

# TIMKEN



## TIMKEN BALL BEARINGS CATALOG

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Барнаул (3852)73-04-60  
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## RADIAL AND ANGULAR CONTACT BEARINGS

**Overview:** Timken is a premier manufacturer of ball bearings. We produce a broad range of precision ball bearings, wide inner ring ball bearings and housed units for standard industrial applications and specialized uses. From standard single-row deep groove radial ball bearings to advanced integral designs, Timken has your solution.

- **Sizes:** 3 mm - 600 mm bore.
- **Markets:** Aircraft, construction, agriculture, machine tool and general industry.
- **Features:** Special coatings for corrosion resistance, special seal designs.
- **Benefits:** Radial: Better life in contaminated environments.

Angular: Single-row angular contact ball bearing - suited to work in lower operating temperature and high speed with a heavy thrust load. Can be mounted in a duplex arrangement. The refined bore tolerance give a higher life.

Double-row angular contact ball bearing - excellent axial and radial rigidity in confined space.





## Radial and Angular Contact Ball Bearings

### Prefixes:

|            |                                                      |
|------------|------------------------------------------------------|
| <b>A</b>   | stainless steel                                      |
| <b>F</b>   | flanged outer ring                                   |
| <b>H</b>   | snug fit                                             |
| <b>J</b>   | extra loose internal fit                             |
| <b>JJ</b>  | extra extra loose internal fit                       |
| <b>L</b>   | internal self-aligning                               |
| <b>M</b>   | precision ABEC 3                                     |
| <b>P</b>   | loose fit                                            |
| <b>R</b>   | normal fit                                           |
| <b>S</b>   | extra small inch-dimension type                      |
| <b>T</b>   | tight fit                                            |
| <b>V</b>   | precision ABEC 5                                     |
| <b>W</b>   | wide-type single-row<br>(same width inner and outer) |
| <b>WIR</b> | single-row, wide inner only                          |

**Bore Size:** (04 and up: multiply last two numbers by five to get bore in millimeters)

|           |        |
|-----------|--------|
| <b>00</b> | 10 mm  |
| <b>01</b> | 12 mm  |
| <b>02</b> | 15 mm  |
| <b>03</b> | 17 mm  |
| <b>04</b> | 20 mm  |
| <b>05</b> | 25 mm  |
| <b>12</b> | 60 mm  |
| <b>20</b> | 100 mm |

### Suffixes:

|                         |                                                |
|-------------------------|------------------------------------------------|
| <b>C1, C2, C3, etc.</b> | (manufacturing code - Timken® use only)        |
| <b>FT</b>               | full ball complement                           |
| <b>K</b>                | Conrad, non-filling slot type                  |
| <b>W</b>                | maximum capacity, filling slot type            |
| <b>WI</b>               | angular contact, low-shoulder outer            |
| <b>WO</b>               | angular contact, low-shoulder inner            |
| <b>WN</b>               | angular contact, low-shoulder, inner and outer |

**W**

**3**

**05**

**K**

**LL**

### Numbers: Basic Type Series:

|             |                                                    |
|-------------|----------------------------------------------------|
| <b>S1</b>   | <b>3, 5, 7, etc.,</b> single-row inch, extra small |
| <b>30</b>   | single-row metric, extra small                     |
| <b>100</b>  | single-row, extra large                            |
| <b>200</b>  | single-row, light                                  |
| <b>300</b>  | single-row, medium                                 |
| <b>5200</b> | double-row, light                                  |
| <b>5300</b> | double-row, medium                                 |
| <b>7200</b> | single-row, angular contact, light                 |
| <b>7300</b> | single-row, angular contact, medium                |
| <b>7400</b> | single-row, angular contact, heavy                 |
| <b>9100</b> | single-row, extra-light                            |
| <b>9300</b> | single-row, ultra-light                            |
| <b>XLS</b>  | inch-dimension, Conrad type                        |

### Additional Features:

|                        |                                                            |
|------------------------|------------------------------------------------------------|
| <b>B</b>               | spherical outside diameter                                 |
| <b>BR</b>              | cast bronze retainer                                       |
| <b>D</b>               | one shield                                                 |
| <b>DD</b>              | two shields                                                |
| <b>G</b>               | Wireloc (snap ring)                                        |
| <b>L</b>               | one Mechani-Seal                                           |
| <b>LL</b>              | two Mechani-Seals                                          |
| <b>MBR</b>             | machined bronze retainer                                   |
| <b>P</b>               | one seal                                                   |
| <b>PP</b>              | two seals                                                  |
| <b>PP2, 3, 4, etc.</b> | Tri-Ply Seals if prefix letter is W<br>(example: W208PPB5) |
| <b>R</b>               | one land-riding rubber seal                                |
| <b>RR</b>              | two land-riding rubber seals                               |
| <b>S</b>               | external self-aligning                                     |
| <b>SMBR</b>            | iron silicon bronze retainer                               |
| <b>T</b>               | one felt seal                                              |
| <b>TT</b>              | two felt seals                                             |

# Radial and Angular Contact Ball Bearings

## RADIAL BALL BEARINGS

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## INTRODUCTION

### EXTRA SMALL SERIES

Extra small bearings are available in the 30 Metric Series, the 33 and S Inch Series and the F Flanged Series. These bearings can sustain radial, thrust and combined loads proportionate to the capacities of the small shafts for which they are designed. They are appropriate for use in fractional horsepower motors, precision instruments, domestic appliances, film projectors and similar devices.

The F flanged series has external shoulders with the bearing for mounting in through-bored housings. This series is used where compactness is essential or where it is not feasible to machine housing shoulders.

All series in the extra small family include shielded versions. The 30 Metric Series is also available with felt seals, Mechani-Seals and rubber seals, while the 33 and S Inch Series is available with rubber seals.

Some sizes in the Extra Small Series are manufactured from stainless steel.

### EXTRA SMALL 33 AND S SERIES BUSINESS MACHINE BEARINGS

Standard and special extra small bearings are available and often used in business machine applications. They include clamp-type collar bearings for slip-fit mounting on shafts, bearings with Wireloc in the outer ring, and rubber cushioned "O" series with special housed units.

### EXTRA LIGHT 9300 AND 9100 SERIES

Bearings in the Extra Light 9300 and 9100 Series are ideally suited for applications where housing diameters are restricted and it is desirable to maintain relatively large shaft diameters. Both series are made in the Conrad or non-filling slot construction with the 9300 Series having a somewhat thinner section.

The 9100 Series is generally available with shields, rubber seals and snap ring combinations. The 9300 Series is selectively available with two rubber seals. Machine tools, textile machinery and jet engine gear boxes are some of the end products in which these series have found wide use.

### LIGHT 200 SERIES

Bearings in the 200 Series have a greater section height than the Extra Light 9300 and 9100 Series bearings and feature a close dimensional balance between bore, outside diameter and width. These characteristics make them well-suited for a broad range of applications involving light to medium loads combined with relatively high speeds.

Their versatility has made them a popular design choice of designers and has resulted in many variations in the series. They are available in either the Conrad or maximum capacity type and with shields, rubber seals, Mechani-Seals, felt seals or a combination of shield and seal. Snap ring combinations are also included.

Wide-type 200 Series rubber seal (W200PP) and Mechani-Seal (W200KLL) bearings are made with standard bores and outside diameters, but in widths equal to the corresponding sizes of double-row bearings. This series offers a larger support area for shaft and housing contact and extra space for lubricant.

### MEDIUM 300 SERIES

The 300 Series radial ball bearings are similar in construction to the 200 Series, but have considerably heavier cross sections throughout. They provide greater radial and thrust capacity and are able to withstand heavier shock loads.

Because of their rugged construction, these bearings are particularly suited for heavy-duty applications like those found in large electric motors, woodworking machinery and gear boxes. This series includes both Conrad and maximum capacity designs as well as shielded, sealed and snap ring variations.

In the 300 Series wide-type, rubber seal (W300PP) and Mechani-Seal (W300KLL) bearings are made with standard bores and outside diameters, but in width equal to the corresponding sizes of double-row bearings.



Extra Small Series



Extra Light 9300 and 9100 Series



Light 200 Series



Medium 300 Series

## XLS AND EXTRA LARGE 100 SERIES

Bearings in the inch-dimension XLS Series and metric-dimension Extra Large 100 Series have extra large diameters and a compact cross section. XLS bearings are made in the Conrad and maximum capacity filling slot designs. The Extra Large 100 Series offers the maximum capacity, filling slot and counterbore types.



XLS and Extra Large 100 Series

## TRI-PLY SEAL DISK HARROW BEARINGS

Bearings with Tri-Ply Seals are designed for service involving severe contamination, such as disk harrows, disk tillers and other seed preparation equipment and certain conveyor applications. Tri-Ply sealed units come in two designs – one consisting of three Timken rubber seals separated by steel spacers and retained by steel caps in the outer ring and the other, a highly effective one-piece, molded seal design. Both designs have an exterior shroud cap to protect the seals and reinforce the exceptional sealing action of the complete unit. A patented notched seal groove design, provided on selected sizes, is one of the most positive seal retention methods ever developed.



Tri-Ply Seal Disk Harrow Bearings

## HEX BORE BEARINGS

These bearings are designed for either outer or inner ring rotation in low speed, moderately loaded applications such as farm machinery and conveyors. Their chief advantage is ease of mounting. Except for axial positioning by adjacent parts, no collars, setscrews or other external parts are required to lock the inner ring to the hex shaft.



Hex Bore Bearings

## R-SEAL DISK HARROW BEARINGS

R-Seal bearings are designed for a wide variety of farm machinery applications where single-lip positive contact seals are required. Each sealing element has a Timken Fafnir rubber seal that effectively seals the bearing with a heavy flare on the cylindrically ground O.D. (inner ring). A steel back-up plate supports the seal rubber and prevents the seal lip from inverting. An outside metal shroud cap gives maximum abrasion protection to the rubber element and completes the assembly that is rolled into the outer ring seal groove for positive retention.

R-Seal radial ball bearings are used in positions in planting, cultivating and harvesting machinery. They are available in various configurations including round bores in metric and inch dimensions and cylindrical and spherical outside diameters.



R-Seal Agricultural Bearings

## ANGULAR CONTACT – SINGLE-ROW 7000 PRODUCT FAMILY

Timken offers a 7200WN Light, 7300WN Medium and 7400WN Heavy Series single-row, angular contact bearings, which are designed for combination loading with high-thrust capacity in one direction.

The 7000WN bearings are manufactured with better than ABEC 1 inner ring bore tolerances and ABEC 3 running accuracy. These bearings, when mounted in a duplex arrangement, provide axial and/or radial rigidity in applications where control of shaft displacement is essential.

These bearings are available with various cage designs as defined in the dimension tables. The external dimensions of all 7000WN bearings interchange with corresponding sizes in the 200, 300 and 400 single-row radial series.



Single-Row Angular Contact Bearings 7000 Product Family

## ANGULAR CONTACT – DOUBLE-ROW

Double-row Angular Contact Bearings are available in the Light 5200 and Medium 5300 Series. These bearings have the same bores and outside diameters as the corresponding sizes in the 200 and 300 Series, single-row, radial type.

Chief advantages of the double-row type are rigidity, compactness and high capacity. The two rows of balls provide for bearings large radial capacity combined with moderate thrust capacity in either direction.

Double-row bearings are available in both the Conrad (K) construction with uninterrupted race shoulders and the maximum capacity type. The latter has a filling slot in the shoulder of both rings and a maximum ball complement.

Sizes with the W suffix have the filling slot on one side only. In these cases, thrust should be applied on the side opposite the filling slot.

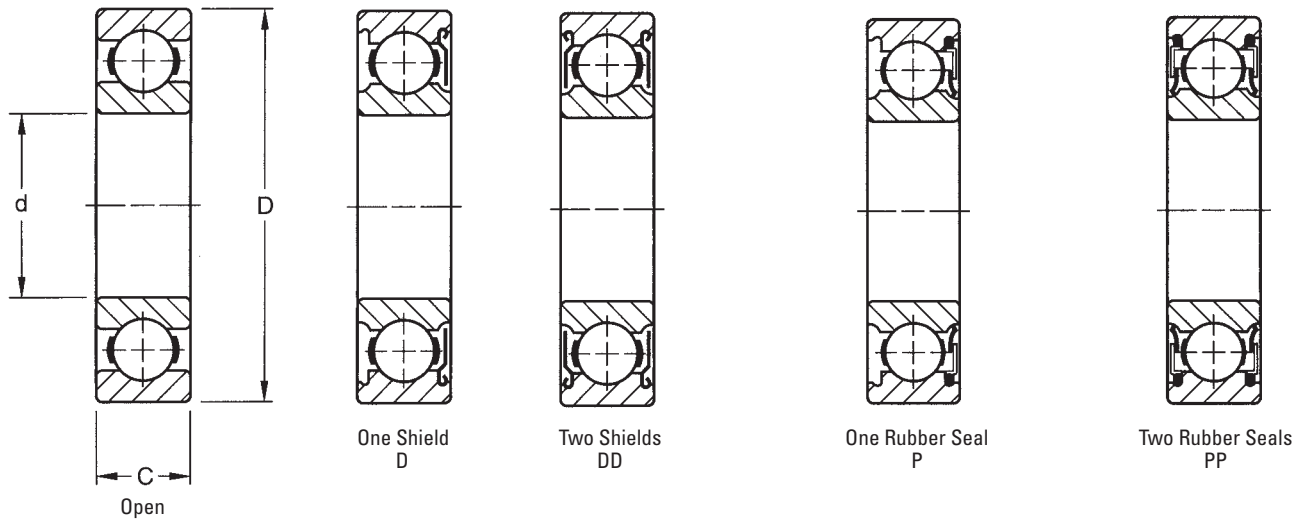


Double-Row Angular Contact



## EXTRA SMALL 30 METRIC SERIES

- Designed for small shafts.
- Can sustain radial, thrust and combined load proportionate to capacities of small shafts.
- Suitable for use in fractional horsepower motors, domestic appliances, precision instruments and similar devices.
- Offer various combinations of shields and seals, as listed below.
- Electric motor quality for applications where quietness is required.
- Stainless steel series, denoted by a prefix A before the bearing number. (Example: A38K)



### OPEN AND SHIELDED TYPES DIMENSIONS – TOLERANCES

| Bearing Number |              |               | Bore $d$                                   |        | Outside Diameter $D$                        |        |       |         | Width $C$                              |       | Fillet Radius <sup>(1)</sup> |       | Wt.   |      | Static Load Rating $C_0$ |      | Extended Dynamic Load Rating $C_E$ <sup>(2)</sup> |      |
|----------------|--------------|---------------|--------------------------------------------|--------|---------------------------------------------|--------|-------|---------|----------------------------------------|-------|------------------------------|-------|-------|------|--------------------------|------|---------------------------------------------------|------|
| open           | one shield D | two shield DD | +0.000 mm, -0.008 mm<br>+0.0000", -0.0003" |        | tolerance<br>+0.000 mm<br>+0.0000" to minus |        |       |         | +0.00 mm, -0.12 mm<br>+0.000", -0.005" |       |                              |       |       |      |                          |      |                                                   |      |
|                |              |               | mm                                         | in.    | mm                                          | in.    | mm    | in.     | mm                                     | in.   | mm                           | in.   | kg    | lbs. | N                        | lbs. | N                                                 | lbs. |
| 34K            | 34KD         | 34KDD         | 4                                          | 0.1575 | 16                                          | 0.6299 | 0.008 | 0.0003  | 5                                      | 0.197 | 0.3                          | 0.012 | 0.005 | 0.01 | 560                      | 125  | 1630                                              | 365  |
| 35K            | 35KD         | 35KDD         | 5                                          | 0.1969 | 19                                          | 0.7480 | 0.009 | 0.00035 | 6                                      | 0.236 | 0.3                          | 0.012 | 0.009 | 0.02 | 865                      | 195  | 2450                                              | 560  |
| 36K            | 36KD         | 36KDD         | 6                                          | 0.2362 | 19                                          | 0.7480 | 0.009 | 0.00035 | 6                                      | 0.236 | 0.3                          | 0.012 | 0.009 | 0.02 | 865                      | 195  | 2450                                              | 560  |
| 37K            | 37KD         | 37KDD         | 7                                          | 0.2756 | 22                                          | 0.8661 | 0.009 | 0.00035 | 7                                      | 0.276 | 0.3                          | 0.012 | 0.009 | 0.02 | 1400                     | 312  | 3650                                              | 830  |
| 38K            | 38KD         | 38KDD         | 8                                          | 0.3150 | 22                                          | 0.8661 | 0.009 | 0.00035 | 7                                      | 0.276 | 0.3                          | 0.012 | 0.009 | 0.02 | 1400                     | 312  | 3650                                              | 830  |
| 38KV           | —            | —             | 8                                          | 0.3150 | 24                                          | 0.9449 | 0.009 | 0.00035 | 7                                      | 0.276 | 0.3                          | 0.012 | 0.018 | 0.04 | 1370                     | 305  | 3650                                              | 830  |
| 39K            | 39KD         | 39KDD         | 9                                          | 0.3543 | 26                                          | 1.0236 | 0.009 | 0.00035 | 8                                      | 0.315 | 0.3                          | 0.012 | 0.018 | 0.04 | 1960                     | 440  | 5000                                              | 1120 |

<sup>(1)</sup> Maximum shaft or housing fillet radius that bearing corners will clear.

<sup>(2)</sup> Based on  $10^6$  revolutions of calculated fatigue life.

### SEALED TYPES DIMENSIONS – TOLERANCES

| Bearing Number |              | Bore $d$                                   |        | Outside Diameter $D$                        |        | Width $C$                              |       | Fillet Radius <sup>(1)</sup> |       | Wt.   |      | Static Load Rating $C_0$ |      | Extended Dynamic Load Rating $C_E$ <sup>(2)</sup> |      |
|----------------|--------------|--------------------------------------------|--------|---------------------------------------------|--------|----------------------------------------|-------|------------------------------|-------|-------|------|--------------------------|------|---------------------------------------------------|------|
| one seal P     | two seals PP | +0.000 mm, -0.008 mm<br>+0.0000", -0.0003" |        | +0.000 mm, -0.009 mm<br>+0.0000", -0.00035" |        | +0.00 mm, -0.12 mm<br>+0.000", -0.005" |       |                              |       |       |      |                          |      |                                                   |      |
|                |              | mm                                         | in.    | mm                                          | in.    | mm                                     | in.   | mm                           | in.   | kg    | lbs. | N                        | lbs. | N                                                 | lbs. |
| 36P            | 36PP         | 6                                          | 0.2362 | 19                                          | 0.7480 | 10                                     | 0.394 | 0.3                          | 0.012 | 0.014 | 0.03 | 865                      | 195  | 2450                                              | 560  |
| 36P2           | 36PP2        | 6                                          | 0.2362 | 19                                          | 0.7480 | 6                                      | 0.236 | 0.3                          | 0.012 | 0.014 | 0.03 | 865                      | 195  | 2450                                              | 560  |
| 37P            | 37PP         | 7                                          | 0.2756 | 22                                          | 0.8661 | 10                                     | 0.394 | 0.3                          | 0.012 | 0.018 | 0.04 | 1370                     | 305  | 3650                                              | 830  |
| 37P2           | 37PP2        | 7                                          | 0.2756 | 22                                          | 0.8661 | 7                                      | 0.276 | 0.3                          | 0.012 | 0.018 | 0.04 | 1400                     | 312  | 3650                                              | 830  |
| 38P            | 38PP         | 8                                          | 0.3150 | 22                                          | 0.8661 | 10                                     | 0.394 | 0.3                          | 0.012 | 0.018 | 0.04 | 1370                     | 305  | 3650                                              | 830  |
| 38P2           | 38PP2        | 8                                          | 0.3150 | 22                                          | 0.8661 | 7                                      | 0.276 | 0.3                          | 0.012 | 0.018 | 0.04 | 1400                     | 312  | 3650                                              | 830  |
| 39P            | 39PP         | 9                                          | 0.3543 | 26                                          | 1.0236 | 8                                      | 0.315 | 0.6                          | 0.024 | 0.023 | 0.05 | 1960                     | 440  | 5000                                              | 1120 |

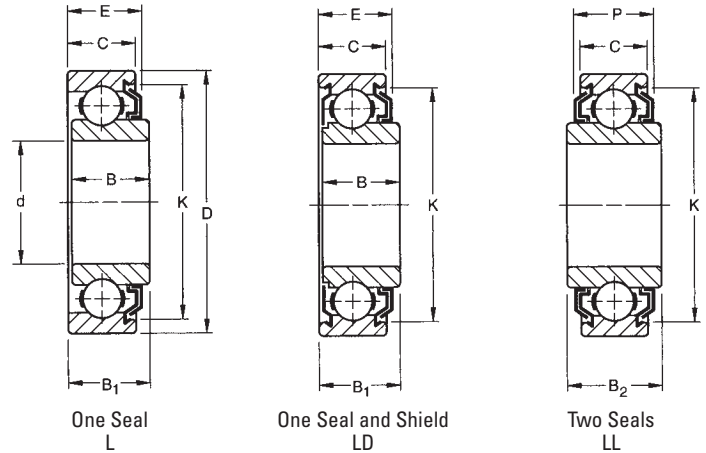
<sup>(1)</sup> Maximum shaft or housing fillet radius that bearing corners will clear.

<sup>(2)</sup> Based on  $10^6$  revolutions of calculated fatigue life.

## EXTRA SMALL 30 METRIC SERIES

### MECHANI-SEALS

- Developed by The Timken® Company.
- Adapted to the 30 metric series for effective grease retention and exclusion of foreign matter.
- Can be operated at speeds comparable to open-type bearings.
- Available with:
  - One Mechani-Seal (suffix L).
  - One Mechani-Seal and one shield (suffix LD).
  - Two Mechani-Seals (suffix LL).



### DIMENSIONS – TOLERANCES

| Bearing Number   |                                    |                    | Bore<br>d<br>+0.000 mm<br>-0.008 mm<br>+0.0000"<br>-0.0003" | Outside<br>Diameter<br>D<br>+0.000 mm<br>-0.009 mm<br>+0.0000"<br>-0.00035" | Width<br>B <sub>1</sub> | Ring Width<br>+0.00 mm, -.12 mm<br>+0.000" -.005" |                               |            | Fillet<br>Radius <sup>(1)</sup> | Seal Protection |             |                                    | Inner<br>Ring<br>Offset <sup>(2)</sup> | Wt.<br>kg lbs. | Static<br>Load<br>Rating<br>C <sub>0</sub> | Extended<br>Dynamic<br>Load<br>Rating<br>C <sub>E</sub> <sup>(4)</sup> |
|------------------|------------------------------------|--------------------|-------------------------------------------------------------|-----------------------------------------------------------------------------|-------------------------|---------------------------------------------------|-------------------------------|------------|---------------------------------|-----------------|-------------|------------------------------------|----------------------------------------|----------------|--------------------------------------------|------------------------------------------------------------------------|
| one<br>seal<br>L | one<br>seal<br>and<br>shield<br>LD | two<br>seals<br>LL |                                                             |                                                                             |                         | inner                                             |                               | outer      |                                 | width           |             | O.D.                               |                                        |                |                                            |                                                                        |
|                  |                                    |                    |                                                             |                                                                             |                         | B                                                 | B <sub>2</sub> <sup>(3)</sup> | C          |                                 | E               | P           | K                                  |                                        |                |                                            |                                                                        |
|                  |                                    |                    | mm in.                                                      | mm in.                                                                      | mm in.                  | mm in.                                            | mm in.                        | mm in.     | mm in.                          | mm in.          | mm in.      | mm in.                             |                                        |                |                                            |                                                                        |
| 36KL             | 36KLD                              | 36KLL              | 6 0.2362                                                    | 19 0.7480                                                                   | 10.31 0.406             | 9.80 0.386                                        | 14.27 0.562                   | 8.00 0.315 | 0.3 0.012                       | 9.60 0.378      | 10.87 0.428 | 16.7 <sup>21</sup> / <sub>32</sub> | 0.50 0.020                             | 0.014 0.03     | 865 195                                    | 2450 560                                                               |
| 36KVL            | —                                  | —                  | 6 0.2362                                                    | 24 0.9449                                                                   | 10.31 0.406             | 9.80 0.386                                        | — —                           | 8.00 0.315 | 0.3 0.012                       | 9.60 0.378      | — —         | 19.0 <sup>3</sup> / <sub>4</sub>   | 0.50 0.020                             | 0.022 0.05     | 865 195                                    | 2450 560                                                               |
| 37KL             | 37KLD                              | 37KLL              | 7 0.2756                                                    | 22 0.8661                                                                   | 10.31 0.406             | 9.80 0.386                                        | 14.27 0.562                   | 8.00 0.315 | 0.3 0.012                       | 9.60 0.378      | 11.18 0.440 | 18.7 <sup>47</sup> / <sub>64</sub> | 0.50 0.020                             | 0.018 0.04     | 1400 312                                   | 3650 830                                                               |
| 37KVL            | 37KVD                              | —                  | 7 0.2756                                                    | 24 0.9449                                                                   | 10.31 0.406             | 9.80 0.386                                        | — —                           | 8.00 0.315 | 0.3 0.012                       | 9.60 0.378      | — —         | 19.0 <sup>3</sup> / <sub>4</sub>   | 0.50 0.020                             | 0.022 0.05     | 1400 312                                   | 3650 830                                                               |
| 38KL             | 38KLD                              | 38KLL              | 8 0.3150                                                    | 22 0.8661                                                                   | 10.31 0.406             | 9.80 0.386                                        | 14.27 0.562                   | 8.00 0.315 | 0.3 0.012                       | 9.60 0.378      | 11.18 0.440 | 18.7 <sup>47</sup> / <sub>64</sub> | 0.50 0.020                             | 0.018 0.04     | 1400 312                                   | 3650 830                                                               |
| 38KVL            | 38KVD                              | 38KVLL             | 8 0.3150                                                    | 24 0.9449                                                                   | 10.31 0.406             | 9.80 0.386                                        | 14.27 0.562                   | 8.00 0.315 | 0.3 0.012                       | 9.60 0.378      | 11.13 0.438 | 19.0 <sup>3</sup> / <sub>4</sub>   | 0.50 0.020                             | 0.022 0.05     | 1370 305                                   | 3650 830                                                               |
| —                | —                                  | 38KLL2             | 8 0.3150                                                    | 22 0.8661                                                                   | — —                     | — —                                               | 12.62 0.497                   | 8.00 0.315 | 0.3 0.012                       | — —             | 11.18 0.440 | 18.7 <sup>47</sup> / <sub>64</sub> | — —                                    | 0.022 0.05     | 1370 305                                   | 3650 830                                                               |
| —                | —                                  | 38KVLL2            | 8 0.3150                                                    | 24 0.9449                                                                   | — —                     | — —                                               | 12.62 0.497                   | 8.00 0.315 | 0.3 0.012                       | — —             | 11.13 0.438 | 19.0 <sup>3</sup> / <sub>4</sub>   | — —                                    | 0.022 0.05     | 1370 305                                   | 3650 830                                                               |
| 39KL2            | 39KLD2                             | —                  | 9 0.3543                                                    | 26 1.0236                                                                   | 10.31 0.406             | 9.80 0.386                                        | — —                           | 8.00 0.315 | 0.6 0.024                       | 9.60 0.378      | — —         | 21.4 <sup>27</sup> / <sub>32</sub> | 0.50 0.020                             | 0.022 0.05     | 1960 440                                   | 5000 1120                                                              |
| —                | 39KVD                              | 39KVLL2            | 9 0.3543                                                    | 30 1.1811                                                                   | — —                     | — —                                               | 16.41 0.646                   | 9.00 0.354 | 0.6 0.024                       | — —             | 15.98 0.629 | 25.4 1                             | 0.50 0.020                             | 0.041 0.09     | 2650 595                                   | 6550 1500                                                              |

(1) Maximum shaft or housing fillet radius that bearing corners will clear.

(2) Does not apply to bearings with two seals.

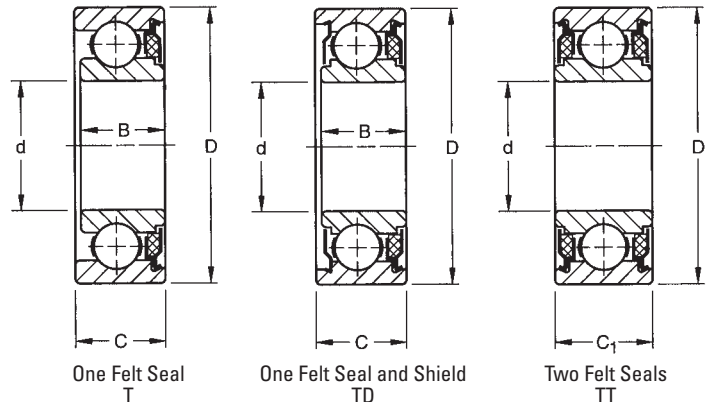
Note: Inner ring offset is .51 mm (.020 inches) for the L, LD, and VLD versions.

(3) Two seals (suffix LL) type only.

(4) Based on 10<sup>6</sup> revolutions of calculated fatigue life.

### FELT-SEALS

- Provide effective barrier against the entrance of foreign matter and the escape of lubricant.
- Contact seal with the felt riding on the ground surface of inner ring O.D.
- Can be operated at moderate speeds without excessive heating because the felt washer absorbs some lubricant.
- Electric motor quality where quietness is required.
- Available with:
  - One felt seal (suffix T).
  - One felt seal and one shield (suffix TD).
  - Two felt seals (suffix TT).



### DIMENSIONS – TOLERANCES

| Bearing Number      |                                    |                    | Bore<br>d<br>+0.000 mm<br>-0.008 mm<br>+0.0000"<br>-0.0003" | Outside<br>Diameter<br>D<br>+0.000 mm<br>-0.009 mm<br>+0.0000"<br>-0.00035" | Ring Width<br>+0.00 mm, -.12 mm<br>+0.000" -.005" |             |                | Inner<br>Ring<br>Offset <sup>(2)</sup> | Fillet<br>Radius <sup>(1)</sup> | Wt.<br>kg lbs. | Static<br>Load<br>Rating<br>C <sub>0</sub> | Extended<br>Dynamic<br>Load<br>Rating<br>C <sub>E</sub> <sup>(3)</sup> |
|---------------------|------------------------------------|--------------------|-------------------------------------------------------------|-----------------------------------------------------------------------------|---------------------------------------------------|-------------|----------------|----------------------------------------|---------------------------------|----------------|--------------------------------------------|------------------------------------------------------------------------|
| one<br>seal<br>T    | one<br>seal<br>and<br>shield<br>TD | two<br>seals<br>TT |                                                             |                                                                             | inner<br>B                                        | outer<br>C  | C <sub>1</sub> |                                        |                                 |                |                                            |                                                                        |
|                     |                                    |                    | mm in.                                                      | mm in.                                                                      | mm in.                                            | mm in.      | mm in.         | mm in.                                 | mm in.                          | kg lbs.        | N lbs.                                     | N lbs.                                                                 |
| 36KT 36KTD 36KTT    | —                                  | —                  | 6 0.2362                                                    | 19 0.7480                                                                   | 9.80 0.386                                        | 10.31 0.406 | 14.27 0.562    | 0.50 0.020                             | 0.3 0.012                       | 0.014 0.03     | 865 195                                    | 2450 560                                                               |
| 36KVT 36KVTD —      | —                                  | —                  | 6 0.2362                                                    | 24 0.9449                                                                   | 9.80 0.386                                        | 10.31 0.406 | — —            | 0.50 0.020                             | 0.3 0.012                       | 0.027 0.06     | 1370 305                                   | 3650 830                                                               |
| 37KT 37KTD —        | —                                  | —                  | 7 0.2756                                                    | 22 0.8661                                                                   | 9.80 0.386                                        | 10.31 0.406 | — —            | 0.50 0.020                             | 0.3 0.012                       | 0.018 0.04     | 1370 305                                   | 3650 830                                                               |
| 37KVT 37KVTD —      | —                                  | —                  | 7 0.2756                                                    | 24 0.9449                                                                   | 9.80 0.386                                        | 10.31 0.406 | — —            | 0.50 0.020                             | 0.3 0.012                       | 0.022 0.05     | 1370 305                                   | 3650 830                                                               |
| 38KT 38KTD 38KTT    | —                                  | —                  | 8 0.3150                                                    | 22 0.8661                                                                   | 9.80 0.386                                        | 10.31 0.406 | 14.27 0.562    | 0.50 0.020                             | 0.3 0.012                       | 0.018 0.04     | 1370 305                                   | 3650 830                                                               |
| 38KVT 38KVTD 38KVTT | —                                  | —                  | 8 0.3150                                                    | 24 0.9449                                                                   | 9.80 0.386                                        | 10.31 0.406 | 14.27 0.562    | 0.50 0.020                             | 0.3 0.012                       | 0.022 0.05     | 1370 305                                   | 3650 830                                                               |
| 39KT 39KTD 39KTT    | —                                  | —                  | 9 0.3543                                                    | 26 1.0236                                                                   | 11.10 0.437                                       | 11.51 0.453 | 14.27 0.562    | 0.40 0.016                             | 0.6 0.024                       | 0.027 0.06     | 1960 440                                   | 5000 1120                                                              |
| 39KVT 39KVTD —      | —                                  | —                  | 9 0.3543                                                    | 30 1.1811                                                                   | 12.19 0.480                                       | 12.70 0.500 | — —            | 0.50 0.020                             | 0.6 0.024                       | 0.041 0.09     | 2650 595                                   | 6550 1500                                                              |

(1) Maximum shaft or housing fillet radius that bearing corners will clear.

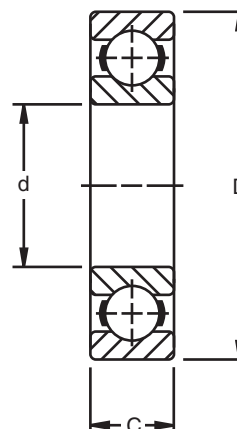
(2) Does not apply to bearings with two seals.

(3) Based on 10<sup>6</sup> revolutions of calculated fatigue life.



## EXTRA SMALL 33 AND S INCH SERIES

- Designed for small shafts.
- Can sustain radial, thrust and combined loads, proportionate to capacities of small shafts.
- Suitable for use in fractional horsepower motors, domestic appliances, precision instruments and similar devices.
- Include combinations of shields and seals, as listed below.
- Electric motor quality for applications where quietness is required.
- Several sizes are manufactured both in standard bearing-quality steel and stainless steel, as indicated in the tables.



### DIMENSIONS – TOLERANCES

| Bearing Number |           | Bore d |        |       |        | Outside Diameter D |        |       |        | Width C |       | Fillet Radius <sup>(1)</sup> |       | Wt.   |      | Static Load Rating C <sub>0</sub> |      | Extended Dynamic Load Rating C <sub>E</sub> <sup>(2)</sup> |      |
|----------------|-----------|--------|--------|-------|--------|--------------------|--------|-------|--------|---------|-------|------------------------------|-------|-------|------|-----------------------------------|------|------------------------------------------------------------|------|
| standard       | stainless | mm     | in.    | mm    | in.    | mm                 | in.    | mm    | in.    | mm      | in.   | mm                           | in.   | kg    | lbs. | N                                 | lbs. | N                                                          | lbs. |
| 33K3           | A33K3     | 3.175  | 0.1250 | 0.008 | 0.0003 | 9.525              | 0.3750 | 0.010 | 0.0004 | 3.96    | 0.156 | 0.3                          | 0.012 | 0.005 | 0.01 | 212                               | 48   | 710                                                        | 160  |
| 33K4           | A33K4     | 3.175  | 0.1250 | 0.008 | 0.0003 | 12.700             | 0.5000 | 0.010 | 0.0004 | 4.37    | 0.172 | 0.3                          | 0.012 | 0.005 | 0.01 | 490                               | 110  | 1430                                                       | 325  |
| 33K5           | A33K5     | 4.762  | 0.1875 | 0.008 | 0.0003 | 12.700             | 0.5000 | 0.010 | 0.0004 | 3.96    | 0.156 | 0.3                          | 0.012 | 0.005 | 0.01 | 490                               | 110  | 1430                                                       | 325  |
| S1K7           | AS1K7     | 6.350  | 0.2500 | 0.008 | 0.0003 | 15.875             | 0.6250 | 0.010 | 0.0004 | 4.98    | 0.196 | 0.3                          | 0.012 | 0.005 | 0.01 | 560                               | 125  | 1630                                                       | 365  |
| S1K            | AS1K      | 6.350  | 0.2500 | 0.008 | 0.0003 | 19.050             | 0.7500 | 0.010 | 0.0004 | 5.56    | 0.219 | 0.4                          | 0.016 | 0.009 | 0.02 | 1160                              | 260  | 3100                                                       | 695  |
| S3K            | AS3K      | 9.525  | 0.3750 | 0.008 | 0.0003 | 22.225             | 0.8750 | 0.010 | 0.0004 | 5.56    | 0.219 | 0.4                          | 0.016 | 0.009 | 0.02 | 1400                              | 312  | 3650                                                       | 830  |
| S5K            | AS5K      | 12.700 | 0.5000 | 0.008 | 0.0003 | 28.575             | 1.1250 | 0.010 | 0.0004 | 6.35    | 0.250 | 0.4                          | 0.016 | 0.018 | 0.04 | 2240                              | 500  | 5600                                                       | 1270 |
| S7K            | AS7K      | 15.875 | 0.6250 | 0.008 | 0.0003 | 34.925             | 1.3750 | 0.013 | 0.0005 | 7.14    | 0.281 | 0.8                          | 0.031 | 0.032 | 0.07 | 3050                              | 682  | 7500                                                       | 1700 |
| S8K            | —         | 19.050 | 0.7500 | 0.010 | 0.0004 | 41.275             | 1.6250 | 0.013 | 0.0005 | 7.92    | 0.312 | 0.8                          | 0.031 | 0.050 | 0.11 | 4400                              | 1000 | 10400                                                      | 2320 |
| S9K            | —         | 22.225 | 0.8750 | 0.010 | 0.0004 | 47.625             | 1.8750 | 0.013 | 0.0005 | 9.52    | 0.375 | 0.8                          | 0.031 | 0.064 | 0.14 | 4900                              | 1120 | 11000                                                      | 2500 |
| S10K           | —         | 25.400 | 1.0000 | 0.010 | 0.0004 | 50.800             | 2.0000 | 0.013 | 0.0005 | 9.52    | 0.375 | 0.8                          | 0.031 | 0.082 | 0.18 | 4900                              | 1120 | 11000                                                      | 2500 |
| S11K           | —         | 28.575 | 1.1250 | 0.010 | 0.0004 | 53.975             | 2.1250 | 0.013 | 0.0005 | 9.52    | 0.375 | 0.8                          | 0.031 | 0.091 | 0.20 | 5400                              | 1220 | 11800                                                      | 2650 |
| S12K           | —         | 31.750 | 1.2500 | 0.013 | 0.0005 | 57.150             | 2.2500 | 0.013 | 0.0005 | 9.52    | 0.375 | 0.8                          | 0.031 | 0.100 | 0.22 | 6000                              | 1340 | 12200                                                      | 2750 |

(1) Maximum shaft or housing fillet radius that bearing corners will clear.

(2) Based on 10<sup>6</sup> revolutions of calculated fatigue life.

### SHIELD AND SEAL COMBINATIONS



One Shield  
D



Two Shields  
DD



One Shield  
And Seal  
PD



Two Seals  
PP



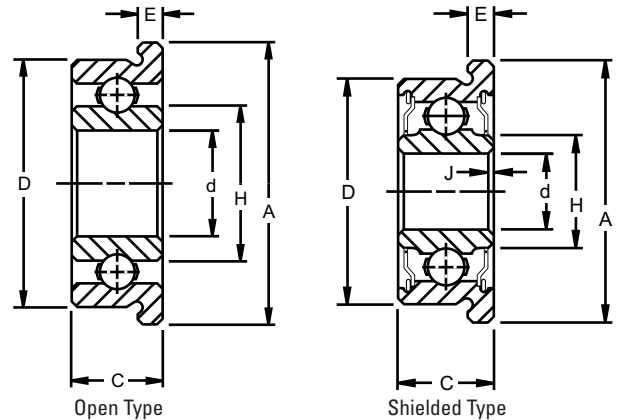
Two Seals  
Wireloc  
PPG

| Standard     |                | Stainless    |                | Width |       |                               | One Shield And Seal PD |  | Two Seals PP |  | Two Seals (Wireloc) PPG |  | Width |       |                               |
|--------------|----------------|--------------|----------------|-------|-------|-------------------------------|------------------------|--|--------------|--|-------------------------|--|-------|-------|-------------------------------|
| One Shield D | Two Shields DD | One Shield D | Two Shields DD | mm    | in.   | in.                           |                        |  |              |  |                         |  | mm    | in.   | in.                           |
| 33KD3        | 33KDD3         | A33KD3       | A33KDD3        | 3.96  | 0.156 | <sup>5</sup> / <sub>32</sub>  | —                      |  | 33PP3        |  | —                       |  | 3.96  | 0.156 | <sup>5</sup> / <sub>32</sub>  |
| 33KD4        | 33KDD4         | —            | —              | 4.37  | 0.172 | <sup>11</sup> / <sub>64</sub> | —                      |  | —            |  | —                       |  | —     | —     | —                             |
| 33KD5        | 33KDD5         | A33KD5       | A33KDD5        | 4.98  | 0.196 | —                             | —                      |  | 33PP5        |  | 33PPG5                  |  | 4.98  | 0.196 | —                             |
| S1KD7        | S1KDD7         | AS1KD7       | AS1KDD7        | 4.98  | 0.196 | —                             | —                      |  | S1PP7        |  | S1PPG7                  |  | 4.98  | 0.196 | —                             |
| S1KD         | S1KDD          | AS1KD        | AS1KDD         | 7.14  | 0.281 | <sup>9</sup> / <sub>32</sub>  | —                      |  | S1PP         |  | S1PPG                   |  | 7.14  | 0.281 | <sup>9</sup> / <sub>32</sub>  |
| S3KD         | S3KDD          | AS3KD        | AS3KDD         | 7.14  | 0.281 | <sup>9</sup> / <sub>32</sub>  | —                      |  | S3PP         |  | S3PPG                   |  | 7.14  | 0.281 | <sup>9</sup> / <sub>32</sub>  |
| S5KD         | S5KDD          | AS5KD        | AS5KDD         | 7.92  | 0.312 | <sup>5</sup> / <sub>16</sub>  | S5PD                   |  | S5PP         |  | S5PPG                   |  | 7.92  | 0.312 | <sup>5</sup> / <sub>16</sub>  |
| S7KD         | S7KDD          | —            | —              | 8.74  | 0.344 | <sup>11</sup> / <sub>32</sub> | —                      |  | S7PP         |  | —                       |  | 8.74  | 0.344 | <sup>11</sup> / <sub>32</sub> |
| S8KD         | S8KDD          | —            | AS8KDD         | 11.13 | 0.438 | <sup>7</sup> / <sub>16</sub>  | S8PD                   |  | S8PP         |  | —                       |  | 11.13 | 0.438 | <sup>7</sup> / <sub>16</sub>  |
| S9KD         | S9KDD          | —            | —              | 12.70 | 0.500 | <sup>1</sup> / <sub>2</sub>   | —                      |  | —            |  | —                       |  | —     | —     | —                             |
| S10KD        | S10KDD         | —            | —              | 12.70 | 0.500 | <sup>1</sup> / <sub>2</sub>   | —                      |  | S10PP2       |  | —                       |  | 12.70 | 0.500 | <sup>1</sup> / <sub>2</sub>   |
| —            | —              | —            | —              | —     | —     | —                             | —                      |  | S12NPP       |  | —                       |  | 12.70 | 0.500 | —                             |

## FLANGED SERIES

### CYLINDRICAL O.D.

- Four sizes offered in flanged construction.
- Integral shoulders for mounting in through-bored housings.
- Straight outside diameters.
- Interchangeable with corresponding unflanged sizes.
- Available with double shields.
- Electric motor quality for applications where quietness is required.



### DIMENSIONS – TOLERANCES

| Bearing Number |                        | Bore<br>d                                      |                                             |      |       | Outside<br>Diameter<br>D                      |                                            | Width<br>C |                                                 | Inner Ring<br>Shoulder   |                                            | Flange    |       |      |       | Shielded Type<br>Overall<br>Width |       |       |       | Wt.   |      | Static<br>Load<br>Rating<br>Co |     | Extended<br>Dynamic<br>Load<br>Rating<br>C <sub>E</sub> <sup>(2)</sup> |     |
|----------------|------------------------|------------------------------------------------|---------------------------------------------|------|-------|-----------------------------------------------|--------------------------------------------|------------|-------------------------------------------------|--------------------------|--------------------------------------------|-----------|-------|------|-------|-----------------------------------|-------|-------|-------|-------|------|--------------------------------|-----|------------------------------------------------------------------------|-----|
| open           | shielded*              | chamfer<br>J x 45°                             |                                             |      |       | +0.000 mm<br>-0.010 mm<br>+0.000"<br>-0.0004" | +0.00 mm<br>-0.13 mm<br>+0.000"<br>-0.005" | H<br>Min.  | A<br>+0.13 mm<br>-0.05 mm<br>+0.005"<br>-0.002" | E<br>±0.05 mm<br>±0.002" | +0.00 mm<br>-0.13 mm<br>+0.000"<br>-0.005" | H<br>Min. | kg    | lbs. | N     | lbs.                              | N     | lbs.  |       |       |      |                                |     |                                                                        |     |
|                |                        | +0.000 mm<br>-0.008 mm<br>+0.0003"<br>-0.0003" | +0.025 mm<br>-0.00 mm<br>+0.010"<br>-0.000" |      |       |                                               |                                            |            |                                                 |                          |                                            |           |       |      |       |                                   |       |       |       |       |      |                                |     |                                                                        |     |
|                |                        | mm                                             | in.                                         | mm   | in.   | mm                                            | in.                                        | mm         | in.                                             | mm                       | in.                                        | mm        | in.   | mm   | in.   | kg                                | lbs.  | N     | lbs.  | N     | lbs. |                                |     |                                                                        |     |
| F33K3          | F33KDD3                | 3.175                                          | 0.1250                                      | 0.30 | 0.012 | 9.525                                         | 0.3750                                     | 3.96       | 0.156                                           | 5.13                     | 0.202                                      | 11.18     | 0.440 | 0.76 | 0.030 | 3.96                              | 0.156 | 4.65  | 0.183 | 0.005 | 0.01 | 212                            | 48  | 710                                                                    | 160 |
| F33K5          | F33KDD5                | 4.762                                          | 0.1875                                      | 0.30 | 0.012 | 12.700                                        | 0.5000                                     | 3.96       | 0.156                                           | 6.86                     | 0.270                                      | 14.35     | 0.565 | 1.07 | 0.042 | 4.98                              | 0.196 | 6.30  | 0.248 | 0.005 | 0.01 | 490                            | 110 | 1430                                                                   | 325 |
| FS1K7          | FS1KDD7 <sup>(1)</sup> | 6.350                                          | 0.2500                                      | 0.30 | 0.012 | 15.875                                        | 0.6250                                     | 4.98       | 0.196                                           | 8.86                     | 0.349                                      | 17.53     | 0.690 | 1.07 | 0.042 | 4.98                              | 0.196 | 8.43  | 0.332 | 0.005 | 0.01 | 560                            | 125 | 1630                                                                   | 365 |
| FS3K           | FS3KDD <sup>(1)</sup>  | 9.525                                          | 0.3750                                      | 0.41 | 0.016 | 22.225                                        | 0.8750                                     | 5.56       | 0.219                                           | 13.13                    | 0.517                                      | 24.61     | 0.969 | 1.57 | 0.062 | 7.14                              | 0.281 | 12.06 | 0.475 | 0.009 | 0.02 | 1400                           | 310 | 3650                                                                   | 830 |

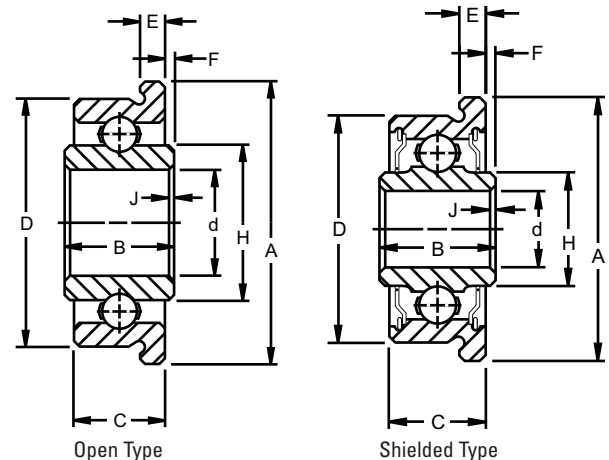
<sup>(1)</sup> Also available in stainless steel. To specify, add prefix "A" before bearing number.

<sup>(2)</sup> Based on 10<sup>6</sup> revolutions of calculated fatigue life.

\* Also available with two contact seals. To specify, replace "KDD" in part number with "PP".

### TAPERED O.D.

- F Flanged series has shoulders integral with the bearings for mounting in through-bored housings.
- Used where compactness is essential or where it is not desirable to machine housing shoulders.
- All sizes in series have tapered outside diameters and are available with double shields.
- Suitable applications include precision instruments, packaging machinery and motion picture projectors.
- Several sizes in the series are manufactured in both standard bearing-quality, chromium-alloy, high-carbon steel and stainless steel (stainless steel specified by suffix "A").
- Electric motor quality where quietness is required.



### DIMENSIONS – TOLERANCES

| Bearing Number    |                     | Bore                              |                                             | Outside<br>Diameter<br>D                     | Inner               |                     | Ring Widths                |            |                      | Flange                                     |                     | Wt.        |         | Static<br>Load<br>Rating<br>C <sub>0</sub> | Extended<br>Dynamic<br>Load<br>C <sub>E</sub> <sup>(4)</sup> |  |
|-------------------|---------------------|-----------------------------------|---------------------------------------------|----------------------------------------------|---------------------|---------------------|----------------------------|------------|----------------------|--------------------------------------------|---------------------|------------|---------|--------------------------------------------|--------------------------------------------------------------|--|
|                   |                     | d<br>chamfer<br>J x 45°           |                                             |                                              |                     |                     | Outer<br>Width             |            | A                    | E                                          |                     |            |         |                                            |                                                              |  |
| open              | shielded            | +0.008 mm<br>-0.00 mm<br>+0.0003" | +0.025 mm<br>-0.00 mm<br>+0.010"<br>-0.000" | +0.000 mm<br>-0.10 mm<br>+0.000"<br>-0.0004" | Inner<br>Width<br>B | Project<br>F        | H <sup>(3)</sup>           | C          | Taper<br>Per<br>Foot | +0.13 mm<br>-0.05 mm<br>+0.005"<br>-0.002" | ±0.05 mm<br>±0.002" |            |         |                                            |                                                              |  |
|                   |                     |                                   |                                             |                                              | ±0.3 mm<br>±0.010"  | ±0.13 mm<br>-0.005" | Min.                       | -0.004"    |                      |                                            |                     |            |         |                                            |                                                              |  |
|                   |                     | mm in.                            | mm in.                                      | mm in.                                       | mm in.              | mm in.              | mm in.                     | mm in.     | mm in.               | mm in.                                     | mm in.              | kg lbs.    | N lbs.  | N lbs.                                     | N lbs.                                                       |  |
| F2 <sup>(1)</sup> | —                   | 4.762 0.1875                      | 0.25 0.010                                  | 11.130 0.4382                                | 4.80 0.189          | 0.41 0.016          | 6.93 0.273                 | 4.14 0.163 | 2.03 0.080           | 12.70 0.500                                | 1.07 0.042          | 0.005 0.01 | 465 106 | 1160 260                                   |                                                              |  |
| —                 | F2DD-2              | 3.175 0.1250                      | 0.25 0.010                                  | 9.534 0.3757                                 | 4.77 0.188          | 0.38 0.015          | 4.60 0.181                 | 4.14 0.163 | 1.90 0.075           | 11.13 0.438                                | 0.94 0.037          | 0.005 0.01 | 212 48  | 710 160                                    |                                                              |  |
| F3                | —                   | 4.762 0.1875                      | 0.25 0.010                                  | 14.305 0.5632                                | 5.54 0.218          | 0.38 0.015          | 6.93 0.273                 | 4.95 0.195 | 2.03 0.080           | 15.88 0.625                                | 1.07 0.042          | 0.005 0.01 | 490 110 | 1430 325                                   |                                                              |  |
| —                 | F3DD                | 4.762 0.1875                      | 0.25 0.010                                  | 14.305 0.5632                                | 6.35 0.250          | 0.38 0.015          | 6.22 0.245                 | 5.74 0.226 | 1.73 0.068           | 15.88 0.625                                | 1.07 0.042          | 0.005 0.01 | 490 110 | 1430 325                                   |                                                              |  |
| F4                | F4DD                | 6.350 0.2500                      | 0.25 0.010                                  | 15.893 0.6257                                | 6.35 0.250          | 0.38 0.015          | 8.41 0.331                 | 5.74 0.226 | 1.73 0.068           | 17.45 0.687                                | 1.07 0.042          | 0.005 0.01 | 560 125 | 1630 365                                   |                                                              |  |
| F5                | F5DD <sup>(2)</sup> | 7.938 0.3125                      | 0.25 0.010                                  | 17.480 0.6882                                | 6.35 0.250          | 0.38 0.015          | 10.41 0.410 <sup>(2)</sup> | 5.74 0.226 | 1.73 0.068           | 19.05 0.750                                | 1.07 0.042          | 0.005 0.01 | 865 196 | 2400 540                                   |                                                              |  |

<sup>(1)</sup> Full type, no retainer. Not suggested for speeds over 500 RPM.

<sup>(2)</sup> H dimension is 9.68 mm (.381") for F5DD.

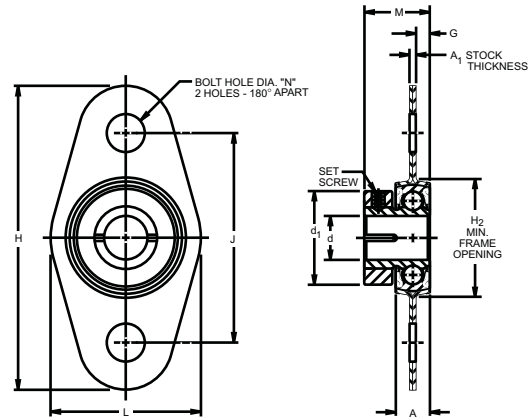
<sup>(3)</sup> Land dimension of the inner ring.

<sup>(4)</sup> Based on 10<sup>6</sup> revolutions of calculated fatigue life.



## ST FLANGETTE UNIT

- Pressed steel housed units designed for light-duty applications.
- Available in shaft sizes from 6.35 mm - 12.7 mm ( $\frac{1}{4}$  to  $\frac{1}{2}$  inch).
- Designed to simplify mounting on side plate or frame-type housings.
- Two identical steel stampings house a clamp-type bearing with a spherical O.D. outer ring.
- Spherical inside surface of each stamping mates with the spherical O.D. of the bearing, providing initial self-alignment at mounting.
- Offers features of basic clamp-type bearing.
- Available with sealed or shielded construction.
- Radial load capacity is 25 percent of basic bearing's dynamic load rating at 33.3 RPM.
- Inspected to ABEC-1 tolerances, except bore.
- Suggested shaft tolerance: Nominal bore size to  $-.0005$  in. resulting in  $.000$  in. to  $.001$  in. loose-shaft fit.



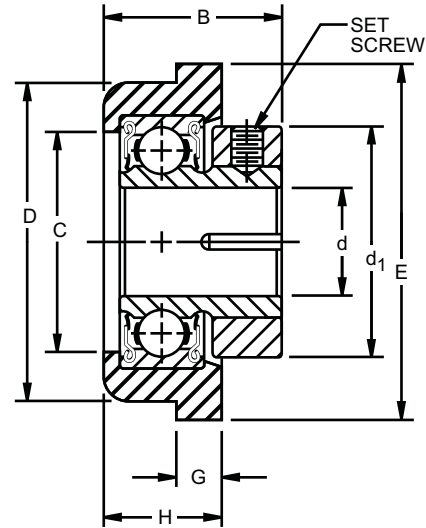
| Unit Number | Bore**<br>d<br>+0.13 mm<br>-0.000 mm<br>+0.0005"<br>-0.0000" | A                    | d <sub>1</sub>         | H <sub>2</sub>         | M            | G           | A <sub>1</sub> | H                       | L                       | J                       | N                    | Set-screw Thread* | Max. Radial Unit Load |
|-------------|--------------------------------------------------------------|----------------------|------------------------|------------------------|--------------|-------------|----------------|-------------------------|-------------------------|-------------------------|----------------------|-------------------|-----------------------|
|             | mm in.                                                       | mm in.               | mm in.                 | mm in.                 | mm in.       | mm in.      | mm in.         | mm in.                  | mm in.                  | mm in.                  | mm in.               |                   | N lbs.                |
| S1PPB7-3 ST | 6.350 0.2500                                                 | 5.556 $\frac{7}{32}$ | 14.287 $\frac{9}{16}$  | 19.844 $\frac{25}{32}$ | 10.922 0.430 | 2.007 0.079 | 0.683 0.0269   | 45.244 $1\frac{25}{32}$ | 22.225 $\frac{7}{8}$    | 30.956 $1\frac{7}{32}$  | 0.219 $\frac{7}{32}$ | 4-40              | 312 70                |
| S3PPB15 ST  | 7.937 0.3125                                                 | 7.144 $\frac{9}{32}$ | 19.844 $\frac{25}{32}$ | 27.781 $1\frac{3}{32}$ | 14.275 0.562 | 2.718 0.107 | 0.836 0.0329   | 53.181 $2\frac{3}{32}$  | 30.163 $1\frac{13}{16}$ | 38.894 $1\frac{17}{32}$ | 0.219 $\frac{7}{32}$ | 8-36              | 668 150               |
| S5PPB2 ST   | 12.700 0.5000                                                | 7.937 $\frac{5}{16}$ | 23.019 $\frac{29}{32}$ | 32.544 $1\frac{9}{32}$ | 15.875 0.625 | 3.048 0.120 | 0.912 0.0359   | 59.531 $2\frac{11}{32}$ | 36.512 $1\frac{17}{16}$ | 45.244 $1\frac{25}{32}$ | 0.219 $\frac{7}{32}$ | 8-36              | 980 220               |

\* All setscrews are hex socket oval point, six fluted socket setscrews available upon request. Setscrews with fused plastic patch available at added cost.

\*\*Bore tolerance applies prior to collar assembly.

## RTF-RUBBER TIRE FLANGE HOUSED UNIT

- Synthetic, conductive elastomer of Durometer hardness 80-85 facilitates mounting of standard cylindrical O.D. bearings in side plate of frame-type housings.
- Generous taper on entrance corner of rubber cartridge simplifies insertion of unit into side panel, assuring reasonable squareness of bearings when fully mounted.
- Bearing is positioned by integral flange of the rubber cartridge.
- Resiliency of elastomer accommodates wider than the standard suggested housing bore tolerance.
- Greater flexibility in adjusting to minor shaft and/or housing alignment.
- Helps reduce airborne noise and structural vibration.
- Additional advantages are similar to features of basic clamp-type bearing design.
- Due to deflection characteristics of the elastomer, radial and thrust ratings for the RTF Series are 10 percent of the basic bearing's dynamic load rating at 33.3 RPM.



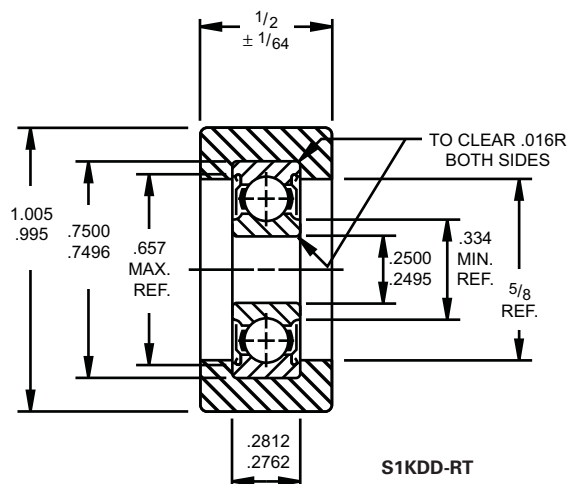
| Unit Number | Bore**<br>d<br>+0.13 mm<br>-0.000 mm<br>+0.0005"<br>-0.0000" | D<br>RTF O.D.<br>±0.13 mm<br>±0.005" | HSG Bore<br>±0.13 mm<br>±0.005" | C                      | d <sub>1</sub>         | E                       | B                      | G                    | H                      | Set-screw Thread* | Max. Radial Unit Load |
|-------------|--------------------------------------------------------------|--------------------------------------|---------------------------------|------------------------|------------------------|-------------------------|------------------------|----------------------|------------------------|-------------------|-----------------------|
|             | mm in.                                                       | mm in.                               | mm in.                          | mm in.                 | mm in.                 | mm in.                  | mm in.                 | mm in.               | mm in.                 |                   | N lbs.                |
| S1PP73RTF   | 6.350 0.2500                                                 | 19.355 0.762                         | 19.050 0.750                    | 13.494 $\frac{17}{32}$ | 14.287 $\frac{9}{16}$  | 22.225 $\frac{7}{8}$    | 11.906 $\frac{15}{32}$ | 1.984 $\frac{5}{64}$ | 7.541 $\frac{19}{64}$  | 4-40              | 116 26                |
| S3PP16RTF   | 7.937 0.3125                                                 | 27.280 1.074                         | 26.975 1.062                    | 19.050 $\frac{3}{4}$   | 19.844 $\frac{25}{32}$ | 30.956 $1\frac{7}{32}$  | 15.875 $\frac{5}{8}$   | 3.969 $\frac{5}{32}$ | 10.319 $\frac{13}{32}$ | 8-36              | 258 58                |
| S3PP4RTF    | 9.525 0.3750                                                 | 27.280 1.074                         | 26.975 1.062                    | 19.050 $\frac{3}{4}$   | 19.844 $\frac{25}{32}$ | 30.956 $1\frac{7}{32}$  | 15.875 $\frac{5}{8}$   | 3.969 $\frac{5}{32}$ | 10.319 $\frac{13}{32}$ | 8-36              | 258 58                |
| S5PP2RTF    | 12.700 0.5000                                                | 35.255 1.388                         | 34.925 1.375                    | 25.400 1               | 23.019 $\frac{29}{32}$ | 38.894 $1\frac{17}{32}$ | 17.859 $\frac{45}{64}$ | 3.969 $\frac{5}{32}$ | 11.906 $\frac{15}{32}$ | 8-36              | 392 88                |

\* All setscrews are hex socket oval point, six fluted socket setscrews available upon request. Setscrews with fused plastic patch available at added cost.

\*\*Bore tolerance applies prior to collar assembly.

## SPECIAL BEARINGS

- Pulley, guide roller and pinch roll bearings:
  - Available in several bore sizes.
  - Lightweight, low inertia, low torque and accurate running characteristics with minimum runout and wobble.
  - Many units feature outer ring assemblies with integral molded tires.
  - Most common tire materials are aluminum, steel and a variety of engineered plastics such as nylon, polycarbonate, acetal resin or polyurethane.
  - Tire material and configuration are determined by application requirements.
  - Standard materials and shapes can be made in many sizes.
  - Timken engineering may assist in testing materials you feel are suitable for your applications.
- Timken universal ring design:
  - Sealed or shielded versions readily available in the most basic bearing sizes.
  - Varying degrees of seal drag, to suit the sealing torque requirements dictated by the environmental conditions of the application.
- Integral assembly design concept:
  - Complete package of bearings, housings, shafts, etc.
  - Assembled and ready to mount.
  - Custom designed to solve customer assembly problems and minimize inventory of multiple components.
  - Overall cost savings.
  - Bearing units shown have been developed especially for business machine applications.



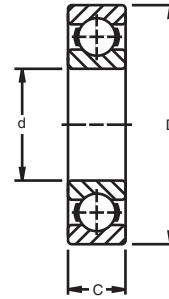
D





## ULTRA LIGHT 9300K SERIES

- Designed for applications where housing diameters are restricted and it is desirable to maintain relatively large shaft diameters.
- Resembles the 9100K Series, except corresponding sizes of the 9300K Series have a somewhat thinner section.
- Used extensively in machine tools, textile machinery and jet engine gearbox applications.



### DIMENSIONS – TOLERANCES

| Bearing Number          | Bore d |        |       |         | Outside Diameter D |        |       |         | Width C |        |      |       | Fillet Radius <sup>(1)</sup> |       | Wt.   |      | Static Load Rating C <sub>0</sub> |      | Extended Dynamic Load Rating C <sub>E</sub> <sup>(4)</sup> |      |
|-------------------------|--------|--------|-------|---------|--------------------|--------|-------|---------|---------|--------|------|-------|------------------------------|-------|-------|------|-----------------------------------|------|------------------------------------------------------------|------|
|                         | mm     | in.    | mm    | in.     | mm                 | in.    | mm    | in.     | mm      | in.    | mm   | in.   | mm                           | in.   | kg    | lbs. | N                                 | lbs. | N                                                          | lbs. |
| 9301K                   | 12     | 0.4724 | 0.008 | 0.0003  | 24                 | 0.9449 | 0.009 | 0.00035 | 6       | 0.236  | 0.12 | 0.005 | 0.3                          | 0.012 | 0.014 | 0.03 | 1600                              | 360  | 3650                                                       | 830  |
| 9302K                   | 15     | 0.5906 | 0.008 | 0.0003  | 28                 | 1.1024 | 0.009 | 0.00035 | 7       | 0.276  | 0.12 | 0.005 | 0.3                          | 0.012 | 0.018 | 0.04 | 2270                              | 510  | 4890                                                       | 1100 |
| 9303K <sup>(2)</sup>    | 17     | 0.6693 | 0.008 | 0.0003  | 30                 | 1.1811 | 0.009 | 0.00035 | 7       | 0.276  | 0.12 | 0.005 | 0.3                          | 0.012 | 0.027 | 0.06 | 2540                              | 570  | 5250                                                       | 1180 |
| 9305K <sup>(2)</sup>    | 25     | 0.9843 | 0.010 | 0.0004  | 42                 | 1.6535 | 0.011 | 0.00045 | 9       | 0.354  | 0.12 | 0.005 | 0.3                          | 0.012 | 0.045 | 0.10 | 4540                              | 1020 | 8010                                                       | 1800 |
| 9306K <sup>(2)(3)</sup> | 30     | 1.1811 | 0.010 | 0.0004  | 47                 | 1.8504 | 0.011 | 0.00045 | 9       | 0.354  | 0.12 | 0.005 | 0.3                          | 0.012 | 0.075 | 0.16 | 4980                              | 1120 | 8270                                                       | 1860 |
| 9307K                   | 35     | 1.3780 | 0.012 | 0.00045 | 55                 | 2.1654 | 0.013 | 0.0005  | 10      | 0.394  | 0.12 | 0.005 | 0.6                          | 0.024 | 0.095 | 0.21 | 8010                              | 1800 | 13300                                                      | 3000 |
| 9308K                   | 40     | 1.5748 | 0.012 | 0.00045 | 62                 | 2.4409 | 0.013 | 0.0005  | 12      | 0.472  | 0.12 | 0.005 | 0.6                          | 0.024 | 0.141 | 0.31 | 8900                              | 2000 | 13800                                                      | 3100 |
| 9310K                   | 50     | 1.9685 | 0.012 | 0.00045 | 72                 | 2.8346 | 0.013 | 0.0005  | 12      | 0.472  | 0.12 | 0.005 | 0.6                          | 0.024 | 0.168 | 0.37 | 11560                             | 2600 | 16700                                                      | 3750 |
| 9311K                   | 55     | 2.1654 | 0.015 | 0.0006  | 80                 | 3.1496 | 0.013 | 0.0005  | 13      | 0.512* | 0.15 | 0.006 | 1.0                          | 0.039 | 0.209 | 0.46 | 14010                             | 3150 | 18900                                                      | 4250 |
| 9313K                   | 65     | 2.5591 | 0.015 | 0.0006  | 90                 | 3.5433 | 0.015 | 0.0006  | 13      | 0.512* | 0.15 | 0.006 | 1.0                          | 0.039 | 0.250 | 0.55 | 16010                             | 3600 | 19600                                                      | 4400 |
| 9316K                   | 80     | 3.1496 | 0.015 | 0.0006  | 110                | 4.3307 | 0.015 | 0.0006  | 16      | 0.630* | 0.15 | 0.006 | 1.0                          | 0.039 | 0.363 | 0.80 | 24020                             | 5400 | 28500                                                      | 6400 |

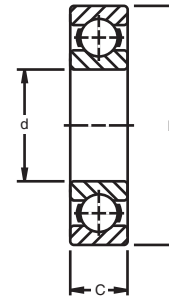
(1) Maximum shaft or housing fillet radius that bearing corners will clear.

(2) Also available with rubber seals, e.g., 9303PP.

(3) Also available with two shields, e.g., 9306KDD.

(4) Based on 10<sup>6</sup> revolutions of calculated fatigue life.

\* Width tolerance is +.00 mm to -.15 mm (+.000" to -.006").



## EXTRA LIGHT 9100K SERIES

- For applications where housing diameters are restricted and it is desirable to maintain relatively large shaft diameters.
- Electric motor quality for applications where quietness is a requirement.

### DIMENSIONS – TOLERANCES

| Bearing Number | Bore d |        |       |         | Outside Diameter D |        |       |         | Width C |        |      |       | Fillet Radius <sup>(1)</sup> |       | Wt.   |      | Static Load Rating C <sub>0</sub> |       | Extended Dynamic Load Rating C <sub>E</sub> <sup>(2)</sup> |       |
|----------------|--------|--------|-------|---------|--------------------|--------|-------|---------|---------|--------|------|-------|------------------------------|-------|-------|------|-----------------------------------|-------|------------------------------------------------------------|-------|
|                | mm     | in.    | mm    | in.     | mm                 | in.    | mm    | in.     | mm      | in.    | mm   | in.   | mm                           | in.   | kg    | lbs. | N                                 | lbs.  | N                                                          | lbs.  |
| 9100K          | 10     | 0.3937 | 0.008 | 0.0003  | 26                 | 1.0236 | 0.009 | 0.00035 | 8       | 0.3150 | 0.12 | 0.005 | 0.3                          | 0.012 | 0.018 | 0.04 | 1960                              | 440   | 5160                                                       | 1160  |
| 9101K          | 12     | 0.4724 | 0.008 | 0.0003  | 28                 | 1.1024 | 0.009 | 0.00035 | 8       | 0.3150 | 0.12 | 0.005 | 0.3                          | 0.012 | 0.018 | 0.04 | 2360                              | 530   | 5870                                                       | 1320  |
| 9102K          | 15     | 0.5906 | 0.008 | 0.0003  | 32                 | 1.2598 | 0.011 | 0.00045 | 9       | 0.3543 | 0.12 | 0.005 | 0.3                          | 0.012 | 0.027 | 0.06 | 2800                              | 630   | 6360                                                       | 1430  |
| 9103K          | 17     | 0.6693 | 0.008 | 0.0003  | 35                 | 1.3780 | 0.011 | 0.00045 | 10      | 0.3937 | 0.12 | 0.005 | 0.3                          | 0.012 | 0.041 | 0.09 | 3200                              | 720   | 6800                                                       | 1530  |
| 9104K          | 20     | 0.7874 | 0.010 | 0.0004  | 42                 | 1.6535 | 0.011 | 0.00045 | 12      | 0.4724 | 0.12 | 0.005 | 0.6                          | 0.024 | 0.073 | 0.16 | 5000                              | 1120  | 10700                                                      | 2400  |
| 9105K          | 25     | 0.9843 | 0.010 | 0.0004  | 47                 | 1.8504 | 0.011 | 0.00045 | 12      | 0.4724 | 0.12 | 0.005 | 0.6                          | 0.024 | 0.077 | 0.17 | 5740                              | 1290  | 11300                                                      | 2550  |
| 9106K          | 30     | 1.1811 | 0.010 | 0.0004  | 55                 | 2.1654 | 0.013 | 0.0005  | 13      | 0.5118 | 0.12 | 0.005 | 1.0                          | 0.039 | 0.118 | 0.26 | 8010                              | 1800  | 14600                                                      | 3350  |
| 9107K          | 35     | 1.3780 | 0.012 | 0.00045 | 62                 | 2.4409 | 0.013 | 0.0005  | 14      | 0.5512 | 0.12 | 0.005 | 1.0                          | 0.039 | 0.145 | 0.32 | 9960                              | 2240  | 18000                                                      | 4050  |
| 9108K          | 40     | 1.5748 | 0.012 | 0.00045 | 68                 | 2.6772 | 0.013 | 0.0005  | 15      | 0.5906 | 0.12 | 0.005 | 1.0                          | 0.039 | 0.195 | 0.43 | 12200                             | 2750  | 20000                                                      | 4500  |
| 9109K          | 45     | 1.7717 | 0.012 | 0.00045 | 75                 | 2.9528 | 0.013 | 0.0005  | 16      | 0.6299 | 0.12 | 0.005 | 1.0                          | 0.039 | 0.249 | 0.55 | 14900                             | 3350  | 24000                                                      | 5400  |
| 9110K          | 50     | 1.9685 | 0.012 | 0.00045 | 80                 | 3.1496 | 0.013 | 0.0005  | 16      | 0.6299 | 0.12 | 0.005 | 1.0                          | 0.039 | 0.272 | 0.60 | 16000                             | 3600  | 24900                                                      | 5600  |
| 9111K          | 55     | 2.1654 | 0.015 | 0.0006  | 90                 | 3.5433 | 0.015 | 0.0006  | 18      | 0.7087 | 0.15 | 0.006 | 1.0                          | 0.039 | 0.390 | 0.86 | 20700                             | 4650  | 32000                                                      | 7200  |
| 9112K          | 60     | 2.3622 | 0.015 | 0.0006  | 95                 | 3.7402 | 0.015 | 0.0006  | 18      | 0.7087 | 0.15 | 0.006 | 1.0                          | 0.039 | 0.417 | 0.92 | 22600                             | 5100  | 33400                                                      | 7500  |
| 9113K          | 65     | 2.5591 | 0.015 | 0.0006  | 100                | 3.9370 | 0.015 | 0.0006  | 18      | 0.7087 | 0.15 | 0.006 | 1.0                          | 0.039 | 0.445 | 0.98 | 24500                             | 5500  | 34700                                                      | 7800  |
| 9114K          | 70     | 2.7559 | 0.015 | 0.0006  | 110                | 4.3307 | 0.015 | 0.0006  | 20      | 0.7874 | 0.15 | 0.006 | 1.0                          | 0.039 | 0.630 | 1.39 | 29800                             | 6700  | 43200                                                      | 9720  |
| 9115K          | 75     | 2.9528 | 0.015 | 0.0006  | 115                | 4.5276 | 0.015 | 0.0006  | 20      | 0.7874 | 0.15 | 0.006 | 1.0                          | 0.039 | 0.680 | 1.50 | 32700                             | 7350  | 44500                                                      | 10000 |
| 9116K          | 80     | 3.1496 | 0.015 | 0.0006  | 125                | 4.9213 | 0.018 | 0.0007  | 22      | 0.8661 | 0.15 | 0.006 | 1.0                          | 0.039 | 0.885 | 1.95 | 35600                             | 8000  | 54300                                                      | 12200 |
| 9117K          | 85     | 3.3465 | 0.020 | 0.0008  | 130                | 5.1181 | 0.018 | 0.0007  | 22      | 0.8661 | 0.20 | 0.008 | 1.0                          | 0.039 | 0.966 | 2.13 | 35600                             | 8000  | 56500                                                      | 12700 |
| 9118K          | 90     | 3.5433 | 0.020 | 0.0008  | 140                | 5.5118 | 0.018 | 0.0007  | 24      | 0.9449 | 0.20 | 0.008 | 1.5                          | 0.059 | 1.157 | 2.55 | 48000                             | 10800 | 66700                                                      | 15000 |
| 9119K          | 95     | 3.7402 | 0.020 | 0.0008  | 145                | 5.7087 | 0.018 | 0.0007  | 24      | 0.9449 | 0.20 | 0.008 | 1.5                          | 0.059 | 1.188 | 2.62 | 52500                             | 11800 | 68100                                                      | 15300 |
| 9120K          | 100    | 3.9370 | 0.020 | 0.0008  | 150                | 5.9055 | 0.018 | 0.0007  | 24      | 0.9449 | 0.20 | 0.008 | 1.5                          | 0.059 | 1.315 | 2.90 | 52500                             | 11800 | 68100                                                      | 15300 |

(1) Maximum shaft or housing fillet radius that bearing corners will clear.

(2) Based on 10<sup>6</sup> revolutions of calculated fatigue life.

Continued on the next page.

# EXTRA LIGHT 9100K SERIES (continued)

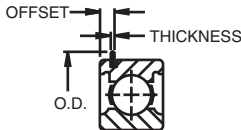
## DIMENSIONS – TOLERANCES

| Bearing Number | Bore d |         |       |        | Outside Diameter D |         |       |        | Width C |        |      |       | Fillet Radius <sup>(1)</sup> |       | Wt.  |       | Static Load Rating C <sub>0</sub> |        | Extended Dynamic Load Rating C <sub>E</sub> <sup>(2)</sup> |        |
|----------------|--------|---------|-------|--------|--------------------|---------|-------|--------|---------|--------|------|-------|------------------------------|-------|------|-------|-----------------------------------|--------|------------------------------------------------------------|--------|
|                | mm     | in.     | mm    | in.    | mm                 | in.     | mm    | in.    | mm      | in.    | mm   | in.   | mm                           | in.   | kg   | lbs.  | N                                 | lbs.   | N                                                          | lbs.   |
| 9121K          | 105    | 4.1339  | 0.020 | 0.0008 | 160                | 6.2992  | 0.025 | 0.0010 | 26      | 1.0236 | 0.20 | 0.008 | 2.0                          | 0.079 | 1.6  | 3.6   | 59600                             | 13400  | 76900                                                      | 17600  |
| 9122K          | 110    | 4.3307  | 0.020 | 0.0008 | 170                | 6.6929  | 0.025 | 0.0010 | 28      | 1.1024 | 0.20 | 0.008 | 2.0                          | 0.080 | —    | —     | 71100                             | 16000  | 92500                                                      | 20800  |
| 9124K          | 120    | 4.7244  | 0.020 | 0.0008 | 180                | 7.0866  | 0.025 | 0.0010 | 28      | 1.1024 | 0.20 | 0.008 | 2.0                          | 0.079 | 2.2  | 4.9   | 71100                             | 16000  | 88900                                                      | 20000  |
| 9126K          | 130    | 5.1181  | 0.025 | 0.0010 | 200                | 7.8740  | 0.030 | 0.0012 | 33      | 1.2992 | 0.25 | 0.010 | 2.0                          | 0.079 | 3.4  | 7.4   | 90700                             | 20400  | 115600                                                     | 26000  |
| 9128K          | 140    | 5.5118  | 0.025 | 0.0010 | 210                | 8.2677  | 0.030 | 0.0012 | 33      | 1.2992 | 0.25 | 0.010 | 2.0                          | 0.080 | 3.6  | 8.0   | 105000                            | 23600  | 124500                                                     | 28000  |
| 9130K          | 150    | 5.9055  | 0.025 | 0.0010 | 225                | 8.8583  | 0.030 | 0.0012 | 35      | 1.3780 | 0.25 | 0.010 | 2.0                          | 0.080 | 5.5  | 12.0  | 92500                             | 20800  | 113400                                                     | 25500  |
| 9132K          | 160    | 6.2992  | 0.025 | 0.0010 | 240                | 9.4488  | 0.030 | 0.0012 | 38      | 1.4961 | 0.25 | 0.010 | 2.0                          | 0.080 | 6.7  | 14.8  | 138000                            | 31000  | 166800                                                     | 37500  |
| 9134K          | 170    | 6.6929  | 0.025 | 0.0010 | 260                | 10.2362 | 0.035 | 0.0014 | 42      | 1.6535 | 0.25 | 0.010 | 2.0                          | 0.080 | 9.0  | 19.8  | 160000                            | 36000  | 189000                                                     | 42500  |
| 9136K          | 180    | 7.0866  | 0.025 | 0.0010 | 280                | 11.0236 | 0.035 | 0.0014 | 44      | 1.8110 | 0.25 | 0.010 | 2.0                          | 0.080 | 11.0 | 24.3  | 195700                            | 44000  | 222000                                                     | 50000  |
| 9138K          | 190    | 7.4803  | 0.030 | 0.0012 | 290                | 11.4173 | 0.035 | 0.0014 | 46      | 1.8110 | 0.30 | 0.012 | 2.0                          | 0.080 | 12.0 | 26.5  | 204000                            | 45500  | 216000                                                     | 48000  |
| 9140K          | 200    | 7.8740  | 0.030 | 0.0012 | 310                | 12.2047 | 0.035 | 0.0014 | 51      | 2.0079 | 0.30 | 0.012 | 2.0                          | 0.080 | 15.4 | 34.0  | 245000                            | 55000  | 245000                                                     | 55000  |
| 9144K          | 220    | 8.6614  | 0.030 | 0.0012 | 340                | 13.3858 | 0.040 | 0.0016 | 56      | 2.2047 | 0.30 | 0.012 | 2.5                          | 0.100 | 20.0 | 44.2  | 290000                            | 65500  | 280000                                                     | 63000  |
| 9146K          | 240    | 9.4488  | 0.030 | 0.0012 | 360                | 14.1732 | 0.040 | 0.0016 | 56      | 2.2047 | 0.30 | 0.012 | 2.5                          | 0.100 | 21.5 | 47.3  | 320000                            | 72000  | 290000                                                     | 65500  |
| 9152K          | 260    | 10.2362 | 0.035 | 0.0014 | 400                | 15.7480 | 0.040 | 0.0016 | 65      | 2.5591 | 0.35 | 0.014 | 3.0                          | 0.120 | 31.6 | 69.6  | 400000                            | 90000  | 345000                                                     | 78000  |
| 9156K          | 280    | 11.0236 | 0.035 | 0.0014 | 420                | 16.5354 | 0.045 | 0.0018 | 65      | 2.5591 | 0.35 | 0.014 | 3.0                          | 0.120 | 33.5 | 73.8  | 355000                            | 80000  | 360000                                                     | 80000  |
| 9160K          | 300    | 11.8110 | 0.035 | 0.0014 | 460                | 18.1102 | 0.045 | 0.0018 | 74      | 2.9134 | 0.35 | 0.014 | 3.0                          | 0.120 | 46.6 | 102.9 | 520000                            | 118000 | 415000                                                     | 93000  |
| 9164K          | 320    | 12.5984 | 0.040 | 0.0016 | 480                | 18.8976 | 0.045 | 0.0018 | 74      | 2.9134 | 0.40 | 0.016 | 3.0                          | 0.120 | 49.1 | 108.3 | 570000                            | 127000 | 430000                                                     | 98000  |
| 9180K          | 400    | 15.7480 | 0.040 | 0.0016 | 600                | 23.6220 | 0.050 | 0.0020 | 90      | 3.5433 | 0.40 | 0.016 | 4.0                          | 0.160 | —    | —     | 815000                            | 180000 | 550000                                                     | 122000 |

(1) Maximum shaft or housing fillet radius that bearing corners will clear.

(2) Based on 10<sup>6</sup> revolutions of calculated fatigue life.

## SHIELDS, SEALS AND SNAP RING COMBINATIONS

| Shields and Seals |                |            |              |                        | Snap Ring (Wireloc) <sup>(1)</sup> |                 |               |  |         |           |       |        |       |
|-------------------|----------------|------------|--------------|------------------------|------------------------------------|-----------------|---------------|---------------------------------------------------------------------------------------|---------|-----------|-------|--------|-------|
| One Shield D      | Two Shields DD | One Seal P | Two Seals PP | One Shield And Seal PD | Open Type G                        | Two Shields DDG | Two Seals PPG | O.D.                                                                                  |         | Thickness |       | Offset |       |
|                   |                |            |              |                        |                                    |                 |               | mm                                                                                    | in.     | mm        | in.   | mm     | in.   |
| 9100KD            | 9100KDD        | 9100P      | 9100PP       | 9100PD                 | —                                  | —               | —             | —                                                                                     | —       | —         | —     | —      | —     |
| 9101KD            | 9101KDD        | 9101P      | 9101PP       | 9101PD                 | —                                  | —               | —             | —                                                                                     | —       | —         | —     | —      | —     |
| 9102KD            | 9102KDD        | 9102P      | 9102PP       | —                      | 9102KG                             | 9102KDDG        | 9102PPG       | 36.5                                                                                  | 1 7/16  | 1.07      | 0.042 | 3.05   | 0.120 |
| 9103KD            | 9103KDD        | 9103P      | 9103PP       | 9103PD <sup>(2)</sup>  | 9103KG                             | 9103KDDG        | 9103PPG       | 39.3                                                                                  | 1 35/64 | 1.07      | 0.042 | 3.05   | 0.120 |
| 9104KD            | 9104KDD        | 9104P      | 9104PP       | —                      | 9104KG                             | 9104KDDG        | 9104PPG       | 46.0                                                                                  | 1 13/16 | 1.07      | 0.042 | 3.05   | 0.120 |
| 9105KD            | 9105KDD        | 9105P      | 9105PP       | —                      | —                                  | —               | —             | 52.4                                                                                  | 2 1/16  | 1.07      | 0.042 | 3.05   | 0.120 |
| 9106KD            | 9106KDD        | 9106P      | 9106PP       | 9106PD                 | 9106KG                             | 9106KDDG        | 9106PPG       | 60.3                                                                                  | 2 3/8   | 1.07      | 0.042 | 3.05   | 0.120 |
| 9107KD            | 9107KDD        | 9107P      | 9107PP       | —                      | 9107KG                             | 9107KDDG        | 9107PPG       | 67.5                                                                                  | 2 21/32 | 1.65      | 0.065 | 3.63   | 0.143 |
| 9108KD            | 9108KDD        | 9108P      | 9108PP       | —                      | 9108KG                             | 9108KDDG        | 9108PPG       | 74.2                                                                                  | 2 59/64 | 1.65      | 0.065 | 4.04   | 0.159 |
| 9109KD            | 9109KDD        | 9109P      | 9109PP       | 9109PD                 | 9109KG                             | 9109KDDG        | 9109PPG       | 81.4                                                                                  | 3 13/64 | 1.65      | 0.065 | 4.04   | 0.159 |
| 9110KD            | 9110KDD        | 9110P      | 9110PP       | —                      | 9110KG                             | —               | —             | 86.5                                                                                  | 3 13/32 | 1.65      | 0.065 | 4.04   | 0.159 |
| 9111KD            | 9111KDD        | 9111P      | 9111PP       | —                      | 9111KG                             | —               | 9111PPG       | 96.4                                                                                  | 3 51/64 | 2.41      | 0.095 | 5.18   | 0.204 |
| 9112KD            | 9112KDD        | 9112P      | 9112PP       | —                      | 9112KG                             | —               | —             | 101.2                                                                                 | 3 63/64 | 2.41      | 0.095 | 5.18   | 0.204 |
| 9113KD            | 9113KDD        | 9113P      | 9113PP       | 9113PD                 | 9113KG                             | —               | 9113PPG       | 106.4                                                                                 | 4 3/16  | 2.41      | 0.095 | 5.18   | 0.204 |
| 9114KD            | 9114KDD        | 9114P      | 9114PP       | —                      | 9114KG                             | —               | —             | 116.3                                                                                 | 4 37/64 | 2.41      | 0.095 | 5.18   | 0.204 |
| 9115KD            | 9115KDD        | 9115P      | 9115PP       | —                      | —                                  | —               | —             | 121.4                                                                                 | 4 25/32 | 2.41      | 0.095 | 5.18   | 0.204 |
| 9117KD            | —              | —          | —            | —                      | 9117KG                             | 9117KDDG        | —             | 139.7                                                                                 | 5 1/2   | 2.77      | 0.109 | 5.54   | 0.218 |
| —                 | —              | —          | —            | —                      | —                                  | —               | —             | —                                                                                     | —       | —         | —     | —      | —     |
| —                 | —              | —          | —            | —                      | —                                  | —               | —             | —                                                                                     | —       | —         | —     | —      | —     |
| 9120KD            | —              | —          | 9120NPP      | —                      | —                                  | —               | —             | 159.5                                                                                 | 6 9/32  | 2.77      | 0.109 | 6.35   | 0.250 |
| 9121KD            | —              | —          | —            | —                      | —                                  | —               | —             | 169.5                                                                                 | 6 43/64 | 2.77      | 0.109 | 6.35   | 0.250 |
| —                 | —              | —          | —            | —                      | —                                  | —               | —             | —                                                                                     | —       | —         | —     | —      | —     |
| 9124KD            | —              | 9124P      | 9124PP       | —                      | 9124KG                             | —               | —             | 192.9                                                                                 | 7 19/32 | 3.05      | 0.120 | 6.63   | 0.261 |
| —                 | —              | —          | —            | —                      | —                                  | —               | —             | —                                                                                     | —       | —         | —     | —      | —     |
| —                 | —              | —          | —            | —                      | —                                  | —               | —             | —                                                                                     | —       | —         | —     | —      | —     |

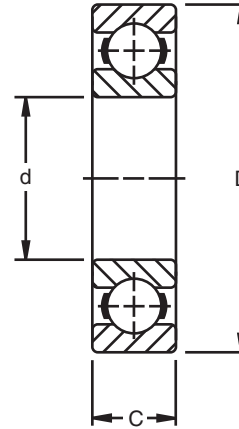
(1) The snap ring is normally packaged separately in the box with bearing.

(2) Width of bearing is 12.700 mm (.5000").



## LIGHT 200K SERIES

- Conrad-type bearing is well-balanced, with deep races and uninterrupted race shoulders. Excellent, general-purpose bearing.
- Capacity to carry radial and thrust in either direction or combined loads.
- Electric motor quality for applications where quietness is a requirement.



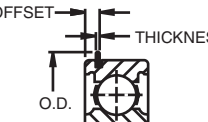
### DIMENSIONS – TOLERANCES

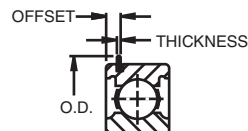
| Bearing Number | Bore d |         |       |         | Outside Diameter D |         |       |         | Width C |        | Fillet Radius <sup>(1)</sup> |       | Wt.    |       | Static Load Rating C <sub>0</sub> |        | Extended Dynamic Load Rating C <sub>E</sub> <sup>(2)</sup> |        |
|----------------|--------|---------|-------|---------|--------------------|---------|-------|---------|---------|--------|------------------------------|-------|--------|-------|-----------------------------------|--------|------------------------------------------------------------|--------|
|                | mm     | in.     | mm    | in.     | mm                 | in.     | mm    | in.     | mm      | in.    | mm                           | in.   | kg     | lbs.  | N                                 | lbs.   | N                                                          | lbs.   |
| 200K           | 10     | 0.3937  | 0.008 | 0.0003  | 30                 | 1.1811  | 0.009 | 0.00035 | 9       | 0.3543 | 0.6                          | 0.024 | 0.027  | 0.06  | 2600                              | 585    | 6800                                                       | 1530   |
| 201K           | 12     | 0.4724  | 0.008 | 0.0003  | 32                 | 1.2598  | 0.011 | 0.00043 | 10      | 0.3937 | 0.6                          | 0.024 | 0.036  | 0.08  | 3000                              | 680    | 7600                                                       | 1730   |
| 202K           | 15     | 0.5906  | 0.008 | 0.0003  | 35                 | 1.3780  | 0.011 | 0.00043 | 11      | 0.4331 | 0.6                          | 0.024 | 0.041  | 0.09  | 3470                              | 830    | 8650                                                       | 1930   |
| 203K           | 17     | 0.6693  | 0.008 | 0.0003  | 40                 | 1.5748  | 0.011 | 0.00043 | 12      | 0.4724 | 0.6                          | 0.024 | 0.064  | 0.14  | 4700                              | 1060   | 10900                                                      | 2450   |
| 204K           | 20     | 0.7874  | 0.010 | 0.0004  | 47                 | 1.8504  | 0.011 | 0.00043 | 14      | 0.5512 | 1.0                          | 0.039 | 0.104  | 0.23  | 6500                              | 1460   | 14400                                                      | 3250   |
| 205K           | 25     | 0.9843  | 0.010 | 0.0004  | 52                 | 2.0472  | 0.013 | 0.0005  | 15      | 0.5906 | 1.0                          | 0.039 | 0.127  | 0.28  | 7800                              | 1760   | 16000                                                      | 3600   |
| 206K           | 30     | 1.1811  | 0.010 | 0.0004  | 62                 | 2.4409  | 0.013 | 0.0005  | 16      | 0.6299 | 1.0                          | 0.039 | 0.195  | 0.43  | 11300                             | 2550   | 22200                                                      | 5000   |
| 207K           | 35     | 1.3780  | 0.012 | 0.00047 | 72                 | 2.8346  | 0.013 | 0.0005  | 17      | 0.6693 | 1.0                          | 0.039 | 0.290  | 0.64  | 15300                             | 3450   | 29100                                                      | 6550   |
| 208K           | 40     | 1.5748  | 0.012 | 0.00047 | 80                 | 3.1496  | 0.013 | 0.0005  | 18      | 0.7087 | 1.0                          | 0.039 | 0.376  | 0.83  | 19800                             | 4460   | 36200                                                      | 8130   |
| 209K           | 45     | 1.7717  | 0.012 | 0.00047 | 85                 | 3.3465  | 0.015 | 0.0006  | 19      | 0.7480 | 1.0                          | 0.039 | 0.426  | 0.94  | 20500                             | 4600   | 36300                                                      | 8160   |
| 210K           | 50     | 1.9685  | 0.012 | 0.00047 | 90                 | 3.5433  | 0.015 | 0.0006  | 20      | 0.7874 | 1.0                          | 0.039 | 0.476  | 1.05  | 23100                             | 5200   | 40000                                                      | 9000   |
| 211K           | 55     | 2.1654  | 0.015 | 0.0006  | 100                | 3.9370  | 0.015 | 0.0006  | 21      | 0.8268 | 1.5                          | 0.059 | 0.635  | 1.40  | 29100                             | 6550   | 49000                                                      | 11000  |
| 212K           | 60     | 2.3622  | 0.015 | 0.0006  | 110                | 4.3307  | 0.015 | 0.0006  | 22      | 0.8661 | 1.5                          | 0.059 | 0.807  | 1.78  | 35500                             | 8000   | 62100                                                      | 13400  |
| 213K           | 65     | 2.5591  | 0.015 | 0.0006  | 120                | 4.7244  | 0.015 | 0.0006  | 23      | 0.9055 | 1.5                          | 0.059 | 1.016  | 2.24  | 39900                             | 9000   | 62100                                                      | 14600  |
| 214K           | 70     | 2.7559  | 0.015 | 0.0006  | 125                | 4.9213  | 0.018 | 0.0007  | 24      | 0.9449 | 1.5                          | 0.059 | 1.107  | 2.44  | 44000                             | 9890   | 69000                                                      | 15500  |
| 215K           | 75     | 2.9528  | 0.015 | 0.0006  | 130                | 5.1181  | 0.018 | 0.0007  | 25      | 0.9843 | 1.5                          | 0.059 | 1.198  | 2.64  | 44800                             | 10100  | 68900                                                      | 15500  |
| 216K           | 80     | 3.1496  | 0.015 | 0.0006  | 140                | 5.5118  | 0.018 | 0.0007  | 26      | 1.0236 | 2.0                          | 0.079 | 1.483  | 3.27  | 54200                             | 12200  | 81300                                                      | 18300  |
| 217K           | 85     | 3.3465  | 0.020 | 0.0008  | 150                | 5.9055  | 0.018 | 0.0007  | 28      | 1.1024 | 2.0                          | 0.079 | 1.860  | 4.10  | 62200                             | 14000  | 95900                                                      | 21600  |
| 218K           | 90     | 3.5433  | 0.020 | 0.0008  | 160                | 6.2992  | 0.025 | 0.0010  | 30      | 1.1811 | 2.0                          | 0.079 | 2.209  | 4.87  | 71100                             | 16000  | 109000                                                     | 24500  |
| 220K           | 100    | 3.9370  | 0.020 | 0.0008  | 180                | 7.0866  | 0.025 | 0.0010  | 34      | 1.3386 | 2.0                          | 0.080 | 4.077  | 8.98  | 93000                             | 20800  | 134000                                                     | 30500  |
| 221K           | 105    | 4.1339  | 0.020 | 0.0008  | 190                | 7.4803  | 0.030 | 0.0012  | 36      | 1.4173 | 2.0                          | 0.080 | 3.777  | 8.32  | 93000                             | 20800  | 127000                                                     | 28500  |
| 222K           | 110    | 4.3307  | 0.020 | 0.0008  | 200                | 7.8740  | 0.030 | 0.0012  | 38      | 1.4961 | 2.0                          | 0.080 | 4.300  | 9.47  | 104900                            | 23600  | 153000                                                     | 34500  |
| 224K           | 120    | 4.7244  | 0.020 | 0.0008  | 215                | 8.4646  | 0.030 | 0.0012  | 40      | 1.5748 | 2.0                          | 0.080 | 7.064  | 15.56 | 133000                            | 30000  | 173000                                                     | 39000  |
| 226K           | 130    | 5.1181  | 0.020 | 0.0010  | 230                | 9.0551  | 0.030 | 0.0012  | 40      | 1.5748 | 3.0                          | 0.120 | 6.642  | 14.63 | 149000                            | 33500  | 189000                                                     | 42500  |
| 228K           | 140    | 5.5118  | 0.025 | 0.0010  | 250                | 9.8425  | 0.030 | 0.0012  | 42      | 1.6535 | 3.0                          | 0.120 | 11.196 | 24.66 | 162000                            | 36500  | 200000                                                     | 45000  |
| 230K           | 150    | 5.9055  | 0.025 | 0.0010  | 270                | 10.6299 | 0.035 | 0.0014  | 45      | 1.7717 | 3.0                          | 0.120 | 12.17  | 26.8  | 180000                            | 40500  | 218000                                                     | 49000  |
| 232K           | 160    | 6.2992  | 0.025 | 0.0010  | 290                | 11.4173 | 0.035 | 0.0014  | 48      | 1.8898 | 3.0                          | 0.120 | 15.03  | 33.1  | 235000                            | 53000  | 260000                                                     | 58500  |
| 234K           | 170    | 6.6929  | 0.025 | 0.0010  | 310                | 12.2047 | 0.035 | 0.0014  | 52      | 2.0472 | 4.0                          | 0.160 | 18.66  | 41.1  | 276000                            | 62000  | 291000                                                     | 65500  |
| 236K           | 180    | 7.0866  | 0.025 | 0.0010  | 320                | 12.5984 | 0.040 | 0.0016  | 52      | 2.0472 | 4.0                          | 0.160 | 19.39  | 42.7  | 298000                            | 67000  | 309000                                                     | 69500  |
| 238K           | 190    | 7.4803  | 0.030 | 0.0012  | 340                | 13.3858 | 0.040 | 0.0016  | 55      | 2.1654 | 4.0                          | 0.160 | 23.02  | 50.7  | 290000                            | 65000  | 300000                                                     | 67000  |
| 240K           | 200    | 7.8740  | 0.030 | 0.0012  | 360                | 14.1732 | 0.040 | 0.0016  | 58      | 2.2835 | 4.0                          | 0.160 | 26.42  | 58.2  | 375000                            | 83000  | 355000                                                     | 80000  |
| 242K           | 210    | 8.2677  | 0.030 | 0.0012  | 380                | 14.9606 | 0.040 | 0.0016  | 61      | 2.4016 | 4.0                          | 0.160 | 32.42  | 71.4  | 335000                            | 76500  | 325000                                                     | 73500  |
| 244K           | 220    | 8.6614  | 0.030 | 0.0012  | 400                | 15.7480 | 0.040 | 0.0016  | 65      | 2.5591 | 4.0                          | 0.160 | 36.96  | 81.4  | 380000                            | 86500  | 355000                                                     | 80000  |
| 246K           | 230    | 9.0551  | 0.030 | 0.0012  | 420                | 16.5354 | 0.045 | 0.0018  | 68      | 2.6772 | 4.0                          | 0.160 | 42.36  | 93.3  | 425000                            | 95000  | 380000                                                     | 85000  |
| 248K           | 240    | 9.4488  | 0.030 | 0.0012  | 440                | 17.3228 | 0.045 | 0.0018  | 72      | 2.8346 | 4.0                          | 0.160 | 46.81  | 103.1 | 520000                            | 116000 | 455000                                                     | 102000 |
| 250K           | 250    | 9.8425  | 0.035 | 0.0014  | 460                | 18.1102 | 0.045 | 0.0018  | 76      | 2.9921 | 4.0                          | 0.160 | 55.57  | 122.4 | 585000                            | 129000 | 490000                                                     | 110000 |
| 252K           | 260    | 10.2362 | 0.035 | 0.0014  | 480                | 18.8976 | 0.045 | 0.0018  | 80      | 3.1496 | 5.0                          | 0.200 | 63.11  | 139.0 | 640000                            | 143000 | 520000                                                     | 118000 |
| 256K           | 280    | 11.0236 | 0.035 | 0.0014  | 500                | 19.6850 | 0.045 | 0.0018  | 80      | 3.1496 | 5.0                          | 0.200 | 64.20  | 141.4 | 710000                            | 160000 | 560000                                                     | 125000 |
| 260K           | 300    | 11.8110 | 0.035 | 0.0014  | 540                | 21.2598 | 0.050 | 0.0020  | 85      | 3.3465 | 5.0                          | 0.200 | 87.49  | 192.7 | 670000                            | 150000 | 520000                                                     | 116000 |
| 264K           | 320    | 12.5984 | 0.040 | 0.0016  | 580                | 22.8346 | 0.050 | 0.0020  | 92      | 3.6220 | 5.0                          | 0.200 | 94.66  | 208.5 | 980000                            | 220000 | 710000                                                     | 160000 |

<sup>(1)</sup> Maximum shaft or housing fillet radius that bearing corners will clear.

<sup>(2)</sup> Based on 10<sup>6</sup> revolutions of calculated fatigue life.

# SHIELDS, SEALS AND SNAP RING COMBINATIONS

| Shields and Seals                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   | Snap Ring (Wireloc) <sup>(1)</sup>                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |  |                                 |           |       |        |       |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------|-----------|-------|--------|-------|
|  |  |  |  |  |  |  |  |  |  |  |  | O.D. Snap Ring                                                                      |                                 | Thickness |       | Offset |       |
|                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   | mm                                                                                  | in.                             | mm        | in.   | mm     | in.   |
| 200KD                                                                             | 200KDD                                                                            | 200P                                                                              | 200PD <sup>(2)</sup>                                                              | 200PP                                                                             | —                                                                                 | —                                                                                 | —                                                                                 | 200KDDG                                                                           | —                                                                                 | 200PPG                                                                            | —                                                                                 | 34.5                                                                                | 1 <sup>23</sup> / <sub>64</sub> | 1.07      | 0.042 | 3.05   | 0.120 |
| 201KD                                                                             | 201KDD                                                                            | 201P                                                                              | 201PD                                                                             | 201PP                                                                             | 201KG                                                                             | 201KDG                                                                            | —                                                                                 | 201KDDG                                                                           | —                                                                                 | 201PPG                                                                            | —                                                                                 | 36.5                                                                                | 1 <sup>7</sup> / <sub>16</sub>  | 1.07      | 0.042 | 3.05   | 0.120 |
| 202KD                                                                             | 202KDD                                                                            | 202P                                                                              | 202PD                                                                             | 202PP                                                                             | 202KG                                                                             | 202KDG                                                                            | —                                                                                 | 202KDDG                                                                           | —                                                                                 | 202PPG                                                                            | —                                                                                 | 39.3                                                                                | 1 <sup>35</sup> / <sub>64</sub> | 1.07      | 0.042 | 3.05   | 0.120 |
| 203KD                                                                             | 203KDD                                                                            | 203P                                                                              | 203PD                                                                             | 203PP                                                                             | 203KG                                                                             | 203KDG                                                                            | —                                                                                 | 203KDDG                                                                           | —                                                                                 | 203PPG                                                                            | —                                                                                 | 44.4                                                                                | 1 <sup>3</sup> / <sub>4</sub>   | 1.07      | 0.042 | 3.05   | 0.120 |
| 204KD                                                                             | 204KDD                                                                            | 204P                                                                              | 204PD                                                                             | 204PP                                                                             | 204KG                                                                             | 204KDG                                                                            | —                                                                                 | 204KDDG                                                                           | —                                                                                 | 204PPG                                                                            | —                                                                                 | 52.4                                                                                | 2 <sup>1</sup> / <sub>16</sub>  | 1.07      | 0.042 | 3.45   | 0.136 |
| 205KD                                                                             | 205KDD                                                                            | 205P                                                                              | 205PD                                                                             | 205PP                                                                             | 205KG                                                                             | 205KDG                                                                            | —                                                                                 | 205KDDG                                                                           | —                                                                                 | 205PPG                                                                            | —                                                                                 | 57.5                                                                                | 2 <sup>17</sup> / <sub>64</sub> | 1.07      | 0.042 | 3.45   | 0.136 |
| 206KD                                                                             | 206KDD                                                                            | 206P                                                                              | 206PD                                                                             | 206PP                                                                             | 206KG                                                                             | 206KDG                                                                            | —                                                                                 | 206KDDG                                                                           | —                                                                                 | 206PPG                                                                            | —                                                                                 | 67.6                                                                                | 2 <sup>21</sup> / <sub>32</sub> | 1.65      | 0.065 | 4.83   | 0.190 |
| 207KD                                                                             | 207KDD                                                                            | 207P                                                                              | 207PD                                                                             | 207PP                                                                             | 207KG                                                                             | 207KDG                                                                            | —                                                                                 | 207KDDG                                                                           | —                                                                                 | 207PPG                                                                            | —                                                                                 | 78.2                                                                                | 3 <sup>5</sup> / <sub>64</sub>  | 1.65      | 0.065 | 4.83   | 0.190 |
| 208KD                                                                             | 208KDD                                                                            | 208P                                                                              | —                                                                                 | 208PP                                                                             | 208KG                                                                             | 208KDG                                                                            | —                                                                                 | 208KDDG                                                                           | —                                                                                 | 208PPG                                                                            | —                                                                                 | 86.5                                                                                | 3 <sup>13</sup> / <sub>32</sub> | 1.65      | 0.065 | 4.83   | 0.190 |
| 209KD                                                                             | 209KDD                                                                            | 209P                                                                              | —                                                                                 | 209PP                                                                             | 209KG                                                                             | 209KDG                                                                            | —                                                                                 | 209KDDG                                                                           | —                                                                                 | —                                                                                 | —                                                                                 | 91.3                                                                                | 3 <sup>19</sup> / <sub>32</sub> | 1.65      | 0.065 | 4.83   | 0.190 |
| 210KD                                                                             | 210KDD                                                                            | 210P                                                                              | —                                                                                 | 210PP                                                                             | 210KG                                                                             | 210KDG                                                                            | —                                                                                 | 210KDDG                                                                           | —                                                                                 | 210NPPG                                                                           | —                                                                                 | 96.4                                                                                | 3 <sup>51</sup> / <sub>64</sub> | 2.41      | 0.095 | 5.59   | 0.220 |
| 211KD                                                                             | 211KDD                                                                            | 211NP                                                                             | 211NPD                                                                            | 211NPP                                                                            | 211KG                                                                             | 211KDG                                                                            | 211KGD                                                                            | 211KDDG                                                                           | —                                                                                 | 211NPPG                                                                           | 211NPDG                                                                           | 106.3                                                                               | 4 <sup>3</sup> / <sub>16</sub>  | 2.41      | 0.095 | 5.59   | 0.220 |
| 212KD                                                                             | 212KDD                                                                            | 212NP                                                                             | 212NPD                                                                            | 212NPP                                                                            | 212KG                                                                             | 212KDG                                                                            | —                                                                                 | —                                                                                 | —                                                                                 | 212NPPG                                                                           | 212NPDG                                                                           | 116.3                                                                               | 4 <sup>37</sup> / <sub>64</sub> | 2.41      | 0.095 | 5.59   | 0.220 |
| 213KD                                                                             | 213KDD                                                                            | 213NP                                                                             | —                                                                                 | 213NPP                                                                            | 213KG                                                                             | —                                                                                 | —                                                                                 | 213KDDG                                                                           | —                                                                                 | 213NPPG                                                                           | 213NPDG                                                                           | 129.4                                                                               | 5 <sup>3</sup> / <sub>32</sub>  | 2.77      | 0.109 | 6.73   | 0.265 |
| 214KD                                                                             | 214KDD                                                                            | 214P                                                                              | —                                                                                 | 214NPP                                                                            | 214KG                                                                             | 214KDG                                                                            | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                 | 134.5                                                                               | 5 <sup>19</sup> / <sub>64</sub> | 2.77      | 0.109 | 6.73   | 0.265 |
| 215KD                                                                             | 215KDD                                                                            | 215P                                                                              | —                                                                                 | 215NPP                                                                            | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                   | —                               | —         | —     | —      | —     |
| 216KD                                                                             | 216KDD                                                                            | —                                                                                 | —                                                                                 | 216NPP                                                                            | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                   | —                               | —         | —     | —      | —     |
| 217KD                                                                             | 217KDD                                                                            | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                   | —                               | —         | —     | —      | —     |
| 218KD                                                                             | 218KDD                                                                            | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                   | —                               | —         | —     | —      | —     |
| —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                   | —                               | —         | —     | —      | —     |
| —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                   | —                               | —         | —     | —      | —     |
| 222KD                                                                             | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                   | —                               | —         | —     | —      | —     |



<sup>(1)</sup> The snap ring is normally packaged separately in the box with the bearing.

<sup>(2)</sup> Available with snap ring as 200PDG.

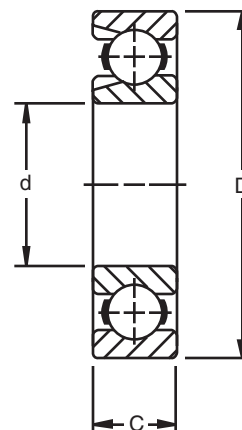
<sup>(3)</sup> Also available in "VV" sealed design. Check for availability.

**Note:** "N" prefix for NP(P) seals indicate non-removable seal.



## LIGHT 200W SERIES

- 200W Series, maximum capacity type, is dimensionally interchangeable with the 200K type, but has greater capacity for supporting heavier radial loads and light thrust loads in either direction.
- Maximum capacity bearings feature a filling slot in shoulder of each raceway to assemble an extra-large complement of balls.
- Consult your Timken representative for the availability of sizes other than those listed here.



### DIMENSIONS – TOLERANCES

| Bearing Number      | Bore d |         |                                             |         | Outside Diameter D |         |                                             |         | Width C |        | Fillet Radius <sup>(1)</sup> | Wt.    |        | Static Load Rating C <sub>0</sub> |        | Extended Dynamic Load Rating* C <sub>e</sub> <sup>(3)</sup> |        |
|---------------------|--------|---------|---------------------------------------------|---------|--------------------|---------|---------------------------------------------|---------|---------|--------|------------------------------|--------|--------|-----------------------------------|--------|-------------------------------------------------------------|--------|
|                     | mm     | in.     | tolerance<br>+0.000 mm<br>+0.0000" to minus |         | mm                 | in.     | tolerance<br>+0.000 mm<br>+0.0000" to minus |         | mm      | in.    |                              | kg     | lbs.   | N                                 | lbs.   | N                                                           | lbs.   |
| 202W                | 15     | 0.5906  | 0.008                                       | 0.0003  | 35                 | 1.3780  | 0.011                                       | 0.00045 | 11      | 0.4331 | 0.6                          | 0.054  | 0.12   | 5060                              | 1140   | 11000                                                       | 2450   |
| 204W <sup>(2)</sup> | 20     | 0.7874  | 0.010                                       | 0.0004  | 47                 | 1.8504  | 0.011                                       | 0.00045 | 14      | 0.5512 | 1.0                          | 0.113  | 0.25   | 9300                              | 2120   | 19500                                                       | 4400   |
| 205W <sup>(2)</sup> | 25     | 0.9843  | 0.010                                       | 0.0004  | 52                 | 2.0472  | 0.013                                       | 0.0005  | 15      | 0.5906 | 1.0                          | 0.141  | 0.31   | 12200                             | 2750   | 22600                                                       | 5100   |
| 206W                | 30     | 1.1811  | 0.010                                       | 0.0004  | 62                 | 2.4409  | 0.013                                       | 0.0005  | 16      | 0.6299 | 1.0                          | 0.213  | 0.47   | 16900                             | 3800   | 31000                                                       | 6950   |
| 207W                | 35     | 1.3780  | 0.012                                       | 0.00047 | 72                 | 2.8346  | 0.013                                       | 0.0005  | 17      | 0.6693 | 1.0                          | 0.313  | 0.69   | 22600                             | 5100   | 40000                                                       | 9000   |
| 208W                | 40     | 1.5748  | 0.012                                       | 0.00047 | 80                 | 3.1496  | 0.013                                       | 0.0005  | 18      | 0.7087 | 1.0                          | 0.413  | 0.91   | 28400                             | 6400   | 47000                                                       | 10600  |
| 209W                | 45     | 1.7717  | 0.012                                       | 0.00047 | 85                 | 3.3465  | 0.015                                       | 0.0006  | 19      | 0.7480 | 1.0                          | 0.463  | 1.02   | 31500                             | 7100   | 50000                                                       | 11200  |
| 210W                | 50     | 1.9685  | 0.012                                       | 0.00047 | 90                 | 3.5433  | 0.015                                       | 0.0006  | 20      | 0.7874 | 1.0                          | 0.522  | 1.15   | 34600                             | 7800   | 52000                                                       | 11800  |
| 211W                | 55     | 2.1654  | 0.015                                       | 0.0006  | 100                | 3.9370  | 0.015                                       | 0.0006  | 21      | 0.8268 | 1.5                          | 0.681  | 1.50   | 40600                             | 9150   | 61000                                                       | 13700  |
| 212W                | 60     | 2.3622  | 0.015                                       | 0.0006  | 110                | 4.3307  | 0.015                                       | 0.0006  | 22      | 0.8661 | 1.5                          | 0.885  | 1.95   | 54200                             | 12200  | 78000                                                       | 17600  |
| 213W                | 65     | 2.5591  | 0.015                                       | 0.0006  | 120                | 4.7244  | 0.015                                       | 0.0006  | 23      | 0.9055 | 1.5                          | 1.207  | 2.66   | 64800                             | 14600  | 92000                                                       | 20800  |
| 214W                | 70     | 2.7559  | 0.015                                       | 0.0006  | 125                | 4.9213  | 0.018                                       | 0.0007  | 24      | 0.9449 | 1.5                          | 1.225  | 2.70   | 71100                             | 16000  | 96000                                                       | 21600  |
| 215W                | 75     | 2.9528  | 0.015                                       | 0.0006  | 130                | 5.1181  | 0.018                                       | 0.0007  | 25      | 0.9843 | 1.5                          | 1.334  | 2.94   | 75500                             | 17000  | 99000                                                       | 22400  |
| 216W                | 80     | 3.1496  | 0.015                                       | 0.0006  | 140                | 5.5118  | 0.018                                       | 0.0007  | 26      | 1.0236 | 2.0                          | 1.633  | 3.60   | 90600                             | 20400  | 114000                                                      | 26000  |
| 217W                | 85     | 3.3465  | 0.020                                       | 0.0008  | 150                | 5.9055  | 0.018                                       | 0.0007  | 28      | 1.1024 | 2.0                          | 2.019  | 4.45   | 96000                             | 22400  | 129000                                                      | 29000  |
| 218W                | 90     | 3.5433  | 0.020                                       | 0.0008  | 160                | 6.2992  | 0.025                                       | 0.0010  | 30      | 1.1811 | 2.0                          | 2.493  | 5.49   | 96500                             | 25500  | 149000                                                      | 33500  |
| 219W                | 95     | 3.7402  | 0.020                                       | 0.0008  | 170                | 6.6929  | 0.025                                       | 0.0010  | 32      | 1.2598 | 2.0                          | 3.039  | 6.70   | 112000                            | 29000  | 169000                                                      | 38000  |
| 220W                | 100    | 3.9370  | 0.020                                       | 0.0008  | 180                | 7.0866  | 0.025                                       | 0.0010  | 34      | 1.3386 | 2.0                          | 3.673  | 8.09   | 127000                            | 33500  | 188000                                                      | 42500  |
| 221W                | 105    | 4.1339  | 0.020                                       | 0.0008  | 190                | 7.4803  | 0.030                                       | 0.0012  | 36      | 1.4173 | 2.0                          | 4.277  | 9.43   | 134000                            | 35500  | 195000                                                      | 44000  |
| 222W                | 110    | 4.3307  | 0.020                                       | 0.0008  | 200                | 7.8740  | 0.030                                       | 0.0012  | 38      | 1.4961 | 2.0                          | 5.144  | 11.34  | 160000                            | 42500  | 222000                                                      | 50000  |
| 224W3               | 120    | 4.7244  | 0.020                                       | 0.0008  | 215                | 8.4646  | 0.030                                       | 0.0012  | 40      | 1.5748 | 2.0                          | 6.586  | 14.52  | 156000                            | 41500  | 222000                                                      | 50000  |
| 226W3               | 130    | 5.1181  | 0.020                                       | 0.0010  | 230                | 9.0551  | 0.030                                       | 0.0012  | 40      | 1.5748 | 3.0                          | 7.627  | 16.80  | 196000                            | 53000  | 260000                                                      | 58500  |
| 228W3               | 140    | 5.5118  | 0.025                                       | 0.0010  | 250                | 9.8425  | 0.030                                       | 0.0012  | 42      | 1.6535 | 3.0                          | 9.307  | 20.50  | 260000                            | 58500  | 270000                                                      | 61000  |
| 230W                | 150    | 5.9055  | 0.025                                       | 0.0010  | 270                | 10.6299 | 0.035                                       | 0.0014  | 45      | 1.7717 | 3.0                          | 12.485 | 27.50  | 290000                            | 65500  | 300000                                                      | 67000  |
| 232W                | 160    | 6.2992  | 0.025                                       | 0.0010  | 290                | 11.4173 | 0.035                                       | 0.0014  | 48      | 1.8898 | 3.0                          | 15.436 | 34.00  | 340000                            | 76500  | 325000                                                      | 73500  |
| 234W                | 170    | 6.6929  | 0.025                                       | 0.0010  | 310                | 12.2047 | 0.035                                       | 0.0014  | 52      | 2.0472 | 4.0                          | 19.068 | 42.00  | 375000                            | 85000  | 345000                                                      | 78000  |
| 236W                | 180    | 7.0866  | 0.025                                       | 0.0010  | 320                | 12.5984 | 0.040                                       | 0.0016  | 52      | 2.0472 | 4.0                          | 19.886 | 43.80  | 405000                            | 90000  | 365000                                                      | 81500  |
| 238W                | 190    | 7.4803  | 0.030                                       | 0.0012  | 340                | 13.3858 | 0.040                                       | 0.0016  | 55      | 2.1654 | 4.0                          | 23.608 | 52.00  | 465000                            | 104000 | 405000                                                      | 91500  |
| 240W                | 200    | 7.8740  | 0.030                                       | 0.0012  | 360                | 14.1732 | 0.040                                       | 0.0016  | 58      | 2.2835 | 4.0                          | 27.150 | 59.80  | 560000                            | 125000 | 465000                                                      | 106000 |
| 242W                | 210    | 8.2677  | 0.030                                       | 0.0012  | 380                | 14.9606 | 0.040                                       | 0.0016  | 61      | 2.4016 | 4.0                          | 33.279 | 73.30  | 570000                            | 129000 | 465000                                                      | 104000 |
| 244W                | 220    | 8.6614  | 0.030                                       | 0.0012  | 400                | 15.7480 | 0.040                                       | 0.0016  | 65      | 2.5591 | 4.0                          | 38.091 | 83.90  | 680000                            | 153000 | 530000                                                      | 120000 |
| 246W                | 230    | 9.0551  | 0.030                                       | 0.0012  | 420                | 16.5354 | 0.045                                       | 0.0018  | 68      | 2.6772 | 4.0                          | 45.719 | 100.70 | 695000                            | 156000 | 530000                                                      | 118000 |
| 248W                | 240    | 9.4488  | 0.030                                       | 0.0012  | 440                | 17.3228 | 0.045                                       | 0.0018  | 72      | 2.8346 | 4.0                          | 48.761 | 107.40 | 865000                            | 193000 | 640000                                                      | 143000 |
| 250W                | 250    | 9.8425  | 0.030                                       | 0.0012  | 460                | 18.1102 | 0.045                                       | 0.0018  | 76      | 2.9921 | 4.0                          | 57.568 | 126.80 | 930000                            | 208000 | 670000                                                      | 150000 |
| 252W                | 260    | 10.2362 | 0.035                                       | 0.0014  | 480                | 18.8976 | 0.045                                       | 0.0018  | 80      | 3.1496 | 5.0                          | 65.468 | 144.20 | 1020000                           | 232000 | 720000                                                      | 160000 |
| 256W                | 280    | 11.0236 | 0.035                                       | 0.0014  | 500                | 19.6850 | 0.045                                       | 0.0018  | 80      | 3.1496 | 5.0                          | 66.921 | 147.40 | 1120000                           | 255000 | 765000                                                      | 170000 |
| 260W                | 300    | 11.8110 | 0.035                                       | 0.0014  | 540                | 21.2598 | 0.050                                       | 0.0020  | 85      | 3.3465 | 5.0                          | 89.894 | 198.00 | 1100000                           | 245000 | 720000                                                      | 160000 |
| 264W                | 320    | 12.5984 | 0.040                                       | 0.0016  | 580                | 22.8346 | 0.050                                       | 0.0020  | 92      | 3.6220 | 5.0                          | 99.473 | 219.10 | 1560000                           | 355000 | 965000                                                      | 216000 |

<sup>(1)</sup> Maximum shaft or housing fillet radius that bearing corners will clear.

