

SHELL TYPE NEEDLE ROLLER BEARINGS

- Shell Type Caged Needle Roller Bearings
- Shell Type Grease Retained Full Complement Needle Roller Bearings



Structure and features

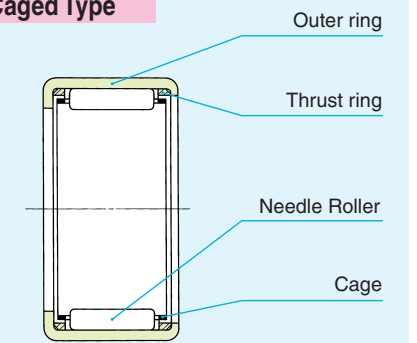
IKO Shell Type Needle Roller Bearings are light-weight bearings with large load ratings. They employ a shell type outer ring made from a thin special-steel plate which is accurately drawn, carburized and quenched, thus providing the lowest sectional height among the needle roller bearings.

There are two types of bearings available in this series; the caged type and the full complement type. The appropriate type can be selected according to the operating conditions. The caged type has a structure in which the needle rollers are accurately guided by the cage and thrust rings. It is useful for applications at high-speed rotation. The full complement type needle roller bearing, on the other hand, is suitable for heavy-load applications at low-speed rotation.

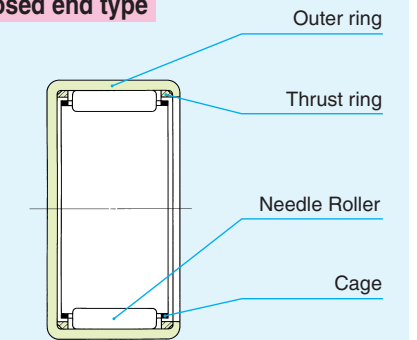
Since these bearings are press-fitted into the housing, no fixtures for axial positioning are needed. They are ideal for use in mass-produced articles that require economy, and have a wide variety of applications.

Structures of Shell Type Needle Roller Bearings

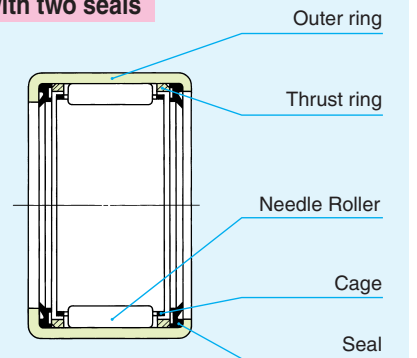
Standard Caged Type



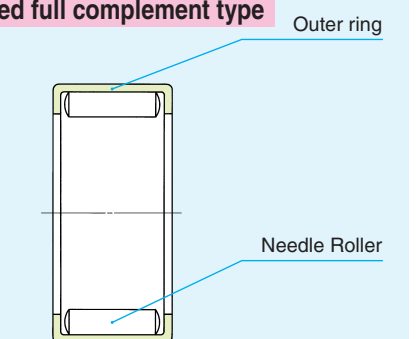
Caged and closed end type



Caged type with two seals



Grease retained full complement type




TA
TLA
BA
BHA

Types

Numerous varieties of Shell Type Needle Roller Bearings are available as shown in Table 1.

Table 1 Type of bearing

| Series | Type | Caged | | | Full complement |
|---------------|------------|-----------|------------|---------------------------|-----------------|
| | | Standard | Closed end | With seals ⁽¹⁾ | Grease retained |
| Metric series | — | TLA ... Z | TLAM | TLA...UU | YTL |
| | Heavy duty | TA ... Z | TAM | — | YT |
| Inch series | — | BA ... Z | BAM | — | YB |
| | Heavy duty | BHA ... Z | BHAM | — | YBH |

Note⁽¹⁾ When the heavy duty type with seals or the closed end type with one seal is required, please consult .

Remark A "W" is added to the model code to indicate that the rolling elements are of the double-row type.
Example TAW 5045 Z

Shell Type Caged Needle Roller Bearings

Standard type

This type has a narrow gap between the bore of the marked-side flange of the outer ring (brand, bearing number, etc. are marked) and the shaft, which prevents grease leaks and the entry of foreign particles. This type has wide applications.

Closed end type

This type is completely closed on one side of the outer ring, and is ideal for use when perfect closing of shaft ends is desired.

The shape of the closed end surface of the outer ring is divided into two types, and the dimensions t_1 and t_2 in the illustrations shown in the dimension tables apply to the bearings with the roller set bore diameters, $F_w > 22$ and $F_w \leq 22$, respectively.

Type with seals at both sides

This type has a wider outer ring than the standard type and is installed with seals consisting of a reinforcing ring and special synthetic rubber to prevent grease leaks and the entry of foreign particles.

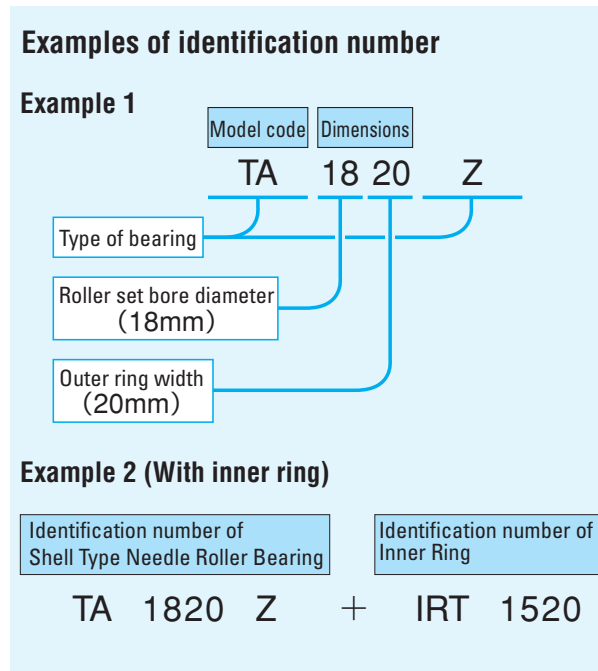
Shell Type Grease Retained Full Complement Needle Roller Bearings

This type has full complement rollers which extend to the full width of the outer ring raceway. It can, therefore, withstand heavy bearing loads and is most suitable for low and medium rotational speeds as well as rocking motions. As lubricating grease is prepacked with the rollers, the bearing can be operated immediately after being fitted.

Identification Number

The identification number of Shell Type Needle Roller Bearings consists of a model code and dimensions. Examples of the arrangement are shown below.

When using with inner rings, the assembled inner rings shown in the dimension tables are used. An example in this case is also shown below. Inner rings are delivered separately.



Accuracy

The outer rings of Shell Type Needle Roller Bearings are thin and therefore cannot avoid deformation due to heat treatment. It is thus not appropriate to take direct measurements of the bearing. The roller set bore diameter is measured using a plug gauge or tapered gauge after press-fitting the bearing to a suitable ring gauge. The gauge specifications are shown in Tables 2.1 and 2.2.

Tolerances of outer ring width C are shown in Table 3.

Table 2.1 Measuring gauges for metric series bearings unit: mm

| F_w Nominal roller set bore diameter | Ring gauge | | Plug gauge | |
|---|--|--|------------|--------|
| | TA...Z ⁽¹⁾ | TLA...Z ⁽²⁾ | Go | No-go |
| 4 | — | 7.981 | 4.004 | 4.016 |
| 5 | — | 8.981 | 5.004 | 5.016 |
| 6 | — | 9.981 | 6.004 | 6.016 |
| 7 | — | 10.977 | 7.005 | 7.020 |
| 8 | 14.992 | 11.977 | 8.005 | 8.020 |
| 9 | 15.992 | 12.977 | 9.005 | 9.020 |
| 10 | 16.992 | 13.977 | 10.005 | 10.020 |
| 12 | 18.991 | 15.977 ⁽³⁾ 17.977 ⁽³⁾ | 12.006 | 12.024 |
| 13 | — | 18.972 | 13.006 | 13.024 |
| 14 | 21.991 | 19.972 | 14.006 | 14.024 |
| 15 | 21.991 | 20.972 | 15.006 | 15.024 |
| 16 | 23.991 | 21.972 | 16.006 | 16.024 |
| 17 | 23.991 | 22.972 | 17.006 | 17.024 |
| 18 | 24.991 | 23.972 | 18.006 | 18.024 |
| 19 | 26.991 | — | 19.007 | 19.028 |
| 20 | 26.991 ⁽⁴⁾ 27.991 ⁽⁴⁾ | 25.972 | 20.007 | 20.028 |
| 21 | 28.991 | — | 21.007 | 21.028 |
| 22 | 28.991 ⁽⁵⁾ 29.991 ⁽⁵⁾ | 27.972 | 22.007 | 22.028 |
| 24 | 30.989 ⁽⁶⁾ 31.989 ⁽⁶⁾ | — | 24.007 | 24.028 |
| 25 | 32.989 | 31.967 | 25.007 | 25.028 |
| 26 | 33.989 | — | 26.007 | 26.028 |
| 28 | 36.989 | 34.967 | 28.007 | 28.028 |
| 29 | 37.989 | — | 29.007 | 29.028 |
| 30 | 39.989 | 36.967 | 30.007 | 30.028 |
| 32 | 41.989 | — | 32.009 | 32.034 |
| 35 | 44.989 | 41.967 | 35.009 | 35.034 |
| 37 | 46.989 | — | 37.009 | 37.034 |
| 38 | 47.989 | — | 38.009 | 38.034 |
| 40 | 49.989 | 46.967 | 40.009 | 40.034 |
| 45 | 54.988 | 51.961 | 45.009 | 45.034 |
| 50 | 61.988 | 57.961 | 50.009 | 50.034 |
| 55 | 66.988 | 62.961 | 55.010 | 55.040 |
| 60 | 71.988 | — | 60.010 | 60.040 |
| 62 | 73.988 | — | 62.010 | 62.040 |
| 65 | 76.988 | — | 65.010 | 65.040 |
| 70 | 81.987 | — | 70.010 | 70.040 |

Notes⁽¹⁾ Also applicable to TAM and YT
⁽²⁾ Also applicable to TLAM, YTL, TLA...UU
⁽³⁾ The upper value is for TLA 1210Z model, and the lower value is for TLA 1212Z model.
⁽⁴⁾ The lower value is for TA 202820Z model, and the upper value is for models other than TA 202820Z model.
⁽⁵⁾ The lower value is for TA 223016Z and TA 223020Z models, and the upper value is for models other than those models.
⁽⁶⁾ The lower value is for TA 243216Z and TA 243220Z models, and the upper value is for models other than those models.

Table 2.2 Measuring gauges for inch series bearings unit: mm

| F_w Nominal roller set bore diameter | Ring gauge | | Plug gauge | |
|---|-----------------------|------------------------|------------|--------|
| | BA...Z ⁽¹⁾ | BHA...Z ⁽²⁾ | Go | No-go |
| 3.969 | 7.155 | — | 3.990 | 4.016 |
| 4.762 | 8.730 | — | 4.783 | 4.808 |
| 6.350 | 11.125 | — | 6.388 | 6.414 |
| 7.938 | 12.713 | 14.300 | 7.976 | 8.001 |
| 9.525 | 14.300 | 15.888 | 9.563 | 9.588 |
| 11.112 | 15.888 | 17.475 | 11.151 | 11.176 |
| 12.700 | 17.475 | 19.063 | 12.738 | 12.764 |
| 14.288 | 19.063 | 20.650 | 14.326 | 14.351 |
| 15.875 | 20.650 | 22.238 | 15.913 | 15.938 |
| 17.462 | 22.238 | 23.825 | 17.501 | 17.526 |
| 19.050 | 25.387 | 26.975 | 19.063 | 19.088 |
| 20.638 | 26.975 | 28.562 | 20.650 | 20.676 |
| 22.225 | 28.562 | 30.150 | 22.238 | 22.263 |
| 23.812 | 30.150 | — | 23.825 | 23.851 |
| 25.400 | 31.737 | 33.325 | 25.413 | 25.438 |
| 26.988 | 33.325 | — | 27.000 | 27.026 |
| 28.575 | 34.912 | 38.087 | 28.588 | 28.613 |
| 30.162 | 38.087 | — | 30.175 | 30.201 |
| 31.750 | 38.087 | 41.262 | 31.763 | 31.788 |
| 33.338 | 41.262 | — | 33.350 | 33.378 |
| 34.925 | 41.262 | 44.437 | 34.938 | 34.966 |
| 38.100 | 47.612 | — | 38.113 | 38.143 |
| 41.275 | 50.787 | — | 41.288 | 41.318 |
| 44.450 | 53.962 | 57.137 | 44.463 | 44.496 |
| 47.625 | 57.137 | — | 47.638 | 47.671 |
| 50.800 | 60.312 | — | 50.815 | 50.848 |
| 52.388 | — | 64.280 | 52.413 | 52.451 |
| 53.975 | 63.487 | — | 53.990 | 54.028 |
| 57.150 | 66.662 | — | 57.165 | 57.203 |
| 66.675 | 76.187 | — | 66.700 | 66.738 |
| 69.850 | 79.362 | — | 69.875 | 69.914 |

Notes⁽¹⁾ Also applicable to BAM and YB
⁽²⁾ Also applicable to BHAM and YBH

Table 3 Tolerances of outer ring width C unit: mm

| Series | Tolerance |
|--------|-----------|
| Metric | 0 ~ -0.20 |
| Inch | 0 ~ -0.25 |

Fit

As the outer ring is thin, the correct dimensions and accuracy of Shell Type Needle Roller Bearings are obtained only after they have been press-fitted into the housing bore. Bearing accuracy is directly affected by housing dimensions, shape and rigidity. This should be taken into account when considering fit and accuracy. The radial clearance after fitting the bearing to the shaft and the housing bore varies with their tolerances.

Table 4 shows the recommended fit for Shell Type Needle Roller Bearings.

Table 5 shows a calculation example of radial clearance after fitting. This calculation applies to bearings without inner ring to be fitted into rigid steel or cast iron housings. When the housing is made of light alloy or a thin steel pipe, it is necessary to check dimensions by actual measurement.

Generally, when making the radial clearance smaller, it is recommended that the shaft diameter be increased, without decreasing the housing bore diameter.

Table 4 Recommended fit

| Type of bearing | Housing material | Tolerance class | | |
|--|----------------------------------|--------------------|-----------------|--------------|
| | | Shaft (1) | | Housing bore |
| | | Without inner ring | With inner ring | |
| TA...Z, BA...Z, BHA...Z, TAM, BAM, BHAM, YT, YB, YBH | Steel Cast iron | h6 | k5(j5) | J7 |
| | Light alloy (Thin steel pipe) | h6 | k5(j5) | M7(N7) |
| TLA...Z, TLAM, YTL, TLA...UU | Steel Cast iron | h6 | k5(j5) | N7 |
| | Light alloy (Thin steel pipe) | h6 | k5(j5) | R7(S7) |

Note(1) When housings are made of light alloy or a thin steel pipe, the roller set bore diameter is greatly affected by the housing thickness and shape. Therefore, before mass-production assembly, assembly tests should be carried out to confirm the amount of dimensional change and to determine the tolerance of the shaft which will give normal clearances.

Table 5 Calculation example of radial clearance after fitting

unit: mm

| Calculation procedure | Example of TLA 2020 Z |
|---|--|
| | |
| <p>① Dimension of roller set bore diameter of bearing after it has been press-fitted into the ring gauge. Dimension of ring gauge (D_0): See Tables 2.1 and 2.2 on page 71. Max. value of roller set bore dia. ($F_{w \max}$): No-go dimension of plug gauge Min. value of roller set bore dia. ($F_{w \min}$): Go dimension of plug gauge</p> | <p>From Table 2.1 on page 71 $D_0 = 25.972$ $F_{w \max} = 20.028$ $F_{w \min} = 20.007$</p> |
| <p>② Dimension of housing bore Max. value of housing bore (D_{\max}): See the dimension table. Min. value of housing bore (D_{\min}): See the dimension table.</p> | <p>From the dimension table on page 81, $D_{\max} = 25.993$ $D_{\min} = 25.972$</p> |
| <p>③ Dimension of roller set bore diameter of bearing after it has been press-fitted into the housing bore Max. value of roller set bore dia. ($F_{we \max}$) = $(D_{\max} - D_0) + F_{w \max}$ Min. value of roller set bore dia. ($F_{we \min}$) = $(D_{\min} - D_0) + F_{w \min}$</p> | <p>From the equations, $F_{we \max} = 20.049$ $F_{we \min} = 20.007$</p> |
| <p>④ Dimension of shaft Max. value of shaft dia. (F_{\max}): See the dimension table. Min. value of shaft dia. (F_{\min}): See the dimension table.</p> | <p>From the dimension table on page 81, $F_{\max} = 20.000$ $F_{\min} = 19.987$</p> |
| <p>⑤ Radial clearance after mounting Max. value of radial clearance ($G_{r \max}$) = $F_{we \max} - F_{\min}$ Min. value of radial clearance ($G_{r \min}$) = $F_{we \min} - F_{\max}$</p> | <p>From the equations, $G_{r \max} = 0.062$ $G_{r \min} = 0.007$ The radial clearance after mounting becomes 0.007~0.062 mm.</p> |

Lubrication

Bearings with prepacked grease are shown in Table 6. ALVANIA GREASE 2 (SHELL) is prepacked as the lubricating grease.

In the case of bearings without prepacked grease, perform proper lubrication for use. If the bearings are operated without lubrication, the wear of the roller contact surfaces will increase and the bearing life will be shortened.

Oil Hole

For Shell Type Needle Roller Bearings with an oil hole, "OH" is appended to the end of the identification number.

Example TA 2525 Z OH

The symbol "OH" is not marked on the bearing itself, but is shown on its packaging, etc. When bearings with multiple oil holes are required, please consult IKO.

Table 6 Bearings with prepacked grease

○ : With prepacked grease × : Without prepacked grease

| Series | Bearing type | Caged | | | Full complement Grease retained |
|---------------|----------------|----------|------------|------------|------------------------------------|
| | | Standard | Closed end | With seals | |
| Metric series | TLA, TLAM, YTL | × | × | ○ | ○ |
| | TA, TAM, YT | × | × | — | ○ |
| Inch series | BA, BAM, YB | × | × | — | ○ |
| | BHA, BHAM, YBH | × | × | — | ○ |

Static Safety Factor

Since Shell Type Needle Roller Bearings employ an outer ring made from a thin steel plate which is drawn, carburized and quenched, excessively large loads must be avoided. The required static safety factor is usually more than 3.

Specifications of shaft and housing

Shell Type Needle Roller Bearings are commonly used without an inner ring. In such cases, the surface hardness of the raceway surface should be 58~64HRC and the surface roughness should not exceed $0.2 \mu m R_a$. However, when the operating condition is not severe, a surface roughness $0.8 \mu m R_a$ or less can be used.

If the surface hardness is low, the load rating must be corrected by the hardness factor shown on page 23. When the shaft cannot be heat treated and finished by grinding, the use of IKO Inner Rings for Shell Type Needle Roller Bearings (See page 294.) is recommended.

Mounting

Shell Type Needle Roller Bearings should be pressed into the housings gently using the appropriate tool as shown in Fig. 1, with their marked end surface up. As the outer ring is thin, it must never be struck directly with a hammer.

