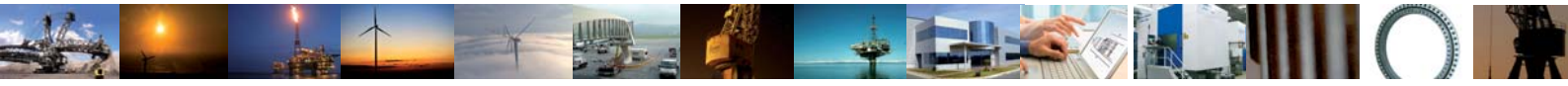
reno gear

Slewing Bearings



Introduction

renogear is a new solution for middle size and heavy duty slewing bearings. Our high tech machinery for turning, drilling, gear cutting, induction hardening and finishing guarantees the requested quality.

renogear is part of the Xubi Group, a worlwide leader and a reference in mechanical transmission components. After many years of experience in this Industry, a new brand is introduced to complete the needs of such a demanding area. renogear meets the highest quality demands and is therefore, able to meet the current customer demands.

renogear produces slewing bearings up to 7.000 milimeters external diameter.

renogear is equipped with the highest quality and most modern means of production and quality control of the industry, and RENOGEAR is certified for "DESIGN & MANUFACTURING OF MEDIUM AND BIG SIZE SLEWING BEARINGS" according to the International ISO9001 - ISO14001 standard. Offers a complete range of slewing bearings customized and adapted to the demands of the customer:

- Single row ball bearing
- Double row ball bearing
- Cross roller bearing
- Three row roller bearing
- Roller/Ball bearing

The gear teeth can be external and internal, both helix and straight.

Renogear offers slewing bearings for many applications such as windgenerators, heavy duty machinery, mining equipment, cranes or machine tools, among others.


LRQA

CERTIFICATE OF APPROVAL

RENOGEAR, S.L.
Poligono Industrial Ugarte, 144 Box 94
20720 Azkoitia, Guipuzkoa
Spain

ISO 9001:2008

Design, and manufacturing of medium and big size Slewing Bearings.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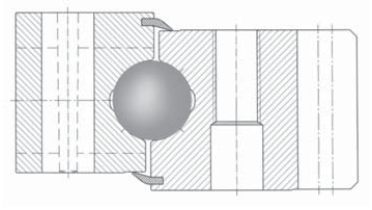
Poligono Industrial Ugarte, 144 Box 94
20720 Azkoitia, Guipuzkoa
Spain

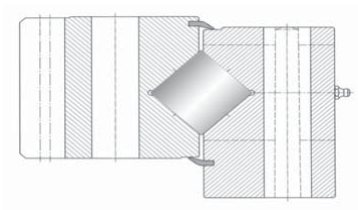
ISO 14001:2004

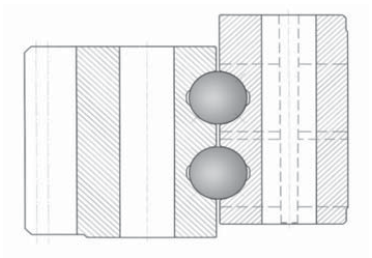
Design, and manufacturing of medium and big size Slewing Bearings.

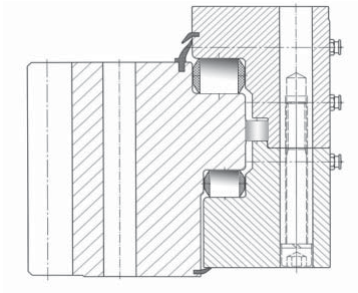
The qualified personnel and engineering of renogear develops slewing bearings according to the needs and technical specifications of each customer. Renogear acomplishes the most challenging requirements of the industry by load or finite element calculations.

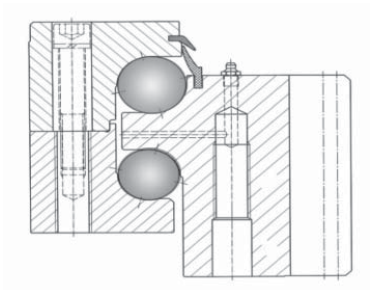
Thanks the vertical integration of renogear, the on site production facilities offer more flexible solutions to the customer in terms of manufacturing and lead times.

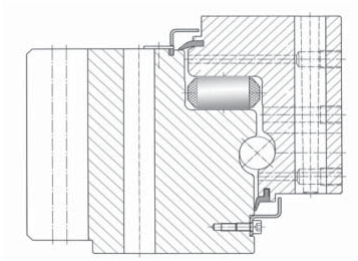












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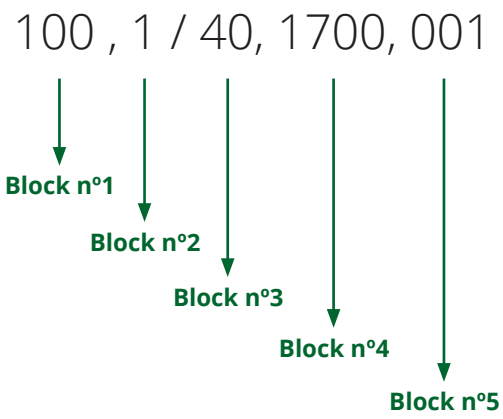
Codification of RENOGEAR S.L. Slewing Bearings

- **Taking the example of this slewing bearing:**



- **Block nº1 = Bearing type**

100	Single-row ball slewing bearing / Four-point contact ball slewing bearing
200	Double-row ball slewing bearing / Eight-point contact ball slewing bearing
300	Double-row ball slewing bearing Type II
400	Three-row roller slewing bearing
500	Balls and rollers combination slewing bearing
600	Cross-roller slewing bearing
700	Special construction slewing bearing

- **Block nº2 = Gearing / Carving**

0	Without gear
1	With external gear
2	With internal gear

- **Block nº3 = Rolling element dimension**

Balls and rollers dimension

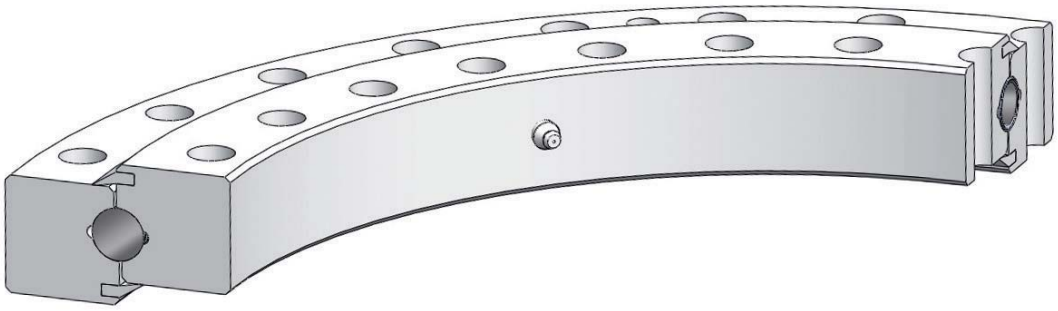
- **Block nº4 = Raceway diameter**

Dimension / diameter of the raceway

- **Block nº5 = Modifications**

000	Without modifications
001	Modification of the drilling holes
002	Other drilling modifications
003	Modification of the clearance
004	Modification of the lubrication connections
005	Modification of the centering
006	Modification of the turning dimensions
007	Dimension / diameter of the raceway

Type **100.0**



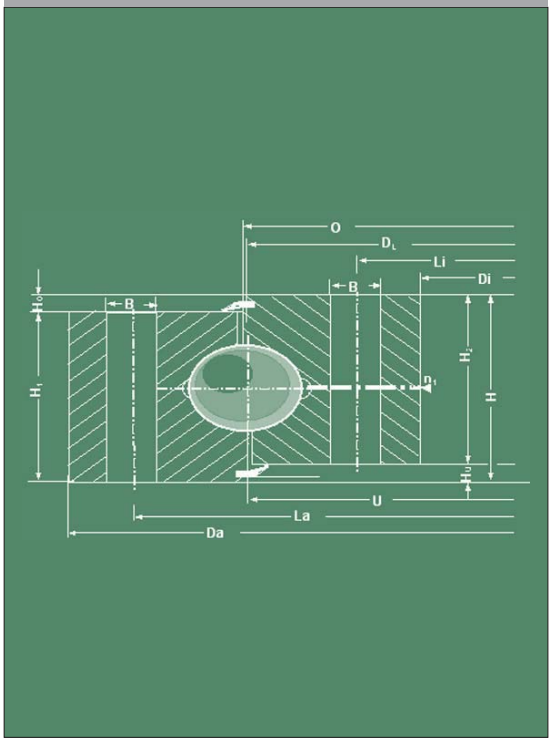
Drawing number	Outer Ø	Inner Ø	Overall height	Weight	Bolt size	Bolt hole Ø	Number of holes	Ext. Bolt circle Ø	Int. Bolt circle Ø
	Da (mm)	Di (mm)	H (mm)	kg	M	B (mm)		La	Li
100,0/20,550,000	637,5	462,5	54	47	16	17,5	20	602,5	497,5
100,0/20,750,000	837,5	662,5	54	65	16	17,5	28	802,5	697,5
100,0/30,950,000	1064	836	72	147	20	22	30	1020	880
100,0/30,1250,000	1364	1136	72	196	20	22	36	1320	1180
100,0/30,1500,000	1614	1386	72	233	20	22	46	1570	1430
100,0/40,2000,000	2138	1862	90	480	24	26	50	2086	1914
100,0/45,2500,000	2646	2357	99	698	24	26	56	2591	2409
100,0/45,3000,000	3164	2836	99	955	30	33	60	3098	2902
100,0/50,3500,000	3671	3329	108	1282	30	33	66	3605	3395
100,0/50,4000,000	4171	3829	108	1474	30	33	72	4105	3895

Products and applications

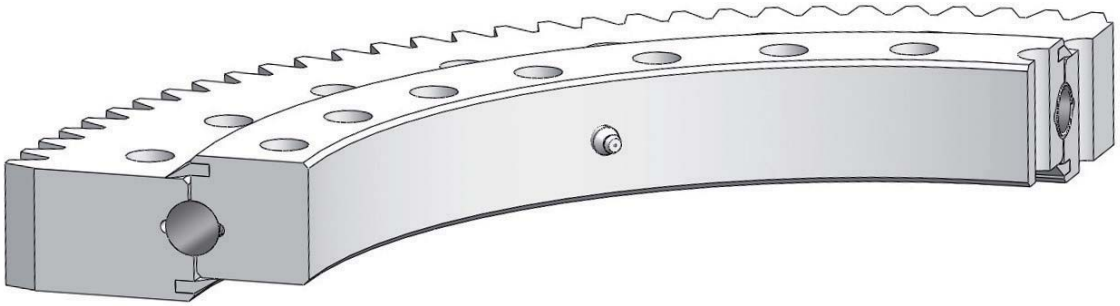
Type 100: single row ball bearing.

Applied for: turning tables, mobile cranes, E.A.F. furnaces, azimuth bearings for wind turbines, solar thermic.

Ring height H1	Ring height H2	Distance at bottom betw. Outer/ inner	Distance at top betw. Outer/ inner	Gear P.C.D.	Module	Teeth number	Croquis
H1 (mm)	H2 (mm)	Hu (mm)	Ho (mm)	(mm)		Z	
45	45	9	9	-	-	-	
45	45	9	9	-	-	-	
63	63	9	9	-	-	-	
63	63	9	9	-	-	-	
63	63	9	9	-	-	-	
81	81	9	9	-	-	-	
90	90	9	9	-	-	-	
90	90	9	9	-	-	-	
99	99	9	9	-	-	-	
99	99	9	9	-	-	-	



Type **100.1**

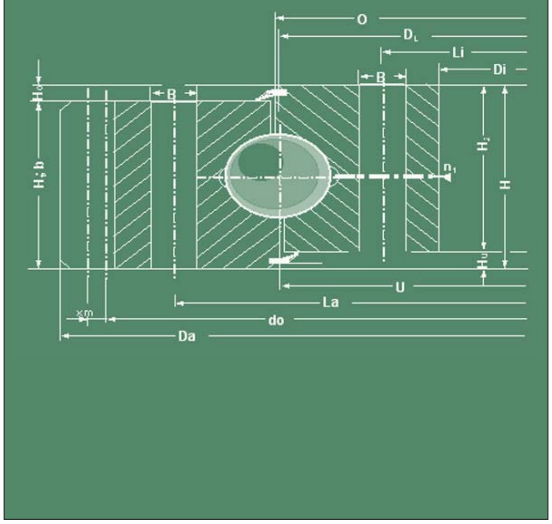


Drawing number	Outer Ø	Inner Ø	Overall height	Weight	Bolt size	Bolt hole Ø	Number of holes	Ext. Bolt circle Ø	Int. Bolt circle Ø
	Da (mm)	Di (mm)	H (mm)	kg	M	B (mm)		La	Li
100,1/20,550,000	672	462,5	54	59	16	17,5	20	602,5	497,5
100,1/20,750,000	864	662,5	54	76	16	17,5	28	802,5	697,5
100,1/30,950,000	1088	836	72	167	20	22	30	1020	880
100,1/30,1250,000	1420	1136	72	256	20	22	36	1320	1180
100,1/30,1500,000	1680	1386	72	317	20	22	46	1570	1430
100,1/40,2000,000	2212	1862	90	641	24	26	50	2086	1914
100,1/45,2500,000	2736	2357	99	975	24	26	56	2591	2409
100,1/45,3000,000	3248	2836	99	1254	30	33	60	3098	2902
100,1/50,3500,000	3780	3329	108	1778	30	33	66	3605	3395
100,1/50,4000,000	4266	3829	108	1963	30	33	72	4105	3895

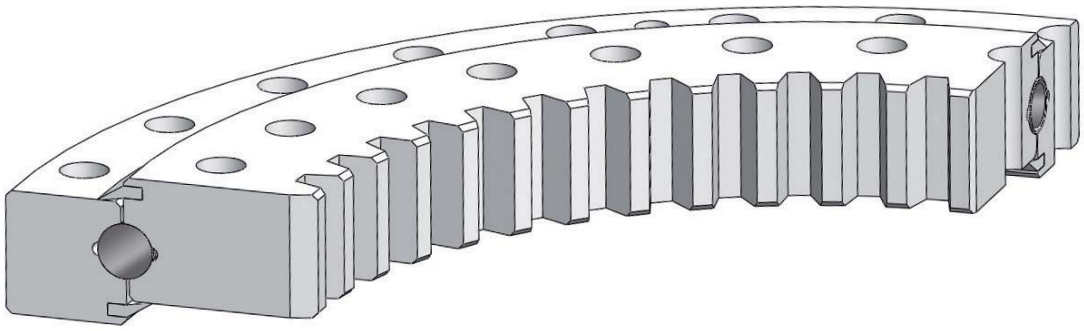
Recent projects:

Year: 2011
Type 100
Applied: Electric Arc Furnace
External teeth
Steel spacers
Reached Lead time: 10 weeks

