



# Rothe Erde<sup>®</sup> Turntables

ThyssenKrupp Rothe Erde



ThyssenKrupp

# Rothe Erde® Turntables

## Technology made-to-measure



**Rothe Erde® turntables –  
Products of proven quality**  
Rothe Erde® turntables have been developed for installation in transport vehicles. Their purpose is to transmit both the axial load, thrust and traction forces.

Our product range comprises ball-bearing and roller-bearing slewing rings, turntables and seamless rolled rings.

We at ThyssenKrupp Rothe Erde put quality first. All our activities from application engineering to design and production including comprehensive customer service are based on the following international quality standards:

- Quality assurance system acc. to DIN EN ISO 9001,
- Environmental protection acc. to DIN EN ISO 14001 and
- Industrial safety acc. to OHSAS 18001.

The standard series turntables shown here are the result of many years' design and manufacturing experience in the field of trailer steering systems for road truck trailers, positively steered semi-trailers, fifth wheel couplings, heavy goods vehicles and special vehicles.

Rothe Erde® turntables are produced to exacting standards and are designed to meet high performance requirements.

Each turntable consists of two steel rings designed for flange mounting. The raceways are machined so as to ensure that the power transmission is favourably directed between the profiled rings and the inserted antifriction bearing steel balls. The turntables are delivered with preservation and grease filling.