Since the outer rings of Shell Type Needle Roller Bearings are firmly fitted to housing bores with interference, it is unnecessary to fix them axially. Fig. 2 shows mounting examples.

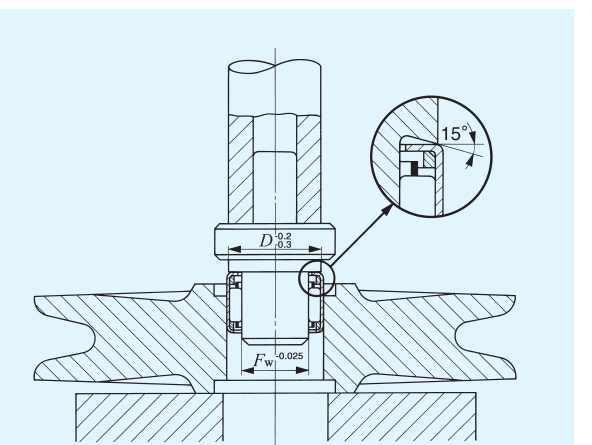


Fig.1 Example of mounting tool

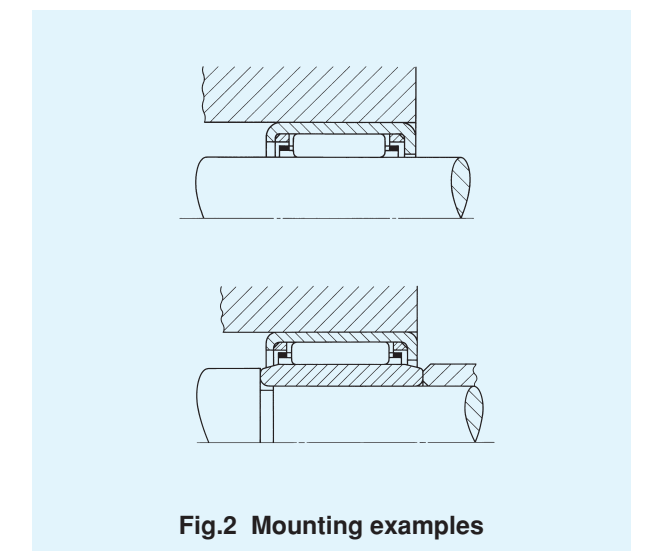
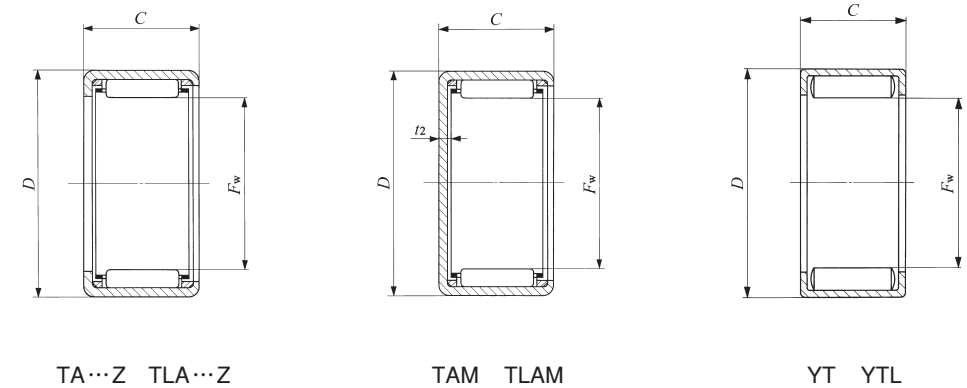


Fig.2 Mounting examples

SHELL TYPE NEEDLE ROLLER BEARINGS



TA
TLA
BA
BHA

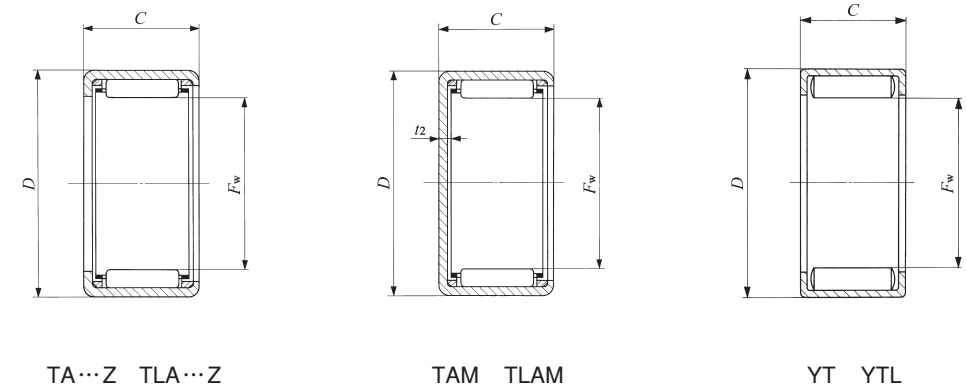
Shaft dia. 4 – 10 mm

| Shaft dia. mm | Identification number | | | | | | | | | |
|---------------|-----------------------|---------------|-----------------|---------------|-------------------|---------------|------------------|---------------|-----------------|---------------|
| | Standard | Mass (Ref.) g | Closed end | Mass (Ref.) g | Standard | Mass (Ref.) g | Closed end | Mass (Ref.) g | Grease retained | Mass (Ref.) g |
| 4 | — | — | — | — | TLA 48 Z | 1.54 | TLAM 48 | 1.67 | — | — |
| | — | — | — | — | — | — | — | — | YTL 48 | 1.73 |
| 5 | — | — | — | — | TLA 59 Z | 1.9 | TLAM 59 | 2 | — | — |
| | — | — | — | — | — | — | — | — | YTL 59 | 2.4 |
| 6 | — | — | — | — | TLA 69 Z | 2.2 | TLAM 69 | 2.3 | — | — |
| 7 | — | — | — | — | TLA 79 Z | 2.5 | TLAM 79 | 2.7 | — | — |
| 8 | — | — | — | — | TLA 810 Z | 3.1 | TLAM 810 | 3.3 | — | — |
| | TA 810 Z | 6.7 | TAM 810 | 7.1 | — | — | — | — | — | — |
| | TA 815 Z | 9.7 | TAM 815 | 10.1 | — | — | — | — | — | — |
| | TA 820 Z | 12.9 | TAM 820 | 13.3 | — | — | — | — | — | — |
| | — | — | — | — | — | — | — | — | YT 810 | 7.7 |
| 9 | — | — | — | — | TLA 910 Z | 3.4 | TLAM 910 | 3.6 | — | — |
| | — | — | — | — | TLA 912 Z | 4 | TLAM 912 | 4.3 | — | — |
| | TA 912 Z | 8.7 | TAM 912 | 9.2 | — | — | — | — | — | — |
| | TA 916 Z | 11.4 | TAM 916 | 11.9 | — | — | — | — | — | — |
| 10 | — | — | — | — | TLA 1010 Z | 3.7 | TLAM 1010 | 4 | — | — |
| | — | — | — | — | TLA 1012 Z | 4.4 | TLAM 1012 | 4.8 | — | — |
| | — | — | — | — | TLA 1015 Z | 5.5 | TLAM 1015 | 5.9 | — | — |
| | TA 1010 Z | 7.9 | TAM 1010 | 8.5 | — | — | — | — | — | — |
| | TA 1012 Z | 9.3 | TAM 1012 | 10 | — | — | — | — | — | — |
| | TA 1015 Z | 11.5 | TAM 1015 | 12.2 | — | — | — | — | — | — |
| | TA 1020 Z | 15.4 | TAM 1020 | 16 | — | — | — | — | — | — |
| | — | — | — | — | — | — | — | — | — | — |

| Boundary dimensions mm | | | | Standard mounting dimensions mm | | | | | | Basic dynamic load rating C | Basic static load rating C ₀ | Allowable rotational speed ⁽¹⁾ | Assembled inner ring |
|------------------------|----|----|---------------------|---------------------------------|-------|-------------------------|--------|--------|--------|-----------------------------|---|---|----------------------|
| F _w | D | C | t ₂ Max. | Shaft dia. h6 | | Housing bore dia. J7 N7 | | | | | | | |
| | | | | Max. | Min. | Max. | Min. | Max. | Min. | N | N | rpm | |
| 4 | 8 | 8 | 1 | 4.000 | 3.992 | — | — | 7.996 | 7.981 | 1 350 | 1 010 | 75 000 | — |
| 4 | 8 | 8 | — | — | — | — | — | — | — | 3 010 | 2 900 | 40 000 | — |
| 5 | 9 | 9 | 1 | 5.000 | 4.992 | — | — | 8.996 | 8.981 | 1 880 | 1 600 | 65 000 | — |
| 5 | 9 | 9 | — | — | — | — | — | — | — | 4 320 | 4 750 | 30 000 | — |
| 6 | 10 | 9 | 1 | 6.000 | 5.992 | — | — | 9.996 | 9.981 | 2 100 | 1 900 | 55 000 | — |
| 7 | 11 | 9 | 1 | 7.000 | 6.991 | — | — | 10.995 | 10.977 | 2 490 | 2 450 | 50 000 | — |
| 8 | 12 | 10 | 1 | 8.000 | 7.991 | — | — | 11.995 | 11.977 | 3 320 | 3 670 | 45 000 | — |
| 8 | 15 | 10 | 1.3 | — | — | — | — | — | — | 3 470 | 2 880 | 45 000 | — |
| 8 | 15 | 15 | 1.3 | — | — | — | — | — | — | 5 780 | 5 570 | 45 000 | — |
| 8 | 15 | 20 | 1.3 | 8.000 | 7.991 | 15.010 | 14.992 | — | — | 8 340 | 8 920 | 45 000 | — |
| 8 | 15 | 10 | — | — | — | — | — | — | — | 7 530 | 7 950 | 19 000 | — |
| 9 | 13 | 10 | 1 | 9.000 | 8.991 | — | — | 12.995 | 12.977 | 3 500 | 4 040 | 45 000 | — |
| 9 | 13 | 12 | 1 | — | — | — | — | — | — | 4 460 | 5 510 | 45 000 | — |
| 9 | 16 | 12 | 1.3 | — | — | — | — | — | — | 5 140 | 4 880 | 45 000 | — |
| 9 | 16 | 16 | 1.3 | 9.000 | 8.991 | 16.010 | 15.992 | — | — | 6 960 | 7 210 | 45 000 | — |
| 9 | 16 | 12 | — | — | — | — | — | — | — | 9 690 | 11 200 | 17 000 | — |
| 10 | 14 | 10 | 1 | — | — | — | — | — | — | 3 870 | 4 740 | 40 000 | IRT 710 |
| 10 | 14 | 12 | 1 | 10.000 | 9.991 | — | — | 13.995 | 13.977 | 4 920 | 6 460 | 40 000 | IRT 712 |
| 10 | 14 | 15 | 1 | — | — | — | — | — | — | 6 390 | 9 040 | 40 000 | IRT 715 |
| 10 | 17 | 10 | 1.3 | — | — | — | — | — | — | 4 150 | 3 780 | 40 000 | IRT 710 |
| 10 | 17 | 12 | 1.3 | — | — | — | — | — | — | 5 590 | 5 540 | 40 000 | IRT 712 |
| 10 | 17 | 15 | 1.3 | 10.000 | 9.991 | 17.010 | 16.992 | — | — | 6 920 | 7 300 | 40 000 | IRT 715 |
| 10 | 17 | 20 | 1.3 | — | — | — | — | — | — | 9 990 | 11 700 | 40 000 | — |

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

SHELL TYPE NEEDLE ROLLER BEARINGS



TA
TLA
BA
BHA

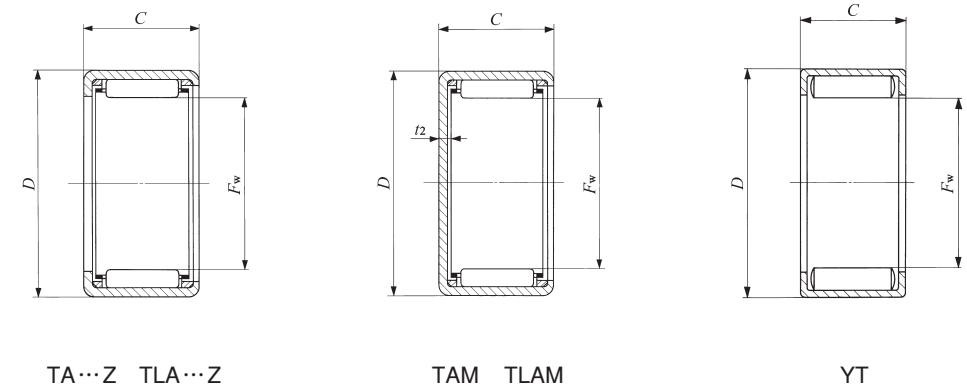
Shaft dia. 12 – 15 mm

| Shaft dia. mm | Identification number | | | | | | | | | |
|------------------|-----------------------|------------------|-----------------|-----------------|-------------------|---------------|------------------|---------------|-----------------|---------------|
| | Standard | Mass (Ref.) g | Closed end | Mass (Ref.) g | Standard | Mass (Ref.) g | Closed end | Mass (Ref.) g | Grease retained | Mass (Ref.) g |
| 12 | — | — | — | — | TLA 1210 Z | 4.3 | TLAM 1210 | 4.7 | — | — |
| | — | — | — | — | — | — | — | — | YTL 1210 | 5.1 |
| | — | — | — | — | TLA 1212 Z | 8.6 | TLAM 1212 | 9.4 | — | — |
| | TA 1212 Z | 10.5 | TAM 1212 | 11.5 | — | — | — | — | — | — |
| | TA 1215 Z | 13.1 | TAM 1215 | 14 | — | — | — | — | — | — |
| | TA 1220 Z | 17.3 | TAM 1220 | 18.3 | — | — | — | — | — | — |
| 13 | TA 1225 Z | 21.5 | TAM 1225 | 22.5 | — | — | — | — | — | — |
| | — | — | — | — | — | — | — | — | YT 1212 | 12.8 |
| | — | — | — | — | TLA 1312 Z | 9.2 | TLAM 1312 | 10.1 | — | — |
| | — | — | — | — | TLA 1412 Z | 9.8 | TLAM 1412 | 10.8 | — | — |
| | — | — | — | — | TLA 1416 Z | 13.2 | TLAM 1416 | 14.3 | — | — |
| | 14 | TA 1416 Z | 18.4 | TAM 1416 | 19.6 | — | — | — | — | — |
| TA 1420 Z | | 23 | TAM 1420 | 24 | — | — | — | — | — | — |
| — | | — | — | — | TLA 1512 Z | 10.4 | TLAM 1512 | 11.5 | — | — |
| — | | — | — | — | TLA 1516 Z | 14 | TLAM 1516 | 15.2 | — | — |
| — | | — | — | — | TLA 1522 Z | 19.1 | TLAM 1522 | 20.5 | — | — |
| 15 | | TA 1510 Z | 10.8 | TAM 1510 | 12.3 | — | — | — | — | — |
| | TA 1512 Z | 12.9 | TAM 1512 | 14.3 | — | — | — | — | — | — |
| | TA 1515 Z | 15.9 | TAM 1515 | 17.3 | — | — | — | — | — | — |
| | TA 1520 Z | 21 | TAM 1520 | 22.5 | — | — | — | — | — | — |
| | TA 1525 Z | 25 | TAM 1525 | 26.5 | — | — | — | — | — | — |
| | — | — | — | — | — | — | — | — | — | — |

| Boundary dimensions mm | | | | Standard mounting dimensions mm | | | | | | Basic dynamic load rating C N | Basic static load rating C ₀ N | Allowable rotational speed ⁽¹⁾ rpm | Assembled inner ring |
|------------------------|----|----|---------------------|---------------------------------|--------|----------------------|--------|--------|--------|-------------------------------|---|---|----------------------|
| F _w | D | C | t ₂ Max. | Shaft dia. h6 | | Housing bore dia. J7 | | | | | | | |
| | | | | Max. | Min. | Max. | Min. | Max. | Min. | | | | |
| 12 | 16 | 10 | 1 | 12.000 | 11.989 | — | — | 15.995 | 15.977 | 4 350 | 5 810 | 35 000 | IRT 810 |
| 12 | 16 | 10 | — | — | — | — | — | — | — | 7 470 | 11 800 | 13 000 | IRT 810 |
| 12 | 18 | 12 | 1.3 | 12.000 | 11.989 | — | — | 17.995 | 17.977 | 6 420 | 7 490 | 35 000 | IRT 812 |
| 12 | 19 | 12 | 1.3 | — | — | — | — | — | — | 6 000 | 6 310 | 35 000 | IRT 812 |
| 12 | 19 | 15 | 1.3 | — | — | — | — | — | — | 7 440 | 8 320 | 35 000 | IRT 815 |
| 12 | 19 | 20 | 1.3 | 12.000 | 11.989 | 19.012 | 18.991 | — | — | 10 700 | 13 300 | 35 000 | — |
| 12 | 19 | 25 | 1.3 | — | — | — | — | — | — | 13 800 | 18 300 | 35 000 | — |
| 12 | 19 | 12 | — | — | — | — | — | — | — | 11 800 | 15 200 | 13 000 | IRT 812 |
| 13 | 19 | 12 | 1.3 | 13.000 | 12.989 | — | — | 18.993 | 18.972 | 6 760 | 8 170 | 30 000 | IRT 1012 |
| 14 | 20 | 12 | 1.3 | 14.000 | 13.989 | — | — | 19.993 | 19.972 | 7 080 | 8 840 | 30 000 | IRT 1012-2 |
| 14 | 20 | 16 | 1.3 | — | — | — | — | — | — | 8 950 | 12 000 | 30 000 | IRT 1016-2 |
| 14 | 22 | 16 | 1.3 | 14.000 | 13.989 | 22.012 | 21.991 | — | — | 10 500 | 12 000 | 30 000 | IRT 1016-2 |
| 14 | 22 | 20 | 1.3 | — | — | — | — | — | — | 13 900 | 17 200 | 30 000 | IRT 1020-2 |
| 15 | 21 | 12 | 1.3 | 15.000 | 14.989 | — | — | 20.993 | 20.972 | 7 380 | 9 520 | 25 000 | IRT 1212 |
| 15 | 21 | 16 | 1.3 | — | — | — | — | — | — | 9 330 | 12 900 | 25 000 | IRT 1216 |
| 15 | 21 | 22 | 1.3 | — | — | — | — | — | — | 13 600 | 20 900 | 25 000 | IRT 1222 |
| 15 | 22 | 10 | 1.3 | 15.000 | 14.989 | 22.012 | 21.991 | — | — | 5 290 | 5 680 | 25 000 | IRT 1010-1 |
| 15 | 22 | 12 | 1.3 | — | — | — | — | — | — | 7 120 | 8 310 | 25 000 | IRT 1012-1 |
| 15 | 22 | 15 | 1.3 | — | — | — | — | — | — | 8 830 | 11 000 | 25 000 | IRT 1015-1 |
| 15 | 22 | 20 | 1.3 | — | — | — | — | — | — | 12 700 | 17 600 | 25 000 | IRT 1020-1 |
| 15 | 22 | 25 | 1.3 | — | — | — | — | — | — | 16 300 | 24 200 | 25 000 | IRT 1025-1 |