Ring height H1	Ring height H2	Distance at bottom betw. Outer/ inner	Distance at top betw. Outer/ inner	Gear P.C.D.	Module	Teeth number	Croquis
H1 (mm)	H2 (mm)	Hu (mm)	Ho (mm)	(mm)		Z	
45	45	9	9	660	6	110	
45	45	9	9	852	6	142	
63	63	9	9	1072	8	134	
63	63	9	9	1400	10	140	
63	63	9	9	1656	12	138	
81	81	9	9	2184	14	156	
90	90	9	9	2704	16	169	
90	90	9	9	3216	16	201	
99	99	9	9	3744	18	208	
99	99	9	9	4230	18	235	

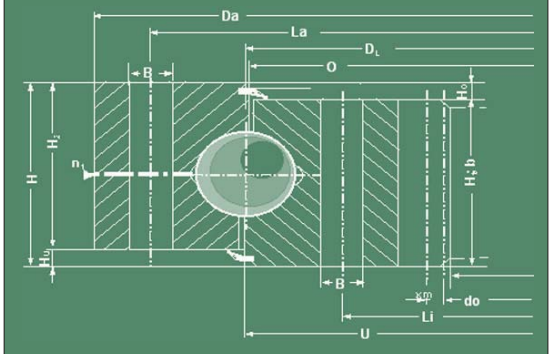


Type **100.2**



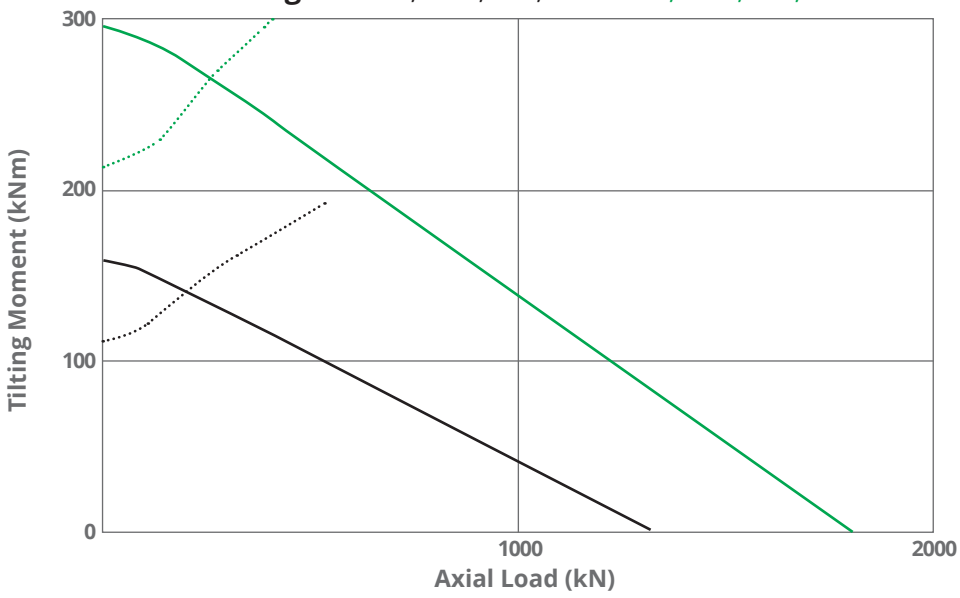
Drawing number	Outer Ø	Inner Ø	Overall height	Weight	Bolt size	Bolt hole Ø	Number of holes	Ext. Bolt circle Ø	Int. Bolt circle Ø
	Da (mm)	Di (mm)	H (mm)	kg	M	B (mm)		La	Li
100,2/20,550,000	637,5	438	54	53	16	17,5	20	602,5	497,5
100,2/20,750,000	837,5	630	54	77	16	17,5	28	802,5	697,5
100,2/30,950,000	1064	816	72	159	20	22	30	1020	880
100,2/30,1250,000	1364	1080	72	245	20	22	36	1320	1180
100,2/30,1500,000	1614	1320	72	302	20	22	46	1570	1430
100,2/40,2000,000	2138	1778	90	633	24	26	50	2086	1914
100,2/45,2500,000	2643	2272	99	916	24	26	56	2591	2409
100,2/45,3000,000	3164	2752	99	1215	30	33	60	3098	2902
100,2/50,3500,000	3671	3248	108	1607	30	33	66	3605	3395
100,2/50,4000,000	4171	3726	108	1949	30	33	72	4105	3895

Ring height H1	Ring height H2	Distance at bottom betw. Outer/ inner	Distance at top betw. Outer/ inner	Gear P.C.D.	Module	Teeth number	Croquis
H1 (mm)	H2 (mm)	Hu (mm)	Ho (mm)	(mm)		Z	
45	45	9	9	450	6	-75	
45	45	9	9	642	6	-107	
63	63	9	9	828	6	-138	
63	63	9	9	1100	10	-110	
63	63	9	9	1344	12	-112	
81	81	9	9	1806	14	-129	
90	90	9	9	2304	16	-144	
90	90	9	9	2784	16	-174	
99	99	9	9	3280	16	-205	
99	99	9	9	3762	18	-209	



Type **100** Load Diagram

Drawing Nº: 100,0/20,550,000 - 100,0/20,750,000



Curve 1.1: Static capacity

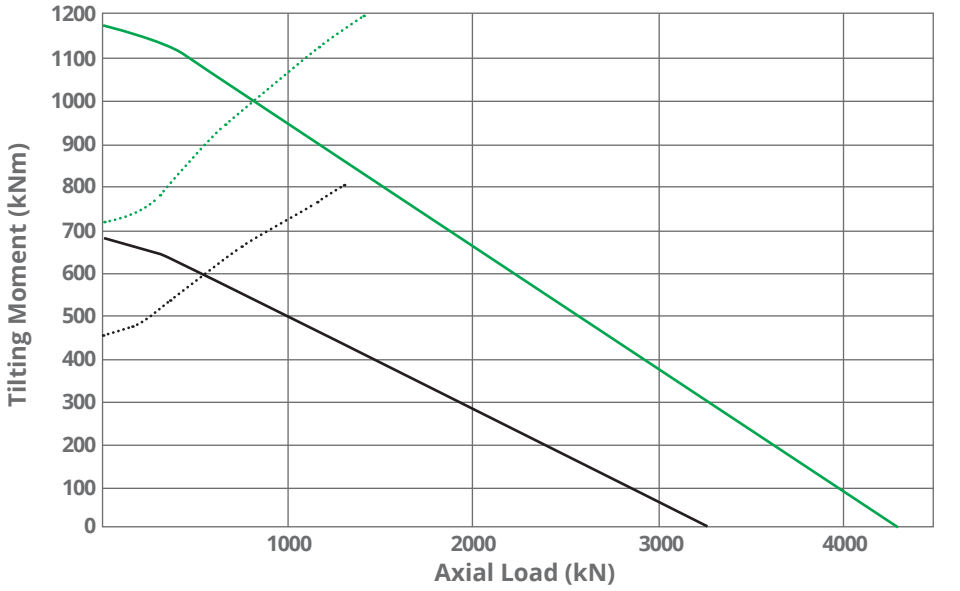
Curve 3: Bolts

Bolt quality:	10,9	10,9
Bolt dia:	M 16	M 16
Number of bolts:	20	28
Min. klamping length:	80	80
Alpha A:	1,6	1,6
Preload:	70%	70%

Bolt capacity curve on the basis of VDI-guideline 2230

Curve 1.1 ——
Curve 3 ·····

Drawing Nº: 100,0/30,950,000 - 100,0/30,1250,000



Curve 1.1: Static capacity

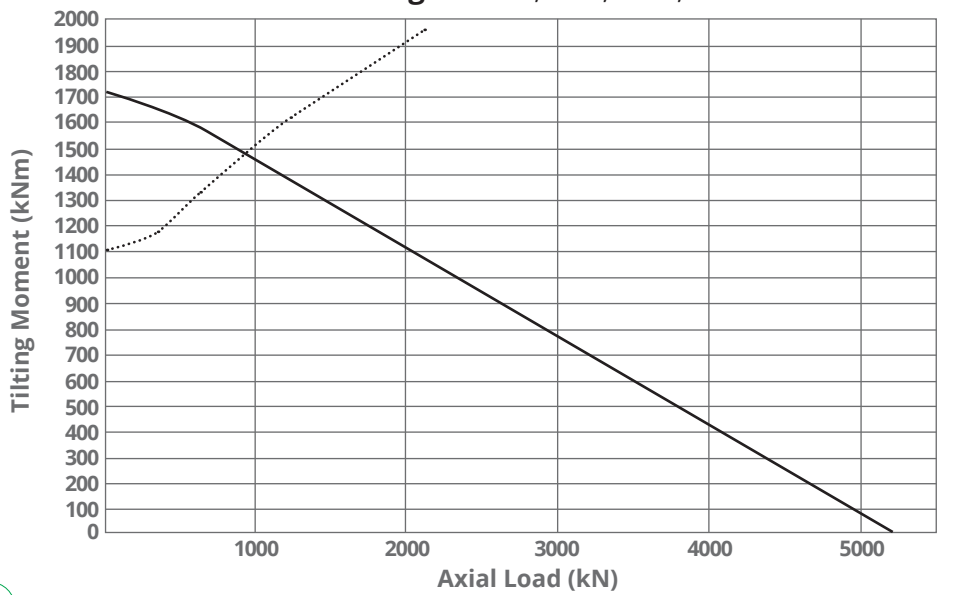
Curve 3: Bolts

Bolt quality:	10,9	10,9
Bolt dia:	M 20	M 20
Number of bolts:	30	36
Min. klamping length:	100	100
Alpha A:	1,6	1,6
Preload:	70%	70%

Bolt capacity curve on the basis of VDI-guideline 2230

Curve 1.1 ——
Curve 3 ·····

Drawing Nº: 100,0/30,1500,000



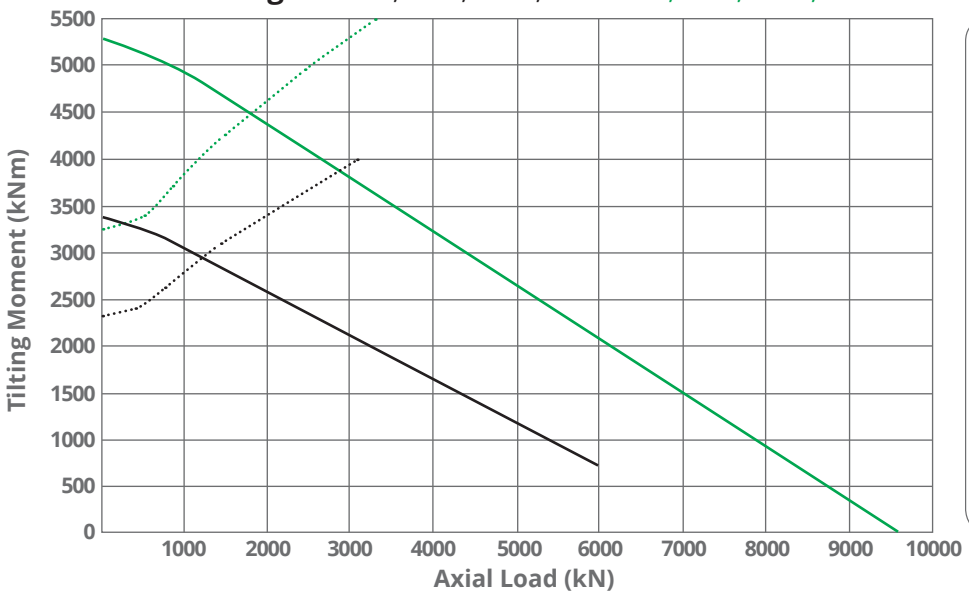
Curve 1.1: Static capacity

Curve 3: Bolts

Bolt quality:	10,9
Bolt dia:	M 20
Number of bolts:	46
Min. klamping length:	100
Alpha A:	1,6
Preload:	70%

Bolt capacity curve on the basis of VDI-guideline 2230

Drawing Nº: 100,0/40,2000,000 - 100,0/40,2500,000



Curve 1.1: Static capacity

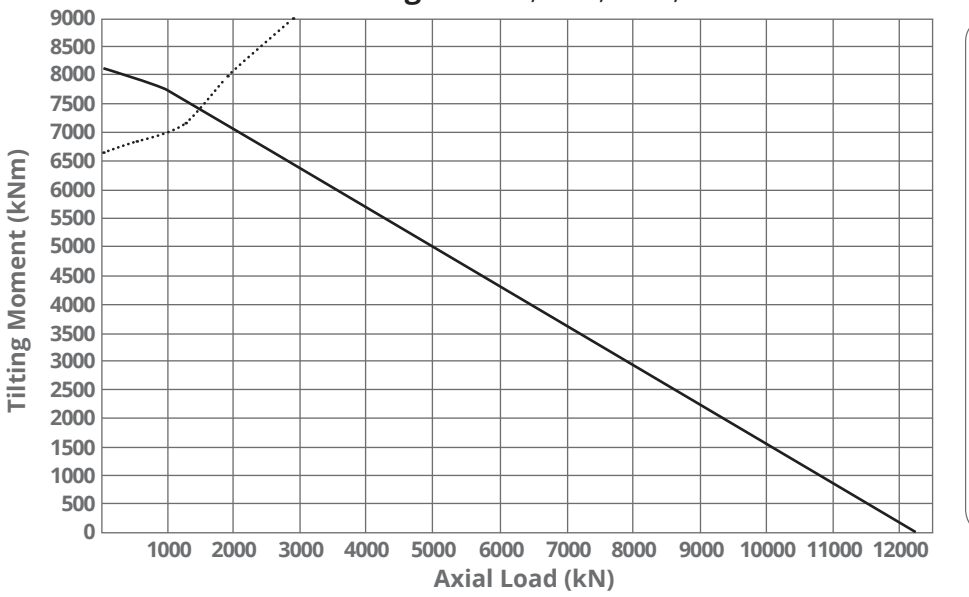
Curve 3: Bolts

Bolt quality:	10,9	10,9
Bolt dia:	M 24	M 24
Number of bolts:	50	56
Min. klamping length:	120	120
Alpha A:	1,6	1,6
Preload:	70%	70%

