洛阳特重轴承有限公司
LUOYANG HEAVY-DUTY BEARING CO.,LTD.

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洛阳特重轴承有限公司
LUOYANG HEAVY-DUTY BEARING CO.,LTD.

转盘轴承安装使用说明书

转盘轴承安装前的处置

1、防锈和包装

LTZC转盘轴承内、外表面均涂轴承防锈润滑两用油，包装采用塑料薄膜、编织带缠绕。大尺寸转盘轴承外表面还要用塑料布缠绕。对于小尺寸精密级转盘轴承再用木箱包装。

2、运输

在运输期间尽可能使轴承水平放置，仅允许稍微倾斜、震动，应避免碰撞。打开包装后用吊装螺栓拧在内圈或外圈的吊装孔内将轴承搬运到安装位置。

3、保管

（1）使用前轴承的防锈期为12个月，请勿打开包装。超过一年后如未安装使用则需维护保养，转盘轴承滚道、外表面、齿面均应进行防锈处理。

（2）在干燥平坦的场地上水平放置。

（3）应与化学品及其它带有腐蚀性的物品隔离存放。

（4）如果多套转盘轴承叠放在一起时，每套转盘轴承之间沿圆周方向至少放置三个均布、高度相等的木垫块，且上、下层垫块位置应放置一致。

转盘轴承的安装

1、安装基座的要求

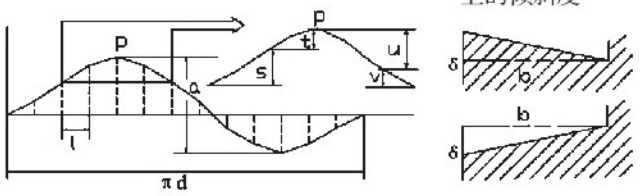
（1）转盘轴承的安装基座应在焊接或铸造工序后进行消除内应力处理，并对与之配合的安装基面进行机械加工，清除表面的毛刺及杂物。安装基座除有足够的刚度

外，其安装基面的技术要求应符合表1的规定。

表1　安装基面的技术要求　单位：μm

孔中心圆直径 D_1 或 D_2mm		平面度			圆周两相邻单位长度L (L=1 个孔距) 上相同方向倾斜度变化量 (s-t) （mm）			圆周两相邻单位长度L (L=1 个孔距) 上相反方向倾斜度变化量 (t+u) （mm）			径向宽度 b 的倾斜度 δ			端面粗糙度 Ra		
		轴承精度等级														
超过	到	P0	P6	P5	P0	P6	P5	P0	P6	P5	P0	P6	P5	P0	P6	P5
250	400	120	80	50							60	40	25	2.5	1.25	0.8
400	630	150	100	60	0.0002L			0.0002L			80	50	30	2.5	1.25	0.8
630	1000	200	120	80	0.00013L			0.00013L			100	60	40	2.5	1.25	0.8
1000	1600	250	150	100	0.00008L			0.00008L			120	80	50	3.2	2.5	1.25
1600	2500	300	200	120							150	100	60	3.2	2.5	1.25
2500	4000	400	250	150							200	120	80	3.2	2.5	1.25
4000	6300	500	300	200							250	150	100	3.2	2.5	1.25

安装基面的平面度　　安装基面在径向宽度上的倾斜度



圆周展开

（2）当径向负荷超过轴向负荷的10%时，应有径向定位。

（3）安装基面应平整、干燥、清洁、无润滑剂。对不能进行机械加工的连续表面应采用注塑法保证安装基面的精度。

2、安装前的准备

（1）安装前打开轴承的包装时，检查轴承回转是否灵活，检查密封圈是否完好，否则更换密封圈。

（2）转盘轴承滚道淬火软带（外部标记“S”或装填塞处），应置于非负荷区或非经常负荷区。

（3）安装螺栓拧紧前，进行齿轮啮合检查，确保啮合间隙符合齿轮精度的要求。

联接螺栓

1、转盘轴承所用联接螺栓应采用高强度螺栓，根据受力情况采用合适的强度等级，其强度等级不低于GB/T3098.1规定的8.8级。螺母采用与螺栓相适应的强度等级，其机械性能应符合GB/T3098.2的规定。

