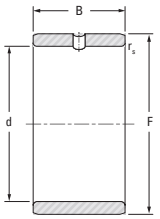
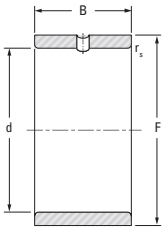


JR.JS1



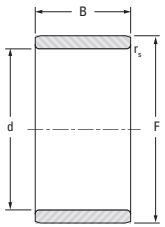
JRZ.JS1

Shaft Dia.	d	F (1)	B	$r_{s\,min.}$	Inner Ring Designation	Approx. Wt.
mm in	**mm** in	**mm** in	**mm** in	**mm** in		**kg** lbs
10 0.3937	**10** 0.3937	**14** 0.5512	**13** 0.512	**0.3** 0.01	JR10x14x13	**0.007** 0.015
	10 0.3937	**14** 0.5512	**14** 0.551	**0.3** 0.01	JRZ10x14x14JS1	**0.008** 0.018
	10 0.3937	**14** 0.5512	**16** 0.630	**0.3** 0.01	JR10x14x16	**0.009** 0.020
	10 0.3937	**14** 0.5512	**20** 0.787	**0.3** 0.01	JR10x14x20	**0.012** 0.026
12 0.4724	**12** 0.4724	**15** 0.5906	**12.5** 0.492	**0.3** 0.01	JR12x15x12,5	**0.006** 0.013
	12 0.4724	**15** 0.5906	**16** 0.630	**0.3** 0.01	JR12x15x16	**0.008** 0.018
	12 0.4724	**15** 0.5906	**16.5** 0.650	**0.3** 0.01	JR12x15x16,5	**0.008** 0.018
	12 0.4724	**15** 0.5906	**18.5** 0.728	**0.3** 0.01	JR12x15x18,5	**0.009** 0.020
	12 0.4724	**15** 0.5906	**22.4** 0.882	**0.2** 0.01	IM 12 15 22,4 P	**0.011** 0.024
	12 0.4724	**15** 0.5906	**22.5** 0.886	**0.3** 0.01	JR12x15x22,5	**0.011** 0.024
	12 0.4724	**16** 0.6299	**12** 0.472	**0.3** 0.01	JR12x16x12	**0.008** 0.018
	12 0.4724	**16** 0.6299	**12** 0.472	**0.3** 0.01	JR12x16x12JS1	**0.008** 0.018
	12 0.4724	**16** 0.6299	**13** 0.512	**0.3** 0.01	JR12x16x13	**0.008** 0.018
	12 0.4724	**16** 0.6299	**14** 0.551	**0.3** 0.01	JRZ12x16x14JS1	**0.010** 0.022
	12 0.4724	**16** 0.6299	**16** 0.630	**0.3** 0.01	JR12x16x16	**0.011** 0.024
	12 0.4724	**16** 0.6299	**20** 0.787	**0.3** 0.01	JR12x16x20	**0.014** 0.031
	12 0.4724	**16** 0.6299	**22** 0.866	**0.3** 0.01	JR12x16x22	**0.015** 0.033
13 0.5118	**13** 0.5118	**18** 0.7087	**16** 0.630	**0.35** 0.014	IM 13 18 16 P	**0.015** 0.033
14 0.5512	**14** 0.5512	**17** 0.6693	**17** 0.669	**0.3** 0.01	JR14x17x17	**0.009** 0.020
15 0.5906	**15** 0.5906	**18** 0.7087	**16.5** 0.650	**0.3** 0.01	JR15x18x16,5	**0.010** 0.022
	15 0.5906	**19** 0.7480	**16** 0.630	**0.3** 0.01	JR15x19x16	**0.013** 0.029
	15 0.5906	**19** 0.7480	**20** 0.787	**0.3** 0.01	JR15x19x20	**0.017** 0.037
	15 0.5906	**20** 0.7874	**12** 0.472	**0.3** 0.01	JR15x20x12	**0.012** 0.026
	15 0.5906	**20** 0.7874	**12** 0.472	**0.3** 0.01	JR15x20x12JS1	**0.012** 0.026

(1) Inner rings for metric full complement needle roller bearings are produced with outside diameter tolerance g5.

Continued on next page.

INNER RINGS



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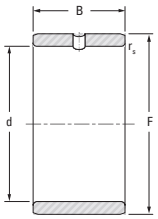
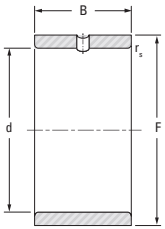


JR.JS1

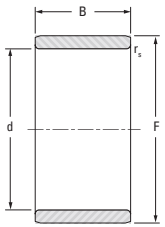


JRZ.JS1

Shaft Dia.	d	F (1)	B	$r_{s\ min.}$	Inner Ring Designation	Approx. Wt.
mm in	mm in	mm in	mm in	mm in		kg lbs
15 0.5906	**15** 0.5906	**20** 0.7874	**13** 0.512	**0.3** 0.01	JR15x20x13	**0.014** 0.031
	15 0.5906	**20** 0.7874	**14** 0.551	**0.3** 0.01	JRZ15x20x14JS1	**0.015** 0.033
	15 0.5906	**20** 0.7874	**16** 0.630	**0.3** 0.01	JR15x20x16	**0.017** 0.037
	15 0.5906	**20** 0.7874	**20** 0.787	**0.35** 0.014	IM 15 20 20 P	**0.021** 0.045
	15 0.5906	**20** 0.7874	**23** 0.906	**0.3** 0.01	JR15x20x23	**0.025** 0.055
	15 0.5906	**20** 0.7874	**26** 1.024	**0.3** 0.01	JR15x20x26	**0.028** 0.062
17 0.6693	**17** 0.6693	**20** 0.7874	**16.5** 0.650	**0.3** 0.01	JR17x20x16,5	**0.011** 0.024
	17 0.6693	**20** 0.7874	**20** 0.787	**0.3** 0.01	JR17x20x20	**0.014** 0.031
	17 0.6693	**20** 0.7874	**20.5** 0.807	**0.3** 0.01	JR17x20x20,5	**0.014** 0.031
	17 0.6693	**20** 0.7874	**30.5** 1.201	**0.3** 0.01	JR17x20x30,5	**0.021** 0.046
	17 0.6693	**21** 0.8268	**16** 0.630	**0.3** 0.01	JR17x21x16	**0.015** 0.033
	17 0.6693	**21** 0.8268	**20** 0.787	**0.3** 0.01	JR17x21x20	**0.019** 0.042
	17 0.6693	**22** 0.8661	**13** 0.512	**0.3** 0.01	JR17x22x13	**0.015** 0.033
	17 0.6693	**22** 0.8661	**13** 0.512	**0.35** 0.014	IM 4903	**0.015** 0.033
	17 0.6693	**22** 0.8661	**16** 0.630	**0.3** 0.01	JR17x22x16	**0.019** 0.042
	17 0.6693	**22** 0.8661	**16** 0.630	**0.3** 0.01	JR17x22x16JS1	**0.019** 0.042
	17 0.6693	**22** 0.8661	**16** 0.630	**0.3** 0.01	JRZ17x22x16JS1	**0.019** 0.042
	17 0.6693	**22** 0.8661	**20** 0.787	**0.35** 0.014	IM 17 22 20 P	**0.023** 0.051
	17 0.6693	**22** 0.8661	**23** 0.906	**0.3** 0.01	JR17x22x23	**0.028** 0.062
	17 0.6693	**22** 0.8661	**26** 1.024	**0.3** 0.01	JR17x22x26	**0.031** 0.068
	17 0.6693	**22** 0.8661	**32** 1.260	**0.3** 0.01	JR17x22x32	**0.038** 0.084
20 0.7874	**20** 0.7874	**24** 0.9449	**16** 0.630	**0.3** 0.01	JR20x24x16	**0.018** 0.040
	20 0.7874	**24** 0.9449	**20** 0.787	**0.3** 0.01	JR20x24x20	**0.022** 0.049
	20 0.7874	**25** 0.9843	**16** 0.630	**0.3** 0.01	JR20x25x16	**0.022** 0.049

(1) Inner rings for metric full complement needle roller bearings are produced with outside diameter tolerance g5.

INNER RINGS



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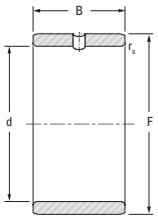
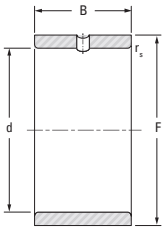


JR.JS1



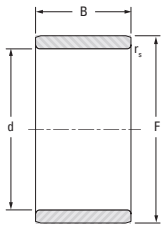
JRZ.JS1

Shaft Dia.	d	F (1)	B	$r_{s\ min.}$	Inner Ring Designation	Approx. Wt.
mm in	mm in	mm in	mm in	mm in		kg lbs
20 0.7874	**20** 0.7874	**25** 0.9843	**16** 0.630	**0.3** 0.01	JR20x25x16JS1	**0.022** 0.049
	20 0.7874	**25** 0.9843	**17** 0.669	**0.3** 0.01	JR20x25x17	**0.023** 0.051
	20 0.7874	**25** 0.9843	**18** 0.709	**0.3** 0.01	JRZ20x25x18JS1	**0.025** 0.055
	20 0.7874	**25** 0.9843	**20** 0.787	**0.3** 0.01	JR20x25x20	**0.028** 0.062
	20 0.7874	**25** 0.9843	**20.5** 0.807	**0.3** 0.01	JR20x25x20,5	**0.029** 0.064
	20 0.7874	**25** 0.9843	**26** 1.024	**0.3** 0.01	JR20x25x26	**0.036** 0.079
	20 0.7874	**25** 0.9843	**26.5** 1.043	**0.3** 0.01	JR20x25x26,5	**0.037** 0.082
	20 0.7874	**25** 0.9843	**30** 1.181	**0.3** 0.01	JR20x25x30	**0.042** 0.093
	20 0.7874	**25** 0.9843	**32** 1.260	**0.3** 0.01	JR20x25x32	**0.044** 0.097
	20 0.7874	**25** 0.9843	**38.5** 1.516	**0.3** 0.01	JR20x25x38,5	**0.054** 0.119
22 0.8661	**22** 0.8661	**26** 1.0236	**16** 0.630	**0.3** 0.01	JR22x26x16	**0.019** 0.042
	22 0.8661	**26** 1.0236	**20** 0.787	**0.3** 0.01	JR22x26x20	**0.023** 0.051
	22 0.8661	**28** 1.1024	**17** 0.669	**0.3** 0.01	JR22x28x17	**0.030** 0.066
	22 0.8661	**28** 1.1024	**20.5** 0.807	**0.3** 0.01	JR22x28x20,5	**0.038** 0.084
	22 0.8661	**28** 1.1024	**30** 1.181	**0.3** 0.01	JR22x28x30	**0.056** 0.123
23 0.9055	**23** 0.9055	**28** 1.1024	**20** 0.787	**0.35** 0.014	IM 23 28 20 P	**0.030** 0.066
25 0.9843	**25** 0.9843	**29** 1.1417	**20** 0.787	**0.3** 0.01	JR25x29x20	**0.027** 0.060
	25 0.9843	**29** 1.1417	**30** 1.181	**0.3** 0.01	JR25x29x30	**0.040** 0.088
	25 0.9843	**30** 1.1811	**16** 0.630	**0.3** 0.01	JR25x30x16	**0.027** 0.060
	25 0.9843	**30** 1.1811	**16** 0.630	**0.3** 0.01	JR25x30x16JS1	**0.027** 0.060
	25 0.9843	**30** 1.1811	**17** 0.669	**0.3** 0.01	JR25x30x17	**0.028** 0.062
	25 0.9843	**30** 1.1811	**18** 0.709	**0.3** 0.01	JRZ25x30x18JS1	**0.031** 0.068
	25 0.9843	**30** 1.1811	**20** 0.787	**0.3** 0.01	JR25x30x20	**0.034** 0.075
	25 0.9843	**30** 1.1811	**20.5** 0.807	**0.3** 0.01	JR25x30x20,5	**0.035** 0.077

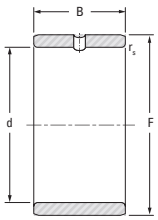
(1) Inner rings for metric full complement needle roller bearings are produced with outside diameter tolerance g5.

Continued on next page.

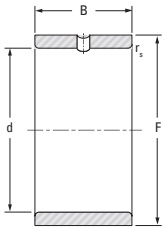
INNER RINGS



JR, IM..P



JR.JS1

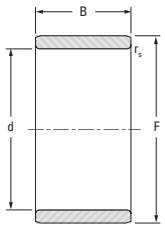


JRZ.JS1

Shaft Dia.	d	F (1)	B	$r_{s\,min.}$	Inner Ring Designation	Approx. Wt.
mm in	mm in	mm in	mm in	mm in		kg lbs
25 0.9843	**25** 0.9843	**30** 1.1811	**26** 1.024	**0.3** 0.01	JR25x30x26	**0.044** 0.097
	25 0.9843	**30** 1.1811	**26.5** 1.043	**0.3** 0.01	JR25x30x26,5	**0.045** 0.099
	25 0.9843	**30** 1.1811	**30** 1.181	**0.3** 0.01	JR25x30x30	**0.051** 0.112
	25 0.9843	**30** 1.1811	**32** 1.260	**0.3** 0.01	JR25x30x32	**0.054** 0.119
	25 0.9843	**30** 1.1811	**38.5** 1.516	**0.3** 0.01	JR25x30x38,5	**0.066** 0.146
28 1.1024	**28** 1.1024	**32** 1.2598	**17** 0.669	**0.3** 0.01	JR28x32x17	**0.028** 0.062
	28 1.1024	**32** 1.2598	**20** 0.787	**0.3** 0.01	JR28x32x20	**0.030** 0.066
	28 1.1024	**32** 1.2598	**30** 1.181	**0.3** 0.01	JR28x32x30	**0.044** 0.097
30 1.1811	**30** 1.1811	**35** 1.3780	**16** 0.630	**0.3** 0.01	JR30x35x16	**0.031** 0.068
	30 1.1811	**35** 1.3780	**17** 0.669	**0.3** 0.01	JR30x35x17	**0.033** 0.073
	30 1.1811	**35** 1.3780	**17** 0.669	**0.35** 0.014	IM 4906	**0.033** 0.073
	30 1.1811	**35** 1.3780	**18** 0.709	**0.3** 0.01	JRZ30x35x18JS1	**0.036** 0.079
	30 1.1811	**35** 1.3780	**20** 0.787	**0.3** 0.01	JR30x35x20	**0.039** 0.086
	30 1.1811	**35** 1.3780	**20** 0.787	**0.3** 0.01	JRZ30x35x20JS1	**0.039** 0.086
	30 1.1811	**35** 1.3780	**20.5** 0.807	**0.3** 0.01	JR30x35x20,5	**0.040** 0.088
	30 1.1811	**35** 1.3780	**26** 1.024	**0.3** 0.01	JR30x35x26	**0.054** 0.119
	30 1.1811	**35** 1.3780	**30** 1.181	**0.3** 0.01	JR30x35x30	**0.057** 0.126
	30 1.1811	**35** 1.3780	**32** 1.260	**0.3** 0.01	JR30x35x32	**0.062** 0.137
	30 1.1811	**38** 1.4961	**20** 0.787	**0.6** 0.02	JR30x38x20JS1	**0.067** 0.148
32 1.2598	**32** 1.2598	**37** 1.4567	**20** 0.787	**0.3** 0.01	JR32x37x20	**0.043** 0.095
	32 1.2598	**37** 1.4567	**30** 1.181	**0.3** 0.01	JR32x37x30	**0.064** 0.141
	32 1.2598	**40** 1.5748	**20** 0.787	**0.6** 0.02	JR32x40x20	**0.069** 0.152
	32 1.2598	**40** 1.5748	**36** 1.417	**0.6** 0.02	JR32x40x36	**0.128** 0.282
35 1.3780	**35** 1.3780	**40** 1.5748	**17** 0.669	**0.3** 0.01	JR35x40x17	**0.040** 0.088

(1) Inner rings for metric full complement needle roller bearings are produced with outside diameter tolerance g5.

INNER RINGS



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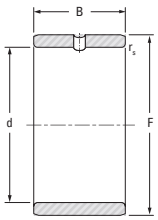

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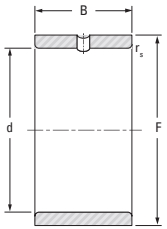

JRZ.JS1

Shaft Dia.	d	F (1)	B	$r_{s\,min.}$	Inner Ring Designation	Approx. Wt.
mm in	mm in	mm in	mm in	mm in		kg lbs
35 1.3780	**35** 1.3780	**40** 1.5748	**20** 0.787	**0.3** 0.01	JR35x40x20	**0.046** 0.101
	35 1.3780	**40** 1.5748	**20.5** 0.807	**0.3** 0.01	JR35x40x20,5	**0.049** 0.108
	35 1.3780	**40** 1.5748	**22** 0.866	**0.3** 0.01	JR35x40x22	**0.052** 0.115
	35 1.3780	**40** 1.5748	**30** 1.181	**0.3** 0.01	JR35x40x30	**0.071** 0.157
	35 1.3780	**40** 1.5748	**34** 1.339	**0.3** 0.01	JR35x40x34	**0.080** 0.176
	35 1.3780	**40** 1.5748	**40** 1.575	**0.3** 0.01	JR35x40x40	**0.094** 0.207
	35 1.3780	**42** 1.6535	**20** 0.787	**0.6** 0.02	JR35x42x20	**0.065** 0.143
	35 1.3780	**42** 1.6535	**20** 0.787	**0.6** 0.02	JR35x42x20JS1	**0.065** 0.143
	35 1.3780	**42** 1.6535	**23** 0.906	**0.6** 0.02	JRZ35x42x23JS1	**0.074** 0.163
	35 1.3780	**42** 1.6535	**36** 1.417	**0.6** 0.02	JR35x42x36	**0.122** 0.269
	35 1.3780	**44** 1.7323	**22** 0.866	**0.6** 0.02	JR35x44x22	**0.097** 0.214
37 1.4567	**37** 1.4567	**42** 1.6535	**20** 0.787	**0.35** 0.014	IM 37 42 20 P	**0.046** 0.101
38 1.4961	**38** 1.4961	**43** 1.6929	**20** 0.787	**0.3** 0.01	JR38x43x20	**0.050** 0.110
	38 1.4961	**43** 1.6929	**30** 1.181	**0.3** 0.01	JR38x43x30	**0.075** 0.165
40 1.5748	**40** 1.5748	**45** 1.7717	**17** 0.669	**0.3** 0.01	JR40x45x17	**0.044** 0.097
	40 1.5748	**45** 1.7717	**20** 0.787	**0.3** 0.01	JR40x45x20	**0.052** 0.115
	40 1.5748	**45** 1.7717	**20.5** 0.807	**0.3** 0.01	JR40x45x20,5	**0.054** 0.119
	40 1.5748	**45** 1.7717	**25** 0.984	**0.35** 0.014	IM 40 45 25 P	**0.062** 0.137
	40 1.5748	**45** 1.7717	**30** 1.181	**0.3** 0.01	JR40x45x30	**0.078** 0.172
	40 1.5748	**45** 1.7717	**34** 1.339	**0.3** 0.01	JR40x45x34	**0.089** 0.196
	40 1.5748	**45** 1.7717	**40** 1.575	**0.3** 0.01	JR40x45x40	**0.115** 0.254
	40 1.5748	**48** 1.8898	**22** 0.866	**0.6** 0.02	JR40x48x22	**0.094** 0.207
	40 1.5748	**48** 1.8898	**23** 0.906	**0.6** 0.02	JRZ40x48x23JS1	**0.100** 0.220
	40 1.5748	**48** 1.8898	**40** 1.575	**0.6** 0.02	JR40x48x40	**0.173** 0.381

(1) Inner rings for metric full complement needle roller bearings are produced with outside diameter tolerance g5.

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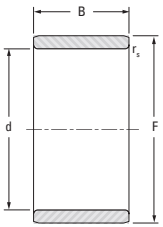
INNER RINGS



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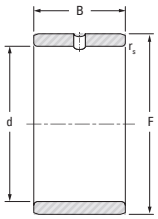

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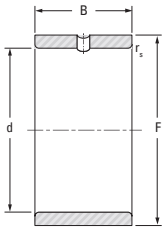
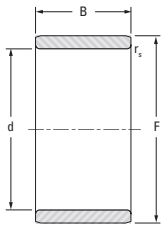


JRZ.JS1

Shaft Dia.	d	F (1)	B	$r_{s\,min.}$	Inner Ring Designation	Approx. Wt.
mm in	mm in	mm in	mm in	mm in		kg lbs
40 1.5748	**40** 1.5748	**50** 1.9685	**20** 0.787	**1** 0.04	JR40x50x20	**0.110** 0.243
42 1.6535	**42** 1.6535	**47** 1.8504	**20** 0.787	**0.3** 0.01	JR42x47x20	**0.055** 0.121
	42 1.6535	**47** 1.8504	**30** 1.181	**0.3** 0.01	JR42x47x30	**0.083** 0.183
45 1.7717	**45** 1.7717	**50** 1.9685	**20** 0.787	**0.3** 0.01	JR45x50x20	**0.058** 0.128
	45 1.7717	**50** 1.9685	**25** 0.984	**0.6** 0.02	JR45x50x25	**0.073** 0.161
	45 1.7717	**50** 1.9685	**25.5** 1.004	**0.3** 0.01	JR45x50x25,5	**0.075** 0.165
	45 1.7717	**50** 1.9685	**35** 1.378	**0.6** 0.02	JR45x50x35	**0.103** 0.227
	45 1.7717	**50** 1.9685	**40** 1.575	**0.3** 0.01	JR45x50x40	**0.117** 0.258
	45 1.7717	**52** 2.0472	**22** 0.866	**0.6** 0.02	JR45x52x22	**0.090** 0.198
	45 1.7717	**52** 2.0472	**22** 0.866	**0.85** 0.033	IM 4909	**0.087** 0.192
	45 1.7717	**52** 2.0472	**23** 0.906	**0.6** 0.02	JR45x52x23	**0.096** 0.212
	45 1.7717	**52** 2.0472	**23** 0.906	**0.6** 0.02	JRZ45x52x23JS1	**0.096** 0.212
	45 1.7717	**52** 2.0472	**40** 1.575	**0.6** 0.02	JR45x52x40	**0.167** 0.368
	45 1.7717	**55** 2.1654	**20** 0.787	**1** 0.04	JR45x55x20	**0.133** 0.293
	45 1.7717	**55** 2.1654	**20** 0.787	**1** 0.04	JR45x55x20JS1	**0.133** 0.293
	45 1.7717	**55** 2.1654	**22** 0.866	**1** 0.04	JR45x55x22	**0.135** 0.298
	45 1.7717	**55** 2.1654	**40** 1.575	**1** 0.04	JR45x55x40	**0.247** 0.545
50 1.9685	**50** 1.9685	**55** 2.1654	**20** 0.787	**0.3** 0.01	JR50x55x20	**0.065** 0.143
	50 1.9685	**55** 2.1654	**25** 0.984	**0.6** 0.02	JR50x55x25	**0.081** 0.179
	50 1.9685	**55** 2.1654	**35** 1.378	**0.65** 0.026	IM 50 55 35 P	**0.107** 0.236
	50 1.9685	**55** 2.1654	**35** 1.378	**0.6** 0.02	JR50x55x35	**0.113** 0.249
	50 1.9685	**55** 2.1654	**40** 1.575	**0.3** 0.01	JR50x55x40	**0.130** 0.287
	50 1.9685	**58** 2.2835	**22** 0.866	**0.6** 0.02	JR50x58x22	**0.117** 0.258
	50 1.9685	**58** 2.2835	**23** 0.906	**0.6** 0.02	JRZ50x58x23JS1	**0.122** 0.269

(1) Inner rings for metric full complement needle roller bearings are produced with outside diameter tolerance g5.

INNER RINGS



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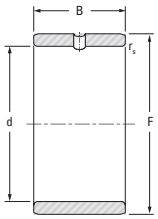

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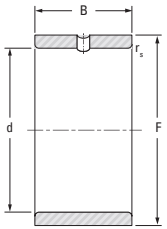


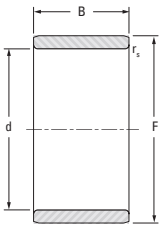
JRZ.JS1

Shaft Dia.	d	F (1)	B	$r_{s\,min.}$	Inner Ring Designation	Approx. Wt.
mm in	mm in	mm in	mm in	mm in		kg lbs
50 1.9685	**50** 1.9685	**58** 2.2835	**40** 1.575	**0.6** 0.02	JR50x58x40	**0.213** 0.470
	50 1.9685	**60** 2.3622	**20** 0.787	**1** 0.04	JR50x60x20	**0.155** 0.342
	50 1.9685	**60** 2.3622	**20** 0.787	**1** 0.04	JR50x60x20JS1	**0.155** 0.342
	50 1.9685	**60** 2.3622	**25** 0.984	**1** 0.04	JR50x60x25	**0.170** 0.375
	50 1.9685	**60** 2.3622	**40** 1.575	**1** 0.04	JR50x60x40	**0.310** 0.683
55 2.1654	**55** 2.1654	**60** 2.3622	**25** 0.984	**0.6** 0.02	JR55x60x25	**0.088** 0.194
	55 2.1654	**60** 2.3622	**35** 1.378	**0.65** 0.026	IM 55 60 35 P	**0.118** 0.260
	55 2.1654	**60** 2.3622	**35** 1.378	**0.6** 0.02	JR55x60x35	**0.124** 0.273
	55 2.1654	**63** 2.4803	**25** 0.984	**1** 0.04	JR55x63x25	**0.141** 0.311
	55 2.1654	**63** 2.4803	**45** 1.772	**1** 0.04	JR55x63x45	**0.286** 0.631
	55 2.1654	**65** 2.5591	**30** 1.181	**1** 0.04	JR55x65x30	**0.222** 0.489
	55 2.1654	**65** 2.5591	**60** 2.362	**1** 0.04	JR55x65x60	**0.444** 0.979
58 2.2835	**58** 2.2835	**65** 2.5591	**25** 0.984	**0.85** 0.033	IM 58 65 25 P	**0.125** 0.276
60 2.3622	**60** 2.3622	**68** 2.6772	**25** 0.984	**0.6** 0.02	JR60x68x25	**0.153** 0.337
	60 2.3622	**68** 2.6772	**35** 1.378	**0.6** 0.02	JR60x68x35	**0.220** 0.485
	60 2.3622	**68** 2.6772	**45** 1.772	**1** 0.04	JR60x68x45	**0.284** 0.626
	60 2.3622	**70** 2.7559	**25** 0.984	**1** 0.04	JR60x70x25	**0.200** 0.441
	60 2.3622	**70** 2.7559	**30** 1.181	**1** 0.04	JR60x70x30	**0.240** 0.529
	60 2.3622	**70** 2.7559	**35** 1.378	**0.85** 0.033	IM 60 70 35 P	**0.280** 0.616
	60 2.3622	**70** 2.7559	**60** 2.362	**1** 0.04	JR60x70x60	**0.480** 1.058
65 2.5591	**65** 2.5591	**72** 2.8346	**25** 0.984	**1** 0.04	JR65x72x25	**0.143** 0.315
	65 2.5591	**72** 2.8346	**45** 1.772	**1** 0.04	JR65x72x45	**0.266** 0.586
	65 2.5591	**73** 2.8740	**25** 0.984	**0.6** 0.02	JR65x73x25	**0.170** 0.375
	65 2.5591	**73** 2.8740	**35** 1.378	**0.6** 0.02	JR65x73x35	**0.240** 0.529

(1) Inner rings for metric full complement needle roller bearings are produced with outside diameter tolerance g5.

Continued on next page.

INNER RINGS



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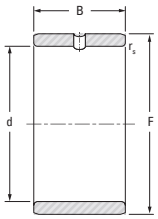

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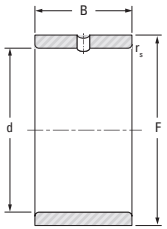
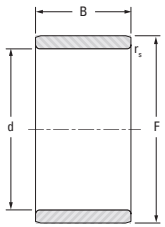


JRZ.JS1

Shaft Dia.	d	F (1)	B	$r_{s\,min.}$	Inner Ring Designation	Approx. Wt.
mm in	mm in	mm in	mm in	mm in		kg lbs
65 2.5591	**65** 2.5591	**75** 2.9528	**28** 1.102	**1** 0.04	JR65x75x28	**0.240** 0.529
	65 2.5591	**75** 2.9528	**30** 1.181	**1** 0.04	JR65x75x30	**0.260** 0.573
	65 2.5591	**75** 2.9528	**60** 2.362	**1** 0.04	JR65x75x60	**0.520** 1.146
70 2.7559	**70** 2.7559	**80** 3.1496	**25** 0.984	**1** 0.04	JR70x80x25	**0.230** 0.507
	70 2.7559	**80** 3.1496	**30** 1.181	**1** 0.04	JR70x80x30	**0.270** 0.595
	70 2.7559	**80** 3.1496	**35** 1.378	**1** 0.04	JR70x80x35	**0.320** 0.705
	70 2.7559	**80** 3.1496	**54** 2.126	**1** 0.04	JR70x80x54	**0.500** 1.102
	70 2.7559	**80** 3.1496	**60** 2.362	**1** 0.04	JR70x80x60	**0.556** 1.226
75 2.9528	**75** 2.9528	**85** 3.3465	**25** 0.984	**1** 0.04	JR75x85x25	**0.240** 0.529
	75 2.9528	**85** 3.3465	**30** 1.181	**1** 0.04	JR75x85x30	**0.289** 0.637
	75 2.9528	**85** 3.3465	**35** 1.378	**1** 0.04	JR75x85x35	**0.338** 0.745
	75 2.9528	**85** 3.3465	**54** 2.126	**1** 0.04	JR75x85x54	**0.530** 1.168
80 3.1496	**80** 3.1496	**90** 3.5433	**25** 0.984	**1** 0.04	JR80x90x25	**0.260** 0.573
	80 3.1496	**90** 3.5433	**30** 1.181	**1** 0.04	JR80x90x30	**0.306** 0.675
	80 3.1496	**90** 3.5433	**35** 1.378	**1** 0.04	JR80x90x35	**0.355** 0.783
	80 3.1496	**90** 3.5433	**54** 2.126	**1** 0.04	JR80x90x54	**0.565** 1.246
85 3.3465	**85** 3.3465	**95** 3.7402	**26** 1.024	**1** 0.04	JR85x95x26	**0.290** 0.639
	85 3.3465	**95** 3.7402	**30** 1.181	**1** 0.04	JR85x95x30	**0.334** 0.736
	85 3.3465	**95** 3.7402	**36** 1.417	**1** 0.04	JR85x95x36	**0.397** 0.875
	85 3.3465	**100** 3.9370	**35** 1.378	**1.1** 0.04	JR85x100x35	**0.595** 1.312
	85 3.3465	**100** 3.9370	**63** 2.480	**1.1** 0.04	JR85x100x63	**1.080** 2.381
90 3.5433	**90** 3.5433	**100** 3.9370	**26** 1.024	**1** 0.04	JR90x100x26	**0.300** 0.661
	90 3.5433	**100** 3.9370	**30** 1.181	**1** 0.04	JR90x100x30	**0.350** 0.772
	90 3.5433	**100** 3.9370	**36** 1.417	**1** 0.04	JR90x100x36	**0.422** 0.930

(1) Inner rings for metric full complement needle roller bearings are produced with outside diameter tolerance g5.