Bolt capacity curve on the basis of VDI-guideline 2230

Curve 1.1 ——
Curve 3 ·····

Drawing Nº: 100,0/45,3000,000



Curve 1.1: Static capacity

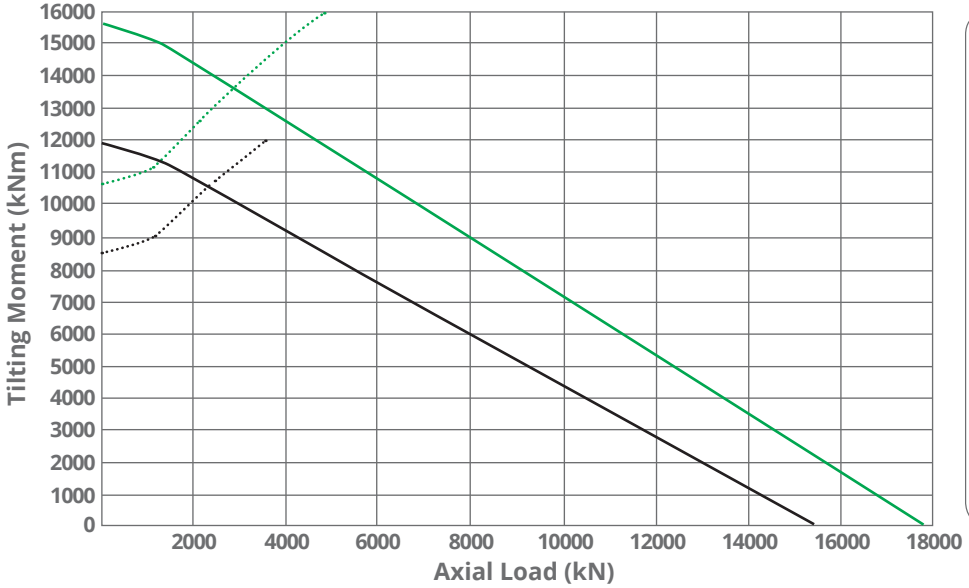
Curve 3: Bolts

Bolt quality:	10,9
Bolt dia:	M 30
Number of bolts:	60
Min. klamping length:	150
Alpha A:	1,6
Preload:	70%

Bolt capacity curve on the basis of VDI-guideline 2230

Curve 1.1 ——
Curve 3 ·····

Drawing Nº: 100,0/50,3500,000 - 100,0/50,4000,000



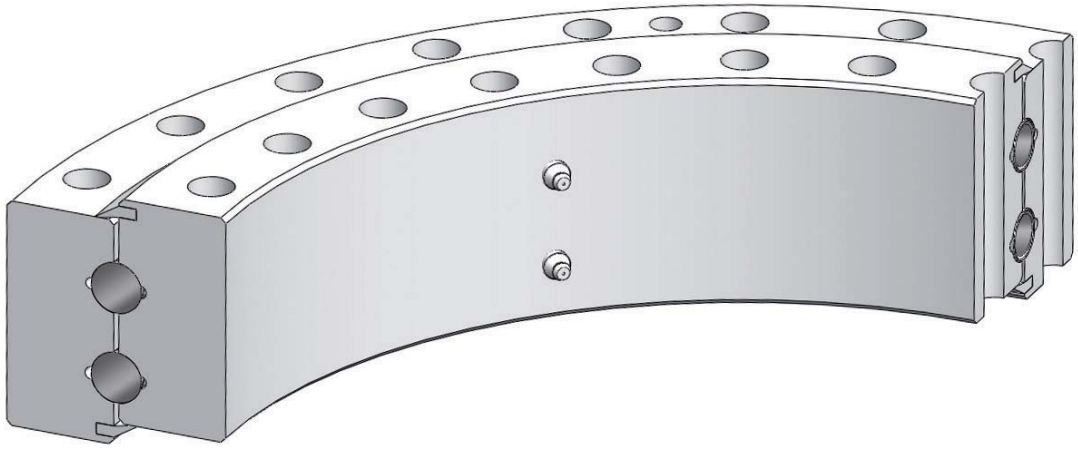
Curve 1.1: Static capacity

Curve 3: Bolts

Bolt quality:	10,9	10,9
Bolt dia:	M 30	M 30
Number of bolts:	66	72
Min. klamping length:	150	150
Alpha A:	1,6	1,6
Preload:	70%	70%

Bolt capacity curve on the basis of VDI-guideline 2230

Type **200.0**



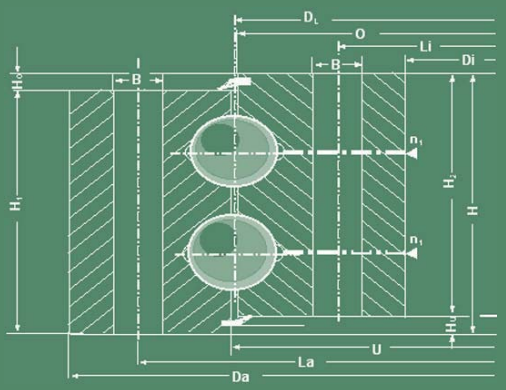
Drawing number	Outer Ø	Inner Ø	Overall height	Weight	Bolt size	Bolt hole Ø	Number of holes	Ext. Bolt circle Ø	Int. Bolt circle Ø
	Da (mm)	Di (mm)	H (mm)	kg	M	B (mm)		La	Li
200,0/20,1000,000	1088	907	85	150	16	17,5	48	1052	947
200,0/20,1250,000	1338	1157	85	190	16	17,5	56	1302	1197
200,0/30,1500,000	1626	1369	119	472	24	26	48	1574	1426
200,0/30,2000,000	2126	1869	119	634	24	26	60	2074	1926
200,0/40,2250,000	2409	2081	152	1170	30	33	54	2343	2157
200,0/40,2500,000	2659	2331	152	1299	30	33	60	2593	2407
200,0/40,2750,000	2909	2581	152	1432	30	33	66	2843	2657
200,0/40,3000,000	3159	2831	152	1569	30	33	72	3093	2907
200,0/50,3500,000	3671	3319	186	2413	30	33	78	3605	3395
200,0/50,3750,000	3921	3569	186	2585	30	33	84	3855	3645
200,0/50,4000,000	4171	3819	186	2761	30	33	90	4105	3895

Products and applications

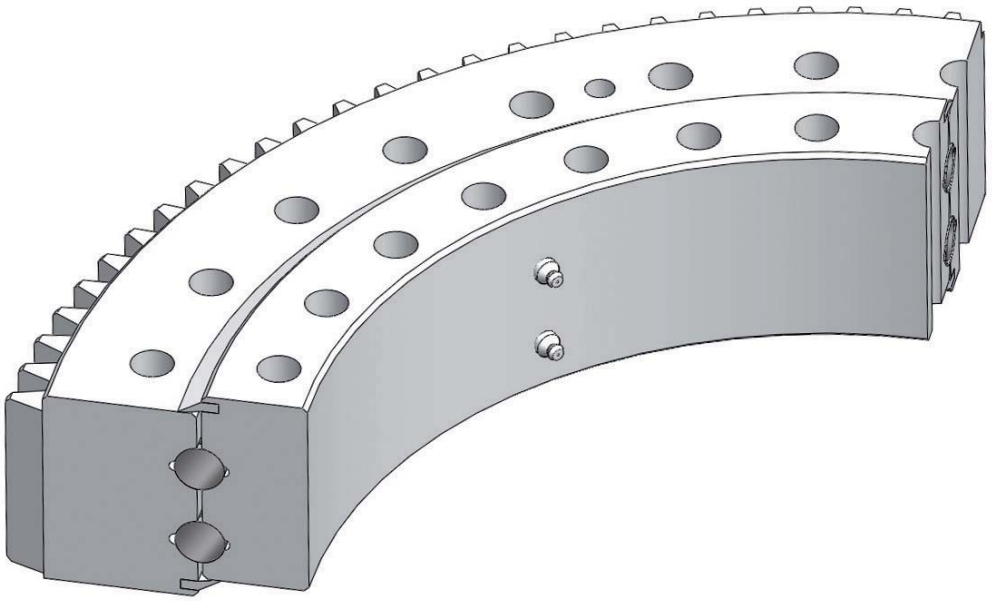
Type 200: double row ball bearing.

Applied for: mobile cranes y harbour cranes, pitch bearings for wind, mining equipment, radar and special antennas.

Ring height H1	Ring height H2	Distance at bottom betw. Outer/ inner	Distance at top betw. Outer/ inner	Gear P.C.D.	Module	Teeth number	Croquis
H1 (mm)	H2 (mm)	Hu (mm)	Ho (mm)	(mm)		Z	
76	76	9	9	-	-	-	
76	76	9	9	-	-	-	
110	110	9	9	-	-	-	
110	110	9	9	-	-	-	
143	143	9	9	-	-	-	
143	143	9	9	-	-	-	
143	143	9	9	-	-	-	
143	143	9	9	-	-	-	
177	177	9	9	-	-	-	
177	177	9	9	-	-	-	
177	177	9	9	-	-	-	



Type **200.1**

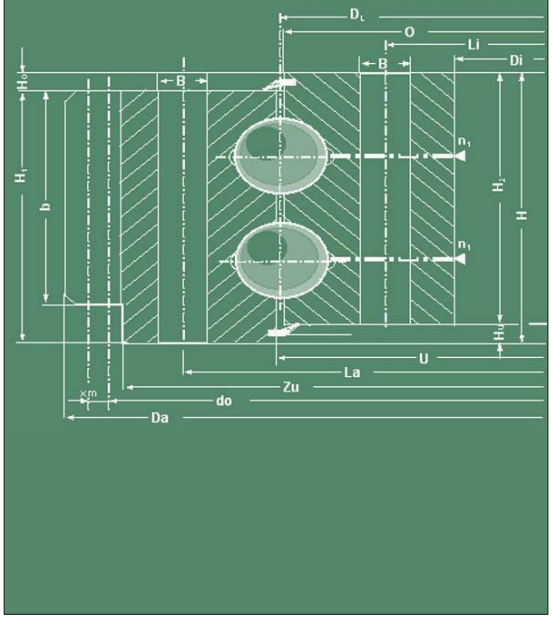


Drawing number	Outer Ø	Inner Ø	Overall height	Weight	Bolt size	Bolt hole Ø	Number of holes	Ext. Bolt circle Ø	Int. Bolt circle Ø
	Da (mm)	Di (mm)	H (mm)	kg	M	B (mm)		La	Li
200,1/20,1000,000	1128	907	85	192	16	17,5	48	1052	947
200,1/20,1250,000	1376	1157	85	239	16	17,5	56	1302	1197
200,1/30,1500,000	1692	1369	119	620	24	26	48	1574	1426
200,1/30,2000,000	2184	1869	119	804	24	26	60	2074	1926
200,1/40,2250,000	2496	2081	152	1547	30	33	54	2343	2157
200,1/40,2500,000	2754	2331	152	1753	30	33	60	2593	2407
200,1/40,2750,000	3006	2581	152	1938	30	33	66	2843	2657
200,1/40,3000,000	3258	2831	152	2129	30	33	72	3093	2907
200,1/50,3500,000	3780	3319	186	3300	30	33	78	3605	3395
200,1/50,3750,000	4040	3569	186	3619	30	33	84	3855	3645
200,1/50,4000,000	4280	3819	186	3767	30	33	90	4105	3895

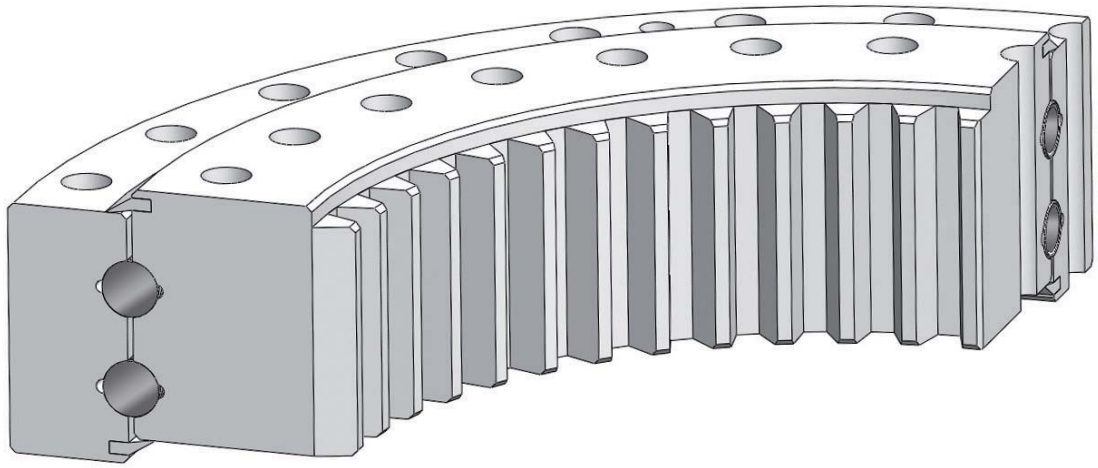
Recent projects:

Year: 2011-12
Type 200
Applied:
Aerospacial Radar/Anthena
Internal teeth
Spacers
Reached Lead time: 14 weeks

Ring height H1	Ring height H2	Distance at bottom betw. Outer/ inner	Distance at top betw. Outer/ inner	Gear P.C.D.	Module	Teeth number	Croquis
H1 (mm)	H2 (mm)	Hu (mm)	Ho (mm)	(mm)		Z	
76	76	9	9	1112	8	139	
76	76	9	9	1360	8	170	
110	110	9	9	1668	12	139	
110	110	9	9	2160	12	180	
143	143	9	9	2464	16	154	
143	143	9	9	2718	18	151	
143	143	9	9	2970	18	165	
143	143	9	9	3222	18	179	
177	177	9	9	3740	20	187	
177	177	9	9	4000	20	200	
177	177	9	9	4240	20	212	

