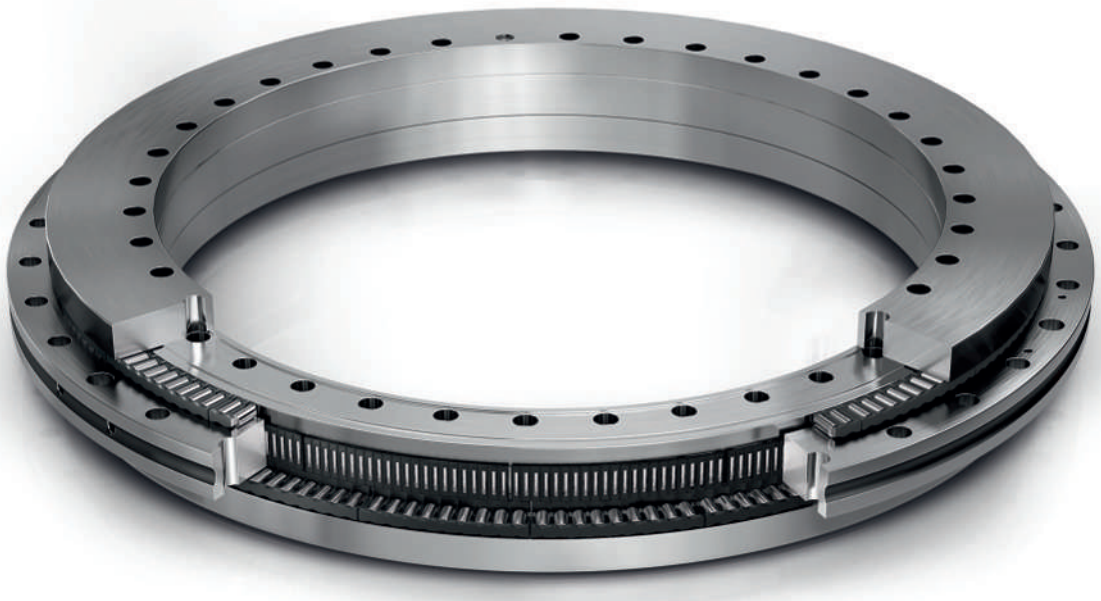
SCHAEFFLER



Axial/Radial Bearings

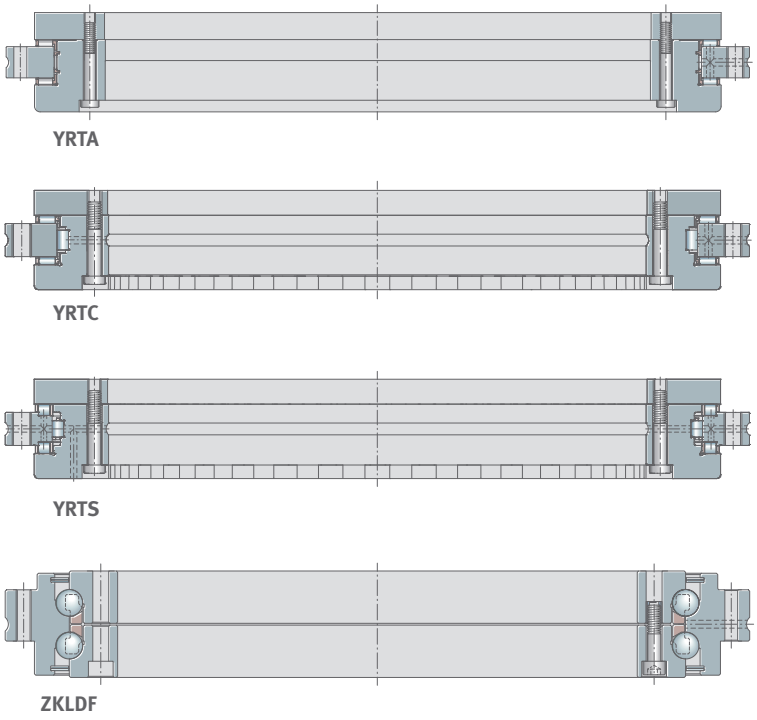
YRTA

Product Data Sheet

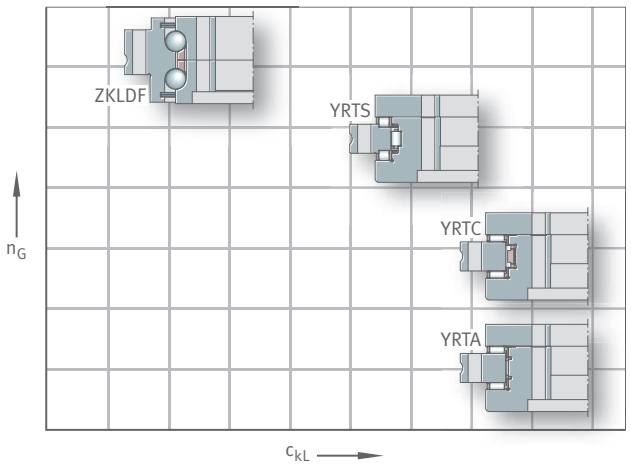
1 Axial/radial bearings

Axial/radial bearings YRTA, YRTC and YRTS are ready-to-fit high precision bearings capable of supporting radial loads, axial loads from both sides and tilting moments without clearance. They are very rigid, have a high load carrying capacity, and run with high accuracy.

1 Axial/radial bearings and axial angular contact ball bearings from Schaeffler



2 Speed and tilting rigidity

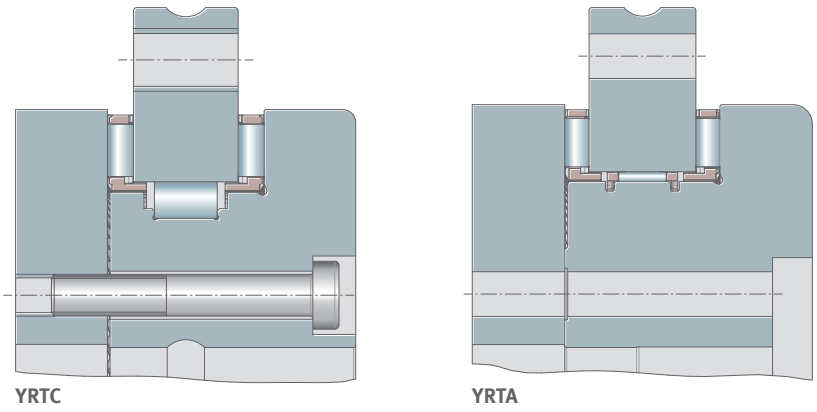


n_G	min^{-1}	Limiting speed
c_{kL}	Nm/mrad	Tilting rigidity of bearing position

2 Bearing design

In terms of their fundamental design, the bearings in the YRTA series are based on the proven three-row YRTC roller bearing design and have been specifically optimised to meet the requirements of automation applications. The bearing is also suitable for classic driven rotary tables. YRTA axial/radial bearings offer the technical advantages of the proven YRTC concept, which have been adapted not only for applications in machine tool peripherals but also for applications in productronics and classic swivelling rotary tables with low accuracy requirements.

3 Adapted internal construction of series YRTA



Axial/radial bearings YRTA

- high precision and tilting rigidity for swivel applications with low dynamics
- cost-optimised solution for rotary axes, not just for machine tools
- applications include pallet changers and rotary storage systems

4 Axial/radial bearings YRTA

The bearings in the YRTA series have a radial cage. Due to the fixing holes in the bearing rings, mounting of the units is very simple.

3 Lubrication

Axial/radial bearings YRTA are supplied already greased and can be relubricated using Arcanol MULTITOP lubricating grease.

The bearings can be relubricated via the outer ring.

4 Sealing

Axial/radial bearings are not sealed.