2、安装螺栓时，可选用调质平垫圈，禁止使用弹簧垫圈。

3、转盘轴承径向定位后，应用力矩扳手交叉拧紧螺栓，同时检查轴承的自由回转状况。拧紧螺栓时，应有足够的预紧力，其预紧力为螺栓材料屈服极限的60%～70%;螺栓的预紧负荷应符合表2的规定。

表2　不同直径螺栓的预紧负荷

螺栓强度等级 ISO898			8.8			10.9			12.9		
屈服极限 N/㎟			≤16 640 >16 660			940			1100		
螺栓直径	螺纹受应力面积 ㎟	螺纹的截面积 ㎟	螺栓安装预紧力 F (N)	理论紧固力矩 MA (Nm)	扭力矩 Nm M'=0.9MA	螺栓安装的预紧力 F (N)	理论紧固力矩 MA (Nm)	扭力矩 Nm M'=0.9MA	螺栓安装预紧力 F (N)	理论紧固力矩 MA (Nm)	扭力矩 Nm M'=0.9MA
M5	14.2	12.7	6400	6.1	5.5	9300	8.9	8.0	10900	10.4	9.3
M8	20.1	17.9	9000	10.4	9.3	13200	15.5	13.9	15400	18	16.2
M8	36.6	32.8	16500	25	22.5	24200	37	33	28500	43	38
M10	58	52.3	26000	51	45	38500	75	67	45000	87	78
M12	84.3	76.2	38500	87	78	56000	120	117	66000	150	135
M14	115	105	53000	140	126	77000	205	184	90000	240	216

M16	157	144	72000	215	193	106000	310	279	124000	370	333
M18	193	175	91000	300	270	129000	430	387	151000	510	459
M20	245	225	117000	430	387	166000	620	558	194000	720	648
M22	303	282	146000	580	522	208000	830	747	243000	970	873
M24	353	324	169000	740	666	239000	1060	954	280000	1240	1116
M27	459	427	221000	1100	990	315000	1550	1395	370000	1850	1665
M30	561	519	270000	1500	1350	385000	2100	1890	450000	2500	2250
M33	694	647	335000	需要采用螺栓液压拉紧装置		480000	需要采用螺栓液压拉紧装置		580000	需要采用螺栓液压拉紧装置	
M36	817	759	395000			560000			680000		
M39	976	913	475000			670000			790000		
M42	1120	1045	542000			772000			904000		
M45	1300	1224	635000			905000			1059000		
M48	1470	1377	714000			1018000			1191000		
M52	1760	1652	857000			1221000			1429000		
M56	2030	1905	988000			1408000			1648000		
M60	2360	2227	1158000			1647000			1927000		

润滑与维护

1、转盘轴承出厂时滚道内涂有少量润滑脂，使用时应根据不同的工作条件，重新充满新的润滑脂。

2、转盘轴承应定期加注润滑脂，每间隔50~100小时加油一次，特殊工作环境、热带、湿度大、灰尘多、温度变化大以及连续工作时，应缩短润滑周期。机器长期停止运转的前后也必须加足新的润滑脂。每次润滑必须将滚道内注满润滑脂，直至从密封处渗出为止。注润滑脂时，要慢慢转动转盘轴承，使润滑脂填充均匀。

