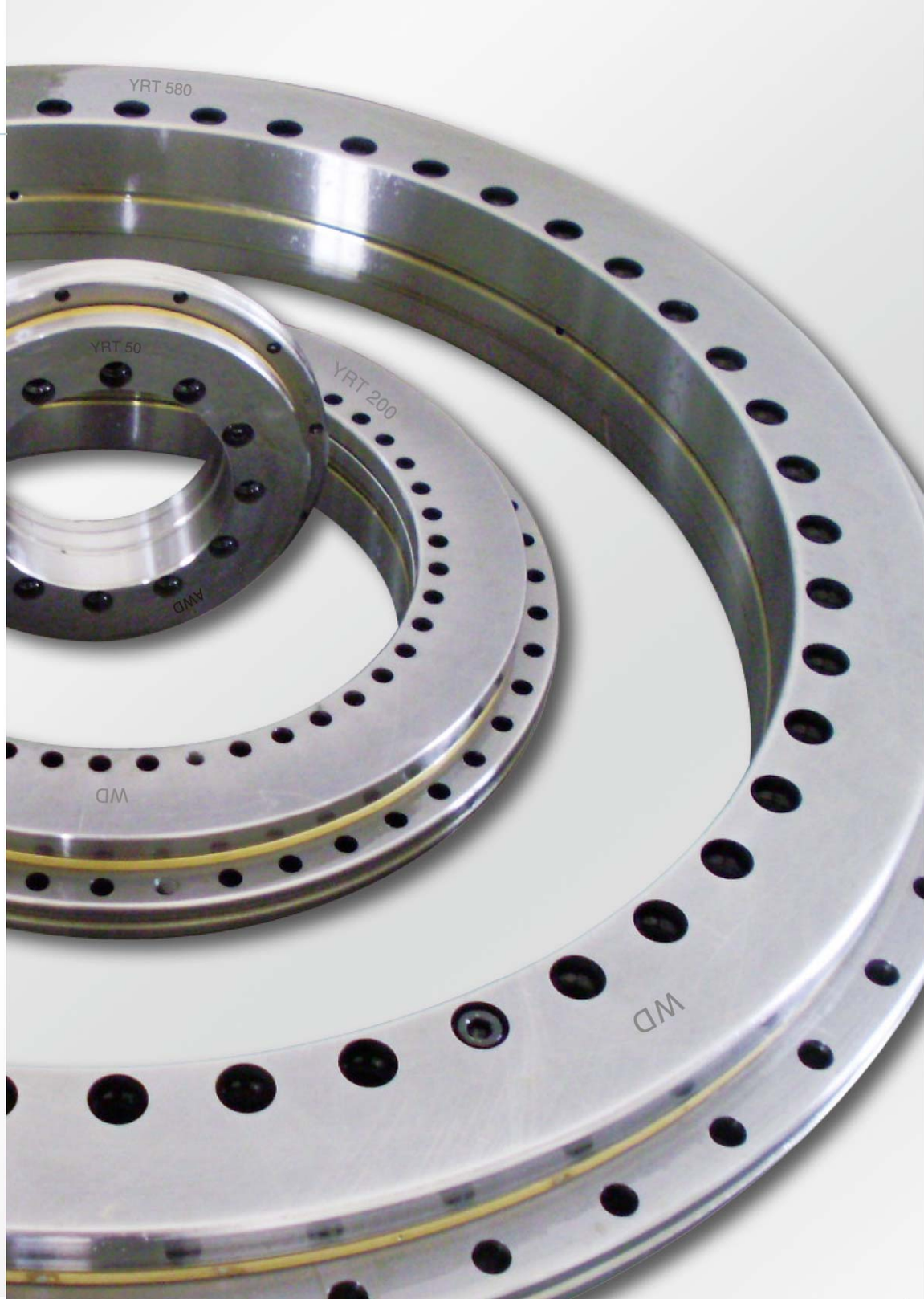
WD
BALL & ROLLER
BEARINGS

YRT Rotary Table Bearings

YRT回转支承轴承

YRT系列轴承主要用于加工中心、数控设备的回转工作台。其内部的三列圆柱滚子可同时承受较大的轴向负荷和径向负荷，具有很高的抗颠覆力矩能力。极高的旋转精度为高精密设备的加工精度等级提供了强有力的支持。产品的集成化设计可有效减少安装空间，并使设计得到了简化。