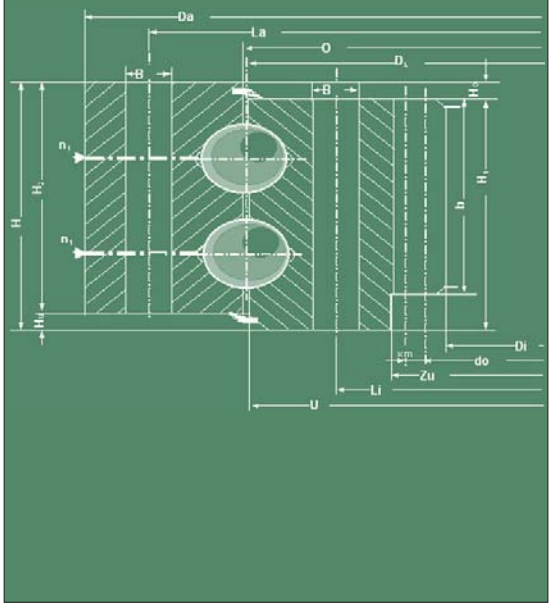


Type **200.2**



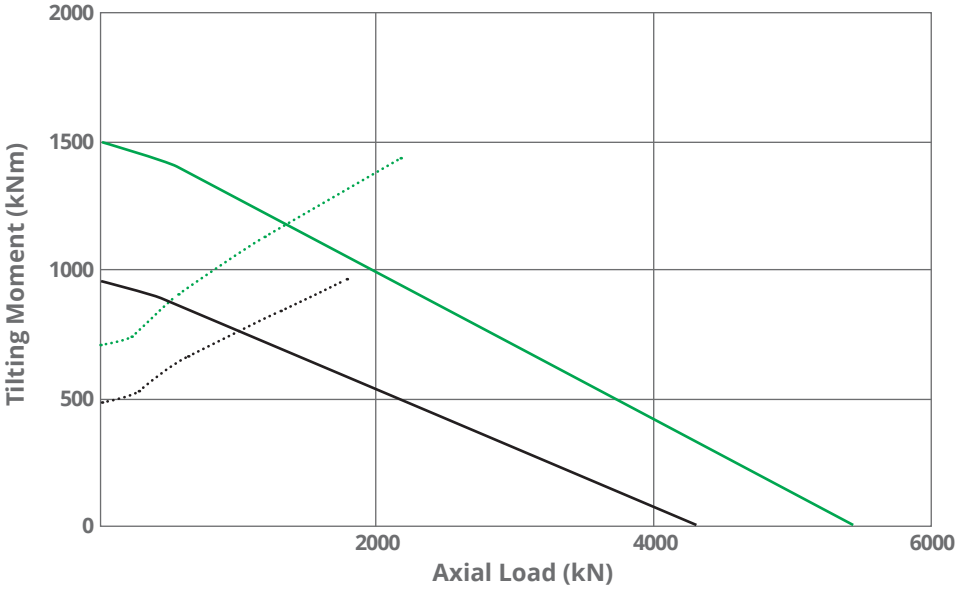
Drawing number	Outer Ø	Inner Ø	Overall height	Weight	Bolt size	Bolt hole Ø	Number of holes	Ext. Bolt circle Ø	Int. Bolt circle Ø
	Da (mm)	Di (mm)	H (mm)	kg	M	B (mm)		La	Li
200,2/20,1000,000	1092	872	85	185	16	17,5	48	1052	947
200,2/20,1250,000	1342	1120	85	237	16	17,5	56	1302	1197
200,2/30,1500,000	1631	1308	119	593	24	26	48	1574	1426
200,2/30,2000,000	2131	1812	119	791	24	26	60	2074	1926
200,2/40,2250,000	2419	2000	152	1504	30	33	54	2343	2157
200,2/40,2500,000	2669	2256	152	1650	30	33	60	2593	2407
200,2/40,2750,000	2919	2484	152	1917	30	33	66	2843	2657
200,2/40,3000,000	3169	2736	152	2091	30	33	72	3093	2907
200,2/50,3500,000	3681	3220	186	3200	30	33	78	3605	3395
200,2/50,3750,000	3931	3460	186	3507	30	33	84	3855	3645
200,2/50,4000,000	4181	3720	186	3667	30	33	90	4105	3895

Ring height H1	Ring height H2	Distance at bottom betw. Outer/ inner	Distance at top betw. Outer/ inner	Gear P.C.D.	Module	Teeth number	Croquis
H1 (mm)	H2 (mm)	Hu (mm)	Ho (mm)	(mm)		Z	
76	76	9	9	888	8	-111	
76	76	9	9	1136	8	-142	
110	110	9	9	1332	12	-111	
110	110	9	9	1836	12	-153	
143	143	9	9	2032	16	-127	
143	143	9	9	2288	18	-143	
143	143	9	9	2520	18	-140	
143	143	9	9	2772	18	-154	
177	177	9	9	3260	20	-163	
177	177	9	9	3500	20	-175	
177	177	9	9	3760	20	-188	



Type **200** Load Diagram

Drawing Nº: 200,0/20,1000,000 - 200,0/20,1250,000



Curve 1.1: Static capacity

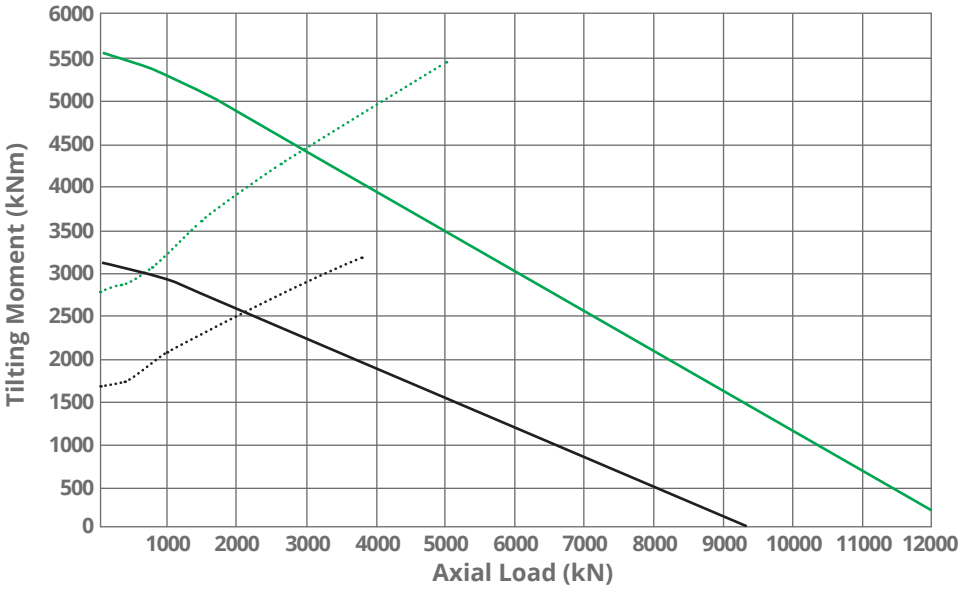
Curve 3: Bolts

Bolt quality:	10,9	10,9
Bolt dia:	M 16	M 16
Number of bolts:	48	56
Min. klamping length:	80	80
Alpha A:	1,6	1,6
Preload:	70%	70%

Bolt capacity curve on the basis of VDI-guideline 2230

Curve 1.1 ——
Curve 3 ·····

Drawing Nº: 200,0/30,1500,000 - 200,0/30,2000,000



Curve 1.1: Static capacity

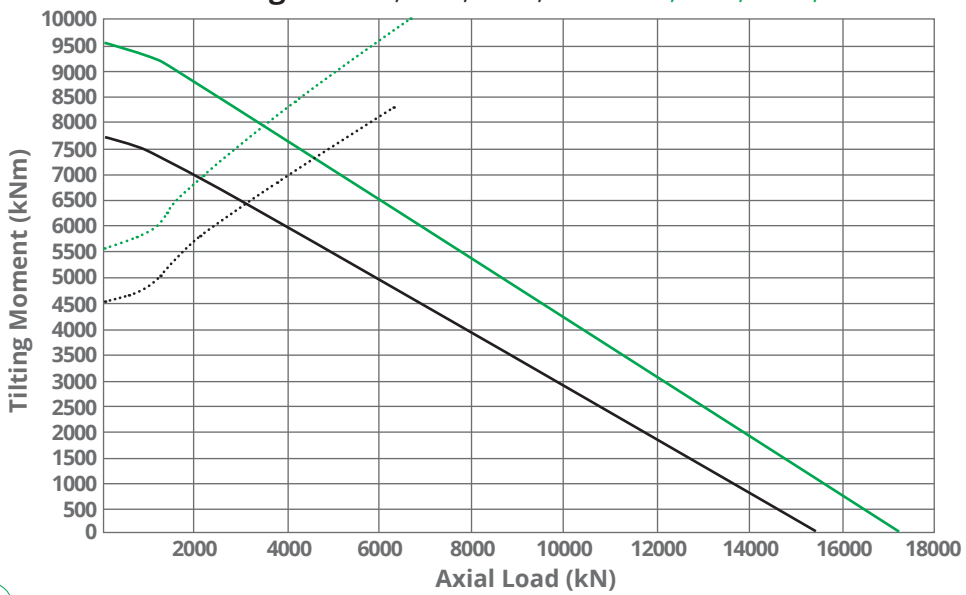
Curve 3: Bolts

Bolt quality:	10,9	10,9
Bolt dia:	M 24	M 24
Number of bolts:	48	60
Min. klamping length:	120	120
Alpha A:	1,6	1,6
Preload:	70%	70%

Bolt capacity curve on the basis of VDI-guideline 2230

Curve 1.1 ——
Curve 3 ·····

Drawing Nº: 200,0/40,2250,000 - 200,0/40,2500,000



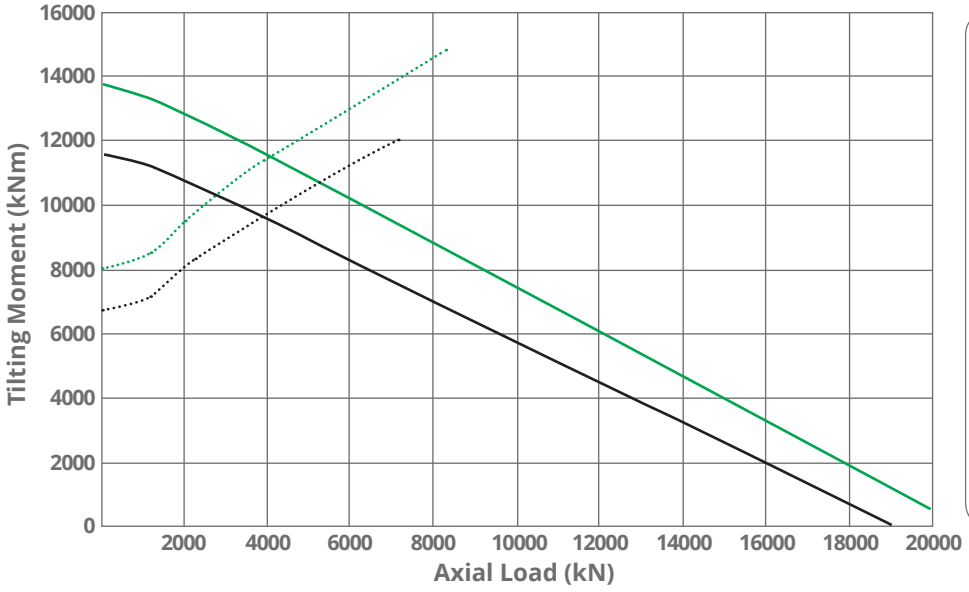
Curve 1.1: Static capacity

Curve 3: Bolts

Bolt quality:	10,9	10,9
Bolt dia:	M 30	M 30
Number of bolts:	54	60
Min. klamping length:	150	150
Alpha A:	1,6	1,6
Preload:	70%	70%

Bolt capacity curve on the basis of VDI-guideline 2230

Drawing Nº: 200,0/40,2750,000 - 200,0/40,3000,000



Curve 1.1: Static capacity

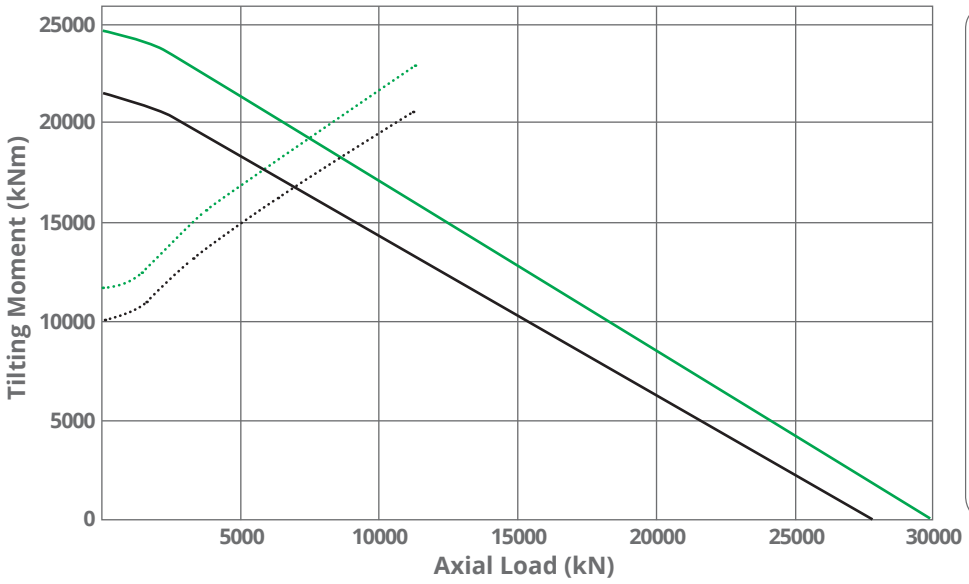
Curve 3: Bolts

Bolt quality:	10,9	10,9
Bolt dia:	M 30	M 30
Number of bolts:	66	72
Min. klamping length:	150	150
Alpha A:	1,6	1,6
Preload:	70%	70%

Bolt capacity curve on the basis of VDI-guideline 2230

Curve 1.1 ——
Curve 3 ·····

Drawing Nº: 200,0/50,3500,000 - 200,0/50,3750,000



Curve 1.1: Static capacity

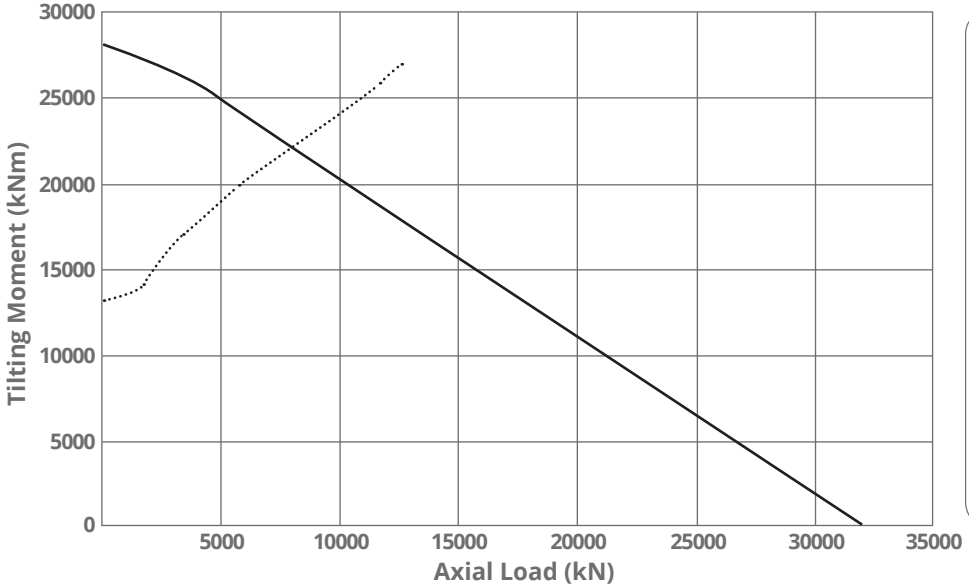
Curve 3: Bolts

Bolt quality:	10,9	10,9
Bolt dia:	M 30	M 30
Number of bolts:	78	84
Min. klamping length:	150	150
Alpha A:	1,6	1,6
Preload:	70%	70%