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

SHELL TYPE NEEDLE ROLLER BEARINGS



TA
TLA
BA
BHA

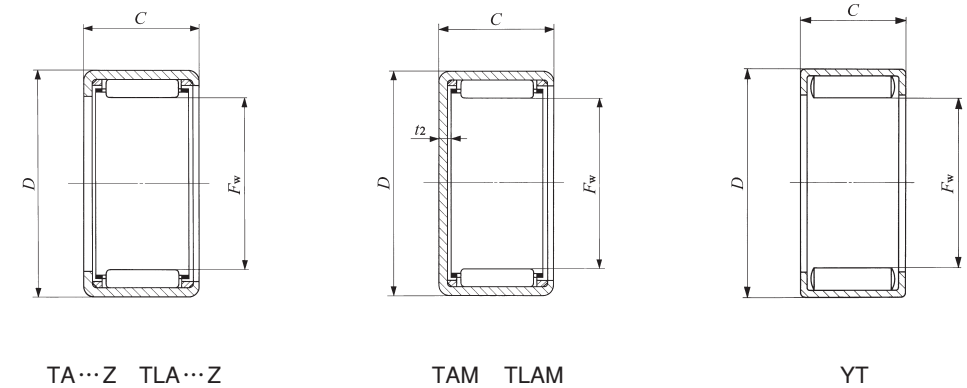
Shaft dia. 16 – 19mm

| Shaft dia. mm | Identification number | | | | | | | | | |
|---------------|-----------------------|---------------|-----------------|---------------|-------------------|---------------|------------------|---------------|-----------------|---------------|
| | Standard | Mass (Ref.) g | Closed end | Mass (Ref.) g | Standard | Mass (Ref.) g | Closed end | Mass (Ref.) g | Grease retained | Mass (Ref.) g |
| 16 | — | — | — | — | TLA 1612 Z | 10.9 | TLAM 1612 | 12.2 | — | — |
| | — | — | — | — | TLA 1616 Z | 14.8 | TLAM 1616 | 16.1 | — | — |
| 16 | TA 1616 Z | 20 | TAM 1616 | 22 | — | — | — | — | — | — |
| | TA 1620 Z | 25 | TAM 1620 | 27 | — | — | — | — | — | — |
| 17 | — | — | — | — | TLA 1712 Z | 11.5 | TLAM 1712 | 13 | — | — |
| | TA 1715 Z | 17.6 | TAM 1715 | 19.5 | — | — | — | — | — | — |
| | TA 1720 Z | 23.5 | TAM 1720 | 25 | — | — | — | — | — | — |
| | TA 1725 Z | 29 | TAM 1725 | 31 | — | — | — | — | — | — |
| | — | — | — | — | — | — | — | — | YT 1715 | 20.5 |
| 18 | — | — | — | — | TLA 1812 Z | 12 | TLAM 1812 | 13.7 | — | — |
| | — | — | — | — | TLA 1816 Z | 16.2 | TLAM 1816 | 17.9 | — | — |
| | TA 1813 Z | 16.4 | TAM 1813 | 18.5 | — | — | — | — | — | — |
| | TA 1815 Z | 18.5 | TAM 1815 | 20.5 | — | — | — | — | — | — |
| | TA 1817 Z | 21 | TAM 1817 | 23 | — | — | — | — | — | — |
| | TA 1819 Z | 23.5 | TAM 1819 | 25.5 | — | — | — | — | — | — |
| | TA 1820 Z | 24.5 | TAM 1820 | 26.5 | — | — | — | — | — | — |
| | TA 1825 Z | 30.5 | TAM 1825 | 32.5 | — | — | — | — | — | — |
| 19 | TA 1916 Z | 23 | TAM 1916 | 25.5 | — | — | — | — | — | — |
| | TA 1920 Z | 29 | TAM 1920 | 31 | — | — | — | — | — | — |

| Boundary dimensions mm | | | | Standard mounting dimensions mm | | | | | | Basic dynamic load rating C | Basic static load rating C ₀ | Allowable rotational speed ⁽¹⁾ | Assembled inner ring |
|------------------------|----|----|---------------------|---------------------------------|--------|-------------------------|--------|--------|--------|-----------------------------|---|---|----------------------|
| F _w | D | C | t ₂ Max. | Shaft dia. h6 | | Housing bore dia. J7 N7 | | | | | | | |
| | | | | Max. | Min. | Max. | Min. | Max. | Min. | N | N | rpm | |
| 16 | 22 | 12 | 1.3 | | | | | | | 7 670 | 10 200 | 25 000 | IRT 1212-1 |
| 16 | 22 | 16 | 1.3 | 16.000 | 15.989 | — | — | 21.993 | 21.972 | 9 700 | 13 800 | 25 000 | IRT 1216-1 |
| 16 | 22 | 22 | 1.3 | | | | | | | 14 200 | 22 400 | 25 000 | IRT 1222-1 |
| 16 | 24 | 16 | 1.3 | | | | | | | 11 100 | 13 300 | 25 000 | IRT 1216-1 |
| 16 | 24 | 20 | 1.3 | 16.000 | 15.989 | 24.012 | 23.991 | — | — | 14 700 | 19 100 | 25 000 | IRT 1220-1 |
| 17 | 23 | 12 | 1.3 | 17.000 | 16.989 | — | — | 22.993 | 22.972 | 7 960 | 10 900 | 25 000 | — |
| 17 | 24 | 15 | 1.3 | | | | | | | 9 660 | 12 700 | 25 000 | IRT 1215-2 |
| 17 | 24 | 20 | 1.3 | | | | | | | 13 900 | 20 400 | 25 000 | IRT 1220-2 |
| 17 | 24 | 25 | 1.3 | 17.000 | 16.989 | 24.012 | 23.991 | — | — | 17 900 | 28 100 | 25 000 | IRT 1225-2 |
| 17 | 24 | 15 | — | | | | | | | 16 600 | 26 000 | 9 000 | IRT 1215-2 |
| 17 | 24 | 25 | — | | | | | | | 27 200 | 49 000 | 9 000 | IRT 1225-2 |
| 18 | 24 | 12 | 1.3 | | | | | | | 8 230 | 11 500 | 20 000 | IRT 1512 |
| 18 | 24 | 16 | 1.3 | 18.000 | 17.989 | — | — | 23.993 | 23.972 | 10 400 | 15 600 | 20 000 | IRT 1516 |
| 18 | 25 | 13 | 1.3 | | | | | | | 9 100 | 12 000 | 20 000 | IRT 1513 |
| 18 | 25 | 15 | 1.3 | | | | | | | 10 100 | 13 600 | 20 000 | IRT 1515 |
| 18 | 25 | 17 | 1.3 | | | | | | | 11 900 | 16 900 | 20 000 | IRT 1517 |
| 18 | 25 | 19 | 1.3 | 18.000 | 17.989 | 25.012 | 24.991 | — | — | 13 700 | 20 200 | 20 000 | IRT 1519 |
| 18 | 25 | 20 | 1.3 | | | | | | | 14 500 | 21 800 | 20 000 | IRT 1520 |
| 18 | 25 | 25 | 1.3 | | | | | | | 18 600 | 30 000 | 20 000 | IRT 1525 |
| 19 | 27 | 16 | 1.3 | | | | | | | 12 200 | 15 700 | 20 000 | IRT 1516-1 |
| 19 | 27 | 20 | 1.3 | 19.000 | 18.987 | 27.012 | 26.991 | — | — | 16 100 | 22 600 | 20 000 | IRT 1520-1 |

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

SHELL TYPE NEEDLE ROLLER BEARINGS



TA
TLA
BA
BHA

Shaft dia. 20 – 21mm

| Shaft dia. mm | Identification number | | | | | | | | | |
|---------------|-----------------------|---------------|-------------------|---------------|-------------------|---------------|------------------|---------------|------------------|---------------|
| | Standard | Mass (Ref.) g | Closed end | Mass (Ref.) g | Standard | Mass (Ref.) g | Closed end | Mass (Ref.) g | Grease retained | Mass (Ref.) g |
| 20 | — | — | — | — | TLA 2012 Z | 13.2 | TLAM 2012 | 15.2 | — | — |
| | — | — | — | — | TLA 2016 Z | 17.8 | TLAM 2016 | 19.9 | — | — |
| | — | — | — | — | TLA 2020 Z | 22 | TLAM 2020 | 24 | — | — |
| | — | — | — | — | TLA 2030 Z | 33 | TLAM 2030 | 35 | — | — |
| | TA 2015 Z | 20 | TAM 2015 | 22.5 | — | — | — | — | — | — |
| | TA 2020 Z | 26.5 | TAM 2020 | 29 | — | — | — | — | — | — |
| | TA 2025 Z | 33 | TAM 2025 | 35.5 | — | — | — | — | — | — |
| | TA 2030 Z | 39.5 | TAM 2030 | 42 | — | — | — | — | — | — |
| | — | — | — | — | — | — | — | — | YT 2015 | 23.5 |
| | — | — | — | — | — | — | — | — | YT 2025 | 41 |
| 20 | TA 202820 Z | 30 | TAM 202820 | 32.5 | — | — | — | — | — | — |
| | — | — | — | — | — | — | — | — | YT 202820 | 37.5 |
| 21 | TA 2116 Z | 25 | TAM 2116 | 28 | — | — | — | — | — | — |
| | TA 2120 Z | 31.5 | TAM 2120 | 34.5 | — | — | — | — | — | — |
| | — | — | — | — | — | — | — | — | YT 2116 | 31 |
| | — | — | — | — | — | — | — | — | YT 2120 | 39 |

| Boundary dimensions mm | | | | Standard mounting dimensions mm | | | | | | Basic dynamic load rating C N | Basic static load rating C ₀ N | Allowable rotational speed ⁽¹⁾ rpm | Assembled inner ring |
|------------------------|----|----|---------------------|---------------------------------|--------|----------------------|--------|--------|--------|-------------------------------|---|---|----------------------|
| F _w | D | C | t ₂ Max. | Shaft dia. h6 | | Housing bore dia. J7 | | | | | | | |
| | | | | Max. | Min. | Max. | Min. | Max. | Min. | | | | |
| 20 | 26 | 12 | 1.3 | | | | | | | 8 740 | 12 900 | 20 000 | — |
| 20 | 26 | 16 | 1.3 | 20.000 | 19.987 | — | — | 25.993 | 25.972 | 11 100 | 17 500 | 20 000 | IRT 1716 |
| 20 | 26 | 20 | 1.3 | | | | | | | 14 500 | 24 700 | 20 000 | IRT 1720 |
| 20 | 26 | 30 | 1.3 | | | | | | | 22 300 | 42 900 | 20 000 | IRT 1730 |
| 20 | 27 | 15 | 1.3 | | | | | | | 10 400 | 14 600 | 20 000 | IRT 1515-2 |
| 20 | 27 | 20 | 1.3 | | | | | | | 15 000 | 23 400 | 20 000 | IRT 1520-2 |
| 20 | 27 | 25 | 1.3 | 20.000 | 19.987 | 27.012 | 26.991 | — | — | 19 200 | 32 200 | 20 000 | IRT 1525-2 |
| 20 | 27 | 30 | 1.3 | | | | | | | 23 100 | 41 000 | 20 000 | IRT 1530-2 |
| 20 | 27 | 15 | — | | | | | | | 18 400 | 30 900 | 7 500 | IRT 1515-2 |
| 20 | 27 | 25 | — | | | | | | | 30 000 | 58 300 | 7 500 | IRT 1525-2 |
| 20 | 28 | 20 | 1.3 | 20.000 | 19.987 | 28.012 | 27.991 | — | — | 16 900 | 24 300 | 20 000 | IRT 1520-2 |
| 20 | 28 | 20 | — | | | | | | | 26 800 | 44 600 | 7 500 | IRT 1520-2 |
| 21 | 29 | 16 | 1.3 | | | | | | | 13 300 | 18 100 | 19 000 | IRT 1716-1 |
| 21 | 29 | 20 | 1.3 | 21.000 | 20.987 | 29.012 | 28.991 | — | — | 17 600 | 25 900 | 19 000 | IRT 1720-1 |
| 21 | 29 | 16 | — | | | | | | | 22 100 | 35 200 | 7 000 | IRT 1716-1 |
| 21 | 29 | 20 | — | | | | | | | 27 500 | 46 800 | 7 000 | IRT 1720-1 |

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

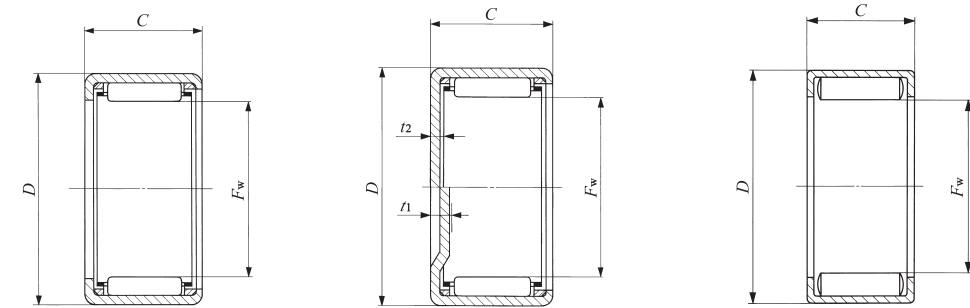
SHELL TYPE NEEDLE ROLLER BEARINGS



Shaft dia. 22 – 24mm

| Shaft dia. mm | Identification number | | | | | | | | | |
|---------------|-----------------------|---------------|-------------------|---------------|-------------------|---------------|------------------|---------------|------------------|---------------|
| | Standard | Mass (Ref.) g | Closed end | Mass (Ref.) g | Standard | Mass (Ref.) g | Closed end | Mass (Ref.) g | Grease retained | Mass (Ref.) g |
| 22 | — | — | — | — | TLA 2212 Z | 15.6 | TLAM 2212 | 18.1 | — | — |
| | — | — | — | — | TLA 2216 Z | 21.5 | TLAM 2216 | 24 | — | — |
| | — | — | — | — | TLA 2220 Z | 26.5 | TLAM 2220 | 29 | — | — |
| | TA 2210 Z | 15 | TAM 2210 | 18.1 | — | — | — | — | — | — |
| | TA 2215 Z | 21.5 | TAM 2215 | 24.5 | — | — | — | — | — | — |
| | TA 2220 Z | 29 | TAM 2220 | 32 | — | — | — | — | — | — |
| | TA 2225 Z | 35.5 | TAM 2225 | 38.5 | — | — | — | — | — | — |
| | TA 2230 Z | 42.5 | TAM 2230 | 45.5 | — | — | — | — | — | — |
| | TA 223016 Z | 26 | TAM 223016 | 29 | — | — | — | — | — | — |
| | TA 223020 Z | 32.5 | TAM 223020 | 35.5 | — | — | — | — | — | — |
| 24 | — | — | — | — | — | — | — | — | YT 223016 | 32 |
| | — | — | — | — | — | — | — | — | YT 223020 | 40.5 |
| | TA 2420 Z | 31 | TAM 2420 | 35 | — | — | — | — | — | — |
| | TA 2428 Z | 43.5 | TAM 2428 | 47 | — | — | — | — | — | — |
| | — | — | — | — | — | — | — | — | YT 2428 | 54 |
| | TA 243216 Z | 28 | TAM 243216 | 32 | — | — | — | — | — | — |
| | TA 243220 Z | 35.5 | TAM 243220 | 39 | — | — | — | — | — | — |
| | — | — | — | — | — | — | — | — | YT 243216 | 34.5 |
| | — | — | — | — | — | — | — | — | YT 243220 | 43.5 |

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



TA...Z TLA...Z

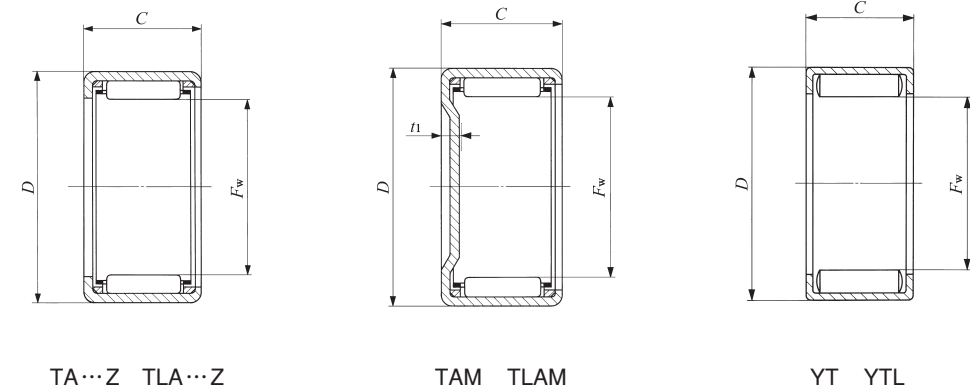
TAM TLAM
 $t_1 (F_w \geq 24)$
 $t_2 (F_w \leq 22)$

YT

| Boundary dimensions mm | | | | Standard mounting dimensions mm | | | | | | Basic dynamic load rating C | Basic static load rating C ₀ | Allowable rotational speed ⁽¹⁾ rpm | Assembled inner ring |
|------------------------|----|----|--------------------------------------|---------------------------------|--------|----------------------|--------|--------|--------|-----------------------------|---|---|----------------------|
| F _w | D | C | t ₁ , t ₂ Max. | Shaft dia. h6 | | Housing bore dia. J7 | | | | | | | |
| | | | | Max. | Min. | Max. | Min. | Max. | Min. | N | N | rpm | |
| 22 | 28 | 12 | 1.3 | 22.000 | 21.987 | — | — | 27.993 | 27.972 | 9 230 | 14 300 | 18 000 | — |
| 22 | 28 | 16 | 1.3 | 22.000 | 21.987 | — | — | 27.993 | 27.972 | 11 700 | 19 300 | 18 000 | IRT 1716-2 |
| 22 | 28 | 20 | 1.3 | 22.000 | 21.987 | 29.012 | 28.991 | — | — | 15 300 | 27 300 | 18 000 | IRT 1720-2 |
| 22 | 29 | 10 | 1.3 | 22.000 | 21.987 | 29.012 | 28.991 | — | — | 6 650 | 8 500 | 18 000 | IRT 1710-2 |
| 22 | 29 | 15 | 1.3 | 22.000 | 21.987 | 29.012 | 28.991 | — | — | 11 100 | 16 400 | 18 000 | IRT 1715-2 |
| 22 | 29 | 20 | 1.3 | 22.000 | 21.987 | 29.012 | 28.991 | — | — | 16 000 | 26 300 | 18 000 | IRT 1720-2 |
| 22 | 29 | 25 | 1.3 | 22.000 | 21.987 | 29.012 | 28.991 | — | — | 19 700 | 34 300 | 18 000 | IRT 1725-2 |
| 22 | 29 | 30 | 1.3 | 22.000 | 21.987 | 29.012 | 28.991 | — | — | 23 800 | 43 700 | 18 000 | IRT 1730-2 |
| 22 | 30 | 16 | 1.3 | 22.000 | 21.987 | 30.012 | 29.991 | — | — | 13 200 | 18 200 | 18 000 | IRT 1716-2 |
| 22 | 30 | 20 | 1.3 | 22.000 | 21.987 | 30.012 | 29.991 | — | — | 17 500 | 26 100 | 18 000 | IRT 1720-2 |
| 22 | 30 | 16 | — | 22.000 | 21.987 | 30.012 | 29.991 | — | — | 22 600 | 36 800 | 7 000 | IRT 1716-2 |
| 22 | 30 | 20 | — | 22.000 | 21.987 | 30.012 | 29.991 | — | — | 28 200 | 48 900 | 7 000 | IRT 1720-2 |
| 24 | 31 | 20 | 3.4 | 24.000 | 23.987 | 31.014 | 30.989 | — | — | 17 000 | 29 200 | 16 000 | IRT 2020 |
| 24 | 31 | 28 | 3.4 | 24.000 | 23.987 | 31.014 | 30.989 | — | — | 24 500 | 46 700 | 16 000 | IRT 2028 |
| 24 | 31 | 28 | — | 24.000 | 23.987 | 31.014 | 30.989 | — | — | 36 800 | 79 900 | 6 500 | IRT 2028 |
| 24 | 32 | 16 | 3.4 | 24.000 | 23.987 | 32.014 | 31.989 | — | — | 14 200 | 20 500 | 16 000 | IRT 2016 |
| 24 | 32 | 20 | 3.4 | 24.000 | 23.987 | 32.014 | 31.989 | — | — | 18 800 | 29 400 | 16 000 | IRT 2020 |
| 24 | 32 | 16 | — | 24.000 | 23.987 | 32.014 | 31.989 | — | — | 23 700 | 40 100 | 6 500 | IRT 2016 |
| 24 | 32 | 20 | — | 24.000 | 23.987 | 32.014 | 31.989 | — | — | 29 500 | 53 200 | 6 500 | IRT 2020 |