YRT bearings are mainly used in machning center and rotary disk of numerical–control equipment. Due to the triple–row cylindrical roller, the YRT bearing is able to afford heavy load both from radial and axial direction at the same time as well as good anti–turnover capability. Due to the extremely high running accuracy, the machining precision of those high–precise equipments are well guaranteed. The intergration design can help to save mounting space and simplize the equipment configuration design.



特性

YRT精密转台轴承是将双向推力轴承与一个向心引导轴承紧固在一起，这些快速安装的预润滑单元具备极高的刚性和承载能力，并且有特别高的旋转精度。它们能够承受径向载荷、两个方向的轴向载荷和颠覆力矩。特别适合需要高精度运行的场合，比如转台、铣头和双面夹具中的轴承配置。由于安装孔在轴承环上，产品特别容易安装。

轴承在安装后有轴向和径向预载。

YRT回转支承轴承
YRT Rotary Table Bearings

密封/润滑

YRT精密转台轴承设有密封件，YRT系列应使用锂基润滑脂，通过外圈和L环进行润滑。

工作温度

YRT精密转台轴承适合的工作温度是30℃～120℃

设计和安全说明

基本额定寿命

载荷容量和基本额定寿命必须经过校准。关于基本额定寿命的校准请联系我们，并且给定速度、载荷和持续操作时间。

静载安全系数

静载安全系数S0是指轴承抵抗永久损坏的能力。它取决于下面的公式：

$$S_0 = \frac{C_{0r}}{F_{0r}} \text{ or } \frac{C_{0a}}{F_{0a}}$$

S0静载安全系数:Cor Coa N

按产品列表的基本额定载荷:For Foa N

轴承承受的最大静载

注意!在切削机床和类似的应用领域，S0必须＞4

极限转速

轴承允许的极限转速已在产品列表中标明。工作温度的变化会更加依赖环境条件，计算是使用基于摩擦力矩的热平衡方法获得。

摩擦力矩

轴承摩擦力矩主要受预载荷和润滑脂的粘度、数量影响。

*润滑剂的粘度和数量依赖润滑剂的等级和工作温度；

*轴承预载依赖安装和邻近零件的几何精度，内、外圈间的温差，螺钉紧固力矩和安装位置。

启动力矩

对YRT轴承来说，必须要考虑到它的启动力矩，它的启动力矩可以随着动速的提高而增加2到2.5倍。

配合零件精度

配合零件必须符合下面的要求，任何偏离将导致轴承摩擦力矩、旋转精度和工作性能的改变。

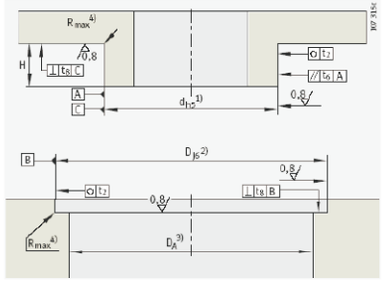
图形说明

1.支撑整个轴承，必须确保支撑方式足够牢靠；

2.只有当为了满足载荷或精密的轴承位置而有径向支撑的要求时，才会要求精密安装；

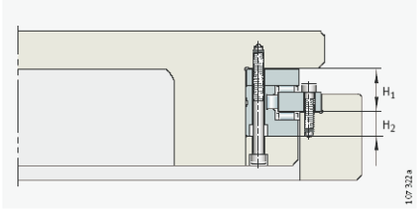
3.注意尺寸表中D1的尺寸，确保回转套圈与配合零件之间有足够的空间；

配合零件的几何和位置精度



Nominal shaft diameter d mm		Deviation d		Roundness Parallelism Perpendicularity t_2, t_2, t_8
over	incl.	for tolerance zone h5 μm		μm
50	80	0	−13	3
80	120	0	−15	4
120	150	0	−18	5
150	180	0	−18	5
180	250	0	−20	7
250	315	0	−23	8
315	400	0	−25	9
400	500	0	−27	10
500	630	0	−28	11
630	800	0	−32	12
800	1000	0	−36	14