Axial/radial bearings in the YRTA series are also optionally available as capped variants with a sheet metal gap seal on both sides. This reduces the ingress of dust in automation applications.

5 Speeds

Axial/radial bearings YRTA are designed for swivel-type operation.

The limiting speeds provided in the product tables must be observed ➤9|14.

6 Rigidity

The product tables give the rigidity values for the complete bearing position. These take account of the deflection of the rolling element set as well as the deformation of the bearing rings and the screw connections ➤9|14.

7 Temperature range

Axial/radial bearings and axial angular contact ball bearings are suitable for operating temperatures from –30 °C to +100 °C.

8 Internal clearance

Once the bearings have been fitted and fully screw mounted, they are radially and axially clearance-free and preloaded.

YRTA bearings are supplied with a defined preload, ensuring uniform frictional torque and a high tilting rigidity. This allows the bearings to run smoothly, thus also rendering them suitable for manually operated swivel tables.

9 Dimensions, tolerances

The tolerances for the main dimensions correspond to tolerance class 6 in accordance with ISO 492 (DIN 620-2).

The tolerances for concentricity and axial runout accuracy can be found in the dimensional tolerances.

1 Dimensional tolerances

d [1]	$t_{\Delta dmp}$		D [1]	$t_{\Delta Dmp}$	
	U	L		U	L
mm	mm	mm	mm	mm	mm
150	0	−0,018	240	0	−0,02
180	0	−0,022	280	0	−0,025
200	0	−0,022	300	0	−0,025
260	0	−0,025	385	0	−0,028
325	0	−0,03	450	0	−0,033
395	0	−0,03	525	0	−0,038
460	0	−0,035	600	0	−0,038

1) the diameter tolerances stated are mean values in accordance with DIN 620

d	mm	Bore diameter
D	mm	Outside diameter
L	mm	Lower limit deviation
$t_{\Delta dmp}$	mm	Deviation of the mean value of the bore diameter from the nominal size in accordance with ISO 492
$t_{\Delta Dmp}$	mm	Deviation of the mean value of the outside diameter from the nominal size in accordance with ISO 492
U	mm	Upper limit deviation

The geometrical and positional tolerances correspond to tolerance class 4 in accordance with ISO 492 (DIN 620-2).

2 Mounting dimensions

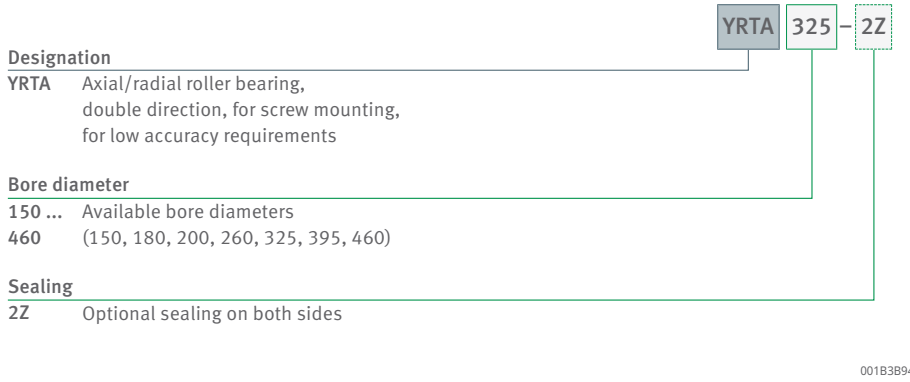
d	H_1	$t_{\Delta H1s}$		H_2	t_1 [2]
		U	L		
mm	mm	mm	mm	mm	µm
150	26	0,03	−0,03	14	6
180	29	0,03	−0,03	14	6
200	30	0,03	−0,03	15	6
260	36,5	0,04	−0,04	18,5	8
325	40	0,05	−0,05	20	8
395	42,5	0,05	−0,05	22,5	8
460	46	0,06	−0,06	24	8