INNER RINGS



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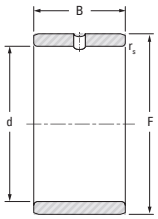

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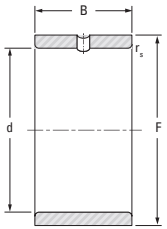


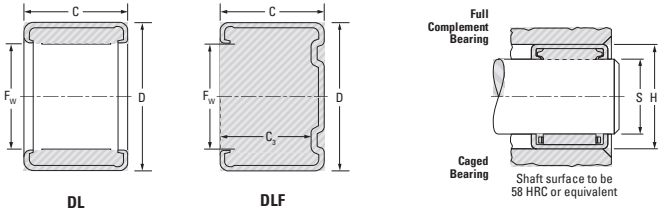
JRZ.JS1

Shaft Dia.	d	F (1)	B	$r_{s\,min.}$	Inner Ring Designation	Approx. Wt.
mm in	mm in	mm in	mm in	mm in		kg lbs
90 3.5433	**90** 3.5433	**105** 4.1339	**32** 1.260	**1.1** 0.04	JR90x105x32	**0.580** 1.279
	90 3.5433	**105** 4.1339	**35** 1.378	**1.1** 0.04	JR90x105x35	**0.624** 1.376
	90 3.5433	**105** 4.1339	**63** 2.480	**1.1** 0.04	JR90x105x63	**1.140** 2.513
95 3.7402	**95** 3.7402	**105** 4.1339	**26** 1.024	**1** 0.04	JR95x105x26	**0.310** 0.683
	95 3.7402	**105** 4.1339	**36** 1.417	**1** 0.04	JR95x105x36	**0.430** 0.948
	95 3.7402	**110** 4.3307	**35** 1.378	**1.1** 0.04	JR95x110x35	**0.653** 1.440
	95 3.7402	**110** 4.3307	**63** 2.480	**1.1** 0.04	JR95x110x63	**1.200** 2.646
100 3.9370	**100** 3.9370	**110** 4.3307	**30** 1.181	**1.1** 0.04	JR100x110x30	**0.384** 0.847
	100 3.9370	**110** 4.3307	**40** 1.575	**1.1** 0.04	JR100x110x40	**0.510** 1.124
	100 3.9370	**115** 4.5276	**40** 1.575	**1.1** 0.04	JR100x115x40	**0.790** 1.742
110 4.3307	**110** 4.3307	**120** 4.7244	**30** 1.181	**1** 0.04	JR110x120x30	**0.425** 0.937
	110 4.3307	**125** 4.9213	**40** 1.575	**1.1** 0.04	JR110x125x40	**0.870** 1.918
120 4.7244	**120** 4.7244	**130** 5.1181	**30** 1.181	**1** 0.04	JR120x130x30	**0.460** 1.014
	120 4.7244	**135** 5.3150	**45** 1.772	**1.1** 0.04	JR120x135x45	**1.060** 2.337
130 5.1181	**130** 5.1181	**145** 5.7087	**35** 1.378	**1.1** 0.04	JR130x145x35	**0.890** 1.962
	130 5.1181	**150** 5.9055	**50** 1.969	**1.5** 0.06	JR130x150x50	**1.730** 3.814
140 5.5118	**140** 5.5118	**155** 6.1024	**35** 1.378	**1.1** 0.04	JR140x155x35	**0.955** 2.105
	140 5.5118	**160** 6.2992	**50** 1.969	**1.5** 0.06	JR140x160x50	**1.860** 4.101
150 5.9055	**150** 5.9055	**165** 6.4961	**40** 1.575	**1.1** 0.04	JR150x165x40	**1.170** 2.579
160 6.2992	**160** 6.2992	**175** 6.8898	**40** 1.575	**1.1** 0.04	JR160x175x40	**1.240** 2.734
170 6.6929	**170** 6.6929	**185** 7.2835	**45** 1.772	**1.1** 0.04	JR170x185x45	**1.480** 3.263
180 7.0866	**180** 7.0866	**195** 7.6772	**45** 1.772	**1.1** 0.04	JR180x195x45	**1.560** 3.439

(1) Inner rings for metric full complement needle roller bearings are produced with outside diameter tolerance g5.

DRAWN CUP NEEDLE ROLLER BEARINGS FULL COMPLEMENT OPEN ENDS, CLOSED ONE END

METRIC SERIES
DL, DLF SERIES



Shaft Dia.	F_w	D	C +0 -0.3 / +0.000 -0.012	$C_{3\,min.}$	Bearing Designation: Open Ends	Bearing Designation: Closed One End	Load Ratings: Dynamic C	Load Ratings: Static C_0	Fatigue Load Limit C_u	Approx. Wt.	Mounting Dimensions: Shaft (h5) Max.	Shaft (h5) Min.	Housing (H6) Max.	Housing (H6) Min.	Inspection gage	Mounting inner ring (pages B-2-43 to B-2-45)
mm in	mm in	mm in	mm in	mm in			kN lbf		kN	kg lbs	mm in	mm in	mm in	mm in		
6 0.2362	**6** 0.2362	**12** 0.4724	**10** 0.394	—	DL 6 10	—	**5.10** 650	**4.80** 850	0.720	**0.004** 0.009	**6.000** 0.2362	**5.995** 0.2360	**12.011** 0.4729	**12.000** 0.4724	Table B2-3	
	6 0.2362	**12** 0.4724	**10** 0.394	**7.7** 0.303	—	DLF 6 10	**5.10** 650	**4.80** 850	0.720	**0.004** 0.010	**6.000** 0.2362	**5.995** 0.2360	**12.011** 0.4729	**12.000** 0.4724	Table B2-3	
8 0.3150	**8** 0.3150	**14** 0.5512	**10** 0.394	—	DL 8 10	—	**6.15** 1010	**6.45** 1460	0.970	**0.005** 0.012	**8.000** 0.3150	**7.994** 0.3147	**14.011** 0.5516	**14.000** 0.5512	Table B2-3	
	8 0.3150	**14** 0.5512	**10** 0.394	**7.7** 0.303	—	DLF 8 10	**6.15** 1010	**6.45** 1460	0.970	**0.006** 0.013	**8.000** 0.3150	**7.994** 0.3147	**14.011** 0.5516	**14.000** 0.5512	Table B2-3	
9 0.3543	**9** 0.3543	**14** 0.5512	**12** 0.472	—	DL 9 14 12	—	**8.95** 1370	**11.9** 1270	1.80	**0.006** 0.013	**9.000** 0.3543	**8.994** 0.3541	**14.011** 0.5516	**14.000** 0.5512	Table B2-3	
	9 0.3547	**14** 0.5512	**12** 0.472	**9.7** 0.382	—	DLF 9 14 12	**8.95** 1370	**11.9** 1270	1.80	**0.007** 0.015	**9.000** 0.3543	**8.994** 0.3541	**14.011** 0.5516	**14.000** 0.5512	Table B2-3	
10 0.3937	**10** 0.3937	**16** 0.6299	**12** 0.472	—	DL 10 12	—	**8.85** 1570	**10.9** 2450	1.65	**0.008** 0.018	**10.000** 0.3937	**9.994** 0.3935	**16.011** 0.6304	**16.000** 0.6299	Table B2-3	
	10 0.3937	**16** 0.6299	**12** 0.472	**9.7** 0.382	—	DLF 10 12	**8.85** 1570	**10.9** 2450	1.65	**0.009** 0.020	**10.000** 0.3937	**9.994** 0.3935	**16.011** 0.6304	**16.000** 0.6299	Table B2-3	
12 0.4724	**12** 0.4724	**18** 0.7087	**10** 0.394	—	DL 12 10	—	**7.85** 1350	**9.75** 2180	1.45	**0.008** 0.017	**12.000** 0.4724	**11.992** 0.4721	**18.011** 0.7091	**18.000** 0.7087	Table B2-3	
	12 0.4724	**18** 0.7087	**10** 0.394	**7.7** 0.303	—	DLF 12 10	**7.85** 1350	**9.75** 2180	1.45	**0.008** 0.018	**12.000** 0.4724	**11.992** 0.4721	**18.011** 0.7091	**18.000** 0.7087	Table B2-3	
	12 0.4724	**18** 0.7087	**12** 0.472	—	DL 12 12	—	**9.80** 1570	**13.0** 2590	1.95	**0.009** 0.021	**12.000** 0.4724	**11.992** 0.4721	**18.011** 0.7091	**18.000** 0.7087	Table B2-3	IM 8 12 12,4
	12 0.4724	**18** 0.7087	**12** 0.472	**9.7** 0.382	—	DLF 12 12	**9.80** 1570	**13.0** 2590	1.95	**0.010** 0.022	**12.000** 0.4724	**11.992** 0.4721	**18.011** 0.7091	**18.000** 0.7087	Table B2-3	IM 8 12 12,4
13 0.5118	**13** 0.5118	**19** 0.7480	**12** 0.472	—	DL 13 12	—	**10.4** 1910	**14.1** 3190	2.15	**0.010** 0.022	**13.000** 0.5118	**12.992** 0.5115	**19.013** 0.7485	**19.000** 0.7480	Table B2-3	IM 9 13 12,4
	13 0.5118	**19** 0.7480	**12** 0.472	**9.7** 0.382	—	DLF 13 12	**10.4** 1910	**14.1** 3190	2.15	**0.011** 0.024	**13.000** 0.5118	**12.992** 0.5115	**19.013** 0.7485	**19.000** 0.7480	Table B2-3	IM 9 13 12,4
14 0.5512	**14** 0.5512	**20** 0.7874	**12** 0.472	—	DL 14 12	—	**10.7** 1780	**15.2** 3030	2.30	**0.011** 0.023	**14.000** 0.5512	**13.992** 0.5509	**20.013** 0.7879	**20.000** 0.7874	Table B2-3	IM 10 14 12,4
	14 0.5512	**20** 0.7874	**12** 0.472	**9.7** 0.382	—	DLF 14 12	**10.7** 1780	**15.2** 3030	2.30	**0.012** 0.026	**14.000** 0.5512	**13.992** 0.5509	**20.013** 0.7879	**20.000** 0.7874	Table B2-3	IM 10 14 12,4
15 0.5906	**15** 0.5906	**21** 0.8268	**12** 0.472	—	DL 15 12	—	**11.3** 2110	**16.3** 3690	2.50	**0.011** 0.024	**15.000** 0.5906	**14.992** 0.5902	**21.013** 0.8273	**21.000** 0.8268	Table B2-3	IM 12 15 12,4
	15 0.5906	**21** 0.8268	**12** 0.472	**9.7** 0.382	—	DLF 15 12	**11.3** 2110	**16.3** 3690	2.50	**0.012** 0.026	**15.000** 0.5906	**14.992** 0.5902	**21.013** 0.8273	**21.000** 0.8268	Table B2-3	IM 12 15 12,4
16 0.6299	**16** 0.6299	**22** 0.8661	**12** 0.472	—	DL 16 12	—	**11.5** 1960	**17.4** 3480	2.65	**0.012** 0.026	**16.000** 0.6299	**15.992** 0.6296	**22.013** 0.8667	**22.000** 0.8661	Table B2-3	IM 12 16 12,4

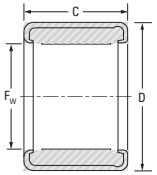
Note) · For information on the speed ratings, contact JTEKT.

Shaft Dia.	F_w	D	C +0 -0.3 / +0.000 -0.012	$C_{3\,min.}$	Bearing Designation: Open Ends	Bearing Designation: Closed One End	Load Ratings: Dynamic C	Load Ratings: Static C_0	Fatigue Load Limit C_u	Approx. Wt.	Mounting Dimensions: Shaft (h5) Max.	Shaft (h5) Min.	Housing (H6) Max.	Housing (H6) Min.	Inspection gage	Mounting inner ring (pages B-2-43 to B-2-45)
mm in	mm in	mm in	mm in	mm in			kN lbf		kN	kg lbs	mm in	mm in	mm in	mm in		
16 0.6299	**16** 0.6299	**22** 0.8661	**12** 0.472	**9.7** 0.382	—	DLF 16 12	**11.5** 1960	**17.4** 3480	2.65	**0.013** 0.029	**16.000** 0.6299	**15.992** 0.6296	**22.013** 0.8667	**22.000** 0.8661	Table B2-3	IM 12 16 12,4
17 0.6693	**17** 0.6693	**23** 0.9055	**12** 0.472	—	DL 17 12	—	**12.0** 2020	**18.5** 3640	2.80	**0.013** 0.029	**17.000** 0.6693	**16.992** 0.6690	**23.013** 0.9060	**23.000** 0.9055	Table B2-3	IM 13 17 12,4
	17 0.6693	**23** 0.9055	**12** 0.472	**9.7** 0.382	—	DLF 17 12	**12.0** 2020	**18.5** 3640	2.80	**0.014** 0.031	**17.000** 0.6693	**16.992** 0.6690	**23.013** 0.9060	**23.000** 0.9055	Table B2-3	IM 13 17 12,4
18 0.7087	**18** 0.7087	**24** 0.9449	**12** 0.472	—	DL 18 12	—	**12.3** 2410	**19.6** 4380	3.00	**0.014** 0.031	**18.000** 0.7087	**17.992** 0.7083	**24.013** 0.9454	**24.000** 0.9449	Table B2-3	IM 13 18 12,4
	18 0.7087	**24** 0.9449	**12** 0.472	**9.7** 0.382	—	DLF 18 12	**12.3** 2410	**19.6** 4380	3.00	**0.016** 0.035	**18.000** 0.7087	**17.992** 0.7083	**24.013** 0.9454	**24.000** 0.9449	Table B2-3	IM 13 18 12,4
	18 0.7087	**24** 0.9449	**16** 0.630	—	DL 18 16	—	**16.9** 3600	**29.6** 6630	4.50	**0.019** 0.042	**18.000** 0.7087	**17.992** 0.7083	**24.013** 0.9454	**24.000** 0.9449	Table B2-3	IM 13 18 16,4
	18 0.7087	**24** 0.9449	**16** 0.630	**13.7** 0.539	—	DLF 18 16	**16.9** 3600	**29.6** 6630	4.50	**0.021** 0.046	**18.000** 0.7087	**17.992** 0.7083	**24.013** 0.9454	**24.000** 0.9449	Table B2-3	IM 13 18 16,4
20 0.7874	**20** 0.7874	**26** 1.0236	**12** 0.472	—	DL 20 12	—	**13.0** 2290	**21.8** 4380	3.30	**0.015** 0.033	**20.000** 0.7874	**19.991** 0.7870	**26.013** 1.0241	**26.000** 1.0236	Table B2-3	IM 15 20 12,4
	20 0.7874	**26** 1.0236	**12** 0.472	**9.7** 0.382	—	DLF 20 12	**13.0** 2290	**21.8** 4380	3.30	**0.017** 0.037	**20.000** 0.7874	**19.991** 0.7870	**26.013** 1.0241	**26.000** 1.0236	Table B2-3	IM 15 20 12,4
	20 0.7874	**26** 1.0236	**16** 0.630	—	DL 20 16	—	**17.8** 3600	**32.8** 6860	5.00	**0.020** 0.044	**20.000** 0.7874	**19.991** 0.7870	**26.013** 1.0241	**26.000** 1.0236	Table B2-3	IM 15 20 16,4
	20 0.7874	**26** 1.0236	**16** 0.630	**13.7** 0.539	—	DLF 20 16	**17.8** 3600	**32.8** 6860	5.00	**0.022** 0.049	**20.000** 0.7874	**19.991** 0.7870	**26.013** 1.0241	**26.000** 1.0236	Table B2-3	IM 15 20 16,4
22 0.8661	**22** 0.8661	**28** 1.1024	**16** 0.630	—	DL 22 16	—	**18.7** 3820	**36.1** 7420	5.55	**0.022** 0.049	**22.000** 0.8661	**21.991** 0.8658	**28.013** 1.1029	**28.000** 1.1024	Table B2-3	IM 17 22 16,4
	22 0.8661	**28** 1.1024	**16** 0.630	**13.7** 0.539	—	DLF 22 16	**18.7** 3820	**36.1** 7420	5.55	**0.025** 0.055	**22.000** 0.8661	**21.991** 0.8658	**28.013** 1.1029	**28.000** 1.1024	Table B2-3	IM 17 22 16,4
25 0.9843	**25** 0.9843	**33** 1.2992	**16** 0.630	—	DL 25 16	—	**23.5** 3600	**38.8** 7310	6.00	**0.035** 0.077	**25.000** 0.9843	**24.991** 0.9839	**33.016** 1.2998	**33.000** 1.2992	Table B2-3	IM 20 25 16,4
	25 0.9843	**33** 1.2992	**16** 0.630	**13.7** 0.539	—	DLF 25 16	**23.5** 3600	**38.8** 7310	6.00	**0.039** 0.086	**25.000** 0.9843	**24.991** 0.9839	**33.016** 1.2998	**33.000** 1.2992	Table B2-3	IM 20 25 16,4
	25 0.9843	**33** 1.2992	**20** 0.787	—	DL 25 20	—	**29.7** 5130	**52.6** 10300	8.35	**0.043** 0.095	**25.000** 0.9843	**24.991** 0.9839	**33.016** 1.2998	**33.000** 1.2992	Table B2-3	IM 20 25 20,4
	25 0.9843	**33** 1.2992	**20** 0.787	**17.7** 0.697	—	DLF 25 20	**29.7** 5130	**52.6** 10300	8.35	**0.047** 0.104	**25.000** 0.9843	**24.991** 0.9839	**33.016** 1.2998	**33.000** 1.2992	Table B2-3	IM 20 25 20,4
28 1.1024	**28** 1.1024	**36** 1.4173	**20** 0.787	—	DL 28 20	—	**31.6** 5510	**58.9** 11700	9.35	**0.047** 0.104	**28.000** 1.1024	**27.991** 1.1020	**36.016** 1.4180	**36.000** 1.4173	Table B2-3	IM 23 28 20,4
	28 1.1024	**36** 1.4173	**20** 0.787	**17.7** 0.697	—	DLF 28 20	**31.6** 5510	**58.9** 11700	9.35	**0.051** 0.112	**28.000** 1.1024	**27.991** 1.1020	**36.016** 1.4180	**36.000** 1.4173	Table B2-3	IM 23 28 20,4
30 1.1811	**30** 1.1811	**38** 1.4961	**16** 0.630	—	DL 30 16	—	**25.9** 4880	**46.6** 10500	7.20	**0.040** 0.088	**30.000** 1.1811	**29.991** 1.1807	**38.016** 1.4967	**38.000** 1.4961	Table B2-3	IM 25 30 16,4
	30 1.1811	**38** 1.4961	**16** 0.630	**13.7** 0.539	—	DLF 30 16	**25.9** 4880	**46.6** 10500	7.20	**0.045** 0.099	**30.000** 1.1811	**29.991** 1.1807	**38.016** 1.4967	**38.000** 1.4961	Table B2-3	IM 25 30 16,4
	30 1.1811	**38** 1.4961	**20** 0.787	—	DL 30 20	—	**32.8** 5850	**63.1** 12600	10.0	**0.050** 0.110	**30.000** 1.1811	**29.991** 1.1807	**38.016** 1.4967	**38.000** 1.4961	Table B2-3	IM 25 30 20,4
	30 1.1811	**38** 1.4961	**20** 0.787	**17.7** 0.697	—	DLF 30 20	**32.8** 5850	**63.1** 12600	10.0	**0.055** 0.121	**30.000** 1.1811	**29.991** 1.1807	**38.016** 1.4967	**38.000** 1.4961	Table B2-3	IM 25 30 20,4
	30 1.1811	**38** 1.4961	**25** 0.984	—	DL 30 25	—	**40.9** 7980	**83.8** 17100	13.1	**0.063** 0.139	**30.000** 1.1811	**29.991** 1.1807	**38.016** 1.4967	**38.000** 1.4961	Table B2-3	IM 25 30 25
	30 1.1811	**38** 1.4961	**25** 0.984	**22.7** 0.894	—	DLF 30 25	**40.9** 7980	**83.8** 17100	13.1	**0.068** 0.150	**30.000** 1.1811	**29.991** 1.1807	**38.016** 1.4967	**38.000** 1.4961	Table B2-3	IM 25 30 25
35 1.3780	**35** 1.3780	**43** 1.6929	**16** 0.630	—	DL 35 16	—	**28.1** 5400	**54.4** 12100	8.40	**0.046** 0.101	**35.000** 1.3780	**34.989** 1.3775	**43.016** 1.6935	**43.000** 1.6929	Table B2-3	IM 30 35 16,4

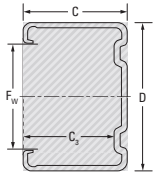
Continued on next page.

DRAWN CUP NEEDLE ROLLER BEARINGS FULL COMPLEMENT OPEN ENDS, CLOSED ONE END

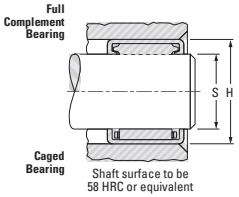
METRIC SERIES
DL, DLF SERIES



DL



DLF

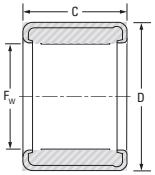


Shaft Dia.	F_w	D	C +0 -0.3 / +0.000 -0.012	$C_{3\,min.}$	Bearing Designation: Open Ends	Bearing Designation: Closed One End	Load Ratings: Dynamic C	Load Ratings: Static C_0	Fatigue Load Limit C_u	Approx. Wt.	Mounting Dimensions: Shaft (h5) Max.	Shaft (h5) Min.	Housing (H6) Max.	Housing (H6) Min.	Inspection gage	Mounting inner ring (pages B-2-43 to B-2-45)
mm in	mm in	mm in	mm in	mm in			kN lbf		kN	kg lbs	mm in	mm in	mm in	mm in		
35 1.3780	35 1.3780	43 1.6929	16 0.630	13.7 0.539	—	DLF 35 16	28.1 5400	54.4 12100	8.40	0.053 0.117	35.000 1.3780	34.989 1.3775	43.016 1.6935	43.000 1.6929	Table B2-3	IM 30 35 16,4
	35 1.3780	43 1.6929	20 0.787	—	DL 35 20	—	35.7 6520	73.7 14600	11.7	0.057 0.126	35.000 1.3780	34.989 1.3775	43.016 1.6935	43.000 1.6929	Table B2-3	IM 30 35 20,4
	35 1.3780	43 1.6929	20 0.787	17.7 0.697	—	DLF 35 20	35.7 6520	73.7 14600	11.7	0.064 0.141	35.000 1.3780	34.989 1.3775	43.016 1.6935	43.000 1.6929	Table B2-3	IM 30 35 20,4
40 1.5748	40 1.5748	48 1.8898	16 0.630	—	DL 40 16	—	30.2 5960	62.2 13900	9.60	0.051 0.112	40.000 1.5748	39.989 1.5744	48.016 1.8904	48.000 1.8898	Table B2-3	IM 35 40 16,4
	40 1.5748	48 1.8898	16 0.063	13.7 0.539	—	DLF 40 16	30.2 5960	62.2 13900	9.60	0.061 0.134	40.000 1.5748	39.989 1.5744	48.016 1.8904	48.000 1.8898	Table B2-3	IM 35 40 16,4
	40 1.5748	48 1.8898	20 0.787	—	DL 40 20	—	38.3 8090	84.3 18900	13.4	0.064 0.141	40.000 1.5748	39.989 1.5744	48.016 1.8904	48.000 1.8898	Table B2-3	IM 35 40 20,4
	40 1.5748	48 1.8898	20 0.787	17.7 0.697	—	DLF 40 20	38.3 8090	84.3 18900	13.4	0.074 0.163	40.000 1.5748	39.989 1.5744	48.016 1.8904	48.000 1.8898	Table B2-3	IM 35 40 20,4
44 1.7323	44 1.7323	52 2.0472	16 0.630	—	DL 44 16	—	31.7 5350	68.4 12800	10.6	0.056 0.123	44.000 1.7323	43.989 1.7319	52.019 2.0480	52.000 2.0472	Table B2-3	IM 40 44 16,4
	44 1.7323	52 2.0472	16 0.630	13.7 0.539	—	DLF 44 16	31.7 5350	68.4 12800	10.6	0.066 0.146	44.000 1.7323	43.989 1.7319	52.019 2.0480	52.000 2.0472	Table B2-3	IM 40 44 16,4
47 1.8504	47 1.8504	55 2.1654	16 0.630	—	DL 47 16	—	32.8 5620	73.1 13700	11.3	0.060 0.132	47.000 1.8504	46.989 1.8500	55.019 2.1661	55.000 2.1654	Table B2-3	
	47 1.8504	55 2.1654	16 0.630	13.7 0.539	—	DLF 47 16	32.8 5620	73.1 13700	11.3	0.071 0.157	47.000 1.8504	46.989 1.8500	55.019 2.1661	55.000 2.1654	Table B2-3	
50 1.9685	50 1.9685	58 2.2835	12 0.472	—	DL 50 12	—	24.1 4500	50.1 11200	7.60	0.047 0.104	50.000 1.9685	49.989 1.9681	58.019 2.2842	58.000 2.2835	Table B2-3	
	50 1.9685	58 2.2835	12 0.472	9.7 0.382	—	DLF 50 12	24.1 4500	50.1 11200	7.60	0.061 0.134	50.000 1.9685	49.989 1.9681	58.019 2.2842	58.000 2.2835	Table B2-3	
	50 1.9685	58 2.2835	18 0.709	—	DL 50 18	—	38.5 8210	91.6 20700	14.4	0.071 0.157	50.000 1.9685	49.989 1.9681	58.019 2.2842	58.000 2.2835	Table B2-3	
	50 1.9685	58 2.2835	18 0.709	15.7 0.618	—	DLF 50 18	38.5 8210	91.6 20700	14.4	0.085 0.187	50.000 1.9685	49.989 1.9681	58.019 2.2842	58.000 2.2835	Table B2-3	
	50 1.9685	58 2.2835	20 0.787	—	DL 50 20	—	43.0 8320	105 20900	16.8	0.077 0.170	50.000 1.9685	49.989 1.9681	58.019 2.2842	58.000 2.2835	Table B2-3	IM 45 50 20,4
	50 1.9685	58 2.2835	20 0.787	17.7 0.697	—	DLF 50 20	43.0 8320	105 20900	16.8	0.091 0.201	50.000 1.9685	49.989 1.9681	58.019 2.2842	58.000 2.2835	Table B2-3	IM 45 50 20,4
55 2.1654	55 2.1654	63 2.4803	20 0.787	—	DL 55 20	—	46.0 8880	115 22900	18.3	0.086 0.190	55.000 2.1654	54.987 2.1648	63.019 2.4811	63.000 2.4803	Table B2-3	IM 50 55 20,4
	55 2.1654	63 2.4803	20 0.787	17.7 0.697	—	DLF 55 20	46.0 8880	115 22900	18.3	0.102 0.225	55.000 2.1654	54.987 2.1648	63.019 2.4811	63.000 2.4803	Table B2-3	IM 50 55 20,4

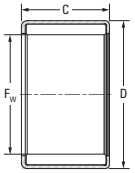
Note) · For information on the speed ratings, contact JTEKT.

DRAWN CUP NEEDLE ROLLER BEARINGS FULL COMPLEMENT OPEN ENDS

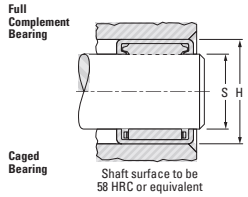
METRIC SERIES
BM, BHM, YM SERIES



BM, BHM



YM



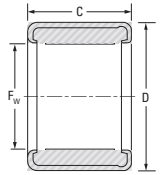
Shaft Dia.	F_w	D	C +0 -0.3 / +0.000 -0.012	$C_{3\,min.}$	Bearing Designation: Open Ends	Load Ratings: Dynamic C	Load Ratings: Static C_0	Fatigue Load Limit C_u	Approx. Wt.	Mounting Dimensions: Shaft (h5) Max.	Shaft (h5) Min.	Housing (H6) Max.	Housing (H6) Min.	Inspection gage	Mounting inner ring (pages B-2-43 to B-2-45)
mm in	mm in	mm in	mm in	mm in		kN lbf		kN	kg lbs	mm in	mm in	mm in	mm in		
3.5 0.1378	3.5	8	11	—	YM040811A	4.50 1010	4.20 940	0.62	0.003	3.500	3.495	8.009	8.000	Table B2-4	—
6.13 0.2413	6.13	11	9.7	—	6YM1110BM	5.20 1170	5.80 1300	0.88	0.004	6.130	6.124	11.011	11.000	Table B2-4	—
8 0.3150	8	12	10	—	YM081210	6.70 1510	8.80 1980	1.35	0.004	8.000	7.994	12.011	12.000	Table B2-4	—
	8	13	10	—	YM081310AM	6.20 1390	7.70 1730	1.15	0.006	8.000	7.994	13.011	13.000	Table B2-4	—
10 0.3937	10	14	10	—	10BM1410	7.20 1620	9.50 2140	1.45	0.004	10.000	9.994	14.011	14.000	Table B2-4	—
12 0.4724	12	18	12	—	12BM1812	10.7 2410	12.8 2880	1.90	0.010	12.000	11.992	18.011	18.000	Table B2-4	—
14 0.5512	14	20	12	—	14BM2012	11.6 2610	14.8 3330	2.25	0.011	14.000	13.992	20.013	20.000	Table B2-4	—
15 0.5906	15	21	10	—	15BM2110	9.75 2190	12.0 2700	1.85	0.009	15.000	14.992	21.013	21.000	Table B2-4	—
	15	21	12	—	15BM2112	12.3 2770	16.1 3620	2.45	0.012	15.000	14.992	21.013	21.000	Table B2-4	—
	15	21	16	—	15BM2116	16.9 3800	24.4 5490	3.70	0.016	15.000	14.992	21.013	21.000	Table B2-4	—
16 0.6299	16	22	12	—	16BM2212	12.9 2900	17.3 3890	2.65	0.012	16.000	15.992	22.013	22.000	Table B2-4	—
17 0.6693	17	23	12	—	17BM2312	13.0 2920	18.2 4090	2.70	0.013	17.000	16.992	23.013	23.000	Table B2-4	—
	17	24	12	—	YM172412-1	16.3 3660	21.5 4830	3.25	0.016	17.000	16.992	24.013	24.000	Table B2-4	
	17	24	17	—	BM172417-1	20.1 4520	28.2 6340	4.30	0.023	17.000	16.992	24.013	24.000	Table B2-4	—
	17	24	20	—	BHM1720A	23.9 5370	35.1 7890	5.55	0.026	17.000	16.992	24.013	24.000	Table B2-4	—
	17	24	25	—	BHM1725	29.9 6720	46.9 10540	7.30	0.034	17.000	16.992	24.013	24.000	Table B2-4	—
18 0.7087	18	24	16	—	18BM2416	18.9 4250	29.4 6610	4.45	0.018	18.000	17.992	24.013	24.000	Table B2-4	—
20 0.7874	20	26	14	—	YM202614	19.0 4270	31.4 7060	4.75	0.019	20.000	19.991	26.013	26.000	Table B2-4	—
	20	26	16	—	20BM2616	18.7 4200	31.7 7130	4.85	0.021	20.000	19.991	26.013	26.000	Table B2-4	—

Note) · For information on the speed ratings, contact JTEKT.