Nominal shaft diameter D mm		Deviation D		Roundness Parallelism Perpendicularity t_2, t_2, t_8
over	incl.	for tolerance zone h5 µm		µm
120	150	+18	−7	5
150	180	+18	−7	5
180	250	+22	−7	7
150	315	+25	−7	8
315	400	+29	−7	9
400	500	+33	−7	10
500	630	+34	−7	11
630	800	+38	−8	12
800	1000	+44	−12	14
1000	1250	+52	−14	16



安装

无支撑圈的L系列支撑圈
无支撑圈的L系列圈的轴承型号为:YRT(孔径)。
带支撑圈的L系列圈
带支撑圈的L系列圈的轴承型号为:YRT<bore diameter>VSP
注意!对带L型支撑的轴承，目前只接受型号后带VSP的预定。如果是常规设计安装L系列支撑圈，轴承的摩擦力矩会有相应的增加，支撑圈的高度至少要是垫圈处轴的高度的2倍。

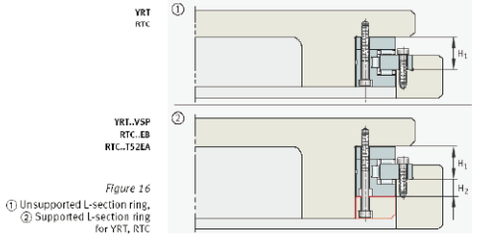


Figure 16
① Unsupported L-section ring,
② Supported L-section ring for YRT, RTC

固定螺丝用来在运输途中固定轴承零件，为了更快捷的定位轴承中心，装配前应拧松螺丝，在装配后再固定或取走螺丝。使用扭矩板手按交叉顺序拧紧固定螺丝，固定过程分为三步，并有各自相应的扭矩MA。
第一步 40% of MA
第二步 70% of MA
第三步 100% of MA
注意固定螺丝的等级是否正确
注意！装配的力只能施加在被装配的套圈上，不要通过滚动体传递。在装配和拆卸轴承时，不要将零件分开或互换，如果轴承的运动异常困难，将固定螺丝拧松，再按照十字顺序重新拧紧，这样做可以消除变形。装配只能按照图表17，装配与维护手册进行。

尺寸公差、安装尺寸，轴向径向跳动

Dimensional tolerances				Mounting dimensions					Axial and radial runout	
Bore		Outside diameter				Re-stric-ted		Re-stric-ted	Stan-dart	Re-stric-ted
d mm	Δd_s mm	D mm	ΔD_s mm	H_1 mm	ΔH_{1s} mm	ΔH_{1s} mm	H_2 mm	ΔH_{2s} mm	µm	µm
50	−0.008	126	−0.011	20	±0.125	±0.025	10	±0.02	2	1
80	−0.009	146	−0.011	23.35	±0.15	±0.025	11.7	±0.02	3	1.5
100	−0.01	185	−0.015	25	±0.175	±0.025	13	±0.02	3	1.5
120	−0.01	210	−0.015	26	±0.175	±0.03	14	±0.02	3	1.5
150	−0.013	240	−0.015	26	±0.175	±0.03	14	±0.02	3	1.5
180	−0.013	280	−0.018	29	±0.175	±0.03	14	±0.025	4	2
200	−0.015	300	−0.018	30	±0.175	±0.04	15	±0.025	4	2
260	−0.018	385	−0.02	36.5	±0.2	±0.05	18.5	±0.025	6	3
325	−0.023	450	−0.023	40	±0.2	±0.05	20	±0.025	6	3
395	−0.023	525	−0.028	42.5	±0.2	±0.05	22.5	±0.025	6	3
460	−0.023	600	−0.028	46	±0.225	±0.06	24	±0.03	6	5[3]
580	−0.025	750	−0.035	60	±0.25	±0.075	30	±0.03	10	5[3]
650	−0.038	870	−0.05	78	±0.25	±0.1	44	±0.03	10	5[3]
852	−0.05	1095	−0.063	80.5	±0.3	±0.12	43.5	±0.03	12	6[3]
950	−0.05	1200	−0.063	86	±0.3	±0.12	46	±0.03	12	6[3]
1030	−0.063	1300	−0.08	92.5	±0.3	±0.15	52.5	±0.03	12	6[3]