<sup>(2)</sup> These sizes have molded nylon cages.

<sup>(3)</sup> Based on 10<sup>6</sup> revolutions of calculated fatigue life.

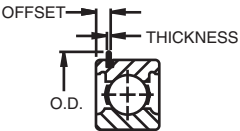
\* For applications where thrust load exceeds 60% of radial load, consult your Timken representative.

Listed in the table below are Timken maximum capacity type bearings (200W Series) with shields, seals and snap ring combinations.

The suffixes of the bearing numbers denote the following:

- **WD** - Filling slot opposite single shield
- **WNP** - Filling slot opposite single seal
- **WG** - Filling slot opposite snap ring
- **WDD** - Two shields
- **WNPP** - Two seals
- **WDG** - Filling slot and snap ring opposite shield
- **WDDG** - Two shields with filling slot opposite snap ring

## SHIELDS, SEALS AND SNAP RING COMBINATIONS

| Shields and Seals    |                   |               |                 | Snap Ring (Wireloc) <sup>(1)</sup> |                       |                    |  |         |           |       |        |       |
|----------------------|-------------------|---------------|-----------------|------------------------------------|-----------------------|--------------------|-------------------------------------------------------------------------------------|---------|-----------|-------|--------|-------|
| One Shield<br>D      | Two Shields<br>DD | One Seal<br>P | Two Seals<br>PP | Open Type<br>G                     | One Shield<br>DG      | Two Shields<br>DDG | O.D.                                                                                |         | Thickness |       | Offset |       |
|                      |                   |               |                 |                                    |                       |                    | mm                                                                                  | in.     | mm        | in.   | mm     | in.   |
| 204VD                | —                 | —             | —               | 204WG                              | —                     | —                  | 52.4                                                                                | 2 1/16  | 1.07      | 0.042 | 3.45   | 0.136 |
| 205VD                | —                 | —             | —               | 205WG                              | —                     | —                  | 57.5                                                                                | 2 17/64 | 1.07      | 0.042 | 3.45   | 0.136 |
| 206VD                | —                 | —             | —               | 206WG                              | 206WDG                | —                  | 67.5                                                                                | 2 21/32 | 1.65      | 0.065 | 4.83   | 0.190 |
| 207VD                | —                 | —             | —               | 207WG                              | 207WDG                | —                  | 78.2                                                                                | 3 5/64  | 1.65      | 0.065 | 4.83   | 0.190 |
| 208VD                | 208WDD            | —             | —               | 208WG                              | 208WDG                | 208WDDG            | 86.5                                                                                | 3 13/32 | 1.65      | 0.065 | 4.83   | 0.190 |
| 209VD                | 209WDD            | —             | —               | 209WG                              | 209WDG                | —                  | 91.3                                                                                | 3 19/32 | 1.65      | 0.065 | 4.83   | 0.190 |
| 210VD                | 210WDD            | —             | —               | 210WG                              | 210WDG <sup>(2)</sup> | —                  | 96.4                                                                                | 3 51/64 | 2.41      | 0.095 | 5.59   | 0.220 |
| 211VD                | 211WDD            | —             | —               | 211WG <sup>(3)</sup>               | 211WDG                | —                  | 106.4                                                                               | 4 3/16  | 2.41      | 0.095 | 5.59   | 0.220 |
| 212VD                | 212WDD            | —             | —               | 212WG                              | 212WDG                | 212WDDG            | 116.3                                                                               | 4 37/64 | 2.41      | 0.095 | 5.59   | 0.220 |
| 213VD                | 213WDD            | 213WNP        | 213WNPP         | 213WG                              | 213WDG                | 213WDDG            | 129.4                                                                               | 5 3/32  | 2.77      | 0.109 | 6.73   | 0.265 |
| 214VD                | 214WDD            | —             | —               | 214WG                              | 214WDG                | —                  | 134.5                                                                               | 5 19/64 | 2.77      | 0.109 | 6.73   | 0.265 |
| 215VD                | 215WDD            | 215WNP        | 215WNPP         | 215WG                              | 215WDG                | 215WDDG            | 139.7                                                                               | 5 1/2   | 2.77      | 0.109 | 6.73   | 0.265 |
| 216VD                | 216WDD            | —             | —               | 216WG                              | 216WDG                | —                  | 149.6                                                                               | 5 57/64 | 2.77      | 0.109 | 7.54   | 0.297 |
| 217VD                | 217WDD            | —             | —               | 217WG                              | 217WDG                | —                  | 159.5                                                                               | 6 9/32  | 2.77      | 0.109 | 7.54   | 0.297 |
| 218VD                | 218WDD            | 218WNP        | —               | 218WG                              | —                     | —                  | 169.5                                                                               | 6 43/64 | 2.77      | 0.109 | 7.54   | 0.297 |
| 219VD                | 219WDD            | —             | —               | —                                  | —                     | —                  | —                                                                                   | —       | —         | —     | —      | —     |
| 220VD                | 220WDD            | —             | —               | 220WG                              | —                     | —                  | 192.9                                                                               | 7 19/32 | 3.05      | 0.12  | 8.61   | 0.339 |
| 221VD                | —                 | —             | —               | —                                  | —                     | —                  | —                                                                                   | —       | —         | —     | —      | —     |
| 222VD                | —                 | —             | —               | —                                  | —                     | —                  | —                                                                                   | —       | —         | —     | —      | —     |
| 224WD <sup>(4)</sup> | —                 | —             | —               | —                                  | —                     | —                  | —                                                                                   | —       | —         | —     | —      | —     |

<sup>(1)</sup> The snap ring is normally packaged separately in the box with the bearing.

<sup>(2)</sup> Also available as a GWD-type filling slot opposite the shield and snap ring.

<sup>(3)</sup> Also available as 211GW with filling slot on same side as snap ring.

<sup>(4)</sup> Width is 1.6535" for the 224WD bearing.



## LIGHT 200 SERIES EXTRA WIDTH INNER RING

- Sizes available in rubber seal (P) and Mechani-Seal (L) design.
- Extra width inner ring provides greater shaft support.
- P seal version uses a Buna N rubber contact seal.
- L seal employs a frictionless metallic member to form a labyrinth.
- Used extensively in high-speed pneumatic tools, small pumps, electric motors, domestic appliances, etc.
- Electric motor quality for applications where quietness is a requirement.

### DIMENSIONS – TOLERANCES

| Bearing Number |                        | Bore d |        | Outside Diameter D |         | Width B <sub>1</sub> |        | Inner Ring Offset |         | Ring Widths 0.00, -.12 mm +0.000", -.005" |       | Fillet Radius <sup>(1)</sup> |       | Wt.   |      | Static Load Rating C <sub>0</sub> |      | Extended Dynamic Load Rating C <sub>E</sub> <sup>(1)</sup> |       |
|----------------|------------------------|--------|--------|--------------------|---------|----------------------|--------|-------------------|---------|-------------------------------------------|-------|------------------------------|-------|-------|------|-----------------------------------|------|------------------------------------------------------------|-------|
| one seal L     | one seal and shield LD | mm     | in.    | mm                 | in.     | mm                   | in.    | mm                | in.     | mm                                        | in.   | mm                           | in.   | kg    | lbs. | N                                 | lbs. | N                                                          | lbs.  |
| 200KL          | 200KLD                 | 10     | 0.3937 | 0.008              | 0.0003  | 30                   | 1.1811 | 0.009             | 0.00035 | 12.19                                     | 0.480 | 8.99                         | 0.354 | 0.036 | 0.08 | 2650                              | 585  | 6550                                                       | 1530  |
| 201KL          | 201KLD                 | 12     | 0.4724 | 0.008              | 0.0003  | 32                   | 1.2598 | 0.011             | 0.00045 | 12.19                                     | 0.480 | 10.01                        | 0.394 | 0.041 | 0.09 | 3000                              | 680  | 7500                                                       | 1730  |
| —              | 201KLD2                | 13     | 0.5118 | 0.008              | 0.0003  | 32                   | 1.2598 | 0.011             | 0.00045 | 12.19                                     | 0.480 | 10.01                        | 0.394 | 0.041 | 0.09 | 3000                              | 680  | 7500                                                       | 1730  |
| 201KL3         | —                      | 11.07  | 0.4358 | 0.008              | 0.0003  | 32                   | 1.2598 | 0.011             | 0.00045 | 12.70                                     | 0.500 | 10.01                        | 0.394 | 0.041 | 0.09 | 3000                              | 680  | 7500                                                       | 1730  |
| 202KL4         | 202KLD4                | 14     | 0.5512 | 0.008              | 0.0003  | 35                   | 1.3780 | 0.011             | 0.00045 | 12.70                                     | 0.500 | 11.00                        | 0.433 | 0.045 | 0.10 | 3690                              | 830  | 8650                                                       | 1930  |
| 202KL          | 202KLD                 | 15     | 0.5906 | 0.008              | 0.0003  | 35                   | 1.3780 | 0.011             | 0.00045 | 12.70                                     | 0.500 | 11.00                        | 0.433 | 0.045 | 0.10 | 3450                              | 830  | 8650                                                       | 1930  |
| 202KL3         | 202KLD3                | 16     | 0.6299 | 0.008              | 0.0003  | 35                   | 1.3780 | 0.011             | 0.00045 | 12.70                                     | 0.500 | 11.00                        | 0.433 | 0.045 | 0.10 | 3450                              | 830  | 8650                                                       | 1930  |
| 203KL          | 203KLD                 | 17     | 0.6693 | 0.008              | 0.0003  | 40                   | 1.5748 | 0.011             | 0.00045 | 14.30                                     | 0.563 | 11.99                        | 0.472 | 0.073 | 0.16 | 4700                              | 1060 | 10800                                                      | 2450  |
| 204KL          | 204KLD                 | 20     | 0.7874 | 0.010              | 0.0004  | 47                   | 1.8504 | 0.011             | 0.00045 | 15.88                                     | 0.625 | 14.00                        | 0.551 | 0.113 | 0.25 | 6200                              | 1460 | 14300                                                      | 3200  |
| 205KL          | 205KLD                 | 25     | 0.9843 | 0.010              | 0.0004  | 52                   | 2.0472 | 0.013             | 0.0005  | 15.88                                     | 0.625 | 15.01                        | 0.591 | 0.132 | 0.29 | 7800                              | 1760 | 16000                                                      | 3600  |
| 206KL          | 206KLD                 | 30     | 1.1811 | 0.010              | 0.0004  | 62                   | 2.4409 | 0.013             | 0.0005  | 19.00                                     | 0.748 | 16.00                        | 0.630 | 0.231 | 0.51 | 10000                             | 2550 | 22200                                                      | 5000  |
| 207KL          | 207KLD                 | 35     | 1.3780 | 0.012              | 0.00045 | 72                   | 2.8346 | 0.013             | 0.0005  | 21.00                                     | 0.827 | 17.00                        | 0.669 | 0.322 | 0.71 | 13700                             | 3450 | 29000                                                      | 6550  |
| 209KL          | 209KLD                 | 45     | 1.7717 | 0.012              | 0.00045 | 85                   | 3.3465 | 0.015             | 0.0006  | 26.00                                     | 1.024 | 19.00                        | 0.748 | 0.508 | 1.12 | 17600                             | 4550 | 37000                                                      | 8300  |
| 211KL          | 211KLD                 | 55     | 2.1654 | 0.015              | 0.0006  | 100                  | 3.9370 | 0.015             | 0.0006  | 27.00                                     | 1.063 | 21.01                        | 0.827 | 0.748 | 1.65 | 29100                             | 6550 | 49000                                                      | 11000 |

<sup>(1)</sup> Based on 10<sup>6</sup> revolutions of calculated fatigue life.

### DIMENSIONS – TOLERANCES

| Bearing Number         |                        | Bore d |        |                                       |         | Outside Diameter D |        |                                       |         | Ring Widths 0.00, -.12 mm +0.000", -.005" |       |                              |       | Fillet Radius <sup>(1)</sup> |       | Wt.   |      | Static Load Rating C <sub>0</sub> |      | Extended Dynamic Load Rating C <sub>E</sub> <sup>(5)</sup> |      |
|------------------------|------------------------|--------|--------|---------------------------------------|---------|--------------------|--------|---------------------------------------|---------|-------------------------------------------|-------|------------------------------|-------|------------------------------|-------|-------|------|-----------------------------------|------|------------------------------------------------------------|------|
| two seals LL           | two seals NPP          |        |        | tolerance +0.000 mm +0.0000" to minus |         |                    |        | tolerance +0.000 mm +0.0000" to minus |         |                                           |       | Inner B <sub>2</sub> Outer C |       |                              |       |       |      |                                   |      |                                                            |      |
|                        |                        | mm     | in.    | mm                                    | in.     | mm                 | in.    | mm                                    | in.     | mm                                        | in.   | mm                           | in.   | mm                           | in.   | kg    | lbs. | N                                 | lbs. | N                                                          | lbs. |
| 200KLL2                | 200KRR3 <sup>(4)</sup> | 10     | 0.3937 | 0.008                                 | 0.0003  | 30                 | 1.1811 | 0.009                                 | 0.00035 | 16.40                                     | 0.646 | 8.99                         | 0.354 | 0.6                          | 0.024 | 0.036 | 0.08 | 2650                              | 585  | 6800                                                       | 1530 |
| 201KLL2                | —                      | 12     | 0.4724 | 0.008                                 | 0.0003  | 32                 | 1.2598 | 0.011                                 | 0.00045 | 15.40                                     | 0.606 | 10.01                        | 0.394 | 0.6                          | 0.024 | 0.041 | 0.09 | 3000                              | 680  | 7500                                                       | 1700 |
| 201KLL3                | —                      | 13     | 0.5118 | 0.008                                 | 0.0003  | 32                 | 1.2598 | 0.011                                 | 0.00045 | 15.40                                     | 0.606 | 10.01                        | 0.394 | 0.6                          | 0.024 | 0.041 | 0.09 | 3000                              | 680  | 7500                                                       | 1700 |
| 202KLL2                | —                      | 15     | 0.5906 | 0.008                                 | 0.0003  | 35                 | 1.3780 | 0.011                                 | 0.00045 | 14.40                                     | 0.567 | 11.00                        | 0.433 | 0.6                          | 0.024 | 0.045 | 0.10 | 3690                              | 830  | 8650                                                       | 1930 |
| 202KLL3                | 202NPP11               | 16     | 0.6299 | 0.008                                 | 0.0003  | 35                 | 1.3780 | 0.011                                 | 0.00045 | 14.40                                     | 0.567 | 11.00                        | 0.433 | 0.6                          | 0.024 | 0.045 | 0.10 | 3690                              | 830  | 8650                                                       | 1930 |
| 203KLL2 <sup>(2)</sup> | 203NPP8                | 17     | 0.6693 | 0.008                                 | 0.0003  | 40                 | 1.5748 | 0.011                                 | 0.00045 | 16.60                                     | 0.654 | 11.99                        | 0.472 | 0.6                          | 0.024 | 0.073 | 0.16 | 4700                              | 1060 | 10800                                                      | 2450 |
| 204KLL2                | 204NPP7                | 20     | 0.7874 | 0.010                                 | 0.0004  | 47                 | 1.8504 | 0.011                                 | 0.00045 | 17.75                                     | 0.699 | 14.00                        | 0.551 | 1.0                          | 0.039 | 0.113 | 0.25 | 6200                              | 1460 | 14300                                                      | 3200 |
| 205KLL2 <sup>(3)</sup> | 205NPP2                | 25     | 0.9843 | 0.010                                 | 0.0004  | 52                 | 2.0472 | 0.013                                 | 0.0005  | 16.75                                     | 0.659 | 15.01                        | 0.591 | 1.0                          | 0.039 | 0.132 | 0.29 | 7800                              | 1760 | 16000                                                      | 3600 |
| 206KLL                 | 206NPP2                | 30     | 1.1811 | 0.010                                 | 0.0004  | 62                 | 2.4409 | 0.013                                 | 0.0005  | 24.00                                     | 0.945 | 16.00                        | 0.630 | 1.0                          | 0.039 | 0.231 | 0.51 | 11300                             | 2550 | 22200                                                      | 5000 |
| 207KLL                 | —                      | 35     | 1.3780 | 0.012                                 | 0.00045 | 72                 | 2.8346 | 0.013                                 | 0.0005  | 25.00                                     | 0.984 | 17.00                        | 0.669 | 1.0                          | 0.039 | 0.322 | 0.71 | 15300                             | 3450 | 29000                                                      | 6550 |
| 208KLL                 | —                      | 40     | 1.5748 | 0.012                                 | 0.00045 | 80                 | 3.1496 | 0.013                                 | 0.0005  | 30.18                                     | 1.188 | 18.01                        | 0.709 | 1.0                          | 0.039 | 0.463 | 1.02 | 20200                             | 4550 | 36000                                                      | 8150 |
| 209KLL                 | —                      | 45     | 1.7717 | 0.012                                 | 0.00045 | 85                 | 3.3465 | 0.015                                 | 0.0006  | 30.00                                     | 1.181 | 19.00                        | 0.748 | 1.0                          | 0.039 | 0.508 | 1.12 | 20200                             | 4550 | 37000                                                      | 8300 |

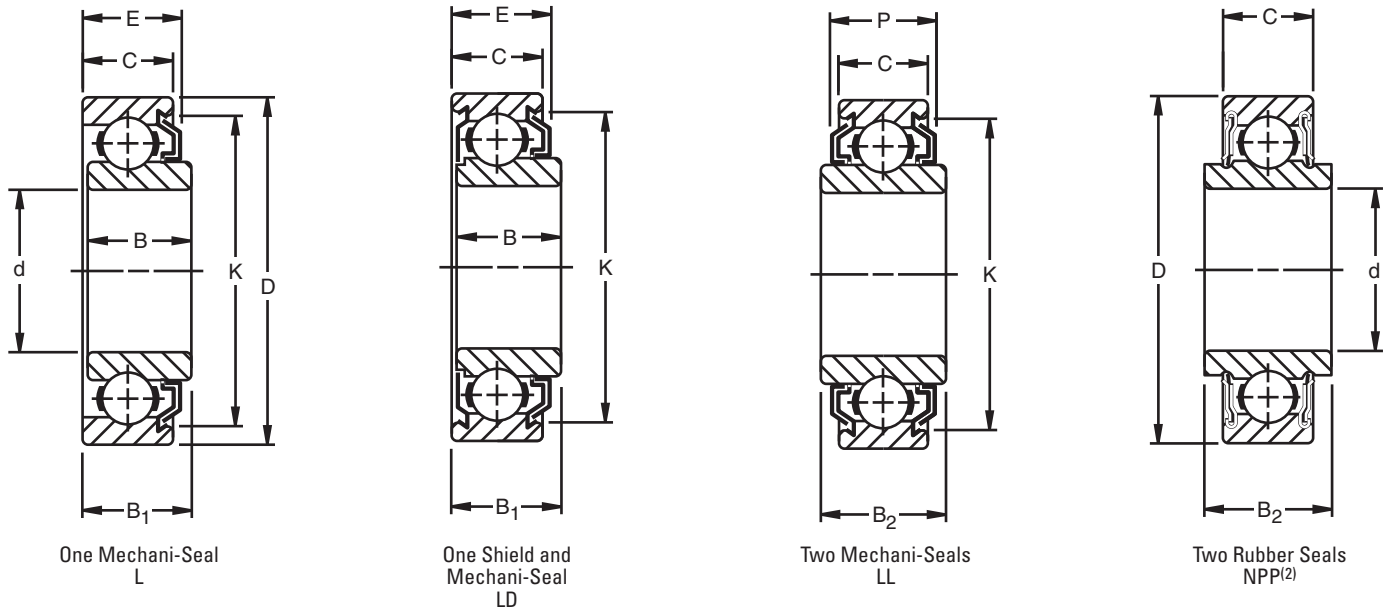
<sup>(1)</sup> Maximum shaft or housing fillet radius that bearing corners will clear.

<sup>(2)</sup> Also available as 203KLL with 18.24 mm (.718") inner ring width.

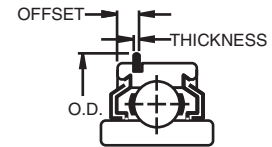
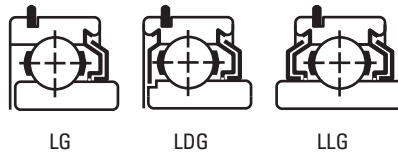
<sup>(3)</sup> Also available as 205KLL with 20.64 mm (.812") inner ring width.

<sup>(4)</sup> Equipped with R-Seal.

<sup>(5)</sup> Based on 10<sup>6</sup> revolutions of calculated fatigue life.



#### MECHANI-SEAL SNAP RING COMBINATIONS



| (Seal Projection)<br>(L, LD, LL Types Only) |       |       |       |           |                                 | One<br>Mechani-Seal |  | One<br>Mechani-Seal<br>and Shield |  | Two<br>Mechani-Seals |  | Snap Ring <sup>(1)</sup> |                                 |           |       |        |       |
|---------------------------------------------|-------|-------|-------|-----------|---------------------------------|---------------------|--|-----------------------------------|--|----------------------|--|--------------------------|---------------------------------|-----------|-------|--------|-------|
| Width                                       |       | P     |       | O.D.<br>K |                                 | LG                  |  | LDG                               |  | LLG                  |  | O.D.                     |                                 | Thickness |       | Offset |       |
| mm                                          | in.   | mm    | in.   | mm        | in.                             |                     |  |                                   |  |                      |  | mm                       | in.                             | mm        | in.   | mm     | in.   |
| 12.22                                       | 0.481 | 15.57 | 0.613 | 25.4      | 1                               | —                   |  | —                                 |  | 200KLLG2             |  | 34.5                     | 1 <sup>23</sup> / <sub>64</sub> | 1.07      | 0.042 | 3.05   | 0.120 |
| 12.19                                       | 0.480 | 14.40 | 0.567 | 27.0      | 1 <sup>1</sup> / <sub>16</sub>  | —                   |  | —                                 |  | 201KLLG2             |  | 36.5                     | 1 <sup>7</sup> / <sub>16</sub>  | 1.07      | 0.042 | 3.05   | 0.120 |
| 12.19                                       | 0.480 | 14.40 | 0.567 | 27.0      | 1 <sup>1</sup> / <sub>16</sub>  | —                   |  | 201KLDG3                          |  | —                    |  | 36.5                     | 1 <sup>7</sup> / <sub>16</sub>  | 1.07      | 0.042 | 3.05   | 0.120 |
| 12.37                                       | 0.487 | 13.79 | 0.543 | 30.2      | 1 <sup>3</sup> / <sub>16</sub>  | —                   |  | 202KLDG                           |  | 202KLLG2             |  | 39.3                     | 1 <sup>35</sup> / <sub>64</sub> | 1.07      | 0.042 | 3.05   | 0.120 |
| 12.37                                       | 0.487 | 13.79 | 0.543 | 30.2      | 1 <sup>3</sup> / <sub>16</sub>  | —                   |  | —                                 |  | 202KLLG3             |  | 39.3                     | 1 <sup>35</sup> / <sub>64</sub> | 1.07      | 0.042 | 3.05   | 0.120 |
| 14.00                                       | 0.551 | 16.00 | 0.630 | 34.9      | 1 <sup>3</sup> / <sub>8</sub>   | 203KLG              |  | —                                 |  | 203KLLG2             |  | 44.4                     | 1 <sup>3</sup> / <sub>4</sub>   | 1.07      | 0.042 | 3.05   | 0.120 |
| 15.57                                       | 0.613 | 17.14 | 0.675 | 40.1      | 1 <sup>37</sup> / <sub>64</sub> | 204KLG2             |  | —                                 |  | 204KLLG2             |  | 52.4                     | 2 <sup>1</sup> / <sub>16</sub>  | 1.07      | 0.042 | 3.45   | 0.136 |
| 15.57                                       | 0.613 | 16.13 | 0.635 | 45.6      | 1 <sup>51</sup> / <sub>64</sub> | 205KLG2             |  | —                                 |  | 205KLLG2             |  | 57.5                     | 2 <sup>17</sup> / <sub>64</sub> | 1.07      | 0.042 | 3.45   | 0.136 |
| 19.48                                       | 0.767 | 22.99 | 0.905 | 54.4      | 2 <sup>9</sup> / <sub>64</sub>  | —                   |  | —                                 |  | 206KLLG              |  | 67.5                     | 2 <sup>21</sup> / <sub>32</sub> | 1.65      | 0.065 | 4.83   | 0.190 |
| 20.50                                       | 0.807 | 23.98 | 0.944 | 62.7      | 2 <sup>15</sup> / <sub>32</sub> | —                   |  | —                                 |  | 207KLLG              |  | 78.2                     | 3 <sup>5</sup> / <sub>64</sub>  | 1.65      | 0.065 | 4.83   | 0.190 |
| 23.32                                       | 0.918 | 28.63 | 1.127 | 69.8      | 2 <sup>3</sup> / <sub>4</sub>   | —                   |  | —                                 |  | —                    |  | 86.5                     | 3 <sup>13</sup> / <sub>32</sub> | 1.65      | 0.065 | 4.83   | 0.190 |
| 24.23                                       | 0.954 | 29.46 | 1.160 | 75.4      | 2 <sup>31</sup> / <sub>32</sub> | —                   |  | —                                 |  | 209KLLG              |  | 91.3                     | 3 <sup>19</sup> / <sub>32</sub> | 1.65      | 0.065 | 4.83   | 0.190 |

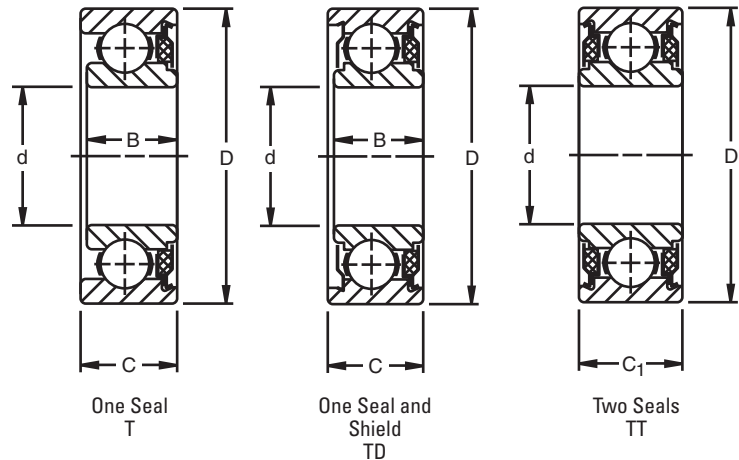
<sup>(1)</sup> The snap ring is normally packaged separately in the box with the bearing.

**NOTE:** "N" prefix indicates a non-removable seal.



## LIGHT 200 SERIES FELT SEAL TYPE

- Permits certain design economies, but cannot be assumed to be suitable for all conditions of service.
- In many cases, they are supplemented by adjacent parts in the application for adequate bearing protection in small equipment such as fractional horsepower motors, electric vacuum cleaners, small gear units, electric and pneumatic tools, etc.
- Suggested for effective grease retention and exclusion of foreign matter.
- Electric motor quality for applications where quietness is a requirement.



### DIMENSIONS – TOLERANCES

| Bearing Number        |                        | Bore d |        |                                       |         | Outside Diameter D |        |                                       |         | Ring Widths +0.00 mm, -0.12 mm<br>0.000, -0.005" |       |                |       | Inner Ring Offset |       | Fillet Radius <sup>(1)</sup> |       | Wt.   |      | Static Load Rating C <sub>0</sub> |      | Extended Dynamic Load Rating C <sub>E</sub> <sup>(3)</sup> |      |
|-----------------------|------------------------|--------|--------|---------------------------------------|---------|--------------------|--------|---------------------------------------|---------|--------------------------------------------------|-------|----------------|-------|-------------------|-------|------------------------------|-------|-------|------|-----------------------------------|------|------------------------------------------------------------|------|
| one seals T           | one seal and shield TD |        |        | tolerance +0.000 mm +0.0000" to minus |         |                    |        | tolerance +0.000 mm +0.0000" to minus |         |                                                  |       | 0.000, -0.005" |       |                   |       |                              |       |       |      |                                   |      |                                                            |      |
|                       |                        | mm     | in.    | mm                                    | in.     | mm                 | in.    | mm                                    | in.     | mm                                               | in.   | mm             | in.   | mm                | in.   | mm                           | in.   | kg    | lbs. | N                                 | lbs. | N                                                          | lbs. |
| 200KT                 | 200KTD                 | 10     | 0.3937 | 0.008                                 | 0.0003  | 30                 | 1.1811 | 0.009                                 | 0.00035 | 12.19                                            | 0.480 | 12.70          | 0.500 | 0.51              | 0.020 | 0.6                          | 0.024 | 0.045 | 0.10 | 2600                              | 585  | 6790                                                       | 1530 |
| —                     | 200KTD2                | 12     | 0.4724 | 0.008                                 | 0.0003  | 30                 | 1.1811 | 0.009                                 | 0.00035 | 12.19                                            | 0.480 | 12.70          | 0.500 | 0.51              | 0.020 | 0.6                          | 0.024 | 0.045 | 0.10 | 2600                              | 585  | 6790                                                       | 1530 |
| 201KT                 | 201KTD                 | 12     | 0.4724 | 0.008                                 | 0.0003  | 32                 | 1.2598 | 0.011                                 | 0.00045 | 12.19                                            | 0.480 | 12.70          | 0.500 | 0.51              | 0.020 | 0.6                          | 0.024 | 0.045 | 0.10 | 3000                              | 680  | 7680                                                       | 1730 |
| 201KT2                | 201KTD2                | 13     | 0.5118 | 0.008                                 | 0.0003  | 32                 | 1.2598 | 0.011                                 | 0.00045 | 12.19                                            | 0.480 | 12.70          | 0.500 | 0.51              | 0.020 | 0.6                          | 0.024 | 0.045 | 0.10 | 3000                              | 680  | 7680                                                       | 1730 |
| 202KT                 | 202KTD                 | 15     | 0.5906 | 0.008                                 | 0.0003  | 35                 | 1.3780 | 0.011                                 | 0.00045 | 12.19                                            | 0.480 | 12.70          | 0.500 | 0.51              | 0.020 | 0.6                          | 0.024 | 0.050 | 0.11 | 3600                              | 830  | 8650                                                       | 1930 |
| 202KT3 <sup>(2)</sup> | 202KTD3 <sup>(2)</sup> | 16     | 0.6299 | 0.008                                 | 0.0003  | 35                 | 1.3780 | 0.011                                 | 0.00045 | 12.19                                            | 0.480 | 12.70          | 0.500 | 0.51              | 0.020 | 0.6                          | 0.024 | 0.050 | 0.11 | 3600                              | 830  | 8650                                                       | 1930 |
| 203KT                 | 203KTD                 | 17     | 0.6693 | 0.008                                 | 0.0003  | 40                 | 1.5748 | 0.011                                 | 0.00045 | 13.67                                            | 0.538 | 14.30          | 0.563 | 0.64              | 0.025 | 0.6                          | 0.024 | 0.077 | 0.17 | 4700                              | 1060 | 10900                                                      | 2450 |
| 204KT                 | 204KTD                 | 20     | 0.7874 | 0.010                                 | 0.0004  | 47                 | 1.8504 | 0.011                                 | 0.00045 | 15.24                                            | 0.600 | 15.88          | 0.625 | 0.64              | 0.025 | 1.0                          | 0.039 | 0.118 | 0.26 | 6500                              | 1460 | 14400                                                      | 3250 |
| 205KT                 | 205KTD                 | 25     | 0.9843 | 0.010                                 | 0.0004  | 52                 | 2.0472 | 0.013                                 | 0.00050 | 15.24                                            | 0.600 | 15.88          | 0.625 | 0.64              | 0.025 | 1.0                          | 0.039 | 0.132 | 0.29 | 7800                              | 1760 | 16000                                                      | 3600 |
| 206KT                 | 206KTD                 | 30     | 1.1811 | 0.010                                 | 0.0004  | 62                 | 2.4409 | 0.013                                 | 0.00050 | 19.00                                            | 0.748 | 19.99          | 0.788 | 0.99              | 0.039 | 1.0                          | 0.039 | 0.245 | 0.54 | 11300                             | 2550 | 22200                                                      | 5000 |
| 207KT                 | 207KTD                 | 35     | 1.3780 | 0.012                                 | 0.00045 | 72                 | 2.8346 | 0.013                                 | 0.00050 | 19.99                                            | 0.787 | 21.01          | 0.827 | 0.99              | 0.039 | 1.0                          | 0.039 | 0.358 | 0.79 | 15300                             | 3450 | 29000                                                      | 6550 |

<sup>(1)</sup> Maximum shaft or housing fillet radius that bearing corners will clear.

<sup>(2)</sup> 202KT3 has 12.29 mm (.484") inner ring width.

<sup>(3)</sup> Based on 10<sup>6</sup> revolutions of calculated fatigue life.

### DIMENSIONS – TOLERANCES

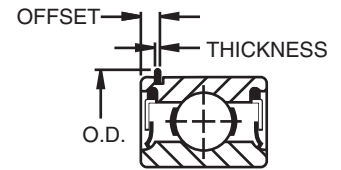
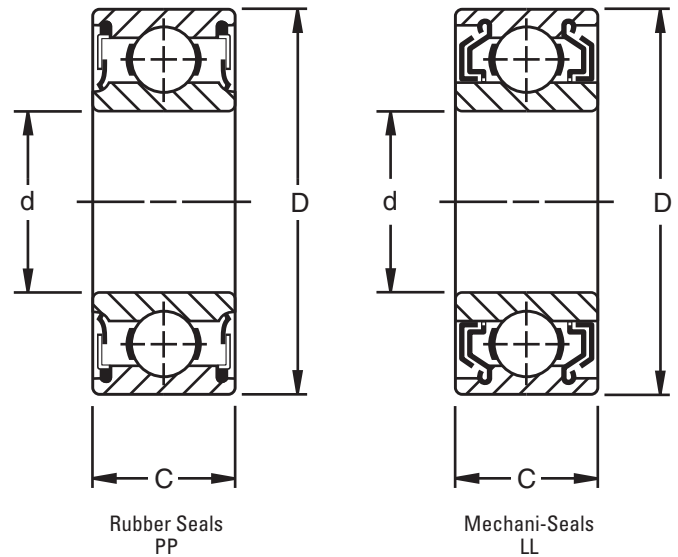
| Bearing Number | Bore d       |        |                                       |         | Outside Diameter D |        |                                       |         | Ring Width C <sub>1</sub>        |       | Fillet Radius <sup>(1)</sup> |       | Wt.   |      | Static Load Rating C <sub>0</sub> |      | Extended Dynamic Load Rating C <sub>E</sub> <sup>(2)</sup> |      |
|----------------|--------------|--------|---------------------------------------|---------|--------------------|--------|---------------------------------------|---------|----------------------------------|-------|------------------------------|-------|-------|------|-----------------------------------|------|------------------------------------------------------------|------|
|                | two seals TT |        | tolerance +0.000 mm +0.0000" to minus |         |                    |        | tolerance +0.000 mm +0.0000" to minus |         | +0.00 mm -0.12 mm +0.000 -0.005" |       |                              |       |       |      |                                   |      |                                                            |      |
|                | mm           | in.    | mm                                    | in.     | mm                 | in.    | mm                                    | in.     | mm                               | in.   | mm                           | in.   | kg    | lbs. | N                                 | lbs. | N                                                          | lbs. |
| 200KTT         | 10           | 0.3937 | 0.008                                 | 0.0003  | 30                 | 1.1811 | 0.009                                 | 0.00035 | 16.66                            | 0.656 | 0.6                          | 0.024 | 0.045 | 0.10 | 2600                              | 585  | 6790                                                       | 1530 |
| 201KTT         | 12           | 0.4724 | 0.008                                 | 0.0003  | 32                 | 1.2598 | 0.011                                 | 0.00043 | 16.66                            | 0.656 | 0.6                          | 0.024 | 0.045 | 0.10 | 3000                              | 680  | 7680                                                       | 1730 |
| 201KTT3        | 13           | 0.5118 | 0.008                                 | 0.0003  | 32                 | 1.2598 | 0.011                                 | 0.00043 | 16.66                            | 0.656 | 0.6                          | 0.024 | 0.045 | 0.10 | 3000                              | 680  | 7680                                                       | 1730 |
| 202KTT         | 15           | 0.5906 | 0.008                                 | 0.0003  | 35                 | 1.3780 | 0.011                                 | 0.00043 | 16.66                            | 0.656 | 0.6                          | 0.024 | 0.050 | 0.11 | 3600                              | 830  | 8650                                                       | 1930 |
| 203KTT         | 17           | 0.6693 | 0.008                                 | 0.0003  | 40                 | 1.5748 | 0.011                                 | 0.00043 | 18.24                            | 0.718 | 0.6                          | 0.024 | 0.077 | 0.17 | 4700                              | 1060 | 10900                                                      | 2450 |
| 204KTT         | 20           | 0.7874 | 0.010                                 | 0.0004  | 47                 | 1.8504 | 0.011                                 | 0.00043 | 20.62                            | 0.812 | 1.0                          | 0.039 | 0.118 | 0.26 | 6500                              | 1460 | 14400                                                      | 3250 |
| 205KTT         | 25           | 0.9843 | 0.010                                 | 0.0004  | 52                 | 2.0472 | 0.013                                 | 0.00051 | 20.62                            | 0.812 | 1.0                          | 0.039 | 0.132 | 0.29 | 7800                              | 1760 | 16000                                                      | 3600 |
| 206KTT         | 30           | 1.1811 | 0.010                                 | 0.0004  | 62                 | 2.4409 | 0.013                                 | 0.00051 | 24.00                            | 0.945 | 1.0                          | 0.039 | 0.245 | 0.54 | 11300                             | 2550 | 22200                                                      | 5000 |
| 207KTT         | 35           | 1.3780 | 0.012                                 | 0.00045 | 72                 | 2.8346 | 0.013                                 | 0.00051 | 25.00                            | 0.984 | 1.0                          | 0.039 | 0.358 | 0.79 | 15300                             | 3450 | 29000                                                      | 6550 |

<sup>(1)</sup> Maximum shaft or housing fillet radius that bearing corners will clear.

<sup>(2)</sup> Based on 10<sup>6</sup> revolutions of calculated fatigue life.

## LIGHT, WIDE TYPE W200PP SERIES W200KLL SERIES

- Rubber seal (W200PP) and Mechani-Seal (W200KLL) types.
- Made with standard bores, standard outside diameters and a single row of balls.
- Same widths as double-row bearings of corresponding size.
- Extra width offers a larger support area for shaft and housing contact and added space for prepacked lubricant.
- Wide-type rubber seal bearings are particularly suited for use in electric motors, where they simplify housing design by eliminating auxiliary seals.
- Wide-type Mechani-Seal ball bearings are designed for applications where frictionless sealing and large grease capacity are required.
- Extremely effective grease retention and exclusion of foreign matter are assured by close running clearance between the seal members and slinger action of the outer member.



### DIMENSIONS – TOLERANCES

| Bearing Number        |                 | Bore d                                |        |       |         | Outside Diameter D                    |        |       |         | Width C                           |       | Fillet Radius <sup>(1)</sup> |       | Wt.   |      | Static Load Rating C <sub>0</sub> |      | Extended Dynamic Load C <sub>E</sub> <sup>(4)</sup> |       | Snap Ring PPG <sup>(3)</sup> |         |           |       |        |       |
|-----------------------|-----------------|---------------------------------------|--------|-------|---------|---------------------------------------|--------|-------|---------|-----------------------------------|-------|------------------------------|-------|-------|------|-----------------------------------|------|-----------------------------------------------------|-------|------------------------------|---------|-----------|-------|--------|-------|
| Contact Seal PP       | Mechani-seal LL | tolerance +0.000 mm +0.0000" to minus |        |       |         | tolerance +0.000 mm +0.0000" to minus |        |       |         | +0.00 mm -0.12 mm +0.000" -0.005" |       |                              |       |       |      |                                   |      |                                                     |       | O.D.                         |         | thickness |       | offset |       |
|                       |                 | mm                                    | in.    | mm    | in.     | mm                                    | in.    | mm    | in.     | mm                                | in.   | mm                           | in.   | kg    | lbs. | N                                 | lbs. | N                                                   | lbs.  | mm                           | in.     | mm        | in.   | mm     | in.   |
| W200PP                | —               | 10                                    | 0.3937 | 0.008 | 0.0003  | 30                                    | 1.1811 | 0.009 | 0.00035 | 14.27                             | 0.562 | 0.6                          | 0.024 | 0.045 | 0.10 | 2650                              | 600  | 6550                                                | 1500  | —                            | —       | —         | —     | —      | —     |
| W201PP                | —               | 12                                    | 0.4724 | 0.008 | 0.0003  | 32                                    | 1.2598 | 0.011 | 0.00045 | 15.88                             | 0.625 | 0.6                          | 0.024 | 0.054 | 0.12 | 3000                              | 695  | 7500                                                | 1700  | —                            | —       | —         | —     | —      | —     |
| W202PP                | —               | 15                                    | 0.5906 | 0.008 | 0.0003  | 35                                    | 1.3780 | 0.011 | 0.00045 | 15.88                             | 0.625 | 0.6                          | 0.024 | 0.064 | 0.14 | 3450                              | 780  | 8650                                                | 1930  | —                            | —       | —         | —     | —      | —     |
| W203PP <sup>(2)</sup> | —               | 17                                    | 0.6693 | 0.008 | 0.0003  | 40                                    | 1.5748 | 0.011 | 0.00045 | 17.48                             | 0.688 | 0.6                          | 0.024 | 0.091 | 0.20 | 4400                              | 1000 | 10600                                               | 2360  | 44.4                         | 1 3/4   | 1.07      | 0.042 | 4.7    | 0.185 |
| W204PP                | W204KLL         | 20                                    | 0.7874 | 0.010 | 0.0004  | 47                                    | 1.8504 | 0.011 | 0.00045 | 20.62                             | 0.812 | 1.0                          | 0.039 | 0.150 | 0.33 | 6200                              | 1400 | 14300                                               | 3200  | —                            | —       | —         | —     | —      | —     |
| W205PP <sup>(2)</sup> | W205KLL         | 25                                    | 0.9843 | 0.010 | 0.0004  | 52                                    | 2.0472 | 0.013 | 0.0005  | 20.62                             | 0.812 | 1.0                          | 0.039 | 0.177 | 0.39 | 6950                              | 1560 | 15600                                               | 3450  | 57.5                         | 2 17/64 | 1.07      | 0.042 | 5.72   | 0.225 |
| W206PP <sup>(2)</sup> | W206KLL         | 30                                    | 1.1811 | 0.010 | 0.0004  | 62                                    | 2.4409 | 0.013 | 0.0005  | 23.83                             | 0.938 | 1.0                          | 0.039 | 0.295 | 0.65 | 10000                             | 2280 | 21600                                               | 4800  | 67.5                         | 2 21/32 | 1.65      | 0.065 | 6.15   | 0.242 |
| W207PP                | W207KLL         | 35                                    | 1.3780 | 0.012 | 0.00045 | 72                                    | 2.8346 | 0.013 | 0.0005  | 26.97                             | 1.062 | 1.0                          | 0.039 | 0.458 | 1.01 | 13700                             | 3050 | 28500                                               | 6400  | —                            | —       | —         | —     | —      | —     |
| W208PP                | W208KLL         | 40                                    | 1.5748 | 0.012 | 0.00045 | 80                                    | 3.1496 | 0.013 | 0.0005  | 30.18                             | 1.188 | 1.0                          | 0.039 | 0.630 | 1.39 | 17600                             | 4000 | 36000                                               | 8150  | —                            | —       | —         | —     | —      | —     |
| W209PP                | W209KLL         | 45                                    | 1.7717 | 0.012 | 0.00045 | 85                                    | 3.3465 | 0.015 | 0.0006  | 30.18                             | 1.188 | 1.0                          | 0.039 | 0.668 | 1.47 | 17600                             | 4000 | 36000                                               | 8150  | —                            | —       | —         | —     | —      | —     |
| W210PP                | —               | 50                                    | 1.9685 | 0.012 | 0.00045 | 90                                    | 3.5433 | 0.015 | 0.0006  | 30.18                             | 1.188 | 1.0                          | 0.039 | 0.767 | 1.69 | 19600                             | 4500 | 39000                                               | 8800  | —                            | —       | —         | —     | —      | —     |
| W214PP                | —               | 70                                    | 2.7559 | 0.015 | 0.0006  | 125                                   | 4.9213 | 0.018 | 0.0007  | 39.67                             | 1.562 | 1.5                          | 0.059 | 1.810 | 3.99 | 37500                             | 8500 | 69500                                               | 15600 | —                            | —       | —         | —     | —      | —     |

<sup>(1)</sup> Maximum shaft or housing fillet radius that bearing corners will clear.

<sup>(2)</sup> Also available with snap ring. To order, add suffix "G" to bearing number. Example: W205PPG.

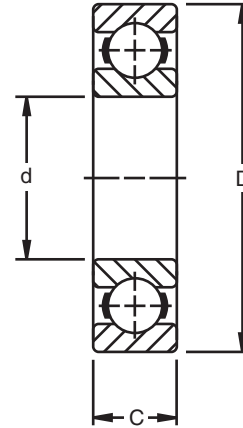
<sup>(3)</sup> The snap ring is normally packaged separately in the box with the bearing.

<sup>(4)</sup> Based on 10<sup>6</sup> revolutions of calculated fatigue life.



## MEDIUM 300K SERIES

- A heavier cross section than the 200 Series.
- Capable of carrying considerably heavier radial, thrust and combined loads for a given bore size.
- Capable of withstanding heavy shock loads. A ball bearing of heavier cross section is rarely required.
- Uses Conrad-type bearing that is well-balanced, with deep races and uninterrupted race shoulders.
- Electric motor quality where quietness is a requirement.



### DIMENSIONS – TOLERANCES

| Bearing Number | Bore d |         | tolerance<br>+0.000 mm<br>+0.0000" to minus |         | Outside Diameter D |         | tolerance<br>+0.000 mm<br>+0.0000" to minus |         | Width C |       | tolerance<br>+0.000 mm<br>+0.0000" to minus |       | Fillet Radius <sup>(1)</sup> |       | Wt.   |       | Static Load Rating C <sub>0</sub> |        | Extended Dynamic Load Rating C <sub>E</sub> <sup>(2)</sup> |        |
|----------------|--------|---------|---------------------------------------------|---------|--------------------|---------|---------------------------------------------|---------|---------|-------|---------------------------------------------|-------|------------------------------|-------|-------|-------|-----------------------------------|--------|------------------------------------------------------------|--------|
|                | mm     | in.     | mm                                          | in.     | mm                 | in.     | mm                                          | in.     | mm      | in.   | mm                                          | in.   | mm                           | in.   | kg    | lbs.  | N                                 | lbs.   | N                                                          | lbs.   |
| 300K           | 10     | 0.3937  | 0.008                                       | 0.0003  | 35                 | 1.3780  | 0.011                                       | 0.00043 | 11      | 0.433 | 0.12                                        | 0.005 | 0.6                          | 0.024 | 0.054 | 0.12  | 3460                              | 780    | 9200                                                       | 2080   |
| 301K           | 12     | 0.4724  | 0.008                                       | 0.0003  | 37                 | 1.4567  | 0.011                                       | 0.00043 | 12      | 0.472 | 0.12                                        | 0.005 | 1.0                          | 0.039 | 0.064 | 0.14  | 3620                              | 815    | 9400                                                       | 2120   |
| 302K           | 15     | 0.5906  | 0.008                                       | 0.0003  | 42                 | 1.6535  | 0.011                                       | 0.00043 | 13      | 0.512 | 0.12                                        | 0.005 | 1.0                          | 0.039 | 0.082 | 0.18  | 5240                              | 1180   | 13300                                                      | 3000   |
| 303K           | 17     | 0.6693  | 0.008                                       | 0.0003  | 47                 | 1.8504  | 0.011                                       | 0.00043 | 14      | 0.551 | 0.12                                        | 0.005 | 1.0                          | 0.039 | 0.109 | 0.24  | 6550                              | 1460   | 15300                                                      | 3450   |
| 304K           | 20     | 0.7874  | 0.010                                       | 0.0004  | 52                 | 2.0472  | 0.013                                       | 0.0005  | 15      | 0.591 | 0.12                                        | 0.005 | 1.0                          | 0.039 | 0.141 | 0.31  | 7800                              | 1760   | 17900                                                      | 4050   |
| 305K           | 25     | 0.9843  | 0.010                                       | 0.0004  | 62                 | 2.4409  | 0.013                                       | 0.0005  | 17      | 0.669 | 0.12                                        | 0.005 | 1.0                          | 0.039 | 0.236 | 0.52  | 12200                             | 2750   | 26600                                                      | 6000   |
| 306K           | 30     | 1.1811  | 0.010                                       | 0.0004  | 72                 | 2.8346  | 0.013                                       | 0.0005  | 19      | 0.748 | 0.12                                        | 0.005 | 1.0                          | 0.039 | 0.354 | 0.78  | 15600                             | 3550   | 33900                                                      | 7650   |
| 307K           | 35     | 1.3780  | 0.012                                       | 0.00047 | 80                 | 3.1496  | 0.013                                       | 0.0005  | 21      | 0.827 | 0.12                                        | 0.005 | 1.5                          | 0.059 | 0.472 | 1.04  | 18400                             | 4150   | 37700                                                      | 8500   |
| 308K           | 40     | 1.5748  | 0.012                                       | 0.00047 | 90                 | 3.5433  | 0.015                                       | 0.0006  | 23      | 0.906 | 0.12                                        | 0.005 | 1.5                          | 0.059 | 0.644 | 1.42  | 25900                             | 5850   | 50600                                                      | 11400  |
| 309K           | 45     | 1.7717  | 0.012                                       | 0.00047 | 100                | 3.9370  | 0.015                                       | 0.0006  | 25      | 0.984 | 0.12                                        | 0.005 | 1.5                          | 0.059 | 0.862 | 1.90  | 31500                             | 7100   | 59500                                                      | 13400  |
| 310K           | 50     | 1.9685  | 0.012                                       | 0.00047 | 110                | 4.3307  | 0.015                                       | 0.0006  | 27      | 1.063 | 0.12                                        | 0.005 | 2.0                          | 0.079 | 1.125 | 2.48  | 37700                             | 8500   | 69300                                                      | 15600  |
| 311K           | 55     | 2.1654  | 0.015                                       | 0.0006  | 120                | 4.7244  | 0.015                                       | 0.0006  | 29      | 1.142 | 0.15                                        | 0.006 | 2.0                          | 0.079 | 1.424 | 3.14  | 44400                             | 10000  | 81200                                                      | 18300  |
| 312K           | 60     | 2.3622  | 0.015                                       | 0.0006  | 130                | 5.1181  | 0.018                                       | 0.0007  | 31      | 1.220 | 0.15                                        | 0.006 | 2.0                          | 0.079 | 1.765 | 3.89  | 51500                             | 11600  | 92300                                                      | 20800  |
| 313K           | 65     | 2.5591  | 0.015                                       | 0.0006  | 140                | 5.5118  | 0.018                                       | 0.0007  | 33      | 1.299 | 0.15                                        | 0.006 | 2.0                          | 0.079 | 2.168 | 4.78  | 59500                             | 13400  | 104000                                                     | 23600  |
| 314K           | 70     | 2.7559  | 0.015                                       | 0.0006  | 150                | 5.9055  | 0.025                                       | 0.0010  | 35      | 1.378 | 0.15                                        | 0.006 | 2.0                          | 0.079 | 2.617 | 5.77  | 67900                             | 15300  | 116000                                                     | 26000  |
| 315K           | 75     | 2.9528  | 0.015                                       | 0.0006  | 160                | 6.2992  | 0.018                                       | 0.0007  | 37      | 1.457 | 0.15                                        | 0.006 | 2.0                          | 0.079 | 3.175 | 7.00  | 76800                             | 17300  | 128000                                                     | 29000  |
| 316K           | 80     | 3.1496  | 0.015                                       | 0.0006  | 170                | 6.6929  | 0.025                                       | 0.0010  | 39      | 1.535 | 0.15                                        | 0.006 | 2.0                          | 0.079 | 3.756 | 8.28  | 85700                             | 19300  | 139000                                                     | 31500  |
| 317K           | 85     | 3.3465  | 0.020                                       | 0.0008  | 180                | 7.0866  | 0.025                                       | 0.0010  | 41      | 1.614 | 0.20                                        | 0.008 | 2.5                          | 0.098 | 5.008 | 11.04 | 95900                             | 21600  | 151000                                                     | 34000  |
| 318K           | 90     | 3.5433  | 0.020                                       | 0.0008  | 190                | 7.4803  | 0.030                                       | 0.0012  | 43      | 1.693 | 0.20                                        | 0.008 | 2.5                          | 0.098 | 5.121 | 11.29 | 106000                            | 24000  | 162000                                                     | 36500  |
| 320K           | 100    | 3.9370  | 0.020                                       | 0.0008  | 215                | 8.4646  | 0.030                                       | 0.0012  | 47      | 1.850 | 0.20                                        | 0.008 | 2.5                          | 0.098 | 7.085 | 15.62 | 139000                            | 31500  | 195000                                                     | 41500  |
| 321K           | 105    | 4.1339  | 0.020                                       | 0.0008  | 225                | 8.8583  | 0.030                                       | 0.0012  | 49      | 1.929 | 0.20                                        | 0.008 | 2.5                          | 0.098 | 10.21 | 22.52 | 163000                            | 36500  | 126000                                                     | 48000  |
| 322K           | 110    | 4.3307  | 0.020                                       | 0.0008  | 240                | 9.4488  | 0.030                                       | 0.0012  | 50      | 1.969 | 0.20                                        | 0.008 | 2.5                          | 0.098 | 12.17 | 26.82 | 166000                            | 37500  | 220000                                                     | 49000  |
| 326K           | 130    | 5.1181  | 0.020                                       | 0.0010  | 280                | 11.0236 | 0.035                                       | 0.0014  | 58      | 2.323 | 0.25                                        | 0.010 | 2.5                          | 0.098 | 18.90 | 41.60 | 240000                            | 54000  | 280000                                                     | 63000  |
| 330K           | 150    | 5.9055  | 0.025                                       | 0.0010  | 320                | 12.5984 | 0.040                                       | 0.0016  | 65      | 2.559 | 0.25                                        | 0.010 | 2.5                          | 0.098 | 27.10 | 59.70 | 310000                            | 69500  | 335000                                                     | 75000  |
| 332K           | 160    | 6.2992  | 0.025                                       | 0.0010  | 340                | 13.3858 | 0.040                                       | 0.0016  | 68      | 2.677 | 0.25                                        | 0.010 | 2.5                          | 0.098 | 31.51 | 69.40 | 310000                            | 69500  | 335000                                                     | 75000  |
| 334K           | 170    | 6.6929  | 0.025                                       | 0.0010  | 360                | 14.1732 | 0.040                                       | 0.0016  | 72      | 2.835 | 0.25                                        | 0.010 | 2.5                          | 0.098 | 36.82 | 81.10 | 355000                            | 80000  | 360000                                                     | 81500  |
| 336K           | 180    | 7.0866  | 0.025                                       | 0.0010  | 380                | 14.9606 | 0.040                                       | 0.0016  | 75      | 2.953 | 0.25                                        | 0.010 | 2.5                          | 0.098 | 42.04 | 92.60 | 390000                            | 88000  | 390000                                                     | 88000  |
| 338K           | 190    | 7.4803  | 0.030                                       | 0.0012  | 400                | 15.7480 | 0.040                                       | 0.0016  | 78      | 3.071 | 0.30                                        | 0.012 | 4.0                          | 0.16  | 47.6  | 105.0 | 440000                            | 98000  | 425000                                                     | 95000  |
| 340K           | 200    | 7.8740  | 0.030                                       | 0.0012  | 420                | 16.5354 | 0.045                                       | 0.0018  | 80      | 3.150 | 0.30                                        | 0.012 | 4.0                          | 0.16  | 56.1  | 123.6 | 465000                            | 104000 | 425000                                                     | 95000  |
| 342K           | 210    | 8.2677  | 0.030                                       | 0.0012  | 440                | 17.3228 | 0.045                                       | 0.0018  | 84      | 3.307 | 0.30                                        | 0.012 | 4.0                          | 0.16  | 58.1  | 128.2 | 570000                            | 129000 | 510000                                                     | 114000 |
| 344K           | 220    | 8.6614  | 0.030                                       | 0.0012  | 460                | 18.1102 | 0.045                                       | 0.0018  | 88      | 3.465 | 0.30                                        | 0.012 | 4.0                          | 0.16  | 69.8  | 154.0 | 610000                            | 137000 | 520000                                                     | 116000 |
| 348K           | 240    | 9.4488  | 0.030                                       | 0.0012  | 500                | 19.6850 | 0.045                                       | 0.0018  | 95      | 3.740 | 0.30                                        | 0.012 | 4.0                          | 0.16  | 81.1  | 178.9 | 735000                            | 163000 | 600000                                                     | 134000 |
| 352K           | 260    | 10.2362 | 0.035                                       | 0.0014  | 540                | 21.2598 | 0.050                                       | 0.0020  | 102     | 4.016 | 0.35                                        | 0.014 | 4.0                          | 0.16  | 98.4  | 217.0 | 850000                            | 190000 | 670000                                                     | 150000 |
| 356K           | 280    | 11.0236 | 0.035                                       | 0.0014  | 580                | 22.8346 | 0.050                                       | 0.0020  | 108     | 4.252 | 0.35                                        | 0.014 | 4.0                          | 0.16  | 142.8 | 315.0 | 780000                            | 176000 | 585000                                                     | 134000 |

<sup>(1)</sup> Maximum shaft or housing fillet radius that bearing corners will clear.

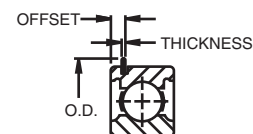
<sup>(2)</sup> Based on 10<sup>6</sup> revolutions of calculated fatigue life.

## SHIELDS, SEALS AND SNAP RING COMBINATIONS

| Shields and Seals |                   |               |                              |                 | Snap Ring (Wireloc) <sup>(1)</sup> |                  |                  |                    |       |                                 |           |       |        |       |
|-------------------|-------------------|---------------|------------------------------|-----------------|------------------------------------|------------------|------------------|--------------------|-------|---------------------------------|-----------|-------|--------|-------|
| One Shield<br>D   | Two Shields<br>DD | One Seal<br>P | One Seal<br>One Shield<br>PD | Two Seals<br>PP | Open<br>Type<br>G                  | One Shield<br>PG | One Shield<br>DG | Two Shields<br>DDG | O.D.  |                                 | Thickness |       | Offset |       |
|                   |                   |               |                              |                 |                                    |                  |                  |                    | mm    | in.                             | mm        | in.   | mm     | in.   |
| 300KD             | 300KDD            | 300P          | —                            | —               | —                                  | —                | —                | —                  | 39.3  | 1 <sup>35</sup> / <sub>64</sub> | 1.07      | 0.042 | 3.05   | 0.120 |
| 301KD             | 301KDD            | —             | —                            | —               | —                                  | —                | —                | —                  | 40.9  | 1 <sup>39</sup> / <sub>64</sub> | 1.07      | 0.042 | 3.05   | 0.120 |
| 302KD             | 302KDD            | —             | —                            | —               | —                                  | —                | —                | —                  | 46.0  | 1 <sup>13</sup> / <sub>16</sub> | 1.07      | 0.042 | 3.05   | 0.120 |
| 303KD             | 303KDD            | 303P          | —                            | 303PP           | 303KG                              | —                | —                | —                  | 52.4  | 2 <sup>1</sup> / <sub>16</sub>  | 1.07      | 0.042 | 3.45   | 0.136 |
| 304KD             | 304KDD            | 304P          | —                            | 304PP           | 304KG                              | —                | 304KDG           | 304KDDG            | 57.5  | 2 <sup>17</sup> / <sub>64</sub> | 1.07      | 0.042 | 3.45   | 0.136 |
| 305KD             | 305KDD            | 305P          | —                            | 305PP           | 305KG                              | —                | 305KDG           | 305KDDG            | 67.5  | 2 <sup>21</sup> / <sub>32</sub> | 1.65      | 0.065 | 4.83   | 0.190 |
| 306KD             | 306KDD            | 306P          | —                            | 306PP           | 306KG                              | —                | 306KDG           | 306KDDG            | 78.2  | 3 <sup>5</sup> / <sub>64</sub>  | 1.65      | 0.065 | 4.83   | 0.190 |
| 307KD             | 307KDD            | 307P          | —                            | 307PP           | 307KG                              | —                | 307KDG           | 307KDDG            | 86.5  | 3 <sup>13</sup> / <sub>32</sub> | 1.65      | 0.065 | 4.83   | 0.190 |
| 308KD             | 308KDD            | 308P          | —                            | 308PP           | 308KG                              | —                | 308KDG           | 308KDDG            | 96.4  | 3 <sup>51</sup> / <sub>64</sub> | 2.41      | 0.095 | 5.59   | 0.220 |
| 309KD             | 309KDD            | 309P          | —                            | 309PP           | 309KG                              | —                | 309KDG           | 309KDDG            | 106.4 | 4 <sup>3</sup> / <sub>16</sub>  | 2.41      | 0.095 | 5.59   | 0.220 |
| 310KD             | 310KDD            | 310P          | —                            | 310PP           | 310KG                              | —                | 310KDG           | 310KDDG            | 116.3 | 4 <sup>37</sup> / <sub>64</sub> | 2.41      | 0.095 | 5.59   | 0.220 |
| 311KD             | 311KDD            | 311NP         | 311NPD                       | 311NPP          | 311KG                              | 311NPG           | —                | 311KDDG            | 129.4 | 5 <sup>3</sup> / <sub>32</sub>  | 2.77      | 0.109 | 6.73   | 0.265 |
| 312KD             | 312KDD            | —             | —                            | 312NPP          | 312KG                              | —                | —                | 312KDDG            | 139.7 | 5 <sup>1</sup> / <sub>2</sub>   | 2.77      | 0.109 | 6.73   | 0.265 |
| 313KD             | 313KDD            | —             | —                            | —               | —                                  | —                | —                | 313KDDG            | 149.6 | 5 <sup>57</sup> / <sub>64</sub> | 2.77      | 0.109 | 7.54   | 0.297 |
| 314KD             | 314KDD            | —             | —                            | —               | —                                  | —                | —                | —                  | —     | —                               | —         | —     | —      | —     |
| 315KD             | 315KDD            | —             | —                            | —               | —                                  | —                | —                | —                  | —     | —                               | —         | —     | —      | —     |
| 316KD             | 316KDD            | —             | —                            | —               | —                                  | —                | —                | —                  | —     | —                               | —         | —     | —      | —     |
| 317KD             | 317KDD            | —             | —                            | —               | —                                  | —                | —                | —                  | —     | —                               | —         | —     | —      | —     |
| —                 | —                 | —             | —                            | —               | —                                  | —                | —                | —                  | —     | —                               | —         | —     | —      | —     |
| 320KD             | 320KDD            | —             | —                            | —               | —                                  | —                | —                | —                  | —     | —                               | —         | —     | —      | —     |

<sup>(1)</sup> The snap ring is normally packaged separately in the box with the bearing.

**Note:** "N" prefix indicates a non-removable seal in NP (P) designs.



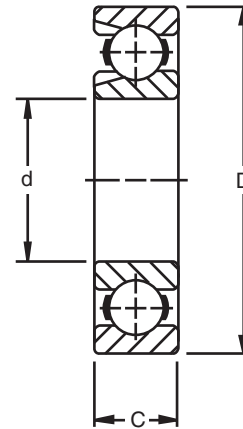
D





## MEDIUM 300W SERIES

- A heavier cross section than the 200 Series.
- Capable of carrying considerably heavier radial, thrust and combined loads for a given bore size.
- Capable of withstanding heavy shock loads. A ball bearing of heavier cross section is rarely required.
- 300W Series bearings are dimensionally interchangeable with the 300K Series. However, bearings within the 300W Series are capable of carrying heavier radial loads, due to their larger ball complements.



### DIMENSIONS – TOLERANCES

| Bearing Number | Bore d |         |                              |         | Outside Diameter D |         |                              |         | Width C |       |                              |       | Fillet Radius <sup>(1)</sup> |       | Wt.    |        | Static Load Rating C <sub>0</sub> |        | Extended Dynamic Load Rating C <sub>E</sub> <sup>(2)</sup> |        |
|----------------|--------|---------|------------------------------|---------|--------------------|---------|------------------------------|---------|---------|-------|------------------------------|-------|------------------------------|-------|--------|--------|-----------------------------------|--------|------------------------------------------------------------|--------|
|                | mm     | in.     | tolerance +0.000 mm to minus |         | mm                 | in.     | tolerance +0.000 mm to minus |         | mm      | in.   | tolerance +0.000 mm to minus |       | mm                           | in.   | kg     | lbs.   | N                                 | lbs.   | N                                                          | lbs.   |
| 303W           | 17     | 0.6693  | 0.008                        | 0.0003  | 47                 | 1.8504  | 0.011                        | 0.00045 | 14      | 0.551 | 0.12                         | 0.005 | 1.0                          | 0.039 | 0.118  | 0.26   | 9400                              | 2120   | 20600                                                      | 4650   |
| 304W           | 20     | 0.7874  | 0.010                        | 0.0004  | 52                 | 2.0472  | 0.013                        | 0.0005  | 15      | 0.591 | 0.12                         | 0.005 | 1.0                          | 0.039 | 0.154  | 0.34   | 11300                             | 2550   | 23900                                                      | 5400   |
| 305W           | 25     | 0.9843  | 0.010                        | 0.0004  | 62                 | 2.4409  | 0.013                        | 0.0005  | 17      | 0.669 | 0.12                         | 0.005 | 1.0                          | 0.039 | 0.259  | 0.57   | 17300                             | 3900   | 33900                                                      | 7650   |
| 306W           | 30     | 1.1811  | 0.010                        | 0.0004  | 72                 | 2.8346  | 0.013                        | 0.0005  | 19      | 0.748 | 0.12                         | 0.005 | 1.0                          | 0.039 | 0.386  | 0.85   | 22600                             | 5100   | 42800                                                      | 9650   |
| 307W           | 35     | 1.3780  | 0.012                        | 0.00047 | 80                 | 3.1496  | 0.013                        | 0.0005  | 21      | 0.827 | 0.12                         | 0.005 | 1.5                          | 0.059 | 0.513  | 1.13   | 29000                             | 6550   | 51500                                                      | 11600  |
| 308W           | 40     | 1.5748  | 0.012                        | 0.00047 | 90                 | 3.5433  | 0.015                        | 0.0006  | 23      | 0.906 | 0.12                         | 0.005 | 1.5                          | 0.059 | 0.844  | 1.86   | 39000                             | 8000   | 66000                                                      | 15000  |
| 309W           | 45     | 1.7717  | 0.012                        | 0.00047 | 100                | 3.9370  | 0.015                        | 0.0006  | 25      | 0.984 | 0.12                         | 0.005 | 1.5                          | 0.059 | 0.934  | 2.06   | 47000                             | 10600  | 78100                                                      | 17600  |
| 310W           | 50     | 1.9685  | 0.012                        | 0.00047 | 110                | 4.3307  | 0.015                        | 0.0006  | 27      | 1.063 | 0.12                         | 0.005 | 2.0                          | 0.079 | 1.207  | 2.66   | 56000                             | 12700  | 92000                                                      | 20800  |
| 311W           | 55     | 2.1654  | 0.015                        | 0.0006  | 120                | 4.7244  | 0.015                        | 0.0006  | 29      | 1.142 | 0.15                         | 0.006 | 2.0                          | 0.079 | 1.542  | 3.40   | 66000                             | 15000  | 106000                                                     | 24000  |
| 312W           | 60     | 2.3622  | 0.015                        | 0.0006  | 130                | 5.1181  | 0.018                        | 0.0007  | 31      | 1.220 | 0.15                         | 0.006 | 2.0                          | 0.079 | 1.923  | 4.24   | 78000                             | 17600  | 122000                                                     | 27500  |
| 313W           | 65     | 2.5591  | 0.015                        | 0.0006  | 140                | 5.5118  | 0.018                        | 0.0007  | 33      | 1.299 | 0.15                         | 0.006 | 2.0                          | 0.079 | 2.413  | 5.32   | 96000                             | 21600  | 144000                                                     | 32500  |
| 314W           | 70     | 2.7559  | 0.015                        | 0.0006  | 150                | 5.9055  | 0.018                        | 0.0007  | 35      | 1.378 | 0.15                         | 0.006 | 2.0                          | 0.079 | 2.885  | 6.36   | 101000                            | 22800  | 153000                                                     | 34500  |
| 315W           | 75     | 2.9528  | 0.015                        | 0.0006  | 160                | 6.2992  | 0.025                        | 0.0010  | 37      | 1.457 | 0.15                         | 0.006 | 2.0                          | 0.079 | 3.497  | 7.71   | 127000                            | 28500  | 180000                                                     | 40500  |
| 316W           | 80     | 3.1496  | 0.015                        | 0.0006  | 170                | 6.6929  | 0.025                        | 0.0010  | 39      | 1.535 | 0.15                         | 0.006 | 2.0                          | 0.079 | 4.154  | 9.15   | 142000                            | 32000  | 195000                                                     | 44000  |
| 317W           | 85     | 3.3465  | 0.020                        | 0.0008  | 180                | 7.0866  | 0.025                        | 0.0010  | 41      | 1.614 | 0.20                         | 0.008 | 2.5                          | 0.098 | 4.872  | 10.74  | 157000                            | 35500  | 211000                                                     | 47500  |
| 318W           | 90     | 3.5433  | 0.020                        | 0.0008  | 190                | 7.4803  | 0.030                        | 0.0012  | 43      | 1.693 | 0.20                         | 0.008 | 2.5                          | 0.098 | 5.625  | 12.39  | 173000                            | 39000  | 226000                                                     | 51000  |
| 319W           | 95     | 3.7402  | 0.020                        | 0.0008  | 200                | 7.8740  | 0.030                        | 0.0012  | 45      | 1.772 | 0.20                         | 0.008 | 2.5                          | 0.098 | 6.514  | 14.36  | 191000                            | 43000  | 239000                                                     | 54000  |
| 320W           | 100    | 3.9370  | 0.020                        | 0.0008  | 215                | 8.4646  | 0.030                        | 0.0012  | 47      | 1.850 | 0.20                         | 0.008 | 2.5                          | 0.098 | 7.992  | 17.62  | 226000                            | 51000  | 270000                                                     | 61000  |
| 321W           | 105    | 4.1339  | 0.020                        | 0.0008  | 225                | 8.8583  | 0.030                        | 0.0012  | 49      | 1.929 | 0.20                         | 0.008 | 2.5                          | 0.098 | 9.117  | 20.10  | 244000                            | 55000  | 284000                                                     | 64000  |
| 322W           | 110    | 4.3307  | 0.020                        | 0.0008  | 240                | 9.4488  | 0.030                        | 0.0012  | 50      | 1.968 | 0.20                         | 0.008 | 2.5                          | 0.098 | 10.81  | 23.84  | 266000                            | 60000  | 302000                                                     | 68000  |
| 324W           | 120    | 4.7244  | 0.020                        | 0.0008  | 260                | 10.2362 | 0.035                        | 0.0014  | 55      | 2.165 | 0.20                         | 0.008 | 2.5                          | 0.098 | 15.01  | 33.10  | 284000                            | 64000  | 319000                                                     | 72000  |
| 326W           | 130    | 5.1181  | 0.025                        | 0.0010  | 280                | 11.0236 | 0.035                        | 0.0014  | 58      | 2.323 | 0.25                         | 0.010 | 2.5                          | 0.098 | 19.56  | 43.12  | 326000                            | 73500  | 355000                                                     | 80000  |
| 328W           | 140    | 5.5118  | 0.025                        | 0.0010  | 300                | 11.8110 | 0.035                        | 0.0014  | 62      | 2.441 | 0.25                         | 0.010 | 2.5                          | 0.098 | 23.06  | 50.80  | 410000                            | 91500  | 400000                                                     | 90000  |
| 330W           | 150    | 5.9055  | 0.025                        | 0.0010  | 320                | 12.5984 | 0.040                        | 0.0016  | 65      | 2.559 | 0.25                         | 0.010 | 2.5                          | 0.098 | 26.81  | 59.10  | 422000                            | 95000  | 422000                                                     | 95000  |
| 336W           | 180    | 7.0866  | 0.025                        | 0.0010  | 380                | 14.9606 | 0.040                        | 0.0016  | 79      | 3.110 | 0.25                         | 0.010 | 2.5                          | 0.098 | 47.66  | 105.10 | 600000                            | 132000 | 524000                                                     | 118000 |
| 338W           | 190    | 7.4803  | 0.030                        | 0.0012  | 400                | 15.7480 | 0.040                        | 0.0016  | 78      | 3.071 | 0.30                         | 0.012 | 4.0                          | 0.160 | 49.21  | 108.40 | 720000                            | 160000 | 580000                                                     | 129000 |
| 340W           | 200    | 7.8740  | 0.030                        | 0.0012  | 420                | 16.5354 | 0.045                        | 0.0018  | 80      | 3.150 | 0.30                         | 0.012 | 4.0                          | 0.160 | 57.48  | 126.60 | 730000                            | 163000 | 570000                                                     | 127000 |
| 342W           | 210    | 8.2677  | 0.030                        | 0.0012  | 440                | 17.3228 | 0.045                        | 0.0018  | 84      | 3.307 | 0.30                         | 0.012 | 4.0                          | 0.160 | 60.70  | 133.70 | 935000                            | 208000 | 720000                                                     | 160000 |
| 344W           | 220    | 8.6614  | 0.030                        | 0.0012  | 460                | 18.1102 | 0.045                        | 0.0018  | 88      | 3.465 | 0.30                         | 0.012 | 4.0                          | 0.160 | 72.10  | 158.80 | 880000                            | 196000 | 700000                                                     | 150000 |
| 348W           | 240    | 9.4488  | 0.030                        | 0.0012  | 500                | 19.6850 | 0.045                        | 0.0018  | 95      | 3.740 | 0.30                         | 0.012 | 4.0                          | 0.160 | 84.99  | 187.20 | 1200000                           | 260000 | 850000                                                     | 186000 |
| 352W           | 260    | 10.2362 | 0.035                        | 0.0014  | 540                | 21.2598 | 0.050                        | 0.0020  | 102     | 4.016 | 0.35                         | 0.014 | 4.0                          | 0.160 | 103.38 | 227.70 | 1400000                           | 310000 | 950000                                                     | 208000 |
| 356W           | 280    | 11.0236 | 0.035                        | 0.0014  | 580                | 22.8346 | 0.050                        | 0.0020  | 108     | 4.252 | 0.35                         | 0.014 | 4.0                          | 0.160 | 146.78 | 323.30 | 1350000                           | 300000 | 855000                                                     | 190000 |

<sup>(1)</sup> Maximum shaft or housing fillet radius that bearing corners will clear.

<sup>(2)</sup> Based on 10<sup>6</sup> revolutions of calculated fatigue life.

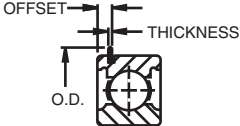
For applications where thrust load exceeds 60% Radial Load, consult your Timken representative.

Listed in the table below are Timken maximum capacity type bearings (300W Series) with shields, seals and snap ring combinations.

The bearing number suffixes denote the following:

- **WD** - filling slot opposite single shield
- **WG** - filling slot opposite snap ring
- **WDD** - two shields
- **WDG** - filling slot and snap ring opposite shield

## SHIELDS, SEALS AND SNAP RING COMBINATIONS

| Shields and Seals |                | Snap Ring (Wireloc) <sup>(1)</sup> |                |                 |  |         |           |       |        |       |
|-------------------|----------------|------------------------------------|----------------|-----------------|-------------------------------------------------------------------------------------|---------|-----------|-------|--------|-------|
| One Shield D      | Two Shields DD | Open Type G                        | Open Shield DG | Two Shields DDG | O.D.                                                                                |         | Thickness |       | Offset |       |
|                   |                |                                    |                |                 | mm                                                                                  | in.     | mm        | in.   | mm     | in.   |
| —                 | —              | —                                  | —              | —               | —                                                                                   | —       | —         | —     | —      | —     |
| —                 | —              | 304WG                              | —              | —               | 57.5                                                                                | 2 17/64 | 1.07      | 0.042 | 3.45   | 0.136 |
| 305WD             | —              | 305WG                              | —              | —               | 67.5                                                                                | 2 21/32 | 1.65      | 0.065 | 4.83   | 0.190 |
| 306WD             | 306WDD         | 306WG                              | 306WDG         | —               | 78.2                                                                                | 3 5/64  | 1.65      | 0.065 | 4.83   | 0.190 |
| 307WD             | 307WDD         | 307WG                              | 307WDG         | —               | 86.5                                                                                | 3 13/32 | 1.65      | 0.065 | 4.83   | 0.190 |
| 308WD             | 308WDD         | 308WG <sup>(2)</sup>               | 308WDG         | —               | 96.4                                                                                | 3 51/64 | 2.41      | 0.095 | 5.59   | 0.220 |
| 309WD             | 309WDD         | 309WG                              | 309WDG         | —               | 106.4                                                                               | 4 3/16  | 2.41      | 0.095 | 5.59   | 0.220 |
| 310WD             | 310WDD         | 310WG                              | 310WDG         | 310WDDG         | 116.3                                                                               | 4 37/64 | 2.41      | 0.095 | 5.59   | 0.220 |
| 311WD             | 311WDD         | 311WG                              | 311WDG         | —               | 129.4                                                                               | 5 3/32  | 2.77      | 0.109 | 6.73   | 0.265 |
| 312WD             | 312WDD         | 312WG <sup>(3)</sup>               | 312WDG         | 312WDDG         | 139.7                                                                               | 5 1/2   | 2.77      | 0.109 | 6.73   | 0.265 |
| 313WD             | 313WDD         | 313WG                              | 313WDG         | 313WDDG         | 149.6                                                                               | 5 57/64 | 2.77      | 0.109 | 7.54   | 0.297 |
| 314WD             | 314WDD         | —                                  | —              | —               | —                                                                                   | —       | —         | —     | —      | —     |
| 315WD             | 315WDD         | —                                  | —              | —               | —                                                                                   | —       | —         | —     | —      | —     |
| 316WD             | 316WDD         | 316WG                              | —              | —               | 182.6                                                                               | 7 3/16  | 3.05      | 0.120 | 8.61   | 0.339 |
| 317WD             | 317WDD         | —                                  | —              | —               | —                                                                                   | —       | —         | —     | —      | —     |
| —                 | —              | —                                  | —              | —               | —                                                                                   | —       | —         | —     | —      | —     |
| —                 | —              | —                                  | —              | —               | —                                                                                   | —       | —         | —     | —      | —     |
| 320WD             | —              | —                                  | —              | —               | —                                                                                   | —       | —         | —     | —      | —     |
| —                 | —              | —                                  | —              | —               | —                                                                                   | —       | —         | —     | —      | —     |
| —                 | —              | 322WG                              | —              | —               | 252.8                                                                               | 9 61/64 | 3.05      | 0.120 | 8.61   | 0.339 |

<sup>(1)</sup> The snap ring is normally packaged separately in the box with the bearing.

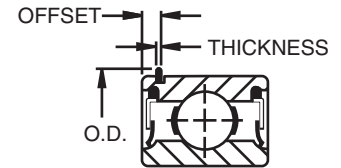
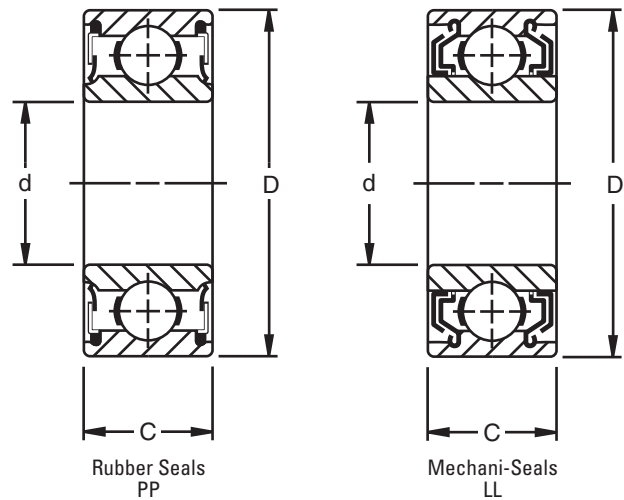
<sup>(2)</sup> Also available as a GW-Type filling slot and snap ring on same side. Also available 308GW2 with 20 mm width.

<sup>(3)</sup> Also available as 312WG-3 with filling slot on same side as snap ring.



## MEDIUM, WIDE TYPE W300PP SERIES AND W300KLL SERIES

- The W300PP (rubber seal) Series and the W300KLL (Mechani-Seal) Series have the same bores and outside diameters as standard 300 Series ball bearings.
- Widths are equal to 5300 Series double-row ball bearings.
- Added width provides extra support on shafts and in housings and eliminates the need for locknuts and lockwashers on applications such as electric motors.
- Prepacked with the right amount of long-life, factory-filtered grease.
- These series incorporate the same advantages as the standard width Mechani-Seal and rubber seal bearings.
- Electric motor quality for applications where quietness is a requirement.



### DIMENSIONS – TOLERANCES

| Bearing Number        | Bore d                 | Outside Diameter D                    | Width C                               | Fillet Radius <sup>(1)</sup>         | Wt.         | Static Load Rating C <sub>0</sub> | Extended Dynamic Load C <sub>e</sub> <sup>(4)</sup> | Snap Ring PPG                        |            |            |
|-----------------------|------------------------|---------------------------------------|---------------------------------------|--------------------------------------|-------------|-----------------------------------|-----------------------------------------------------|--------------------------------------|------------|------------|
|                       |                        |                                       |                                       |                                      |             |                                   |                                                     | O.D.                                 | Thickness  | Offset     |
| Contact Seal PP       | Mechani-Seal LL        | tolerance +0.000 mm +0.0000" to minus | tolerance +0.000 mm +0.0000" to minus | +0.00 mm -12 mm +0.000" -0.005"      | mm in.      | kg lbs.                           | N lbs.                                              | N lbs.                               | mm in.     | mm in.     |
| W304PP                | —                      | 20 0.7874 0.010 0.0004                | 52 2.0472 0.013 0.0005                | 22.22 0.875 1.0 0.039                | 0.213 0.47  | 7800 1760                         | 17900 4050                                          | — — — —                              | — —        | — —        |
| W305PP <sup>(2)</sup> | —                      | 25 0.9843 0.010 0.0004                | 62 2.4409 0.013 0.0005                | 25.40 1.000 1.0 0.039                | 0.354 0.78  | 12200 2750                        | 26600 6000                                          | 67.5 2 <sup>21</sup> / <sub>35</sub> | 1.65 0.065 | 4.82 0.190 |
| W306PP                | —                      | 30 1.1811 0.010 0.0004                | 72 2.8346 0.013 0.0005                | 30.18 1.188 1.0 0.039                | 0.558 1.23  | 15600 3550                        | 33900 7650                                          | — — — —                              | — —        | — —        |
| W307PP                | W307KLL                | 35 1.3780 0.012 0.00047               | 80 3.1496 0.013 0.0005                | 34.92 1.375 1.5 0.059                | 0.780 1.72  | 18400 4150                        | 37700 8500                                          | — — — —                              | — —        | — —        |
| W308PP <sup>(2)</sup> | W308KLL <sup>(2)</sup> | 40 1.5748 0.012 0.00047               | 90 3.5433 0.015 0.0006                | 36.53 1.438 1.5 0.059                | 1.021 2.25  | 25900 5850                        | 50600 11400                                         | 96.4 3 <sup>51</sup> / <sub>64</sub> | 2.41 0.095 | 5.59 0.220 |
| W309PP                | W309KLL                | 45 1.7717 0.012 0.00047               | 100 3.9370 0.015 0.0006               | 39.67 1.562 1.5 0.059                | 1.370 3.02  | 31500 7100                        | 59000 13400                                         | — — — —                              | — —        | — —        |
| W310PP                | —                      | 50 1.9685 0.012 0.00047               | 110 4.3307 0.015 0.0006               | 44.45 1.750 2.0 0.079                | 1.828 4.03  | 37700 8500                        | 69000 15600                                         | — — — —                              | — —        | — —        |
| W311PP <sup>(2)</sup> | W311KLL                | 55 2.1654 0.015 0.0006                | 120 4.7244 0.015 0.0006               | 49.23 1.938 <sup>(3)</sup> 2.0 0.079 | 2.386 5.26  | 44400 10000                       | 81000 18300                                         | 129.4 5 <sup>3</sup> / <sub>32</sub> | 2.77 0.109 | 0.73 0.265 |
| W312PP <sup>(2)</sup> | W312KLL                | 60 2.3622 0.015 0.0006                | 130 5.1181 0.018 0.0007               | 53.98 2.125 <sup>(3)</sup> 2.0 0.079 | 3.053 6.73  | 51500 11600                       | 92000 20800                                         | 139.7 5 <sup>1</sup> / <sub>2</sub>  | 2.77 0.109 | 0.73 0.265 |
| W313PP                | —                      | 65 2.5591 0.015 0.0006                | 140 5.5118 0.018 0.0007               | 58.72 2.312 <sup>(3)</sup> 2.0 0.079 | 3.883 8.56  | 59500 13400                       | 104000 23600                                        | — — — —                              | — —        | — —        |
| W314PP                | —                      | 70 2.7559 0.015 0.0006                | 150 5.9055 0.018 0.0007               | 63.50 2.500 <sup>(3)</sup> 2.0 0.079 | 4.731 10.43 | 67000 15300                       | 116000 26000                                        | — — — —                              | — —        | — —        |
| W315PP                | —                      | 75 2.9528 0.015 0.0006                | 160 6.2992 0.025 0.0010               | 68.28 2.688 <sup>(3)</sup> 2.0 0.079 | 5.811 12.81 | 76000 17300                       | 128000 29000                                        | — — — —                              | — —        | — —        |

<sup>(1)</sup> Maximum shaft or housing fillet radius that bearing corners will clear.

<sup>(2)</sup> Also available with snap ring. To order, add suffix "G" to bearing number. Example: W305PPG.

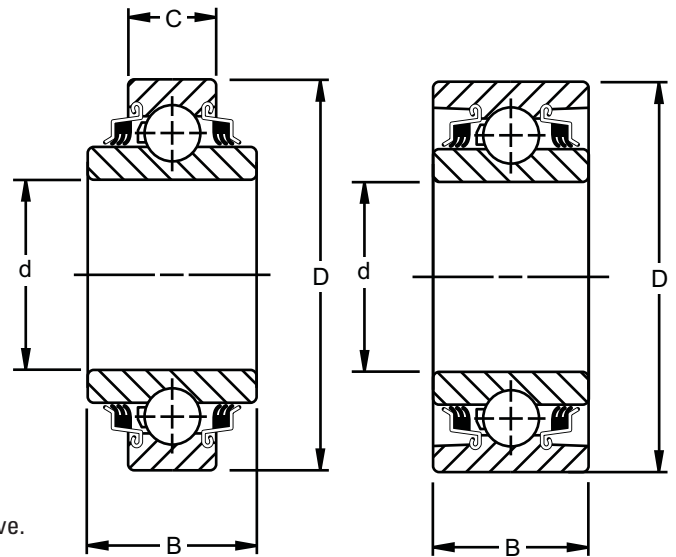
The snap ring is normally packaged separately in the box with the bearing.

<sup>(3)</sup> Width tolerance is .00 mm to -.15 mm (.000" to -.006").

<sup>(4)</sup> Based on 10<sup>6</sup> revolutions of calculated fatigue life.

## TRI-PLY SEAL SERIES NON-RELUBRICATABLE TYPE CYLINDRICAL O.D.

- Designed for environments where severe contamination is present, such as agricultural tillage equipment.
- One-piece Tri-Ply seals:
  - Incorporate a highly effective design molded to an exterior shroud cap.
  - Provide exceptionally effective protection against loss of lubricant and entrance of wet or abrasive contaminants.
- Seven-piece Tri-Ply construction:
  - Standard on certain sizes.
  - Shroud cap nests closely with the outside seal.
  - Helps protect the rubber seal members from fiber wrap warpage and abrasion.
  - Balanced design, identified by deep races, large balls and extra-wide or heavy, shock-resistant inner and outer rings.
- Use of Tri-Ply Seal bearings simplifies housing designs and their extra inner ring width provides greater support on the shaft.
- For speeds in excess of 500 RPM, consult your Timken representative.



Type 1

Type 2

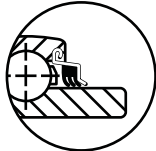


Figure 1

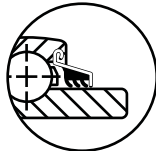


Figure 2

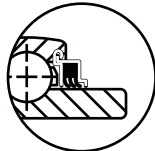


Figure 3

### ROUND BORE

| Bearing Number | Type-Fig. | Bore d |        |       |        | Outside Diameter D |        |       |        | Ring Widths<br>0.00, -.12 mm<br>+0.000", -.005" |         |       |       | Balls |        | Wt.   |       | Static Load Rating C <sub>0</sub> |       | Extended Dynamic Load Rating C <sub>E</sub> <sup>(2)</sup> |       |
|----------------|-----------|--------|--------|-------|--------|--------------------|--------|-------|--------|-------------------------------------------------|---------|-------|-------|-------|--------|-------|-------|-----------------------------------|-------|------------------------------------------------------------|-------|
|                |           | mm     | in.    | mm    | in.    | mm                 | in.    | mm    | in.    | B Inner                                         | C Outer | mm    | in.   | No.   | Size   | kg    | lbs.  | N                                 | lbs.  | N                                                          | lbs.  |
| W208PP10       | 1-1       | 38.113 | 1.5005 | 0.013 | 0.0005 | 80                 | 3.1496 | 0.013 | 0.0005 | 42.87                                           | 1.688   | 21.00 | 0.827 | 9     | 1/2    | 0.681 | 1.50  | 19900                             | 4500  | 36800                                                      | 8300  |
| W210PP8        | 2-        | 38.860 | 1.5300 | 0.250 | 0.0100 | 90                 | 3.5433 | 0.015 | 0.0006 | 30.18                                           | 1.188   | 30.18 | 1.188 | 10    | 1/2    | 0.894 | 1.97  | 23000                             | 5200  | 39900                                                      | 9000  |
| W210PP2        | 2-        | 49.230 | 1.9380 | 0.013 | 0.0005 | 90                 | 3.5433 | 0.015 | 0.0006 | 30.18                                           | 1.188   | 30.18 | 1.188 | 10    | 1/2    | 0.767 | 1.69  | 23000                             | 5200  | 39900                                                      | 9000  |
| W211PP2        | 2-2       | 55.580 | 2.1880 | 0.015 | 0.0006 | 100                | 3.9370 | 0.015 | 0.0006 | 33.34 <sup>(1)</sup>                            | 1.312   | 33.34 | 1.312 | 10    | 9/16   | 1.056 | 2.33  | 29000                             | 6550  | 48800                                                      | 11000 |
| W214PP2        | 2-        | 70.000 | 2.7559 | 0.015 | 0.0006 | 125                | 4.9213 | 0.020 | 0.0008 | 39.69 <sup>(1)</sup>                            | 1.562   | 39.69 | 1.562 | 10    | 1 1/16 | 1.901 | 4.19  | 43500                             | 9800  | 71000                                                      | 16000 |
| W315PP2        | 2-        | 76.342 | 3.0056 | 0.015 | 0.0006 | 160                | 6.2992 | 0.025 | 0.0010 | 68.26 <sup>(1)</sup>                            | 2.688   | 68.26 | 2.688 | 8     | 1 1/16 | 5.956 | 13.13 | 76800                             | 17300 | 128000                                                     | 29000 |

<sup>(1)</sup> Inner and outer width tolerance is .00 mm to -.15 mm (.000" to .006").

<sup>(2)</sup> Based on 10<sup>6</sup> revolutions of calculated fatigue life.

### SQUARE BORE

| Bearing Number | Type-Fig. | Shaft Size d |       | Outside Diameter D |        |       |        | Ring Widths<br>0.00, -.12 mm<br>+0.000", -.005" |       |         |         | Balls |      | Wt.  |      | Static Load Rating C <sub>0</sub> |      | Extended Dynamic Load Rating C <sub>E</sub> <sup>(2)</sup> |       |
|----------------|-----------|--------------|-------|--------------------|--------|-------|--------|-------------------------------------------------|-------|---------|---------|-------|------|------|------|-----------------------------------|------|------------------------------------------------------------|-------|
|                |           | mm           | in.   | mm                 | in.    | mm    | in.    | mm                                              | in.   | B Inner | C Outer | mm    | in.  | kg   | lbs. | N                                 | lbs. | N                                                          | lbs.  |
| W208PP6        | 1-1       | 25.4         | 1     | 80                 | 3.1496 | 0.013 | 0.0005 | 36.51                                           | 1.438 | 18      | 0.709   | 9     | 1/2  | 0.73 | 1.62 | 19900                             | 4500 | 36800                                                      | 8300  |
| W208PP5        | 1-1       | 28.6         | 1 1/8 | 80                 | 3.1496 | 0.013 | 0.0005 | 36.51                                           | 1.438 | 18      | 0.709   | 9     | 1/2  | 0.68 | 1.50 | 19900                             | 4500 | 36800                                                      | 8300  |
| W208PP8        | 1-1       | 28.6         | 1 1/8 | 80                 | 3.1496 | 0.013 | 0.0005 | 36.51                                           | 1.438 | 30.18   | 1.188   | 9     | 1/2  | 0.75 | 1.66 | 19900                             | 4500 | 36800                                                      | 8300  |
| W211PP3        | 2-2       | 38.1         | 1 1/2 | 100                | 3.9370 | 0.015 | 0.0006 | 33.34 <sup>(1)</sup>                            | 1.312 | 33.34   | 1.312   | 10    | 9/16 | 1.27 | 2.79 | 29000                             | 6550 | 48800                                                      | 11000 |
| W211PP5        | 1-2       | 38.1         | 1 1/2 | 101.6              | 4.0000 | 0.015 | 0.0006 | 44.45 <sup>(1)</sup>                            | 1.750 | 36.52   | 1.438   | 10    | 7/16 | 1.58 | 3.48 | 29000                             | 6550 | 48800                                                      | 11000 |

<sup>(1)</sup> Inner and outer width tolerance is .00 mm to -.15 mm (.000" to .006").

<sup>(2)</sup> Based on 10<sup>6</sup> revolutions of calculated fatigue life.



## TRI-PLY SEAL SERIES NON-RELUBRICATABLE TYPE SPHERICAL O.D.

- Similar in design and features to bearings shown on D27, except for a spherical O.D.

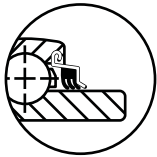


Figure 1

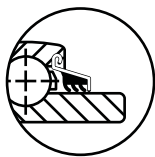


Figure 2

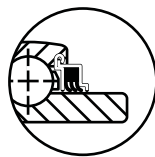
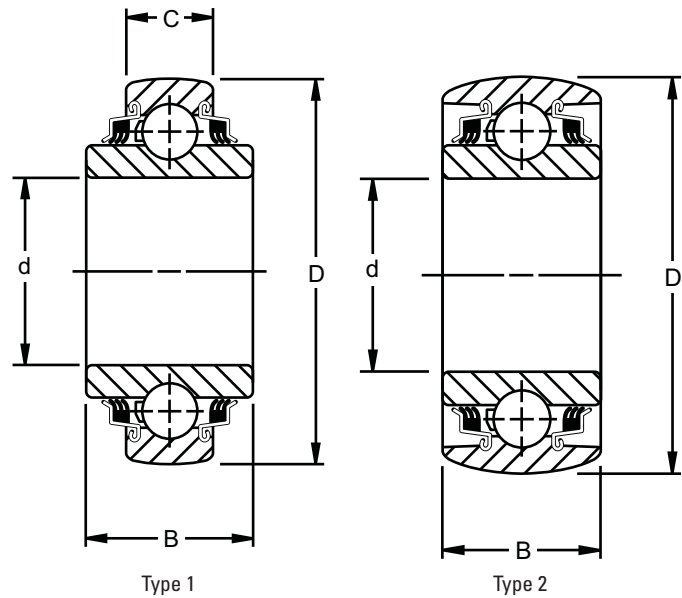


Figure 3



Type 1

Type 2

### ROUND BORE

| Bearing Number | Type-Fig. | Bore d                                      |        |       |        | Outside Diameter D                          |       |       |        | Ring Widths<br>+0.00, -12 mm<br>+0.000", -0.005" |       |         |       | Balls |       | Stamping Size |       | Wt.  |       | Static Load Rating C <sub>0</sub> |       | Extended Dynamic Load Rating C <sub>E</sub> <sup>(2)</sup> |      |
|----------------|-----------|---------------------------------------------|--------|-------|--------|---------------------------------------------|-------|-------|--------|--------------------------------------------------|-------|---------|-------|-------|-------|---------------|-------|------|-------|-----------------------------------|-------|------------------------------------------------------------|------|
|                |           | tolerance<br>+0.000 mm<br>+0.0000" to minus |        |       |        | tolerance<br>+0.000 mm<br>+0.0000" to minus |       |       |        | B Inner                                          |       | C Outer |       | No.   | Size  |               |       |      |       | N                                 | lbs.  | N                                                          | lbs. |
|                |           | mm                                          | in.    | mm    | in.    | mm                                          | in.   | mm    | in.    | mm                                               | in.   | mm      | in.   | mm    | in.   | kg            | lbs.  |      |       | N                                 | lbs.  | N                                                          | lbs. |
| W208PPB7       | 1-1       | 30.170                                      | 1.1880 | 0.013 | 0.0005 | 80                                          | 3.150 | 0.013 | 0.0005 | 30.18                                            | 1.188 | 18.00   | 0.709 | 9     | 1/2   | 80MS          | 0.640 | 1.41 | 19900 | 4500                              | 36800 | 8300                                                       |      |
| W208PPB2       | 1-        | 38.113                                      | 1.5005 | 0.013 | 0.0005 | 80                                          | 3.150 | 0.013 | 0.0005 | 42.96                                            | 1.688 | 18.00   | 0.709 | 9     | 1/2   | 80MS          | 0.721 | 1.59 | 19900 | 4500                              | 36800 | 8300                                                       |      |
| W208PPB23      | 1-1       | 38.113                                      | 1.5005 | 0.013 | 0.0005 | 80                                          | 3.150 | 0.013 | 0.0005 | 42.96                                            | 1.688 | 30.18   | 1.188 | 9     | 15/32 | 80MS          | 0.681 | 1.50 | 15600 | 3550                              | 32000 | 7200                                                       |      |
| W209PPB2       | 2-2       | 45.000                                      | 1.7717 | 0.013 | 0.0005 | 85                                          | 3.346 | 0.015 | 0.0006 | 30.18                                            | 1.188 | 30.18   | 1.188 | 9     | 1/2   | 85MS          | 0.653 | 1.44 | 20200 | 4550                              | 36800 | 8300                                                       |      |
| W209PPB4       | 2-2       | 39.000                                      | 1.5350 | 0.250 | 0.0100 | 85                                          | 3.346 | 0.015 | 0.0006 | 30.18                                            | 1.188 | 30.18   | 1.188 | 9     | 1/2   | 85MS          | 0.748 | 1.65 | 20200 | 4550                              | 36800 | 8300                                                       |      |
| W210PPB2       | 2-        | 49.230                                      | 1.9380 | 0.013 | 0.0005 | 90                                          | 3.543 | 0.015 | 0.0006 | 30.18                                            | 1.188 | 30.18   | 1.188 | 10    | 1/2   | 90MS          | 0.708 | 1.56 | 23000 | 5200                              | 39900 | 9000                                                       |      |
| W210PPB5       | 2-        | 45.340                                      | 1.7850 | 0.250 | 0.0100 | 90                                          | 3.543 | 0.015 | 0.0006 | 30.18                                            | 1.188 | 30.18   | 1.188 | 10    | 1/2   | 90MS          | 0.794 | 1.75 | 23000 | 5200                              | 39900 | 9000                                                       |      |
| W211PPB2       | 2-2       | 55.580                                      | 2.1880 | 0.015 | 0.0006 | 100                                         | 3.937 | 0.015 | 0.0006 | 33.34 <sup>(1)</sup>                             | 1.312 | 33.34   | 1.312 | 10    | 9/16  | 100MS         | 0.966 | 3.63 | 29000 | 6550                              | 48800 | 11000                                                      |      |
| W214PPB2       | 2-        | 70.000                                      | 2.7559 | 0.015 | 0.0006 | 125                                         | 4.921 | 0.02  | 0.0008 | 39.69 <sup>(1)</sup>                             | 1.562 | 39.69   | 1.562 | 10    | 11/16 | —             | 1.796 | 3.96 | 43500 | 9800                              | 71000 | 16000                                                      |      |
| W214PPB9       | 1-        | 70.260                                      | 2.7660 | 0.025 | 0.0010 | 125                                         | 4.921 | 0.02  | 0.0008 | 44.45 <sup>(1)</sup>                             | 1.750 | 28.00   | 1.102 | 10    | 11/16 | —             | 1.796 | 3.96 | 43500 | 9800                              | 71000 | 16000                                                      |      |

<sup>(1)</sup> Inner and outer width tolerance is .00 mm to -.15 mm (.000" to -.006").

<sup>(2)</sup> Based on 10<sup>6</sup> revolutions of calculated fatigue life.

### SQUARE BORE

| Bearing Number | Type-Fig. | Shaft Size |       | Outside Diameter D                          |        |       |        | Ring Widths<br>+0.00, -12 mm<br>+0.000", -0.005" |       |         |       | Balls |      | Stamping Size | Wt.   | Static Load Rating C <sub>0</sub> |       | Extended Dynamic Load Rating C <sub>E</sub> <sup>(2)</sup> |       |       |
|----------------|-----------|------------|-------|---------------------------------------------|--------|-------|--------|--------------------------------------------------|-------|---------|-------|-------|------|---------------|-------|-----------------------------------|-------|------------------------------------------------------------|-------|-------|
|                |           | to minus   |       | tolerance<br>+0.000 mm<br>+0.0000" to minus |        |       |        | B Inner                                          |       | C Outer |       | No.   | Size |               |       | kg                                | lbs.  | N                                                          | lbs.  |       |
|                |           | mm         | in.   | mm                                          | in.    | mm    | in.    | mm                                               | in.   | mm      | in.   | mm    | in.  | mm            | in.   | kg                                | lbs.  | N                                                          | lbs.  |       |
| W208PPB13      | 1-1       | 22.2       | 7/8   | 80                                          | 3.1496 | 0.013 | 0.0005 | 36.53                                            | 1.438 | 18.00   | 0.709 | 9     | 1/2  | 80MS          | 0.735 | 1.62                              | 19900 | 4500                                                       | 36800 | 8300  |
| W208PPB6       | 1-1       | 25.4       | 1     | 80                                          | 3.1496 | 0.013 | 0.0005 | 36.53                                            | 1.438 | 18.00   | 0.709 | 9     | 1/2  | 80MS          | 0.721 | 1.59                              | 19900 | 4500                                                       | 36800 | 8300  |
| W208PPB5       | 1-1       | 28.6       | 1 1/8 | 80                                          | 3.1496 | 0.013 | 0.0005 | 36.53                                            | 1.438 | 18.00   | 0.709 | 9     | 1/2  | 80MS          | 0.667 | 1.47                              | 19900 | 4500                                                       | 36800 | 8300  |
| W209PPB5       | 1-2       | 31.8       | 1 1/4 | 85                                          | 3.3465 | 0.015 | 0.0006 | 36.53                                            | 1.438 | 30.18   | 1.188 | 9     | 1/2  | 85MS          | 0.794 | 1.75                              | 20200 | 4550                                                       | 36800 | 8300  |
| W210PPB4       | 2-        | 28.6       | 1 1/8 | 90                                          | 3.5433 | 0.015 | 0.0006 | 30.18                                            | 1.188 | 30.18   | 1.188 | 10    | 1/2  | 90MS          | 0.957 | 2.11                              | 23000 | 5200                                                       | 39900 | 9000  |
| W210PPB6       | 1-        | 28.6       | 1 1/8 | 90                                          | 3.5433 | 0.015 | 0.0006 | 36.53                                            | 1.438 | 30.18   | 1.188 | 10    | 1/2  | 90MS          | 1.021 | 2.25                              | 23000 | 5200                                                       | 39900 | 9000  |
| W211PPB3       | 2-2       | 38.1       | 1 1/2 | 100                                         | 3.9370 | 0.015 | 0.0006 | 33.34 <sup>(1)</sup>                             | 1.312 | 33.34   | 1.312 | 10    | 9/16 | 100MS         | 1.207 | 2.66                              | 29000 | 6550                                                       | 48800 | 11000 |

<sup>(1)</sup> Inner and outer width tolerance is .00 mm to -.15 mm (.000" to -.006").

<sup>(2)</sup> Based on 10<sup>6</sup> revolutions of calculated fatigue life.

## TRI-PLY SEAL SERIES RELUBRICATABLE TYPE

- Similar in design and features to those shown on the preceding two pages.
- Includes a provision for relubrication.

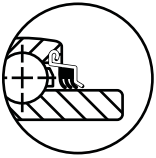


Figure 1



Figure 2

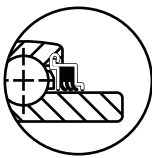
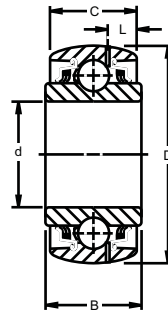
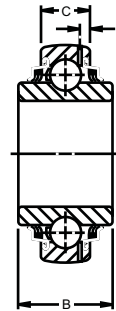


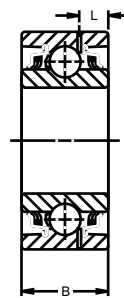
Figure 3



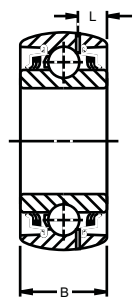
Type 1



Type 2



Type 3



Type 4

### ROUND BORE

| Bearing Number          | Type-Fig. | Bore d                                         |        |       |        | Outside Diameter D                             |        |       |        | Ring Width<br>+0.00 mm, -0.12 mm<br>+0.000", - .005" |       |            |       | Balls |        | L     |       | Wt.   |      | Static Load Rating<br>C <sub>0</sub> |       | Extended Dynamic Load<br>C <sub>E</sub> <sup>(3)</sup> |       |     |      |
|-------------------------|-----------|------------------------------------------------|--------|-------|--------|------------------------------------------------|--------|-------|--------|------------------------------------------------------|-------|------------|-------|-------|--------|-------|-------|-------|------|--------------------------------------|-------|--------------------------------------------------------|-------|-----|------|
|                         |           | tolerance<br>+0.000 mm<br>+0.0000"<br>to minus |        |       |        | tolerance<br>+0.000 mm<br>+0.0000"<br>to minus |        |       |        | B<br>Inner                                           |       | C<br>Outer |       | No.   | Size   | mm    | in.   | kg    | lbs. | N                                    | lbs.  | N                                                      | lbs.  |     |      |
|                         |           | mm                                             | in.    | mm    | in.    | mm                                             | in.    | mm    | in.    | mm                                                   | in.   | in.        | mm    |       |        |       |       |       |      |                                      |       |                                                        |       | in. | kg   |
| ROUND BORE              |           | mm                                             | in.    | mm    | in.    | mm                                             | in.    | mm    | in.    | mm                                                   | in.   | mm         | in.   |       | in.    | mm    | in.   | kg    | lbs. |                                      |       | N                                                      | lbs.  | N   | lbs. |
| GW209PPB4               | 4-2       | 39.00                                          | 1.5350 | 0.250 | 0.0100 | 85                                             | 3.3465 | 0.015 | 0.0006 | 30.18                                                | 1.188 | 30.18      | 1.188 | 9     | 1/2    | 8.79  | 0.346 | 0.748 | 1.65 | 20200                                | 4550  | 36800                                                  | 8300  |     |      |
| GW209PPB2               | 4-2       | 45.00                                          | 1.7717 | 0.013 | 0.0005 | 85                                             | 3.3465 | 0.015 | 0.0006 | 30.18                                                | 1.188 | 30.18      | 1.188 | 9     | 1/2    | 8.79  | 0.346 | 0.653 | 1.44 | 20200                                | 4550  | 36800                                                  | 8300  |     |      |
| GW209PPB11              | 2-2       | 45.24                                          | 1.7810 | 0.250 | 0.0100 | 85                                             | 3.3465 | 0.015 | 0.0006 | 36.53                                                | 1.438 | 22.00      | 0.866 | 9     | 1/2    | 4.55  | 0.179 | 0.621 | 1.37 | 20200                                | 4550  | 36800                                                  | 8300  |     |      |
| GW210PP3                | 3-        | 37.53                                          | 1.4065 | 0.013 | 0.0005 | 90                                             | 3.5433 | 0.015 | 0.0006 | 30.18                                                | 1.188 | 30.18      | 1.188 | 10    | 1/2    | 9.02  | 0.355 | 1.021 | 2.25 | 23000                                | 5200  | 39900                                                  | 9000  |     |      |
| GW210PPB5               | 4-        | 45.34                                          | 1.7850 | 0.250 | 0.0100 | 90                                             | 3.5433 | 0.015 | 0.0006 | 30.18                                                | 1.188 | 30.18      | 1.188 | 10    | 1/2    | 9.02  | 0.355 | 0.794 | 1.75 | 23000                                | 5200  | 39900                                                  | 9000  |     |      |
| GW210PPB2               | 4-        | 49.23                                          | 1.9380 | 0.013 | 0.0005 | 90                                             | 3.5433 | 0.015 | 0.0006 | 30.18                                                | 1.188 | 30.18      | 1.188 | 10    | 1/2    | 9.02  | 0.355 | 0.681 | 1.50 | 23000                                | 5200  | 39900                                                  | 9000  |     |      |
| GW210PP9 <sup>(1)</sup> | 2-        | 49.40                                          | 1.9450 | 0.180 | 0.0070 | 90                                             | 3.5433 | 0.015 | 0.0006 | 36.53                                                | 1.438 | 23.00      | 0.906 | 10    | 1/2    | 4.70  | 0.185 | 0.794 | 1.75 | 23000                                | 5200  | 39900                                                  | 9000  |     |      |
| GW211PPB13              | 2-2       | 45.34                                          | 1.7850 | 0.250 | 0.0100 | 100                                            | 3.9370 | 0.015 | 0.0006 | 33.34                                                | 1.312 | 25.00      | 0.984 | 10    | 9/16   | 5.82  | 0.299 | 0.916 | 2.02 | 29000                                | 6550  | 48800                                                  | 11000 |     |      |
| GW211PPB10              | 4-2       | 49.23                                          | 1.9380 | 0.015 | 0.0006 | 100                                            | 3.9370 | 0.015 | 0.0006 | 33.34 <sup>(2)</sup>                                 | 1.312 | 33.34      | 1.312 | 10    | 9/16   | 9.96  | 0.392 | 1.025 | 2.26 | 29000                                | 6550  | 48800                                                  | 11000 |     |      |
| GW211PPB14              | 2-2       | 51.18                                          | 2.0150 | 0.250 | 0.0100 | 100                                            | 3.9370 | 0.015 | 0.0006 | 33.34 <sup>(2)</sup>                                 | 1.312 | 25.00      | 0.984 | 10    | 9/16   | 5.82  | 0.229 | 0.907 | 2.00 | 29000                                | 6550  | 48800                                                  | 11000 |     |      |
| GW211PP2                | 3-2       | 55.58                                          | 2.1880 | 0.015 | 0.0006 | 100                                            | 3.9370 | 0.015 | 0.0006 | 33.34 <sup>(2)</sup>                                 | 1.312 | 33.34      | 1.312 | 10    | 9/16   | 9.96  | 0.392 | 1.361 | 3.00 | 29000                                | 6550  | 48800                                                  | 11000 |     |      |
| GW211PPB2               | 4-2       | 55.58                                          | 2.1880 | 0.015 | 0.0006 | 100                                            | 3.9370 | 0.015 | 0.0006 | 33.34 <sup>(2)</sup>                                 | 1.312 | 33.34      | 1.312 | 10    | 9/16   | 9.96  | 0.392 | 1.188 | 2.62 | 29000                                | 6550  | 48800                                                  | 11000 |     |      |
| GW211PPB8               | 2-2       | 55.58                                          | 2.1880 | 0.015 | 0.0006 | 100                                            | 3.9370 | 0.015 | 0.0006 | 33.34 <sup>(2)</sup>                                 | 1.312 | 25.00      | 0.984 | 10    | 9/16   | 5.82  | 0.229 | 0.839 | 1.85 | 29000                                | 6550  | 48800                                                  | 11000 |     |      |
| GW211PPB9               | 2-2       | 55.75                                          | 2.1950 | 0.180 | 0.0070 | 100                                            | 3.9370 | 0.015 | 0.0006 | 39.69 <sup>(2)</sup>                                 | 1.562 | 25.00      | 0.984 | 10    | 9/16   | 5.41  | 0.213 | 0.916 | 2.02 | 29000                                | 6550  | 48800                                                  | 11000 |     |      |
| GW214PPB6               | 2-        | 68.28                                          | 2.6881 | 0.015 | 0.0006 | 125                                            | 4.9213 | 0.020 | 0.0008 | 68.26 <sup>(2)</sup>                                 | 2.688 | 28.00      | 1.102 | 10    | 1 1/16 | 5.54  | 0.218 | 2.155 | 4.75 | 43500                                | 9800  | 71000                                                  | 16000 |     |      |
| GW214PP2                | 3-        | 70.00                                          | 2.7559 | 0.015 | 0.0006 | 125                                            | 4.9213 | 0.020 | 0.0008 | 39.69 <sup>(2)</sup>                                 | 1.562 | 39.69      | 1.562 | 10    | 1 1/16 | 10.52 | 0.414 | 1.901 | 4.19 | 43500                                | 9800  | 71000                                                  | 16000 |     |      |
| GW214PPB2               | 4-        | 70.00                                          | 2.7559 | 0.015 | 0.0006 | 125                                            | 4.9213 | 0.020 | 0.0008 | 39.69 <sup>(2)</sup>                                 | 1.562 | 39.69      | 1.562 | 10    | 1 1/16 | 10.52 | 0.414 | 1.796 | 3.96 | 43500                                | 9800  | 71000                                                  | 16000 |     |      |
| GW214PPB5               | 1-        | 70.00                                          | 2.7559 | 0.015 | 0.0006 | 125                                            | 4.9213 | 0.020 | 0.0008 | 61.90 <sup>(2)</sup>                                 | 2.438 | 39.69      | 1.562 | 10    | 1 1/16 | 10.52 | 0.414 | 2.155 | 4.75 | 43500                                | 9800  | 71000                                                  | 16000 |     |      |
| GW216PPB3               | 2-3       | 76.45                                          | 3.0100 | 0.250 | 0.0100 | 140                                            | 5.5118 | 0.020 | 0.0008 | 63.50 <sup>(2)</sup>                                 | 2.500 | 30.00      | 1.181 | 11    | 23/32  | 6.10  | 0.240 | —     | —    | 54000                                | 12200 | 81000                                                  | 18300 |     |      |
| GW216PP5                | 3-3       | 63.88                                          | 2.5150 | 0.250 | 0.0100 | 140                                            | 5.5118 | 0.020 | 0.0008 | 63.50 <sup>(2)</sup>                                 | 2.500 | 30.00      | 1.181 | 11    | 23/32  | 6.10  | 0.240 | —     | —    | 54000                                | 12200 | 81000                                                  | 18300 |     |      |

### SQUARE BORE

|                         |     | Shaft Size |       |     |        |       |        |                      |       |       |       |     |        |       |       |       |      |       |       |       |       |
|-------------------------|-----|------------|-------|-----|--------|-------|--------|----------------------|-------|-------|-------|-----|--------|-------|-------|-------|------|-------|-------|-------|-------|
| SQUARE BORE             |     | mm         | in.   | mm  | in.    | mm    | in.    | mm                   | in.   | mm    | in.   | in. | mm     | in.   | kg    | lbs.  | N    | lbs.  | N     | lbs.  |       |
| GW208PPB6               | 2-1 | 25.4       | 1     | 80  | 3.1496 | 0.013 | 0.0005 | 36.53                | 1.438 | 21.00 | 0.827 | 9   | 1/2    | 5.66  | 0.223 | 0.794 | 1.75 | 19900 | 4500  | 36800 | 8300  |
| GW208PPB5               | 2-1 | 28.6       | 1 1/8 | 80  | 3.1496 | 0.013 | 0.0005 | 36.53                | 1.438 | 21.00 | 0.827 | 9   | 1/2    | 5.66  | 0.223 | 0.667 | 1.47 | 19900 | 4500  | 36800 | 8300  |
| GW208PPB8               | 1-1 | 28.6       | 1 1/8 | 80  | 3.1496 | 0.013 | 0.0005 | 36.53                | 1.438 | 30.18 | 1.188 | 9   | 1/2    | 8.36  | 0.329 | 0.794 | 1.75 | 19900 | 4500  | 36800 | 8300  |
| GW208PPB17              | 3-1 | 28.6       | 1 1/8 | 80  | 3.3755 | 0.013 | 0.0005 | 36.53                | 1.438 | 30.18 | 1.188 | 9   | 1/2    | 8.28  | 0.326 | 0.925 | 2.04 | 19900 | 4500  | 36800 | 8300  |
| GW209PPB5               | 1-2 | 31.8       | 1 1/4 | 85  | 3.3456 | 0.015 | 0.0006 | 36.53                | 1.438 | 30.18 | 1.188 | 9   | 1/2    | 8.79  | 0.346 | 0.794 | 1.75 | 20200 | 4550  | 36800 | 8300  |
| GW209PPB8               | 2-2 | 31.8       | 1 1/4 | 85  | 3.3456 | 0.015 | 0.0006 | 36.53                | 1.438 | 22.00 | 0.866 | 9   | 1/2    | 4.55  | 0.179 | 0.748 | 1.65 | 20200 | 4550  | 36800 | 8300  |
| GW210PP4                | 3-  | 28.6       | 1 1/8 | 90  | 3.5433 | 0.015 | 0.0006 | 30.18                | 1.188 | 30.18 | 1.188 | 10  | 1/2    | 9.02  | 0.355 | 1.048 | 2.31 | 23000 | 5200  | 39900 | 9000  |
| GW210PPB4               | 4-  | 28.6       | 1 1/8 | 90  | 3.5433 | 0.015 | 0.0006 | 30.18                | 1.188 | 30.18 | 1.188 | 10  | 1/2    | 9.02  | 0.355 | 0.794 | 1.75 | 23000 | 5200  | 39900 | 9000  |
| GW211PP3                | 3-2 | 38.1       | 1 1/2 | 100 | 3.9370 | 0.015 | 0.0006 | 33.34 <sup>(2)</sup> | 1.312 | 33.34 | 1.312 | 10  | 9/16   | 9.96  | 0.392 | 1.266 | 2.79 | 29000 | 6550  | 48800 | 11000 |
| GW211PPB3               | 4-2 | 38.1       | 1 1/2 | 100 | 3.9370 | 0.015 | 0.0006 | 33.34 <sup>(2)</sup> | 1.312 | 33.34 | 1.312 | 10  | 9/16   | 9.96  | 0.392 | 1.207 | 2.66 | 29000 | 6550  | 48800 | 11000 |
| GW211PP17               | 3-2 | 38.1       | 1 1/2 | 100 | 3.9370 | 0.015 | 0.0006 | 44.45 <sup>(2)</sup> | 1.750 | 33.34 | 1.312 | 10  | 9/16   | 9.96  | 0.392 | 1.188 | 2.62 | 29000 | 6550  | 48800 | 11000 |
| GW214PPB4               | 4-  | 50.8       | 2     | 125 | 4.9213 | 0.020 | 0.0008 | 39.69 <sup>(2)</sup> | 1.562 | 39.69 | 1.562 | 10  | 1 1/16 | 10.52 | 0.414 | 2.155 | 4.75 | 43500 | 9800  | 71000 | 16000 |
| GW216PPB4               | 2-3 | 44.4       | 1 3/4 | 140 | 5.5118 | 0.020 | 0.0008 | 63.50 <sup>(2)</sup> | 2.500 | 30.00 | 1.181 | 11  | 23/32  | 6.10  | 0.240 | —     | —    | 54000 | 12200 | 81000 | 18300 |
| GW216PP2 <sup>(1)</sup> | 2-3 | 57.2       | 2 1/4 | 140 | 5.5118 | 0.020 | 0.0008 | 63.50 <sup>(2)</sup> | 2.500 | 30.00 | 1.181 | 11  | 23/32  | 6.10  | 0.240 | —     | —    | 54000 | 12200 | 81000 | 18300 |
| GW226PPB2               | 2-3 | 57.2       | 2 1/4 | 140 | 5.5118 | 0.020 | 0.0008 | 63.50 <sup>(2)</sup> | 2.500 | 30.00 | 1.181 | 11  | 23/32  | 6.10  | 0.240 | —     | —    | 54000 | 12200 | 81000 | 18300 |

<sup>(1)</sup> Cylindrical O.D.