Bolt capacity curve on the basis of VDI-guideline 2230

Curve 1.1 ——
Curve 3 ·····

Drawing Nº: 200,0/50,4000,000



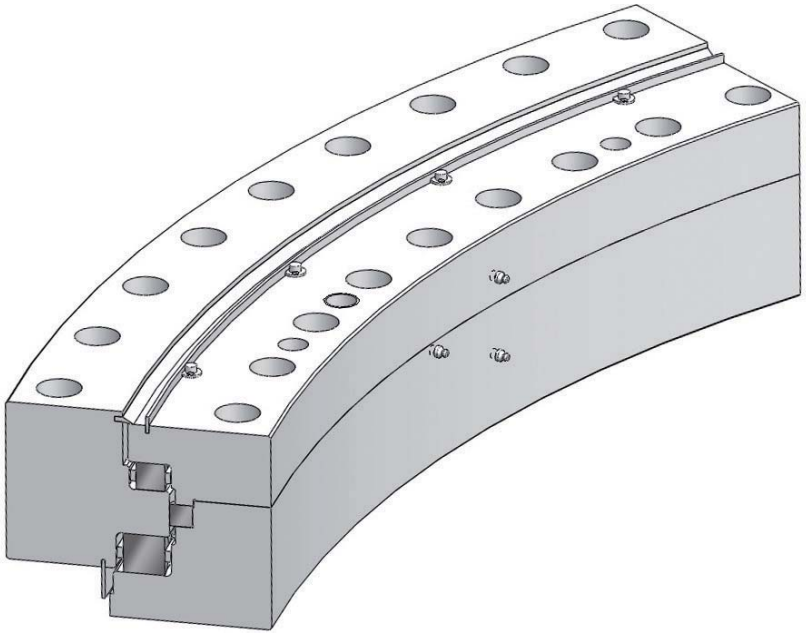
Curve 1.1: Static capacity

Curve 3: Bolts

Bolt quality:	10,9
Bolt dia:	M 30
Number of bolts:	90
Min. klamping length:	150
Alpha A:	1,6
Preload:	70%

Bolt capacity curve on the basis of VDI-guideline 2230

Type **400.0**

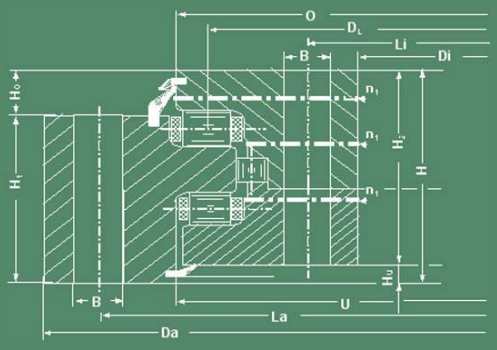


Drawing number	Outer Ø	Inner Ø	Overall height	Weight	Bolt size	Bolt hole Ø	Number of holes	Ext. Bolt circle Ø	Int. Bolt circle Ø
	Da (mm)	Di (mm)	H (mm)	kg	M	B (mm)		La	Li
400,0/20,1000,000	1140	869	132	342	20	22	48	1096	913
400,0/20,1500,000	1640	1369	132	521	20	22	60	1596	1413
400,0/20,2000,000	2140	1869	132	714	20	22	72	2096	1913
400,0/25,2500,000	2665	2342	147	1177	24	26	66	2613	2394
400,0/25,3000,000	3165	2842	147	1419	24	26	84	3113	2894
400,0/36,3000,000	3262	2763	189	2666	42	45	66	3172	2853
400,0/36,3500,000	3762	3263	189	3130	42	45	72	3672	3353
400,0/40,4000,000	4267	3748	219	4353	42	45	78	4177	3838

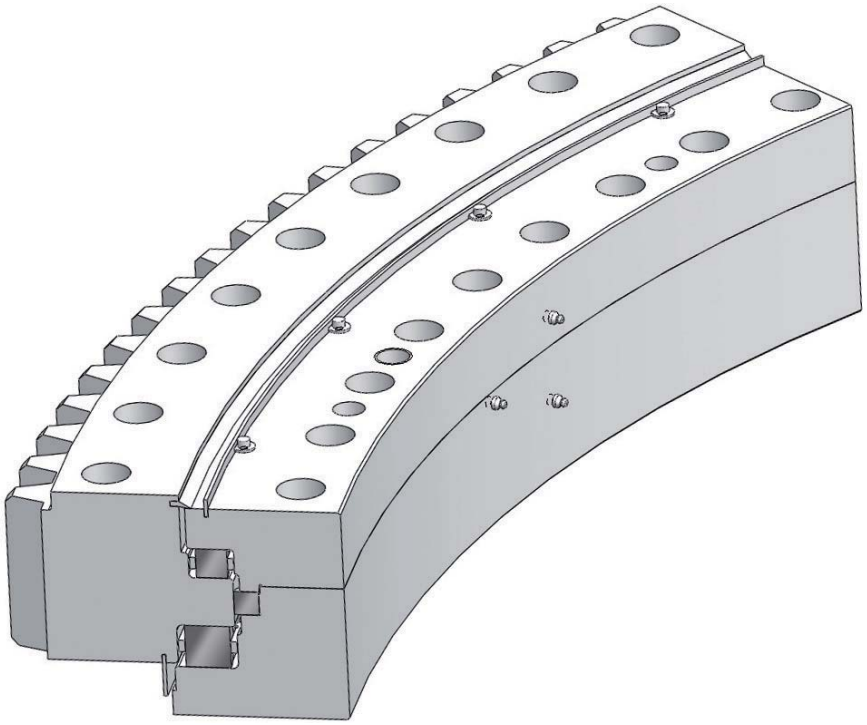
Products and applications

Year: 2015
Type: 400 Three row roller bearing
Applied: Swing bridge , Greenwich, UK
Reached lead time: 12 weeks.

Ring height H1	Ring height H2	Distance at bottom betw. Outer/ inner	Distance at top betw. Outer/ inner	Gear P.C.D.	Module	Teeth number	Croquis
H1 (mm)	H2 (mm)	Hu (mm)	Ho (mm)	(mm)		Z	
106	123	9	26	-	-	-	
106	123	9	26	-	-	-	
106	123	9	26	-	-	-	
117	138	9	30	-	-	-	
117	138	9	30	-	-	-	
147	180	9	42	-	-	-	
147	180	9	42	-	-	-	
169	210	9	50	-	-	-	



Type **400.1**

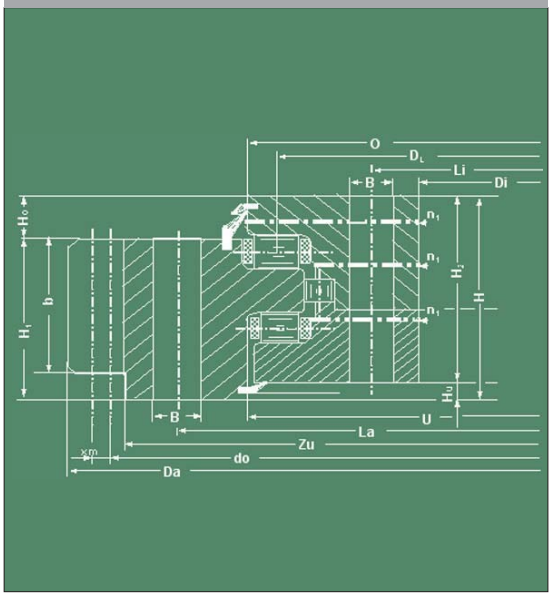


Drawing number	Outer Ø	Inner Ø	Overall height	Weight	Bolt size	Bolt hole Ø	Number of holes	Ext. Bolt circle Ø	Int. Bolt circle Ø
	Da (mm)	Di (mm)	H (mm)	kg	M	B (mm)		La	Li
400,1/20,1000,000	1176	869	132	396	20	22	48	1096	913
400,1/20,1500,000	1690	1369	132	630	20	22	60	1596	1413
400,1/20,2000,000	2226	1869	132	959	20	22	72	2096	1913
400,1/25,2500,000	2752	2342	147	1517	24	26	66	2613	2394
400,1/25,3000,000	3264	2842	147	1878	24	26	84	3113	2894
400,1/36,3000,000	3328	2763	189	2060	42	45	66	3172	2853
400,1/36,3500,000	3852	3263	189	2751	42	45	72	3672	3353
400,1/40,4000,000	4356	3748	219	5153	42	45	78	4177	3838

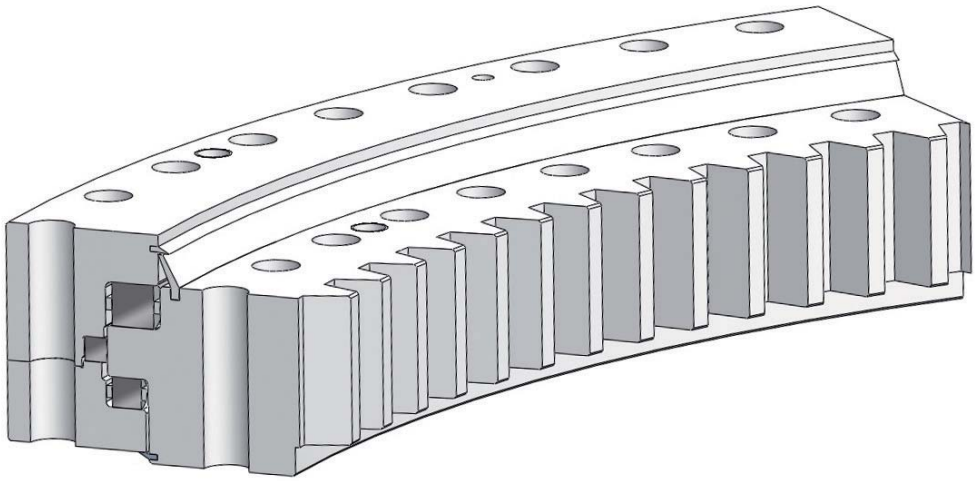
Recent projects:

Year: 2011
Type 400
Applied: Mobile Harbour Crane
Internal teeth
Steel cages
Reached Lead time: 16 weeks

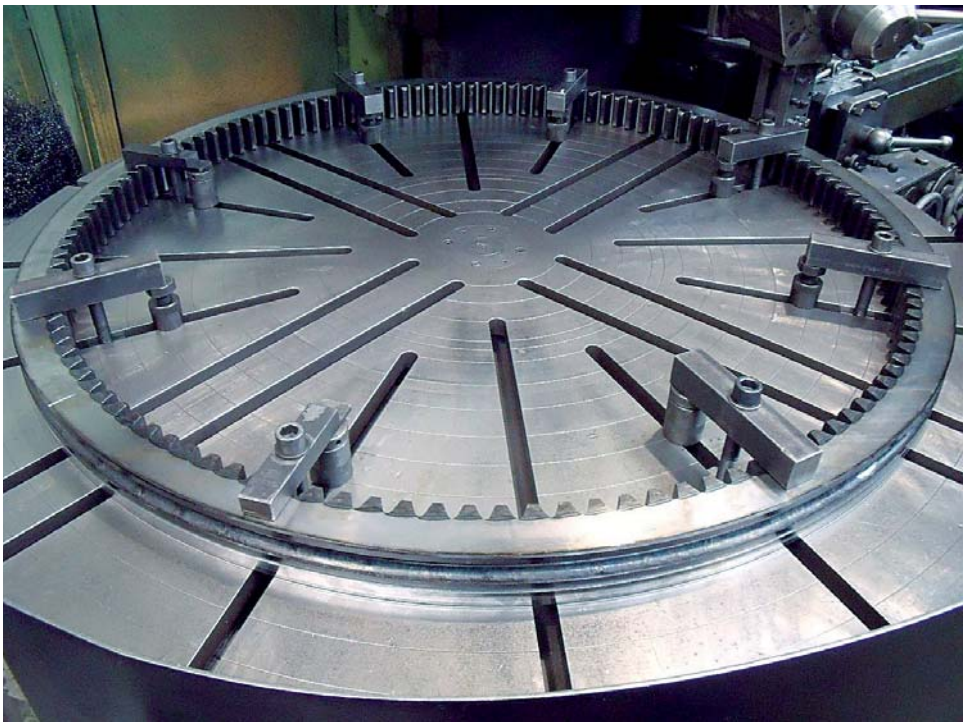
Ring height H1	Ring height H2	Distance at bottom betw. Outer/ inner	Distance at top betw. Outer/ inner	Gear P.C.D.	Module	Teeth number	Croquis
H1 (mm)	H2 (mm)	Hu (mm)	Ho (mm)	(mm)		Z	
106	123	9	26	1160	8	145	
106	123	9	26	1670	10	167	
106	123	9	26	2198	14	157	
117	138	9	30	2720	16	170	
117	138	9	30	3232	16	202	
147	180	9	42	3296	16	206	
147	180	9	42	3816	18	212	
169	210	9	50	4320	18	240	



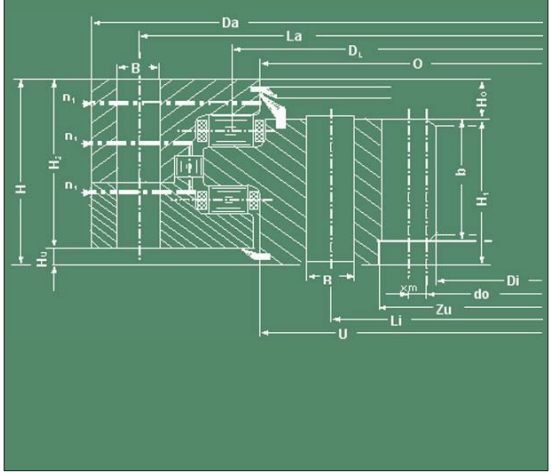
Type **400.2**



Drawing number	Outer Ø	Inner Ø	Overall height	Weight	Bolt size	Bolt hole Ø	Number of holes	Ext. Bolt circle Ø	Int. Bolt circle Ø
	Da (mm)	Di (mm)	H (mm)	kg	M	B (mm)		La	Li
400,2/20,1000,000	1131	824	132	383	20	22	48	1087	904
400,2/20,1500,000	1631	1310	132	611	20	22	60	1587	1404
400,2/20,2000,000	2131	1778	132	912	20	22	72	2087	1904
400,2/25,2500,000	2658	2240	147	1499	24	26	66	2606	2387
400,2/25,3000,000	3158	2736	147	1827	24	26	84	3106	2887
400,2/36,3000,000	3237	2672	189	3003	42	45	66	3147	2828
400,2/36,3500,000	3737	3150	189	3656	42	45	72	3647	3328
400,2/40,4000,000	4252	3654	219	5009	42	45	78	4162	3823