For rotating inner and outer ring,measured on fitted bearing, with ideal adjacent construction.
Special design,YRT only.
By agreement only for rotating outer ring.

Dimensional tolerances				Mounting dimensions			Axial and radial runout
Bore		Outside diameter					
d mm	Δd_s mm	D mm	ΔD_s mm	H_1 mm	ΔH_{1s} mm	H_2 mm	µm
200	−0.015	300	−0.018	30	$^{+0.04}_{-0.06}$	15	4
260	−0.018	385	−0.02	36.5	$^{+0.05}_{-0.07}$	18.5	6
325	−0.023	450	−0.023	40	$^{+0.06}_{-0.07}$	20	6
395	−0.023	525	−0.028	42.5	$^{+0.06}_{-0.07}$	22.5	6
460	−0.023	600	−0.028	46	$^{+0.07}_{-0.08}$	24	6

For rotating inner and outer ring,measured on fitted bearing, with ideal adjacent construction.

特殊设计

可提供YRT:轴向与径向跳动添加版，轴向或径向跳动公差减少50%，公差减少50%，YRT:装配H1和H2时更接近的公差，添加版：H1公差……H2公差……

Features:

YRT precision rotary table bearing is a kind of bearing fixed by a bidirectional thrust bearing and a centripetal–guided bearing. They can support radial loads, axial loads from both directions and tilting moments free from clearance and are particularly suitable for bearing arrangements with high requirements for running accuracy, like rotary tables, millings heads and reversible clamps.Due to the fixing holes in the bearing rings, the units are very easy to fit.
The bearings are radially and axially preloaded after fitting.

Sealing/Lubricant:

YRT bearings are supplied with seals. YRT bearings are greased by a lithium complex soap grease and can be lubricated via the outer ring and L–section ring.

Operating temperature:

YRT bearings are suitable for operating temperatures from 30℃ to 120℃

Design and safety guidelines

Basic rating life:

The load carrying capacity and life must be checked for the radial and axial bearing component.
Please contact us in relation to checking of the basic rating life .The speed ,load and operating duration must be given.

Static load safety factor:

The static load safety factor S0 indicates the security against impermissible permanent deformations in the bearing.
It is determined as follows:

$$S_0 = \frac{C_{0r}}{F_{0r}} \text{ or } \frac{C_{0a}}{F_{0a}}$$

Static load safety factor :Cor Coa N
Basic static load rating according to dimension tables: For Foa N
Maximum static load on the radial or axial bearing.
Caution! In machine tools and similar areas of application,S0 should be > 4

Limiting speeds:

The bearings allow the limiting speeds given in the dimension tables. The operating temperatures occurring are heavily dependent on the environmental conditions. Calculation is possible by means of a thermal balance analysis based on frictional torque data.

Frictional torque:

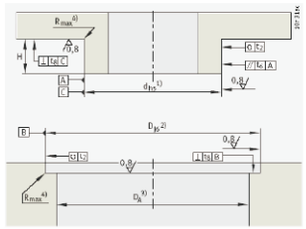
The bearing frictional torque MRL is influenced primarily by the viscosity and quantity of the lubricant and the bearing preload.
The lubricant viscosity and quantity are dependent on the lubricant grade and operating temperature.
The bearing preload is dependent on the mounting fits, the geometrical accuracy of the adjacent parts, the temperature difference between the inner and outer ring, the screw tightening torque and the mounting situation.

Starting torque:

For YRT bearing, it must be taken into consideration that the frictional torque can increase by a factor of between 2 and 2.5 with increasing speed.

