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Crossed Roller Precision Bearings

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



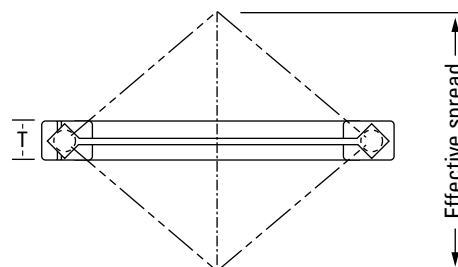
grinding machines. It also is uniquely suited to many other pivot and pedestal applications where space is limited and the lowest possible center of gravity of a rotating mass is required.

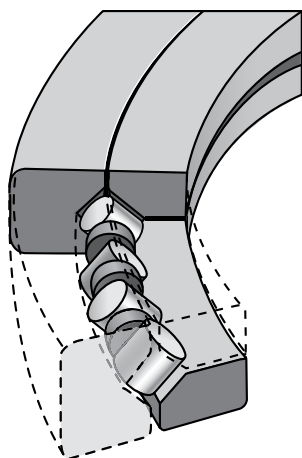
Features	Benefits
• Two rows of rollers in the space of one • Cross section occupies little space	• Less housing material • Machining requirements reduced • Reduced cost
• Roller configuration gives wide effective spread • Line contact on roller and raceway	• Maximum accuracy of rotation • High stability • Greater tilting stiffness
• Adjustable design for optimum preload	• Longer expected bearing life • Maximum rigidity • 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 • Low running torque
• Case-hardened 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 suggest a configuration for your environment and application.

Timken crossed roller bearings are available in bore sizes ranging from 203.2 mm to 1549.4 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.

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

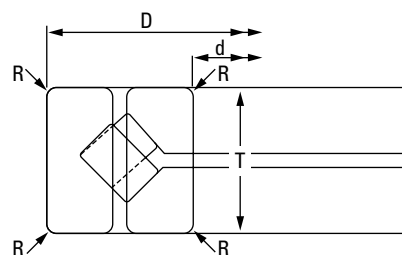
⁽¹⁾Not all types and sizes are listed. Other design configurations are available. Contact your Timken representative for further information.

⁽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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