TA
TLA
BA
BHA

SHELL TYPE NEEDLE ROLLER BEARINGS



TA
TLA
BA
BHA

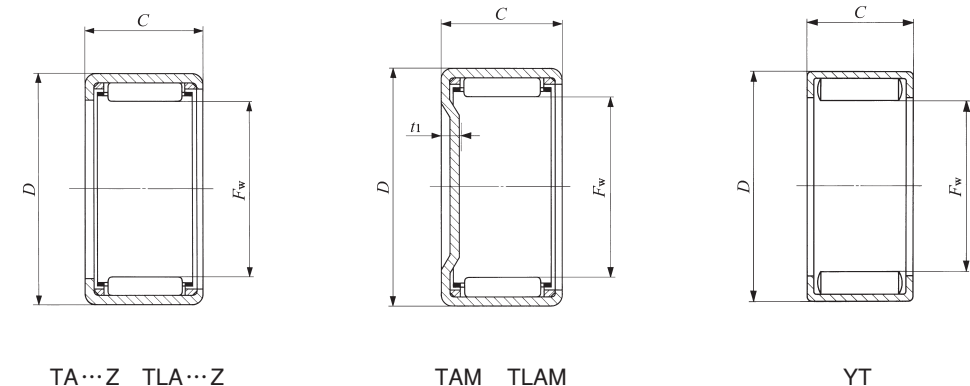
Shaft dia. 25 – 28 mm

| Shaft dia. mm | Identification number | | | | | | | | | |
|---------------|-----------------------|---------------|-----------------|---------------|-------------------|---------------|------------------|---------------|-----------------|---------------|
| | Standard | Mass (Ref.) g | Closed end | Mass (Ref.) g | Standard | Mass (Ref.) g | Closed end | Mass (Ref.) g | Grease retained | Mass (Ref.) g |
| 25 | — | — | — | — | TLA 2512 Z | 19.7 | TLAM 2512 | 23.5 | — | — |
| | — | — | — | — | TLA 2516 Z | 26 | TLAM 2516 | 29.5 | — | — |
| | — | — | — | — | TLA 2520 Z | 32 | TLAM 2520 | 36 | — | — |
| | — | — | — | — | TLA 2526 Z | 41.5 | TLAM 2526 | 45.5 | — | — |
| | — | — | — | — | TLAW2538Z | 58.5 | TLAMW2538 | 62 | — | — |
| | — | — | — | — | — | — | — | — | YTL 2526 | 51.5 |
| | TA 2510 Z | 19.1 | TAM 2510 | 23 | — | — | — | — | — | — |
| | TA 2515 Z | 28.5 | TAM 2515 | 32.5 | — | — | — | — | — | — |
| | TA 2520 Z | 36.5 | TAM 2520 | 40.5 | — | — | — | — | — | — |
| | TA 2525 Z | 45.5 | TAM 2525 | 49 | — | — | — | — | — | — |
| | TA 2530 Z | 54.5 | TAM 2530 | 58.5 | — | — | — | — | — | — |
| | — | — | — | — | — | — | — | — | YT 2510 | 22.5 |
| | — | — | — | — | — | — | — | — | YT 2515 | 33 |
| | — | — | — | — | — | — | — | — | YT 2520 | 45 |
| | — | — | — | — | — | — | — | — | YT 2525 | 57 |
| 26 | TA 2616 Z | 30.5 | TAM 2616 | 34.5 | — | — | — | — | — | — |
| | TA 2620 Z | 38 | TAM 2620 | 42.5 | — | — | — | — | — | — |
| | — | — | — | — | — | — | — | — | YT 2616 | 37 |
| | — | — | — | — | — | — | — | — | YT 2620 | 46.5 |
| | — | — | — | — | — | — | — | — | — | — |
| 28 | — | — | — | — | TLA 2816 Z | 28.5 | TLAM 2816 | 33.5 | — | — |
| | — | — | — | — | TLA 2820 Z | 35.5 | TLAM 2820 | 40.5 | — | — |
| | TA 2820 Z | 45 | TAM 2820 | 50 | — | — | — | — | — | — |
| | TA 2830 Z | 67.5 | TAM 2830 | 72.5 | — | — | — | — | — | — |
| | — | — | — | — | — | — | — | — | YT 2820 | 56.5 |
| | — | — | — | — | — | — | — | — | — | — |
| | — | — | — | — | — | — | — | — | — | — |

Note⁽¹⁾ Allowable rotational speed applies to oil lubrication. For grease lubrication, a maximum of 60% of this value is allowable.
 Remarks1. "W" in the identification number indicates that rolling elements are arranged in double rows.
 2. Shell Type Grease Retained Full Complement Needle Roller Bearings are provided with prepacked grease. Standard type and closed end type bearings are not provided with prepacked grease, so perform proper lubrication when using these types of bearings.

| Boundary dimensions mm | | | | Standard mounting dimensions mm | | | | | | Basic dynamic load rating C N | Basic static load rating C ₀ N | Allowable rotational speed ⁽¹⁾ rpm | Assembled inner ring |
|------------------------|----|----|---------------------|---------------------------------|--------|-------------------------|--------|--------|--------|-------------------------------|---|---|----------------------|
| F _w | D | C | t ₁ Max. | Shaft dia. h6 | | Housing bore dia. J7 N7 | | | | | | | |
| | | | | Max. | Min. | Max. | Min. | Max. | Min. | | | | |
| 25 | 32 | 12 | 2.8 | | | | | | | 9 440 | 13 900 | 15 000 | — |
| 25 | 32 | 16 | 2.8 | | | | | | | 12 800 | 20 500 | 15 000 | — |
| 25 | 32 | 20 | 2.8 | 25.000 | 24.987 | — | — | 31.992 | 31.967 | 16 900 | 29 300 | 15 000 | IRT 2020-1 |
| 25 | 32 | 26 | 2.8 | | | | | | | 22 600 | 42 500 | 15 000 | IRT 2026-1 |
| 25 | 32 | 38 | 2.8 | | | | | | | 28 900 | 58 500 | 15 000 | IRT 2038-1 |
| 25 | 32 | 26 | — | | | | | | | 35 000 | 75 800 | 6 000 | IRT 2026-1 |
| 25 | 33 | 10 | 3.4 | | | | | | | 7 990 | 9 900 | 15 000 | IRT 2010-1 |
| 25 | 33 | 15 | 3.4 | | | | | | | 13 400 | 19 300 | 15 000 | IRT 2015-1 |
| 25 | 33 | 20 | 3.4 | 25.000 | 24.987 | 33.014 | 32.989 | — | — | 19 500 | 31 100 | 15 000 | IRT 2020-1 |
| 25 | 33 | 25 | 3.4 | | | | | | | 24 100 | 40 800 | 15 000 | IRT 2025-1 |
| 25 | 33 | 30 | 3.4 | | | | | | | 29 100 | 52 000 | 15 000 | IRT 2030-1 |
| 25 | 33 | 10 | — | | | | | | | 15 500 | 23 600 | 6 000 | IRT 2010-1 |
| 25 | 33 | 15 | — | 25.000 | 24.987 | 33.014 | 32.989 | — | — | 22 700 | 38 300 | 6 000 | IRT 2015-1 |
| 25 | 33 | 20 | — | | | | | | | 30 200 | 55 400 | 6 000 | IRT 2020-1 |
| 25 | 33 | 25 | — | | | | | | | 37 200 | 72 500 | 6 000 | IRT 2025-1 |
| 26 | 34 | 16 | 3.4 | | | | | | | 15 200 | 22 900 | 15 000 | IRT 2216 |
| 26 | 34 | 20 | 3.4 | 26.000 | 25.987 | 34.014 | 33.989 | — | — | 20 100 | 32 800 | 15 000 | IRT 2220 |
| 26 | 34 | 16 | — | | | | | | | 24 700 | 43 300 | 6 000 | IRT 2216 |
| 26 | 34 | 20 | — | | | | | | | 30 800 | 57 500 | 6 000 | IRT 2220 |
| 28 | 35 | 16 | 2.8 | 28.000 | 27.987 | — | — | 34.992 | 34.967 | 13 800 | 23 500 | 13 000 | — |
| 28 | 35 | 20 | 2.8 | | | | | | | 18 300 | 33 600 | 13 000 | IRT 2220-1 |
| 28 | 37 | 20 | 3.4 | | | | | | | 21 200 | 32 300 | 13 000 | IRT 2220-1 |
| 28 | 37 | 30 | 3.4 | 28.000 | 27.987 | 37.014 | 36.989 | — | — | 33 000 | 56 900 | 13 000 | IRT 2230-1 |
| 28 | 37 | 20 | — | | | | | | | 34 700 | 61 700 | 5 500 | IRT 2220-1 |

SHELL TYPE NEEDLE ROLLER BEARINGS



TA
TLA
BA
BHA

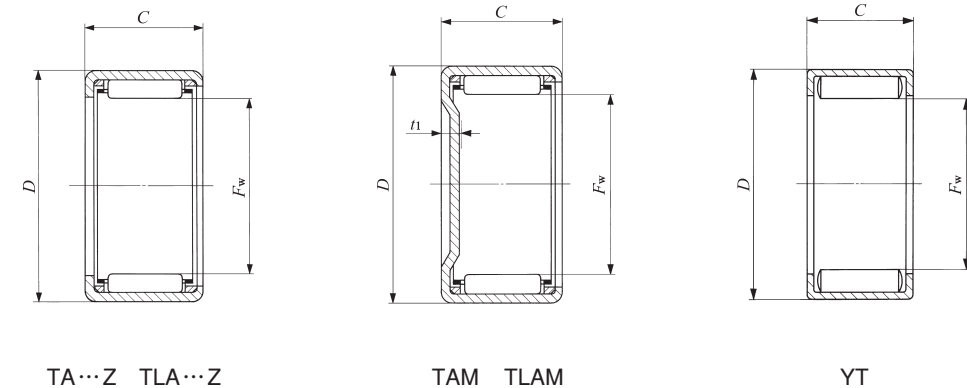
Shaft dia. 29 – 35mm

| Shaft dia. mm | Identification number | | | | | | | | | |
|---------------|-----------------------|---------------|------------|---------------|------------|---------------|------------|---------------|-----------------|---------------|
| | Standard | Mass (Ref.) g | Closed end | Mass (Ref.) g | Standard | Mass (Ref.) g | Closed end | Mass (Ref.) g | Grease retained | Mass (Ref.) g |
| 29 | TA 2920 Z | 47 | TAM 2920 | 52 | — | — | — | — | — | — |
| | TA 2930 Z | 70 | TAM 2930 | 75.5 | — | — | — | — | — | — |
| | — | — | — | — | — | — | — | — | YT 2920 | 58.5 |
| 30 | — | — | — | — | TLA 3012 Z | 23.5 | TLAM 3012 | 29 | — | — |
| | — | — | — | — | TLA 3016 Z | 30.5 | TLAM 3016 | 36 | — | — |
| | — | — | — | — | TLA 3018 Z | 34.5 | TLAM 3018 | 40 | — | — |
| | — | — | — | — | TLA 3020 Z | 38 | TLAM 3020 | 43.5 | — | — |
| | — | — | — | — | TLA 3026 Z | 49 | TLAM 3026 | 54.5 | — | — |
| | — | — | — | — | TLAW3038 Z | 69 | TLAMW3038 | 74.5 | — | — |
| | — | — | — | — | — | — | — | — | — | — |
| 30 | TA 3013 Z | 36.5 | TAM 3013 | 42.5 | — | — | — | — | — | — |
| | TA 3015 Z | 42 | TAM 3015 | 47.5 | — | — | — | — | — | — |
| | TA 3020 Z | 54.5 | TAM 3020 | 60 | — | — | — | — | — | — |
| | TA 3025 Z | 68 | TAM 3025 | 73.5 | — | — | — | — | — | — |
| | TA 3030 Z | 80 | TAM 3030 | 85.5 | — | — | — | — | — | — |
| 32 | TA 3220 Z | 57.5 | TAM 3220 | 63.5 | — | — | — | — | — | — |
| | TA 3230 Z | 86 | TAM 3230 | 97.5 | — | — | — | — | — | — |
| | — | — | — | — | — | — | — | — | YT 3220 | 71.5 |
| 35 | — | — | — | — | TLA 3512 Z | 27 | TLAM 3512 | 34.5 | — | — |
| | — | — | — | — | TLA 3516 Z | 35 | TLAM 3516 | 42.5 | — | — |
| | — | — | — | — | TLA 3520 Z | 43.5 | TLAM 3520 | 51 | — | — |
| 35 | TA 3512 Z | 38.5 | TAM 3512 | 46 | — | — | — | — | — | — |
| | TA 3515 Z | 48 | TAM 3515 | 56 | — | — | — | — | — | — |
| | TA 3520 Z | 62.5 | TAM 3520 | 70 | — | — | — | — | — | — |
| | TA 3525 Z | 78 | TAM 3525 | 85.5 | — | — | — | — | — | — |
| | TA 3530 Z | 97 | TAM 3530 | 105 | — | — | — | — | — | — |

Note(1) Allowable rotational speed applies to oil lubrication. For grease lubrication, a maximum of 60% of this value is allowable.
 Remarks1. "W" in the identification number indicates that rolling elements are arranged in double rows.
 2. Shell Type Grease Retained Full Complement Needle Roller Bearings are provided with prepacked grease. Standard type and closed end type bearings are not provided with prepacked grease, so perform proper lubrication when using these types of bearings.

| Boundary dimensions mm | | | | Standard mounting dimensions mm | | | | | | Basic dynamic load rating C N | Basic static load rating C ₀ N | Allowable rotational speed(1) rpm | Assembled inner ring |
|------------------------|----|----|---------------------|---------------------------------|--------|----------------------|--------|--------|--------|-------------------------------|---|-----------------------------------|----------------------|
| F _w | D | C | t ₁ Max. | Shaft dia. h6 | | Housing bore dia. J7 | | | | | | | |
| | | | | Max. | Min. | Max. | Min. | Max. | Min. | | | | |
| 29 | 38 | 20 | 3.4 | | | | | | | 22 000 | 34 200 | 13 000 | IRT 2520 |
| 29 | 38 | 30 | 3.4 | 29.000 | 28.987 | 38.014 | 37.989 | — | — | 34 200 | 60 300 | 13 000 | IRT 2530 |
| 29 | 38 | 20 | — | | | | | | | 35 500 | 64 100 | 5 000 | IRT 2520 |
| 30 | 37 | 12 | 2.8 | | | | | | | 10 400 | 16 600 | 12 000 | — |
| 30 | 37 | 16 | 2.8 | | | | | | | 14 100 | 24 500 | 12 000 | — |
| 30 | 37 | 18 | 2.8 | | | | | | | 16 400 | 29 800 | 12 000 | — |
| 30 | 37 | 20 | 2.8 | 30.000 | 29.987 | — | — | 36.992 | 36.967 | 18 600 | 35 100 | 12 000 | IRT 2520-1 |
| 30 | 37 | 26 | 2.8 | | | | | | | 24 800 | 50 900 | 12 000 | IRT 2526-1 |
| 30 | 37 | 38 | 2.8 | | | | | | | 31 900 | 70 200 | 12 000 | IRT 2538-1 |
| 30 | 40 | 13 | 3.4 | | | | | | | 13 500 | 16 800 | 12 000 | — |
| 30 | 40 | 15 | 3.4 | | | | | | | 16 800 | 22 400 | 12 000 | IRT 2515-1 |
| 30 | 40 | 20 | 3.4 | 30.000 | 29.987 | 40.014 | 39.989 | — | — | 24 500 | 36 300 | 12 000 | IRT 2520-1 |
| 30 | 40 | 25 | 3.4 | | | | | | | 31 600 | 50 300 | 12 000 | IRT 2525-1 |
| 30 | 40 | 30 | 3.4 | | | | | | | 36 700 | 60 700 | 12 000 | IRT 2530-1 |
| 32 | 42 | 20 | 3.4 | | | | | | | 25 400 | 38 600 | 11 000 | IRT 2820 |
| 32 | 42 | 30 | 3.4 | 32.000 | 31.984 | 42.014 | 41.989 | — | — | 39 500 | 68 400 | 11 000 | IRT 2830 |
| 32 | 42 | 20 | — | | | | | | | 39 900 | 70 100 | 4 500 | IRT 2820 |
| 35 | 42 | 12 | 2.8 | | | | | | | 11 600 | 20 000 | 10 000 | IRT 3012 |
| 35 | 42 | 16 | 2.8 | 35.000 | 34.984 | — | — | 41.992 | 41.967 | 15 700 | 29 600 | 10 000 | — |
| 35 | 42 | 20 | 2.8 | | | | | | | 20 700 | 42 300 | 10 000 | IRT 3020 |
| 35 | 45 | 12 | 3.4 | | | | | | | 14 800 | 19 900 | 10 000 | IRT 3012 |
| 35 | 45 | 15 | 3.4 | | | | | | | 18 500 | 26 500 | 10 000 | IRT 3015 |
| 35 | 45 | 20 | 3.4 | 35.000 | 34.984 | 45.014 | 44.989 | — | — | 27 000 | 43 100 | 10 000 | IRT 3020 |
| 35 | 45 | 25 | 3.4 | | | | | | | 34 800 | 59 700 | 10 000 | IRT 3025 |
| 35 | 45 | 30 | 3.4 | | | | | | | 40 600 | 72 600 | 10 000 | IRT 3030 |