Accuracy of adjacent construction:

The adjacent construction should be produced in accordance with Figure and the tolerances must be in accordance with the tables starting on page. Any deviations will influence the bearing frictional torque ,running accuracy and running characteristics.



Requirements for the adjacent construction–YRT.

Legend to Figure:

1.Support over whole bearing height. It must be ensured that the means of support has adequate rigidity.
2.A precise fit is only necessary if radial support due to the load or a precise bearing position is required.
3.Note the bearing diameter D_1 according to the dimension tables. Ensure that there is sufficient distance between the rotating bearing rings and the adjacent construction.
Geometrical and positional accuracy of the adjacent construction:

Nominal shaft diameter d mm		Deviation d	Roundness Parallelism Perpendicularity t_2, t_2, t_8
over	incl.	for tolerance zone h5 μm	μm
50	80	0 –13	3
80	120	0 –15	4
120	150	0 –18	5
150	180	0 –18	5
180	250	0 –20	7
250	315	0 –23	8
315	400	0 –25	9
400	500	0 –27	10
500	630	0 –28	11
630	800	0 –32	12
800	1000	0 –36	14

Geometrical and positional accuracy for shafts–YRT

Nominal shaft diameter D mm		Deviation D	Roundness Parallelism Perpendicularity t_2, t_2, t_8
over	incl.	for tolerance zone h5 μm	μm
120	150	+18 –7	5
150	180	+18 –7	5
180	250	+22 –7	7
150	315	+25 –7	8
315	400	+29 –7	9
400	500	+33 –7	10
500	630	+34 –7	11
630	800	+38 –8	12
800	1000	+44 –12	14
1000	1250	+52 –14	16

Geometrical and positional accuracy for housings–YRT

Mounting dimensions H1、H 2 :

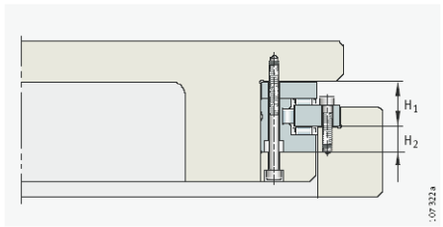


Figure 15
Mounting dimension H1、H 2

L–section ring without support ring:
For the case "L–section ring without support ring", the bearing designation is :YRT<bore diameter>
L–section ring with support ring:YRT bore diameter VSP
For the case "L–section ring with support ring", the bearing designation is :YRT<bore diameter>VSP
Caution! For bearing arrangements with a supported L–section ring , only bearings with the suffix VSP、EB or T52EA can be ordered. If the normal design is mounted with a supported L–section ring, there will be a considerable increase in the bearing frictional torque .The support ring should be at least twice as the shaft locating washer of the bearing.

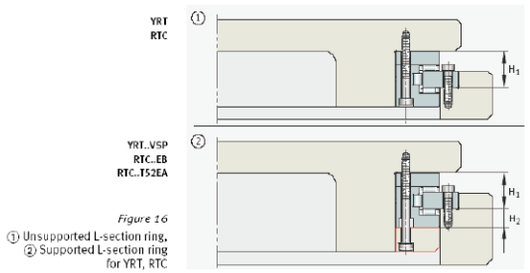


Figure 16
① Unsupported L-section ring,
② Supported L-section ring for YRT, RTC

Fitting:

Retaining screws secure the bearing components during transport, For easier centring of the bearing ,the screws should be loosened before fitting and either secured again or removed after fitting. Tighten the fixing screws in crosswise sequence by using a torque wrench in three stages to the specified tightening torque MA, rotating the bearing:

Stage 1 40% of MA

Stage 2 70% of MA

Stage 3 100% of MA

Observe the correct grade of the fixing screws.

Caution! Mounting forces must only be applied to the bearing ring to be fitted, never through the rolling elements. Bearing components must not be separated or interchanged during fitting and dismantling. If the bearing is unusually difficult to move ,loosen the fixing screws and tighten them again in steps with a crosswise sequence. This will eliminate any distortion. Bearings should only be fitted in accordance with ,Fitting and Maintenance Manual.