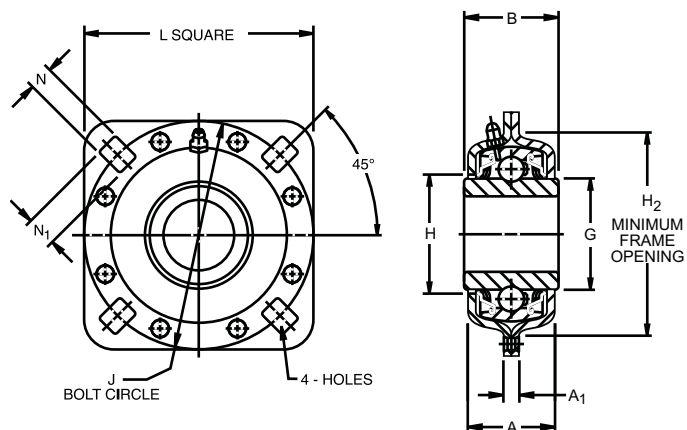
<sup>(2)</sup> Inner and outer width tolerance is .00 mm to -.15 mm (.000" to -.006").

<sup>(3)</sup> Based on 10<sup>6</sup> revolutions of calculated fatigue life.



## TRI-PLY SERIES DISK HARROW UNITS

- The answer to versatility in design.
- For extra-special design needs, this unit incorporates a Tri-Ply bearing mounted in two stampings, riveted together with two o-rings.
- Available in two basic size groups, one incorporating a 209 and the other a 211 bearing.
- Both size groups offer these features:
  - Dynamic alignment capability ( $\pm 3^\circ$ ).
  - Shroud effect from close clearance of stamping to inner ring.
  - Relubrication.
  - One unit piece for ease of handling and assembly.
  - Fitting flange mates with outer ring milled recess, preventing possibility of outer ring circumferential movement.
  - Stampings are case hardened to minimize wear.
  - Units are equipped with nylon retainer, molded one-piece seals and patented notched outer ring seal grooves.



### 209 METRIC SERIES

| Unit Number | Shaft Diameter | B  | H <sub>2</sub> | J     | N <sub>1</sub> | N    | L     | G Ref. | H    | A    | A <sub>1</sub> | Static Load Rating C <sub>0</sub> | Extended Dynamic Load Rating C <sub>E</sub> <sup>(1)</sup> |
|-------------|----------------|----|----------------|-------|----------------|------|-------|--------|------|------|----------------|-----------------------------------|------------------------------------------------------------|
|             | mm             | mm | mm             | mm    | mm             | mm   | mm    | mm     | mm   | mm   | mm             | N                                 | N                                                          |
| DHU 30S-209 | 30 SQ.         | 43 | 101.6          | 127.0 | 16.7           | 13.5 | 127.0 | 57.9   | 59.9 | 42.5 | 6.7            | 18000                             | 36500                                                      |
| DHU 40R-209 | 40 SQ.         | 43 | 101.6          | 127.0 | 16.7           | 13.5 | 127.0 | 57.9   | 59.9 | 42.5 | 6.7            | 18000                             | 36500                                                      |
| DHU 45R-209 | 45 RD.         | 43 | 101.6          | 127.0 | 16.7           | 13.5 | 127.0 | 57.9   | 59.9 | 42.5 | 6.7            | 18000                             | 36500                                                      |

### 211 METRIC SERIES

|             |        |    |       |       |      |      |       |      |      |      |     |       |       |
|-------------|--------|----|-------|-------|------|------|-------|------|------|------|-----|-------|-------|
| DHU 40S-211 | 40 SQ. | 51 | 113.5 | 139.7 | 15.1 | 13.5 | 139.7 | 69.7 | 73.0 | 49.2 | 7.5 | 25000 | 48000 |
| DHU 50R-211 | 50 RD. | 51 | 113.5 | 139.7 | 15.1 | 13.5 | 139.7 | 69.7 | 73.0 | 49.2 | 7.5 | 25000 | 48000 |
| DHU 55R-211 | 55 RD. | 51 | 113.5 | 139.7 | 15.1 | 13.5 | 139.7 | 69.7 | 73.0 | 49.2 | 7.5 | 25000 | 48000 |

### 209 SERIES

| Unit Number  | Shaft Diameter | B       | H <sub>2</sub> | J   | N <sub>1</sub> | N     | L   | G Ref. | H       | A       | A <sub>1</sub> | Static Load Rating C <sub>0</sub> | Extended Dynamic Load Rating C <sub>E</sub> <sup>(1)</sup> |
|--------------|----------------|---------|----------------|-----|----------------|-------|-----|--------|---------|---------|----------------|-----------------------------------|------------------------------------------------------------|
|              | in.            | in.     | in.            | in. | in.            | in.   | in. | in.    | in.     | in.     | in.            | lbs.                              | lbs.                                                       |
| DHU 1½ R-209 | 1 ½ RD.        | 1 11/16 | 4              | 5   | 21/32          | 17/32 | 5   | 2.279  | 2 23/64 | 1 43/64 | 17/64          | 4000                              | 8150                                                       |
| DHU 1⅝ S-209 | 1 ⅝ SQ.        | 1 11/16 | 4              | 5   | 21/32          | 17/32 | 5   | 2.279  | 2 23/64 | 1 43/64 | 17/64          | 4000                              | 8150                                                       |
| DHU 1¾ R-209 | 1 ¾ RD.        | 1 11/16 | 4              | 5   | 21/32          | 17/32 | 5   | 2.279  | 2 23/64 | 1 43/64 | 17/64          | 4000                              | 8150                                                       |
| DHU 1¼ S-209 | 1 ¼ SQ.        | 1 ¾     | 4              | 5   | 21/32          | 17/32 | 5   | 2.279  | 2 23/64 | 1 43/64 | 17/64          | 4000                              | 8150                                                       |
| DHU 491 A    | 1 ¾ RD.        | 1 ¾     | 4              | 5   | 21/32          | 17/32 | 5   | 2.279  | 2 23/64 | 1 43/64 | 17/64          | 4000                              | 8150                                                       |

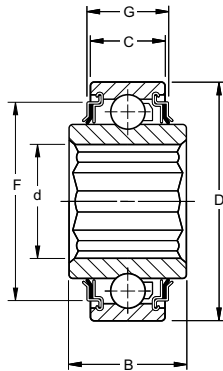
### 211 SERIES

|              |         |        |   |     |       |       |     |       |       |         |       |      |       |
|--------------|---------|--------|---|-----|-------|-------|-----|-------|-------|---------|-------|------|-------|
| DHU 1½ S-211 | 1 ½ SQ. | 2      | 4 | 5 ½ | 19/32 | 17/32 | 5 ½ | 2.746 | 2 7/8 | 1 15/16 | 19/64 | 5600 | 10800 |
| DHU 1¾ R-211 | 1 ¾ RD. | 2 ⅞    | 4 | 5 ½ | 19/32 | 17/32 | 5 ½ | 2.746 | 2 7/8 | 1 15/16 | 19/64 | 5600 | 10800 |
| DHU 2⅞ R-211 | 2 ⅞ RD. | 2 3/16 | 4 | 5 ½ | 19/32 | 17/32 | 5 ½ | 2.746 | 2 7/8 | 1 15/16 | 19/64 | 5600 | 10800 |

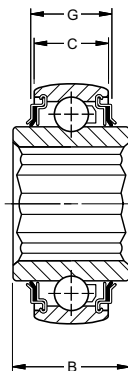
<sup>(2)</sup> Based on 10<sup>6</sup> revolutions of calculated fatigue life.

## HEX BORE BEARINGS

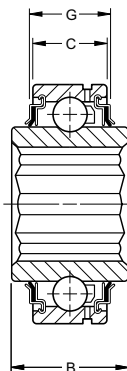
- Designed to be used for outer or inner ring rotation in low-speed, moderately-loaded applications, primarily in agricultural implements and conveyors.
- Tolerances of the hex bore are suitable for mounting on cold rolled hex shafting.
- Main advantage is ease of mounting. Except for axial positioning by adjacent parts, no collars, setscrews or other locking devices are required to lock the inner ring to the hex shaft.
- Utilize the R-Type shroud seal.



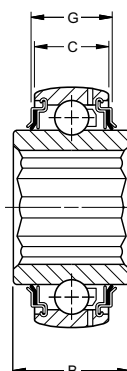
Type 1



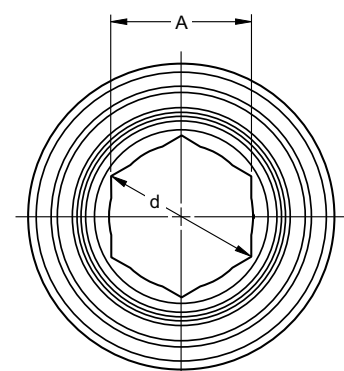
Type 2



Type 3



Type 4



| Bearing Number             | Type | Hex Shaft Size | A            |                                    | Hex Bore                              |                                       | d                          |                          | Outside Diameter D |        | Width |        | F                 |       | G     | Balls | Wt.   | Static Load Rating C <sub>0</sub> |       | Extended Dynamic Load Rating C <sub>e</sub> <sup>(3)</sup> |      |      |       |      |       |      |       |      |
|----------------------------|------|----------------|--------------|------------------------------------|---------------------------------------|---------------------------------------|----------------------------|--------------------------|--------------------|--------|-------|--------|-------------------|-------|-------|-------|-------|-----------------------------------|-------|------------------------------------------------------------|------|------|-------|------|-------|------|-------|------|
|                            |      |                | Across Flats | tolerance -0.00 mm +0.000" to plus | tolerance +0.000 mm +0.0000" to minus | tolerance +0.000 mm +0.0000" to minus | +0.000 mm +0.0000" C Outer | -0.12 mm -0.005" B Inner |                    |        |       |        |                   |       |       |       |       |                                   |       |                                                            |      |      |       |      |       |      |       |      |
|                            |      |                |              |                                    |                                       |                                       |                            |                          |                    |        |       |        |                   |       |       |       |       |                                   |       |                                                            |      |      |       |      |       |      |       |      |
|                            |      |                | mm           | in.                                | mm                                    | in.                                   | mm                         | in.                      | mm                 | in.    | mm    | in.    | mm                | in.   | mm    | in.   | in.   | kg                                | lbs.  | N                                                          | lbs. | N    | lbs.  |      |       |      |       |      |
| NON-RELUBRICATABLE TYPE    |      |                |              |                                    |                                       |                                       |                            |                          |                    |        |       |        |                   |       |       |       |       |                                   |       |                                                            |      |      |       |      |       |      |       |      |
| 202KRR3                    | 1    | 9/16           | 14.30        | 0.563                              | 0.13                                  | 0.005                                 | 16.46                      | 0.648                    | 35                 | 1.3780 | 0.013 | 0.0005 | 11                | 0.433 | 13.00 | 0.512 | —     | —                                 | —     | —                                                          | 8    | 7/32 | 0.054 | 0.12 | 4400  | 1000 | 10600 | 2360 |
| 204KRR2                    | 1    | 11/16          | 17.65        | 0.695                              | 0.13                                  | 0.005                                 | 20.22                      | 0.796                    | 47                 | 1.8504 | 0.013 | 0.0005 | 14                | 0.551 | 20.96 | 0.825 | —     | —                                 | —     | —                                                          | 8    | 5/16 | 0.145 | 0.32 | 6200  | 1400 | 14300 | 3200 |
| 205KRR2                    | 1    | 7/8            | 22.25        | 0.876                              | 0.13                                  | 0.005                                 | 25.65                      | 1.010                    | 52                 | 2.0472 | 0.013 | 0.0005 | 15                | 0.591 | 25.40 | 1.000 | —     | —                                 | —     | —                                                          | 9    | 5/16 | 0.200 | 0.44 | 6950  | 1560 | 15600 | 3450 |
| 205KRRB2                   | 2    | 7/8            | 22.25        | 0.876                              | 0.13                                  | 0.005                                 | 25.65                      | 1.010                    | 52                 | 2.0472 | 0.013 | 0.0005 | 15                | 0.591 | 25.40 | 1.000 | —     | —                                 | —     | —                                                          | 9    | 5/16 | 0.200 | 0.44 | 6950  | 1560 | 15600 | 3450 |
| 205PPB13 <sup>(1)</sup>    | 2    | 7/8            | 22.25        | 0.876                              | 0.13                                  | 0.005                                 | 25.65                      | 1.010                    | 52                 | 2.0472 | 0.013 | 0.0005 | 15                | 0.591 | 25.40 | 1.000 | 42.67 | 1.680                             | 20.19 | 0.795                                                      | 9    | 5/16 | 0.200 | 0.44 | 6950  | 1560 | 15600 | 3450 |
| 206KPP3 <sup>(1)</sup>     | 1    | 1              | 25.43        | 1.001                              | 0.13                                  | 0.005                                 | 29.31                      | 1.154                    | 62                 | 2.4409 | 0.013 | 0.0005 | 16                | 0.630 | 24.00 | 0.945 | 52.07 | 2.050                             | 19.56 | 0.770                                                      | 9    | 3/8  | 0.345 | 0.76 | 10000 | 2280 | 21600 | 4800 |
| 206KPPB3 <sup>(1)</sup>    | 2    | 1              | 25.43        | 1.001                              | 0.13                                  | 0.005                                 | 29.31                      | 1.154                    | 62                 | 2.4409 | 0.013 | 0.0005 | 18                | 0.709 | 24.00 | 0.945 | 52.07 | 2.050                             | 19.56 | 0.770                                                      | 9    | 3/8  | 0.345 | 0.76 | 10000 | 2280 | 21600 | 4800 |
| 206KRR6                    | 1    | 1              | 25.43        | 1.001                              | 0.13                                  | 0.005                                 | 29.31                      | 1.154                    | 62                 | 2.4409 | 0.013 | 0.0005 | 16                | 0.630 | 24.00 | 0.945 | 52.07 | 2.050                             | 19.56 | 0.770                                                      | 9    | 3/8  | 0.341 | 0.75 | 10000 | 2280 | 21600 | 4800 |
| 206KRRB6                   | 2    | 1              | 25.43        | 1.001                              | 0.13                                  | 0.005                                 | 29.31                      | 1.154                    | 62                 | 2.4409 | 0.013 | 0.0005 | 18                | 0.709 | 24.00 | 0.945 | 52.07 | 2.050                             | 19.56 | 0.770                                                      | 9    | 3/8  | 0.341 | 0.75 | 10000 | 2280 | 21600 | 4800 |
| 207KPP3                    | 1    | 1 1/4          | 31.77        | 1.251                              | 0.13                                  | 0.005                                 | 36.40                      | 1.433                    | 72                 | 2.8346 | 0.013 | 0.0005 | 17                | 0.669 | 37.70 | 1.484 | 60.35 | 2.376                             | 19.68 | 0.775                                                      | 9    | 7/16 | 0.454 | 1.00 | 13700 | 3050 | 28500 | 6400 |
| 207KPPB3                   | 2    | 1 1/4          | 31.77        | 1.251                              | 0.13                                  | 0.005                                 | 36.40                      | 1.433                    | 72                 | 2.8346 | 0.013 | 0.0005 | 17                | 0.669 | 37.70 | 0.984 | 60.35 | 2.376                             | 19.68 | 0.775                                                      | 9    | 7/16 | 0.395 | 0.87 | 13700 | 3050 | 28500 | 6400 |
| 207KRRB9                   | 2    | 1 1/8          | 28.60        | 1.126                              | 0.13                                  | 0.005                                 | 32.97                      | 1.298                    | 72                 | 2.8346 | 0.013 | 0.0005 | 17                | 0.669 | 37.70 | 1.484 | 60.35 | 2.376                             | 19.68 | 0.775                                                      | 9    | 7/16 | 0.454 | 1.00 | 13700 | 3050 | 28500 | 6400 |
| 207KRRB12                  | 2    | 1 1/8          | 28.60        | 1.126                              | 0.13                                  | 0.005                                 | 32.97                      | 1.298                    | 72                 | 2.8346 | 0.013 | 0.0005 | 17                | 0.669 | 25.00 | 0.984 | 60.35 | 2.376                             | 19.68 | 0.775                                                      | 9    | 7/16 | 0.395 | 0.87 | 13700 | 3050 | 28500 | 6400 |
| 207KRR17                   | 1    | 1 1/4          | 31.77        | 1.251                              | 0.13                                  | 0.005                                 | 36.65                      | 1.443                    | 72                 | 2.8346 | 0.013 | 0.0005 | 17                | 0.669 | 25.00 | 0.984 | 60.35 | 2.376                             | 19.68 | 0.775                                                      | 9    | 7/16 | 0.395 | 0.87 | 13700 | 3050 | 28500 | 6400 |
| 207KRRB17                  | 2    | 1 1/4          | 31.77        | 1.251                              | 0.13                                  | 0.005                                 | 36.65                      | 1.443                    | 72                 | 2.8346 | 0.013 | 0.0005 | 17                | 0.669 | 25.00 | 0.984 | 60.35 | 2.376                             | 19.68 | 0.775                                                      | 9    | 7/16 | 0.395 | 0.87 | 13700 | 3050 | 28500 | 6400 |
| W208PPB16 <sup>(1)</sup>   | 2    | 1 1/4          | 31.77        | 1.251                              | 0.13                                  | 0.005                                 | 36.65                      | 1.443                    | 80                 | 3.1496 | 0.013 | 0.0005 | 18                | 0.709 | 36.53 | 1.438 | 68.43 | 2.694                             | 25.27 | 0.995                                                      | 9    | 1/2  | 0.658 | 1.45 | 17600 | 4000 | 36000 | 8150 |
| W208KRRB6                  | 2    | 1 3/8          | 34.95        | 1.376                              | 0.13                                  | 0.005                                 | 40.30                      | 1.587                    | 80                 | 3.1496 | 0.013 | 0.0005 | 21                | 0.827 | 36.53 | 1.438 | 68.43 | 2.694                             | 23.54 | 0.927                                                      | 9    | 1/2  | —     | —    | 17600 | 4000 | 36000 | 8150 |
| W208KRR8                   | 1    | 1 1/4          | 31.77        | 1.251                              | 0.13                                  | 0.005                                 | 36.65                      | 1.443                    | 80                 | 3.1496 | 0.013 | 0.0005 | 18                | 0.709 | 36.53 | 1.438 | 68.43 | 2.694                             | 20.45 | 0.805                                                      | 9    | 1/2  | 0.658 | 1.45 | 17600 | 4000 | 36000 | 8150 |
| 209KRRB2                   | 2    | 1 1/2          | 38.12        | 1.501                              | 0.13                                  | 0.005                                 | 43.99                      | 1.732                    | 85                 | 3.3456 | 0.015 | 0.0006 | 19                | 0.748 | 30.00 | 1.181 | 73.86 | 2.908                             | 23.27 | 0.916                                                      | 9    | 1/2  | 0.576 | 1.27 | 17600 | 4000 | 36000 | 8150 |
| W210PPB7 <sup>(1)</sup>    | 2    | 1 5/8          | 41.30        | 1.626                              | 0.13                                  | 0.005                                 | 47.65                      | 1.876                    | 90                 | 3.5433 | 0.015 | 0.0006 | 30.18             | 1.188 | 30.18 | 1.188 | —     | —                                 | —     | —                                                          | 10   | 1/2  | 0.794 | 1.75 | 19600 | 4500 | 39000 | 8800 |
| RELUBRICATABLE TYPE        |      |                |              |                                    |                                       |                                       |                            |                          |                    |        |       |        |                   |       |       |       |       |                                   |       |                                                            |      |      |       |      |       |      |       |      |
| G206KPP4 <sup>(1)</sup>    | 3    | 1              | 25.43        | 1.001                              | 0.13                                  | 0.005                                 | 29.26                      | 1.152                    | 62                 | 2.4409 | 0.13  | 0.005  | 18                | 0.709 | 24.00 | 0.945 | —     | —                                 | —     | —                                                          | 9    | 3/8  | 0.281 | 0.62 | 10000 | 2280 | 21600 | 4800 |
| G206KPPB4 <sup>(1)</sup>   | 4    | 1              | 25.43        | 1.001                              | 0.13                                  | 0.005                                 | 29.26                      | 1.152                    | 62                 | 2.4409 | 0.13  | 0.005  | 18                | 0.709 | 24.00 | 0.945 | 52.07 | 2.050                             | 19.56 | 0.770                                                      | 9    | 3/8  | 0.277 | 0.61 | 10000 | 2280 | 21600 | 4800 |
| G206KRRB6                  | 4    | 1              | 25.43        | 1.001                              | 0.13                                  | 0.005                                 | 29.26                      | 1.152                    | 62                 | 2.4409 | 0.13  | 0.005  | 18                | 0.709 | 24.00 | 0.945 | 52.07 | 2.050                             | 19.56 | 0.770                                                      | 9    | 3/8  | 0.268 | 0.59 | 10000 | 2280 | 21600 | 4800 |
| G207KPPB2 <sup>(1)</sup>   | 4    | 1 1/8          | 28.60        | 1.126                              | 0.13                                  | 0.005                                 | 32.97                      | 1.298                    | 72                 | 2.8346 | 0.13  | 0.005  | 19                | 0.748 | 37.70 | 1.484 | 60.32 | 2.375                             | 25.40 | 1.000                                                      | 9    | 7/16 | 0.454 | 1.00 | 13700 | 3050 | 28500 | 6400 |
| GW208KRRB5                 | 4    | 1 1/4          | 31.77        | 1.251                              | 0.13                                  | 0.005                                 | 36.65                      | 1.443                    | 80                 | 3.1496 | 0.13  | 0.005  | 21                | 0.827 | 36.51 | 1.438 | 60.35 | 2.694                             | 22.43 | 0.883                                                      | 9    | 1/2  | 0.635 | 1.40 | 17600 | 4000 | 36000 | 8150 |
| GW208PPB22 <sup>(1)</sup>  | 4    | 1 1/4          | 31.88        | 1.255                              | 0.13                                  | 0.005                                 | 36.75                      | 1.447                    | 80                 | 3.1496 | 0.13  | 0.005  | 21                | 0.827 | 36.51 | 1.438 | 52.07 | 2.050                             | 28.32 | 1.115                                                      | 9    | 1/2  | 0.681 | 1.50 | 17600 | 4000 | 36000 | 8150 |
| GC1200KPPB2 <sup>(1)</sup> |      | 1 3/4          | 44.48        | 1.751                              | 0.13                                  | 0.005                                 | 51.31                      | 2.020                    | 100                | 3.9370 | 0.015 | 0.0006 | 24 <sup>(2)</sup> | 0.945 | 57.15 | 2.250 | 86.11 | 3.390                             | 29.01 | 1.142                                                      | 10   | 9/16 | 1.521 | 3.35 | 19600 | 4500 | 39000 | 8800 |

<sup>(1)</sup> Tri-Ply Seal bearing.

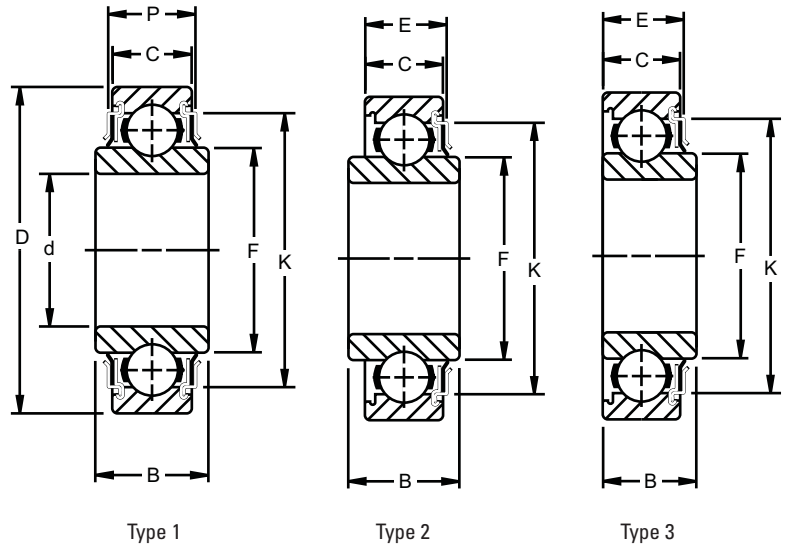
<sup>(2)</sup> Inner and outer ring tolerance is .00 mm to -.15 mm (.000" to -.006").

<sup>(3)</sup> Based on 10<sup>6</sup> revolutions of calculated fatigue life.



## LIGHT 200 SERIES R-SEAL TYPE

- Consists of deep groove, Conrad-type bearings.
- Incorporates a flare-out, contact R-Seal.
- Synthetic rubber impregnated washer is enclosed between two metal shields, providing excellent protection against contaminants.
- Because of the heavy contact seal, this series is normally employed in moderate-speed service.



## DIMENSIONS – TOLERANCES

| Bearing Type Number |   | Bore d |        |       |        | Outside Diameter D |        |       |        | Width                |       |       |       | E      |       | P     |       | K     |       | Fillet Radius <sup>(1)</sup> |       | F     |       | Static Load Rating C <sub>0</sub> |      | Extended Dynamic Load Rating C <sub>e</sub> <sup>(3)</sup> |       |
|---------------------|---|--------|--------|-------|--------|--------------------|--------|-------|--------|----------------------|-------|-------|-------|--------|-------|-------|-------|-------|-------|------------------------------|-------|-------|-------|-----------------------------------|------|------------------------------------------------------------|-------|
|                     |   | mm     | in.    | mm    | in.    | mm                 | in.    | mm    | in.    | mm                   | in.   | mm    | in.   | mm     | in.   | mm    | in.   | mm    | in.   | mm                           | in.   | mm    | in.   | N                                 | lbs. | N                                                          | lbs.  |
| 203KR2              | 3 | 15.883 | 0.6253 | 0.008 | 0.0003 | 40                 | 1.5748 | 0.013 | 0.0005 | 14.00                | 0.551 | 12    | 0.472 | —      | —     | —     | —     | —     | —     | 0.6                          | 0.024 | 24.44 | 0.962 | 4700                              | 1060 | 10900                                                      | 2450  |
| 203KRR2             | 1 | 16.256 | 0.6400 | 0.130 | 0.0005 | 40                 | 1.5748 | 0.013 | 0.0005 | 18.29                | 0.720 | 12    | 0.472 | —      | —     | —     | —     | —     | —     | 0.6                          | 0.024 | 24.44 | 0.962 | 4700                              | 1060 | 10900                                                      | 2450  |
| 203KRR5             | 1 | 13.081 | 0.5150 | 0.130 | 0.0005 | 40                 | 1.5748 | 0.013 | 0.0005 | 18.29                | 0.720 | 12    | 0.472 | —      | —     | —     | —     | —     | —     | 0.6                          | 0.024 | 24.44 | 0.962 | 4700                              | 1060 | 10900                                                      | 2450  |
| 203KRR7             | 1 | 17     | 0.6693 | 0.008 | 0.0003 | 40                 | 1.5748 | 0.013 | 0.0005 | 16.61                | 0.654 | 12    | 0.472 | —      | —     | —     | —     | —     | —     | 0.6                          | 0.024 | 24.44 | 0.962 | 4700                              | 1060 | 10900                                                      | 2450  |
| 204KR2              | 3 | 19.063 | 0.7505 | 0.013 | 0.0005 | 45.225             | 1.7805 | 0.013 | 0.0005 | 15.49                | 0.610 | 15.49 | 0.610 | —      | —     | —     | —     | —     | —     | 1                            | 0.039 | 28.73 | 1.131 | 6500                              | 1460 | 14400                                                      | 3250  |
| 204KRR3             | 1 | 20     | 0.7874 | 0.010 | 0.0004 | 47                 | 1.8504 | 0.013 | 0.0005 | 17.75                | 0.699 | 14    | 0.551 | —      | —     | —     | —     | —     | —     | 1                            | 0.039 | 28.73 | 1.131 | 6500                              | 1460 | 14400                                                      | 3250  |
| 205KR4              | 2 | 25.413 | 1.0005 | 0.013 | 0.0005 | 52                 | 2.0472 | 0.013 | 0.0005 | 25.40                | 1.000 | 15    | 0.591 | 15.875 | 0.625 | —     | —     | 42.67 | 1.68  | 1                            | 0.039 | 33.81 | 1.331 | 7800                              | 1760 | 16000                                                      | 3600  |
| 206KR7              | 2 | 30     | 1.1811 | 0.010 | 0.0004 | 62                 | 2.4409 | 0.013 | 0.0005 | 24.00                | 0.945 | 16    | 0.630 | 17.780 | 0.700 | —     | —     | 52.07 | 2.05  | 1                            | 0.039 | 40.28 | 1.586 | 11300                             | 2550 | 21800                                                      | 4900  |
| 206KRR8             | 1 | 30     | 1.1811 | 0.013 | 0.0004 | 62                 | 2.4409 | 0.013 | 0.0005 | 24.00                | 0.945 | 16    | 0.630 | —      | —     | 19.56 | 0.77  | 52.07 | 2.05  | 1                            | 0.039 | 39.09 | 1.539 | 11300                             | 2250 | 21800                                                      | 4900  |
| 207KRR              | 1 | 35     | 1.3780 | 0.013 | 0.0005 | 72                 | 2.8346 | 0.013 | 0.0005 | 25.00                | 0.984 | 17    | 0.669 | —      | —     | 19.68 | 0.775 | 60.35 | 2.376 | 1                            | 0.039 | 46.94 | 1.848 | 15000                             | 3450 | 29000                                                      | 6550  |
| 208KRR2             | 1 | 40     | 1.5748 | 0.013 | 0.0005 | 80                 | 3.1496 | 0.013 | 0.0005 | 27.00                | 1.063 | 21    | 0.827 | —      | —     | 21.31 | 0.839 | 68.45 | 2.695 | 1                            | 0.039 | 52.25 | 2.057 | 19800                             | 4460 | 36200                                                      | 8130  |
| 209KRR3             | 1 | 45     | 1.7717 | 0.013 | 0.0005 | 85                 | 3.3465 | 0.013 | 0.0005 | 27.00                | 1.063 | 21    | 0.827 | —      | —     | 24.18 | 0.952 | 72.42 | 2.851 | 1                            | 0.039 | 57.89 | 2.279 | 20500                             | 4600 | 36300                                                      | 8160  |
| 210KRR              | 1 | 50     | 1.9685 | 0.013 | 0.0005 | 90                 | 3.5433 | 0.015 | 0.0006 | 30.00                | 1.181 | 20    | 0.787 | —      | —     | 24.03 | 0.946 | 77.60 | 3.055 | 1                            | 0.039 | 62.81 | 2.473 | 23100                             | 5200 | 40000                                                      | 9000  |
| 212KRR              | 1 | 60     | 2.3622 | 0.015 | 0.0006 | 110                | 4.3307 | 0.015 | 0.0006 | 36.00 <sup>(2)</sup> | 1.417 | 22    | 0.886 | —      | —     | 30.02 | 1.182 | 99.87 | 3.932 | 1                            | 0.039 | 76.45 | 3.010 | 35500                             | 8000 | 58600                                                      | 13200 |

<sup>(1)</sup> Maximum shaft or housing fillet radius which bearing corners will clear.

<sup>(2)</sup> Inner and outer width tolerance is .00 mm to -.15 mm (.000" to .0006").

<sup>(3)</sup> Based on 10<sup>6</sup> revolutions of calculated fatigue life.

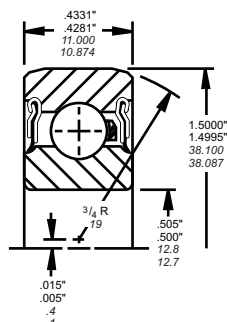
## FARM RADIAL SPECIALS

### BEARING NUMBER 202NPP9

#### SPECIAL FEATURES

- ½ in. Bore
- O.D. corner turned to a ¾ in. radius
- Special heavy stiff seals of Buna-N rubber
- Crimped-in seal

#### TYPICAL APPLICATIONS Cam Follower

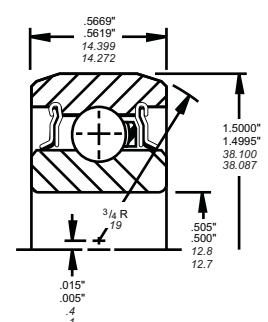


### BEARING NUMBER 202KRR7

#### SPECIAL FEATURES

- ½ in. Bore
- 1½ in. O.D.
- Thick outer ring

#### TYPICAL APPLICATIONS Cam Follower



Continued on the next page.

## FARM RADIAL SPECIALS (continued)

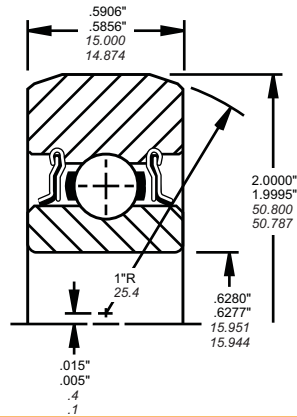
### BEARING NUMBER 203KRR3

#### SPECIAL FEATURES

- 5/8 in. Bore
- 2 in. O.D.
- Thick outer ring

#### TYPICAL APPLICATIONS

Cam Follower  
Guide Rolls for Baler Plunger



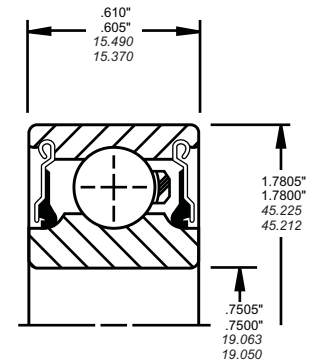
### BEARING NUMBER P204RR6

#### SPECIAL FEATURES

- 3/4 in. Bore
- 1.7805 in. O.D.
- Replaces 204KRNP2

#### TYPICAL APPLICATIONS

Mower Spindle



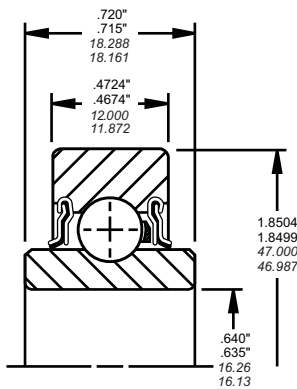
### BEARING NUMBER 203KRR6

#### SPECIAL FEATURES

- 5/8 in. Bore
- 47 mm O.D.
- Thick outer ring

#### TYPICAL APPLICATIONS

Idler Pulley  
Idler Sprocket



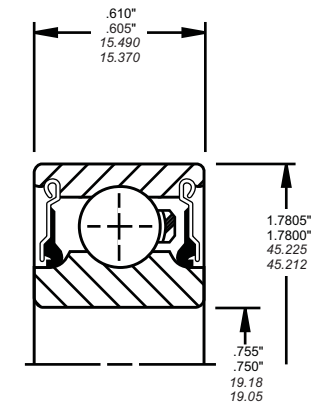
### BEARING NUMBER 204RR7

#### SPECIAL FEATURES

- 3/4 in. Bore
- 1.7805 in. O.D.
- Replaces 204KRNP3

#### TYPICAL APPLICATIONS

Rolling Cultivator  
Disk



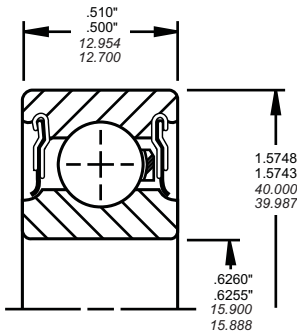
### BEARING NUMBER 203NPP9

#### SPECIAL FEATURES

- 5/8 in. Bore
- Width .500"

#### TYPICAL APPLICATIONS

Disk Grain Drill



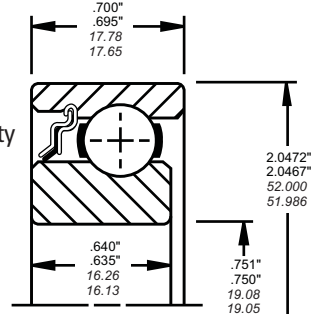
### BEARING NUMBER 205KR3

#### SPECIAL FEATURES

- 3/4 in. Bore
- Excellent moment load capacity available from special internal geometry of races
- Heavy contact flare-out type R-Seal with shroud cap

#### TYPICAL APPLICATIONS

Disk Hiller, Planter



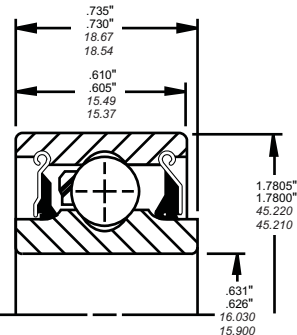
### BEARING NUMBER 204RY2

#### SPECIAL FEATURES

- 5/8 in. Bore
- Gothic Arch Race

#### TYPICAL APPLICATIONS

Planter  
Double Disk Opener



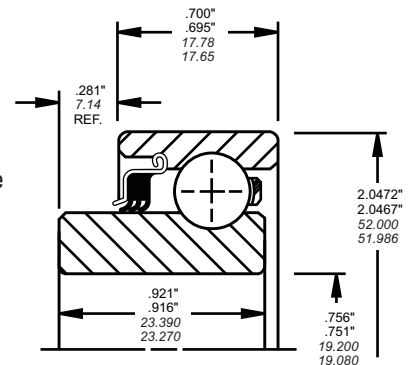
### BEARING NUMBER 205KP6

#### SPECIAL FEATURES

- 3/4 in. Bore
- Tri-Ply Seal on one side with shroud cap

#### TYPICAL APPLICATIONS

Rolling Cultivator



Continued on the next page.



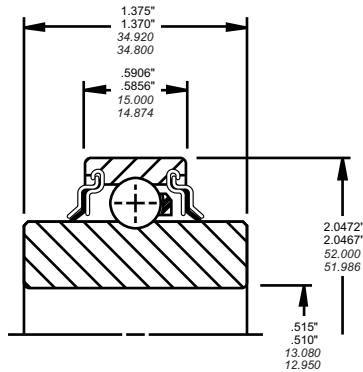
## FARM RADIAL SPECIALS (continued)

### BEARING NUMBER 205KRR6

#### SPECIAL FEATURES

- 1/2 in. Bore
- Extended inner ring

**TYPICAL APPLICATIONS**  
Potato Harvester

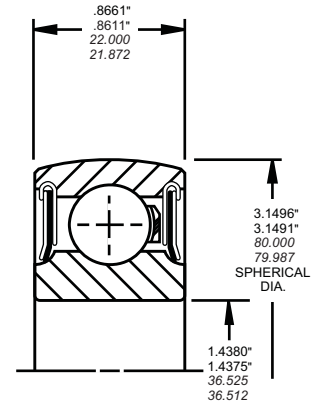


### BEARING NUMBER 208NPPB5

#### SPECIAL FEATURES

- 1 7/16 in. Bore
- PP Seals with shroud cap

**TYPICAL APPLICATIONS**  
Baler Crank Pin

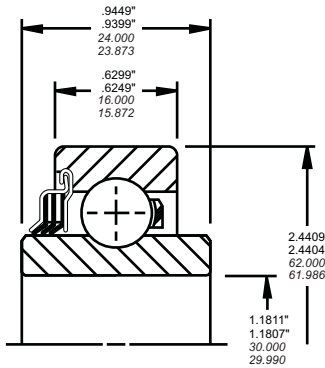


### BEARING NUMBER 206KP2

#### SPECIAL FEATURES

- Tri-Ply Seal on one side with shroud cap

**TYPICAL APPLICATIONS**  
Combine

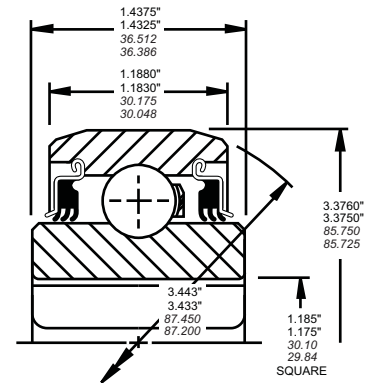


### BEARING NUMBER 208PPB12

#### SPECIAL FEATURES

- 1 1/8 in. Square Bore
- Molded Tri-Ply seal
- Heavy outer ring

**TYPICAL APPLICATIONS**  
Disk Harrow

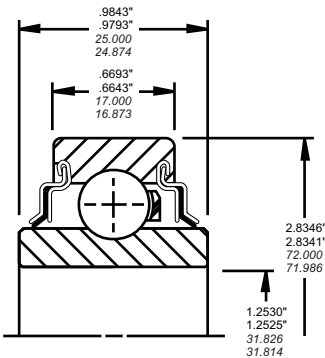


### BEARING NUMBER 207KRR14

#### SPECIAL FEATURES

- 1 1/4 in. Bore

**TYPICAL APPLICATIONS**  
Disk Harrow  
Transport Wheel

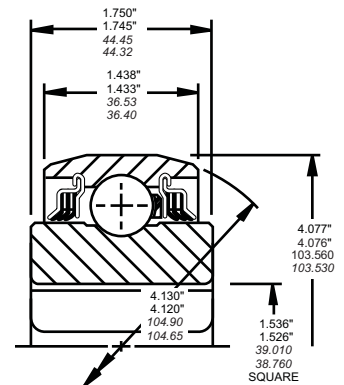


### BEARING NUMBER W211PPB6

#### SPECIAL FEATURES

- 1 1/2 in. Square Bore
- Tri-Ply seal with shroud cap
- Heavy outer ring

**TYPICAL APPLICATIONS**  
Disk Harrow

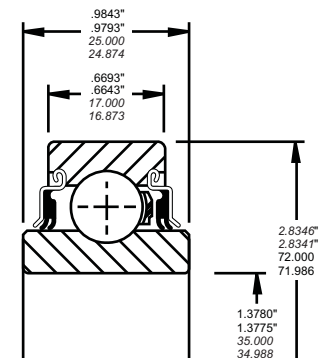


### BEARING NUMBER 207KYY

#### SPECIAL FEATURES

- Molded double lip seal

**TYPICAL APPLICATIONS**  
Disk Harrow  
Transport Wheel

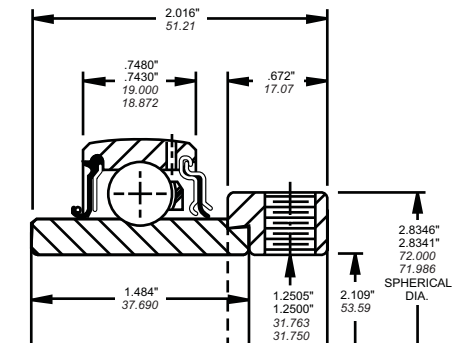


### BEARING NUMBER G1104KRXB2

#### SPECIAL FEATURES

- Oil Seal on one side

**TYPICAL APPLICATIONS**  
Chain Case



## SPECIAL BEARINGS

| Size               | Special Features                                                                                     | Typical Application                                              |
|--------------------|------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|
| 200KRR3            | Inner Ring Width .6457/.6407<br>One piece molded seals                                               | Windrower                                                        |
| J202KRR8           | Extended Inner Width .880/.875                                                                       | Tobacco Harvester                                                |
| 202NPP9            | 1/2" Bore-O.D. corner turned to<br>3/4" radius                                                       | Baler Cam Foller                                                 |
| P202NPP11          | Extra Wide Inner .5669/.5619 Bore<br>16mm .6299/.6296                                                | Cam Follower                                                     |
| P203KRR3           | 5/8" Bore 2" O.D. Heavy section<br>outer ring                                                        | Cam Follower Guide<br>Rolls for Baler Plunger                    |
| 203KRR6            | 5/8" Bore 47mm O.D. Heavy<br>section outer ring                                                      | Baler Pick-up                                                    |
| 203NPP9            | 5/8" Bore .500" width                                                                                | Disk Grain Drill Opener                                          |
| P203PP10           | .6255/.6260" Bore                                                                                    | Light Duty Disk Applications                                     |
| BB203KRR2<br>A2139 | Wide Inner .720/.715 Bore<br>.6400/.6350 Gothic arch races                                           | Rotary Hoe                                                       |
| P204KR2            | Bore .7505/.7500 Width .610/.605<br>O.D. 1.7805/1.7800                                               | Rotary Lawn Tractor<br>Blade Spindle Bearing                     |
| 204KRD4            | 5/8" Bore extended inner R-Seal<br>side .689/.685                                                    | Disk Opener Seed<br>Drill                                        |
| 204KRN5            | Bore .631/.626 Extended Inner<br>Width 1.125/1.120                                                   | Planter Opener Wheels                                            |
| P204KRRB5          | Bore .793/.788 Inner Width<br>.6988/.6938                                                            | Row Crop Machine                                                 |
| 204RR6<br>E8728    | Ground Bore .7505/.7500 Width<br>.610 O.D. 1.7805 Extra loose radial<br>play. Replaces 204KRN5 E8728 | Planter Gage Wheels                                              |
| P204RR6            | Same as above except standard<br>radial play. Replaces 204KRN5                                       | Garden Tractor Mower<br>Spindle                                  |
| H204KRN6           | Bore, O.D., Width same as<br>P204KR2                                                                 | Planter                                                          |
| 204RR7<br>E8728    | 3/4" Bore 1.7805 O.D. .610 Width<br>Extra loose radial play. Replaces<br>204KRN5 E8728               | Rolling Cultivator Disk<br>Sprockets, Pulleys and<br>Disk Opener |
| 205NPP2            | Inner Width .6594/.6544                                                                              | Miscellaneous                                                    |
| 205KR3             | 3/4" Bore , Special Races, Heavy<br>R-Seal with Shroud Cap                                           | Disk Hiller Planter and<br>Cotton Picker                         |
| 205KP6             | 3/4" Bore Tri-Ply seal on one side<br>with shroud cap                                                | Rolling Cultivator<br>Coulter Bearing                            |
| 205KRR6            | 1/2" Bore extended inner ring                                                                        | Windrow Digger                                                   |
| 205KRR7            | 1/2" Bore 1.500/1.495 Extended<br>Inner Ring with Offset race                                        | Cone Roller Beet and<br>Potato Harvester                         |
| 205PPB7<br>FS544   | 15/16" Bore Tri-Ply Seals<br>1.375/1.3760 Inner Width                                                | Rolling Cultivator                                               |
| G205KPRB11         | 7/8" Hex Bore, One R-Seal and<br>one Tri-Ply Seal Inner Width<br>1.000/.975                          | Corn Head Mechanism                                              |
| 205PP9<br>FS544    | 3/4" Bore Inner Width<br>1.3750/1.3700 Tri-Ply Seals                                                 | Cultivator                                                       |
| 205PP10            | 5/8" Bore Inner Width 1.375/1.370<br>Tri-Ply Seals                                                   | Potato Harvester                                                 |
| 205PP11            | 1" Bore Inner Width 1.187/1.185<br>Tri-Ply Seals                                                     | Marker Wheel                                                     |

| Size               | Special Features                                                                                                | Typical Application                       |
|--------------------|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|
| 205PP12            | 5/8" Bore Inner Width 1.500/1.495<br>Tri-Ply Seals                                                              | Cone Roller, Beet and<br>Potato Harvester |
| 205PP13            | 7/8" Hex Bore Inner Width<br>1.000/.995 Tri-Ply Seals                                                           | Corn Head Mechanism                       |
| 206KRD             | Offset Rings<br>Inner Width .748/.743<br>Outer Width .6299/.6249<br>R-Seal on extended inner side               | Combine                                   |
| 206KP2             | Tri-Ply Seal one side Wide Inner<br>Ring .9449/.9399                                                            | Combine                                   |
| 206KPP2            | Tri-Ply Seals Wide Inner Ring<br>.9449/.9399                                                                    | Forage Harvester                          |
| H206KRP2<br>A1391  | 3/4" Bore Wide Inner Ring .9449/<br>.9399 Extended on R-Seal side                                               | Disk Hiller and Bedders                   |
| 206KPPB3           | 1" Hex Bore Tri-Ply Seals Inner<br>Ring Width .9449/.9399                                                       | Disk Harrow                               |
| 206KRR4            | Large Inner Ring Bore Corner<br>to clear .090 R Shaft Fillet                                                    | Drive Shaft Bearing                       |
| 206KRRB3           | 1 1/8" Bore Flare out type R-Seal<br>with Shroud Cap                                                            | Corn Picker Snapping<br>Rolls             |
| 206KRRB9           | 1" Bore Inner Width .9450/.9400                                                                                 | Planter                                   |
| 206KRR13           | 3/4" Bore                                                                                                       | Idler Sprocket Bearing<br>for round Baler |
| 207KRR3            | Large Inner Ring Bore Corner to<br>clear .090 R Shaft Fillet                                                    | Trencher                                  |
| 207KRR8            | Large Inner Ring Bore Corner to<br>clear .090 R Shaft Fillet Narrow<br>Inner .8499/.8399"                       | Baler                                     |
| P207KRRB10         | 1 1/4" Bore Flare out type R-Seal<br>with Shroud Cap                                                            | Corn Picker Snapping<br>Rolls             |
| 207KRR12           | 1 1/8" Hex Bore                                                                                                 | Forage Harvester                          |
| P207KRN5B13        | Bore 1.2505/1.2500 Extended<br>Inner 1.000/.945 on R-Seal Side                                                  | Corn Picker Gathering<br>Chain            |
| 207KRR14           | Bore 1.2530/1.2525                                                                                              | Disk Harrow Transport<br>Wheel            |
| 207KYY             | Double Lip Seal                                                                                                 | Disk Harrow Transport<br>Wheel            |
| P208KRR4<br>A1849  | Bore 1.5312/1.5307 Large Inner<br>Ring Bore Corner to clear .090R<br>Shaft Fillet                               | Clutch Shaft                              |
| 208NPPB5           | Bore 1.4380/1.4375 Plya Seals<br>with Shroud Cap                                                                | Crank Pin for Square<br>Baler             |
| 209KRRB2           | 1" Hex Bore                                                                                                     | Round Baler                               |
| 304KR2             | Offset Inner Ring with .7087/<br>.7037 Width                                                                    | Tractor Water Pump                        |
| BB9105KRR2         | 1" Bore Inner Extended on one<br>side with 1.000/.995 Width Two<br>17/64 dia. holes in Inner Ring<br>180° apart | Hay Rake                                  |
| 9113KDD3<br>FS264C | Cap Extends Past Inner Face<br>on one side                                                                      | PTO Drive                                 |
| 9114KDD3<br>FS264C | Cap Extends Past Inner Face<br>on one side                                                                      | PTO Drive                                 |
| 9117K3             | Bore 3.2500/3.2492<br>O.D. 5.000/4.9992                                                                         | PTO Drive                                 |

D

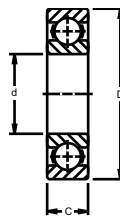




# BALL BEARINGS

## XLS/BIC SERIES – CONRAD TYPE

- An inch-dimension series with extra large diameters.
- Conrad or non-filling slot design.
- Compact sections for adaptability in applications where space is restricted.

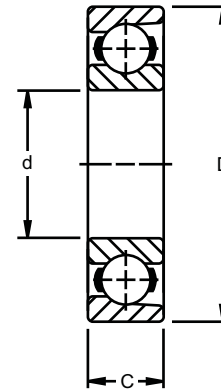


### DIMENSIONS – TOLERANCES

| Bearing Number | Bore d                                |         |       |        | Outside Diameter D                    |         |       |        | Width C                               |        |      |       | Fillet Radius <sup>(1)</sup> |       | Wt.   |      | Static Load Rating C <sub>0</sub> |       | Extended Dynamic Load Rating C <sub>E</sub> <sup>(2)</sup> |       |
|----------------|---------------------------------------|---------|-------|--------|---------------------------------------|---------|-------|--------|---------------------------------------|--------|------|-------|------------------------------|-------|-------|------|-----------------------------------|-------|------------------------------------------------------------|-------|
|                | tolerance +0.000 mm +0.0000" to minus |         |       |        | tolerance +0.000 mm +0.0000" to minus |         |       |        | tolerance +0.000 mm +0.0000" to minus |        |      |       |                              |       |       |      |                                   |       |                                                            |       |
|                | mm                                    | in.     | mm    | in.    | mm                                    | in.     | mm    | in.    | mm                                    | in.    | mm   | in.   | mm                           | in.   | kg    | lbs. | N                                 | lbs.  | N                                                          | lbs.  |
| XLS44K         | 69.850                                | 2.7500  | 0.015 | 0.0006 | 104.775                               | 4.1250  | 0.015 | 0.0006 | 17.460                                | 0.6875 | 0.13 | 0.005 | 1.2                          | 0.047 | 0.449 | 0.99 | 22000                             | 4900  | 28500                                                      | 6400  |
| XLS48K2        | 76.200                                | 3.0000  | 0.015 | 0.0006 | 114.300                               | 4.5000  | 0.015 | 0.0006 | 19.050                                | 0.7500 | 0.13 | 0.005 | 1.2                          | 0.047 | 0.567 | 1.25 | 33500                             | 7500  | 44000                                                      | 9800  |
| XLS52K         | 82.550                                | 3.2500  | 0.020 | 0.0008 | 120.650                               | 4.7500  | 0.020 | 0.0008 | 19.050                                | 0.7500 | 0.13 | 0.005 | 1.2                          | 0.047 | 0.626 | 1.38 | 30000                             | 6700  | 35500                                                      | 8000  |
| XLS56K         | 88.900                                | 3.5000  | 0.020 | 0.0008 | 127.000                               | 5.0000  | 0.020 | 0.0008 | 19.050                                | 0.7500 | 0.13 | 0.005 | 1.7                          | 0.065 | 0.671 | 1.48 | 31500                             | 7100  | 36500                                                      | 8150  |
| XLS60K2        | 95.250                                | 3.7500  | 0.020 | 0.0008 | 133.350                               | 5.2500  | 0.020 | 0.0008 | 19.050                                | 0.7500 | 0.13 | 0.005 | 1.6                          | 0.063 | 0.712 | 1.57 | 34500                             | 7800  | 39000                                                      | 8650  |
| XLS64K2        | 101.600                               | 4.0000  | 0.020 | 0.0008 | 142.849                               | 5.6240  | 0.025 | 0.0010 | 22.230                                | 0.8750 | 0.13 | 0.005 | 2.0                          | 0.080 | 0.794 | 1.75 | 41500                             | 9500  | 47500                                                      | 10600 |
| 41BIC196       | 104.648                               | 4.1250  | 0.020 | 0.0008 | 152.400                               | 6.0000  | 0.025 | 0.0010 | 22.230                                | 0.8750 | 0.20 | 0.008 | 2.5                          | 0.100 | 1.471 | 3.24 | 47500                             | 10600 | 55000                                                      | 12500 |
| 42BIC196       | 107.950                               | 4.2500  | 0.020 | 0.0008 | 152.400                               | 6.0000  | 0.025 | 0.0010 | 22.230                                | 0.8750 | 0.20 | 0.008 | 2.5                          | 0.100 | 1.374 | 3.03 | 47500                             | 10600 | 55000                                                      | 12500 |
| 43BIC206       | 111.125                               | 4.3750  | 0.020 | 0.0008 | 158.750                               | 6.2500  | 0.025 | 0.0010 | 22.230                                | 0.8750 | 0.20 | 0.008 | 2.5                          | 0.100 | 1.542 | 3.40 | 51000                             | 11400 | 57000                                                      | 12900 |
| XLS72KD2       | 114.300                               | 4.5000  | 0.020 | 0.0008 | 158.730                               | 6.2490  | 0.025 | 0.0010 | 22.230                                | 0.8750 | 0.20 | 0.008 | 2.0                          | 0.080 | 1.121 | 2.47 | 54000                             | 12000 | 60000                                                      | 13400 |
| 45BIC206       | 114.300                               | 4.5000  | 0.020 | 0.0008 | 158.750                               | 6.2500  | 0.025 | 0.0010 | 22.230                                | 0.8750 | 0.20 | 0.008 | 2.5                          | 0.100 | 1.442 | 3.18 | 51000                             | 11400 | 57000                                                      | 12900 |
| 46BIC216       | 117.475                               | 4.6250  | 0.020 | 0.0008 | 165.100                               | 6.5000  | 0.025 | 0.0010 | 22.230                                | 0.8750 | 0.20 | 0.008 | 2.5                          | 0.100 | 1.615 | 3.56 | 54000                             | 12000 | 58500                                                      | 13200 |
| 47BIC216       | 120.650                               | 4.7500  | 0.025 | 0.0010 | 165.100                               | 6.5000  | 0.025 | 0.0010 | 22.230                                | 0.8750 | 0.25 | 0.010 | 2.5                          | 0.100 | 1.512 | 3.33 | 57000                             | 12700 | 61000                                                      | 13700 |
| 48BIC225       | 123.825                               | 4.8750  | 0.025 | 0.0010 | 177.800                               | 7.0000  | 0.025 | 0.0010 | 25.400                                | 1.0000 | 0.25 | 0.010 | 2.5                          | 0.100 | 2.254 | 4.97 | 65500                             | 15000 | 75000                                                      | 16600 |
| XLS76K2        | 120.650                               | 4.7500  | 0.025 | 0.0010 | 165.100                               | 6.5000  | 0.025 | 0.0010 | 22.230                                | 0.8750 | 0.25 | 0.010 | 1.7                          | 0.065 | 1.157 | 2.55 | 57000                             | 12700 | 61000                                                      | 13700 |
| XLS80K2        | 127.000                               | 5.0000  | 0.025 | 0.0010 | 177.775                               | 6.9990  | 0.025 | 0.0010 | 25.400                                | 1.0000 | 0.25 | 0.010 | 2.0                          | 0.080 | 1.611 | 3.55 | 67000                             | 15000 | 72000                                                      | 16300 |
| 50BIC225       | 127.000                               | 5.0000  | 0.025 | 0.0010 | 177.800                               | 7.0000  | 0.025 | 0.0010 | 25.400                                | 1.0000 | 0.25 | 0.010 | 2.5                          | 0.100 | 2.3   | 5.0  | 65500                             | 15000 | 75000                                                      | 16600 |
| 51BIC240       | 130.175                               | 5.1250  | 0.025 | 0.0010 | 184.150                               | 7.2500  | 0.030 | 0.0012 | 25.400                                | 1.0000 | 0.25 | 0.010 | 2.5                          | 0.100 | 2.5   | 5.5  | 69500                             | 15600 | 76500                                                      | 17300 |
| 52BIC240       | 133.350                               | 5.2500  | 0.025 | 0.0010 | 184.150                               | 7.2500  | 0.030 | 0.0012 | 25.400                                | 1.0000 | 0.25 | 0.010 | 2.5                          | 0.100 | 2.4   | 5.2  | 69500                             | 15600 | 76500                                                      | 17300 |
| 53BIC247       | 136.525                               | 5.3750  | 0.025 | 0.0010 | 190.500                               | 7.5000  | 0.030 | 0.0012 | 25.400                                | 1.0000 | 0.25 | 0.010 | 2.5                          | 0.100 | 2.6   | 5.7  | 75000                             | 16600 | 80000                                                      | 17600 |
| 55BIC247       | 139.700                               | 5.5000  | 0.025 | 0.0010 | 190.500                               | 7.5000  | 0.030 | 0.0012 | 25.400                                | 1.0000 | 0.25 | 0.010 | 2.5                          | 0.100 | 2.5   | 5.4  | 75000                             | 16600 | 80000                                                      | 17600 |
| 56BIC251       | 142.875                               | 5.6250  | 0.025 | 0.0010 | 196.850                               | 7.7500  | 0.030 | 0.0012 | 25.400                                | 1.0000 | 0.25 | 0.010 | 2.5                          | 0.100 | 2.7   | 5.9  | 75000                             | 16600 | 80000                                                      | 17600 |
| 57BIC251       | 146.050                               | 5.7500  | 0.025 | 0.0010 | 196.850                               | 7.7500  | 0.030 | 0.0012 | 25.400                                | 1.0000 | 0.25 | 0.010 | 2.5                          | 0.100 | 2.5   | 5.6  | 75000                             | 16600 | 80000                                                      | 17600 |
| 58BIC258       | 149.225                               | 5.8750  | 0.025 | 0.0010 | 203.200                               | 8.0000  | 0.030 | 0.0012 | 25.400                                | 1.0000 | 0.25 | 0.010 | 2.5                          | 0.100 | 2.8   | 6.1  | 78000                             | 17300 | 81500                                                      | 18000 |
| 60BIC258       | 152.400                               | 6.0000  | 0.025 | 0.0010 | 203.200                               | 8.0000  | 0.030 | 0.0012 | 25.400                                | 1.0000 | 0.25 | 0.010 | 2.5                          | 0.100 | 2.6   | 5.8  | 78000                             | 17300 | 81500                                                      | 18000 |
| 62BIC290       | 158.750                               | 6.2500  | 0.025 | 0.0010 | 215.900                               | 8.5000  | 0.030 | 0.0012 | 28.575                                | 1.1250 | 0.25 | 0.010 | 3.0                          | 0.120 | 3.5   | 7.7  | 104000                            | 23200 | 106000                                                     | 23600 |
| 65BIC298       | 165.100                               | 6.5000  | 0.025 | 0.0010 | 222.250                               | 8.7500  | 0.030 | 0.0012 | 28.575                                | 1.1250 | 0.25 | 0.010 | 3.0                          | 0.120 | 3.6   | 7.9  | 98000                             | 22000 | 102000                                                     | 22800 |
| 67BIC301       | 171.450                               | 6.7500  | 0.025 | 0.0010 | 228.600                               | 9.0000  | 0.030 | 0.0012 | 28.575                                | 1.1250 | 0.25 | 0.010 | 3.0                          | 0.120 | 3.7   | 8.2  | 104000                            | 23200 | 104000                                                     | 23600 |
| 70BIC309       | 177.800                               | 7.0000  | 0.025 | 0.0010 | 241.300                               | 9.5000  | 0.030 | 0.0012 | 31.750                                | 1.2500 | 0.25 | 0.010 | 3.0                          | 0.120 | 4.8   | 10.6 | 116000                            | 26000 | 118000                                                     | 26500 |
| 72BIC340       | 184.150                               | 7.2500  | 0.030 | 0.0012 | 247.650                               | 9.7500  | 0.030 | 0.0012 | 31.750                                | 1.2500 | 0.31 | 0.012 | 3.0                          | 0.120 | 4.9   | 10.8 | 122000                            | 27500 | 122000                                                     | 27000 |
| 75BIC348       | 190.500                               | 7.5000  | 0.030 | 0.0012 | 254.000                               | 10.0000 | 0.036 | 0.0014 | 31.750                                | 1.2500 | 0.31 | 0.012 | 3.0                          | 0.120 | 5.0   | 11.1 | 122000                            | 27500 | 122000                                                     | 27000 |
| 77BIC351       | 196.850                               | 7.7500  | 0.030 | 0.0012 | 266.700                               | 10.5000 | 0.036 | 0.0014 | 34.925                                | 1.3750 | 0.31 | 0.012 | 3.0                          | 0.120 | 6.3   | 13.9 | 146000                            | 32500 | 143000                                                     | 32500 |
| 80BIC359       | 203.200                               | 8.0000  | 0.030 | 0.0012 | 273.050                               | 10.7500 | 0.036 | 0.0014 | 34.925                                | 1.3750 | 0.31 | 0.012 | 3.0                          | 0.120 | 6.5   | 14.2 | 146000                            | 32500 | 143000                                                     | 32500 |
| 82BIC390       | 209.550                               | 8.2500  | 0.030 | 0.0012 | 279.400                               | 11.0000 | 0.036 | 0.0014 | 34.925                                | 1.3750 | 0.31 | 0.012 | 3.0                          | 0.120 | 6.6   | 14.6 | 153000                            | 34500 | 150000                                                     | 33500 |
| 85BIC391       | 215.900                               | 8.5000  | 0.030 | 0.0012 | 292.100                               | 11.5000 | 0.036 | 0.0014 | 38.100                                | 1.5000 | 0.31 | 0.012 | 3.0                          | 0.120 | 8.2   | 18.0 | 166000                            | 37500 | 163000                                                     | 36500 |
| 87BIC393       | 222.250                               | 8.7500  | 0.030 | 0.0012 | 298.450                               | 11.7500 | 0.036 | 0.0014 | 38.100                                | 1.5000 | 0.31 | 0.012 | 3.0                          | 0.120 | 8.4   | 18.5 | 176000                            | 40000 | 170000                                                     | 38000 |
| 90BIC401       | 228.600                               | 9.0000  | 0.030 | 0.0012 | 304.800                               | 12.0000 | 0.036 | 0.0014 | 38.100                                | 1.5000 | 0.31 | 0.012 | 3.0                          | 0.120 | 8.6   | 18.9 | 176000                            | 40000 | 166000                                                     | 37500 |
| 95BIC430       | 241.300                               | 9.5000  | 0.030 | 0.0012 | 323.850                               | 12.7500 | 0.041 | 0.0016 | 41.275                                | 1.6250 | 0.36 | 0.014 | 4.0                          | 0.160 | 10.6  | 23.4 | 200000                            | 45000 | 190000                                                     | 42500 |
| 100BIC439      | 254.000                               | 10.0000 | 0.036 | 0.0014 | 336.550                               | 13.2500 | 0.041 | 0.0016 | 41.275                                | 1.6250 | 0.36 | 0.014 | 4.0                          | 0.160 | 11.1  | 24.4 | 212000                            | 47500 | 193000                                                     | 43000 |
| 105BIC470      | 266.700                               | 10.5000 | 0.036 | 0.0014 | 355.600                               | 14.0000 | 0.041 | 0.0016 | 44.450                                | 1.7500 | 0.36 | 0.014 | 4.0                          | 0.160 | 13.5  | 29.8 | 255000                            | 57000 | 224000                                                     | 50000 |
| 110BIC479      | 279.400                               | 11.0000 | 0.036 | 0.0014 | 368.300                               | 14.5000 | 0.041 | 0.0016 | 44.450                                | 1.7500 | 0.36 | 0.014 | 4.0                          | 0.160 | 14.1  | 31.0 | 255000                            | 57000 | 220000                                                     | 50000 |
| 115BIC510      | 292.100                               | 11.5000 | 0.036 | 0.0014 | 387.350                               | 15.2500 | 0.041 | 0.0016 | 47.625                                | 1.8750 | 0.36 | 0.014 | 5.0                          | 0.200 | 16.9  | 37.2 | 280000                            | 64000 | 240000                                                     | 54000 |
| 120BIC519      | 304.800                               | 12.0000 | 0.036 | 0.0014 | 406.400                               | 16.0000 | 0.046 | 0.0018 | 50.800                                | 2.0000 | 0.36 | 0.014 | 5.0                          | 0.200 | 20.0  | 44.1 | 315000                            | 71000 | 255000                                                     | 58500 |
| 125BIC550      | 317.500                               | 12.5000 | 0.041 | 0.0016 | 419.100                               | 16.5000 | 0.046 | 0.0018 | 50.800                                | 2.0000 | 0.41 | 0.016 | 5.0                          | 0.200 | 20.7  | 45.7 | 325000                            | 73500 | 265000                                                     | 60000 |
| 135BIC580      | 342.900                               | 13.5000 | 0.041 | 0.0016 | 457.200                               | 18.0000 | 0.046 | 0.0018 | 57.150                                | 2.2500 | 0.41 | 0.016 | 5.0                          | 0.200 | 27.9  | 61.6 | 415000                            | 93000 | 315000                                                     | 71000 |
| 140BIC588      | 355.600                               | 14.0000 | 0.041 | 0.0016 | 469.900                               | 18.5000 | 0.046 | 0.0018 | 57.150                                |        |      |       |                              |       |       |      |                                   |       |                                                            |       |

## BIH SERIES – MAXIMUM CAPACITY TYPE

- An inch-dimension series with extra large diameters.
- Maximum capacity design.
- Feature a counterbored outer ring to permit increased number of balls.
- Can carry thrust in one direction only, against the full shouldered side of the outer race.
- Compact sections for adaptability to applications where space is restricted.



### DIMENSIONS – TOLERANCES BIH SERIES

| Bearing Number | Bore<br>d |         |       |        | Outside Diameter<br>D |         |       |        | Width<br>C |        |      |       | Fillet Radius <sup>(1)</sup> |      | Wt.   |      | Static Load Rating<br>C <sub>0</sub> |        | Extended Dynamic Load Rating<br>C <sub>E</sub> <sup>(2)</sup> |       |
|----------------|-----------|---------|-------|--------|-----------------------|---------|-------|--------|------------|--------|------|-------|------------------------------|------|-------|------|--------------------------------------|--------|---------------------------------------------------------------|-------|
|                | mm        | in.     | mm    | in.    | mm                    | in.     | mm    | in.    | mm         | in.    | mm   | in.   | mm                           | in.  | kg    | lbs. | N                                    | lbs.   | N                                                             | lbs.  |
| 41BIH196       | 104.775   | 4.1250  | 0.020 | 0.0008 | 152.400               | 6.0000  | 0.025 | 0.0010 | 22.23      | 0.8750 | 0.20 | 0.008 | 2.5                          | 0.10 | 1.411 | 3.11 | 63000                                | 14000  | 65500                                                         | 14600 |
| 42BIH196       | 107.950   | 4.2500  | 0.020 | 0.0008 | 152.400               | 6.0000  | 0.025 | 0.0010 | 22.23      | 0.8750 | 0.20 | 0.008 | 2.5                          | 0.10 | 1.321 | 2.91 | 71000                                | 16000  | 72000                                                         | 16300 |
| 43BIH206       | 111.125   | 4.3750  | 0.020 | 0.0008 | 158.750               | 6.2500  | 0.025 | 0.0010 | 22.23      | 0.8750 | 0.20 | 0.008 | 2.5                          | 0.10 | 1.483 | 3.27 | 51000                                | 11400  | 57000                                                         | 12900 |
| 45BIH206       | 114.300   | 4.5000  | 0.020 | 0.0008 | 158.750               | 6.2500  | 0.025 | 0.0010 | 22.23      | 0.8750 | 0.20 | 0.008 | 2.5                          | 0.10 | 1.383 | 3.05 | 75000                                | 16600  | 73500                                                         | 16600 |
| 46BIH216       | 117.475   | 4.6250  | 0.020 | 0.0008 | 165.100               | 6.5000  | 0.025 | 0.0010 | 22.23      | 0.8750 | 0.20 | 0.008 | 2.5                          | 0.10 | 1.561 | 3.44 | 80000                                | 18000  | 76500                                                         | 17300 |
| 48BIH225       | 123.825   | 4.8750  | 0.025 | 0.0010 | 177.800               | 7.0000  | 0.025 | 0.0010 | 25.40      | 1.0000 | 0.25 | 0.010 | 2.5                          | 0.10 | 2.209 | 4.87 | 104000                               | 23200  | 100000                                                        | 22400 |
| 50BIH225       | 127.000   | 5.0000  | 0.025 | 0.0010 | 177.800               | 7.0000  | 0.025 | 0.0010 | 25.40      | 1.0000 | 0.25 | 0.010 | 2.5                          | 0.10 | 2.3   | 5.0  | 104000                               | 23200  | 100000                                                        | 22400 |
| 51BIH240       | 130.175   | 5.1250  | 0.025 | 0.0010 | 184.150               | 7.2500  | 0.030 | 0.0012 | 25.40      | 1.0000 | 0.25 | 0.010 | 2.5                          | 0.10 | 2.5   | 5.5  | 108000                               | 24000  | 102000                                                        | 22800 |
| 52BIH240       | 133.350   | 5.2500  | 0.025 | 0.0010 | 184.150               | 7.2500  | 0.030 | 0.0012 | 25.40      | 1.0000 | 0.25 | 0.010 | 2.5                          | 0.10 | 2.4   | 5.2  | 104000                               | 23200  | 100000                                                        | 22400 |
| 53BIH247       | 136.525   | 5.3750  | 0.025 | 0.0010 | 190.500               | 7.5000  | 0.030 | 0.0012 | 25.40      | 1.0000 | 0.25 | 0.010 | 2.5                          | 0.10 | 2.6   | 5.7  | 112000                               | 25000  | 104000                                                        | 23200 |
| 55BIH247       | 139.700   | 5.5000  | 0.025 | 0.0010 | 190.500               | 7.5000  | 0.030 | 0.0012 | 25.40      | 1.0000 | 0.25 | 0.010 | 2.5                          | 0.10 | 2.5   | 5.4  | 112000                               | 25000  | 104000                                                        | 23200 |
| 56BIH251       | 142.875   | 5.6250  | 0.025 | 0.0010 | 196.850               | 7.7500  | 0.030 | 0.0012 | 25.40      | 1.0000 | 0.25 | 0.010 | 2.5                          | 0.10 | 2.7   | 5.9  | 116000                               | 26000  | 106000                                                        | 23600 |
| 57BIH251       | 146.050   | 5.7500  | 0.025 | 0.0010 | 196.850               | 7.7500  | 0.030 | 0.0012 | 25.40      | 1.0000 | 0.25 | 0.010 | 2.5                          | 0.10 | 2.5   | 5.6  | 116000                               | 26000  | 106000                                                        | 23600 |
| 58BIH258       | 149.225   | 5.8750  | 0.025 | 0.0010 | 203.200               | 8.0000  | 0.030 | 0.0012 | 25.40      | 1.0000 | 0.25 | 0.010 | 2.5                          | 0.10 | 2.8   | 6.1  | 118000                               | 26500  | 108000                                                        | 24000 |
| 60BIH258       | 152.400   | 6.0000  | 0.025 | 0.0010 | 203.200               | 8.0000  | 0.030 | 0.0012 | 25.40      | 1.0000 | 0.25 | 0.010 | 2.5                          | 0.10 | 2.6   | 5.8  | 118000                               | 26500  | 108000                                                        | 24000 |
| 62BIH290       | 158.750   | 6.2500  | 0.025 | 0.0010 | 215.900               | 8.5000  | 0.030 | 0.0012 | 28.575     | 1.1250 | 0.25 | 0.010 | 3.0                          | 0.12 | 3.5   | 7.7  | 146000                               | 33500  | 134000                                                        | 30000 |
| 65BIH298       | 165.100   | 6.5000  | 0.025 | 0.0010 | 222.250               | 8.7500  | 0.030 | 0.0012 | 28.575     | 1.1250 | 0.25 | 0.010 | 3.0                          | 0.12 | 3.6   | 7.9  | 153000                               | 34500  | 137000                                                        | 30500 |
| 67BIH301       | 171.450   | 6.7500  | 0.025 | 0.0010 | 228.600               | 9.0000  | 0.030 | 0.0012 | 28.575     | 1.1250 | 0.25 | 0.010 | 3.0                          | 0.12 | 3.7   | 8.2  | 160000                               | 35500  | 137000                                                        | 31000 |
| 70BIH309       | 177.800   | 7.0000  | 0.025 | 0.0010 | 241.300               | 9.5000  | 0.030 | 0.0012 | 31.750     | 1.2500 | 0.25 | 0.010 | 3.0                          | 0.12 | 4.8   | 10.6 | 180000                               | 40500  | 160000                                                        | 35500 |
| 72BIH340       | 184.150   | 7.2500  | 0.030 | 0.0012 | 247.650               | 9.7500  | 0.030 | 0.0012 | 31.750     | 1.2500 | 0.31 | 0.012 | 3.0                          | 0.12 | 4.9   | 10.8 | 186000                               | 42500  | 160000                                                        | 36000 |
| 75BIH348       | 190.500   | 7.5000  | 0.030 | 0.0012 | 254.000               | 10.0000 | 0.036 | 0.0014 | 31.750     | 1.2500 | 0.31 | 0.012 | 3.0                          | 0.12 | 5.0   | 11.1 | 193000                               | 43000  | 163000                                                        | 36500 |
| 77BIH351       | 196.850   | 7.7500  | 0.030 | 0.0012 | 266.700               | 10.5000 | 0.036 | 0.0014 | 34.925     | 1.3750 | 0.31 | 0.012 | 3.0                          | 0.12 | 6.3   | 13.9 | 228000                               | 51000  | 193000                                                        | 44000 |
| 80BIH359       | 203.200   | 8.0000  | 0.030 | 0.0012 | 273.050               | 10.7500 | 0.036 | 0.0014 | 34.925     | 1.3750 | 0.31 | 0.012 | 3.0                          | 0.12 | 6.5   | 14.2 | 236000                               | 53000  | 200000                                                        | 45000 |
| 82BIH390       | 209.550   | 8.2500  | 0.030 | 0.0012 | 279.400               | 11.0000 | 0.036 | 0.0014 | 34.925     | 1.3750 | 0.31 | 0.012 | 3.0                          | 0.12 | 6.6   | 10.6 | 245000                               | 55000  | 200000                                                        | 45500 |
| 85BIH391       | 215.900   | 8.5000  | 0.030 | 0.0012 | 292.100               | 11.5000 | 0.036 | 0.0014 | 38.100     | 1.5000 | 0.31 | 0.012 | 3.0                          | 0.12 | 8.2   | 18.0 | 270000                               | 61000  | 224000                                                        | 50000 |
| 87BIH393       | 222.250   | 8.7500  | 0.030 | 0.0012 | 298.450               | 11.7500 | 0.036 | 0.0014 | 38.100     | 1.5000 | 0.31 | 0.012 | 3.0                          | 0.12 | 8.4   | 18.5 | 270000                               | 61000  | 224000                                                        | 50000 |
| 90BIH401       | 228.600   | 9.0000  | 0.030 | 0.0012 | 304.800               | 12.0000 | 0.036 | 0.0014 | 38.100     | 1.5000 | 0.31 | 0.012 | 3.0                          | 0.12 | 8.6   | 18.9 | 280000                               | 63000  | 228000                                                        | 51000 |
| 95BIH430       | 241.300   | 9.5000  | 0.030 | 0.0012 | 323.850               | 12.7500 | 0.036 | 0.0014 | 41.275     | 1.6250 | 0.36 | 0.014 | 4.0                          | 0.16 | 10.6  | 23.4 | 315000                               | 71000  | 255000                                                        | 57000 |
| 100BIH439      | 254.00    | 10.0000 | 0.036 | 0.0014 | 336.550               | 13.2500 | 0.041 | 0.0016 | 41.275     | 1.6250 | 0.36 | 0.014 | 4.0                          | 0.16 | 11.1  | 24.4 | 325000                               | 73500  | 260000                                                        | 58500 |
| 105BIH470      | 266.700   | 10.5000 | 0.036 | 0.0014 | 355.600               | 14.0000 | 0.041 | 0.0016 | 44.450     | 1.7500 | 0.36 | 0.014 | 4.0                          | 0.16 | 13.5  | 29.8 | 400000                               | 90000  | 300000                                                        | 68000 |
| 110BIH479      | 279.400   | 11.0000 | 0.036 | 0.0014 | 368.300               | 14.5000 | 0.041 | 0.0016 | 44.450     | 1.7500 | 0.36 | 0.014 | 4.0                          | 0.16 | 14.1  | 31.0 | 415000                               | 93000  | 305000                                                        | 69500 |
| 115BIH510      | 292.100   | 11.5000 | 0.036 | 0.0014 | 387.350               | 15.2500 | 0.041 | 0.0016 | 47.625     | 1.8750 | 0.36 | 0.014 | 5.0                          | 0.20 | 16.9  | 37.2 | 465000                               | 104000 | 335000                                                        | 75000 |
| 120BIH519      | 304.800   | 12.0000 | 0.036 | 0.0014 | 406.400               | 16.0000 | 0.046 | 0.0018 | 50.800     | 2.0000 | 0.36 | 0.014 | 5.0                          | 0.20 | 20.0  | 44.1 | 510000                               | 116000 | 355000                                                        | 80000 |
| 135BIH580      | 342.900   | 13.5000 | 0.041 | 0.0016 | 457.200               | 18.0000 | 0.046 | 0.0018 | 57.150     | 2.2500 | 0.41 | 0.016 | 5.0                          | 0.20 | 27.9  | 61.6 | 655000                               | 146000 | 425000                                                        | 95000 |
| 140BIH588      | 355.600   | 14.0000 | 0.041 | 0.0016 | 469.900               | 18.5000 | 0.046 | 0.0018 | 57.150     | 2.2500 | 0.41 | 0.016 | 5.0                          | 0.20 | 28.8  | 63.4 | 680000                               | 150000 | 430000                                                        | 96500 |

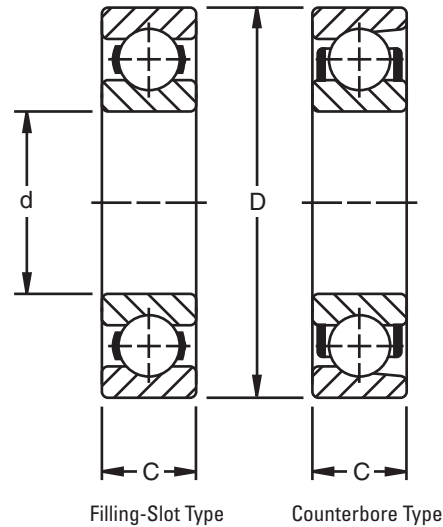
(1) Maximum shaft or housing fillet radius that bearing corners will clear.

(2) Based on 10<sup>6</sup> revolutions of calculated fatigue life.



## EXTRA LARGE 100 SERIES

- Dimensions originally established to meet specific design requirements, before standard dimensions were established by the American Bearing Manufacturers Association (ABMA).
- A metric series.
- Available in the 100 Series (extra light).
- Available in a radially-fitted counterbore type, having a maximum complement of balls.
- Identified by the suffix "WI," these are designed to take thrust in one direction only.



### DIMENSIONS – TOLERANCES

| Bearing Number    |                   |                        | Bore d                                |        |       |        | Outside Diameter D                    |         |       |        | Width C                           |                      | Fillet Radius <sup>(1)</sup> |       | Wt.               |       |                   |               | Static Load Rating C <sub>0</sub> |       | Extended Dynamic Load C <sub>E</sub> <sup>(5)</sup> |       |        |       |
|-------------------|-------------------|------------------------|---------------------------------------|--------|-------|--------|---------------------------------------|---------|-------|--------|-----------------------------------|----------------------|------------------------------|-------|-------------------|-------|-------------------|---------------|-----------------------------------|-------|-----------------------------------------------------|-------|--------|-------|
| Filling-slot Type | Counter-bore Type | One Shield D           | tolerance +0.000 mm +0.0000" to minus |        |       |        | tolerance +0.000 mm +0.0000" to minus |         |       |        | +0.00 mm -0.25 mm +0.000" -0.010" |                      |                              |       | Filling-slot Type |       | Counter-bore Type | Shielded Type |                                   |       |                                                     |       |        |       |
|                   |                   |                        | mm                                    | in.    | mm    | in.    | mm                                    | in.     | mm    | in.    | mm                                | in.                  | mm                           | in.   | kg                | lbs.  | kg                | lbs.          | kg                                | lbs.  | N                                                   | lbs.  | N      | lbs.  |
| 120W2             | —                 | 120WD2N                | 100                                   | 3.9370 | 0.020 | 0.0008 | 160                                   | 6.2992  | 0.025 | 0.0010 | 28                                | 1.102 <sup>(4)</sup> | 2.01                         | 0.079 | 2.041             | 4.50  | —                 | —             | 2.041                             | 4.50  | 75000                                               | 17000 | 106000 | 24000 |
| 122W              | 122WI             | 122WD2N <sup>(3)</sup> | 110                                   | 4.3307 | 0.020 | 0.0008 | 175                                   | 6.8898  | 0.025 | 0.0010 | 30                                | 1.181 <sup>(4)</sup> | 2.01                         | 0.079 | 2.762             | 6.09  | 2.835             | 6.25          | 3.157                             | 6.96  | 80000                                               | 18000 | 116000 | 26000 |
| 124W              | 124WI             | 124WD                  | 120                                   | 4.7244 | 0.020 | 0.0008 | 190                                   | 7.4803  | 0.030 | 0.0012 | 32                                | 1.260 <sup>(4)</sup> | 2.01                         | 0.079 | 3.475             | 7.66  | 3.538             | 7.80          | 3.466                             | 7.64  | 98000                                               | 22400 | 140000 | 31500 |
| 126W              | 126WI             | 126WD                  | 130                                   | 5.1181 | 0.025 | 0.0010 | 205                                   | 8.0709  | 0.030 | 0.0012 | 34                                | 1.339                | 2.01                         | 0.079 | 4.376             | 9.56  | 4.318             | 9.52          | 4.332                             | 9.55  | 110000                                              | 24500 | 146000 | 33500 |
| 128W              | 128WI             | 128WD                  | 140                                   | 5.5118 | 0.025 | 0.0010 | 220                                   | 8.6614  | 0.030 | 0.0012 | 36                                | 1.417                | 2.01                         | 0.079 | 5.239             | 11.55 | 5.244             | 11.56         | 5.294                             | 11.67 | 122000                                              | 27000 | 163000 | 36500 |
| 130W              | —                 | 130WD                  | 150                                   | 5.9055 | 0.025 | 0.0010 | 235                                   | 9.2520  | 0.030 | 0.0012 | 38                                | 1.496                | 2.01                         | 0.079 | 6.278             | 13.84 | —                 | —             | 6.437                             | 14.19 | 140000                                              | 31500 | 183000 | 41500 |
| 132W              | —                 | 132WD                  | 160                                   | 6.2992 | 0.025 | 0.0010 | 250                                   | 9.8425  | 0.030 | 0.0012 | 40                                | 1.575                | 2.49                         | 0.098 | 7.394             | 16.30 | —                 | —             | 7.484                             | 16.50 | 160000                                              | 35500 | 208000 | 46500 |
| 134W              | —                 | —                      | 170                                   | 6.6929 | 0.025 | 0.0010 | 265                                   | 10.4331 | 0.035 | 0.0014 | 42                                | 1.654                | 2.49                         | 0.098 | 9.049             | 19.95 | —                 | —             | —                                 | —     | 180000                                              | 40000 | 224000 | 51000 |
| —                 | —                 | 136WD2N                | 180                                   | 7.0866 | 0.025 | 0.0010 | 280                                   | 11.0236 | 0.035 | 0.0014 | 49                                | 1.929                | 2.49                         | 0.098 | —                 | —     | —                 | —             | 11.004                            | 24.26 | 200000                                              | 45000 | 245000 | 55000 |
| 138W              | —                 | —                      | 190                                   | 7.4803 | 0.03  | 0.0120 | 300                                   | 11.8110 | 0.035 | 0.0014 | 46                                | 1.811 <sup>(2)</sup> | 2.49                         | 0.098 | 12.928            | 28.50 | —                 | —             | —                                 | —     | 245000                                              | 56000 | 285000 | 64000 |

<sup>(1)</sup> Maximum shaft or housing fillet radius that bearing corners will clear.

<sup>(2)</sup> +0.00 mm, -0.25 mm (+0.000", -0.010").

<sup>(3)</sup> 35 mm width.

<sup>(4)</sup> Width tolerance is +0.00 mm, -0.20 mm (+0.000", -0.008").

<sup>(5)</sup> Based on 10<sup>6</sup> revolutions of calculated fatigue life.

## 7000WN PRODUCT FAMILY

### INTRODUCTION

The high performance 7000WN Angular Contact Product Family is specifically designed to support heavy thrust loads at lower operating temperatures at high speeds. Included in the angular contact series are the following design features:

- Refined bore diameter tolerance
- Increased thrust capacity
- Extended load capacity
- Lower operating temperatures
- Better than ABEC 1 bore diameter tolerances
- High operating contact angle
- Improved ball section ratio
- Low shoulder inner and outer rings improve oil flow

A feature of this series is the refined bore diameter tolerance. The closer bore tolerance in the WN product family reduces the broad range of interference and thus prevents the development of undesirable high preload in mounted duplex pairs. As a result, longer bearing life is achieved and high operating temperatures are avoided.

This product family can support heavy thrust loads by combining high shoulders on the thrust side of both rings with a high operating angle. In addition, uniformity of load per ball under combined loads is more favorable with a high contact angle and results in longer bearing life.

Maximum clearance between the one-piece brass or bronze cage and the land diameters of both rings is achieved in the WN construction. Utilizing low shoulder diameters on the non-thrust sides of inner and outer rings promotes efficient oil passage through the bearing resulting in lower operating temperatures and longer bearing life.

The 7000WN Product Family is divided into several designs. Sizes 7207-7218WN and 7304-7318WN have a 40 degree contact angle and a one-piece, ball-piloted, pressed brass cage. Sizes 7219-7230WN and 7319-7330WN have a 40 degree contact angle and a one-piece, outer ring-piloted, high-strength machined bronze cage. The 7412WN and 7415WN both have a 40 degree contact angle and a one-piece conical, high-strength machined bronze cage.

The 7000WN Product Family is available as single bearings and duplex sets. A single with the suffix "SU" is flush ground on both faces for universal mounting. Such bearings can be used as singles or duplex mounted back-to-back (DB), face-to-face (DF) or tandem (DT), depending on the functional requirements of the design. The mounting of duplex "SU" bearings will result in a preload range of minimum internal clearance to a solid preload.

Bearings without the "SU" designation are not flush ground and are intended to be used as singles. These bearings are used to support thrust from one direction and are often accompanied by a preload spring.

Bearings with the suffix "DU" are flush ground on both faces for universal mounting. A duplex pair of "DU" bearings can be mounted (DB, DF, or DT), depending on the functional requirements of the design. These bearings, after mounting, will result in a range of positive light preload.

### APPLICATIONS

These design features are advantageous in applications such as oil refining pump systems where higher productivity and longer system life is important. Other applications where these features are equally suited are deep well pump motors, vertical and horizontal pumps, worm gear and right angle drives, spindles, live centers and gearboxes. For applications requiring a high degree of axial and radial rigidity, these bearings are suggested in preloaded duplex mountings.

### MOUNTING

Although each 7000WN Product Family bearing is a self-contained unit, the construction is such that they are frequently mounted as two bearings opposed, so that thrust can be carried in either direction.

Unlike the radial type, the angular contact bearing, when mounted alone, requires adjustment and must be installed with care. As the bearing is relatively loose axially before mounting, it is important that the design incorporate some means to move the outer ring axially into its correct position relative to the inner ring. This adjustment should be made when the bearing is mounted. A common method is to place a preload spring or shims at one bearing location.

The correct adjustment of the single bearing is obtained when the initial axial looseness of the assembly is removed. This eliminates the possibility of premature bearing damage due to excessive preloading or looseness through improper adjustment.

Bearings designated "SU" are ground on both surfaces to permit universal mounting. These duplex sets are ideally suited for applications which involve a combination of radial loads from either direction. "SU" bearings are flush ground so that under a specific axial gage load the inner ring will protrude beyond the face of the outer ring. This design results in an internal axial clearance within the bearing pair that helps to minimize build-up of excessive preload within the bearings when mounted on a shaft with maximum interference.

To assure correct mounting of bearings in the 7000WN Product Family, the word THRUST is marked on the thrust face of both the inner and outer rings. This face should abut against the housing shoulder or the end cover, depending on the required direction of "thrust".

### ORDERING INFORMATION

**"SU" Suffix:** All bearings are packaged singly.  
To obtain a pair of SU flush ground bearings for duplex mounting, specify two bearings.  
Example: (2) 7210WN SU bearings.

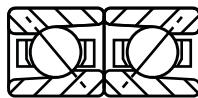
**"DU" Suffix:** All bearings are packaged as a pair in a single box.  
To obtain a pair of DU flush ground bearings for duplex mounting, specify one pair.  
Example: one pair-7219WN MBR-DU.

**No Suffix:** All bearings are packaged singly.  
No other designation is required to obtain

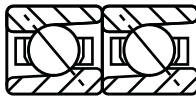
## MOUNTING ARRANGEMENTS



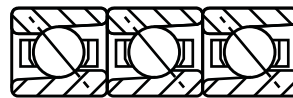
Duplex- DB  
Back-to-Back



Duplex- DF  
Face-to-Face



Duplex- DT Tandem



Three Bearings in Tandem

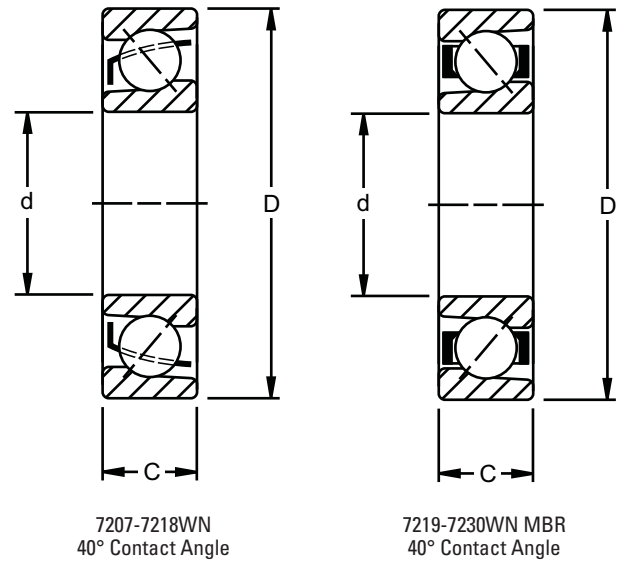


Two in Tandem Opposed  
with a Single Bearing



## LIGHT 7200WN SERIES

- Dimensionally interchangeable with the radial 200 Series.
- 7000WN Product Family includes a refined bore diameter.
- A single bearing is suggested for applications in which the thrust load is in one direction or, in the case of combined loads, the thrust load is high in relation to the radial load.
- A duplex pair is suggested for applications where thrust is present in both directions or where axial displacement of the shaft must be restricted.
- For exceptionally high thrust loads in one direction, a tandem pair can be used, opposed by a third bearing.
- Sizes 7201K through 7203WN have a 20 degree contact angle and a nylon cage.
- Sizes 7204WN through 7218WN have a 40 degree contact angle and a one-piece, ball-piloted, pressed brass cage.
- Larger sizes 7219WN through 7230WN have a 40 degree contact angle and a one-piece, outer ring piloted high-strength machined bronze cage.



## DIMENSIONS – TOLERANCES

| Bearing Number           | Bore d |        | tolerance +0.000 mm +0.0000" to minus |        | Outside Diameter D |         | tolerance +0.000 mm +0.0000" to minus |         | Width C |        | tolerance +0.000 mm +0.0000" to minus |       | Fillet Radius <sup>(1)</sup> |       | Wt.    |       | Static Load Rating C <sub>0</sub> |       | Extended Dynamic Load Rating C <sub>e</sub> <sup>(4)</sup> |       |
|--------------------------|--------|--------|---------------------------------------|--------|--------------------|---------|---------------------------------------|---------|---------|--------|---------------------------------------|-------|------------------------------|-------|--------|-------|-----------------------------------|-------|------------------------------------------------------------|-------|
|                          | mm     | in.    | mm                                    | in.    | mm                 | in.     | mm                                    | in.     | mm      | in.    | mm                                    | in.   | mm                           | in.   | kg     | lbs.  | N                                 | lbs.  | N                                                          | lbs.  |
| 7201K                    | 12     | 0.4724 | 0.008                                 | 0.0003 | 32                 | 1.2598  | 0.011                                 | 0.00043 | 10      | 0.3937 | 0.12                                  | 0.005 | 0.6                          | 0.024 | 0.036  | 0.08  | 2790                              | 630   | 7100                                                       | 1600  |
| 7202W                    | 15     | 0.5906 | 0.008                                 | 0.0003 | 35                 | 1.3780  | 0.011                                 | 0.00043 | 11      | 0.4331 | 0.12                                  | 0.005 | 0.6                          | 0.024 | 0.045  | 0.10  | 4700                              | 1060  | 10300                                                      | 2320  |
| 7203W                    | 17     | 0.6693 | 0.008                                 | 0.0003 | 40                 | 1.5748  | 0.011                                 | 0.00043 | 12      | 0.4727 | 0.12                                  | 0.005 | 0.6                          | 0.024 | 0.068  | 0.15  | 6930                              | 1560  | 14200                                                      | 3200  |
| 7204WN <sup>(2)(3)</sup> | 20     | 0.7874 | 0.010                                 | 0.0004 | 47                 | 1.8504  | 0.011                                 | 0.00043 | 14      | 0.5512 | 0.12                                  | 0.005 | 1.0                          | 0.039 | 0.104  | 0.23  | 8100                              | 1830  | 16800                                                      | 3800  |
| 7205WN <sup>(3)</sup>    | 25     | 0.9843 | 0.010                                 | 0.0004 | 52                 | 2.0472  | 0.013                                 | 0.0005  | 15      | 0.5906 | 0.12                                  | 0.005 | 1.0                          | 0.039 | 0.132  | 0.29  | 9400                              | 2120  | 16600                                                      | 3750  |
| 7206WN                   | 30     | 1.1811 | 0.010                                 | 0.0004 | 62                 | 2.4409  | 0.013                                 | 0.0005  | 16      | 0.6299 | 0.12                                  | 0.005 | 1.0                          | 0.039 | 0.209  | 0.46  | 13500                             | 3050  | 23000                                                      | 5200  |
| 7207WN                   | 35     | 1.3780 | 0.010                                 | 0.0004 | 72                 | 2.8346  | 0.013                                 | 0.0005  | 17      | 0.6693 | 0.12                                  | 0.005 | 1.0                          | 0.039 | 0.286  | 0.63  | 18000                             | 4150  | 30800                                                      | 6950  |
| 7208WN                   | 40     | 1.5748 | 0.010                                 | 0.0004 | 80                 | 3.1496  | 0.013                                 | 0.0005  | 18      | 0.7087 | 0.12                                  | 0.005 | 1.0                          | 0.039 | 0.331  | 0.73  | 23000                             | 5200  | 36000                                                      | 8150  |
| 7209WN                   | 45     | 1.7717 | 0.010                                 | 0.0004 | 85                 | 3.3465  | 0.015                                 | 0.0006  | 19      | 0.7480 | 0.12                                  | 0.005 | 1.0                          | 0.039 | 0.435  | 0.96  | 25900                             | 5850  | 40500                                                      | 9150  |
| 7210WN                   | 50     | 1.9685 | 0.010                                 | 0.0004 | 90                 | 3.5433  | 0.015                                 | 0.0006  | 20      | 0.7874 | 0.12                                  | 0.005 | 1.0                          | 0.039 | 0.508  | 1.12  | 28400                             | 6400  | 42500                                                      | 9500  |
| 7211WN                   | 55     | 2.1654 | 0.010                                 | 0.0004 | 100                | 3.9370  | 0.015                                 | 0.0006  | 21      | 0.8268 | 0.15                                  | 0.006 | 1.5                          | 0.059 | 0.635  | 1.40  | 36200                             | 8150  | 52000                                                      | 11800 |
| 7212WN                   | 60     | 2.3622 | 0.010                                 | 0.0004 | 110                | 4.3307  | 0.015                                 | 0.0006  | 22      | 0.8661 | 0.15                                  | 0.006 | 1.5                          | 0.059 | 0.835  | 1.84  | 44000                             | 10000 | 63000                                                      | 14300 |
| 7213WN                   | 65     | 2.5591 | 0.010                                 | 0.0004 | 120                | 4.7244  | 0.015                                 | 0.0006  | 23      | 0.9055 | 0.15                                  | 0.006 | 1.5                          | 0.059 | 1.061  | 2.34  | 52400                             | 11800 | 72400                                                      | 16300 |
| 7214WN                   | 70     | 2.7559 | 0.010                                 | 0.0004 | 125                | 4.9213  | 0.018                                 | 0.0007  | 24      | 0.9449 | 0.15                                  | 0.006 | 1.5                          | 0.059 | 1.171  | 2.58  | 57300                             | 12900 | 78000                                                      | 17600 |
| 7215WN                   | 75     | 2.9528 | 0.010                                 | 0.0004 | 130                | 5.1181  | 0.018                                 | 0.0007  | 25      | 0.9843 | 0.15                                  | 0.006 | 1.5                          | 0.059 | 1.271  | 2.80  | 58000                             | 13200 | 78000                                                      | 17600 |
| 7216WN                   | 80     | 3.1496 | 0.010                                 | 0.0004 | 140                | 5.5118  | 0.018                                 | 0.0007  | 26      | 1.0236 | 0.15                                  | 0.006 | 2.0                          | 0.079 | 1.483  | 3.27  | 65500                             | 15600 | 91500                                                      | 20400 |
| 7217WN                   | 85     | 3.3465 | 0.013                                 | 0.0005 | 150                | 5.9055  | 0.018                                 | 0.0007  | 28      | 1.1024 | 0.20                                  | 0.008 | 2.0                          | 0.079 | 2.096  | 4.62  | 76500                             | 18300 | 106000                                                     | 23600 |
| 7218WN                   | 90     | 3.5433 | 0.013                                 | 0.0005 | 160                | 6.2992  | 0.025                                 | 0.0010  | 30      | 1.1811 | 0.20                                  | 0.008 | 2.0                          | 0.079 | 2.567  | 5.66  | 88000                             | 21200 | 119000                                                     | 27000 |
| 7219WN MBR               | 95     | 3.7402 | 0.013                                 | 0.0005 | 170                | 6.6929  | 0.025                                 | 0.0010  | 32      | 1.2600 | 0.20                                  | 0.008 | 2.0                          | 0.079 | 3.025  | 6.67  | 93000                             | 22800 | 133000                                                     | 30000 |
| 7220WN MBR               | 100    | 3.9370 | 0.013                                 | 0.0005 | 180                | 7.0866  | 0.025                                 | 0.0010  | 34      | 1.3390 | 0.20                                  | 0.008 | 2.0                          | 0.079 | 3.460  | 7.62  | 106000                            | 25500 | 146000                                                     | 33500 |
| 7222WN MBR               | 110    | 4.3307 | 0.013                                 | 0.0005 | 200                | 7.8740  | 0.030                                 | 0.0012  | 38      | 1.4960 | 0.20                                  | 0.008 | 2.0                          | 0.079 | 5.162  | 11.38 | 134000                            | 32500 | 173000                                                     | 39000 |
| 7224WN MBR               | 120    | 4.7244 | 0.013                                 | 0.0005 | 215                | 8.4646  | 0.030                                 | 0.0012  | 40      | 1.5750 | 0.20                                  | 0.008 | 2.0                          | 0.079 | 6.354  | 14.01 | 160000                            | 36500 | 188000                                                     | 42500 |
| 7226WN MBR               | 130    | 5.1181 | 0.018                                 | 0.0007 | 230                | 9.0551  | 0.030                                 | 0.0012  | 40      | 1.5750 | 0.25                                  | 0.010 | 2.5                          | 0.098 | 7.543  | 16.63 | 176000                            | 43000 | 211000                                                     | 47500 |
| 7228WN MBR               | 140    | 5.5118 | 0.018                                 | 0.0007 | 250                | 9.8425  | 0.030                                 | 0.0012  | 42      | 1.6540 | 0.25                                  | 0.010 | 2.5                          | 0.098 | 9.634  | 21.24 | 200000                            | 47500 | 224000                                                     | 50000 |
| 7230WN MBR               | 150    | 5.9055 | 0.018                                 | 0.0007 | 270                | 10.6299 | 0.035                                 | 0.0014  | 45      | 1.7720 | 0.25                                  | 0.010 | 2.5                          | 0.098 | 11.731 | 25.84 | 240000                            | 56000 | 248000                                                     | 56000 |

<sup>(1)</sup> Maximum shaft or housing fillet radius that bearing corners will clear.

<sup>(2)</sup> Also available as W design.

<sup>(3)</sup> Also available with 20° contact angle and nylon cage.

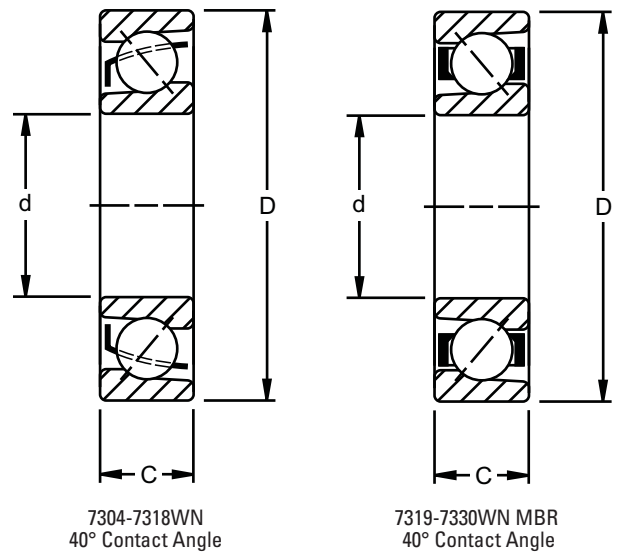
<sup>(4)</sup> Based on 10<sup>6</sup> revolutions of calculated fatigue life.

**Note:** 7208WN-7212WN also available with a one-piece, high-strength machined bronze retainer (MBR).

This cage can be quoted on the other sizes by request.

## MEDIUM 7300WN SERIES

- Dimensionally interchangeable with the radial 300 Series.
- The 7000WN Product Family includes a refined bore diameter. The 7300WN Series can sustain heavier thrust and combined loads than the 7200WN Series.
- A single bearing is suggested for applications in which the thrust load is in one direction or, in the case of combined loads, the thrust load is high in relation to the radial load.
- A duplex pair is suggested for applications where thrust is present in both directions or where axial displacement of the shaft must be restricted.
- For exceptionally high thrust loads in one direction, a tandem pair can be used, opposed by a third bearing.
- Size 7303W has a 20 degree contact angle and a steel cage.
- Sizes 7304WN through 7318WN have a 40 degree contact angle and a one-piece, ball-piloted, pressed brass cage.
- Larger sizes 7319WN through 7330WN have a 40 degree contact angle and a one-piece, outer ring piloted high-strength machined bronze cage.
- Sizes 7306WN to 7318WN also available with a one-piece, high-strength, machined bronze retainer.



### DIMENSIONS – TOLERANCES

| Bearing Number | Bore d |        |       |        | Outside Diameter D |         |       |         | Width C |        |      |       | Fillet Radius <sup>(1)</sup> |       | Wt.    |       | Static Load Rating C <sub>0</sub> |       | Extended Dynamic Load Rating C <sub>e</sub> <sup>(2)</sup> |       |
|----------------|--------|--------|-------|--------|--------------------|---------|-------|---------|---------|--------|------|-------|------------------------------|-------|--------|-------|-----------------------------------|-------|------------------------------------------------------------|-------|
|                | mm     | in.    | mm    | in.    | mm                 | in.     | mm    | in.     | mm      | in.    | mm   | in.   | mm                           | in.   | kg     | lbs.  | N                                 | lbs.  | N                                                          | lbs.  |
| 7303W          | 17     | 0.6693 | 0.008 | 0.0003 | 47                 | 1.8504  | 0.011 | 0.00045 | 14      | 0.5512 | 0.12 | 0.005 | 1.0                          | 0.039 | 0.118  | 0.26  | 9200                              | 2080  | 20200                                                      | 4550  |
| 7304WN         | 20     | 0.7874 | 0.010 | 0.0004 | 52                 | 2.0472  | 0.013 | 0.0005  | 15      | 0.5906 | 0.12 | 0.005 | 1.0                          | 0.039 | 0.150  | 0.33  | 9590                              | 2160  | 19500                                                      | 4400  |
| 7305WN         | 25     | 0.9843 | 0.010 | 0.0004 | 62                 | 2.4409  | 0.013 | 0.0005  | 17      | 0.6693 | 0.12 | 0.005 | 1.0                          | 0.039 | 0.241  | 0.53  | 13300                             | 3000  | 26500                                                      | 5850  |
| 7306WN         | 30     | 1.1811 | 0.010 | 0.0004 | 72                 | 2.8346  | 0.013 | 0.0005  | 19      | 0.7480 | 0.12 | 0.005 | 1.0                          | 0.039 | 0.363  | 0.80  | 20800                             | 4650  | 34600                                                      | 7800  |
| 7307WN         | 35     | 1.3780 | 0.010 | 0.0004 | 80                 | 3.1496  | 0.013 | 0.0005  | 21      | 0.8268 | 0.12 | 0.005 | 1.5                          | 0.059 | 0.408  | 0.90  | 23900                             | 5400  | 41300                                                      | 9300  |
| 7308WN         | 40     | 1.5748 | 0.010 | 0.0004 | 90                 | 3.5433  | 0.015 | 0.0006  | 23      | 0.9055 | 0.12 | 0.005 | 1.5                          | 0.059 | 0.667  | 1.47  | 30200                             | 6800  | 50600                                                      | 11400 |
| 7309WN         | 45     | 1.7717 | 0.010 | 0.0004 | 100                | 3.9370  | 0.015 | 0.0006  | 25      | 0.9843 | 0.12 | 0.005 | 1.5                          | 0.059 | 0.885  | 1.95  | 39900                             | 9000  | 66600                                                      | 15000 |
| 7310WN         | 50     | 1.9685 | 0.010 | 0.0004 | 110                | 4.3307  | 0.015 | 0.0006  | 27      | 1.0630 | 0.12 | 0.005 | 2.0                          | 0.079 | 1.139  | 2.51  | 47900                             | 10800 | 76800                                                      | 17300 |
| 7311WN         | 55     | 2.1654 | 0.010 | 0.0004 | 120                | 4.7244  | 0.015 | 0.0006  | 29      | 1.1417 | 0.15 | 0.006 | 2.0                          | 0.079 | 1.592  | 3.51  | 56400                             | 12700 | 88800                                                      | 20000 |
| 7312WN         | 60     | 2.3622 | 0.010 | 0.0004 | 130                | 5.1181  | 0.018 | 0.0007  | 31      | 1.2205 | 0.15 | 0.006 | 2.0                          | 0.079 | 1.969  | 4.34  | 64800                             | 14600 | 101000                                                     | 22800 |
| 7313WN         | 65     | 2.5591 | 0.010 | 0.0004 | 140                | 5.5118  | 0.018 | 0.0007  | 33      | 1.2992 | 0.15 | 0.006 | 2.0                          | 0.079 | 2.477  | 5.46  | 75500                             | 17000 | 115000                                                     | 26000 |
| 7314WN         | 70     | 2.7559 | 0.010 | 0.0004 | 150                | 5.9055  | 0.018 | 0.0007  | 35      | 1.3780 | 0.15 | 0.006 | 2.0                          | 0.079 | 2.676  | 5.90  | 85700                             | 19300 | 128000                                                     | 29000 |
| 7315WN         | 75     | 2.9528 | 0.010 | 0.0004 | 160                | 6.2992  | 0.025 | 0.0010  | 37      | 1.4567 | 0.15 | 0.006 | 2.0                          | 0.079 | 3.452  | 7.61  | 98000                             | 22000 | 142000                                                     | 32000 |
| 7316WN         | 80     | 3.1496 | 0.010 | 0.0004 | 170                | 6.6929  | 0.025 | 0.0010  | 39      | 1.5354 | 0.15 | 0.006 | 2.0                          | 0.079 | 4.504  | 9.92  | 108000                            | 24500 | 153000                                                     | 34500 |
| 7317WN         | 85     | 3.3465 | 0.013 | 0.0005 | 180                | 7.0866  | 0.025 | 0.0010  | 41      | 1.6124 | 0.20 | 0.008 | 2.5                          | 0.098 | 4.940  | 10.88 | 122000                            | 27500 | 166000                                                     | 37500 |
| 7318WN         | 90     | 3.5433 | 0.013 | 0.0005 | 190                | 7.4803  | 0.030 | 0.0012  | 43      | 1.6929 | 0.20 | 0.008 | 2.5                          | 0.098 | 6.247  | 13.76 | 135000                            | 30500 | 177000                                                     | 40000 |
| 7319WN MBR     | 95     | 3.7402 | 0.013 | 0.0005 | 200                | 7.8740  | 0.030 | 0.0012  | 45      | 1.7717 | 0.20 | 0.008 | 2.5                          | 0.098 | 6.706  | 14.77 | 148000                            | 33500 | 191000                                                     | 43000 |
| 7320WN MBR     | 100    | 3.9370 | 0.013 | 0.0005 | 215                | 8.4646  | 0.030 | 0.0012  | 47      | 1.8504 | 0.20 | 0.008 | 2.5                          | 0.098 | 8.227  | 18.12 | 177000                            | 40000 | 217000                                                     | 49000 |
| 7321WN MBR     | 105    | 4.1339 | 0.013 | 0.0005 | 225                | 8.8583  | 0.030 | 0.0012  | 49      | 1.9291 | 0.20 | 0.008 | 2.5                          | 0.098 | 9.498  | 20.92 | 191000                            | 43000 | 226000                                                     | 51000 |
| 7322WN MBR     | 110    | 4.3307 | 0.013 | 0.0005 | 240                | 9.4488  | 0.030 | 0.0012  | 50      | 1.9685 | 0.20 | 0.008 | 2.5                          | 0.098 | 10.892 | 23.99 | 226000                            | 51000 | 253000                                                     | 57000 |
| 7324WN MBR     | 120    | 4.7244 | 0.013 | 0.0005 | 260                | 10.2362 | 0.035 | 0.0014  | 55      | 2.1654 | 0.20 | 0.008 | 2.5                          | 0.098 | 14.356 | 31.62 | 259000                            | 58500 | 284000                                                     | 64000 |
| 7326WN MBR     | 130    | 5.1181 | 0.018 | 0.0007 | 280                | 11.0236 | 0.035 | 0.0014  | 58      | 2.2835 | 0.25 | 0.010 | 3.0                          | 0.118 | 17.339 | 38.19 | 302000                            | 68000 | 315000                                                     | 71000 |
| 7328WN MBR     | 140    | 5.5118 | 0.018 | 0.0007 | 300                | 11.8110 | 0.035 | 0.0014  | 62      | 2.4409 | 0.25 | 0.010 | 3.0                          | 0.118 | 20.294 | 44.70 | 346000                            | 78000 | 339000                                                     | 76500 |
| 7330WN MBR     | 150    | 5.9055 | 0.018 | 0.0007 | 320                | 12.5984 | 0.040 | 0.0016  | 65      | 2.5591 | 0.25 | 0.010 | 3.0                          | 0.118 | 24.907 | 54.86 | 390000                            | 88000 | 368000                                                     | 83000 |

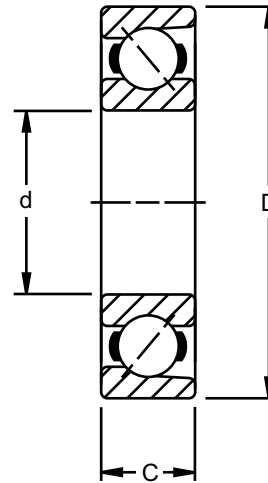
<sup>(1)</sup> Maximum shaft or housing fillet radius that bearing corners will clear.