SHELL TYPE NEEDLE ROLLER BEARINGS



TA
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BHA

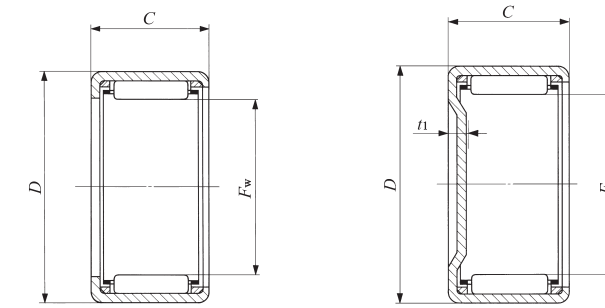
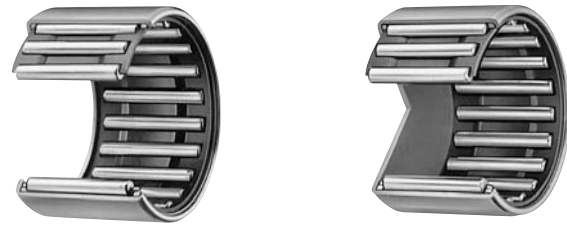
Shaft dia. 37 – 45mm

| Shaft dia. mm | Identification number | | | | | | | | | |
|------------------|-----------------------|------------------|------------|------------------|------------|------------------|------------|------------------|-----------------|------------------|
| | Standard | Mass (Ref.) g | Closed end | Mass (Ref.) g | Standard | Mass (Ref.) g | Closed end | Mass (Ref.) g | Grease retained | Mass (Ref.) g |
| 37 | TA 3720 Z | 64.5 | TAM 3720 | 73 | — | — | — | — | — | — |
| | TA 3730 Z | 101 | TAM 3730 | 110 | — | — | — | — | — | — |
| | — | — | — | — | — | — | — | — | YT 3720 | 81 |
| 38 | TA 3815 Z | 51 | TAM 3815 | 60 | — | — | — | — | — | — |
| | TA 3820 Z | 65.5 | TAM 3820 | 74.5 | — | — | — | — | — | — |
| | TA 3825 Z | 82.5 | TAM 3825 | 96 | — | — | — | — | — | — |
| | TA 3830 Z | 104 | TAM 3830 | 114 | — | — | — | — | — | — |
| | TAW 3845 Z | 149 | TAMW 3845 | 159 | — | — | — | — | — | — |
| 40 | — | — | — | — | TLA 4012 Z | 30 | TLAM 4012 | 40 | — | — |
| | — | — | — | — | TLA 4016 Z | 39 | TLAM 4016 | 49 | — | — |
| | — | — | — | — | TLA 4020 Z | 49 | TLAM 4020 | 58.5 | — | — |
| | TA 4015 Z | 54 | TAM 4015 | 63.5 | — | — | — | — | — | — |
| | TA 4020 Z | 69.5 | TAM 4020 | 79 | — | — | — | — | — | — |
| | TA 4025 Z | 86.5 | TAM 4025 | 102 | — | — | — | — | — | — |
| | TA 4030 Z | 110 | TAM 4030 | 120 | — | — | — | — | — | — |
| | TA 4040 Z | 144 | TAM 4040 | 154 | — | — | — | — | — | — |
| | — | — | — | — | — | — | — | — | YT 4015 | 63.5 |
| | — | — | — | — | — | — | — | — | YT 4025 | 109 |
| 45 | — | — | — | — | TLA 4516 Z | 43.5 | TLAM 4516 | 56 | — | — |
| | — | — | — | — | TLA 4520 Z | 54.5 | TLAM 4520 | 67 | — | — |
| | TA 4520 Z | 77 | TAM 4520 | 90 | — | — | — | — | — | — |
| | TA 4525 Z | 102 | TAM 4525 | 115 | — | — | — | — | — | — |
| | TA 4530 Z | 122 | TAM 4530 | 135 | — | — | — | — | — | — |
| | TA 4540 Z | 161 | TAM 4540 | 174 | — | — | — | — | — | — |
| | — | — | — | — | — | — | — | — | YT 4520 | 96 |
| | — | — | — | — | — | — | — | — | YT 4525 | 122 |
| | — | — | — | — | — | — | — | — | — | — |

Note(1) Allowable rotational speed applies to oil lubrication. For grease lubrication, a maximum of 60% of this value is allowable.
 Remarks1. "W" in the identification number indicates that rolling elements are arranged in double rows.
 2. Shell Type Grease Retained Full Complement Needle Roller Bearings are provided with prepacked grease. Standard type and closed end type bearings are not provided with prepacked grease, so perform proper lubrication when using these types of bearings.

| Boundary dimensions mm | | | | Standard mounting dimensions mm | | | | | | Basic dynamic load rating C | Basic static load rating C ₀ | Allowable rotational speed ⁽¹⁾ rpm | Assembled inner ring |
|---------------------------|----|----|------------------------|---------------------------------|--------|----------------------------|--------|--------|--------|-----------------------------------|---|--|-------------------------|
| F _w | D | C | t ₁ Max. | Shaft dia. h6 | | Housing bore dia. J7 N7 | | | | | | | |
| | | | | Max. | Min. | Max. | Min. | Max. | Min. | | | | |
| 37 | 47 | 20 | 3.4 | | | | | | | 27 800 | 45 400 | 9 500 | IRT 3220 |
| 37 | 47 | 30 | 3.4 | 37.000 | 36.984 | 47.014 | 46.989 | — | — | 41 800 | 76 700 | 9 500 | IRT 3230 |
| 37 | 47 | 20 | — | | | | | | | 43 300 | 81 300 | 4 000 | IRT 3220 |
| 38 | 48 | 15 | 3.4 | | | | | | | 19 000 | 28 000 | 9 000 | IRT 3215-1 |
| 38 | 48 | 20 | 3.4 | | | | | | | 27 700 | 45 600 | 9 000 | IRT 3220-1 |
| 38 | 48 | 25 | 3.4 | 38.000 | 37.984 | 48.014 | 47.989 | — | — | 35 600 | 63 100 | 9 000 | IRT 3225-1 |
| 38 | 48 | 30 | 3.4 | | | | | | | 43 100 | 80 600 | 9 000 | IRT 3230-1 |
| 38 | 48 | 45 | 3.4 | | | | | | | 55 700 | 112 000 | 9 000 | IRT 3245-1 |
| 40 | 47 | 12 | 2.8 | | | | | | | 12 400 | 22 800 | 8 500 | — |
| 40 | 47 | 16 | 2.8 | 40.000 | 39.984 | — | — | 46.992 | 46.967 | 16 700 | 33 700 | 8 500 | — |
| 40 | 47 | 20 | 2.8 | | | | | | | 22 100 | 48 200 | 8 500 | IRT 3520 |
| 40 | 50 | 15 | 3.4 | | | | | | | 19 500 | 29 400 | 8 500 | IRT 3515 |
| 40 | 50 | 20 | 3.4 | | | | | | | 28 400 | 47 800 | 8 500 | IRT 3520 |
| 40 | 50 | 25 | 3.4 | | | | | | | 36 600 | 66 200 | 8 500 | IRT 3525 |
| 40 | 50 | 30 | 3.4 | 40.000 | 39.984 | 50.014 | 49.989 | — | — | 44 300 | 84 600 | 8 500 | IRT 3530 |
| 40 | 50 | 40 | 3.4 | | | | | | | 56 700 | 116 000 | 8 500 | IRT 3540 |
| 40 | 50 | 15 | — | | | | | | | 33 400 | 59 800 | 4 000 | IRT 3515 |
| 40 | 50 | 25 | — | | | | | | | 55 300 | 114 000 | 4 000 | IRT 3525 |
| 45 | 52 | 16 | 2.8 | | | | | | | 17 800 | 37 800 | 7 500 | — |
| 45 | 52 | 20 | 2.8 | 45.000 | 44.984 | — | — | 51.991 | 51.961 | 23 400 | 54 000 | 7 500 | IRT 4020 |
| 45 | 55 | 20 | 3.4 | | | | | | | 30 600 | 54 600 | 7 500 | IRT 4020 |
| 45 | 55 | 25 | 3.4 | | | | | | | 39 400 | 75 600 | 7 500 | IRT 4025 |
| 45 | 55 | 30 | 3.4 | 45.000 | 44.984 | 55.018 | 54.988 | — | — | 47 700 | 96 600 | 7 500 | IRT 4030 |
| 45 | 55 | 40 | 3.4 | | | | | | | 61 300 | 133 000 | 7 500 | IRT 4040 |
| 45 | 55 | 20 | — | | | | | | | 47 800 | 98 200 | 3 500 | IRT 4020 |
| 45 | 55 | 25 | — | | | | | | | 59 100 | 129 000 | 3 500 | IRT 4025 |

SHELL TYPE NEEDLE ROLLER BEARINGS



TA...Z TLA...Z

TAM TLAM

TA
TLA
BA
BHA

Shaft dia. 50 – 62mm

| Shaft dia. mm | Identification number | | | | | | | | | |
|-------------------|-----------------------|------------------|------------------|------------------|-------------------|------------------|------------------|------------------|-----------------|------------------|
| | Standard | Mass (Ref.) g | Closed end | Mass (Ref.) g | Standard | Mass (Ref.) g | Closed end | Mass (Ref.) g | Grease retained | Mass (Ref.) g |
| 50 | — | — | — | — | TLA 5020 Z | 69 | TLAM 5020 | 84.5 | — | — |
| | — | — | — | — | TLA 5025 Z | 86 | TLAM 5025 | 107 | — | — |
| | TA 5012 Z | 62.5 | TAM 5012 | 78 | — | — | — | — | — | — |
| | TA 5015 Z | 78 | TAM 5015 | 98.5 | — | — | — | — | — | — |
| | TA 5020 Z | 107 | TAM 5020 | 123 | — | — | — | — | — | — |
| | TA 5025 Z | 134 | TAM 5025 | 150 | — | — | — | — | — | — |
| | TA 5030 Z | 161 | TAM 5030 | 178 | — | — | — | — | — | — |
| | TA 5040 Z | 210 | TAM 5040 | 230 | — | — | — | — | — | — |
| TAW 5045 Z | 230 | TAMW 5045 | 245 | — | — | — | — | — | — | |
| 55 | — | — | — | — | TLA 5520 Z | 75 | TLAM 5520 | 98.5 | — | — |
| | — | — | — | — | TLA 5525 Z | 98.5 | TLAM 5525 | 118 | — | — |
| | TA 5520 Z | 116 | TAM 5520 | 136 | — | — | — | — | — | — |
| | TA 5525 Z | 145 | TAM 5525 | 165 | — | — | — | — | — | — |
| | TA 5530 Z | 175 | TAM 5530 | 195 | — | — | — | — | — | — |
| | TA 5540 Z | 230 | TAM 5540 | 250 | — | — | — | — | — | — |
| | TAW 5545 Z | 250 | TAMW 5545 | 270 | — | — | — | — | — | — |
| | TAW 5550 Z | 280 | TAMW 5550 | 300 | — | — | — | — | — | — |
| 60 | TA 6025 Z | 158 | TAM 6025 | 182 | — | — | — | — | — | — |
| | TA 6030 Z | 191 | TAM 6030 | 215 | — | — | — | — | — | — |
| | TA 6040 Z | 250 | TAM 6040 | 275 | — | — | — | — | — | — |
| | TAW 6045 Z | 270 | TAMW 6045 | 295 | — | — | — | — | — | — |
| | TAW 6050 Z | 305 | TAMW 6050 | 330 | — | — | — | — | — | — |
| 62 | TA 6212 Z | 78 | TAM 6212 | 107 | — | — | — | — | — | — |

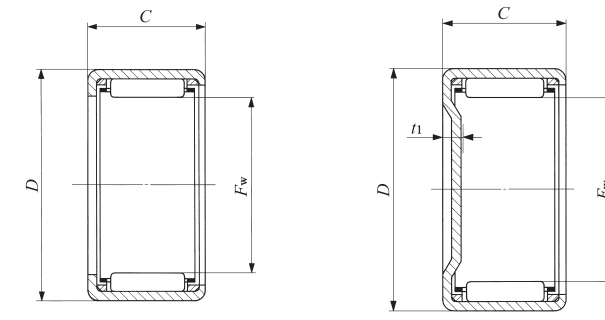
Note(1) Allowable rotational speed applies to oil lubrication. For grease lubrication, a maximum of 60% of this value is allowable.

Remarks1. "W" in the identification number indicates that rolling elements are arranged in double rows.

2. Shell Type Grease Retained Full Complement Needle Roller Bearings are provided with prepacked grease. Standard type and closed end type bearings are not provided with prepacked grease, so perform proper lubrication when using these types of bearings.

| Boundary dimensions mm | | | | Standard mounting dimensions mm | | | | | | Basic dynamic load rating C | Basic static load rating C ₀ | Allowable rotational speed ⁽¹⁾ rpm | Assembled inner ring |
|---------------------------|----|----|------------------------|---------------------------------|--------|-------------------------|--------|--------|--------|-----------------------------------|---|--|-------------------------|
| F _w | D | C | t ₁ Max. | Shaft dia. h6 | | Housing bore dia. J7 | | | | | | | |
| | | | | Max. | Min. | Max. | Min. | Max. | Min. | | | | |
| 50 | 58 | 20 | 2.8 | 50.000 | 49.984 | — | — | 57.991 | 57.961 | 28 800 | 64 100 | 6 500 | IRT 4520 |
| 50 | 58 | 25 | 2.8 | 50.000 | 49.984 | — | — | 57.991 | 57.961 | 36 900 | 88 400 | 6 500 | IRT 4525 |
| 50 | 62 | 12 | 3.4 | — | — | — | — | — | — | 17 700 | 24 000 | 6 500 | IRT 4512 |
| 50 | 62 | 15 | 3.4 | — | — | — | — | — | — | 25 800 | 39 000 | 6 500 | IRT 4515 |
| 50 | 62 | 20 | 3.4 | — | — | — | — | — | — | 38 000 | 64 000 | 6 500 | IRT 4520 |
| 50 | 62 | 25 | 3.4 | 50.000 | 49.984 | 62.018 | 61.988 | — | — | 49 100 | 89 000 | 6 500 | IRT 4525 |
| 50 | 62 | 30 | 3.4 | — | — | — | — | — | — | 59 500 | 114 000 | 6 500 | IRT 4530 |
| 50 | 62 | 40 | 3.4 | — | — | — | — | — | — | 76 500 | 157 000 | 6 500 | IRT 4540 |
| 50 | 62 | 45 | 3.4 | — | — | — | — | — | — | 76 700 | 158 000 | 6 500 | IRT 4545 |
| 55 | 63 | 20 | 2.8 | 55.000 | 54.981 | — | — | 62.991 | 62.961 | 29 800 | 69 400 | 5 500 | IRT 5020-1 |
| 55 | 63 | 25 | 2.8 | 55.000 | 54.981 | — | — | 62.991 | 62.961 | 38 300 | 95 700 | 5 500 | IRT 5025-1 |
| 55 | 67 | 20 | 3.4 | — | — | — | — | — | — | 39 600 | 69 700 | 5 500 | IRT 5020-1 |
| 55 | 67 | 25 | 3.4 | — | — | — | — | — | — | 51 200 | 97 000 | 5 500 | IRT 5025-1 |
| 55 | 67 | 30 | 3.4 | 55.000 | 54.981 | 67.018 | 66.988 | — | — | 62 000 | 124 000 | 5 500 | IRT 5030-1 |
| 55 | 67 | 40 | 3.4 | — | — | — | — | — | — | 80 000 | 172 000 | 5 500 | IRT 5040-1 |
| 55 | 67 | 45 | 3.4 | — | — | — | — | — | — | 79 900 | 172 000 | 5 500 | IRT 5045-1 |
| 55 | 67 | 50 | 3.4 | — | — | — | — | — | — | 91 500 | 205 000 | 5 500 | IRT 5050-1 |
| 60 | 72 | 25 | 3.4 | — | — | — | — | — | — | 54 700 | 108 000 | 5 000 | IRT 5025 |
| 60 | 72 | 30 | 3.4 | — | — | — | — | — | — | 66 300 | 139 000 | 5 000 | IRT 5030 |
| 60 | 72 | 40 | 3.4 | 60.000 | 59.981 | 72.018 | 71.988 | — | — | 85 700 | 193 000 | 5 000 | IRT 5040 |
| 60 | 72 | 45 | 3.4 | — | — | — | — | — | — | 85 400 | 193 000 | 5 000 | IRT 5045 |
| 60 | 72 | 50 | 3.4 | — | — | — | — | — | — | 97 800 | 229 000 | 5 000 | IRT 5050 |
| 62 | 74 | 12 | 3.4 | 62.000 | 61.981 | 74.018 | 73.988 | — | — | 20 100 | 30 300 | 4 500 | IRT 5212 |

SHELL TYPE NEEDLE ROLLER BEARINGS



TA...Z

TAM

Shaft dia. 65 – 70mm

| Shaft dia. mm | Identification number | | | | | | | | | |
|------------------|-----------------------|------------------|------------|------------------|----------|------------------|------------|------------------|-----------------|------------------|
| | Standard | Mass (Ref.) g | Closed end | Mass (Ref.) g | Standard | Mass (Ref.) g | Closed end | Mass (Ref.) g | Grease retained | Mass (Ref.) g |
| 65 | TA 6525 Z | 169 | TAM 6525 | 197 | — | — | — | — | — | — |
| | TA 6530 Z | 205 | TAM 6530 | 230 | — | — | — | — | — | — |
| | TAW 6545 Z | 290 | TAMW 6545 | 315 | — | — | — | — | — | — |
| | TAW 6550 Z | 330 | TAMW 6550 | 355 | — | — | — | — | — | — |
| 70 | TA 7025 Z | 181 | TAM 7025 | 215 | — | — | — | — | — | — |
| | TA 7030 Z | 220 | TAM 7030 | 250 | — | — | — | — | — | — |
| | TA 7040 Z | 290 | TAM 7040 | 320 | — | — | — | — | — | — |
| | TAW 7050 Z | 350 | TAMW 7050 | 380 | — | — | — | — | — | — |

Note⁽¹⁾ Allowable rotational speed applies to oil lubrication. For grease lubrication, a maximum of 60% of this value is allowable.
 Remarks1. "W" in the identification number indicates that rolling elements are arranged in double rows.
 2. Shell Type Grease Retained Full Complement Needle Roller Bearings are provided with prepacked grease. Standard type and closed end type bearings are not provided with prepacked grease, so perform proper lubrication when using these types of bearings.

| Boundary dimensions mm | | | | Standard mounting dimensions mm | | | | | | Basic dynamic load rating C | Basic static load rating C ₀ | Allowable rotational speed ⁽¹⁾ rpm | Assembled inner ring |
|---------------------------|----|----|------------------------|---------------------------------|--------|-------------------------|--------|------|------|-----------------------------------|---|--|-------------------------|
| F _w | D | C | t ₁ Max. | Shaft dia. h6 | | Housing bore dia. J7 | | | | | | | |
| | | | | Max. | Min. | Max. | Min. | Max. | Min. | | | | |
| 65 | 77 | 25 | 3.4 | | | | | | | 56 500 | 116 000 | 4 000 | IRT 5525 |
| 65 | 77 | 30 | 3.4 | 65.000 | 64.981 | 77.018 | 76.988 | — | — | 68 500 | 149 000 | 4 000 | IRT 5530 |
| 65 | 77 | 45 | 3.4 | | | | | | | 88 300 | 207 000 | 4 000 | IRT 5545 |
| 65 | 77 | 50 | 3.4 | | | | | | | 101 000 | 246 000 | 4 000 | IRT 5550 |
| 70 | 82 | 25 | 3.4 | | | | | | | 58 500 | 124 000 | 3 500 | IRT 6025 |
| 70 | 82 | 30 | 3.4 | 70.000 | 69.981 | 82.022 | 81.987 | — | — | 70 900 | 159 000 | 3 500 | IRT 6030 |
| 70 | 82 | 40 | 3.4 | | | | | | | 92 000 | 222 000 | 3 500 | IRT 6040 |
| 70 | 82 | 50 | 3.4 | | | | | | | 105 000 | 262 000 | 3 500 | IRT 6050 |