2) for rotating inner ring and rotating outer ring

d	mm	Bore diameter
H_1	mm	Contact surface height from outer ring
H_2	mm	Contact surface height from outer ring
L	mm	Lower limit deviation
$t_{\Delta H1s}$	mm	Deviation of height from nominal size in accordance with ISO 492
$t_{\Delta H2s}$	mm	Deviation of height from nominal size in accordance with ISO 492
t_1	µm	Axial and radial runout, measured on fitted bearing with ideal adjacent construction
U	mm	Upper limit deviation

10 Structure of the ordering designation

5 Structure of the ordering designation for axial/radial bearings YRTA



11 Dimensioning

11.1 Static load safety factor

The static load safety factor S_0 indicates the security against impermissible permanent deformations in the bearing.

In machine tools and similar areas of application, S_0 should be > 4.

11.2 Static limiting load diagrams

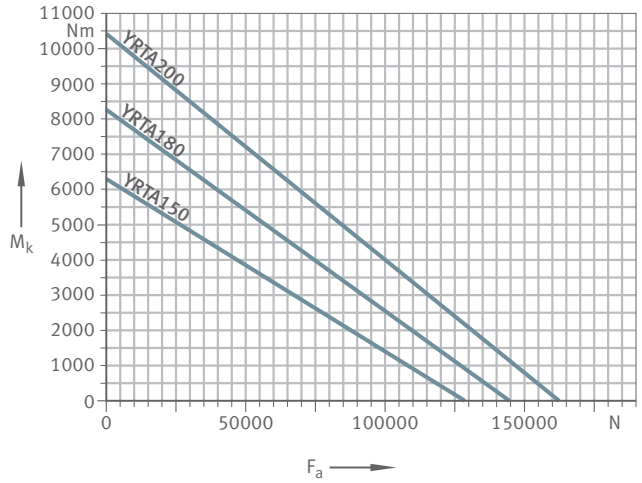
The static limiting load diagram can be used for:

- rapid checking of the selected bearing size under predominantly static load
- calculation of the tilting moment M_k that can be supported by the bearing in addition to the axial load

The limiting load diagrams are based on a rolling element set with a static load safety factor $S_0 \geq 4$ as well as the screw and bearing ring strength.

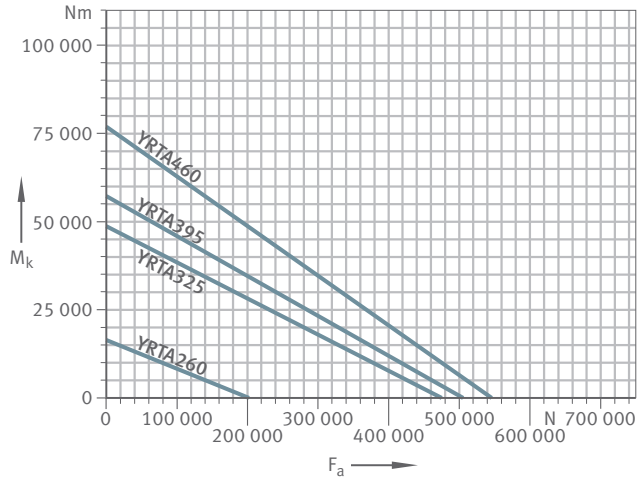
The static limiting load must not be exceeded when dimensioning the bearing arrangement.

6 Static limiting load diagram for YRTA150 to YRTA200



M_k	Nm	Max. tilting moment
F_a	N	Axial load

7 Static limiting load diagram for YRTA260 to YRTA460



M_k	Nm	Max. tilting moment
F_a	N	Axial load

11.3 Frictional torque

The guide values for the frictional torques for axial/radial bearings were determined at a measurement speed n = 5 min^{-1}.

12 Design of the adjacent construction

The hole pattern for the YRTA series corresponds to the hole pattern for the YRTC series, however, the fixing holes in the inner ring do not have individual countersunk holes. The countersunk holes are replaced by a circumferential undercut.