<sup>(2)</sup> Based on 10<sup>6</sup> revolutions of calculated fatigue life.

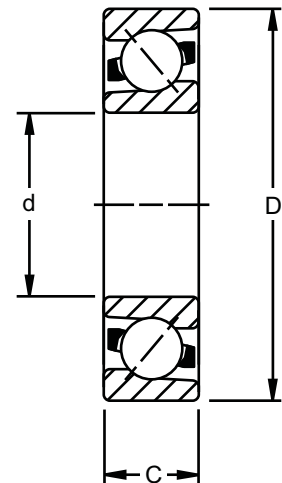


## HEAVY 7400 SERIES

- Dimensionally interchangeable with the radial 400 Series.
- Sizes with a "WN" suffix include a refined bore diameter tolerance.
- Can sustain heavier thrust and combined loads than the 7300WN Series.
- A single bearing is suggested for applications in which the thrust load is in one direction or, in the case of combined loads, the thrust load is high in relation to the radial load.
- A duplex pair is suggested for applications where thrust is present in both directions or where axial displacement of the shaft must be restricted.
- For exceptionally high thrust loads in one direction, a tandem pair can be used, opposed by a third bearing.
- Sizes with a suffix "W" have a 20 degree contact angle and a steel retainer.
- Sizes with a suffix "PW" have a 35 degree contact angle and a steel retainer.
- Sizes with a "WN" suffix have a 40 degree contact angle and a one-piece, high-strength machined bronze cage.



7405W-7409W  
20° Contact Angle  
7410PW-7420PW  
35° Contact Angle



7412WN and 7415WN MBR  
40° Contact Angle

## DIMENSIONS – TOLERANCES

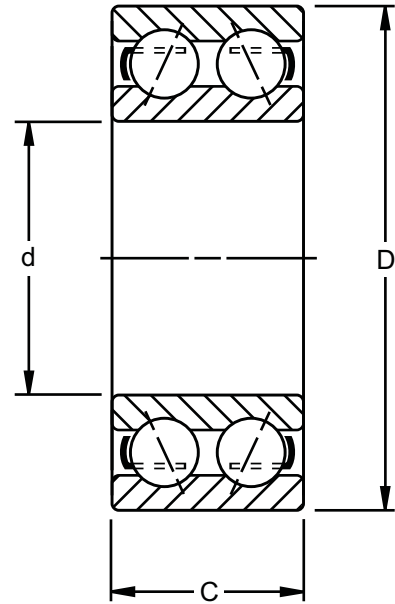
| Bearing Number | Bore d |        | tolerance<br>+0.000 mm<br>+0.0000" to minus |         | Outside Diameter D |         | tolerance<br>+0.000 mm<br>+0.0000" to minus |        | Width C |        | tolerance<br>+0.000 mm<br>+0.0000" to minus |       | Fillet Radius <sup>(1)</sup> |       | Wt.    |       | Static Load Rating C <sub>0</sub> |       | Extended Dynamic Load Rating C <sub>E</sub> <sup>(2)</sup> |       |
|----------------|--------|--------|---------------------------------------------|---------|--------------------|---------|---------------------------------------------|--------|---------|--------|---------------------------------------------|-------|------------------------------|-------|--------|-------|-----------------------------------|-------|------------------------------------------------------------|-------|
|                | mm     | in.    | mm                                          | in.     | mm                 | in.     | mm                                          | in.    | mm      | in.    | mm                                          | in.   | mm                           | in.   | kg     | lbs.  | N                                 | lbs.  | N                                                          | lbs.  |
| 7405W          | 25     | 0.9843 | 0.010                                       | 0.0004  | 80                 | 3.1496  | 0.013                                       | 0.0005 | 21      | 0.8268 | 0.12                                        | 0.005 | 1.5                          | 0.060 | 0.925  | 2.04  | 25900                             | 5850  | 53300                                                      | 12000 |
| 7406W          | 30     | 1.1811 | 0.010                                       | 0.0004  | 90                 | 3.5433  | 0.015                                       | 0.0006 | 23      | 0.9055 | 0.12                                        | 0.005 | 1.5                          | 0.060 | 0.957  | 2.11  | 35500                             | 8000  | 69000                                                      | 15600 |
| 7407W          | 35     | 1.3780 | 0.012                                       | 0.00045 | 100                | 3.9370  | 0.015                                       | 0.0006 | 25      | 0.9843 | 0.12                                        | 0.005 | 1.5                          | 0.060 | 1.002  | 2.21  | 42800                             | 9650  | 79900                                                      | 18000 |
| 7408W          | 40     | 1.5748 | 0.012                                       | 0.00045 | 110                | 4.3307  | 0.015                                       | 0.0006 | 27      | 1.0630 | 0.12                                        | 0.005 | 2.0                          | 0.080 | 1.311  | 2.89  | 56400                             | 12700 | 99500                                                      | 22400 |
| 7409W          | 45     | 1.7717 | 0.012                                       | 0.00045 | 120                | 4.7244  | 0.015                                       | 0.0006 | 29      | 1.1417 | 0.12                                        | 0.005 | 2.0                          | 0.080 | 1.647  | 3.63  | 62000                             | 14000 | 106000                                                     | 24000 |
| 7410WN         | 50     | 1.9685 | 0.012                                       | 0.00045 | 130                | 5.1181  | 0.018                                       | 0.0007 | 31      | 1.2205 | 0.12                                        | 0.005 | 2.0                          | 0.080 | 2.195  | 4.84  | 66600                             | 15000 | 115000                                                     | 26000 |
| 7411PW         | 55     | 2.1654 | 0.015                                       | 0.0006  | 140                | 5.5118  | 0.018                                       | 0.0007 | 33      | 1.2992 | 0.15                                        | 0.006 | 2.0                          | 0.080 | 2.681  | 5.91  | 71000                             | 16000 | 122000                                                     | 27500 |
| 7412WN         | 60     | 2.3622 | 0.010                                       | 0.0004  | 150                | 5.9055  | 0.018                                       | 0.0007 | 35      | 1.3780 | 0.15                                        | 0.006 | 2.0                          | 0.080 | 3.257  | 7.18  | 85700                             | 19300 | 135000                                                     | 30500 |
| 7413WN         | 65     | 2.5591 | 0.015                                       | 0.0006  | 160                | 6.2992  | 0.025                                       | 0.0010 | 37      | 1.4567 | 0.15                                        | 0.006 | 2.0                          | 0.080 | 3.896  | 8.59  | 91500                             | 20400 | 142000                                                     | 32000 |
| 7414WN         | 70     | 2.7559 | 0.015                                       | 0.0006  | 180                | 7.0866  | 0.025                                       | 0.0010 | 42      | 1.6535 | 0.15                                        | 0.006 | 2.5                          | 0.100 | 5.688  | 12.54 | 115500                            | 26000 | 173000                                                     | 39000 |
| 7415WN         | 75     | 2.9528 | 0.010                                       | 0.0004  | 190                | 7.4803  | 0.030                                       | 0.0012 | 45      | 1.7717 | 0.15                                        | 0.006 | 2.5                          | 0.100 | 6.745  | 14.87 | 148000                            | 33500 | 202000                                                     | 45500 |
| 7416WN         | 80     | 3.1496 | 0.015                                       | 0.0006  | 200                | 7.8740  | 0.030                                       | 0.0012 | 48      | 1.8898 | 0.15                                        | 0.006 | 2.5                          | 0.100 | 7.747  | 17.08 | 153000                            | 34500 | 206000                                                     | 46500 |
| 7418PW         | 90     | 3.5433 | 0.020                                       | 0.0008  | 225                | 8.8583  | 0.030                                       | 0.0012 | 54      | 2.1268 | 0.20                                        | 0.008 | 3.0                          | 0.120 | 11.159 | 24.60 | 200000                            | 45000 | 236000                                                     | 53000 |
| 7420PW         | 100    | 3.9370 | 0.020                                       | 0.0008  | 265                | 10.4331 | 0.036                                       | 0.0014 | 60      | 2.3622 | 0.20                                        | 0.008 | 3.0                          | 0.120 | 18.643 | 41.10 | 279000                            | 63000 | 315000                                                     | 71000 |

<sup>(1)</sup> Maximum shaft or housing fillet radius that bearing corners will clear.

<sup>(2)</sup> Based on 10<sup>6</sup> revolutions of calculated fatigue life.

## LIGHT 5200 SERIES

- Features the same bores and outside diameters as the corresponding bearings in the 200 Series single-row radial type.
- Double-row angular contact ball bearings meet the demand for increased axial and radial rigidity in applications where the design limits space.
- Available in both Conrad and maximum capacity types.
- Suffix "K" denotes Conrad (example: 5203K).
- Suffix "W" or no suffix denotes maximum capacity type (example: 5212W, 5213).
- Please note: these double-row series bearings are not prelubricated.



### DIMENSIONS – TOLERANCES

| Bearing Number       | Bore d |        |       |         | Outside Diameter D |        |       |         | Width C |                      |         | Fillet Radius <sup>(1)</sup> |       | Contact Angle | Wt.   |       | Static Load Rating C <sub>0</sub> |       | Extended Dynamic Load Rating C <sub>e</sub> <sup>(6)</sup> |       |
|----------------------|--------|--------|-------|---------|--------------------|--------|-------|---------|---------|----------------------|---------|------------------------------|-------|---------------|-------|-------|-----------------------------------|-------|------------------------------------------------------------|-------|
|                      | mm     | in.    | mm    | in.     | mm                 | in.    | mm    | in.     | mm      | in.                  | in.     | mm                           | in.   |               | kg    | lbs.  | N                                 | lbs.  | N                                                          | lbs.  |
| 5200K <sup>(2)</sup> | 10     | 0.3937 | 0.008 | 0.0003  | 30                 | 1.1811 | 0.009 | 0.00035 | 14.27   | 0.562                | 9/16    | 0.6                          | 0.024 | 20°           | 0.054 | 0.12  | 5060                              | 1140  | 10600                                                      | 2400  |
| 5201K <sup>(2)</sup> | 12     | 0.4724 | 0.008 | 0.0003  | 32                 | 1.2598 | 0.012 | 0.00045 | 15.88   | 0.625                | 5/8     | 0.6                          | 0.024 | 20°           | 0.068 | 0.15  | 4700                              | 1060  | 9060                                                       | 2040  |
| 5202K <sup>(2)</sup> | 15     | 0.5906 | 0.008 | 0.0003  | 35                 | 1.3780 | 0.012 | 0.00045 | 15.88   | 0.625                | 5/8     | 0.6                          | 0.024 | 20°           | 0.073 | 0.16  | 7100                              | 1600  | 13500                                                      | 3050  |
| 5203K <sup>(2)</sup> | 17     | 0.6693 | 0.008 | 0.0003  | 40                 | 1.5748 | 0.012 | 0.00045 | 17.48   | 0.688                | 11/16   | 0.6                          | 0.024 | 20°           | 0.104 | 0.23  | 9200                              | 2080  | 16800                                                      | 3800  |
| 5204K <sup>(2)</sup> | 20     | 0.7874 | 0.010 | 0.0004  | 47                 | 1.8504 | 0.012 | 0.00045 | 20.62   | 0.812                | 13/16   | 1.0                          | 0.039 | 20°           | 0.163 | 0.36  | 12600                             | 2850  | 22600                                                      | 5100  |
| 5205K <sup>(2)</sup> | 25     | 0.9843 | 0.010 | 0.0004  | 52                 | 2.0472 | 0.013 | 0.0005  | 20.62   | 0.812                | 13/16   | 1.0                          | 0.039 | 20°           | 0.186 | 0.41  | 15100                             | 3400  | 24800                                                      | 5600  |
| 5206K                | 30     | 1.1811 | 0.010 | 0.0004  | 62                 | 2.4409 | 0.013 | 0.0005  | 23.83   | 0.938                | 15/16   | 1.0                          | 0.039 | 20°           | 0.295 | 0.65  | 21700                             | 4900  | 34600                                                      | 7800  |
| 5206W                | 30     | 1.1811 | 0.010 | 0.0004  | 62                 | 2.4409 | 0.013 | 0.0005  | 23.83   | 0.938                | 15/16   | 1.0                          | 0.039 | 30°           | 0.295 | 0.65  | 27000                             | 6100  | 39000                                                      | 8800  |
| 5207K                | 35     | 1.3780 | 0.012 | 0.00047 | 72                 | 2.8346 | 0.013 | 0.0005  | 26.97   | 1.062                | 1 1/16  | 1.0                          | 0.039 | 20°           | 0.481 | 1.06  | 29000                             | 6550  | 45000                                                      | 10200 |
| 5207W                | 35     | 1.3780 | 0.012 | 0.00047 | 72                 | 2.8346 | 0.013 | 0.0005  | 26.97   | 1.062                | 1 1/16  | 1.0                          | 0.039 | 30°           | 0.481 | 1.06  | 36800                             | 8300  | 51500                                                      | 11600 |
| 5208K                | 40     | 1.5748 | 0.012 | 0.00047 | 80                 | 3.1496 | 0.013 | 0.0005  | 30.17   | 1.188                | 1 3/16  | 1.0                          | 0.039 | 20°           | 0.566 | 1.32  | 33900                             | 7650  | 51500                                                      | 11600 |
| 5208W                | 40     | 1.5748 | 0.012 | 0.00047 | 80                 | 3.1496 | 0.013 | 0.0005  | 30.17   | 1.188                | 1 3/16  | 1.0                          | 0.039 | 30°           | 0.599 | 1.32  | 47000                             | 10600 | 62000                                                      | 14000 |
| 5209K                | 45     | 1.7717 | 0.012 | 0.00047 | 85                 | 3.3456 | 0.015 | 0.0006  | 30.17   | 1.188                | 1 3/16  | 1.0                          | 0.039 | 20°           | 0.699 | 1.54  | 39000                             | 8800  | 57000                                                      | 12900 |
| 5209W                | 45     | 1.7717 | 0.012 | 0.00047 | 85                 | 3.3456 | 0.015 | 0.0006  | 30.17   | 1.188                | 1 3/16  | 1.0                          | 0.039 | 30°           | 0.699 | 1.54  | 51500                             | 11600 | 64800                                                      | 14600 |
| 5210K                | 50     | 1.9685 | 0.012 | 0.00047 | 90                 | 3.5433 | 0.015 | 0.0006  | 30.17   | 1.188                | 1 3/16  | 1.0                          | 0.039 | 20°           | 0.753 | 1.66  | 44400                             | 10000 | 62000                                                      | 14000 |
| 5210W                | 50     | 1.9685 | 0.012 | 0.00047 | 90                 | 3.5433 | 0.015 | 0.0006  | 30.17   | 1.188                | 1 3/16  | 1.0                          | 0.039 | 30°           | 0.753 | 1.66  | 56000                             | 12700 | 66600                                                      | 15000 |
| 5211K                | 55     | 2.1654 | 0.015 | 0.0006  | 100                | 3.9370 | 0.015 | 0.0006  | 33.32   | 1.312 <sup>(4)</sup> | 1 5/16  | 1.5                          | 0.059 | 20°           | 1.039 | 2.29  | 71000                             | 12700 | 76000                                                      | 17300 |
| 5211W                | 55     | 2.1654 | 0.015 | 0.0006  | 100                | 3.9370 | 0.015 | 0.0006  | 33.32   | 1.312 <sup>(4)</sup> | 1 5/16  | 1.5                          | 0.059 | 30°           | 1.039 | 2.29  | 62000                             | 16000 | 84000                                                      | 19000 |
| 5212K                | 60     | 2.3622 | 0.015 | 0.0006  | 110                | 4.3307 | 0.015 | 0.0006  | 36.53   | 1.438 <sup>(4)</sup> | 1 7/16  | 1.5                          | 0.059 | 20°           | 1.388 | 3.06  | 88800                             | 14000 | 85000                                                      | 19300 |
| 5212W                | 60     | 2.3622 | 0.015 | 0.0006  | 110                | 4.3307 | 0.015 | 0.0006  | 36.53   | 1.438 <sup>(4)</sup> | 1 7/16  | 1.5                          | 0.059 | 30°           | 1.388 | 3.06  | 72000                             | 20000 | 103000                                                     | 23800 |
| 5213K                | 65     | 2.5591 | 0.015 | 0.0006  | 120                | 4.7244 | 0.015 | 0.0006  | 38.10   | 1.500 <sup>(4)</sup> | 1 1/2   | 1.5                          | 0.059 | 20°           | 1.923 | 4.24  | 76800                             | 17300 | 101000                                                     | 22800 |
| 5213 <sup>(3)</sup>  | 65     | 2.5591 | 0.015 | 0.0006  | 120                | 4.7244 | 0.015 | 0.0006  | 38.10   | 1.500 <sup>(4)</sup> | 1 1/2   | 1.5                          | 0.059 | 30°           | 1.923 | 4.24  | 92000                             | 20800 | 99500                                                      | 22400 |
| 5214K                | 70     | 2.7559 | 0.015 | 0.0006  | 125                | 4.9213 | 0.018 | 0.0007  | 39.67   | 1.562 <sup>(4)</sup> | 1 9/16  | 1.5                          | 0.059 | 20°           | 2.096 | 4.62  | 84000                             | 19000 | 108000                                                     | 24500 |
| 5214 <sup>(3)</sup>  | 70     | 2.7559 | 0.015 | 0.0006  | 125                | 4.9213 | 0.018 | 0.0007  | 39.67   | 1.562 <sup>(4)</sup> | 1 9/16  | 1.5                          | 0.059 | 30°           | 2.096 | 4.62  | 126000                            | 28500 | 139000                                                     | 31500 |
| 5215K                | 75     | 2.9528 | 0.015 | 0.0006  | 130                | 5.1181 | 0.018 | 0.0007  | 41.28   | 1.625 <sup>(4)</sup> | 1 5/8   | 1.5                          | 0.059 | 20°           | 2.336 | 5.15  | 85700                             | 19300 | 108000                                                     | 24500 |
| 5215 <sup>(3)</sup>  | 75     | 2.9528 | 0.015 | 0.0006  | 130                | 5.1181 | 0.018 | 0.0007  | 41.28   | 1.625 <sup>(4)</sup> | 1 5/8   | 1.5                          | 0.059 | 30°           | 2.336 | 5.15  | 137000                            | 31000 | 144000                                                     | 32500 |
| 5216 <sup>(3)</sup>  | 80     | 3.1496 | 0.015 | 0.0006  | 140                | 5.5118 | 0.018 | 0.0007  | 44.45   | 1.750 <sup>(4)</sup> | 1 3/4   | 2.0                          | 0.079 | 30°           | 2.867 | 6.32  | 162000                            | 36500 | 168000                                                     | 38000 |
| 5217 <sup>(3)</sup>  | 85     | 3.3465 | 0.020 | 0.0008  | 150                | 5.9055 | 0.018 | 0.0007  | 49.23   | 1.938 <sup>(5)</sup> | 1 15/16 | 2.0                          | 0.079 | 30°           | 3.629 | 8.00  | 177000                            | 40000 | 188000                                                     | 42500 |
| 5218W                | 90     | 3.5433 | 0.020 | 0.0008  | 160                | 6.2992 | 0.025 | 0.0010  | 52.37   | 2.062 <sup>(5)</sup> | 2 1/16  | 2.0                          | 0.079 | 20°           | 4.518 | 9.96  | 191000                            | 43000 | 202000                                                     | 45500 |
| 5219 <sup>(3)</sup>  | 95     | 3.7402 | 0.020 | 0.0008  | 170                | 6.6929 | 0.025 | 0.0010  | 55.58   | 2.188 <sup>(5)</sup> | 2 3/16  | 2.0                          | 0.079 | 30°           | 5.411 | 11.93 | 235000                            | 53000 | 244000                                                     | 55000 |
| 5220W                | 100    | 3.9370 | 0.020 | 0.0008  | 180                | 7.0866 | 0.025 | 0.0010  | 60.32   | 2.375 <sup>(5)</sup> | 2 3/8   | 2.0                          | 0.079 | 20°           | 6.541 | 14.42 | 253000                            | 57000 | 259000                                                     | 58500 |
| 5221W                | 105    | 4.1339 | 0.020 | 0.0008  | 190                | 7.4803 | 0.030 | 0.0012  | 65.10   | 2.563 <sup>(5)</sup> | 2 3/4   | 2.0                          | 0.079 | 20°           | 7.537 | 16.60 | 301000                            | 67600 | 300000                                                     | 67500 |
| 5222 <sup>(3)</sup>  | 110    | 4.3307 | 0.020 | 0.0008  | 200                | 7.8740 | 0.030 | 0.0012  | 69.85   | 2.750 <sup>(5)</sup> | 2 3/4   | 2.0                          | 0.079 | 30°           | 9.503 | 20.95 | 339000                            | 76500 | 326000                                                     | 73500 |

<sup>(1)</sup> Maximum shaft or housing fillet radius that bearing corners will clear.

<sup>(2)</sup> Sizes have PRB molded nylon retainers.

<sup>(3)</sup> These sizes have contact angle converging inside the bearing.

<sup>(4)</sup> Width tolerance is +.00 mm to -.15 mm (+.000 to -.006").

<sup>(5)</sup> Width tolerance is +.00 mm to -.20 mm (+.000 to -.008").

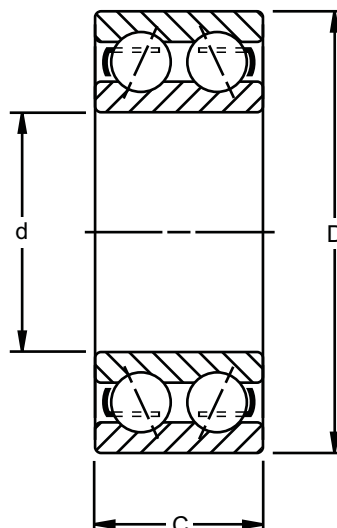
<sup>(6)</sup> Based on 10<sup>6</sup> revolutions of calculated fatigue life.

**Note:** See page D45 for Shield and Snap Ring Combinations.



## MEDIUM 5300 SERIES

- Features the same bores and outside diameters as corresponding bearings in the 300 Series single-row radial type.
- Double-row angular contact ball bearings meet the demand for increased axial and radial rigidity in applications where design limits space.
- Available in Conrad and maximum capacity types.
- Suffix "K" denotes Conrad type (example: 5303K).
- Suffix "W" or no suffix denotes maximum capacity type (examples: 5312W, 5319).
- Please note that these double-row series bearings are not prelubricated.



### DIMENSIONS – TOLERANCES

| Bearing Number       | Bore d |        |                                       |         | Outside Diameter D |         |                                       |         | Width C |                      |                                     |     | Fillet Radius <sup>(1)</sup> | Contact Angle | Wt.    |       | Static Load Rating C <sub>0</sub> |        | Extended Dynamic Load Rating C <sub>E</sub> <sup>(6)</sup> |        |
|----------------------|--------|--------|---------------------------------------|---------|--------------------|---------|---------------------------------------|---------|---------|----------------------|-------------------------------------|-----|------------------------------|---------------|--------|-------|-----------------------------------|--------|------------------------------------------------------------|--------|
|                      |        |        | tolerance +0.000 mm +0.0000" to minus |         |                    |         | tolerance +0.000 mm +0.0000" to minus |         |         |                      | +0.00 mm, -0.12 mm +0.000", -0.005" |     |                              |               |        |       |                                   |        |                                                            |        |
|                      | mm     | in.    | mm                                    | in.     | mm                 | in.     | mm                                    | in.     | mm      | in.                  | mm                                  | in. |                              |               | kg     | lbs.  | N                                 | lbs.   | N                                                          | lbs.   |
| 5302                 | 15     | 0.5906 | 0.008                                 | 0.0003  | 42                 | 1.6535  | 0.012                                 | 0.00045 | 19.05   | 0.75                 | ¾                                   | 1.0 | 0.039                        | 20°           | 0.141  | 0.31  | 9200                              | 2080   | 16800                                                      | 3800   |
| 5303K                | 17     | 0.6693 | 0.008                                 | 0.0003  | 47                 | 1.8504  | 0.012                                 | 0.00045 | 22.22   | 0.875                | 7/8                                 | 1.0 | 0.039                        | 20°           | 0.191  | 0.42  | 12600                             | 2850   | 22600                                                      | 5100   |
| 5304K <sup>(2)</sup> | 20     | 0.7874 | 0.010                                 | 0.0004  | 52                 | 2.0472  | 0.013                                 | 0.0005  | 22.22   | 0.875                | 7/8                                 | 1.0 | 0.039                        | 20°           | 0.222  | 0.49  | 15300                             | 3450   | 28400                                                      | 6400   |
| 5305K <sup>(2)</sup> | 25     | 0.9843 | 0.010                                 | 0.0004  | 62                 | 2.4409  | 0.013                                 | 0.0005  | 25.4    | 1.000                | 1                                   | 1.0 | 0.039                        | 20°           | 0.367  | 0.81  | 21100                             | 4750   | 37700                                                      | 8500   |
| 5306K                | 30     | 1.1811 | 0.010                                 | 0.0004  | 72                 | 2.8346  | 0.013                                 | 0.0005  | 30.17   | 1.188                | 1⅜                                  | 1.0 | 0.039                        | 20°           | 0.612  | 1.35  | 29000                             | 6550   | 47000                                                      | 10600  |
| 5306W                | 30     | 1.1811 | 0.010                                 | 0.0004  | 72                 | 2.8346  | 0.013                                 | 0.0005  | 30.17   | 1.188                | 1⅜                                  | 1.0 | 0.039                        | 30°           | 0.612  | 1.35  | 41000                             | 9300   | 62000                                                      | 14000  |
| 5307K                | 35     | 1.3780 | 0.012                                 | 0.00047 | 80                 | 3.1496  | 0.013                                 | 0.0005  | 34.93   | 1.375                | 1⅜                                  | 1.5 | 0.059                        | 20°           | 0.871  | 1.92  | 36000                             | 8300   | 59500                                                      | 13400  |
| 5307W                | 35     | 1.3780 | 0.012                                 | 0.00047 | 80                 | 3.1496  | 0.013                                 | 0.0005  | 34.93   | 1.375                | 1⅜                                  | 1.5 | 0.059                        | 30°           | 0.871  | 1.92  | 47900                             | 10800  | 69200                                                      | 15600  |
| 5308K                | 40     | 1.5748 | 0.012                                 | 0.00047 | 90                 | 3.5433  | 0.015                                 | 0.0006  | 36.53   | 1.438                | 1⅞                                  | 1.5 | 0.059                        | 20°           | 1.139  | 2.51  | 46000                             | 10400  | 72400                                                      | 16300  |
| 5308W                | 40     | 1.5748 | 0.012                                 | 0.00047 | 90                 | 3.5433  | 0.015                                 | 0.0006  | 36.53   | 1.438                | 1⅞                                  | 1.5 | 0.059                        | 30°           | 1.139  | 2.51  | 66600                             | 15000  | 90600                                                      | 20400  |
| 5309K                | 45     | 1.7717 | 0.012                                 | 0.00047 | 100                | 3.9370  | 0.015                                 | 0.0006  | 39.67   | 1.562                | 1⅞                                  | 1.5 | 0.059                        | 20°           | 1.433  | 3.16  | 56400                             | 12700  | 87000                                                      | 19600  |
| 5309W                | 45     | 1.7717 | 0.012                                 | 0.00047 | 100                | 3.9370  | 0.015                                 | 0.0006  | 39.67   | 1.562                | 1⅞                                  | 1.5 | 0.059                        | 30°           | 1.433  | 3.16  | 81000                             | 18300  | 106000                                                     | 24000  |
| 5310K                | 50     | 1.9685 | 0.012                                 | 0.00047 | 110                | 4.3307  | 0.015                                 | 0.0006  | 44.45   | 1.750                | 1¾                                  | 2.0 | 0.079                        | 20°           | 2.091  | 4.61  | 73000                             | 16600  | 111000                                                     | 25000  |
| 5310W                | 50     | 1.9685 | 0.012                                 | 0.00047 | 110                | 4.3307  | 0.015                                 | 0.0006  | 44.45   | 1.750                | 1¾                                  | 2.0 | 0.079                        | 30°           | 2.091  | 4.61  | 97000                             | 22000  | 126000                                                     | 28500  |
| 5311K                | 55     | 2.1654 | 0.015                                 | 0.0006  | 120                | 4.7244  | 0.015                                 | 0.0006  | 49.22   | 1.938 <sup>(3)</sup> | 1⅞                                  | 2.0 | 0.079                        | 20°           | 2.722  | 6.00  | 86700                             | 19500  | 124400                                                     | 28000  |
| 5311W                | 55     | 2.1654 | 0.015                                 | 0.0006  | 120                | 4.7244  | 0.015                                 | 0.0006  | 49.22   | 1.938 <sup>(3)</sup> | 1⅞                                  | 2.0 | 0.079                        | 20°           | 2.722  | 6.00  | 113000                            | 25500  | 144000                                                     | 32500  |
| 5312W                | 60     | 2.3622 | 0.015                                 | 0.0006  | 130                | 5.1181  | 0.018                                 | 0.0007  | 53.98   | 2.125 <sup>(3)</sup> | 2⅛                                  | 2.0 | 0.079                        | 20°           | 3.423  | 7.54  | 151000                            | 34000  | 191000                                                     | 43000  |
| 5313W                | 65     | 2.5591 | 0.015                                 | 0.0006  | 140                | 5.5118  | 0.018                                 | 0.0007  | 58.72   | 2.312 <sup>(3)</sup> | 2⅝                                  | 2.0 | 0.079                        | 20°           | 4.163  | 9.17  | 173000                            | 39000  | 213000                                                     | 48000  |
| 5314W                | 70     | 2.7559 | 0.015                                 | 0.0006  | 150                | 5.9055  | 0.018                                 | 0.0007  | 63.50   | 2.500 <sup>(3)</sup> | 2½                                  | 2.0 | 0.079                        | 20°           | 5.362  | 11.82 | 195000                            | 44000  | 239000                                                     | 54000  |
| 5315W                | 75     | 2.9528 | 0.015                                 | 0.0006  | 160                | 6.2992  | 0.025                                 | 0.0010  | 68.30   | 2.689 <sup>(3)</sup> | 2⅞                                  | 2.0 | 0.079                        | 20°           | 6.428  | 14.17 | 222000                            | 50000  | 266000                                                     | 60000  |
| 5316W                | 80     | 3.1496 | 0.015                                 | 0.0006  | 170                | 6.6929  | 0.025                                 | 0.0010  | 68.28   | 2.688 <sup>(3)</sup> | 2⅞                                  | 2.0 | 0.079                        | 20°           | 7.366  | 16.24 | 248000                            | 56000  | 284000                                                     | 64000  |
| 5317W                | 85     | 3.3465 | 0.020                                 | 0.0008  | 180                | 7.0866  | 0.025                                 | 0.0010  | 73.02   | 2.875 <sup>(4)</sup> | 2⅞                                  | 2.5 | 0.098                        | 20°           | 8.827  | 19.46 | 279000                            | 63000  | 308000                                                     | 69500  |
| 5318W                | 90     | 3.5433 | 0.020                                 | 0.0008  | 190                | 7.4803  | 0.030                                 | 0.0012  | 73.02   | 2.875 <sup>(4)</sup> | 2⅞                                  | 2.5 | 0.098                        | 20°           | 9.616  | 21.20 | 308000                            | 69500  | 333000                                                     | 75000  |
| 5319W                | 95     | 3.7402 | 0.020                                 | 0.0008  | 200                | 7.8740  | 0.030                                 | 0.0012  | 77.77   | 3.062 <sup>(4)</sup> | 3⅜                                  | 2.5 | 0.098                        | 30°           | 11.562 | 25.49 | 319000                            | 72000  | 333000                                                     | 75000  |
| 5320W                | 100    | 3.9370 | 0.020                                 | 0.0008  | 215                | 8.4646  | 0.030                                 | 0.0012  | 82.55   | 3.250 <sup>(4)</sup> | 3¼                                  | 2.5 | 0.098                        | 20°           | 14.333 | 31.57 | 377000                            | 85000  | 377000                                                     | 85000  |
| 5322W                | 110    | 4.3307 | 0.020                                 | 0.0008  | 240                | 9.4488  | 0.030                                 | 0.0012  | 92.08   | 3.625 <sup>(4)</sup> | 3⅝                                  | 2.5 | 0.098                        | 20°           | 20.153 | 44.43 | 479000                            | 108000 | 453000                                                     | 102000 |
| 5324W                | 120    | 4.7244 | 0.020                                 | 0.0008  | 260                | 10.2362 | 0.035                                 | 0.0014  | 104.78  | 4.125 <sup>(4)</sup> | 4⅞                                  | 2.5 | 0.098                        | 20°           | 28.291 | 62.37 | 555000                            | 125000 | 497000                                                     | 112000 |
| 5328W                | 140    | 5.5118 | 0.025                                 | 0.0010  | 300                | 11.8110 | 0.035                                 | 0.0014  | 114.30  | 4.500 <sup>(5)</sup> | 4½                                  | 3.0 | 0.118                        | 20°           | 38.102 | 84.00 | 630000                            | 140000 | 570000                                                     | 129000 |

<sup>(1)</sup> Maximum shaft or housing fillet radius that bearing corners will clear.

<sup>(2)</sup> Sizes have PRB molded nylon retainers.

<sup>(3)</sup> Width tolerance is +.00 mm to -.15 mm (+.000 to -.006").

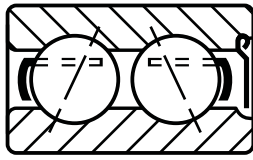
<sup>(4)</sup> Width tolerance is +.00 mm to -.20 mm (+.000 to -.008").

<sup>(5)</sup> Width tolerance is +.00 mm to -.25 mm (+.000 to -.010").

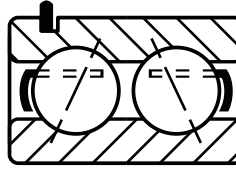
<sup>(6)</sup> Based on 10<sup>6</sup> revolutions of calculated fatigue life.

**Note:** See opposite page for shield and snap ring combinations.

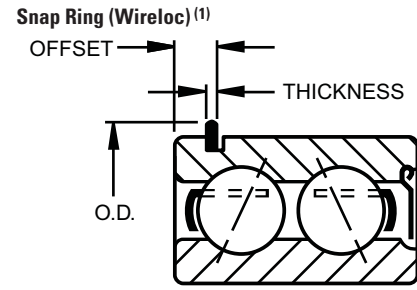
## SHIELD AND SNAP RING COMBINATIONS



One Shield D



Open Type G



One Shield DG

### 5200 SERIES

| Bearing Number        | Width<br>+0.00 mm, -.12 mm<br>+0.000", -.005" |                      |        | Wt.   |      | Bearing Number       | Snap Ring <sup>(1)</sup> |           |        | Wt.   |       |
|-----------------------|-----------------------------------------------|----------------------|--------|-------|------|----------------------|--------------------------|-----------|--------|-------|-------|
|                       | mm                                            | in.                  | in.    | kg    | lbs. |                      | O.D.                     | Thickness | Offset | kg    | lbs.  |
| 5200KDD2              | 15.88                                         | 0.625 <sup>(3)</sup> | 5/8    | 0.054 | 0.12 | —                    | 34.5                     | 1.07      | 3.05   | —     | —     |
| 5201KD(DD)            | 15.88                                         | 0.625                | 5/8    | 0.064 | 0.14 | —                    | 36.5                     | 1.07      | 3.05   | —     | —     |
| —                     | —                                             | —                    | —      | —     | —    | —                    | 39.3                     | 1.07      | 3.05   | —     | —     |
| 5203KD(KDD3)          | 17.48                                         | 0.688                | 1 1/16 | 0.159 | 0.35 | 5203KDG              | 44.4                     | 1.07      | 3.05   | 0.127 | 0.28  |
| 5204KD                | 20.62                                         | 0.812                | 1 3/16 | 0.118 | 0.26 | 5204KG               | 52.4                     | 1.07      | 3.45   | 0.150 | 0.33  |
| 5205KD                | 22.22                                         | 0.875                | 7/8    | 0.204 | 0.45 | 5205KG               | 57.5                     | 1.07      | 3.45   | 0.200 | 0.44  |
| 5206WD                | 26.97                                         | 1.062                | 1 1/16 | 0.336 | 0.74 | 5206WG(KG)           | 67.5                     | 1.65      | 4.83   | 0.331 | 0.73  |
| 5207WD                | 30.17                                         | 1.188                | 1 3/16 | 0.546 | 1.21 | 5207KG               | 78.2                     | 1.65      | 4.83   | —     | —     |
| 5208WD                | 30.17                                         | 1.188                | 1 3/16 | 0.662 | 1.46 | —                    | 86.5                     | 1.65      | 4.83   | —     | —     |
| 5209WD                | 30.17                                         | 1.188                | 1 3/16 | 0.712 | 1.57 | 5209WG(KG)           | 91.3                     | 1.65      | 4.83   | 0.721 | 1.59  |
| 5210WD                | 33.32                                         | 1.312                | 1 5/16 | 0.816 | 1.80 | 5210WG(KG)           | 96.4                     | 2.41      | 5.59   | 0.771 | 1.70  |
| 5211WD                | 33.32                                         | 1.312                | 1 5/16 | 1.043 | 2.30 | 5211WG(KG)           | 106.4                    | 2.41      | 5.59   | 1.066 | 2.35  |
| 5212WD                | 39.67                                         | 1.562                | 1 9/16 | 1.497 | 3.30 | 5212WG(KG)           | 116.3                    | 2.41      | 5.59   | 1.424 | 3.14  |
| 5213WD                | —                                             | —                    | —      | —     | —    | —                    | 129.4                    | 2.77      | 6.73   | —     | —     |
| 5214WD <sup>(2)</sup> | 39.67                                         | 1.562                | 1 9/16 | 2.137 | 4.71 | —                    | 134.5                    | 2.77      | 6.73   | —     | —     |
| —                     | —                                             | —                    | —      | —     | —    | 5215G <sup>(2)</sup> | 139.7                    | 2.77      | 6.73   | 2.327 | 5.13  |
| 5216DD <sup>(2)</sup> | 47.62                                         | 1.875                | 1 7/8  | 3.062 | 6.75 | 5216G <sup>(2)</sup> | 149.6                    | 2.77      | 7.54   | 2.962 | 6.53  |
| —                     | —                                             | —                    | —      | —     | —    | 5217G <sup>(2)</sup> | 159.5                    | 2.77      | 7.54   | 3.724 | 8.21  |
| 5218WD                | 52.37                                         | 2.062                | 2 1/16 | 4.504 | 9.93 | —                    | 169.5                    | 2.77      | 7.54   | —     | —     |
| —                     | —                                             | —                    | —      | —     | —    | 5219G <sup>(2)</sup> | 182.6                    | 3.05      | 8.61   | 5.498 | 12.12 |

### 5300 SERIES

| Bearing Number       | Width<br>+0.00 mm, -.12 mm<br>+0.000", -.005" |       |         | Wt.   |       | Bearing <sup>(4)</sup> Number | Snap Ring <sup>(1)</sup> |           |        | Wt.   |       |
|----------------------|-----------------------------------------------|-------|---------|-------|-------|-------------------------------|--------------------------|-----------|--------|-------|-------|
|                      | mm                                            | in.   | in.     | kg    | lbs.  |                               | O.D.                     | Thickness | Offset | kg    | lbs.  |
| 5303KDD              | 22.25                                         | 0.875 | 7/8     | —     | —     | 5303KG                        | 52.4                     | 1.07      | 3.45   | 0.227 | 0.50  |
| 5304KDD              | 22.25                                         | 0.875 | 7/8     | —     | —     | 5304KG                        | 57.6                     | 1.07      | 3.45   | 0.231 | 0.51  |
| 5305KDD2             | 25.4                                          | 1.000 | 1       | —     | —     | 5305KG                        | 67.5                     | 1.65      | 4.83   | 0.376 | 0.83  |
| 5306WD               | 33.32                                         | 1.312 | 1 5/16  | 0.640 | 1.41  | 5306WG(KG)                    | 78.2                     | 1.65      | 4.83   | 0.608 | 1.34  |
| 5307WD               | 38.10                                         | 1.500 | 1 1/2   | 0.857 | 1.89  | 5307WG(KG)                    | 86.5                     | 1.65      | 4.83   | 0.807 | 1.78  |
| 5308WD               | 39.67                                         | 1.562 | 1 9/16  | 1.143 | 2.52  | 5308WG(KG)                    | 96.4                     | 2.41      | 5.59   | 1.102 | 2.43  |
| 5309WD               | 42.88                                         | 1.688 | 1 11/16 | 1.665 | 3.67  | 5309WG(KG)                    | 106.4                    | 2.41      | 5.59   | 1.461 | 3.22  |
| 5310WD               | 47.62                                         | 1.875 | 1 7/8   | 2.019 | 4.45  | 5310WG(KG)                    | 116.3                    | 2.41      | 5.59   | 1.932 | 4.26  |
| 5311D <sup>(4)</sup> | 52.37                                         | 2.062 | 2 1/16  | 2.826 | 6.23  | 5311WG(KG)                    | 129.4                    | 2.77      | 6.73   | 2.789 | 6.15  |
| 5312D <sup>(4)</sup> | 57.15                                         | 2.250 | 2 1/4   | 3.423 | 7.54  | 5312WG(KG)                    | 139.7                    | 2.77      | 6.73   | 3.493 | 7.70  |
| 5313D <sup>(4)</sup> | 61.72                                         | 2.438 | 2 7/16  | 4.663 | 10.28 | 5313WG(KG)                    | 149.6                    | 2.77      | 7.54   | 4.291 | 9.46  |
| —                    | —                                             | —     | —       | —     | —     | 5314WG(KG)                    | 159.5                    | 2.77      | 7.54   | 5.466 | 12.05 |
| —                    | —                                             | —     | —       | —     | —     | 5315KG                        | 169.6                    | 2.77      | 7.54   | —     | —     |

(1) The snap ring is normally packaged separately in the box with the bearing.

(2) These sizes have contact angle converging inside bearing (30°).

(3) Inner ring width is 19.05 mm (.7500").

(4) Ring widths are different for these parts. Contact a Timken sales engineer to validate size.

## WIDE INNER RING

For the most up-to-date wide inner ring ball bearing data, please see the Timken Ball Bearing Housed Unit Catalog.





## ***Wide Inner Ring Ball Bearings***



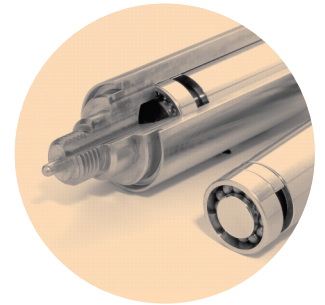
### **WIDE INNER RING**

For the most up-to-date wide inner ring ball bearing data, please see the Timken Ball Bearing Housed Unit Catalog.

## SUPER PRECISION MACHINE TOOL BEARINGS

**Overview:** Timken is a premier manufacturer of Fafnir® super precision machine tool ball bearings. From standard catalog ABMA/ISO designs to custom sizes and features, Timken has the super precision ball bearing to meet your needs.

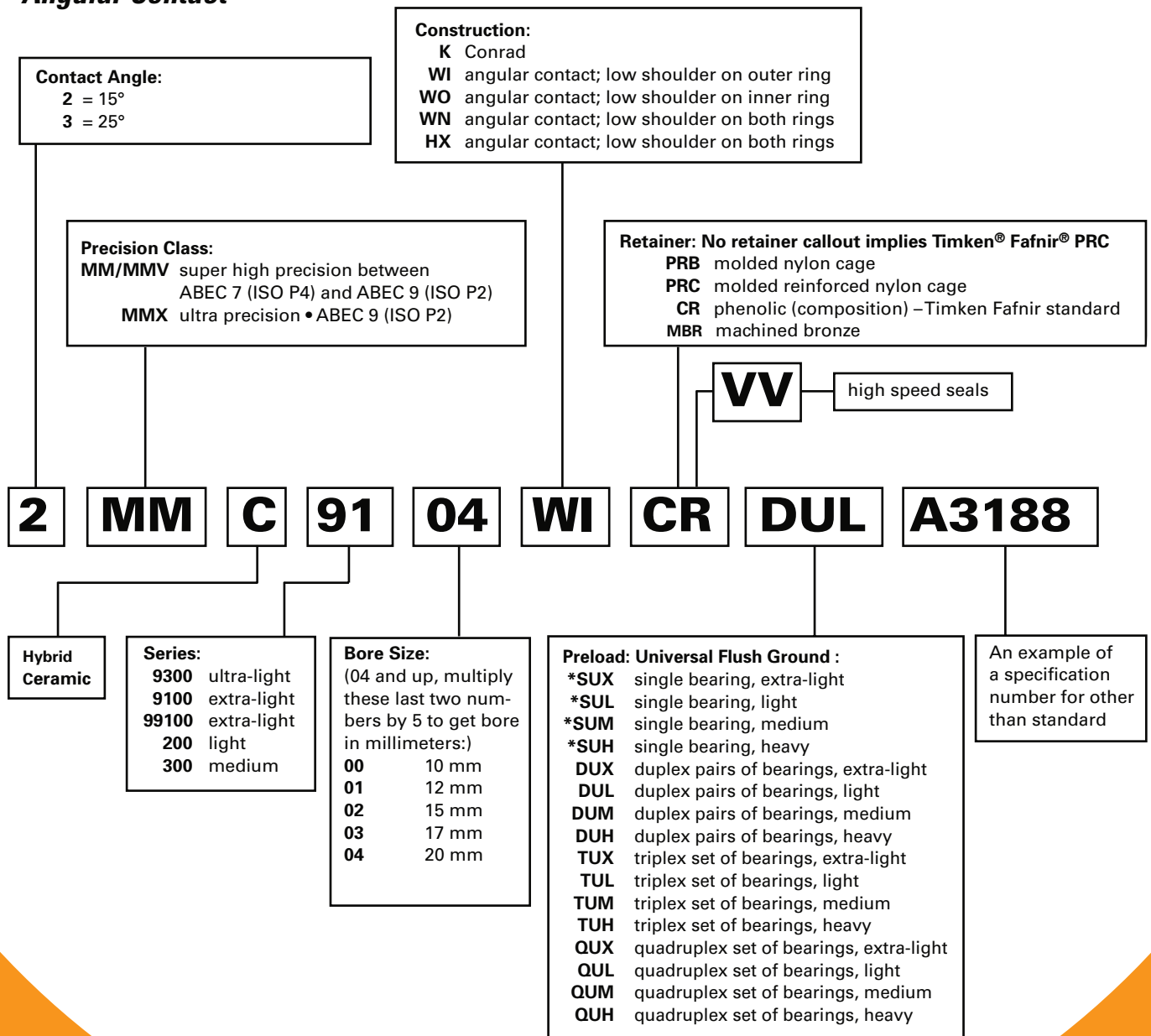
- **Sizes:** 10 mm - 300 mm (.3937 in. - 11.8110 in.) bore.  
26 mm - 400 mm (1.0236 in. - 15.7480 in.) O.D.
- **Markets:** High speed machine tool spindles, high stiffness ball screw support systems, low noise “quiet” bearings, aircraft generator, defense.
- **Features:** ABMA ABEC 7/9 (ISO P4/P2) precision level angular contact 15°, 25°, 60°; single and double-row ball screw; high speed seals’ ceramic balls; advanced materials.
- **Benefits:** Very high speed; high accuracy; high stiffness; low operating temperature; low noise; low vibration.



D

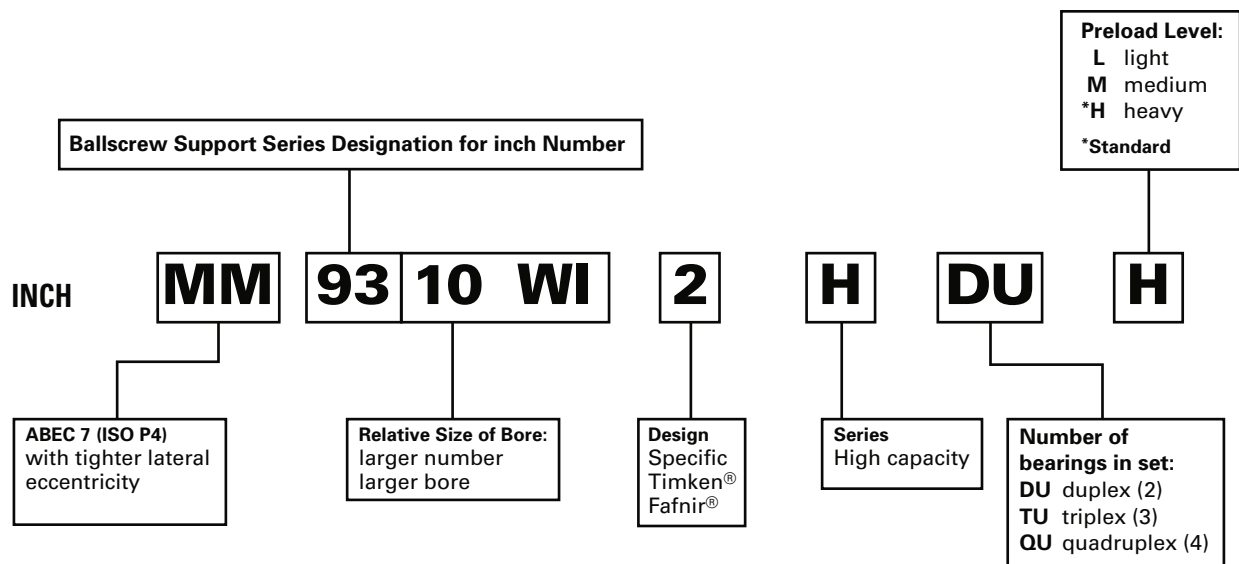
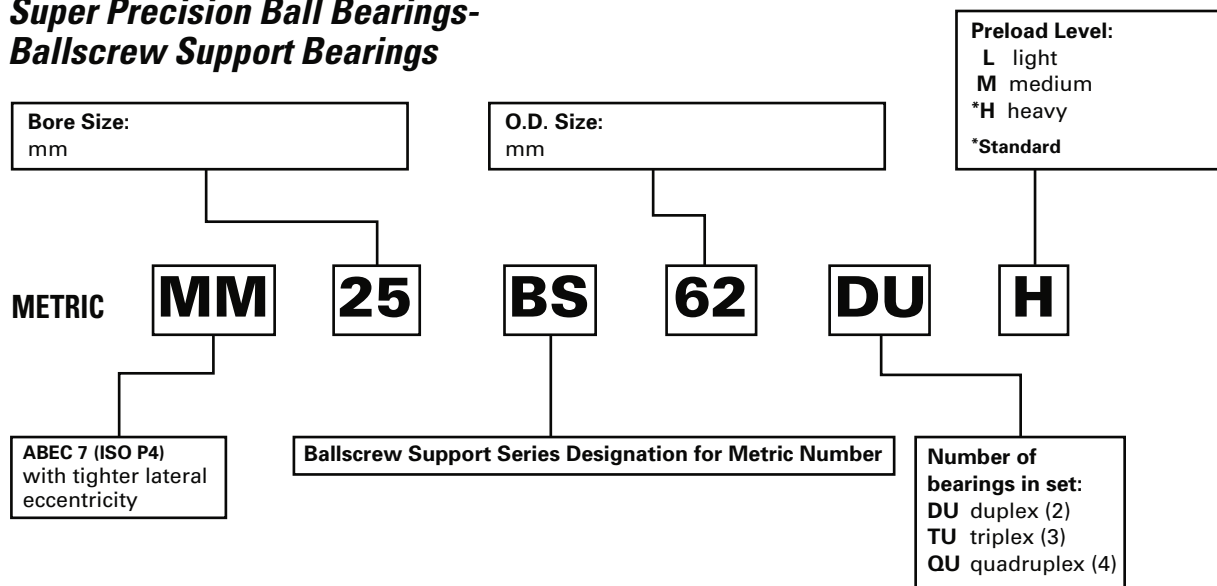


## Super Precision Ball Bearings Angular Contact





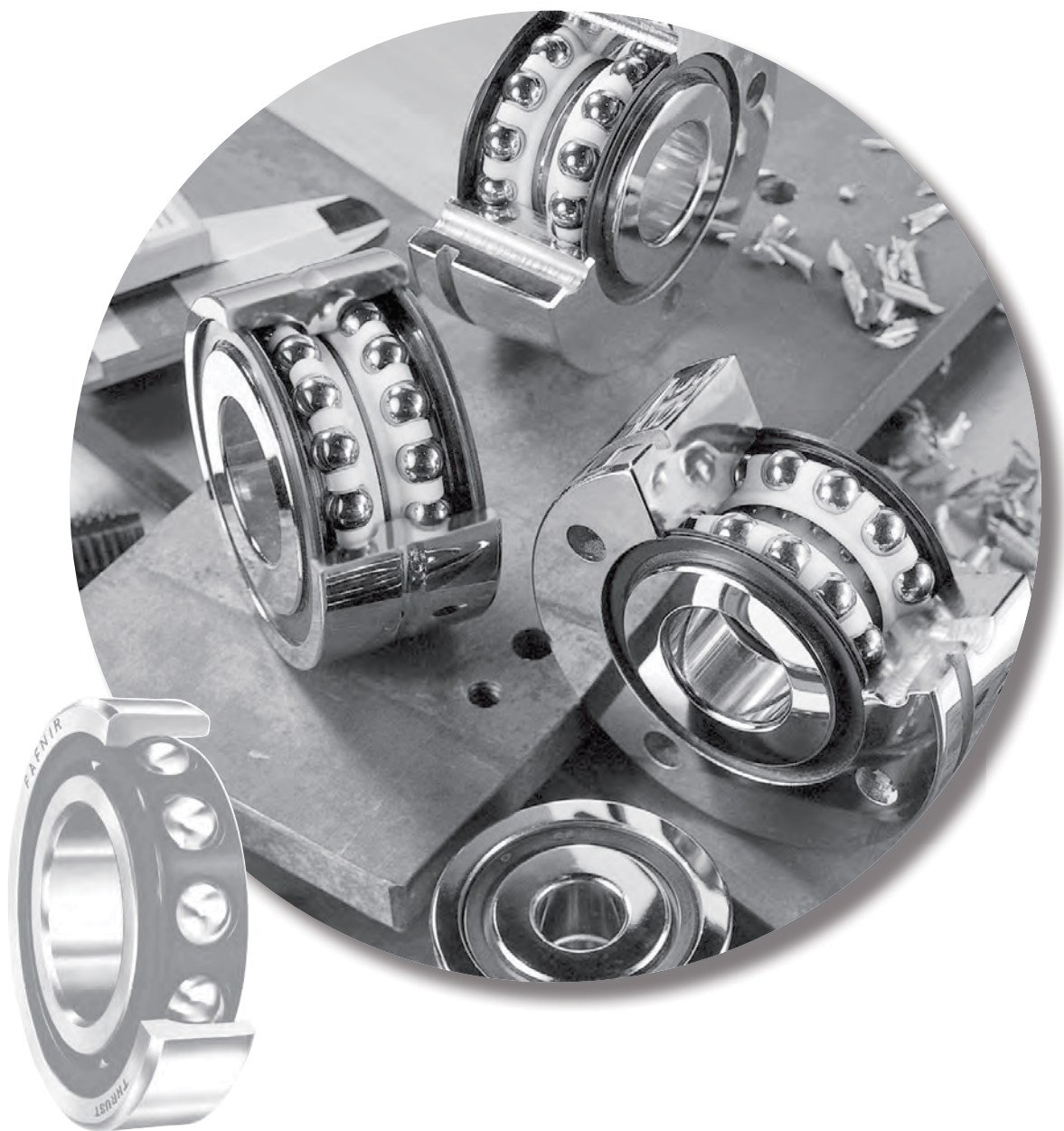
## Super Precision Ball Bearings- Ballscrew Support Bearings



D



D



# Super Precision Ball Bearings

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## INTRODUCTION

### MEANINGS OF PREFIXES AND SUFFIXES

In the Timken® Fafnir® numbering system the basic number which denotes the size and series is always retained. When special variations are made, as in the case of precision bearings, prefixes and suffixes are added which have definite meanings as follows:

#### PREFIXES

- MM** • Super Precision • ABEC 7/ABEC 9 (ISO P4/P2)
- 2MM/2MMV** • Super Precision between ABEC 7 and ABEC 9 (ISO P4/P2) • low contact angle - 15°
- 3MM/3MMV** • Super Precision between ABEC 7 and ABEC 9 (ISO P4/P2) • high contact angle - 25°
- MMX** • Ultra Precision • ABEC 9 • (ISO P2)

#### SUFFIXES

- K** • Deep groove radial
- WI** • Angular contact-low shoulder on outer
- WO** • Angular contact-low shoulder on inner
- WN** • Angular contact-low shoulder on both inner and outer
- HX** • Angular contact-low shoulder on both inner and outer
- CR** • Composition cage (non-metallic)
- MBR** • Machined bronze cage
- SR** • Machined steel cage
- PRB** • Molded nylon cage
- PRC** • Molded nylon cage (reinforced)
- PRF, PRG** • Special high performance material
- SUL** • Flush-ground single bearing • Light preload
- SUM** • Flush-ground single bearing • Medium preload
- SUH** • Flush-ground single bearing • Heavy preload
- DUL** • Flush-ground duplex bearings • Light preload
- DUM** • Flush-ground duplex bearings • Medium preload
- DUH** • Flush-ground duplex bearings • Heavy preload
- TUL** • Flush-ground triplex bearings • Light preload
- TUM** • Flush-ground triplex bearings • Medium preload
- TUH** • Flush-ground triplex bearings • Heavy preload
- QUL** • Flush-ground quadruplex bearings • Light preload
- QUM** • Flush-ground quadruplex bearings • Medium preload
- QUH** • Flush-ground quadruplex bearings • Heavy preload

### PERFORMANCE

The performance of a super precision bearing is not completely defined by the ABEC/ISO classes. The latitude of these classes allows for a significant range of variability in product performance among bearing manufacturers. Characteristics such as raceway curvature and uniformity; the balls' conformance to sphericity; race and ball surface finish; waviness of contact areas; preload offset tolerance; cleanliness; calibration of envelope dimensions; matching of bearings within a set; cage design and material; lubricant; radial play; contact angle and precision of ball complement are not defined by ABEC/ISO. All have a direct impact on the service life and performance of a bearing. The lack of a comprehensive standard allows inferior bearings to be marketed as ABEC 7 or 9 (ISO P4 or P2) without the ability to produce superior performance. All Timken MM, MMV, and MMX precision grade comply with strict controls over these non-specified parameters, to provide premium performance.

## OPTIMIZED GRADES OF PRECISION

### MM, MMV – SUPER PRECISION, SUPER HIGH PRECISION (ABEC 7/9, ISO P4/P2)

Super precision bearings manufactured to the MM(V) tolerance class operate with running accuracy and performance levels meeting ABEC 9 (ISO P2) yet maintain non-critical features at ABEC 7 (ISO P4) level for cost-effectiveness. Bore and O.D. surfaces are coded in micron units for the convenience of the discriminating machine tool builder striving for optimum fitting of crucial spindle components.

### MMX – ULTRAPRECISION (ABEC 9, ISO P2)

Super precision bearings with closer tolerances and running accuracies than ABEC 7 (ISO P4) bearings are made to ABEC 9 (ISO P2) tolerances. Bearings produced to these tolerances are generally used on ultra-high-speed grinding spindles designed for tight dimensional tolerances and super-fine surface finishes. Contact your Timken representative for availability of product range.

## BEARING TYPES

### ANGULAR-CONTACT BEARINGS

2MM-WI types with 15 degree initial contact angle are designed to meet the needs of machine builders for precision bearings which will operate at as low a temperature as possible for a wide range of speeds and operating loads. In order for machines to produce more accurate work at a higher production rate, the bearings must provide a high degree of rigidity in both axial and radial directions while operating at minimum temperatures. For example, precision machining or cutting tools impose heavier loads on bearings than those encountered in precision grinding. In the former, speeds are slower and loads heavier than the latter, where speeds are high and loads light. The 2MM-WI Type gives the machine builder the flexibility required to meet such variations in applications.

**3MM-WI** manufactured with 25 degree contact angle, are for use on applications where the loading on the bearings is predominately thrust – and a high degree of axial rigidity is a definite requirement. Typical applications for these are large vertical rotary surface grinders, horizontal and vertical disc grinders, and thrust bearing applications for heavy-duty lathes where the bearings must directly carry extremely high tail stock or chucking pressure.

**2MM-WO** with 15 degree initial contact angle are designed for extremely high-speed applications where centrifugal force of the balls is the principal load on the bearing. Unlike the MM-WI Type, which has a low shoulder outer ring, the 2MM-WO Type has full shoulders on both sides of the outer race and a low shoulder on one side of the inner ring. This design permits assembly with a maximum complement of balls and a one-piece cage which pilots against the precision-ground lands of the outer ring. Generally this bearing series is supplied with a separable inner ring and ball retaining cage along with special race geometry for extremely high-speed operation.

**2MMV and 3MMV-HX** are dimensionally interchangeable with equivalent 9100, 99100, 9300 and ISO Series-10 and 19 bearings. These designs enable spindle heads to remove more material in less time while maintaining superior machining tolerances. This is achieved through a proven combination of unique ball complements with precision engineering raceway geometries.

**2MMV and 3MMV-HX VV** possess all of the high-speed advantages of the HX but with true high speed seals. These bearing seals protect lubricant from outside contaminants while ensuring internal lubricant retention, extending service life significantly.

**2MMV and 3MMV 99100WN** are available with 15 degree or 25 degree contact angle variations and have been developed to operate under the demanding requirements of high-speed machine tools. They incorporate design features which permit operation at higher speeds than standard angular contact ball bearings. The bore, outside diameter and width are the same as the MM9100 Series.

## BALL SCREW SUPPORT BEARINGS

To meet the demands of the servo-controlled machinery field, the Timken® Fafnir® ball screw support bearings are specially designed with steep contact angles and offer high levels of stiffness for ball screw application requirements. Timken's most recent product offering in this area is a series of double-row, sealed, flanged (or cartridge) units that use an integral double-row outer ring to help simplify installation procedures. Timken offers the following ball screw support bearing products:

- Inch Series bearings (MM9300)
- Metric Series bearings (MMBS)
- Flanged Cylindrical Cartridge housings (BSBU)
- Pillow Block housings (BSPB)
- Integral Double-Row units (MMN, MMF)



2MM-WI &  
3MM-WI Types



HXVV Types



2MMV99100 Types



MM9300WI DUH (Inch)  
MM...BS...DUH (Metric)





## INTRODUCTION

Workhead and tool spindles are the most important components of machine tools. Consequently, to reach the requirements for spindle speed, work accuracy and finish, selection of the proper size and type of ball bearings to support these spindles is a critical design problem.

Of all the anti-friction bearing types, super precision ball bearings have proved to be the best value for the wide variety of bearing applications covering broad ranges of operating loads, speeds and lubrication conditions. Duplexed, preloaded, angular contact bearings with one-piece composition retainers, have excellent capacity and provide maximum spindle rigidity. These bearings are widely used in achieving faster speeds, greater accuracy, smoother finishes and higher production rates.

Many considerations are involved in the choice of bearings for precision applications. Among those which influence the performance of machine tool spindles are the internal fit-up and geometry of the bearings, the mounting arrangement, the shaft and housing mounting fits, the balance and alignment of the rotating parts, and last, but equally important, the lubrication. While many of these factors are significant in slow-speed applications, all of them must be considered for high-speed spindles.

To minimize deflection under load, shafts for machine tool spindles are designed to have a minimum unsupported length and maximum cross-section. For the same reason, spindle housings are designed heavy enough to carry the work load. Their cross-sections are made as uniform as possible to reduce stress concentration during uneven deflection of the frame due to thermal changes. In addition, heavy, well-proportioned housings can function as sinks to conduct heat away from ball bearings.

## SELECTIVE ASSEMBLY

Under certain conditions it may be desirable to control fits more accurately without the added expense of using closer tolerance bearings and assembly parts. This can be accomplished by selective assembly of the bearings, shafts, and housings, after they have been sized and sorted according to bores and outside diameters. Timken provides bore and O.D. micron coding as standard practice for super precision angular contact radial ball bearings. This improved fit-up at assembly provides a higher degree of precision from the spindle.

## SUCCESSFUL APPLICATIONS

Detailed assembly drawings on the following pages are representative of successful applications of Timken® Fafnir® super precision bearings on such equipment; high-cycle wheel heads; high-speed internal grinding spindles; super precision work heads; and high-speed router spindles. It is hoped that these arrangements will stimulate questions regarding your particular application problems which will promptly be addressed by your Timken representative.

## SPECIAL REQUIREMENTS

High-speed grease-lubricated spindles and heavy precision workheads requiring unusual rigidity and running accuracy are a few of the many special problems involving super precision bearings. These and many other applications generally require design features that can be reviewed by your Timken representative.

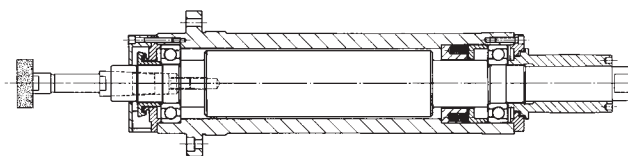
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## APPLICATIONS

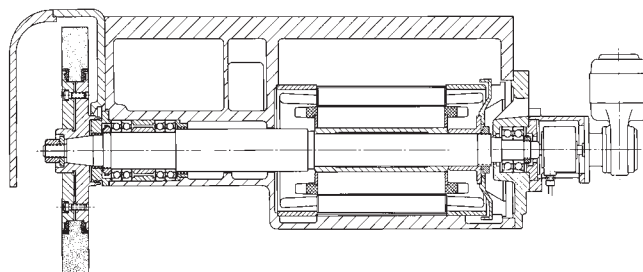
### HIGH-SPEED INTERNAL GRINDING SPINDLE

Designed for internal precision grinding, this spindle incorporates 2MM9106W0-CR super precision bearings, preloaded by a nest of coiled helical springs mounted in a cartridge. Thrust load exerted by the springs assures intimate contact of the balls with the bearing raceways under all operating conditions. The sealed construction provides highly effective protection against intrusion of coolant and foreign matter. Grease, packed in each bearing prior to assembly, is sealed-in for life. Operating speed of this spindle is 25000 RPM.



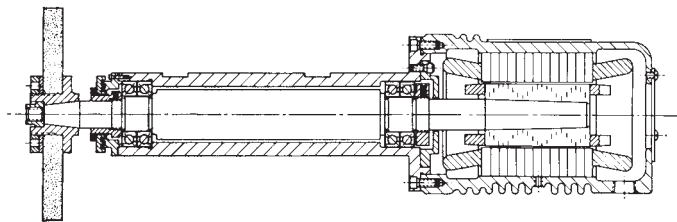
### ULTRA PRECISION SURFACE GRINDING SPINDLE

2MMX9122W1-DUM super precision bearings, produced to ABEC9 tolerances, are employed in this horizontal surface grinding spindle for maximum rigidity and accuracy. A back-to-back pair of 2MM312W1-CR-DUL super precision bearings is used at the floating location. This spindle grinds surfaces that are accurate within .000025 inch, flat and parallel, are square within .000010 inch, and to a surface finish of 5 rms, or better. The spindle, driven by a 30 hp motor, operates at 900 RPM. Bearings are packed with grease prior to assembly.



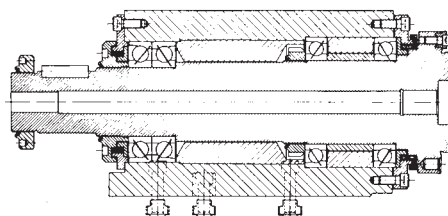
### PRECISION SURFACE GRINDING SPINDLE

This motorized surface grinding spindle, operating at 3600 RPM, uses 2MM9107W1-DUM duplex super precision preloaded bearings at both locations, mounted back-to-back, with one pair floating. Labyrinth slinger-type sealing prevents entry of contaminants and seals in the lubrication. Bearings are grease lubricated for life.



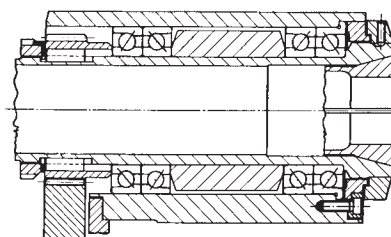
### HEAVY-DUTY PRECISION BORING SPINDLE

Super precision, duplexed, preloaded bearings mounted back-to-back are used at each location in this boring spindle to assure smooth performance and a high degree of radial and axial rigidity. Operating speeds vary between 200 and 3000 RPM. Equal-length spacers between the bearings at the work end increase spindle rigidity. When the bearings are properly positioned on the shaft and the respective rings securely clamped, the preload is reproduced and no subsequent adjustment is required. Just prior to assembly, each bearing is packed with grease for life.



### SIX-SPINDLE AUTOMATIC SCREW MACHINE

This bearing arrangement meets the demand for a high-speed, heavy-duty, multiple-spindle screw machine to operate with constant accuracy at maximum production. Because of the hollow shaft construction and the short distance between bearings, extra-light series duplex pairs are used at each location. This affords a high degree of radial rigidity and adds stiffness to the shaft. By mounting a duplex pair of flanged (3MMF) bearings with a 2MM super precision bearing, back-to-back, under a predetermined preload at the front end, accuracy and rigidity of the spindle are assured and permit a straight housing bore. The rear pair of back-to-back bearings is allowed to float in the housing, making an outer-ring spacer unnecessary. Lubrication is by pressure-feed oil circulation.

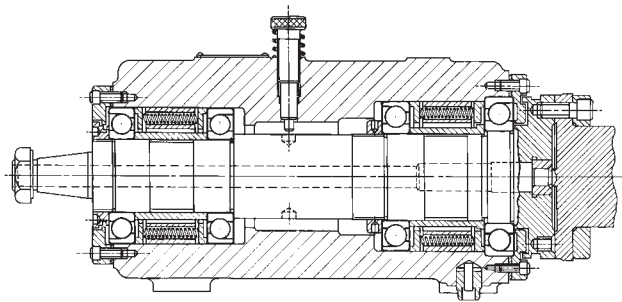


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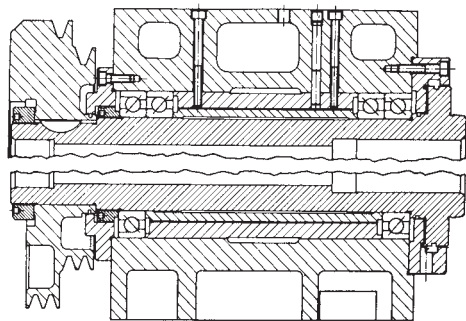
### HIGH-SPEED PRECISION BORING HEAD

This high-speed boring head operates at 2500 to 3000 RPM, employing angular-contact, super precision bearings. The front bearings are of different sizes. The outer ring of the larger bearing abuts and is clamped against the housing shoulder. The inboard bearing is permitted to move axially in its housing under spring load. At the rear location two bearings, of the same size and spring loaded, are allowed to float in the housing as temperature differentials occur in the operation spindle. With this head, interference shafts may be permitted without affecting bearing preload. Excessive heat generation is prevented, resulting in low operating temperatures. Bearings are grease lubricated.



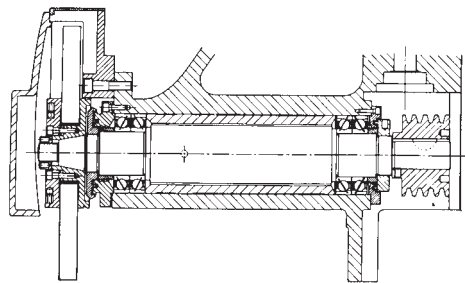
### ULTRA PRECISION GRINDING WORKHEAD

This workhead must maintain straightness and roundness accuracy within ten millionths (.000010) of an inch. To meet such rigid requirements for extremely close dimensional control, ultra precision ball bearings and a shaft of extra stiffness are used. The bearings for such applications are manufactured to tolerances closer than those for ABEC 9 (ISO P2) specifications. Equally important is the high degree of workmanship and accuracy with which the shaft, housing and component parts of the workhead must be made. Upper section shows a four-bearing arrangement for heavy work. Lower half shows a two-bearing mounting for lighter work. In either case, the bearings are packed with grease, prior to mounting.



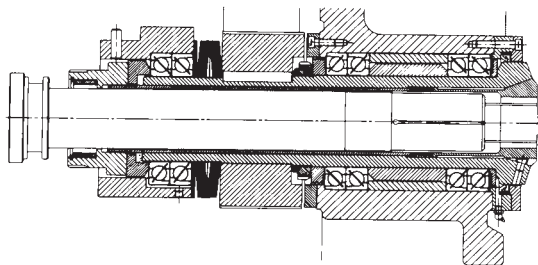
### PRECISION TOOLROOM SURFACE GRINDER SPINDLE

Timken® Fafnir® duplexed, super precision, preloaded bearings used in this spindle provide the high degree of rigidity in both directions necessary to meet requirements for modern surface grinding and to assure efficient performance at a low operating temperature. The housing is bored straight-through to assure true alignment – the housing shoulders are eliminated. The precision ground outer sleeve is doveled to the housing to provide the means for stabilizing the spindle axially at the work end bearing location. The rear pair of bearings floats to compensate for thermal changes. Bearings are grease lubricated for life just prior to assembly.



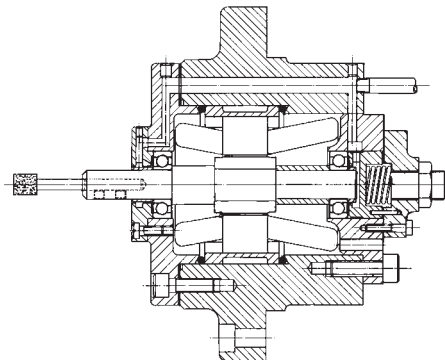
### SINGLE BAR MACHINE

This spindle is supported by two pairs of 2MM9124WI-DUM super precision bearings, mounted back-to-back in tandem pairs. Operating speeds vary from 78 to 1500 RPM. A pair of 2MM9122WI-DUM bearings mounted in tandem carries a 25000 pound thrust load during the unchucking operation. The bearings are grease packed for life prior to assembly.



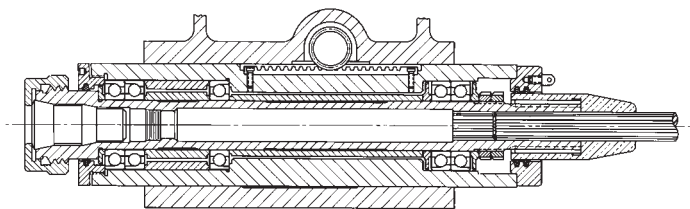
### 100,000 RPM HIGH-CYCLE WHEELHEAD

Super precision 2MMX9101W0-CR bearings produced to ABEC 9 (ISO P2) RPM tolerances are spring-loaded in this wheelhead which operates at 100,000 RPM. Oil mist lubrication is employed and the motor is water cooled.



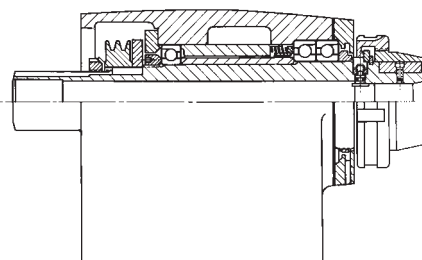
### PRECISION JIG-BORING SPINDLE

This jig-boring spindle delivers extreme accuracy over a wide range of speeds. Excellently designed, it is supported with 2MM210WI-DUM grease-lubricated super precision bearings. With this spindle, holes located to an accuracy of one ten-thousandth (.0001) of an inch are bore ground straight and to size limits of better than two ten-thousandths (.0002) of an inch.



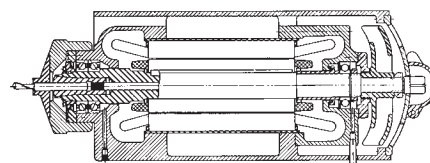
### SUPER PRECISION LATHE HEADSTOCK

This lathe spindle produces work held to a roundness of 35 millionths (.000035) of an inch. Maximum operating speed is 4800 RPM. Tandem pair of 3MM9114WI-DUL bearings is opposed by a spring-loaded 3MM9113WI bearing, resulting in excellent spindle rigidity. Bearings are prelubricated with grease.



### HIGH-SPEED MOTORIZED ROUTER

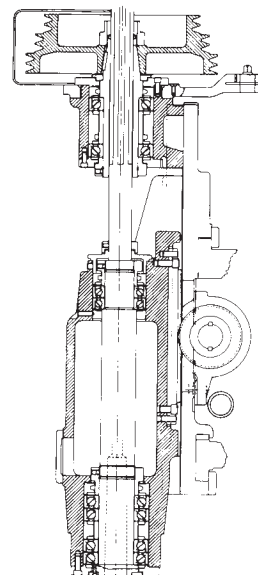
A specially matched duplex pair of Timken® Fafnir® 2MM210WI-DU-FS223 super precision ball bearings, mounted back-to-back at the work end, affords the necessary bearing rigidity to permit routing through aluminum plate one inch thick with a single pass. The upper bearing is spring-loaded and permitted to float. Router is driven by a 30 hp motor at speeds up to 15000 RPM, and uses oil mist lubrication.



### PRECISION VERTICAL MILLING SPINDLE

This spindle operates at 12 different speeds ranging from 260 to 6200 rpm under a wide variety of conditions. At the work end, two duplex pairs of Timken Fafnir 2MM212WI-DUL preloaded bearings are mounted in tandem in a back-to-back arrangement, separated by spacers of equal length. This affords extremely high radial and axial rigidity. At the center, a pair of Timken Fafnir 2MM210WI-DUL bearings mounted back-to-back permits axial float of the spindle to compensate for thermal changes.

The driving pulley shaft is rigidly supported by a widely spaced duplex pair of Timken Fafnir 2MM212WI-DUL preloaded bearings. All bearings are grease packed for life.

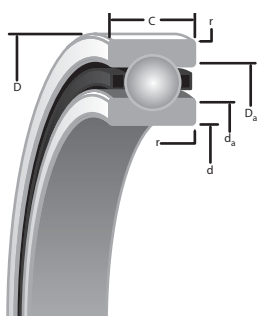


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## ULTRA-LIGHT 2(3)MM9300WI (ISO 19) SERIES

### DIMENSIONAL SERIES METRIC



### SUPER PRECISION MM:

Running accuracy and performance meet ABEC 9 (ISO P2) levels. Non-critical features conform to ABEC 7 (ISO P4) requirements.

### WI CONSTRUCTION:

- Incorporates low shoulder on non-thrust side of outer rings.
- Maximum complement of balls separated by one-piece cage piloted against a ground thrust shoulder land of the outer ring.

| Bearing Number<br>2MM or 3MM |                       |             |                      | Ball Qty.<br>x Dia. | Wt.<br>kg | (2MM) LOAD RATINGS<br>(steel ball & ceramic ball) |                      |                    | (3MM) LOAD RATINGS<br>(steel ball & ceramic ball) |                      |                    |
|------------------------------|-----------------------|-------------|----------------------|---------------------|-----------|---------------------------------------------------|----------------------|--------------------|---------------------------------------------------|----------------------|--------------------|
|                              | d                     | D           | C                    |                     |           | C <sub>0</sub> (stat)                             | C <sub>e</sub> (dyn) | Limiting Speed(Ng) | C <sub>0</sub> (stat)                             | C <sub>e</sub> (dyn) | Limiting Speed(Ng) |
|                              | Bore                  | O.D.        | Width <sup>(1)</sup> |                     |           |                                                   |                      |                    |                                                   |                      |                    |
|                              | in/tol: +0; -.000(μm) |             |                      | mm                  | kg        | N                                                 |                      | RPM                | N                                                 |                      | RPM                |
| 9300WI                       | 10<br>(4)             | 22<br>(5)   | 6<br>(40)            | 12 x 3.2            | 0.01      | 1640<br>1460                                      | 3510<br>3510         | 77500<br>93000     | 1580<br>1410                                      | 3380<br>3380         | 69800<br>83760     |
| 9301WI                       | 12<br>(4)             | 24<br>(5)   | 6<br>(80)            | 13 x 3.2            | 0.01      | 1840<br>1640                                      | 3690<br>3690         | 67200<br>80640     | 1770<br>1580                                      | 3550<br>3550         | 66500<br>79800     |
| 9302WI                       | 15<br>(4)             | 28<br>(5)   | 7<br>(80)            | 13 x 3.6            | 0.02      | 2370<br>2110                                      | 4560<br>4560         | 55600<br>66720     | 2280<br>2030                                      | 4360<br>4360         | 50000<br>60000     |
| 9303WI                       | 17<br>(4)             | 30<br>(5)   | 7<br>(80)            | 14 x 3.6            | 0.02      | 2800<br>2500                                      | 4970<br>4970         | 50100<br>60120     | 2680<br>2380                                      | 4740<br>4740         | 45100<br>5120      |
| 9304WI                       | 20<br>(5)             | 37<br>(6)   | 9<br>(120)           | 14 x 4.8            | 0.04      | 4560<br>4050                                      | 8080<br>8080         | 42100<br>50520     | 4360<br>3880                                      | 7700<br>7700         | 41600<br>49920     |
| 9305WI                       | 25<br>(5)             | 42<br>(6)   | 9<br>(120)           | 17 x 4.8            | 0.04      | 5750<br>5120                                      | 9040<br>9040         | 34800<br>41760     | 5470<br>4860                                      | 8590<br>8590         | 31300<br>37500     |
| 9306WI                       | 30<br>(5)             | 47<br>(6)   | 9<br>(120)           | 19 x 4.8            | 0.05      | 6610<br>5890                                      | 9540<br>9540         | 29700<br>35640     | 6270<br>5580                                      | 9040<br>9040         | 26700<br>32000     |
| 9307WI                       | 35<br>(6)             | 55<br>(7)   | 10<br>(120)          | 19 x 5.6            | 0.08      | 9020<br>8020                                      | 12600<br>12600       | 25400<br>30480     | 8530<br>7590                                      | 11600<br>11600       | 22900<br>27500     |
| 9308WI                       | 40<br>(6)             | 62<br>(7)   | 12<br>(120)          | 19 x 6.4            | 0.11      | 11700<br>10400                                    | 16000<br>16000       | 22400<br>26880     | 11100<br>9890                                     | 15100<br>15100       | 20200<br>2250      |
| 9309WI                       | 45<br>(6)             | 68<br>(7)   | 12<br>(120)          | 21 x 6.4            | 0.13      | 13200<br>11700                                    | 16800<br>16800       | 20000<br>24000     | 12500<br>11100                                    | 15900<br>15900       | 18000<br>21600     |
| 9310WI                       | 50<br>(6)             | 72<br>(7)   | 12<br>(120)          | 23 x 6.4            | 0.14      | 14600<br>13000                                    | 17600<br>17600       | 18300<br>21960     | 13800<br>12300                                    | 16600<br>16600       | 16500<br>14800     |
| 9311WI                       | 55<br>(7)             | 80<br>(7)   | 13<br>(150)          | 23 x 7.1            | 0.19      | 18500<br>16400                                    | 21800<br>21800       | 16600<br>19920     | 17400<br>15500                                    | 20600<br>20600       | 14900<br>17900     |
| 9312WI                       | 60<br>(7)             | 85<br>(8)   | 13<br>(150)          | 25 x 7.1            | 0.20      | 20200<br>18000                                    | 22700<br>22700       | 15300<br>18360     | 19000<br>16900                                    | 21400<br>21400       | 13800<br>16500     |
| 9313WI                       | 65<br>(7)             | 90<br>(8)   | 13<br>(150)          | 27 x 7.1            | 0.22      | 21900<br>19500                                    | 23600<br>23600       | 14200<br>17040     | 20400<br>18100                                    | 22200<br>22200       | 12800<br>15300     |
| 9314WI                       | 70<br>(7)             | 100<br>(8)  | 16<br>(150)          | 24 x 8.7            | 0.34      | 29000<br>25800                                    | 32000<br>32000       | 13100<br>15720     | 27300<br>24300                                    | 30200<br>30200       | 11800<br>14100     |
| 9315WI                       | 75<br>(7)             | 105<br>(8)  | 16<br>(150)          | 25 x 8.7            | 0.36      | 30300<br>26900                                    | 32500<br>32500       | 12300<br>14760     | 28400<br>25200                                    | 30600<br>30600       | 11100<br>13300     |
| 9316WI                       | 80<br>(7)             | 110<br>(8)  | 16<br>(150)          | 27 x 8.7            | 0.39      | 32700<br>29100                                    | 33800<br>33800       | 11600<br>13920     | 30500<br>27100                                    | 31900<br>31900       | 10400<br>12500     |
| 9317WI                       | 85<br>(8)             | 120<br>(8)  | 18<br>(200)          | 26 x 9.5            | 0.56      | 37500<br>33400                                    | 38700<br>38700       | 10800<br>12960     | 35000<br>31200                                    | 36500<br>36500       | 9700<br>11600      |
| 9318WI                       | 90<br>(8)             | 125<br>(9)  | 18<br>(200)          | 26 x 10.3           | 0.57      | 44000<br>39200                                    | 45000<br>45000       | 10300<br>12360     | 41200<br>36700                                    | 42400<br>42400       | 9300<br>11100      |
| 9319WI                       | 95<br>(8)             | 130<br>(9)  | 18<br>(200)          | 28 x 10.3           | 0.60      | 47400<br>42200                                    | 46800<br>46800       | 9800<br>11760      | 44200<br>39300                                    | 44100<br>44100       | 8800<br>10500      |
| 9320WI                       | 100<br>(8)            | 140<br>(9)  | 20<br>(200)          | 29 x 10.3           | 0.85      | 48800<br>43400                                    | 47200<br>47200       | 9100<br>10920      | 45500<br>40500                                    | 44400<br>44400       | 8200<br>9800       |
| 9322WI                       | 110<br>(8)            | 150<br>(9)  | 20<br>(200)          | 31 x 10.3           | 0.92      | 51700<br>46000                                    | 48400<br>48400       | 8400<br>10080      | 48200<br>42900                                    | 45600<br>45600       | 7600<br>9100       |
| 9324WI                       | 120<br>(8)            | 165<br>(10) | 22<br>(200)          | 30 x 11.9           | 1.24      | 66900<br>59500                                    | 62000<br>62000       | 7700<br>9240       | 62300<br>55,500                                   | 58300<br>58300       | 6900<br>8300       |
| 9326WI                       | 130<br>(10)           | 180<br>(10) | 24<br>(250)          | 30 x 13.5           | 1.65      | 86400<br>76900                                    | 78500<br>78500       | 7100<br>8520       | 80500<br>71700                                    | 73900<br>73900       | 6400<br>7700       |
| 9328WI                       | 140<br>(10)           | 190<br>(10) | 24<br>(250)          | 32 x 13.5           | 1.75      | 91600<br>81500                                    | 80700<br>80700       | 6600<br>7920       | 85400<br>76000                                    | 76000<br>76000       | 5900<br>7000       |
| 9330WI                       | 150<br>(10)           | 210<br>(10) | 28<br>(250)          | 27 x 17.5           | 2.61      | 130800<br>116400                                  | 119200<br>119200     | 6200<br>7440       | 122700<br>109200                                  | 112400<br>112400     | 5600<br>6700       |
| 9332WI                       | 160<br>(10)           | 220<br>(10) | 28<br>(250)          | 27 x 18.3           | 2.75      | 143100<br>127300                                  | 128900<br>128900     | 5800<br>6960       | 134100<br>119300                                  | 121600<br>121600     | 5800<br>6690       |
| 9334WI                       | 170<br>(10)           | 230<br>(11) | 28<br>(250)          | 29 x 18.3           | 2.88      | 153600<br>13670                                   | 133700<br>133700     | 5500<br>6600       | 143200<br>127500                                  | 126000<br>126000     | 5000<br>6000       |
| 9340WI                       | 200<br>(12)           | 280<br>(13) | 38<br>(300)          | 27 x 23.8           | 6.29      | 243300<br>216300                                  | 209400<br>209400     | 4600<br>5520       | 228800<br>203600                                  | 19700<br>19700       | 4100<br>4900       |

(Ng) For a single, grease lubricated, spring pretrained bearing. This value to be used in permissible Operating Speed (Sp) calculation.

(1) Width tolerance of pretrained bearing set +0/-0.25 mm (+0/-0.010").

(2) ABMA STD 20 (r<sub>as</sub> max).

| r<br>Rad. <sup>(2)</sup> | Suggested<br>Shoulder Diameters |       |                          |       | Shaft Diameter |         | Mounting Fits |       | FIXED                        |         |               |       | FLOATING                     |         |                   |       | Bearing<br>Number<br>2MM or<br>3MM |
|--------------------------|---------------------------------|-------|--------------------------|-------|----------------|---------|---------------|-------|------------------------------|---------|---------------|-------|------------------------------|---------|-------------------|-------|------------------------------------|
|                          | d <sub>a</sub> (Shaft)          |       | D <sub>a</sub> (Housing) |       | Min.           | Max.    | Loose         | Tight | Housing Bore<br>(Stationary) |         | Mounting Fits |       | Housing Bore<br>(Stationary) |         | Housing Clearance |       |                                    |
|                          | Max.                            | Min.  | Max.                     | Min.  |                |         |               |       | Min.                         | Max.    | Tight         | Loose | Max.                         | Min.    | Max.              | Min.  |                                    |
| mm                       | mm                              | mm    | mm                       | mm    | mm             | mm      | mm            | mm    | mm                           | mm      | mm            | mm    | mm                           | mm      | mm                | mm    |                                    |
| 0.3                      | 13.2                            | 13    | 19.6                     | 19.3  | 9.995          | 10.000  | 0.005         | 0.004 | 22                           | 22.005  | 0.000         | 0.010 | 22.010                       | 22.005  | 0.015             | 0.005 | 9300WI                             |
| 0.3                      | 15.2                            | 14.9  | 21.6                     | 21.3  | 11.995         | 12.000  | 0.005         | 0.004 | 24                           | 24.005  | 0.000         | 0.010 | 24.010                       | 24.005  | 0.015             | 0.005 | 9301WI                             |
| 0.3                      | 18.3                            | 18.1  | 25.5                     | 25.2  | 14.995         | 15.000  | 0.005         | 0.004 | 28                           | 28.005  | 0.000         | 0.010 | 28.010                       | 28.005  | 0.015             | 0.005 | 9302WI                             |
| 0.3                      | 20.3                            | 20    | 27.5                     | 27.2  | 16.995         | 17.000  | 0.005         | 0.004 | 30                           | 30.005  | 0.000         | 0.010 | 30.010                       | 30.005  | 0.015             | 0.005 | 9303WI                             |
| 0.3                      | 24.1                            | 23.9  | 33.7                     | 33.4  | 19.995         | 20.000  | 0.005         | 0.005 | 37                           | 37.006  | 0.000         | 0.012 | 37.010                       | 37.005  | 0.016             | 0.005 | 9304WI                             |
| 0.3                      | 29.1                            | 28.9  | 38.7                     | 38.4  | 24.995         | 25.000  | 0.005         | 0.005 | 42                           | 42.006  | 0.000         | 0.012 | 42.010                       | 42.005  | 0.016             | 0.005 | 9305WI                             |
| 0.3                      | 34.1                            | 33.9  | 43.7                     | 43.4  | 29.995         | 30.000  | 0.005         | 0.005 | 47                           | 47.006  | 0.000         | 0.012 | 47.012                       | 47.007  | 0.018             | 0.007 | 9306WI                             |
| 0.6                      | 40                              | 39.5  | 51.1                     | 50.6  | 34.995         | 35.000  | 0.005         | 0.006 | 55                           | 55.008  | 0.000         | 0.015 | 55.012                       | 55.007  | 0.019             | 0.007 | 9307WI                             |
| 0.6                      | 45.1                            | 44.6  | 57.9                     | 57.4  | 39.995         | 40.000  | 0.005         | 0.006 | 62                           | 62.008  | 0.000         | 0.015 | 62.012                       | 62.007  | 0.019             | 0.007 | 9308WI                             |
| 0.6                      | 50.7                            | 50.1  | 63.4                     | 62.9  | 44.995         | 45.000  | 0.005         | 0.006 | 68                           | 68.008  | 0.000         | 0.015 | 68.012                       | 68.007  | 0.019             | 0.007 | 9309WI                             |
| 0.6                      | 55.1                            | 54.6  | 67.9                     | 67.4  | 49.995         | 50.000  | 0.005         | 0.006 | 72                           | 72.008  | 0.000         | 0.015 | 72.011                       | 72.007  | 0.019             | 0.007 | 9310WI                             |
| 1                        | 60.9                            | 60.4  | 75.2                     | 74.7  | 54.995         | 55.000  | 0.005         | 0.007 | 80                           | 80.008  | 0.000         | 0.015 | 80.012                       | 80.008  | 0.020             | 0.008 | 9311WI                             |
| 1                        | 65.8                            | 65.3  | 80.2                     | 79.7  | 59.995         | 60.000  | 0.005         | 0.007 | 85                           | 85.008  | 0.000         | 0.016 | 85.016                       | 85.009  | 0.024             | 0.009 | 9312WI                             |
| 1                        | 70.8                            | 70.3  | 85.2                     | 84.7  | 64.995         | 65.000  | 0.005         | 0.007 | 90                           | 90.008  | 0.000         | 0.016 | 90.015                       | 90.007  | 0.023             | 0.007 | 9313WI                             |
| 1                        | 76.8                            | 76.3  | 94.3                     | 93.8  | 69.995         | 70.000  | 0.005         | 0.007 | 100                          | 100.008 | 0.000         | 0.016 | 100.018                      | 100.010 | 0.025             | 0.010 | 9314WI                             |
| 1                        | 81.9                            | 81.1  | 99.4                     | 98.6  | 74.995         | 75.005  | 0.005         | 0.012 | 105                          | 105.008 | 0.000         | 0.016 | 105.019                      | 105.011 | 0.026             | 0.011 | 9315WI                             |
| 1                        | 86.9                            | 86.1  | 104.4                    | 103.6 | 79.995         | 80.005  | 0.005         | 0.012 | 110                          | 110.008 | 0.000         | 0.016 | 110.018                      | 110.010 | 0.025             | 0.010 | 9316WI                             |
| 1                        | 93.6                            | 92.8  | 112.7                    | 111.9 | 84.995         | 85.005  | 0.005         | 0.012 | 120                          | 120.008 | 0.000         | 0.016 | 120.018                      | 120.010 | 0.025             | 0.010 | 9317WI                             |
| 1                        | 97.8                            | 97    | 118.5                    | 117.7 | 89.995         | 90.005  | 0.005         | 0.013 | 125                          | 125.008 | 0.000         | 0.017 | 125.021                      | 125.011 | 0.030             | 0.011 | 9318WI                             |
| 1                        | 102.8                           | 102   | 123.5                    | 122.7 | 94.995         | 95.005  | 0.005         | 0.013 | 130                          | 130.009 | 0.000         | 0.018 | 130.020                      | 130.010 | 0.029             | 0.010 | 9319WI                             |
| 1                        | 110.3                           | 109.5 | 131                      | 130.2 | 99.995         | 100.005 | 0.005         | 0.013 | 140                          | 140.009 | 0.000         | 0.018 | 140.020                      | 140.010 | 0.029             | 0.010 | 9320WI                             |
| 1                        | 120.3                           | 119.5 | 141                      | 140.2 | 109.995        | 110.005 | 0.005         | 0.013 | 150                          | 150.009 | 0.000         | 0.018 | 150.023                      | 150.012 | 0.032             | 0.012 | 9322WI                             |
| 1                        | 131.2                           | 130.4 | 155                      | 154.3 | 119.995        | 120.005 | 0.005         | 0.013 | 165                          | 165.01  | 0.000         | 0.020 | 165.022                      | 165.012 | 0.032             | 0.012 | 9324WI                             |
| 1.5                      | 142.1                           | 141.4 | 169.2                    | 168.4 | 129.995        | 130.005 | 0.005         | 0.015 | 180                          | 180.01  | 0.000         | 0.020 | 180.022                      | 180.012 | 0.032             | 0.012 | 9326WI                             |
| 1.5                      | 152.1                           | 151.4 | 179.2                    | 178.4 | 139.995        | 140.005 | 0.005         | 0.015 | 190                          | 190.01  | 0.000         | 0.021 | 190.022                      | 190.012 | 0.033             | 0.012 | 9328WI                             |
| 2                        | 163.1                           | 162.4 | 198.2                    | 197.4 | 149.995        | 150.005 | 0.005         | 0.015 | 210                          | 210.011 | 0.000         | 0.022 | 210.025                      | 210.015 | 0.036             | 0.015 | 9330WI                             |
| 2                        | 173.2                           | 172.4 | 208.2                    | 207.4 | 159.995        | 160.005 | 0.005         | 0.015 | 220                          | 220.011 | 0.000         | 0.022 | 220.025                      | 220.015 | 0.036             | 0.015 | 9332WI                             |
| 2                        | 185.4                           | 184.7 | 216.1                    | 215.4 | 169.995        | 170.005 | 0.005         | 0.015 | 230                          | 230.011 | 0.000         | 0.022 | 230.025                      | 230.015 | 0.036             | 0.015 | 9334WI                             |
| 2.1                      | 216.8                           | 216   | 264.5                    | 263.7 | 199.993        | 200.008 | 0.007         | 0.019 | 280                          | 280.013 | 0.000         | 0.026 | 280.031                      | 280.018 | 0.044             | 0.018 | 9340WI                             |

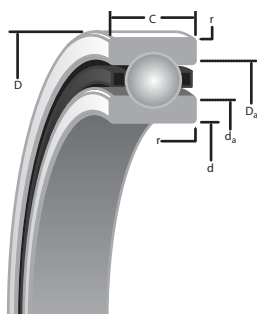
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## ULTRA-LIGHT 2(3)MM9300WI (ISO 19) SERIES

### DIMENSIONAL SERIES INCHES



### SUPER PRECISION MM:

Running accuracy and performance meet ABEC 9 (ISO P2) levels. Non-critical features conform to ABEC 7 (ISO P4) requirements.

### WI CONSTRUCTION:

- Incorporates low shoulder on non-thrust side of outer rings.
- Maximum complement of balls separated by one-piece cage piloted against a ground thrust shoulder land of the outer ring.

| Bearing Number<br>2MM or 3MM |                         |                 |                 | Ball Qty.<br>x Dia. | Wt.<br>lbs. | (2MM) LOAD RATINGS<br>(steel ball & ceramic ball) |                      |                    | (3MM) LOAD RATINGS<br>(steel ball & ceramic ball) |                      |                    |
|------------------------------|-------------------------|-----------------|-----------------|---------------------|-------------|---------------------------------------------------|----------------------|--------------------|---------------------------------------------------|----------------------|--------------------|
|                              | d                       | D               | C               |                     |             | C <sub>0</sub> (stat)                             | C <sub>e</sub> (dyn) | Limiting Speed(Ng) | C <sub>0</sub> (stat)                             | C <sub>e</sub> (dyn) | Limiting Speed(Ng) |
|                              | in./tol: +0; -0.000(μm) |                 |                 |                     |             | lbs.                                              |                      | RPM                | lbs.                                              |                      | RPM                |
| 9300WI                       | 0.3937<br>(1.5)         | 0.8661<br>(2)   | 0.2362<br>(16)  | 12 x 1/8            | 0.02        | 370<br>330                                        | 790<br>790           | 77500<br>93000     | 360<br>320                                        | 760<br>760           | 69800<br>83760     |
| 9301WI                       | 0.4724<br>(1.5)         | 0.9449<br>(2)   | 0.2362<br>(31)  | 13 x 1/8            | 0.03        | 410<br>370                                        | 830<br>830           | 67200<br>80640     | 400<br>350                                        | 800<br>800           | 60500<br>79800     |
| 9302WI                       | 0.5906<br>(1.5)         | 1.1024<br>(2)   | 0.2756<br>(31)  | 13 x 9/64           | 0.04        | 530<br>470                                        | 1030<br>1030         | 55600<br>66720     | 510<br>460                                        | 980<br>980           | 50000<br>60000     |
| 9303WI                       | 0.6693<br>(1.5)         | 1.1811<br>(2)   | 0.2756<br>(31)  | 14 x 9/64           | 0.04        | 630<br>560                                        | 1120<br>1120         | 50100<br>60120     | 600<br>540                                        | 1070<br>1070         | 45100<br>54120     |
| 9304WI                       | 0.7874<br>(2)           | 1.4567<br>(2.5) | 0.3543<br>(47)  | 14 x 3/16           | 0.08        | 1020<br>910                                       | 1820<br>1820         | 42100<br>50520     | 920<br>870                                        | 1730<br>1730         | 37900<br>49920     |
| 9305WI                       | 0.9843<br>(2)           | 1.6535<br>(2.5) | 0.3543<br>(47)  | 17 x 3/16           | 0.1         | 1290<br>1150                                      | 2030<br>2030         | 34800<br>41760     | 1230<br>1090                                      | 1930<br>1930         | 31300<br>37560     |
| 9306WI                       | 1.1811<br>(2)           | 1.8504<br>(2.5) | 0.3543<br>(47)  | 19 x 3/16           | 0.11        | 1490<br>1320                                      | 2150<br>2150         | 29700<br>35640     | 1410<br>1260                                      | 2030<br>2030         | 26700<br>32040     |
| 9307WI                       | 1.378<br>(2.5)          | 2.1654<br>(3)   | 0.3937<br>(47)  | 19 x 7/32           | 0.17        | 2030<br>1800                                      | 2830<br>2830         | 25400<br>30480     | 1920<br>1710                                      | 2680<br>2680         | 22900<br>27480     |
| 9308WI                       | 1.5748<br>(2.5)         | 2.4409<br>(3)   | 0.4724<br>(47)  | 19 x 1/4            | 0.25        | 2640<br>2350                                      | 3600<br>3600         | 22400<br>26880     | 2500<br>2220                                      | 3400<br>3400         | 20200<br>24240     |
| 9309WI                       | 1.7717<br>(2.5)         | 2.6772<br>(3)   | 0.4724<br>(47)  | 21 x 1/4            | 0.29        | 2960<br>2640                                      | 3785<br>3785         | 20000<br>24000     | 2810<br>2500                                      | 3560<br>3560         | 18000<br>21600     |
| 9310WI                       | 1.9685<br>(2.5)         | 2.8346<br>(3)   | 0.4724<br>(47)  | 23 x 1/4            | 0.3         | 3290<br>2930                                      | 3950<br>3950         | 18300<br>21960     | 3100<br>2760                                      | 3730<br>3730         | 16500<br>19800     |
| 9311WI                       | 2.1654<br>(3)           | 3.1496<br>(3)   | 0.5118<br>(59)  | 23 x 9/32           | 0.41        | 4150<br>3700                                      | 4900<br>4900         | 16600<br>19920     | 3920<br>3490                                      | 4620<br>4620         | 14900<br>17880     |
| 9312WI                       | 2.3622<br>(3)           | 3.3465<br>(3)   | 0.5118<br>(59)  | 25 x 9/32           | 0.44        | 4540<br>4040                                      | 5100<br>5100         | 15300<br>18360     | 4270<br>3800                                      | 4820<br>4820         | 13800<br>16560     |
| 9313WI                       | 2.5591<br>(3)           | 3.5433<br>(3)   | 0.5118<br>(59)  | 27 x 9/32           | 0.47        | 4910<br>4370                                      | 5290<br>5290         | 14200<br>17040     | 4580<br>4080                                      | 4990<br>4990         | 12800<br>15360     |
| 9314WI                       | 2.7559<br>(3)           | 3.937<br>(3)    | 0.6299<br>(59)  | 24 x 11/32          | 0.76        | 6510<br>5800                                      | 7200<br>7200         | 13100<br>15720     | 6130<br>5450                                      | 6790<br>6790         | 11800<br>14160     |
| 9315WI                       | 2.9528<br>(3)           | 4.1339<br>(3)   | 0.6299<br>(59)  | 25 x 11/32          | 0.80        | 6810<br>6060                                      | 7310<br>7310         | 12300<br>14760     | 6380<br>5670                                      | 6890<br>6890         | 11100<br>13320     |
| 9316WI                       | 3.1496<br>(3)           | 4.3307<br>(3)   | 0.6299<br>(59)  | 27 x 11/32          | 0.85        | 7350<br>6540                                      | 7600<br>7600         | 11600<br>13920     | 6860<br>6100                                      | 7170<br>7170         | 10400<br>12480     |
| 9317WI                       | 3.3465<br>(3)           | 4.7244<br>(3)   | 0.7087<br>(79)  | 26 x 3/8            | 1.23        | 8440<br>7510                                      | 8700<br>8700         | 10800<br>12960     | 7880<br>7010                                      | 8200<br>8200         | 9700<br>11640      |
| 9318WI                       | 3.5433<br>(3)           | 4.9213<br>(3.5) | 0.7087<br>(79)  | 26 x 13/32          | 1.26        | 9900<br>8810                                      | 10100<br>10100       | 10300<br>12360     | 9270<br>8250                                      | 9540<br>9540         | 9300<br>11160      |
| 9319WI                       | 3.7402<br>(3)           | 5.1181<br>(3.5) | 0.7087<br>(79)  | 28 x 13/32          | 1.33        | 10700<br>9480                                     | 10500<br>10500       | 9800<br>11760      | 9930<br>8840                                      | 9910<br>9910         | 8800<br>10560      |
| 9320WI                       | 3.937<br>(3)            | 5.5118<br>(3.5) | 0.7874<br>(79)  | 29 x 13/32          | 1.87        | 11000<br>9760                                     | 10600<br>10600       | 9100<br>10920      | 10200<br>9100                                     | 9900<br>9900         | 8200<br>9840       |
| 9322WI                       | 4.3307<br>(3)           | 5.9055<br>(3.5) | 0.7874<br>(79)  | 31 x 13/32          | 2.02        | 11600<br>10300                                    | 10900<br>10900       | 8400<br>10080      | 10800<br>9650                                     | 10200<br>10200       | 7600<br>9120       |
| 9324WI                       | 4.7244<br>(3)           | 6.4961<br>(4)   | 0.8661<br>(79)  | 30 x 15/32          | 2.74        | 15000<br>13400                                    | 13900<br>13900       | 7700<br>9240       | 14000<br>12500                                    | 13100<br>13100       | 6900<br>8280       |
| 9326WI                       | 5.1181<br>(4)           | 7.0866<br>(4)   | 0.9449<br>(98)  | 30 x 17/32          | 3.63        | 19400<br>17300                                    | 17600<br>17600       | 7100<br>8520       | 18100<br>16100                                    | 16600<br>16600       | 6400<br>7680       |
| 9328WI                       | 5.5118<br>(4)           | 7.4803<br>(4.5) | 0.9449<br>(98)  | 32 x 17/32          | 3.85        | 20600<br>18300                                    | 18200<br>18200       | 6600<br>7920       | 19200<br>17100                                    | 17100<br>17100       | 5900<br>7080       |
| 9330WI                       | 5.9055<br>(4)           | 8.2677<br>(4.5) | 1.1024<br>(98)  | 27 x 11/16          | 5.75        | 20400<br>26200                                    | 26805<br>26805       | 6200<br>7440       | 21600<br>24500                                    | 25300<br>25300       | 5600<br>6720       |
| 9332WI                       | 6.2992<br>(4)           | 8.6614<br>(4.5) | 1.1024<br>(98)  | 27 x 23/32          | 6.06        | 32200<br>28600                                    | 29000<br>29000       | 5800<br>6960       | 30100<br>26800                                    | 27300<br>27300       | 5800<br>6960       |
| 9334WI                       | 6.6929<br>(4)           | 9.0551<br>(4.5) | 1.1024<br>(98)  | 29 x 23/32          | 6.34        | 34500<br>30700                                    | 30100<br>30100       | 5500<br>6600       | 32200<br>28700                                    | 28300<br>28300       | 5000<br>6000       |
| 9340WI                       | 7.874<br>(4.5)          | 11.0236<br>(5)  | 1.4961<br>(118) | 27 x 15/16          | 13.87       | 54600<br>48600                                    | 47100<br>47100       | 4600<br>5520       | 51400<br>45800                                    | 44400<br>44400       | 4100<br>4920       |

(Ng) For a single, grease lubricated, spring preloaded bearing. This value to be used in permissible Operating Speed (Sp) calculation.

(1) Width tolerance of preloaded bearing set +0/-0.25 mm (+0/-0.010").