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SHELL TYPE NEEDLE ROLLER BEARINGS

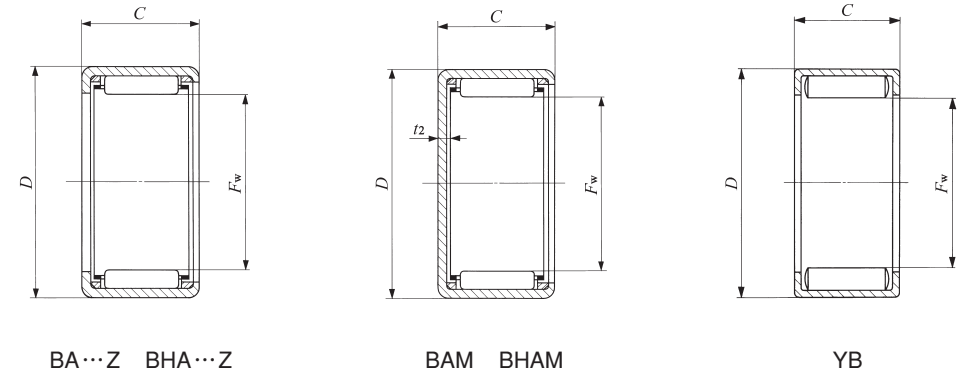
Inch Series



Shaft dia. 3.969 – 9.525mm

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

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



| Boundary dimensions mm(inch) | | | | Standard mounting dimensions mm | | | | Basic dynamic load rating C N | Basic static load rating C ₀ N | Allowable rotational speed ⁽¹⁾ rpm | Assembled inner ring |
|------------------------------|---------------|--------------|------------------------|---------------------------------|-------|-------------------------|--------|-------------------------------------|---|--|----------------------|
| F _w | D | C | t ₂ Max. | Shaft dia. h6 | | Housing bore dia. J7 | | | | | |
| | | | | Max. | Min. | Max. | Min. | | | | |
| 3.969 (5/32) | 7.144 (5/32) | 3.96 (.156) | — | 3.969 | 3.961 | 7.152 | 7.137 | 1 350 | 1 220 | 40 000 | — |
| 3.969 (5/32) | 7.144 (5/32) | 6.35 (.250) | — | — | — | — | — | 2 320 | 2 440 | 40 000 | — |
| 4.762 (3/16) | 8.731 (5/16) | 6.35 (.250) | — | 4.762 | 4.754 | 8.739 | 8.724 | 2 770 | 2 700 | 30 000 | — |
| 6.350 (1/4) | 11.112 (7/16) | 6.35 (.250) | 1 | — | — | — | — | 1 770 | 1 390 | 55 000 | — |
| 6.350 (1/4) | 11.112 (7/16) | 7.92 (.312) | 1 | — | — | — | — | 1 510 | 1 120 | 55 000 | — |
| 6.350 (1/4) | 11.112 (7/16) | 11.13 (.438) | 1 | 6.350 | 6.341 | 11.122 | 11.104 | 2 650 | 2 310 | 55 000 | — |
| 6.350 (1/4) | 11.112 (7/16) | 7.92 (.312) | — | — | — | — | — | 4 450 | 4 870 | 25 000 | — |
| 6.350 (1/4) | 11.112 (7/16) | 11.13 (.438) | — | — | — | — | — | 6 320 | 7 650 | 25 000 | — |
| 7.938 (5/16) | 12.700 (1/2) | 7.92 (.312) | 1 | — | — | — | — | 1 880 | 1 560 | 45 000 | — |
| 7.938 (5/16) | 12.700 (1/2) | 9.52 (.375) | 1 | — | — | — | — | 2 620 | 2 390 | 45 000 | — |
| 7.938 (5/16) | 12.700 (1/2) | 11.13 (.438) | 1 | 7.938 | 7.929 | 12.710 | 12.692 | 3 310 | 3 220 | 45 000 | — |
| 7.938 (5/16) | 12.700 (1/2) | 14.27 (.562) | 1 | — | — | — | — | 4 190 | 4 360 | 45 000 | — |
| 7.938 (5/16) | 12.700 (1/2) | 7.92 (.312) | — | — | — | — | — | 5 110 | 6 090 | 20 000 | — |
| 7.938 (5/16) | 14.288 (9/16) | 11.13 (.438) | 1.3 | 7.938 | 7.929 | 14.298 | 14.280 | 4 150 | 3 730 | 45 000 | — |
| 9.525 (3/8) | 14.288 (9/16) | 7.92 (.312) | 1 | — | — | — | — | 2 220 | 2 010 | 40 000 | — |
| 9.525 (3/8) | 14.288 (9/16) | 9.52 (.375) | 1 | — | — | — | — | 3 090 | 3 080 | 40 000 | — |
| 9.525 (3/8) | 14.288 (9/16) | 12.70 (.500) | 1 | 9.525 | 9.516 | 14.298 | 14.280 | 4 190 | 4 560 | 40 000 | — |
| 9.525 (3/8) | 14.288 (9/16) | 14.27 (.562) | 1 | — | — | — | — | 4 940 | 5 630 | 40 000 | — |
| 9.525 (3/8) | 14.288 (9/16) | 15.88 (.625) | 1 | — | — | — | — | 5 660 | 6 700 | 40 000 | — |
| 9.525 (3/8) | 14.288 (9/16) | 6.35 (.250) | — | — | — | — | — | 4 470 | 5 360 | 16 000 | — |
| 9.525 (3/8) | 14.288 (9/16) | 9.52 (.375) | — | 9.525 | 9.516 | 14.298 | 14.280 | 6 920 | 9 410 | 16 000 | — |
| 9.525 (3/8) | 14.288 (9/16) | 12.70 (.500) | — | — | — | — | — | 9 210 | 13 600 | 16 000 | — |
| 9.525 (3/8) | 14.288 (9/16) | 15.88 (.625) | — | — | — | — | — | 11 300 | 17 800 | 16 000 | — |
| 9.525 (3/8) | 15.875 (5/8) | 12.70 (.500) | 1.3 | 9.525 | 9.516 | 15.885 | 15.867 | 4 880 | 4 740 | 40 000 | — |

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SHELL TYPE NEEDLE ROLLER BEARINGS

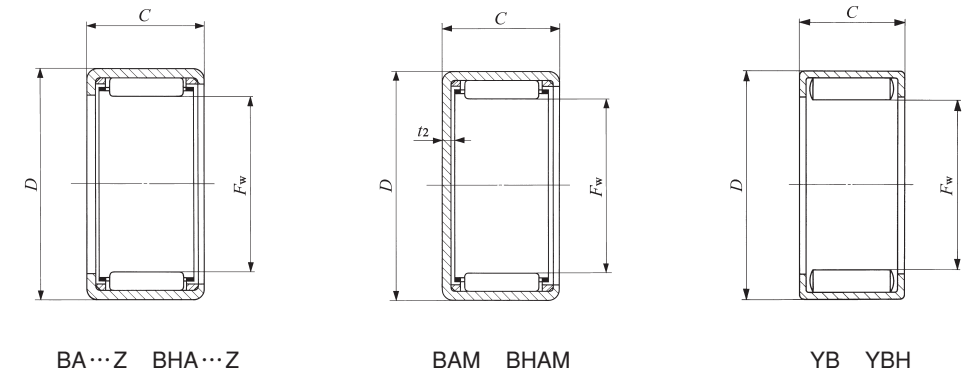
Inch Series



Shaft dia. 11.112 – 12.700mm

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

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

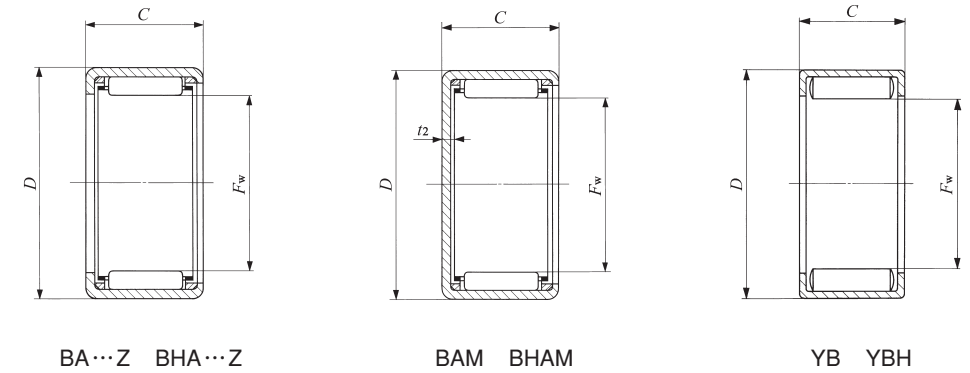


| Boundary dimensions mm(inch) | | | | Standard mounting dimensions mm | | | | Basic dynamic load rating C N | Basic static load rating C ₀ N | Allowable rotational speed ⁽¹⁾ rpm | Assembled inner ring | | | | |
|------------------------------|----------------|--------------|------------------------|---------------------------------|--------|--------------------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

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SHELL TYPE NEEDLE ROLLER BEARINGS

Inch Series



Shaft dia. 14.288 – 15.875mm

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

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

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

SHELL TYPE NEEDLE ROLLER BEARINGS

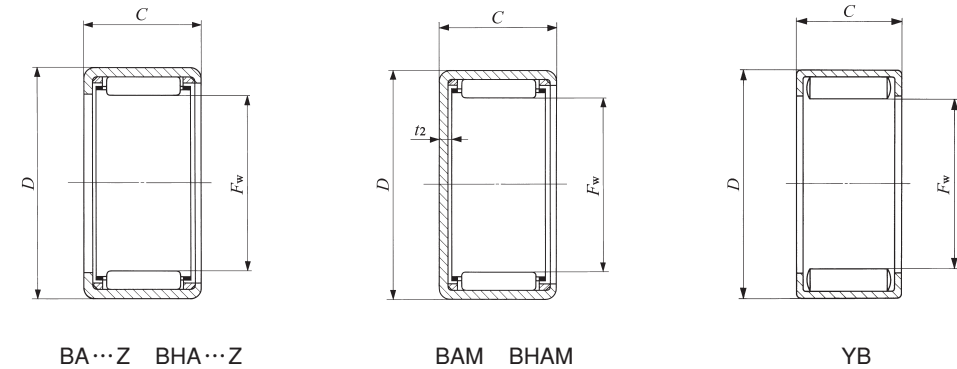
Inch Series



Shaft dia. 17.462 – 19.050mm

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

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



| Boundary dimensions mm(inch) | | | | Standard mounting dimensions mm | | | | Basic dynamic load rating C N | Basic static load rating C ₀ N | Allowable rotational speed ⁽¹⁾ rpm | Assembled inner ring |
|------------------------------|-----------------|---------------|------------------------|---------------------------------|--------|-------------------------|--------|-------------------------------------|---|--|----------------------|
| F _w | D | C | t ₂ Max. | Shaft dia. h6 | | Housing bore dia. J7 | | | | | |
| | | | | Max. | Min. | Max. | Min. | | | | |
| 17.462 (11/16) | 22.225 (7/8) | 9.52 (.375) | 1.3 | | | | | 4 530 | 5 980 | 25 000 | IRB 86 |
| 17.462 (11/16) | 22.225 (7/8) | 12.70 (.500) | 1.3 | | | | | 6 140 | 8 850 | 25 000 | IRB 88 |
| 17.462 (11/16) | 22.225 (7/8) | 15.88 (.625) | 1.3 | 17.462 | 17.451 | 22.237 | 22.216 | 8 280 | 13 000 | 25 000 | — |
| 17.462 (11/16) | 22.225 (7/8) | 19.05 (.750) | 1.3 | | | | | 10 200 | 17 000 | 25 000 | IRB 812 |
| 17.462 (11/16) | 22.225 (7/8) | 19.05 (.750) | — | | | | | 18 700 | 40 300 | 8 500 | IRB 812 |
| 17.462 (11/16) | 23.812 (15/16) | 11.13 (.438) | 1.3 | | | | | 6 860 | 8 530 | 25 000 | — |
| 17.462 (11/16) | 23.812 (15/16) | 12.70 (.500) | 1.3 | 17.462 | 17.451 | 23.824 | 23.803 | 7 320 | 9 270 | 25 000 | IRB 88 |
| 17.462 (11/16) | 23.812 (15/16) | 15.88 (.625) | 1.3 | | | | | 10 500 | 14 900 | 25 000 | — |
| 17.462 (11/16) | 23.812 (15/16) | 19.05 (.750) | 1.3 | | | | | 13 200 | 19 900 | 25 000 | IRB 812 |
| 19.050 (3/4) | 25.400 (1) | 9.52 (.375) | 1.3 | | | | | 5 040 | 5 850 | 20 000 | — |
| 19.050 (3/4) | 25.400 (1) | 12.70 (.500) | 1.3 | | | | | 6 910 | 8 780 | 20 000 | IRB 88-1 |
| 19.050 (3/4) | 25.400 (1) | 15.88 (.625) | 1.3 | 19.050 | 19.037 | 25.412 | 25.391 | 9 500 | 13 200 | 20 000 | IRB 810-1 |
| 19.050 (3/4) | 25.400 (1) | 19.05 (.750) | 1.3 | | | | | 11 900 | 17 700 | 20 000 | IRB 812-1 |
| 19.050 (3/4) | 25.400 (1) | 22.22 (.875) | 1.3 | | | | | 14 200 | 22 200 | 20 000 | IRB 814-1 |
| 19.050 (3/4) | 25.400 (1) | 25.40 (1.000) | 1.3 | | | | | 16 300 | 26 500 | 20 000 | IRB 816-1 |
| 19.050 (3/4) | 25.400 (1) | 6.35 (.250) | — | | | | | 7 820 | 10 200 | 8 000 | — |
| 19.050 (3/4) | 25.400 (1) | 12.70 (.500) | — | 19.050 | 19.037 | 25.412 | 25.391 | 16 600 | 26 900 | 8 000 | IRB 88-1 |
| 19.050 (3/4) | 25.400 (1) | 15.88 (.625) | — | | | | | 20 500 | 35 300 | 8 000 | IRB 810-1 |
| 19.050 (3/4) | 25.400 (1) | 19.05 (.750) | — | | | | | 24 100 | 43 400 | 8 000 | IRB 812-1 |
| 19.050 (3/4) | 26.988 (1 1/16) | 19.05 (.750) | 1.3 | 19.050 | 19.037 | 27.000 | 26.979 | 16 600 | 22 600 | 20 000 | IRB 812-1 |

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SHELL TYPE NEEDLE ROLLER BEARINGS