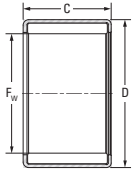
Continued on next page.

DRAWN CUP NEEDLE ROLLER BEARINGS FULL COMPLEMENT OPEN ENDS

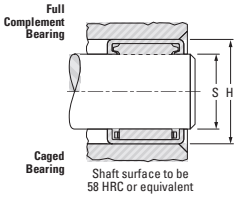
METRIC SERIES
BM, BHM, YM SERIES



BM, BHM



YM

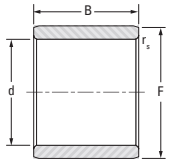


Shaft Dia.	F_w	D	C +0 -0.3 (+0.000 -0.012)	$C_{3\,min.}$	Bearing Designation Open Ends	Load Ratings Dynamic C	Load Ratings Static C_0	Fatigue Load Limit C_u	Approx. Wt.	Mounting Dimensions Shaft (h5) Max.	Shaft (h5) Min.	Housing (H6) Max.	Housing (H6) Min.	Inspection gage	Mounting inner ring (pages B-2-43 to B-2-45)
mm in	mm in	mm in	mm in	mm in		kN lbf		kN	kg lbs	mm in	mm in	mm in	mm in		
20 0.7874	20	26	20	—	20BM2620	23.6 5310	42.7 9600	6.70	0.026	20.000	19.991	26.013	26.000	Table B2-4	—
	20	27	15	—	BM2015	19.6 4410	28.0 6290	4.25	0.022	20.000	19.991	27.013	27.000	Table B2-4	—
	20	27	26	—	BM2026	34.7 7800	58.3 13110	9.10	0.040	20.000	19.991	27.013	27.000	Table B2-4	—
21 0.8268	21	27	20	—	21YM2720J	25.6 5750	47.6 10700	7.45	0.029	21.000	20.991	27.013	27.000	Table B2-4	—
22 0.8661	22	29	25	—	BM222925	33.5 7530	60.1 13510	9.40	0.043	22.000	21.991	29.013	29.000	Table B2-4	—
25 0.9843	25	32	16	—	BM2516	23.6 5310	38.3 8610	5.85	0.028	25.000	24.991	32.016	32.000	Table B2-4	—
	25	32	20	—	BM2520	30.0 6740	52.0 11690	8.15	0.036	25.000	24.991	32.016	32.000	Table B2-4	—
	25	32	26	—	BM2526	38.9 8740	72.7 16340	11.4	0.048	25.000	24.991	32.016	32.000	Table B2-4	—
	25	33	25	—	BHM2525	39.3 8830	66.6 14970	10.4	0.053	25.000	24.991	33.016	33.000	Table B2-4	—
28 1.1024	28	34	17	—	BM2817	26.0 5840	50.0 11240	7.80	0.029	28.000	27.991	34.016	34.000	Table B2-4	—
	28	34	24	—	BM2824	36.3 8160	77.1 17330	12.1	0.042	28.000	27.991	34.016	34.000	Table B2-4	
	28	37	30	—	28BHM3730	54.8 12320	95.1 21380	14.9	0.080	28.000	27.991	37.016	37.000	Table B2-4	—
	28	39	30	—	BM283930A	55.8 12540	86.3 19400	13.5	0.101	28.000	27.991	39.016	39.000	Table B2-4	—
30 1.1811	30	37	20	—	30BM3720	33.6 7550	62.9 14140	10.0	0.042	30.000	29.991	37.016	37.000	Table B2-4	—
	30	37	26	—	30BM3726	43.6 9800	87.7 19710	13.7	0.056	30.000	29.991	37.016	37.000	Table B2-4	—
34 1.3386	34	42	25	—	34YM4225L	46.3 10410	94.1 21150	14.7	0.075	34.000	33.989	42.016	42.000	Table B2-4	—
38 1.4961	38	48	20	—	YM3820PL	48.1 10810	83.3 18730	13.3	0.082	38.000	37.989	48.016	48.000	Table B2-4	—
40 1.5748	40	53	20	—	YM405320JM	59.6 13400	89.9 20210	14.4	0.116	40.000	39.989	53.019	53.000	Table B2-4	—

Note) · For information on the speed ratings, contact JTEKT.

INNER RINGS FOR FULL COMPLEMENT DRAWN CUP NEEDLE ROLLER BEARINGS

METRIC SERIES



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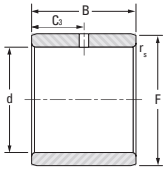

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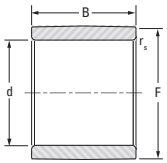


IM…R6

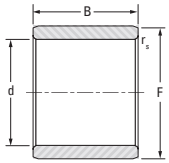
Shaft Dia.	d	F (1)	B	Hole Location C_3	$r_{s\,min.}$	Inner Ring Designation	Approx. Wt.
mm in	mm in	mm in	mm in	mm in	mm in		kg lbs
8 0.3150	8 0.3150	12 0.4724	12.4 0.488		0.3 0.01	IM 8 12 12,4	0.006 0.013
9 0.3543	9 0.3543	13 0.5118	12.4 0.488		0.3 0.01	IM 9 13 12,4	0.006 0.013
	9 0.3543	13 0.5118	12.4 0.488		0.3 0.01	IM 9 13 12,4 R6	0.006 0.013
10 0.3937	10 0.3937	14 0.5512	12.4 0.488		0.3 0.01	IM 10 14 12,4	0.007 0.015
	10 0.3937	14 0.5512	16.4 0.646		0.3 0.01	IM 10 14 16,4	0.009 0.020
11 0.4331	11 0.4331	15 0.5906	12.4 0.488		0.3 0.01	IM 11 15 12,4	0.008 0.018
12 0.4724	12 0.4724	15 0.5906	12.4 0.488		0.2 0.01	IM 12 15 12,4	0.006 0.013
	12 0.4724	16 0.6299	12.4 0.488		0.2 0.01	IM 12 16 12,4	0.008 0.018
	12 0.4724	16 0.6299	12.4 0.488		0.3 0.01	IM 12 16 12,4 R6	0.008 0.018
	12 0.4724	16 0.6299	12.4 0.488	6.2 0.24	0.3 0.01	IMC 12 16 12,4	0.008 0.018
13 0.5118	13 0.5118	17 0.6693	12.4 0.488		0.3 0.01	IM 13 17 12,4	0.009 0.020
	13 0.5118	18 0.7087	12.4 0.488		0.35 0.014	IM 13 18 12,4	0.011 0.025
	13 0.5118	18 0.7087	12.4 0.488		0.35 0.014	IM 13 18 12,4 R6	0.011 0.025
	13 0.5118	18 0.7087	16.4 0.646		0.35 0.014	IM 13 18 16,4	0.015 0.033
15 0.5906	15 0.5906	20 0.7874	12.4 0.488		0.35 0.014	IM 15 20 12,4	0.013 0.028
	15 0.5906	20 0.7874	16.4 0.646		0.35 0.014	IM 15 20 16,4	0.017 0.037
	17 0.6693	22 0.8661	16.4 0.646		0.35 0.014	IM 17 22 16,4	0.019 0.041
	17 0.6693	22 0.8661	16.4 0.646		0.35 0.014	IM 17 22 16,4 R6	0.019 0.041
17 0.6693	17 0.6693	22 0.8661	16.4 0.646	8.2 0.32	0.35 0.014	IMC 17 22 16,4	0.019 0.041
20 0.7874	20 0.7874	25 0.9843	16.4 0.646		0.35 0.014	IM 20 25 16,4	0.022 0.047
	20 0.7874	25 0.9843	16.4 0.646		0.35 0.014	IM 20 25 16,4 R6	0.022 0.047
	20 0.7874	25 0.9843	16.4 0.646	8.2 0.32	0.35 0.014	IMC 20 25 16,4	0.022 0.047
	20 0.7874	25 0.9843	20.4 0.803		0.35 0.014	IM 20 25 20,4	0.027 0.060

(1) Call for O.D. tolerance

Continued on next page.

INNER RINGS FOR FULL COMPLEMENT DRAWN CUP NEEDLE ROLLER BEARINGS

METRIC SERIES



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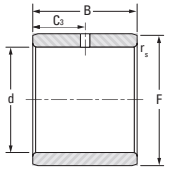
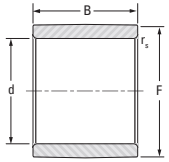


IMC



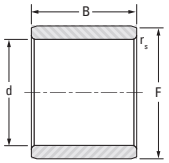
IM…R6

Shaft Dia.	d	F (1)	B	Hole Location C_3	$r_{s\ min.}$	Inner Ring Designation	Approx. Wt.
mm in	mm in	mm in	mm in	mm in	mm in		kg lbs
20 0.7874	**20** 0.7874	**25** 0.9843	**20.4** 0.803	**10.2** 0.40	**0.35** 0.014	IMC 20 25 20,4	**0.027** 0.060
	20 0.7874	**25** 0.9843	**25.0** 0.984		**0.35** 0.014	IM 20 25 25	**0.033** 0.073
23 0.9055	**23** 0.9055	**28** 1.1024	**20.4** 0.803		**0.35** 0.014	IM 23 28 20,4	**0.031** 0.067
25 0.9843	**25** 0.9843	**30** 1.1811	**16.4** 0.646		**0.35** 0.014	IM 25 30 16,4	**0.027** 0.060
	25 0.9843	**30** 1.1811	**16.4** 0.646		**0.35** 0.014	IM 25 30 16,4 R6	**0.027** 0.060
	25 0.9843	**30** 1.1811	**16.4** 0.646	**8.2** 0.32	**0.35** 0.014	IMC 25 30 16,4	**0.027** 0.058
	25 0.9843	**30** 1.1811	**20.4** 0.803		**0.35** 0.014	IM 25 30 20,4	**0.033** 0.073
	25 0.9843	**30** 1.1811	**20.4** 0.803	**10.2** 0.40	**0.35** 0.014	IMC 25 30 20,4	**0.033** 0.073
	25 0.9843	**30** 1.1811	**25** 0.984		**0.35** 0.014	IM 25 30 25	**0.040** 0.088
30 1.1811	**30** 1.1811	**35** 1.3780	**16.4** 0.646		**0.35** 0.014	IM 30 35 16,4	**0.031** 0.068
	30 1.1811	**35** 1.3780	**16.4** 0.646		**0.35** 0.014	IM 30 35 16,4 R6	**0.031** 0.068
	30 1.1811	**35** 1.3780	**16.4** 0.646	**8.2** 0.32	**0.35** 0.014	IMC 30 35 16,4	**0.031** 0.068
	30 1.1811	**35** 1.3780	**20.4** 0.803		**0.35** 0.014	IM 30 35 20,4	**0.039** 0.086
	30 1.1811	**35** 1.3780	**20.4** 0.803		**0.35** 0.014	IM 30 35 20,4 R6	**0.039** 0.086
	30 1.1811	**35** 1.3780	**20.4** 0.803	**10.2** 0.40	**0.35** 0.014	IMC 30 35 20,4	**0.039** 0.086
	30 1.1811	**35** 1.3780	**25.0** 0.984		**0.35** 0.014	IM 30 35 25	**0.048** 0.106
35 1.3780	**35** 1.3780	**40** 1.5748	**16.4** 0.646		**0.35** 0.014	IM 35 40 16,4	**0.036** 0.079
	35 1.3780	**40** 1.5748	**16.4** 0.646		**0.35** 0.014	IM 35 40 16,4 R6	**0.036** 0.079
	35 1.3780	**40** 1.5748	**20.4** 0.803		**0.35** 0.014	IM 35 40 20,4	**0.045** 0.099
	35 1.3780	**40** 1.5748	**20.4** 0.803		**0.35** 0.014	IM 35 40 20,4 R6	**0.045** 0.099
	35 1.3780	**40** 1.5748	**20.4** 0.803	**10.2** 0.40	**0.35** 0.014	IMC 35 40 20,4	**0.045** 0.099
	35 1.3780	**40** 1.5748	**25** 0.984		**0.35** 0.014	IM 35 40 25	**0.055** 0.121
40 1.5748	**40** 1.5748	**44** 1.7323	**16.4** 0.646		**0.3** 0.01	IM 40 44 16,4	**0.032** 0.071

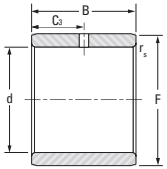
(1) Call for O.D. tolerance

INNER RINGS FOR FULL COMPLEMENT DRAWN CUP NEEDLE ROLLER BEARINGS

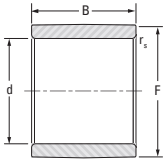
METRIC SERIES



IM



IMC



IM…R6

Shaft Dia.	d	F (1)	B	Hole Location C_3	$r_{s\ min.}$	Inner Ring Designation	Approx. Wt.
mm in	mm in	mm in	mm in	mm in	mm in		kg lbs
40 1.5748	**40** 1.5748	**44** 1.7323	**16.4** 0.646		**0.3** 0.01	IM 40 44 16,4 R6	**0.032** 0.071
	40 1.5748	**44** 1.7323	**16.4** 0.646	**8.2** 0.32	**0.3** 0.01	IMC 40 44 16,4	**0.032** 0.071
	40 1.5748	**45** 1.7717	**20.4** 0.803		**0.35** 0.014	IM 40 45 20,4	**0.051** 0.112
	40 1.5748	**44** 1.7323	**20.4** 0.803	**10.2** 0.40	**0.35** 0.014	IMC 40 45 20,4	**0.051** 0.112
45 1.7717	**45** 1.7717	**50** 1.9685	**20.4** 0.803		**0.65** 0.026	IM 45 50 20,4	**0.056** 0.123
	45 1.7717	**50** 1.9685	**20.4** 0.803		**0.65** 0.026	IM 45 50 20,4 R6	**0.056** 0.123
	45 1.7717	**50** 1.9685	**25** 0.984		**0.65** 0.026	IM 45 50 25	**0.069** 0.152
	45 1.7717	**50** 1.9685	**25** 0.984		**0.65** 0.026	IM 45 50 25 R6	**0.069** 0.152
50 1.9685	**50** 1.9685	**55** 2.1654	**20.4** 0.803		**0.65** 0.026	IM 50 55 20,4 R6	**0.062** 0.137
	50 1.9685	**55** 2.1654	**20.4** 0.803		**0.65** 0.026	IM 50 55 20,4	**0.062** 0.137

(1) Call for O.D. tolerance

DRAWN CUP NEEDLE ROLLER BEARINGS

INCH SERIES

When a rolling bearing is needed for a compact and economical design, where it is not practical to harden and grind the housing bore, or where the housing materials are of low rigidity such as cast iron, aluminum or even plastics – drawn cup needle roller bearings should be considered.

REFERENCE STANDARDS

- **ANSI/ABMA 18.2** – needle roller bearings - radial, inch design.
- **JIS B 1536** – rolling bearings – needle roller bearings – boundary dimensions and tolerances.

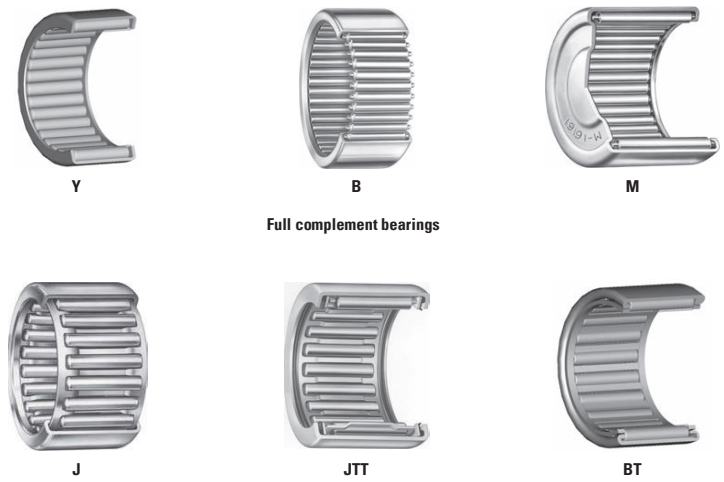


Fig. B2-9. Types of inch series drawn cup needle roller bearings

CONSTRUCTION

FULL COMPLEMENT BEARINGS

The original drawn cup needle roller bearing employs a full complement of needle rollers. The full complement drawn cup bearing combines maximum load-carrying capability with the advantages of the drawn outer ring.

The inward turned lips of the cup are used to mechanically retain the full complement of needle rollers, providing their positive radial retention – even though it may be necessary to remove the shaft repeatedly during servicing of the mechanism employing the bearing.

Fig. B2-10. Full complement bearing

CAGED BEARINGS

The one-piece steel cage, used in most caged drawn cup bearings, is designed to provide rigidity and minimize wear. This cage design separates the roller guiding and roller retainment functions. The portions of the cage that retain the rollers cannot contact the rollers while the bearing is operating. Thus, there is no wear which might affect roller retention.

The cage contacts the rollers only near their ends at the roller pitch line, so accurate guidance is achieved with least effort. Pitch line guidance at the ends of the rollers prevents skewing and assures roller stability, with little stress on the cage itself. The design minimizes the contact area and force required for roller guidance, and thus minimizes drag between cage and rollers.

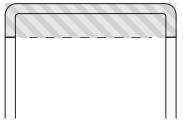


Fig. B2-11. Caged bearing

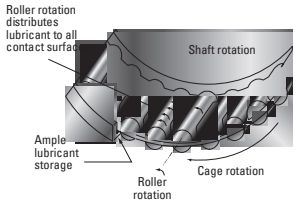


Fig. B2-12. Cage design

The same design feature that assures no contact between roller retention bars and rollers while the bearing is operating, also provides ample clearance along the length of the roller to enhance the circulation of lubricant.

There are bearings with other cage designs. Bearings with engineered polymer cages are for use where operating conditions permit. Before applying bearings with engineered polymer cages, please consult your representative.

SEALED BEARINGS

Drawn cup caged needle roller bearings are offered with integral seals. The tables of dimensions on pages B-2-72 and B-2-73 indicate those sizes available with lip contact seals. The seal lip design achieves a light and constant contact with the shaft throughout the range of mounting bearing clearances thereby ensuring positive sealing and low frictional drag.

Sealed drawn cup bearings are intended to retain grease or non-pressurized oil within a bearing while also preventing contaminants from entering the raceway area.

Details of shaft design for sealed bearings are given in the engineering section.

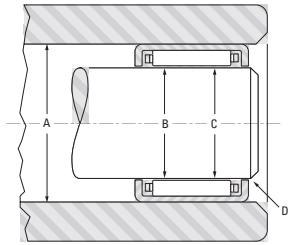
The standard lip contact seals are compatible with common lubricating oils and petroleum based fuels. But they are adversely affected by certain fire-resistant hydraulic fluids and most common solvents.

If the operating temperature must be outside of the specified range, or if the seals are exposed to unusual fluids, please consult your representative.

DIMENSIONAL ACCURACY AND MOUNTING DIMENSIONS

MANUFACTURING TOLERANCES AND RESULTING CLEARANCES

Reference: J-1616 bearing



A. Housing bore tolerance 0.025 mm (0.0010in)
B. Manufacturing tolerance for bearing 0.023 mm (0.0009 in)
C. Shaft diameter tolerance 0.013 mm (0.0005 in)
D. Min. Initial radial clearance 0.013 mm (0.0005 in)

Fig. B2-13. Manufacturing tolerances and resulting clearances

BEARING MOUNTING FITS AND RADIAL INTERNAL CLEARANCE

Drawn cup bearings are manufactured to a degree of precision that will satisfy the radial clearance requirements of most applications. The total radial clearance of an installed drawn cup bearing results from the buildup of manufacturing tolerances of the housing bore, inner raceway O.D., and the bearing – as well as the minimum radial clearance required for the application.

For bearings of nominal inch dimensions, the suggested mounting dimensions will provide correct running clearance for most applications. Closer control of radial clearance would be governed by the user's capability of holding housing and shaft raceway dimensional tolerances tighter than the limits shown in the bearing tables.

The drawing illustrates the manufacturing tolerances and resulting clearances applying to medium size drawn cup bearings, in rotating applications, when using the suggested tabulated mounting dimensions.

Radial clearance in a mounted bearing may be more closely controlled by reducing the manufacturing tolerances of the housing bore and inner raceway diameter. Where extremely close control of radial clearance is required for bearings of nominal inch dimensions, extra-precision full complement bearings are available (see page B-2-63).

TOLERANCES FOR HOUSING MATERIALS OF LOW RIGIDITY

For housing materials of low rigidity, or steel housings of small section, it is suggested that for initial trial the housing bore diameters given in the bearing tables be reduced by the amounts shown in Table B2-5. To maintain normal radial internal clearance, the inner raceway diameter tolerance given in the bearing tables should be used.

Table B2-5. Low Rigidity Housing Bore

Nom. housing bore				Subtract	
Over	Incl.	Over	Incl.		
mm		in		mm	in
0.0	**9.5**	0.00	0.38	**0.010**	0.0004
9.5	**25.4**	0.38	1.00	**0.015**	0.0006
25.4	**50.8**	1.00	2.00	**0.025**	0.0010
50.8	**76.2**	2.00	3.00	**0.030**	0.0012
76.2	**152.4**	3.00	6.00	**0.036**	0.0014

OUTER RING ROTATION

For applications where the outer ring rotates with respect to the load, it is suggested that both the housing bore and inner raceway diameter be reduced. Bearings of nominal inch dimensions should have the housing bore and inner raceway diameters reduced by 0.013 mm (0.0005 in)

OSCILLATING MOTION

Applications involving oscillating motion often require reduced radial clearances. This reduction is accomplished by increasing the shaft raceway diameters as shown in Table B2-6.

Table B2-6. Nominal inch bearing oscillating shaft size

Shaft size		Add	
mm	in	mm	in
2.38 to 4.76	0.094 to 0.188	**0.008**	0.0003
6.35 to 47.62	0.250 to 1.875	**0.013**	0.0005
50.8 to 139.70	2.000 to 5.500	**0.015**	0.0006

For information on fits to housing materials of low rigidity and on fits during outer ring rotation and during oscillation rotation, contact JTEKT.

INNER RINGS

Where it becomes impractical to meet the shaft raceway design requirements (hardness, case depth, surface finish, etc.) outlined in the engineering section, standard inner rings for drawn cup bearings are available. These are tabulated on pages B-2-74 to B-2-76 of the drawn cup section.

Inner rings for drawn cup bearings are designed to be a loose transition fit on the shaft and should be clamped against a shoulder. If a tight transition fit must be used to keep the inner ring from rotating relative to the shaft, the inner ring O.D., as mounted, must not exceed the raceway diameters required by the drawn cup bearing for the particular application.

LOAD RATING FACTORS

Dynamic Loads

Drawn cup needle roller bearings can accommodate only radial loads.

$P = F_r$

P = The maximum dynamic radial load that may be applied to a drawn cup bearing based on the dynamic load rating, C_r given in the bearing tables. This load should be $\leq C_r/3$.

Static Loads

$$f_0 = \frac{C_0}{P_0}$$

f_0 = static load safety factor

C_0 = basic static load rating

P_0 = maximum applied static load

To ensure satisfactory operation of drawn cup needle roller bearings under all types of conditions the static load safety factor f_0 should be ≥ 3.

INSPECTION PROCEDURES

Although the bearing cup (outer ring) is accurately drawn from strip steel it may go out of round during heat treatment. When the bearing is pressed into a true, round housing or ring gage of correct size and wall thickness, it becomes round and is sized properly. For this reason, it is incorrect to inspect an unmounted drawn cup bearing by measuring the O.D. The correct method for inspecting the bearing size is to:

1. Press the bearing into a ring gage of proper size.
2. Plug the bearing bore with the appropriate "go" and "no go" gages.

Tables B2-7 and B2-8 starting on page B-2-50 provide the correct ring and plug gage diameters for inspecting drawn cup needle roller bearings.

When the letter **H** appears in the columns headed "Bearing Bore Designation" and "Nominal Shaft Diameter" in Table B2-7, the gage sizes listed are for the larger cross section bearings, which include **H** in their bearing designation prefix.

Example

Find the ring gage and plug gage dimensions for a BH-68 bearing.

The nominal bore diameter (F_w) for this bearing, as shown in the table of dimensions on page B-2-55, is 9.525 mm (0.3750 in). Since the letter H appears in the bearing designation, the following information will be found opposite H6 9.525 mm (0.3750 in) in Table B2-7 on page B-2-50.

	in
ring gage	0.6255
diameter under needle rollers, min.	0.3765
diameter under needle rollers, max.	0.3774

The "go" plug gage is the same size as the minimum needle roller complement bore diameter and the "no go" plug gage size is 0.002 mm (0.0001 in) larger than the maximum bore diameter. Therefore the correct ring and plug gage dimensions are:

	in
ring gage	0.6255
plug gage, "go"	0.3765
plug gage, "no go"	0.3775

These same gage dimensions also apply to JH-68.

Table B2-7 applies to the B, M, J and JTT series. Table B2-8 applies to the BT.

B

Table B2-7. Ring and plug gage dimensions

Bearing bore designation	Nominal shaft diameter	Nominal. bore diameter	Ring gage	Needle roller complement bore diameter	
				Max.	Min.
	mm in	mm in	mm in	mm in	mm in
2	**3.175** 1/8	**3.175** 0.1250	**6.363** 0.2505	**3.218** 0.1267	**3.195** 0.1258
2 1/2	**3.970** 5/32	**3.967** 0.1562	**7.155** 0.2817	**4.013** 0.1580	**3.99** 0.1571
3	**4.763** 3/16	**4.763** 0.1875	**8.730** 0.3437	**4.806** 0.1892	**4.783** 0.1883
4	**6.350** 1/4	**6.350** 0.2500	**11.125** 0.4380	**6.411** 0.2524	**6.388** 0.2515
5	**7.938** 5/16	**7.938** 0.3125	**12.713** 0.5005	**7.998** 0.3149	**7.976** 0.3140
H 5	**H 7.938** H 5/16	**7.938** 0.3125	**14.300** 0.5630	**7.998** 0.3149	**7.976** 0.3140
6	**9.525** 3/8	**9.525** 0.3750	**14.300** 0.5630	**9.586** 0.3774	**9.563** 0.3765
H 6	**H 9.525** H 3/8	**9.525** 0.3750	**15.888** 0.6255	**9.586** 0.3774	**9.563** 0.3765
7	**11.113** 7/16	**11.113** 0.4375	**15.888** 0.6255	**11.174** 0.4399	**11.151** 0.4390
H 7	**H 11.113** H 7/16	**11.113** 0.4375	**17.475** 0.6880	**11.174** 0.4399	**11.151** 0.4390
8	**12.700** 1/2	**12.700** 0.5000	**17.475** 0.6880	**12.761** 0.5024	**12.738** 0.5015
H 8	**H12.700** H 1/2	**12.700** 0.5000	**19.063** 0.7505	**12.761** 0.5024	**12.738** 0.5015
9	**14.288** 9/16	**14.288** 0.5625	**19.063** 0.7505	**14.349** 0.5649	**14.326** 0.5640
H 9	**H 14.288** H 9/16	**14.288** 0.5625	**20.650** 0.8130	**14.349** 0.5649	**14.326** 0.5640
10	**15.875** 5/8	**15.875** 0.6250	**20.650** 0.8130	**14.349** 0.6274	**15.913** 0.6265
H 10	**H 15.875** H 5/8	**15.875** 0.6250	**22.238** 0.8755	**14.349** 0.6274	**15.913** 0.6265
11	**17.463** 11/16	**17.463** 0.6875	**22.238** 0.8755	**17.524** 0.6899	**17.501** 0.6890
H 11	**H 17.463** H 11/16	**17.463** 0.6875	**23.825** 0.9380	**17.524** 0.6899	**17.501** 0.6890
12	**19.050** 3/4	**19.050** 0.7500	**25.387** 0.9995	**19.086** 0.7514	**19.063** 0.7505
H 12	**H 19.050** H 3/4	**19.050** 0.7500	**26.975** 1.0620	**19.086** 0.7514	**19.063** 0.7505
13	**20.638** 13/16	**20.638** 0.8125	**26.975** 1.0620	**20.673** 0.8139	**20.650** 0.8130
H 13	**H 20.638** H 13/16	**20.638** 0.8125	**28.562** 1.1245	**20.673** 0.8139	**20.650** 0.8130
14	**22.225** 7/8	**22.225** 0.8750	**28.562** 1.1245	**22.261** 0.8764	**22.238** 0.8755
H 14	**H 22.225** H 7/8	**22.225** 0.8750	**30.150** 1.1870	**22.261** 0.8764	**22.238** 0.8755