(2) ABMA STD 20 (r<sub>as</sub> max).

| r<br>Rad. <sup>(2)</sup> | Suggested<br>Shoulder Diameters |      |                          |       | Shaft Diameter |        | Mounting Fits |         | FIXED                        |         |               |        | FLOATING                     |          |                   |         |        |
|--------------------------|---------------------------------|------|--------------------------|-------|----------------|--------|---------------|---------|------------------------------|---------|---------------|--------|------------------------------|----------|-------------------|---------|--------|
|                          | d <sub>a</sub> (Shaft)          |      | D <sub>a</sub> (Housing) |       |                |        |               |         | Housing Bore<br>(Stationary) |         | Mounting Fits |        | Housing Bore<br>(Stationary) |          | Housing Clearance |         |        |
|                          | Max.                            | Min. | Max.                     | Min.  | Min.           | Max.   | Loose         | Tight   | Min.                         | Max.    | Tight         | Loose  | Max.                         | Min.     | Max.              | Min.    |        |
| in.                      | in.                             | in.  | in.                      | in.   | in.            | in.    | in.           | in.     | in.                          | in.     | in.           | in.    | in.                          | in.      | in.               | in.     |        |
| 0.012                    | 0.52                            | 0.51 | 0.77                     | 0.76  | 0.3935         | 0.3937 | 0.0002        | 0.00015 | 0.8661                       | 0.8663  | 0.0000        | 0.0004 | 0.86650                      | 0.86630  | 0.00060           | 0.00020 | 9300WI |
| 0.012                    | 0.60                            | 0.59 | 0.85                     | 0.84  | 0.4722         | 0.4724 | 0.0002        | 0.00015 | 0.9449                       | 0.9451  | 0.0000        | 0.0004 | 0.94530                      | 0.94510  | 0.00060           | 0.00020 | 9301WI |
| 0.012                    | 0.72                            | 0.71 | 1.00                     | 0.99  | 0.5904         | 0.5906 | 0.0002        | 0.00015 | 1.0236                       | 1.0238  | 0.0000        | 0.0004 | 1.02400                      | 1.02380  | 0.00060           | 0.00020 | 9302WI |
| 0.012                    | 0.80                            | 0.79 | 1.08                     | 1.07  | 0.6691         | 0.6693 | 0.0002        | 0.00015 | 1.1811                       | 1.1813  | 0.0000        | 0.0004 | 1.18150                      | 1.18130  | 0.00060           | 0.00020 | 9303WI |
| 0.012                    | 0.95                            | 0.94 | 1.33                     | 1.32  | 0.7872         | 0.7874 | 0.0002        | 0.0002  | 1.4567                       | 1.4570  | 0.0000        | 0.0005 | 1.45710                      | 1.45690  | 0.00070           | 0.00020 | 9304WI |
| 0.012                    | 1.15                            | 1.14 | 1.52                     | 1.51  | 0.9841         | 0.9843 | 0.0002        | 0.0002  | 1.6535                       | 1.6538  | 0.0000        | 0.0005 | 1.65390                      | 1.65370  | 0.00070           | 0.00020 | 9305WI |
| 0.012                    | 1.34                            | 1.33 | 1.72                     | 1.71  | 1.1809         | 1.1811 | 0.0002        | 0.0002  | 1.8504                       | 1.8507  | 0.0000        | 0.0005 | 1.85090                      | 1.85070  | 0.00080           | 0.00030 | 9306WI |
| 0.024                    | 1.57                            | 1.55 | 2.01                     | 1.99  | 1.3778         | 1.3780 | 0.0002        | 0.00025 | 2.1654                       | 2.1657  | 0.0000        | 0.0006 | 2.16590                      | 2.16570  | 0.00080           | 0.00030 | 9307WI |
| 0.024                    | 1.78                            | 1.76 | 2.28                     | 2.26  | 1.5746         | 1.5748 | 0.0002        | 0.00025 | 2.4409                       | 2.4412  | 0.0000        | 0.0006 | 2.44140                      | 2.44120  | 0.00080           | 0.00030 | 9308WI |
| 0.024                    | 1.99                            | 1.97 | 2.50                     | 2.48  | 1.7715         | 1.7717 | 0.0002        | 0.00025 | 2.6772                       | 2.6775  | 0.0000        | 0.0006 | 2.67770                      | 2.67750  | 0.00080           | 0.00030 | 9309WI |
| 0.024                    | 2.17                            | 2.15 | 2.67                     | 2.65  | 1.9683         | 1.9685 | 0.0002        | 0.00025 | 2.8346                       | 2.8349  | 0.0000        | 0.0006 | 2.83510                      | 2.83490  | 0.00080           | 0.00030 | 9310WI |
| 0.039                    | 2.40                            | 2.38 | 2.96                     | 2.94  | 2.1652         | 2.1654 | 0.0002        | 0.0003  | 3.1496                       | 3.1499  | 0.0000        | 0.0006 | 3.15010                      | 3.14990  | 0.00080           | 0.00030 | 9311WI |
| 0.039                    | 2.59                            | 2.57 | 3.16                     | 3.14  | 2.3620         | 2.3622 | 0.0002        | 0.0003  | 3.3465                       | 3.3468  | 0.0000        | 0.0006 | 3.34710                      | 3.34680  | 0.00090           | 0.00030 | 9312WI |
| 0.039                    | 2.79                            | 2.77 | 3.35                     | 3.33  | 2.5589         | 2.5591 | 0.0002        | 0.0003  | 3.5433                       | 3.5436  | 0.0000        | 0.0006 | 3.54390                      | 3.54360  | 0.00090           | 0.00030 | 9313WI |
| 0.039                    | 3.02                            | 3.00 | 3.71                     | 3.69  | 2.7557         | 2.7559 | 0.0002        | 0.0003  | 3.9370                       | 3.9373  | 0.0000        | 0.0006 | 3.93770                      | 3.93740  | 0.00100           | 0.00040 | 9314WI |
| 0.039                    | 3.22                            | 3.19 | 3.91                     | 3.88  | 2.9526         | 2.9530 | 0.0002        | 0.0005  | 4.1339                       | 4.1342  | 0.0000        | 0.0006 | 4.13460                      | 4.13430  | 0.00100           | 0.00040 | 9315WI |
| 0.039                    | 3.42                            | 3.39 | 4.11                     | 4.08  | 3.1494         | 3.1498 | 0.0002        | 0.0005  | 4.3307                       | 4.3310  | 0.0000        | 0.0006 | 4.33140                      | 4.33110  | 0.00100           | 0.00040 | 9316WI |
| 0.039                    | 3.69                            | 3.66 | 4.44                     | 4.41  | 3.3463         | 3.3467 | 0.0002        | 0.0005  | 4.7244                       | 4.7247  | 0.0000        | 0.0006 | 4.72510                      | 4.72480  | 0.00100           | 0.00040 | 9317WI |
| 0.039                    | 3.85                            | 3.82 | 4.66                     | 4.63  | 3.5431         | 3.5435 | 0.0002        | 0.0005  | 4.9213                       | 4.9216  | 0.0000        | 0.0007 | 4.92210                      | 4.92170  | 0.00120           | 0.00040 | 9318WI |
| 0.039                    | 4.05                            | 4.02 | 4.86                     | 4.83  | 3.7400         | 3.7404 | 0.0002        | 0.0005  | 5.1181                       | 5.1185  | 0.0000        | 0.0007 | 5.11890                      | 5.11850  | 0.00110           | 0.00040 | 9319WI |
| 0.039                    | 4.34                            | 4.31 | 5.16                     | 5.13  | 3.9368         | 3.9372 | 0.0002        | 0.0005  | 5.5118                       | 5.5122  | 0.0000        | 0.0007 | 5.51260                      | 5.51220  | 0.00110           | 0.00040 | 9320WI |
| 0.039                    | 4.74                            | 4.71 | 5.55                     | 5.52  | 4.3305         | 4.3309 | 0.0002        | 0.0005  | 5.9055                       | 5.9059  | 0.0000        | 0.0007 | 5.90640                      | 5.90600  | 0.00120           | 0.00050 | 9322WI |
| 0.039                    | 5.16                            | 5.13 | 6.10                     | 6.07  | 4.7242         | 4.7246 | 0.0002        | 0.0005  | 6.4961                       | 6.4965  | 0.0000        | 0.0008 | 6.49700                      | 6.49660  | 0.00130           | 0.00050 | 9324WI |
| 0.059                    | 5.60                            | 5.57 | 6.66                     | 6.63  | 5.1179         | 5.1183 | 0.0002        | 0.0006  | 7.0866                       | 7.0870  | 0.0000        | 0.0008 | 7.08750                      | 7.08710  | 0.00130           | 0.00050 | 9326WI |
| 0.059                    | 5.99                            | 5.96 | 7.05                     | 7.02  | 5.5116         | 5.5120 | 0.0002        | 0.0006  | 7.4803                       | 7.4807  | 0.0000        | 0.0008 | 7.48120                      | 7.48080  | 0.00140           | 0.00050 | 9328WI |
| 0.079                    | 6.42                            | 6.39 | 7.80                     | 7.77  | 5.9053         | 5.9057 | 0.0002        | 0.0006  | 8.2677                       | 8.2682  | 0.0000        | 0.0009 | 8.26870                      | 8.26830  | 0.00150           | 0.00060 | 9330WI |
| 0.079                    | 6.82                            | 6.79 | 8.20                     | 8.17  | 6.2990         | 6.2994 | 0.0002        | 0.0006  | 8.6614                       | 8.6619  | 0.0000        | 0.0009 | 8.6624                       | 8.6620   | 0.00150           | 0.00060 | 9332WI |
| 0.079                    | 7.30                            | 7.27 | 8.51                     | 8.48  | 6.6927         | 6.6931 | 0.0002        | 0.0006  | 9.0551                       | 9.0556  | 0.0000        | 0.0009 | 9.05610                      | 9.05570  | 0.00150           | 0.00060 | 9334WI |
| 0.083                    | 8.54                            | 8.51 | 10.41                    | 10.38 | 7.8737         | 7.8743 | 0.0003        | 0.0008  | 11.0236                      | 11.0241 | 0.0000        | 0.0010 | 11.02490                     | 11.02440 | 0.00180           | 0.00080 | 9340WI |

D





## ULTRA-LIGHT 2MM9300WI (ISO 19) SERIES

### DUPLEX PERFORMANCE DATA

### MOUNTING ARRANGEMENTS



Suggested  
DB



Tandem  
DT



Special Applications  
DF

| Bearing<br>Number                               | PRELOAD |      |      |                          | AXIAL STIFFNESS <sup>(1)</sup> |        |        |                          | RADIAL STIFFNESS <sup>(1)</sup> |         |         | SPACER OFFSETS <sup>(1)</sup> |                    |                    |
|-------------------------------------------------|---------|------|------|--------------------------|--------------------------------|--------|--------|--------------------------|---------------------------------|---------|---------|-------------------------------|--------------------|--------------------|
|                                                 | DUX     | DUL  | DUM  | DUH                      | X-light                        | Light  | Medium | Heavy                    | Light                           | Medium  | Heavy   | X-Light<br>to Light           | Light to<br>Medium | Medium<br>to Heavy |
|                                                 | N       |      |      |                          | N/μm                           |        |        |                          | N/μm                            |         |         | μm                            |                    |                    |
| METRIC DUPLEX PERFORMANCE DATA 2MM9300WI SERIES |         |      |      |                          |                                |        |        |                          |                                 |         |         |                               |                    |                    |
| 2MM9300WI                                       | —       | 15   | 25   | 55                       | 14.17                          | 16.44  | 21.69  | 29.21                    | 73.11                           | 92.17   | 115.43  | 1.3                           | 2.8                | 4.1                |
| 2MM9301WI                                       | —       | 15   | 25   | 55                       | 14.87                          | 17.32  | 22.74  | 30.61                    | 76.96                           | 97.42   | 121.91  | 1.0                           | 2.5                | 4.1                |
| 2MM9302WI                                       | —       | 20   | 45   | 90                       | 16.44                          | 20.11  | 26.76  | 36.55                    | 98.12                           | 123.30  | 153.91  | 2.0                           | 3.8                | 5.6                |
| 2MM9303WI                                       | —       | 20   | 65   | 130                      | 17.84                          | 21.86  | 34.63  | 47.75                    | 107.91                          | 154.96  | 192.74  | 1.8                           | 6.4                | 6.4                |
| 2MM9304WI                                       | —       | 45   | 90   | 160                      | 18.19                          | 26.41  | 35.68  | 46.17                    | 148.32                          | 186.09  | 222.47  | 4.8                           | 5.8                | 6.6                |
| 2MM9305WI                                       | —       | 45   | 110  | 180                      | 20.64                          | 29.56  | 43.90  | 54.57                    | 168.78                          | 228.24  | 265.15  | 4.3                           | 7.4                | 5.3                |
| 2MM9306WI                                       | —       | 45   | 110  | 180                      | 22.04                          | 31.48  | 46.52  | 57.89                    | 181.55                          | 246.08  | 286.14  | 4.1                           | 6.9                | 5.1                |
| 2MM9307WI                                       | —       | 45   | 110  | 240                      | 25.36                          | 33.06  | 48.27  | 68.74                    | 189.42                          | 258.68  | 333.53  | 3.0                           | 6.6                | 9.1                |
| 2MM9308WI                                       | 30      | 65   | 160  | 310                      | 27.28                          | 39.00  | 55.44  | 76.08                    | 229.12                          | 304.68  | 380.76  | 4.8                           | 7.6                | 9.4                |
| 2MM9309WI                                       | 30      | 90   | 180  | 360                      | 30.78                          | 46.35  | 62.26  | 85.35                    | 270.22                          | 340.18  | 425.53  | 5.8                           | 6.6                | 9.7                |
| 2MM9310WI                                       | 40      | 90   | 200  | 400                      | 34.28                          | 48.97  | 68.91  | 94.80                    | 286.84                          | 376.21  | 469.96  | 5.1                           | 7.6                | 9.7                |
| 2MM9311WI                                       | 40      | 110  | 240  | 490                      | 38.83                          | 55.27  | 76.96  | 105.46                   | 320.24                          | 416.96  | 521.03  | 5.6                           | 8.1                | 10.7               |
| 2MM9312WI                                       | 40      | 110  | 240  | 510                      | 43.73                          | 58.24  | 80.63  | 112.64                   | 338.08                          | 441.10  | 559.51  | 4.6                           | 7.6                | 10.9               |
| 2MM9313WI                                       | 70      | 130  | 270  | 530                      | 50.02                          | 65.59  | 87.62  | 119.63                   | 378.83                          | 478.00  | 597.63  | 4.6                           | 6.9                | 10.4               |
| 2MM9314WI                                       | 70      | 180  | 360  | 710                      | 49.67                          | 69.44  | 93.05  | 127.50                   | 416.61                          | 525.40  | 656.75  | 6.9                           | 8.6                | 13.0               |
| 2MM9315WI                                       | 90      | 180  | 380  | 760                      | 53.17                          | 71.18  | 97.77  | 134.15                   | 427.81                          | 550.94  | 688.58  | 6.1                           | 9.4                | 13.0               |
| 2MM9316WI                                       | 90      | 200  | 400  | 800                      | 57.89                          | 78.18  | 104.59 | 143.59                   | 468.73                          | 591.16  | 738.95  | 6.4                           | 8.6                | 13.0               |
| 2MM9317WI                                       | 110     | 270  | 530  | 1070                     | 61.39                          | 85.88  | 115.78 | 160.03                   | 521.20                          | 655.00  | 817.48  | 8.1                           | 10.7               | 15.5               |
| 2MM9318WI                                       | 110     | 270  | 530  | 1070                     | 65.06                          | 90.25  | 120.51 | 164.93                   | 528.37                          | 666.72  | 833.75  | 7.9                           | 10.2               | 15.0               |
| 2MM9319WI                                       | 130     | 290  | 580  | 1160                     | 70.13                          | 97.42  | 130.13 | 178.05                   | 570.17                          | 719.36  | 899.51  | 7.9                           | 10.2               | 15.0               |
| 2MM9320WI                                       | 130     | 360  | 710  | 1470                     | 75.38                          | 108.26 | 145.52 | 203.23                   | 626.49                          | 788.27  | 993.43  | 9.1                           | 11.2               | 17.3               |
| 2MM9322WI                                       | 180     | 400  | 800  | 1600                     | 88.15                          | 125.75 | 169.48 | 234.19                   | 681.41                          | 856.84  | 1068.81 | 9.1                           | 11.4               | 17.0               |
| 2MM9324WI                                       | 200     | 490  | 980  | 1960                     | 97.77                          | 144.47 | 192.74 | 265.50                   | 752.94                          | 947.08  | 1181.97 | 10.7                          | 13.2               | 19.3               |
| 2MM9326WI                                       | 220     | 620  | 1220 | 2450                     | 106.69                         | 150.06 | 201.48 | 280.36                   | 846.52                          | 1058.84 | 1322.07 | 13.0                          | 14.2               | 21.3               |
| 2MM9328WI                                       | 270     | 620  | 1250 | 2560                     | 105.11                         | 159.68 | 214.43 | 297.33                   | 883.59                          | 1112.54 | 1401.30 | 11.2                          | 14.2               | 21.8               |
| 2MM9330WI                                       | 290     | 850  | 1690 | 3450                     | 119.98                         | 181.72 | 243.99 | 332.14                   | 954.95                          | 1203.31 | 1512.71 | 16.8                          | 18.0               | 27.4               |
| 2MM9332WI                                       | 489     | 980  | 1980 | 3960                     | 131.9                          | 173.6  | 234.1  | 322.1                    | 1013.5                          | 1281.0  | 1600.0  | 12.70                         | 19.80              | 28.45              |
| 2MM9334WI                                       | 360     | 1020 | 2050 | 4000                     | 163.36                         | 215.13 | 288.76 | 397.02                   | 1085.95                         | 1367.72 | 1696.36 | 17.5                          | 19.3               | 27.2               |
| 2MM9340WI                                       | 778     | 1560 | 3110 | 6230                     | 164.93                         | 217.05 | 291.03 | 399.82                   | 1296.71                         | 1634.27 | 2042.83 | 16.3                          | 24.4               | 36.1               |
| lbs.                                            |         |      |      | 10 <sup>6</sup> lbs./in. |                                |        |        | 10 <sup>6</sup> lbs./in. |                                 |         |         | in.                           |                    |                    |
| INCH DUPLEX PERFORMANCE DATA 2MM9300WI SERIES   |         |      |      |                          |                                |        |        |                          |                                 |         |         |                               |                    |                    |
| 2MM9300WI                                       | —       | 3    | 6    | 12                       | 0.081                          | 0.094  | 0.124  | 0.167                    | 0.418                           | 0.527   | 0.66    | 0.00005                       | 0.00011            | 0.00016            |
| 2MM9301WI                                       | —       | 3    | 6    | 12                       | 0.085                          | 0.099  | 0.13   | 0.175                    | 0.44                            | 0.557   | 0.697   | 0.00004                       | 0.0001             | 0.00016            |
| 2MM9302WI                                       | —       | 5    | 10   | 20                       | 0.094                          | 0.115  | 0.153  | 0.209                    | 0.561                           | 0.705   | 0.88    | 0.00008                       | 0.00015            | 0.00022            |
| 2MM9303WI                                       | —       | 5    | 15   | 30                       | 0.102                          | 0.125  | 0.198  | 0.273                    | 0.617                           | 0.886   | 1.102   | 0.00007                       | 0.00025            | 0.00025            |
| 2MM9304WI                                       | —       | 10   | 20   | 35                       | 0.104                          | 0.151  | 0.204  | 0.264                    | 0.848                           | 1.064   | 1.272   | 0.00019                       | 0.00023            | 0.00026            |
| 2MM9305WI                                       | —       | 10   | 25   | 40                       | 0.118                          | 0.169  | 0.251  | 0.312                    | 0.965                           | 1.305   | 1.516   | 0.00017                       | 0.00029            | 0.00021            |
| 2MM9306WI                                       | —       | 10   | 25   | 40                       | 0.126                          | 0.18   | 0.266  | 0.331                    | 1.038                           | 1.407   | 1.636   | 0.00016                       | 0.00027            | 0.00020            |
| 2MM9307WI                                       | —       | 10   | 25   | 55                       | 0.145                          | 0.189  | 0.276  | 0.393                    | 1.083                           | 1.479   | 1.907   | 0.00012                       | 0.00026            | 0.00036            |
| 2MM9308WI                                       | 5       | 15   | 35   | 70                       | 0.156                          | 0.223  | 0.317  | 0.435                    | 1.31                            | 1.742   | 2.177   | 0.00019                       | 0.00030            | 0.00037            |
| 2MM9309WI                                       | 10      | 20   | 40   | 80                       | 0.176                          | 0.265  | 0.356  | 0.488                    | 1.545                           | 1.945   | 2.433   | 0.00023                       | 0.00026            | 0.00038            |
| 2MM9310WI                                       | 10      | 20   | 45   | 90                       | 0.196                          | 0.28   | 0.394  | 0.542                    | 1.64                            | 2.151   | 2.687   | 0.00020                       | 0.0003             | 0.00038            |
| 2MM9311WI                                       | 10      | 25   | 55   | 110                      | 0.222                          | 0.316  | 0.44   | 0.603                    | 1.831                           | 2.384   | 2.979   | 0.00022                       | 0.00032            | 0.00042            |
| 2MM9312WI                                       | 10      | 25   | 55   | 115                      | 0.25                           | 0.333  | 0.461  | 0.644                    | 1.933                           | 2.522   | 3.199   | 0.00018                       | 0.0003             | 0.00043            |
| 2MM9313WI                                       | 15      | 30   | 60   | 120                      | 0.286                          | 0.375  | 0.501  | 0.684                    | 2.166                           | 2.733   | 3.417   | 0.00018                       | 0.00027            | 0.00041            |
| 2MM9314WI                                       | 15      | 40   | 80   | 160                      | 0.284                          | 0.397  | 0.532  | 0.729                    | 2.382                           | 3.004   | 3.755   | 0.00027                       | 0.00034            | 0.00051            |
| 2MM9315WI                                       | 20      | 40   | 85   | 170                      | 0.304                          | 0.407  | 0.559  | 0.767                    | 2.446                           | 3.15    | 3.937   | 0.00024                       | 0.00037            | 0.00051            |
| 2MM9316WI                                       | 20      | 45   | 90   | 180                      | 0.331                          | 0.447  | 0.598  | 0.821                    | 2.68                            | 3.38    | 4.225   | 0.00025                       | 0.00034            | 0.00051            |
| 2MM9317WI                                       | 25      | 60   | 120  | 240                      | 0.351                          | 0.491  | 0.662  | 0.915                    | 2.98                            | 3.745   | 4.674   | 0.00032                       | 0.00042            | 0.00061            |
| 2MM9318WI                                       | 25      | 60   | 120  | 240                      | 0.372                          | 0.516  | 0.689  | 0.943                    | 3.021                           | 3.812   | 4.767   | 0.00031                       | 0.00040            | 0.00059            |
| 2MM9319WI                                       | 30      | 65   | 130  | 260                      | 0.401                          | 0.557  | 0.744  | 1.018                    | 3.26                            | 4.113   | 5.143   | 0.00031                       | 0.00040            | 0.00059            |
| 2MM9320WI                                       | 30      | 80   | 160  | 330                      | 0.431                          | 0.619  | 0.832  | 1.162                    | 3.582                           | 4.507   | 5.68    | 0.00036                       | 0.00044            | 0.00068            |
| 2MM9322WI                                       | 40      | 90   | 180  | 360                      | 0.504                          | 0.719  | 0.969  | 1.339                    | 3.896                           | 4.899   | 6.111   | 0.00036                       | 0.00045            | 0.00067            |
| 2MM9324WI                                       | 45      | 110  | 220  | 440                      | 0.559                          | 0.826  | 1.102  | 1.518                    | 4.305                           | 5.415   | 6.758   | 0.00042                       | 0.00052            | 0.00076            |
| 2MM9326WI                                       | 50      | 140  | 275  | 550                      | 0.61                           | 0.858  | 1.152  | 1.603                    | 4.84                            | 6.054   | 7.559   | 0.00051                       | 0.00056            | 0.00084            |
| 2MM9328WI                                       | 60      | 140  | 280  | 575                      | 0.601                          | 0.913  | 1.226  | 1.7                      | 5.052                           | 6.361   | 8.012   | 0.00044                       | 0.00056            | 0.00086            |
| 2MM9330WI                                       | 65      | 190  | 380  | 775                      | 0.686                          | 1.039  | 1.395  | 1.899                    | 5.46                            | 6.88    | 8.649   | 0.00066                       | 0.00071            | 0.00108            |
| 2MM9332WI                                       | 110     | 220  | 445  | 890                      | 0.753                          | 0.991  | 1.337  | 1.839                    | 5.787                           | 7.315   | 9.135   | 0.00050                       | 0.00078            | 0.00112            |
| 2MM9334WI                                       | 80      | 230  | 460  | 900                      | 0.934                          | 1.23   | 1.651  | 2.27                     | 6.209                           | 7.82    | 9.699   | 0.00069                       | 0.00076            | 0.00107            |
| 2MM9340WI                                       | 175     | 350  | 700  | 1400                     | 0.943                          | 1.241  | 1.664  | 2.286                    | 7.414                           | 9.344   | 11.68   | 0.00064                       | 0.00096            | 0.00142            |

Notes: <sup>(1)</sup> For DB or DF arrangements only. For other mounting arrangements contact your Timken representative.

# ULTRA-LIGHT 3MM9300WI (ISO 19) SERIES

## DUPLEX PERFORMANCE DATA

## MOUNTING ARRANGEMENTS



Suggested  
DB



Tandem  
DT



Special Applications  
DF

| Bearing<br>Number                                          | PRELOAD |      |      |       | AXIAL STIFFNESS <sup>(1)</sup> |        |       | RADIAL STIFFNESS <sup>(1)</sup> |        |         | SPACER OFFSETS <sup>(1)</sup> |                    |
|------------------------------------------------------------|---------|------|------|-------|--------------------------------|--------|-------|---------------------------------|--------|---------|-------------------------------|--------------------|
|                                                            | DUX     | DUL  | DUM  | DUH   | Light                          | Medium | Heavy | Light                           | Medium | Heavy   | Light to<br>Medium            | Medium<br>to Heavy |
|                                                            | N       |      |      |       | N/μm                           |        |       | N/μm                            |        |         | μm                            |                    |
| METRIC DUPLEX PERFORMANCE DATA 3MM9300WI SERIES            |         |      |      |       |                                |        |       |                                 |        |         |                               |                    |
| 3MM9300WI                                                  | —       | 20   | 45   | 90    | 32.7                           | 42.3   | 55.3  | 70.5                            | 88.7   | 110.9   | 2.54                          | 3.81               |
| 3MM9301WI                                                  | —       | 20   | 45   | 90    | 34.5                           | 44.5   | 58.14 | 74.4                            | 93.7   | 117.3   | 2.03                          | 3.81               |
| 3MM9302WI                                                  | —       | 45   | 90   | 160   | 46.4                           | 60.2   | 75.2  | 96.9                            | 121.6  | 145.2   | 3.30                          | 4.06               |
| 3MM9303WI                                                  | —       | 45   | 130  | 240   | 50.7                           | 77.0   | 98.6  | 106.5                           | 152.5  | 184.5   | 5.59                          | 5.08               |
| 3MM9304WI                                                  | —       | 45   | 155  | 265   | 51.8                           | 82.7   | 102.4 | 112.4                           | 170.6  | 202.6   | 6.60                          | 5.08               |
| 3MM9305WI                                                  | —       | 65   | 180  | 310   | 67.9                           | 97.9   | 122.4 | 146.7                           | 202.9  | 242.8   | 5.33                          | 4.83               |
| 3MM9306WI                                                  | —       | 70   | 180  | 310   | 72.9                           | 105.3  | 130.7 | 157.8                           | 218.8  | 262.0   | 5.08                          | 4.57               |
| 3MM9307WI                                                  | 45      | 90   | 240  | 420   | 84.6                           | 123.3  | 152.5 | 182.8                           | 255.7  | 304.9   | 5.84                          | 5.08               |
| 3MM9308WI                                                  | 65      | 130  | 310  | 560   | 101.8                          | 139.4  | 174.9 | 218.8                           | 289.8  | 349.3   | 5.84                          | 6.10               |
| 3MM9309WI                                                  | 90      | 160  | 360  | 670   | 114.7                          | 156.2  | 199.7 | 246.3                           | 323.9  | 396.3   | 5.84                          | 6.86               |
| 3MM9310WI                                                  | 90      | 160  | 400  | 670   | 121.5                          | 174.6  | 210.9 | 261.5                           | 357.8  | 419.6   | 6.60                          | 5.59               |
| 3MM9311WI                                                  | 90      | 200  | 490  | 850   | 138.7                          | 193.8  | 239.8 | 294.5                           | 396.3  | 472.6   | 6.86                          | 6.60               |
| 3MM9312WI                                                  | 90      | 200  | 510  | 890   | 146.7                          | 207.6  | 257.5 | 311.1                           | 425.4  | 508.4   | 6.86                          | 6.60               |
| 3MM9313WI                                                  | 110     | 220  | 530  | 1070  | 159.7                          | 221.2  | 290.0 | 339.3                           | 454.4  | 599.2   | 6.60                          | 8.38               |
| 3MM9314WI                                                  | 130     | 290  | 710  | 1290  | 171.6                          | 239.4  | 301.7 | 366.4                           | 494.8  | 599.2   | 8.13                          | 8.64               |
| 3MM9315WI                                                  | 155     | 310  | 760  | 1330  | 180.8                          | 251.3  | 313.4 | 385.7                           | 518.8  | 622.8   | 8.13                          | 8.13               |
| 3MM9316WI                                                  | 180     | 330  | 800  | 1380  | 194.8                          | 269.3  | 332.7 | 415.7                           | 556.7  | 663.4   | 7.87                          | 7.62               |
| 3MM9317WI                                                  | 220     | 440  | 1070 | 1870  | 214.9                          | 298.2  | 371.8 | 462.1                           | 617.0  | 738.3   | 9.65                          | 9.65               |
| 3MM9318WI                                                  | 220     | 400  | 930  | 1670  | 212.7                          | 290.5  | 363.1 | 455.3                           | 605.2  | 730.2   | 8.38                          | 8.89               |
| 3MM9319WI                                                  | 220     | 470  | 1160 | 2000  | 235.8                          | 329.9  | 408.0 | 504.1                           | 682.1  | 814.2   | 9.65                          | 9.14               |
| 3MM9320WI                                                  | 310     | 600  | 1470 | 2560  | 264.3                          | 369.2  | 459.8 | 562.0                           | 754.7  | 901.4   | 10.92                         | 10.41              |
| 3MM9322WI                                                  | 330     | 670  | 1600 | 2780  | 286.5                          | 397.9  | 494.8 | 608.7                           | 812.1  | 968.6   | 10.92                         | 10.41              |
| 3MM9324WI                                                  | 400     | 800  | 1960 | 3450  | 311.7                          | 421.3  | 543.9 | 663.7                           | 891.8  | 1,069.2 | 12.19                         | 12.19              |
| 3MM9326WI                                                  | 510     | 1020 | 2450 | 4340  | 352.6                          | 488.3  | 611.5 | 751.2                           | 1002.2 | 1198.9  | 13.46                         | 13.72              |
| 3MM9328WI                                                  | 530     | 1070 | 2560 | 4450  | 373.1                          | 516.8  | 642.1 | 795.4                           | 1062.2 | 1268.5  | 13.21                         | 13.21              |
| 3MM9330WI                                                  | 710     | 1450 | 3450 | 6000  | 401.1                          | 551.1  | 688.2 | 854.6                           | 1144.0 | 1363.0  | 16.76                         | 16.26              |
| 3MM9332WI                                                  | 800     | 1580 | 3950 | 6940  | 418.2                          | 588.9  | 734.1 | 876.5                           | 1215.9 | 1455.7  | 18.80                         | 17.78              |
| 3MM9334WI                                                  | 800     | 1600 | 4000 | 6940  | 440.0                          | 618.2  | 760.4 | 944.3                           | 1280.7 | 1519.0  | 18.29                         | 16.26              |
| 3MM9340WI                                                  | 1250    | 3110 | 6230 | 12460 | 580.1                          | 751.0  | 985.0 | 1222.0                          | 1537.0 | 1920.4  | 18.80                         | 28.70              |
| lbs. 10 <sup>3</sup> lbs./in. 10 <sup>3</sup> lbs./in. in. |         |      |      |       |                                |        |       |                                 |        |         |                               |                    |
| INCH DUPLEX PERFORMANCE DATA 3MM9300WI SERIES              |         |      |      |       |                                |        |       |                                 |        |         |                               |                    |
| 3MM9300WI                                                  | —       | 5    | 10   | 20    | 0.187                          | 0.242  | 0.316 | 0.403                           | 0.507  | 0.634   | 0.00010                       | 0.00015            |
| 3MM9301WI                                                  | —       | 5    | 10   | 20    | 0.197                          | 0.254  | 0.332 | 0.425                           | 0.535  | 0.670   | 0.00008                       | 0.00015            |
| 3MM9302WI                                                  | —       | 10   | 20   | 35    | 0.265                          | 0.344  | 0.430 | 0.554                           | 0.695  | 0.830   | 0.00013                       | 0.00016            |
| 3MM9303WI                                                  | —       | 10   | 30   | 55    | 0.290                          | 0.440  | 0.564 | 0.609                           | 0.872  | 1.055   | 0.00022                       | 0.00020            |
| 3MM9304WI                                                  | —       | 10   | 35   | 60    | 0.296                          | 0.472  | 0.585 | 0.642                           | 0.974  | 1.157   | 0.00026                       | 0.00020            |
| 3MM9305WI                                                  | —       | 15   | 40   | 70    | 0.388                          | 0.560  | 0.700 | 0.839                           | 1.160  | 1.388   | 0.00021                       | 0.00019            |
| 3MM9306WI                                                  | —       | 15   | 40   | 70    | 0.417                          | 0.602  | 0.747 | 0.902                           | 1.251  | 1.498   | 0.00020                       | 0.00018            |
| 3MM9307WI                                                  | 10      | 20   | 55   | 95    | 0.484                          | 0.705  | 0.872 | 1.045                           | 1.462  | 1.743   | 0.00023                       | 0.00020            |
| 3MM9308WI                                                  | 15      | 30   | 70   | 125   | 0.582                          | 0.797  | 1.000 | 1.251                           | 1.657  | 1.997   | 0.00023                       | 0.00024            |
| 3MM9309WI                                                  | 20      | 35   | 80   | 150   | 0.656                          | 0.893  | 1.142 | 1.408                           | 1.852  | 2.266   | 0.00023                       | 0.00027            |
| 3MM9310WI                                                  | 20      | 35   | 90   | 150   | 0.695                          | 0.998  | 1.206 | 1.495                           | 2.046  | 2.399   | 0.00026                       | 0.00022            |
| 3MM9311WI                                                  | 20      | 45   | 110  | 190   | 0.793                          | 1.108  | 1.371 | 1.684                           | 2.266  | 2.702   | 0.00027                       | 0.00026            |
| 3MM9312WI                                                  | 20      | 45   | 115  | 200   | 0.839                          | 1.187  | 1.472 | 1.779                           | 2.432  | 2.907   | 0.00027                       | 0.00026            |
| 3MM9313WI                                                  | 25      | 50   | 120  | 240   | 0.913                          | 1.265  | 1.658 | 1.940                           | 2.598  | 3.426   | 0.00026                       | 0.00033            |
| 3MM9314WI                                                  | 30      | 65   | 160  | 290   | 0.981                          | 1.369  | 1.725 | 2.095                           | 2.829  | 3.426   | 0.00032                       | 0.00034            |
| 3MM9315WI                                                  | 35      | 70   | 170  | 300   | 1.034                          | 1.437  | 1.792 | 2.205                           | 2.966  | 3.561   | 0.00032                       | 0.00032            |
| 3MM9316WI                                                  | 40      | 75   | 180  | 310   | 1.114                          | 1.540  | 1.902 | 2.377                           | 3.183  | 3.793   | 0.00031                       | 0.00030            |
| 3MM9317WI                                                  | 50      | 100  | 240  | 420   | 1.229                          | 1.705  | 2.126 | 2.642                           | 3.528  | 4.221   | 0.00038                       | 0.00038            |
| 3MM9318WI                                                  | 50      | 90   | 210  | 375   | 1.216                          | 1.661  | 2.076 | 2.603                           | 3.460  | 4.175   | 0.00033                       | 0.00035            |
| 3MM9319WI                                                  | 50      | 105  | 260  | 450   | 1.348                          | 1.886  | 2.333 | 2.882                           | 3.900  | 4.655   | 0.00038                       | 0.00036            |
| 3MM9320WI                                                  | 70      | 135  | 330  | 575   | 1.511                          | 2.111  | 2.629 | 3.213                           | 4.315  | 5.154   | 0.00043                       | 0.00041            |
| 3MM9322WI                                                  | 75      | 150  | 360  | 625   | 1.638                          | 2.275  | 2.829 | 3.480                           | 4.643  | 5.538   | 0.00043                       | 0.00041            |
| 3MM9324WI                                                  | 90      | 180  | 440  | 775   | 1.782                          | 2.409  | 3.110 | 3.795                           | 5.099  | 6.113   | 0.00048                       | 0.00048            |
| 3MM9326WI                                                  | 115     | 230  | 550  | 975   | 2.016                          | 2.792  | 3.496 | 4.295                           | 5.730  | 6.855   | 0.00053                       | 0.00054            |
| 3MM9328WI                                                  | 120     | 240  | 575  | 1000  | 2.130                          | 2.950  | 3.660 | 4.548                           | 6.073  | 7.253   | 0.00052                       | 0.00052            |
| 3MM9330WI                                                  | 160     | 325  | 775  | 1350  | 2.296                          | 3.172  | 3.939 | 4.886                           | 6.519  | 7.793   | 0.00066                       | 0.00064            |
| 3MM9332WI                                                  | 180     | 355  | 890  | 1560  | 2.388                          | 3.363  | 4.192 | 5.119                           | 6.943  | 8.312   | 0.00074                       | 0.00070            |
| 3MM9334WI                                                  | 180     | 360  | 900  | 1560  | 2.512                          | 3.530  | 4.342 | 5.392                           | 7.313  | 8.674   | 0.00072                       | 0.00064            |
| 3MM9340WI                                                  | 280     | 700  | 1400 | 2800  | 3.317                          | 4.294  | 5.632 | 6.987                           | 8.788  | 10.980  | 0.00074                       | 0.00113            |

Notes: <sup>(1)</sup> For DB or DF arrangements only. For other mounting arrangements contact your Timken representative.



## ULTRA-LIGHT 2MM9300WI (ISO 19) SERIES

### SPEED CAPABILITY DATA

| Bearing Number | Grease Capacity |       | Kluber Isoflex |       | Operating Speeds <sup>(2)</sup> (DB Mounting) <sup>(1)</sup> |            |       |        |         |       |
|----------------|-----------------|-------|----------------|-------|--------------------------------------------------------------|------------|-------|--------|---------|-------|
|                | NBU15           |       | NBU15          |       | DUL                                                          | Grease DUM | DUH   | DUL    | Oil DUM | DUH   |
|                | 25%             | 40%   | 15%            | 20%   |                                                              |            |       |        |         |       |
|                | grams           | grams | grams          | grams | RPM                                                          | RPM        | RPM   | RPM    | RPM     | RPM   |
| 2MM9300WI      | 0.09            | 0.15  | 0.06           | 0.08  | 62000                                                        | 46500      | 31000 | 105400 | 79100   | 52700 |
| 2MM9301WI      | 0.11            | 0.17  | 0.07           | 0.10  | 53800                                                        | 40300      | 26900 | 91500  | 68500   | 45700 |
| 2MM9302WI      | 0.17            | 0.28  | 0.12           | 0.15  | 44500                                                        | 33400      | 22200 | 75700  | 56800   | 37700 |
| 2MM9303WI      | 0.19            | 0.30  | 0.12           | 0.16  | 40100                                                        | 30100      | 20000 | 68200  | 51200   | 34000 |
| 2MM9304WI      | 0.40            | 0.60  | 0.25           | 0.34  | 33700                                                        | 25300      | 16800 | 57300  | 43000   | 28600 |
| 2MM9305WI      | 0.40            | 0.70  | 0.29           | 0.39  | 27800                                                        | 20900      | 13900 | 47300  | 35500   | 23600 |
| 2MM9306WI      | 0.50            | 0.80  | 0.34           | 0.45  | 23800                                                        | 17800      | 11900 | 40500  | 30300   | 20200 |
| 2MM9307WI      | 0.80            | 1.20  | 0.51           | 0.68  | 20300                                                        | 15200      | 10200 | 34500  | 25800   | 17300 |
| 2MM9308WI      | 1.20            | 1.90  | 0.80           | 1.07  | 17900                                                        | 13400      | 9000  | 30400  | 22800   | 15300 |
| 2MM9309WI      | 1.30            | 2.10  | 0.88           | 1.18  | 16000                                                        | 12000      | 8000  | 27200  | 20400   | 13600 |
| 2MM9310WI      | 1.40            | 2.30  | 0.95           | 1.27  | 14600                                                        | 11000      | 7300  | 24800  | 18700   | 12400 |
| 2MM9311WI      | 1.90            | 3.00  | 1.30           | 1.70  | 13300                                                        | 10000      | 6600  | 22600  | 17000   | 11200 |
| 2MM9312WI      | 2.00            | 3.20  | 1.40           | 1.80  | 12200                                                        | 9200       | 6100  | 20700  | 15600   | 10400 |
| 2MM9313WI      | 2.10            | 3.40  | 1.40           | 1.90  | 11400                                                        | 8500       | 5700  | 19400  | 14500   | 9700  |
| 2MM9314WI      | 3.60            | 5.70  | 2.40           | 3.20  | 10500                                                        | 7900       | 5200  | 17900  | 13400   | 8800  |
| 2MM9315WI      | 3.80            | 6.10  | 2.50           | 3.40  | 9800                                                         | 7400       | 4900  | 16700  | 12600   | 8300  |
| 2MM9316WI      | 4.00            | 6.40  | 2.70           | 3.50  | 9300                                                         | 7000       | 4600  | 15800  | 11900   | 7800  |
| 2MM9317WI      | 5.30            | 8.60  | 3.60           | 4.80  | 8600                                                         | 6500       | 4300  | 14600  | 11100   | 7300  |
| 2MM9318WI      | 5.90            | 9.40  | 3.90           | 5.20  | 8200                                                         | 6200       | 4100  | 13900  | 10500   | 7000  |
| 2MM9319WI      | 6.10            | 9.70  | 4.10           | 5.40  | 7800                                                         | 5900       | 3900  | 13300  | 10000   | 6600  |
| 2MM9320WI      | 7.50            | 12.00 | 5.00           | 6.70  | 7300                                                         | 5500       | 3600  | 12400  | 9400    | 6100  |
| 2MM9322WI      | 8.10            | 13.00 | 5.40           | 7.30  | 6700                                                         | 5000       | 3400  | 11400  | 8500    | 5800  |
| 2MM9324WI      | 11.10           | 17.80 | 7.40           | 9.90  | 6200                                                         | 4600       | 3100  | 10500  | 7800    | 5300  |
| 2MM9326WI      | 14.60           | 23.30 | 9.70           | 13.00 | 5700                                                         | 4300       | 2800  | 9700   | 7300    | 4800  |
| 2MM9328WI      | 15.50           | 24.80 | 10.40          | 13.80 | 5300                                                         | 4000       | 2600  | 9000   | 6800    | 4400  |
| 2MM9330WI      | 24.80           | 39.70 | 16.60          | 22.10 | 5000                                                         | 3700       | 2500  | 8500   | 6300    | 4300  |
| 2MM9332WI      | 26.20           | 41.90 | 17.50          | 23.30 | 4600                                                         | 3500       | 2300  | 7900   | 5900    | 3900  |
| 2MM9334WI      | 28.20           | 45.20 | 18.90          | 25.10 | 4400                                                         | 3300       | 2200  | 7500   | 5600    | 3700  |
| 2MM9340WI      | 56.80           | 90.90 | 37.90          | 50.60 | 3700                                                         | 2800       | 1800  | 6300   | 4700    | 3100  |

<sup>(1)</sup> For other mounting arrangement configurations refer to the engineering section on Permissible Speed calculation methods.

<sup>(2)</sup> For ceramic ball complements use 120% of speeds shown.

# ULTRA-LIGHT 3MM9300WI (ISO 19) SERIES

## SPEED CAPABILITY DATA

| Bearing Number | Grease Capacity |       | Kluber Isoflex |       | Operating Speeds <sup>(2)</sup> (DB Mounting) <sup>(1)</sup> |            |       |       |         |       |
|----------------|-----------------|-------|----------------|-------|--------------------------------------------------------------|------------|-------|-------|---------|-------|
|                | NBU15           |       | NBU15          |       | DUL                                                          | Grease DUM | DUH   | DUL   | Oil DUM | DUH   |
|                | 25%             | 40%   | 15%            | 20%   |                                                              |            |       |       |         |       |
|                | grams           | grams | grams          | grams | RPM                                                          | RPM        | RPM   | RPM   | RPM     | RPM   |
| 3MM9300WI      | 0.09            | 0.15  | 0.06           | 0.08  | 55800                                                        | 41850      | 27900 | 94860 | 71190   | 47430 |
| 3MM9301WI      | 0.11            | 0.17  | 0.07           | 0.10  | 48420                                                        | 36270      | 24210 | 82350 | 61650   | 41130 |
| 3MM9302WI      | 0.17            | 0.28  | 0.12           | 0.15  | 40050                                                        | 30060      | 19980 | 68130 | 51120   | 33930 |
| 3MM9303WI      | 0.19            | 0.30  | 0.12           | 0.16  | 36090                                                        | 27090      | 18000 | 61380 | 46080   | 30600 |
| 3MM9304WI      | 0.40            | 0.60  | 0.25           | 0.34  | 30330                                                        | 22770      | 15120 | 51570 | 38700   | 25740 |
| 3MM9305WI      | 0.40            | 0.70  | 0.29           | 0.39  | 25020                                                        | 18810      | 12510 | 42570 | 31950   | 21240 |
| 3MM9306WI      | 0.50            | 0.80  | 0.34           | 0.45  | 21420                                                        | 16020      | 10710 | 36450 | 27270   | 18180 |
| 3MM9307WI      | 0.80            | 1.20  | 0.51           | 0.68  | 18270                                                        | 13680      | 9180  | 31050 | 23220   | 15570 |
| 3MM9308WI      | 1.20            | 1.90  | 0.80           | 1.07  | 16110                                                        | 12060      | 8100  | 27360 | 20520   | 3770  |
| 3MM9309WI      | 1.30            | 2.10  | 0.88           | 1.18  | 14400                                                        | 10800      | 7200  | 24480 | 18360   | 12240 |
| 3MM9310WI      | 1.40            | 2.30  | 0.95           | 1.27  | 13140                                                        | 9900       | 6570  | 22320 | 16830   | 11160 |
| 3MM9311WI      | 1.90            | 3.00  | 1.30           | 1.70  | 11970                                                        | 9000       | 5940  | 20340 | 15300   | 10080 |
| 3MM9312WI      | 2.00            | 3.20  | 1.40           | 1.80  | 10980                                                        | 8280       | 5490  | 18630 | 14040   | 9360  |
| 3MM9313WI      | 2.10            | 3.40  | 1.40           | 1.90  | 10260                                                        | 7650       | 5130  | 17460 | 13050   | 8730  |
| 3MM9314WI      | 3.60            | 5.70  | 2.40           | 3.20  | 9450                                                         | 7110       | 4680  | 16110 | 12060   | 7920  |
| 3MM9315WI      | 3.80            | 6.10  | 2.50           | 3.40  | 8820                                                         | 6660       | 4410  | 15030 | 11340   | 7470  |
| 3MM9316WI      | 4.00            | 6.40  | 2.70           | 3.50  | 8370                                                         | 6300       | 4140  | 14220 | 10710   | 7020  |
| 3MM9317WI      | 5.30            | 8.60  | 3.60           | 4.80  | 7740                                                         | 5850       | 3870  | 13140 | 9990    | 6570  |
| 3MM9318WI      | 5.90            | 9.40  | 3.90           | 5.20  | 7380                                                         | 5580       | 3690  | 12510 | 9450    | 6300  |
| 3MM9319WI      | 6.10            | 9.70  | 4.10           | 5.40  | 7020                                                         | 5310       | 3510  | 11970 | 9000    | 5940  |
| 3MM9320WI      | 7.50            | 12.00 | 5.00           | 6.70  | 6570                                                         | 4950       | 3240  | 11160 | 8460    | 5490  |
| 3MM9322WI      | 8.10            | 13.00 | 5.40           | 7.30  | 6030                                                         | 4500       | 3060  | 10260 | 7650    | 5220  |
| 3MM9324WI      | 11.10           | 17.80 | 7.40           | 9.90  | 5580                                                         | 4140       | 2790  | 9450  | 7020    | 4770  |
| 3MM9326WI      | 14.60           | 23.30 | 9.70           | 13.00 | 5130                                                         | 3870       | 2520  | 8730  | 6570    | 4320  |
| 3MM9328WI      | 15.50           | 24.80 | 10.40          | 13.80 | 4770                                                         | 3600       | 2340  | 8100  | 6120    | 3960  |
| 3MM9330WI      | 24.80           | 39.70 | 16.60          | 22.10 | 4500                                                         | 3330       | 2250  | 7650  | 5670    | 3870  |
| 3MM9332WI      | 26.20           | 41.90 | 17.50          | 23.30 | 4140                                                         | 3150       | 2070  | 7110  | 5310    | 3510  |
| 3MM9334WI      | 28.20           | 45.20 | 18.90          | 25.10 | 3960                                                         | 2970       | 1980  | 6750  | 5040    | 3330  |
| 3MM9340WI      | 56.80           | 90.90 | 37.90          | 50.60 | 3330                                                         | 2520       | 1620  | 5670  | 4230    | 2790  |

<sup>(1)</sup> For other mounting arrangement configurations refer to the engineering section on Permissible Speed calculation methods.

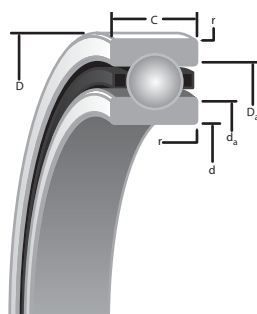
<sup>(2)</sup> For ceramic ball complements use 120% of speeds shown.


**D**




## ULTRA-LIGHT 2(3)MMV9300HX (ISO 19) SERIES

### DIMENSIONAL SERIES METRIC



D

### SUPER PRECISION MM:

Running accuracy and performance meet ABEC 9 (ISO P2) levels. Non-critical features conform to ABEC 7 (ISO P4) requirements.

### WI CONSTRUCTION:

- Incorporates low shoulder on non-thrust side of outer rings.
- Maximum complement of balls separated by one-piece cage piloted against a ground thrust shoulder land of the outer ring.

| Bearing Number<br>2MM or 3MM |                   |             |                      | Ball Qty.<br>x Dia. | Wt.<br>kg | (2MM) LOAD RATINGS<br>(steel ball & ceramic ball) |                      |                    | (3MM) LOAD RATINGS<br>(steel ball & ceramic ball) |                      |                    |
|------------------------------|-------------------|-------------|----------------------|---------------------|-----------|---------------------------------------------------|----------------------|--------------------|---------------------------------------------------|----------------------|--------------------|
|                              | d                 | D           | C                    |                     |           | C <sub>0</sub> (stat)                             | C <sub>e</sub> (dyn) | Limiting Speed(Ng) | C <sub>0</sub> (stat)                             | C <sub>e</sub> (dyn) | Limiting Speed(Ng) |
|                              | Bore              | O.D.        | Width <sup>(1)</sup> |                     |           |                                                   |                      |                    |                                                   |                      |                    |
|                              | mm/tol: +0; -(µm) |             |                      | mm                  | kg        | N                                                 |                      | RPM                | N                                                 |                      | RPM                |
| 9300HX                       | 10<br>(4)         | 22<br>(5)   | 6<br>(40)            | 12 x 3.2            | 0.01      | 534<br>489                                        | 1468<br>1468         | 91700<br>110040    | 534<br>489                                        | 1379<br>1379         | 82500<br>99000     |
| 9301HX                       | 12<br>(4)         | 24<br>(5)   | 6<br>(80)            | 14 x 3.2            | 0.01      | 610<br>540                                        | 1500<br>1500         | 80000<br>96000     | 580<br>520                                        | 1420<br>1420         | 72000<br>86400     |
| 9302HX                       | 15<br>(4)         | 28<br>(5)   | 7<br>(80)            | 13 x 3.6            | 0.02      | 979<br>890                                        | 2091<br>2091         | 66800<br>80160     | 890<br>801                                        | 2046<br>2046         | 60100<br>72120     |
| 9303HX                       | 17<br>(4)         | 30<br>(5)   | 7<br>(80)            | 14 x 3.6            | 0.02      | 1023<br>934                                       | 2224<br>2224         | 60400<br>72480     | 979<br>890                                        | 2091<br>2091         | 54400<br>65280     |
| 9304HX                       | 20<br>(5)         | 37<br>(6)   | 9<br>(120)           | 14 x 4.8            | 0.04      | 1690<br>1512                                      | 3514<br>3514         | 50200<br>60240     | 1601<br>1423                                      | 3336<br>3336         | 45200<br>54240     |
| 9305HX                       | 25<br>(5)         | 42<br>(6)   | 9<br>(120)           | 17 x 4.8            | 0.04      | 2046<br>1824                                      | 3781<br>3781         | 41800<br>50160     | 1913<br>1735                                      | 3603<br>3603         | 37600<br>45120     |
| 9306HX                       | 30<br>(5)         | 47<br>(6)   | 9<br>(120)           | 19 x 4.8            | 0.05      | 2402<br>2135                                      | 4048<br>4048         | 35900<br>43080     | 2224<br>1957                                      | 3825<br>3825         | 32300<br>38760     |
| 9307HX                       | 35<br>(6)         | 55<br>(7)   | 10<br>(120)          | 19 x 5.6            | 0.08      | 3158<br>2847                                      | 5115<br>5115         | 30500<br>36600     | 2980<br>2624                                      | 4804<br>4804         | 27500<br>33000     |
| 9308HX                       | 40<br>(6)         | 62<br>(7)   | 12<br>(120)          | 19 x 6.4            | 0.11      | 6005<br>5338                                      | 10675<br>10675       | 28000<br>33600     | 5693<br>5071                                      | 10097<br>10097       | 25200<br>30240     |
| 9309HX                       | 45<br>(6)         | 68<br>(7)   | 12<br>(120)          | 21 x 6.4            | 0.13      | 6716<br>6005                                      | 11164<br>11164       | 25000<br>30000     | 6405<br>5693                                      | 10586<br>10586       | 22500<br>27000     |
| 9310HX                       | 50<br>(6)         | 72<br>(7)   | 12<br>(120)          | 23 x 6.4            | 0.14      | 7473<br>6672                                      | 11698<br>11698       | 22900<br>27480     | 7072<br>6405                                      | 11031<br>11031       | 20600<br>24720     |
| 9311HX                       | 55<br>(7)         | 80<br>(7)   | 13<br>(150)          | 23 x 7.1            | 0.19      | 9430<br>8407                                      | 14500<br>14500       | 20700<br>24840     | 8896<br>7917                                      | 13700<br>13700       | 18600<br>22320     |
| 9312HX                       | 60<br>(7)         | 85<br>(8)   | 13<br>(150)          | 25 x 7.1            | 0.2       | 10319<br>9207                                     | 15123<br>15123       | 19200<br>23040     | 9697<br>8629                                      | 14278<br>14278       | 17300<br>20760     |
| 9313HX                       | 65<br>(7)         | 90<br>(8)   | 13<br>(150)          | 27 x 7.1            | 0.22      | 11164<br>9919                                     | 15701<br>15701       | 17800<br>21360     | 10400<br>9250                                     | 14800<br>14800       | 16000<br>19200     |
| 9314HX                       | 70<br>(7)         | 100<br>(8)  | 16<br>(150)          | 24 x 8.7            | 0.34      | 14767<br>13166                                    | 21306<br>21306       | 16400<br>19680     | 13922<br>12365                                    | 20105<br>20105       | 14800<br>17760     |
| 9315HX                       | 75<br>(7)         | 105<br>(8)  | 16<br>(150)          | 25 x 8.7            | 0.36      | 15435<br>13744                                    | 21617<br>21617       | 15400<br>18480     | 14500<br>12899                                    | 20416<br>20416       | 13900<br>16680     |
| 9316HX                       | 80<br>(7)         | 110<br>(8)  | 16<br>(150)          | 27 x 8.7            | 0.39      | 16680<br>14856                                    | 22507<br>22507       | 14500<br>17400     | 15568<br>13833                                    | 21217<br>21217       | 13100<br>15720     |
| 9317HX                       | 85<br>(8)         | 120<br>(8)  | 18<br>(200)          | 26 x 9.5            | 0.56      | 19171<br>17036                                    | 25754<br>25754       | 13500<br>16200     | 17836<br>15879                                    | 24242<br>24242       | 12200<br>14640     |
| 9318HX                       | 90<br>(8)         | 125<br>(9)  | 18<br>(200)          | 26 x 10.3           | 0.57      | 22462<br>19972                                    | 29935<br>29935       | 12900<br>15480     | 20995<br>18682                                    | 28200<br>28200       | 11600<br>13920     |
| 9319HX                       | 95<br>(8)         | 130<br>(9)  | 18<br>(200)          | 28 x 10.3           | 0.6       | 24197<br>21528                                    | 31136<br>31136       | 12300<br>14760     | 22507<br>20060                                    | 29312<br>29312       | 10300<br>12360     |
| 9320HX                       | 100<br>(8)        | 140<br>(9)  | 20<br>(200)          | 29 x 10.3           | 0.85      | 24864<br>22151                                    | 31403<br>31403       | 11400<br>13680     | 23174<br>20639                                    | 29535<br>29535       | 9900<br>11800      |
| 9322HX                       | 110<br>(8)        | 150<br>(9)  | 20<br>(200)          | 31 x 10.3           | 0.92      | 26377<br>23485                                    | 32204<br>32204       | 10500<br>12600     | 24597<br>21884                                    | 30291<br>30291       | 9500<br>11400      |
| 9324HX                       | 120<br>(8)        | 165<br>(10) | 22<br>(200)          | 30 x 11.9           | 1.24      | 34,161<br>30424                                   | 41277<br>41277       | 9600<br>11520      | 31803<br>28334                                    | 38831<br>38831       | 8600<br>10320      |
| 9326HX                       | 130<br>(10)       | 180<br>(10) | 24<br>(250)          | 30 x 13.5           | 1.65      | 44035<br>39187                                    | 52042<br>52042       | 8900<br>10680      | 41055<br>36518                                    | 48928<br>48928       | 8000<br>9600       |
| 9328HX                       | 140<br>(10)       | 190<br>(10) | 24<br>(250)          | 32 x 13.5           | 1.75      | 46704<br>41544                                    | 53821<br>53821       | 8300<br>9960       | 43501<br>38742                                    | 50707<br>50707       | 7500<br>9000       |
| 9330HX                       | 150<br>(10)       | 210<br>(10) | 28<br>(250)          | 27 x 17.5           | 2.61      | 66720<br>59603                                    | 79174<br>79174       | 7700<br>9240       | 62717<br>55600                                    | 74726<br>74726       | 6900<br>8280       |

(Ng) For a single, grease lubricated, spring preloaded bearing. This value to be used in permissible Operating Speed (Sp) calculation.

(1) Width tolerance of preloaded bearing set +0/-0.25 mm (+0/-0.010").

(2) ABMA STD 20 (r<sub>as</sub> max).

| r<br>Rad. <sup>(2)</sup> | Suggested<br>Shoulder Diameters |       |                          |       | Shaft Diameter |         | Mounting Fits |        | FIXED                        |         |               |       | FLOATING                     |         |                   |       | Bearing<br>Number<br>2MM or<br>3MM |
|--------------------------|---------------------------------|-------|--------------------------|-------|----------------|---------|---------------|--------|------------------------------|---------|---------------|-------|------------------------------|---------|-------------------|-------|------------------------------------|
|                          | d <sub>a</sub> (Shaft)          |       | D <sub>a</sub> (Housing) |       | Min.           | Max.    | Loose         | Tight  | Housing Bore<br>(Stationary) |         | Mounting Fits |       | Housing Bore<br>(Stationary) |         | Housing Clearance |       |                                    |
|                          | Max.                            | Min.  | Max.                     | Min.  |                |         |               |        | Min.                         | Max.    | Tight         | Loose | Max.                         | Min.    | Max.              | Min.  |                                    |
| mm                       | mm                              | mm    | mm                       | mm    | mm             | mm      | mm            | mm     | mm                           | mm      | mm            | mm    | mm                           | mm      | mm                | mm    |                                    |
| 0.3                      | 13.2                            | 13    | 19.6                     | 19.3  | 9.995          | 10.000  | 0.005         | 0.004  | 22.000                       | 22.005  | 0.0000        | 0.010 | 22.010                       | 22.005  | 0.015             | 0.005 | 9300HX                             |
| 0.3                      | 15.2                            | 14.9  | 21.6                     | 21.3  | 11.995         | 12.000  | 0.005         | 0.004  | 24.000                       | 24.005  | 0.000         | 0.010 | 24.010                       | 24.005  | 0.015             | 0.005 | 9301HX                             |
| 0.3                      | 18.3                            | 18.1  | 25.5                     | 25.2  | 14.995         | 15.000  | 0.005         | 0.004  | 28.000                       | 28.005  | 0.000         | 0.010 | 28.010                       | 28.005  | 0.015             | 0.005 | 9302HX                             |
| 0.3                      | 20.3                            | 20    | 27.5                     | 27.2  | 16.995         | 17.000  | 0.005         | 0.004  | 30.000                       | 30.005  | 0.000         | 0.010 | 30.010                       | 30.005  | 0.015             | 0.005 | 9303HX                             |
| 0.3                      | 24.1                            | 23.9  | 33.7                     | 33.4  | 19.995         | 20.000  | 0.005         | 0.005  | 37.000                       | 37.006  | 0.000         | 0.012 | 37.010                       | 37.005  | 0.016             | 0.005 | 9304HX                             |
| 0.3                      | 29.1                            | 28.9  | 38.7                     | 38.4  | 24.995         | 25.000  | 0.005         | 0.005  | 42.000                       | 42.006  | 0.000         | 0.012 | 42.010                       | 42.005  | 0.016             | 0.005 | 9305HX                             |
| 0.3                      | 34.1                            | 33.9  | 43.7                     | 43.4  | 29.995         | 30.000  | 0.005         | 0.005  | 47.000                       | 47.006  | 0.000         | 0.012 | 47.012                       | 47.007  | 0.018             | 0.007 | 9306HX                             |
| 0.6                      | 40                              | 39.5  | 51.1                     | 50.6  | 34.995         | 35.000  | 0.005         | 0.006  | 55.000                       | 55.008  | 0.000         | 0.015 | 55.012                       | 55.007  | 0.019             | 0.007 | 9307HX                             |
| 0.6                      | 45.1                            | 44.6  | 57.9                     | 57.4  | 39.995         | 40.000  | 0.005         | 0.006  | 62.000                       | 62.008  | 0.000         | 0.015 | 62.012                       | 62.007  | 0.019             | 0.007 | 9308HX                             |
| 0.6                      | 50.7                            | 50.1  | 63.4                     | 62.9  | 44.995         | 45.000  | 0.005         | 0.006  | 68.000                       | 68.008  | 0.000         | 0.015 | 68.012                       | 68.007  | 0.019             | 0.007 | 9309HX                             |
| 0.6                      | 55.1                            | 54.6  | 67.9                     | 67.4  | 49.995         | 50.000  | 0.005         | 0.006  | 72.000                       | 72.008  | 0.000         | 0.015 | 72.011                       | 72.007  | 0.019             | 0.007 | 9310HX                             |
| 1.0                      | 60.9                            | 60.4  | 75.2                     | 74.7  | 54.995         | 55.000  | 0.005         | 0.007  | 80.000                       | 80.008  | 0.000         | 0.015 | 80.012                       | 80.008  | 0.020             | 0.008 | 9311HX                             |
| 1.0                      | 65.8                            | 65.3  | 80.2                     | 79.7  | 59.995         | 60.000  | 0.005         | 0.007  | 85.000                       | 85.008  | 0.000         | 0.016 | 85.016                       | 85.009  | 0.024             | 0.009 | 9312HX                             |
| 1.0                      | 70.8                            | 70.3  | 85.2                     | 84.7  | 64.995         | 65.000  | 0.005         | 0.007  | 90.000                       | 90.008  | 0.0000        | 0.016 | 90.015                       | 90.007  | 0.023             | 0.007 | 9313HX                             |
| 1.0                      | 76.8                            | 76.3  | 94.3                     | 93.8  | 69.995         | 70.000  | 0.005         | 0.007  | 100.000                      | 100.008 | 0.0000        | 0.016 | 100.018                      | 100.010 | 0.025             | 0.010 | 9314HX                             |
| 1.0                      | 81.9                            | 81.1  | 99.4                     | 98.6  | 74.995         | 75.005  | 0.005         | 0.012  | 105.000                      | 105.008 | 0.0000        | 0.016 | 105.019                      | 105.011 | 0.026             | 0.011 | 9315HX                             |
| 1.0                      | 86.9                            | 86.1  | 104.4                    | 103.6 | 79.995         | 80.005  | 0.005         | 0.012  | 110.000                      | 110.008 | 0.0000        | 0.016 | 110.018                      | 110.010 | 0.025             | 0.010 | 9316HX                             |
| 1.0                      | 93.6                            | 92.8  | 112.7                    | 111.9 | 84.995         | 85.005  | 0.005         | 0.012  | 120.000                      | 120.008 | 0.0000        | 0.016 | 120.018                      | 120.010 | 0.025             | 0.010 | 9317HX                             |
| 1.0                      | 97.8                            | 97.0  | 118.5                    | 117.7 | 89.995         | 90.005  | 0.005         | 0.013  | 125.000                      | 125.008 | 0.0000        | 0.017 | 125.021                      | 125.011 | 0.030             | 0.011 | 9318HX                             |
| 1.0                      | 102.8                           | 102.0 | 123.5                    | 122.7 | 94.995         | 95.005  | 0.005         | 0.013  | 130.000                      | 130.009 | 0.0000        | 0.018 | 130.020                      | 130.010 | 0.029             | 0.010 | 9319HX                             |
| 1.0                      | 110.3                           | 109.5 | 131                      | 130.2 | 99.995         | 100.005 | 0.005         | 0.013  | 140.000                      | 140.009 | 0.0000        | 0.018 | 140.020                      | 140.010 | 0.029             | 0.010 | 9320HX                             |
| 1.0                      | 120.3                           | 119.5 | 141                      | 140.2 | 109.995        | 110.005 | 0.005         | 0.013  | 150.000                      | 150.009 | 0.0000        | 0.018 | 150.023                      | 150.012 | 0.032             | 0.012 | 9322HX                             |
| 1.0                      | 131.2                           | 130.4 | 155                      | 154.3 | 119.995        | 120.005 | 0.005         | 0.013  | 165.000                      | 165.010 | 0.0000        | 0.020 | 165.022                      | 165.012 | 0.032             | 0.012 | 9324HX                             |
| 1.5                      | 142.1                           | 141.4 | 169.2                    | 168.4 | 129.995        | 130.005 | 0.005         | 0.015  | 180.000                      | 180.010 | 0.0000        | 0.020 | 180.022                      | 180.012 | 0.032             | 0.012 | 9326HX                             |
| 1.5                      | 152.1                           | 151.4 | 179.2                    | 178.4 | 139.995        | 140.005 | 0.005         | 0.0150 | 190.000                      | 190.010 | 0.0000        | 0.021 | 190.022                      | 190.012 | 0.033             | 0.012 | 9328HX                             |
| 2.0                      | 163.1                           | 162.4 | 198.2                    | 197.4 | 149.995        | 150.005 | 0.005         | 0.015  | 210.000                      | 210.011 | 0.0000        | 0.022 | 210.025                      | 210.015 | 0.036             | 0.015 | 9330HX                             |

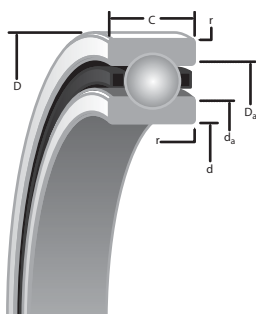
D





## ULTRA-LIGHT 2(3)MMV9300HX (ISO 19) SERIES

### DIMENSIONAL SERIES INCHES



### SUPER PRECISION MM:

Running accuracy and performance meet ABEC 9 (ISO P2) levels. Non-critical features conform to ABEC 7 (ISO P4) requirements.

### WI CONSTRUCTION:

- Incorporates low shoulder on non-thrust side of outer rings.
- Maximum complement of balls separated by one-piece cage piloted against a ground thrust shoulder land of the outer ring.

| Bearing Number<br>2MM or 3MM |                       |                 |                      | Ball Qty.<br>x Dia. | Wt.  | (2MM) LOAD RATINGS<br>(steel ball & ceramic ball) |                      |                                | (3MM) LOAD RATINGS<br>(steel ball & ceramic ball) |                      |                                |
|------------------------------|-----------------------|-----------------|----------------------|---------------------|------|---------------------------------------------------|----------------------|--------------------------------|---------------------------------------------------|----------------------|--------------------------------|
|                              | d                     | D               | C                    |                     |      | C <sub>0</sub> (stat)                             | C <sub>e</sub> (dyn) | Limiting Speed <sup>(Ng)</sup> | C <sub>0</sub> (stat)                             | C <sub>e</sub> (dyn) | Limiting Speed <sup>(Ng)</sup> |
|                              | Bore                  | O.D.            | Width <sup>(1)</sup> |                     |      |                                                   |                      |                                |                                                   |                      |                                |
|                              | in./tol: +0; -.000(X) |                 |                      | in.                 | lbs. | lbs.                                              |                      | RPM                            | lbs.                                              |                      | RPM                            |
| 9300HX                       | 0.3937<br>(1.5)       | 0.8661<br>(2)   | 0.2362<br>(16)       | 13 x 3/32           | 0.02 | 120<br>110                                        | 330<br>330           | 91700<br>110040                | 120<br>110                                        | 310<br>310           | 82500<br>99000                 |
| 9301HX                       | 0.4724<br>(1.5)       | 0.9449<br>(2)   | 0.2362<br>(31)       | 14 x 3/32           | 0.03 | 140<br>120                                        | 340<br>340           | 80000<br>96000                 | 130<br>120                                        | 320<br>320           | 72000<br>86400                 |
| 9302HX                       | 0.5906<br>(1.5)       | 1.1024<br>(2)   | 0.2756<br>(31)       | 16 x 7/64           | 0.04 | 220<br>200                                        | 470<br>470           | 66800<br>80160                 | 200<br>180                                        | 460<br>460           | 60100<br>72120                 |
| 9303HX                       | 0.6693<br>(1.5)       | 1.1811<br>(2)   | 0.2756<br>(31)       | 17 x 7/64           | 0.04 | 230<br>210                                        | 500<br>500           | 60400<br>72480                 | 220<br>200                                        | 470<br>470           | 54400<br>65280                 |
| 9304HX                       | 0.7874<br>(2)         | 1.4567<br>(2.5) | 0.3543<br>(47)       | 17 x 9/64           | 0.08 | 380<br>340                                        | 790<br>790           | 50200<br>60240                 | 360<br>320                                        | 750<br>750           | 45200<br>54240                 |
| 9305HX                       | 0.9843<br>(2)         | 1.6535<br>(2.5) | 0.3543<br>(47)       | 20 x 9/64           | 0.1  | 460<br>410                                        | 850<br>850           | 41800<br>50160                 | 430<br>390                                        | 810<br>810           | 37600<br>45120                 |
| 9306HX                       | 1.1811<br>(2)         | 1.8504<br>(2.5) | 0.3543<br>(47)       | 23 x 9/64           | 0.11 | 540<br>480                                        | 910<br>910           | 35900<br>43080                 | 500<br>440                                        | 860<br>860           | 32300<br>38760                 |
| 9307HX                       | 1.378<br>(2.5)        | 2.1654<br>(3)   | 0.3937<br>(47)       | 25 x 5/32           | 0.18 | 710<br>640                                        | 1150<br>1150         | 30500<br>36600                 | 670<br>590                                        | 1080<br>1080         | 27500<br>33000                 |
| 9308HX                       | 1.5748<br>(2.5)       | 2.4409<br>(3)   | 0.4724<br>(47)       | 19 x 1/4            | 0.25 | 1350<br>1200                                      | 2400<br>2400         | 28000<br>33600                 | 1280<br>1140                                      | 2270<br>2270         | 25200<br>30240                 |
| 9309HX                       | 1.7717<br>(2.5)       | 2.6772<br>(3)   | 0.4724<br>(47)       | 21 x 1/4            | 0.29 | 1510<br>1350                                      | 2510<br>2510         | 25000<br>30000                 | 1440<br>1280                                      | 2380<br>2380         | 22500<br>27000                 |
| 9310HX                       | 1.9685<br>(2.5)       | 2.8346<br>(3)   | 0.4724<br>(47)       | 23 x 1/4            | 0.3  | 1680<br>1500                                      | 2630<br>2630         | 22900<br>27480                 | 1590<br>1440                                      | 2480<br>2480         | 20600<br>24720                 |
| 9311HX                       | 2.1654<br>(3)         | 3.1496<br>(3)   | 0.5118<br>(59)       | 23 x 9/32           | 0.39 | 2120<br>1890                                      | 3260<br>3260         | 20700<br>24840                 | 2000<br>1780                                      | 3080<br>3080         | 18600<br>22320                 |
| 9312HX                       | 2.3622<br>(3)         | 3.3465<br>(3)   | 0.5118<br>(59)       | 25 x 9/32           | 0.43 | 2320<br>2070                                      | 3400<br>3400         | 19200<br>23040                 | 2180<br>1940                                      | 3210<br>3210         | 17300<br>20760                 |
| 9313HX                       | 2.5591<br>(3)         | 3.5433<br>(3)   | 0.5118<br>(59)       | 27 x 9/32           | 0.45 | 2510<br>2230                                      | 3530<br>3530         | 17800<br>21360                 | 2340<br>2080                                      | 3320<br>3320         | 16000<br>19200                 |
| 9314HX                       | 2.7559<br>(3)         | 3.937<br>(3)    | 0.6299<br>(59)       | 24 x 11/32          | 0.75 | 3320<br>2960                                      | 4790<br>4790         | 16400<br>19680                 | 3130<br>2780                                      | 4520<br>4520         | 14800<br>17760                 |
| 9315HX                       | 2.9528<br>(3)         | 4.1339<br>(3)   | 0.6299<br>(59)       | 25 x 11/32          | 0.8  | 3470<br>3090                                      | 4860<br>4860         | 15400<br>18480                 | 3260<br>2900                                      | 4590<br>4590         | 13900<br>16680                 |
| 9316HX                       | 3.1496<br>(3)         | 4.3307<br>(3)   | 0.6299<br>(59)       | 27 x 11/32          | 0.8  | 3750<br>3340                                      | 5060<br>5060         | 14500<br>17400                 | 3500<br>3110                                      | 4770<br>4770         | 13100<br>15720                 |
| 9317HX                       | 3.3465<br>(3)         | 4.7244<br>(3)   | 0.7087<br>(79)       | 26 x 3/8            | 1.16 | 4310<br>3830                                      | 5790<br>5790         | 13500<br>16200                 | 4010<br>3570                                      | 5450<br>5450         | 12200<br>14640                 |
| 9318HX                       | 3.5433<br>(3)         | 4.9213<br>(3.5) | 0.7087<br>(79)       | 26 x 13/32          | 1.2  | 5050<br>4490                                      | 6730<br>6730         | 12900<br>15480                 | 4720<br>4200                                      | 6340<br>6340         | 11600<br>13920                 |
| 9319HX                       | 3.7402<br>(3)         | 5.1181<br>(3.5) | 0.7087<br>(79)       | 28 x 13/32          | 1.26 | 5440<br>4840                                      | 7000<br>7000         | 12300<br>14760                 | 5060<br>4510                                      | 6590<br>6590         | 10300<br>12360                 |
| 9320HX                       | 3.937<br>(3)          | 5.5118<br>(3.5) | 0.7874<br>(79)       | 29 x 13/32          | 1.8  | 5590<br>4980                                      | 7060<br>7060         | 11400<br>13680                 | 5210<br>4640                                      | 6640<br>6640         | 10000<br>12000                 |
| 9322HX                       | 4.3307<br>(3)         | 5.9055<br>(3.5) | 0.7874<br>(79)       | 31 x 13/32          | 1.92 | 5930<br>5280                                      | 7240<br>7240         | 10500<br>12600                 | 5530<br>4920                                      | 6810<br>6810         | 9500<br>11400                  |
| 9324HX                       | 4.7244<br>(3)         | 6.4961<br>(4)   | 0.8661<br>(79)       | 30 x 15/32          | 2.6  | 7680<br>6840                                      | 9280<br>9280         | 9600<br>11520                  | 7150<br>6370                                      | 8730<br>8730         | 8600<br>10320                  |
| 9326HX                       | 5.1181<br>(4)         | 7.0866<br>(4)   | 0.9449<br>(98)       | 30 x 17/32          | 3.63 | 9900<br>8810                                      | 11700<br>11700       | 8900<br>10680                  | 9230<br>8210                                      | 11000<br>11000       | 8000<br>9600                   |
| 9328HX                       | 5.5118<br>(4)         | 7.4803<br>(4.5) | 0.9449<br>(98)       | 32 x 17/32          | 3.85 | 10500<br>9340                                     | 12100<br>12100       | 8300<br>9960                   | 9780<br>8710                                      | 11400<br>11400       | 7500<br>9000                   |
| 9330HX                       | 5.9055<br>(4)         | 8.2677<br>(4.5) | 1.1024<br>(98)       | 27 x 11/16          | 5.75 | 15000<br>13400                                    | 17800<br>17800       | 7700<br>9240                   | 14100<br>12500                                    | 16800<br>16800       | 6900<br>8200                   |

<sup>(Ng)</sup> For a single, grease lubricated, spring preloaded bearing. This value to be used in permissible Operating Speed (Sp) calculation.

<sup>(1)</sup> Width tolerance of preloaded bearing set +0/-0.25 mm (+0/-0.010").

<sup>(2)</sup> ABMA STD 20 (r<sub>as</sub> max).

| r<br>Rad. <sup>(2)</sup> | Suggested<br>Shoulder Diameters |      |                          |      | Shaft Diameter |        | Mounting Fits |         | FIXED                        |        |               |        | FLOATING                     |        |                   |        | Bearing<br>Number<br>2MM or<br>3MM |
|--------------------------|---------------------------------|------|--------------------------|------|----------------|--------|---------------|---------|------------------------------|--------|---------------|--------|------------------------------|--------|-------------------|--------|------------------------------------|
|                          | d <sub>a</sub> (Shaft)          |      | D <sub>a</sub> (Housing) |      | Min.           | Max.   | Loose         | Tight   | Housing Bore<br>(Stationary) |        | Mounting Fits |        | Housing Bore<br>(Stationary) |        | Housing Clearance |        |                                    |
|                          | Max.                            | Min. | Max.                     | Min. |                |        |               |         | Min.                         | Max.   | Tight         | Loose  | Max.                         | Min.   | Max.              | Min.   |                                    |
| in.                      | in.                             | in.  | in.                      | in.  | in.            | in.    | in.           | in.     | in.                          | in.    | in.           | in.    | in.                          | in.    | in.               | in.    |                                    |
| 0.012                    | 0.52                            | 0.51 | 0.77                     | 0.76 | 0.3935         | 0.3937 | 0.0002        | 0.00015 | 0.8661                       | 0.8663 | 0.0000        | 0.0004 | 0.8665                       | 0.8663 | 0.0006            | 0.0002 | 9300HX                             |
| 0.012                    | 0.6                             | 0.59 | 0.85                     | 0.84 | 0.4722         | 0.4724 | 0.0002        | 0.00015 | 0.9449                       | 0.9451 | 0.0000        | 0.0004 | 0.9453                       | 0.9451 | 0.0006            | 0.0002 | 9301HX                             |
| 0.012                    | 0.72                            | 0.71 | 1                        | 0.99 | 0.5904         | 0.5906 | 0.0002        | 0.00015 | 1.0236                       | 1.0238 | 0.0000        | 0.0004 | 1.0240                       | 1.0238 | 0.0006            | 0.0002 | 9302HX                             |
| 0.012                    | 0.8                             | 0.79 | 1.08                     | 1.07 | 0.6691         | 0.6693 | 0.0002        | 0.00015 | 1.1811                       | 1.1813 | 0.0000        | 0.0004 | 1.1815                       | 1.1813 | 0.0006            | 0.0002 | 9303HX                             |
| 0.012                    | 0.95                            | 0.94 | 1.33                     | 1.32 | 0.7872         | 0.7874 | 0.0002        | 0.0002  | 1.4567                       | 1.4570 | 0.0000        | 0.0005 | 1.4571                       | 1.4569 | 0.0007            | 0.0002 | 9304HX                             |
| 0.012                    | 1.15                            | 1.14 | 1.52                     | 1.51 | 0.9841         | 0.9843 | 0.0002        | 0.0002  | 1.6535                       | 1.6538 | 0.0000        | 0.0005 | 1.6539                       | 1.6537 | 0.0007            | 0.0002 | 9305HX                             |
| 0.012                    | 1.34                            | 1.33 | 1.72                     | 1.71 | 1.1809         | 1.1811 | 0.0002        | 0.0002  | 1.8504                       | 1.8507 | 0.0000        | 0.0005 | 1.8509                       | 1.8507 | 0.0008            | 0.0003 | 9306HX                             |
| 0.024                    | 1.57                            | 1.55 | 2.01                     | 1.99 | 1.3778         | 1.3780 | 0.0002        | 0.00025 | 2.1654                       | 2.1657 | 0.0000        | 0.0006 | 2.1659                       | 2.1657 | 0.0008            | 0.0003 | 9307HX                             |
| 0.024                    | 1.78                            | 1.76 | 2.28                     | 2.26 | 1.5746         | 1.5748 | 0.0002        | 0.00025 | 2.4409                       | 2.4412 | 0.0000        | 0.0006 | 2.4414                       | 2.4412 | 0.0008            | 0.0003 | 9308HX                             |
| 0.024                    | 1.99                            | 1.97 | 2.5                      | 2.48 | 1.7715         | 1.7717 | 0.0002        | 0.00025 | 2.6772                       | 2.6775 | 0.0000        | 0.0006 | 2.6777                       | 2.6775 | 0.0008            | 0.0003 | 9309HX                             |
| 0.024                    | 2.17                            | 2.15 | 2.67                     | 2.65 | 1.9683         | 1.9685 | 0.0002        | 0.00025 | 2.8346                       | 2.8349 | 0.0000        | 0.0006 | 2.8351                       | 2.8349 | 0.0008            | 0.0003 | 9310HX                             |
| 0.039                    | 2.4                             | 2.38 | 2.96                     | 2.94 | 2.1652         | 2.1654 | 0.0002        | 0.0003  | 3.1496                       | 3.1499 | 0.0000        | 0.0006 | 3.1501                       | 3.1499 | 0.0008            | 0.0003 | 9311HX                             |
| 0.039                    | 2.59                            | 2.57 | 3.16                     | 3.14 | 2.3620         | 2.3622 | 0.0002        | 0.0003  | 3.3465                       | 3.3468 | 0.0000        | 0.0006 | 3.3471                       | 3.3468 | 0.0009            | 0.0003 | 9312HX                             |
| 0.039                    | 2.79                            | 2.77 | 3.35                     | 3.33 | 2.5589         | 2.5591 | 0.0002        | 0.0003  | 3.5433                       | 3.5436 | 0.0000        | 0.0006 | 3.5439                       | 3.5436 | 0.0009            | 0.0003 | 9313HX                             |
| 0.039                    | 3.02                            | 3    | 3.71                     | 3.69 | 2.7557         | 2.7559 | 0.0002        | 0.0003  | 3.9370                       | 3.9373 | 0.0000        | 0.0006 | 3.9377                       | 3.9374 | 0.0010            | 0.0004 | 9314HX                             |
| 0.039                    | 3.22                            | 3.19 | 3.91                     | 3.88 | 2.9526         | 2.9530 | 0.0002        | 0.0005  | 4.1339                       | 4.1342 | 0.0000        | 0.0006 | 4.1346                       | 4.1343 | 0.0010            | 0.0004 | 9315HX                             |
| 0.039                    | 3.42                            | 3.39 | 4.11                     | 4.08 | 3.1494         | 3.1498 | 0.0002        | 0.0005  | 4.3307                       | 4.3310 | 0.0000        | 0.0006 | 4.3314                       | 4.3311 | 0.0010            | 0.0004 | 9316HX                             |
| 0.039                    | 3.69                            | 3.66 | 4.44                     | 4.41 | 3.3463         | 3.3467 | 0.0002        | 0.0005  | 4.7244                       | 4.7247 | 0.0000        | 0.0006 | 4.7251                       | 4.7248 | 0.0010            | 0.0004 | 9317HX                             |
| 0.039                    | 3.85                            | 3.82 | 4.66                     | 4.63 | 3.5431         | 3.5435 | 0.0002        | 0.0005  | 4.9213                       | 4.9216 | 0.0000        | 0.0007 | 4.9221                       | 4.9217 | 0.0012            | 0.0004 | 9318HX                             |
| 0.039                    | 4.05                            | 4.02 | 4.86                     | 4.83 | 3.7400         | 3.7404 | 0.0002        | 0.0005  | 5.1181                       | 5.1185 | 0.0000        | 0.0007 | 5.1189                       | 5.1185 | 0.0011            | 0.0004 | 9319HX                             |
| 0.039                    | 4.34                            | 4.31 | 5.16                     | 5.13 | 3.9368         | 3.9372 | 0.0002        | 0.0005  | 5.5118                       | 5.5122 | 0.0000        | 0.0007 | 5.5126                       | 5.5122 | 0.0011            | 0.0004 | 9320HX                             |
| 0.039                    | 4.74                            | 4.71 | 5.55                     | 5.52 | 4.3305         | 4.3309 | 0.0002        | 0.0005  | 5.9055                       | 5.9059 | 0.0000        | 0.0007 | 5.9064                       | 5.9060 | 0.0012            | 0.0005 | 9322HX                             |
| 0.039                    | 5.16                            | 5.13 | 6.1                      | 6.07 | 4.7242         | 4.7246 | 0.0002        | 0.0005  | 6.4961                       | 6.4965 | 0.0000        | 0.0008 | 6.4970                       | 6.4966 | 0.0013            | 0.0005 | 9324HX                             |
| 0.059                    | 5.6                             | 5.57 | 6.66                     | 6.63 | 5.1179         | 5.1183 | 0.0002        | 0.0006  | 7.0866                       | 7.0870 | 0.0000        | 0.0008 | 7.0875                       | 7.0871 | 0.0013            | 0.0005 | 9326HX                             |
| 0.059                    | 5.99                            | 5.96 | 7.05                     | 7.02 | 5.5116         | 5.5120 | 0.0002        | 0.0006  | 7.4803                       | 7.4807 | 0.0000        | 0.0008 | 7.4812                       | 7.4808 | 0.0014            | 0.0005 | 9328HX                             |
| 0.079                    | 6.42                            | 6.39 | 7.8                      | 7.77 | 5.9053         | 5.9057 | 0.0002        | 0.0006  | 8.2677                       | 8.2682 | 0.0000        | 0.0009 | 8.2687                       | 8.2683 | 0.0015            | 0.0006 | 9330HX                             |

D





## ULTRA-LIGHT 2MMV9300HX (ISO 19) SERIES

### DUPLEX PERFORMANCE DATA

### MOUNTING ARRANGEMENTS



Suggested  
DB



Tandem  
DT



Special Applications  
DF

| Bearing<br>Number                                | PRELOAD |        |       | AXIAL STIFFNESS <sup>(1)</sup> |        |        | RADIAL STIFFNESS <sup>(1)</sup> |        |        | SPACER OFFSETS <sup>(1)</sup> |                    |
|--------------------------------------------------|---------|--------|-------|--------------------------------|--------|--------|---------------------------------|--------|--------|-------------------------------|--------------------|
|                                                  | Light   | Medium | Heavy | Light                          | Medium | Heavy  | Light                           | Medium | Heavy  | Light to<br>Medium            | Medium to<br>Heavy |
|                                                  | N       |        |       | N/μm                           |        |        | N/μm                            |        |        | μm                            |                    |
| METRIC DUPLEX PERFORMANCE DATA 2MMV9300HX SERIES |         |        |       |                                |        |        |                                 |        |        |                               |                    |
| 2MMV9300HX                                       | 9       | 25     | 55    | 10.2                           | 15.6   | 21.0   | 61.0                            | 88.5   | 110.8  | 5.6                           | 5.6                |
| 2MMV9301HX                                       | 9       | 25     | 55    | 10.7                           | 16.7   | 22.8   | 61.3                            | 88.2   | 110.2  | 5.1                           | 5.6                |
| 2MMV9302HX                                       | 20      | 45     | 85    | 17.0                           | 22.7   | 31.0   | 96.4                            | 120.9  | 150.9  | 4.6                           | 6.6                |
| 2MMV9303HX                                       | 20      | 45     | 85    | 16.9                           | 22.3   | 30.0   | 100.9                           | 127.1  | 159.1  | 4.6                           | 6.6                |
| 2MMV9304HX                                       | 20      | 65     | 135   | 18.2                           | 28.5   | 38.7   | 109.6                           | 157.9  | 197.3  | 7.6                           | 8.1                |
| 2MMV9305HX                                       | 20      | 65     | 135   | 20.2                           | 31.3   | 42.3   | 122.0                           | 176.3  | 220.5  | 7.1                           | 7.1                |
| 2MMV9306HX                                       | 20      | 65     | 135   | 22.0                           | 33.9   | 45.7   | 133.7                           | 193.6  | 242.6  | 6.1                           | 6.6                |
| 2MMV9307HX                                       | 45      | 110    | 225   | 30.8                           | 44.6   | 60.5   | 185.7                           | 251.7  | 314.6  | 7.1                           | 8.6                |
| 2MMV9308HX                                       | 45      | 135    | 265   | 29.5                           | 45.1   | 60.1   | 177.9                           | 259.6  | 325.7  | 9.7                           | 10.2               |
| 2MMV9309HX                                       | 45      | 155    | 310   | 31.5                           | 50.9   | 68.0   | 189.4                           | 292.1  | 366.4  | 10.7                          | 10.7               |
| 2MMV9310HX                                       | 65      | 175    | 355   | 38.7                           | 56.7   | 75.9   | 232.6                           | 324.6  | 407.0  | 9.1                           | 10.7               |
| 2MMV9311HX                                       | 65      | 200    | 400   | 39.5                           | 60.3   | 80.5   | 241.2                           | 352.2  | 442.0  | 10.7                          | 11.2               |
| 2MMV9312HX                                       | 65      | 225    | 445   | 41.7                           | 66.2   | 88.3   | 254.1                           | 385.7  | 483.9  | 11.7                          | 11.7               |
| 2MMV9313HX                                       | 65      | 225    | 445   | 43.7                           | 69.3   | 92.3   | 266.7                           | 406.1  | 509.8  | 11.2                          | 11.2               |
| 2MMV9314HX                                       | 110     | 335    | 665   | 51.0                           | 78.1   | 104.5  | 316.6                           | 461.2  | 578.4  | 13.7                          | 14.7               |
| 2MMV9315HX                                       | 110     | 335    | 665   | 52.3                           | 80.0   | 107.0  | 325.0                           | 474.0  | 594.7  | 13.2                          | 14.2               |
| 2MMV9316HX                                       | 110     | 335    | 665   | 54.9                           | 83.8   | 111.8  | 341.2                           | 499.0  | 626.5  | 12.7                          | 13.7               |
| 2MMV9317HX                                       | 135     | 400    | 800   | 58.4                           | 89.3   | 119.3  | 365.2                           | 533.1  | 669.2  | 14.2                          | 15.2               |
| 2MMV9318HX                                       | 135     | 400    | 800   | 59.4                           | 90.4   | 120.2  | 373.1                           | 548.1  | 688.9  | 14.2                          | 15.2               |
| 2MMV9319HX                                       | 135     | 400    | 800   | 62.2                           | 94.5   | 125.5  | 390.6                           | 575.9  | 724.3  | 13.7                          | 14.7               |
| 2MMV9320HX                                       | 155     | 490    | 975   | 67.4                           | 104.6  | 139.5  | 423.4                           | 630.5  | 791.8  | 15.2                          | 15.7               |
| 2MMV9322HX                                       | 175     | 535    | 1065  | 73.8                           | 112.7  | 150.4  | 464.0                           | 678.6  | 851.9  | 15.2                          | 16.3               |
| 2MMV9324HX                                       | 225     | 665    | 1335  | 80.9                           | 123.4  | 164.7  | 513.7                           | 752.1  | 944.3  | 17.3                          | 18.3               |
| 2MMV9326HX                                       | 245     | 735    | 1465  | 87.9                           | 133.4  | 177.0  | 545.9                           | 805.2  | 1012.7 | 17.8                          | 18.8               |
| 2MMV9328HX                                       | 265     | 800    | 1600  | 94.6                           | 143.6  | 190.6  | 587.5                           | 865.4  | 1088.2 | 17.8                          | 19.3               |
| 2MMV9330HX                                       | 355     | 1065   | 2135  | 99.6                           | 151.1  | 200.6  | 630.0                           | 930.8  | 1170.8 | 22.4                          | 24.4               |
|                                                  | lbs.    |        |       | 10 <sup>6</sup> lbs./in.       |        |        | 10 <sup>6</sup> lbs./in.        |        |        | in.                           |                    |
| INCH DUPLEX PERFORMANCE DATA 2MMV9300HX SERIES   |         |        |       |                                |        |        |                                 |        |        |                               |                    |
| 2MMV9300HX                                       | 2       | 6      | 12    | 0.0581                         | 0.0894 | 0.1202 | 0.3489                          | 0.5059 | 0.6337 | 0.00022                       | 0.00022            |
| 2MMV9301HX                                       | 2       | 6      | 12    | 0.0614                         | 0.0957 | 0.1301 | 0.3506                          | 0.5044 | 0.6300 | 0.00020                       | 0.00022            |
| 2MMV9302HX                                       | 5       | 10     | 20    | 0.0972                         | 0.1297 | 0.1770 | 0.5509                          | 0.6912 | 0.8627 | 0.00018                       | 0.00026            |
| 2MMV9303HX                                       | 5       | 10     | 20    | 0.0966                         | 0.1275 | 0.1718 | 0.5769                          | 0.7266 | 0.9097 | 0.00018                       | 0.00026            |
| 2MMV9304HX                                       | 5       | 15     | 30    | 0.1043                         | 0.1627 | 0.2213 | 0.6269                          | 0.9029 | 1.1280 | 0.00030                       | 0.00032            |
| 2MMV9305HX                                       | 5       | 15     | 30    | 0.1154                         | 0.1787 | 0.2417 | 0.6977                          | 1.0080 | 1.2610 | 0.00028                       | 0.00028            |
| 2MMV9306HX                                       | 5       | 15     | 30    | 0.1258                         | 0.1940 | 0.2611 | 0.7644                          | 1.1070 | 1.3870 | 0.00024                       | 0.00026            |
| 2MMV9307HX                                       | 10      | 25     | 50    | 0.1759                         | 0.2550 | 0.3460 | 1.0620                          | 1.4390 | 1.7990 | 0.00028                       | 0.00034            |
| 2MMV9308HX                                       | 10      | 30     | 60    | 0.1688                         | 0.2576 | 0.3437 | 1.0170                          | 1.4840 | 1.8620 | 0.00038                       | 0.00040            |
| 2MMV9309HX                                       | 10      | 35     | 70    | 0.1799                         | 0.2910 | 0.3889 | 1.0830                          | 1.6700 | 2.0950 | 0.00042                       | 0.00042            |
| 2MMV9310HX                                       | 15      | 40     | 80    | 0.2214                         | 0.3243 | 0.4340 | 1.3300                          | 1.8560 | 2.3270 | 0.00036                       | 0.00042            |
| 2MMV9311HX                                       | 15      | 45     | 90    | 0.2260                         | 0.3449 | 0.4603 | 1.3790                          | 2.0140 | 2.5270 | 0.00042                       | 0.00044            |
| 2MMV9312HX                                       | 15      | 50     | 100   | 0.2382                         | 0.3783 | 0.5051 | 1.4530                          | 2.2050 | 2.7670 | 0.00046                       | 0.00046            |
| 2MMV9313HX                                       | 15      | 50     | 100   | 0.2501                         | 0.3962 | 0.5278 | 1.5250                          | 2.3220 | 2.9150 | 0.00044                       | 0.00044            |
| 2MMV9314HX                                       | 25      | 75     | 150   | 0.2915                         | 0.4465 | 0.5977 | 1.8100                          | 2.6370 | 3.3070 | 0.00054                       | 0.00058            |
| 2MMV9315HX                                       | 25      | 75     | 150   | 0.2991                         | 0.4575 | 0.6117 | 1.8580                          | 2.7100 | 3.4000 | 0.00052                       | 0.00056            |
| 2MMV9316HX                                       | 25      | 75     | 150   | 0.3140                         | 0.4790 | 0.6390 | 1.9510                          | 2.8530 | 3.5820 | 0.00050                       | 0.00054            |
| 2MMV9317HX                                       | 30      | 90     | 180   | 0.3339                         | 0.5104 | 0.6820 | 2.0880                          | 3.0480 | 3.8260 | 0.00056                       | 0.00060            |
| 2MMV9318HX                                       | 30      | 90     | 180   | 0.3396                         | 0.5167 | 0.6874 | 2.1330                          | 3.1340 | 3.9390 | 0.00056                       | 0.00060            |
| 2MMV9319HX                                       | 30      | 90     | 180   | 0.3559                         | 0.5403 | 0.7174 | 2.2330                          | 3.2930 | 4.1410 | 0.00054                       | 0.00058            |
| 2MMV9320HX                                       | 35      | 110    | 220   | 0.3852                         | 0.5978 | 0.7975 | 2.4210                          | 3.6050 | 4.5270 | 0.00060                       | 0.00062            |
| 2MMV9322HX                                       | 40      | 120    | 240   | 0.4221                         | 0.6444 | 0.8601 | 2.6530                          | 3.8800 | 4.8710 | 0.00060                       | 0.00064            |
| 2MMV9324HX                                       | 50      | 150    | 300   | 0.4624                         | 0.7057 | 0.9418 | 2.9370                          | 4.3000 | 5.3990 | 0.00068                       | 0.00072            |
| 2MMV9326HX                                       | 55      | 165    | 330   | 0.5028                         | 0.7627 | 1.0120 | 3.1210                          | 4.6040 | 5.7900 | 0.00070                       | 0.00074            |
| 2MMV9328HX                                       | 60      | 180    | 360   | 0.5408                         | 0.8209 | 1.0900 | 3.3590                          | 4.9480 | 6.2220 | 0.00070                       | 0.00076            |
| 2MMV9330HX                                       | 80      | 240    | 480   | 0.5694                         | 0.8640 | 1.1470 | 3.6020                          | 5.3220 | 6.6940 | 0.00088                       | 0.00096            |

Notes: <sup>(1)</sup> For DB or DF arrangements only. For other mounting arrangements contact your Timken representative.

# ULTRA-LIGHT 3MMV9300HX (ISO 19) SERIES

## DUPLEX PERFORMANCE DATA

### MOUNTING ARRANGEMENTS



Suggested  
DB



Tandem  
DT



Special Applications  
DF

| Bearing<br>Number                                | PRELOAD |        |       | AXIAL STIFFNESS <sup>(1)</sup> |        |        | RADIAL STIFFNESS <sup>(1)</sup> |        |         | SPACER OFFSETS <sup>(1)</sup> |                    |
|--------------------------------------------------|---------|--------|-------|--------------------------------|--------|--------|---------------------------------|--------|---------|-------------------------------|--------------------|
|                                                  | Light   | Medium | Heavy | Light                          | Medium | Heavy  | Light                           | Medium | Heavy   | Light to<br>Medium            | Medium<br>to Heavy |
|                                                  | N       |        |       | N/μm                           |        |        | N/μm                            |        |         | μm                            |                    |
| METRIC DUPLEX PERFORMANCE DATA 3MMV9300HX SERIES |         |        |       |                                |        |        |                                 |        |         |                               |                    |
| 3MMV9300HX                                       | 22      | 45     | 90    | 28.53                          | 36.82  | 48.06  | 60.22                           | 75.61  | 94.48   | 2.79                          | 4.06               |
| 3MMV9301HX                                       | 22      | 45     | 90    | 29.93                          | 38.58  | 50.28  | 63.30                           | 79.51  | 99.41   | 2.54                          | 4.06               |
| 3MMV9302HX                                       | 22      | 65     | 135   | 34.07                          | 50.72  | 66.06  | 72.78                           | 104.78 | 131.04  | 4.06                          | 4.57               |
| 3MMV9303HX                                       | 22      | 65     | 135   | 35.45                          | 52.71  | 68.60  | 75.75                           | 109.14 | 136.54  | 4.06                          | 4.32               |
| 3MMV9304HX                                       | 45      | 110    | 225   | 48.76                          | 67.98  | 88.46  | 103.86                          | 140.69 | 175.95  | 4.57                          | 5.59               |
| 3MMV9305HX                                       | 45      | 110    | 225   | 54.17                          | 75.33  | 97.75  | 115.68                          | 156.99 | 196.59  | 4.06                          | 5.08               |
| 3MMV9306HX                                       | 45      | 110    | 225   | 59.33                          | 82.33  | 106.58 | 126.87                          | 172.47 | 216.18  | 3.56                          | 4.57               |
| 3MMV9307HX                                       | 65      | 175    | 355   | 74.51                          | 106.06 | 137.72 | 159.18                          | 220.72 | 276.34  | 5.08                          | 5.59               |
| 3MMV9308HX                                       | 65      | 225    | 445   | 70.62                          | 108.04 | 139.41 | 154.45                          | 233.67 | 293.31  | 7.11                          | 7.11               |
| 3MMV9309HX                                       | 90      | 245    | 490   | 83.32                          | 119.21 | 153.84 | 182.60                          | 257.80 | 323.74  | 6.10                          | 7.11               |
| 3MMV9310HX                                       | 90      | 265    | 535   | 88.43                          | 130.41 | 168.25 | 193.61                          | 282.11 | 354.17  | 6.60                          | 7.11               |
| 3MMV9311HX                                       | 110     | 335    | 665   | 99.24                          | 146.29 | 188.72 | 216.70                          | 315.69 | 396.50  | 7.11                          | 8.13               |
| 3MMV9312HX                                       | 110     | 335    | 665   | 104.80                         | 154.33 | 198.86 | 228.59                          | 333.88 | 419.41  | 6.60                          | 7.62               |
| 3MMV9313HX                                       | 110     | 335    | 665   | 110.22                         | 162.15 | 208.66 | 239.96                          | 351.37 | 441.80  | 6.60                          | 7.11               |
| 3MMV9314HX                                       | 155     | 490    | 980   | 122.31                         | 183.12 | 235.94 | 265.50                          | 394.05 | 495.14  | 8.64                          | 9.14               |
| 3MMV9315HX                                       | 155     | 490    | 980   | 125.63                         | 187.84 | 242.06 | 272.49                          | 404.89 | 508.96  | 8.64                          | 9.14               |
| 3MMV9316HX                                       | 155     | 490    | 980   | 132.14                         | 197.46 | 254.13 | 285.96                          | 426.23 | 536.07  | 8.13                          | 8.64               |
| 3MMV9317HX                                       | 200     | 625    | 1245  | 144.52                         | 215.48 | 277.74 | 313.42                          | 463.66 | 582.59  | 9.14                          | 10.16              |
| 3MMV9318HX                                       | 200     | 625    | 1245  | 148.32                         | 220.72 | 283.69 | 319.72                          | 475.73 | 598.51  | 9.14                          | 9.65               |
| 3MMV9319HX                                       | 200     | 625    | 1245  | 155.70                         | 231.57 | 297.33 | 334.58                          | 499.86 | 629.12  | 8.64                          | 9.14               |
| 3MMV9320HX                                       | 245     | 735    | 1465  | 170.75                         | 251.16 | 323.04 | 369.04                          | 540.62 | 679.84  | 9.14                          | 10.16              |
| 3MMV9322HX                                       | 265     | 800    | 1600  | 183.82                         | 270.40 | 348.05 | 397.55                          | 581.89 | 731.61  | 9.14                          | 10.16              |
| 3MMV9324HX                                       | 310     | 935    | 1870  | 198.51                         | 291.73 | 374.99 | 427.46                          | 628.07 | 790.37  | 10.16                         | 11.18              |
| 3MMV9326HX                                       | 355     | 1065   | 2135  | 216.35                         | 317.27 | 407.34 | 462.79                          | 684.21 | 861.73  | 10.67                         | 11.68              |
| 3MMV9328HX                                       | 400     | 1200   | 2400  | 235.07                         | 344.90 | 443.02 | 504.06                          | 743.15 | 935.54  | 10.67                         | 12.19              |
| 3MMV9330HX                                       | 535     | 1600   | 3200  | 249.06                         | 365.54 | 469.26 | 540.62                          | 799.12 | 1006.55 | 13.72                         | 15.24              |
|                                                  | lbs.    |        |       | 10 <sup>6</sup> lbs./in.       |        |        | 10 <sup>6</sup> lbs./in.        |        |         | in.                           |                    |
| INCH DUPLEX PERFORMANCE DATA 3MMV9300HX SERIES   |         |        |       |                                |        |        |                                 |        |         |                               |                    |
| 3MMV9300HX                                       | 5       | 10     | 20    | 0.163                          | 0.211  | 0.275  | 0.344                           | 0.432  | 0.540   | .00011                        | .00016             |
| 3MMV9301HX                                       | 5       | 10     | 20    | 0.171                          | 0.221  | 0.288  | 0.362                           | 0.455  | 0.568   | .00010                        | .00016             |
| 3MMV9302HX                                       | 5       | 15     | 30    | 0.195                          | 0.290  | 0.378  | 0.416                           | 0.599  | 0.749   | .00016                        | .00018             |
| 3MMV9303HX                                       | 5       | 15     | 30    | 0.203                          | 0.301  | 0.392  | 0.433                           | 0.624  | 0.781   | .00016                        | .00017             |
| 3MMV9304HX                                       | 10      | 25     | 50    | 0.279                          | 0.389  | 0.506  | 0.594                           | 0.804  | 1.006   | .00018                        | .00022             |
| 3MMV9305HX                                       | 10      | 25     | 50    | 0.310                          | 0.431  | 0.559  | 0.661                           | 0.898  | 1.124   | .00016                        | .00020             |
| 3MMV9306HX                                       | 10      | 25     | 50    | 0.339                          | 0.471  | 0.609  | 0.725                           | 0.986  | 1.236   | .00014                        | .00018             |
| 3MMV9307HX                                       | 15      | 40     | 80    | 0.426                          | 0.606  | 0.787  | 0.910                           | 1.262  | 1.580   | .00020                        | .00022             |
| 3MMV9308HX                                       | 15      | 50     | 100   | 0.404                          | 0.618  | 0.797  | 0.883                           | 1.336  | 1.677   | .00028                        | .00028             |
| 3MMV9309HX                                       | 20      | 55     | 110   | 0.476                          | 0.682  | 0.880  | 1.044                           | 1.474  | 1.851   | .00024                        | .00028             |
| 3MMV9310HX                                       | 20      | 60     | 120   | 0.506                          | 0.746  | 0.962  | 1.107                           | 1.613  | 2.025   | .00026                        | .00028             |
| 3MMV9311HX                                       | 25      | 75     | 150   | 0.567                          | 0.836  | 1.079  | 1.239                           | 1.805  | 2.267   | .00028                        | .00032             |
| 3MMV9312HX                                       | 25      | 75     | 150   | 0.599                          | 0.882  | 1.137  | 1.307                           | 1.909  | 2.398   | .00026                        | .00030             |
| 3MMV9313HX                                       | 25      | 75     | 150   | 0.630                          | 0.927  | 1.193  | 1.372                           | 2.009  | 2.526   | .00026                        | .00028             |
| 3MMV9314HX                                       | 35      | 110    | 220   | 0.699                          | 1.047  | 1.349  | 1.518                           | 2.253  | 2.831   | .00034                        | .00036             |
| 3MMV9315HX                                       | 35      | 110    | 220   | 0.718                          | 1.074  | 1.384  | 1.558                           | 2.315  | 2.910   | .00034                        | .00036             |
| 3MMV9316HX                                       | 35      | 110    | 220   | 0.756                          | 1.129  | 1.453  | 1.635                           | 2.437  | 3.065   | .00032                        | .00034             |
| 3MMV9317HX                                       | 45      | 140    | 280   | 0.826                          | 1.232  | 1.588  | 1.792                           | 2.651  | 3.331   | .00036                        | .00040             |
| 3MMV9318HX                                       | 45      | 140    | 280   | 0.848                          | 1.262  | 1.622  | 1.828                           | 2.720  | 3.422   | .00036                        | .00038             |
| 3MMV9319HX                                       | 45      | 140    | 280   | 0.890                          | 1.324  | 1.700  | 1.913                           | 2.858  | 3.597   | .00034                        | .00036             |
| 3MMV9320HX                                       | 55      | 165    | 330   | 0.976                          | 1.436  | 1.847  | 2.110                           | 3.091  | 3.887   | .00036                        | .00040             |
| 3MMV9322HX                                       | 60      | 180    | 360   | 1.051                          | 1.546  | 1.990  | 2.273                           | 3.327  | 4.183   | .00036                        | .00040             |
| 3MMV9324HX                                       | 70      | 210    | 420   | 1.135                          | 1.668  | 2.144  | 2.444                           | 3.591  | 4.519   | .00040                        | .00044             |
| 3MMV9326HX                                       | 80      | 240    | 480   | 1.237                          | 1.814  | 2.329  | 2.646                           | 3.912  | 4.927   | .00042                        | .00046             |
| 3MMV9328HX                                       | 90      | 270    | 540   | 1.344                          | 1.972  | 2.533  | 2.882                           | 4.249  | 5.349   | .00042                        | .00048             |
| 3MMV9330HX                                       | 120     | 360    | 720   | 1.424                          | 2.090  | 2.683  | 3.091                           | 4.569  | 5.755   | .00054                        | .00060             |

Notes: <sup>(1)</sup> For DB or DF arrangements only. For other mounting arrangements contact your Timken representative.



## ULTRA-LIGHT 2MMV9300HX (ISO 19) SERIES

### SPEED CAPABILITY DATA

| Bearing Number | Grease Capacity |       | Kluber Isoflex |       | Operating Speeds <sup>(2)</sup> (DB Mounting) <sup>(1)</sup> |            |       |        |         |       |
|----------------|-----------------|-------|----------------|-------|--------------------------------------------------------------|------------|-------|--------|---------|-------|
|                | NBU15           |       | NBU15          |       | DUL                                                          | Grease DUM | DUH   | DUL    | Oil DUM | DUH   |
|                | 25%             | 40%   | 15%            | 20%   |                                                              |            |       |        |         |       |
|                | grams           | grams | grams          | grams | RPM                                                          | RPM        | RPM   | RPM    | RPM     | RPM   |
| 2MMV9300HX     | 0.11            | 0.18  | 0.06           | 0.09  | 73360                                                        | 55020      | 36680 | 123795 | 93534   | 62310 |
| 2MMV9301HX     | 0.13            | 0.20  | 0.07           | 0.11  | 64000                                                        | 48000      | 32000 | 108000 | 81600   | 54360 |
| 2MMV9302HX     | 0.20            | 0.33  | 0.12           | 0.17  | 53440                                                        | 40080      | 26720 | 90180  | 68136   | 45391 |
| 2MMV9303HX     | 0.23            | 0.36  | 0.12           | 0.18  | 48320                                                        | 36240      | 24160 | 81540  | 61608   | 41042 |
| 2MMV9304HX     | 0.48            | 0.71  | 0.25           | 0.39  | 40160                                                        | 30120      | 20080 | 67770  | 51204   | 34111 |
| 2MMV9305HX     | 0.48            | 0.83  | 0.29           | 0.44  | 33440                                                        | 25080      | 16720 | 56430  | 42636   | 28403 |
| 2MMV9306HX     | 0.60            | 0.95  | 0.34           | 0.51  | 28720                                                        | 21540      | 14360 | 48465  | 36618   | 24394 |
| 2MMV9307HX     | 0.95            | 1.43  | 0.51           | 0.77  | 24400                                                        | 18300      | 12200 | 41175  | 31110   | 20725 |
| 2MMV9308HX     | 1.43            | 2.26  | 0.8            | 1.22  | 22400                                                        | 16800      | 11200 | 37800  | 28560   | 19026 |
| 2MMV9309HX     | 1.55            | 2.50  | 0.88           | 1.34  | 20000                                                        | 15000      | 10000 | 33750  | 25500   | 16988 |
| 2MMV9310HX     | 1.67            | 2.74  | 0.95           | 1.44  | 18320                                                        | 13740      | 9160  | 30915  | 23358   | 15561 |
| 2MMV9311HX     | 2.26            | 3.57  | 1.3            | 1.93  | 16560                                                        | 12420      | 8280  | 27945  | 21114   | 14066 |
| 2MMV9312HX     | 2.38            | 3.81  | 1.4            | 2.05  | 15360                                                        | 11520      | 7680  | 25920  | 19584   | 13046 |
| 2MMV9313HX     | 2.50            | 4.05  | 1.4            | 2.16  | 14240                                                        | 10680      | 7120  | 24030  | 18156   | 12095 |
| 2MMV9314HX     | 4.29            | 6.79  | 2.4            | 3.64  | 13120                                                        | 9840       | 6560  | 22140  | 16728   | 11144 |
| 2MMV9315HX     | 4.52            | 7.26  | 2.5            | 3.86  | 12320                                                        | 9240       | 6160  | 20790  | 15708   | 10464 |
| 2MMV9316HX     | 4.76            | 7.62  | 2.7            | 3.98  | 11600                                                        | 8700       | 5800  | 19575  | 14790   | 9853  |
| 2MMV9317HX     | 6.31            | 10.24 | 3.6            | 5.45  | 10800                                                        | 8100       | 5400  | 18225  | 13770   | 9173  |
| 2MMV9318HX     | 7.02            | 11.19 | 3.9            | 5.91  | 10320                                                        | 7740       | 5160  | 17415  | 13158   | 8766  |
| 2MMV9319HX     | 7.26            | 11.55 | 4.1            | 6.14  | 9840                                                         | 7380       | 4920  | 16605  | 12546   | 8358  |
| 2MMV9320HX     | 8.93            | 14.29 | 5              | 7.61  | 9120                                                         | 6840       | 4560  | 15390  | 11628   | 7746  |
| 2MMV9322HX     | 9.64            | 15.48 | 5.4            | 8.30  | 8,400                                                        | 6300       | 4200  | 14175  | 10710   | 7135  |
| 2MMV9324HX     | 13.21           | 21.19 | 7.4            | 11.25 | 7680                                                         | 5760       | 3840  | 12960  | 9792    | 6523  |
| 2MMV9326HX     | 17.38           | 27.74 | 9.7            | 14.77 | 7088                                                         | 5316       | 3540  | 11960  | 9037    | 6020  |
| 2MMV9328HX     | 18.45           | 29.52 | 10.4           | 15.68 | 6616                                                         | 4962       | 3300  | 11165  | 8435    | 5619  |
| 2MMV9330HX     | 29.52           | 47.26 | 16.6           | 25.11 | 6168                                                         | 4626       | 3080  | 10410  | 7864    | 5239  |

<sup>(1)</sup> For other mounting arrangement configurations refer to the engineering section on Permissible Speed calculation methods.

<sup>(2)</sup> For ceramic ball complements use 120% of speeds shown.

## ULTRA-LIGHT 3MMV9300HX (ISO 19) SERIES

### SPEED CAPABILITY DATA

| Bearing Number | Grease Capacity |       | Kluber Isoflex |       | Operating Speeds <sup>(2)</sup> (DB Mounting) <sup>(1)</sup> |               |       |        |            |       |
|----------------|-----------------|-------|----------------|-------|--------------------------------------------------------------|---------------|-------|--------|------------|-------|
|                | NBU15           |       | NBU15          |       | DUL                                                          | Grease<br>DUM | DUH   | DUL    | Oil<br>DUM | DUH   |
|                | 25%             | 40%   | 15%            | 20%   |                                                              |               |       |        |            |       |
|                | grams           | grams | grams          | grams | RPM                                                          | RPM           | RPM   | RPM    | RPM        | RPM   |
| 3MMV9300HX     | 0.11            | 0.18  | 0.06           | 0.08  | 66080                                                        | 49560         | 33040 | 111510 | 84250      | 56125 |
| 3MMV9301HX     | 0.13            | 0.20  | 0.07           | 0.10  | 57600                                                        | 43200         | 28800 | 97200  | 73440      | 48900 |
| 3MMV9302HX     | 0.20            | 0.33  | 0.12           | 0.15  | 48080                                                        | 36060         | 24040 | 81135  | 61300      | 40850 |
| 3MMV9303HX     | 0.23            | 0.36  | 0.12           | 0.16  | 43440                                                        | 32580         | 21720 | 73305  | 55390      | 36900 |
| 3MMV9304HX     | 0.48            | 0.71  | 0.25           | 0.34  | 36160                                                        | 27120         | 18080 | 61020  | 46100      | 30700 |
| 3MMV9305HX     | 0.48            | 0.83  | 0.29           | 0.39  | 30080                                                        | 22560         | 15040 | 50760  | 38350      | 25550 |
| 3MMV9306HX     | 0.60            | 0.95  | 0.34           | 0.45  | 25840                                                        | 19380         | 12920 | 43605  | 32950      | 21950 |
| 3MMV9307HX     | 0.95            | 1.43  | 0.51           | 0.69  | 22000                                                        | 16500         | 11000 | 37125  | 28050      | 18690 |
| 3MMV9308HX     | 1.43            | 2.26  | 0.8            | 1.08  | 20160                                                        | 15120         | 10080 | 34020  | 25700      | 17125 |
| 3MMV9309HX     | 1.55            | 2.50  | 0.88           | 1.19  | 18000                                                        | 13500         | 9000  | 30375  | 22950      | 15290 |
| 3MMV9310HX     | 1.67            | 2.74  | 0.95           | 1.28  | 16480                                                        | 12360         | 8240  | 27810  | 21000      | 14000 |
| 3MMV9311HX     | 2.26            | 3.57  | 1.3            | 1.72  | 14960                                                        | 11220         | 7480  | 25245  | 19075      | 12700 |
| 3MMV9312HX     | 2.38            | 3.81  | 1.4            | 1.82  | 13760                                                        | 10320         | 6880  | 23220  | 17500      | 11690 |
| 3MMV9313HX     | 2.50            | 4.05  | 1.4            | 1.92  | 12800                                                        | 9600          | 6400  | 21600  | 16320      | 10875 |
| 3MMV9314HX     | 4.29            | 6.79  | 2.4            | 3.23  | 11840                                                        | 8880          | 5920  | 19980  | 15100      | 10060 |
| 3MMV9315HX     | 4.52            | 7.26  | 2.5            | 3.43  | 11120                                                        | 8340          | 5560  | 18765  | 14175      | 9450  |
| 3MMV9316HX     | 4.76            | 7.62  | 2.7            | 3.54  | 10480                                                        | 7860          | 5240  | 17685  | 13360      | 8900  |
| 3MMV9317HX     | 6.31            | 10.24 | 3.6            | 4.85  | 9680                                                         | 7260          | 4840  | 16335  | 12350      | 8225  |
| 3MMV9318HX     | 7.02            | 11.19 | 3.9            | 5.25  | 9280                                                         | 6960          | 4640  | 15660  | 11825      | 7880  |
| 3MMV9319HX     | 7.26            | 11.55 | 4.1            | 5.45  | 8800                                                         | 6600          | 4400  | 14850  | 11220      | 7475  |
| 3MMV9320HX     | 8.93            | 14.29 | 5              | 6.77  | 8240                                                         | 6180          | 4120  | 13905  | 10500      | 7000  |
| 3MMV9322HX     | 9.64            | 15.48 | 5.4            | 7.37  | 7544                                                         | 5658          | 3772  | 12731  | 9620       | 6400  |
| 3MMV9324HX     | 13.21           | 21.19 | 7.4            | 10.00 | 6912                                                         | 5184          | 3456  | 11664  | 8810       | 5875  |
| 3MMV9326HX     | 17.38           | 27.74 | 9.7            | 13.13 | 6376                                                         | 4782          | 3188  | 10760  | 8130       | 5415  |
| 3MMV9328HX     | 18.45           | 29.52 | 10.4           | 13.94 | 5960                                                         | 4470          | 2980  | 10058  | 7600       | 5050  |
| 3MMV9330HX     | 29.52           | 47.26 | 16.6           | 22.32 | 5552                                                         | 4164          | 2776  | 9369   | 7080       | 4710  |

<sup>(1)</sup> For other mounting arrangement configurations refer to the engineering section on Permissible Speed calculation methods.

<sup>(2)</sup> For ceramic ball complements use 120% of speeds shown.

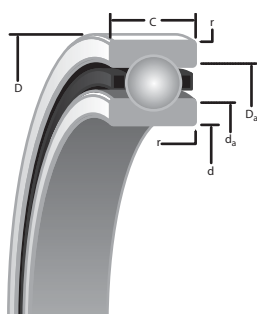
D





## EXTRA-LIGHT 2(3)MMV99100WN (ISO 10) SERIES

### DIMENSIONAL SERIES METRIC



D

### SUPER PRECISION MM:

Running accuracy and performance meet ABEC 9 (ISO P2) levels. Non-critical features conform to ABEC 7 (ISO P4) requirements.