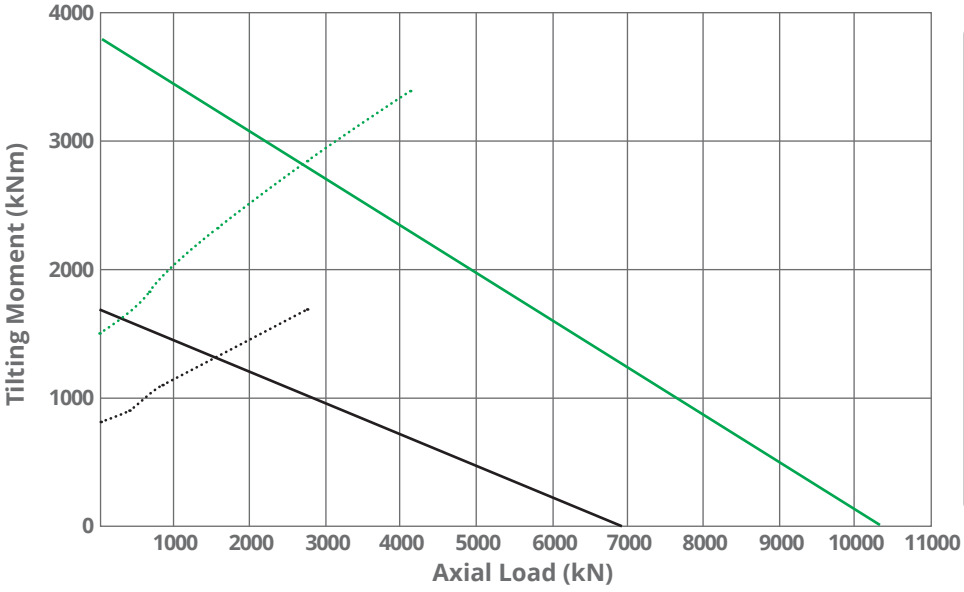


Ring height H1	Ring height H2	Distance at bottom betw. Outer/ inner	Distance at top betw. Outer/ inner	Gear P.C.D.	Module	Teeth number	Croquis
H1 (mm)	H2 (mm)	Hu (mm)	Ho (mm)	(mm)		Z	
106	123	9	26	840	8	-105	
106	123	9	26	1330	10	-133	
106	123	9	26	1806	14	-129	
117	138	9	30	2272	16	-142	
117	138	9	30	2768	16	-173	
147	180	9	42	2704	16	-169	
147	180	9	42	3186	18	-177	
169	210	9	50	3690	18	-205	



Type **400** Load Diagram

Drawing Nº: 400,0/20,1000,000 - 400,0/20,1500,000



Curve 1.1: Static capacity

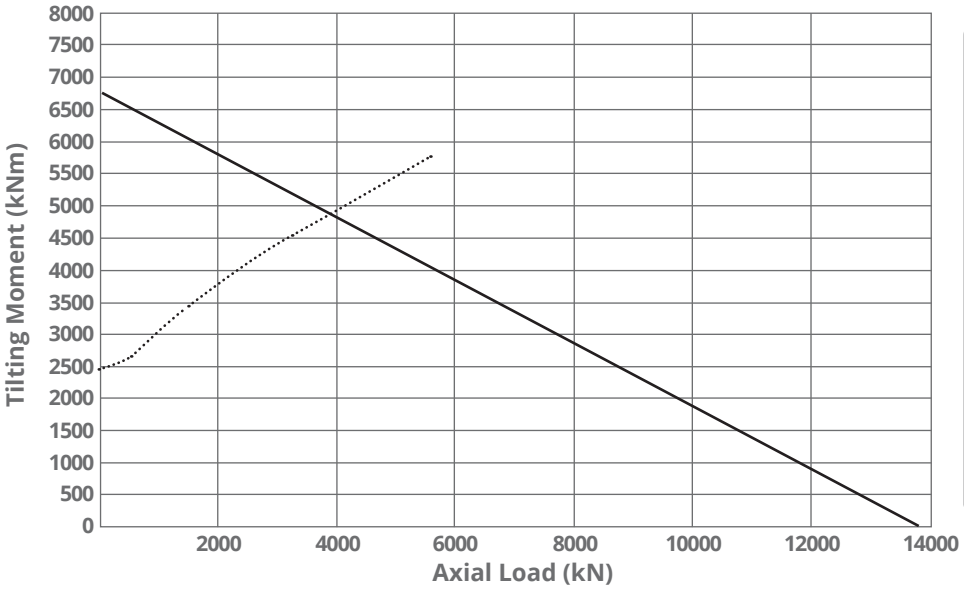
Curve 3: Bolts

Bolt quality:	10,9	10,9
Bolt dia:	M 20	M 20
Number of bolts:	60	60
Min. klamping length:	100	100
Alpha A:	1,6	1,6
Preload:	70%	70%

Bolt capacity curve on the basis of VDI-guideline 2230

Curve 1.1 ——
Curve 3 ·····

Drawing Nº: 400,0/20,2000,000



Curve 1.1: Static capacity

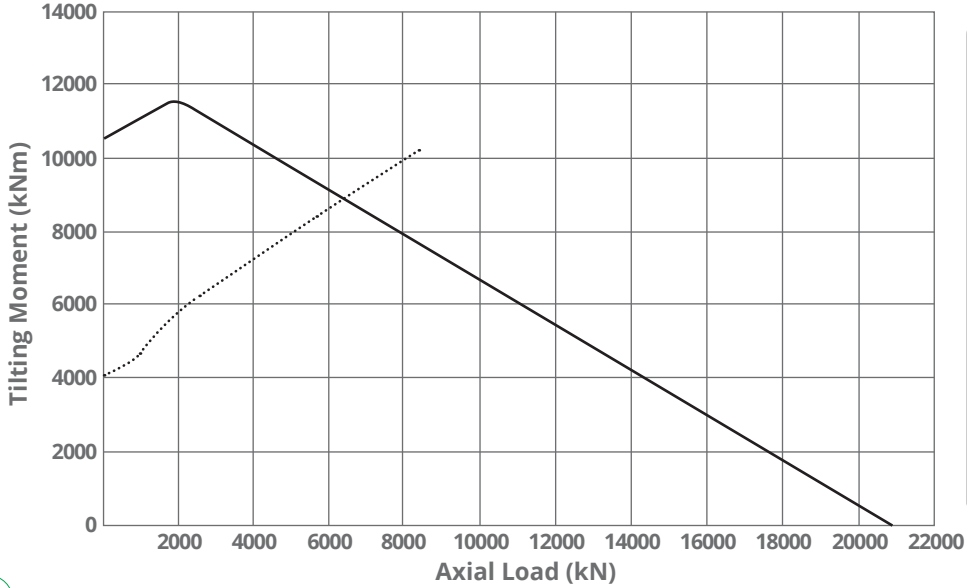
Curve 3: Bolts

Bolt quality:	10,9
Bolt dia:	M 20
Number of bolts:	72
Min. klamping length:	100
Alpha A:	1,6
Preload:	70%

Bolt capacity curve on the basis of VDI-guideline 2230

Curve 1.1 ——
Curve 3 ·····

Drawing Nº: 400,0/25,2500,000



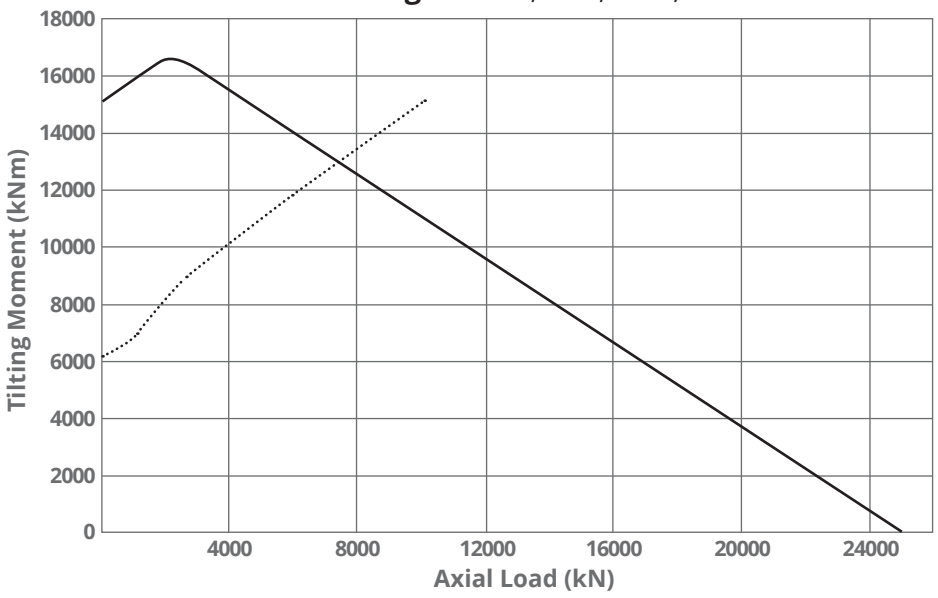
Curve 1.1: Static capacity

Curve 3: Bolts

Bolt quality:	10,9
Bolt dia:	M 24
Number of bolts:	66
Min. klamping length:	120
Alpha A:	1,6
Preload:	70%

Bolt capacity curve on the basis of VDI-guideline 2230

Drawing Nº: 400,0/25,3000,000



Curve 1.1: Static capacity

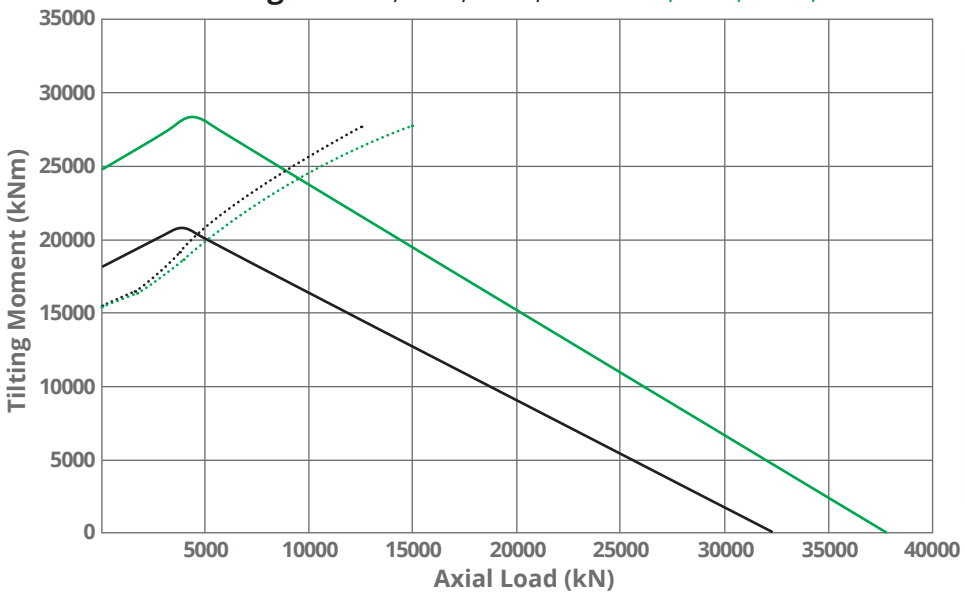
Curve 3: Bolts

Bolt quality:	10,9
Bolt dia:	M 24
Number of bolts:	50
Min. klamping length:	120
Alpha A:	1,6
Preload:	70%

Bolt capacity curve on the basis of VDI-guideline 2230

Curve 1.1 ——
Curve 3 ·····

Drawing Nº: 400,2/36,3000,000 - 400,2/36,3500,000



Curve 1.1: Static capacity

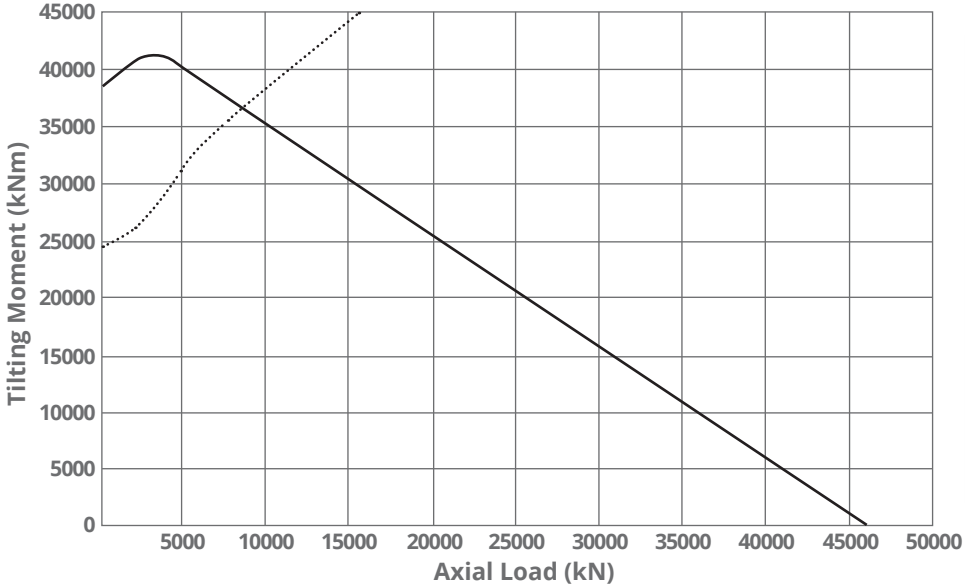
Curve 3: Bolts

Bolt quality:	10,9	10,9
Bolt dia:	M 42	M 42
Number of bolts:	66	72
Min. klamping length:	210	210
Alpha A:	1,6	1,6
Preload:	70%	70%

Bolt capacity curve on the basis of VDI-guideline 2230

Curve 1.1 ——
Curve 3 ·····

Drawing Nº: 400,2/40,4000,000



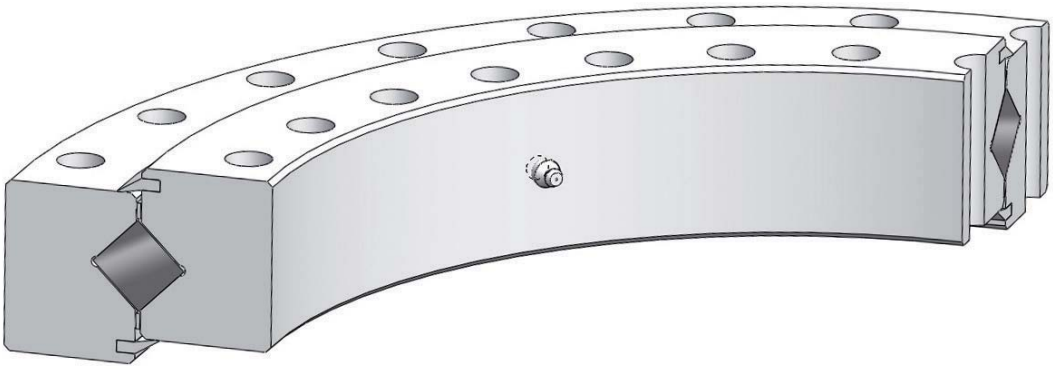
Curve 1.1: Static capacity

Curve 3: Bolts

Bolt quality:	10,9
Bolt dia:	M 42
Number of bolts:	78
Min. klamping length:	210
Alpha A:	1,6
Preload:	70%