3、齿面应经常清除杂物，并涂以相应的润滑脂。

4、转盘轴承首次运转100小时后，应检查螺栓的预紧力。以后每运转500小时检查一次，必须保持足够的预紧力。

5、使用中注意转盘轴承的运转情况，如发现噪音、冲击、功率突然增大，应立即停机检查，排除故障，必要时需拆检。

6、经常查看密封的完好情况，如果发现密封带破损应及时更换。如发现脱落应及时复位。

润滑脂的选择

转盘轴承的润滑，因为综合工作因素较多，可根据具体要求选择最佳的润滑脂。推荐的润滑脂如表3。

表3　推荐润滑油脂

转盘轴承	工作条件		润滑位置	润滑脂		
				名称	牌号	标准号
尼龙或金属保持架、橡胶圈密封	低温、常温、潮湿 -40℃～+60℃		滚道	钙基润滑脂	ZG-3 ZG-4Z ZG-5	GB491
			齿轮	石墨钙基润滑脂	ZG-S	SY1405
金属保持架迷宫式密封	高温	40℃～140℃	滚道	锂基润滑脂	ZL-1 ZL-2	0/SY1002
				M_oS_2复合钙基润滑脂	3号	
			齿轮	4号高温润滑脂	ZN6-4	GB491
	潮湿	80℃～180℃	滚道	M_oS_2复合钙基润滑脂	2号	
			齿轮	4号高温润滑脂	ZN6-4	GB491
	常温、耐海水腐蚀 ～50℃		滚道	2号铝基润滑脂	ZU-2	SYB1408
			齿轮	2号铝基润滑脂	ZU-2	SYB1408
金属保持架橡胶圈或其他密封	常温、重载 -20℃～+130℃		滚道	美孚极压锂基润滑脂	Mobilux EP2（力士）	
			滚道	壳牌极压锂基润滑脂	Shell Alvania EP2（爱万利）	
			滚道	BP 极压锂基润滑脂	BP Energrease LS-EP	

沿此边线剪下寄回

特重轴承
HEAVY-DUTY BEARING

用 户 意 见 反 馈 表

尊敬的用户，请将您的意见，及时反馈给洛阳特重轴承有限公司。

使用单位：_____

轴承型号及编号：_____

反馈意见

①_____

②_____

③_____

注：洛阳特重轴承有限公司质量服务电话：0379-62921300
技术咨询电话：0379-62921308　62921305

Slewing rings

Mounting and Maintenance instructions

Treatment before mounting

Mounting the slewing ring

Maintenance

Treatment before mounting

1)Packing

All LTZC slewing bearings leave their factory with rust inhibitor lubricant coatings on both the inner and outer surfaces. Bearings are generally Kraft paper wrapped, with larger bearings have an additional Poly-wrap seal. Individual wooden packaging is manufactured for larger bearings, these packaging systems allow for easier transportation, handling and storage.

2)Storage

Bearings should be stored in a clean, dry and chemical free environment, (not outside). They should be well supported preferably on a flat surface in the horizontal position, if several bearings of equal size are to be stored they should be stacked, again, in the horizontal position with equal in size dividing blocks at a minimum 120 degrees around the top and bottom of the corresponding surfaces of each bearing. These bearings can be stored for up to 12 months from the date of manufacture without any additional maintenance. For bearings that remain in storage over 12 months these should have their grease and rust preventative coatings removed, once cleaned these surfaces should be re-coated and the bearing re-greased, LTZC recommend that guidance should be sought from LTZC in order to carry out this storage maintenance task, should it be required.

3)Transportation

The slewing ring should be placed on flat, slightly incline and shake are allowed. They should be free from collision with any other rigid materials during the period of transporting. Lift the slewing ring to the mounting surface by using of screw bolt on the inner or outer rings after unwrap the package.

Mounting the slewing ring

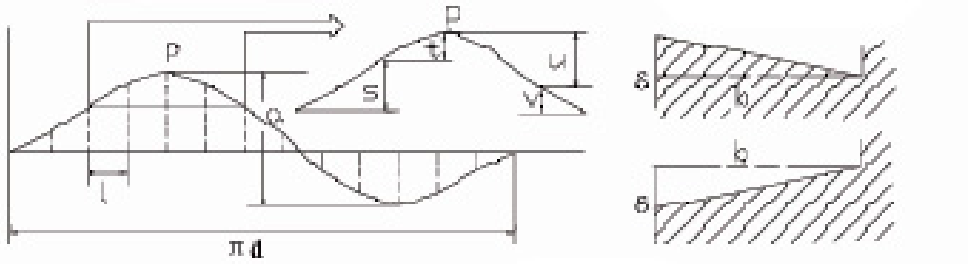
LTZC take great care in producing slewing bearings for their customers, these rings, balls & rollers are precision bearing components, it is important that the assembler take care to install these bearings inline with the manufacturer's instructions, in order to ensure efficient and effective operation of their customer's equipment. Prior to installation a close inspection should be performed so as to ensure that upper and lower mounting surfaces are flat level and parallel to each other (see Table & Graph opposite), these surfaces should be paint free, free from indentations, burrs or any other contaminant that could cause distortion or misalignment between the inner and outer ring when mounted to their corresponding surfaces. The surfaces themselves should have sufficient hardness and have such a structure so as to avoid distortion or deflection when the bearing is under load. ***Table 1*** *opposite provides clear indication as to the acceptance criteria for mounting surfaces for these types of bearings. The bearing should be brought into position by either firmly secured eyebolts or nylon strops, in both cases a minimum of three supports should be applied. The LTZC slewing bearing has a soft zone marked with an "S" on the outer-ring; this location is in direct line with the load-hole plug, it is important that this area is located at 90 degrees to the major load zone. In order to ensure that the bearing is operating with minimum torque install the lock down bolts but do not tighten, measure this torque value over 360 degrees so as to ensure correct alignment for both inner and outer ring, also any pinion gear drive that may apply. Providing these resistances are acceptable then the lock down may begin in the transverse directional manner, prior to this lock down there should be enough pre-load applied to equal 70% of the field limit. Bolts should be torqued in accordance with their size, grade and bolt manufacturers specification,* ***Table 2*** *shows an indication as to these recommended values, the use of any type of lock washer is prohibited from any slewing ring installations.*