### WN CONSTRUCTION:

- Incorporates low shoulder on non-thrust side of outer and inner rings.
- Maximum complement of balls separated by one-piece cage piloted against a ground thrust shoulder land of the outer ring.

| Bearing<br>Number |                   |             |                           |                     |       | (2MM) LOAD RATINGS<br>(steel ball & ceramic ball) |                      |                                    | (3MM) LOAD RATINGS<br>(steel ball & ceramic ball) |                      |                                    |
|-------------------|-------------------|-------------|---------------------------|---------------------|-------|---------------------------------------------------|----------------------|------------------------------------|---------------------------------------------------|----------------------|------------------------------------|
|                   |                   |             |                           |                     |       | C <sub>0</sub> (stat)                             | C <sub>e</sub> (dyn) | Limiting<br>Speed(N <sub>g</sub> ) | C <sub>0</sub> (stat)                             | C <sub>e</sub> (dyn) | Limiting<br>Speed(N <sub>g</sub> ) |
| 2MM or<br>3MM     | d<br>Bore         | D<br>O.D.   | C<br>Width <sup>(1)</sup> | Ball Qty.<br>x Dia. | Wt.   |                                                   |                      |                                    |                                                   |                      |                                    |
| METRIC            | mm/tol: +0; -(µm) |             |                           | mm                  | kg.   | N                                                 |                      | RPM                                | N                                                 |                      | RPM                                |
| 99101WN           | 12<br>(4)         | 28<br>(5)   | 8<br>(80)                 | 9 x 4.76            | 0.019 | 1740<br>1550                                      | 4540<br>4540         | 75800<br>90960                     | 1670<br>1490                                      | 4360<br>4360         | 68200<br>81840                     |
| 99102WN           | 15<br>(4)         | 32<br>(6)   | 9<br>(80)                 | 11 x 4.76           | 0.028 | 2240<br>1990                                      | 5220<br>5220         | 64300<br>77160                     | 2140<br>1900                                      | 5000<br>5000         | 57900<br>69480                     |
| 99103WN           | 17<br>(4)         | 35<br>(6)   | 10<br>(80)                | 13 x 4.76           | 0.038 | 2510<br>2230                                      | 5530<br>5530         | 56900<br>68280                     | 2400<br>2140                                      | 5280<br>5280         | 51200<br>61440                     |
| 99104WN           | 20<br>(5)         | 42<br>(6)   | 12<br>(120)               | 11 x 6.35           | 0.064 | 4690<br>4180                                      | 9760<br>9760         | 43800<br>52200                     | 4470<br>3980                                      | 9310<br>9310         | 39400<br>47280                     |
| 99105WN           | 25<br>(5)         | 47<br>(6)   | 12<br>(120)               | 13 x 6.35           | 0.074 | 5800<br>5160                                      | 10900<br>10900       | 36500<br>43800                     | 5510<br>4900                                      | 10300<br>10300       | 32900<br>39480                     |
| 99106WN           | 30<br>(5)         | 55<br>(7)   | 13<br>(120)               | 16 x 6.35           | 0.116 | 7460<br>6640                                      | 12300<br>12300       | 29500<br>35400                     | 7060<br>6280                                      | 11600<br>11600       | 26600<br>31920                     |
| 99107WN           | 35<br>(6)         | 62<br>(7)   | 14<br>(120)               | 21 x 5.56           | 0.167 | 7840<br>6980                                      | 11100<br>11100       | 25300<br>30360                     | 7440<br>6620                                      | 10500<br>10500       | 22800<br>27360                     |
| 99108WN           | 40<br>(6)         | 68<br>(7)   | 15<br>(120)               | 24 x 5.56           | 0.207 | 9150<br>8140                                      | 11900<br>11900       | 22000<br>26400                     | 8590<br>7650                                      | 11200<br>11200       | 19800<br>23760                     |
| 99109WN           | 45<br>(6)         | 75<br>(7)   | 16<br>(120)               | 23 x 6.35           | 0.259 | 11400<br>10200                                    | 14800<br>14800       | 20200<br>24240                     | 10700<br>9560                                     | 14000<br>14000       | 18200<br>21840                     |
| 99110WN           | 50<br>(6)         | 80<br>(7)   | 16<br>(120)               | 25 x 6.35           | 0.281 | 12500<br>11100                                    | 15400<br>15400       | 18500<br>22200                     | 11700<br>10400                                    | 14500<br>14500       | 16700<br>20040                     |
| 99111WN           | 55<br>(7)         | 90<br>(8)   | 18<br>(150)               | 25 x 7.14           | 0.417 | 15800<br>14100                                    | 19100<br>19100       | 16600<br>19920                     | 14800<br>13200                                    | 18000<br>18000       | 14900<br>17880                     |
| 99112WN           | 60<br>(7)         | 95<br>(8)   | 18<br>(150)               | 26 x 7.14           | 0.445 | 16400<br>14600                                    | 19300<br>19300       | 15400<br>18480                     | 15300<br>13600                                    | 18200<br>18200       | 13900<br>16680                     |
| 99113WN           | 65<br>(7)         | 100<br>(8)  | 18<br>(150)               | 28 x 7.14           | 0.474 | 17600<br>15700                                    | 20000<br>20000       | 14400<br>17280                     | 16400<br>14600                                    | 18800<br>18800       | 13000<br>15600                     |
| 99114WN           | 70<br>(7)         | 110<br>(8)  | 20<br>(150)               | 28 x 7.94           | 0.665 | 21700<br>19300                                    | 24300<br>24300       | 13200<br>15840                     | 20300<br>18000                                    | 22900<br>22900       | 11900<br>14280                     |
| 99115WN           | 75<br>(7)         | 115<br>(8)  | 20<br>(150)               | 30 x 7.94           | 0.699 | 23100<br>20600                                    | 25000<br>25000       | 12300<br>14760                     | 21600<br>19200                                    | 23500<br>23500       | 11100<br>13320                     |
| 99116WN           | 80<br>(7)         | 125<br>(9)  | 22<br>(150)               | 29 x 8.73           | 0.944 | 27200<br>24200                                    | 29300<br>29300       | 11600<br>13920                     | 25300<br>22500                                    | 27500<br>27500       | 10400<br>12480                     |
| 99117WN           | 85<br>(8)         | 130<br>(9)  | 22<br>(200)               | 31 x 8.73           | 0.991 | 28900<br>25700                                    | 30200<br>30200       | 11000<br>13200                     | 26900<br>23900                                    | 28400<br>28400       | 9900<br>11880                      |
| 99118WN           | 90<br>(8)         | 140<br>(9)  | 24<br>(200)               | 28 x 10.32          | 1.266 | 36100<br>32700                                    | 39000<br>39000       | 10400<br>12480                     | 34400<br>30600                                    | 36800<br>36800       | 9400<br>11280                      |
| 99119WN           | 95<br>(8)         | 145<br>(9)  | 24<br>(200)               | 29 x 10.32          | 1.303 | 37900<br>33800                                    | 39600<br>39600       | 9900<br>11880                      | 35400<br>31500                                    | 37300<br>37300       | 8900<br>10680                      |
| 99120WN           | 100<br>(8)        | 150<br>(9)  | 24<br>(200)               | 31 x 10.32          | 1.374 | 40400<br>35900                                    | 40900<br>40900       | 9400<br>11280                      | 37700<br>33600                                    | 38500<br>38500       | 8500<br>10200                      |
| 99121WN           | 105<br>(8)        | 160<br>(10) | 26<br>(200)               | 30 x 11.11          | 1.729 | 45400<br>40400                                    | 45900<br>45900       | 8900<br>10680                      | 42400<br>37800                                    | 43400<br>43400       | 8000<br>9600                       |
| 99122WN           | 110<br>(8)        | 170<br>(10) | 28<br>(200)               | 30 x 11.91          | 2.188 | 52100<br>46400                                    | 52200<br>52200       | 8500<br>10200                      | 48800<br>43400                                    | 49300<br>49300       | 7700<br>8880                       |
| 99124WN           | 120<br>(8)        | 180<br>(10) | 28<br>(200)               | 32 x 11.91          | 2.343 | 55200<br>49200                                    | 53500<br>53500       | 7900<br>9480                       | 51700<br>46000                                    | 50600<br>50600       | 7100<br>8520                       |
| 99126WN           | 130<br>(10)       | 200<br>(11) | 33<br>(250)               | 32 x 13.49          | 3.563 | 71200<br>63400                                    | 67500<br>67500       | 7100<br>8520                       | 66600<br>59200                                    | 63700<br>63700       | 6400<br>7680                       |
| 99128WN           | 140<br>(10)       | 210<br>(11) | 33<br>(250)               | 34 x 13.49          | 3.776 | 75200<br>67000                                    | 69300<br>69300       | 6600<br>7920                       | 70300<br>62600                                    | 65300<br>65300       | 5900<br>7080                       |
| 99130WN           | 150<br>(10)       | 225<br>(11) | 35<br>(250)               | 34 x 15.08          | 4.509 | 91500<br>81400                                    | 83800<br>83800       | 6200<br>7440                       | 85600<br>76200                                    | 79100<br>79100       | 5600<br>6720                       |

(N<sub>g</sub>) For a single, grease lubricated, spring preloaded bearing. This value to be used in permissible Operating Speed (Sp) calculation.

(1) Width tolerance of preloaded bearing set +0/-0.25 mm (+0/-0.010").

(2) ABMA STD 20 (r<sub>as</sub> max).

| r<br>Rad. <sup>(2)</sup> | Suggested<br>Shoulder Diameters |        |                          |        | Shaft Diameter |         | Mounting Fits |       | FIXED                        |         |               |       | FLOATING                     |         |                   |       | Bearing<br>Number<br>2MM or<br>3MM |
|--------------------------|---------------------------------|--------|--------------------------|--------|----------------|---------|---------------|-------|------------------------------|---------|---------------|-------|------------------------------|---------|-------------------|-------|------------------------------------|
|                          | d <sub>a</sub> (Shaft)          |        | D <sub>a</sub> (Housing) |        | Min.           | Max.    | Loose         | Tight | Housing Bore<br>(Stationary) |         | Mounting Fits |       | Housing Bore<br>(Stationary) |         | Housing Clearance |       |                                    |
|                          | Max.                            | Min.   | Max.                     | Min.   |                |         |               |       | Min.                         | Max.    | Tight         | Loose | Max.                         | Min.    | Max.              | Min.  |                                    |
| mm                       | mm                              | mm     | mm                       | mm     | mm             | mm      | mm            | mm    | mm                           | mm      | mm            | mm    | mm                           | mm      | mm                | mm    |                                    |
| 0.3                      | 15.64                           | 15.44  | 24.56                    | 24.36  | 11.995         | 12.000  | 0.005         | 0.004 | 28                           | 28.005  | 0.0000        | 0.010 | 28.010                       | 28.005  | 0.015             | 0.005 | 99101WN                            |
| 0.3                      | 19.14                           | 18.94  | 28.06                    | 27.86  | 14.995         | 15.000  | 0.005         | 0.004 | 32                           | 32.005  | 0.0000        | 0.011 | 32.010                       | 32.005  | 0.016             | 0.005 | 99102WN                            |
| 0.3                      | 21.64                           | 21.44  | 30.56                    | 30.36  | 16.995         | 17.000  | 0.005         | 0.004 | 35                           | 35.006  | 0.0000        | 0.012 | 35.010                       | 35.005  | 0.016             | 0.005 | 99103WN                            |
| 0.6                      | 25.05                           | 24.85  | 37.15                    | 36.95  | 19.995         | 20.000  | 0.005         | 0.005 | 42                           | 42.006  | 0.0000        | 0.012 | 42.010                       | 42.005  | 0.016             | 0.005 | 99104WN                            |
| 0.6                      | 30.05                           | 29.85  | 42.15                    | 41.95  | 24.995         | 25.000  | 0.005         | 0.005 | 47                           | 47.006  | 0.0000        | 0.012 | 47.012                       | 47.007  | 0.018             | 0.007 | 99105WN                            |
| 1                        | 36.55                           | 36.35  | 48.65                    | 48.45  | 29.995         | 30.000  | 0.005         | 0.005 | 55                           | 55.008  | 0.0000        | 0.015 | 55.012                       | 55.007  | 0.019             | 0.007 | 99106WN                            |
| 1                        | 43.34                           | 43.14  | 53.86                    | 53.66  | 34.995         | 35.000  | 0.005         | 0.006 | 62                           | 62.008  | 0.0000        | 0.015 | 62.012                       | 62.007  | 0.019             | 0.007 | 99107WN                            |
| 1                        | 48.84                           | 48.64  | 59.36                    | 59.16  | 39.995         | 40.000  | 0.005         | 0.006 | 68                           | 68.008  | 0.0000        | 0.015 | 68.012                       | 68.007  | 0.019             | 0.007 | 99108WN                            |
| 1                        | 54.05                           | 53.85  | 66.15                    | 65.95  | 44.995         | 45.000  | 0.005         | 0.006 | 75                           | 75.008  | 0.0000        | 0.015 | 75.014                       | 75.009  | 0.022             | 0.009 | 99109WN                            |
| 1                        | 59.05                           | 58.85  | 71.15                    | 70.95  | 49.995         | 50.000  | 0.005         | 0.006 | 80                           | 80.008  | 0.0000        | 0.015 | 80.012                       | 80.008  | 0.020             | 0.008 | 99110WN                            |
| 1                        | 65.76                           | 65.56  | 79.44                    | 79.24  | 54.995         | 55.000  | 0.005         | 0.007 | 90                           | 90.008  | 0.0000        | 0.016 | 90.015                       | 90.007  | 0.023             | 0.007 | 99111WN                            |
| 1                        | 70.76                           | 70.56  | 84.44                    | 84.24  | 59.995         | 60.000  | 0.005         | 0.007 | 95                           | 95.008  | 0.0000        | 0.016 | 95.016                       | 95.009  | 0.024             | 0.009 | 99112WN                            |
| 1                        | 75.76                           | 75.56  | 89.44                    | 89.24  | 64.995         | 65.000  | 0.005         | 0.007 | 100                          | 100.008 | 0.0000        | 0.016 | 100.016                      | 100.009 | 0.024             | 0.009 | 99113WN                            |
| 1                        | 82.46                           | 82.26  | 97.74                    | 97.54  | 69.995         | 70.000  | 0.005         | 0.007 | 110                          | 110.008 | 0.0000        | 0.016 | 110.018                      | 110.010 | 0.025             | 0.010 | 99114WN                            |
| 1                        | 87.46                           | 87.26  | 102.74                   | 102.54 | 74.995         | 75.005  | 0.005         | 0.012 | 115                          | 115.008 | 0.0000        | 0.016 | 115.019                      | 115.011 | 0.026             | 0.010 | 99115WN                            |
| 1                        | 94.17                           | 93.97  | 111.03                   | 110.83 | 79.995         | 80.005  | 0.005         | 0.012 | 125                          | 125.008 | 0.0000        | 0.017 | 125.021                      | 125.011 | 0.030             | 0.011 | 99116WN                            |
| 1                        | 99.17                           | 98.97  | 116.03                   | 115.83 | 84.995         | 85.005  | 0.005         | 0.012 | 130                          | 130.009 | 0.0000        | 0.018 | 130.020                      | 130.010 | 0.029             | 0.010 | 99117WN                            |
| 1.5                      | 105.08                          | 104.88 | 125.12                   | 124.92 | 89.995         | 90.005  | 0.005         | 0.013 | 140                          | 140.009 | 0.0000        | 0.018 | 140.020                      | 140.010 | 0.029             | 0.010 | 99118WN                            |
| 1.5                      | 110.08                          | 109.88 | 130.12                   | 129.92 | 94.995         | 95.005  | 0.005         | 0.013 | 145                          | 145.009 | 0.0000        | 0.018 | 145.021                      | 145.011 | 0.030             | 0.011 | 99119WN                            |
| 1.5                      | 115.08                          | 114.88 | 135.12                   | 134.92 | 99.995         | 100.005 | 0.005         | 0.013 | 150                          | 150.009 | 0.0000        | 0.018 | 150.023                      | 150.012 | 0.032             | 0.012 | 99120WN                            |
| 2                        | 121.79                          | 121.59 | 143.41                   | 143.21 | 104.995        | 105.005 | 0.005         | 0.013 | 160                          | 160.009 | 0.0000        | 0.022 | 160.022                      | 160.012 | 0.033             | 0.012 | 99121WN                            |
| 2                        | 128.49                          | 128.29 | 151.71                   | 151.51 | 109.995        | 110.005 | 0.005         | 0.013 | 170                          | 170.010 | 0.0000        | 0.020 | 170.022                      | 170.012 | 0.032             | 0.012 | 99122WN                            |
| 2                        | 138.49                          | 138.29 | 161.71                   | 161.51 | 119.995        | 120.005 | 0.005         | 0.013 | 180                          | 180.010 | 0.0000        | 0.020 | 180.022                      | 180.012 | 0.032             | 0.012 | 99124WN                            |
| 2                        | 151.91                          | 151.71 | 178.29                   | 178.09 | 129.995        | 130.005 | 0.005         | 0.015 | 200                          | 200.011 | 0.0000        | 0.022 | 200.025                      | 200.015 | 0.036             | 0.015 | 99126WN                            |
| 2                        | 161.91                          | 161.71 | 188.29                   | 188.09 | 139.995        | 140.005 | 0.005         | 0.015 | 210                          | 210.011 | 0.0000        | 0.022 | 210.025                      | 210.015 | 0.036             | 0.015 | 99128WN                            |
| 2                        | 172.82                          | 172.62 | 202.38                   | 202.18 | 149.995        | 150.005 | 0.005         | 0.015 | 225                          | 225.011 | 0.0000        | 0.022 | 225.025                      | 225.015 | 0.036             | 0.015 | 99130WN                            |

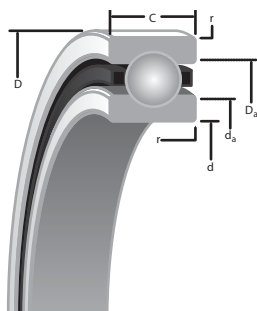
D





## EXTRA-LIGHT 2(3)MMV99100WN (ISO 10) SERIES

### DIMENSIONAL SERIES INCHES



D

### SUPER PRECISION MM:

Running accuracy and performance meet ABEC 9 (ISO P2) levels. Non-critical features conform to ABEC 7 (ISO P4) requirements.

### WN CONSTRUCTION:

- Incorporates low shoulder on non-thrust side of outer and inner rings.
- Maximum complement of balls separated by one-piece cage piloted against a ground thrust shoulder land of the outer ring.

| Bearing Number<br>2MM or 3MM |                         |                 |                           | Ball Qty.<br>x Dia. | Wt.<br>lbs. | (2MM) LOAD RATINGS<br>(steel ball & ceramic ball) |                      |                                           | (3MM) LOAD RATINGS<br>(steel ball & ceramic ball) |                      |                                           |
|------------------------------|-------------------------|-----------------|---------------------------|---------------------|-------------|---------------------------------------------------|----------------------|-------------------------------------------|---------------------------------------------------|----------------------|-------------------------------------------|
|                              | d<br>Bore               | D<br>O.D.       | C<br>Width <sup>(1)</sup> |                     |             | C <sub>0</sub> (stat)                             | C <sub>e</sub> (dyn) | Limiting Speed <sup>(N<sub>g</sub>)</sup> | C <sub>0</sub> (stat)                             | C <sub>e</sub> (dyn) | Limiting Speed <sup>(N<sub>g</sub>)</sup> |
| INCH                         | in./tol: +0; -0.000(μm) |                 |                           | in.                 | lbs.        | lbs.                                              |                      | RPM                                       | lbs.                                              |                      | RPM                                       |
| 99101WN                      | 0.4724<br>(1.5)         | 1.1024<br>(2)   | 0.315<br>(31)             | 9 x 3/16            | 0.04        | 390<br>360                                        | 1020<br>1020         | 75800<br>90960                            | 380<br>340                                        | 980<br>980           | 68200<br>81840                            |
| 99102WN                      | 0.5906<br>(1.5)         | 1.2598<br>(2.5) | 0.3543<br>(31)            | 11 x 3/16           | 0.06        | 500<br>450                                        | 1170<br>1170         | 64300<br>77160                            | 480<br>430                                        | 1120<br>1120         | 57900<br>69480                            |
| 99103WN                      | 0.6693<br>(1.5)         | 1.378<br>(2.5)  | 0.3937<br>(31)            | 13 x 3/16           | 0.08        | 560<br>500                                        | 1240<br>1240         | 56900<br>68280                            | 540<br>480                                        | 1190<br>1190         | 51200<br>61440                            |
| 99104WN                      | 0.7874<br>(2)           | 1.6535<br>(2.5) | 0.4724<br>(47)            | 11 x 1/4            | 0.14        | 1050<br>940                                       | 2190<br>2190         | 43800<br>52560                            | 1000<br>890                                       | 2090<br>2090         | 39400<br>47280                            |
| 99105WN                      | 0.9843<br>(2)           | 1.8504<br>(2.5) | 0.4724<br>(47)            | 13 x 1/4            | 0.16        | 1300<br>1160                                      | 2450<br>2450         | 36500<br>43800                            | 1240<br>1100                                      | 2330<br>2330         | 32900<br>39480                            |
| 99106WN                      | 1.1811<br>(2)           | 2.1654<br>(3)   | 0.5118<br>(47)            | 16 x 1/4            | 0.25        | 1680<br>1490                                      | 2770<br>2770         | 29500<br>35400                            | 1590<br>1410                                      | 2620<br>2620         | 26600<br>31920                            |
| 99107WN                      | 1.378<br>(2.5)          | 2.4409<br>(3)   | 0.5512<br>(47)            | 21 x 7/32           | 0.37        | 1760<br>1570                                      | 2510<br>2510         | 25300<br>30360                            | 1670<br>1490                                      | 2360<br>2360         | 22800<br>27360                            |
| 99108WN                      | 1.5748<br>(2.5)         | 2.6772<br>(3)   | 0.5906<br>(47)            | 24 x 7/32           | 0.46        | 2060<br>1830                                      | 2670<br>2670         | 22000<br>26400                            | 1930<br>1720                                      | 2510<br>2510         | 19800<br>23760                            |
| 99109WN                      | 1.7717<br>(2.5)         | 2.9528<br>(3)   | 0.6299<br>(47)            | 23 x 1/4            | 0.57        | 2570<br>2280                                      | 3340<br>3340         | 20200<br>24240                            | 2410<br>2150                                      | 3140<br>3140         | 18200<br>21840                            |
| 99110WN                      | 1.9685<br>(2.5)         | 3.1496<br>(3)   | 0.6299<br>(47)            | 25 x 1/4            | 0.62        | 2810<br>2500                                      | 3470<br>3470         | 18500<br>22200                            | 2630<br>2340                                      | 3260<br>3260         | 16700<br>20040                            |
| 99111WN                      | 2.1654<br>(3)           | 3.5433<br>(3)   | 0.7087<br>(59)            | 25 x 9/32           | 0.92        | 3550<br>3160                                      | 4290<br>4290         | 16600<br>19920                            | 3330<br>2960                                      | 4040<br>4040         | 14900<br>17880                            |
| 99112WN                      | 2.3622<br>(3)           | 3.7402<br>(3)   | 0.7087<br>(59)            | 26 x 9/32           | 0.98        | 3700<br>3290                                      | 4340<br>4340         | 15400<br>18480                            | 3440<br>3060                                      | 4080<br>4080         | 13900<br>16680                            |
| 99113WN                      | 2.5591<br>(3)           | 3.937<br>(3)    | 0.7087<br>(59)            | 28 x 9/32           | 1.05        | 3960<br>3520                                      | 4500<br>4500         | 14400<br>17280                            | 3680<br>3280                                      | 4230<br>4230         | 13000<br>15600                            |
| 99114WN                      | 2.7559<br>(3)           | 4.3307<br>(3)   | 0.7874<br>(59)            | 28 x 5/16           | 1.47        | 4890<br>4350                                      | 5450<br>5540         | 13200<br>15840                            | 4569<br>4060                                      | 5140<br>5140         | 11900<br>14280                            |
| 99115WN                      | 2.9528<br>(3)           | 4.5276<br>(3)   | 0.7874<br>(59)            | 30 x 5/16           | 1.54        | 5200<br>4630                                      | 5620<br>5620         | 12300<br>14760                            | 4850<br>4320                                      | 5290<br>5290         | 11100<br>13320                            |
| 99116WN                      | 3.1496<br>(3)           | 4.9213<br>(3.5) | 0.8661<br>(59)            | 29 x 11/32          | 2.08        | 6110<br>5440                                      | 6580<br>6580         | 11600<br>13920                            | 5690<br>5070                                      | 6190<br>6190         | 10400<br>12480                            |
| 99117WN                      | 3.3465<br>(3)           | 5.1181<br>(3.5) | 0.8661<br>(79)            | 31 x 11/32          | 2.18        | 6490<br>5770                                      | 6780<br>6780         | 11000<br>13200                            | 6040<br>5380                                      | 6380<br>6380         | 9900<br>11880                             |
| 99118WN                      | 3.5433<br>(3)           | 5.5118<br>(3.5) | 0.9449<br>(79)            | 28 x 13/32          | 2.79        | 8270<br>7360                                      | 8780<br>8780         | 10400<br>13480                            | 7720<br>6870                                      | 8280<br>8280         | 9400<br>11280                             |
| 99119WN                      | 3.7402<br>(3)           | 5.7087<br>(3.5) | 0.9449<br>(79)            | 29 x 13/32          | 2.87        | 8530<br>7590                                      | 8890<br>8890         | 9900<br>11880                             | 7970<br>7090                                      | 8390<br>8390         | 8900<br>10680                             |
| 99120WN                      | 3.937<br>(3)            | 5.9055<br>(3.5) | 0.9449<br>(79)            | 31 x 13/32          | 3.03        | 9070<br>8080                                      | 9190<br>9190         | 9400<br>11280                             | 8480<br>7540                                      | 8660<br>8660         | 8500<br>10200                             |
| 99121WN                      | 4.1339<br>(3)           | 6.2992<br>(4)   | 1.0236<br>(79)            | 30 x 7/16           | 3.81        | 10200<br>9080                                     | 10300<br>10300       | 8900<br>10680                             | 9540<br>8490                                      | 9750<br>9750         | 8000<br>9600                              |
| 99122WN                      | 4.3307<br>(3)           | 6.6929<br>(4)   | 1.1024<br>(79)            | 30 x 15/32          | 4.82        | 11700<br>10400                                    | 11700<br>11700       | 8500<br>10200                             | 11000<br>9760                                     | 11100<br>11100       | 7700<br>8880                              |
| 99124WN                      | 4.7244<br>(3)           | 7.0866<br>(4)   | 1.1024<br>(79)            | 32 x 15/32          | 5.17        | 12400<br>11100                                    | 12000<br>12000       | 7900<br>9480                              | 11600<br>10300                                    | 11400<br>11400       | 7100<br>8520                              |
| 99126WN                      | 5.1181<br>(4)           | 7.874<br>(4.5)  | 1.2992<br>(98)            | 32 x 17/32          | 7.85        | 16000<br>14300                                    | 15200<br>15200       | 7100<br>8520                              | 15000<br>13300                                    | 14300<br>14300       | 6400<br>7680                              |
| 99128WN                      | 5.5118<br>(4)           | 8.2677<br>(4.5) | 1.2992<br>(98)            | 34 x 17/32          | 8.32        | 16900<br>15100                                    | 15600<br>15600       | 6600<br>7920                              | 15800<br>14100                                    | 14700<br>14700       | 5900<br>7080                              |
| 99130WN                      | 5.9055<br>(4)           | 8.8583<br>(4.5) | 1.378<br>(98)             | 34 x 19/32          | 9.94        | 20600<br>18300                                    | 18800<br>18800       | 6200<br>7440                              | 19300<br>17100                                    | 17800<br>17800       | 5600<br>6720                              |

(N<sub>g</sub>) For a single, grease lubricated, spring preloaded bearing. This value to be used in permissible Operating Speed (Sp) calculation.

(1) Width tolerance of preloaded bearing set +0/-0.25 mm (+0/-0.010").

(2) ABMA STD 20 (r<sub>as</sub> max).

| r<br>Rad. <sup>(2)</sup> | Suggested<br>Shoulder Diameters |      |             |      | Shaft Diameter |        | Mounting Fits |         | FIXED                        |        |               |         | FLOATING                     |        |                   |        | Bearing<br>Number<br>2MM or<br>3MM |
|--------------------------|---------------------------------|------|-------------|------|----------------|--------|---------------|---------|------------------------------|--------|---------------|---------|------------------------------|--------|-------------------|--------|------------------------------------|
|                          | d <sub>a</sub> (Shaft)          |      | D (Housing) |      | Min.           | Max.   | Loose         | Tight   | Housing Bore<br>(Stationary) |        | Mounting Fits |         | Housing Bore<br>(Stationary) |        | Housing Clearance |        |                                    |
|                          | Max.                            | Min. | Max.        | Min. |                |        |               |         | Min.                         | Max.   | Tight         | Loose   | Max.                         | Min.   | Max.              | Min.   |                                    |
| in.                      | in.                             | in.  | in.         | in.  | in.            | in.    | in.           | in.     | in.                          | in.    | in.           | in.     | in.                          | in.    | in.               | in.    |                                    |
| 0.012                    | 0.62                            | 0.61 | 0.99        | 0.98 | 0.4722         | 0.4724 | 0.0002        | 0.00015 | 1.1024                       | 1.1026 | 0.0000        | 0.0004  | 1.1028                       | 1.1026 | 0.0006            | 0.0002 | 99101WN                            |
| 0.012                    | 0.76                            | 0.75 | 1.13        | 1.12 | 0.5904         | 0.5906 | 0.0002        | 0.00015 | 1.2598                       | 1.2600 | 0.0000        | 0.00045 | 1.2602                       | 1.2600 | 0.0007            | 0.0002 | 99102WN                            |
| 0.012                    | 0.86                            | 0.85 | 1.23        | 1.22 | 0.6691         | 0.6693 | 0.0002        | 0.00015 | 1.3780                       | 1.3783 | 0.0000        | 0.0005  | 1.3784                       | 1.3782 | 0.0007            | 0.0002 | 99103WN                            |
| 0.024                    | 0.99                            | 0.98 | 1.49        | 1.48 | 0.7872         | 0.7874 | 0.0002        | 0.00020 | 1.6535                       | 1.6538 | 0.0000        | 0.0005  | 1.6539                       | 1.6537 | 0.0007            | 0.0002 | 99104WN                            |
| 0.024                    | 1.19                            | 1.18 | 1.69        | 1.68 | 0.9841         | 0.9843 | 0.0002        | 0.00020 | 1.8504                       | 1.8507 | 0.0000        | 0.0005  | 1.8509                       | 1.8507 | 0.0008            | 0.0003 | 99105WN                            |
| 0.039                    | 1.44                            | 1.43 | 1.94        | 1.93 | 1.1809         | 1.1811 | 0.0002        | 0.00020 | 2.1654                       | 2.1657 | 0.0000        | 0.0006  | 2.1659                       | 2.1657 | 0.0008            | 0.0003 | 99106WN                            |
| 0.039                    | 1.71                            | 1.70 | 2.15        | 2.14 | 1.3778         | 1.378  | 0.0002        | 0.00025 | 2.4409                       | 2.4412 | 0.0000        | 0.0006  | 2.4414                       | 2.4412 | 0.0008            | 0.0003 | 99107WN                            |
| 0.039                    | 1.93                            | 1.92 | 2.36        | 2.35 | 1.5746         | 1.5748 | 0.0002        | 0.00025 | 2.6772                       | 2.6775 | 0.0000        | 0.0006  | 2.6777                       | 2.6775 | 0.0008            | 0.0003 | 99108WN                            |
| 0.039                    | 2.13                            | 2.12 | 2.63        | 2.62 | 1.7715         | 1.7717 | 0.0002        | 0.00025 | 2.9528                       | 2.9531 | 0.0000        | 0.0006  | 2.9533                       | 2.9531 | 0.0008            | 0.0003 | 99109WN                            |
| 0.039                    | 2.33                            | 2.32 | 2.83        | 2.82 | 1.9683         | 1.9685 | 0.0002        | 0.00025 | 3.1496                       | 3.1499 | 0.0000        | 0.0006  | 3.1501                       | 3.1499 | 0.0008            | 0.0003 | 99110WN                            |
| 0.039                    | 2.59                            | 2.58 | 3.16        | 3.15 | 2.1652         | 2.1654 | 0.0002        | 0.00030 | 3.5433                       | 3.5436 | 0.0000        | 0.0006  | 3.5439                       | 3.5436 | 0.0009            | 0.0003 | 99111WN                            |
| 0.039                    | 2.79                            | 2.78 | 3.35        | 3.34 | 2.362          | 2.3622 | 0.0002        | 0.00030 | 3.7402                       | 3.7405 | 0.0000        | 0.0006  | 3.7408                       | 3.7405 | 0.0009            | 0.0003 | 99112WN                            |
| 0.039                    | 2.99                            | 2.98 | 3.55        | 3.54 | 2.5589         | 2.5591 | 0.0002        | 0.00030 | 3.9370                       | 3.9373 | 0.0000        | 0.0006  | 3.9377                       | 3.9374 | 0.0010            | 0.0004 | 99113WN                            |
| 0.039                    | 3.25                            | 3.24 | 3.88        | 3.87 | 2.7557         | 2.7559 | 0.0002        | 0.00030 | 4.3307                       | 4.3310 | 0.0000        | 0.0006  | 4.3314                       | 4.3311 | 0.0010            | 0.0004 | 99114WN                            |
| 0.039                    | 3.45                            | 3.44 | 4.07        | 4.06 | 2.9526         | 2.9530 | 0.0002        | 0.00050 | 4.5276                       | 4.5279 | 0.0000        | 0.0006  | 4.5283                       | 4.5280 | 0.0010            | 0.0004 | 99115WN                            |
| 0.039                    | 3.71                            | 3.70 | 4.40        | 4.39 | 3.1494         | 3.1498 | 0.0002        | 0.00050 | 4.9213                       | 4.9216 | 0.0000        | 0.0007  | 4.9221                       | 4.9217 | 0.0012            | 0.0004 | 99116WN                            |
| 0.039                    | 3.91                            | 3.90 | 4.60        | 4.59 | 3.3463         | 3.3467 | 0.0002        | 0.00050 | 5.1181                       | 5.1185 | 0.0000        | 0.0007  | 5.1189                       | 5.1185 | 0.0011            | 0.0004 | 99117WN                            |
| 0.059                    | 4.14                            | 4.13 | 4.95        | 4.94 | 3.5431         | 3.5435 | 0.0002        | 0.00050 | 5.5118                       | 5.5122 | 0.0000        | 0.0007  | 5.5126                       | 5.5122 | 0.0011            | 0.0004 | 99118WN                            |
| 0.059                    | 4.34                            | 4.33 | 5.15        | 5.14 | 3.7400         | 3.7404 | 0.0002        | 0.00050 | 5.7087                       | 5.7091 | 0.0000        | 0.0007  | 5.7095                       | 5.7091 | 0.0011            | 0.0004 | 99119WN                            |
| 0.059                    | 4.54                            | 4.53 | 5.35        | 5.34 | 3.9368         | 3.9372 | 0.0002        | 0.00050 | 5.9055                       | 5.9059 | 0.0000        | 0.0007  | 5.9064                       | 5.9060 | 0.0012            | 0.0005 | 99120WN                            |
| 0.079                    | 4.80                            | 4.79 | 5.67        | 5.66 | 4.1337         | 4.1341 | 0.0002        | 0.00050 | 6.2992                       | 6.2996 | 0.0000        | 0.0008  | 6.3001                       | 6.2997 | 0.0013            | 0.0005 | 99121WN                            |
| 0.079                    | 5.06                            | 5.05 | 6.00        | 5.99 | 4.3305         | 4.3309 | 0.0002        | 0.00050 | 6.6929                       | 6.6933 | 0.0000        | 0.0008  | 6.6938                       | 6.6934 | 0.0013            | 0.0005 | 99122WN                            |
| 0.079                    | 5.46                            | 5.45 | 6.39        | 6.38 | 4.7242         | 4.7246 | 0.0002        | 0.00050 | 7.0866                       | 7.0870 | 0.0000        | 0.0008  | 7.0875                       | 7.0871 | 0.0013            | 0.0005 | 99124WN                            |
| 0.079                    | 5.98                            | 5.97 | 7.05        | 7.04 | 5.1179         | 5.1183 | 0.0002        | 0.00060 | 7.8740                       | 7.8745 | 0.0000        | 0.0009  | 7.8750                       | 7.8746 | 0.0015            | 0.0006 | 99126WN                            |
| 0.079                    | 6.38                            | 6.37 | 7.44        | 7.43 | 5.5116         | 5.512  | 0.0002        | 0.00060 | 8.2677                       | 8.2682 | 0.0000        | 0.0009  | 8.2687                       | 8.2683 | 0.0015            | 0.0006 | 99128WN                            |
| 0.079                    | 6.81                            | 6.80 | 8.00        | 7.99 | 5.9053         | 5.9057 | 0.0002        | 0.00060 | 8.8583                       | 8.8588 | 0.0000        | 0.0009  | 8.8593                       | 8.8589 | 0.0015            | 0.0006 | 99130WN                            |

D





## EXTRA-LIGHT 2MMV99100WN (ISO 10) SERIES

### DUPLEX PERFORMANCE DATA

### MOUNTING ARRANGEMENTS



Suggested  
DB



Tandem  
DT



Special Applications  
DF

| Bearing<br>Number                                 | PRELOAD           |     |      |      | AXIAL STIFFNESS <sup>(1)</sup>           |        |        |        | RADIAL STIFFNESS <sup>(1)</sup>          |         |         | SPACER OFFSETS <sup>(1)</sup> |                    |                    |
|---------------------------------------------------|-------------------|-----|------|------|------------------------------------------|--------|--------|--------|------------------------------------------|---------|---------|-------------------------------|--------------------|--------------------|
|                                                   | DUX               | DUL | DUM  | DUH  | X-light                                  | Light  | Medium | Heavy  | Light                                    | Medium  | Heavy   | X-Light<br>to Light           | Light to<br>Medium | Medium<br>to Heavy |
|                                                   | N (= lbs x 4.448) |     |      |      | N/μm (= 10 <sup>6</sup> lbs/in x 175.12) |        |        |        | N/μm (= 10 <sup>6</sup> lbs/in x 175.12) |         |         | μm                            |                    |                    |
| METRIC DUPLEX PERFORMANCE DATA 2MMV99100WN SERIES |                   |     |      |      |                                          |        |        |        |                                          |         |         |                               |                    |                    |
| 2MMV99101WN                                       | -                 | 20  | 40   | 90   | -                                        | 13.47  | 17.84  | 24.14  | 60.69                                    | 78.71   | 99.52   | —                             | 5.59               | 8.38               |
| 2MMV99102WN                                       | -                 | 20  | 40   | 90   | -                                        | 15.22  | 20.11  | 27.11  | 89.72                                    | 113.86  | 139.92  | —                             | 5.08               | 7.62               |
| 2MMV99103WN                                       | -                 | 20  | 40   | 90   | -                                        | 16.97  | 22.21  | 29.73  | 99.69                                    | 127.15  | 156.71  | —                             | 4.57               | 6.86               |
| 2MMV99104WN                                       | 20                | 40  | 90   | 180  | 17.14                                    | 22.39  | 29.91  | 40.75  | 125.75                                   | 155.84  | 195.54  | 4.57                          | 6.86               | 10.16              |
| 2MMV99105WN                                       | 20                | 70  | 130  | 270  | 21.51                                    | 29.21  | 39.18  | 53.87  | 140.09                                   | 174.20  | 218.97  | 5.59                          | 7.87               | 11.43              |
| 2MMV99106WN                                       | 20                | 70  | 130  | 270  | 24.49                                    | 33.06  | 44.07  | 60.17  | 173.50                                   | 220.20  | 276.52  | 4.83                          | 6.86               | 10.16              |
| 2MMV99107WN                                       | 40                | 90  | 180  | 360  | 33.41                                    | 44.07  | 59.12  | 81.15  | 209.71                                   | 269.00  | 337.03  | 4.57                          | 6.86               | 10.16              |
| 2MMV99108WN                                       | 70                | 110 | 220  | 440  | 39.00                                    | 52.12  | 70.13  | 96.72  | 247.13                                   | 312.37  | 391.25  | 5.08                          | 7.37               | 10.67              |
| 2MMV99109WN                                       | 70                | 130 | 270  | 530  | 41.45                                    | 54.74  | 73.81  | 101.79 | 279.67                                   | 352.95  | 441.80  | 5.59                          | 8.38               | 12.19              |
| 2MMV99110WN                                       | 70                | 130 | 270  | 530  | 43.55                                    | 57.54  | 77.31  | 106.34 | 295.41                                   | 373.24  | 467.51  | 5.33                          | 7.87               | 11.68              |
| 2MMV99111WN                                       | 90                | 180 | 360  | 710  | 51.07                                    | 67.16  | 90.25  | 124.35 | 349.45                                   | 440.40  | 550.94  | 6.10                          | 9.14               | 13.21              |
| 2MMV99112WN                                       | 90                | 180 | 360  | 710  | 52.30                                    | 68.74  | 92.35  | 126.80 | 358.55                                   | 452.29  | 565.80  | 5.84                          | 8.89               | 12.95              |
| 2MMV99113WN                                       | 110               | 220 | 440  | 890  | 59.64                                    | 78.71  | 106.16 | 146.74 | 376.38                                   | 475.38  | 595.18  | 6.35                          | 9.65               | 13.97              |
| 2MMV99114WN                                       | 110               | 220 | 440  | 890  | 62.26                                    | 81.68  | 109.14 | 149.36 | 426.58                                   | 538.17  | 626.14  | 6.10                          | 9.40               | 13.72              |
| 2MMV99115WN                                       | 130               | 270 | 530  | 1070 | 69.61                                    | 91.65  | 122.95 | 168.95 | 446.34                                   | 563.70  | 705.90  | 6.60                          | 9.91               | 14.73              |
| 2MMV99116WN                                       | 160               | 310 | 620  | 1250 | 0.17                                     | 95.67  | 128.55 | 177.00 | 489.55                                   | 617.57  | 772.53  | 7.37                          | 11.18              | 11.18              |
| 2MMV99117WN                                       | 180               | 360 | 710  | 1420 | 79.58                                    | 105.11 | 141.67 | 195.36 | 511.41                                   | 645.73  | 808.56  | 7.62                          | 11.43              | 16.76              |
| 2MMV99118WN                                       | 200               | 400 | 800  | 1600 | 80.63                                    | 106.16 | 142.54 | 196.06 | 537.12                                   | 678.61  | 850.01  | 8.64                          | 12.95              | 18.80              |
| 2MMV99119WN                                       | 200               | 400 | 800  | 1600 | 82.38                                    | 108.44 | 145.34 | 199.74 | 549.54                                   | 694.70  | 870.65  | 8.38                          | 12.70              | 12.70              |
| 2MMV99120WN                                       | 220               | 440 | 890  | 1780 | 89.37                                    | 117.71 | 158.11 | 217.58 | 605.50                                   | 764.49  | 957.05  | 8.64                          | 12.95              | 19.05              |
| 2MMV99121WN                                       | 240               | 490 | 980  | 1960 | 94.10                                    | 123.83 | 165.81 | 229.99 | 631.91                                   | 797.72  | 823.60  | 8.89                          | 13.46              | 20.57              |
| 2MMV99122WN                                       | 270               | 530 | 1070 | 2140 | 99.87                                    | 131.00 | 175.07 | 244.34 | 642.58                                   | 813.11  | 1019.49 | 9.14                          | 13.97              | 22.10              |
| 2MMV99124WN                                       | 310               | 620 | 1250 | 2490 | 110.19                                   | 144.99 | 194.31 | 264.45 | 724.26                                   | 914.03  | 1144.20 | 9.65                          | 14.73              | 20.83              |
| 2MMV99126WN                                       | 400               | 800 | 1600 | 3200 | 121.56                                   | 160.21 | 215.30 | 292.43 | 810.49                                   | 1023.51 | 1281.67 | 11.43                         | 17.02              | 23.88              |
| 2MMV99128WN                                       | 420               | 850 | 1690 | 3380 | 128.73                                   | 169.65 | 228.07 | 311.85 | 889.19                                   | 1121.46 | 1395.00 | 11.18                         | 17.02              | 24.38              |
| 2MMV99130WN                                       | 440               | 890 | 1780 | 3560 | 135.20                                   | 177.35 | 236.99 | 323.74 | 937.99                                   | 1184.25 | 1490.15 | 11.43                         | 17.02              | 25.40              |
| lbs.                                              |                   |     |      |      |                                          |        |        |        |                                          |         |         |                               |                    |                    |

Notes: <sup>(1)</sup> For DB or DF arrangements only. For other mounting arrangements contact your Timken representative.

# EXTRA-LIGHT 3MMV99100HX (ISO 10) SERIES

## DUPLEX PERFORMANCE DATA

## MOUNTING ARRANGEMENTS



Suggested  
DB



Tandem  
DT



Special Applications  
DF

| Bearing<br>Number                                 | PRELOAD |      |      |      | AXIAL STIFFNESS <sup>(1)</sup> |        |        |        | RADIAL STIFFNESS <sup>(1)</sup> |         |         | SPACER OFFSETS <sup>(1)</sup> |                    |                    |
|---------------------------------------------------|---------|------|------|------|--------------------------------|--------|--------|--------|---------------------------------|---------|---------|-------------------------------|--------------------|--------------------|
|                                                   | DUX     | DUL  | DUM  | DUH  | X-light                        | Light  | Medium | Heavy  | Light                           | Medium  | Heavy   | X-Light<br>to Light           | Light to<br>Medium | Medium<br>to Heavy |
|                                                   | N       |      |      |      | N/μm                           |        |        |        | N/μm                            |         |         | μm                            |                    |                    |
| METRIC DUPLEX PERFORMANCE DATA 3MMV99100WN SERIES |         |      |      |      |                                |        |        |        |                                 |         |         |                               |                    |                    |
| 3MMV99101WN                                       | —       | 40   | 90   | 180  | —                              | 35.85  | 46.00  | 59.99  | 58.77                           | 75.03   | 92.52   | —                             | 4.32               | 6.60               |
| 3MMV99102WN                                       | —       | 40   | 90   | 180  | —                              | 40.75  | 52.30  | 67.86  | 85.70                           | 105.99  | 132.92  | —                             | 3.81               | 5.84               |
| 3MMV99103WN                                       | —       | 40   | 90   | 180  | —                              | 45.30  | 58.07  | 75.21  | 95.50                           | 118.41  | 148.84  | —                             | 3.30               | 5.33               |
| 3MMV99104WN                                       | 40      | 90   | 180  | 360  | 47.92                          | 61.39  | 79.23  | 103.37 | 115.26                          | 145.52  | 182.60  | 3.30                          | 5.08               | 7.87               |
| 3MMV99105WN                                       | 70      | 130  | 270  | 530  | 61.74                          | 79.05  | 102.49 | 134.32 | 128.55                          | 162.83  | 204.46  | 3.81                          | 5.84               | 8.89               |
| 3MMV99106WN                                       | 70      | 130  | 270  | 530  | 70.48                          | 90.25  | 116.66 | 152.16 | 162.66                          | 205.86  | 258.15  | 3.30                          | 5.08               | 7.87               |
| 3MMV99107WN                                       | 90      | 180  | 360  | 710  | 90.07                          | 115.61 | 149.89 | 196.76 | 200.79                          | 253.26  | 317.09  | 3.56                          | 5.33               | 8.13               |
| 3MMV99108WN                                       | 110     | 220  | 440  | 890  | 106.34                         | 136.60 | 177.17 | 233.14 | 233.32                          | 294.01  | 368.16  | 3.56                          | 5.59               | 8.64               |
| 3MMV99109WN                                       | 130     | 270  | 530  | 1070 | 114.03                         | 146.39 | 189.94 | 249.76 | 262.00                          | 329.86  | 412.76  | 4.06                          | 6.35               | 9.65               |
| 3MMV99110WN                                       | 130     | 270  | 530  | 1070 | 120.33                         | 154.44 | 200.09 | 262.52 | 276.69                          | 348.75  | 436.73  | 3.81                          | 6.10               | 9.14               |
| 3MMV99111WN                                       | 180     | 360  | 710  | 1420 | 137.12                         | 176.12 | 228.42 | 300.13 | 330.56                          | 415.91  | 519.98  | 4.57                          | 7.11               | 10.67              |
| 3MMV99112WN                                       | 180     | 360  | 710  | 1420 | 140.62                         | 180.50 | 234.02 | 307.30 | 339.31                          | 426.93  | 533.97  | 4.32                          | 6.86               | 10.41              |
| 3MMV99113WN                                       | 220     | 440  | 890  | 1780 | 159.68                         | 205.33 | 266.72 | 351.55 | 356.27                          | 448.79  | 561.60  | 4.83                          | 7.62               | 11.43              |
| 3MMV99114WN                                       | 220     | 440  | 890  | 1780 | 163.53                         | 210.05 | 271.97 | 356.80 | 407.17                          | 512.46  | 640.83  | 4.83                          | 7.37               | 11.18              |
| 3MMV99115WN                                       | 270     | 530  | 1070 | 2220 | 182.42                         | 234.54 | 304.33 | 406.99 | 426.23                          | 536.77  | 671.62  | 5.08                          | 7.87               | 12.95              |
| 3MMV99116WN                                       | 310     | 620  | 1250 | 2450 | 193.96                         | 249.23 | 323.22 | 422.03 | 464.18                          | 584.17  | 735.48  | 5.59                          | 8.64               | 12.95              |
| 3MMV99117WN                                       | 360     | 710  | 1420 | 2670 | 212.33                         | 273.02 | 354.52 | 454.91 | 485.00                          | 610.93  | 764.31  | 5.84                          | 9.14               | 12.19              |
| 3MMV99118WN                                       | 400     | 800  | 1600 | 3110 | 216.18                         | 277.74 | 360.29 | 468.21 | 510.36                          | 643.11  | 805.06  | 6.35                          | 9.91               | 14.48              |
| 3MMV99119WN                                       | 400     | 800  | 1600 | 3110 | 221.25                         | 284.04 | 368.16 | 478.00 | 522.43                          | 658.50  | 824.48  | 6.35                          | 9.91               | 14.22              |
| 3MMV99120WN                                       | 440     | 890  | 1780 | 3560 | 239.79                         | 308.00 | 399.47 | 525.05 | 575.25                          | 724.44  | 901.08  | 6.35                          | 9.91               | 15.24              |
| 3MMV99121WN                                       | 490     | 980  | 2000 | 4000 | 246.61                         | 316.74 | 414.34 | 544.99 | 603.75                          | 760.12  | 955.48  | 6.86                          | 11.18              | 16.51              |
| 3MMV99122WN                                       | 530     | 1070 | 2220 | 4450 | 259.55                         | 333.18 | 438.47 | 576.30 | 617.75                          | 779.00  | 980.49  | 7.11                          | 11.94              | 17.53              |
| 3MMV99124WN                                       | 620     | 1250 | 2450 | 4890 | 285.79                         | 367.29 | 473.28 | 622.47 | 695.40                          | 875.20  | 1094.70 | 7.62                          | 11.43              | 17.78              |
| 3MMV99126WN                                       | 800     | 1600 | 3110 | 6230 | 323.91                         | 416.44 | 534.49 | 702.75 | 771.31                          | 971.39  | 1211.71 | 8.64                          | 12.70              | 20.07              |
| 3MMV99128WN                                       | 850     | 1690 | 3340 | 6670 | 343.33                         | 441.27 | 569.82 | 749.27 | 845.82                          | 1057.97 | 1323.29 | 8.64                          | 12.95              | 20.07              |
| 3MMV99130WN                                       | 890     | 1780 | 3560 | 7120 | 352.25                         | 451.94 | 585.39 | 767.81 | 900.39                          | 1139.47 | 1425.44 | 8.89                          | 13.72              | 21.08              |
|                                                   | lbs.    |      |      |      | 10 <sup>6</sup> lbs./in.       |        |        |        | 10 <sup>6</sup> lbs./in.        |         |         | in.                           |                    |                    |
| INCH DUPLEX PERFORMANCE DATA 3MMV99100WN SERIES   |         |      |      |      |                                |        |        |        |                                 |         |         |                               |                    |                    |
| 3MMV99101WN                                       | —       | 10   | 20   | 40   | —                              | 0.205  | 0.263  | 0.343  | 0.336                           | 0.429   | 0.529   | —                             | 0.00017            | 0.00026            |
| 3MMV99102WN                                       | —       | 10   | 20   | 40   | —                              | 0.233  | 0.299  | 0.388  | 0.490                           | 0.606   | 0.760   | —                             | 0.00015            | 0.00023            |
| 3MMV99103WN                                       | —       | 10   | 20   | 40   | —                              | 0.259  | 0.332  | 0.430  | 0.546                           | 0.677   | 0.851   | —                             | 0.00013            | 0.00021            |
| 3MMV99104WN                                       | 10      | 20   | 40   | 80   | 0.274                          | 0.351  | 0.453  | 0.591  | 0.659                           | 0.832   | 1.044   | 0.00013                       | 0.0002             | 0.00031            |
| 3MMV99105WN                                       | 15      | 30   | 60   | 120  | 0.353                          | 0.452  | 0.586  | 0.768  | 0.735                           | 0.931   | 1.169   | 0.00015                       | 0.00023            | 0.00035            |
| 3MMV99106WN                                       | 15      | 30   | 60   | 120  | 0.403                          | 0.516  | 0.667  | 0.870  | 0.93                            | 1.177   | 1.476   | 0.00013                       | 0.0002             | 0.00031            |
| 3MMV99107WN                                       | 20      | 40   | 80   | 160  | 0.515                          | 0.661  | 0.857  | 1.125  | 1.148                           | 1.448   | 1.813   | 0.00014                       | 0.00021            | 0.00032            |
| 3MMV99108WN                                       | 25      | 50   | 100  | 200  | 0.608                          | 0.781  | 1.013  | 1.333  | 1.334                           | 1.681   | 2.105   | 0.00014                       | 0.00022            | 0.00034            |
| 3MMV99109WN                                       | 30      | 60   | 120  | 240  | 0.652                          | 0.837  | 1.086  | 1.428  | 1.498                           | 1.886   | 2.360   | 0.00016                       | 0.00025            | 0.00038            |
| 3MMV99110WN                                       | 30      | 60   | 120  | 240  | 0.688                          | 0.883  | 1.144  | 1.501  | 1.582                           | 1.994   | 2.497   | 0.00015                       | 0.00024            | 0.00036            |
| 3MMV99111WN                                       | 40      | 80   | 160  | 320  | 0.784                          | 1.007  | 1.306  | 1.716  | 1.890                           | 2.378   | 2.973   | 0.00018                       | 0.00028            | 0.00042            |
| 3MMV99112WN                                       | 40      | 80   | 160  | 320  | 0.804                          | 1.032  | 1.338  | 1.757  | 1.940                           | 2.441   | 3.053   | 0.00017                       | 0.00027            | 0.00041            |
| 3MMV99113WN                                       | 50      | 100  | 200  | 400  | 0.913                          | 1.174  | 1.525  | 2.010  | 2.037                           | 2.566   | 3.211   | 0.00019                       | 0.0003             | 0.00045            |
| 3MMV99114WN                                       | 50      | 100  | 200  | 400  | 0.935                          | 1.201  | 1.555  | 2.040  | 2.328                           | 2.930   | 3.664   | 0.00019                       | 0.00029            | 0.00044            |
| 3MMV99115WN                                       | 60      | 120  | 240  | 500  | 1.043                          | 1.341  | 1.740  | 2.327  | 2.437                           | 3.069   | 3.840   | 0.0002                        | 0.00031            | 0.00051            |
| 3MMV99116WN                                       | 70      | 140  | 280  | 550  | 1.109                          | 1.425  | 1.848  | 2.413  | 2.654                           | 3.340   | 4.176   | 0.00022                       | 0.00034            | 0.00051            |
| 3MMV99117WN                                       | 80      | 160  | 320  | 600  | 1.214                          | 1.561  | 2.027  | 2.601  | 2.773                           | 3.493   | 4.370   | 0.00023                       | 0.00036            | 0.00048            |
| 3MMV99118WN                                       | 90      | 180  | 360  | 700  | 1.236                          | 1.588  | 2.060  | 2.677  | 2.918                           | 3.677   | 4.603   | 0.00025                       | 0.00039            | 0.00057            |
| 3MMV99119WN                                       | 90      | 180  | 360  | 700  | 1.265                          | 1.624  | 2.105  | 2.733  | 2.987                           | 3.765   | 4.714   | 0.00025                       | 0.00039            | 0.00056            |
| 3MMV99120WN                                       | 100     | 200  | 400  | 800  | 1.371                          | 1.761  | 2.284  | 3.002  | 3.289                           | 4.142   | 5.152   | 0.00025                       | 0.00039            | 0.00060            |
| 3MMV99121WN                                       | 110     | 220  | 450  | 900  | 1.410                          | 1.811  | 2.369  | 3.116  | 3.452                           | 4.346   | 5.463   | 0.00027                       | 0.00044            | 0.00065            |
| 3MMV99122WN                                       | 120     | 240  | 500  | 1000 | 1.484                          | 1.905  | 2.507  | 3.295  | 3.532                           | 4.454   | 5.606   | 0.00028                       | 0.00047            | 0.00069            |
| 3MMV99124WN                                       | 140     | 280  | 550  | 1100 | 1.634                          | 2.100  | 2.706  | 3.559  | 3.976                           | 5.004   | 6.259   | 0.0003                        | 0.00045            | 0.00070            |
| 3MMV99126WN                                       | 180     | 360  | 700  | 1400 | 1.852                          | 2.381  | 3.056  | 4.018  | 4.410                           | 5.554   | 6.928   | 0.00034                       | 0.00050            | 0.00079            |
| 3MMV99128WN                                       | 190     | 380  | 750  | 1500 | 1.963                          | 2.523  | 3.258  | 4.284  | 4.836                           | 6.049   | 7.566   | 0.00034                       | 0.00051            | 0.00079            |
| 3MMV99130WN                                       | 200     | 400  | 800  | 1600 | 2.014                          | 2.584  | 3.347  | 4.390  | 5.148                           | 6.515   | 8.150   | 0.00035                       | 0.00054            | 0.00083            |

Notes: <sup>(1)</sup> For DB or DF arrangements only. For other mounting arrangements contact your Timken representative.



## EXTRA-LIGHT 2MMV99100WN (ISO 10) SERIES

### SPEED CAPABILITY DATA

| Bearing Number | Grease Capacity |       | Kluber Isoflex |       | Operating Speeds <sup>(2)</sup> (DB Mounting) <sup>(1)</sup> |            |       |        |         |       |
|----------------|-----------------|-------|----------------|-------|--------------------------------------------------------------|------------|-------|--------|---------|-------|
|                | NBU15           |       | NBU15          |       | DUL                                                          | Grease DUM | DUH   | DUL    | Oil DUM | DUH   |
|                | 25%             | 40%   | 15%            | 20%   |                                                              |            |       |        |         |       |
|                | grams           | grams | grams          | grams | RPM                                                          | RPM        | RPM   | RPM    | RPM     | RPM   |
| 2MMV99101WN    | 0.3             | 0.5   | 0.2            | 0.27  | 68200                                                        | 60600      | 45500 | 116000 | 103000  | 77400 |
| 2MMV99102WN    | 0.4             | 0.6   | 0.24           | 0.32  | 57900                                                        | 51400      | 38600 | 98400  | 98400   | 65600 |
| 2MMV99103WN    | 0.5             | 0.7   | 0.31           | 0.41  | 51200                                                        | 45500      | 34100 | 87100  | 87100   | 58000 |
| 2MMV99104WN    | 0.9             | 1.4   | 0.58           | 0.77  | 39400                                                        | 35000      | 26300 | 67000  | 67000   | 44700 |
| 2MMV99105WN    | 1               | 1.6   | 0.67           | 0.9   | 32900                                                        | 29200      | 21900 | 55800  | 55800   | 37200 |
| 2MMV99106WN    | 1.3             | 2.1   | 0.87           | 1.17  | 26600                                                        | 23600      | 17700 | 45100  | 45100   | 30100 |
| 2MMV99107WN    | 1.4             | 2.2   | 0.91           | 1.22  | 22800                                                        | 20200      | 15200 | 38700  | 38700   | 25800 |
| 2MMV99108WN    | 1.7             | 2.7   | 1.14           | 1.52  | 19800                                                        | 17600      | 13200 | 33700  | 33700   | 22400 |
| 2MMV99109WN    | 2.2             | 3.5   | 1.47           | 1.96  | 18200                                                        | 16200      | 12100 | 30900  | 30900   | 20600 |
| 2MMV99110WN    | 2.4             | 3.8   | 1.58           | 2.11  | 16700                                                        | 14800      | 11100 | 28300  | 28300   | 18900 |
| 2MMV99111WN    | 3.4             | 5.4   | 2.2            | 3     | 14900                                                        | 13300      | 10000 | 25400  | 25400   | 17000 |
| 2MMV99112WN    | 3.6             | 5.8   | 2.4            | 3.2   | 13900                                                        | 12300      | 9200  | 23600  | 23600   | 15600 |
| 2MMV99113WN    | 3.8             | 6.1   | 2.6            | 3.4   | 13000                                                        | 11500      | 8600  | 22000  | 22000   | 14600 |
| 2MMV99114WN    | 5.1             | 8.2   | 3.4            | 4.6   | 11900                                                        | 10600      | 7900  | 20200  | 20200   | 13400 |
| 2MMV99115WN    | 5.5             | 8.8   | 3.7            | 4.9   | 11100                                                        | 9800       | 7400  | 18800  | 18800   | 12600 |
| 2MMV99116WN    | 7.1             | 11.3  | 4.7            | 6.3   | 10400                                                        | 9300       | 7000  | 17700  | 17700   | 11900 |
| 2MMV99117WN    | 7.4             | 11.8  | 4.9            | 6.6   | 9900                                                         | 8800       | 6600  | 16800  | 16800   | 11200 |
| 2MMV99118WN    | 9.7             | 15.6  | 6.5            | 8.7   | 9400                                                         | 8300       | 6200  | 15900  | 15900   | 10500 |
| 2MMV99119WN    | 13.3            | 21.3  | 7.1            | 9.5   | 8900                                                         | 7900       | 5900  | 15100  | 15100   | 10000 |
| 2MMV99120WN    | 10.6            | 17    | 7.4            | 9.9   | 8500                                                         | 7500       | 5600  | 14400  | 14400   | 9500  |
| 2MMV99121WN    | 17.1            | 27.4  | 9.1            | 12.2  | 8000                                                         | 7100       | 5300  | 13600  | 13600   | 9000  |
| 2MMV99122WN    | 16              | 25.6  | 10.7           | 14.2  | 7700                                                         | 6800       | 5100  | 13000  | 13000   | 8700  |
| 2MMV99124WN    | 17.1            | 27.4  | 11.4           | 15.3  | 7100                                                         | 6300       | 4700  | 12100  | 12100   | 8000  |
| 2MMV99126WN    | 25.8            | 41.3  | 17.2           | 23    | 6400                                                         | 5700       | 4300  | 10900  | 10900   | 7300  |
| 2MMV99128WN    | 27.5            | 43.9  | 18.3           | 24.4  | 5900                                                         | 5300       | 4000  | 10100  | 10100   | 6800  |
| 2MMV99130WN    | 43.9            | 70.3  | 29.3           | 39.1  | 5600                                                         | 5000       | 3700  | 9500   | 9500    | 6300  |

<sup>(1)</sup> For other mounting arrangement configurations refer to the engineering section on Permissible Speed calculation methods.

<sup>(2)</sup> For ceramic ball complements use 120% of speeds shown.

## EXTRA-LIGHT 3MMV99100WN (ISO 10) SERIES

### SPEED CAPABILITY DATA

| Bearing Number | Grease Capacity |       | Kluber Isoflex |       | Operating Speeds <sup>(2)</sup> (DB Mounting) <sup>(1)</sup> |               |       |       |            |       |
|----------------|-----------------|-------|----------------|-------|--------------------------------------------------------------|---------------|-------|-------|------------|-------|
|                | NBU15           |       | NBU15          |       | DUL                                                          | Grease<br>DUM | DUH   | DUL   | Oil<br>DUM | DUH   |
|                | 25%             | 40%   | 15%            | 20%   |                                                              |               |       |       |            |       |
|                | grams           | grams | grams          | grams | RPM                                                          | RPM           | RPM   | RPM   | RPM        | RPM   |
| 3MMV99101WN    | 0.3             | 0.5   | 0.2            | 0.3   | 58000                                                        | 47700         | 34100 | 86900 | 71600      | 51100 |
| 3MMV99102WN    | 0.4             | 0.6   | 0.2            | 0.3   | 49000                                                        | 40500         | 28900 | 73800 | 60800      | 43400 |
| 3MMV99103WN    | 0.5             | 0.7   | 0.3            | 0.4   | 43500                                                        | 35800         | 25600 | 65300 | 53800      | 38400 |
| 3MMV99104WN    | 0.9             | 1.4   | 0.6            | 0.8   | 33500                                                        | 27600         | 19700 | 50200 | 41400      | 29500 |
| 3MMV99105WN    | 1.0             | 1.6   | 0.7            | 0.9   | 27900                                                        | 23000         | 16400 | 41800 | 34400      | 24600 |
| 3MMV99106WN    | 1.3             | 2.1   | 0.9            | 1.2   | 22500                                                        | 18500         | 13200 | 33800 | 27800      | 19900 |
| 3MMV99107WN    | 1.4             | 2.2   | 0.9            | 1.2   | 19300                                                        | 15900         | 11300 | 28900 | 23800      | 17000 |
| 3MMV99108WN    | 1.7             | 2.7   | 1.1            | 1.5   | 16800                                                        | 13900         | 9900  | 25200 | 20800      | 14800 |
| 3MMV99109WN    | 2.2             | 3.5   | 1.5            | 2.0   | 15500                                                        | 12700         | 9100  | 23200 | 19100      | 13600 |
| 3MMV99110WN    | 2.4             | 3.8   | 1.6            | 2.1   | 14200                                                        | 11700         | 8300  | 21300 | 17500      | 12500 |
| 3MMV99111WN    | 3.4             | 5.4   | 2.2            | 3.0   | 12700                                                        | 10400         | 7400  | 19000 | 15600      | 11200 |
| 3MMV99112WN    | 3.6             | 5.8   | 2.4            | 3.2   | 11800                                                        | 9700          | 6900  | 17700 | 14600      | 10400 |
| 3MMV99113WN    | 3.8             | 6.1   | 2.6            | 3.4   | 11000                                                        | 9100          | 6500  | 16600 | 13600      | 9700  |
| 3MMV99114WN    | 5.1             | 8.2   | 3.4            | 4.6   | 10100                                                        | 8300          | 5900  | 15200 | 12500      | 8900  |
| 3MMV99115WN    | 5.5             | 8.8   | 3.7            | 4.9   | 9400                                                         | 7800          | 5500  | 14100 | 11700      | 8300  |
| 3MMV99116WN    | 7.1             | 11.3  | 4.7            | 6.3   | 8800                                                         | 7300          | 5200  | 13300 | 10900      | 7800  |
| 3MMV99117WN    | 7.4             | 11.8  | 4.9            | 6.6   | 8400                                                         | 6900          | 4900  | 12600 | 10400      | 7400  |
| 3MMV99118WN    | 9.7             | 15.6  | 6.5            | 8.7   | 7900                                                         | 6500          | 4700  | 11900 | 9800       | 7000  |
| 3MMV99119WN    | 13.3            | 21.3  | 7.1            | 9.5   | 7600                                                         | 6200          | 4500  | 11400 | 9400       | 6700  |
| 3MMV99120WN    | 10.6            | 17.0  | 7.4            | 9.9   | 7200                                                         | 5900          | 4200  | 10800 | 8900       | 6300  |
| 3MMV99121WN    | 17.1            | 27.4  | 9.1            | 12.2  | 6800                                                         | 5600          | 4000  | 10300 | 8500       | 6000  |
| 3MMV99122WN    | 16.0            | 25.6  | 10.7           | 14.2  | 6500                                                         | 5300          | 3800  | 9700  | 8000       | 5700  |
| 3MMV99124WN    | 17.1            | 27.4  | 11.4           | 15.3  | 6000                                                         | 4900          | 3500  | 9000  | 7400       | 5300  |
| 3MMV99126WN    | 25.8            | 41.3  | 17.2           | 23.0  | 5400                                                         | 4500          | 3200  | 8100  | 6700       | 4800  |
| 3MMV99128WN    | 27.5            | 43.9  | 18.3           | 24.4  | 5100                                                         | 4200          | 3000  | 7600  | 6300       | 4500  |
| 3MMV99130WN    | 43.9            | 70.3  | 29.3           | 39.1  | 4800                                                         | 3900          | 2800  | 7200  | 5900       | 4200  |

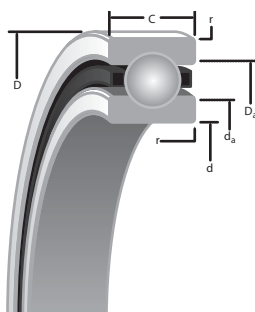
<sup>(1)</sup> For other mounting arrangement configurations refer to the engineering section on Permissible Speed calculation methods.

<sup>(2)</sup> For ceramic ball complements use 120% of speeds shown.



## ULTRA-LIGHT MM9100K (ISO 10) SERIES

### DIMENSIONAL SIZES METRIC



#### SUPER PRECISION MM:

Running accuracy and performance meet ABEC 9 (ISO P2) levels. Non-critical features conform to ABEC 7 (ISO P4) requirements.

#### CONRAD CONSTRUCTION:

- Maximum complement of balls separated by two-piece land piloted cage

| Bearing Number | d<br>Bore        | D<br>O.D.   | C<br>Width <sup>(1)</sup> | Ball Qty.<br>x Dia. | Wt.   | LOAD RATINGS<br>(steel ball & ceramic ball) |                      |                                              |
|----------------|------------------|-------------|---------------------------|---------------------|-------|---------------------------------------------|----------------------|----------------------------------------------|
|                |                  |             |                           |                     |       | C <sub>0</sub> (stat)                       | C <sub>e</sub> (dyn) | Limiting<br>Speed <sup>(N<sub>g</sub>)</sup> |
| METRIC         | mm/tol: +0; (µm) |             |                           | mm                  | kg    | N                                           | RPM                  |                                              |
| MM9101K        | 12<br>(4)        | 28<br>(5)   | 8<br>(80)                 | 8 x 4.76            | 0.020 | 2400                                        | 5670                 | 52800                                        |
|                |                  |             |                           |                     |       | 2130                                        | 5670                 | 63400                                        |
| MM9103K        | 17<br>(4)        | 35<br>(6)   | 10<br>(80)                | 10 x 4.76           | 0.038 | 3300                                        | 6660                 | 39600                                        |
|                |                  |             |                           |                     |       | 2890                                        | 6660                 | 47500                                        |
| MM9104K        | 20<br>(5)        | 42<br>(6)   | 12<br>(120)               | 8 x 6.35            | 0.064 | 4400                                        | 9620                 | 34000                                        |
|                |                  |             |                           |                     |       | 3980                                        | 9620                 | 40800                                        |
| MM9105K        | 25<br>(5)        | 47<br>(6)   | 12<br>(120)               | 10 x 6.35           | 0.074 | 5900                                        | 11200                | 28300                                        |
|                |                  |             |                           |                     |       | 5210                                        | 11200                | 34000                                        |
| MM9106K        | 30<br>(5)        | 55<br>(7)   | 13<br>(120)               | 11 x 7.14           | 0.109 | 8300                                        | 14700                | 23300                                        |
|                |                  |             |                           |                     |       | 7390                                        | 14700                | 28000                                        |
| MM9107K        | 35<br>(6)        | 62<br>(7)   | 14<br>(120)               | 11 x 7.94           | 0.144 | 10300                                       | 17700                | 20700                                        |
|                |                  |             |                           |                     |       | 9150                                        | 17700                | 24800                                        |
| MM9108K        | 40<br>(6)        | 68<br>(7)   | 15<br>(120)               | 12 x 7.94           | 0.180 | 11600                                       | 18600                | 18200                                        |
|                |                  |             |                           |                     |       | 10300                                       | 18600                | 21800                                        |
| MM9109K        | 45<br>(6)        | 75<br>(7)   | 16<br>(120)               | 13 x 8.73           | 0.230 | 15100                                       | 23300                | 16300                                        |
|                |                  |             |                           |                     |       | 13500                                       | 23300                | 19600                                        |
| MM9110K        | 50<br>(6)        | 80<br>(7)   | 16<br>(120)               | 14 x 8.73           | 0.248 | 16700                                       | 24200                | 14900                                        |
|                |                  |             |                           |                     |       | 14700                                       | 24200                | 17900                                        |
| MM9111K        | 55<br>(7)        | 90<br>(8)   | 18<br>(150)               | 13 x 10.32          | 0.362 | 21400                                       | 31400                | 13500                                        |
|                |                  |             |                           |                     |       | 18900                                       | 31400                | 16200                                        |
| MM9112K        | 60<br>(7)        | 95<br>(8)   | 18<br>(150)               | 14 x 10.32          | 0.430 | 23200                                       | 32600                | 12500                                        |
|                |                  |             |                           |                     |       | 20600                                       | 32600                | 15000                                        |
| MM9113K        | 65<br>(7)        | 100<br>(8)  | 18<br>(150)               | 15 x 10.32          | 0.450 | 25200                                       | 33900                | 11600                                        |
|                |                  |             |                           |                     |       | 22400                                       | 33900                | 13900                                        |
| MM9114K        | 70<br>(7)        | 110<br>(8)  | 20<br>(150)               | 14 x 11.91          | 0.620 | 30900                                       | 42200                | 10700                                        |
|                |                  |             |                           |                     |       | 27500                                       | 42200                | 12800                                        |
| MM9115K        | 75<br>(7)        | 115<br>(8)  | 20<br>(150)               | 15 x 11.91          | 0.606 | 33400                                       | 43800                | 10100                                        |
|                |                  |             |                           |                     |       | 29800                                       | 43800                | 12100                                        |
| MM9116K        | 80<br>(7)        | 125<br>(9)  | 22<br>(150)               | 14 x 13.49          | 0.804 | 40000                                       | 52800                | 9420                                         |
|                |                  |             |                           |                     |       | 35300                                       | 52800                | 11300                                        |
| MM9117K        | 85<br>(8)        | 130<br>(9)  | 22<br>(200)               | 15 x 13.49          | 0.845 | 42900                                       | 54900                | 8900                                         |
|                |                  |             |                           |                     |       | 38300                                       | 54900                | 10700                                        |
| MM9118K        | 90<br>(9)        | 140<br>(9)  | 24<br>(200)               | 14 x 15.08          | 1.092 | 49800                                       | 64500                | 8390                                         |
|                |                  |             |                           |                     |       | 44100                                       | 64500                | 10100                                        |
| MM9120K        | 100<br>(8)       | 150<br>(9)  | 24<br>(200)               | 15 x 15.08          | 1.208 | 54300                                       | 66700                | 7630                                         |
|                |                  |             |                           |                     |       | 48200                                       | 66700                | 9160                                         |
| MM9122K        | 110<br>(8)       | 170<br>(10) | 28<br>(200)               | 14 x 17.46          | 1.882 | 66700                                       | 83400                | 6840                                         |
|                |                  |             |                           |                     |       | 59900                                       | 83400                | 8240                                         |
| MM9124K        | 120<br>(8)       | 180<br>(10) | 28<br>(200)               | 15 x 17.46          | 2.019 | 72500                                       | 86300                | 6320                                         |
|                |                  |             |                           |                     |       | 65000                                       | 86300                | 7500                                         |
| MM9126K        | 130<br>(10)      | 200<br>(11) | 33<br>(250)               | 14 x 20.64          | 3.041 | 94300                                       | 112600               | 5810                                         |
|                |                  |             |                           |                     |       | 83600                                       | 112600               | 6975                                         |

(N<sub>g</sub>) For a single, grease lubricated, spring preloaded bearing. This value to be used in permissible Operating Speed (Sp) calculation.

<sup>(1)</sup> Width tolerance of preloaded bearing set +0/-0.25 mm (+0/-0.010").

<sup>(2)</sup> ABMA STD 20 (r<sub>as</sub> max).

| r<br>Rad. <sup>(2)</sup> | Suggested<br>Shoulder Diameters |       |                          |       | Shaft Diameter |         | Mounting Fits |       | FIXED                        |         |               |       | FLOATING                     |         |                   |       |         |
|--------------------------|---------------------------------|-------|--------------------------|-------|----------------|---------|---------------|-------|------------------------------|---------|---------------|-------|------------------------------|---------|-------------------|-------|---------|
|                          | d <sub>a</sub> (Shaft)          |       | D <sub>a</sub> (Housing) |       |                |         |               |       | Housing Bore<br>(Stationary) |         | Mounting Fits |       | Housing Bore<br>(Stationary) |         | Housing Clearance |       |         |
|                          | Max.                            | Min.  | Max.                     | Min.  | Min.           | Max.    | Loose         | Tight | Min.                         | Max.    | Tight         | Loose | Max.                         | Min.    | Max.              | Min.  |         |
| mm                       | mm                              | mm    | mm                       | mm    | mm             | mm      | mm            | mm    | mm                           | mm      | mm            | mm    | mm                           | mm      | mm                | mm    |         |
| 0.3                      | 16.1                            | 15.9  | 25.5                     | 25.3  | 11.995         | 12.000  | 0.005         | 0.004 | 28                           | 28.005  | 0.000         | 0.010 | 28.010                       | 28.005  | 0.015             | 0.005 | MM9101K |
| 0.3                      | 21.7                            | 21.5  | 31.1                     | 30.9  | 16.995         | 17.000  | 0.005         | 0.004 | 35                           | 35.006  | 0.000         | 0.012 | 35.010                       | 35.005  | 0.016             | 0.005 | MM9103K |
| 0.6                      | 25.0                            | 24.8  | 37.7                     | 37.5  | 19.995         | 20.000  | 0.005         | 0.005 | 42                           | 42.006  | 0.000         | 0.012 | 42.010                       | 42.005  | 0.016             | 0.005 | MM9104K |
| 0.6                      | 30.1                            | 29.9  | 42.6                     | 42.3  | 24.995         | 25.000  | 0.005         | 0.005 | 47                           | 47.006  | 0.000         | 0.012 | 47.012                       | 47.007  | 0.018             | 0.007 | MM9105K |
| 1.0                      | 36.2                            | 35.9  | 50.7                     | 50.4  | 29.995         | 30.000  | 0.005         | 0.005 | 55                           | 55.008  | 0.000         | 0.015 | 55.012                       | 55.007  | 0.019             | 0.007 | MM9106K |
| 1.0                      | 41.2                            | 40.6  | 56.6                     | 56.1  | 34.995         | 35.000  | 0.005         | 0.006 | 62                           | 62.008  | 0.000         | 0.015 | 62.012                       | 62.007  | 0.019             | 0.007 | MM9107K |
| 1.0                      | 46.2                            | 45.7  | 62.2                     | 61.7  | 39.995         | 40.000  | 0.005         | 0.006 | 68                           | 68.008  | 0.000         | 0.015 | 68.012                       | 68.007  | 0.019             | 0.007 | MM9108K |
| 1.0                      | 51.8                            | 51.3  | 69.3                     | 68.8  | 44.995         | 45.000  | 0.005         | 0.006 | 75                           | 75.008  | 0.000         | 0.015 | 75.014                       | 75.009  | 0.022             | 0.009 | MM9109K |
| 1.0                      | 56.6                            | 56.1  | 74.2                     | 73.7  | 49.995         | 50.000  | 0.005         | 0.006 | 80                           | 80.008  | 0.000         | 0.015 | 80.012                       | 80.008  | 0.020             | 0.008 | MM9110K |
| 1.0                      | 62.7                            | 62.2  | 83.3                     | 82.8  | 54.995         | 55.000  | 0.005         | 0.007 | 90                           | 90.008  | 0.000         | 0.016 | 90.015                       | 90.007  | 0.023             | 0.007 | MM9111K |
| 1.0                      | 67.8                            | 67.3  | 88.1                     | 87.6  | 59.995         | 60.000  | 0.005         | 0.007 | 95                           | 95.008  | 0.000         | 0.016 | 95.016                       | 95.009  | 0.024             | 0.009 | MM9112K |
| 1.0                      | 72.6                            | 72.1  | 93.2                     | 92.7  | 64.995         | 65.000  | 0.005         | 0.007 | 100                          | 100.008 | 0.000         | 0.016 | 100.018                      | 100.010 | 0.025             | 0.010 | MM9113K |
| 1.0                      | 78.2                            | 77.7  | 102.4                    | 101.9 | 69.995         | 70.000  | 0.005         | 0.007 | 110                          | 110.008 | 0.000         | 0.016 | 110.018                      | 110.010 | 0.025             | 0.010 | MM9114K |
| 1.0                      | 83.4                            | 82.7  | 107.3                    | 106.6 | 74.995         | 75.005  | 0.005         | 0.012 | 115                          | 115.008 | 0.000         | 0.016 | 115.019                      | 115.011 | 0.026             | 0.010 | MM9115K |
| 1.0                      | 89.3                            | 88.5  | 116.5                    | 115.7 | 79.995         | 80.005  | 0.005         | 0.012 | 125                          | 125.008 | 0.000         | 0.017 | 125.021                      | 125.011 | 0.030             | 0.011 | MM9116K |
| 1.0                      | 94.9                            | 94.1  | 122.1                    | 121.3 | 84.995         | 85.005  | 0.005         | 0.012 | 130                          | 130.009 | 0.000         | 0.018 | 130.020                      | 130.010 | 0.029             | 0.010 | MM9117K |
| 1.5                      | 100.5                           | 99.7  | 130.9                    | 130.2 | 89.995         | 90.005  | 0.005         | 0.013 | 140                          | 140.009 | 0.000         | 0.018 | 140.020                      | 140.010 | 0.029             | 0.010 | MM9118K |
| 1.5                      | 110.6                           | 109.9 | 140.8                    | 140.1 | 99.995         | 100.005 | 0.005         | 0.013 | 150                          | 150.009 | 0.000         | 0.018 | 150.023                      | 150.012 | 0.032             | 0.012 | MM9120K |
| 2.0                      | 123.1                           | 122.3 | 158.4                    | 157.6 | 109.995        | 110.005 | 0.005         | 0.013 | 170                          | 170.010 | 0.000         | 0.020 | 170.022                      | 170.012 | 0.032             | 0.012 | MM9122K |
| 2.0                      | 133.2                           | 132.5 | 168.3                    | 167.5 | 119.995        | 120.005 | 0.005         | 0.013 | 180                          | 180.010 | 0.000         | 0.020 | 180.022                      | 180.012 | 0.032             | 0.012 | MM9124K |
| 2.0                      | 144.9                           | 144.2 | 186.6                    | 185.8 | 129.995        | 130.005 | 0.005         | 0.015 | 200                          | 200.011 | 0.000         | 0.022 | 200.025                      | 200.015 | 0.036             | 0.015 | MM9126K |

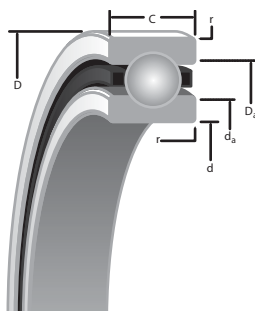
D





## EXTRA-LIGHT MM9100K (ISO 10) SERIES

### DIMENSIONAL SIZES INCHES



#### SUPER PRECISION MM:

Running accuracy and performance meet ABEC 9 (ISO P2) levels. Non-critical features conform to ABEC 7 (ISO P4) requirements.

#### CONRAD CONSTRUCTION:

- Maximum complement of balls separated by two-piece land piloted cage.

| Bearing Number | d<br>Bore              | D<br>O.D.       | C<br>Width <sup>(1)</sup> | Ball Qty.<br>x Dia. | Wt.<br>lbs. | LOAD RATINGS<br>(steel ball & ceramic ball) |                      |                |
|----------------|------------------------|-----------------|---------------------------|---------------------|-------------|---------------------------------------------|----------------------|----------------|
|                |                        |                 |                           |                     |             | C <sub>0</sub> (stat)                       | C <sub>e</sub> (dyn) | Limiting Speed |
| INCH           | in./tol: +0; -0.000(X) |                 |                           | in.                 | lbs.        | lbs.                                        |                      | RPM            |
| MM9101K        | 0.4724<br>(1.5)        | 1.1024<br>(2)   | 0.3150<br>(31)            | 8 x 3/16            | 0.04        | 540<br>480                                  | 1280<br>1280         | 52800<br>63400 |
| MM9103K        | 0.6693<br>(1.5)        | 1.3780<br>(2.5) | 0.3937<br>(31)            | 10 x 3/16           | 0.08        | 735<br>650                                  | 1500<br>1500         | 39600<br>47500 |
| MM9104K        | 0.7874<br>(2)          | 1.6535<br>(2.5) | 0.4724<br>(47)            | 8 x 1/4             | 0.14        | 1000<br>890                                 | 2160<br>2160         | 34000<br>40800 |
| MM9105K        | 0.9843<br>(2)          | 1.8504<br>(2.5) | 0.4724<br>(47)            | 10 x 1/4            | 0.16        | 1320<br>1170                                | 2510<br>2510         | 28300<br>34000 |
| MM9106K        | 1.1811<br>(2)          | 2.1654<br>(3)   | 0.5118<br>(47)            | 11 x 9/32           | 0.24        | 1860<br>1660                                | 3300<br>3300         | 23300<br>28000 |
| MM9107K        | 1.3780<br>(2.5)        | 2.4409<br>(3)   | 0.5512<br>(47)            | 11 x 5/16           | 0.32        | 2320<br>2060                                | 3980<br>3980         | 20700<br>24800 |
| MM9108K        | 1.5748<br>(2.5)        | 2.6772<br>(3)   | 0.5906<br>(47)            | 12 x 5/16           | 0.40        | 2600<br>2310                                | 4180<br>4180         | 18300<br>21800 |
| MM9109K        | 1.7717<br>(2.5)        | 2.9528<br>(3)   | 0.6299<br>(47)            | 13 x 11/32          | 0.51        | 3400<br>3030                                | 5230<br>5230         | 16300<br>19600 |
| MM9110K        | 1.9685<br>(2.5)        | 3.1496<br>(3)   | 0.6299<br>(47)            | 14 x 11/32          | 0.55        | 3750<br>3310                                | 5440<br>5440         | 14900<br>17900 |
| MM9111K        | 2.1654<br>(3)          | 3.5433<br>(3)   | 0.7087<br>(59)            | 13 x 13/32          | 0.80        | 4800<br>4250                                | 7050<br>7050         | 13500<br>16200 |
| MM9112K        | 2.3622<br>(3)          | 3.7402<br>(3)   | 0.7087<br>(59)            | 14 x 13/32          | 0.95        | 5210<br>4630                                | 7340<br>7340         | 12500<br>15000 |
| MM9113K        | 2.5591<br>(3)          | 3.9370<br>(3)   | 0.7087<br>(59)            | 15 x 13/32          | 0.99        | 5650<br>5030                                | 7610<br>7610         | 11600<br>13900 |
| MM9114K        | 2.7559<br>(3)          | 4.3307<br>(3)   | 0.7874<br>(59)            | 14 x 15/32          | 1.37        | 6940<br>6180                                | 9490<br>9490         | 10700<br>12800 |
| MM9115K        | 2.9528<br>(3)          | 4.5276<br>(3)   | 0.7874<br>(59)            | 15 x 15/32          | 1.34        | 7500<br>6700                                | 9850<br>9850         | 10100<br>12100 |
| MM9116K        | 3.1496<br>(3)          | 4.9213<br>(3.5) | 0.8661<br>(59)            | 14 x 17/32          | 1.77        | 9000<br>7940                                | 11900<br>11900       | 9420<br>11300  |
| MM9117K        | 3.3465<br>(3)          | 5.1181<br>(3.5) | 0.8661<br>(79)            | 15 x 17/32          | 1.86        | 9650<br>8600                                | 12300<br>12300       | 8900<br>10700  |
| MM9118K        | 3.5433<br>(3)          | 5.5118<br>(3.5) | 0.9449<br>(79)            | 14 x 19/32          | 2.41        | 11200<br>9920                               | 14500<br>14500       | 8390<br>10100  |
| MM9120K        | 3.9370<br>(3)          | 5.9055<br>(3.5) | 0.9449<br>(79)            | 15 x 19/32          | 2.66        | 12200<br>10800                              | 15000<br>15000       | 7630<br>9160   |
| MM9122K        | 4.3307<br>(3)          | 6.6929<br>(4)   | 1.1024<br>(79)            | 14 x 11/16          | 4.15        | 15000<br>13500                              | 18700<br>18700       | 6840<br>8,210  |
| MM9124K        | 4.7244<br>(3)          | 7.0866<br>(4)   | 1.1024<br>(79)            | 15 x 11/16          | 4.45        | 16300<br>14600                              | 19400<br>19400       | 6320<br>7580   |
| MM9126K        | 5.1181<br>(4)          | 7.8740<br>(4.5) | 1.2992<br>(98)            | 14 x 13/16          | 6.70        | 21200<br>18800                              | 25300<br>25300       | 5810<br>6975   |

(N<sub>g</sub>) For a single, grease lubricated, spring preloaded bearing. This value to be used in permissible Operating Speed (Sp) calculation.

(<sup>1</sup>) Width tolerance of preloaded bearing set +0/-0.25 mm (+0/-0.010").

(<sup>2</sup>) ABMA STD 20 (r<sub>as</sub> max).

| r<br>Rad. <sup>(2)</sup> | Suggested<br>Shoulder Diameters |      |                          |      | Shaft Diameter |        | Mounting Fits |         | FIXED                        |        |               |        | FLOATING                     |        |                   |         |         |
|--------------------------|---------------------------------|------|--------------------------|------|----------------|--------|---------------|---------|------------------------------|--------|---------------|--------|------------------------------|--------|-------------------|---------|---------|
|                          | d <sub>s</sub> (Shaft)          |      | D <sub>a</sub> (Housing) |      |                |        |               |         | Housing Bore<br>(Stationary) |        | Mounting Fits |        | Housing Bore<br>(Stationary) |        | Housing Clearance |         |         |
|                          | Max.                            | Min. | Max.                     | Min. | Min.           | Max.   | Loose         | Tight   | Min.                         | Max.   | Tight         | Loose  | Max.                         | Min.   | Max.              | Min.    |         |
| in.                      | in.                             | in.  | in.                      | in.  | in.            | in.    | in.           | in.     | in.                          | in.    | in.           | in.    | in.                          | in.    | in.               | in.     |         |
| 0.012                    | 0.64                            | 0.63 | 1.01                     | 1.00 | 0.4722         | 0.4724 | 0.0002        | 0.00015 | 1.1024                       | 1.1026 | 0.0000        | 0.0004 | 1.1028                       | 1.1026 | 0.00060           | 0.00020 | MM9101K |
| 0.012                    | 0.86                            | 0.85 | 1.23                     | 1.22 | 0.6691         | 0.6693 | 0.0002        | 0.00015 | 1.3780                       | 1.3783 | 0.0000        | 0.0005 | 1.3784                       | 1.3782 | 0.00070           | 0.00020 | MM9103K |
| 0.024                    | 0.99                            | 0.98 | 1.49                     | 1.48 | 0.7872         | 0.7874 | 0.0002        | 0.0002  | 1.6535                       | 1.6538 | 0.0000        | 0.0005 | 1.6539                       | 1.6537 | 0.00070           | 0.00020 | MM9104K |
| 0.024                    | 1.19                            | 1.18 | 1.68                     | 1.67 | 0.9841         | 0.9843 | 0.0002        | 0.0002  | 1.8504                       | 1.8507 | 0.0000        | 0.0005 | 1.8509                       | 1.8507 | 0.00080           | 0.00030 | MM9105K |
| 0.039                    | 1.43                            | 1.42 | 2.00                     | 1.99 | 1.1809         | 1.1811 | 0.0002        | 0.0002  | 2.1654                       | 2.1657 | 0.0000        | 0.0006 | 2.1659                       | 2.1657 | 0.00080           | 0.00030 | MM9106K |
| 0.039                    | 1.62                            | 1.60 | 2.23                     | 2.21 | 1.3778         | 1.3780 | 0.0002        | 0.00025 | 2.4409                       | 2.4412 | 0.0000        | 0.0006 | 2.4414                       | 2.4412 | 0.00080           | 0.00030 | MM9107K |
| 0.039                    | 1.82                            | 1.80 | 2.45                     | 2.43 | 1.5746         | 1.5748 | 0.0002        | 0.00025 | 2.6772                       | 2.6775 | 0.0000        | 0.0006 | 2.6777                       | 2.6775 | 0.00080           | 0.00030 | MM9108K |
| 0.039                    | 2.04                            | 2.02 | 2.73                     | 2.71 | 1.7715         | 1.7717 | 0.0002        | 0.00025 | 2.9528                       | 2.9531 | 0.0000        | 0.0006 | 2.9533                       | 2.9531 | 0.00080           | 0.00030 | MM9109K |
| 0.039                    | 2.23                            | 2.21 | 2.92                     | 2.90 | 1.9683         | 1.9685 | 0.0002        | 0.00025 | 3.1496                       | 3.1499 | 0.0000        | 0.0006 | 3.1501                       | 3.1499 | 0.00080           | 0.00030 | MM9110K |
| 0.039                    | 2.47                            | 2.45 | 3.28                     | 3.26 | 2.1652         | 2.1654 | 0.0002        | 0.0003  | 3.5433                       | 3.5436 | 0.0000        | 0.0006 | 3.5439                       | 3.5436 | 0.00090           | 0.00030 | MM9111K |
| 0.039                    | 2.67                            | 2.65 | 3.47                     | 3.45 | 2.3620         | 2.3622 | 0.0002        | 0.0003  | 3.7402                       | 3.7405 | 0.0000        | 0.0006 | 3.7408                       | 3.7405 | 0.00090           | 0.00030 | MM9112K |
| 0.039                    | 2.86                            | 2.84 | 3.67                     | 3.65 | 2.5589         | 2.5591 | 0.0002        | 0.0003  | 3.9370                       | 3.9373 | 0.0000        | 0.0006 | 3.9377                       | 3.9374 | 0.00100           | 0.00040 | MM9113K |
| 0.039                    | 3.08                            | 3.06 | 4.03                     | 4.01 | 2.7557         | 2.7559 | 0.0002        | 0.0003  | 4.3307                       | 4.3310 | 0.0000        | 0.0006 | 4.3314                       | 4.3311 | 0.00100           | 0.00040 | MM9114K |
| 0.039                    | 3.29                            | 3.26 | 4.23                     | 4.20 | 2.9526         | 2.9530 | 0.0002        | 0.0005  | 4.5276                       | 4.5279 | 0.0000        | 0.0006 | 4.5283                       | 4.5280 | 0.00100           | 0.00040 | MM9115K |
| 0.039                    | 3.52                            | 3.49 | 4.59                     | 4.56 | 3.1494         | 3.1498 | 0.0002        | 0.0005  | 4.9213                       | 4.9216 | 0.0000        | 0.0007 | 4.9221                       | 4.9217 | 0.00120           | 0.00040 | MM9116K |
| 0.039                    | 3.74                            | 3.71 | 4.81                     | 4.78 | 3.3463         | 3.3467 | 0.0002        | 0.0005  | 5.1181                       | 5.1185 | 0.0000        | 0.0007 | 5.1189                       | 5.1185 | 0.00110           | 0.00040 | MM9117K |
| 0.059                    | 3.96                            | 3.93 | 5.16                     | 5.13 | 3.5431         | 3.5435 | 0.0002        | 0.0005  | 5.5118                       | 5.5122 | 0.0000        | 0.0007 | 5.5126                       | 5.5122 | 0.00110           | 0.00040 | MM9118K |
| 0.059                    | 4.36                            | 4.33 | 5.55                     | 5.52 | 3.9368         | 3.9372 | 0.0002        | 0.0005  | 5.9055                       | 5.9059 | 0.0000        | 0.0007 | 5.9064                       | 5.9060 | 0.00120           | 0.00050 | MM9120K |
| 0.079                    | 4.85                            | 4.82 | 6.24                     | 6.21 | 4.3305         | 4.3309 | 0.0002        | 0.0005  | 6.6929                       | 6.6933 | 0.0000        | 0.0008 | 6.6938                       | 6.6934 | 0.00130           | 0.00050 | MM9122K |
| 0.079                    | 5.25                            | 5.22 | 6.63                     | 6.60 | 4.7242         | 4.7246 | 0.0002        | 0.0005  | 7.0866                       | 7.0870 | 0.0000        | 0.0008 | 7.0875                       | 7.0871 | 0.00130           | 0.00050 | MM9124K |
| 0.079                    | 5.71                            | 5.68 | 7.35                     | 7.32 | 5.1179         | 5.1183 | 0.0002        | 0.0006  | 7.8740                       | 7.8745 | 0.0000        | 0.0009 | 7.8750                       | 7.8746 | 0.00150           | 0.00060 | MM9126K |

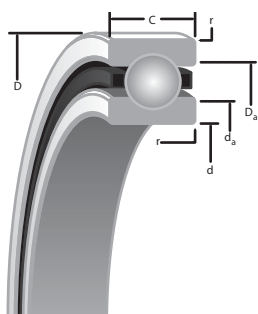
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## LIGHT 2(3)MM200WI (ISO 02) SERIES

### DIMENSIONAL SERIES METRIC



### SUPER PRECISION MM:

Running accuracy and performance meet ABEC 9 (ISO P2) levels. Non-critical features conform to ABEC 7 (ISO P4) requirements.

### WI CONSTRUCTION:

- Incorporates low shoulder on non-thrust side of outer rings.
- Maximum complement of balls separated by one-piece cage piloted against a ground thrust shoulder land of the outer ring.

| Bearing<br>Number |                       |               |                           |                     |       | (2MM) LOAD RATINGS<br>(steel ball & ceramic ball) |                      |                                   | (3MM) LOAD RATINGS<br>(steel ball & ceramic ball) |                      |                                   |
|-------------------|-----------------------|---------------|---------------------------|---------------------|-------|---------------------------------------------------|----------------------|-----------------------------------|---------------------------------------------------|----------------------|-----------------------------------|
|                   |                       |               |                           |                     |       | C <sub>0</sub> (stat)                             | C <sub>e</sub> (dyn) | Limiting<br>Speed <sup>(N9)</sup> | C <sub>0</sub> (stat)                             | C <sub>e</sub> (dyn) | Limiting<br>Speed <sup>(N9)</sup> |
| 2MM or<br>3MM     | d<br>Bore             | D<br>O.D.     | C<br>Width <sup>(1)</sup> | Ball Qty.<br>x Dia. | Wt.   |                                                   |                      |                                   |                                                   |                      |                                   |
| METRIC            | mm/tol: +0; - $\mu$ m |               |                           | mm                  | kg    | N                                                 |                      | RPM                               | N                                                 |                      | RPM                               |
| 200WI             | 10<br>(3.8)           | 30<br>(5.1)   | 9<br>(40)                 | 8 x 5.56            | 0.03  | 2900<br>2610                                      | 7100<br>7100         | 62800<br>75400                    | 2800<br>2540                                      | 6900<br>6900         | 56500<br>67800                    |
| 201WI             | 12<br>(3.8)           | 32<br>(6.4)   | 10<br>(80)                | 9 x 5.95            | 0.036 | 3800<br>3410                                      | 8760<br>8760         | 56700<br>68000                    | 3700<br>3320                                      | 8500<br>8500         | 51000<br>61200                    |
| 202WI             | 15<br>(3.8)           | 35<br>(6.4)   | 11<br>(80)                | 10 x 5.95           | 0.044 | 4500<br>4010                                      | 9580<br>9580         | 47800<br>57400                    | 4400<br>3880                                      | 9250<br>9250         | 43000<br>51600                    |
| 203WI             | 17<br>(3.8)           | 40<br>(6.4)   | 12<br>(80)                | 10 x 6.75           | 0.064 | 5900<br>5170                                      | 12000<br>12000       | 41900<br>50300                    | 5600<br>5000                                      | 11600<br>11600       | 37700<br>45200                    |
| 204WI             | 20<br>(5.1)           | 47<br>(6.4)   | 14<br>(130)               | 10 x 7.94           | 0.103 | 8100<br>7160                                      | 16100<br>16100       | 35700<br>42800                    | 7700<br>6900                                      | 15500<br>15500       | 32100<br>38500                    |
| 205WI             | 25<br>(5.1)           | 52<br>(7.7)   | 15<br>(130)               | 12 x 7.94           | 0.127 | 10200<br>9110                                     | 18400<br>18400       | 29800<br>35800                    | 9800<br>8690                                      | 17600<br>17600       | 26800<br>32200                    |
| 206WI             | 30<br>(5.1)           | 62<br>(7.7)   | 16<br>(130)               | 12 x 9.53           | 0.195 | 14700<br>13100                                    | 25500<br>25500       | 25100<br>30100                    | 14000<br>12500                                    | 24400<br>24400       | 22600<br>27100                    |
| 207WI             | 35<br>(6.4)           | 72<br>(7.7)   | 17<br>(130)               | 12 x 11.11          | 0.282 | 20000<br>17800                                    | 33700<br>33700       | 21600<br>25900                    | 19100<br>17100                                    | 32200<br>32200       | 19400<br>23300                    |
| 208WI             | 40<br>(6.4)           | 80<br>(7.7)   | 18<br>(130)               | 11 x 12.70          | 0.352 | 23800<br>21100                                    | 40,400<br>40400      | 19300<br>23100                    | 22700<br>20200                                    | 38700<br>38700       | 17400<br>20900                    |
| 209WI             | 45<br>(6.4)           | 85<br>(7.7)   | 19<br>(130)               | 13 x 12.70          | 0.408 | 28800<br>25600                                    | 45200<br>45200       | 17500<br>21000                    | 27600<br>24500                                    | 43100<br>43100       | 15800<br>19000                    |
| 210WI             | 50<br>(6.4)           | 90<br>(7.7)   | 20<br>(130)               | 14 x 12.70          | 0.457 | 31700<br>28200                                    | 47400<br>47400       | 16000<br>19200                    | 30200<br>26900                                    | 45200<br>45200       | 14400<br>17300                    |
| 211WI             | 55<br>(7.7)           | 100<br>(7.7)  | 21<br>(150)               | 14 x 14.29          | 0.608 | 40000<br>35500                                    | 58700<br>58700       | 14500<br>17400                    | 38500<br>34000                                    | 55900<br>55900       | 13100<br>15700                    |
| 212WI             | 60<br>(7.7)           | 110<br>(7.7)  | 22<br>(150)               | 14 x 15.88          | 0.787 | 48900<br>43600                                    | 71000<br>71000       | 13200<br>15800                    | 47100<br>41800                                    | 67700<br>67700       | 11900<br>14300                    |
| 213WI             | 65<br>(7.7)           | 120<br>(7.7)  | 23<br>(150)               | 14 x 16.67          | 0.998 | 54700<br>48700                                    | 77400<br>77400       | 12100<br>14300                    | 52500<br>46500                                    | 73700<br>73700       | 10900<br>13100                    |
| 214WI             | 70<br>(7.7)           | 125<br>(9)    | 24<br>(150)               | 14 x 17.46          | 1.074 | 60000<br>53600                                    | 84200<br>84200       | 11400<br>13700                    | 57400<br>51100                                    | 80200<br>80200       | 10300<br>12400                    |
| 215WI             | 75<br>(7.7)           | 130<br>(9)    | 25<br>(150)               | 15 x 17.46          | 1.174 | 64900<br>58200                                    | 87900<br>87900       | 10800<br>13000                    | 62300<br>55600                                    | 83700<br>83700       | 9700<br>11600                     |
| 216WI             | 80<br>(7.7)           | 140<br>(9)    | 26<br>(150)               | 15 x 19.05          | 1.448 | 77000<br>69000                                    | 102900<br>102900     | 10100<br>12100                    | 73800<br>65800                                    | 98000<br>98000       | 9100<br>10900                     |
| 217WI             | 85<br>(7.7)           | 150<br>(9)    | 28<br>(200)               | 15 x 20.64          | 1.817 | 90700<br>80,700                                   | 118900<br>118900     | 9400<br>11300                     | 85800<br>76800                                    | 113300<br>113300     | 8500<br>10200                     |
| 218WI             | 90<br>(7.7)           | 160<br>(10.3) | 30<br>(200)               | 14 x 22.23          | 2.196 | 97900<br>87100                                    | 129900<br>129900     | 8900<br>10700                     | 92500<br>82900                                    | 123700<br>123700     | 8000<br>9600                      |
| 219WI             | 95<br>(7.7)           | 170<br>(10.3) | 32<br>(200)               | 14 x 23.81          | 2.669 | 111200<br>9600                                    | 147100<br>147100     | 8400<br>10100                     | 106800<br>94900                                   | 140100<br>140100     | 7600<br>9100                      |
| 220WI             | 100<br>(7.7)          | 180<br>(10.3) | 34<br>(200)               | 14 x 25.40          | 3.209 | 126800<br>112900                                  | 165200<br>165200     | 8000<br>9600                      | 120100<br>107800                                  | 15500<br>157500      | 7200<br>8600                      |
| 222WI             | 110<br>(7.7)          | 200<br>(11.5) | 38<br>(200)               | 14 x 28.58          | 4.486 | 160100<br>142000                                  | 194900<br>194900     | 7200<br>8600                      | 153500<br>135900                                  | 185800<br>185800     | 6500<br>7800                      |
| 224WI             | 120<br>(7.7)          | 215<br>(11.5) | 40<br>(200)               | 14 x 30.16          | 5.358 | 180100<br>159600                                  | 210100<br>210100     | 6700<br>8000                      | 173500<br>152400                                  | 200500<br>200500     | 6000<br>7200                      |
| 226WI             | 130<br>(10.3)         | 230<br>(11.5) | 40<br>(250)               | 17 x 30.16          | 6.468 | 222400<br>197400                                  | 238200<br>238200     | 6100<br>7300                      | 211300<br>188800                                  | 226800<br>226800     | 5500<br>6600                      |
| 230WI             | 150<br>(10.3)         | 270<br>(12.8) | 45<br>(250)               | 15 x 38.10          | 9.98  | 302500<br>272100                                  | 305200<br>305200     | 5300<br>6400                      | 291300<br>259900                                  | 290900<br>290900     | 4800<br>5800                      |

(N9) For a single, grease lubricated, spring preloaded bearing. This value to be used in permissible Operating Speed (Sp) calculation.

(1) Width tolerance of preloaded bearing set +0/-0.25 mm (+0/-0.010").

(2) ABMA STD 20 (r<sub>as</sub> max).

| r<br>Rad. <sup>(2)</sup> | Suggested<br>Shoulder Diameters |       |                          |       | Shaft Diameter |         | Mounting Fits |       | FIXED                        |         |               |       | FLOATING                     |         |                   |       | Bearing<br>Number<br>2MM or<br>3MM |
|--------------------------|---------------------------------|-------|--------------------------|-------|----------------|---------|---------------|-------|------------------------------|---------|---------------|-------|------------------------------|---------|-------------------|-------|------------------------------------|
|                          | d <sub>a</sub> (Shaft)          |       | D <sub>a</sub> (Housing) |       | Min.           | Max.    | Loose         | Tight | Housing Bore<br>(Stationary) |         | Mounting Fits |       | Housing Bore<br>(Stationary) |         | Housing Clearance |       |                                    |
|                          | Max.                            | Min.  | Max.                     | Min.  |                |         |               |       | Min.                         | Max.    | Tight         | Loose | Max.                         | Min.    | Max.              | Min.  |                                    |
| mm                       | mm                              | mm    | mm                       | mm    | mm             | mm      | mm            | mm    | mm                           | mm      | mm            | mm    | mm                           | mm      | mm                | mm    |                                    |
| 0.6                      | 15.1                            | 14.9  | 26                       | 25.8  | 9.995          | 10.000  | 0.005         | 0.004 | 30                           | 30.005  | 0.000         | 0.010 | 30.010                       | 30.005  | 0.015             | 0.005 | 200WI                              |
| 0.6                      | 16.6                            | 16.4  | 28.1                     | 27.8  | 11.995         | 12.000  | 0.005         | 0.004 | 32                           | 32.005  | 0.000         | 0.011 | 32.010                       | 32.005  | 0.016             | 0.005 | 201WI                              |
| 0.6                      | 19.2                            | 18.9  | 31.1                     | 30.9  | 14.995         | 15.000  | 0.005         | 0.004 | 35                           | 35.006  | 0.000         | 0.012 | 35.010                       | 35.005  | 0.016             | 0.005 | 202WI                              |
| 0.6                      | 21.7                            | 21.5  | 35.7                     | 35.4  | 16.995         | 17.000  | 0.005         | 0.004 | 40                           | 40.006  | 0.000         | 0.012 | 40.010                       | 40.005  | 0.016             | 0.005 | 203WI                              |
| 1                        | 26                              | 25.8  | 41.5                     | 41.3  | 19.995         | 20.000  | 0.005         | 0.005 | 47                           | 47.006  | 0.000         | 0.012 | 47.012                       | 47.007  | 0.018             | 0.007 | 204WI                              |
| 1                        | 31.1                            | 30.9  | 47.1                     | 46.9  | 24.995         | 25.000  | 0.005         | 0.005 | 52                           | 52.006  | 0.000         | 0.013 | 52.012                       | 52.007  | 0.019             | 0.007 | 205WI                              |
| 1                        | 36.7                            | 36.5  | 56                       | 55.8  | 29.995         | 30.000  | 0.005         | 0.005 | 62                           | 62.008  | 0.000         | 0.015 | 62.012                       | 62.007  | 0.019             | 0.007 | 206WI                              |
| 1                        | 42.7                            | 42.2  | 65.3                     | 64.8  | 34.995         | 35.000  | 0.005         | 0.006 | 72                           | 72.008  | 0.000         | 0.015 | 72.011                       | 72.007  | 0.019             | 0.007 | 207WI                              |
| 1                        | 47.8                            | 47.2  | 73.2                     | 72.6  | 39.995         | 40.000  | 0.005         | 0.006 | 80                           | 80.008  | 0.000         | 0.015 | 80.012                       | 80.008  | 0.02              | 0.008 | 208WI                              |
| 1                        | 52.8                            | 52.3  | 78.2                     | 77.7  | 44.995         | 45.000  | 0.005         | 0.006 | 85                           | 85.008  | 0.000         | 0.016 | 85.016                       | 85.009  | 0.024             | 0.009 | 209WI                              |
| 1                        | 57.9                            | 57.4  | 83.3                     | 82.8  | 49.995         | 50.000  | 0.005         | 0.006 | 90                           | 90.008  | 0.000         | 0.016 | 90.015                       | 90.007  | 0.023             | 0.007 | 210WI                              |
| 1.5                      | 63.8                            | 63.3  | 92.2                     | 91.7  | 54.995         | 55.000  | 0.005         | 0.007 | 100                          | 100.008 | 0.000         | 0.016 | 100.018                      | 100.010 | 0.025             | 0.01  | 211WI                              |
| 1.5                      | 69.9                            | 69.3  | 101.4                    | 100.8 | 59.995         | 60.000  | 0.005         | 0.007 | 110                          | 110.008 | 0.000         | 0.016 | 110.018                      | 110.010 | 0.025             | 0.010 | 212WI                              |
| 1.5                      | 76.2                            | 75.7  | 109.7                    | 109.2 | 64.995         | 65.000  | 0.005         | 0.007 | 120                          | 120.008 | 0.000         | 0.016 | 120.018                      | 120.010 | 0.025             | 0.010 | 213WI                              |
| 1.5                      | 80.8                            | 80.3  | 115.8                    | 115.3 | 69.995         | 70.000  | 0.005         | 0.007 | 125                          | 125.008 | 0.000         | 0.017 | 125.021                      | 125.011 | 0.03              | 0.011 | 214WI                              |
| 1.5                      | 86                              | 85.2  | 120.8                    | 120   | 74.995         | 75.005  | 0.005         | 0.012 | 130                          | 130.009 | 0.000         | 0.018 | 130.020                      | 130.010 | 0.029             | 0.010 | 215WI                              |
| 2                        | 91.3                            | 90.6  | 129.9                    | 129.2 | 79.995         | 80.005  | 0.005         | 0.012 | 140                          | 140.009 | 0.000         | 0.018 | 140.020                      | 140.010 | 0.029             | 0.010 | 216WI                              |
| 2                        | 97.4                            | 96.7  | 138.8                    | 138.1 | 84.995         | 85.005  | 0.005         | 0.012 | 150                          | 150.009 | 0.000         | 0.018 | 150.023                      | 150.012 | 0.032             | 0.012 | 217WI                              |
| 2                        | 103.5                           | 102.7 | 148                      | 147.2 | 89.995         | 90.005  | 0.005         | 0.013 | 160                          | 160.009 | 0.000         | 0.022 | 160.022                      | 160.012 | 0.033             | 0.012 | 218WI                              |
| 2.1                      | 109.4                           | 108.6 | 157.1                    | 153.3 | 94.995         | 95.005  | 0.005         | 0.013 | 170                          | 170.010 | 0.000         | 0.02  | 170.022                      | 170.012 | 0.032             | 0.012 | 219WI                              |
| 2.1                      | 115.2                           | 114.4 | 166                      | 165.2 | 99.995         | 100.005 | 0.005         | 0.013 | 180                          | 180.010 | 0.000         | 0.02  | 180.022                      | 180.012 | 0.032             | 0.012 | 220WI                              |
| 2.1                      | 127.1                           | 126.4 | 184.3                    | 183.5 | 109.995        | 110.005 | 0.005         | 0.013 | 200                          | 200.011 | 0.000         | 0.022 | 200.025                      | 200.015 | 0.036             | 0.015 | 222WI                              |
| 2.1                      | 138.1                           | 137.3 | 198.5                    | 197.7 | 119.995        | 120.005 | 0.005         | 0.013 | 215                          | 215.011 | 0.000         | 0.022 | 215.025                      | 215.015 | 0.036             | 0.015 | 224WI                              |
| 2.5                      | 150.5                           | 149.7 | 211                      | 210.2 | 129.995        | 130.005 | 0.005         | 0.015 | 230                          | 230.011 | 0.000         | 0.022 | 230.025                      | 230.015 | 0.036             | 0.015 | 226WI                              |
| 2.5                      | 172.6                           | 171.8 | 248.8                    | 248   | 149.995        | 150.005 | 0.005         | 0.015 | 270                          | 270.013 | 0.000         | 0.026 | 270.031                      | 270.018 | 0.044             | 0.018 | 230WI                              |

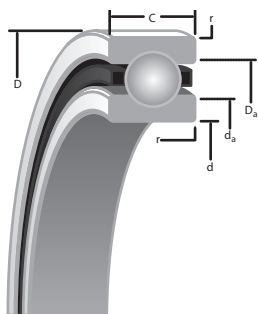
D





## LIGHT 2(3)MM200WI (ISO 02) SERIES

### DIMENSIONAL SERIES INCHES



D

### SUPER PRECISION MM:

Running accuracy and performance meet ABEC 9 (ISO P2) levels. Non-critical features conform to ABEC 7 (ISO P4) requirements.