12.1 Fits

The selection of fits leads to transition fits, i.e. depending on the actual dimensional position of the bearing diameter and mounting dimensions, clearance fits or interference fits can arise.

13 Further information

Further information can be found in the following publications:

TPI 120 | High Precision Bearings for Combined Loads | https://www.schaeffler.de/std/200D

14 Product tables

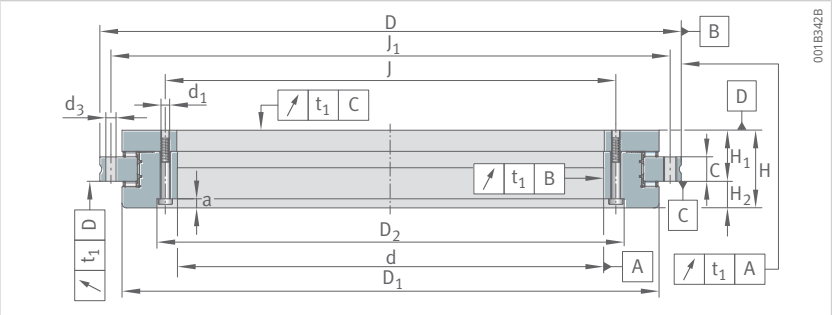
14.1 Explanations of the product tables

1	–	Two retaining screws
2	–	Screw counterbores in the L-section ring open to the bearing bore
a	mm	Countersink depth
C	mm	Outer ring width
C_{0a}	N	Basic static load rating, axial
C_{0r}	N	Basic static load rating, radial
C_a	N	Basic dynamic load rating, axial
c_{aL}	N/µm	Axial rigidity of bearing position
c_{aW}	N/µm	Axial rigidity of rolling element set
c_{kL}	Nm/mrad	Tilting rigidity of bearing position
c_{kW}	Nm/mrad	Tilting rigidity of rolling element set
C_r	N	Basic dynamic load rating, radial
c_{rL}	N/µm	Radial rigidity of bearing position
c_{rW}	N/µm	Radial rigidity of rolling element set
d	mm	Bore diameter
D	mm	Outside diameter
d_1	mm	Bore diameter
D_1	mm	Inner ring diameter
D_2	mm	Outside diameter of undercut
d_3	mm	Diameter of fixing holes, outer ring
G	–	Thread
H	mm	Height
H_1	mm	Contact surface height from outer ring
H_2	mm	Contact surface height from outer ring
J	mm	Pitch circle diameter of fixing holes
J_1	mm	Pitch circle diameter of fixing holes, outer ring
m	kg	Mass
M_A	Nm	Tightening torque
M_R	Nm	Frictional torque
n	–	Number of screw mounting holes
n_A	–	Number of fixing screws in outer ring
n_G	min^{-1}	Limiting speed
n_G	–	Number of threaded holes
n_I	–	Number of fixing screws in inner ring
t	°	Pitch angle of fixing holes

14.2 YRTA

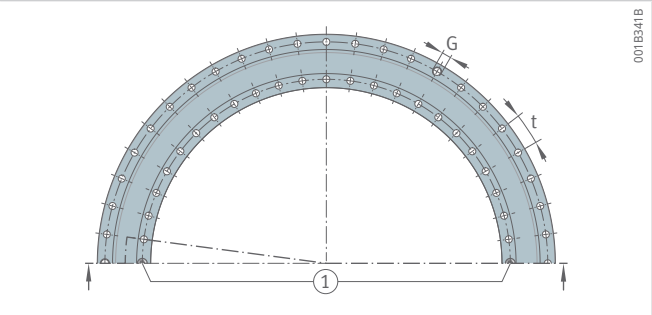
Double direction

For automation



YRTA

Designation	d	D	H	H_1	H_2	C	D_1 max.	J	J_1
–	mm	mm	mm	mm	mm	mm	mm	mm	mm
YRTA150	150	240	43	26	14	12	214	165	225
YRTA180	180	280	43	29	14	15	244	194	260
YRTA200	200	300	45	30	15	15	274	215	285
YRTA260	260	385	55	36,5	18,5	18	345	280	365
YRTA325	325	450	60	40	20	20	415	342	430
YRTA395	395	525	65	42,5	22,5	20	486	415	505
YRTA460	460	600	70	46	24	22	560	482	580



