

Selecting the right slewing bearing

Slewing bearings are typically used in applications where their ability to transmit relatively high loads is of primary importance. However, there are other potential application requirements that can have a significant impact in the selection of an appropriate slewing bearing, and they should be thoroughly considered during the selection process. These considerations include, among others, rotational speed, protection from contamination, accuracy, frictional resistance, and temperature range of the operating environment.



Steps for selecting a slewing bearing

Please note that these guidelines apply to 'normal slewing applications,' which are defined as those that meet the following conditions:

Vertical axis of rotation

Compressive thrust and moment loading

Radial load less than 10% of the thrust load

Oscillation or intermittent rotation with occasional pitch line velocity

Operating temperature within -30°C to $+60^{\circ}\text{C}$)

Mounting surfaces reinforced and machined to bearing manufacturer's criteria

Proper installation

Periodic lubrication

Periodic confirmation of specified bolt tension

If yours is not a 'normal application,' Please contact us. Our engineering will customize the slewing ring for you according to your requirements.



Step 1

Determine what is required of your application in terms of load, speed, accuracy, torque, environment, coatings, mounting arrangements, and lubrication. For standard models, please download our catalog.

Step 2

Determine all maximum bearing loads, being sure to include all dynamic and static loads imposed on the bearing.

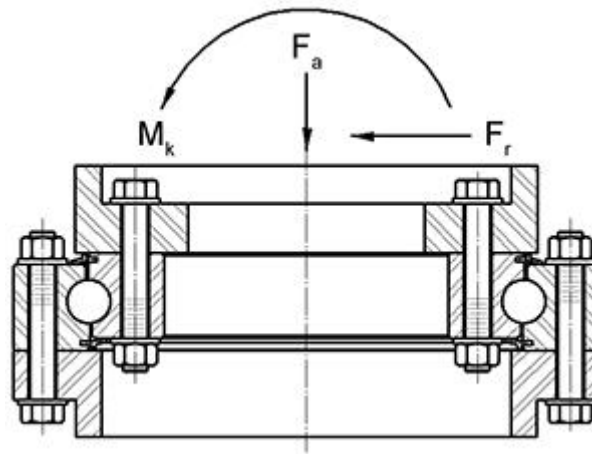
Consider all applied forces to the bearing and gear—not only at rated and working loads, but also need to consider the following information:

extreme weather conditions

impact or testing

assembly or disassembly

all other situations



Step 3

Multiply the resultant bearing forces by the applicable safety factor (SF). See Table 1 for the service factors of common applications

Table 1—Service factors	
Application	Service factor (SF)
Aerial lift devices	
Aerial baskets, platforms, ladders, etc.	1.00
Conveyors	1.00
Cranes	

Mobile (loads limited by machine stability)	
Normal construction duty (tire mounted)	1.00
Normal construction duty (crawler mounted)	1.10
Production duty such as scrap and ship yards	1.25
Forestry handling (logging)	1.50
Stacker cranes (must include dynamic forces as loads)	1.25
Pedestal or tower (loads not limited by machine stability)	
Loads continually monitored by safe load device	1.25
Applications with risk of sudden impact load application	1.50
Excavators	
Load limited by tipping	1.25
Load limited by hydraulic pressure relief	1.50
Index and turnstile tables* (include any shock loads for evaluation)	
Occasional use with intermittent rotation	1.00
Frequent use with intermittent rotation	1.25

Frequent use with intermittent rotation and impact loads	1.50
Industrial manipulators and robots	
Occasional service	1.00
Frequent service	1.25
Steering gear (must include dynamic and shock loads due to transit forces)	
Pneumatic tires	1.25
Solid tires	1.50

Step 4

If an integral gear is desired, determine the required gear capacity. As with bearing loads, consider all conditions that would generate potential gear loads. Examples include dynamic loads while working vs static loads; loads on incline; and overload testing. Consider also the duty cycle at each of these conditions.



Step 5

Slewing bearings can be designed to suit a number of mounting arrangements. If there are requirements for pinion and bolt, please inform our engineer in detail



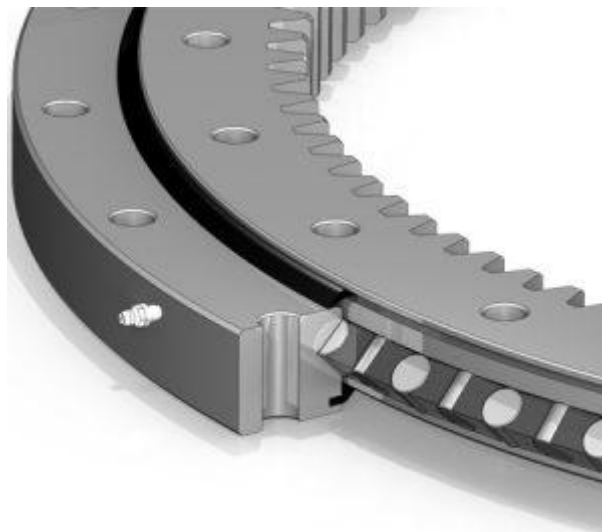
Step 6

Review available bearing styles and cross-sections. Xuzhou Hbang slewing bearing Catalog provides detailed information about the design features, sizes, and ratings of each bearing series [Download the catalog](#).