### WI CONSTRUCTION:

- Incorporates low shoulder on non-thrust side of outer rings.
- Maximum complement of balls separated by one-piece cage piloted against a ground thrust shoulder land of the outer ring.

| Bearing Number<br>2MM or 3MM | d<br>Bore              | D<br>O.D.       | C<br>Width <sup>(1)</sup> | Ball Qty.<br>x Dia. | Wt.<br>lbs. | (2MM) LOAD RATINGS<br>(steel ball & ceramic ball) |                      |                                  | (3MM) LOAD RATINGS<br>(steel ball & ceramic ball) |                      |                                  |
|------------------------------|------------------------|-----------------|---------------------------|---------------------|-------------|---------------------------------------------------|----------------------|----------------------------------|---------------------------------------------------|----------------------|----------------------------------|
|                              |                        |                 |                           |                     |             | C <sub>0</sub> (stat)                             | C <sub>e</sub> (dyn) | Limiting Speed (N <sub>g</sub> ) | C <sub>0</sub> (stat)                             | C <sub>e</sub> (dyn) | Limiting Speed (N <sub>g</sub> ) |
| INCHES                       | in./tol: +0; -0.000(X) |                 |                           | in.                 | lbs.        | lbs.                                              |                      | RPM                              | lbs.                                              |                      | RPM                              |
| 200WI                        | 0.3937<br>(1.5)        | 1.1811<br>(2)   | 0.3543<br>(16)            | 8 x 7/32            | 0.07        | 660<br>590                                        | 1600<br>1600         | 62800<br>75400                   | 640<br>570                                        | 1550<br>1550         | 56500<br>67800                   |
| 201WI                        | 0.4724<br>(1.5)        | 1.2598<br>(2.5) | 0.3937<br>(31)            | 9 x 15/64           | 0.08        | 860<br>770                                        | 1970<br>1970         | 56700<br>68000                   | 830<br>750                                        | 1910<br>1910         | 51000<br>61200                   |
| 202WI                        | 0.5906<br>(1.5)        | 1.378<br>(2.5)  | 0.4331<br>(31)            | 10 x 15/64          | 0.1         | 1010<br>900                                       | 2200<br>2200         | 47800<br>57400                   | 980<br>870                                        | 2080<br>2080         | 43000<br>51600                   |
| 203WI                        | 0.6693<br>(1.5)        | 1.5748<br>(2.5) | 0.4724<br>(31)            | 10 x 17/64          | 0.14        | 1320<br>1160                                      | 2750<br>2750         | 41900<br>50300                   | 1270<br>1120                                      | 2600<br>2600         | 37700<br>45200                   |
| 204WI                        | 0.7874<br>(2)          | 1.8504<br>(2.5) | 0.5512<br>(47)            | 10 x 5/16           | 0.23        | 1810<br>1610                                      | 3620<br>3620         | 35700<br>42800                   | 1730<br>1550                                      | 3490<br>3490         | 32100<br>38500                   |
| 205WI                        | 0.9843<br>(2)          | 2.0472<br>(3)   | 0.5906<br>(47)            | 12 x 5/16           | 0.28        | 2320<br>2050                                      | 4130<br>4130         | 29800<br>35800                   | 2200<br>1950                                      | 3950<br>3950         | 26800<br>32100                   |
| 206WI                        | 1.1811<br>(2)          | 2.4409<br>(3)   | 0.6299<br>(47)            | 12 x 3/8            | 0.43        | 3310<br>2940                                      | 5740<br>5740         | 25100<br>30100                   | 3150<br>2810                                      | 5490<br>5490         | 22600<br>27100                   |
| 207WI                        | 1.378<br>(2.5)         | 2.8346<br>(3)   | 0.6693<br>(47)            | 12 x 7/16           | 0.62        | 4490<br>4000                                      | 7580<br>7580         | 21600<br>25900                   | 4300<br>3820                                      | 7240<br>7240         | 19400<br>23300                   |
| 208WI                        | 1.5748<br>(2.5)        | 3.1496<br>(3)   | 0.7087<br>(47)            | 11 x 1/2            | 0.78        | 5340<br>4750                                      | 9070<br>9070         | 19300<br>23200                   | 5100<br>4550                                      | 8690<br>8690         | 17400<br>20900                   |
| 209WI                        | 1.7717<br>(2.5)        | 3.3465<br>(3)   | 0.748<br>(47)             | 13 x 1/2            | 0.9         | 6470<br>5760                                      | 10200<br>10200       | 17500<br>21000                   | 6200<br>5500                                      | 9700<br>9700         | 15800<br>19000                   |
| 210WI                        | 1.9685<br>(2.5)        | 3.5433<br>(3)   | 0.7874<br>(47)            | 14 x 1/2            | 1.01        | 7130<br>6340                                      | 10700<br>10700       | 16000<br>19200                   | 6800<br>6050                                      | 10200<br>10200       | 14400<br>17300                   |
| 211WI                        | 2.1654<br>(3)          | 3.937<br>(3)    | 0.8268<br>(59)            | 14 x 9/16           | 1.34        | 9000<br>7980                                      | 13200<br>13200       | 14500<br>17400                   | 8650<br>7640                                      | 12600<br>12600       | 13100<br>15700                   |
| 212WI                        | 2.3622<br>(3)          | 4.3307<br>(3)   | 0.8661<br>(59)            | 14 x 5/8            | 1.74        | 11000<br>9810                                     | 16000<br>16000       | 13200<br>15800                   | 10600<br>9400                                     | 15200<br>15200       | 11900<br>14300                   |
| 213WI                        | 2.5591<br>(3)          | 4.7244<br>(3)   | 0.9055<br>(59)            | 14 x 21/32          | 2.2         | 12300<br>11000                                    | 17400<br>17400       | 12100<br>14500                   | 11800<br>10400                                    | 16600<br>16600       | 10900<br>13100                   |
| 214WI                        | 2.7559<br>(3)          | 4.9213<br>(3.5) | 0.9449<br>(59)            | 14 x 11/16          | 2.37        | 13400<br>12100                                    | 18900<br>18900       | 11400<br>13700                   | 12900<br>11500                                    | 18000<br>18000       | 10300<br>12400                   |
| 215WI                        | 2.9528<br>(3)          | 5.1181<br>(3.5) | 0.9843<br>(59)            | 15 x 11/16          | 2.59        | 14600<br>13100                                    | 19800<br>19800       | 10800<br>13000                   | 14000<br>12500                                    | 18800<br>18800       | 9700<br>11600                    |
| 216WI                        | 3.1496<br>(3)          | 5.5118<br>(3.5) | 1.0236<br>(59)            | 15 x 3/4            | 3.19        | 17300<br>15500                                    | 23100<br>23100       | 10100<br>12100                   | 16600<br>14800                                    | 22000<br>22000       | 9100<br>10900                    |
| 217WI                        | 3.3465<br>(3)          | 5.9055<br>(3.5) | 1.1024<br>(79)            | 15 x 13/16          | 4.01        | 20400<br>18200                                    | 26700<br>26700       | 9400<br>11300                    | 19300<br>17300                                    | 25500<br>25500       | 8500<br>10200                    |
| 218WI                        | 3.5433<br>(3)          | 6.2992<br>(4)   | 1.1811<br>(79)            | 14 x 7/8            | 4.84        | 22000<br>19600                                    | 29200<br>29200       | 8900<br>10700                    | 20800<br>18600                                    | 27800<br>27800       | 8000<br>9600                     |
| 219WI                        | 3.7402<br>(3)          | 6.6929<br>(4)   | 1.2598<br>(79)            | 14 x 15/16          | 5.88        | 25000<br>22400                                    | 33100<br>33100       | 8400<br>10100                    | 24000<br>21300                                    | 31500<br>31500       | 7600<br>9100                     |
| 220WI                        | 3.937<br>(3)           | 7.0866<br>(4)   | 1.3386<br>(79)            | 14 x 1              | 7.07        | 28500<br>25400                                    | 37100<br>37100       | 8000<br>9600                     | 27000<br>24200                                    | 35400<br>35400       | 7200<br>8600                     |
| 222WI                        | 4.3307<br>(3)          | 7.874<br>(4.5)  | 1.4961<br>(79)            | 14 x 1 1/8          | 9.89        | 36000<br>31900                                    | 43800<br>43800       | 7200<br>8600                     | 34500<br>30600                                    | 41800<br>41800       | 6500<br>7800                     |
| 224WI                        | 4.7244<br>(3)          | 8.4646<br>(4.5) | 1.5748<br>(79)            | 14 x 1 3/16         | 11.81       | 40500<br>35900                                    | 47200<br>47200       | 6700<br>8000                     | 39000<br>34300                                    | 45100<br>45100       | 6000<br>7200                     |
| 226WI                        | 5.1181<br>(4)          | 9.0551<br>(4.5) | 1.5748<br>(98)            | 17 x 1 3/16         | 14.26       | 50000<br>44400                                    | 53500<br>53500       | 6100<br>7300                     | 47500<br>42500                                    | 51000<br>51000       | 5500<br>6600                     |
| 230WI                        | 5.9055<br>(4)          | 10.6299<br>(5)  | 1.7717<br>(98)            | 15 x 1 1/2          | 22          | 68000<br>61200                                    | 68600<br>68600       | 5300<br>6400                     | 65500<br>58400                                    | 65400<br>65400       | 4800<br>5800                     |

(N<sub>g</sub>) For a single, grease lubricated, spring preloaded bearing. This value to be used in permissible Operating Speed (Sp) calculation.

<sup>(1)</sup> Width tolerance of preloaded bearing set +0/-0.25 mm (+0/-0.010").

<sup>(2)</sup> ABMA STD 20 (r<sub>as</sub> max).

| r<br>Rad. <sup>(2)</sup> | Suggested<br>Shoulder Diameters |      |                          |      | Shaft Diameter |        | Mounting Fits |         | FIXED                        |         |               |         | FLOATING                     |          |                   |         | Bearing<br>Number<br>2MM or<br>3MM |  |
|--------------------------|---------------------------------|------|--------------------------|------|----------------|--------|---------------|---------|------------------------------|---------|---------------|---------|------------------------------|----------|-------------------|---------|------------------------------------|--|
|                          | d <sub>a</sub> (Shaft)          |      | D <sub>a</sub> (Housing) |      | Min.           | Max.   | Loose         | Tight   | Housing Bore<br>(Stationary) |         | Mounting Fits |         | Housing Bore<br>(Stationary) |          | Housing Clearance |         |                                    |  |
|                          | Max.                            | Min. | Max.                     | Min. |                |        |               |         | Min.                         | Max.    | Tight         | Loose   | Max.                         | Min.     | Max.              | Min.    |                                    |  |
| in.                      | in.                             | in.  | in.                      | in.  | in.            | in.    | in.           | in.     | in.                          | in.     | in.           | in.     | in.                          | in.      | in.               | in.     |                                    |  |
| 0.024                    | 0.60                            | 0.59 | 1.03                     | 1.02 | 0.3935         | 0.3937 | 0.0002        | 0.00015 | 1.1811                       | 1.1813  | 0.000         | 0.0004  | 1.18150                      | 1.18130  | 0.00060           | 0.00020 | 200WI                              |  |
| 0.024                    | 0.66                            | 0.65 | 1.11                     | 1.10 | 0.4722         | 0.4724 | 0.0002        | 0.00015 | 1.2598                       | 1.2600  | 0.000         | 0.00045 | 1.26020                      | 1.26000  | 0.00070           | 0.00020 | 201WI                              |  |
| 0.024                    | 0.76                            | 0.75 | 1.23                     | 1.22 | 0.5904         | 0.5906 | 0.0002        | 0.00015 | 1.3780                       | 1.3783  | 0.000         | 0.0005  | 1.37840                      | 1.37820  | 0.00070           | 0.00020 | 202WI                              |  |
| 0.024                    | 0.86                            | 0.85 | 1.41                     | 1.40 | 0.6691         | 0.6693 | 0.0002        | 0.00015 | 1.5748                       | 1.5751  | 0.000         | 0.0005  | 1.57520                      | 1.57500  | 0.00070           | 0.00020 | 203WI                              |  |
| 0.039                    | 1.03                            | 1.02 | 1.64                     | 1.63 | 0.7872         | 0.7874 | 0.0002        | 0.0002  | 1.8504                       | 1.8507  | 0.000         | 0.0005  | 1.85090                      | 1.85070  | 0.00080           | 0.00030 | 204WI                              |  |
| 0.039                    | 1.23                            | 1.22 | 1.86                     | 1.85 | 0.9841         | 0.9843 | 0.0002        | 0.0002  | 2.0472                       | 2.0475  | 0.000         | 0.00055 | 2.04770                      | 2.04750  | 0.00080           | 0.00030 | 205WI                              |  |
| 0.039                    | 1.45                            | 1.44 | 2.21                     | 2.20 | 1.1809         | 1.1811 | 0.0002        | 0.0002  | 2.4409                       | 2.4412  | 0.000         | 0.0006  | 2.44140                      | 2.44120  | 0.00080           | 0.00030 | 206WI                              |  |
| 0.039                    | 1.68                            | 1.66 | 2.57                     | 2.55 | 1.3778         | 1.3780 | 0.0002        | 0.00025 | 2.8346                       | 2.8349  | 0.000         | 0.0006  | 2.83510                      | 2.83490  | 0.00080           | 0.00030 | 207WI                              |  |
| 0.039                    | 1.88                            | 1.86 | 2.88                     | 2.86 | 1.5746         | 1.5748 | 0.0002        | 0.00025 | 3.1496                       | 3.1499  | 0.000         | 0.0006  | 3.15010                      | 3.14990  | 0.00080           | 0.00030 | 208WI                              |  |
| 0.039                    | 2.08                            | 2.06 | 3.08                     | 3.06 | 1.7715         | 1.7717 | 0.0002        | 0.00025 | 3.3465                       | 3.3468  | 0.000         | 0.0006  | 3.34710                      | 3.34680  | 0.00090           | 0.00030 | 209WI                              |  |
| 0.039                    | 2.28                            | 2.26 | 3.28                     | 3.26 | 1.9683         | 1.9685 | 0.0002        | 0.00025 | 3.5433                       | 3.5436  | 0.000         | 0.0006  | 3.54390                      | 3.54360  | 0.00090           | 0.00030 | 210WI                              |  |
| 0.059                    | 2.51                            | 2.49 | 3.63                     | 3.61 | 2.1652         | 2.1654 | 0.0002        | 0.0003  | 3.9370                       | 3.9373  | 0.000         | 0.0006  | 3.93770                      | 3.93740  | 0.00100           | 0.00040 | 211WI                              |  |
| 0.059                    | 2.75                            | 2.73 | 3.99                     | 3.97 | 2.3620         | 2.3622 | 0.0002        | 0.0003  | 4.3307                       | 4.3310  | 0.000         | 0.0006  | 4.33140                      | 4.33110  | 0.00100           | 0.00040 | 212WI                              |  |
| 0.059                    | 3.00                            | 2.98 | 4.32                     | 4.30 | 2.5589         | 2.5591 | 0.0002        | 0.0003  | 4.7244                       | 4.7247  | 0.000         | 0.0006  | 4.72510                      | 4.72480  | 0.00100           | 0.00040 | 213WI                              |  |
| 0.059                    | 3.18                            | 3.16 | 4.56                     | 4.54 | 2.7557         | 2.7559 | 0.0002        | 0.0003  | 4.9213                       | 4.9216  | 0.000         | 0.0007  | 4.92210                      | 4.92170  | 0.00120           | 0.00040 | 214WI                              |  |
| 0.059                    | 3.39                            | 3.36 | 4.76                     | 4.73 | 2.9526         | 2.9530 | 0.0002        | 0.0005  | 5.1181                       | 5.1185  | 0.000         | 0.0007  | 5.11890                      | 5.11850  | 0.00110           | 0.00040 | 215WI                              |  |
| 0.079                    | 3.60                            | 3.57 | 5.12                     | 5.09 | 3.1494         | 3.1498 | 0.0002        | 0.0005  | 5.5118                       | 5.5122  | 0.000         | 0.0007  | 5.51260                      | 5.51220  | 0.00110           | 0.00040 | 216WI                              |  |
| 0.079                    | 3.84                            | 3.81 | 5.47                     | 5.44 | 3.3463         | 3.3467 | 0.0002        | 0.0005  | 5.9055                       | 5.9059  | 0.000         | 0.0007  | 5.90640                      | 5.90600  | 0.00120           | 0.00050 | 217WI                              |  |
| 0.079                    | 4.08                            | 4.05 | 5.83                     | 5.8  | 3.5431         | 3.5435 | 0.0002        | 0.0005  | 6.2992                       | 6.2996  | 0.000         | 0.0008  | 6.30010                      | 6.29970  | 0.00130           | 0.00050 | 218WI                              |  |
| 0.079                    | 4.31                            | 4.28 | 6.19                     | 6.16 | 3.7400         | 3.7404 | 0.0002        | 0.0005  | 6.6929                       | 6.6933  | 0.000         | 0.0008  | 6.69380                      | 6.69340  | 0.00130           | 0.00050 | 219WI                              |  |
| 0.079                    | 4.54                            | 4.51 | 6.54                     | 6.51 | 3.9368         | 3.9372 | 0.0002        | 0.0005  | 7.0866                       | 7.0870  | 0.000         | 0.0008  | 7.08750                      | 7.08710  | 0.00130           | 0.00050 | 220WI                              |  |
| 0.079                    | 5.01                            | 4.98 | 7.26                     | 7.23 | 4.3305         | 4.3309 | 0.0002        | 0.0005  | 7.8740                       | 7.8745  | 0.000         | 0.0009  | 7.87500                      | 7.87460  | 0.00150           | 0.00060 | 222WI                              |  |
| 0.079                    | 5.44                            | 5.41 | 7.82                     | 7.79 | 4.7242         | 4.7246 | 0.0002        | 0.0005  | 8.4646                       | 8.4651  | 0.000         | 0.0009  | 8.46560                      | 8.46520  | 0.00150           | 0.00060 | 224WI                              |  |
| 0.098                    | 5.93                            | 5.9  | 8.31                     | 8.28 | 5.1179         | 5.1183 | 0.0002        | 0.0006  | 9.0551                       | 9.0556  | 0.000         | 0.0009  | 9.05610                      | 9.05570  | 0.00150           | 0.00060 | 226WI                              |  |
| 0.098                    | 6.8                             | 6.77 | 9.8                      | 9.77 | 5.9053         | 5.9057 | 0.0002        | 0.0006  | 10.6299                      | 10.6304 | 0.000         | 0.0010  | 10.63120                     | 10.63070 | 0.00180           | 0.00080 | 230WI                              |  |

D





## LIGHT 2MM200WI (ISO 02) SERIES

### DUPLEX PERFORMANCE DATA

### MOUNTING ARRANGEMENTS



Suggested  
DB



Tandem  
DT



Special Applications  
DF

| Bearing<br>Number                              | PRELOAD |      |      |      | AXIAL STIFFNESS <sup>(1)</sup> |        |        |        | RADIAL STIFFNESS <sup>(1)</sup> |         |         | SPACER OFFSETS <sup>(1)</sup> |                    |                    |
|------------------------------------------------|---------|------|------|------|--------------------------------|--------|--------|--------|---------------------------------|---------|---------|-------------------------------|--------------------|--------------------|
|                                                | DUX     | DUL  | DUM  | DUH  | X-light                        | Light  | Medium | Heavy  | Light                           | Medium  | Heavy   | X-Light<br>to Light           | Light to<br>Medium | Medium<br>to Heavy |
|                                                | N       |      |      |      | N/μm                           |        |        |        | N/μm                            |         |         | μm                            |                    |                    |
| METRIC DUPLEX PERFORMANCE DATA 2MM200WN SERIES |         |      |      |      |                                |        |        |        |                                 |         |         |                               |                    |                    |
| 2MM200WI                                       | —       | 20   | 90   | 160  | —                              | 18.54  | 33.06  | 42.85  | 85.88                           | 136.07  | 162.13  | —                             | 10.41              | 7.11               |
| 2MM201WI                                       | —       | 20   | 90   | 160  | —                              | 19.24  | 34.11  | 44.07  | 96.02                           | 153.56  | 183.30  | —                             | 9.91               | 6.86               |
| 2MM202WI                                       | —       | 20   | 90   | 180  | —                              | 20.64  | 36.20  | 49.67  | 102.67                          | 164.93  | 205.51  | —                             | 9.40               | 8.38               |
| 2MM203WI                                       | —       | 40   | 130  | 330  | —                              | 25.54  | 41.10  | 63.84  | 137.12                          | 197.46  | 263.05  | —                             | 10.67              | 15.24              |
| 2MM204WI                                       | —       | 70   | 180  | 360  | —                              | 30.08  | 46.17  | 64.36  | 168.43                          | 232.97  | 289.81  | —                             | 11.68              | 12.95              |
| 2MM205WI                                       | —       | 90   | 220  | 400  | —                              | 37.60  | 56.49  | 74.86  | 209.53                          | 283.16  | 340.88  | —                             | 11.43              | 10.92              |
| 2MM206WI                                       | —       | 90   | 220  | 560  | —                              | 38.30  | 56.49  | 87.10  | 222.47                          | 303.10  | 405.77  | —                             | 11.18              | 18.54              |
| 2MM207WI                                       | —       | 130  | 400  | 780  | —                              | 47.22  | 75.91  | 104.42 | 269.35                          | 388.10  | 478.70  | —                             | 17.27              | 16.76              |
| 2MM208WI                                       | —       | 130  | 440  | 890  | —                              | 45.30  | 75.73  | 105.46 | 261.65                          | 392.65  | 489.20  | —                             | 20.57              | 19.56              |
| 2MM209WI                                       | 110     | 180  | 560  | 1110 | 46.52                          | 56.14  | 91.82  | 128.20 | 322.87                          | 472.58  | 588.36  | 5.08                          | 20.32              | 20.32              |
| 2MM210WI                                       | 130     | 220  | 560  | 1220 | 51.60                          | 64.19  | 95.67  | 139.57 | 366.24                          | 496.89  | 637.86  | 6.35                          | 16.76              | 22.61              |
| 2MM211WI                                       | 160     | 220  | 780  | 1560 | 54.22                          | 63.31  | 109.49 | 153.74 | 382.86                          | 582.42  | 724.61  | 4.83                          | 25.65              | 23.62              |
| 2MM212WI                                       | 180     | 330  | 890  | 1890 | 59.12                          | 77.66  | 119.11 | 171.40 | 456.31                          | 632.26  | 802.44  | 9.65                          | 22.61              | 27.69              |
| 2MM213WI                                       | 200     | 440  | 1000 | 2110 | 62.61                          | 88.32  | 126.28 | 181.20 | 511.76                          | 668.64  | 846.52  | 13.46                         | 20.83              | 28.96              |
| 2MM214WI                                       | 220     | 440  | 1110 | 2220 | 67.86                          | 89.72  | 133.97 | 186.97 | 519.80                          | 703.80  | 876.25  | 11.18                         | 23.88              | 27.69              |
| 2MM215WI                                       | 240     | 560  | 1220 | 2450 | 72.93                          | 102.49 | 145.34 | 203.06 | 586.96                          | 760.64  | 946.38  | 14.48                         | 21.59              | 28.19              |
| 2MM216WI                                       | 270     | 670  | 1450 | 2780 | 77.66                          | 113.16 | 159.16 | 217.75 | 639.96                          | 825.18  | 1014.59 | 17.02                         | 22.86              | 28.45              |
| 2MM217WI                                       | 290     | 780  | 1670 | 3340 | 80.63                          | 119.28 | 167.38 | 234.19 | 692.78                          | 890.07  | 1108.17 | 19.05                         | 24.89              | 33.27              |
| 2MM218WI                                       | 330     | 780  | 1780 | 3560 | 82.55                          | 116.83 | 168.25 | 235.07 | 678.61                          | 891.47  | 1109.92 | 18.03                         | 27.94              | 35.31              |
| 2MM219WI                                       | 360     | 890  | 2000 | 4000 | 86.75                          | 126.10 | 179.97 | 250.98 | 726.88                          | 932.74  | 1183.02 | 20.07                         | 28.96              | 37.08              |
| 2MM220WI                                       | 380     | 1110 | 2220 | 4450 | 88.85                          | 137.65 | 187.14 | 261.30 | 795.8                           | 1000.08 | 1245.99 | 25.91                         | 27.43              | 39.62              |
| 2MM222WI                                       | 440     | 1330 | 2670 | 5340 | 98.64                          | 153.91 | 208.48 | 289.81 | 881.32                          | 1108.17 | 1381.36 | 28.19                         | 29.46              | 42.93              |
| 2MM224WI                                       | 490     | 1470 | 2940 | 5870 | 102.84                         | 158.81 | 215.65 | 300.13 | 926.97                          | 1166.06 | 1453.59 | 29.46                         | 31.24              | 45.47              |
| 2MM226WI                                       | 560     | 1650 | 3290 | 6580 | 121.21                         | 186.44 | 252.38 | 350.32 | 1089.45                         | 1372.44 | 1712.80 | 27.94                         | 29.97              | 43.69              |
| 2MM230WI                                       | 690     | 1890 | 3780 | 7560 | 130.30                         | 192.74 | 258.85 | 356.10 | 1136.85                         | 1437.33 | 1797.97 | 29.46                         | 33.53              | 49.28              |
| lbs.                                           |         |      |      |      |                                |        |        |        |                                 |         |         |                               |                    |                    |

Notes: <sup>(1)</sup> For DB or DF arrangements only. For other mounting arrangements contact your Timken representative.

# LIGHT 3MM200WI (ISO 02) SERIES

## DUPLEX PERFORMANCE DATA

## MOUNTING ARRANGEMENTS



Suggested  
DB



Tandem  
DT



Special Applications  
DF

| Bearing<br>Number                              | PRELOAD |      |      |       | AXIAL STIFFNESS <sup>(1)</sup> |        |        | RADIAL STIFFNESS <sup>(1)</sup> |         |         | SPACER OFFSETS <sup>(1)</sup> |                    |                    |
|------------------------------------------------|---------|------|------|-------|--------------------------------|--------|--------|---------------------------------|---------|---------|-------------------------------|--------------------|--------------------|
|                                                | DUX     | DUL  | DUM  | DUH   | Light                          | Medium | Heavy  | Light                           | Medium  | Heavy   | X-Light<br>to Light           | Light to<br>Medium | Medium<br>to Heavy |
|                                                | N       |      |      |       | N/μm                           |        |        | N/μm                            |         |         | μm                            |                    |                    |
| METRIC DUPLEX PERFORMANCE DATA 3MM200WI SERIES |         |      |      |       |                                |        |        |                                 |         |         |                               |                    |                    |
| 3MM200WI                                       | —       | 40   | 130  | 270   | 39.35                          | 59.99  | 79.75  | 84.65                           | 121.38  | 150.94  | —                             | 7.11               | 7.62               |
| 3MM201WI                                       | —       | 40   | 130  | 270   | 44.77                          | 67.51  | 88.85  | 94.10                           | 135.90  | 169.48  | —                             | 6.35               | 6.86               |
| 3MM202WI                                       | —       | 70   | 180  | 360   | 55.44                          | 80.45  | 106.51 | 115.96                          | 160.21  | 199.39  | —                             | 6.60               | 6.60               |
| 3MM203WI                                       | —       | 90   | 330  | 440   | 63.84                          | 105.99 | 119.28 | 132.92                          | 204.46  | 223.87  | —                             | 11.43              | 4.06               |
| 3MM204WI                                       | —       | 130  | 360  | 560   | 75.21                          | 109.66 | 131.35 | 159.51                          | 220.02  | 253.26  | —                             | 9.65               | 6.60               |
| 3MM205WI                                       | —       | 160  | 400  | 670   | 89.20                          | 128.20 | 157.76 | 189.59                          | 258.50  | 303.98  | —                             | 8.89               | 7.37               |
| 3MM206WI                                       | —       | 220  | 560  | 890   | 106.16                         | 150.76 | 182.42 | 227.02                          | 306.77  | 356.10  | —                             | 10.41              | 7.87               |
| 3MM207WI                                       | 130     | 310  | 780  | 1330  | 126.45                         | 179.62 | 223.52 | 267.42                          | 360.99  | 428.33  | 6.86                          | 12.19              | 12.19              |
| 3MM208WI                                       | 160     | 360  | 890  | 1330  | 132.57                         | 187.84 | 220.90 | 275.64                          | 372.71  | 423.96  | 7.11                          | 13.21              | 8.64               |
| 3MM209WI                                       | 180     | 440  | 1110 | 1780  | 159.86                         | 226.85 | 274.24 | 332.14                          | 448.44  | 520.50  | 7.87                          | 13.72              | 10.67              |
| 3MM210WI                                       | 200     | 490  | 1220 | 2000  | 173.68                         | 246.43 | 300.65 | 360.12                          | 486.22  | 568.25  | 7.62                          | 13.97              | 11.43              |
| 3MM211WI                                       | 220     | 620  | 1560 | 2450  | 193.61                         | 274.94 | 330.21 | 407.34                          | 549.71  | 634.36  | 9.65                          | 15.75              | 11.68              |
| 3MM212WI                                       | 240     | 760  | 1890 | 2890  | 213.73                         | 303.63 | 360.47 | 450.02                          | 607.43  | 695.05  | 11.18                         | 17.53              | 11.94              |
| 3MM213WI                                       | 270     | 850  | 2110 | 3340  | 225.62                         | 320.42 | 385.65 | 474.50                          | 640.48  | 740.18  | 11.94                         | 18.54              | 13.72              |
| 3MM214WI                                       | 290     | 890  | 2220 | 3560  | 231.39                         | 328.46 | 397.37 | 492.87                          | 665.67  | 772.53  | 12.19                         | 19.05              | 14.73              |
| 3MM215WI                                       | 360     | 980  | 2450 | 3780  | 250.28                         | 355.75 | 424.13 | 532.75                          | 719.19  | 825.53  | 11.68                         | 19.30              | 13.72              |
| 3MM216WI                                       | 400     | 1110 | 2780 | 4450  | 269.87                         | 383.03 | 462.79 | 570.35                          | 770.61  | 894.61  | 12.45                         | 20.32              | 15.75              |
| 3MM217WI                                       | 440     | 1200 | 3000 | 4890  | 280.36                         | 397.37 | 483.42 | 600.43                          | 812.41  | 949.18  | 12.45                         | 21.08              | 17.02              |
| 3MM218WI                                       | 490     | 1330 | 3110 | 5560  | 286.14                         | 394.75 | 498.12 | 608.83                          | 805.06  | 968.42  | 13.72                         | 20.83              | 21.84              |
| 3MM219WI                                       | 560     | 1560 | 3110 | 6230  | 310.27                         | 402.97 | 531.00 | 655.70                          | 824.65  | 1029.29 | 15.24                         | 17.27              | 26.67              |
| 3MM220WI                                       | 600     | 1730 | 3470 | 6940  | 328.29                         | 426.41 | 561.60 | 694.18                          | 873.45  | 1090.50 | 16.26                         | 18.29              | 27.94              |
| 3MM222WI                                       | 690     | 2050 | 4082 | 8180  | 359.94                         | 466.81 | 613.90 | 762.39                          | 960.03  | 1199.46 | 17.78                         | 19.81              | 30.23              |
| 3MM224WI                                       | 820     | 2250 | 4480 | 8980  | 377.78                         | 490.07 | 643.98 | 805.76                          | 1014.77 | 1267.85 | 17.53                         | 20.57              | 31.50              |
| 3MM226WI                                       | 980     | 2560 | 5120 | 10230 | 448.09                         | 580.49 | 761.86 | 954.08                          | 1190.72 | 1503.97 | 16.51                         | 19.81              | 30.48              |
| 3MM230WI                                       | 1290    | 3110 | 6230 | 12450 | 473.63                         | 612.32 | 801.04 | 1009.87                         | 1276.25 | 1598.24 | 17.53                         | 22.86              | 35.05              |
|                                                | lbs.    |      |      |       | 10 <sup>6</sup> lbs./in.       |        |        | 10 <sup>6</sup> lbs./in.        |         |         | in.                           |                    |                    |
| INCH DUPLEX PERFORMANCE DATA 3MM200WI SERIES   |         |      |      |       |                                |        |        |                                 |         |         |                               |                    |                    |
| 3MM200WI                                       | —       | 10   | 30   | 60    | 0.225                          | 0.343  | 0.456  | 0.484                           | 0.694   | 0.863   | —                             | 0.00028            | 0.00030            |
| 3MM201WI                                       | —       | 10   | 30   | 60    | 0.256                          | 0.386  | 0.508  | 0.538                           | 0.777   | 0.969   | —                             | 0.00025            | 0.00027            |
| 3MM202WI                                       | —       | 15   | 40   | 80    | 0.317                          | 0.460  | 0.609  | 0.663                           | 0.916   | 1.140   | —                             | 0.00026            | 0.00026            |
| 3MM203WI                                       | —       | 20   | 75   | 100   | 0.365                          | 0.606  | 0.682  | 0.76                            | 1.169   | 1.280   | —                             | 0.00045            | 0.00016            |
| 3MM204WI                                       | —       | 30   | 80   | 125   | 0.430                          | 0.627  | 0.751  | 0.912                           | 1.258   | 1.448   | —                             | 0.00038            | 0.00026            |
| 3MM205WI                                       | —       | 35   | 90   | 150   | 0.510                          | 0.733  | 0.902  | 1.084                           | 1.478   | 1.738   | —                             | 0.00035            | 0.00029            |
| 3MM206WI                                       | —       | 50   | 125  | 200   | 0.607                          | 0.862  | 1.043  | 1.298                           | 1.754   | 2.036   | —                             | 0.00041            | 0.00031            |
| 3MM207WI                                       | 30      | 70   | 175  | 300   | 0.723                          | 1.027  | 1.278  | 1.529                           | 2.064   | 2.449   | 0.00027                       | 0.00048            | 0.00048            |
| 3MM208WI                                       | 35      | 80   | 200  | 300   | 0.758                          | 1.074  | 1.263  | 1.576                           | 2.131   | 2.424   | 0.00028                       | 0.00052            | 0.00034            |
| 3MM209WI                                       | 40      | 100  | 250  | 400   | 0.914                          | 1.297  | 1.568  | 1.899                           | 2.564   | 2.976   | 0.00031                       | 0.00054            | 0.00042            |
| 3MM210WI                                       | 45      | 110  | 275  | 450   | 0.993                          | 1.409  | 1.719  | 2.059                           | 2.780   | 3.249   | 0.00030                       | 0.00055            | 0.00045            |
| 3MM211WI                                       | 50      | 140  | 350  | 550   | 1.107                          | 1.572  | 1.888  | 2.329                           | 3.143   | 3.627   | 0.00038                       | 0.00062            | 0.00046            |
| 3MM212WI                                       | 55      | 170  | 425  | 650   | 1.222                          | 1.736  | 2.061  | 2.573                           | 3.473   | 3.974   | 0.00044                       | 0.00069            | 0.00047            |
| 3MM213WI                                       | 60      | 190  | 475  | 750   | 1.290                          | 1.832  | 2.205  | 2.713                           | 3.662   | 4.232   | 0.00047                       | 0.00073            | 0.00054            |
| 3MM214WI                                       | 65      | 200  | 500  | 800   | 1.323                          | 1.878  | 2.272  | 2.818                           | 3.806   | 4.417   | 0.00048                       | 0.00075            | 0.00058            |
| 3MM215WI                                       | 80      | 220  | 550  | 850   | 1.431                          | 2.034  | 2.425  | 3.046                           | 4.112   | 4.720   | 0.00046                       | 0.00076            | 0.00054            |
| 3MM216WI                                       | 90      | 250  | 625  | 1000  | 1.543                          | 2.190  | 2.646  | 3.261                           | 4.406   | 5.115   | 0.00049                       | 0.00080            | 0.00062            |
| 3MM217WI                                       | 100     | 270  | 675  | 1100  | 1.603                          | 2.272  | 2.764  | 3.433                           | 4.645   | 5.427   | 0.00049                       | 0.00083            | 0.00067            |
| 3MM218WI                                       | 110     | 300  | 700  | 1250  | 1.636                          | 2.257  | 2.848  | 3.481                           | 4.603   | 5.537   | 0.00054                       | 0.00082            | 0.00086            |
| 3MM219WI                                       | 125     | 350  | 700  | 1400  | 1.774                          | 2.304  | 3.036  | 3.749                           | 4.715   | 5.885   | 0.00060                       | 0.00068            | 0.00105            |
| 3MM220WI                                       | 135     | 390  | 780  | 1560  | 1.877                          | 2.438  | 3.211  | 3.969                           | 4.994   | 6.235   | 0.00064                       | 0.00072            | 0.00110            |
| 3MM222WI                                       | 155     | 460  | 920  | 1840  | 2.058                          | 2.669  | 3.510  | 4.359                           | 5.489   | 6.858   | 0.00070                       | 0.00078            | 0.00119            |
| 3MM224WI                                       | 185     | 505  | 1010 | 2020  | 2.160                          | 2.802  | 3.682  | 4.607                           | 5.802   | 7.249   | 0.00069                       | 0.00081            | 0.00124            |
| 3MM226WI                                       | 220     | 575  | 1150 | 2300  | 2.562                          | 3.319  | 4.356  | 5.455                           | 6.808   | 8.599   | 0.00065                       | 0.00078            | 0.00120            |
| 3MM230WI                                       | 290     | 700  | 1400 | 2800  | 2.708                          | 3.501  | 4.580  | 5.774                           | 7.297   | 9.138   | 0.00069                       | 0.00090            | 0.00138            |

Notes: <sup>(1)</sup> For DB or DF arrangements only. For other mounting arrangements contact your Timken representative.



## LIGHT 2MM200WI (ISO 02) SERIES

### SPEED CAPABILITY DATA

| Bearing Number | Grease Capacity |        | Kluber Isoflex |       | Operating Speeds <sup>(2)</sup> (DB Mounting) <sup>(1)</sup> |               |       |       |            |       |
|----------------|-----------------|--------|----------------|-------|--------------------------------------------------------------|---------------|-------|-------|------------|-------|
|                | NBU15           |        | NBU15          |       | DUL                                                          | Grease<br>DUM | DUH   | DUL   | Oil<br>DUM | DUH   |
|                | 25%             | 40%    | 15%            | 20%   |                                                              |               |       |       |            |       |
|                | grams           | grams  | grams          | grams | RPM                                                          | RPM           | RPM   | RPM   | RPM        | RPM   |
| 2MM200WI       | 0.30            | 0.50   | 0.20           | 0.27  | 50200                                                        | 37700         | 25100 | 85300 | 64100      | 42700 |
| 2MM201WI       | 0.40            | 0.60   | 0.25           | 0.33  | 45400                                                        | 34000         | 22200 | 79100 | 57800      | 39400 |
| 2MM202WI       | 0.50            | 0.80   | 0.32           | 0.43  | 38200                                                        | 28700         | 19100 | 66300 | 48800      | 33200 |
| 2MM203WI       | 0.70            | 1.10   | 0.45           | 0.59  | 33500                                                        | 25100         | 16500 | 58100 | 42700      | 29100 |
| 2MM204WI       | 1.10            | 1.70   | 0.72           | 0.96  | 28600                                                        | 21400         | 14300 | 48600 | 36400      | 24300 |
| 2MM205WI       | 1.30            | 2.10   | 0.88           | 1.18  | 23800                                                        | 17900         | 11900 | 40500 | 30400      | 20200 |
| 2MM206WI       | 2.00            | 3.10   | 1.31           | 1.74  | 20000                                                        | 15100         | 10000 | 34200 | 25600      | 17000 |
| 2MM207WI       | 2.70            | 4.40   | 1.82           | 2.43  | 17300                                                        | 13,000        | 8600  | 29400 | 22000      | 14600 |
| 2MM208WI       | 3.70            | 6.00   | 2.49           | 3.32  | 15400                                                        | 11600         | 7700  | 26200 | 19700      | 13100 |
| 2MM209WI       | 4.20            | 6.60   | 2.77           | 3.70  | 14000                                                        | 10500         | 7000  | 22800 | 17900      | 11900 |
| 2MM210WI       | 4.80            | 7.60   | 3.20           | 4.30  | 12500                                                        | 9600          | 6400  | 21800 | 16300      | 10900 |
| 2MM211WI       | 6.10            | 9.70   | 4.10           | 5.40  | 11600                                                        | 8700          | 5800  | 19700 | 14800      | 9900  |
| 2MM212WI       | 7.50            | 12.00  | 5.00           | 6.70  | 10600                                                        | 7920          | 5300  | 18000 | 13500      | 9000  |
| 2MM213WI       | 9.20            | 14.60  | 6.10           | 8.10  | 9700                                                         | 7260          | 4800  | 16500 | 12300      | 8200  |
| 2MM214WI       | 10.60           | 16.90  | 7.00           | 9.40  | 9100                                                         | 6840          | 4600  | 15500 | 11600      | 7800  |
| 2MM215WI       | 11.60           | 18.60  | 7.80           | 10.30 | 8600                                                         | 6480          | 4300  | 14600 | 11020      | 7300  |
| 2MM216WI       | 13.70           | 22.00  | 9.20           | 12.20 | 8100                                                         | 6060          | 4000  | 13800 | 10300      | 6800  |
| 2MM217WI       | 16.90           | 27.10  | 11.30          | 15.10 | 7500                                                         | 5640          | 3800  | 12800 | 9590       | 6500  |
| 2MM218WI       | 21.50           | 34.40  | 14.40          | 19.10 | 7100                                                         | 5340          | 3600  | 12100 | 9080       | 6100  |
| 2MM219WI       | 25.80           | 41.40  | 17.30          | 23.00 | 6700                                                         | 5040          | 3400  | 11400 | 8570       | 5800  |
| 2MM220WI       | 30.70           | 49.10  | 20.50          | 27.30 | 6400                                                         | 4800          | 3200  | 10900 | 8160       | 5400  |
| 2MM222WI       | 42.30           | 67.60  | 28.20          | 37.60 | 5800                                                         | 4320          | 2900  | 9900  | 7340       | 4900  |
| 2MM224WI       | 51.40           | 82.30  | 34.30          | 45.80 | 5400                                                         | 4020          | 2700  | 9200  | 6830       | 4600  |
| 2MM226WI       | 50.80           | 81.30  | 33.90          | 45.20 | 4900                                                         | 3660          | 2400  | 8300  | 6220       | 4100  |
| 2MM230WI       | 82.40           | 131.90 | 55.00          | 73.40 | 4200                                                         | 3180          | 2160  | 7100  | 5410       | 3600  |

<sup>(1)</sup> For other mounting arrangement configurations refer to the engineering section on Permissible Speed calculation methods.

<sup>(2)</sup> For ceramic ball complements use 120% of speeds shown.

## LIGHT 3MM200WI (ISO 02) SERIES

### SPEED CAPABILITY DATA

| Bearing Number | Grease Capacity |        | Klubers Isoflex |       | Operating Speeds <sup>(2)</sup> (DB Mounting) <sup>(1)</sup> |            |       |       |         |       |
|----------------|-----------------|--------|-----------------|-------|--------------------------------------------------------------|------------|-------|-------|---------|-------|
|                | NBU15           |        | NBU15           |       | DUL                                                          | Grease DUM | DUH   | DUL   | Oil DUM | DUH   |
|                | 25%             | 40%    | 15%             | 20%   |                                                              |            |       |       |         |       |
|                | grams           | grams  | grams           | grams | RPM                                                          | RPM        | RPM   | RPM   | RPM     | RPM   |
| 3MM200WI       | 0.30            | 0.50   | 0.20            | 0.27  | 45180                                                        | 33930      | 22590 | 76770 | 57690   | 38430 |
| 3MM201WI       | 0.40            | 0.60   | 0.25            | 0.33  | 40860                                                        | 30600      | 19980 | 71190 | 52020   | 35460 |
| 3MM202WI       | 0.50            | 0.80   | 0.32            | 0.43  | 34380                                                        | 25830      | 17190 | 59670 | 43920   | 29880 |
| 3MM203WI       | 0.70            | 1.10   | 0.45            | 0.59  | 30150                                                        | 22590      | 14850 | 52290 | 38430   | 26190 |
| 3MM204WI       | 1.10            | 1.70   | 0.72            | 0.96  | 25740                                                        | 19260      | 12870 | 43740 | 32760   | 21870 |
| 3MM205WI       | 1.30            | 2.10   | 0.88            | 1.18  | 21420                                                        | 16110      | 10710 | 36450 | 27360   | 18180 |
| 3MM206WI       | 2.00            | 3.10   | 1.31            | 1.74  | 18000                                                        | 13590      | 9000  | 30780 | 23040   | 15300 |
| 3MM207WI       | 2.70            | 4.40   | 1.82            | 2.43  | 15570                                                        | 11700      | 7740  | 26460 | 19800   | 13140 |
| 3MM208WI       | 3.70            | 6.00   | 2.49            | 3.32  | 13860                                                        | 10440      | 6930  | 23580 | 17730   | 11790 |
| 3MM209WI       | 4.20            | 6.60   | 2.77            | 3.70  | 12600                                                        | 9450       | 6300  | 20520 | 16110   | 10710 |
| 3MM210WI       | 4.80            | 7.60   | 3.20            | 4.30  | 11250                                                        | 8640       | 5760  | 19620 | 14670   | 9810  |
| 3MM211WI       | 6.10            | 9.70   | 4.10            | 5.40  | 10440                                                        | 7830       | 5220  | 17730 | 13320   | 8910  |
| 3MM212WI       | 7.50            | 12.00  | 5.00            | 6.70  | 9540                                                         | 7128       | 4770  | 16200 | 12150   | 8100  |
| 3MM213WI       | 9.20            | 14.60  | 6.10            | 8.10  | 8730                                                         | 6534       | 4320  | 14850 | 11070   | 7380  |
| 3MM214WI       | 10.60           | 16.90  | 7.00            | 9.40  | 8190                                                         | 6156       | 4140  | 13950 | 10440   | 7020  |
| 3MM215WI       | 11.60           | 18.60  | 7.80            | 10.30 | 7740                                                         | 5832       | 3870  | 13140 | 9918    | 6570  |
| 3MM216WI       | 13.70           | 22.00  | 9.20            | 12.20 | 7290                                                         | 5454       | 3600  | 12420 | 9270    | 6120  |
| 3MM217WI       | 16.90           | 27.10  | 11.30           | 15.10 | 6750                                                         | 5076       | 3420  | 11520 | 8631    | 5850  |
| 3MM218WI       | 21.50           | 34.40  | 14.40           | 19.10 | 6390                                                         | 4806       | 3240  | 10890 | 8172    | 5490  |
| 3MM219WI       | 25.80           | 41.40  | 17.30           | 23.00 | 6030                                                         | 4536       | 3060  | 10260 | 7713    | 5220  |
| 3MM220WI       | 30.70           | 49.10  | 20.50           | 27.30 | 5760                                                         | 4320       | 2880  | 9810  | 7344    | 4860  |
| 3MM222WI       | 42.30           | 67.60  | 28.20           | 37.60 | 5220                                                         | 3888       | 2610  | 8910  | 6606    | 4410  |
| 3MM224WI       | 51.40           | 82.30  | 34.30           | 45.80 | 4860                                                         | 3618       | 2430  | 8280  | 6147    | 4140  |
| 3MM226WI       | 50.80           | 81.30  | 33.90           | 45.20 | 4410                                                         | 3294       | 2160  | 7470  | 5598    | 3690  |
| 3MM230WI       | 82.40           | 131.90 | 55.00           | 73.40 | 3780                                                         | 2862       | 1944  | 6390  | 4869    | 3240  |

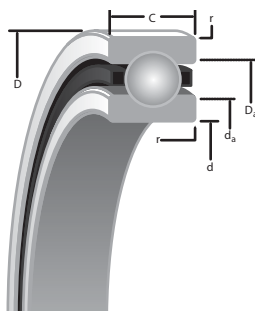
<sup>(1)</sup> For other mounting arrangement configurations refer to the engineering section on Permissible Speed calculation methods.

<sup>(2)</sup> For ceramic ball complements use 120% of speeds shown.



## LIGHT MM200K (ISO 02) SERIES

### DIMENSIONAL SIZES METRIC



#### SUPER PRECISION MM:

Running accuracy and performance meet ABEC 9 (ISO P2) levels. Non-critical features conform to ABEC 7 (ISO P4) requirements.

#### CONRAD CONSTRUCTION:

- Maximum complement of balls separated by two-piece land piloted cage.

| Bearing Number | d<br>Bore         | D<br>O.D.  | C<br>Width <sup>(1)</sup> | Ball Qty.<br>x Dia. | Wt.   | LOAD RATINGS<br>(steel ball & ceramic ball) |                      |                    |
|----------------|-------------------|------------|---------------------------|---------------------|-------|---------------------------------------------|----------------------|--------------------|
|                |                   |            |                           |                     |       | C <sub>0</sub> (stat)                       | C <sub>0</sub> (dyn) | Limiting Speed(Ng) |
| METRIC         | mm/tol: +0; -(μm) |            |                           | mm                  | kg    | N                                           | RPM                  |                    |
| MM201K         | 12<br>(4)         | 32<br>(6)  | 10<br>(80)                | 7 x 5.95            | 0.035 | 3000<br>2710                                | 7550<br>7550         | 52200<br>62600     |
| MM202K         | 15<br>(4)         | 35<br>(6)  | 11<br>(80)                | 8 x 5.95            | 0.043 | 3700<br>3290                                | 8450<br>8450         | 44000<br>52800     |
| MM203K         | 17<br>(4)         | 40<br>(6)  | 12<br>(80)                | 8 x 6.75            | 0.062 | 4700<br>4230                                | 10600<br>10600       | 38500<br>46200     |
| MM204K         | 20<br>(5)         | 47<br>(6)  | 14<br>(130)               | 8 x 7.94            | 0.1   | 6500<br>5860                                | 14200<br>14200       | 32800<br>39400     |
| MM205K         | 25<br>(5)         | 52<br>(7)  | 15<br>(130)               | 9 x 7.94            | 0.122 | 7800<br>6980                                | 15500<br>15500       | 27400<br>32900     |
| MM206K         | 30<br>(5)         | 62<br>(7)  | 16<br>(130)               | 9 x 9.53            | 0.185 | 11300<br>10000                              | 21600<br>21600       | 23000<br>27600     |
| MM207K         | 35<br>(6)         | 72<br>(7)  | 17<br>(130)               | 9 x 11.11           | 0.267 | 15300<br>13600                              | 28500<br>28500       | 19800<br>23800     |
| MM208K         | 40<br>(6)         | 80<br>(7)  | 18<br>(130)               | 9 x 12.70           | 0.337 | 20000<br>17700                              | 36200<br>36200       | 17700<br>21200     |
| MM209K         | 45<br>(6)         | 85<br>(8)  | 19<br>(130)               | 9 x 12.70           | 0.377 | 20200<br>18200                              | 36300<br>36300       | 16000<br>19200     |
| MM210K         | 50<br>(6)         | 90<br>(8)  | 20<br>(130)               | 10 x 12.70          | 0.425 | 23100<br>20600                              | 38900<br>38900       | 14600<br>17500     |
| MM211K         | 55<br>(7)         | 100<br>(8) | 21<br>(150)               | 10 x 14.29          | 0.564 | 29100<br>26000                              | 48100<br>48100       | 13300<br>16000     |
| MM212K         | 60<br>(7)         | 110<br>(8) | 22<br>(150)               | 10 x 15.88          | 0.727 | 36300<br>32000                              | 58200<br>58200       | 12100<br>14500     |
| MM213K         | 65<br>(7)         | 120<br>(8) | 23<br>(150)               | 10 x 16.67          | 0.928 | 40000<br>35600                              | 63400<br>63400       | 11100<br>13300     |
| MM214K         | 70<br>(7)         | 125<br>(9) | 24<br>(150)               | 10 x 17.46          | 0.994 | 43600<br>39200                              | 69000<br>69000       | 10500<br>12600     |
| MM215K         | 75<br>(7)         | 130<br>(9) | 25<br>(150)               | 10 x 17.46          | 1.074 | 44500<br>39900                              | 68900<br>68900       | 9900<br>11900      |
| MM216K         | 80<br>(7)         | 140<br>(9) | 26<br>(150)               | 10 x 19.05          | 1.317 | 53400<br>47200                              | 80600<br>80600       | 9200<br>11000      |

(Ng) For a single, grease lubricated, spring pretrained bearing. This value to be used in permissible Operating Speed (Sp) calculation.

<sup>(1)</sup> Width tolerance of pretrained bearing set +0/-0.25 mm (+0/-0.010").

<sup>(2)</sup> ABMA STD 20 (r<sub>as</sub> max).

| r<br>Rad. <sup>(2)</sup> | Suggested<br>Shoulder Diameters |      |                          |       | Shaft Diameter |        | Mounting Fits |       | FIXED                        |         |               |       | FLOATING                     |         |                   |       |        |
|--------------------------|---------------------------------|------|--------------------------|-------|----------------|--------|---------------|-------|------------------------------|---------|---------------|-------|------------------------------|---------|-------------------|-------|--------|
|                          | d <sub>a</sub> (Shaft)          |      | D <sub>a</sub> (Housing) |       |                |        |               |       | Housing Bore<br>(Stationary) |         | Mounting Fits |       | Housing Bore<br>(Stationary) |         | Housing Clearance |       |        |
|                          | Max.                            | Min. | Max.                     | Min.  | Min.           | Max.   | Loose         | Tight | Min.                         | Max.    | Tight         | Loose | Max.                         | Min.    | Max.              | Min.  |        |
| mm                       | mm                              | mm   | mm                       | mm    | mm             | mm     | in.           | in.   | in.                          | in.     | in.           | in.   | in.                          | in.     | in.               | in.   |        |
| 0.6                      | 16.6                            | 16.4 | 28.1                     | 27.8  | 11.9950        | 12.000 | 0.005         | 0.004 | 32                           | 32.005  | 0.000         | 0.011 | 32.010                       | 32.005  | 0.016             | 0.005 | MM201K |
| 0.6                      | 19.2                            | 18.9 | 31.1                     | 30.9  | 14.9950        | 15.000 | 0.005         | 0.004 | 35                           | 35.006  | 0.000         | 0.012 | 35.010                       | 35.005  | 0.016             | 0.005 | MM202K |
| 0.6                      | 21.7                            | 21.5 | 35.7                     | 35.4  | 16.9950        | 17.000 | 0.005         | 0.004 | 40                           | 40.006  | 0.000         | 0.012 | 40.010                       | 40.005  | 0.016             | 0.005 | MM203K |
| 1                        | 26                              | 25.8 | 41.5                     | 41.3  | 19.9950        | 20.000 | 0.005         | 0.005 | 47                           | 47.006  | 0.000         | 0.012 | 47.012                       | 47.007  | 0.018             | 0.007 | MM204K |
| 1                        | 31.1                            | 30.9 | 47.1                     | 46.9  | 24.9950        | 25.000 | 0.005         | 0.005 | 52                           | 52.006  | 0.000         | 0.013 | 52.012                       | 52.007  | 0.019             | 0.007 | MM205K |
| 1                        | 36.7                            | 36.5 | 56                       | 55.8  | 29.9950        | 30.000 | 0.005         | 0.005 | 62                           | 62.008  | 0.000         | 0.015 | 62.012                       | 62.007  | 0.019             | 0.007 | MM206K |
| 1                        | 42.7                            | 42.2 | 65.3                     | 64.8  | 34.9950        | 35.000 | 0.005         | 0.006 | 72                           | 72.008  | 0.000         | 0.015 | 72.011                       | 72.007  | 0.019             | 0.007 | MM207K |
| 1                        | 47.8                            | 47.2 | 73.2                     | 72.6  | 39.9950        | 40.000 | 0.005         | 0.006 | 80                           | 80.008  | 0.000         | 0.015 | 80.012                       | 80.008  | 0.020             | 0.008 | MM208K |
| 1                        | 52.8                            | 52.3 | 78.2                     | 77.7  | 44.9950        | 45.000 | 0.005         | 0.006 | 85                           | 85.008  | 0.000         | 0.016 | 85.016                       | 85.009  | 0.024             | 0.009 | MM209K |
| 1                        | 57.9                            | 57.4 | 83.3                     | 82.8  | 49.9950        | 50.000 | 0.005         | 0.006 | 90                           | 90.008  | 0.000         | 0.016 | 90.015                       | 90.007  | 0.023             | 0.007 | MM210K |
| 1.5                      | 63.8                            | 63.3 | 92.2                     | 91.7  | 54.9950        | 55.000 | 0.005         | 0.007 | 100                          | 100.008 | 0.000         | 0.016 | 100.018                      | 100.010 | 0.025             | 0.010 | MM211K |
| 1.5                      | 69.9                            | 69.3 | 101.4                    | 100.8 | 59.9950        | 60.000 | 0.005         | 0.007 | 110                          | 110.008 | 0.000         | 0.016 | 110.018                      | 110.010 | 0.025             | 0.010 | MM212K |
| 1.5                      | 76.2                            | 75.7 | 109.7                    | 109.2 | 64.9950        | 65.000 | 0.005         | 0.007 | 120                          | 120.008 | 0.000         | 0.016 | 120.018                      | 120.010 | 0.025             | 0.010 | MM213K |
| 1.5                      | 80.8                            | 80.3 | 115.8                    | 115.3 | 69.9950        | 70.000 | 0.005         | 0.007 | 125                          | 125.008 | 0.000         | 0.017 | 125.021                      | 125.011 | 0.030             | 0.011 | MM214K |
| 1.5                      | 86                              | 85.2 | 120.8                    | 120   | 74.9950        | 75.005 | 0.005         | 0.012 | 130                          | 130.009 | 0.000         | 0.018 | 130.020                      | 130.010 | 0.029             | 0.010 | MM215K |
| 2                        | 91.3                            | 90.6 | 129.9                    | 129.2 | 79.9950        | 80.005 | 0.005         | 0.012 | 140                          | 140.009 | 0.000         | 0.018 | 140.020                      | 140.010 | 0.029             | 0.010 | MM216K |

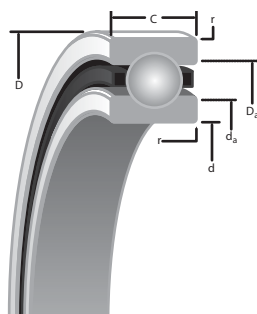
D





## LIGHT MM200K (ISO 02) SERIES

### DIMENSIONAL SIZES INCHES



#### SUPER PRECISION MM:

Running accuracy and performance meet ABEC 9 (ISO P2) levels. Non-critical features conform to ABEC 7 (ISO P4) requirements.

#### CONRAD CONSTRUCTION:

- Maximum complement of balls separated by two-piece land piloted cage.

| Bearing Number | d<br>Bore               | D<br>O.D.       | C<br>Width <sup>(1)</sup> | Ball Qty.<br>x Dia.                | Wt.  | LOAD RATINGS<br>(steel ball & ceramic ball) |                      |                                |
|----------------|-------------------------|-----------------|---------------------------|------------------------------------|------|---------------------------------------------|----------------------|--------------------------------|
|                |                         |                 |                           |                                    |      | C <sub>0</sub> (stat)                       | C <sub>e</sub> (dyn) | Limiting Speed <sup>(Ng)</sup> |
| INCH           | in./tol: +0; -0.000(μm) |                 |                           | in.                                | lbs. | lbs.                                        |                      | RPM                            |
| MM201K         | 0.4724<br>(1.5)         | 1.2598<br>(2.5) | 0.394<br>(31)             | 7 x <sup>15</sup> / <sub>64</sub>  | 0.08 | 680<br>610                                  | 1700<br>1700         | 52200<br>62600                 |
| MM202K         | 0.5906<br>(1.5)         | 1.378<br>(2.5)  | 0.4331<br>(31)            | 8 x <sup>15</sup> / <sub>64</sub>  | 0.09 | 830<br>740                                  | 1900<br>1900         | 44000<br>52800                 |
| MM203K         | 0.6693<br>(1.5)         | 1.5748<br>(2.5) | 0.4724<br>(31)            | 8 x <sup>17</sup> / <sub>64</sub>  | 0.14 | 1060<br>950                                 | 2380<br>2380         | 38500<br>46200                 |
| MM204K         | 0.7874<br>(2)           | 1.8504<br>(2.5) | 0.5512<br>(47)            | 8 x <sup>5</sup> / <sub>16</sub>   | 0.22 | 1460<br>1320                                | 3190<br>3190         | 32800<br>39400                 |
| MM205K         | 0.9843<br>(2)           | 2.0472<br>(3)   | 0.5906<br>(47)            | 9 x <sup>5</sup> / <sub>16</sub>   | 0.27 | 1760<br>1570                                | 3490<br>3490         | 27400<br>32900                 |
| MM206K         | 1.1811<br>(2)           | 2.4409<br>(3)   | 0.6299<br>(47)            | 9 x <sup>3</sup> / <sub>8</sub>    | 0.41 | 2550<br>2.25                                | 4850<br>4850         | 23000<br>27600                 |
| MM207K         | 1.378<br>(2.5)          | 2.8346<br>(3)   | 0.6693<br>(47)            | 9 x <sup>7</sup> / <sub>16</sub>   | 0.59 | 3450<br>3060                                | 6400<br>6400         | 19800<br>23800                 |
| MM208K         | 1.5748<br>(2.5)         | 3.1496<br>(3)   | 0.7087<br>(47)            | 9 x <sup>1</sup> / <sub>2</sub>    | 0.74 | 4500<br>3970                                | 8130<br>8130         | 17700<br>21200                 |
| MM209K         | 1.7717<br>(2.5)         | 3.3465<br>(3)   | 0.748<br>(47)             | 9 x <sup>1</sup> / <sub>2</sub>    | 0.83 | 4550<br>4090                                | 8160<br>8160         | 16000<br>19200                 |
| MM210K         | 1.9685<br>(2.5)         | 3.5433<br>(3)   | 0.7874<br>(47)            | 10 x <sup>1</sup> / <sub>2</sub>   | 0.94 | 5200<br>4640                                | 8740<br>8740         | 14600<br>17500                 |
| MM211K         | 2.1654<br>(3)           | 3.937<br>(3)    | 0.8268<br>(59)            | 10 x <sup>9</sup> / <sub>16</sub>  | 1.24 | 6550<br>5850                                | 10800<br>10800       | 13300<br>16000                 |
| MM212K         | 2.3622<br>(3)           | 4.3307<br>(3)   | 0.8661<br>(59)            | 10 x <sup>5</sup> / <sub>8</sub>   | 1.60 | 8150<br>7190                                | 13100<br>13100       | 12100<br>14500                 |
| MM213K         | 2.5591<br>(3)           | 4.7244<br>(3)   | 0.9055<br>(59)            | 10 x <sup>21</sup> / <sub>32</sub> | 2.05 | 9000<br>8000                                | 14300<br>14300       | 11100<br>13300                 |
| MM214K         | 2.7559<br>(3)           | 4.9213<br>(3.5) | 0.9449<br>(59)            | 10 x <sup>11</sup> / <sub>16</sub> | 2.19 | 9800<br>8800                                | 15500<br>15500       | 10500<br>12600                 |
| MM215K         | 2.9528<br>(3)           | 5.1181<br>(3.5) | 0.9843<br>(59)            | 10 x <sup>11</sup> / <sub>16</sub> | 2.37 | 10000<br>8960                               | 15500<br>15500       | 9900<br>11900                  |
| MM216K         | 3.1496<br>(3)           | 5.5118<br>(3.5) | 1.0236<br>(59)            | 10 x <sup>3</sup> / <sub>4</sub>   | 2.9  | 12000<br>10600                              | 18100<br>18100       | 9200<br>11000                  |

(Ng) For a single, grease lubricated, spring pretrained bearing. This value to be used in permissible Operating Speed (Sp) calculation.

(1) Width tolerance of pretrained bearing set +0/-0.25 mm (+0/-0.010").

(2) ABMA STD 20 (r<sub>as</sub> max).

| r<br>Rad. <sup>(2)</sup> | Suggested<br>Shoulder Diameters |      |                          |      | Shaft Diameter |        | Mounting Fits |         | FIXED                        |        |               |         | FLOATING                     |         |                   |         |        |
|--------------------------|---------------------------------|------|--------------------------|------|----------------|--------|---------------|---------|------------------------------|--------|---------------|---------|------------------------------|---------|-------------------|---------|--------|
|                          | d <sub>a</sub> (Shaft)          |      | D <sub>a</sub> (Housing) |      |                |        |               |         | Housing Bore<br>(Stationary) |        | Mounting Fits |         | Housing Bore<br>(Stationary) |         | Housing Clearance |         |        |
|                          | Max.                            | Min. | Max.                     | Min. | Min.           | Max.   | Loose         | Tight   | Min.                         | Max.   | Tight         | Loose   | Max.                         | Min.    | Max.              | Min.    |        |
| in.                      | in.                             | in.  | in.                      | in.  | in.            | in.    | in.           | in.     | in.                          | in.    | in.           | in.     | in.                          | in.     | in.               | in.     |        |
| 0.024                    | 0.66                            | 0.65 | 1.11                     | 1.10 | 0.4722         | 0.4724 | 0.0002        | 0.00015 | 1.2598                       | 1.2600 | 0.000         | 0.00045 | 1.26020                      | 1.26000 | 0.00070           | 0.00020 | MM201K |
| 0.024                    | 0.76                            | 0.75 | 1.23                     | 1.22 | 0.5904         | 0.5906 | 0.0002        | 0.00015 | 1.3780                       | 1.3783 | 0.000         | 0.0005  | 1.37840                      | 1.37820 | 0.00070           | 0.00020 | MM202K |
| 0.024                    | 0.86                            | 0.85 | 1.41                     | 1.40 | 0.6691         | 0.6693 | 0.0002        | 0.00015 | 1.5748                       | 1.5751 | 0.000         | 0.0005  | 1.57520                      | 1.57500 | 0.00070           | 0.00020 | MM203K |
| 0.039                    | 1.03                            | 1.02 | 1.64                     | 1.63 | 0.7872         | 0.7874 | 0.0002        | 0.0002  | 1.8504                       | 1.8507 | 0.000         | 0.0005  | 1.85090                      | 1.85070 | 0.00080           | 0.00030 | MM204K |
| 0.039                    | 1.23                            | 1.22 | 1.86                     | 1.85 | 0.9841         | 0.9843 | 0.0002        | 0.0002  | 2.0472                       | 2.0475 | 0.000         | 0.00055 | 2.04770                      | 2.04750 | 0.00080           | 0.00030 | MM205K |
| 0.039                    | 1.45                            | 1.44 | 2.21                     | 2.20 | 1.1809         | 1.1811 | 0.0002        | 0.0002  | 2.4409                       | 2.4412 | 0.000         | 0.0006  | 2.44140                      | 2.44120 | 0.00080           | 0.00030 | MM206K |
| 0.039                    | 1.68                            | 1.66 | 2.57                     | 2.55 | 1.3778         | 1.3780 | 0.0002        | 0.00025 | 2.8346                       | 2.8349 | 0.000         | 0.0006  | 2.83510                      | 2.83490 | 0.00080           | 0.00030 | MM207K |
| 0.039                    | 1.88                            | 1.86 | 2.88                     | 2.86 | 1.5746         | 1.5748 | 0.0002        | 0.00025 | 3.1496                       | 3.1499 | 0.000         | 0.0006  | 3.15010                      | 3.14990 | 0.00080           | 0.00030 | MM208K |
| 0.039                    | 2.08                            | 2.06 | 3.08                     | 3.06 | 1.7715         | 1.7717 | 0.0002        | 0.00025 | 3.3465                       | 3.3468 | 0.000         | 0.0006  | 3.34710                      | 3.34680 | 0.00090           | 0.00030 | MM209K |
| 0.039                    | 2.28                            | 2.26 | 3.28                     | 3.26 | 1.9683         | 1.9685 | 0.0002        | 0.00025 | 3.5433                       | 3.5436 | 0.000         | 0.0006  | 3.54390                      | 3.54360 | 0.00090           | 0.00030 | MM210K |
| 0.059                    | 2.51                            | 2.49 | 3.63                     | 3.61 | 2.1652         | 2.1654 | 0.0002        | 0.0003  | 3.9370                       | 3.9373 | 0.000         | 0.0006  | 3.93770                      | 3.93740 | 0.00100           | 0.00040 | MM211K |
| 0.059                    | 2.75                            | 2.73 | 3.99                     | 3.97 | 2.3620         | 2.3622 | 0.0002        | 0.0003  | 4.3307                       | 4.3310 | 0.000         | 0.0006  | 4.33140                      | 4.33110 | 0.00100           | 0.00040 | MM212K |
| 0.059                    | 3.00                            | 2.98 | 4.32                     | 4.30 | 2.5589         | 2.5591 | 0.0002        | 0.0003  | 4.7244                       | 4.7247 | 0.000         | 0.0006  | 4.72510                      | 4.72480 | 0.00100           | 0.00040 | MM213K |
| 0.059                    | 3.18                            | 3.16 | 4.56                     | 4.54 | 2.7557         | 2.7559 | 0.0002        | 0.0003  | 4.9213                       | 4.9216 | 0.000         | 0.0007  | 4.92210                      | 4.92170 | 0.00120           | 0.00040 | MM214K |
| 0.059                    | 3.39                            | 3.36 | 4.76                     | 4.73 | 2.9526         | 2.9530 | 0.0002        | 0.0005  | 5.1181                       | 5.1185 | 0.000         | 0.0007  | 5.11890                      | 5.11850 | 0.00110           | 0.00040 | MM215K |
| 0.079                    | 3.60                            | 3.57 | 5.12                     | 5.09 | 3.1494         | 3.1498 | 0.0002        | 0.0005  | 5.5118                       | 5.5122 | 0.000         | 0.0007  | 5.51260                      | 5.51220 | 0.00110           | 0.00040 | MM216K |

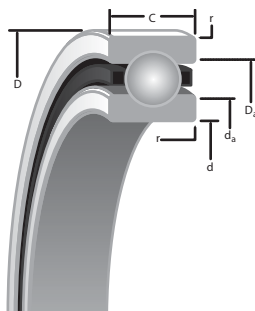
D





## MEDIUM 2(3)MM300WI (ISO 03) SERIES

### DIMENSIONAL SERIES METRIC



### SUPER PRECISION MM:

Running accuracy and performance meet ABEC 9 (ISO P2) levels. Non-critical features conform to ABEC 7 (ISO P4) requirements.

### WI CONSTRUCTION:

- Incorporates low shoulder on non-thrust side of outer rings.
- Maximum complement of balls separated by one-piece cage piloted against a ground thrust shoulder land of the outer ring.

| Bearing Number<br><br>2MM or 3MM | d<br>Bore      D<br>O.D.      C<br>Width <sup>(1)</sup> |             |             | Ball Qty.<br>x Dia.      Wt. |       | (2MM) LOAD RATINGS<br>(steel ball & ceramic ball) |                      |                                | (3MM) LOAD RATINGS<br>(steel ball & ceramic ball) |                      |                                |
|----------------------------------|---------------------------------------------------------|-------------|-------------|------------------------------|-------|---------------------------------------------------|----------------------|--------------------------------|---------------------------------------------------|----------------------|--------------------------------|
|                                  |                                                         |             |             |                              |       | C <sub>0</sub> (stat)                             | C <sub>e</sub> (dyn) | Limiting Speed <sup>(Ng)</sup> | C <sub>0</sub> (stat)                             | C <sub>e</sub> (dyn) | Limiting Speed <sup>(Ng)</sup> |
| METRIC                           | mm/tol: +0; -(µm)                                       |             |             | mm                           | kg    | N                                                 |                      | RPM                            | N                                                 |                      | RPM                            |
| 301WI                            | 12<br>(4)                                               | 37<br>(6)   | 12<br>(80)  | 8 x 7.14                     | 0.061 | 4700<br>4230                                      | 11000<br>11000       | 47600<br>57100                 | 4600<br>4060                                      | 10900<br>10900       | 42800<br>51400                 |
| 302WI                            | 15<br>(4)                                               | 42<br>(6)   | 13<br>(80)  | 10 x 6.75                    | 0.087 | 5810<br>5170                                      | 12900<br>12900       | 38100<br>45700                 | 5600<br>5000                                      | 11600<br>11600       | 34300<br>41200                 |
| 303WI                            | 17<br>(4)                                               | 47<br>(6)   | 14<br>(80)  | 7 x 9.53                     | 0.104 | 7280<br>6480                                      | 16900<br>16900       | 36800<br>44200                 | 7100<br>6300                                      | 16400<br>16400       | 33100<br>39700                 |
| 304WI                            | 20<br>(5)                                               | 52<br>(7)   | 15<br>(120) | 8 x 10.32                    | 0.137 | 10000<br>8900                                     | 21500<br>21500       | 32200<br>38600                 | 9650<br>8590                                      | 20900<br>20900       | 29000<br>34800                 |
| 305WI                            | 25<br>(5)                                               | 62<br>(7)   | 17<br>(120) | 9 x 11.91                    | 0.221 | 15300<br>13600                                    | 30500<br>30500       | 26200<br>31400                 | 14800<br>13200                                    | 29500<br>29500       | 23600<br>28300                 |
| 306WI                            | 30<br>(5)                                               | 72<br>(7)   | 19<br>(120) | 10 x 13.49                   | 0.328 | 22200<br>19800                                    | 34120<br>34120       | 22100<br>26500                 | 21500<br>19100                                    | 39900<br>39900       | 19900<br>23900                 |
| 307WI                            | 35<br>(6)                                               | 80<br>(7)   | 21<br>(120) | 10 x 14.29                   | 0.443 | 25600<br>22800                                    | 46200<br>46200       | 19200<br>23000                 | 24700<br>22000                                    | 44500<br>44500       | 17300<br>20800                 |
| 308WI                            | 40<br>(6)                                               | 90<br>(8)   | 23<br>(120) | 11 x 15.88                   | 0.608 | 35000<br>31200                                    | 59700<br>59700       | 16900<br>20300                 | 38900<br>30100                                    | 57500<br>57500       | 15200<br>18200                 |
| 309WI                            | 45<br>(6)                                               | 100<br>(8)  | 25<br>(120) | 10 x 17.46                   | 0.809 | 38700<br>34500                                    | 66500<br>66500       | 15100<br>18100                 | 37400<br>33300                                    | 64100<br>64100       | 13600<br>16300                 |
| 310WI                            | 50<br>(6)                                               | 110<br>(8)  | 27<br>(120) | 10 x 19.05                   | 1.046 | 46200<br>41200                                    | 77900<br>77900       | 13600<br>16300                 | 44700<br>39800                                    | 75100<br>75100       | 12200<br>14600                 |
| 311WI                            | 55<br>(7)                                               | 120<br>(8)  | 29<br>(150) | 10 x 20.64                   | 1.332 | 54600<br>48600                                    | 90200<br>90200       | 12400<br>14900                 | 52600<br>46800                                    | 86700<br>86700       | 11200<br>13400                 |
| 312WI                            | 60<br>(7)                                               | 130<br>(9)  | 31<br>(150) | 10 x 22.23                   | 1.665 | 63500<br>56600                                    | 103100<br>103100     | 11400<br>13700                 | 61100<br>54400                                    | 99100<br>99100       | 10300<br>12400                 |
| 313WI                            | 65<br>(7)                                               | 140<br>(9)  | 33<br>(150) | 11 x 23.81                   | 2.101 | 80500<br>71700                                    | 124400<br>124400     | 10500<br>12600                 | 77400<br>68900                                    | 119700<br>119700     | 9500<br>11400                  |
| 314WI                            | 70<br>(7)                                               | 150<br>(9)  | 35<br>(150) | 11 x 25.40                   | 2.548 | 91900<br>81800                                    | 139900<br>139900     | 9800<br>11800                  | 88300<br>78500                                    | 134500<br>134500     | 8800<br>10600                  |
| 319WI                            | 95<br>(7)                                               | 200<br>(10) | 45<br>(200) | 10 x 34.93                   | 5.587 | 155900<br>138800                                  | 204400<br>204400     | 7400<br>8900                   | 150400<br>133900                                  | 196800<br>196800     | 6700<br>8000                   |

(Ng) For a single, grease lubricated, spring preloaded bearing. This value to be used in permissible Operating Speed (Sp) calculation.

(1) Width tolerance of preloaded bearing set +0/-0.25 mm (+0/-0.010").

(2) ABMA STD 20 (r<sub>as</sub> max).

| r<br>Rad. <sup>(2)</sup> | Suggested<br>Shoulder Diameters |       |                          |       | Shaft Diameter |        | Mounting Fits |       | FIXED                        |         |                               |       | FLOATING     |         |                   |       | Bearing<br>Number<br>2MM or<br>3MM |
|--------------------------|---------------------------------|-------|--------------------------|-------|----------------|--------|---------------|-------|------------------------------|---------|-------------------------------|-------|--------------|---------|-------------------|-------|------------------------------------|
|                          | d <sub>a</sub> (Shaft)          |       | D <sub>a</sub> (Housing) |       |                |        |               |       | Housing Bore<br>(Stationary) |         | Mounting Fits<br>(Stationary) |       | Housing Bore |         | Housing Clearance |       |                                    |
|                          | Max.                            | Min.  | Max.                     | Min.  | Min.           | Max.   | Loose         | Tight | Min.                         | Max.    | Tight                         | Loose | Max.         | Min.    | Max.              | Min.  |                                    |
| mm                       | mm                              | mm    | mm                       | mm    | mm             | mm     | mm            | mm    | mm                           | mm      | mm                            | mm    | mm           | mm      | mm                | mm    |                                    |
| 1                        | 17.7                            | 17.4  | 32.1                     | 31.9  | 11.995         | 12.000 | 0.005         | 0.004 | 37.000                       | 37.006  | 0.000                         | 0.012 | 37.010       | 37.005  | 0.016             | 0.005 | 301WI                              |
| 1                        | 22.2                            | 22.0  | 35.7                     | 35.4  | 14.995         | 15.000 | 0.005         | 0.004 | 42.000                       | 42.006  | 0.000                         | 0.012 | 42.010       | 42.005  | 0.016             | 0.005 | 302WI                              |
| 1                        | 22.7                            | 22.5  | 42.0                     | 41.8  | 16.995         | 17.000 | 0.005         | 0.004 | 47.000                       | 47.006  | 0.000                         | 0.012 | 47.012       | 47.007  | 0.018             | 0.007 | 303WI                              |
| 1                        | 30.1                            | 29.9  | 46.6                     | 46.4  | 19.995         | 20.000 | 0.005         | 0.005 | 52.000                       | 52.006  | 0.000                         | 0.013 | 52.012       | 52.007  | 0.019             | 0.007 | 304WI                              |
| 1                        | 32.1                            | 31.9  | 55.8                     | 55.5  | 24.995         | 25.000 | 0.005         | 0.005 | 62.000                       | 62.008  | 0.000                         | 0.015 | 62.012       | 62.007  | 0.019             | 0.007 | 305WI                              |
| 1                        | 37.7                            | 37.5  | 65.2                     | 64.9  | 29.995         | 30.000 | 0.005         | 0.005 | 72.000                       | 72.008  | 0.000                         | 0.015 | 72.011       | 72.007  | 0.019             | 0.007 | 306WI                              |
| 1.5                      | 43.7                            | 43.2  | 72.1                     | 71.6  | 34.995         | 35.000 | 0.005         | 0.006 | 80.000                       | 80.008  | 0.000                         | 0.015 | 80.012       | 80.008  | 0.020             | 0.008 | 307WI                              |
| 1.5                      | 49.8                            | 49.3  | 81.3                     | 80.8  | 39.995         | 40.000 | 0.005         | 0.006 | 90.000                       | 90.008  | 0.000                         | 0.016 | 90.015       | 90.007  | 0.023             | 0.007 | 308WI                              |
| 1.5                      | 55.9                            | 55.4  | 90.2                     | 89.7  | 44.995         | 45.000 | 0.005         | 0.006 | 100.000                      | 100.008 | 0.000                         | 0.016 | 100.018      | 100.010 | 0.025             | 0.010 | 309WI                              |
| 2                        | 61.2                            | 60.7  | 99.8                     | 99.3  | 49.995         | 50.000 | 0.005         | 0.006 | 110.000                      | 110.008 | 0.000                         | 0.016 | 110.018      | 110.010 | 0.025             | 0.010 | 310WI                              |
| 2                        | 67.3                            | 66.8  | 108.7                    | 108.2 | 54.995         | 55.000 | 0.005         | 0.007 | 120.000                      | 120.008 | 0.000                         | 0.016 | 120.018      | 120.010 | 0.025             | 0.010 | 311WI                              |
| 2                        | 43.2                            | 72.6  | 117.9                    | 117.3 | 59.995         | 60.000 | 0.005         | 0.007 | 130.000                      | 130.009 | 0.000                         | 0.018 | 130.020      | 130.010 | 0.029             | 0.010 | 312WI                              |
| 2                        | 80.3                            | 79.8  | 126.8                    | 126.2 | 64.995         | 65.000 | 0.005         | 0.007 | 140.000                      | 140.009 | 0.000                         | 0.018 | 140.020      | 140.010 | 0.029             | 0.010 | 313WI                              |
| 2                        | 85.3                            | 84.8  | 135.6                    | 135.1 | 69.995         | 70.000 | 0.005         | 0.007 | 150.000                      | 150.009 | 0.000                         | 0.018 | 150.023      | 150.012 | 0.032             | 0.012 | 314WI                              |
| 3                        | 113.2                           | 112.4 | 183.3                    | 182.5 | 94.995         | 95.000 | 0.005         | 0.013 | 200.00                       | 200.011 | 0.000                         | 0.022 | 200.025      | 200.015 | 0.036             | 0.015 | 319WI                              |

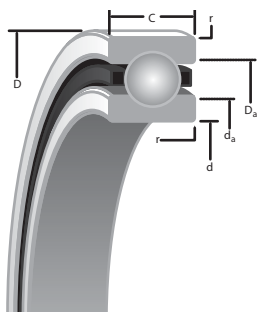
D





## MEDIUM 2(3)MM300WI (ISO 03) SERIES

### DIMENSIONAL SERIES INCHES



**SUPER PRECISION MM:**  
Running accuracy and performance meet ABEC 9 (ISO P2) levels. Non-critical features conform to ABEC 7 (ISO P4) requirements.

### WI CONSTRUCTION:

- Incorporates low shoulder on non-thrust side of outer rings.
- Maximum complement of balls separated by one-piece cage piloted against a ground thrust shoulder land of the outer ring.

| Bearing<br>Number |                        |                 |                | Ball Qty.<br>x Dia. | Wt.   | (2MM) LOAD RATINGS<br>(steel ball & ceramic ball) |                       |                      | (3MM) LOAD RATINGS<br>(steel ball & ceramic ball) |                       |                      |
|-------------------|------------------------|-----------------|----------------|---------------------|-------|---------------------------------------------------|-----------------------|----------------------|---------------------------------------------------|-----------------------|----------------------|
|                   | 2MM or<br>3MM          | d<br>Bore       | D<br>O.D.      |                     |       | C<br>Width <sup>(1)</sup>                         | C <sub>0</sub> (stat) | C <sub>e</sub> (dyn) | Limiting<br>Speed <sup>(Ng)</sup>                 | C <sub>0</sub> (stat) | C <sub>e</sub> (dyn) |
| INCH              | in/101: +0; -0.000(μm) |                 |                | in.                 | lbs.  | lbs.                                              |                       | RPM                  | lbs.                                              |                       | RPM                  |
| 301WI             | 0.4724<br>(1.5)        | 1.4567<br>(2.5) | 0.4724<br>(31) | 8 x 9/32            | 0.13  | 1,060<br>950                                      | 2450<br>2450          | 47600<br>57100       | 1040<br>920                                       | 2450<br>2450          | 42800<br>51400       |
| 302WI             | 0.5906<br>(1.5)        | 1.6535<br>(2.5) | 0.5118<br>(31) | 10 x 17/64          | 0.19  | 1320<br>1160                                      | 2700<br>2700          | 38100<br>45700       | 1270<br>1120                                      | 2600<br>2600          | 34300<br>41200       |
| 303WI             | 0.6693<br>(1.5)        | 1.8504<br>(2.5) | 0.5512<br>(31) | 7 x 3/8             | 0.23  | 1630<br>1460                                      | 3900<br>3900          | 36800<br>44100       | 1600<br>1420                                      | 3690<br>3690          | 33100<br>39700       |
| 304WI             | 0.7874<br>(2)          | 2.0472<br>(3)   | 0.5906<br>(47) | 8 x 13/32           | 0.30  | 2200<br>2000                                      | 4840<br>4840          | 32200<br>38600       | 2160<br>1930                                      | 4700<br>4700          | 29000<br>34800       |
| 305WI             | 0.9843<br>(2)          | 2.4409<br>(3)   | 0.6693<br>(47) | 9 x 15/32           | 0.49  | 3450<br>3060                                      | 6850<br>6850          | 26200<br>31400       | 3350<br>2970                                      | 6630<br>6630          | 23600<br>28300       |
| 306WI             | 1.1811<br>(2)          | 2.8346<br>(3)   | 0.748<br>(47)  | 10 x 17/32          | 0.72  | 4990<br>4440                                      | 9270<br>9270          | 22100<br>26500       | 4820<br>4290                                      | 8960<br>8960          | 19900<br>23900       |
| 307WI             | 1.378<br>(2.5)         | 3.1496<br>(3)   | 0.8268<br>(47) | 10 x 9/16           | 0.98  | 5700<br>5130                                      | 10400<br>10400        | 19200<br>23000       | 5600<br>4940                                      | 10000<br>10000        | 17300<br>20800       |
| 308WI             | 1.5748<br>(2.5)        | 3.5433<br>(3)   | 0.9055<br>(47) | 11 x 5/8            | 1.34  | 7800<br>7010                                      | 13400<br>13400        | 16900<br>20300       | 7600<br>6770                                      | 12900<br>12900        | 15200<br>18200       |
| 309WI             | 1.7717<br>(2.5)        | 3.937<br>(3)    | 0.9843<br>(47) | 10 x 11/16          | 1.78  | 8650<br>7750                                      | 15000<br>15000        | 15100<br>18100       | 8500<br>7480                                      | 14400<br>14400        | 13600<br>16300       |
| 310WI             | 1.9685<br>(2.5)        | 4.3307<br>(3)   | 1.063<br>(47)  | 10 x 3/4            | 2.31  | 10400<br>9250                                     | 17500<br>17500        | 13600<br>16300       | 10000<br>8940                                     | 16900<br>16900        | 12200<br>14600       |
| 311WI             | 2.1654<br>(3)          | 4.7244<br>(3)   | 1.1417<br>(59) | 10 x 13/16          | 2.94  | 12200<br>10900                                    | 20300<br>20300        | 12400<br>14900       | 11800<br>10500                                    | 19500<br>19500        | 11200<br>13400       |
| 312WI             | 2.3622<br>(3)          | 5.1181<br>(3.5) | 1.2205<br>(59) | 10 x 7/8            | 3.67  | 14300<br>12700                                    | 23200<br>23200        | 11400<br>13700       | 13700<br>12200                                    | 22300<br>22300        | 10300<br>12400       |
| 313WI             | 2.5591<br>(3)          | 5.5118<br>(3.5) | 1.2992<br>(59) | 11 x 15/16          | 4.63  | 18000<br>16100                                    | 28000<br>28000        | 10500<br>12600       | 17300<br>15500                                    | 26900<br>26900        | 9500<br>11400        |
| 314WI             | 2.7559<br>(3)          | 5.9055<br>(3.5) | 1.378<br>(59)  | 11 x 1              | 5.62  | 20800<br>18400                                    | 31500<br>31500        | 9800<br>11800        | 20000<br>17700                                    | 30200<br>30200        | 8800<br>10600        |
| 319WI             | 3.7402<br>(3)          | 7.8740<br>(4)   | 1.7717<br>(79) | 10 x 1 3/8          | 12.32 | 35100<br>31200                                    | 46000<br>46000        | 7400<br>8900         | 33800<br>30100                                    | 44200<br>44200        | 6700<br>8000         |

(Ng) For a single, grease lubricated, spring preloaded bearing. This value to be used in permissible Operating Speed (Sp) calculation.

(1) Width tolerance of preloaded bearing set +0/-0.25 mm (+0/-0.010").

(2) ABMA STD 20 (r<sub>as</sub> max).

| r<br>Rad. <sup>(2)</sup> | Suggested<br>Shoulder Diameters |      |                          |      | Shaft Diameter |        | Mounting Fits |         | FIXED                        |        |               |         | FLOATING                     |         |                   |         | Bearing<br>Number<br>2MM or<br>3MM |
|--------------------------|---------------------------------|------|--------------------------|------|----------------|--------|---------------|---------|------------------------------|--------|---------------|---------|------------------------------|---------|-------------------|---------|------------------------------------|
|                          | d <sub>a</sub> (Shaft)          |      | D <sub>a</sub> (Housing) |      |                |        |               |         | Housing Bore<br>(Stationary) |        | Mounting Fits |         | Housing Bore<br>(Stationary) |         | Housing Clearance |         |                                    |
|                          | Max.                            | Min. | Max.                     | Min. | Min.           | Max.   | Loose         | Tight   | Min.                         | Max.   | Might         | Loose   | Max.                         | Min.    | Max.              | Min.    |                                    |
| in.                      | in.                             | in.  | in.                      | in.  | in.            | in.    | in.           | in.     | in.                          | in.    | in.           | in.     | in.                          | in.     | in.               | in.     |                                    |
| 0.039                    | 0.7                             | 0.69 | 1.27                     | 1.26 | 0.4722         | 0.4724 | 0.0002        | 0.00015 | 1.4567                       | 1.4570 | 0.000         | 0.0005  | 1.45710                      | 1.45690 | 0.00070           | 0.00020 | 301WI                              |
| 0.039                    | 0.88                            | 0.87 | 1.41                     | 1.4  | 0.5904         | 0.5906 | 0.0002        | 0.00015 | 1.6535                       | 1.6538 | 0.000         | 0.0005  | 1.65390                      | 1.65370 | 0.00070           | 0.00020 | 302WI                              |
| 0.039                    | 0.9                             | 0.89 | 1.66                     | 1.65 | 0.6691         | 0.6693 | 0.0002        | 0.00015 | 1.8504                       | 1.8507 | 0.000         | 0.0005  | 1.85090                      | 1.85070 | 0.00080           | 0.00030 | 303WI                              |
| 0.039                    | 1.19                            | 1.18 | 1.84                     | 1.83 | 0.7872         | 0.7874 | 0.0002        | 0.00020 | 2.0472                       | 2.0475 | 0.000         | 0.00055 | 2.04770                      | 2.04750 | 0.00080           | 0.00030 | 304WI                              |
| 0.039                    | 1.27                            | 1.26 | 2.2                      | 2.19 | 0.9841         | 0.9843 | 0.0002        | 0.00020 | 2.4409                       | 2.4412 | 0.000         | 0.0006  | 2.44140                      | 2.44120 | 0.00080           | 0.00030 | 305WI                              |
| 0.039                    | 1.49                            | 1.48 | 2.57                     | 2.56 | 1.1809         | 1.1811 | 0.0002        | 0.00020 | 2.8346                       | 2.8349 | 0.000         | 0.0006  | 2.83510                      | 2.83490 | 0.00080           | 0.00030 | 306WI                              |
| 0.059                    | 1.72                            | 1.7  | 2.84                     | 2.82 | 1.3778         | 1.3780 | 0.0002        | 0.00025 | 3.1496                       | 3.1499 | 0.000         | 0.0006  | 3.15010                      | 3.14990 | 0.00080           | 0.00030 | 307WI                              |
| 0.059                    | 1.96                            | 1.94 | 3.2                      | 3.18 | 1.5746         | 1.5748 | 0.0002        | 0.00025 | 3.5433                       | 3.5436 | 0.000         | 0.0006  | 3.54390                      | 3.54360 | 0.00090           | 0.00030 | 308WI                              |
| 0.059                    | 2.2                             | 2.18 | 3.55                     | 3.53 | 1.7715         | 1.7717 | 0.0002        | 0.00025 | 3.9370                       | 3.9373 | 0.000         | 0.0006  | 3.93770                      | 3.93740 | 0.00100           | 0.00040 | 309WI                              |
| 0.079                    | 2.41                            | 2.39 | 3.93                     | 3.91 | 1.9683         | 1.9685 | 0.0002        | 0.00025 | 4.3307                       | 4.3310 | 0.000         | 0.0006  | 4.33140                      | 4.33110 | 0.00100           | 0.00040 | 310WI                              |
| 0.079                    | 2.65                            | 2.63 | 4.28                     | 4.26 | 2.1652         | 2.1654 | 0.0002        | 0.00030 | 4.7244                       | 4.7247 | 0.000         | 0.0006  | 4.72510                      | 4.72480 | 0.00100           | 0.00040 | 311WI                              |
| 0.079                    | 2.88                            | 2.86 | 4.64                     | 4.62 | 2.3620         | 2.3622 | 0.0002        | 0.00030 | 5.1181                       | 5.1185 | 0.000         | 0.0007  | 5.11890                      | 5.11850 | 0.00110           | 0.00040 | 312WI                              |
| 0.079                    | 3.16                            | 3.14 | 4.99                     | 4.97 | 2.5589         | 2.5591 | 0.0002        | 0.00030 | 5.5118                       | 5.5122 | 0.000         | 0.0007  | 5.51260                      | 5.51220 | 0.00110           | 0.00040 | 313WI                              |
| 0.079                    | 3.36                            | 3.34 | 5.34                     | 5.32 | 2.7557         | 2.7559 | 0.0002        | 0.00030 | 5.9055                       | 5.9059 | 0.000         | 0.0007  | 5.90640                      | 5.90600 | 0.00120           | 0.00050 | 314WI                              |

D





## MEDIUM 2(3)MM300WI (ISO 03) SERIES

### DUPLEX PERFORMANCE DATA

### MOUNTING ARRANGEMENTS



Suggested  
DB



Tandem  
DT



Special Applications  
DF

| Bearing<br>Number<br>2MM or 3MM                | PRELOAD |      |      |      | AXIAL STIFFNESS <sup>(1)</sup> |        |        |        | RADIAL STIFFNESS <sup>(1)</sup> |        |         | SPACER OFFSETS <sup>(1)</sup> |                    |                    |
|------------------------------------------------|---------|------|------|------|--------------------------------|--------|--------|--------|---------------------------------|--------|---------|-------------------------------|--------------------|--------------------|
|                                                | DUX     | DUL  | DUM  | DUH  | X-light                        | Light  | Medium | Heavy  | Light                           | Medium | Heavy   | X-Light<br>to Light           | Light to<br>Medium | Medium<br>to Heavy |
|                                                | N       |      |      |      | N/μm                           |        |        |        | N/μm                            |        |         | μm                            |                    |                    |
| METRIC DUPLEX PERFORMANCE DATA 2MM300WI SERIES |         |      |      |      |                                |        |        |        |                                 |        |         |                               |                    |                    |
| 2MM301WI                                       | —       | 20   | 70   | 180  | —                              | 17.49  | 27.81  | 44.25  | 98.82                           | 153.56 | 183.30  | —                             | 7.87               | 12.45              |
| 2MM302WI                                       | 20      | 40   | 110  | 220  | —                              | 27.46  | 40.93  | 57.19  | 143.24                          | 164.93 | 205.51  | —                             | 7.87               | 9.14               |
| 2MM303WI                                       | 40      | 70   | 160  | 310  | —                              | 26.58  | 38.83  | 54.57  | 147.44                          | 197.46 | 263.05  | —                             | 10.92              | 13.46              |
| 2MM304WI                                       | 40      | 90   | 220  | 400  | —                              | 33.06  | 49.85  | 66.46  | 181.72                          | 232.97 | 289.81  | —                             | 12.95              | 121.92             |
| 2MM305WI                                       | 90      | 160  | 330  | 620  | —                              | 46.17  | 65.24  | 88.50  | 247.83                          | 283.16 | 340.88  | —                             | 12.7               | 14.99              |
| 2MM306WI                                       | 90      | 180  | 440  | 780  | —                              | 49.50  | 74.68  | 98.47  | 271.27                          | 303.10 | 405.77  | —                             | 17.27              | 15.49              |
| 2MM307WI                                       | 110     | 220  | 560  | 1000 | —                              | 55.97  | 85.18  | 114.38 | 323.91                          | 388.10 | 478.70  | —                             | 18.8               | 17.78              |
| 2MM308WI                                       | 130     | 290  | 670  | 1220 | —                              | 64.71  | 94.62  | 127.85 | 364.67                          | 392.65 | 489.20  | —                             | 19.05              | 20.07              |
| 2MM309WI                                       | 180     | 330  | 780  | 1560 | —                              | 70.13  | 103.02 | 145.17 | 393.18                          | 472.58 | 588.36  | —                             | 20.57              | 25.15              |
| 2MM310WI                                       | 220     | 440  | 1000 | 1780 | —                              | 81.15  | 117.36 | 156.01 | 366.24                          | 496.89 | 637.86  | —                             | 22.35              | 22.86              |
| 2MM311WI                                       | 270     | 560  | 1110 | 2110 | —                              | 88.15  | 121.38 | 167.20 | 382.86                          | 582.42 | 724.61  | —                             | 21.34              | 27.69              |
| 2MM312WI                                       | 270     | 560  | 1330 | 2450 | —                              | 89.72  | 133.80 | 180.85 | 456.31                          | 632.26 | 802.44  | —                             | 27.94              | 28.19              |
| 2MM313WI                                       | 330     | 670  | 1670 | 3000 | —                              | 104.24 | 157.93 | 211.28 | 511.76                          | 668.64 | 846.52  | —                             | 30.48              | 28.96              |
| 2MM314WI                                       | 400     | 780  | 1890 | 3450 | —                              | 110.89 | 166.33 | 224.22 | 519.80                          | 703.80 | 876.25  | —                             | 32.26              | 32.00              |
| 2MM319WI                                       | 670     | 1330 | 3110 | 6230 | —                              | 140.44 | 206.03 | 290.33 | 726.88                          | 932.74 | 1183.02 | —                             | 41.05              | 50.24              |
| Bearing<br>Number<br>2MM or 3MM                | PRELOAD |      |      |      | AXIAL STIFFNESS <sup>(1)</sup> |        |        |        | RADIAL STIFFNESS <sup>(1)</sup> |        |         | SPACER OFFSETS <sup>(1)</sup> |                    |                    |
|                                                | DUX     | DUL  | DUM  | DUH  | X-light                        | Light  | Medium | Heavy  | Light                           | Medium | Heavy   | X-Light<br>to Light           | Light to<br>Medium | Medium<br>to Heavy |
|                                                | N       |      |      |      | N/μm                           |        |        |        | N/μm                            |        |         | μm                            |                    |                    |
| METRIC DUPLEX PERFORMANCE DATA 3MM300WI SERIES |         |      |      |      |                                |        |        |        |                                 |        |         |                               |                    |                    |
| 3MM301WI                                       | 40      | 90   | 180  | 310  | —                              | 58.59  | 76.61  | 96.37  | 94.10                           | 135.90 | 169.48  | —                             | 5.33               | 6.10               |
| 3MM302WI                                       | 40      | 90   | 180  | 360  | —                              | 66.46  | 86.75  | 115.08 | 115.96                          | 160.21 | 199.39  | —                             | 4.57               | 7.11               |
| 3MM303WI                                       | 40      | 110  | 270  | 440  | —                              | 63.66  | 89.02  | 109.49 | 132.92                          | 204.46 | 223.87  | —                             | 8.13               | 7.11               |
| 3MM304WI                                       | 90      | 160  | 360  | 620  | —                              | 79.23  | 108.96 | 136.77 | 159.51                          | 220.02 | 253.26  | —                             | 8.38               | 8.64               |
| 3MM305WI                                       | 110     | 220  | 530  | 890  | —                              | 101.62 | 142.19 | 174.90 | 189.59                          | 258.50 | 303.98  | —                             | 10.16              | 8.89               |
| 3MM306WI                                       | 135     | 270  | 670  | 1110 | —                              | 112.29 | 159.33 | 196.06 | 227.02                          | 306.77 | 356.10  | —                             | 11.68              | 9.91               |
| 3MM307WI                                       | 180     | 360  | 850  | 1560 | —                              | 134.85 | 187.84 | 241.01 | 267.42                          | 360.99 | 428.33  | —                             | 12.19              | 13.21              |
| 3MM308WI                                       | 220     | 440  | 1110 | 1780 | —                              | 150.41 | 214.08 | 259.20 | 275.64                          | 372.71 | 423.96  | —                             | 14.48              | 11.18              |
| 3MM309WI                                       | 270     | 530  | 1330 | 2220 | —                              | 165.98 | 235.94 | 290.51 | 332.14                          | 448.44 | 520.50  | —                             | 15.75              | 13.46              |
| 3MM310WI                                       | 310     | 620  | 1560 | 2670 | —                              | 178.75 | 254.13 | 316.57 | 360.12                          | 486.22 | 568.25  | —                             | 17.27              | 15.49              |
| 3MM311WI                                       | 400     | 780  | 1780 | 3110 | —                              | 198.16 | 272.32 | 342.10 | 407.34                          | 549.71 | 634.36  | —                             | 17.02              | 17.27              |
| 3MM312WI                                       | 450     | 890  | 2000 | 3560 | —                              | 213.38 | 291.21 | 367.81 | 450.02                          | 607.43 | 695.05  | —                             | 17.53              | 18.80              |
| 3MM313WI                                       | 560     | 1110 | 2670 | 4450 | —                              | 249.23 | 348.93 | 429.55 | 474.50                          | 640.48 | 740.18  | —                             | 20.83              | 18.29              |
| 3MM314WI                                       | 620     | 1220 | 2890 | 5120 | —                              | 262.52 | 365.02 | 460.34 | 492.87                          | 665.67 | 772.53  | —                             | 21.08              | 21.59              |
| 3MM319WI                                       | 1070    | 2110 | 4890 | 8900 | —                              | 328.81 | 453.52 | 578.22 | 655.70                          | 824.65 | 1029.29 | —                             | 28.19              | 30.99              |

Notes: <sup>(1)</sup> For DB or DF arrangements only. For other mounting arrangements contact your Timken representative.

## MEDIUM 2(3)MM300WI (ISO 03) SERIES

### SPEED CAPABILITY DATA

| Bearing Number         | Grease Capacity |       | Kluber Isoflex |       | Operating Speeds <sup>(2)</sup> |               |       | (DB Mounting) <sup>(1)</sup> |            |       |
|------------------------|-----------------|-------|----------------|-------|---------------------------------|---------------|-------|------------------------------|------------|-------|
|                        | NBU15           |       | NBU15          |       | DUL                             | Grease<br>DUM | DUH   | DUL                          | Oil<br>DUM | DUH   |
|                        | 25%             | 40%   | 15%            | 20%   |                                 |               |       |                              |            |       |
|                        | grams           | grams | grams          | grams | RPM                             | RPM           | RPM   | RPM                          | RPM        | RPM   |
| <b>2MM300WI SERIES</b> |                 |       |                |       |                                 |               |       |                              |            |       |
| 2MM301WI               | 0.6             | 1.0   | 0.40           | 0.53  | 35700                           | 28600         | 19000 | 60700                        | 48600      | 32400 |
| 2MM302WI               | 0.7             | 1.2   | 0.49           | 0.65  | 28600                           | 22900         | 15200 | 48600                        | 38900      | 25900 |
| 2MM303WI               | 1.2             | 2.0   | 0.83           | 1.10  | 27600                           | 22100         | 14700 | 46900                        | 37500      | 25000 |
| 2MM304WI               | 1.5             | 2.5   | 1.03           | 1.38  | 24200                           | 19300         | 12900 | 41100                        | 32800      | 21900 |
| 2MM305WI               | 2.3             | 3.8   | 1.57           | 2.09  | 19700                           | 15700         | 10500 | 33400                        | 26700      | 17800 |
| 2MM306WI               | 3.5             | 5.6   | 2.35           | 3.14  | 16600                           | 13300         | 8800  | 28200                        | 22500      | 15000 |
| 2MM307WI               | 4.6             | 7.4   | 3.07           | 4.10  | 14400                           | 11500         | 7700  | 24500                        | 19600      | 13100 |
| 2MM308WI               | 6.4             | 10.2  | 4.25           | 5.66  | 12700                           | 10100         | 6800  | 21500                        | 17200      | 11500 |
| 2MM309WI               | 8.5             | 13.6  | 5.68           | 7.58  | 11300                           | 9100          | 6000  | 19300                        | 15400      | 10300 |
| 2MM310WI               | 11.1            | 17.8  | 7.40           | 9.90  | 10200                           | 8200          | 5400  | 17300                        | 13900      | 9200  |
| 2MM311WI               | 14.2            | 22.7  | 9.50           | 12.60 | 9300                            | 7400          | 5000  | 15800                        | 12600      | 8400  |
| 2MM312WI               | 17.7            | 28.3  | 11.80          | 15.80 | 8600                            | 6800          | 4600  | 14500                        | 11600      | 7800  |
| 2MM313WI               | 20.7            | 33.2  | 13.80          | 18.50 | 7900                            | 6300          | 4200  | 13400                        | 10700      | 7100  |
| 2MM314WI               | 25.2            | 40.3  | 16.80          | 22.40 | 7400                            | 5900          | 3900  | 12500                        | 10000      | 6700  |
| 2MM319WI               | 60.9            | 97.4  | 40.60          | 54.10 | 5600                            | 4400          | 3000  | 9400                         | 7500       | 5000  |
| <b>3MM300WI SERIES</b> |                 |       |                |       |                                 |               |       |                              |            |       |
| 3MM301WI               | 0.6             | 1.0   | 0.40           | 0.53  | 32130                           | 25740         | 17100 | 54630                        | 43740      | 29160 |
| 3MM302WI               | 0.7             | 1.2   | 0.49           | 0.65  | 25740                           | 20610         | 13680 | 43740                        | 35010      | 23310 |
| 3MM303WI               | 1.2             | 2.0   | 0.83           | 1.10  | 24840                           | 19890         | 13230 | 42210                        | 33750      | 22500 |
| 3MM304WI               | 1.5             | 2.5   | 1.03           | 1.38  | 21780                           | 17370         | 11610 | 36990                        | 29520      | 19710 |
| 3MM305WI               | 2.3             | 3.8   | 1.57           | 2.09  | 17730                           | 14130         | 9450  | 30060                        | 24030      | 16020 |
| 3MM306WI               | 3.5             | 5.6   | 2.35           | 3.14  | 14940                           | 11970         | 7920  | 25380                        | 20250      | 13500 |
| 3MM307WI               | 4.6             | 7.4   | 3.07           | 4.10  | 12960                           | 10350         | 6930  | 22050                        | 17640      | 11790 |
| 3MM308WI               | 6.4             | 10.2  | 4.25           | 5.66  | 11430                           | 9090          | 6120  | 19350                        | 15480      | 10350 |
| 3MM309WI               | 8.5             | 13.6  | 5.68           | 7.58  | 10170                           | 8190          | 5400  | 17370                        | 13860      | 9270  |
| 3MM310WI               | 11.1            | 17.8  | 7.40           | 9.90  | 9180                            | 7380          | 4860  | 15570                        | 12510      | 8280  |
| 3MM311WI               | 14.2            | 22.7  | 9.50           | 12.60 | 8370                            | 6660          | 4500  | 14220                        | 11340      | 7560  |
| 3MM312WI               | 17.7            | 28.3  | 11.80          | 15.80 | 7740                            | 6120          | 4140  | 13050                        | 10440      | 7020  |
| 3MM313WI               | 20.7            | 33.2  | 13.80          | 18.50 | 7110                            | 5670          | 3780  | 12060                        | 9630       | 6390  |
| 3MM314WI               | 25.2            | 40.3  | 16.80          | 22.40 | 6660                            | 5310          | 3510  | 11250                        | 9000       | 6030  |
| 3MM319WI               | 60.9            | 97.4  | 40.60          | 54.10 | 5040                            | 3960          | 2700  | 8460                         | 6750       | 4500  |

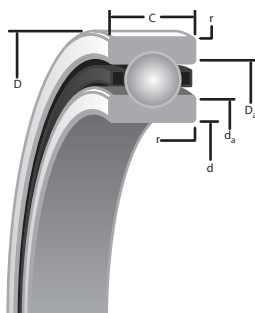
<sup>(1)</sup> For other mounting arrangement configurations refer to the engineering section on Permissible Speed calculation methods.

<sup>(2)</sup> For ceramic ball complements use 120% of speeds shown.



## MEDIUM MM300K (ISO 03) SERIES

### DIMENSIONAL SIZES METRIC / INCH



#### SUPER PRECISION MM:

Running accuracy and performance meet ABEC 9 (ISO P2) levels. Non-critical features conform to ABEC 7 (ISO P4) requirements.

#### CONRAD CONSTRUCTION:

- Maximum complement of balls separated by two-piece land piloted cage.

| Bearing Number | d<br>Bore             | D<br>O.D.       | C<br>Width <sup>(1)</sup> | Ball Qty.<br>x Dia.               | Wt.<br>kg | LOAD RATINGS<br>(steel ball & ceramic ball) |                           |                                         |
|----------------|-----------------------|-----------------|---------------------------|-----------------------------------|-----------|---------------------------------------------|---------------------------|-----------------------------------------|
|                |                       |                 |                           |                                   |           | C <sub>0</sub> (stat)<br>N                  | C <sub>e</sub> (dyn)<br>N | Limiting Speed (N <sub>g</sub> )<br>RPM |
| METRIC         | in./tol: +0; - (μm)   |                 |                           | mm                                | kg        |                                             |                           |                                         |
| MM305K         | 25<br>(5)             | 62<br>(7)       | 17<br>(130)               | 7 x 11.9                          | 0.222     | 12200                                       | 26700                     | 26,500                                  |
| MM306K         | 30<br>(5)             | 72<br>(7)       | 19<br>(130)               | 7 x 13.5                          | 0.327     | 15800                                       | 34000                     | 22,300                                  |
| MM307K         | 35<br>(6)             | 80<br>(7)       | 21<br>(130)               | 7 x 14.3                          | 0.431     | 18500                                       | 37800                     | 19,400                                  |
| MM308K         | 40<br>(6)             | 90<br>(8)       | 23<br>(130)               | 8 x 15.9                          | 0.594     | 22700                                       | 46300                     | 17,100                                  |
| MM309K         | 45<br>(6)             | 100<br>(8)      | 25<br>(130)               | 8 x 17.5                          | 0.807     | 31600                                       | 59600                     | 15,200                                  |
| MM310K         | 50<br>(6)             | 110<br>(8)      | 27<br>(130)               | 8 x 19.1                          | 1.052     | 37800                                       | 69400                     | 13,800                                  |
| MM311K         | 55<br>(7)             | 120<br>(8)      | 29<br>(150)               | 8 x 20.6                          | 1.329     | 44500                                       | 81400                     | 12,500                                  |
| MM312K         | 60<br>(7)             | 130<br>(9)      | 31<br>(150)               | 8 x 22.2                          | 1.665     | 51600                                       | 92500                     | 11,500                                  |
| MM313K         | 65<br>(7)             | 140<br>(9)      | 33<br>(150)               | 8 x 23.8                          | 2.046     | 59600                                       | 105000                    | 10,700                                  |
| MM314K         | 70<br>(7)             | 150<br>(9)      | 35<br>(150)               | 8 x 25.4                          | 2.486     | 68100                                       | 115600                    | 9,900                                   |
| INCH           | in./tol: +0; -.000(X) |                 |                           | in.                               | lbs.      | lbs.                                        |                           | RPM                                     |
| MM305K         | 0.9843<br>(2)         | 2.4409<br>(3)   | 0.6693<br>(47)            | 7 x <sup>15</sup> / <sub>32</sub> | 0.49      | 2750                                        | 6000                      | 26,500                                  |
| MM306K         | 1.1811<br>(2)         | 2.8346<br>(3)   | 0.748<br>(47)             | 7 x <sup>17</sup> / <sub>32</sub> | 0.72      | 3550                                        | 7650                      | 22,300                                  |
| MM307K         | 1.378<br>(2.5)        | 3.1496<br>(3)   | 0.8268<br>(47)            | 7 x <sup>9</sup> / <sub>16</sub>  | 0.95      | 4150                                        | 8500                      | 19,400                                  |
| MM308K         | 1.5748<br>(2.5)       | 3.5433<br>(3)   | 0.9055<br>(47)            | 8 x <sup>5</sup> / <sub>8</sub>   | 1.31      | 5100                                        | 10400                     | 17,100                                  |
| MM309K         | 1.7717<br>(2.5)       | 3.937<br>(3)    | 0.9843<br>(47)            | 8 x <sup>11</sup> / <sub>16</sub> | 1.78      | 7100                                        | 13400                     | 15,200                                  |
| MM310K         | 1.9685<br>(2.5)       | 4.3307<br>(3)   | 1.063<br>(47)             | 8 x <sup>3</sup> / <sub>4</sub>   | 2.32      | 8500                                        | 15600                     | 13,800                                  |
| MM311K         | 2.1654<br>(3)         | 4.7244<br>(3)   | 1.1417<br>(59)            | 8 x <sup>13</sup> / <sub>16</sub> | 2.93      | 10000                                       | 18300                     | 12,500                                  |
| MM312K         | 2.3622<br>(3)         | 5.1181<br>(3.5) | 1.2205<br>(59)            | 8 x <sup>7</sup> / <sub>8</sub>   | 3.67      | 11600                                       | 20800                     | 11,500                                  |
| MM313K         | 2.5591<br>(3)         | 5.5118<br>(3.5) | 1.2992<br>(59)            | 8 x <sup>15</sup> / <sub>16</sub> | 4.51      | 13400                                       | 23600                     | 10,700                                  |
| MM314K         | 2.7559<br>(3)         | 5.9055<br>(3.5) | 1.378<br>(59)             | 8 x 1                             | 5.48      | 15300                                       | 26000                     | 9,900                                   |

(N<sub>g</sub>) For a single, grease lubricated, spring pretrained bearing. This value to be used in permissible Operating Speed (Sp) calculation.

<sup>(1)</sup> Width tolerance of pretrained bearing set +0/-0.25 mm (+0/-0.010").

<sup>(2)</sup> ABMA STD 20 (r<sub>as</sub> max).

| r<br>Rad. <sup>(2)</sup> | Suggested<br>Shoulder Diameters |      |                          |       | Shaft Diameter |        | Mounting Fits |         | FIXED                        |         |               |        | FLOATING                     |         |                   |         |        |
|--------------------------|---------------------------------|------|--------------------------|-------|----------------|--------|---------------|---------|------------------------------|---------|---------------|--------|------------------------------|---------|-------------------|---------|--------|
|                          | d <sub>a</sub> (Shaft)          |      | D <sub>a</sub> (Housing) |       |                |        |               |         | Housing Bore<br>(Stationary) |         | Mounting Fits |        | Housing Bore<br>(Stationary) |         | Housing Clearance |         |        |
|                          | Max.                            | Min. | Max.                     | Min.  | Min.           | Max.   | Loose         | Tight   | Min.                         | Max.    | Tight         | Loose  | Max.                         | Min.    | Max.              | Min.    |        |
| mm                       | mm                              | mm   | mm                       | mm    | mm             | mm     | mm            | mm      | mm                           | mm      | mm            | mm     | mm.                          | mm.     | mm.               | mm      |        |
| 1                        | 32.1                            | 31.9 | 55.8                     | 55.5  | 24.995         | 25.000 | 0.005         | 0.005   | 62                           | 62.008  | 0.000         | 0.015  | 62.012                       | 62.007  | 0.019             | 0.007   | MM305K |
| 1                        | 37.7                            | 37.5 | 65.2                     | 64.9  | 29.995         | 30.000 | 0.005         | 0.005   | 72                           | 72.008  | 0.000         | 0.015  | 72.011                       | 72.007  | 0.019             | 0.007   | MM306K |
| 1.5                      | 43.7                            | 43.2 | 72.1                     | 71.6  | 34.995         | 35.000 | 0.005         | 0.006   | 80                           | 80.008  | 0.000         | 0.015  | 80.012                       | 80.008  | 0.020             | 0.008   | MM307K |
| 1.5                      | 49.8                            | 49.3 | 81.3                     | 80.8  | 39.995         | 40.000 | 0.005         | 0.006   | 90                           | 90.008  | 0.000         | 0.016  | 90.015                       | 90.007  | 0.023             | 0.007   | MM308K |
| 1.5                      | 55.9                            | 55.4 | 90.2                     | 89.7  | 44.995         | 45.000 | 0.005         | 0.006   | 100                          | 100.008 | 0.000         | 0.016  | 100.018                      | 100.010 | 0.025             | 0.010   | MM309K |
| 1.5                      | 61.2                            | 60.7 | 99.8                     | 99.3  | 49.995         | 50.000 | 0.005         | 0.006   | 110                          | 110.008 | 0.000         | 0.016  | 110.018                      | 110.010 | 0.025             | 0.010   | MM310K |
| 2                        | 67.3                            | 66.8 | 108.7                    | 108.2 | 54.995         | 55.000 | 0.005         | 0.007   | 120                          | 120.008 | 0.000         | 0.016  | 120.018                      | 120.010 | 0.025             | 0.010   | MM311K |
| 2                        | 43.2                            | 72.6 | 117.9                    | 117.3 | 59.995         | 60.000 | 0.005         | 0.007   | 130                          | 130.009 | 0.000         | 0.018  | 130.020                      | 130.010 | 0.029             | 0.010   | MM312K |
| 2                        | 80.3                            | 79.8 | 126.8                    | 126.2 | 64.995         | 65.000 | 0.005         | 0.007   | 140                          | 140.009 | 0.000         | 0.018  | 140.020                      | 140.010 | 0.029             | 0.010   | MM313K |
| 2                        | 85.3                            | 84.8 | 135.6                    | 135.1 | 69.995         | 70.000 | 0.005         | 0.007   | 150                          | 150.009 | 0.000         | 0.018  | 150.023                      | 150.012 | 0.032             | 0.012   | MM314K |
| in.                      | in.                             | in.  | in.                      | in.   | in.            | in.    | in.           | in.     | in.                          | in.     | in.           | in.    | in.                          | in.     | in.               | in.     |        |
| 0.039                    | 1.27                            | 1.26 | 2.2                      | 2.19  | 0.9841         | 0.9843 | 0.0002        | 0.0002  | 2.4409                       | 2.4412  | 0.0000        | 0.0006 | 2.44140                      | 2.44120 | 0.00080           | 0.0003  | MM305K |
| 0.039                    | 1.49                            | 1.48 | 2.57                     | 2.56  | 1.1809         | 1.1811 | 0.0002        | 0.0002  | 2.8346                       | 2.8349  | 0.0000        | 0.0006 | 2.83510                      | 2.83490 | 0.00080           | 0.0003  | MM306K |
| 0.059                    | 1.72                            | 1.7  | 2.84                     | 2.82  | 1.3778         | 1.3780 | 0.0002        | 0.00025 | 3.1496                       | 3.1499  | 0.0000        | 0.0006 | 3.15010                      | 3.14990 | 0.00080           | 0.0003  | MM308K |
| 0.059                    | 1.96                            | 1.94 | 3.2                      | 3.18  | 1.5746         | 1.5748 | 0.0002        | 0.00025 | 3.5433                       | 3.5436  | 0.0000        | 0.0006 | 3.54390                      | 3.54360 | 0.00090           | 0.0003  | MM308K |
| 0.059                    | 2.2                             | 2.18 | 3.55                     | 3.53  | 1.7715         | 1.7717 | 0.0002        | 0.00025 | 3.9370                       | 3.9373  | 0.0000        | 0.0006 | 3.93770                      | 3.93740 | 0.00100           | 0.0004  | MM309K |
| 0.059                    | 2.41                            | 2.39 | 3.93                     | 3.91  | 1.9683         | 1.9685 | 0.0002        | 0.00025 | 4.3307                       | 4.3310  | 0.0000        | 0.0006 | 4.33140                      | 4.33110 | 0.00100           | 0.0004  | MM310K |
| 0.079                    | 2.65                            | 2.63 | 4.28                     | 4.26  | 2.1652         | 2.1654 | 0.0002        | 0.0003  | 4.7244                       | 4.7247  | 0.0000        | 0.0006 | 4.72510                      | 4.72480 | 0.00100           | 0.0004  | MM311K |
| 0.079                    | 2.88                            | 2.86 | 4.64                     | 4.62  | 2.3620         | 2.3622 | 0.0002        | 0.0003  | 5.1181                       | 5.1185  | 0.0000        | 0.0007 | 5.11890                      | 5.11850 | 0.00110           | 0.0004  | MM312K |
| 0.079                    | 3.16                            | 3.14 | 4.99                     | 4.97  | 2.5589         | 2.5591 | 0.0002        | 0.0003  | 5.5118                       | 5.5122  | 0.0000        | 0.0007 | 5.51260                      | 5.51220 | 0.00110           | 0.0004  | MM313K |
| 0.079                    | 3.36                            | 3.34 | 5.34                     | 5.32  | 2.7557         | 2.7559 | 0.0002        | 0.0003  | 5.9055                       | 5.9059  | 0.0000        | 0.0007 | 5.90640                      | 5.90600 | 0.00120           | 0.00050 | MM314K |

D

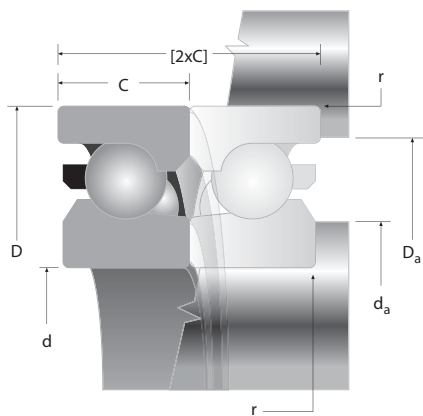




## BALL SCREW SUPPORT SERIES

### DIMENSIONAL SIZES – METRIC SERIES (METRIC UNITS)

- Designed for maximum axial rigidity, low drag torque, and extreme control of lateral eccentricity.
- Manufactured to ABEC 9 axial tolerances.
- Nonseparable angular-contact type design (60° contact angle).
- Manufactured to ABEC 7 radial and envelope tolerances.
- Maximum complement of balls.
- Supplied prelubricated with heavy-duty grease NLGI #2.
- Packaged in DB arrangement [can be mounted in duplexed pairs and in multiplexed sets in either Back-to-Back (DB), Face-to-Face (DF) or Tandem (DT) arrangements].



| Bearing Number | d<br>Bore         | D<br>O.D.  | C<br>Width <sup>(1)</sup> | Wt.  | Ball Qty.<br>x Dia. | r<br>Rad. <sup>(2)</sup> | d <sub>a</sub> (Shaft) |        | D <sub>a</sub> (Housing) |        | Shaft Dia. |        | Housing Dia. |      |
|----------------|-------------------|------------|---------------------------|------|---------------------|--------------------------|------------------------|--------|--------------------------|--------|------------|--------|--------------|------|
|                | mm/tol: +0; -(μm) |            |                           | kg   | mm                  | mm                       | Max.                   | Min.   | Max.                     | Min.   | Max.       | Min.   | Max.         | Min. |
| <b>METRIC</b>  |                   |            |                           |      |                     |                          | mm                     | mm     | mm                       | mm     | mm         | mm     | mm           | mm   |
| MM12BS32       | 12<br>(4)         | 32<br>(6)  | 10<br>(80)                | .04  | 11 x 4.8            | 0.8                      | 17.63                  | 17.37  | 26.63                    | 26.37  | 11.996     | 11.992 | 32.006       | 32   |
| MM15BS35       | 15<br>(4)         | 35<br>(6)  | 11<br>(80)                | .05  | 13 x 4.8            | 0.8                      | 20.63                  | 20.37  | 29.63                    | 29.37  | 14.996     | 14.992 | 35.006       | 35   |
| MM17BS47       | 17<br>(4)         | 47<br>(6)  | 15<br>(80)                | .13  | 12 x 7.9            | 0.8                      | 23.13                  | 22.87  | 41.63                    | 41.37  | 16.996     | 16.992 | 47.006       | 47   |
| MM20BS47       | 20<br>(5)         | 47<br>(6)  | 15<br>(120)               | .12  | 12 x 7.9            | 0.8                      | 26.13                  | 25.87  | 41.63                    | 41.37  | 19.995     | 19.99  | 47.006       | 47   |
| MM25BS52       | 25<br>(5)         | 52<br>(7)  | 15<br>(120)               | .14  | 13 x 7.9            | 0.8                      | 31.63                  | 31.37  | 43.63                    | 43.37  | 24.995     | 24.99  | 52.007       | 52   |
| MM25BS62       | 25<br>(5)         | 62<br>(7)  | 15<br>(120)               | .23  | 17 x 7.9            | 0.8                      | 35.13                  | 34.87  | 56.13                    | 55.87  | 24.995     | 24.99  | 62.007       | 62   |
| MM30BS62       | 30<br>(5)         | 62<br>(7)  | 15<br>(120)               | .21  | 17 x 7.9            | 0.8                      | 40.13                  | 39.87  | 56.13                    | 55.87  | 29.995     | 29.99  | 62.007       | 62   |
| MM30BS72       | 30<br>(5)         | 72<br>(7)  | 15<br>(120)               | .32  | 18 x 8.7            | 0.8                      | 40.13                  | 39.87  | 56.13                    | 55.87  | 29.995     | 29.99  | 72.007       | 72   |
| MM35BS72       | 35<br>(6)         | 72<br>(7)  | 15<br>(120)               | .29  | 18 x 8.7            | 0.8                      | 42.13                  | 41.87  | 64.13                    | 63.87  | 34.994     | 34.988 | 72.007       | 72   |
| MM35BS100      | 35<br>(6)         | 100<br>(8) | 20<br>(120)               | .86  | 18 x 12.7           | 0.8                      | 42.13                  | 41.87  | 90.13                    | 89.87  | 39.994     | 39.988 | 72.007       | 72   |
| MM40BS72       | 40<br>(6)         | 72<br>(7)  | 15<br>(120)               | .25  | 18 x 8.7            | 0.8                      | 47.13                  | 46.87  | 64.13                    | 63.87  | 44.994     | 44.988 | 75.007       | 75   |
| MM40BS90       | 40<br>(6)         | 90<br>(8)  | 15<br>(120)               | .49  | 24 x 8.7            | 0.8                      | 47.13                  | 46.87  | 82.13                    | 81.87  | 39.994     | 39.988 | 90.008       | 90   |
| MM40BS90-20    | 40<br>(6)         | 90<br>(8)  | 20<br>(120)               | .66  | 24 x 8.7            | 0.8                      | 47.13                  | 46.87  | 82.13                    | 81.87  | 39.994     | 39.998 | 90.008       | 90   |
| MM40BS90-23    | 40<br>(6)         | 90<br>(8)  | 23<br>(120)               | .75  | 24 x 8.7            | 0.8                      | 47.13                  | 46.87  | 82.13                    | 81.87  | 39.994     | 39.988 | 90.008       | 90   |
| MM40BS100      | 40<br>(6)         | 100<br>(8) | 20<br>(120)               | .82  | 18 x 12.7           | 0.8                      | 47.13                  | 46.87  | 90.13                    | 89.87  | 39.994     | 39.988 | 100.007      | 100  |
| MM45BS75       | 45<br>(6)         | 75<br>(7)  | 15<br>(120)               | .25  | 20 x 8.7            | 0.8                      | 52.13                  | 51.87  | 69.13                    | 68.87  | 39.994     | 39.988 | 72.007       | 72   |
| MM45BS100      | 45<br>(6)         | 100<br>(8) | 20<br>(120)               | .76  | 18 x 12.7           | 0.8                      | 54.13                  | 53.87  | 90.13                    | 89.87  | 44.994     | 44.988 | 100.008      | 100  |
| MM50BS90       | 50<br>(6)         | 90<br>(8)  | 15<br>(120)               | .41  | 24 x 8.7            | 0.8                      | 59.13                  | 58.87  | 82.13                    | 81.87  | 49.994     | 49.988 | 90.008       | 90   |
| MM50BS100      | 50<br>(6)         | 100<br>(8) | 20<br>(120)               | .71  | 18 x 12.7           | 0.8                      | 59.13                  | 58.87  | 90.13                    | 89.87  | 49.994     | 49.988 | 100.008      | 100  |
| MM55BS90       | 55<br>(7)         | 90<br>(8)  | 15<br>(150)               | .36  | 24 x 8.7            | 0.8                      | 63.13                  | 62.87  | 82.13                    | 81.87  | 54.993     | 54.986 | 90.008       | 90   |
| MM55BS120      | 55<br>(7)         | 120<br>(8) | 20<br>(150)               | 1.14 | 21 x 12.7           | 1                        | 65.13                  | 64.87  | 110.13                   | 109.87 | 54.993     | 54.986 | 120.008      | 120  |
| MM60BS120      | 60<br>(7)         | 120<br>(8) | 20<br>(150)               | 1.06 | 21 x 12.7           | 1                        | 70.13                  | 69.87  | 110.13                   | 109.87 | 59.993     | 59.986 | 120.008      | 120  |
| MM75BS110      | 75<br>(7)         | 110<br>(8) | 15<br>(150)               | .46  | 30 x 8.7            | 0.8                      | 84.13                  | 83.87  | 102.13                   | 101.87 | 74.993     | 74.986 | 110.008      | 110  |
| MM100BS150     | 100<br>(8)        | 150<br>(9) | 20<br>(200)               | 1.28 | 26 x 12.7           | 1                        | 110.13                 | 109.87 | 138.13                   | 137.87 | 99.992     | 99.984 | 150.009      | 150  |

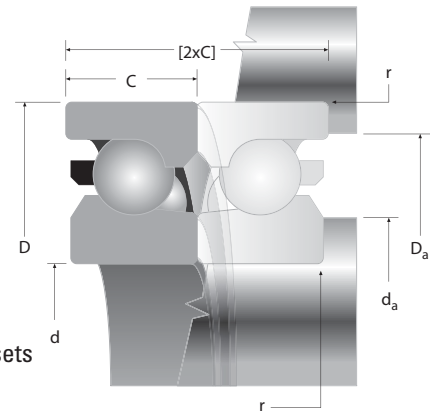
(1) Width tolerance of preloaded bearing set +0/-0.25 mm (+0/-0.010").