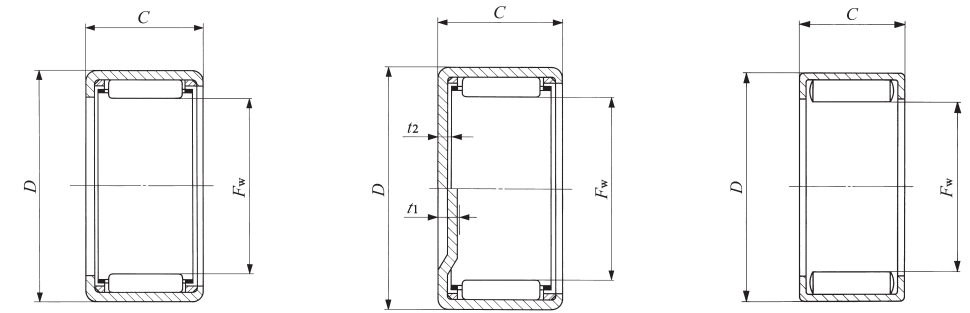
Inch Series



Shaft dia. 20.638 – 22.225mm

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

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



BA...Z BHA...Z

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

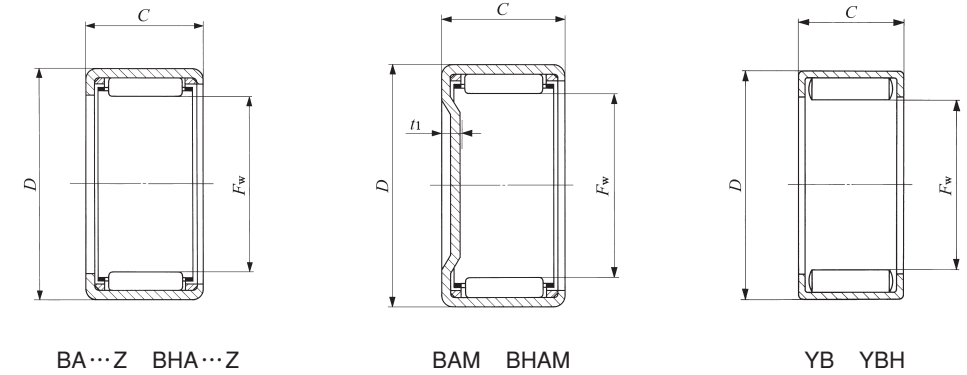
YB YBH

| Boundary dimensions mm(inch) | | | | Standard mounting dimensions mm | | | | Basic dynamic load rating C N | Basic static load rating C ₀ N | Allowable rotational speed(1) rpm | Assembled inner ring | | | | |
|------------------------------|-----------------|--------------|--|---------------------------------|--------|----------------------|--------|-------------------------------------|---|--------------------------------------|----------------------|--------|--------|--------|----------|
| F _w | D | C | t ₁ t ₂ Max. | Shaft dia. h6 | | Housing bore dia. J7 | | | | | | | | | |
| | | | | Max. | Min. | Max. | Min. | | | | | | | | |
| 20.638 (13/16) | 26.988 (1 1/16) | 9.52 (.375) | 1.3 | 20.638 | 20.625 | 27.000 | 26.979 | 5 230 | 6 300 | 19 000 | — | | | | |
| 20.638 (13/16) | 26.988 (1 1/16) | 12.70 (.500) | 1.3 | | | | | 7 170 | 9 450 | 19 000 | IRB 98 | | | | |
| 20.638 (13/16) | 26.988 (1 1/16) | 15.88 (.625) | 1.3 | | | | | 9 870 | 14 200 | 19 000 | IRB 910 | | | | |
| 20.638 (13/16) | 26.988 (1 1/16) | 19.05 (.750) | 1.3 | | | | | 12 400 | 19 000 | 19 000 | IRB 912 | | | | |
| 20.638 (13/16) | 26.988 (1 1/16) | 22.22 (.875) | 1.3 | | | | | 14 700 | 23 800 | 19 000 | IRB 914 | | | | |
| 20.638 (13/16) | 26.988 (1 1/16) | 25.40(1.000) | 1.3 | | | | | 16 900 | 28 500 | 19 000 | IRB 916 | | | | |
| 20.638 (13/16) | 26.988 (1 1/16) | 31.75(1.250) | 1.3 | | | | | 21 200 | 38 100 | 19 000 | IRB 920 | | | | |
| 20.638 (13/16) | 26.988 (1 1/16) | 9.52 (.375) | — | | | | | 13 000 | 20 100 | 7 500 | — | | | | |
| 20.638 (13/16) | 26.988 (1 1/16) | 12.70 (.500) | — | | | | | 17 400 | 29 200 | 7 500 | IRB 98 | | | | |
| 20.638 (13/16) | 28.575 (1 1/8) | 12.70 (.500) | 1.3 | | | | | 20.638 | 20.625 | 28.587 | 28.566 | 9 500 | 11 200 | 19 000 | IRB 98 |
| 20.638 (13/16) | 28.575 (1 1/8) | 15.88 (.625) | 1.3 | | | | | | | | | 13 800 | 18 200 | 19 000 | IRB 910 |
| 20.638 (13/16) | 28.575 (1 1/8) | 19.05 (.750) | 1.3 | | | | | | | | | 17 300 | 24 400 | 19 000 | IRB 912 |
| 20.638 (13/16) | 28.575 (1 1/8) | 15.88 (.625) | — | | | | | | | | | 22 900 | 36 300 | 7 500 | IRB 910 |
| 20.638 (13/16) | 28.575 (1 1/8) | 19.05 (.750) | — | | | | | | | | | 27 200 | 45 300 | 7 500 | IRB 912 |
| 22.225 (7/8) | 28.575 (1 1/8) | 9.52 (.375) | 2.8 | 22.225 | 22.212 | 28.587 | 28.566 | | | | | 5 430 | 6 740 | 18 000 | IRB 106 |
| 22.225 (7/8) | 28.575 (1 1/8) | 12.70 (.500) | 2.8 | | | | | | | | | 7 440 | 10 100 | 18 000 | IRB 108 |
| 22.225 (7/8) | 28.575 (1 1/8) | 19.05 (.750) | 2.8 | | | | | | | | | 12 800 | 20 400 | 18 000 | IRB 1012 |
| 22.225 (7/8) | 28.575 (1 1/8) | 22.22 (.875) | 2.8 | | | | | 15 300 | 25 500 | 18 000 | IRB 1014 | | | | |
| 22.225 (7/8) | 28.575 (1 1/8) | 25.40(1.000) | 2.8 | | | | | 17 600 | 30 500 | 18 000 | IRB 1016 | | | | |
| 22.225 (7/8) | 28.575 (1 1/8) | 28.58(1.125) | 2.8 | | | | | 19 800 | 35 600 | 18 000 | — | | | | |
| 22.225 (7/8) | 28.575 (1 1/8) | 34.92(1.375) | 2.8 | | | | | 24 100 | 45 700 | 18 000 | IRB 1022 | | | | |
| 22.225 (7/8) | 28.575 (1 1/8) | 12.70 (.500) | — | | | | | 18 100 | 31 400 | 7 000 | IRB 108 | | | | |
| 22.225 (7/8) | 28.575 (1 1/8) | 19.05 (.750) | — | | | | | 26 300 | 50 700 | 7 000 | IRB 1012 | | | | |
| 22.225 (7/8) | 28.575 (1 1/8) | 25.40(1.000) | — | | | | | 33 800 | 70 200 | 7 000 | IRB 1016 | | | | |
| 22.225 (7/8) | 30.162 (1 1/8) | 15.88 (.625) | 3.4 | 22.225 | 22.212 | 30.176 | 30.151 | 14 300 | 19 500 | 18 000 | — | | | | |
| 22.225 (7/8) | 30.162 (1 1/8) | 19.05 (.750) | 3.4 | | | | | 18 000 | 26 100 | 18 000 | IRB 1012 | | | | |
| 22.225 (7/8) | 30.162 (1 1/8) | 25.40(1.000) | 3.4 | | | | | 23 600 | 36 900 | 18 000 | IRB 1016 | | | | |
| 22.225 (7/8) | 30.162 (1 1/8) | 19.05 (.750) | — | | | | | 28 200 | 49 000 | 7 000 | IRB 1012 | | | | |

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SHELL TYPE NEEDLE ROLLER BEARINGS

Inch Series



Shaft dia. 23.812 – 26.988mm

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

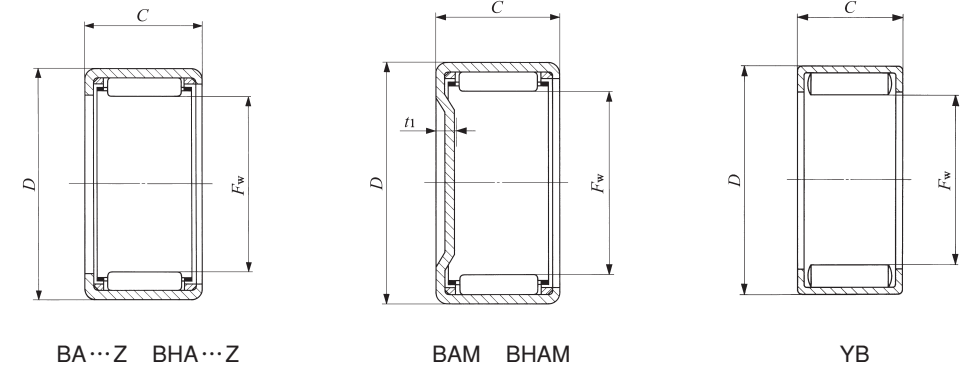
Note⁽¹⁾ Allowable rotational speed applies to oil lubrication. For grease lubrication, a maximum of 60% of this value is allowable.
 Remark Shell Type Grease Retained Full Complement Needle Roller Bearings are provided with prepacked grease. Standard type and closed end type bearings are not provided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

| Boundary dimensions mm(inch) | | | | Standard mounting dimensions mm | | | | Basic dynamic load rating C N | Basic static load rating C ₀ N | Allowable rotational speed ⁽¹⁾ rpm | Assembled inner ring |
|------------------------------|-----------------|---------------|------------------------|---------------------------------|--------|----------------------|--------|-------------------------------------|---|--|----------------------|
| F _w | D | C | t ₁ Max. | Shaft dia. h6 | | Housing bore dia. J7 | | | | | |
| | | | | Max. | Min. | Max. | Min. | | | | |
| 23.812 (15/16) | 30.162 (1 3/16) | 12.70 (.500) | 2.8 | 23.812 | 23.799 | 30.176 | 30.151 | 8 000 | 11 400 | 16 000 | — |
| 23.812 (15/16) | 30.162 (1 3/16) | 15.88 (.625) | 2.8 | 23.812 | 23.799 | 30.176 | 30.151 | 11 000 | 17 100 | 16 000 | IRB 1110 |
| 23.812 (15/16) | 30.162 (1 3/16) | 25.40 (1.000) | 2.8 | 23.812 | 23.799 | 30.176 | 30.151 | 18 900 | 34 300 | 16 000 | IRB 1116 |
| 25.400 (1) | 31.750 (1 1/4) | 9.52 (.375) | 2.8 | 25.400 | 25.387 | 31.764 | 31.739 | 6 010 | 8 020 | 15 000 | — |
| 25.400 (1) | 31.750 (1 1/4) | 11.13 (.438) | 2.8 | 25.400 | 25.387 | 31.764 | 31.739 | 7 720 | 11 100 | 15 000 | — |
| 25.400 (1) | 31.750 (1 1/4) | 12.70 (.500) | 2.8 | 25.400 | 25.387 | 31.764 | 31.739 | 8 240 | 12 000 | 15 000 | IRB 128 |
| 25.400 (1) | 31.750 (1 1/4) | 15.88 (.625) | 2.8 | 25.400 | 25.387 | 31.764 | 31.739 | 11 300 | 18 100 | 15 000 | — |
| 25.400 (1) | 31.750 (1 1/4) | 19.05 (.750) | 2.8 | 25.400 | 25.387 | 31.764 | 31.739 | 14 200 | 24 300 | 15 000 | IRB 1212 |
| 25.400 (1) | 31.750 (1 1/4) | 22.22 (.875) | 2.8 | 25.400 | 25.387 | 31.764 | 31.739 | 16 900 | 30 400 | 15 000 | IRB 1214 |
| 25.400 (1) | 31.750 (1 1/4) | 25.40 (1.000) | 2.8 | 25.400 | 25.387 | 31.764 | 31.739 | 19 400 | 36 300 | 15 000 | IRB 1216 |
| 25.400 (1) | 31.750 (1 1/4) | 31.75 (1.250) | 2.8 | 25.400 | 25.387 | 31.764 | 31.739 | 24 400 | 48 500 | 15 000 | IRB 1220 |
| 25.400 (1) | 31.750 (1 1/4) | 12.70 (.500) | — | 25.400 | 25.387 | 31.764 | 31.739 | 19 400 | 36 000 | 6 000 | IRB 128 |
| 25.400 (1) | 31.750 (1 1/4) | 19.05 (.750) | — | 25.400 | 25.387 | 31.764 | 31.739 | 28 200 | 58 000 | 6 000 | IRB 1212 |
| 25.400 (1) | 31.750 (1 1/4) | 25.40 (1.000) | — | 25.400 | 25.387 | 31.764 | 31.739 | 36 300 | 80 300 | 6 000 | IRB 1216 |
| 25.400 (1) | 33.338 (1 3/16) | 12.70 (.500) | 3.4 | 25.400 | 25.387 | 33.352 | 33.327 | 10 200 | 13 100 | 15 000 | IRB 128 |
| 25.400 (1) | 33.338 (1 3/16) | 15.88 (.625) | 3.4 | 25.400 | 25.387 | 33.352 | 33.327 | 15 300 | 22 100 | 15 000 | — |
| 25.400 (1) | 33.338 (1 3/16) | 19.05 (.750) | 3.4 | 25.400 | 25.387 | 33.352 | 33.327 | 19 300 | 29 700 | 15 000 | IRB 1212 |
| 25.400 (1) | 33.338 (1 3/16) | 22.22 (.875) | 3.4 | 25.400 | 25.387 | 33.352 | 33.327 | 23 000 | 37 200 | 15 000 | IRB 1214 |
| 25.400 (1) | 33.338 (1 3/16) | 25.40 (1.000) | 3.4 | 25.400 | 25.387 | 33.352 | 33.327 | 26 400 | 44 500 | 15 000 | IRB 1216 |
| 25.400 (1) | 33.338 (1 3/16) | 31.75 (1.250) | 3.4 | 25.400 | 25.387 | 33.352 | 33.327 | 33 200 | 59 600 | 15 000 | IRB 1220 |
| 25.400 (1) | 33.338 (1 3/16) | 38.10 (1.500) | 3.4 | 25.400 | 25.387 | 33.352 | 33.327 | 39 400 | 74 400 | 15 000 | — |
| 25.400 (1) | 33.338 (1 3/16) | 12.70 (.500) | — | 25.400 | 25.387 | 33.352 | 33.327 | 20 900 | 34 100 | 6 000 | IRB 128 |
| 25.400 (1) | 33.338 (1 3/16) | 19.05 (.750) | — | 25.400 | 25.387 | 33.352 | 33.327 | 30 700 | 56 100 | 6 000 | IRB 1212 |
| 25.400 (1) | 33.338 (1 3/16) | 25.40 (1.000) | — | 25.400 | 25.387 | 33.352 | 33.327 | 39 900 | 78 400 | 6 000 | IRB 1216 |
| 26.988 (1 1/16) | 33.338 (1 3/16) | 15.88 (.625) | 2.8 | 26.988 | 26.975 | 33.352 | 33.327 | 11 600 | 19 200 | 14 000 | — |
| 26.988 (1 1/16) | 33.338 (1 3/16) | 25.40 (1.000) | 2.8 | 26.988 | 26.975 | 33.352 | 33.327 | 20 000 | 38 300 | 14 000 | — |

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SHELL TYPE NEEDLE ROLLER BEARINGS

Inch Series



TA
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BA
BHA

Shaft dia. 28.575 – 30.162mm

| Shaft dia. mm (inch) | Identification number | | | | | | | | | |
|----------------------------|-----------------------|---------------------|-----------------|---------------------|-------------------|---------------------|------------------|---------------------|-----------------|---------------------|
| | Standard | Mass (Ref.) g | Closed end | Mass (Ref.) g | Standard | Mass (Ref.) g | Closed end | Mass (Ref.) g | Grease retained | Mass (Ref.) g |
| 28.575 (1 1/8) | BA 186 Z | 14.5 | BAM 186 | 18.1 | — | — | — | — | — | — |
| | BA 188 Z | 19.5 | BAM 188 | 23 | — | — | — | — | — | — |
| | BA 1812 Z | 29.5 | BAM 1812 | 33 | — | — | — | — | — | — |
| | BA 1816 Z | 39 | BAM 1816 | 42.5 | — | — | — | — | — | — |
| | BA 1820 Z | 48.5 | BAM 1820 | 52 | — | — | — | — | — | — |
| | — | — | — | — | — | — | — | — | YB 188 | 25.5 |
| | — | — | — | — | — | — | — | — | YB 1812 | 38.5 |
| | — | — | — | — | — | — | — | — | YB 1816 | 51.5 |
| | — | — | — | — | BHA 1812 Z | 45 | BHAM 1812 | 49 | — | — |
| | — | — | — | — | BHA 1816 Z | 60 | BHAM 1816 | 64 | — | — |
| — | — | — | — | BHA 1818 Z | 67.5 | BHAM 1818 | 71.5 | — | — | |
| — | — | — | — | BHA 1820 Z | 73.5 | BHAM 1820 | 78 | — | — | |
| 30.162 (1 3/16) | BA 1910 Z | 32.5 | BAM 1910 | 37.5 | — | — | — | — | — | — |
| | BA 1916 Z | 52 | BAM 1916 | 57 | — | — | — | — | — | |
| | — | — | — | — | — | — | — | — | YB 1910 | 42.5 |

| Boundary dimensions mm(inch) | | | | Standard mounting dimensions mm | | | | Basic dynamic load rating <i>C</i> N | Basic static load rating <i>C</i> ₀ N | Allowable rotational speed ⁽¹⁾ rpm | Assembled inner ring |
|------------------------------|----------------|---------------|-------------------------------|---------------------------------|--------|-------------------------|--------|--|--|--|----------------------|
| <i>F</i> _w | <i>D</i> | <i>C</i> | <i>t</i> ₁ Max. | Shaft dia. h6 | | Housing bore dia. J7 | | | | | |
| | | | | Max. | Min. | Max. | Min. | | | | |
| 28.575 (1 1/8) | 34.925 (1 3/8) | 9.52 (.375) | 2.8 | | | | | 6 330 | 8 910 | 13 000 | — |
| 28.575 (1 1/8) | 34.925 (1 3/8) | 12.70 (.500) | 2.8 | | | | | 8 680 | 13 400 | 13 000 | IRB 148 |
| 28.575 (1 1/8) | 34.925 (1 3/8) | 19.05 (.750) | 2.8 | | | | | 15 000 | 26 900 | 13 000 | IRB 1412 |
| 28.575 (1 1/8) | 34.925 (1 3/8) | 25.40 (1.000) | 2.8 | 28.575 | 28.562 | 34.939 | 34.914 | 20 500 | 40 300 | 13 000 | IRB 1416 |
| 28.575 (1 1/8) | 34.925 (1 3/8) | 31.75 (1.250) | 2.8 | | | | | 25 700 | 53 900 | 13 000 | IRB 1420 |
| 28.575 (1 1/8) | 34.925 (1 3/8) | 12.70 (.500) | — | | | | | 20 700 | 40 500 | 5 500 | IRB 148 |
| 28.575 (1 1/8) | 34.925 (1 3/8) | 19.05 (.750) | — | | | | | 30 000 | 65 300 | 5 500 | IRB 1412 |
| 28.575 (1 1/8) | 34.925 (1 3/8) | 25.40 (1.000) | — | | | | | 38 700 | 90 400 | 5 500 | IRB 1416 |
| 28.575 (1 1/8) | 38.100 (1 1/2) | 19.05 (.750) | 3.4 | | | | | 22 500 | 32 200 | 13 000 | IRB 1412 |
| 28.575 (1 1/8) | 38.100 (1 1/2) | 25.40 (1.000) | 3.4 | 28.575 | 28.562 | 38.114 | 38.089 | 30 900 | 48 600 | 13 000 | IRB 1416 |
| 28.575 (1 1/8) | 38.100 (1 1/2) | 28.58 (1.125) | 3.4 | | | | | 34 900 | 56 600 | 13 000 | — |
| 28.575 (1 1/8) | 38.100 (1 1/2) | 31.75 (1.250) | 3.4 | | | | | 37 100 | 61 100 | 13 000 | IRB 1420 |
| 30.162 (1 3/16) | 38.100 (1 1/2) | 15.88 (.625) | 2.8 | | | | | 15 000 | 22 500 | 12 000 | — |
| 30.162 (1 3/16) | 38.100 (1 1/2) | 25.40 (1.000) | 2.8 | 30.162 | 30.146 | 38.114 | 38.089 | 25 800 | 45 300 | 12 000 | — |
| 30.162 (1 3/16) | 38.100 (1 1/2) | 15.88 (.625) | — | | | | | 28 400 | 53 600 | 5 000 | — |