Bolt capacity curve on the basis of VDI-guideline 2230

Type **600.0**



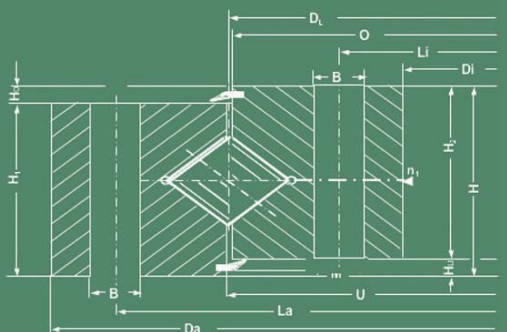
Drawing number	Outer Ø	Inner Ø	Overall height	Weight	Bolt size	Bolt hole Ø	Number of holes	Ext. Bolt circle Ø	Int. Bolt circle Ø
	Da (mm)	Di (mm)	H (mm)	kg	M	B (mm)		La	Li
600,0/16,1000,000	1086,5	913,5	55	84	16	17,5	30	1051,5	948,5
600,0/25,1500,000	1615	1385	75	243	20	22	40	1571	1429
600,0/25,2000,000	2115	1885	75	326	20	22	46	2071	1929
600,0/32,2250,000	2390	2110	90	540	24	26	56	2338	2162
600,0/32,2500,000	2640	2360	90	602	24	26	60	2588	2412
600,0/40,3000,000	3176	2824	108	1093	30	33	70	3110	2890
600,0/50,3500,000	3690	3310	130	1681	30	33	76	3624	3376
600,0/50,4000,000	4190	3810	130	1929	30	33	88	4124	3876

Products and applications

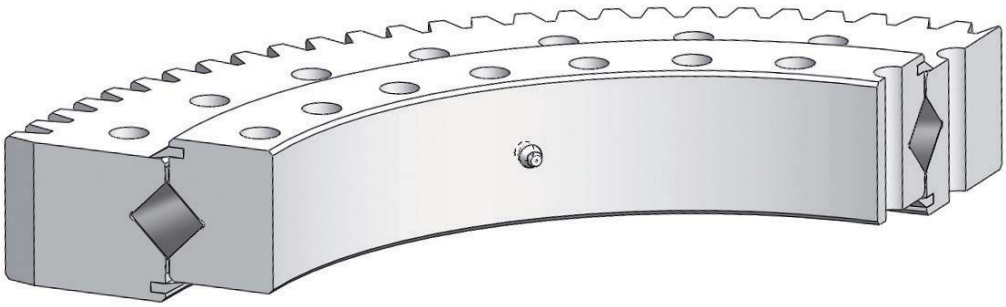
Type 600: crossed roller bearing.

Applied for: special machinery, marine propulsion.

Ring height H1	Ring height H2	Distance at bottom betw. Outer/ inner	Distance at top betw. Outer/ inner	Gear P.C.D.	Module	Teeth number	Croquis
H1 (mm)	H2 (mm)	Hu (mm)	Ho (mm)	(mm)		Z	
45	45	10	10	-	-	-	
65	65	10	10	-	-	-	
65	65	10	10	-	-	-	
80	80	10	10	-	-	-	
80	80	10	10	-	-	-	
98	98	10	10	-	-	-	
120	120	10	10	-	-	-	
120	120	10	10	-	-	-	



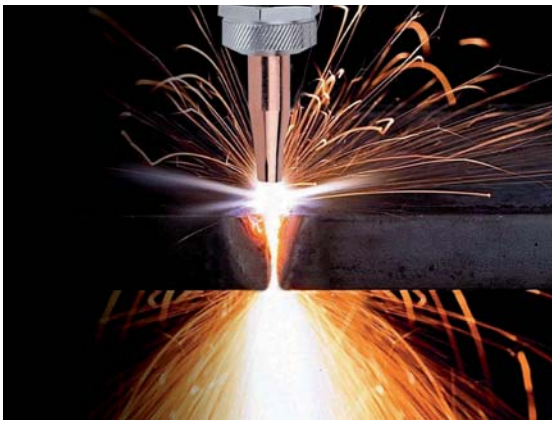
Type **600.1**



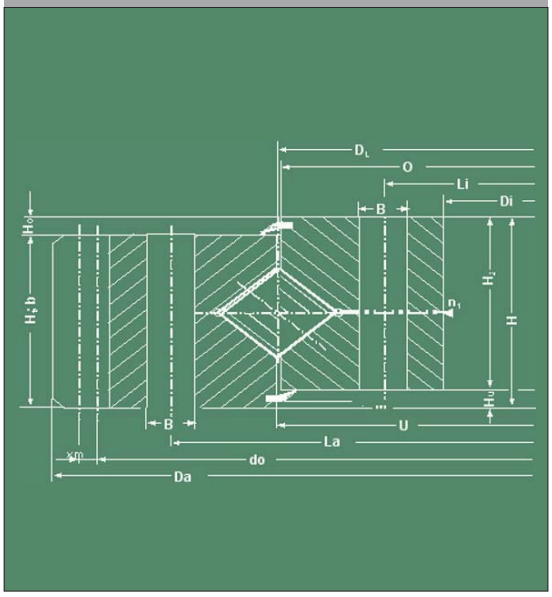
Drawing number	Outer Ø	Inner Ø	Overall height	Weight	Bolt size	Bolt hole Ø	Number of holes	Ext. Bolt circle Ø	Int. Bolt circle Ø
	Da (mm)	Di (mm)	H (mm)	kg	M	B (mm)		La	Li
600,1/16,1000,000	1128	913	55	109	16	17,5	30	1051,5	948,5
600,1/25,1500,000	1670	1385	75	315	20	22	40	1571	1429
600,1/25,2000,000	2198	1885	75	469	20	22	46	2071	1929
600,1/32,2250,000	2464	2110	90	718	24	26	56	2338	2162
600,1/32,2500,000	2736	2360	90	856	24	26	60	2588	2412
600,1/40,3000,000	3264	2824	108	1435	30	33	70	3110	2890
600,1/50,3500,000	3798	3310	130	2279	30	33	76	3624	3376
600,1/50,4000,000	4284	3810	130	2518	30	33	88	4124	3876

Recent projects:

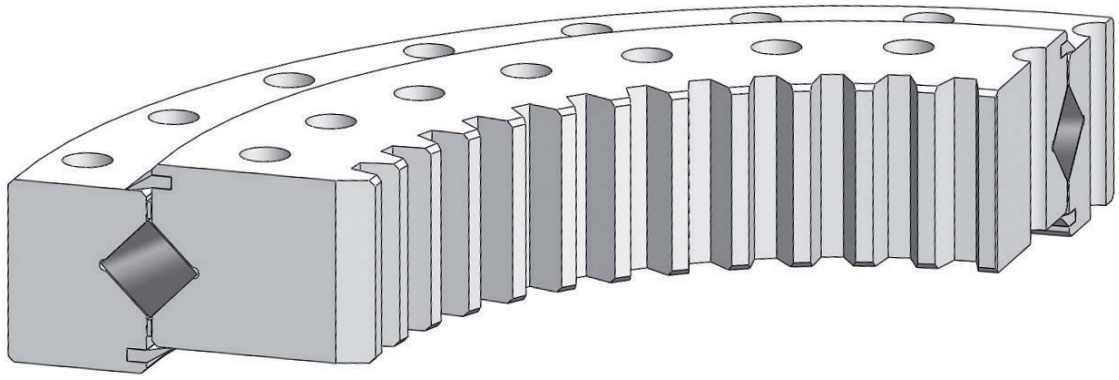
Year: 2012
Type 600
Applied:
Special Welding machine
Internal teeth
Special spacer
Reached Lead time: 10 weeks



Ring height H1	Ring height H2	Distance at bottom betw. Outer/ inner	Distance at top betw. Outer/ inner	Gear P.C.D.	Module	Teeth number	Croquis
H1 (mm)	H2 (mm)	Hu (mm)	Ho (mm)	(mm)		Z	
45	45	10	10	1112	8	139	
65	65	10	10	1650	10	165	
65	65	10	10	2170	14	155	
80	80	10	10	2436	14	174	
80	80	10	10	2704	16	169	
98	98	10	10	3232	16	202	
120	120	10	10	3762	18	209	
120	120	10	10	4248	18	236	

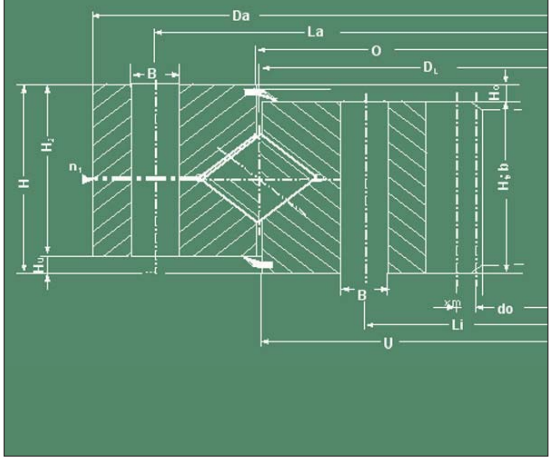


Type **600.2**



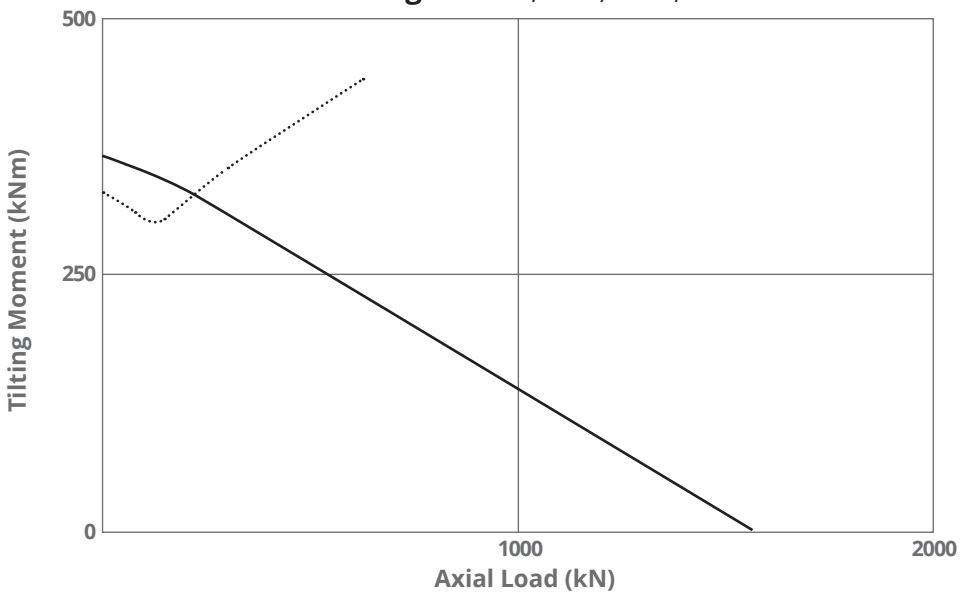
Drawing number	Outer Ø	Inner Ø	Overall height	Weight	Bolt size	Bolt hole Ø	Number of holes	Ext. Bolt circle Ø	Int. Bolt circle Ø
	Da (mm)	Di (mm)	H (mm)	kg	M	B (mm)		La	Li
600,2/16,1000,000	1086	872	55	105	16	17,5	30	1051,5	948,5
600,2/25,1500,000	1615	1330	75	303	20	22	40	1571	1429
600,2/25,2000,000	2115	1806	75	443	20	22	46	2071	1929
600,2/32,2250,000	2390	2030	90	704	24	26	56	2338	2162
600,2/32,2500,000	2640	2272	90	803	24	26	60	2588	2412
600,2/40,3000,000	3176	2736	108	1389	30	33	70	3110	2890
600,2/50,3500,000	3690	3204	130	2192	30	33	76	3624	3376
600,2/50,4000,000	4190	3708	130	2496	30	33	88	4124	3876

Ring height H1	Ring height H2	Distance at bottom betw. Outer/ inner	Distance at top betw. Outer/ inner	Gear P.C.D.	Module	Teeth number	Croquis
H1 (mm)	H2 (mm)	Hu (mm)	Ho (mm)	(mm)		Z	
45	45	10	10	888	8	-111	
65	65	10	10	1350	10	-135	
65	65	10	10	1834	14	-131	
80	80	10	10	2058	14	-147	
80	80	10	10	2304	16	-144	
98	98	10	10	2768	16	-173	
120	120	10	10	3240	18	-180	
120	120	10	10	3744	18	-208	



Type **600** Load Diagram

Drawing Nº: 600,0/16,1000,000



Curve 1.1: Static capacity

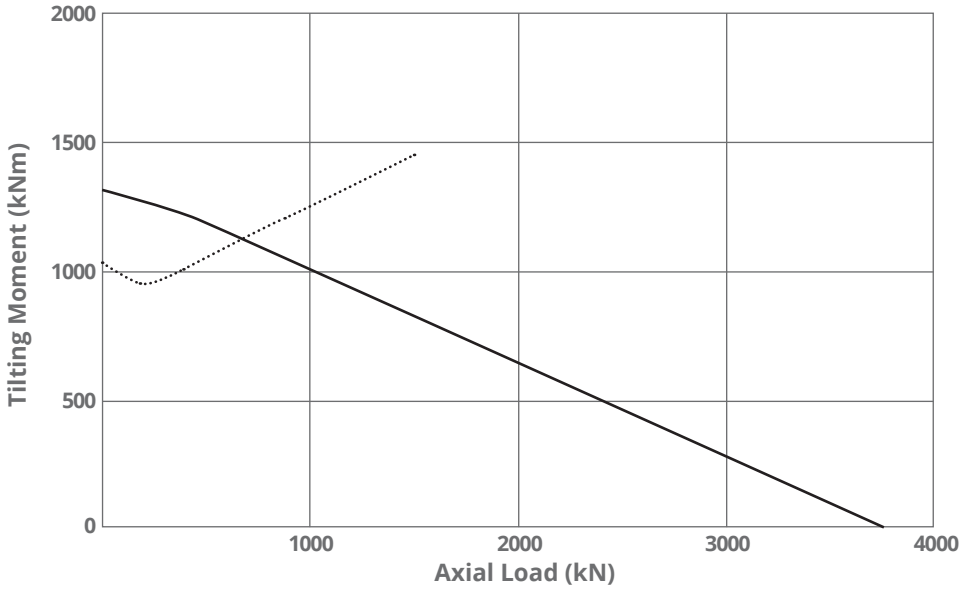
Curve 3: Bolts

Bolt quality:	10,9
Bolt dia:	M 16
Number of bolts:	30
Min. klamping length:	80
Alpha A:	1,6
Preload:	70%