(2) ABMA STD 20 (r<sub>as</sub> max).

## BALL SCREW SUPPORT SERIES

### DIMENSIONAL SIZES – METRIC SERIES (INCH UNITS)

- Designed for maximum axial rigidity, low drag torque, and extreme control of lateral eccentricity.
- Manufactured to ABEC 9 axial tolerances.
- Nonseparable angular-contact type design (60° contact angle).
- Manufactured to ABEC 7 radial and envelope tolerances.
- Maximum complement of balls.
- Supplied prelubricated with heavy-duty grease NLGI #2.
- Packaged in DB arrangement [can be mounted in duplexed pairs and in multiplexed sets in either Back-to-Back (DB), Face-to-Face (DF) or Tandem (DT) arrangements].



| Bearing Number | d<br>Bore         | D<br>O.D.       | C<br>Width <sup>(1)</sup> | Wt. <sup>(3)</sup> | Ball Qty.<br>x Dia. | r<br>Rad. <sup>(2)</sup> | d <sub>a</sub> (Shaft)<br>Max. Min. | D <sub>a</sub> (Housing)<br>Max. Min. | Shaft Dia.<br>Max. Min. | Housing Dia.<br>Max. Min. |
|----------------|-------------------|-----------------|---------------------------|--------------------|---------------------|--------------------------|-------------------------------------|---------------------------------------|-------------------------|---------------------------|
| INCH           | mm/tol: +0; -(μm) |                 |                           | lbs.               | in.                 | in.                      | in. in.                             | in. in.                               | in. in.                 | in. in.                   |
| MM12BS32       | 0.4724<br>(1.5)   | 1.2598<br>(2.5) | 0.3937<br>(31)            | 0.09               | 11 x 3/16           | 0.031                    | 0.6941 0.6839                       | 1.0484 1.0382                         | 0.4723 0.4721           | 1.2601 1.2598             |
| MM15BS35       | 0.5906<br>(1.5)   | 1.3780<br>(2.5) | 0.4331<br>(31)            | 0.11               | 13 x 3/16           | 0.031                    | 0.8122 0.8020                       | 1.1665 1.1563                         | 0.5904 0.5902           | 1.3782 1.3780             |
| MM17BS47       | 0.6693<br>(1.5)   | 1.8504<br>(2.5) | 0.5906<br>(31)            | 0.29               | 12 x 5/32           | 0.031                    | 0.9106 0.9004                       | 1.6390 1.6287                         | 0.6691 0.6690           | 1.8506 1.8504             |
| MM20BS47       | 0.7874<br>(2)     | 1.8504<br>(2.5) | 0.5906<br>(47)            | 0.26               | 12 x 5/32           | 0.031                    | 1.0287 1.0185                       | 1.6390 1.6287                         | 0.7872 0.7870           | 1.8506 1.8504             |
| MM25BS52       | 0.9843<br>(2)     | 2.0472<br>(3)   | 0.5906<br>(47)            | 0.37               | 13 x 5/32           | 0.031                    | 1.2453 1.2350                       | 1.7177 1.7075                         | 0.9841 0.9839           | 2.0475 2.0472             |
| MM25BS62       | 0.9843<br>(2)     | 2.4409<br>(3)   | 0.5906<br>(47)            | 0.51               | 17 x 5/32           | 0.031                    | 1.3831 1.3728                       | 2.2098 2.1996                         | 0.9841 0.9839           | 2.4412 2.4409             |
| MM30BS62       | 1.1811<br>(2)     | 2.4409<br>(3)   | 0.5906<br>(47)            | 0.46               | 17 x 5/32           | 0.031                    | 1.5799 1.5697                       | 2.2098 2.1996                         | 1.1809 1.1807           | 2.4412 2.4409             |
| MM30BS72       | 1.1811<br>(2)     | 2.8346<br>(3)   | 0.5906<br>(47)            | 0.71               | 18 x 11/32          | 0.031                    | 1.5799 1.5697                       | 2.2098 2.1996                         | 1.1809 1.1807           | 2.8349 2.8346             |
| MM35BS72       | 1.3780<br>(2.5)   | 2.8346<br>(3)   | 0.5906<br>(47)            | 0.64               | 18 x 11/32          | 0.031                    | 1.6587 1.6484                       | 2.5248 2.5146                         | 1.3777 1.3775           | 2.8349 2.8346             |
| MM35BS100      | 1.3780<br>(2.5)   | 3.9370<br>(3)   | 0.7874<br>(47)            | 1.90               | 18 x 1/2            | 0.031                    | 1.6587 1.6484                       | 3.5484 3.5382                         | 1.3777 1.3775           | 3.9373 3.9370             |
| MM40BS72       | 1.5748<br>(2.5)   | 2.8346<br>(3)   | 0.5906<br>(47)            | 0.55               | 18 x 11/32          | 0.031                    | 1.8555 1.8453                       | 2.5248 2.5146                         | 1.5746 1.5743           | 2.8349 2.8346             |
| MM40BS90       | 1.5748<br>(2.5)   | 3.5433<br>(3)   | 0.5906<br>(47)            | 1.08               | 24 x 11/32          | 0.031                    | 1.8555 1.8453                       | 3.2335 3.2232                         | 1.5746 1.5743           | 3.5436 3.5433             |
| MM40BS90-20    | 1.5748<br>(2.5)   | 3.5433<br>(3)   | 0.7874<br>(47)            | 1.46               | 24 x 11/32          | 0.031                    | 1.8555 1.8453                       | 3.2335 3.2232                         | 1.5746 1.5743           | 3.5436 3.5433             |
| MM40BS90-23    | 1.5748<br>(2.5)   | 3.5433<br>(3)   | 0.9055<br>(47)            | 1.65               | 24 x 11/32          | 0.031                    | 1.8555 1.8453                       | 3.2335 3.2232                         | 1.5746 1.5743           | 3.5436 3.5433             |
| MM40BS100      | 1.5748<br>(2.5)   | 3.9370<br>(3)   | 0.7874<br>(47)            | 1.81               | 18 x 1/2            | 0.031                    | 1.8555 1.8453                       | 3.5484 3.5382                         | 1.5746 1.5743           | 3.9373 3.9370             |
| MM45BS75       | 1.7717<br>(2.5)   | 2.9528<br>(3)   | 0.5906<br>(47)            | 0.55               | 20 x 11/32          | 0.031                    | 2.0524 2.0421                       | 2.7217 2.7114                         | 1.7714 1.7712           | 2.9530 2.9528             |
| MM45BS100      | 1.7717<br>(2.5)   | 3.9370<br>(3)   | 0.7874<br>(47)            | 1.68               | 18 x 1/2            | 0.031                    | 2.1311 2.1209                       | 3.5484 3.5382                         | 1.7714 1.7712           | 3.9373 3.9370             |
| MM50BS90       | 1.9685<br>(2.5)   | 3.5433<br>(3)   | 0.5906<br>(47)            | 0.90               | 24 x 11/32          | 0.031                    | 2.3280 2.3177                       | 3.2335 3.2232                         | 1.9683 1.9680           | 3.5436 3.5433             |
| MM50BS100      | 1.9685<br>(2.5)   | 3.9370<br>(3)   | 0.7874<br>(47)            | 1.57               | 18 x 1/2            | 0.031                    | 2.3280 2.3177                       | 3.5484 3.5382                         | 1.9683 1.9680           | 3.9373 3.9370             |
| MM55BS90       | 2.1654<br>(3)     | 3.5433<br>(3)   | 0.5906<br>(59)            | 0.79               | 24 x 11/32          | 0.031                    | 2.4854 2.4752                       | 3.2335 3.2232                         | 2.1651 2.1648           | 3.5436 3.5433             |
| MM55BS120      | 2.1654<br>(3)     | 4.7244<br>(3)   | 0.7874<br>(59)            | 2.51               | 21 x 1/2            | 0.039                    | 2.5642 2.5539                       | 4.3358 4.3256                         | 2.1651 2.1648           | 4.7247 4.7244             |
| MM60BS120      | 2.3622<br>(3)     | 4.7244<br>(3)   | 0.7874<br>(59)            | 2.34               | 21 x 1/2            | 0.039                    | 2.7610 2.7508                       | 4.3358 4.3256                         | 2.3619 2.3617           | 4.7247 4.7244             |
| MM75BS110      | 2.9528<br>(3)     | 4.3307<br>(3)   | 0.5906<br>(59)            | 1.01               | 30 x 11/32          | 0.031                    | 3.3122 3.3020                       | 4.0209 4.0106                         | 2.9525 2.9522           | 4.3310 4.3307             |
| MM100BS150     | 3.9370<br>(3)     | 5.9055<br>(3.5) | 0.7874<br>(79)            | 2.82               | 26 x 1/2            | 0.039                    | 4.3358 4.3256                       | 5.4382 5.4280                         | 3.9367 3.9364           | 5.9059 5.9055             |

<sup>(1)</sup>Width tolerance of preloaded bearing set +0/-0.25 mm (+0/-0.010").

<sup>(2)</sup>ABMA STD 20 (r<sub>as</sub> max).

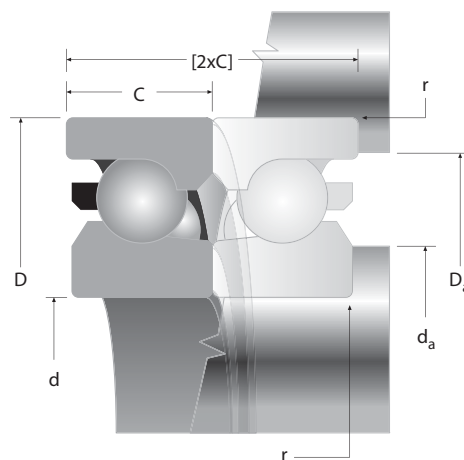
<sup>(3)</sup>Single bearing.



## BALL SCREW SUPPORT SERIES

### DIMENSIONAL SIZES – INCH SERIES

- Designed for maximum axial rigidity, low drag torque, and extreme control of lateral eccentricity.
- Manufactured to ABEC 9 axial tolerances.
- Nonseparable angular-contact type design (60° contact angle).
- Manufactured to ABEC 7 radial and envelope tolerances.
- Maximum complement of balls.
- Supplied prelubricated with heavy-duty grease NLGI #2.
- Packaged in DB arrangement [can be mounted in duplexed pairs and in multiplexed sets in either Back-to-Back (DB), Face-to-Face (DF) or Tandem (DT) arrangements].



### INCHES DIMENSIONAL SIZES - BALL SCREW SUPPORT SERIES

| Bearing Number    | d<br>Bore            | D<br>O.D.       | C<br>Width <sup>(1)</sup> | Wt. <sup>(4)</sup> | Ball Qty.<br>x Dia. | r<br>Rad. <sup>(2)</sup> | d <sub>a</sub> (Shaft) |       | D <sub>a</sub> (Housing) |       | Shaft Dia. |        | Housing Dia. |        |
|-------------------|----------------------|-----------------|---------------------------|--------------------|---------------------|--------------------------|------------------------|-------|--------------------------|-------|------------|--------|--------------|--------|
|                   | in/tol: +0; -.000(X) |                 |                           | lbs.               | in.                 | in.                      | in.                    | in.   | in.                      | in.   | in.        | in.    | in.          | in.    |
| <b>MM9306WI2H</b> | 0.7874<br>(2)        | 1.8504<br>(2.5) | 0.625<br>(.47)            | 0.28               | 12 x 5/16           | 0.031                    | 1.083                  | 1.073 | 1.641                    | 1.631 | 0.7872     | 0.787  | 1.8507       | 1.8504 |
| <b>MM9308WI2H</b> | 0.9385<br>(2)        | 2.4409<br>(3)   | 0.625<br>(.47)            | 0.56               | 17 x 5/16           | 0.031                    | 1.321                  | 1.311 | 2.179                    | 2.169 | 0.9383     | 0.9381 | 2.4412       | 2.4409 |
| <b>MM9310WI2H</b> | 1.5000<br>(2.5)      | 2.8346<br>(3)   | 0.6250<br>(.47)           | 0.62               | 18 x 11/32          | 0.031                    | 1.865                  | 1.855 | 2.479                    | 2.469 | 1.4997     | 1.4994 | 2.8349       | 2.8346 |
| <b>MM9311WI3H</b> | 1.7510<br>(2.5)      | 3.0000<br>(3)   | 0.6250<br>(.47)           | 0.63               | 20 x 11/32          | 0.031                    | 2.057                  | 2.047 | 2.672                    | 2.662 | 1.7507     | 1.7504 | 3.0003       | 3.0000 |
| <b>MM9313WI5H</b> | 2.2500<br>(3)        | 3.5433<br>(3)   | 0.6250<br>(.59)           | 0.80               | 24 x 11/32          | 0.031                    | 2.577                  | 2.567 | 3.196                    | 3.186 | 2.2497     | 2.2494 | 3.5436       | 3.5433 |
| <b>MM9316WI3H</b> | 3.0000<br>(3)        | 4.3307<br>(3)   | 0.6250<br>(.59)           | 1.04               | 30 x 11/32          | 0.031                    | 3.380                  | 3.370 | 4.000                    | 3.990 | 2.9997     | 2.9994 | 4.3310       | 4.3307 |
| <b>MM9321WI3</b>  | 4.0000<br>(3)        | 5.7087<br>(3.5) | 0.8750<br>(.79)           | 2.60               | 37 x 3/8            | 0.039                    | 4.418                  | 4.408 | 5.301                    | 5.291 | 3.9997     | 3.9994 | 5.7091       | 5.7087 |
| <b>MM9326WI6H</b> | 5.0000<br>(3)        | 7.0866<br>(4)   | 0.8750<br>(.98)           | 3.85               | 35 x 1/2            | 0.039                    | 5.669                  | 5.659 | 6.611                    | 6.601 | 4.9997     | 4.9994 | 7.0870       | 7.0866 |

| MWTRIC            | mm/tol: +0; -(mm) |             |                | kg   | mm        | mm  | mm      | mm      | mm      | mm      | mm      | mm      | mm      | mm      |
|-------------------|-------------------|-------------|----------------|------|-----------|-----|---------|---------|---------|---------|---------|---------|---------|---------|
| <b>MM9306WI2H</b> | 20<br>(5)         | 47<br>(6)   | 15.88<br>(120) | 0.13 | 12 x 7.9  | 0.8 | 27.508  | 27.254  | 41.681  | 41.427  | 19.995  | 19.990  | 47.008  | 47.000  |
| <b>MM9308WI2H</b> | 23.8<br>(5)       | 62.0<br>(7) | 15.88<br>(120) | 0.25 | 17 x 7.9  | 0.8 | 33.553  | 33.299  | 55.347  | 55.093  | 23.833  | 23.828  | 62.006  | 61.999  |
| <b>MM9310WI2H</b> | 38.1<br>(6)       | 72<br>(7)   | 15.88<br>(120) | 0.28 | 18 x 8.7  | 0.8 | 47.371  | 47.117  | 62.967  | 62.713  | 38.092  | 38.085  | 72.006  | 71.999  |
| <b>MM9311WI3H</b> | 44.5<br>(6)       | 76.2<br>(7) | 15.88<br>(120) | 0.29 | 20 x 8.7  | 0.8 | 52.248  | 51.994  | 67.869  | 67.615  | 44.468  | 44.460  | 76.208  | 76.200  |
| <b>MM9313WI5H</b> | 57.2<br>(7)       | 90<br>(7)   | 15.88<br>(150) | 0.36 | 24 x 8.7  | 0.8 | 65.456  | 65.202  | 81.178  | 80.924  | 57.142  | 57.135  | 90.007  | 90.000  |
| <b>MM9316WI3H</b> | 76.2<br>(7)       | 110<br>(7)  | 15.88<br>(150) | 0.47 | 30 x 8.7  | 0.8 | 85.852  | 85.598  | 101.600 | 101.346 | 76.192  | 76.185  | 110.007 | 110.000 |
| <b>MM9321WI3</b>  | 101.6<br>(7)      | 145<br>(9)  | 22.23<br>(200) | 1.18 | 37 x 9.5  | 1   | 112.217 | 111.963 | 134.645 | 134.391 | 101.592 | 101.585 | 145.011 | 145.001 |
| <b>MM9326WI6H</b> | 127<br>(7)        | 180<br>(10) | 22.23<br>(250) | 1.75 | 35 x 12.7 | 1   | 143.993 | 143.739 | 167.919 | 167.665 | 126.992 | 126.985 | 180.010 | 180.000 |

(1) Width tolerance of preloaded bearing set +0/-0.25 mm (+0/-0.010").

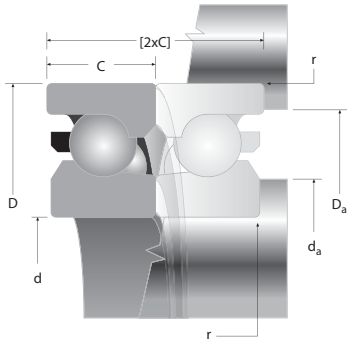
(2) Refer to engineering section for width tolerance of preloaded ball screw support bearings.

(3) ABMA Std. 20 (r<sub>as</sub> max).

(4) Single bearing.

# BALL SCREW SUPPORT SERIES

## PERFORMANCE DATA METRIC SERIES (METRIC UNITS)



| Bearing Number                            | Static Limiting Thrust Capacity <sup>(3)</sup><br>T <sub>L</sub> | Dynamic Axial Thrust Load Rating <sup>(1)(3)</sup><br>C <sub>ae</sub> | Max. Speed | Axial Spring Constant <sup>(3)</sup> | Drag Torque (preloaded set) | Preload <sup>(2)(3)</sup> (Heavy) |
|-------------------------------------------|------------------------------------------------------------------|-----------------------------------------------------------------------|------------|--------------------------------------|-----------------------------|-----------------------------------|
|                                           | N                                                                | N                                                                     | RPM        | N/μm                                 | N-m                         | N                                 |
| <b>METRIC SERIES - METRIC UNITS - DUH</b> |                                                                  |                                                                       |            |                                      |                             |                                   |
| MM12BS32DUH                               | 11400                                                            | 9500                                                                  | 7300       | 425                                  | 0.28                        | 1000                              |
| MM15BS35DUH                               | 13700                                                            | 10400                                                                 | 6400       | 490                                  | 0.30                        | 1200                              |
| MM17BS47DUH                               | 24900                                                            | 24900                                                                 | 4700       | 750                                  | 0.32                        | 3110                              |
| MM20BS47DUH                               | 24900                                                            | 24900                                                                 | 4700       | 750                                  | 0.32                        | 3110                              |
| MM25BS52DUH                               | 27100                                                            | 26000                                                                 | 4300       | 780                                  | .39                         | 2700                              |
| MM25BS62DUH                               | 35600                                                            | 29800                                                                 | 3300       | 1050                                 | 0.44                        | 4450                              |
| MM30BS62DUH                               | 35600                                                            | 29800                                                                 | 3300       | 1050                                 | 0.44                        | 4450                              |
| MM30BS72DUH                               | 45400                                                            | 36300                                                                 | 2900       | 1260                                 | 0.44                        | 6230                              |
| MM35BS72DUH                               | 45400                                                            | 36300                                                                 | 2900       | 1260                                 | 0.44                        | 6230                              |
| MM40BS72DUH                               | 45400                                                            | 36300                                                                 | 2900       | 1260                                 | 0.44                        | 6230                              |
| MM45BS75DUH                               | 50700                                                            | 38500                                                                 | 2700       | 1380                                 | 0.56                        | 6670                              |
| MM40BS90DUH                               | 60900                                                            | 41400                                                                 | 2200       | 1660                                 | 0.82                        | 8010                              |
| MM40BS90-20DUH                            | 60900                                                            | 41400                                                                 | 2200       | 1660                                 | .82                         | 8010                              |
| MM40BS90-23DUH                            | 60900                                                            | 41400                                                                 | 2200       | 1660                                 | .82                         | 8010                              |
| MM50BS90DUH                               | 60900                                                            | 41400                                                                 | 2200       | 1660                                 | 0.82                        | 8010                              |
| MM55BS90DUH                               | 60900                                                            | 41400                                                                 | 2200       | 1660                                 | 0.82                        | 8010                              |
| MM35BS100DUH                              | 93400                                                            | 71200                                                                 | 2000       | 1750                                 | 1.02                        | 12900                             |
| MM40BS100DUH                              | 93400                                                            | 71200                                                                 | 2000       | 1750                                 | 1.02                        | 12900                             |
| MM45BS100DUH                              | 93400                                                            | 71200                                                                 | 2000       | 1750                                 | 1.02                        | 12900                             |
| MM50BS100DUH                              | 93400                                                            | 71200                                                                 | 2000       | 1750                                 | 1.02                        | 12900                             |
| MM75BS110DUH                              | 77000                                                            | 44500                                                                 | 1700       | 2080                                 | 1.00                        | 9790                              |
| MM55BS120DUH                              | 133400                                                           | 75600                                                                 | 1700       | 2150                                 | 1.36                        | 15570                             |
| MM60BS120DUH                              | 133400                                                           | 75600                                                                 | 1700       | 2150                                 | 1.36                        | 15570                             |
| MM100BS150DUH                             | 115600                                                           | 57400                                                                 | 1300       | 3400                                 | 2.18                        | 21350                             |
| <b>METRIC SERIES - METRIC UNITS - QUH</b> |                                                                  |                                                                       |            |                                      |                             |                                   |
| MM12BS32QUH                               | 22800                                                            | 15400                                                                 | 5100       | 850                                  | 0.56                        | 2000                              |
| MM15BS35QUH                               | 27400                                                            | 16850                                                                 | 4500       | 980                                  | 0.60                        | 2400                              |
| MM17BS47QUH                               | 49800                                                            | 40500                                                                 | 3300       | 1510                                 | 0.64                        | 6230                              |
| MM20BS47QUH                               | 49800                                                            | 40500                                                                 | 3300       | 1510                                 | 0.64                        | 6230                              |
| MM25BS52QUH                               | 54300                                                            | 42300                                                                 | 3000       | 1560                                 | 0.49                        | 5400                              |
| MM25BS62QUH                               | 71200                                                            | 48500                                                                 | 2300       | 2100                                 | 0.88                        | 8900                              |
| MM30BS62QUH                               | 71200                                                            | 48500                                                                 | 2300       | 2100                                 | 0.88                        | 8900                              |
| MM30BS72QUH                               | 90700                                                            | 58700                                                                 | 2000       | 2520                                 | 0.88                        | 12450                             |
| MM35BS72QUH                               | 90700                                                            | 58700                                                                 | 2000       | 2520                                 | 0.88                        | 12450                             |
| MM40BS72QUH                               | 90700                                                            | 58700                                                                 | 2000       | 2520                                 | 0.88                        | 12450                             |
| MM45BS75QUH                               | 101400                                                           | 62700                                                                 | 1900       | 2770                                 | 1.12                        | 13340                             |
| MM40BS90QUH                               | 121900                                                           | 67200                                                                 | 1500       | 3330                                 | 1.64                        | 16010                             |
| MM50BS90QUH                               | 121900                                                           | 67200                                                                 | 1500       | 3330                                 | 1.64                        | 16010                             |
| MM55BS90QUH                               | 121900                                                           | 67200                                                                 | 1500       | 3330                                 | 1.64                        | 16010                             |
| MM35BS100QUH                              | 186800                                                           | 115600                                                                | 1400       | 3500                                 | 2.04                        | 25800                             |
| MM40BS100QUH                              | 186800                                                           | 115600                                                                | 1400       | 3500                                 | 2.04                        | 25800                             |
| MM45BS100QUH                              | 186800                                                           | 115600                                                                | 1400       | 3500                                 | 2.04                        | 25800                             |
| MM50BS100QUH                              | 186800                                                           | 115600                                                                | 1400       | 3500                                 | 2.04                        | 25800                             |
| MM75BS110QUH                              | 153900                                                           | 72100                                                                 | 1200       | 4170                                 | 2.00                        | 19570                             |
| MM55BS120QUH                              | 266900                                                           | 122800                                                                | 1200       | 4310                                 | 2.72                        | 31140                             |
| MM60BS120QUH                              | 266900                                                           | 122800                                                                | 1200       | 4310                                 | 2.72                        | 31140                             |
| MM100BS150QUH                             | 231300                                                           | 93400                                                                 | 900        | 6790                                 | 4.36                        | 42700                             |

<sup>(1)</sup> Based on 1500 hours L<sub>10</sub> life and permissible speed.

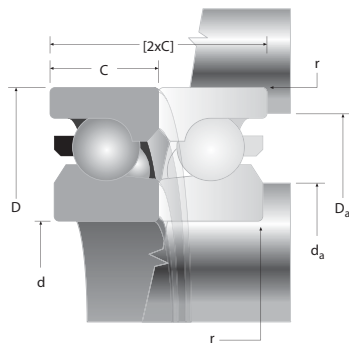
<sup>(2)</sup> Heavy preload is standard.

<sup>(3)</sup> Data presented is for a single bearing in a DUH set and for two bearings in a QUH set mounted DB or DF.



## BALL SCREW SUPPORT SERIES

### PERFORMANCE DATA METRIC SERIES (INCH UNITS)



| Bearing Number                          | Static Limiting Thrust Capacity <sup>(3)</sup><br>T <sub>L</sub> | Dynamic Axial Thrust Load Rating <sup>(1)(3)</sup><br>C <sub>ae</sub> | Max. Speed | Axial Spring Constant <sup>(3)</sup> | Drag Torque (preloaded set) | Preload <sup>(2)(3)</sup> (Heavy) |
|-----------------------------------------|------------------------------------------------------------------|-----------------------------------------------------------------------|------------|--------------------------------------|-----------------------------|-----------------------------------|
|                                         | lbs.                                                             | lbs.                                                                  | RPM        | 10 <sup>6</sup> lbs./in.             | in.-lbs.                    | lbs.                              |
| <b>METRIC SERIES - INCH UNITS - DUH</b> |                                                                  |                                                                       |            |                                      |                             |                                   |
| MM12BS32DUH                             | 2600                                                             | 2140                                                                  | 7300       | 2.4                                  | 2.48                        | 200                               |
| MM15BS35DUH                             | 3100                                                             | 2340                                                                  | 6400       | 2.8                                  | 2.65                        | 300                               |
| MM17BS47DUH                             | 5600                                                             | 5600                                                                  | 4700       | 4.3                                  | 2.83                        | 700                               |
| MM20BS47DUH                             | 5600                                                             | 5600                                                                  | 4700       | 4.3                                  | 2.83                        | 700                               |
| MM25BS52DUH                             | 6100                                                             | 5850                                                                  | 4300       | 4.5                                  | 3.45                        | 600                               |
| MM25BS62DUH                             | 8000                                                             | 6700                                                                  | 3300       | 6                                    | 3.88                        | 1000                              |
| MM30BS62DUH                             | 8000                                                             | 6700                                                                  | 3300       | 6                                    | 3.88                        | 1000                              |
| MM30BS72DUH                             | 10200                                                            | 8160                                                                  | 2900       | 7.2                                  | 3.88                        | 1400                              |
| MM35BS72DUH                             | 10200                                                            | 8160                                                                  | 2900       | 7.2                                  | 3.88                        | 1400                              |
| MM40BS72DUH                             | 10200                                                            | 8160                                                                  | 2900       | 7.2                                  | 3.88                        | 1400                              |
| MM45BS75DUH                             | 11400                                                            | 8660                                                                  | 2700       | 7.9                                  | 4.96                        | 1500                              |
| MM40BS90DUH                             | 13700                                                            | 9310                                                                  | 2200       | 9.5                                  | 7.26                        | 1800                              |
| MM40BS90DUH-20                          | 13700                                                            | 9310                                                                  | 2200       | 9.5                                  | 7.26                        | 1800                              |
| MM40BS90DUH-23                          | 13700                                                            | 9310                                                                  | 2200       | 9.5                                  | 7.26                        | 1800                              |
| MM50BS90DUH                             | 13700                                                            | 9310                                                                  | 2200       | 9.5                                  | 7.26                        | 1800                              |
| MM55BS90DUH                             | 13700                                                            | 9310                                                                  | 2200       | 9.5                                  | 7.26                        | 1800                              |
| MM35BS100DUH                            | 21000                                                            | 16010                                                                 | 2000       | 10                                   | 9.03                        | 2900                              |
| MM40BS100DUH                            | 21000                                                            | 16010                                                                 | 2000       | 10                                   | 9.03                        | 2900                              |
| MM45BS100DUH                            | 21000                                                            | 16010                                                                 | 2000       | 10                                   | 9.03                        | 2900                              |
| MM50BS100DUH                            | 21000                                                            | 16010                                                                 | 2000       | 10                                   | 9.03                        | 2900                              |
| MM75BS110DUH                            | 17300                                                            | 10000                                                                 | 1700       | 11.9                                 | 8.85                        | 2200                              |
| MM55BS120DUH                            | 30000                                                            | 17000                                                                 | 1700       | 12.3                                 | 12.04                       | 3500                              |
| MM60BS120DUH                            | 30000                                                            | 17000                                                                 | 1700       | 12.3                                 | 12.04                       | 3500                              |
| MM100BS150DUH                           | 26000                                                            | 12900                                                                 | 1300       | 19.4                                 | 19.29                       | 4800                              |
| <b>METRIC SERIES - INCH UNITS - QUH</b> |                                                                  |                                                                       |            |                                      |                             |                                   |
| MM12BS32QUH                             | 5100                                                             | 3500                                                                  | 5100       | 4.9                                  | 4.96                        | 400                               |
| MM15BS35QUH                             | 6200                                                             | 3800                                                                  | 4500       | 5.6                                  | 5.31                        | 500                               |
| MM17BS47QUH                             | 11200                                                            | 9100                                                                  | 3300       | 8.6                                  | 5.65                        | 1400                              |
| MM20BS47QUH                             | 11200                                                            | 9100                                                                  | 3300       | 8.6                                  | 5.65                        | 1400                              |
| MM25BS52QUH                             | 12200                                                            | 9500                                                                  | 3000       | 8.9                                  | 6.90                        | 1200                              |
| MM25BS62QUH                             | 16000                                                            | 10900                                                                 | 2300       | 12                                   | 7.78                        | 2000                              |
| MM30BS62QUH                             | 16000                                                            | 10900                                                                 | 2300       | 12                                   | 7.78                        | 2000                              |
| MM30BS72QUH                             | 20400                                                            | 13200                                                                 | 2000       | 14.4                                 | 7.78                        | 2800                              |
| MM35BS72QUH                             | 20400                                                            | 13200                                                                 | 2000       | 14.4                                 | 7.78                        | 2800                              |
| MM40BS72QUH                             | 20400                                                            | 13200                                                                 | 2000       | 14.4                                 | 7.78                        | 2800                              |
| MM45BS75QUH                             | 22800                                                            | 14100                                                                 | 1900       | 15.8                                 | 9.92                        | 3000                              |
| MM40BS90QUH                             | 27400                                                            | 15100                                                                 | 1500       | 19                                   | 14.51                       | 3600                              |
| MM50BS90QUH                             | 27400                                                            | 15100                                                                 | 1500       | 19                                   | 14.51                       | 3600                              |
| MM55BS90QUH                             | 27400                                                            | 15100                                                                 | 1500       | 19                                   | 14.51                       | 3600                              |
| MM35BS100QUH                            | 42000                                                            | 26000                                                                 | 1400       | 20                                   | 18.05                       | 5800                              |
| MM40BS100QUH                            | 42000                                                            | 26000                                                                 | 1400       | 20                                   | 18.05                       | 5800                              |
| MM45BS100QUH                            | 42000                                                            | 26000                                                                 | 1400       | 20                                   | 18.05                       | 5800                              |
| MM50BS100QUH                            | 42000                                                            | 26000                                                                 | 1400       | 20                                   | 18.05                       | 5800                              |
| MM75BS110QUH                            | 34600                                                            | 16200                                                                 | 1200       | 23.8                                 | 17.70                       | 4400                              |
| MM55BS120QUH                            | 60000                                                            | 27600                                                                 | 1200       | 24.6                                 | 24.08                       | 7000                              |
| MM60BS120QUH                            | 60000                                                            | 27600                                                                 | 1200       | 24.6                                 | 24.08                       | 7000                              |
| MM100BS150QUH                           | 52000                                                            | 21000                                                                 | 900        | 38.8                                 | 38.59                       | 9600                              |

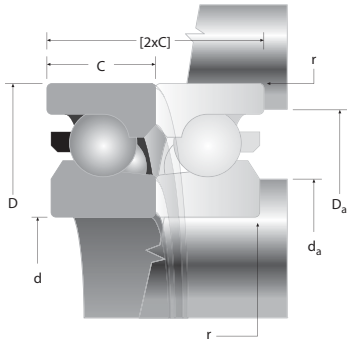
(1) Based on 1500 hours L<sub>10</sub> life and permissible speed.

(2) Heavy preload is standard.

(3) Data presented is for a single bearing in a DUH set and for two bearings in a QUH set mounted DB or DF.

# BALL SCREW SUPPORT SERIES

## PERFORMANCE DATA INCH SERIES (INCH UNITS)



| Bearing Number                                | Static Limiting Thrust Capacity <sup>(3)</sup><br>T <sub>L</sub> | Dynamic Axial Thrust Load Rating <sup>(1)(3)</sup><br>C <sub>ae</sub> | Max. Speed | Axial Spring Constant <sup>(3)</sup> | Drag Torque (preloaded set) | Preload <sup>(2)(3)</sup> (Heavy) |
|-----------------------------------------------|------------------------------------------------------------------|-----------------------------------------------------------------------|------------|--------------------------------------|-----------------------------|-----------------------------------|
|                                               | lbs.                                                             | lbs.                                                                  | RPM        | 10 <sup>6</sup> lbs./in.             | in.-lbs.                    | lbs.                              |
| <b>INCH SERIES - INCH UNITS - DUH / QUH</b>   |                                                                  |                                                                       |            |                                      |                             |                                   |
| MM9306WI2H DUH                                | 5600                                                             | 5600                                                                  | 4700       | 4.30                                 | 2.83                        | 700                               |
| MM9308WI2H DUH                                | 8000                                                             | 6700                                                                  | 3300       | 6.00                                 | 3.89                        | 1000                              |
| MM9310WI2H DUH                                | 10200                                                            | 8150                                                                  | 2900       | 7.20                                 | 3.89                        | 1400                              |
| MM9311WI3H DUH                                | 11400                                                            | 8650                                                                  | 2700       | 7.90                                 | 4.96                        | 1500                              |
| MM9313WI5H DUH                                | 13700                                                            | 9300                                                                  | 2200       | 9.50                                 | 7.26                        | 1800                              |
| MM9316WI3H DUH                                | 17300                                                            | 10000                                                                 | 1700       | 11.90                                | 8.85                        | 2200                              |
| MM9321WI3D DUH                                | 26000                                                            | 12900                                                                 | 1300       | 19.40                                | 9.01                        | 4800                              |
| MM9326WI6H DUH                                | 42000                                                            | 21200                                                                 | 1000       | 20.70                                | 11.1                        | 6000                              |
| MM9306WI2H QUH                                | 11200                                                            | 9100                                                                  | 3300       | 8.60                                 | 5.66                        | 1400                              |
| MM9308WI2H QUH                                | 16000                                                            | 10900                                                                 | 2300       | 12.00                                | 7.78                        | 2000                              |
| MM9310WI2H QUH                                | 20400                                                            | 13200                                                                 | 2000       | 14.40                                | 7.78                        | 2800                              |
| MM9311WI3H QUH                                | 22800                                                            | 14100                                                                 | 1900       | 15.80                                | 9.92                        | 3000                              |
| MM9313WI5H QUH                                | 27400                                                            | 15100                                                                 | 1500       | 19.00                                | 14.52                       | 3600                              |
| MM9316WI3H QUH                                | 34600                                                            | 16200                                                                 | 1200       | 23.80                                | 17.7                        | 4400                              |
| MM9321WI3Q QUH                                | 52000                                                            | 21000                                                                 | 900        | 38.80                                | 18.02                       | 9600                              |
| MM9326WI6H QUH                                | 84000                                                            | 34400                                                                 | 700        | 41.40                                | 22.22                       | 12000                             |
| <b>N N RPM N/μm N-m N</b>                     |                                                                  |                                                                       |            |                                      |                             |                                   |
| <b>INCH SERIES - METRIC UNITS - DUH / QUH</b> |                                                                  |                                                                       |            |                                      |                             |                                   |
| MM9306WI2H DUH                                | 24900                                                            | 24900                                                                 | 4700       | 750                                  | 0.32                        | 3110                              |
| MM9308WI2H DUH                                | 35600                                                            | 29800                                                                 | 3300       | 1050                                 | 0.44                        | 4450                              |
| MM9310WI2H DUH                                | 45400                                                            | 36300                                                                 | 2900       | 1260                                 | 0.44                        | 6230                              |
| MM9311WI3H DUH                                | 50700                                                            | 38500                                                                 | 2700       | 1380                                 | 0.56                        | 6670                              |
| MM9313WI5H DUH                                | 60900                                                            | 41400                                                                 | 2200       | 1660                                 | 0.82                        | 8010                              |
| MM9316WI3H DUH                                | 77000                                                            | 44500                                                                 | 1700       | 2080                                 | 1                           | 9790                              |
| MM9321WI3D DUH                                | 115700                                                           | 57400                                                                 | 1300       | 3400                                 | 1.02                        | 21350                             |
| MM9326WI6H DUH                                | 186800                                                           | 94300                                                                 | 1000       | 3630                                 | 1.26                        | 26690                             |
| MM9306WI2H QUH                                | 49800                                                            | 40500                                                                 | 3300       | 1510                                 | 0.64                        | 6230                              |
| MM9308WI2H QUH                                | 71200                                                            | 48500                                                                 | 2300       | 2100                                 | 0.88                        | 8900                              |
| MM9310WI2H QUH                                | 90700                                                            | 58700                                                                 | 2000       | 2520                                 | 0.88                        | 12450                             |
| MM9311WI3H QUH                                | 101400                                                           | 62700                                                                 | 1900       | 2770                                 | 1.12                        | 13340                             |
| MM9313WI5H QUH                                | 121900                                                           | 67200                                                                 | 1500       | 3330                                 | 1.64                        | 16010                             |
| MM9316WI3H QUH                                | 153900                                                           | 72100                                                                 | 1200       | 4170                                 | 2                           | 19570                             |
| MM9321WI3Q QUH                                | 231300                                                           | 93400                                                                 | 900        | 6800                                 | 2.04                        | 42700                             |
| MM9326WI6H QUH                                | 373600                                                           | 153000                                                                | 700        | 7250                                 | 2.51                        | 53380                             |

(1) Based on 1500 hours L<sub>10</sub> life and permissible speed.

(2) Heavy preload is standard.

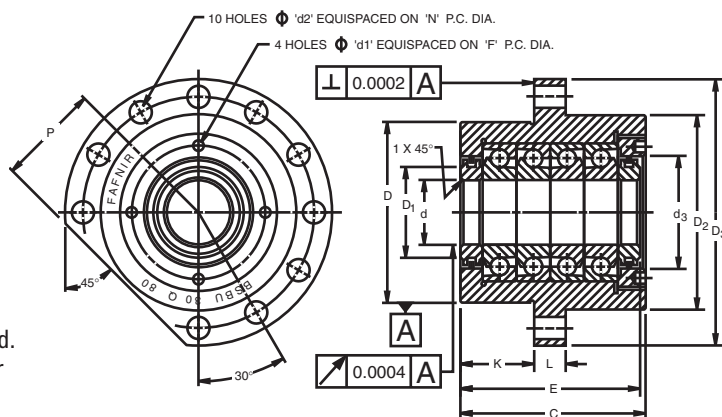
(3) Data presented is for a single bearing in a DUH set and for two bearings in a QUH set mounted DB or DF.



## BSBU D

### STANDARD AND HEAVY-DUTY BEARINGS

- Designed and developed to give the machine manufacturer a ready-made unit providing excellent stiffness and accuracy in ball screw applications.
- Units combine the features of MM-BS-DU (Duplex) ball screw bearings with an accurately manufactured housing and laminar ring seals.
- Each unit is prepacked with a measured quantity of high quality bearing grease and requires no further lubrication.
- Units are supplied with the bearings in pairs mounted in the "DB" ("O") arrangement.
- Other bearing arrangements can be accommodated if required. Please consult your Timken representative with details of your requirements or for suggested shaft and housing fits.



### STANDARD SERIES – DIMENSIONAL TOLERANCES $\pm .13 \text{ mm}$ ( $\pm 0.005''$ ) UNLESS OTHERWISE STATED.

| Shaft Dia. | Unit Number                | C            | d                                    | d <sub>1</sub> | d <sub>2</sub> | d <sub>3</sub> | D                                    | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | E                                | F            | K            | L            | N             | P          | Wt.         |
|------------|----------------------------|--------------|--------------------------------------|----------------|----------------|----------------|--------------------------------------|----------------|----------------|----------------|----------------------------------|--------------|--------------|--------------|---------------|------------|-------------|
| mm         | (Bearing Set)              | mm in.       | mm in.                               | mm in.         | mm 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.     |
| 17         | BSBU17D60<br>(MM17BS47DUH) | 47.0<br>1.85 | 17.000<br>16.996<br>0.6693<br>0.6691 | 4.3<br>0.17    | 6.6<br>0.26    | 36.0<br>1.42   | 60.000<br>59.987<br>2.3622<br>2.3617 | 26.0<br>1.02   | 64.0<br>2.52   | 90.0<br>3.54   | 44.26<br>43.24<br>1.742<br>1.702 | 42.5<br>1.67 | 32.0<br>1.26 | 13.0<br>0.51 | 76.0<br>2.99  | 32<br>1.26 | 1.1<br>2.42 |
| 20         | BSBU20D60<br>(MM20BS47DUH) | 47.0<br>1.85 | 20.000<br>19.996<br>0.7874<br>0.7872 | 4.3<br>0.17    | 6.6<br>0.26    | 36.0<br>1.42   | 60.000<br>59.987<br>2.3622<br>2.3617 | 26.0<br>1.02   | 64.0<br>2.52   | 90.0<br>3.54   | 44.26<br>43.24<br>1.742<br>1.702 | 42.5<br>1.67 | 32.0<br>1.26 | 13.0<br>0.51 | 76.0<br>2.99  | 32<br>1.26 | 1.1<br>2.42 |
| 25         | BSBU25D80<br>(MM25BS62DUH) | 52.0<br>2.05 | 25.000<br>24.996<br>0.9842<br>0.9841 | 4.3<br>0.17    | 9.2<br>0.36    | 50.0<br>1.97   | 80.000<br>79.987<br>3.1496<br>3.1491 | 40.0<br>1.57   | 88.0<br>3.46   | 120.0<br>4.72  | 50.26<br>49.24<br>1.979<br>1.938 | 59.5<br>2.34 | 32.0<br>1.26 | 15.0<br>0.59 | 102.0<br>4.02 | 44<br>1.73 | 2.3<br>5.06 |
| 30         | BSBU30D80<br>(MM30BS62DUH) | 52.0<br>2.05 | 30.000<br>29.996<br>1.1811<br>1.1809 | 4.3<br>0.17    | 9.2<br>0.36    | 50.0<br>1.97   | 80.000<br>79.987<br>3.1496<br>3.1491 | 40.0<br>1.57   | 88.0<br>3.46   | 120.0<br>4.72  | 50.26<br>49.24<br>1.979<br>1.938 | 59.5<br>2.34 | 32.0<br>1.26 | 15.0<br>0.59 | 102.0<br>4.02 | 44<br>1.73 | 2.2<br>4.84 |
| 35         | BSBU35D90<br>(MM35BS72DUH) | 52.0<br>2.05 | 35.000<br>34.995<br>1.378<br>1.3778  | 4.3<br>0.17    | 9.2<br>0.36    | 60.0<br>2.36   | 90.000<br>89.985<br>3.5433<br>3.5427 | 46.0<br>1.81   | 98.0<br>3.86   | 130.0<br>5.12  | 50.26<br>49.24<br>1.979<br>1.938 | 66.5<br>2.62 | 32.0<br>1.26 | 15.0<br>0.59 | 113.0<br>4.45 | 49<br>1.93 | 3.2<br>7.04 |
| 40         | BSBU40D90<br>(MM40BS72DUH) | 52.0<br>2.05 | 40.000<br>39.995<br>1.5748<br>1.5746 | 4.3<br>0.17    | 9.2<br>0.36    | 60.0<br>2.36   | 90.000<br>89.985<br>3.5433<br>3.5427 | 46.0<br>1.81   | 98.0<br>3.86   | 130.0<br>5.12  | 50.26<br>49.24<br>1.979<br>1.938 | 66.5<br>2.62 | 32.0<br>1.26 | 15.0<br>0.59 | 113.0<br>4.45 | 49<br>1.93 | 3.1<br>6.82 |

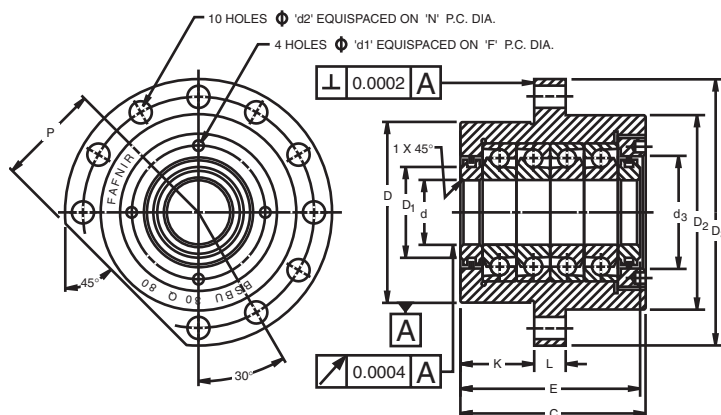
### HEAVY-DUTY SERIES

|    |                              |              |                                      |             |              |              |                                        |             |               |               |                                  |              |              |              |               |            |               |
|----|------------------------------|--------------|--------------------------------------|-------------|--------------|--------------|----------------------------------------|-------------|---------------|---------------|----------------------------------|--------------|--------------|--------------|---------------|------------|---------------|
| 35 | BSBU35D124<br>(MM35BS100DUH) | 66.0<br>2.60 | 35.000<br>34.995<br>1.3780<br>1.3778 | 5.3<br>0.21 | 11.4<br>0.45 | 76.0<br>2.99 | 124.000<br>123.982<br>4.8819<br>4.8812 | 66.0<br>2.6 | 128.0<br>5.04 | 165.0<br>6.50 | 64.26<br>63.24<br>2.530<br>2.490 | 90.0<br>3.54 | 43.5<br>1.71 | 17.0<br>0.67 | 146.0<br>5.75 | 64<br>2.52 | 6.3<br>13.86  |
| 40 | BSBU40D124<br>(MM40BS100DUH) | 66.0<br>2.60 | 40.000<br>39.995<br>1.5748<br>1.5746 | 5.3<br>0.21 | 11.4<br>0.45 | 76.0<br>2.99 | 124.000<br>123.982<br>4.8819<br>4.8812 | 66.0<br>2.6 | 128.0<br>5.04 | 165.0<br>6.50 | 64.26<br>63.24<br>2.530<br>2.490 | 90.0<br>3.54 | 43.5<br>1.71 | 17.0<br>0.67 | 146.0<br>5.75 | 64<br>2.52 | 6.1<br>13.42  |
| 45 | BSBU45D124<br>(MM45BS100DUH) | 66.0<br>2.60 | 45.000<br>44.995<br>1.7716<br>1.7714 | 5.3<br>0.21 | 11.4<br>0.45 | 76.0<br>2.99 | 124.000<br>123.982<br>4.8819<br>4.8812 | 66.0<br>2.6 | 128.0<br>5.04 | 165.0<br>6.50 | 64.26<br>63.24<br>2.530<br>2.490 | 90.0<br>3.54 | 43.5<br>1.71 | 17.0<br>0.67 | 146.0<br>5.75 | 64<br>2.52 | 6.0<br>13.2   |
| 50 | BSBU50D124<br>(MM50BS100DUH) | 66.0<br>2.60 | 50.000<br>49.995<br>1.9685<br>1.9683 | 5.3<br>0.21 | 11.4<br>0.45 | 76.0<br>2.99 | 124.000<br>123.982<br>4.8819<br>4.8812 | 66.0<br>2.6 | 128.0<br>5.04 | 165.0<br>6.50 | 64.26<br>63.24<br>2.530<br>2.490 | 90.0<br>3.54 | 43.5<br>1.71 | 17.0<br>0.67 | 146.0<br>5.75 | 64<br>2.52 | 5.9<br>12.898 |

## BSBU Q

## STANDARD AND HEAVY-DUTY BEARINGS

- Similar in design and features to the series BSBU D except MM-BS-QU Quadruplex bearings are used.
- Units are supplied with the bearings in quad sets mounted in the "DB" ("O") arrangement.
- Consult your Timken representative for suggested shaft.

STANDARD SERIES – DIMENSIONAL TOLERANCES  $\pm 0.005'' \pm .13 \text{ mm}$  ( $\pm 0.005''$ ) UNLESS OTHERWISE STATED.

| Shaft Dia. | Unit Number   | C      | d                | d <sub>1</sub> | d <sub>2</sub> | d <sub>3</sub> | D                | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | E              | F      | K      | L      | N      | P      | Wt.     |
|------------|---------------|--------|------------------|----------------|----------------|----------------|------------------|----------------|----------------|----------------|----------------|--------|--------|--------|--------|--------|---------|
| mm         | (Bearing Set) | mm in. | mm in.           | mm in.         | mm 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. |
| 17         | BSBU17Q60     | 77.0   | 17.000<br>16.996 | 4.3            | 6.6            | 36.0           | 60.000<br>59.987 | 26.0           | 64.0           | 90.0           | 74.26<br>72.74 | 42.5   | 32.0   | 13.0   | 76.0   | 32.0   | 1.7     |
|            | (MM17BS47QUH) | 3.03   | 0.6693<br>0.6690 | 0.17           | 0.26           | 1.42           | 2.3622<br>2.3617 | 1.02           | 2.52           | 3.54           | 2.924<br>2.864 | 1.67   | 1.26   | 0.51   | 2.99   | 1.26   | 3.74    |
| 20         | BSBU20Q60     | 77.0   | 20.000<br>19.996 | 4.3            | 6.6            | 36.0           | 60.000<br>59.987 | 26.0           | 64.0           | 90.0           | 74.26<br>72.74 | 42.5   | 32.0   | 13.0   | 76.0   | 32.0   | 1.7     |
|            | (MM20BS47QUH) | 3.03   | 0.7874<br>0.7872 | 0.17           | 0.26           | 1.42           | 2.3622<br>2.3617 | 1.02           | 2.52           | 3.54           | 2.924<br>2.864 | 1.67   | 1.26   | 0.51   | 2.99   | 1.26   | 3.74    |
| 25         | BSBU25Q80     | 82.0   | 25.000<br>24.996 | 4.3            | 9.2            | 50.0           | 80.000<br>79.987 | 40.0           | 88.0           | 120.0          | 80.26<br>78.74 | 59.5   | 32.0   | 15.0   | 102.0  | 44.0   | 3.5     |
|            | (MM25BS62QUH) | 3.23   | 0.9842<br>0.9841 | 0.17           | 0.36           | 1.97           | 3.1496<br>3.1491 | 1.57           | 3.46           | 4.72           | 3.160<br>3.100 | 2.34   | 1.26   | 0.59   | 4.02   | 1.73   | 7.7     |
| 30         | BSBU30Q80     | 82.0   | 30.000<br>29.996 | 4.3            | 9.2            | 50.0           | 80.000<br>79.987 | 40.0           | 88.0           | 120.0          | 80.26<br>78.74 | 59.5   | 32.0   | 15.0   | 102.0  | 44.0   | 3.4     |
|            | (MM30BS62QUH) | 3.23   | 1.1811<br>1.1809 | 0.17           | 0.36           | 1.97           | 3.1496<br>3.1491 | 1.57           | 3.46           | 4.72           | 3.160<br>3.100 | 2.34   | 1.26   | 0.59   | 4.02   | 1.73   | 7.48    |
| 35         | BSBU35Q90     | 82.0   | 35.000<br>34.995 | 4.3            | 9.2            | 60.0           | 90.000<br>89.985 | 46.0           | 98.0           | 130.0          | 80.26<br>78.74 | 66.5   | 32.0   | 15.0   | 113.0  | 49.0   | 4.6     |
|            | (MM35BS72QUH) | 3.23   | 1.3780<br>1.3778 | 0.17           | 0.36           | 2.36           | 3.5433<br>3.5427 | 1.81           | 3.86           | 5.12           | 3.160<br>3.100 | 2.62   | 1.26   | 0.59   | 4.45   | 1.93   | 10.12   |
| 40         | BSBU40Q90     | 82.0   | 40.000<br>39.995 | 4.3            | 9.2            | 60.0           | 90.000<br>89.985 | 46.0           | 98.0           | 130.0          | 80.26<br>78.74 | 66.5   | 32.0   | 15.0   | 113.0  | 49.0   | 4.5     |
|            | (MM40BS72QUH) | 3.23   | 1.5748<br>1.5746 | 0.17           | 0.36           | 2.36           | 3.5433<br>3.5427 | 1.81           | 3.86           | 5.12           | 3.160<br>3.100 | 2.62   | 1.26   | 0.59   | 4.45   | 1.93   | 9.9     |

## HEAVY-DUTY SERIES

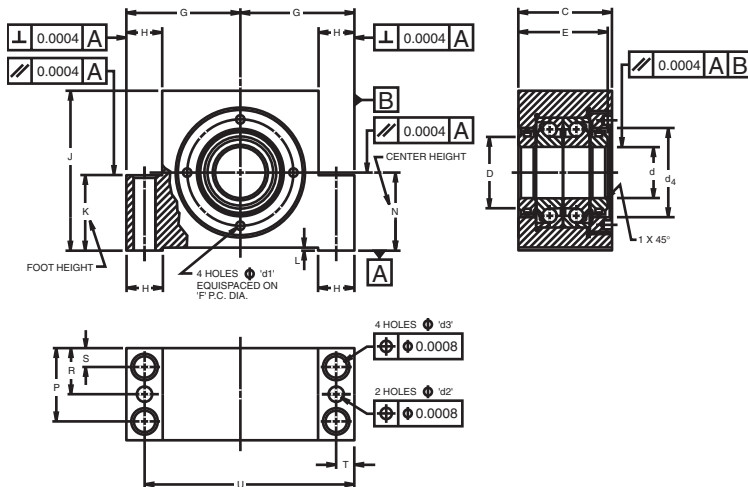
|    |                |       |                  |      |      |      |                    |      |       |       |                  |      |      |      |       |      |       |
|----|----------------|-------|------------------|------|------|------|--------------------|------|-------|-------|------------------|------|------|------|-------|------|-------|
| 35 | BSBU35Q124     | 106.0 | 35.000<br>34.995 | 5.3  | 11.4 | 76.0 | 124.000<br>123.982 | 66.0 | 128.0 | 165.0 | 104.26<br>102.74 | 90.0 | 43.5 | 17.0 | 146.0 | 64.0 | 10.1  |
|    | (MM35BS100QUH) | 4.17  | 1.3780<br>1.3778 | 0.21 | 0.45 | 2.99 | 4.8819<br>4.8812   | 2.6  | 5.04  | 6.5   | 4.105<br>4.045   | 3.54 | 1.71 | 0.67 | 5.75  | 2.52 | 22.22 |
| 40 | BSBU40Q124     | 106.0 | 40.000<br>39.995 | 5.3  | 11.4 | 76.0 | 124.000<br>123.982 | 66.0 | 128.0 | 165.0 | 104.26<br>102.74 | 90.0 | 43.5 | 17.0 | 146.0 | 64.0 | 9.7   |
|    | (MM40BS100QUH) | 4.17  | 1.5748<br>1.5746 | 0.21 | 0.45 | 2.99 | 4.8819<br>4.8812   | 2.6  | 5.04  | 6.5   | 4.105<br>4.045   | 3.54 | 1.71 | 0.67 | 5.75  | 2.52 | 21.34 |
| 45 | BSBU45Q124     | 106.0 | 45.000<br>44.995 | 5.3  | 11.4 | 76.0 | 124.000<br>123.982 | 66.0 | 128.0 | 165.0 | 104.26<br>102.74 | 90.0 | 43.5 | 17.0 | 146.0 | 64.0 | 9.5   |
|    | (MM45BS100QUH) | 4.17  | 1.7716<br>1.7714 | 0.21 | 0.45 | 2.99 | 4.8819<br>4.8812   | 2.6  | 5.04  | 6.5   | 4.105<br>4.045   | 3.54 | 1.71 | 0.67 | 5.75  | 2.52 | 20.9  |
| 50 | BSBU50Q124     | 106.0 | 50.000<br>49.995 | 5.3  | 11.4 | 76.0 | 124.000<br>123.982 | 66.0 | 128.0 | 165.0 | 104.26<br>102.74 | 90.0 | 43.5 | 17.0 | 146.0 | 64.0 | 9.3   |
|    | (MM50BS100QUH) | 4.17  | 1.9685<br>1.9683 | 0.21 | 0.45 | 2.99 | 4.8819<br>4.8812   | 2.6  | 5.04  | 6.5   | 4.105<br>4.045   | 3.54 | 1.71 | 0.67 | 5.75  | 2.52 | 20.46 |



## BSPB D

### STANDARD AND HEAVY-DUTY BEARINGS

- Design of bearing pillow block unit for ball screw applications.
- Incorporates similar features to the series BSBU D but is designed to bolt down onto a flat surface, parallel to the ball screw axis.
- In the standard unit, pilot holes for dowels are provided.
- Units with finished holes for dowels can be supplied by special order if required.
- Consult your Timken representative for suggested shaft.



### STANDARD SERIES – DIMENSIONAL TOLERANCES $\pm .13 \text{ mm}$ ( $\pm 0.005''$ ) UNLESS OTHERWISE STATED.

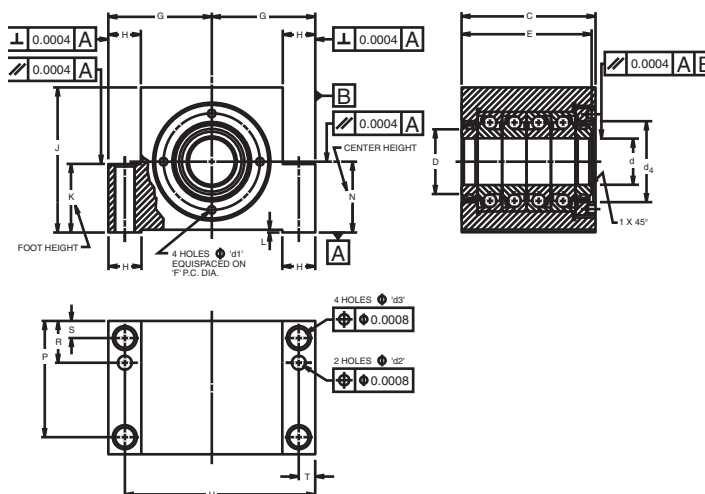
| Shaft Dia. | Unit Number   | C                | d                | d <sub>1</sub> | d <sub>2</sub> | d <sub>3</sub> | d <sub>4</sub> | D      | E              | F      | G                | H      | J      | K      | L      | N                | P      | R      | S      | T      | U      | Wt.     |
|------------|---------------|------------------|------------------|----------------|----------------|----------------|----------------|--------|----------------|--------|------------------|--------|--------|--------|--------|------------------|--------|--------|--------|--------|--------|---------|
| mm         | (Bearing Set) | mm in.           | mm in.           | mm in.         | mm in.         | mm in.         | mm in.         | mm in. | mm in.         | mm 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. |
| 17         | BSPB17D32     | 47.000<br>46.950 | 17.000<br>16.996 | 4.3            | 7.8            | 9.0            | 36.0           | 26.0   | 44.26<br>43.24 | 42.5   | 47.000<br>46.987 | 17     | 62     | 32.0   | 1.0    | 32.000<br>31.987 | 38.0   | 22.0   | 9.0    | 8.5    | 85.5   | 1.5     |
|            | (MM17BS47DUH) | 1.850<br>1.848   | 0.6693<br>0.6691 | 0.17           | 0.31           | 0.35           | 1.42           | 1.02   | 1.742<br>1.702 | 1.67   | 1.8504<br>1.8499 | 0.67   | 2.44   | 1.26   | 0.04   | 1.2598<br>1.2593 | 1.50   | 0.87   | 0.35   | 0.33   | 3.37   | 3.3     |
| 20         | BSPB20D32     | 47.000<br>46.950 | 20.000<br>19.996 | 4.3            | 7.8            | 9.0            | 36.0           | 26.0   | 44.26<br>43.24 | 42.5   | 47.000<br>46.987 | 17     | 62     | 32.0   | 1.0    | 32.000<br>31.987 | 38.0   | 22.0   | 9.0    | 8.5    | 85.5   | 1.5     |
|            | (MM20BS47DUH) | 1.850<br>1.848   | 0.7874<br>0.7872 | 0.17           | 0.31           | 0.35           | 1.42           | 1.02   | 1.742<br>1.702 | 1.67   | 1.8504<br>1.8499 | 0.67   | 2.44   | 1.26   | 0.04   | 1.2598<br>1.2593 | 1.50   | 0.87   | 0.35   | 0.33   | 3.37   | 3.3     |
| 25         | BSPB25D42     | 52.000<br>51.950 | 25.000<br>24.996 | 4.3            | 9.8            | 11.0           | 50.0           | 40.0   | 50.26<br>49.24 | 59.5   | 62.500<br>62.487 | 20     | 85     | 42.0   | 1.0    | 42.000<br>41.987 | 42.0   | 25.0   | 10.0   | 10.0   | 115.0  | 2.8     |
|            | (MM25BS62DUH) | 2.047<br>2.045   | 0.9842<br>0.9841 | 0.17           | 0.39           | 0.43           | 1.97           | 1.57   | 1.979<br>1.938 | 2.34   | 2.4606<br>2.4601 | 0.79   | 3.35   | 1.65   | 0.04   | 1.6535<br>1.6530 | 1.65   | 0.98   | 0.39   | 0.39   | 4.53   | 6.16    |
| 30         | BSPB30D42     | 52.000<br>51.920 | 30.000<br>29.996 | 4.3            | 9.8            | 11.0           | 50.0           | 40.0   | 50.26<br>49.24 | 59.5   | 62.500<br>62.487 | 20     | 85     | 42.0   | 1.0    | 42.000<br>41.987 | 42.0   | 25.0   | 10.0   | 10.0   | 115.0  | 2.7     |
|            | (MM30BS62DUH) | 2.047<br>2.045   | 1.1811<br>1.1809 | 0.17           | 0.39           | 0.43           | 1.97           | 1.57   | 1.979<br>1.938 | 2.34   | 2.4606<br>2.4601 | 0.79   | 3.35   | 1.65   | 0.04   | 1.6535<br>1.6530 | 1.65   | 0.98   | 0.39   | 0.39   | 4.53   | 5.94    |
| 35         | BSPB35D50     | 52.000<br>51.950 | 35.000<br>34.995 | 4.3            | 13.0           | 13.0           | 60.0           | 46.0   | 50.26<br>49.24 | 66.5   | 68.000<br>67.987 | 20.5   | 95     | 50     | 1.0    | 50.000<br>49.987 | 42.0   | 25.0   | 10.0   | 10.0   | 126.0  | 3.8     |
|            | (MM35BS72DUH) | 2.047<br>2.045   | 1.3780<br>1.3778 | 0.17           | 0.51           | 0.51           | 2.36           | 1.81   | 1.979<br>1.938 | 2.62   | 2.6772<br>2.6767 | 0.81   | 3.74   | 1.97   | 0.04   | 1.9685<br>1.9680 | 1.65   | 0.98   | 0.39   | 0.39   | 4.96   | 8.36    |
| 40         | BSPB40D50     | 52.000<br>51.950 | 40.000<br>39.995 | 4.3            | 13.0           | 13.0           | 60.0           | 46.0   | 50.26<br>49.24 | 66.5   | 68.000<br>67.987 | 20.5   | 95     | 50.0   | 1.0    | 50.000<br>49.987 | 42.0   | 25.0   | 10.0   | 10.0   | 126.0  | 3.7     |
|            | (MM40BS72DUH) | 2.047<br>2.045   | 1.5748<br>1.5746 | 0.17           | 0.51           | 0.51           | 2.36           | 1.81   | 1.979<br>1.938 | 2.62   | 2.6772<br>2.6767 | 0.81   | 3.74   | 1.97   | 0.04   | 1.9685<br>1.9680 | 1.65   | 0.98   | 0.39   | 0.39   | 4.96   | 8.14    |

### HEAVY-DUTY SERIES

|    |                |                  |                  |      |      |      |      |      |                |      |                  |      |       |      |      |                  |      |      |      |      |       |       |
|----|----------------|------------------|------------------|------|------|------|------|------|----------------|------|------------------|------|-------|------|------|------------------|------|------|------|------|-------|-------|
| 35 | BSPB35D65      | 66.000<br>65.950 | 35.000<br>34.995 | 5.3  | 11.8 | 18.0 | 76.0 | 66.0 | 64.26<br>63.24 | 90.0 | 95.000<br>94.987 | 30.0 | 130.0 | 65.0 | 1.0  | 65.000<br>64.987 | 53.0 | 32.0 | 13.0 | 15.0 | 175.0 | 9.7   |
|    | (MM35BS100DUH) | 2.598<br>2.596   | 1.3780<br>1.3778 | 0.21 | 0.46 | 0.71 | 2.99 | 2.6  | 2.530<br>2.490 | 3.54 | 3.7402<br>3.7396 | 1.18 | 5.12  | 2.56 | 0.04 | 2.5590<br>2.5585 | 2.09 | 1.26 | 0.51 | 0.59 | 6.89  | 21.34 |
| 40 | BSPB40D65      | 66.000<br>65.950 | 40.000<br>39.995 | 5.3  | 11.8 | 18.0 | 76.0 | 66.0 | 64.26<br>63.24 | 90.0 | 95.000<br>94.987 | 30.0 | 130.0 | 65.0 | 1.0  | 65.000<br>64.987 | 53.0 | 32.0 | 13.0 | 15.0 | 175.0 | 9.5   |
|    | (MM40BS100DUH) | 2.598<br>2.596   | 1.5748<br>1.5746 | 0.21 | 0.46 | 0.71 | 2.99 | 2.6  | 2.530<br>2.490 | 3.54 | 3.7402<br>3.7396 | 1.18 | 5.12  | 2.56 | 0.04 | 2.5590<br>2.5585 | 2.09 | 1.26 | 0.51 | 0.59 | 6.89  | 20.9  |
| 45 | BSPB45D65      | 66.000<br>65.950 | 45.000<br>44.995 | 5.3  | 11.8 | 18.0 | 76.0 | 66.0 | 64.26<br>63.24 | 90.0 | 95.000<br>94.987 | 30.0 | 130.0 | 65.0 | 1.0  | 65.000<br>64.987 | 53.0 | 32.0 | 13.0 | 15.0 | 175.0 | 9.3   |
|    | (MM45BS100DUH) | 2.598<br>2.596   | 1.7716<br>1.7714 | 0.21 | 0.46 | 0.71 | 2.99 | 2.6  | 2.530<br>2.490 | 3.54 | 3.7402<br>3.7396 | 1.18 | 5.12  | 2.56 | 0.04 | 2.5590<br>2.5585 | 2.09 | 1.26 | 0.51 | 0.59 | 6.89  | 20.46 |
| 50 | BSPB50D65      | 66.000<br>65.950 | 50.000<br>49.995 | 5.3  | 11.8 | 18.0 | 76.0 | 66.0 | 64.26<br>63.24 | 90.0 | 95.000<br>94.987 | 30.0 | 130.0 | 65.0 | 1.0  | 65.000<br>64.987 | 53.0 | 32.0 | 13.0 | 15.0 | 175.0 | 9.1   |
|    | (MM50BS100DUH) | 2.598<br>2.596   | 1.9685<br>1.9683 | 0.21 | 0.46 | 0.71 | 2.99 | 2.6  | 2.530<br>2.490 | 3.54 | 3.7402<br>3.7396 | 1.18 | 5.12  | 2.56 | 0.04 | 2.5590<br>2.5585 | 2.09 | 1.26 | 0.51 | 0.59 | 6.89  | 20.02 |

## BSPB Q BALL SCREW SUPPORT BEARING PILLOW BLOCK UNITS

- Similar in design and features to the Series BSPB D, except MM-BS-QU quadropex bearings are used.
- Units are supplied with the bearings in quad sets mounted in the "DB" ("O") arrangement.
- Consult your Timken representative for suggested shaft fits.



### STANDARD SERIES – DIMENSIONAL TOLERANCES $\pm .13 \text{ mm}$ ( $\pm 0.005''$ ) UNLESS OTHERWISE STATED.

| Shaft Dia. | Unit Number                | C                                | d                                    | d <sub>1</sub> | d <sub>2</sub> | d <sub>3</sub> | d <sub>4</sub> | D            | E                                | F            | G                                    | H            | J          | K            | L           | N                                    | P            | R            | S            | T            | U             | Wt.         |
|------------|----------------------------|----------------------------------|--------------------------------------|----------------|----------------|----------------|----------------|--------------|----------------------------------|--------------|--------------------------------------|--------------|------------|--------------|-------------|--------------------------------------|--------------|--------------|--------------|--------------|---------------|-------------|
| mm         | (Bearing Set)              | mm in.                           | mm in.                               | mm in.         | mm in.         | mm in.         | mm in.         | mm in.       | mm in.                           | mm 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.     |
| 17         | BSPB17Q32<br>(MM17BS47QUH) | 77.00<br>76.95<br>3.031<br>3.03  | 17.000<br>16.996<br>0.6693<br>0.6691 | 4.3<br>0.17    | 7.8<br>0.31    | 9.0<br>0.35    | 36.0<br>1.42   | 26.0<br>1.02 | 74.26<br>72.74<br>2.924<br>2.864 | 42.5<br>1.67 | 47.000<br>46.987<br>1.8504<br>1.8499 | 17<br>0.67   | 62<br>2.44 | 32.0<br>1.26 | 1.0<br>0.04 | 32.000<br>31.987<br>1.2598<br>1.2593 | 38.0<br>1.50 | 22.0<br>0.87 | 9.0<br>0.35  | 8.5<br>0.33  | 85.5<br>3.37  | 1.5<br>3.3  |
| 20         | BSPB20Q32<br>(MM20BS47QUH) | 77.00<br>76.95<br>3.031<br>3.03  | 20.000<br>19.996<br>0.7874<br>0.7872 | 4.3<br>0.17    | 7.8<br>0.31    | 9.0<br>0.35    | 36.0<br>1.42   | 26.0<br>1.02 | 74.26<br>72.74<br>2.924<br>2.864 | 42.5<br>1.67 | 47.000<br>46.987<br>1.8504<br>1.8499 | 17<br>0.67   | 62<br>2.44 | 32.0<br>1.26 | 1.0<br>0.04 | 32.000<br>31.987<br>1.2598<br>1.2593 | 38.0<br>1.50 | 22.0<br>0.87 | 9.0<br>0.35  | 8.5<br>0.33  | 85.5<br>3.37  | 1.5<br>3.3  |
| 25         | BSPB25Q42<br>(MM25BS62QUH) | 82.00<br>81.95<br>3.228<br>3.226 | 25.000<br>24.996<br>0.9842<br>0.9841 | 4.3<br>0.17    | 9.8<br>0.39    | 11.0<br>0.43   | 50.0<br>1.97   | 40.0<br>1.57 | 80.26<br>78.74<br>3.16<br>3.1    | 59.5<br>2.34 | 62.500<br>62.487<br>2.4606<br>2.4601 | 20<br>0.79   | 85<br>3.35 | 42.0<br>1.65 | 1.0<br>0.04 | 42.000<br>41.987<br>1.6535<br>1.6530 | 42.0<br>1.65 | 25.0<br>0.98 | 10.0<br>0.39 | 10.0<br>0.39 | 115.0<br>4.53 | 2.8<br>6.16 |
| 30         | BSPB30Q42<br>(MM30BS62QUH) | 82.00<br>81.95<br>3.228<br>3.226 | 30.000<br>29.996<br>1.1811<br>1.1809 | 4.3<br>0.17    | 9.8<br>0.39    | 11.0<br>0.43   | 50.0<br>1.97   | 40.0<br>1.57 | 80.26<br>78.74<br>3.16<br>3.1    | 59.5<br>2.34 | 62.500<br>62.487<br>2.4606<br>2.4601 | 20<br>0.79   | 85<br>3.35 | 42.0<br>1.65 | 1.0<br>0.04 | 42.000<br>41.987<br>1.6535<br>1.6530 | 42.0<br>1.65 | 25.0<br>0.98 | 10.0<br>0.39 | 10.0<br>0.39 | 115.0<br>4.53 | 2.7<br>5.94 |
| 35         | BSPB35Q50<br>(MM35BS72QUH) | 82.00<br>81.95<br>3.228<br>3.226 | 35.000<br>34.995<br>1.3780<br>1.3778 | 4.3<br>0.17    | 13.0<br>0.51   | 13.0<br>0.51   | 60.0<br>2.36   | 46.0<br>1.81 | 80.26<br>78.74<br>3.16<br>3.1    | 66.5<br>2.62 | 68.000<br>67.987<br>2.6772<br>2.6767 | 20.5<br>0.81 | 95<br>3.74 | 50<br>1.97   | 1.0<br>0.04 | 50.000<br>49.987<br>1.9685<br>1.9680 | 42.0<br>1.65 | 25.0<br>0.98 | 10.0<br>0.39 | 10.0<br>0.39 | 126.0<br>4.96 | 3.8<br>8.36 |
| 40         | BSPB40Q50<br>(MM40BS72QUH) | 82.00<br>81.95<br>4.173<br>4.171 | 40.000<br>39.995<br>1.5748<br>1.5746 | 4.3<br>0.17    | 13.0<br>0.51   | 13.0<br>0.51   | 60.0<br>2.36   | 46.0<br>1.81 | 80.26<br>78.74<br>4.105<br>4.045 | 66.5<br>2.62 | 68.000<br>67.987<br>2.6772<br>2.6767 | 20.5<br>0.81 | 95<br>3.74 | 50.0<br>1.97 | 1.0<br>0.04 | 50.000<br>49.987<br>1.9685<br>1.9680 | 42.0<br>1.65 | 25.0<br>0.98 | 10.0<br>0.39 | 10.0<br>0.39 | 126.0<br>4.96 | 3.7<br>8.14 |

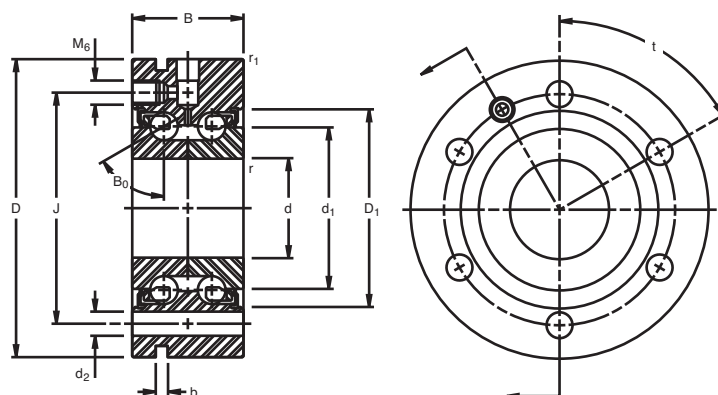
### HEAVY-DUTY SERIES

|    |                             |                                    |                                      |             |              |              |              |             |                                    |              |                                      |              |               |              |             |                                      |              |              |              |              |               |              |
|----|-----------------------------|------------------------------------|--------------------------------------|-------------|--------------|--------------|--------------|-------------|------------------------------------|--------------|--------------------------------------|--------------|---------------|--------------|-------------|--------------------------------------|--------------|--------------|--------------|--------------|---------------|--------------|
| 35 | BSPB35Q65<br>(MM35BS100QUH) | 106.00<br>105.95<br>3.228<br>3.226 | 35.000<br>34.995<br>1.3780<br>1.3778 | 5.3<br>0.21 | 11.8<br>0.46 | 18.0<br>0.71 | 76.0<br>2.99 | 66.0<br>2.6 | 104.26<br>102.74<br>3.16<br>3.1    | 90.0<br>3.54 | 95.000<br>94.987<br>3.7402<br>3.7396 | 30.0<br>1.18 | 130.0<br>5.12 | 65.0<br>2.56 | 1.0<br>0.04 | 65.000<br>64.987<br>2.5590<br>2.5585 | 53.0<br>2.09 | 32.0<br>1.26 | 13.0<br>0.51 | 15.0<br>0.59 | 175.0<br>6.89 | 9.7<br>21.34 |
| 40 | BSPB40Q65<br>(MM40BS100QUH) | 106.00<br>105.95<br>4.173<br>4.171 | 40.000<br>39.995<br>1.5748<br>1.5746 | 5.3<br>0.21 | 11.8<br>0.46 | 18.0<br>0.71 | 76.0<br>2.99 | 66.0<br>2.6 | 104.26<br>102.74<br>4.105<br>4.045 | 90.0<br>3.54 | 95.000<br>94.987<br>3.7402<br>3.7396 | 30.0<br>1.18 | 130.0<br>5.12 | 65.0<br>2.56 | 1.0<br>0.04 | 65.000<br>64.987<br>2.5590<br>2.5585 | 53.0<br>2.09 | 32.0<br>1.26 | 13.0<br>0.51 | 15.0<br>0.59 | 175.0<br>6.89 | 9.5<br>20.9  |
| 45 | BSPB45Q65<br>(MM45BS100QUH) | 106.00<br>105.95<br>4.173<br>4.171 | 45.000<br>44.995<br>1.7716<br>1.7714 | 5.3<br>0.21 | 11.8<br>0.46 | 18.0<br>0.71 | 76.0<br>2.99 | 66.0<br>2.6 | 104.26<br>102.74<br>4.105<br>4.045 | 90.0<br>3.54 | 95.000<br>94.987<br>3.7402<br>3.7396 | 30.0<br>1.18 | 130.0<br>5.12 | 65.0<br>2.56 | 1.0<br>0.04 | 65.000<br>64.987<br>2.5590<br>2.5585 | 53.0<br>2.09 | 32.0<br>1.26 | 13.0<br>0.51 | 15.0<br>0.59 | 175.0<br>6.89 | 9.3<br>20.46 |
| 50 | BSPB50Q65<br>(MM50BS100QUH) | 106.00<br>105.95<br>4.173<br>4.171 | 50.000<br>49.995<br>1.9685<br>1.9683 | 5.3<br>0.21 | 11.8<br>0.46 | 18.0<br>0.71 | 76.0<br>2.99 | 66.0<br>2.6 | 104.26<br>102.74<br>4.105<br>4.045 | 90.0<br>3.54 | 95.000<br>94.987<br>3.7402<br>3.7396 | 30.0<br>1.18 | 130.0<br>5.12 | 65.0<br>2.56 | 1.0<br>0.04 | 65.000<br>64.987<br>2.5590<br>2.5585 | 53.0<br>2.09 | 32.0<br>1.26 | 13.0<br>0.51 | 15.0<br>0.59 | 175.0<br>6.89 | 9.1<br>20.02 |



## SEALED, DOUBLE-ROW BALL SCREW SUPPORT BEARINGS FLANGED STYLE

### MMF SERIES



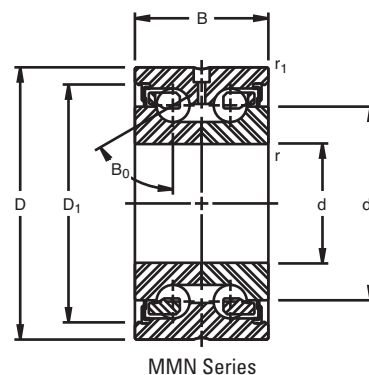
MMF Series Flanged

#### METRIC AND INCH DIMENSIONAL SIZES

| Bearing Number   | Bore<br>d/Tol       | O.D.<br>D/Tol       | Width<br>B/Tol     | Wt.   | Outer<br>Rs <sub>1</sub><br>r <sub>1</sub> | Inner<br>Rs<br>r | Min.<br>D <sub>1</sub> | Max.<br>d <sub>1</sub> | Housing<br>Shoulder<br>Dia. | Shaft<br>Shoulder<br>Dia. | d <sub>2</sub><br>Hole<br>Dia. | Holes<br>Qty. | b    | Pitch<br>Circle<br>J | Hole<br>Spacing<br>t | Contact<br>Angle<br>B <sub>0</sub> | Heavy<br>Series |
|------------------|---------------------|---------------------|--------------------|-------|--------------------------------------------|------------------|------------------------|------------------------|-----------------------------|---------------------------|--------------------------------|---------------|------|----------------------|----------------------|------------------------------------|-----------------|
| METRIC           | mm +0/- (µm)        |                     |                    | kg    | mm                                         | mm               | mm                     | mm                     | mm                          | mm                        | mm                             |               |      | mm                   | degrees              |                                    |                 |
| MMF512BS55PP DM  | 12<br>(3.8)         | 55<br>(7.6)         | 25<br>(254)        | 0.40  | 0.6                                        | 0.3              | 33.1                   | 25.0                   | 32.0                        | 19.0                      | 6.5                            | 3             | 3    | 42                   | 120                  | 60                                 |                 |
| MMF515BS60PP DM  | 15<br>(3.8)         | 60<br>(7.6)         | 25<br>(254)        | 0.47  | 0.6                                        | 0.3              | 37.0                   | 27.6                   | 34.5                        | 21.5                      | 6.5                            | 3             | 3    | 46                   | 120                  | 60                                 |                 |
| MMF517BS62PP DM  | 17<br>(3.8)         | 62<br>(7.6)         | 25<br>(254)        | 0.49  | 0.6                                        | 0.3              | 37.8                   | 28.4                   | 36.5                        | 23.5                      | 6.5                            | 3             | 3    | 48                   | 120                  | 60                                 |                 |
| MMF520BS68PP DM  | 20<br>(5.1)         | 68<br>(7.6)         | 28<br>(254)        | 0.64  | 0.6                                        | 0.3              | 43.2                   | 34.5                   | 42.5                        | 27.5                      | 6.5                            | 4             | 3    | 53                   | 90                   | 60                                 |                 |
| MMF525BS75PP DM  | 25<br>(5.1)         | 75<br>(7.6)         | 28<br>(254)        | 0.76  | 0.6                                        | 0.3              | 49.5                   | 40.6                   | 48.0                        | 33.5                      | 6.5                            | 4             | 3    | 58                   | 90                   | 60                                 |                 |
| MMF530BS80PP DM  | 30<br>(5.1)         | 80<br>(7.6)         | 28<br>(254)        | 0.84  | 0.6                                        | 0.3              | 54.3                   | 45.6                   | 53.5                        | 38.5                      | 6.5                            | 6             | 3    | 63                   | 60                   | 60                                 |                 |
| MMF540BS100PP DM | 40<br>(6.4)         | 100<br>(7.6)        | 34<br>(254)        | 1.50  | 0.6                                        | 0.3              | 68.7                   | 57.5                   | 67.0                        | 49.0                      | 8.5                            | 4             | 3    | 80                   | 90                   | 60                                 |                 |
| MMF550BS115PP DM | 50<br>(6.4)         | 115<br>(7.6)        | 34<br>(254)        | 1.37  | 0.6                                        | 0.3              | 82.6                   | 71.5                   | 81.0                        | 63.0                      | 8.5                            | 6             | 3    | 94                   | 60                   | 60                                 |                 |
| MMF550BS140PP DM | 50<br>(6.4)         | 140<br>(8.9)        | 54<br>(254)        | 4.89  | 0.6                                        | 0.6              | 99.6                   | 81.1                   | 98.5                        | 66.0                      | 10.5                           | 12            | 3    | 113                  | 30                   | 60                                 | H               |
| MMF560BS145PP DM | 60<br>(7.6)         | 145<br>(8.9)        | 45<br>(254)        | 4.28  | 0.6                                        | 0.6              | 100.0                  | 89.0                   | 98.0                        | 72.0                      | 8.5                            | 8             | 3    | 120                  | 45                   | 60                                 |                 |
| INCHES           | in. +0/-(x)         |                     |                    | lbs.  | in.                                        | in.              | in.                    | in.                    | in.                         | in.                       | in.                            | Qty.          |      | in.                  | degrees              |                                    |                 |
| MMF512BS55PP DM  | 0.4724<br>(0.00015) | 2.1654<br>(0.0003)  | 0.9843<br>(0.0100) | 0.88  | 0.024                                      | 0.012            | 1.304                  | 0.905                  | 1.260                       | 0.748                     | 0.256                          | 3             | .118 | 1.654                | 120                  | 60                                 |                 |
| MMF515BS60PP DM  | 0.5906<br>(0.00015) | 2.3622<br>(0.0003)  | 0.9843<br>(0.0100) | 1.04  | 0.024                                      | 0.012            | 1.456                  | 1.088                  | 1.358                       | 0.846                     | 0.256                          | 3             | .118 | 1.811                | 120                  | 60                                 |                 |
| MMF517BS62PP DM  | 0.6693<br>(0.00015) | 2.4409<br>(0.0003)  | 0.9843<br>(0.0100) | 1.08  | 0.024                                      | 0.012            | 1.490                  | 1.117                  | 1.437                       | 0.925                     | 0.256                          | 3             | .118 | 1.890                | 120                  | 60                                 |                 |
| MMF520BS68PP DM  | 0.7874<br>(0.0002)  | 2.6772<br>(0.0003)  | 1.1024<br>(0.0100) | 1.42  | 0.024                                      | 0.012            | 1.700                  | 1.357                  | 1.673                       | 1.083                     | 0.256                          | 4             | .118 | 2.087                | 90                   | 60                                 |                 |
| MMF525BS75PP DM  | 0.9843<br>(0.0002)  | 2.9528<br>(0.0003)  | 1.1024<br>(0.0100) | 1.68  | 0.024                                      | 0.012            | 1.943                  | 1.599                  | 1.890                       | 1.319                     | 0.256                          | 4             | .118 | 2.283                | 90                   | 60                                 |                 |
| MMF530BS80PP DM  | 1.1811<br>(0.0002)  | 3.1496<br>(0.0003)  | 1.1024<br>(0.0100) | 1.86  | 0.024                                      | 0.012            | 2.138                  | 1.795                  | 2.106                       | 1.516                     | 0.256                          | 6             | .118 | 2.480                | 60                   | 60                                 |                 |
| MMF540BS100PP DM | 1.5748<br>(0.00025) | 3.937<br>(0.0003)   | 1.3386<br>(0.0100) | 3.41  | 0.024                                      | 0.012            | 2.704                  | 2.264                  | 2.638                       | 1.929                     | 0.335                          | 4             | .118 | 3.150                | 90                   | 60                                 |                 |
| MMF550BS115PP DM | 1.9685<br>(0.00025) | 4.5276<br>(0.0003)  | 1.3386<br>(0.0100) | 4.37  | 0.024                                      | 0.012            | 3.250                  | 2.815                  | 3.189                       | 2.408                     | 0.335                          | 6             | .118 | 3.701                | 60                   | 60                                 |                 |
| MMF550BS140PP DM | 1.9685<br>(0.00025) | 5.5118<br>(0.00035) | 2.1260<br>(0.0100) | 10.78 | 0.024                                      | 0.024            | 3.919                  | 3.192                  | 3.878                       | 2.598                     | 0.413                          | 12            | .118 | 4.449                | 30                   | 60                                 | H               |
| MMF560BS145PP DM | 2.3622<br>(0.0003)  | 5.7087<br>(0.00035) | 1.7717<br>(0.0100) | 9.43  | 0.024                                      | 0.024            | 3.938                  | 3.308                  | 3.858                       | 2.835                     | 0.335                          | 8             | .118 | 4.724                | 45                   | 60                                 |                 |

# SEALED, DOUBLE-ROW BALL SCREW SUPPORT BEARINGS CARTRIDGE STYLE

## MMN SERIES



MMN Series

### METRIC AND INCH DIMENSIONAL SIZES

| Bearing Number   | Bore<br>d/Tol       | O.D.<br>D/Tol       | Width<br>B/Tol     | Wt.  | Outer<br>R <sub>1</sub> | Inner<br>r | Min.<br>d <sub>1</sub> | Max.<br>dia. | Housing<br>Shoulder<br>Dia. | Shaft<br>Shoulder<br>Dia. | Contact<br>Dia.<br>B <sub>0</sub> | Heavy<br>Series |
|------------------|---------------------|---------------------|--------------------|------|-------------------------|------------|------------------------|--------------|-----------------------------|---------------------------|-----------------------------------|-----------------|
| METRIC           | mm +0/- (μm)        |                     |                    | kg   | mm                      | mm         | mm                     | mm           | mm                          | mm                        | degrees                           |                 |
| MMN512BS42PP DM  | 12<br>(3.8)         | 42<br>(6.4)         | 25<br>(254)        | 0.20 | 0.6                     | 0.3        | 33.1                   | 25.0         | 32.0                        | 19.0                      | 60                                |                 |
| MMN515BS45PP DM  | 15<br>(3.8)         | 45<br>(6.4)         | 25<br>(254)        | 0.23 | 0.6                     | 0.3        | 37.0                   | 27.6         | 34.5                        | 21.5                      | 60                                |                 |
| MMN517BS47PP DM  | 17<br>(3.8)         | 47<br>(6.4)         | 25<br>(254)        | 0.24 | 0.6                     | 0.3        | 37.8                   | 28.4         | 36.5                        | 23.5                      | 60                                |                 |
| MMN520BS52PP DM  | 20<br>(5.1)         | 52<br>(7.6)         | 28<br>(254)        | 0.32 | 0.6                     | 0.3        | 43.2                   | 34.5         | 42.5                        | 27.5                      | 60                                |                 |
| MMN525BS57PP DM  | 25<br>(5.1)         | 57<br>(7.6)         | 28<br>(254)        | 0.35 | 0.6                     | 0.3        | 49.3                   | 40.6         | 48.0                        | 33.5                      | 60                                |                 |
| MMN530BS62PP DM  | 30<br>(5.1)         | 62<br>(7.6)         | 28<br>(254)        | 0.40 | 0.6                     | 0.3        | 54.3                   | 45.6         | 53.5                        | 38.5                      | 60                                |                 |
| MMN540BS75PPDM   | 40<br>(6.4)         | 75<br>(7.6)         | 34<br>(254)        | 0.64 | 0.6                     | 0.3        | 68.7                   | 57.5         | 67.0                        | 49.0                      | 60                                |                 |
| MMN550BS90PP DM  | 50<br>(6.4)         | 90<br>(7.6)         | 34<br>(254)        | 0.91 | 0.6                     | 0.3        | 82.6                   | 71.5         | 81.0                        | 63.0                      | 60                                |                 |
| MMN550BS110PP DM | 50<br>(6.4)         | 110<br>(8.9)        | 54<br>(254)        | 2.42 | 0.6                     | 0.6        | 99.6                   | 81.1         | 98.5                        | 66.0                      | 60                                | H               |
| MMN560BS110PP DM | 60<br>(7.6)         | 110<br>(8.9)        | 45<br>(254)        | 1.82 | 0.6                     | 0.6        | 100.0                  | 84.0         | 98.0                        | 72.0                      | 60                                |                 |
| INCHES           | in. +0/-(x)         |                     |                    | lbs. | in.                     | in.        | in.                    | in.          | in.                         | in.                       | degrees                           |                 |
| MMN512BS42PP DM  | 0.4724<br>(0.00015) | 1.6535<br>(0.00025) | 0.9843<br>(0.0100) | 0.44 | 0.024                   | 0.012      | 1.304                  | 0.985        | 1.259                       | 0.748                     | 60                                |                 |
| MMN515BS45PP DM  | 0.5906<br>(0.00015) | 1.7717<br>(0.00025) | 0.9843<br>(0.0100) | 0.50 | 0.024                   | 0.012      | 1.456                  | 1.088        | 1.358                       | 0.846                     | 60                                |                 |
| MMN517BS47PP DM  | 0.6693<br>(0.00015) | 1.8504<br>(0.00025) | 0.9843<br>(0.0100) | 0.54 | 0.024                   | 0.012      | 1.490                  | 1.117        | 1.437                       | 0.925                     | 60                                |                 |
| MMN520BS52PP DM  | 0.7874<br>(0.0002)  | 2.0472<br>(0.0003)  | 1.1024<br>(0.0100) | 0.70 | 0.024                   | 0.012      | 1.700                  | 1.357        | 1.673                       | 1.083                     | 60                                |                 |
| MMN525BS57PP DM  | 0.9843<br>(0.0002)  | 2.2441<br>(0.0003)  | 1.1024<br>(0.0100) | 0.78 | 0.024                   | 0.012      | 1.943                  | 1.599        | 1.890                       | 1.319                     | 60                                |                 |
| MMN530BS62PP DM  | 1.1811<br>(0.0002)  | 2.4409<br>(0.0003)  | 1.1024<br>(0.0100) | 0.88 | 0.024                   | 0.012      | 2.138                  | 1.795        | 2.106                       | 1.516                     | 60                                |                 |
| MMN540BS75PPDM   | 1.5748<br>(0.00025) | 2.9528<br>(0.0003)  | 1.3386<br>(0.0100) | 1.42 | 0.024                   | 0.012      | 2.704                  | 2.264        | 2.638                       | 1.929                     | 60                                |                 |
| MMN550BS90PP DM  | 1.9685<br>(0.00025) | 3.5433<br>(0.0003)  | 1.3386<br>(0.0100) | 2.02 | 0.024                   | 0.012      | 3.250                  | 2.815        | 3.189                       | 2.408                     | 60                                |                 |
| MMN550BS110PP DM | 1.9685<br>(0.00025) | 4.3307<br>(0.00035) | 2.1260<br>(0.0100) | 5.34 | 0.024                   | 0.024      | 3.919                  | 3.192        | 3.878                       | 2.598                     | 60                                | H               |
| MMN560BS110PP DM | 2.3622<br>(0.0003)  | 4.3307<br>(0.00035) | 1.7717<br>(0.0100) | 4.02 | 0.024                   | 0.024      | 3.938                  | 3.308        | 3.858                       | 2.835                     | 60                                |                 |



## EX-CELL-O SPINDLE BEARINGS

- “EX” Series (Timken® Fafnir® WI construction) designed to meet Ex-Cell-O replacement requirements for inch nominal spindles with bore and O.D. tolerances nominal to plus.
- “XWO” Series (Timken Fafnir WO separable construction) designed to meet Ex-Cell-O replacement requirements for inch nominal spindles with bore and O.D. tolerances nominal to minus.
- Measurement of shafts and housings (or reconditioning of parts) should determine replacement bearing style.
- Shafts and housings should be checked (and reworked) to avoid improper shaft and housing fits.
- Preload selection should be based on operating speed and lubrication system of spindle.

## MM-EX

### REPLACEMENT BEARINGS - FOR EX-CELL-O SPINDLES

| Bearing Number      | Ex-Cell-O Part No. | Preload lbs. | Bore (in.) |        | O.D. (in.) |        | Width - Pair (in.) |        | Maximum Speed (RPM) |
|---------------------|--------------------|--------------|------------|--------|------------|--------|--------------------|--------|---------------------|
|                     |                    |              | Max.       | Min.   | Max.       | Min.   | Max.               | Min.   |                     |
| MM20EXCR DU FS223   | 20                 | 0            | 0.3752     | .3750  | 1.1252     | 1.1250 | 0.6875             | 0.6775 | 65000               |
| MM30EXCR DU FS223   | 30                 | 0            | 0.6252     | .6250  | 1.5002     | 1.5000 | 1.0000             | 0.9900 | 35000               |
| MM30EXCR DU 5 #     | 30                 | 5            | 0.6252     | .6250  | 1.5002     | 1.5000 | 1.0000             | 0.9900 | 25000               |
| MM50EXCR DU FS223   | 50                 | 0            | 0.8127     | .8125  | 2.0002     | 2.0000 | 1.0000             | 0.9900 | 30000               |
| MM50EXCR DU 10 #    | 50                 | 10           | 0.8127     | .8125  | 2.0002     | 2.0000 | 1.0000             | 0.9900 | 18000               |
| MM50EXCR DU 50 #    | 50                 | 50           | 0.8127     | .8125  | 2.0002     | 2.0000 | 1.0000             | 0.9900 | 5000                |
| *MM55EXCR DU 10 #   | 55                 | 10           | 0.8127     | .8125  | 2.0002     | 2.0000 | 1.0000             | 0.9900 | 22000               |
| MM57EXCR DU FS223   | 57                 | 0            | 1.0627     | 1.0625 | 2.2502     | 2.2500 | 1.0000             | 0.9900 | 30000               |
| MM57EXCR DU 10 #    | 57                 | 10           | 1.0627     | 1.0625 | 2.2502     | 2.2500 | 1.0000             | 0.9900 | 15000               |
| MM57EXCR DU 50 #    | 57                 | 50           | 1.0627     | 1.0625 | 2.2502     | 2.2500 | 1.0000             | 0.9900 | 5000                |
| MM67EXCR DU FS223   | 67                 | 0            | 1.2502     | 1.2500 | 2.4377     | 2.4375 | 1.2500             | 1.2400 | 30000               |
| MM67EXCR DU 10 #    | 67                 | 10           | 1.2502     | 1.2500 | 2.4377     | 2.4375 | 1.2500             | 1.2400 | 12500               |
| MM67EXCR DU 30 #    | 67                 | 30           | 1.2502     | 1.2500 | 2.4377     | 2.4375 | 1.2500             | 1.2400 | 7500                |
| MM67EXCR DU 75 #    | 67                 | 75           | 1.2502     | 1.2500 | 2.4377     | 2.4375 | 1.2500             | 1.2400 | 4500                |
| MM90EXCR DU 20 #    | 90                 | 20           | 1.6252     | 1.6250 | 3.4377     | 3.4375 | 1.6250             | 1.6150 | 10000               |
| MM90EXCR DU 100 #   | 90                 | 100          | 1.6252     | 1.6250 | 3.4377     | 3.4375 | 1.6250             | 1.6150 | 4500                |
| MM90EXCR DU 150 #   | 90                 | 150          | 1.6252     | 1.6250 | 3.4377     | 3.4375 | 1.6250             | 1.6150 | 2700                |
| MM90EXCR DU 250 #   | 90                 | 250          | 1.6252     | 1.6250 | 3.4377     | 3.4375 | 1.6250             | 1.6150 | 900                 |
| **MM92EXCR DU 20 #  | 92                 | 20           | 1.7502     | 1.7500 | 3.4377     | 3.4375 | 1.6250             | 1.6150 | 12000               |
| **MM92EXCR DU 100 # | 92                 | 100          | 1.7502     | 1.7500 | 3.4377     | 3.4375 | 1.6250             | 1.6150 | 4500                |
| **MM92EXCR DU 150 # | 92                 | 150          | 1.7502     | 1.7500 | 3.4377     | 3.4375 | 1.6250             | 1.6150 | 2700                |
| **MM92EXCR DU 250 # | 92                 | 250          | 1.7502     | 1.7500 | 3.4377     | 3.4375 | 1.6250             | 1.6150 | 900                 |
| MM115EXCR DU 30 #   | 115                | 30           | 2.2502     | 2.2500 | 4.7502     | 4.7500 | 2.2500             | 2.2400 | 5000                |
| MM115EXCR DU 250 #  | 115                | 250          | 2.2502     | 2.2500 | 4.7502     | 4.7500 | 2.2500             | 2.2400 | 3600                |
| MM115EXCR DU 350 #  | 115                | 350          | 2.2502     | 2.2500 | 4.7502     | 4.7500 | 2.2500             | 2.2400 | 1800                |
| MM135EXCR DU 20 #   | 135                | 20           | 1.2502     | 1.2500 | 2.6877     | 2.6875 | 1.2500             | 1.2400 | 8000                |
| MM135EXCR DU 75 #   | 135                | 75           | 1.2502     | 1.2500 | 2.6877     | 2.6875 | 1.2500             | 1.2400 | 4000                |
| MM155EXCR DU 150 #  | 155                | 150          | 2.7502     | 2.7500 | 4.7502     | 4.7500 | 2.2500             | 2.2400 | 4000                |
| MM155EXCR DU 300 #  | 155                | 300          | 2.7502     | 2.7500 | 4.7502     | 4.7500 | 2.2500             | 2.2400 | 1800                |
| MM165EXCR DU 200 #  | 165                | 200          | 3.5002     | 3.5000 | 6.3127     | 6.3125 | 3.0000             | 2.9900 | 2800                |
| MM165EXCR DU 400 #  | 165                | 400          | 3.5002     | 3.5000 | 6.3127     | 6.3125 | 3.0000             | 2.9900 | 1200                |

These bearings not intended for new design applications. Consult your local Timken representative.

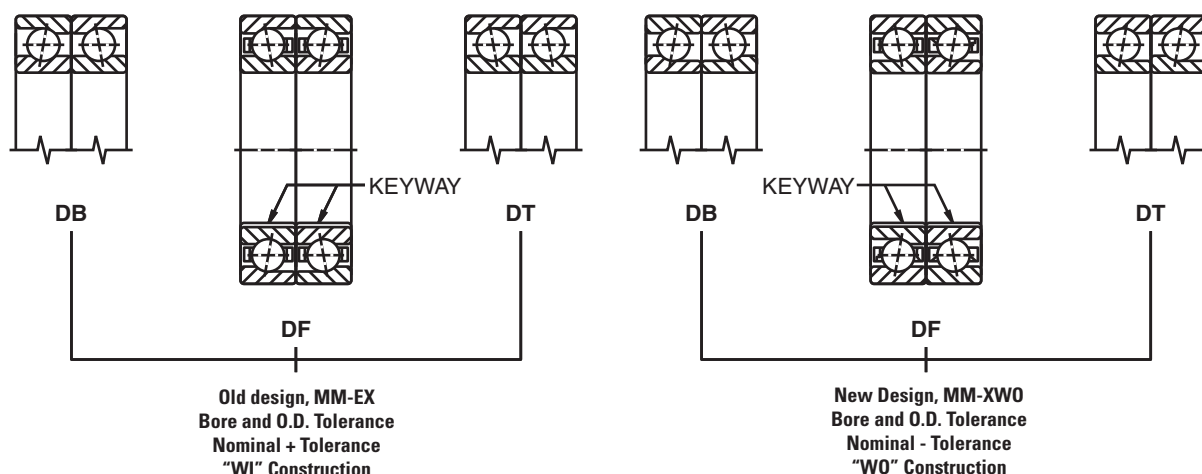
Do not interchange with MM-XWO.

\* Four slots in outer ring faces.

\*\* No keyway in bore.

FS-223 Zero to negative preload.

# TIMKEN MM-EX AND MM-XWO BEARINGS FOR REPLACEMENT ON EX-CELL-O SPINDLES



## MM-XWO

### REPLACEMENT BEARINGS -FOR EX-CELL-O SPINDLES

| Bearing Number      | Ex-Cell-O Part No. | Preload lbs. | Bore (in.) |         | O.D. (in.) |        | Width - Pair (in.) |        | Maximum (RPM) |       |       |
|---------------------|--------------------|--------------|------------|---------|------------|--------|--------------------|--------|---------------|-------|-------|
|                     |                    |              | Max.       | Min.    | Max.       | Min.   | Max.               | Min.   | Grease        | Oil   | Mist  |
| MM20XWOCRDU E9103A  | XLO 20-107         | 0            | 0.37500    | 0.37485 | 1.1250     | 1.1248 | 0.6875             | 0.6675 | 40000         | 65000 | 80000 |
| MM30XWOCRDU E9103C  | XLO 30-57          | 10           | 0.62500    | 0.62485 | 1.5000     | 1.4998 | 1.0000             | 0.9800 | 27000         | 30000 | 35000 |
| MM30XWOCRDU E9103A  | XLO 30-107         | 0            | 0.62500    | 0.62485 | 1.5000     | 1.4998 | 1.0000             | 0.9800 | 35000         | 40000 | 60000 |
| MM55XWOCRDU E9103E  | XLO 55-27          | 50           | 0.81250    | 0.81235 | 2.0000     | 1.9998 | 1.0000             | 0.9800 | 5000          | 8000  | 12000 |
| MM55XWOCRDU E9103C  | XLO 55-57          | 20           | 0.81250    | 0.81235 | 2.0000     | 1.9998 | 1.0000             | 0.9800 | 20000         | 22000 | 24000 |
| MM55XWOCRDU E9103A  | XLO 55-107         | 0            | 0.81250    | 0.81235 | 2.0000     | 1.9998 | 1.0000             | 0.9800 | 24000         | 27000 | 45000 |
| MM57XWOCRDU E9103F  | XLO 57-17          | 100          | 1.06250    | 1.06235 | 2.2500     | 2.2498 | 1.0000             | 0.9800 | 2000          | 4000  | 6000  |
| MM57XWOCRDU E9103C  | XLO 57-57          | 20           | 1.06250    | 1.06235 | 2.2500     | 2.2498 | 1.0000             | 0.9800 | 18000         | 20000 | 22000 |
| MM57XWOCRDU E9103A  | XLO 57-107         | 0            | 1.06250    | 1.06235 | 2.2500     | 2.2498 | 1.0000             | 0.9800 | 22000         | 25000 | 35000 |
| MM67XWOCRDU E9103F  | XLO 67-17          | 90           | 1.25000    | 1.24980 | 2.4375     | 2.4373 | 1.2500             | 1.2300 | 36000         | 4500  | 6000  |
| MM67XWOCRDU E9103C  | XLO 67-57          | 20           | 1.25000    | 1.24980 | 2.4375     | 2.4373 | 1.2500             | 1.2300 | 12500         | 15000 | 20000 |
| MM67XWOCRDU E9103A  | XLO 67-107         | 0            | 1.25000    | 1.24980 | 2.4375     | 2.4373 | 1.2500             | 1.2300 | 16000         | 20000 | 30000 |
| MM90XWOCRDU E9103F  | XLO 90-17          | 250          | 1.62500    | 1.62480 | 3.4375     | 3.4372 | 1.6250             | 1.6050 | 1000          | 2000  | 4000  |
| MM90XWOCRDU E9103D  | XLO 90-47          | 175          | 1.62500    | 1.62480 | 3.4375     | 3.4372 | 1.6250             | 1.6050 | 3000          | 5000  | 8000  |
| MM90XWOCRDU E9103C  | XLO 90-57          | 100          | 1.62500    | 1.62480 | 3.4375     | 3.4372 | 1.6250             | 1.6050 | 5000          | 7000  | 11000 |
| MM90XWOCRDU E9103A  | XLO 90-77          | 20           | 1.62500    | 1.62480 | 3.4375     | 3.4372 | 1.6250             | 1.6050 | 10000         | 14000 | 20000 |
| MM115XWOCRDU E9103E | XLO 115-27         | 300          | 2.25000    | 2.24980 | 4.7500     | 4.7496 | 2.2500             | 2.2300 | 1000          | 2000  | 3000  |
| MM115XWOCRDU E9103C | XLO 115-47         | 150          | 2.25000    | 2.24980 | 4.7500     | 4.7496 | 2.2500             | 2.2300 | 3000          | 4500  | 7000  |
| MM115XWOCRDU E9103A | XLO 115-77         | 30           | 2.25000    | 2.24980 | 4.7500     | 4.7496 | 2.2500             | 2.2300 | 6000          | 8000  | 15000 |
| MM135XWOCRDU E9103C | XLO 135-67         | 50           | 1.25000    | 1.24980 | 2.6875     | 2.6873 | 1.2500             | 1.2300 | 6000          | 7000  | 12000 |
| MM135XWOCRDU E9103A | XLO 135-10         | 70           | 1.25000    | 1.24980 | 2.6875     | 2.6873 | 1.2500             | 1.2300 | 15000         | 19000 | 28000 |
| MM155XWOCRDU E9103D | XLO 155-37         | 300          | 2.75000    | 2.74980 | 4.7500     | 4.7496 | 2.2500             | 2.2300 | 1000          | 2000  | 3000  |
| MM155XWOCRDU E9103B | XLO 155-67         | 150          | 2.75000    | 2.74980 | 4.7500     | 4.7496 | 2.2500             | 2.2300 | 4000          | 5000  | 6500  |
| MM155XWOCRDU E9103A | XLO 155-87         | 50           | 2.75000    | 2.74980 | 4.7500     | 4.7496 | 2.2500             | 2.2300 | 6000          | 7000  | 10000 |
| MM165XWOCRDU E9103E | XLO 165-27         | 800          | 3.50000    | 3.49975 | 6.3125     | 6.3121 | 3.0000             | 2.9800 | 500           | 1000  | 2000  |
| MM165XWOCRDU E9103C | XLO 165-57         | 250          | 3.50000    | 3.49975 | 6.3125     | 6.3121 | 3.0000             | 2.9800 | 2000          | 3000  | 5000  |
| MM165XWOCRDU E9103A | XLO 165-87         | 50           | 3.50000    | 3.49975 | 6.3125     | 6.3121 | 3.0000             | 2.9800 | 5000          | 6500  | 9000  |

Do not interchange with MM-EX.

MM-XWO produced to nominal minus tolerance.



Алматы (7273)495-231  
Ангарск (3955)60-70-56  
Архангельск (8182)63-90-72  
Астрахань (8512)99-46-04  
Барнаул (3852)73-04-60  
Белгород (4722)40-23-64  
Благовещенск (4162)22-76-07  
Брянск (4832)59-03-52  
Владивосток (423)249-28-31  
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Омск (3812)21-46-40  
Орел (4862)44-53-42  
Оренбург (3532)37-68-04  
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Псков (8112)59-10-37  
Пермь (342)205-81-47

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Саранск (8342)22-96-24  
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Смоленск (4812)29-41-54  
Сочи (862)225-72-31  
Ставрополь (8652)20-65-13  
Сургут (3462)77-98-35  
Сыктывкар (8212)25-95-17  
Тамбов (4752)50-40-97  
Тверь (4822)63-31-35

Тольятти (8482)63-91-07  
Томск (3822)98-41-53  
Тула (4872)33-79-87  
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Череповец (8202)49-02-64  
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Якутск (4112)23-90-97  
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