Bearing bore designation	Nominal shaft diameter	Nominal. bore diameter	Ring gage	Needle roller complement bore diameter	
				Max.	Min.
	mm in	mm in	mm in	mm in	mm in
15	**23.813** 15/16	**23.813** 0.9375	**30.150** 1.1870	**23.848** 0.9389	**23.825** 0.9380
16	**25.400** 1	**25.400** 1.0000	**31.737** 1.2495	**25.436** 1.0014	**25.413** 1.0005
H 16	**H 25.400** H 1	**25.400** 1.0000	**33.325** 1.3120	**25.436** 1.0014	**25.413** 1.0005
17	**26.988** 1 1/16	**26.988** 1.0625	**33.325** 1.3120	**27.023** 1.0639	**27.000** 1.0630
18	**28.575** 1 1/8	**28.575** 1.1250	**34.912** 1.3745	**28.611** 1.1264	**28.588** 1.1255
H 18	**H 28.575** H 1 1/8	**28.575** 1.1250	**38.087** 1.4995	**28.611** 1.1264	**28.588** 1.1255
19	**30.163** 1 3/16	**30.163** 1.1875	**38.087** 1.4995	**30.198** 1.1889	**30.175** 1.1880
20	**31.750** 1 1/4	**31.750** 1.2500	**38.087** 1.4995	**31.786** 1.2514	**31.763** 1.2505
H 20	**H 31.750** H 1 1/4	**31.750** 1.2500	**41.262** 1.6245	**31.786** 1.2514	**31.763** 1.2505
21	**33.338** 1 5/16	**33.338** 1.3125	**41.262** 1.6245	**33.376** 1.3140	**33.350** 1.3130
22	**34.925** 1 3/8	**34.925** 1.3750	**41.262** 1.6245	**34.963** 1.3765	**34.938** 1.3755
H 22	**H 34.925** H1 3/8	**34.925** 1.3750	**44.437** 1.7495	**34.963** 1.3765	**34.938** 1.3755
24	**38.100** 1 1/2	**38.100** 1.5000	**47.612** 1.8745	**38.141** 1.5016	**38.113** 1.5005
26	**41.275** 1 5/8	**41.275** 1.6250	**50.787** 1.9995	**41.316** 1.6266	**41.288** 1.6255
28	**44.450** 1 3/4	**44.450** 1.7500	**53.962** 2.1245	**44.493** 1.7517	**44.463** 1.7505
30	**47.625** 1 7/8	**47.625** 1.8750	**57.137** 2.2495	**47.668** 1.8767	**47.638** 1.8755
32	**50.800** 2	**50.800** 2.0000	**60.312** 2.3745	**50.846** 2.0018	**50.815** 2.0006
H 33	**H 52.388** H 2 1/16	**52.388** 2.0625	**64.280** 2.5307	**52.436** 2.0644	**52.400** 2.0630
34	**53.975** 2 1/8	**53.975** 2.1250	**63.487** 2.4995	**54.026** 2.1270	**53.990** 2.1256
36	**57.150** 2 1/4	**57.150** 2.2500	**66.662** 2.6245	**57.201** 2.2520	**57.165** 2.2506
42	**66.675** 2 5/8	**66.675** 2.6250	**76.187** 2.9995	**66.736** 2.6274	**66.700** 2.6260
44	**69.850** 2 3/4	**69.850** 2.7500	**79.362** 3.1245	**69.911** 2.7524	**69.875** 2.7510
56	**88.900** 3 1/2	**88.900** 3.5000	**101.587** 3.9995	**88.961** 3.5024	**88.925** 3.5010
88	**139.700** 5 1/2	**139.700** 5.5000	**152.375** 5.9990	**139.774** 5.5029	**139.725** 5.5010

Bearing bore should be checked with "go" and "no go" plug gages. The "go" gage size is the minimum needle roller complement bore diameter. The "no go" gage size is larger than the maximum needle roller complement bore diameter by 0.0001 in

Table B2-8. Ring and plug gage dimensions[1)]

Needle roller complement bore diameter F_w nominal size	Ring gage	Plug gage	
		Go	No go
mm (in)	mm	mm	mm
4.762(3/16)	8.730	4.783	4.808
6.350(1/4)	11.125	6.388	6.413
7.938(5/16)	12.713 14.300	7.976	8.001
9.525(3/8)	14.300 15.888	9.563	9.588
11.112(7/16)	15.888 17.475	11.151	11.176
12.700(1/2)	17.475 19.063	12.738	12.763
14.288(9/16)	19.063 20.650	14.326	14.351
15.875(5/8)	20.650 22.237	15.913	15.938
17.462(11/16)	22.237 23.825	17.501	17.526
19.050(3/4)	25.387	19.063	19.088
20.638(13/16)	26.975 28.562	20.650	20.675
22.225(7/8)	28.562 30.150	22.238	22.263
23.812(15/16)	30.150	23.825	23.850
25.400(1)	31.737 33.325	25.413	25.438

Needle roller complement bore diameter F_w nominal size	Ring gage	Plug gage	
		Go	No go
mm (in)	mm	mm	mm
26.988(1 1/16)	33.325	27.000	27.025
28.575(1 1/8)	34.912 38.087	28.588	28.613
30.162(1 3/16)	38.087	30.175	30.200
31.750(1 1/4)	38.087 41.262	31.763	31.788
33.338(1 5/16)	41.262	33.350	33.378
34.925(1 3/8)	41.262 44.437	34.938	34.966
38.100(1 1/2)	47.612	38.113	38.143
41.275(1 5/8)	50.787	41.288	41.318
44.450(1 3/4)	53.962	44.463	44.496
47.625(1 7/8)	57.137	47.638	47.671
50.800(2)	60.312	50.815	50.848
52.388(2 1/16)	64.280	52.413	52.451
53.975(2 1/8)	63.487	53.990	54.028
57.150(2 1/4)	66.662	57.165	57.203
63.500(2 1/2)	73.139	63.515	63.553
66.675(2 5/8)	76.187	66.700	66.738
69.850(2 3/4)	79.362	69.875	69.913
88.900(3 1/2)	101.587	88.925	88.963

1) These values apply to the needle roller bearings of the BT series with inch nominal dimensions.

B

INSTALLATION OF DRAWN CUP NEEDLE ROLLER BEARINGS

GENERAL INSTALLATION REQUIREMENTS

- A drawn cup needle roller bearing must be pressed into its housing.
- An installation tool, similar to the ones shown, must be used in conjunction with a standard press.
- The bearing must not be hammered into its housing – even in conjunction with the proper assembly mandrel.
- The bearing must not be pressed tightly against a shoulder in the housing.
- If it is necessary to use a shouldered housing, the depth of the housing bore must be sufficient to ensure the housing shoulder fillet, and the shoulder face, clear the bearing.
- The installation tool must be coaxial with the housing bore.

INSTALLATION OF OPEN END BEARINGS

It is advisable to utilize a positive stop on the press tool to locate the bearing properly in the housing. The assembly tool should have a leader or a pilot, as shown, to aid in starting the bearing true in the housing. The ball detent shown on the drawing is used to assist in aligning the rollers of a full complement bearing during installation and to hold the bearing on the installation tool. A caged-type drawn cup bearing does not require a ball detent to align its rollers. The ball detent may still be used to hold the bearing on the installation tool or an "O" ring may be used as shown in the drawing on this page. The bearing should be installed with the marked end (the end with identification markings) against the angled shoulder of the pressing tool.

A – 0.40 mm (0.016 in) less than housing bore
B – 0.08 mm (0.003 in) less than shaft diameter
C – distance bearing will be inset into housing, minimum of 0.20 mm (0.008 in)
D – pilot length should be length of bearing less 0.80 mm (0.030 in)
E – approximately 1/2 D

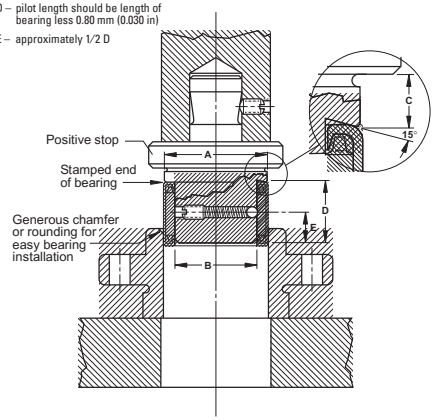


Fig. B2-14. Installation of open ends caged bearings

A – 0.40 mm (0.016 in) less than housing bore
B – 0.08 mm (0.003 in) less than shaft diameter
C – distance bearing will be inset into housing, minimum of 0.20 mm (0.008 in)
D – pilot length should be length of bearing less 0.80 mm (0.030 in)
E – approximately ½ D

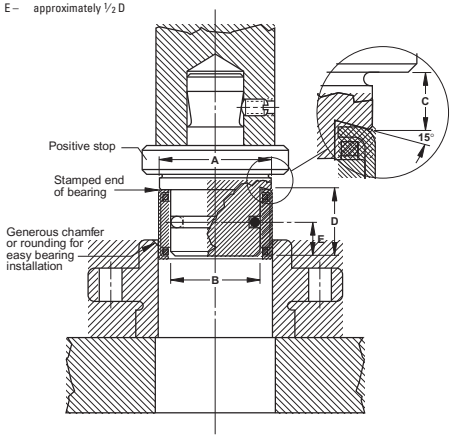


Fig. B2-15. Installation of open ends full complement bearings

INSTALLATION OF CLOSED END BEARINGS

The installation tool combines all the features of the tool used to install open end bearings. But the pilot is spring loaded and is part of the press bed.

The angled shoulder of the pressing tool should bear against the closed end, with the bearing held on the pilot, to aid in starting the bearing true in the housing.

A – 0.40 mm (0.016 in) less than housing bore
B – 0.08 mm (0.003 in) less than shaft diameter
C – distance bearing will be inset into housing, minimum of 0.20 mm (0.008 in)

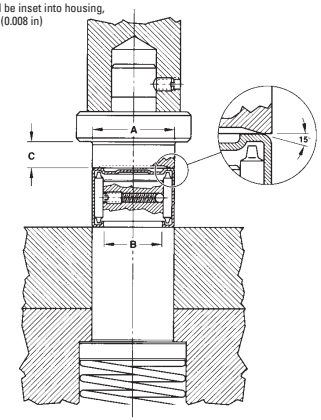


Fig. B2-16. Installation of closed end bearings

EXTRACTION OF DRAWN CUP NEEDLE ROLLER BEARINGS

The need to extract a drawn cup needle roller bearing does not arise often. Standard extractor tools may be purchased from a reputable manufacturer. Customers may produce the special extraction tools at their own facilities. After extraction, the drawn cup needle roller bearing should not be reused.

EXTRACTION FROM A STRAIGHT HOUSING

When it is necessary to extract a drawn cup needle roller bearing from a straight housing, a similar tool to the installation tool – but without the stop – may be used. To avoid damage to the bearing, pressure should be applied against the marked end of the bearing, just as it is done at installation.

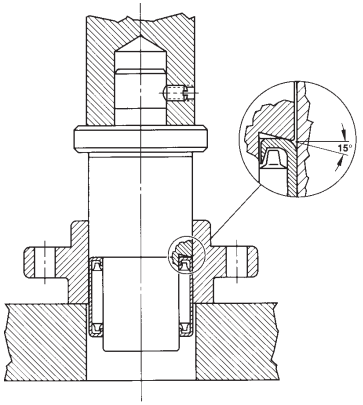


Fig. B2-17. Extraction from a straight housing

EXTRACTION FROM A SHOULDERED HOUSING

(with bearing pressed up close to the shoulder)

The tool to be used, as shown, is of a similar type described for a shouldered or dead end housing. But the rollers must first be removed from the bearing.

The four segment puller jaws are collapsed and slipped into the empty cup. The jaws are then forced outward into the cup bore, by means of the tapered expansion rod. The jaws should bear on the lip as near as possible to the cup bore. The cup is then pressed out from the top.

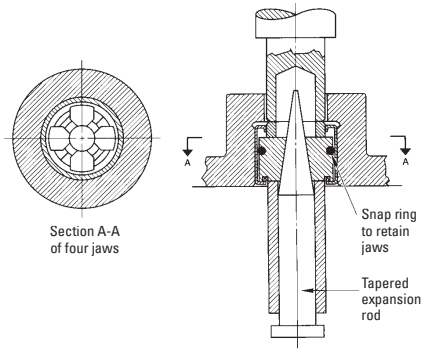


Fig. B2-18. Extraction from a shouldered housing

EXTRACTION FROM A SHOULDERED OR DEAD END HOUSING

(with space between the bearing and the housing shoulder)

Bearings may be extracted from shouldered or dead end housings with a common bearing puller tool as shown. This type of tool is slotted in two places, at right angles, to form four prongs. The four puller prongs are pressed together and inserted into the space between the end of the bearing and the shoulder. The prongs are forced outward by inserting the expansion rod, and then the bearing is extracted. Do not reuse the bearing after extraction.

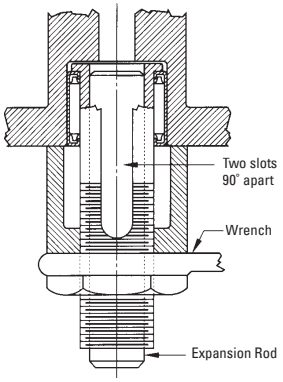
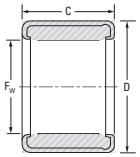


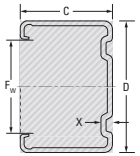
Fig. B2-19. Extraction from a shouldered or dead end housing

FULL COMPLEMENT BEARINGS
OPEN ENDS, CLOSED ONE END

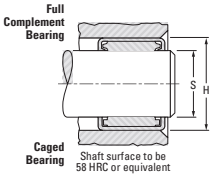
INCH SERIES
B, BH, NB, NBH, M- 1, MH- 1 SERIES



B, BH, NB, NBH



M- 1, MH- 1



Shaft Dia.	F_w	D	C +0.000 -0.012 (+0 -0.3)	$X_{max.}$	Bearing Designation		Load Ratings Dynamic	Load Ratings Static	Fatigue Load Limit C_u	Approx. Wt.		Mounting Dimensions Shaft		Mounting Dimensions Housing		Inspection gage	Mounting inner ring (pages B-2-74 to B-2-76)
					Open Ends	Closed One End	C	C_0		Open Ends	Closed One End	Max.	Min.	Max.	Min.		
in	mm in	mm in	mm in	mm in			kN lbf		kN	kg lbs		mm in	mm in	mm in	mm in		
1/8	3.175 0.1250	6.350 0.2500	6.35 0.250	—	B-24	—	1.73 390	1.65 370	0.24	0.001 0.002	—	3.175 0.1250	3.167 0.1247	6.363 0.2505	6.350 0.2500	Table B2-7	
5/32	3.970 0.1563	7.142 0.2812	6.35 0.250	—	B-2 1/2 4	—	2.00 450	2.00 450	0.31	0.001 0.002	—	3.970 0.1563	3.962 0.1560	7.155 0.2817	7.142 0.2812	Table B2-7	
	3.970 0.1563	7.142 0.2812	7.92 0.312	—	B-2 1/2 5	—	2.58 580	2.80 630	0.42	0.001 0.003	—	3.970 0.1563	3.962 0.1560	7.155 0.2817	7.142 0.2812	Table B2-7	
3/16	4.763 0.1875	8.733 0.3438	6.35 0.250	1.78 0.070	B-34	M-341	2.20 490	2.12 480	0.36	0.001 0.003	0.002 0.004	4.763 0.1875	4.755 0.1872	8.730 0.3437	8.717 0.3432	Table B2-7	
	4.763 0.1875	8.733 0.3438	9.53 0.375	1.78 0.070	B-36	M-361	3.78 850	4.23 950	0.64	0.002 0.005	0.003 0.006	4.763 0.1875	4.755 0.1872	8.730 0.3437	8.717 0.3432	Table B2-7	
1/4	6.350 0.2500	11.113 0.4375	6.35 0.250	2.03 0.080	B-44	M-441	2.74 620	2.63 590	0.45	0.002 0.005	0.003 0.006	6.350 0.2500	6.337 0.2495	11.125 0.4380	11.100 0.4370	Table B2-7	
	6.350 0.2500	11.113 0.4375	7.92 0.312	2.03 0.080	B-45	M-451	3.55 800	3.68 830	0.56	0.003 0.007	0.004 0.008	6.350 0.2500	6.337 0.2495	11.125 0.4380	11.100 0.4370	Table B2-7	
	6.350 0.2500	11.113 0.4375	9.53 0.375	—	B-46	—	4.55 1020	5.06 1140	0.77	0.004 0.008	—	6.350 0.2500	6.337 0.2495	11.125 0.4380	11.100 0.4370	Table B2-7	
	6.350 0.2500	11.113 0.4375	11.13 0.438	2.03 0.080	B-47	M-471	5.51 1240	6.46 1450	0.98	0.004 0.009	0.005 0.011	6.350 0.2500	6.337 0.2495	11.125 0.4380	11.100 0.4370	Table B2-7	
5/16	7.938 0.3125	12.700 0.5000	7.92 0.312	2.03 0.080	B-55	M-551	4.08 920	4.60 1030	0.70	0.004 0.008	0.004 0.009	7.938 0.3125	7.925 0.3120	12.713 0.5005	12.687 0.4995	Table B2-7	
	7.938 0.3125	12.700 0.5000	9.53 0.375	—	B-56	—	5.23 1180	6.33 1420	0.97	0.005 0.010	—	7.938 0.3125	7.925 0.3120	12.713 0.5005	12.687 0.4995	Table B2-7	
	7.938 0.3125	12.700 0.5000	11.13 0.438	2.03 0.080	B-57	M-571	6.33 1420	8.09 1820	1.20	0.005 0.011	0.006 0.013	7.938 0.3125	7.925 0.3120	12.713 0.5005	12.687 0.4995	Table B2-7	
	7.938 0.3125	12.700 0.5000	14.27 0.562	—	B-59	—	8.37 1880	11.6 2600	1.75	0.006 0.014	—	7.938 0.3125	7.925 0.3120	12.713 0.5005	12.687 0.4995	Table B2-7	
	7.938 0.3125	14.288 0.5625	11.13 0.438	2.29 0.090	BH-57	MH-571	7.01 1580	7.33 1650	1.10	0.007 0.016	0.008 0.018	7.938 0.3125	7.925 0.3120	14.300 0.5630	14.275 0.5620	Table B2-7	
	7.938 0.3125	14.288 0.5625	14.27 0.562	—	BH-59	—	9.46 2130	10.8 2420	1.65	0.009 0.020	—	7.938 0.3125	7.925 0.3120	14.300 0.5630	14.275 0.5620	Table B2-7	
21/64	8.331 0.3280	14.288 0.5625	12.70 0.500	—	NB-3	—	8.10 1820	9.56 2150	1.45	0.008 0.018	—	8.331 0.3280	8.319 0.3275	14.300 0.5630	14.275 0.5620	Table B2-7	
3/8	9.525 0.3750	14.288 0.5625	7.92 0.312	2.03 0.080	B-65	M-651	4.55 1020	5.53 1240	0.84	0.004 0.009	0.005 0.010	9.525 0.3750	9.512 0.3745	14.300 0.5630	14.275 0.5620	Table B2-7	IRA-3
	9.525 0.3750	14.288 0.5625	9.53 0.375	2.03 0.080	B-66	M-661	5.83 1310	7.61 1710	1.15	0.005 0.011	0.005 0.012	9.525 0.3750	9.512 0.3745	14.300 0.5630	14.275 0.5620	Table B2-7	IRA-3
	9.525 0.3750	14.288 0.5625	11.13 0.438	—	B-67	—	7.06 1590	9.72 2190	1.45	0.006 0.013	—	9.525 0.3750	9.512 0.3745	14.300 0.5630	14.275 0.5620	Table B2-7	IRA-3

Note) · For information on the speed ratings, contact JTEKT.

(1) IRA inner ring provides additional length if required.

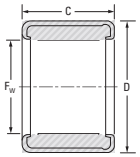
Shaft Dia.	F_w	D	C +0.000 +0.012 (+0 -0.3)	$X_{max.}$	Bearing Designation		Load Ratings Dynamic	Load Ratings Static	Fatigue Load Limit C_u	Approx. Wt.		Mounting Dimensions Shaft		Mounting Dimensions Housing		Inspection gage	Mounting inner ring (pages B-2-74 to B-2-76)
					Open Ends	Closed One End	C	C_0		Open Ends	Closed One End	Max.	Min.	Max.	Min.		
in	mm in	mm in	mm in	mm in			kN lbf		kN	kg lbs		mm in	mm in	mm in	mm in		
3/8	9.525 0.3750	14.288 0.5625	12.70 0.500	2.03 0.080	B-68	M-681	8.21 1850	11.8 2650	1.80	0.007 0.015	0.008 0.017	9.525 0.3750	9.512 0.3745	14.300 0.5630	14.275 0.5620	Table B2-7	IRA-3
	9.525 0.3750	14.288 0.5625	14.27 0.562	—	B-69	—	9.33 2100	13.9 3130	2.10	0.007 0.016	—	9.525 0.3750	9.512 0.3745	14.300 0.5630	14.275 0.5620	Table B2-7	
	9.525 0.3750	14.288 0.5625	15.88 0.625	2.03 0.080	B-610	M-6101	10.4 2340	16.0 3590	2.40	0.008 0.018	0.010 0.021	9.525 0.3750	9.512 0.3745	14.300 0.5630	14.275 0.5620	Table B2-7	
	9.525 0.3750	15.875 0.6250	12.70 0.500	—	BH-68	—	9.35 2100	10.9 2460	1.65	0.010 0.021	—	9.525 0.3750	9.512 0.3745	15.888 0.6255	15.862 0.6245	Table B2-7	IRA-3
7/16	11.113 0.4375	15.875 0.6250	9.53 0.375	—	B-76	—	6.37 1430	8.88 2000	1.35	0.005 0.012	—	11.113 0.4375	11.100 0.4370	15.888 0.6255	15.862 0.6245	Table B2-7	IRA-4
	11.113 0.4375	15.875 0.6250	11.13 0.438	—	B-77	—	7.71 1730	11.3 2550	1.70	0.007 0.015	—	11.113 0.4375	11.100 0.4370	15.888 0.6255	15.862 0.6245	Table B2-7	IRA-4
	11.113 0.4375	15.875 0.6250	12.70 0.500	2.03 0.080	B-78	M-781	8.97 2020	13.8 3100	2.10	0.008 0.017	0.009 0.019	11.113 0.4375	11.100 0.4370	15.888 0.6255	15.862 0.6245	Table B2-7	IRA-4
	11.113 0.4375	15.875 0.6250	15.88 0.625	—	B-710	—	11.4 2560	18.7 4200	2.80	0.010 0.021	—	11.113 0.4375	11.100 0.4370	15.888 0.6255	15.862 0.6245	Table B2-7	
	11.113 0.4375	17.463 0.6875	12.70 0.500	—	BH-78	—	10.3 2320	12.8 2870	1.95	0.010 0.023	—	11.113 0.4375	11.100 0.4370	17.475 0.6880	17.450 0.6870	Table B2-7	IRA-4
0.439	11.151 0.439	15.908 0.6263	12.70 0.500	—	NB-38		9.00 2020	13.8 3100	2.10	0.032 0.071	—	11.151 0.4390	11.143 0.4387	15.908 0.6263	15.9 0.6260	Table B2-7	
1/2	12.700 0.5000	17.463 0.6875	7.92 0.312	2.03 0.080	B-85	M-851	5.36 1200	7.38 1660	1.15	0.005 0.012	0.006 0.014	12.700 0.5000	12.687 0.4995	17.475 0.6880	17.450 0.6870	Table B2-7	IRA-5
	12.700 0.5000	17.463 0.6875	9.53 0.375	2.03 0.080	B-86	M-861	6.87 1540	10.2 2290	1.55	0.006 0.014	0.007 0.016	12.700 0.5000	12.687 0.4995	17.475 0.6880	17.450 0.6870	Table B2-7	IRA-5
	12.700 0.5000	17.463 0.6875	11.13 0.438	2.03 0.080	B-87	M-871	8.31 1870	13.0 2920	1.95	0.007 0.016	0.008 0.018	12.700 0.5000	12.687 0.4995	17.475 0.6880	17.450 0.6870	Table B2-7	IRA-5
	12.700 0.5000	17.463 0.6875	12.70 0.500	2.03 0.080	B-88	—	9.63 2160	15.7 3530	2.40	0.009 0.019	0.010 0.021	12.700 0.5000	12.687 0.4995	17.475 0.6880	17.450 0.6870	Table B2-7	IRA-5
	12.700 0.5000	17.463 0.6875	12.70 0.500	2.03 0.080	—	M-881	9.66 2170	15.8 3550	2.40	—	0.010 0.021	12.700 0.5000	12.687 0.4995	17.475 0.6880	17.450 0.6870	Table B2-7	
	12.700 0.5000	17.463 0.6875	15.88 0.625	2.03 0.080	B-810	M-8101	12.2 2750	21.3 4800	3.20	0.010 0.023	0.012 0.026	12.700 0.5000	12.687 0.4995	17.475 0.6880	17.450 0.6870	Table B2-7	
	12.700 0.5000	17.463 0.6875	19.05 0.750	2.03 0.080	B-812	M-8121	14.7 3300	26.9 6050	4.20	0.013 0.028	0.014 0.031	12.700 0.5000	12.687 0.4995	17.475 0.6880	17.450 0.6870	Table B2-7	
	12.700 0.5000	19.050 0.7500	11.13 0.438	—	BH-87	—	9.46 2130	11.8 2650	1.80	0.010 0.023	—	12.700 0.5000	12.687 0.4995	19.063 0.7505	19.037 0.7495	Table B2-7	IRA-5
	12.700 0.5000	19.050 0.7500	12.70 0.500	—	BH-88	—	11.2 2510	14.6 3280	2.20	0.012 0.026	—	12.700 0.5000	12.687 0.4995	19.063 0.7505	19.037 0.7495	Table B2-7	IRA-5
	12.700 0.5000	19.050 0.7500	15.88 0.625	—	BH-810	—	14.4 3230	20.2 4540	3.05	0.015 0.033	—	12.700 0.5000	12.687 0.4995	19.063 0.7505	19.037 0.7495	Table B2-7	
	12.700 0.5000	19.050 0.7500	19.05 0.750	2.29 0.090	BH-812	MH-8121	17.4 3910	25.8 5790	3.95	0.018 0.039	0.020 0.044	12.700 0.5000	12.687 0.4995	19.063 0.7505	19.037 0.7495	Table B2-7	
9/16	14.288 0.5625	19.050 0.7500	7.92 0.312	2.03 0.080	B-95	M-951	5.72 1290	8.31 1870	1.25	0.006 0.013	0.006 0.014	14.288 0.5625	14.275 0.5620	19.063 0.7505	19.037 0.7495	Table B2-7	IR-68
	14.288 0.5625	19.050 0.7500	9.53 0.375	2.03 0.080	B-96	M-961	7.33 1650	11.4 2570	1.75	0.007 0.015	0.008 0.018	14.288 0.5625	14.275 0.5620	19.063 0.7505	19.037 0.7495	Table B2-7	IR-68
	14.288 0.5625	19.050 0.7500	11.13 0.438	2.03 0.080	B-97	M-971	8.87 1990	14.6 3280	2.20	0.008 0.018	0.010 0.021	14.288 0.5625	14.275 0.5620	19.063 0.7505	19.037 0.7495	Table B2-7	IR-68
	14.288 0.5625	19.050 0.7500	12.70 0.500	2.03 0.080	B-98	M-981	10.3 2320	17.7 3990	2.70	0.009 0.020	0.010 0.023	14.288 0.5625	14.275 0.5620	19.063 0.7505	19.037 0.7495	Table B2-7	IR-68
	14.288 0.5625	19.050 0.7500	15.88 0.625	2.03 0.080	B-910	M-9101	13.1 2940	24.0 5400	3.60	0.012 0.026	0.013 0.029	14.288 0.5625	14.275 0.5620	19.063 0.7505	19.037 0.7495	Table B2-7	IR-612(1)

Continued on next page.

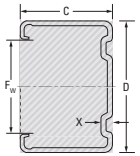
B

FULL COMPLEMENT BEARINGS
OPEN ENDS, CLOSED ONE END

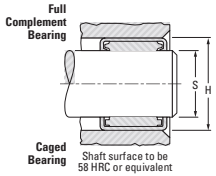
INCH SERIES
B, BH, NB, NBH, M- 1, MH- 1 SERIES



B, BH, NB, NBH



M- 1, MH- 1



Shaft Dia.	F_w	D	C +0 -0.3 +0.000 -0.012	$X_{max.}$	Bearing Designation		Load Ratings Dynamic	Load Ratings Static	Fatigue Load Limit C_u	Approx. Wt.		Mounting Dimensions Shaft		Mounting Dimensions Housing		Inspection gage	Mounting inner ring (pages B-2-74 to B-2-76)
					Open Ends	Closed One End	C	C_0		Open Ends	Closed One End	Max.	Min.	Max.	Min.		
in	mm in	mm in	mm in	mm in			kN lbf		kN	kg lbs		mm in	mm in	mm in	mm in		
9/16	**14.288** 0.5625	**19.050** 0.7500	**19.05** 0.750	**2.03** 0.080	B-912	M-9121	**15.6** 3510	**30.3** 6820	4.70	**0.014** 0.031	**0.015** 0.034	**14.288** 0.5625	**14.275** 0.5620	**19.063** 0.7505	**19.037** 0.7495	Table B2-7	IR-612(1)
	14.288 0.5625	**20.638** 0.8125	**12.70** 0.500	—	BH-98	—	**12.0** 2690	**16.4** 3690	2.50	**0.013** 0.029	—	**14.288** 0.5625	**14.275** 0.5620	**20.650** 0.8130	**20.625** 0.8120	Table B2-7	IR-68
	14.288 0.5625	**20.638** 0.8125	**15.88** 0.625	—	BH-910	—	**15.4** 3460	**22.7** 5110	3.45	**0.016** 0.036	—	**14.288** 0.5625	**14.275** 0.5620	**20.650** 0.8130	**20.625** 0.8120	Table B2-7	IR-612(1)
	14.288 0.5625	**20.638** 0.8125	**19.05** 0.750	—	BH-912	—	**18.6** 4190	**29.0** 6520	4.45	**0.020** 0.043	—	**14.288** 0.5625	**14.275** 0.5620	**20.650** 0.8130	**20.625** 0.8120	Table B2-7	IR-612(1)
5/8	**15.875** 0.6250	**20.638** 0.8125	**7.92** 0.312	**2.03** 0.080	B-105	M-1051	**6.05** 1360	**9.24** 2080	1.40	**0.006** 0.014	**0.007** 0.016	**15.875** 0.6250	**15.862** 0.6245	**20.650** 0.8130	**20.625** 0.8120	Table B2-7	IR-68-1
	15.875 0.6250	**20.638** 0.8125	**11.13** 0.438	**2.03** 0.080	B-107	M-1071	**9.39** 2110	**16.2** 3650	2.45	**0.009** 0.020	**0.010** 0.022	**15.875** 0.6250	**15.862** 0.6245	**20.650** 0.8130	**20.625** 0.8120	Table B2-7	IR-68-1
	15.875 0.6250	**20.638** 0.8125	**12.70** 0.500	**2.03** 0.080	B-108	M-1081	**10.9** 2450	**19.7** 4430	3.00	**0.010** 0.022	**0.012** 0.026	**15.875** 0.6250	**15.862** 0.6245	**20.650** 0.8130	**20.625** 0.8120	Table B2-7	IR-68-1
	15.875 0.6250	**20.638** 0.8125	**15.88** 0.625	**2.03** 0.080	B-1010	M-10101	**13.80** 3110	**26.7** 6000	4.00	**0.013** 0.028	**0.015** 0.032	**15.875** 0.6250	**15.862** 0.6245	**20.650** 0.8130	**20.625** 0.8120	Table B2-7	IR-612-1
	15.875 0.6250	**20.638** 0.8125	**19.05** 0.750	**2.03** 0.080	B-1012	M-10121	**16.6** 3720	**33.7** 7580	5.25	**0.015** 0.034	**0.017** 0.038	**15.875** 0.6250	**15.862** 0.6245	**20.650** 0.8130	**20.625** 0.8120	Table B2-7	IR-612-1
	15.875 0.6250	**22.212** 0.8745	**12.70** 0.500	**2.29** 0.090	BH-108	MH-1081	**12.7** 2860	**18.3** 4110	2.75	**0.014** 0.031	**0.016** 0.035	**15.875** 0.6250	**15.862** 0.6245	**22.238** 0.8755	**22.212** 0.8745	Table B2-7	IR-68-1
	15.875 0.6250	**22.212** 0.8745	**15.88** 0.625	—	BH-1010	—	**16.4** 3680	**25.3** 5680	3.85	**0.018** 0.039	—	**15.875** 0.6250	**15.862** 0.6245	**22.238** 0.8755	**22.212** 0.8745	Table B2-7	IR-612-1
	15.875 0.6250	**22.212** 0.8745	**19.05** 0.750	—	BH-1012	—	**19.8** 4450	**32.3** 7250	4.95	**0.021** 0.047	—	**15.875** 0.6250	**15.862** 0.6245	**22.238** 0.8755	**22.212** 0.8745	Table B2-7	IR-612-1
	15.875 0.6250	**22.212** 0.8745	**25.40** 1.000	—	BH-1016	—	**26.2** 5890	**46.2** 10390	7.10	**0.028** 0.062	—	**15.875** 0.6250	**15.862** 0.6245	**22.238** 0.8755	**22.212** 0.8745	Table B2-7	
11/16	**17.463** 0.6875	**22.212** 0.8745	**9.53** 0.375	**2.03** 0.080	B-116	M-1161	**8.17** 1840	**14.0** 3140	2.15	**0.008** 0.018	**0.009** 0.020	**17.463** 0.6875	**17.450** 0.6870	**22.238** 0.8755	**22.212** 0.8745	Table B2-7	
	17.463 0.6875	**22.212** 0.8745	**12.70** 0.500	**2.03** 0.080	B-118	M-1181	**11.5** 2580	**21.7** 4880	3.30	**0.011** 0.024	**0.012** 0.027	**17.463** 0.6875	**17.450** 0.6870	**22.238** 0.8755	**22.212** 0.8745	Table B2-7	
	17.463 0.6875	**22.212** 0.8745	**15.88** 0.625	**2.03** 0.080	B-1110	M-11101	**14.6** 3270	**29.4** 6610	4.40	**0.014** 0.030	**0.015** 0.034	**17.463** 0.6875	**17.450** 0.6870	**22.238** 0.8755	**22.212** 0.8745	Table B2-7	
	17.463 0.6875	**22.212** 0.8745	**19.05** 0.750	**2.03** 0.080	B-1112	M-11121	**17.4** 3920	**37.1** 8340	5.75	**0.016** 0.036	**0.019** 0.041	**17.463** 0.6875	**17.450** 0.6870	**22.238** 0.8755	**22.212** 0.8745	Table B2-7	
	17.463 0.6875	**23.813** 0.9375	**11.13** 0.438	—	BH-117	—	**11.4** 2560	**16.2** 3650	2.45	**0.014** 0.030	—	**17.463** 0.6875	**17.450** 0.6870	**23.825** 0.9380	**23.800** 0.9370	Table B2-7	
	17.463 0.6875	**23.813** 0.9375	**15.88** 0.625	**2.29** 0.090	BH-1110	MH-11101	**17.3** 3890	**27.8** 6250	4.25	**0.019** 0.042	**0.021** 0.047	**17.463** 0.6875	**17.450** 0.6870	**23.825** 0.9380	**23.800** 0.9370	Table B2-7	

Note) · For information on the speed ratings, contact JTEKT.