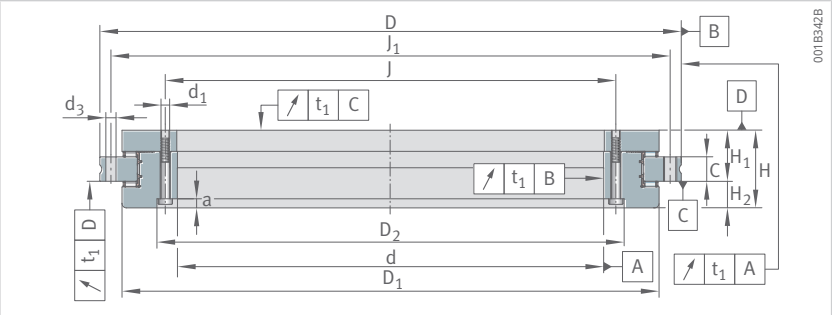
Hole pattern

C_a	C_{0a}	C_r	C_{0r}	n_G	M_R
N	N	N	N	min^{-1}	Nm
113000	650000	23300	83000	210	8
119000	730000	24500	94000	190	9
130000	850000	28000	115000	170	11
149000	1090000	31500	147000	130	17
219000	1900000	46000	255000	110	24
234000	2190000	51000	305000	90	35
255000	2550000	55000	355000	80	45

YRTA

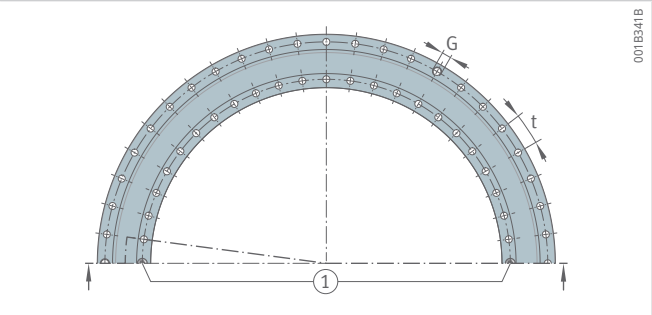
Double direction

For automation



YRTA

Designation	d_1	D_2	a	n_I	d_3	n_A	M_A
–	mm	mm	mm	–	mm	–	Nm
YRTA150	7	176,6	6,2	34	7	33	14
YRTA180	7	205,6	6,2	46	7	45	14
YRTA200	7	226,6	6,2	46	7	45	14
YRTA260	9,3	295,8	8,2	34	9,3	33	34
YRTA325	9,3	357,8	8,2	34	9,3	33	34
YRTA395	9,3	430,8	8,2	46	9,3	45	34
YRTA460	9,3	497,8	8,2	46	9,3	45	34



Hole pattern

n	t	G	n_G	c_{aL}	c_{rL}	c_{kL}	c_{aW}	c_{rW}	c_{kW}
–	°	–	–	N/µm	N/µm	Nm/mrad	N/µm	N/µm	Nm/mrad
36	10	M8	3	3800	3200	18600	11100	6500	59000
48	7,5	M8	3	4700	3600	29000	13500	7700	80600
48	7,5	M8	3	4900	4100	40000	15500	10000	122000
36	10	M12	3	6900	5300	104000	19000	8500	244000
36	10	M12	3	7100	6300	159000	33000	20000	575000
48	7,5	M12	3	9900	5800	280000	37000	25000	909000
48	7,5	M12	3	12000	6500	429000	43000	30000	1420000

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