# Crossed Roller Precision Bearings

TIMKEN
Where You Turn

## Designed to offer the highest levels of rotation accuracy and rigidity while conserving space and saving material costs.

### Applications

- *Precision rotary and indexing tables for machine tools*
- *Vertical and horizontal boring mills*
- *Vertical grinding machines*
- *Rotary surface grinding machines*
- *Large gear hobbing machines*
- *Turrets – gun and radar*
- *Large telescopes (radio and optical)*
- *Swiveling cameras*
- *Steering pivots and castors*
- *Pivots where height is restricted*
- *Microscope tables*
- *Crane center pivots*
- *Swiveling bogies*
- *Welding manipulators*
- *Large tanker mooring buoys*
- *Rotary assembly jigs*
- *Industrial robots*

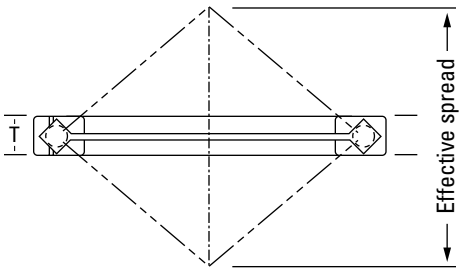
This bearing features two sets of races and rollers brought together at right angles – with alternate rollers facing opposite directions. To save space and require less housing material, the bearing's cross section height barely exceeds that of a single-row bearing. Its steep-angle, tapered geometry results in a total effective bearing spread many times greater than the width of the bearing itself.

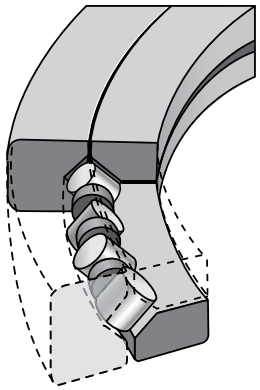
Able to withstand high overturning moments, the crossed roller bearing is ideal for the table bearing of machine tools, including vertical boring and grinding machines. It also is uniquely suited to many other pivot and pedestal application where space is limited and the lowest possible center of gravity of a rotating mass is required.

| Features | Benefits |
|---|---|
| • Two rows of rollers in the space of one<br>• Cross section occupies little space | • Less housing material<br>• Machining requirements reduced<br>• Reduced cost |
| • Roller configuration gives wide effective spread<br>• Line contact on roller and raceway | • Maximum accuracy of rotation<br>• High stability<br>• Greater tilting stiffness |
| • Adjustable design for optimum preload | • Longer expected bearing life<br>• Maximum rigidity<br>• Minimum runout |
| • Relubrication ability – lubricant, fed between the single races, may pass out at each side of the bearing | • Allows lubricants and contaminants to be purged |
| • Nylon separators | • Low inertia<br>• Low running torque |
| • Case-carburized steel | • Provides tough, shock-resistant core and hard, wear-resistant surfaces |

*Type TXRDO*

***Schematic showing the principle of the crossed roller bearing, where two sets of rollers are at right angles to each other (alternate rollers facing opposite directions) within a section height 'T'. Total effective bearing spread and, hence, stability of the bearing is much greater than the actual section height 'T'.***





*Type TXRDO*

The bearing's most common configuration is type TXRDO, featuring a double outer race and two inner rings, with rollers spaced by nylon separators. Other configurations to fit specific application needs are available. We will be happy to recommend a configuration for your environment and application.

Timken crossed roller bearings are available in bore sizes ranging from 203.200 mm to 1549.400 mm (8 in. to 61 in.), with radial and axial runouts as low as 5.08 µm (0.0002 in.); other design configurations are available.

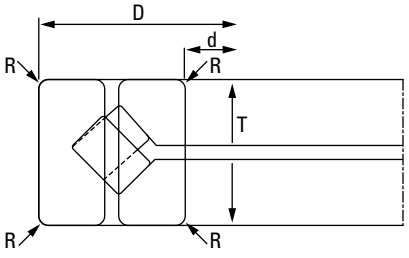
For more information, please consult an authorized Timken distributor or sales representative.