(1) IRA inner ring provides additional length if required.

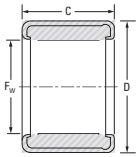
Shaft Dia.	F_w	D	C +0 -0.3 +0.000 -0.012	$X_{max.}$	Bearing Designation		Load Ratings Dynamic	Load Ratings Static	Fatigue Load Limit C_u	Approx. Wt.		Mounting Dimensions Shaft		Mounting Dimensions Housing		Inspection gage	Mounting inner ring (pages B-2-74 to B-2-76)
					Open Ends	Closed One End	C	C_0		Open Ends	Closed One End	Max.	Min.	Max.	Min.		
in	mm in	mm in	mm in	mm in			kN lbf		kN	kg lbs		mm in	mm in	mm in	mm in		
11/16	**17.463** 0.6875	**23.813** 0.9375	**19.05** 0.750	—	BH-1112	—	**20.9** 4700	**35.5** 7980	5.45	**0.023** 0.051	—	**17.463** 0.6875	**17.450** 0.6870	**23.825** 0.9380	**23.800** 0.9370	Table B2-7	
3/4	**19.050** 0.7500	**25.400** 1.0000	**9.53** 0.375	**2.29** 0.090	B-126	M-1261	**9.70** 2180	**13.6** 3050	2.10	**0.012** 0.027	**0.014** 0.031	**19.050** 0.7500	**19.037** 0.7495	**25.413** 1.0005	**25.387** 0.9995	Table B2-7	IR-88
	19.050 0.7500	**25.400** 1.0000	**12.70** 0.500	**2.29** 0.090	B-128	M-1281	**14.1** 3170	**22.0** 4940	3.30	**0.016** 0.036	**0.019** 0.041	**19.050** 0.7500	**19.037** 0.7495	**25.413** 1.0005	**25.387** 0.9995	Table B2-7	IR-88
	19.050 0.7500	**25.400** 1.0000	**15.88** 0.625	**2.29** 0.090	B-1210	M-12101	**18.1** 4070	**30.4** 6830	4.60	**0.020** 0.045	**0.024** 0.052	**19.050** 0.7500	**19.037** 0.7495	**25.413** 1.0005	**25.387** 0.9995	Table B2-7	IR-812(1)
	19.050 0.7500	**25.400** 1.0000	**19.05** 0.750	**2.29** 0.090	B-1212	M-12121	**21.9** 4930	**38.7** 8710	5.95	**0.024** 0.054	**0.028** 0.062	**19.050** 0.7500	**19.037** 0.7495	**25.413** 1.0005	**25.387** 0.9995	Table B2-7	IR-812(1)
13/16	**20.638** 0.8125	**26.988** 1.0625	**9.53** 0.375	—	B-136	—	**10.1** 2280	**14.7** 3300	2.25	**0.013** 0.029	—	**20.638** 0.8125	**20.625** 0.8120	**27.000** 1.0630	**26.975** 1.0620	Table B2-7	
	20.638 0.8125	**26.988** 1.0625	**12.70** 0.500	**2.29** 0.090	B-138	M-1381	**14.7** 3300	**23.8** 5350	3.60	**0.018** 0.039	**0.020** 0.044	**20.638** 0.8125	**20.625** 0.8120	**27.000** 1.0630	**26.975** 1.0620	Table B2-7	
	20.638 0.8125	**26.988** 1.0625	**22.23** 0.875	**2.29** 0.090	B-1314	M-13141	**26.7** 6010	**51.1** 11490	7.90	**0.031** 0.068	**0.035** 0.077	**20.638** 0.8125	**20.625** 0.8120	**27.000** 1.0630	**26.975** 1.0620	Table B2-7	
	20.638 0.8125	**26.988** 1.0625	**25.40** 1.000	**2.29** 0.090	B-1316	M-13161	**30.3** 6820	**60.2** 13530	9.25	**0.035** 0.078	**0.040** 0.088	**20.638** 0.8125	**20.625** 0.8120	**27.000** 1.0630	**26.975** 1.0620	Table B2-7	
	20.638 0.8125	**26.988** 1.0625	**31.75** 1.250	—	B-1320	—	**37.3** 8380	**78.4** 17620	12.0	**0.044** 0.098	—	**20.638** 0.8125	**20.625** 0.8120	**27.000** 1.0630	**26.975** 1.0620	Table B2-7	
	20.638 0.8125	**28.575** 1.1250	**12.70** 0.500	**2.79** 0.110	BH-138	MH-1381	**14.8** 3330	**20.8** 4680	3.10	**0.023** 0.050	**0.026** 0.057	**20.638** 0.8125	**20.625** 0.8120	**28.588** 1.1255	**28.562** 1.1245	Table B2-7	
	20.638 0.8125	**28.575** 1.1250	**15.88** 0.625	**2.79** 0.110	BH-1310	MH-13101	**19.7** 4430	**29.9** 6720	4.50	**0.029** 0.063	**0.032** 0.071	**20.638** 0.8125	**20.625** 0.8120	**28.588** 1.1255	**28.562** 1.1245	Table B2-7	
	20.638 0.8125	**28.575** 1.1250	**19.05** 0.750	**2.79** 0.110	BH-1312	MH-13121	**24.2** 5440	**39.0** 8760	6.10	**0.034** 0.076	**0.039** 0.086	**20.638** 0.8125	**20.625** 0.8120	**28.588** 1.1255	**28.562** 1.1245	Table B2-7	
7/8	**22.225** 0.8750	**28.575** 1.1250	**9.53** 0.375	**2.29** 0.090	B-146	M-1461	**10.6** 2380	**15.8** 3560	2.45	**0.014** 0.031	**0.016** 0.035	**22.225** 0.8750	**22.212** 0.8745	**28.588** 1.1255	**28.562** 1.1245	Table B2-7	
	22.225 0.8750	**28.575** 1.1250	**12.70** 0.500	**2.29** 0.090	B-148	M-1481	**15.4** 3450	**25.6** 5760	3.85	**0.019** 0.042	**0.022** 0.048	**22.225** 0.8750	**22.212** 0.8745	**28.588** 1.1255	**28.562** 1.1245	Table B2-7	IR-1012(1)
	22.225 0.8750	**28.575** 1.1250	**19.05** 0.750	**2.29** 0.090	B-1412	M-14121	**23.9** 5370	**45.2** 10160	6.95	**0.028** 0.062	**0.032** 0.070	**22.225** 0.8750	**22.212** 0.8745	**28.588** 1.1255	**28.562** 1.1245	Table B2-7	IR-1012(1)
	22.225 0.8750	**28.575** 1.1250	**25.40** 1.000	**2.29** 0.090	B-1416	M-14161	**31.6** 7100	**64.8** 14570	10.0	**0.038** 0.083	**0.043** 0.094	**22.225** 0.8750	**22.212** 0.8745	**28.588** 1.1255	**28.562** 1.1245	Table B2-7	IR-1016
	22.225 0.8750	**28.575** 1.1250	**28.58** 1.125	—	B-1418	—	**35.2** 7920	**74.6** 16770	11.4	**0.043** 0.094	—	**22.225** 0.8750	**22.212** 0.8745	**28.588** 1.1255	**28.562** 1.1245	Table B2-7	
	22.225 0.8750	**30.163** 1.1875	**15.88** 0.625	**2.79** 0.110	BH-1410	MH-14101	**20.3** 4570	**32.2** 7240	4.85	**0.030** 0.067	**0.035** 0.076	**22.225** 0.8750	**22.212** 0.8745	**30.175** 1.1880	**30.150** 1.1870	Table B2-7	IR-1012(1)
	22.225 0.8750	**30.163** 1.1875	**19.05** 0.750	**2.79** 0.110	BH-1412	MH-14121	**25.0** 5620	**42.0** 9440	6.55	**0.036** 0.080	**0.041** 0.091	**22.225** 0.8750	**22.212** 0.8745	**30.175** 1.1880	**30.150** 1.1870	Table B2-7	IR-1012(1)
	22.225 0.8750	**30.163** 1.1875	**25.40** 1.000	—	BH-1416	—	**33.7** 7570	**61.6** 13850	9.60	**0.049** 0.107	—	**22.225** 0.8750	**22.212** 0.8745	**30.175** 1.1880	**30.150** 1.1870	Table B2-7	IR-1016
15/16	**23.813** 0.9375	**30.163** 1.1875	**12.70** 0.500	—	B-158	—	**15.9** 3580	**27.5** 6180	4.15	**0.020** 0.044	—	**23.813** 0.9375	**23.800** 0.9370	**30.175** 1.1880	**30.150** 1.1870	Table B2-7	
	23.813 0.9375	**30.163** 1.1875	**25.40** 1.000	**2.29** 0.090	B-1516	M-15161	**32.8** 7370	**69.5** 15620	10.7	**0.040** 0.088	**0.045** 0.100	**23.813** 0.9375	**23.800** 0.9370	**30.175** 1.1880	**30.150** 1.1870	Table B2-7	
1	**25.400** 1.0000	**31.750** 1.2500	**9.53** 0.375	—	B-166	—	**11.3** 2550	**18.1** 4070	2.80	**0.016** 0.035	—	**25.400** 1.0000	**25.387** 0.9995	**31.763** 1.2505	**31.737** 1.2495	Table B2-7	IR-128
	25.400 1.0000	**31.750** 1.2500	**11.13** 0.438	**2.29** 0.090	B-167	M-1671	**14.0** 3140	**23.7** 5320	3.60	**0.019** 0.041	**0.021** 0.046	**25.400** 1.0000	**25.387** 0.9995	**31.763** 1.2505	**31.737** 1.2495	Table B2-7	IR-128
	25.400 1.0000	**31.750** 1.2500	**12.70** 0.5000	**2.29** 0.090	B-168	M-1681	**16.5** 3710	**29.3** 6590	4.45	**0.021** 0.047	**0.024** 0.053	**25.400** 1.0000	**25.387** 0.9995	**31.763** 1.2505	**31.737** 1.2495	Table B2-7	IR-128

Continued on next page.

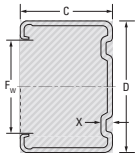
B

FULL COMPLEMENT BEARINGS
OPEN ENDS, CLOSED ONE END

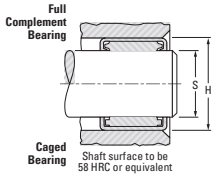
INCH SERIES
B, BH, NB, NBH, M- 1, MH- 1 SERIES



B, BH, NB, NBH



M- 1, MH- 1



Shaft Dia.	F_w	D	C +0 -0.3 / +0.000 -0.012	$X_{max.}$	Bearing Designation		Load Ratings Dynamic	Load Ratings Static	Fatigue Load Limit C_u	Approx. Wt.		Mounting Dimensions Shaft		Mounting Dimensions Housing		Inspection gage	Mounting inner ring (pages B-2-74 to B-2-76)
					Open Ends	Closed One End	C	C_0		Open Ends	Closed One End	Max.	Min.	Max.	Min.		
in	mm in	mm in	mm in	mm in			kN lbf		kN	kg lbs		mm in	mm in	mm in	mm in		
1	25.400 1.0000	31.750 1.2500	15.88 0.625	2.29 0.090	B-1610	M-16101	21.2 4770	40.5 9110	6.15	0.026 0.058	0.030 0.066	25.400 1.0000	25.387 0.9995	31.763 1.2505	31.737 1.2495	Table B2-7	IR-1212
	25.400 1.0000	31.750 1.2500	19.05 0.750	2.29 0.090	B-1612	M-16121	25.7 5770	51.7 11620	7.95	0.032 0.070	0.036 0.080	25.400 1.0000	25.387 0.9995	31.763 1.2505	31.737 1.2495	Table B2-7	IR-1212
	25.400 1.0000	31.750 1.2500	25.40 1.000	2.29 0.090	B-1616	M-16161	34.0 7640	74.1 16660	11.4	0.043 0.094	0.048 0.106	25.400 1.0000	25.387 0.9995	31.763 1.2505	31.737 1.2495	Table B2-7	IR-1216(1)
	25.400 1.0000	33.338 1.3125	12.70 0.500	2.79 0.110	BH-168	MH-1681	16.6 3740	25.6 5760	3.80	0.027 0.060	0.031 0.068	25.400 1.0000	25.387 0.9995	33.350 1.3130	33.325 1.3120	Table B2-7	IR-128
	25.400 1.0000	33.338 1.3125	15.88 0.625	—	BH-1610	—	22.0 4950	36.8 8280	5.50	0.034 0.075	—	25.400 1.0000	25.387 0.9995	33.350 1.3130	33.325 1.3120	Table B2-7	IR-1212
	25.400 1.0000	33.338 1.3125	19.05 0.750	2.79 0.110	BH-1612	MH-16121	27.1 6090	48.0 10800	7.45	0.041 0.090	0.046 0.102	25.400 1.0000	25.387 0.9995	33.350 1.3130	33.325 1.3120	Table B2-7	IR-1212
	25.400 1.0000	33.338 1.3125	22.23 0.875	—	BH-1614	—	31.9 7170	59.2 13300	9.15	0.048 0.105	—	25.400 1.0000	25.387 0.9995	33.350 1.3130	33.325 1.3120	Table B2-7	IR-1216(1)
	25.400 1.0000	33.338 1.3125	25.40 1.000	2.79 0.110	BH-1616	MH-16161	36.5 8200	70.4 15830	10.9	0.054 0.120	0.062 0.136	25.400 1.0000	25.387 0.9995	33.350 1.3130	33.325 1.3120	Table B2-7	IR-1216(1)
	25.400 1.0000	33.338 1.3125	31.75 1.250	—	BH-1620	—	45.2 10160	92.8 20860	14.2	0.068 0.150	—	25.400 1.0000	25.387 0.9995	33.350 1.3130	33.325 1.3120	Table B2-7	IR-1220
	25.400 1.0000	33.338 1.3125	38.10 1.500	2.79 0.110	BH-1624	MH-16241	53.5 12030	115 25900	17.7	0.082 0.180	0.093 0.204	25.400 1.0000	25.387 0.9995	33.350 1.3130	33.325 1.3120	Table B2-7	IR-1224
1 1/16	26.988 1.0625	33.338 1.3125	15.88 0.625	2.29 0.090	B-1710	M-17101	21.9 4930	43.1 9680	6.55	0.028 0.062	0.032 0.070	26.988 1.0625	26.975 1.0620	33.350 1.3130	33.325 1.3120	Table B2-7	
	26.988 1.0625	34.925 1.3750	19.05 0.750	—	BH-1712	—	29.5 6630	52.4 11780	8.05	0.035 0.078	—	26.988 1.0625	26.975 1.0620	34.938 1.3755	34.912 1.3745	Table B2-7	
1 1/8	28.575 1.1250	34.925 1.3750	9.53 0.375	2.29 0.090	B-186	M-1861	12.1 2720	20.4 4580	3.10	0.018 0.039	0.020 0.044	28.575 1.1250	28.562 1.1245	34.938 1.3755	34.912 1.3745	Table B2-7	IR-1416(1)
	28.575 1.1250	34.925 1.3750	12.70 0.500	2.29 0.090	B-188	M-1881	17.6 3950	33.0 7420	4.95	0.024 0.052	0.027 0.059	28.575 1.1250	28.562 1.1245	34.938 1.3755	34.912 1.3745	Table B2-7	IR-1416(1)
	28.575 1.1250	34.925 1.3750	15.88 0.625	—	B-1810	—	22.6 5080	45.6 10250	6.90	0.029 0.065	—	28.575 1.1250	28.562 1.1245	34.938 1.3755	34.912 1.3745	Table B2-7	IR-1416(1)
	28.575 1.1250	34.925 1.3750	19.05 0.750	2.29 0.090	B-1812	M-18121	27.3 6140	58.2 13080	8.90	0.035 0.078	0.040 0.088	28.575 1.1250	28.562 1.1245	34.938 1.3755	34.912 1.3745	Table B2-7	IR-1416(1)
	28.575 1.1250	34.925 1.3750	25.40 1.000	2.29 0.090	B-1816	M-18161	36.1 8120	83.4 18750	12.8	0.047 0.104	0.054 0.118	28.575 1.1250	28.562 1.1245	34.938 1.3755	34.912 1.3745	Table B2-7	IR-1416(1)
	28.575 1.1250	38.100 1.5000	19.05 0.750	3.05 0.120	BH-1812	MH-18121	31.5 7090	52.9 11900	8.30	0.056 0.123	0.063 0.138	28.575 1.1250	28.562 1.1245	38.113 1.5005	38.087 1.4995	Table B2-7	IR-1416(1)
	28.575 1.1250	38.100 1.5000	25.40 1.000	3.05 0.120	BH-1816	MH-18161	42.5 9560	77.8 17500	12.0	0.074 0.164	0.084 0.186	28.575 1.1250	28.562 1.1245	38.113 1.5005	38.087 1.4995	Table B2-7	IR-1416(1)

Note) · For information on the speed ratings, contact JTEKT.

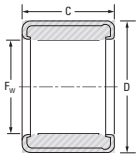
(1) IRA inner ring provides additional length if required.

Shaft Dia.	F_w	D	C +0 -0.3 / +0.000 -0.012	$X_{max.}$	Bearing Designation		Load Ratings Dynamic	Load Ratings Static	Fatigue Load Limit C_u	Approx. Wt.		Mounting Dimensions Shaft		Mounting Dimensions Housing		Inspection gage	Mounting inner ring (pages B-2-74 to B-2-76)
					Open Ends	Closed One End	C	C_0		Open Ends	Closed One End	Max.	Min.	Max.	Min.		
in	mm in	mm in	mm in	mm in			kN lbf		kN	kg lbs		mm in	mm in	mm in	mm in		
1 1/8	28.575 1.1250	38.100 1.5000	31.75 1.250	3.05 0.120	BH-1820	MH-18201	53.0 11910	103 23200	15.8	0.093 0.205	0.105 0.232	28.575 1.1250	28.562 1.1245	38.113 1.5005	38.087 1.4995	Table B2-7	
1 3/16	30.163 1.1875	38.100 1.5000	15.88 0.625	2.79 0.110	B-1910	M-19101	24.1 5420	43.8 9840	6.55	0.040 0.088	0.045 0.099	30.163 1.1875	30.150 1.1870	38.113 1.5005	38.087 1.4995	Table B2-7	
	30.163 1.1875	38.100 1.5000	25.40 1.000	—	B-1916	—	39.9 8970	83.7 18820	13.0	0.064 0.140	—	30.163 1.1875	30.150 1.1870	38.113 1.5005	38.087 1.4995	Table B2-7	
1 1/4	31.750 1.2500	38.100 1.5000	12.70 0.500	2.29 0.090	B-208	M-2081	18.6 4170	36.7 8250	5.50	0.026 0.057	0.029 0.065	31.750 1.2500	31.737 1.2495	38.113 1.5005	38.087 1.4995	Table B2-7	IR-1612
	31.750 1.2500	38.100 1.5000	15.88 0.625	2.29 0.090	B-2010	M-20101	23.9 5370	50.7 11400	7.70	0.032 0.071	0.044 0.097	31.750 1.2500	31.737 1.2495	38.113 1.5005	38.087 1.4995	Table B2-7	IR-1612
	31.750 1.2500	38.100 1.5000	19.05 0.750	2.29 0.090	B-2012	M-20121	28.9 6490	64.7 14540	9.90	0.039 0.086	0.045 0.099	31.750 1.2500	31.737 1.2495	38.113 1.5005	38.087 1.4995	Table B2-7	IR-1612
	31.750 1.2500	38.100 1.5000	25.40 1.000	2.29 0.090	B-2016	M-20161	38.2 8590	92.7 20840	14.2	0.052 0.114	0.059 0.130	31.750 1.2500	31.737 1.2495	38.113 1.5005	38.087 1.4995	Table B2-7	IR-1616(1)
	31.750 1.2500	38.100 1.5000	31.75 1.250	2.29 0.090	B-2020	M-20201	46.9 10540	121 27200	18.4	0.065 0.143	0.073 0.162	31.750 1.2500	31.737 1.2495	38.113 1.5005	38.087 1.4995	Table B2-7	
	31.750 1.2500	41.275 1.6250	12.70 0.500	3.05 0.120	BH-208	MH-2081	19.7 4420	30.0 6750	4.50	0.041 0.090	0.046 0.102	31.750 1.2500	31.737 1.2495	41.288 1.6255	41.262 1.6245	Table B2-7	IR-1612
	31.750 1.2500	41.275 1.6250	19.05 0.750	3.05 0.120	BH-2012	MH-20121	33.1 7440	58.6 13170	9.10	0.061 0.135	0.069 0.153	31.750 1.2500	31.737 1.2495	41.288 1.6255	41.262 1.6245	Table B2-7	IR-1612
	31.750 1.2500	41.275 1.6250	25.40 1.000	3.05 0.120	BH-2016	MH-20161	44.9 10100	86.6 19470	13.4	0.081 0.179	0.092 0.203	31.750 1.2500	31.737 1.2495	41.288 1.6255	41.262 1.6245	Table B2-7	IR-1616(1)
	31.750 1.2500	41.275 1.6250	31.75 1.250	3.05 0.120	BH-2020	MH-20201	55.9 12570	115 25800	17.6	0.102 0.224	0.115 0.254	31.750 1.2500	31.737 1.2495	41.288 1.6255	41.262 1.6245	Table B2-7	
1 5/16	33.338 1.3125	41.275 1.6250	12.70 0.500	2.79 0.110	B-218	M-2181	19.3 4330	33.7 7570	5.00	0.034 0.076	0.039 0.086	33.338 1.3125	33.325 1.3120	41.288 1.6255	41.262 1.6245	Table B2-7	
	33.338 1.3125	41.275 1.6250	15.88 0.625	2.79 0.110	B-2110	M-21101	25.5 5740	48.4 10880	7.25	0.043 0.095	0.049 0.108	33.338 1.3125	33.325 1.3120	41.288 1.6255	41.262 1.6245	Table B2-7	
	33.338 1.3125	41.275 1.6250	31.75 1.250	—	B-2120	—	52.6 11820	123 27650	18.8	0.087 0.191	—	33.338 1.3125	33.325 1.3120	41.288 1.6255	41.262 1.6245	Table B2-7	
1 3/8	34.925 1.3750	41.275 1.6250	12.70 0.500	2.29 0.090	B-228	M-2281	19.5 4390	40.3 9060	6.05	0.028 0.062	0.032 0.070	34.925 1.3750	34.912 1.3745	41.288 1.6255	41.262 1.6245	Table B2-7	IR-1812
	34.925 1.3750	41.275 1.6250	19.05 0.750	2.29 0.090	B-2212	M-22121	30.4 6830	71.2 16000	10.9	0.043 0.094	0.049 0.107	34.925 1.3750	34.912 1.3745	41.288 1.6255	41.262 1.6245	Table B2-7	IR-1812
	34.925 1.3750	41.275 1.6250	25.40 1.000	2.29 0.090	B-2216	M-22161	40.2 9030	102 22900	15.7	0.057 0.125	0.064 0.142	34.925 1.3750	34.912 1.3745	41.288 1.6255	41.262 1.6245	Table B2-7	IR-1816
	34.925 1.3750	41.275 1.6250	31.75 1.250	2.29 0.090	B-2220	M-22201	49.3 11080	133 29900	20.3	0.071 0.156	0.080 0.177	34.925 1.3750	34.912 1.3745	41.288 1.6255	41.262 1.6245	Table B2-7	IR-1820
	34.925 1.3750	44.450 1.7500	12.70 0.500	—	BH-228	—	21.2 4770	33.5 7540	5.15	0.044 0.098	—	34.925 1.3750	34.912 1.3745	44.463 1.7505	44.437 1.7495	Table B2-7	IR-1812
	34.925 1.3750	44.450 1.7500	15.88 0.625	—	BH-2210	—	28.5 6410	48.9 11000	7.45	0.055 0.122	—	34.925 1.3750	34.912 1.3745	44.463 1.7505	44.437 1.7495	Table B2-7	IR-1812
	34.925 1.3750	44.450 1.7500	19.05 0.750	3.05 0.120	BH-2212	MH-22121	35.3 7930	64.3 14450	10.0	0.066 0.146	0.075 0.165	34.925 1.3750	34.912 1.3745	44.463 1.7505	44.437 1.7495	Table B2-7	IR-1812
	34.925 1.3750	44.450 1.7500	25.40 1.000	3.05 0.120	BH-2216	MH-22161	47.6 10700	94.8 21300	14.7	0.088 0.195	0.100 0.221	34.925 1.3750	34.912 1.3745	44.463 1.7505	44.437 1.7495	Table B2-7	IR-1816
	34.925 1.3750	44.450 1.7500	31.75 1.250	—	BH-2220	—	59.4 13350	126 28300	19.4	0.111 0.244	0.125 0.276	34.925 1.3750	34.912 1.3745	44.463 1.7505	44.437 1.7495	Table B2-7	IR-1820
1 1/2	38.100 1.5000	47.625 1.8750	12.70 0.500	3.05 0.120	B-248	M-2481	22.3 5020	37.1 8340	5.60	0.048 0.105	0.054 0.119	38.100 1.5000	38.087 1.4995	47.638 1.8755	47.612 1.8745	Table B2-7	IR-1916
	38.100 1.5000	47.625 1.8750	15.88 0.625	3.05 0.120	B-2410	M-24101	29.9 6720	53.9 12120	8.10	0.060 0.132	0.068 0.150	38.100 1.5000	38.087 1.4995	47.638 1.8755	47.612 1.8745	Table B2-7	IR-1916

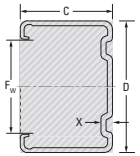
Continued on next page.