Table 1 : Technical Specifications for slewing ring mounting Surface

Center hole diameter D1 or D2 mm		Flatness a			Deviation of inclination pitch with same direction on circle adjacent unit length (L= a row pitch)			Deviation of inclination pitch with same direction on circle adjacent unit length (L= a row pitch)			Inclination pitch of radial width b δ			Surface roughness Ra		
PRECISION CLASS																
OVER	TO	G	E	D	G	E	D	G	E	D	G	E	D	G	E	D
250	400	120	80	50	T2000.0	T3I000.0	T8000.0	T2000.0	T3I000.0	T8000.0	60	40	25	2.5	1.25	0.8
400	630	150	100	60							80	50	30	2.5	12.5	0.8
630	100	200	120	80							100	60	40	2.2	12.5	0.8
1000	1600	250	150	100							120	80	50	3.2	2.5	1.25
1600	2500	300	200	120							150	100	60	3.2	2.5	1.25
2500	400	400	250	150							200	120	80	3.2	2.5	1.25
4000	6300	500	300	200							250	150	100	3.2	2.5	1.25

Flatness of working table surface

Gradient of working table surface on the radial width



Circle Outspread

Table 2 :The pre-load of different bolts

Strength class of bolt ISO898			*8.8 M≤16 640*			*10.9 940*			*12.9 1100*		
limit of yielding N/mm2			*M＜16 660*								
Dia.	*Stress area*	*Section area*	*Pre-tightening force*	*Theoretical fastener moment*	*torque NM*	*Pre-tightening force*	*Theoretical fastener moment*	*torque NM*	*Pre-tightening force*	*Theoretical fastener moment*	*torque NM*
	mm2	*mm2*	*FMN*	*MANm*	*M=0.9MA*	*FMN*	*MANm*	*M=0.9MA*	*FMN*	*MANm*	*M=0.9MA*
M5	*14.2*	*12.7*	*6400*	*6.1*	*5.5*	*9300*	*8.9*	*8*	*10900*		
M6	*20.1*	*17.9*	*9000*	*10.4*	*9.3*	*13200*	*15.5*	*13.9*	*15400*	*10.4*	*9.3*
M8	*36.6*	*32.8*	*16500*	*25*	*22.5*	*24200*	*37*	*33*	*28500*	*18*	*16.2*
M10	*58*	*52.3*	*26000*	*51*	*45*	*38500*	*75*	*67*	*45000*	*43*	*38*
M12	*84.3*	*76.2*	*38500*	*87*	*78*	*56000*	*120*	*117*	*66000*	*87*	*78*
M14	*115*	*105*	*53000*	*140*	*126*	*77000*	*205*	*184*	*90000*	*150*	*135*
M16	*157*	*144*	*72000*	*215*	*193*	*106000*	*310*	*279*	*124000*	*240*	*216*
M18	*193*	*175*	*91000*	*300*	*270*	*129000*	*430*	*387*	*151000*	*370*	*333*
M20	*245*	*225*	*117000*	*430*	*387*	*166000*	*620*	*558*	*194000*	*510*	*459*
M22	*303*	*282*	*146000*	*580*	*522*	*208000*	*830*	*747*	*24300*	*720*	*648*
M24	*353*	*324*	*168000*	*740*	*666*	*239000*	*1060*	*954*	*280000*	*970*	*873*
M27	*459*	*427*	*221000*	*1100*	*990*	*315000*	*1550*	*1395*	*370000*	*1240*	*1116*
M30	*561*	*519*	*270000*	*1500*	*1350*	*385000*	*2100*	*1890*	*450000*	*1850*	*1665*
M33	*694*	*647*	*335000*			*480000*			*560000*	*2500*	*2250*
M36	*817*	*759*	*395000*			*560000*			*660000*		
M39	*976*	*913*	*475000*			*670000*			*790000*		
M42	*1120*	*1045*	*542000*	*need bolt liquor*		*772000*	*need bolt liquor*		*904000*	*need bolt liquor*	
M45	*1300*	*1224*	*635000*	*straining device*		*905000*	*straining device*		*1059000*	*straining device*	
M48	*1470*	*1377*	*714000*			*1018000*			*1191000*		
M52	*1760*	*1652*	*857000*			*1221000*			*1429000*		
M56	*2030*	*1905*	*989000*			*1408000*			*1648000*		
M60	*2360*	*2227*	*1156000*			*1647000*			*1927000*		