## Dimensions and Ratings
## Crossed Roller Bearing Type TXRDO[1]
### (Double Outer Race – Two Inner Races)

| Metric Precision Levels S, P | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| D | d | T | R | Load Ratings[2] | | K[4] | Preload[5] | Part Number |
| O.D. | Bore | Width | Radius | Radial[3] | Axial | | | |
| **mm** in. | **mm** in. | **mm** in. | **mm** in. | **kN** lbs. | **kN** lbs. | | **mm** in. | |
| **400.000** 15.748 | **300.000** 11.8110 | **37.000** 1.4567 | **1.5** 0.06 | **63.0** 14200 | **80.1** 18000 | 0.45 | **0.025 to 0.040** 0.001 to 0.0015 | JXR637050 |
| **425.000** 16.7323 | **310.000** 12.2047 | **45.000** 1.7717 | **2.5** 0.10 | **82.2** 18500 | **102.0** 22900 | 0.46 | **0.025 to 0.040** 0.001 to 0.0015 | JXR652050 |
| **495.000** 19.4882 | **370.000** 14.5669 | **50.000** 1.9685 | **3.0** 0.12 | **93.6** 21000 | **119.0** 26800 | 0.45 | **0.040 to 0.050** 0.0015 to 0.002 | JXR699050 |

| Inch Precision Levels 3, 0 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| D | d | T | R | Load Ratings[2] | | K[4] | Preload[5] | Part Number |
| O.D. | Bore | Width | Radius | Radial[3] | Axial | | | |
| **mm** in. | **mm** in. | **mm** in. | **mm** in. | **kN** lbs. | **kN** lbs. | | **mm** in. | |
| **279.400** 11.0000 | **203.200** 8.0000 | **31.750** 1.2500 | **1.5** 0.06 | **51.2** 11500 | **61.4** 13800 | 0.48 | **0.025 to 0.040** 0.001 to 0.0015 | XR496051 |
| **457.200** 18.0000 | **330.200** 13.0000 | **63.500** 2.5000 | **3.3** 0.13 | **100.0** 22500 | **123.0** 27600 | 0.47 | **0.040 to 0.050** 0.0015 to 0.002 | XR678052 |
| **609.600** 24.0000 | **457.200** 18.0000 | **63.500** 2.5000 | **3.3** 0.13 | **141.0** 31600 | **178.0** 40100 | 0.45 | **0.040 to 0.050** 0.0015 to 0.002 | XR766051 |
| **760.000** 29.9213 | **580.000** 22.8346 | **80.000** 3.1500 | **6.4** 0.25 | **215.0** 48400 | **234.0** 52500 | 0.46 | **0.075 to 0.100** 0.003 to 0.004 | XR820060 |
| **914.400** 36.0000 | **685.800** 27.0000 | **79.375** 3.1250 | **3.3** 0.13 | **270.0** 60700 | **343.0** 77200 | 0.45 | **0.075 to 0.100** 0.003 to 0.004 | XR855053 |
| **1117.600** 44.0000 | **901.700** 35.5000 | **82.550** 3.2500 | **3.3** 0.13 | **300.0** 67400 | **395.0** 88900 | 0.44 | **0.100 to 0.150** 0.004 to 0.006 | XR882055 |
| **1327.150** 52.2500 | **1028.700** 40.5000 | **114.300** 4.5000 | **3.3** 0.13 | **405.0** 91000 | **534.0** 120000 | 0.44 | **0.125 to 0.180** 0.005 to 0.007 | XR889058 |
| **1828.800** 72.0000 | **1549.400** 61.0000 | **101.600** 4.0000 | **3.3** 0.13 | **516.0** 116000 | **698.0** 157000 | 0.43 | **0.150 to 0.200** 0.006 to 0.008 | XR897051 |

[1]Not all types and sizes are listed. Other design configurations are available. Contact your Timken representative for further information.
[2]Load calculations based on 500 RPM for 3000 hours.
[3]Two-row radial load rating shown.
[4]K-factor is a ratio of radial load rating to axial load rating – see Engineering Section of Machine Tool Catalog for usage.
[5]Preload set by adjustments to top inner ring clamping spacer plate. Value ranges listed apply to typical lower speed applications. Other preload values may be appropriate, and are available on request. Contact your Timken representative.

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