FULL COMPLEMENT BEARINGS
OPEN ENDS, CLOSED ONE END

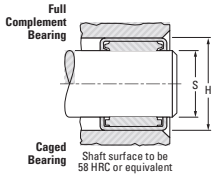
INCH SERIES
B, BH, NB, NBH, M- 1, MH- 1 SERIES



B, BH, NB, NBH



M- 1, MH- 1



Shaft Dia.	F_w	D	C +0 -0.3 +0.000 -0.012	$X_{max.}$	Bearing Designation Open Ends	Bearing Designation Closed One End	Load Ratings Dynamic C	Load Ratings Static C_0	Fatigue Load Limit C_u	Approx. Wt. Open Ends	Approx. Wt. Closed One End	Mounting Dimensions Shaft Max.	Shaft Min.	Housing Max.	Housing Min.	Inspection gage	Mounting inner ring (pages B-2-74 to B-2-76)
in	mm in	mm in	mm in	mm in			kN lbf		kN	kg lbs		mm in	mm in	mm in	mm in		
1 1/2	38.100 1.5000	47.625 1.8750	19.05 0.750	3.05 0.120	B-2412	M-24121	36.9 8290	70.7 15900	11.1	0.072 0.158	0.081 0.179	38.100 1.5000	38.087 1.4995	47.638 1.8755	47.612 1.8745	Table B2-7	IR-1916
	38.100 1.5000	47.625 1.8750	22.23 0.875	3.05 0.120	B-2414	M-24141	43.5 9780	87.5 19670	13.6	0.083 0.184	0.095 0.209	38.100 1.5000	38.087 1.4995	47.638 1.8755	47.612 1.8745	Table B2-7	IR-1916
	38.100 1.5000	47.625 1.8750	25.40 1.000	3.05 0.120	B-2416	M-24161	49.7 11170	104 23380	16.1	0.096 0.211	0.108 0.239	38.100 1.5000	38.087 1.4995	47.638 1.8755	47.612 1.8745	Table B2-7	IR-1916
	38.100 1.5000	47.625 1.8750	31.75 1.250	3.05 0.120	B-2420	M-24201	62.0 13940	138 31000	21.2	0.119 0.263	0.135 0.298	38.100 1.5000	38.087 1.4995	47.638 1.8755	47.612 1.8745	Table B2-7	IR-1920
1 5/8	41.275 1.6250	50.800 2.0000	12.70 0.500	—	B-268	—	22.7 5100	39.2 8820	5.85	0.051 0.113	—	41.275 1.6250	41.262 1.6245	50.813 2.0005	50.787 1.9995	Table B2-7	IR-2020(1)
	41.275 1.6250	50.800 2.0000	15.88 0.625	3.05 0.120	B-2610	M-26101	30.6 6890	57.4 12900	8.60	0.064 0.141	0.073 0.160	41.275 1.6250	41.262 1.6245	50.813 2.0005	50.787 1.9995	Table B2-7	IR-2020(1)
	41.275 1.6250	50.800 2.0000	25.40 1.000	—	B-2616	—	51.4 11550	112 25200	17.4	0.103 0.226	—	41.275 1.6250	41.262 1.6245	50.813 2.0005	50.787 1.9995	Table B2-7	IR-2020(1)
	41.275 1.6250	50.800 2.0000	31.75 1.250	3.05 0.120	B-2620	M-26201	64.0 14400	148 33270	22.9	0.128 0.282	0.145 0.320	41.275 1.6250	41.262 1.6245	50.813 2.0005	50.787 1.9995	Table B2-7	IR-2220(1)
1 3/4	44.450 1.7500	53.975 2.1250	19.05 0.750	3.05 0.120	B-2812	M-28121	39.3 8830	81.5 18320	12.8	0.082 0.181	0.093 0.205	44.450 1.7500	44.437 1.7495	53.988 2.1255	53.962 2.1245	Table B2-7	IR-2316
	44.450 1.7500	53.975 2.1250	25.40 1.000	3.05 0.120	B-2816	M-28161	53.3 11980	121 27100	18.8	0.110 0.242	0.124 0.274	44.450 1.7500	44.437 1.7495	53.988 2.1255	53.962 2.1245	Table B2-7	IR-2316
	44.450 1.7500	53.975 2.1250	31.75 1.250	—	B-2820	—	66.4 14930	160 36000	24.7	0.137 0.302	—	44.450 1.7500	44.437 1.7495	53.988 2.1255	53.962 2.1245	Table B2-7	IR-2324
	44.450 1.7500	53.975 2.1250	38.10 1.500	3.05 0.120	B-2824	M-26241	78.7 17700	199 44800	30.5	0.165 0.363	0.186 0.411	44.450 1.7500	44.437 1.7495	53.988 2.1255	53.962 2.1245	Table B2-7	IR-2324
1 7/8	47.625 1.8750	57.150 2.2500	12.70 0.500	3.05 0.120	B-308	M-3081	25.1 5650	46.4 10430	7.00	0.059 0.129	0.066 0.146	47.625 1.8750	47.612 1.8745	57.163 2.2505	57.137 2.2495	Table B2-7	
	47.625 1.8750	57.150 2.2500	15.888 0.625	—	B-3010	—	33.6 7550	67.4 15150	10.2	0.073 0.161	—	47.625 1.8750	47.612 1.8745	57.163 2.2505	57.137 2.2495	Table B2-7	
	47.625 1.8750	57.150 2.2500	19.05 0.750	—	B-3012	—	41.5 9330	88.4 19870	13.9	0.088 0.193	—	47.625 1.8750	47.612 1.8745	57.163 2.2505	57.137 2.2495	Table B2-7	
	47.625 1.8750	57.150 2.2500	25.40 1.000	3.05 0.120	B-3016	M-30161	56.0 12600	130 29200	20.1	0.117 0.258	0.132 0.292	47.625 1.8750	47.612 1.8745	57.163 2.2505	57.137 2.2495	Table B2-7	
2	50.800 2.0000	60.325 2.3750	12.70 0.500	3.05 0.120	B-328	M-3281	25.4 5710	48.2 10840	7.20	0.062 0.136	0.070 0.154	50.800 2.0000	50.785 1.9994	60.338 2.3755	60.312 2.3745	Table B2-7	
	50.800 2.0000	60.325 2.3750	15.88 0.625	—	B-3210	—	34.2 7680	70.7 15900	10.6	0.078 0.171	—	50.800 2.0000	50.785 1.9994	60.338 2.3755	60.312 2.3745	Table B2-7	
	50.800 2.0000	60.325 2.3750	22.23 0.875	—	B-3214	—	50.1 11260	116 26080	18.0	0.108 0.239	—	50.800 2.0000	50.785 1.9994	60.338 2.3755	60.312 2.3745	Table B2-7	

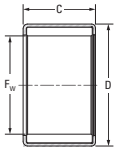
Note) · For information on the speed ratings, contact JTEKT.

(1) IRA inner ring provides additional length if required.

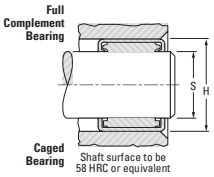
Shaft Dia.	F_w	D	C +0 -0.3 +0.000 -0.012	$X_{max.}$	Bearing Designation Open Ends	Bearing Designation Closed One End	Load Ratings Dynamic C	Load Ratings Static C_0	Fatigue Load Limit C_u	Approx. Wt. Open Ends	Approx. Wt. Closed One End	Mounting Dimensions Shaft Max.	Shaft Min.	Housing Max.	Housing Min.	Inspection gage	Mounting inner ring (pages B-2-74 to B-2-76)
in	mm in	mm in	mm in	mm in			kN lbf		kN	kg lbs		mm in	mm in	mm in	mm in		
2	50.800 2.0000	60.325 2.3750	25.40 1.000	3.05 0.120	B-3216	M-32161	57.5 12930	138 31000	21.5	0.124 0.273	0.140 0.309	50.800 2.0000	50.785 1.9994	60.338 2.3755	60.312 2.3745	Table B2-7	
	50.800 2.0000	60.325 2.3750	31.75 1.250	3.05 0.120	B-3220	M-32201	71.5 16070	183 41100	28.3	0.155 0.341	0.175 0.386	50.800 2.0000	50.785 1.9994	60.338 2.3755	60.312 2.3745	Table B2-7	
	50.800 2.0000	60.325 2.3750	38.10 1.500	3.05 0.120	B-3224	M-32241	84.8 19060	228 51200	34.9	0.186 0.410	0.211 0.465	50.800 2.0000	50.785 1.9994	60.338 2.3755	60.312 2.3745	Table B2-7	
	50.800 2.0000	60.325 2.3750	44.45 1.750	3.05 0.120	B-3228	M-32281	97.6 21940	272 61150	41.9	0.217 0.478	0.245 0.541	50.800 2.0000	50.785 1.9994	60.338 2.3755	60.312 2.3745	Table B2-7	
2 1/16	52.388 2.0625	64.292 2.5312	19.05 0.750	—	BH-3312	—	46.1 10360	86.9 19540	13.4	0.122 0.269	—	52.388 2.0625	52.372 2.0619	64.305 2.5317	64.280 2.5307	Table B2-7	IR-2916
	52.388 2.0625	64.292 2.5312	25.40 1.000	3.56 0.140	BH-3316	MH-33161	64.2 14430	133 29900	20.7	0.162 0.358	0.184 0.406	52.388 2.0625	52.372 2.0619	64.305 2.5317	64.280 2.5307	Table B2-7	IR-2916
	52.388 2.0625	64.292 2.5312	38.10 1.500	3.56 0.140	BH-3324	MH-33241	96.8 21760	226 50700	34.8	0.244 0.537	0.276 0.609	52.388 2.0625	52.372 2.0619	64.305 2.5317	64.280 2.5307	Table B2-7	IR-2924
2 1/8	53.975 2.1250	63.500 2.5000	12.70 0.500	—	B-348	—	26.1 5870	51.3 11530	7.65	0.065 0.144	—	53.975 2.1250	53.960 2.1244	63.513 2.5005	63.487 2.4995	Table B2-7	IR-3024
	53.975 2.1250	63.500 2.5000	19.05 0.750	—	B-3412	—	43.6 9790	99.0 22260	15.5	0.098 0.216	—	53.975 2.1250	53.960 2.1244	63.513 2.5005	63.487 2.4995	Table B2-7	IR-3024
	53.975 2.1250	63.500 2.5000	25.40 1.000	3.05 0.120	B-3416	M-34161	59.1 13290	147 33000	22.8	0.131 0.289	0.148 0.327	53.975 2.1250	53.960 2.1244	63.513 2.5005	63.487 2.4995	Table B2-7	IR-3024
	53.975 2.1250	63.500 2.5000	31.75 1.250	—	B-3420	—	73.6 16550	194 43700	30.1	0.164 0.361	—	53.975 2.1250	53.960 2.1244	63.513 2.5005	63.487 2.4995	Table B2-7	IR-3024
	53.975 2.1250	63.500 2.5000	38.10 1.500	3.05 0.120	B-3424	M-34241	87.3 19630	242 54400	37.1	0.196 0.433	0.223 0.491	53.975 2.1250	53.960 2.1244	63.513 2.5005	63.487 2.4995	Table B2-7	IR-3024
2 1/4	57.150 2.2500	66.675 2.6250	19.05 0.750	3.30 0.130	B-3612	M-36121	46 10340	105 23700	16.5	0.103 0.228	0.117 0.258	57.150 2.2500	57.135 2.2494	66.688 2.6255	66.662 2.6245	Table B2-7	
	57.150 2.2500	66.675 2.6250	25.40 1.000	—	B-3616	—	62.3 14010	155.6 35000	24.2	0.138 0.304	—	57.150 2.2500	57.135 2.2494	66.688 2.6255	66.662 2.6245	Table B2-7	
	57.150 2.2500	66.675 2.6250	31.75 1.250	—	B-3620	—	77.5 17420	206 46400	31.8	0.172 0.380	—	57.150 2.2500	57.135 2.2494	66.688 2.6255	66.662 2.6245	Table B2-7	
	57.150 2.2500	66.675 2.6250	38.10 1.500	3.30 0.130	B-3624	M-36241	91.9 20660	257 57700	39.6	0.207 0.456	0.235 0.517	57.150 2.2500	57.135 2.2494	66.688 2.6255	66.662 2.6245	Table B2-7	
2 1/2	63.500 2.5000	73.020 2.8750	19.05 0.750	—	NB-4012	—	48.1 10800	117 26300	18.4	0.116 0.255	—	63.500 2.5000	63.485 2.4994	73.165 2.8805	73.139 2.8795	Table B2-7	
	63.500 2.5000	73.020 2.8750	28.58 1.125	—	NB-4018	—	73.3 16500	201 45200	31.2	0.174 0.383	—	63.500 2.5000	63.485 2.4994	73.165 2.8805	73.139 2.8795	Table B2-7	
	63.500 2.5000	73.020 2.8750	38.10 1.500	—	NB-4024	—	96.2 21600	285 64100	44.5	0.231 0.508	—	63.500 2.5000	63.485 2.4994	73.165 2.8805	73.139 2.8795	Table B2-7	
2 5/8	66.675 2.6250	76.200 3.0000	25.40 1.000	3.30 0.130	B-4216	M-42161	66.7 15000	182 40900	23.9	0.159 0.351	0.181 0.398	66.675 2.6250	66.660 2.6244	76.213 3.0005	76.187 2.9995	Table B2-7	
2 3/4	69.850 2.7500	79.375 3.1250	15.88 0.625	—	B-4410	—	41.0 9210	98.0 22000	14.9	0.104 0.229	—	69.850 2.7500	69.835 2.7494	79.388 3.1255	79.362 3.1245	Table B2-7	IR-4016
	69.850 2.7500	79.375 3.1250	19.050 0.7500	—	B-4412	—	50.7 11400	129 29000	20.1	0.124 0.274	—	69.850 2.7500	69.835 2.7494	79.388 3.1255	79.362 3.1245	Table B2-7	IR-4016
	69.850 2.7500	79.375 3.1250	25.40 1.000	—	B-4416	—	68.8 15470	191 42940	29.5	0.166 0.366	—	69.850 2.7500	69.835 2.7494	79.388 3.1255	79.362 3.1245	Table B2-7	IR-4016
	69.850 2.7500	79.375 3.1250	31.75 1.250	3.30 0.130	B-4420	M-44201	85.5 19220	252 56700	38.9	0.208 0.458	0.235 0.519	69.850 2.7500	69.835 2.7494	79.388 3.1255	79.362 3.1245	Table B2-7	
3	76.200 3.0000	88.900 3.5000	19.05 0.750	—	NBH-4812	—	59.3 13300	127 28600	19.7	0.186 0.409	—	76.200 3.0000	76.185 2.9994	89.040 3.5055	89.014 3.5045	Table B2-7	
	76.200 3.0000	88.900 3.5000	38.10 1.500	—	NBH-4824	—	124 27900	329 74000	51.4	0.372 0.818	—	76.200 3.0000	76.185 2.9994	89.040 3.5055	89.014 3.5045	Table B2-7	
3 1/2	88.900 3.5000	101.600 4.0000	19.05 0.750	—	B-5612	—	65.1 14630	150 33700	22.9	0.212 0.468	—	88.900 3.5000	88.885 3.4994	101.613 4.0005	101.587 3.9995	Table B2-7	
5 1/2	139.700 5.5000	152.400 6.0000	19.05 0.750	—	B-8812	—	76.8 17260	231 52000	31.6	0.325 0.717	—	139.700 5.5000	139.682 5.4993	152.425 6.0010	152.375 5.9990	Table B2-7	

FULL COMPLEMENT BEARINGS
OPEN ENDS

INCH SERIES
Y SERIES



Y



Shaft Dia.	F_w	D	C +0 -0.3 (+0.000 -0.012)	$X_{max.}$	Bearing Designation	Load Ratings Dynamic	Load Ratings Static	Fatigue Load Limit	Approx. Wt.	Mounting Dimensions Shaft		Mounting Dimensions Housing		Inspection gage
					Open Ends	C	C_0	C_u	Open Ends	Max.	Min.	Max.	Min.	
in	mm in	mm in	mm in	mm in		kN lbf		kN	kg lbs	mm in	mm in	mm in	mm in	
5/32	3.970 0.1563	7.142 0.2812	3.96 0.156	—	Y-2 1/2 2 1/2	1.29 290	1.14 260	—	0.001 0.002	3.970 0.1563	3.962 0.1560	7.155 0.2817	7.142 0.2812	Table B2-7
3/8	9.525 0.3750	14.288 0.5625	9.53 0.375	—	Y-66	6.67 1500	9.04 2030	1.45	0.005 0.011	9.525 0.3750	9.512 0.3745	14.300 0.5630	14.275 0.5620	Table B2-7
	9.525 0.3750	14.288 0.5625	19.05 0.750	—	Y-612	13.2 2970	21.6 4860	3.5	0.010 0.022	9.525 0.3750	9.512 0.3745	14.300 0.5630	14.275 0.5620	Table B2-7
7/16	11.113 0.4375	15.875 0.625	9.53 0.375	—	Y-76	7.29 1640	10.6 2380	1.7	0.005 0.012	11.113 0.4375	11.100 0.4370	15.888 0.6255	15.862 0.6245	Table B2-7
9/16	14.288 0.5625	19.050 0.7500	9.53 0.375	—	Y-96	8.38 1880	13.6 3060	2.2	0.007 0.015	14.288 0.5625	14.275 0.5620	19.063 0.7505	19.037 0.7495	Table B2-7
	14.288 0.5625	19.050 0.7500	12.70 0.500	—	Y-98	11.3 2540	19.9 4470	3.2	0.009 0.020	14.288 0.5625	14.275 0.5620	19.063 0.7505	19.037 0.7495	Table B2-7
	14.288 0.5625	19.050 0.7500	15.88 0.625	—	Y-910	14.0 3150	26.2 5890	4.2	0.012 0.026	14.288 0.5625	14.275 0.5620	19.063 0.7505	19.037 0.7495	Table B2-7
	14.288 0.5625	19.050 0.7500	19.05 0.750	—	Y-912	16.5 3710	32.5 7310	5.25	0.014 0.031	14.288 0.5625	14.275 0.5620	19.063 0.7505	19.037 0.7495	Table B2-7
5/8	15.875 0.6250	20.638 0.8125	15.88 0.625	—	Y-1010	14.8 3330	29.2 6560	4.7	0.013 0.029	15.875 0.6250	15.862 0.6245	20.650 0.8130	20.625 0.8120	Table B2-7
11/16	17.463 0.6875	22.212 0.8745	6.35 0.250	—	Y-114	5.76 1290	8.92 2010	1.55	0.005 0.012	17.463 0.6875	17.450 0.6870	22.238 0.8755	22.212 0.8745	Table B2-7

Note) · For information on the speed ratings, contact JTEKT.

EXTRA-PRECISION BEARINGS

INCH SERIES

Open-end full-complement mechanically retained drawn cup needle roller bearings, manufactured to inch standards, are offered with extra-precision specifications. The manufacturing tolerance of these bearings is one-third that of the standard precision bearings. In production operations, using closer tolerances on shaft and housing, they will assemble with consistently lower radial internal clearances than can be expected with the standard precision series bearings.

Extra-precision bearings are suitable for those applications requiring close control of radial play and eccentricity. They are also preferred when two bearings are mounted adjacent to each other because greater accuracy in manufacture will provide better load distribution between the bearings.

Nominal dimensions, load ratings, speed ratings and other general specifications for extra-precision bearings are the same as for the corresponding "B" or "BH" sizes of drawn cup needle roller bearings. Consequently, the data on pages B-2-54 to B-2-61 can be used in bearing size selection.

When ordering an extra-precision bearing, add the prefix letter "G" to the bearing designation. For example, after following the size selection procedure outlined in the engineering section, bearing B-1212 is selected – but extra-precision tolerances are required. These are designated by ordering a GB-1212 bearing.

To realize the advantages of the expected closer radial internal clearance of the extra-precision bearing, the user must have the capability of producing housing bore and shaft raceway diameters to the close tolerances indicated by the bearing tables on page B-2-65.

The resulting total radial internal clearance, within the installed GB-1212 extra-precision drawn cup needle roller bearing, will lie in the range from 0.005 mm to 0.030 mm (0.0002 in to 0.0012 in)

Inspection dimensions for the extra-precision bearings are given in table on page B-2-64. Note that these bearings must be inspected while mounted in the specified ring gage. Bearing bores are checked with "go" and "no go" plug gages. The "go" gage size is the minimum diameter inside the needle rollers. The "no go" gage size is 0.002 mm (0.0001 in) larger than the maximum diameter inside the needle rollers.

Procedures for selecting ring and plug gage dimensions are the same as for those involving standard precision needle roller bearings – except that the ring gage diameters and diameters inside the needle rollers must be drawn from the table on page B-2-64.

B

Table B2-9. Inspection for extra-precision drawn cup needle roller bearings – inch series

Nominal shaft diameter	Gaging		
	Ring gage	Diameter inside needle rollers	
		Max.	Min.
mm in	mm in	mm in	mm in
3.175 1/8	6.281 0.2473	3.200 0.1260	3.190 0.1256
3.970 5/32	7.074 0.2785	3.995 0.1573	3.985 0.1569
4.763 3/16	8.611 0.3390	4.788 0.1885	4.777 0.1881
6.350 1/4	10.993 0.4328	6.375 0.2510	6.365 0.2506
7.938 5/16	12.581 0.4953	7.963 0.3135	7.953 0.3131
H 7.938 H 5/16	14.168 0.5578	7.963 0.3135	7.953 0.3131
9.525 3/8	14.168 0.5578	9.550 0.3760	9.540 0.3756
H 9.525 H 3/8	15.756 0.6203	9.550 0.3760	9.540 0.3756
11.113 7/16	15.756 0.6203	11.138 0.4385	11.127 0.4381
H 11.113 H 7/16	17.343 0.6828	11.138 0.4385	11.127 0.4381
12.700 1/2	17.343 0.6828	12.725 0.5010	12.715 0.5006
H 12.700 H 1/2	18.931 0.7453	12.725 0.5010	12.715 0.5006
14.288 9/16	18.931 0.7453	14.313 0.5635	14.303 0.5631
H 14.288 H 9/16	20.518 0.8078	14.313 0.5635	14.303 0.5631
15.875 5/8	20.518 0.8078	15.900 0.6260	15.890 0.6256
H 15.875 H 5/8	22.106 0.8703	15.900 0.6260	15.890 0.6256
17.463 11/16	22.106 0.8703	17.488 0.6885	17.478 0.6881
H 17.463 H 11/16	23.693 0.9328	17.488 0.6885	17.478 0.6881
19.050 3/4	25.273 0.9950	19.068 0.7507	19.058 0.7503
H 19.050 H 3/4	26.861 1.0575	19.068 0.7507	19.058 0.7503
20.638 13/16	26.861 1.0575	20.655 0.8132	20.645 0.8128
H 20.638 H 13/16	28.448 1.1200	20.655 0.8132	20.645 0.8128
22.225 7/8	28.448 1.1200	22.243 0.8757	22.233 0.8753
H 22.225 H 7/8	30.036 1.1825	22.243 0.8757	22.233 0.8753

Nominal shaft diameter	Gaging		
	Ring gage	Diameter inside needle rollers	
		Max.	Min.
mm in	mm in	mm in	mm in
23.813 15/16	30.036 1.1825	23.830 0.9382	23.820 0.9378
25.400 1	31.623 1.2450	25.418 1.0007	25.408 1.0003
H 25.400 H 1	33.211 1.3075	25.418 1.0007	25.408 1.0003
26.988 1 1/16	33.211 1.3075	27.005 1.0632	26.995 1.0628
28.575 1 1/8	34.798 1.3700	28.593 1.1257	28.583 1.1253
H 28.575 H 1 1/8	37.973 1.4950	28.593 1.1257	28.583 1.1253
30.163 1 3/16	37.973 1.4950	30.180 1.1882	30.170 1.1878
31.750 1 1/4	37.973 1.4950	31.768 1.2507	31.758 1.2503
H 31.750 H 1 1/4	41.148 1.6200	31.768 1.2507	31.758 1.2503
33.338 1 5/16	41.148 1.6200	33.355 1.3132	33.345 1.3128
34.925 1 3/8	41.148 1.6200	34.943 1.3757	34.933 1.3753
H 34.925 H 1 3/8	44.323 1.7450	34.943 1.3757	34.933 1.3753
38.100 1 1/2	47.498 1.8700	38.120 1.5008	38.108 1.5003
41.275 1 5/8	50.673 1.9950	41.295 1.6258	41.283 1.6253
44.450 1 3/4	53.848 2.1200	44.470 1.7508	44.458 1.7503
47.625 1 7/8	57.023 2.2450	47.645 1.8758	47.633 1.8753
50.800 2	60.198 2.3700	50.820 2.0008	50.808 2.0003
H 52.388 H 2 1/16	64.166 2.5262	52.408 2.0633	52.395 2.0628
53.975 2 1/8	63.373 2.4950	53.995 2.1258	53.983 2.1253
57.150 2 1/4	66.548 2.6200	57.170 2.2508	57.158 2.2503
66.675 2 5/8	76.073 2.9950	66.700 2.6260	66.685 2.6254
69.850 2 3/4	79.248 3.1200	69.875 2.7510	69.860 2.7504
88.900 3 1/2	101.473 3.9950	88.925 3.5010	88.710 3.5004

Table B2-10. Mounting dimensions for extra-precision drawn cup needle roller bearings – inch series

Bearing bore designation	Mounting					
	Nominal bore	Nominal O.D.	Shaft raceway diameter		Housing bore	
			Max.	Min.	Max.	Min.
	mm in	mm in	mm in	mm in	mm in	mm in
GB-2	3.175 0.1250	6.350 0.2500	3.178 0.1251	3.170 0.1248	6.281 0.2473	6.274 0.2470
GB-2 1/2	3.967 0.1562	7.142 0.2812	3.973 0.1564	3.965 0.1561	7.074 0.2785	7.066 0.2782
GB-3	4.763 0.1875	8.733 0.3438	4.765 0.1876	4.757 0.1873	8.611 0.3390	8.603 0.3387
GB-4	6.350 0.2500	11.113 0.4375	6.353 0.2501	6.345 0.2498	10.993 0.4328	10.986 0.4325
GB-5	7.938 0.3125	12.700 0.5000	7.940 0.3126	7.932 0.3123	12.581 0.4953	12.573 0.4950
GBH-5	7.938 0.3125	14.288 0.5625	7.940 0.3126	7.932 0.3123	14.168 0.5578	14.161 0.5575
GB-6	9.525 0.3750	14.288 0.5625	9.528 0.3751	9.520 0.3748	14.168 0.5578	14.161 0.5575
GBH-6	9.525 0.3750	15.875 0.6250	9.528 0.3751	9.520 0.3748	15.756 0.6203	15.748 0.6200
GB-7	11.113 0.4375	15.875 0.6250	11.115 0.4376	11.107 0.4373	15.756 0.6203	15.748 0.6200
GBH-7	11.113 0.4375	17.463 0.6875	11.115 0.4376	11.107 0.4373	17.343 0.6828	17.336 0.6825
GB-8	12.700 0.5000	17.463 0.6875	12.703 0.5001	12.695 0.4998	17.343 0.6828	17.336 0.6825
GBH-8	12.700 0.5000	19.050 0.7500	12.703 0.5001	12.695 0.4998	18.931 0.7453	18.923 0.7450
GB-9	14.288 0.5625	19.050 0.7500	14.290 0.5626	14.282 0.5623	18.931 0.7453	18.923 0.7450
GBH-9	14.288 0.5625	20.638 0.8125	14.290 0.5626	14.282 0.5623	20.518 0.8078	20.511 0.8075
GB-10	15.875 0.6250	20.638 0.8125	14.878 0.6251	15.870 0.6248	20.518 0.8078	20.511 0.8075
GBH-10	15.875 0.6250	22.225 0.8750	14.878 0.6251	15.870 0.6248	22.106 0.8703	22.098 0.8700
GB-11	17.463 0.6875	22.225 0.8750	17.465 0.6876	17.457 0.6873	22.106 0.8703	22.098 0.8700
GBH-11	17.463 0.6875	23.813 0.9375	17.465 0.6876	17.457 0.6873	23.693 0.9328	23.686 0.9325
GB-12	19.050 0.7500	25.400 1.0000	19.053 0.7501	19.045 0.7498	25.281 0.9953	25.273 0.9950
GBH-12	19.050 0.7500	26.988 1.0625	19.053 0.7501	19.045 0.7498	26.868 1.0578	26.861 1.0575
GB-13	20.638 0.8125	26.988 1.0625	20.640 0.8126	20.632 0.8123	26.868 1.0578	26.861 1.0575
GBH-13	20.638 0.8125	28.575 1.1250	20.640 0.8126	20.632 0.8123	28.456 1.1203	28.448 1.1200
GB-14	22.225 0.8750	28.575 1.1250	22.228 0.8751	22.220 0.8748	28.456 1.1203	28.448 1.1200
GBH-14	22.225 0.8750	30.163 1.1875	22.228 0.8751	22.220 0.8748	30.046 1.1829	30.036 1.1825

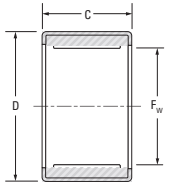
Bearing bore designation	Mounting					
	Nominal bore	Nominal O.D.	Shaft raceway diameter		Housing bore	
			Max.	Min.	Max.	Min.
	mm in	mm in	mm in	mm in	mm in	mm in
GB-15	23.813 0.9375	30.163 1.1875	23.815 0.9376	23.807 0.9373	30.046 1.1829	30.036 1.1825
GB-16	25.400 1.0000	31.750 1.2500	25.403 1.0001	25.395 0.9998	31.633 1.2454	31.623 1.2450
GBH-16	25.400 1.0000	33.338 1.3125	25.403 1.0001	25.395 0.9998	33.221 1.3079	33.211 1.3075
GB-17	26.988 1.0625	33.338 1.3125	26.990 1.0626	26.982 1.0623	33.221 1.3079	33.211 1.3075
GB-18	28.575 1.1250	34.925 1.3750	28.578 1.1251	28.570 1.1248	34.808 1.3704	34.798 1.3700
GBH-18	28.575 1.1250	38.100 1.5000	28.578 1.1251	28.570 1.1248	37.986 1.4955	37.973 1.4950
GB-19	30.163 1.1875	38.100 1.5000	30.165 1.1876	30.157 1.1873	37.986 1.4955	37.973 1.4950
GB-20	31.750 1.2500	38.100 1.5000	31.753 1.2501	31.745 1.2498	37.986 1.4955	37.973 1.4950
GBH-20	31.750 1.2500	41.275 1.6250	31.753 1.2501	31.745 1.2498	41.161 1.6205	41.148 1.6200
GB-21	33.338 1.3125	41.275 1.6250	33.340 1.3126	33.332 1.3123	41.161 1.6205	41.148 1.6200
GB-22	34.925 1.3750	41.275 1.6250	34.925 1.3750	34.917 1.3747	41.161 1.6205	41.148 1.6200
GBH-22	34.925 1.3750	44.450 1.7500	34.925 1.3750	34.917 1.3747	44.336 1.7455	44.323 1.7450
GB-24	38.100 1.5000	47.625 1.8750	38.100 1.5000	38.092 1.4997	47.511 1.8705	47.498 1.8700
GB-26	41.275 1.6250	50.800 2.0000	41.275 1.6250	41.267 1.6247	50.686 1.9955	50.673 1.9950
GB-28	44.450 1.7500	53.975 2.1250	44.450 1.7500	44.442 1.7497	53.861 2.1205	53.848 2.1200
GB-30	47.625 1.8750	57.150 2.2500	47.625 1.8750	47.617 1.8747	57.036 2.2455	57.023 2.2450
GB-32	50.800 2.0000	60.325 2.3750	50.800 2.0000	50.792 1.9997	60.211 2.3705	60.198 2.3700
GBH-33	52.388 2.0625	64.293 2.5312	52.385 2.0624	52.377 2.0621	64.178 2.5267	64.166 2.5262
GB-34	53.975 2.1250	63.500 2.5000	53.973 2.1249	53.965 2.1246	63.386 2.4955	63.373 2.4950
GB-36	57.150 2.2500	66.675 2.6250	57.148 2.2499	57.140 2.2496	66.561 2.6205	66.548 2.6200
GB-42	66.675 2.6250	76.200 3.0000	66.670 2.6248	66.662 2.6245	76.088 2.9956	76.073 2.9950
GB-44	69.850 2.7500	79.375 3.1250	69.845 2.7498	69.837 2.7495	79.263 3.1206	79.248 3.1200
GB-56	88.900 3.5000	101.600 4.0000	88.895 3.4998	88.887 3.4995	101.488 3.9956	101.473 3.9950

NOTE

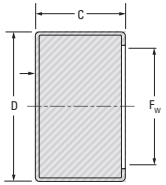
Check for availability as not every size may be in production.