Maintenance

1)Periodic inspection of Bolts and abnormity

In-order to ensure optimum performance and longevity of LTZC slewing bearings in operation, the mounting screws must be checked at regular fixed intervals of time or operating hours. LTZC recommend that after the first 100 hours of operation that the bolts preload of the inner ring and outer ring is checked and adjusted (if required) to the installation value. After that, checking every 500 operating hours later. Additional, the slewing ring must be stop operating to check if the noise, impact, and power increased abruptly happened.

2)Lubrication

Lubrication should be applied according to the actual working conditions after the slewing ring mounted. Re-lubrication should be applied preferably with the slow rotation of the bearing at the same time as injecting grease, in order to apply even distribution of the grease. Greasing should generally take place after 100 hours of operation, where the application is in fast turning equipment or in a continuous cycle operation then this re-greasing should take place after 8 hours of operation. If gears or pinion drives are integrated into these applications then this gearing should also be greased at these intervals. When these bearings are operating in extremely hostile conditions e.g.: extreme temperatures, excessively dusty environment or within a high moisture content environment then it is recommended that greasing intervals be closely reviewed, the ***LTZC SR Technical Department*** *will advise their customers on such issues as this.*
Automatic Greasing systems can be applied to these Bearings; however, this does not eliminate the visual inspections and bolt/mounting tension checks that are required periodically.

Note: At the time of delivery the raceway and gear is not greased if customer do not special require.

3) Grease selection

The end user should select the lubricant grease according to the actual working conditions. See the following ***Table 3.***

Table 3: Grease of selection

Slewing ring Structure and Seal type	*Work condition*		*Lubrication Place*	*Grease*	
				Name	*Model*
The whole, split cage or Plastic Spacer Rubber seal	*Low temperature, normal temperature and aquosity -40 ℃- +60 ℃*		*Raceway*	*Calcium base grease*	*ZG - -3* *ZG - -4* *ZG - -5*
			Gear	*Graphite Calcium base grease*	*ZG - -S*
Metal spacer	*High temperature and aquosity*	*40 ℃- 140 ℃*	*Raceway*	*Lithium base grease*	*ZG - 1* *ZG - 2*
				MoS2 Complex Calcium base grease	*NO. 3*
			Gear	*NO.4 High- temperature Grease*	*ZN6 -4*
Labyrinthic seal		*80 ℃- 180 ℃*	*Raceway*	*MoS2 Complex Calcium base grease*	*NO. 2*
			Gear	*NO.4 High- temperature Grease*	*ZN6 -4*
		Normal temperature, sea water corrosion-resistant -50 ℃	*Raceway*	*NO.2 aluminum-based grease*	*ZU - 2*
			Gear	*NO.2 aluminum-based grease*	*ZU - 2*

Comment by end user:

1. Feedback

(1) _____

(2) _____

(3) _____

2. Proposal

(1) _____

(2) _____

(3) _____

Send feedback and Proposal directly to the following address:

Luoyang Heavy-duty Bearing Co.Ltd

Address:Bearing Professional Park,Xianglushan Industrial Cluster Zone,Louyang China.

Tel: 0086-379-60109100 Fax:0086-379-60212758

Email: eric.wang@ltzzc.com;