YRT Dimensional tolerances, mounting dimensions, axial and radial runout YRT

Dimensional tolerances				Mounting dimensions					Axial and radial runout	
Bore		Outside diameter				Re-stric-ted		Re-stric-ted	Stan-dart	Re-stric-ted
d mm	Δd_s mm	D mm	ΔD_s mm	H_1 mm	ΔH_{1s} mm	ΔH_{1s} mm	H_2 mm	ΔH_{2s} mm	µm	µm
50	–0.008	126	–0.011	20	±0.125	±0.025	10	±0.02	2	1
80	–0.009	146	–0.011	23.35	±0.15	±0.025	11.7	±0.02	3	1.5
100	–0.01	185	–0.015	25	±0.175	±0.025	13	±0.02	3	1.5
120	–0.01	210	–0.015	26	±0.175	±0.03	14	±0.02	3	1.5
150	–0.013	240	–0.015	26	±0.175	±0.03	14	±0.02	3	1.5
180	–0.013	280	–0.018	29	±0.175	±0.03	14	±0.025	4	2
200	–0.015	300	–0.018	30	±0.175	±0.04	15	±0.025	4	2
260	–0.018	385	–0.02	36.5	±0.2	±0.05	18.5	±0.025	6	3
325	–0.023	450	–0.023	40	±0.2	±0.05	20	±0.025	6	3
395	–0.023	525	–0.028	42.5	±0.2	±0.05	22.5	±0.025	6	3
460	–0.023	600	–0.028	46	±0.225	±0.06	24	±0.03	6	5[3]
580	–0.025	750	–0.035	60	±0.25	±0.075	30	±0.03	10	5[3]
650	–0.038	870	–0.05	78	±0.25	±0.1	44	±0.03	10	5[3]
852	–0.05	1095	–0.063	80.5	±0.3	±0.12	43.5	±0.03	12	6[3]
950	–0.05	1200	–0.063	86	±0.3	±0.12	46	±0.03	12	6[3]
1030	–0.063	1300	–0.08	92.5	±0.3	±0.15	52.5	±0.03	12	6[3]

For rotating inner and outer ring,measured on fitted bearing,with ideal adjacent construction.
Special design,YRT only.
By agreement only for rotating outer ring.

Dimensional tolerances, mounting dimensions, axial and radial runout YRT speed

Dimensional tolerances				Mounting dimensions			Axial and radial runout
Bore		Outside diameter					
d mm	Δd_s mm	D mm	ΔD_s mm	H_1 mm	ΔH_{1s} mm	H_2 mm	µm
200	–0.015	300	–0.018	30	$^{+0.04}_{-0.06}$	15	4
260	–0.018	385	–0.02	36.5	$^{+0.05}_{-0.07}$	18.5	6
325	–0.023	450	–0.023	40	$^{+0.06}_{-0.07}$	20	6
395	–0.023	525	–0.028	42.5	$^{+0.06}_{-0.07}$	22.5	6
460	–0.023	600	–0.028	46	$^{+0.07}_{-0.08}$	24	6

For rotating inner and outer ring,measured on fitted bearing,with ideal adjacent construction.

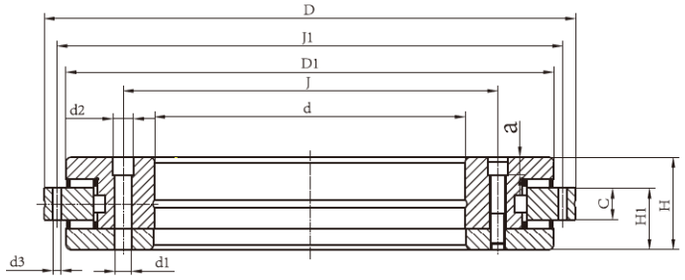
Special designs:

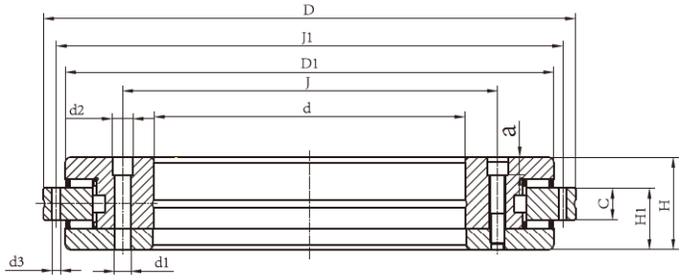
For YRT, axial and radial runout tolerances reduced by 50%,

Additional text: axial/radial runout 50%

For YRT, loser tolerance on mounting dimensions H1 and H2.