CAGED BEARINGS – OPEN ENDS, CLOSED ONE END

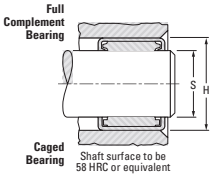
INCH SERIES
J, JH, MJ- 1, MJH- 1 SERIES



J, JH



MJ- 1, MJH- 1



Shaft Dia.	F_w	D	C +0 +0.000 -0.3 -0.012	$Y_{max.}$	Bearing Designation		Load Ratings Dynamic	Load Ratings Static	Fatigue Load Limit C_u	Speed Ratings		Approx. Wt.		Mounting Dimensions Shaft		Mounting Dimensions Housing		Inspection gage	Mounting inner ring (pages B-2-74 to B-2-76)
					Open Ends	Closed One End	C	C_0		Grease	Oil	Open Ends	Closed One End	Max.	Min.	Max.	Min.		
in	mm in	mm in	mm in	mm in			kN lbf		kN	min^{-1}		kg lbs		mm in	mm in	mm in	mm in		
1/8	3.175 0.1250	6.350 0.2500	4.78 0.188	—	JP-23-F	—	0.90 200	0.61 140	0.100	33000	51000	0.001 0.001	—	3.175 0.1250	3.167 0.1247	6.363 0.2505	6.350 0.2500	Table B2-7	
	3.175 0.1250	6.350 0.2500	6.35 0.250	—	JP-24-F	—	1.33 300	1.01 230	0.150	33000	51000	0.001 0.001	—	3.175 0.1250	3.167 0.1247	6.363 0.2505	6.350 0.2500	Table B2-7	
5/32	3.970 0.1563	7.142 0.2812	4.78 0.188	—	JP-2 1/2 3F	—	0.91 200	0.62 140	0.110	31000	47000	0.001 0.001	—	3.970 0.1563	3.962 0.1560	7.155 0.2817	7.142 0.2812	Table B2-7	
3/16	4.763 0.1875	8.733 0.3438	4.77 0.188	—	JP-33-F	—	1.07 240	0.73 160	0.120	25000	38000	0.001 0.002	—	4.763 0.1875	4.755 0.1872	8.730 0.3437	8.717 0.3432	Table B2-7	
	4.763 0.1875	8.733 0.3438	6.35 0.250	—	JP-34-F	—	1.72 390	1.34 300	0.200	25000	38000	0.001 0.002	—	4.763 0.1875	4.755 0.1872	8.730 0.3437	8.717 0.3432	Table B2-7	
	4.763 0.1875	8.733 0.3438	9.53 0.375	1.02 0.040	J-36	MJ-361	2.28 510	1.92 430	0.290	25000	38000	0.002 0.004	0.002 0.005	4.763 0.1875	4.755 0.1872	8.730 0.3437	8.717 0.3432	Table B2-7	
1/4	6.350 0.2500	11.113 0.4375	7.92 0.312	1.02 0.040	J-45	MJ-451	2.21 500	1.74 390	0.300	20000	30000	0.003 0.006	0.003 0.007	6.350 0.2500	6.337 0.2495	11.125 0.4380	11.100 0.4370	Table B2-7	
	6.350 0.2500	11.113 0.4375	11.13 0.438	1.02 0.040	J-47	MJ-471	3.40 760	3.01 680	0.450	20000	30000	0.004 0.008	0.004 0.009	6.350 0.2500	6.337 0.2495	11.125 0.4380	11.100 0.4370	Table B2-7	
5/16	7.938 0.3125	12.700 0.5000	7.92 0.312	—	J-55	—	2.40 540	2.01 450	0.340	18000	28000	0.003 0.007	—	7.938 0.3125	7.925 0.3120	12.713 0.5005	12.687 0.4995	Table B2-7	
	7.938 0.3125	12.700 0.5000	11.13 0.438	1.02 0.040	J-57	MJ-571	4.03 910	3.92 880	0.590	18000	28000	0.004 0.009	0.005 0.011	7.938 0.3125	7.925 0.3120	12.713 0.5005	12.687 0.4995	Table B2-7	
	7.938 0.3125	14.288 0.5625	11.13 0.438	1.02 0.040	JH-57	MJH-571	4.65 1050	3.76 850	0.570	14000	22000	0.006 0.013	0.007 0.016	7.938 0.3125	7.925 0.3120	14.300 0.5630	14.275 0.5620	Table B2-7	
3/8	9.525 0.3750	14.288 0.5625	7.92 0.312	1.02 0.040	J-65	MJ-651	2.73 610	2.49 560	0.430	18000	27000	0.004 0.008	0.004 0.009	9.525 0.3750	9.512 0.3745	14.300 0.5630	14.275 0.5620	Table B2-7	IRA-3
	9.525 0.3750	14.288 0.5625	9.53 0.375	1.02 0.040	J-66	MJ-661	3.53 790	3.46 780	0.530	18000	27000	0.004 0.009	0.005 0.010	9.525 0.3750	9.512 0.3745	14.300 0.5630	14.275 0.5620	Table B2-7	IRA-3
	9.525 0.3750	14.288 0.5625	12.70 0.500	1.02 0.040	J-68	MJ-681	5.22 1170	5.72 1290	0.860	18000	27000	0.005 0.012	0.006 0.013	9.525 0.3750	9.512 0.3745	14.300 0.5630	14.275 0.5620	Table B2-7	IRA-3
	9.525 0.3750	15.875 0.6250	12.70 0.500	—	JH-68	—	6.59 1480	6.08 1370	0.920	13000	20000	0.008 0.017	—	9.525 0.3750	9.512 0.3745	15.888 0.6255	15.862 0.6245	Table B2-7	IRA-3
7/16	11.113 0.4375	15.875 0.6250	12.70 0.500	1.02 0.040	J-78	MJ-781	6.34 1430	7.67 1720	1.15	17000	26000	0.006 0.014	0.007 0.016	11.113 0.4375	11.100 0.4370	15.888 0.6255	15.862 0.6245	Table B2-7	
	11.113 0.4375	17.463 0.6875	12.70 0.500	—	JH-78	—	7.10 1600	6.89 1550	1.05	13000	19000	0.009 0.019	—	11.113 0.4375	11.100 0.4370	17.475 0.6880	17.450 0.6870	Table B2-7	

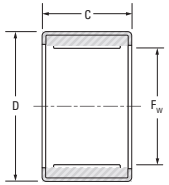
(1) IRA inner ring provides additional length if required.

Shaft Dia.	F_w	D	C +0 +0.000 -0.3 -0.012	$Y_{max.}$	Bearing Designation		Load Ratings Dynamic	Load Ratings Static	Fatigue Load Limit C_u	Speed Ratings		Approx. Wt.		Mounting Dimensions Shaft		Mounting Dimensions Housing		Inspection gage	Mounting inner ring (pages B-2-74 to B-2-76)
					Open Ends	Closed One End	C	C_0		Grease	Oil	Open Ends	Closed One End	Max.	Min.	Max.	Min.		
in	mm in	mm in	mm in	mm in			kN lbf		kN	min^{-1}		kg lbs		mm in	mm in	mm in	mm in		
1/2	12.700 0.5000	17.463 0.6875	7.92 0.312	1.02 0.040	J-85	MJ-851	3.46 780	3.66 820	0.630	16000	25000	0.005 0.010	0.005 0.012	12.700 0.5000	12.687 0.4995	17.475 0.6880	17.450 0.6870	Table B2-7	IRA-5
	12.700 0.5000	17.463 0.6875	9.53 0.375	1.02 0.040	J-86	MJ-861	4.67 1050	5.39 1210	0.830	16000	25000	0.005 0.011	0.006 0.013	12.700 0.5000	12.687 0.4995	17.475 0.6880	17.450 0.6870	Table B2-7	IRA-5
	12.700 0.5000	17.463 0.6875	12.70 0.500	1.02 0.040	J-88	MJ-881	6.32 1420	7.92 1780	1.20	16000	25000	0.007 0.015	0.008 0.018	12.700 0.5000	12.687 0.4995	17.475 0.6880	17.450 0.6870	Table B2-7	IRA-5
	12.700 0.5000	17.463 0.6875	19.05 0.750	—	J-812	—	10.2 2290	14.7 3300	2.25	16000	25000	0.010 0.023	—	12.700 0.5000	12.687 0.4995	17.475 0.6880	17.450 0.6870	Table B2-7	
	12.700 0.5000	19.050 0.7500	11.13 0.438	1.02 0.040	JH-87	MJH-871	6.39 1440	6.20 1390	0.950	12000	19000	0.009 0.019	0.010 0.023	12.700 0.5000	12.687 0.4995	19.063 0.7505	19.037 0.7495	Table B2-7	IRA-5
	12.700 0.5000	19.050 0.7500	12.70 0.500	1.02 0.040	JH-88	MJH-881	7.56 1700	7.69 1730	1.15	12000	19000	0.010 0.022	0.012 0.026	12.700 0.5000	12.687 0.4995	19.063 0.7505	19.037 0.7495	Table B2-7	IRA-5
	12.700 0.5000	19.050 0.7500	19.05 0.750	—	JH-812	—	12.3 2770	14.4 3240	2.25	12000	19000	0.015 0.032	—	12.700 0.5000	12.687 0.4995	19.063 0.7505	19.037 0.7495	Table B2-7	
9/16	14.288 0.5625	19.050 0.750	11.13 0.438	1.02 0.040	J-97	MJ-971	5.47 1230	6.80 1530	1.05	16000	25000	0.007 0.016	0.009 0.019	14.288 0.5625	14.275 0.5620	19.063 0.7505	19.037 0.7495	Table B2-7	IR-68
	14.288 0.5625	19.050 0.7500	12.70 0.500	1.02 0.040	J-98	MJ-981	6.23 1400	8.03 1810	1.20	16000	25000	0.008 0.017	0.009 0.020	14.288 0.5625	14.275 0.5620	19.063 0.7505	19.037 0.7495	Table B2-7	IR-68
	14.288 0.5625	19.050 0.7500	15.88 0.625	—	J-910	—	8.27 1860	11.6 2610	1.75	16000	25000	0.010 0.021	—	14.288 0.5625	14.275 0.5620	19.063 0.7505	19.037 0.7495	Table B2-7	IR-612(1)
	14.288 0.5625	20.638 0.8125	12.70 0.500	1.02 0.040	JH-98	MJH-981	7.98 1790	8.49 1910	1.30	12000	18000	0.011 0.025	0.014 0.030	14.288 0.5625	14.275 0.5620	20.650 0.8130	20.625 0.8120	Table B2-7	IR-68
5/8	15.875 0.6250	20.638 0.8125	12.70 0.500	1.02 0.040	J-108	MJ-1081	6.71 1510	9.13 2050	1.40	13000	21000	0.009 0.019	0.010 0.023	15.875 0.6250	15.862 0.6245	20.650 0.8130	20.625 0.8120	Table B2-7	IR-68-1
	15.875 0.6250	20.638 0.8125	15.88 0.625	1.02 0.040	J-1010	MJ-10101	8.80 1980	12.9 2900	1.95	13000	21000	0.010 0.023	0.013 0.028	15.875 0.6250	15.862 0.6245	20.650 0.8130	20.625 0.8120	Table B2-7	IR-612-1
	15.875 0.6250	20.638 0.8125	19.05 0.750	1.02 0.040	J-1012	MJ-10121	11.8 2650	18.9 4250	2.90	13000	21000	0.013 0.028	0.015 0.033	15.875 0.6250	15.862 0.6245	20.650 0.8130	20.625 0.8120	Table B2-7	IR-612-1
	15.875 0.6250	22.212 0.8745	15.88 0.625	1.02 0.040	JH-1010	MJH-10101	11.6 2610	14.1 3170	2.15	14000	21000	0.015 0.032	0.017 0.037	15.875 0.6250	15.862 0.6245	22.238 0.8755	22.212 0.8745	Table B2-7	IR-612-1
	15.875 0.6250	22.212 0.8745	25.40 1.000	1.02 0.040	JH-1016	MJH-10161	19.8 4450	28.1 6320	4.35	14000	21000	0.024 0.052	0.028 0.062	15.875 0.6250	15.862 0.6245	22.238 0.8755	22.212 0.8745	Table B2-7	
11/16	17.463 0.6875	22.212 0.8745	19.05 0.750	1.02 0.040	J-1112	MJ-11121	12.5 2800	20.9 4700	3.20	12000	19000	0.014 0.030	0.016 0.036	17.463 0.6875	17.450 0.6870	22.238 0.8755	22.212 0.8745	Table B2-7	
	17.463 0.6875	23.813 0.9375	15.88 0.625	1.02 0.040	JH-1110	MJH-11101	12.1 2710	15.2 3420	2.30	13000	19000	0.016 0.035	0.019 0.042	17.463 0.6875	17.450 0.6870	23.825 0.9380	23.800 0.9370	Table B2-7	
	17.463 0.6875	23.813 0.9375	19.05 0.750	—	JH-1112	—	16.1 3620	22.2 4990	3.10	13000	19000	0.019 0.042	—	17.463 0.6875	17.450 0.6870	23.825 0.9380	23.800 0.9370	Table B2-7	
3/4	19.050 0.7500	25.400 1.0000	9.53 0.375	—	J-126	—	6.49 1460	7.05 1580	1.10	11000	18000	0.010 0.022	—	19.050 0.7500	19.037 0.7495	25.413 1.0005	25.387 0.9995	Table B2-7	IR-88
	19.050 0.7500	25.400 1.0000	12.70 0.500	—	J-128	—	9.94 2230	12.2 2740	1.85	11000	18000	0.014 0.030	—	19.050 0.7500	19.037 0.7495	25.413 1.0005	25.387 0.9995	Table B2-7	IR-88
	19.050 0.7500	25.400 1.0000	15.88 0.625	1.02 0.040	J-1210	MJ-12101	12.5 2810	16.3 3670	2.50	11000	18000	0.017 0.038	0.020 0.045	19.050 0.7500	19.037 0.7495	25.413 1.0005	25.387 0.9995	Table B2-7	IR-812(1)
	19.050 0.7500	25.400 1.0000	19.05 0.750	1.02 0.040	J-1212	MJ-12121	15.5 3490	21.6 4860	3.35	11000	18000	0.020 0.045	0.025 0.054	19.050 0.7500	19.037 0.7495	25.413 1.0005	25.387 0.9995	Table B2-7	IR-812(1)
	19.050 0.7500	26.988 1.0625	19.05 0.750	1.02 0.040	JH-1212	MJH-12121	19.1 4290	23.6 5300	3.70	12000	18000	0.026 0.058	0.031 0.069	19.050 0.7500	19.037 0.7495	27.000 1.0630	26.975 1.0620	Table B2-7	IR-812(1)

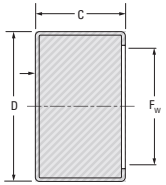
Continued on next page.

CAGED BEARINGS – OPEN ENDS, CLOSED ONE END

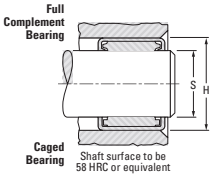
INCH SERIES
J, JH, MJ- 1, MJH- 1 SERIES



J, JH



MJ- 1, MJH- 1



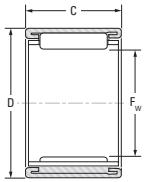
Shaft Dia.	F_w	D	C +0 -0.3 / +0.000 -0.012	$Y_{max.}$	Bearing Designation: Open Ends	Bearing Designation: Closed One End	Load Ratings: Dynamic C	Load Ratings: Static C_0	Fatigue Load Limit C_u	Speed Ratings: Grease	Speed Ratings: Oil	Approx. Wt.: Open Ends	Approx. Wt.: Closed One End	Mounting Dimensions: Shaft Max.	Shaft Min.	Housing Max.	Housing Min.	Inspection gage	Mounting inner ring (pages B-2-74 to B-2-76)
in	mm in	mm in	mm in	mm in			kN lbf		kN	min^{-1}		kg lbs		mm in	mm in	mm in	mm in		
13/16	20.638 0.8125	26.988 1.0625	22.23 0.875	—	J-1314	—	19.3 4340	29.31 6590	4.55	10000	16000	0.025 0.056	—	20.638 0.8125	20.625 0.8120	27.000 1.0630	26.975 1.0620	Table B2-7	
	20.638 0.8125	28.575 1.1250	19.05 0.750	1.27 0.050	JH-1312	MJH-13121	18.8 4220	24.5 5510	3.85	11000	16000	0.028 0.062	0.034 0.074	20.638 0.8125	20.625 0.8120	28.588 1.1255	28.562 1.1245	Table B2-7	
7/8	22.225 0.8750	28.575 1.1250	9.53 0.375	—	J-146	—	7.20 1620	8.43 1900	1.30	9700	15000	0.012 0.026	—	22.225 0.8750	22.212 0.8745	28.588 1.1255	28.562 1.1245	Table B2-7	IR-1012(1)
	22.225 0.8750	28.575 1.1250	12.70 0.500	—	J-148	—	10.9 2460	14.5 3260	2.20	9700	15000	0.015 0.034	—	22.225 0.8750	22.212 0.8745	28.588 1.1255	28.562 1.1245	Table B2-7	IR-1012(1)
	22.225 0.8750	28.575 1.1250	19.05 0.750	1.02 0.040	J-1412	MJ-14121	17.9 4020	24.5 5510	4.20	9700	15000	0.024 0.052	0.028 0.062	22.225 0.8750	22.212 0.8745	28.588 1.1255	28.562 1.1245	Table B2-7	IR-1012(1)
	22.225 0.8750	28.575 1.1250	25.40 1.000	1.02 0.040	J-1416	MJ-14161	23.7 5320	39.0 8760	6.05	9700	15000	0.031 0.069	0.059 0.129	22.225 0.8750	22.212 0.8745	28.588 1.1255	28.562 1.1245	Table B2-7	IR-1016
	22.225 0.8750	30.163 1.1875	19.05 0.750	1.27 0.050	JH-1412	MJH-14121	18.3 4120	24.5 5510	3.75	9800	15000	0.030 0.066	0.036 0.079	22.225 0.8750	22.212 0.8745	30.175 1.1880	30.150 1.1870	Table B2-7	IR-1012(1)
	22.225 0.8750	30.163 1.1875	25.40 1.000	1.27 0.050	JH-1416	MJH-14161	25.4 5710	37.4 8400	5.80	9800	15000	0.040 0.089	0.048 0.106	22.225 0.8750	22.212 0.8745	30.175 1.1880	30.150 1.1870	Table B2-7	IR-1016
1	25.400 1.0000	31.750 1.2500	19.05 0.750	—	J-1612	—	18.1 4070	28.8 6480	4.45	8400	13000	0.026 0.058	—	25.400 1.0000	25.387 0.9995	31.763 1.2505	31.737 1.2495	Table B2-7	IR-1212
	25.400 1.0000	31.750 1.2500	25.40 1.000	1.02 0.040	J-1616	MJ-16161	25.0 5610	43.4 9760	6.75	8400	13000	0.035 0.077	0.042 0.092	25.400 1.0000	25.387 0.9995	31.763 1.2505	31.737 1.2495	Table B2-7	IR-1216(1)
	25.400 1.0000	33.338 1.3125	19.05 0.750	1.27 0.050	JH-1612	MJH-16121	20.7 4650	29.6 6650	4.60	8500	13000	0.034 0.074	0.040 0.088	25.400 1.0000	25.387 0.9995	33.350 1.3130	33.325 1.3120	Table B2-7	IR-1212
	25.400 1.0000	33.338 1.3125	25.40 1.000	1.27 0.050	JH-1616	MJH-16161	27.6 6200	42.9 9640	6.65	8500	13000	0.045 0.099	0.054 0.119	25.400 1.0000	25.387 0.9995	33.350 1.3130	33.325 1.3120	Table B2-7	IR-1216(1)
1 1/8	28.575 1.1250	34.925 1.3750	12.70 0.500	1.02 0.040	J-188	MJ-1881	11.7 2620	16.9 3800	2.55	7400	11000	0.020 0.043	0.023 0.050	28.575 1.1250	28.562 1.1245	34.938 1.3755	34.912 1.3745	Table B2-7	IR-1416(1)
	28.575 1.1250	34.925 1.3750	19.05 0.750	1.02 0.040	J-1812	MJ-18121	19.0 4280	31.8 7140	4.90	7400	11000	0.029 0.064	0.035 0.076	28.575 1.1250	28.562 1.1245	34.938 1.3755	34.912 1.3745	Table B2-7	IR-1416(1)
	28.575 1.1250	34.925 1.3750	25.40 1.000	1.02 0.040	J-1816	MJ-18161	26.2 5880	47.8 10750	7.40	7400	11000	0.039 0.086	0.047 0.103	28.575 1.1250	28.562 1.1245	34.938 1.3755	34.912 1.3745	Table B2-7	IR-1416(1)
	28.575 1.1250	38.100 1.5000	19.05 0.750	1.27 0.050	JH-1812	MJH-18121	23.3 5240	31.3 7040	4.75	7600	12000	0.046 0.101	0.055 0.121	28.575 1.1250	28.562 1.1245	38.113 1.5005	38.087 1.4995	Table B2-7	IR-1416(1)
	28.575 1.1250	38.100 1.5000	25.40 1.000	1.27 0.050	JH-1816	MJH-18161	33.1 7450	49.2 11060	7.70	7600	12000	0.061 0.135	0.074 0.162	28.575 1.1250	28.562 1.1245	38.113 1.5005	38.087 1.4995	Table B2-7	IR-1416(1)

(1) IRA inner ring provides additional length if required.

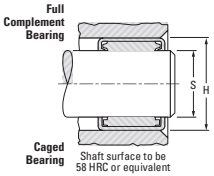
Shaft Dia.	F_w	D	C +0 -0.3 / +0.000 -0.012	$Y_{max.}$	Bearing Designation: Open Ends	Bearing Designation: Closed One End	Load Ratings: Dynamic C	Load Ratings: Static C_0	Fatigue Load Limit C_u	Speed Ratings: Grease	Speed Ratings: Oil	Approx. Wt.: Open Ends	Approx. Wt.: Closed One End	Mounting Dimensions: Shaft Max.	Shaft Min.	Housing Max.	Housing Min.	Inspection gage	Mounting inner ring (pages B-2-74 to B-2-76)
in	mm in	mm in	mm in	mm in			kN lbf		kN	min^{-1}		kg lbs		mm in	mm in	mm in	mm in		
1 1/8	28.575 1.1250	38.100 1.5000	28.58 1.125	1.27 0.050	JH-1818	MJH-18181	36.3 8160	55.3 12430	8.60	7600	12000	0.069 0.152	0.082 0.181	28.575 1.1250	28.562 1.1245	38.113 1.5005	38.087 1.4995	Table B2-7	
1 1/4	31.750 1.2500	38.100 1.5000	19.05 0.750	1.02 0.040	J-2012	MJ-20121	19.8 4460	34.7 7800	5.35	6600	10000	0.036 0.080	0.043 0.095	31.750 1.2500	31.737 1.2495	38.113 1.5005	38.087 1.4995	Table B2-7	IR-1612
	31.750 1.2500	38.100 1.5000	25.40 1.000	1.02 0.040	J-2016	MJ-20161	28.8 6480	56.3 12660	8.70	6600	10000	0.043 0.094	0.051 0.113	31.750 1.2500	31.737 1.2495	38.113 1.5005	38.087 1.4995	Table B2-7	IR-1616(1)
	31.750 1.2500	41.275 1.6250	19.05 0.750	—	JH-2012	—	24.1 5420	34.0 7640	5.80	6800	10000	0.050 0.111	—	31.750 1.2500	31.737 1.2495	41.288 1.6255	41.262 1.6245	Table B2-7	IR-1612
	31.750 1.2500	41.275 1.6250	25.40 1.000	—	JH-2016	—	34.0 7640	52.8 11870	8.20	6800	10000	0.067 0.148	—	31.750 1.2500	31.737 1.2495	41.288 1.6255	41.262 1.6245	Table B2-7	IR-1616(1)
	31.750 1.2500	41.275 1.6250	31.75 1.250	—	JH-2020	—	43.4 9750	72.3 16250	10.8	6800	10000	0.084 0.185	—	31.750 1.2500	31.737 1.2495	41.288 1.6255	41.262 1.6245	Table B2-7	
1 3/8	34.925 1.3750	41.275 1.6250	12.70 0.500	1.02 0.040	J-228	MJ-2281	14.0 3140	22.9 5150	3.50	6000	9200	0.024 0.052	0.028 0.062	34.925 1.3750	34.912 1.3745	41.288 1.6255	41.262 1.6245	Table B2-7	IR-1812
	34.925 1.3750	41.275 1.6250	19.05 0.750	—	J-2212	—	22.8 5130	43.0 9660	6.65	6000	9200	0.035 0.077	—	34.925 1.3750	34.912 1.3745	41.288 1.6255	41.262 1.6245	Table B2-7	IR-1812
	34.925 1.3750	44.450 1.7500	19.05 0.750	1.27 0.050	JH-2212	MJH-22121	26.2 5900	38.4 8640	5.90	6100	9400	0.055 0.121	0.065 0.144	34.925 1.3750	34.912 1.3745	44.463 1.7505	44.437 1.7495	Table B2-7	IR-1812
	34.925 1.3750	44.450 1.7500	25.40 1.000	1.27 0.050	JH-2216	MJH-22161	36.5 8210	58.8 13220	9.20	6100	9400	0.073 0.161	0.087 0.192	34.925 1.3750	34.912 1.3745	44.463 1.7505	44.437 1.7495	Table B2-7	IR-1816
1 1/2	38.100 1.5000	47.625 1.8750	19.05 0.750	1.27 0.050	J-2412	MJ-24121	29.9 6720	47.1 10590	7.40	5600	8600	0.059 0.131	0.094 0.208	38.100 1.5000	38.087 1.4995	47.638 1.8755	47.612 1.8745	Table B2-7	IR-1916
	38.100 1.5000	47.625 1.8750	25.40 1.000	1.27 0.050	J-2416	MJ-24161	39.3 8840	66.9 15040	10.4	5600	8600	0.079 0.174	0.094 0.208	38.100 1.5000	38.087 1.4995	47.638 1.8755	47.612 1.8745	Table B2-7	IR-1916
	38.100 1.5000	47.625 1.8750	31.75 1.250	—	J-2420	—	49.5 11130	90.0 20230	14.0	5600	8600	0.099 0.218	—	38.100 1.5000	38.087 1.4995	47.638 1.8755	47.612 1.8745	Table B2-7	IR-1920
1 5/8	41.275 1.6250	50.800 2.0000	15.88 0.625	—	J-2610	—	26.1 5870	41.0 9210	6.25	5100	7900	0.053 0.117	—	41.275 1.6250	41.262 1.6245	50.813 2.0005	50.787 1.9995	Table B2-7	IR-2020(1)
	41.275 1.6250	50.800 2.0000	25.40 1.000	1.27 0.050	J-2616	M-26161	39.3 8830	69.0 15500	10.8	5100	7900	0.085 0.187	0.101 0.223	41.275 1.6250	41.262 1.6245	50.813 2.0005	50.787 1.9995	Table B2-7	IR-2020(1)
1 3/4	44.450 1.7500	53.975 2.1250	19.05 0.750	1.27 0.050	J-2812	MJ-28121	29.6 6650	49.3 11080	7.45	4700	7300	0.068 0.150	0.081 0.179	44.450 1.7500	44.437 1.7495	53.988 2.1255	53.962 2.1245	Table B2-7	IR-2316
	44.450 1.7500	53.975 2.1250	25.40 1.000	1.27 0.050	J-2816	MJ-28161	40.1 9010	72.9 16390	11.4	4700	7300	0.091 0.200	0.108 0.239	44.450 1.7500	44.437 1.7495	53.988 2.1255	53.962 2.1245	Table B2-7	IR-2316
	44.450 1.7500	53.975 2.1250	38.10 1.500	1.27 0.050	J-2824	MJ-28241	59.8 13440	122 27400	18.9	4700	7300	0.136 0.300	0.162 0.358	44.450 1.7500	44.437 1.7495	53.988 2.1255	53.962 2.1245	Table B2-7	IR-2324
1 7/8	47.625 1.8750	57.150 2.2500	25.40 1.000	1.27 0.050	J-3016	MJ-30161	41.1 9240	76.0 17080	11.9	4400	6800	0.097 0.213	0.115 0.254	47.625 1.8750	47.612 1.8745	57.163 2.2505	57.137 2.2495	Table B2-7	
2	50.800 2.0000	60.325 2.3750	25.40 1.000	1.27 0.050	J-3216	MJ-32161	42.4 9530	81.2 18250	12.7	4100	6300	0.103 0.226	0.137 0.301	50.800 2.0000	50.785 1.9994	60.338 2.3755	60.312 2.3745	Table B2-7	
2 1/4	57.150 2.2500	66.675 2.6250	19.05 0.750	—	J-3612	—	35.4 7960	65.9 14810	10.0	3600	5600	0.086 0.189	—	57.150 2.2500	57.135 2.2494	66.688 2.6255	66.662 2.6245	Table B2-7	
	57.150 2.2500	66.675 2.6250	25.40 1.000	—	J-3616	—	46.1 10360	92.3 20750	14.4	3600	5600	0.114 0.252	—	57.150 2.2500	57.135 2.2494	66.688 2.6255	66.662 2.6245	Table B2-7	
2 3/4	69.850 2.7500	79.375 3.1250	19.05 0.750	—	J-4412	—	36.2 8140	72.9 16390	11.3	2900	4500	0.103 0.227	—	69.850 2.7500	69.835 2.7494	79.388 3.1255	79.362 3.1245	Table B2-7	IR-4016

CAGED BEARINGS – OPEN ENDS

INCH SERIES
BT SERIES



BT



Shaft Dia.	F_w	D	C +0 -0.3 (+0.000 -0.012)	Y max.	Bearing Designation Open Ends	Load Ratings Dynamic C	Load Ratings Static C_0	Fatigue Load Limit C_u	Speed Ratings Grease	Speed Ratings Oil	Approx. Wt. Open Ends	Mounting Dimensions Shaft Max.	Shaft Min.	Housing Max.	Housing Min.	Inspection gage	Mounting inner ring (pages B-2-74 to B-2-76)
in	mm in	mm in	mm in	mm in		kN lbf		kN	min^{-1}		kg lbs	mm in	mm in	mm in	mm in		
11/16	**17.462** 0.6870	**22.225** 0.875	**19.05** 0.750	—	BT1112-1	**12.7** 2850	**21.2** 4770	3.30	12000	19000	**0.015** 0.033	**17.462** 0.6875	**17.451** 0.6870	**22.237** 0.8755	**22.216** 0.8746	Table B2-8	—
7/8	**22.225** 0.875	**28.575** 1.125	**9.525** 0.375	—	BT146P	**7.05** 1580	**8.55** 1920	1.35	9800	15000	**0.012** 0.027	**22.225** 0.8750	**22.212** 0.8745	**28.587** 1.1255	**28.566** 1.1246	Table B2-8	—
1	**25.400** 1.0000	**31.750** 1.250	**9.525** 0.375	—	BT166	**7.45** 1670	**9.50** 2140	1.50	8500	13000	**0.014** 0.031	**25.400** 1.0000	**25.387** 0.9995	**31.764** 1.2506	**31.739** 1.2496	Table B2-8	—
1 1/8	**28.575** 1.125	**34.925** 1.375	**12.70** 0.500	—	BT188	**13.1** 2940	**20.3** 4560	3.10	7200	11000	**0.021** 0.047	**28.575** 1.1250	**28.562** 1.1245	**34.939** 1.3756	**34.914** 1.3746	Table B2-8	—
1 3/16	**30.162** 1.187	**38.100** 1.500	**25.40** 1.000	—	BT1916M	**31.5** 7080	**51.9** 11670	8.15	7200	11000	**0.054** 0.119	**30.162** 1.1875	**30.146** 1.1869	**38.114** 1.5006	**38.089** 1.4996	Table B2-8	—
1 1/4	**31.750** 1.250	**38.100** 1.500	**19.05** 0.750	—	BT2012	**21.2** 4770	**38.7** 8700	6.00	6500	10000	**0.035** 0.077	**31.750** 1.2500	**31.734** 1.2494	**38.114** 1.5006	**38.089** 1.4996	Table B2-8	—
1 5/8	**41.275** 1.625	**50.800** 2.000	**22.225** 0.875	—	BT2614	**34.1** 7670	**56.9** 12790	9.00	5100	7900	**0.082** 0.180	**41.275** 1.6250	**41.259** 1.6244	**50.818** 2.0007	**50.788** 1.9995	Table B2-8	—
1 7/8	**47.625** 1.875	**57.150** 2.250	**15.875** 0.625	—	BT3010-1	**25.2** 5660	**40.1** 9010	6.20	4400	6800	**0.064** 0.140	**47.625** 1.8750	**47.609** 1.8744	**57.168** 2.2507	**57.138** 2.2495	Table B2-8	—

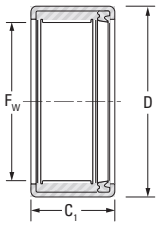
NOTES

B

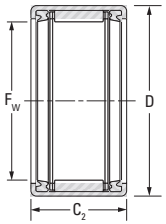
SEALED DRAWN CUP BEARINGS

INCH SERIES

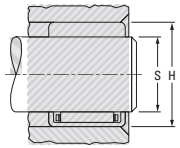
- Check for availability. Not all bearings are in production.
- Pre-packed with general purpose ball and roller bearing grease unless otherwise specified.
- Bearing operating temperature limited between -30° C and +110° C (-25° F and +225° F).
- Consult your representative for operating temperatures outside the above range or if seals have been exposed to unusual fluids.
- Speed rating based on shaft contact speed of 610 m/min. (2000 fpm).
- Reduce the listed speed rating by one-half for outer ring rotation.