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

SHELL TYPE NEEDLE ROLLER BEARINGS

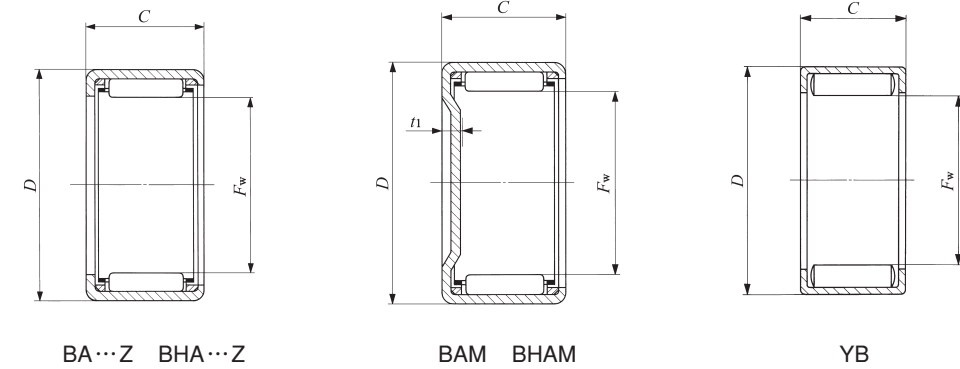
Inch Series



Shaft dia. 31.750 – 33.338mm

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

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



| Boundary dimensions mm(inch) | | | | Standard mounting dimensions mm | | | | Basic dynamic load rating C N | Basic static load rating C ₀ N | Allowable rotational speed ⁽¹⁾ rpm | Assembled inner ring |
|------------------------------|----------------|---------------|------------------------|---------------------------------|--------|----------------------|--------|-------------------------------------|---|--|----------------------|
| F _w | D | C | t ₁ Max. | Shaft dia. h6 | | Housing bore dia. J7 | | | | | |
| | | | | Max. | Min. | Max. | Min. | | | | |
| 31.750 (1 1/4) | 38.100 (1 1/2) | 12.70 (.500) | 2.8 | | | | | 9 100 | 14 700 | 12 000 | IRB 168 |
| 31.750 (1 1/4) | 38.100 (1 1/2) | 15.88 (.625) | 2.8 | | | | | 12 500 | 22 200 | 12 000 | IRB 1610 |
| 31.750 (1 1/4) | 38.100 (1 1/2) | 19.05 (.750) | 2.8 | 31.750 | 31.734 | 38.114 | 38.089 | 15 700 | 29 600 | 12 000 | IRB 1612 |
| 31.750 (1 1/4) | 38.100 (1 1/2) | 25.40 (1.000) | 2.8 | | | | | 21 500 | 44 300 | 12 000 | IRB 1616 |
| 31.750 (1 1/4) | 38.100 (1 1/2) | 31.75 (1.250) | 2.8 | | | | | 26 900 | 59 200 | 12 000 | IRB 1620 |
| 31.750 (1 1/4) | 38.100 (1 1/2) | 15.88 (.625) | — | | | | | 27 000 | 59 000 | 4 500 | IRB 1610 |
| 31.750 (1 1/4) | 38.100 (1 1/2) | 19.05 (.750) | — | | | | | 31 800 | 72 500 | 4 500 | IRB 1612 |
| 31.750 (1 1/4) | 38.100 (1 1/2) | 25.40 (1.000) | — | 31.750 | 31.734 | 38.114 | 38.089 | 40 900 | 100 000 | 4 500 | IRB 1616 |
| 31.750 (1 1/4) | 38.100 (1 1/2) | 28.58 (1.125) | — | | | | | 45 300 | 114 000 | 4 500 | — |
| 31.750 (1 1/4) | 38.100 (1 1/2) | 31.75 (1.250) | — | | | | | 49 400 | 128 000 | 4 500 | IRB 1620 |
| 31.750 (1 1/4) | 41.275 (1 5/8) | 12.70 (.500) | 3.4 | | | | | 13 700 | 17 600 | 12 000 | IRB 168 |
| 31.750 (1 1/4) | 41.275 (1 5/8) | 19.05 (.750) | 3.4 | | | | | 24 100 | 36 400 | 12 000 | IRB 1612 |
| 31.750 (1 1/4) | 41.275 (1 5/8) | 25.40 (1.000) | 3.4 | 31.750 | 31.734 | 41.289 | 41.264 | 33 200 | 55 000 | 12 000 | IRB 1616 |
| 31.750 (1 1/4) | 41.275 (1 5/8) | 31.75 (1.250) | 3.4 | | | | | 40 000 | 69 600 | 12 000 | IRB 1620 |
| 33.338 (1 5/16) | 41.275 (1 5/8) | 12.70 (.500) | 2.8 | | | | | 11 100 | 15 800 | 11 000 | IRB 168-1 |
| 33.338 (1 5/16) | 41.275 (1 5/8) | 15.88 (.625) | 2.8 | 33.338 | 33.322 | 41.289 | 41.264 | 15 400 | 23 900 | 11 000 | IRB 1610-1 |
| 33.338 (1 5/16) | 41.275 (1 5/8) | 19.05 (.750) | 2.8 | | | | | 19 300 | 32 100 | 11 000 | IRB 1612-1 |

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SHELL TYPE NEEDLE ROLLER BEARINGS

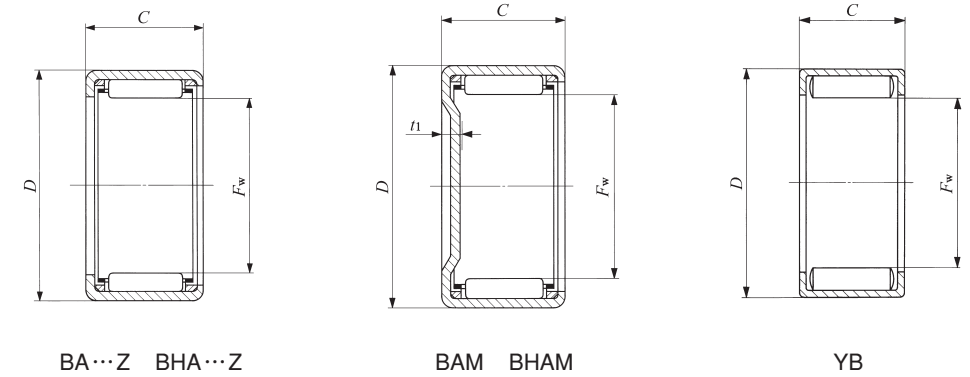
Inch Series



Shaft dia. 34.925 – 38.100mm

| Shaft dia. mm (inch) | Identification number | | | | | | | | | |
|----------------------------|-----------------------|---------------------|-----------------|---------------------|-------------------|---------------------|------------------|---------------------|-----------------|---------------------|
| | Standard | Mass (Ref.) g | Closed end | Mass (Ref.) g | Standard | Mass (Ref.) g | Closed end | Mass (Ref.) g | Grease retained | Mass (Ref.) g |
| 34.925 (1 3/8) | BA 228 Z | 23.5 | BAM 228 | 29 | — | — | — | — | — | — |
| | BA 2212 Z | 35.5 | BAM 2212 | 41 | — | — | — | — | — | — |
| | BA 2216 Z | 47.5 | BAM 2216 | 53 | — | — | — | — | — | — |
| | BA 2220 Z | 59 | BAM 2220 | 64 | — | — | — | — | — | — |
| | — | — | — | — | — | — | — | — | YB 228 | 30.5 |
| | — | — | — | — | — | — | — | — | YB 2212 | 46 |
| | — | — | — | — | — | — | — | — | YB 2220 | 77.5 |
| | — | — | — | — | BHA 228 Z | 37 | BHAM 228 | 43 | — | — |
| | — | — | — | — | BHA 2210 Z | 44 | BHAM 2210 | 50 | — | — |
| | — | — | — | — | BHA 2212 Z | 53 | BHAM 2212 | 59 | — | — |
| — | — | — | — | BHA 2216 Z | 71 | BHAM 2216 | 77 | — | — | |
| — | — | — | — | BHA 2220 Z | 87 | BHAM 2220 | 98.5 | — | — | |
| 38.100 (1 1/2) | BA 248 Z | 38.5 | BAM 248 | 47.5 | — | — | — | — | — | — |
| | BA 2410 Z | 48.5 | BAM 2410 | 57.5 | — | — | — | — | — | — |
| | BA 2412 Z | 58.5 | BAM 2412 | 67.5 | — | — | — | — | — | — |
| | BA 2414 Z | 69 | BAM 2414 | 78 | — | — | — | — | — | — |
| | BA 2416 Z | 79 | BAM 2416 | 88 | — | — | — | — | — | — |
| | BA 2420 Z | 97.5 | BAM 2420 | 106 | — | — | — | — | — | — |
| | — | — | — | — | — | — | — | — | YB 246 | 38 |
| | — | — | — | — | — | — | — | — | YB 248 | 51.5 |
| | — | — | — | — | — | — | — | — | YB 2414 | 91 |
| | — | — | — | — | — | — | — | — | YB 2416 | 105 |
| — | — | — | — | — | — | — | — | YB 2420 | 131 | |

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



| Boundary dimensions mm(inch) | | | | Standard mounting dimensions mm | | | | Basic dynamic load rating C N | Basic static load rating C ₀ N | Allowable rotational speed ⁽¹⁾ rpm | Assembled inner ring |
|------------------------------|----------------|---------------|------------------------|---------------------------------|--------|-------------------------|--------|-------------------------------------|---|--|----------------------|
| F _w | D | C | t ₁ Max. | Shaft dia. h6 | | Housing bore dia. J7 | | | | | |
| | | | | Max. | Min. | Max. | Min. | | | | |
| 34.925 (1 3/8) | 41.275 (1 5/8) | 12.70 (.500) | 2.8 | | | | | 9 770 | 16 600 | 10 000 | IRB 188 |
| 34.925 (1 3/8) | 41.275 (1 5/8) | 19.05 (.750) | 2.8 | | | | | 16 900 | 33 500 | 10 000 | IRB 1812 |
| 34.925 (1 3/8) | 41.275 (1 5/8) | 25.40 (1.000) | 2.8 | | | | | 23 100 | 50 200 | 10 000 | IRB 1816 |
| 34.925 (1 3/8) | 41.275 (1 5/8) | 31.75 (1.250) | 2.8 | 34.925 | 34.909 | 41.289 | 41.264 | 28 900 | 67 100 | 10 000 | IRB 1820 |
| 34.925 (1 3/8) | 41.275 (1 5/8) | 12.70 (.500) | — | | | | | 23 000 | 49 500 | 4 500 | IRB 188 |
| 34.925 (1 3/8) | 41.275 (1 5/8) | 19.05 (.750) | — | | | | | 33 400 | 79 800 | 4 500 | IRB 1812 |
| 34.925 (1 3/8) | 41.275 (1 5/8) | 31.75 (1.250) | — | | | | | 52 000 | 141 000 | 4 500 | IRB 1820 |
| 34.925 (1 3/8) | 44.450 (1 3/4) | 12.70 (.500) | 3.4 | | | | | 14 100 | 18 800 | 10 000 | IRB 188 |
| 34.925 (1 3/8) | 44.450 (1 3/4) | 15.88 (.625) | 3.4 | | | | | 19 700 | 28 800 | 10 000 | — |
| 34.925 (1 3/8) | 44.450 (1 3/4) | 19.05 (.750) | 3.4 | 34.925 | 34.909 | 44.464 | 44.439 | 24 800 | 38 800 | 10 000 | IRB 1812 |
| 34.925 (1 3/8) | 44.450 (1 3/4) | 25.40 (1.000) | 3.4 | | | | | 34 100 | 58 400 | 10 000 | IRB 1816 |
| 34.925 (1 3/8) | 44.450 (1 3/4) | 31.75 (1.250) | 3.4 | | | | | 41 200 | 74 200 | 10 000 | IRB 1820 |
| 38.100 (1 1/2) | 47.625 (1 7/8) | 12.70 (.500) | 2.8 | | | | | 12 900 | 17 900 | 9 000 | — |
| 38.100 (1 1/2) | 47.625 (1 7/8) | 15.88 (.625) | 2.8 | | | | | 17 800 | 27 100 | 9 000 | IRB 2010 |
| 38.100 (1 1/2) | 47.625 (1 7/8) | 19.05 (.750) | 2.8 | | | | | 22 500 | 36 600 | 9 000 | — |
| 38.100 (1 1/2) | 47.625 (1 7/8) | 22.22 (.875) | 2.8 | 38.100 | 38.084 | 47.639 | 47.614 | 26 700 | 45 600 | 9 000 | IRB 2014 |
| 38.100 (1 1/2) | 47.625 (1 7/8) | 25.40 (1.000) | 2.8 | | | | | 31 100 | 55 400 | 9 000 | IRB 2016 |
| 38.100 (1 1/2) | 47.625 (1 7/8) | 31.75 (1.250) | 2.8 | | | | | 39 000 | 74 200 | 9 000 | IRB 2020 |
| 38.100 (1 1/2) | 47.625 (1 7/8) | 9.52 (.375) | — | | | | | 21 000 | 34 100 | 4 000 | — |
| 38.100 (1 1/2) | 47.625 (1 7/8) | 12.70 (.500) | — | | | | | 28 700 | 50 900 | 4 000 | — |
| 38.100 (1 1/2) | 47.625 (1 7/8) | 22.22 (.875) | — | 38.100 | 38.084 | 47.639 | 47.614 | 48 900 | 101 000 | 4 000 | IRB 2014 |
| 38.100 (1 1/2) | 47.625 (1 7/8) | 25.40 (1.000) | — | | | | | 55 100 | 118 000 | 4 000 | IRB 2016 |
| 38.100 (1 1/2) | 47.625 (1 7/8) | 31.75 (1.250) | — | | | | | 66 800 | 151 000 | 4 000 | IRB 2020 |

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SHELL TYPE NEEDLE ROLLER BEARINGS

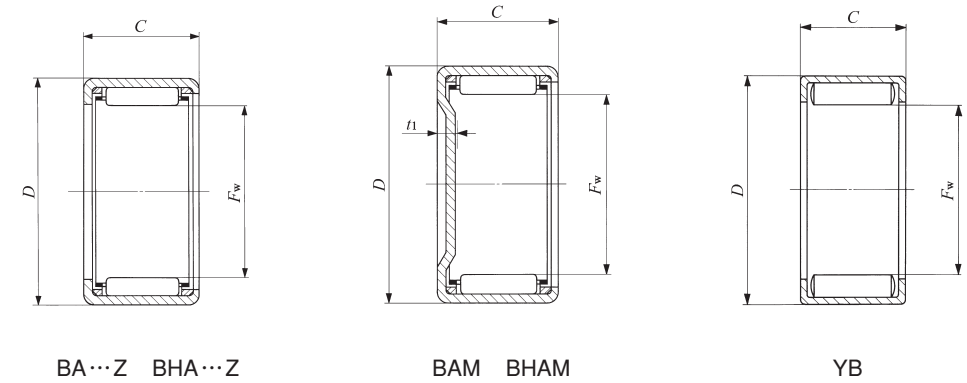
Inch Series



Shaft dia. 41.275 – 52.388mm

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

Note(1) Allowable rotational speed applies to oil lubrication. For grease lubrication, a maximum of 60% of this value is allowable.
 Remarks1. "W" in the identification number indicates that rolling elements are arranged in double rows.
 2. Shell Type Grease Retained Full Complement Needle Roller Bearings are provided with prepacked grease. Standard type and closed end type bearings are not provided with prepacked grease, so perform proper lubrication when using these types of bearings.



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

SHELL TYPE NEEDLE ROLLER BEARINGS

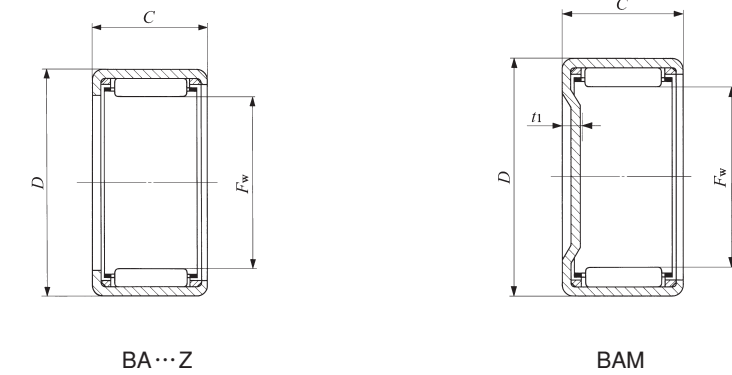
Inch Series



Shaft dia. 53.975 – 69.850mm

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

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

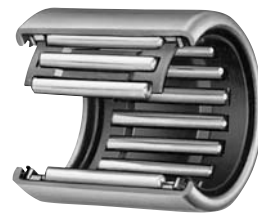


TA
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BA
BHA

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

SHELL TYPE NEEDLE ROLLER BEARINGS

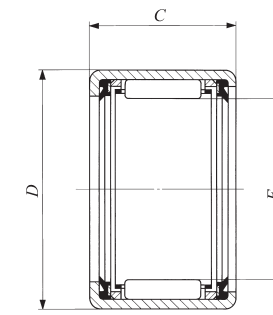
With seals



Shaft dia. 12 – 50mm

| Shaft dia. mm | Identification number | Mass (Ref.) g | Boundary dimensions mm | | | Standard mounting dimensions mm | | | |
|------------------|----------------------------|---------------------|------------------------|----------|----------|---------------------------------|--------|-------------------------|--------|
| | | | F_w | D | C | Shaft dia. h6 | | Housing bore dia. N7 | |
| | | | | | | Max. | Min. | Max. | Min. |
| 12 | TLA 1216 UU | 11.7 | 12 | 18 | 16 | 12.000 | 11.989 | 17.995 | 17.977 |
| 14 | TLA 1416 UU | 13.3 | 14 | 20 | 16 | 14.000 | 13.989 | 19.993 | 19.972 |
| 15 | TLA 1516 UU | 14 | 15 | 21 | 16 | 15.000 | 14.989 | 20.993 | 20.972 |
| 16 | TLA 1616 UU | 14.8 | 16 | 22 | 16 | 16.000 | 15.989 | 21.993 | 21.972 |
| 18 | TLA 1816 UU | 16.3 | 18 | 24 | 16 | 18.000 | 17.989 | 23.993 | 23.972 |
| 20 | TLA 2016 UU TLA 2020 UU | 17.8 22.5 | 20 20 | 26 26 | 16 20 | 20.000 | 19.987 | 25.993 | 25.972 |
| 22 | TLA 2216 UU TLA 2220 UU | 19.4 25 | 22 22 | 28 28 | 16 20 | 22.000 | 21.987 | 27.993 | 27.972 |
| 25 | TLA 2516 UU TLA 2520 UU | 26 33 | 25 25 | 32 32 | 16 20 | 25.000 | 24.987 | 31.992 | 31.967 |
| 28 | TLA 2820 UU | 36.5 | 28 | 35 | 20 | 28.000 | 27.987 | 34.992 | 34.967 |
| 30 | TLA 3016 UU TLA 3020 UU | 30.5 39 | 30 30 | 37 37 | 16 20 | 30.000 | 29.987 | 36.992 | 36.967 |
| 35 | TLA 3516 UU TLA 3520 UU | 35 45 | 35 35 | 42 42 | 16 20 | 35.000 | 34.984 | 41.992 | 41.967 |
| 40 | TLA 4016 UU TLA 4020 UU | 39.5 50.5 | 40 40 | 47 47 | 16 20 | 40.000 | 39.984 | 46.992 | 46.967 |
| 45 | TLA 4520 UU | 56 | 45 | 52 | 20 | 45.000 | 44.984 | 51.991 | 51.961 |
| 50 | TLA 5026 UU | 89 | 50 | 58 | 26 | 50.000 | 49.984 | 57.991 | 57.961 |

Note⁽¹⁾ Allowable rotational speed applies to grease lubrication.
Remark The type with seals is provided with prepacked grease.



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| Basic dynamic load rating C N | Basic static load rating C_0 N | Allowable rotational speed ⁽¹⁾ rpm |
|---------------------------------------|--|--|
| 6 420 | 7 490 | 14 000 |
| 7 080 | 8 840 | 12 000 |
| 7 380 | 9 520 | 11 000 |
| 7 670 | 10 200 | 11 000 |
| 8 230 | 11 500 | 9 000 |
| 8 740 11 100 | 12 900 17 500 | 9 000 9 000 |
| 9 230 11 700 | 14 300 19 300 | 8 000 8 000 |
| 9 440 12 800 | 13 900 20 500 | 7 000 7 000 |
| 13 800 | 23 500 | 6 000 |
| 10 400 14 100 | 16 600 24 500 | 5 500 5 500 |
| 11 600 15 700 | 20 000 29 600 | 5 000 5 000 |
| 12 400 16 700 | 22 800 33 700 | 4 500 4 500 |
| 17 800 | 37 800 | 4 000 |
| 28 800 | 64 100 | 3 500 |