Additional text:H1 with tolerance ± ……, H2 with tolerance ± ……





YRT Rotary Table Bearing

Bearing Code	Boundary dimensions								Fixing holes							Extraction thread		Number of pitches X angle of pitches	Screw tightening torque	Basic load rating				Limiting speed	Bearing frictional torque	Weight
									Inner ring				Outer ring		Number of retaining screws					Axial		Radial				
	d	D	H	H1	C	D_1max	J	J1	d1	d2	a	Quantity	d3	Quantity		G	Quantity	Quantity	MA	Dynamic load Ca	Static load Coa	Dynamic load Cr	Static load Cor	Grease r/min		
	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm		mm						N m						N m	Kg
YRT50	50	126	30	20	10	105	63	116	5.6			10	5.6	12	2			12X30°	8.5	56	280	28.5	49.5	440	2.5	1.6
YRT80–TV	80	146	35	23.35	12	130	92	138	5.6	10	4	10	4.6	12	2			12X30°	8.5/4.5	38	158	44	98	350	3	2.4
YRT100	100	185	38	25	12	160	112	170	5.6	10	5.4	16	5.6	15	2	M5	3	18X20°	8.5	73	370	52	108	280	3	4.1
YRT120	120	210	40	26	12	184	135	195	7	11	6.2	22	7	21	2	M8	3	24X15°	14	80	445	70	148	230	7	5.3
YRT150	150	240	40	26	12	214	165	225	7	11	6.2	34	7	33	2	M8	3	36X10°	14	85	510	77	179	210	13	6.2
YRT180	180	280	43	29	15	244	194	260	7	11	6.2	46	7	45	2	M8	3	48X7.5°	14	92	580	83	209	190	14	7.7
YRT200	200	300	45	30	15	274	215	285	7	11	6.2	46	7	45	2	M8	3	48X7.5°	14	98	650	89	236	170	15	9.7
YRT260	260	385	55	36.5	18	345	280	365	9.3	15	8.2	34	9.3	33	2	M12	3	36X10°	34	109	810	102	310	130	25	18.3
YRT325	325	450	60	40	20	415	342	430	9.3	15	8.2	34	9.3	33	2	M12	3	36X10°	34	186	1710	134	415	110	48	25
YRT395	395	525	65	42.5	20	486	415	505	9.3	15	8.2	46	9.3	45	2	M12	3	48X7.5°	34	202	2010	133	435	90	55	33
YRT460	460	600	70	46	22	560	482	580	9.3	15	8.2	46	9.3	45	2	M12	3	48X7.5°	34	217	2300	187	650	80	70	45
YRT580	580	750	90	60	30	700	610	720	11.4	18	11	46	11.4	42	2	M12	6	48X7.5°	68	390	3600	211	820	60	140	89
YRT650	650	870	122	78	34	800	680	830	14	20	13	46	14	42	2	M12	6	48X7.5°	116	495	5200	415	1500	55	200	170
YRT850	850	1095	124	80.5	37	1018	890	1055	18	26	17	58	18	54	2	M12	6	60X6°	284	560	6600	475	1970	40	300	253
YRT950	950	1200	132	86	40	1130	990	1160	18	26	17	58	18	54	2	M16	6	60X6°	284	1040	10300	600	2450	40	600	312
YRT1030	1030	1300	145	92.5	40	1215	1075	1255	18	26	17	60	18	66	12	M16	6	72X5°	284	1080	11000	620	2650	35	800	375