JT – One Seal



JT – Two Seals



Shaft surface to be 58 HRC or equivalent

Drawn cup bearings of nominal inch dimensions, with one closed end, that are not tabulated, may be made available upon request.

Mounting dimensions are based on the inner ring rotating and the outer ring being stationary, relative to the load. The housing should be of high strength material.

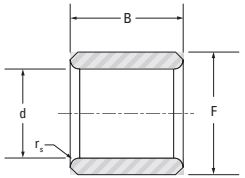
Shaft Dia.	F_w	D	Bearings With One Seal			Bearings With Two Seals		
			C_1 +0 +0.000 -0.3 -0.010	Bearing Designation	Approx. Wt.	C_2 +0 +0.000 -0.3 -0.010	Bearing Designation	Approx. Wt.
in	mm in	mm in	mm in		kg lbs			kg lbs
5/16	7.938 0.3125	12.700 0.5000	9.53 0.375	JT-56	0.004 0.008	11.13 0.438	JTT-57	0.004 0.009
	7.938 0.3125	12.700 0.5000	—	—	—	14.27 0.562	JTT-59	0.005 0.012
3/8	9.525 0.3750	14.288 0.5625	9.53 0.375	JT-66	0.004 0.009	11.13 0.438	JTT-67	0.005 0.011
	9.525 0.3750	14.288 0.5625	14.27 0.562	JT-69	0.006 0.014	—	—	—
1/2	12.700 0.5000	17.463 0.6875	9.53 0.375	JT-86	0.005 0.012	11.13 0.438	JTT-87	0.006 0.013
	12.700 0.5000	17.463 0.6875	14.27 0.562	JT-89	0.008 0.017	15.88 0.625	JTT-810	0.009 0.019
	12.700 0.5000	17.463 0.6875	—	—	—	22.23 0.875	JTT-814	0.012 0.027
9/16	14.288 0.5625	19.050 0.7500	14.27 0.562	JT-99	0.009 0.019	15.88 0.625	JTT-910	0.010 0.021
	14.288 0.5625	19.050 0.7500	—	—	—	19.05 0.750	JTT-912	0.011 0.025
5/8	15.875 0.6250	20.638 0.8125	14.27 0.562	JT-109	0.010 0.021	15.88 0.625	JTT-1010	0.010 0.023
	15.875 0.6250	20.638 0.8125	—	—	—	19.05 0.750	JTT-1012	0.013 0.028
	15.875 0.6250	20.638 0.8125	—	—	—	22.23 0.875	JTT-1014	0.015 0.032
11/16	17.463 0.6875	22.225 0.8750	—	—	—	22.23 0.875	JTT-1114	0.016 0.035
3/4	19.050 0.7500	25.400 1.0000	14.27 0.562	JT-129	0.015 0.034	15.88 0.625	JTT-1210	0.017 0.038
	19.050 0.7500	25.400 1.0000	17.48 0.688	JT-1211	0.019 0.041	—	—	—
	19.050 0.7500	25.400 1.0000	20.62 0.812	JT-1213	0.022 0.049	22.23 0.875	JTT-1214	0.024 0.053
7/8	22.225 0.8750	28.575 1.1250	14.27 0.562	JT-149	0.018 0.039	15.88 0.625	JTT-1410	0.020 0.043
	22.225 0.8750	28.575 1.1250	26.97 1.062	JT-1417	0.033 0.073	—	—	—
1	25.400 1.0000	31.750 1.2500	20.62 0.812	JT-1613	0.029 0.063	22.23 0.875	JTT-1614	0.031 0.068
1 1/8	28.575 1.1250	34.925 1.3750	20.62 0.812	JT-1813	0.032 0.070	22.23 0.875	JTT-1814	0.034 0.075
1 1/4	31.750 1.2500	38.100 1.5000	20.62 0.812	JT-2013	0.035 0.077	—	—	—
	31.750 1.2500	38.100 1.5000	—	—	—	28.58 1.125	JTT-2018	0.048 0.106
1 1/2	38.100 1.5000	47.625 1.8750	33.32 1.312	JT-2421	0.104 0.229	—	—	—

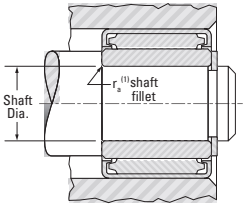
Load Ratings		Fatigue Load Limit C_u	Approx. Speed Rating (Grease)	Mounting Dimensions				Inspection			Shaft Dia.
Dynamic	Static			S		H		Ring Gage	Plug Gage		
C	C_0			Max.	Min.	Max.	Min.		go	no go	
kN lbf		kN	min^{-1}	mm in	mm in	mm in	mm in				in
2.40 540	2.00 450	0.340	18000	7.938 0.3125	7.925 0.3120	12.713 0.5005	12.687 0.4995	12.713 0.5005	7.976 0.3140	8.001 0.3150	5/16
4.05 910	3.91 880	0.590	18000	7.938 0.3125	7.925 0.3120	12.713 0.5005	12.687 0.4995	12.713 0.5005	7.976 0.3140	8.001 0.3150	
2.74 615	2.49 560	0.430	18000	9.525 0.3750	9.512 0.3745	14.300 0.5630	14.275 0.5620	14.300 0.5630	9.563 0.3765	9.589 0.3775	3/8
5.20 1 170	5.74 1 290	0.860	18000	9.525 0.3750	9.512 0.3745	14.300 0.5630	14.275 0.5620	14.300 0.5630	9.563 0.3765	9.589 0.3775	
3.47 780	3.65 820	0.630	15000	12.700 0.5000	12.687 0.4995	17.475 0.6880	17.450 0.6870	17.475 0.6880	12.738 0.5015	12.764 0.5025	1/2
6.32 1 420	7.92 1 780	1.20	15000	12.700 0.5000	12.687 0.4995	17.475 0.6880	17.450 0.6870	17.475 0.6880	12.738 0.5015	12.764 0.5025	
10.2 2 300	14.7 3 310	2.25	15000	12.700 0.5000	12.687 0.4995	17.475 0.6880	17.450 0.6870	17.475 0.6880	12.738 0.5015	12.764 0.5025	
6.23 1 400	8.01 1 800	1.20	14000	14.288 0.5625	14.275 0.5620	19.063 0.7505	19.037 0.7495	19.063 0.7505	14.326 0.5640	14.351 0.5650	9/16
8.18 1 840	11.4 2 560	1.70	14000	14.288 0.5625	14.275 0.5620	19.063 0.7505	19.037 0.7495	19.063 0.7505	14.326 0.5640	14.351 0.5650	
6.72 1 510	9.12 2 050	1.40	12000	15.875 0.6250	15.862 0.6245	20.650 0.8130	20.625 0.8120	20.650 0.8130	15.913 0.6265	15.939 0.6275	5/8
8.81 1 980	12.9 2 910	1.95	12000	15.875 0.6250	15.862 0.6245	20.650 0.8130	20.625 0.8120	20.650 0.8130	15.913 0.6265	15.939 0.6275	
11.7 2 640	18.9 4 240	2.90	12000	15.875 0.6250	15.862 0.6245	20.650 0.8130	20.625 0.8120	20.650 0.8130	15.913 0.6265	15.939 0.6275	
12.5 2 800	20.9 4 700	3.20	11000	17.463 0.6875	17.450 0.6870	22.238 0.8755	22.212 0.8745	22.238 0.8755	17.501 0.6890	17.526 0.6900	11/16
9.92 2 230	12.2 2 740	1.85	10000	19.050 0.7500	19.037 0.7495	25.413 1.0005	25.387 0.9995	25.387 0.9995	19.063 0.7505	19.088 0.7515	3/4
12.5 2 810	16.3 3 670	2.50	10000	19.050 0.7500	19.037 0.7495	25.413 1.0005	25.387 0.9995	25.387 0.9995	19.063 0.7505	19.088 0.7515	
15.5 3 490	21.6 4 860	3.35	10000	19.050 0.7500	19.037 0.7495	25.413 1.0005	25.387 0.9995	25.387 0.9995	19.063 0.7505	19.088 0.7515	
10.9 2 460	14.5 3 260	2.20	8700	22.225 0.8750	22.212 0.8745	28.588 1.1255	28.562 1.1245	28.562 1.1245	22.238 0.8755	22.263 0.8765	7/8
23.7 5 320	39.0 8 760	6.05	8700	22.225 0.8750	22.212 0.8745	28.588 1.1255	28.562 1.1245	28.562 1.1245	22.238 0.8755	22.263 0.8765	
18.1 4 080	28.8 6 480	4.45	7600	25.400 1.0000	25.387 0.9995	31.763 1.2505	31.737 1.2495	31.737 1.2495	25.413 1.0005	25.438 1.0015	1
19.0 4 280	31.8 7 140	4.90	6800	28.575 1.1250	28.562 1.1245	34.938 1.3755	34.912 1.3745	34.912 1.3745	28.588 1.1255	28.613 1.1265	1 1/8
19.8 4 460	34.7 7 800	5.35	6100	31.750 1.2500	31.737 1.2495	38.113 1.5005	38.087 1.4995	38.087 1.4995	31.763 1.2505	31.788 1.2515	1 1/4
28.8 6 480	56.5 12 700	8.70	6100	31.750 1.2500	31.737 1.2495	38.113 1.5005	38.087 1.4995	38.087 1.4995	31.763 1.2505	31.788 1.2515	
49.4 11 100	89.9 20 200	14.0	5100	38.100 1.5000	38.087 1.4995	47.638 1.8755	47.612 1.8745	47.612 1.8745	38.113 1.5005	38.143 1.5017	1 1/2

B

INNER RINGS FOR INCH SERIES DRAWN CUP BEARINGS

- Check for availability.
- Ideal choice when shaft is not practical to use as inner raceway.
- Provided in inch (IR, IRA) nominal dimensions for use with inch series drawn cup bearings.
- Designed to meet established inch tolerances.
- Designed to be wider than matching drawn cup bearing.
- Maximum shaft fillet radius ($r_{a\,max.}$) cannot exceed inner ring bore chamfer ($r_{s\,min.}$) as shown.
- Optional centralized lubrication groove (bore) and thru-hole available – specify when ordering.
- Designed to provide a loose transition fit on the shaft and should be axially clamped against a shoulder.
- If a tight transition fit must be used to keep the inner ring from rotating relative to the shaft, the inner ring O.D. must not exceed the raceway diameter for the matching drawn cup bearing after being mounted on the shaft.
- See tables for bearing raceway diameter dimensions.
- After mounting, if O.D. of inner ring exceeds required raceway diameter for matching bearing, ring should be ground to proper diameter while mounted on shaft.





Shaft Dia.	d		F		B		$r_{s\,min.}$	Inner Ring Designation	Mounting Dimensions Transition Fit				Approx. Wt.
									Loose		Tight		
	Max.	Min.	Max.	Min.	Max.	Min.	Min.		Max.	Min.	Max.	Min.	
in	mm in	mm in	mm in	mm in	mm in	mm in	mm in		mm in	mm in	mm in	mm in	kg lbs
3/16	4.826 0.1900	4.813 0.1895	9.525 0.3750	9.512 0.3745	13.61 0.536	13.36 0.526	0.64 0.025	IRA-3	4.818 0.1897	4.806 0.1892	4.829 0.1901	4.816 0.1896	0.005 0.012
1/4	6.350 0.2500	6.337 0.2495	11.113 0.4375	11.100 0.4370	13.61 0.536	13.36 0.526	0.64 0.025	IRA-4	6.342 0.2497	6.330 0.2492	6.353 0.2501	6.340 0.2496	0.006 0.014
5/16	7.938 0.3125	7.925 0.3120	12.700 0.5000	12.687 0.4995	13.61 0.536	13.36 0.526	0.64 0.025	IRA-5	7.930 0.3122	7.917 0.3117	7.940 0.3126	7.927 0.3121	0.008 0.017
3/8	9.525 0.3750	9.512 0.3745	14.288 0.5625	14.275 0.5620	13.08 0.515	12.83 0.505	0.64 0.025	IR-68	9.517 0.3747	9.505 0.3742	9.528 0.3751	9.515 0.3746	0.009 0.019
	9.525 0.3750	9.512 0.3745	14.288 0.5625	14.275 0.5620	19.43 0.765	19.18 0.755	0.64 0.025	IR-612	9.517 0.3747	9.505 0.3742	9.528 0.3751	9.515 0.3746	0.013 0.028
	9.525 0.3750	9.512 0.3745	14.288 0.5625	14.275 0.5620	19.96 0.786	19.71 0.776	0.64 0.025	IRA-6	9.517 0.3747	9.505 0.3742	9.528 0.3751	9.515 0.3746	0.013 0.029
	9.525 0.3750	9.512 0.3745	15.875 0.6250	15.862 0.6245	13.08 0.515	12.83 0.505	0.64 0.025	IR-68-1	9.517 0.3747	9.505 0.3742	9.528 0.3751	9.515 0.3746	0.012 0.027
	9.525 0.3750	9.512 0.3745	15.875 0.6250	15.862 0.6245	19.43 0.765	19.18 0.755	0.64 0.025	IR-612-1	9.517 0.3747	9.505 0.3742	9.528 0.3751	9.515 0.3746	0.018 0.040
7/16	11.113 0.4375	11.100 0.4370	15.875 0.6250	15.862 0.6245	19.96 0.786	19.71 0.776	0.64 0.025	IRA-7	11.105 0.4372	11.092 0.4367	11.115 0.4376	11.102 0.4371	0.015 0.033
1/2	12.700 0.5000	12.687 0.4995	19.050 0.7500	19.037 0.7495	13.08 0.515	12.83 0.505	1.02 0.040	IR-88	12.692 0.4997	12.680 0.4992	12.703 0.5001	12.690 0.4996	0.015 0.033
	12.700 0.5000	12.687 0.4995	19.050 0.7500	19.037 0.7495	19.43 0.765	19.18 0.755	1.02 0.040	IR-812	12.692 0.4997	12.680 0.4992	12.703 0.5001	12.690 0.4996	0.023 0.050

Bore and O.D. tolerance limits correspond to the single mean diameter (the arithmetical mean of the largest and smallest diameters in a single radial plane).

(1) $r_{a\,max.}$ is equal to minimum inner ring bore chamfer ($r_{s\,min.}$).

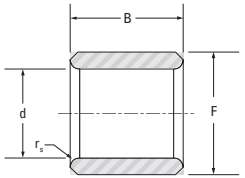
Shaft Dia.	d		F		B		$r_{s\,min.}$	Inner Ring Designation	Mounting Dimensions Transition Fit				Approx. Wt.
									Loose		Tight		
	Max.	Min.	Max.	Min.	Max.	Min.	Min.		Max.	Min.	Max.	Min.	
in	mm in	mm in	mm in	mm in	mm in	mm in	mm in		mm in	mm in	mm in	mm in	kg lbs
1/2	12.700 0.5000	12.687 0.4995	19.050 0.7500	19.037 0.7495	19.96 0.786	19.71 0.776	1.02 0.040	IRA-8	12.692 0.4997	12.680 0.4992	12.703 0.5001	12.690 0.4996	0.023 0.051
5/8	15.875 0.6250	15.862 0.6245	22.225 0.8750	22.212 0.8745	19.43 0.765	19.18 0.755	1.02 0.040	IR-1012	15.867 0.6247	15.855 0.6242	15.878 0.6251	15.865 0.6246	0.027 0.060
	15.875 0.6250	15.862 0.6245	22.225 0.8750	22.212 0.8745	19.96 0.786	19.71 0.776	1.02 0.040	IRA-10	15.867 0.6247	15.855 0.6242	15.878 0.6251	15.865 0.6246	0.028 0.062
	15.875 0.6250	15.862 0.6245	22.225 0.8750	22.212 0.8745	25.78 1.015	25.53 1.005	1.02 0.040	IR-1016	15.867 0.6247	15.855 0.6242	15.878 0.6251	15.865 0.6246	0.036 0.080
3/4	19.050 0.7500	19.037 0.7495	25.400 1.0000	25.387 0.9995	13.08 0.515	12.83 0.505	1.02 0.040	IR-128	19.042 0.7497	19.030 0.7492	19.053 0.7501	19.040 0.7496	0.021 0.047
	19.050 0.7500	19.037 0.7495	25.400 1.0000	25.387 0.9995	19.43 0.765	19.18 0.755	1.02 0.040	IR-1212	19.042 0.7497	19.030 0.7492	19.053 0.7501	19.040 0.7496	0.032 0.070
	19.050 0.7500	19.037 0.7495	25.400 1.0000	25.387 0.9995	25.78 1.015	25.53 1.005	1.02 0.040	IR-1216	19.042 0.7497	19.030 0.7492	19.053 0.7501	19.040 0.7496	0.042 0.093
	19.050 0.7500	19.037 0.7495	25.400 1.0000	25.387 0.9995	26.31 1.036	26.06 1.026	1.02 0.040	IRA-12	19.042 0.7497	19.030 0.7492	19.053 0.7501	19.040 0.7496	0.043 0.095
	19.050 0.7500	19.037 0.7495	25.400 1.0000	25.387 0.9995	32.13 1.265	31.88 1.255	1.02 0.040	IR-1220	19.042 0.7497	19.030 0.7492	19.053 0.7501	19.040 0.7496	0.053 0.116
	19.050 0.7500	19.037 0.7495	25.400 1.0000	25.387 0.9995	38.48 1.515	38.23 1.505	1.02 0.040	IR-1224	19.042 0.7497	19.030 0.7492	19.053 0.7501	19.040 0.7496	0.063 0.139
13/16	20.638 0.8125	20.625 0.8120	25.400 1.0000	25.387 0.9995	19.43 0.765	19.18 0.755	1.02 0.040	IR-1312	20.630 0.8122	20.617 0.8117	20.640 0.8126	20.627 0.8121	0.024 0.054
	20.638 0.8125	20.625 0.8120	25.400 1.0000	25.387 0.9995	25.78 1.015	25.53 1.005	1.02 0.040	IR-1316	20.630 0.8122	20.617 0.8117	20.640 0.8126	20.627 0.8121	0.033 0.072
7/8	22.225 0.8750	22.212 0.8745	28.575 1.1250	28.562 1.1245	25.78 1.015	25.53 1.005	1.02 0.040	IR-1416	22.217 0.8747	22.205 0.8742	22.228 0.8751	22.215 0.8746	0.050 0.111
	22.225 0.8750	22.212 0.8745	28.575 1.1250	28.562 1.1245	26.31 1.036	26.06 1.026	1.02 0.040	IRA-14	22.217 0.8747	22.205 0.8742	22.228 0.8751	22.215 0.8746	0.050 0.111
15/16	23.813 0.9375	23.800 0.9370	28.575 1.1250	28.562 1.1245	25.78 1.015	25.53 1.005	1.02 0.040	IR-1516	23.805 0.9372	23.792 0.9367	23.815 0.9376	23.802 0.9371	0.037 0.082
1	25.400 1.0000	25.387 0.9995	31.750 1.2500	31.737 1.2495	19.43 0.765	19.18 0.755	1.02 0.040	IR-1612	25.392 0.9997	25.380 0.9992	25.403 1.0001	25.390 0.9996	0.041 0.090
	25.400 1.0000	25.387 0.9995	31.750 1.2500	31.737 1.2495	25.78 1.015	25.53 1.005	1.02 0.040	IR-1616	25.392 0.9997	25.380 0.9992	25.403 1.0001	25.390 0.9996	0.057 0.125
	25.400 1.0000	25.387 0.9995	31.750 1.2500	31.737 1.2495	26.31 1.036	26.06 1.026	1.02 0.040	IRA-16	25.392 0.9997	25.380 0.9992	25.403 1.0001	25.390 0.9996	0.056 0.124
1 1/8	28.575 1.1250	28.562 1.1245	34.925 1.3750	34.912 1.3745	19.43 0.765	19.18 0.755	1.02 0.040	IR-1812	28.567 1.1247	28.555 1.1242	28.578 1.1251	28.565 1.1246	0.045 0.100
	28.575 1.1250	28.562 1.1245	34.925 1.3750	34.912 1.3745	25.78 1.015	25.53 1.005	1.02 0.040	IR-1816	28.567 1.1247	28.555 1.1242	28.578 1.1251	28.565 1.1246	0.060 0.133
	28.575 1.1250	28.562 1.1245	34.925 1.3750	34.912 1.3745	32.13 1.265	31.88 1.255	1.02 0.040	IR-1820	28.567 1.1247	28.555 1.1242	28.578 1.1251	28.565 1.1246	0.075 0.166
1 3/16	30.163 1.1875	30.150 1.1870	38.100 1.5000	38.087 1.4995	25.78 1.015	25.53 1.005	1.02 0.040	IR-1916	30.155 1.1872	30.142 1.1867	30.165 1.1876	30.152 1.1871	0.084 0.186
	30.163 1.1875	30.150 1.1870	38.100 1.5000	38.087 1.4995	32.13 1.265	31.88 1.255	1.02 0.040	IR-1920	30.155 1.1872	30.142 1.1867	30.165 1.1876	30.152 1.1871	0.101 0.223
1 1/4	31.750 1.2500	31.737 1.2495	38.100 1.5000	38.087 1.4995	25.78 1.015	25.53 1.005	1.52 0.060	IR-2016	31.742 1.2497	31.730 1.2492	31.753 1.2501	31.740 1.2496	0.069 0.152
	31.750 1.2500	31.737 1.2495	38.100 1.5000	38.087 1.4995	32.13 1.265	31.88 1.255	1.52 0.060	IR-2020	31.742 1.2497	31.730 1.2492	31.753 1.2501	31.740 1.2496	0.086 0.190

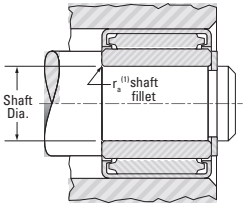
Bore and O.D. tolerance limits correspond to the single mean diameter (the arithmetical mean of the largest and smallest diameters in a single radial plane).

Continued on next page.

INNER RINGS FOR INCH SERIES DRAWN CUP BEARINGS

- Check for availability.
- Ideal choice when shaft is not practical to use as inner raceway.
- Provided in inch (IR, IRA) nominal dimensions for use with inch series drawn cup bearings.
- Designed to meet established inch tolerances.
- Designed to be wider than matching drawn cup bearing.
- Maximum shaft fillet radius ($r_{a\,max.}$) cannot exceed inner ring bore chamfer ($r_{s\,min.}$) as shown.
- Optional centralized lubrication groove (bore) and thru-hole available – specify when ordering.
- Designed to provide a loose transition fit on the shaft and should be axially clamped against a shoulder.
- If a tight transition fit must be used to keep the inner ring from rotating relative to the shaft, the innr ring O.D. must not exceed the raceway diameter for the matching drawn cup bearing after being mounted on the shaft.
- See tables for bearing raceway diameter dimensions.
- After mounting, if O.D. of inner ring exceeds required raceway diameter for matching bearing, ring should be ground to proper diameter while mounted on shaft.





Shaft Dia.	d		F		B		$r_{s\,min.}$	Inner Ring Designation	Mounting Dimensions Transition Fit				Approx. Wt.
									Loose		Tight		
	Max.	Min.	Max.	Min.	Max.	Min.	Min.		Max.	Min.	Max.	Min.	
in	mm in	mm in	mm in	mm in	mm in	mm in	mm in		mm in	mm in	mm in	mm in	kg lbs
1 1/4	31.750 1.2500	31.737 1.2495	38.100 1.5000	38.087 1.4995	32.66 1.286	32.41 1.276	1.52 0.060	IRA-20	31.742 1.2497	31.730 1.2492	31.753 1.2501	31.740 1.2496	0.086 0.190
1 3/8	34.925 1.3750	34.912 1.3745	41.275 1.6250	41.262 1.6245	32.13 1.265	31.88 1.255	1.52 0.060	IR-2220	34.917 1.3747	34.905 1.3742	34.928 1.3751	34.915 1.3746	0.094 0.208
1 7/16	36.513 1.4375	36.500 1.4370	44.450 1.7500	44.437 1.7495	25.78 1.015	25.53 1.005	1.52 0.060	IR-2316	36.505 1.4372	36.492 1.4367	36.515 1.4376	36.502 1.4371	0.100 0.220
	36.513 1.4375	36.500 1.4370	44.450 1.7500	44.437 1.7495	38.48 1.515	38.23 1.505	1.52 0.060	IR-2324	36.505 1.4372	36.492 1.4367	36.515 1.4376	36.502 1.4371	0.150 0.331
1 1/2	38.100 1.5000	38.087 1.4995	44.450 1.7500	44.437 1.7495	25.78 1.015	25.53 1.005	1.52 0.060	IR-2416	38.092 1.4997	38.080 1.4992	38.103 1.5001	38.090 1.4996	0.078 0.173
	38.100 1.5000	38.087 1.4995	44.450 1.7500	44.437 1.7495	38.48 1.515	38.23 1.505	1.52 0.060	IR-2424	38.092 1.4997	38.080 1.4992	38.103 1.5001	38.090 1.4996	0.122 0.270
1 11/16	42.863 1.6875	42.850 1.6870	52.388 2.0625	52.375 2.0620	38.48 1.515	38.23 1.505	1.52 0.060	IR-2724	42.855 1.6872	42.842 1.6867	42.865 1.6876	42.852 1.6871	0.212 0.468
1 3/4	44.450 1.7500	44.437 1.7495	52.388 2.0625	52.375 2.0620	38.48 1.515	38.23 1.505	1.52 0.060	IR-2824	44.442 1.7497	44.430 1.7492	44.453 1.7501	44.440 1.7496	0.180 0.396
1 13/16	46.038 1.8125	46.025 1.8120	52.388 2.0625	52.375 2.0620	25.78 1.015	25.53 1.005	1.52 0.060	IR-2916	46.030 1.8122	46.017 1.8117	46.040 1.8126	46.027 1.8121	0.097 0.214
	46.038 1.8125	46.025 1.8120	52.388 2.0625	52.375 2.0620	38.48 1.515	38.23 1.505	1.52 0.060	IR-2924	46.030 1.8122	46.017 1.8117	46.040 1.8126	46.027 1.8121	0.146 0.322
1 7/8	47.625 1.8750	47.612 1.8745	53.975 2.1250	53.962 2.1245	38.48 1.515	38.23 1.505	1.52 0.060	IR-3024	47.617 1.8747	47.605 1.8742	47.628 1.8751	47.615 1.8746	0.145 0.319
2 1/2	63.500 2.5000	63.487 2.4995	69.850 2.7500	69.837 2.7495	25.78 1.015	25.53 1.005	1.52 0.060	IR-4016	63.495 2.4998	63.477 2.4991	63.505 2.5002	63.487 2.4995	0.132 0.290

Bore and O.D. tolerance limits correspond to the single mean diameter (the arithmetical mean of the largest and smallest diameters in a single radial plane).

(1) $r_{a\,max.}$ is equal to minimum inner ring bore chamfer ($r_{s\,min.}$).

DRAWN CUP ROLLER CLUTCHES

Overview: Drawn cup needle roller clutches are similar to drawn cup needle roller bearings in design; however, they allow free rotation in only one direction while transmitting torque in the opposite direction. These designs use the same small radial section as drawn cup needle roller bearings and are offered as clutch-only units or as clutch and bearing assemblies.

- **Catalogue range:** 3.2 mm – 35 mm (0.1250 in – 1.3780 in) bore.
- **Markets:** Office equipment, paper-towel dispensers, exercise equipment, appliances and two-speed gearboxes.
- **Features:** Compact, lightweight and operate directly on a hardened shaft.
- **Benefits:** Installation is easily accomplished with a simple press fit.