Bolt capacity curve on the basis of VDI-guideline 2230

Curve 1.1 ——
Curve 3 ·····

Drawing Nº: 100,0/25,1500,000



Curve 1.1: Static capacity

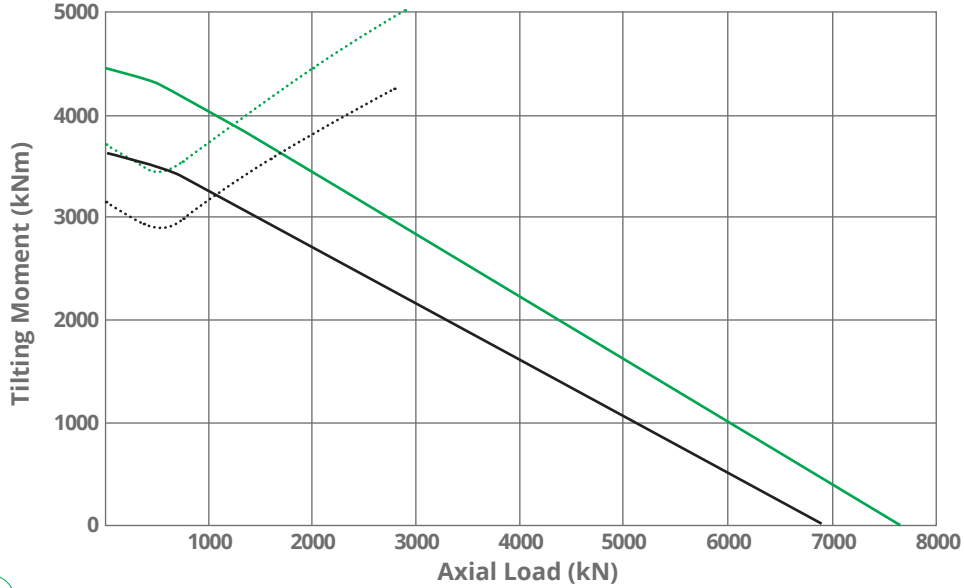
Curve 3: Bolts

Bolt quality:	10,9
Bolt dia:	M 20
Number of bolts:	40
Min. klamping length:	100
Alpha A:	1,6
Preload:	70%

Bolt capacity curve on the basis of VDI-guideline 2230

Curve 1.1 ——
Curve 3 ·····

Drawing Nº: 600,0/32,2250,000 - 600,0/32,2500,000



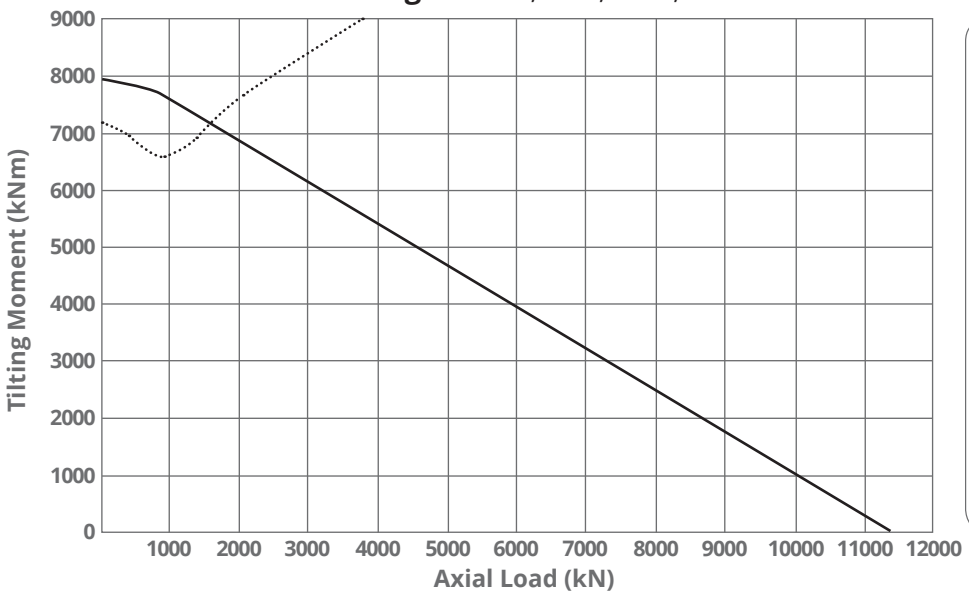
Curve 1.1: Static capacity

Curve 3: Bolts

Bolt quality:	10,9	10,9
Bolt dia:	M 24	M 24
Number of bolts:	56	60
Min. klamping length:	120	120
Alpha A:	1,6	1,6
Preload:	70%	70%

Bolt capacity curve on the basis of VDI-guideline 2230

Drawing Nº: 600,0/40,3000,000



Curve 1.1: Static capacity

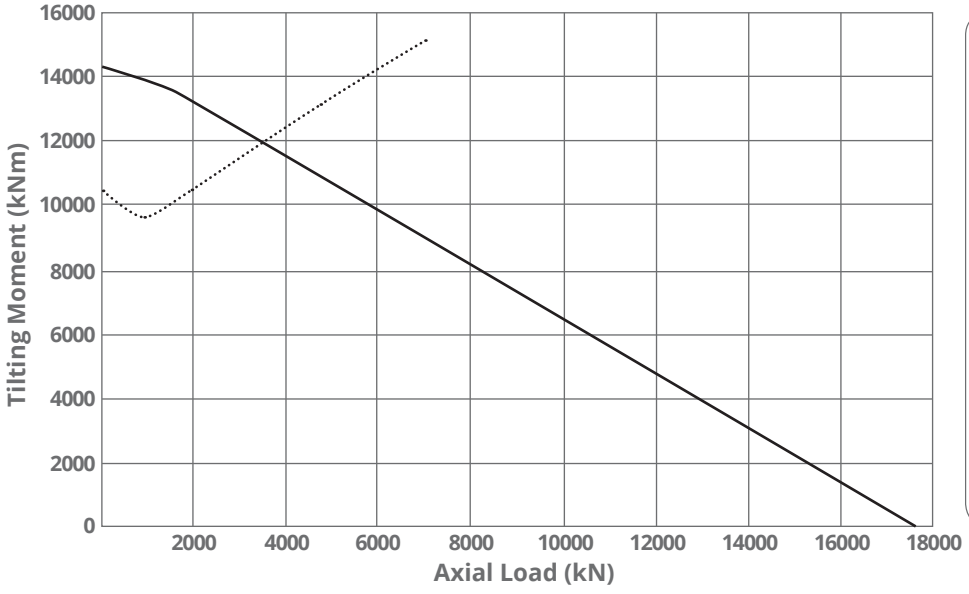
Curve 3: Bolts

Bolt quality:	10,9
Bolt dia:	M 30
Number of bolts:	60
Min. klamping length:	150
Alpha A:	1,6
Preload:	70%

Bolt capacity curve on the basis of VDI-guideline 2230

Curve 1.1 ——
Curve 3 ·····

Drawing Nº: 600,0/50,3500,000



Curve 1.1: Static capacity

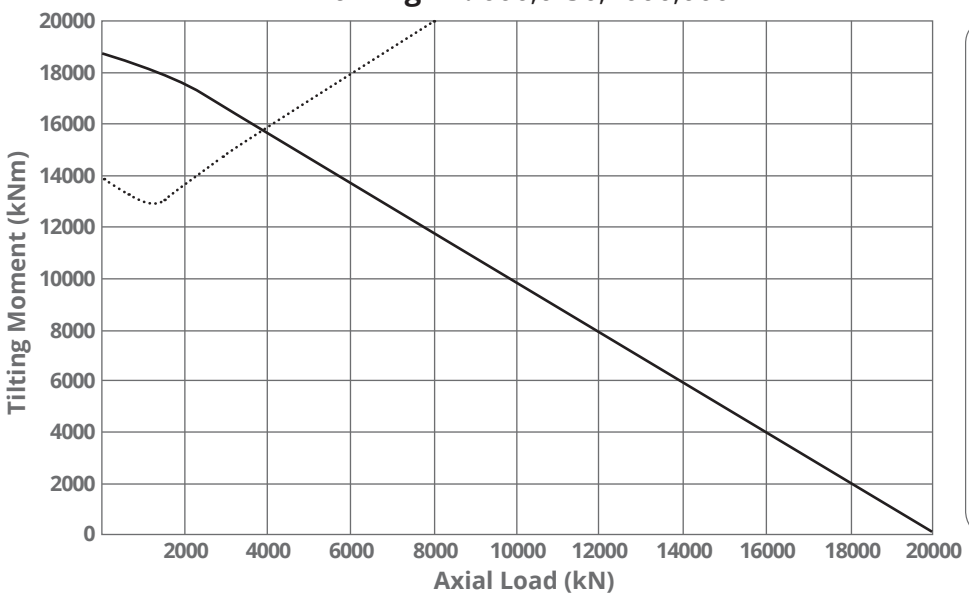
Curve 3: Bolts

Bolt quality:	10,9
Bolt dia:	M 30
Number of bolts:	76
Min. klamping length:	150
Alpha A:	1,6
Preload:	70%

Bolt capacity curve on the basis of VDI-guideline 2230

Curve 1.1 ——
Curve 3 ·····

Drawing Nº: 600,0/50,4000,000



Curve 1.1: Static capacity

Curve 3: Bolts

Bolt quality:	10,9
Bolt dia:	M 30
Number of bolts:	88
Min. klamping length:	150
Alpha A:	1,6
Preload:	70%

Bolt capacity curve on the basis of VDI-guideline 2230

Instructions for transport & storage (Assembly and maintenance)

This set of instructions has been designed to ensure the correct use of the slewing ring and bearing once it has left the RENOGEAR SL premises after passing our Quality tests.

Transport and storage

RENOGEAR recommends transporting the product in a horizontal position inside the box specifically designed for that purpose, with a view to preventing the bearing from receiving any impacts during transport and protecting it from the external atmospheric conditions (humidity, dust...).

Whenever the size of the slewing ring (>2.5 meters) does not allow transport in a horizontal position, RENOGEAR recommends the use of special inclined devices designed for transport with an internal cross piece to avoid radial strain.

RENOGEAR recommends applying the same methods for transport and storage.

Handling

Move the bearing using the eyebolts specially made for transport that you will see in each bearing. Each of the rings in the bearing has three threaded holes where the eyebolts are tied for transporting it with a crane.

Prevent the bearing from being axially or radially hit.

Handle the bearing with extreme care to avoid damaging it.

Lubrication

All bearings have been properly lubricated by RENOGEAR prior to delivery. Correct lubrication is achieved when there is a thin layer of grease between the joint and the ring's surface. Nonetheless, RENOGEAR recommends lubricating the bearing again once installed in the equipment. It is also best to lubricate the bearing when it is rotating. Each bearing has a dimensioned amount of greasing nipples. It is necessary to calculate the amount of grease to be used at each application. A specification of the grease recommended by RENOGEAR in each application is provided both at the end of this report and in the Quality information handed to the client.

Greasing nipples are already assembled in all RENOGEAR's bearings at delivery.

Assembly

In order for the bearing to work correctly and complete its useful life, it is essential to assemble it on a flat enough surface.

The maximum admissible deviation from flatness (including angle inclination) of the support surface is defined in this table:

Raceway circle diameter in mm D_1	Drawing deviation including angle inclination for each surface support P in mm for		
	Rotating joints on 2 path balls Axial ball bearings	Rotating joints on 1 path balls Four contact ball bearing* Four contact ball bearing double	Rotating joints on rollers Combined bearings
up to 500	0,15	0,10	0,07
up to 1000	0,20	0,15	0,10
up to 1500	0,25	0,19	0,12
up to 2000	0,30	0,22	0,15
up to 2500	0,35	0,25	0,17
up to 4000	0,40	0,30	0,20

The value set as the maximum admissible deviation from flatness can only be exceeded once every 180º.

Angle deviation in a 100 mm wide support surface must also stay within the values set in the abovementioned table.

RENOGEAR recommends mechanizing support surfaces if the values for flatness and angle deviation set on the table are not met.

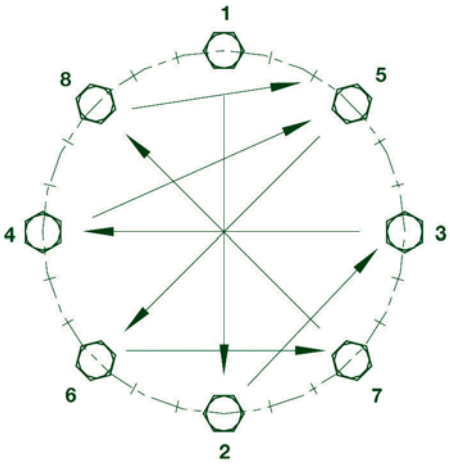
The bearings will have marks on the hardening transition areas and on the notched area with the highest radial oscillation.

Non-hardened areas will always coincide with the filler plugs and they will be marked with an “S” (soft).

The notched areas with the highest radial oscillation will be painted red. These notches are used for the sprocket-wheel adjustment during assembly. The adjustment between the two elements must be at least 0.03 times the module.

The bearing must be cross-tied to the support surface, as shown in the attached drawing.

A table with a guideline of tightening values for a 10.9 quality screw as set forth in DIN standard 267 is also attached.



Thread diameter / screw	Bore diameter mm	Tightening torques in Nm in screws of class $\mu_G = \mu_K = 0,14$	
		For hydraulic screwdriver M_{dr}	For spanner M_d
	DIN / ISO 273	10.9	10.9
M 12	14	130	117
M 14	16	205	184
M 16	17,5	310	279
M 18	20	430	387
M 20	22	620	558
M 24	26	1060	954
M 27	30	1550	1395
M 30	33	2100	1890
		Grade 8	Grade 8
UNC $^5/_8$” - 11	18	286	260
UNC $^3/_4$” - 10	21	506	460
UNC $^7/_8$” - 9	25	803	730
UNC 1” - 8	27,5	1210	1100
UNC 1$^1/_8$” - 7	32	1716	1560
UNC 1$^1/_4$” - 7	35	2410	2190
		Grade 5	Grade 5
UNC $^5/_8$” - 18	18	320	290
UNC $^3/_4$” - 16	21	560	510
UNC $^7/_8$” - 14	25	902	820
UNC 1” - 12	27,5	1330	1210
UNC 1$^1/_8$” - 12	32	1936	1760
UNC 1$^1/_4$” - 12	35	2685	2440

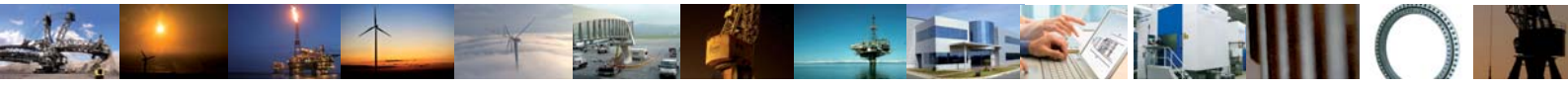
Maintenance

RENOGEAR recommends clients to schedule periodic maintenance of the bearings. It is recommended to include the following items in the maintenance process: lubricating the tread way with the grease recommended by RENOGEAR, verifying fixing screws, checking the joints and performing a superficial cleaning of the bearing. The most suitable moment for maintenance is when the bearing has been working for between 50 and 100 hours, depending on duty cycles and environmental conditions.

RENOGEAR recommends bolt torque to be that indicated at the end of this report.

RENOGEAR recommends avoiding the use of aggressive cleaning products that may damage the joints.

reno gear



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