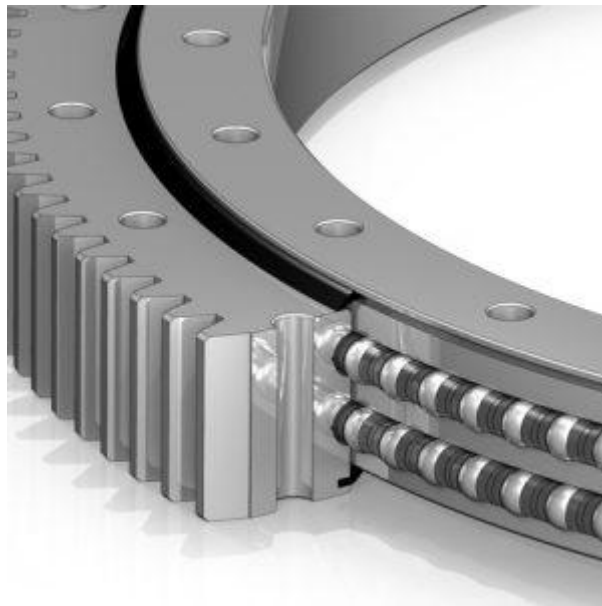
Single row ball slewing bearing



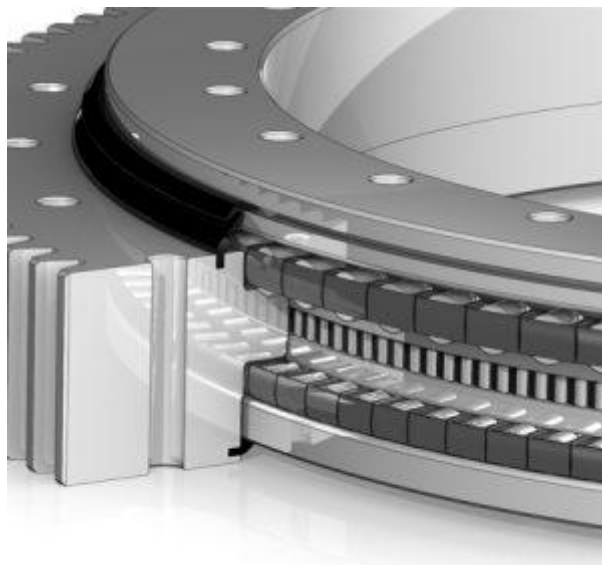
Row cross roller slewing bearing



Double row ball slewing bearing



Three row roller slewing bearing



Step 7

Make a preliminary selection by comparing the resultant operating bearing forces, including service factor (SF), to the bearing's rating curve.

In order for a bearing to be appropriate for a given application, all required resultant force combinations should fall below the curve.

Assure all extreme load conditions fall below the bearing's rating curve. If extreme load condition is static and only occurs several times during bearing's service life do not include the service factor. Otherwise, include the service factor.

The maximum thrust rating of a bearing should exceed 3 times the maximum operating thrust force on the bearing, regardless of the moment force at that condition. This criteria is due to concern for rigidity of the supporting structure and ability to properly distribute the load around the bearing's diameter. If the bearing desired does not meet this criteria, contact the bearing manufacturer for assistance.

Step 8

Check the gear size, quality, and rating for suitability.

Step 9

Finally, confirm that the bearing you select meets all of your design requirements. Submit a completed specification data sheet and we will send you production drawing for reference.

Conclusion

Like all bearings, slewing bearings are used as connecting parts and have the functions of rotation and load bearing. Traditional slewing ring bearings are considered large diameter, large section, low precision bearings. But today, they have apertures as small as 50 millimeters, making them suitable for robotics, radar pedestals, and other precision applications.

Use a single large diameter bearing to allow wires and tubing to pass through the bearing bore. This simplifies the overall design, helps protect components, and improves appearance. Choosing the correct slewing bearing is the key. Attention to all relevant design requirements, and with the assistance of the bearing manufacturer, a slew bearing that meets or exceeds all application requirements can be specified