# Bearing configurations and bearing tables

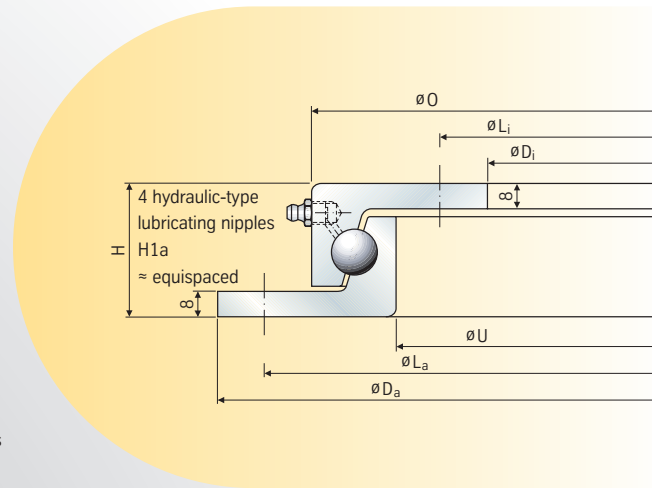
## Types 16 L – 16 – 80 – 80 S

Drawing No. · Type		Track diameter	Weight (approx.)	Outer diameter	Inner diameter	Overall height	Outer bolt circle diameter	Inner bolt circle diameter	Bore diameter	Number of grease nipples	Diameter	Diameter
		D <sub>L</sub> mm	kg	D <sub>a</sub> mm	D <sub>i</sub> mm	H mm	L <sub>a</sub> mm	L <sub>i</sub> mm	B mm	n <sub>1</sub> mm	D <sub>a1</sub> mm	O mm
16 L	<b>Type 16 L undrilled</b>											
	310.16.0300.000 · Typ 16 L/400	320.0	11.0	404	236.0	42	375	260	–	4	–	346
	310.16.0400.000 · Typ 16 L/500	420.0	15.0	504	336.0	42	475	360	–	4	–	446
	310.16.0500.000 · Typ 16 L/650	570.0	20.0	654	486.0	42	625	510	–	4	–	596
	310.16.0600.000 · Typ 16 L/750	670.0	23.0	754	586.0	42	725	610	–	4	–	696
	310.16.0700.000 · Typ 16 L/850	770.0	27.0	854	686.0	42	825	710	–	4	–	796
	310.16.0800.000 · Typ 16 L/950	870.0	30.0	954	786.0	42	925	810	–	4	–	896
310.16.0900.000 · Typ 16 L/1050	970.0	34.0	1054	886.0	42	1025	910	–	4	–	996	
16	<b>Type 16 undrilled</b>											
	320.16.0400.000 · Typ 16/500	407.5	17.0	500	315.0	48	475	340	–	4	–	434
	320.16.0500.000 · Typ 16/650	557.5	23.0	650	465.0	48	625	490	–	4	–	584
	320.16.0600.000 · Typ 16/750	657.5	26.0	750	565.0	48	725	590	–	4	–	684
	320.16.0700.000 · Typ 16/850	757.5	30.0	850	665.0	48	825	690	–	4	–	784
	320.16.0800.000 · Typ 16/950	857.5	34.0	950	765.0	48	925	790	–	4	–	884
320.16.0900.000 · Typ 16/1050	957.5	39.0	1050	865.0	48	1025	890	–	4	–	984	
80	<b>Type 80 undrilled</b>											
	330.16.0500.000 · Typ 80/685	598.5	38.0	721	567.0	80	671	657	–	4	696	–
	330.16.0700.000 · Typ 80/880	793.5	48.0	916	762.0	80	866	852	–	4	891	–
	330.16.0900.000 · Typ 80/1000	913.5	58.0	1036	882.0	80	984	970	–	4	1011	–
	330.16.1000.000 · Typ 80/1090	1003.5	63.0	1126	972.0	80	1074	1060	–	4	1101	–
	<b>Type 80 drilled</b>											
330.16.0700.010 · Typ 80/880	793.5	48.0	916	762.0	80	866	852	16	4	891	–	
330.16.1000.010 · Typ 80/1090	1003.5	63.0	1126	972.0	80	1074	1060	18	4	1101	–	
80 S	<b>Type 80 S undrilled</b>											
	350.16.1000.000 · Typ 80 S/1100	1002.5/992.5	73.0	1108	959.5	80	–	–	–	6	1095	–
	350.16.0700.000 · Typ 80 S/890	792.5/782.5	57.0	894	749.5	80	–	–	–	6	880	–
	350.16.0500.000 · Typ 80 S/660	562.5/552.5	40.6	664	519.5	80	–	–	–	6	650	–
	<b>Type 80 S drilled</b>											
	350.16.1000.010 · Typ 80 S/1100	1002.5/992.5	72.8	1108	959.5	80	1074	1060	16	6	1095	–
350.16.0710.010 · Typ 80 S/890 A	792.5/782.5	56.7	894	749.5	80	866	852	16	6	880	–	
350.16.0700.010 · Typ 80 S/890	792.5/782.5	56.8	894	749.5	80	866	852	16	6	880	–	
350.16.0500.010 · Typ 80 S/660	562.5/552.5	40.4	664	519.5	80	636	622	14	6	650	–	

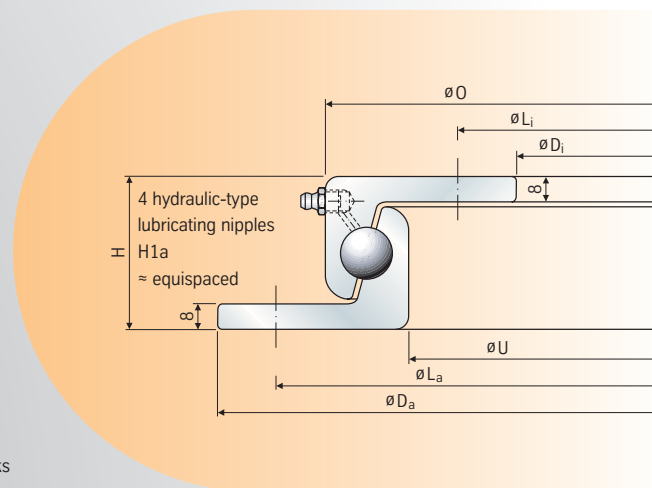
\* For other axle combinations or other uses, please ask us

\*\* Type 80 S/890 A: Permissible load valid for fifth wheel couplings

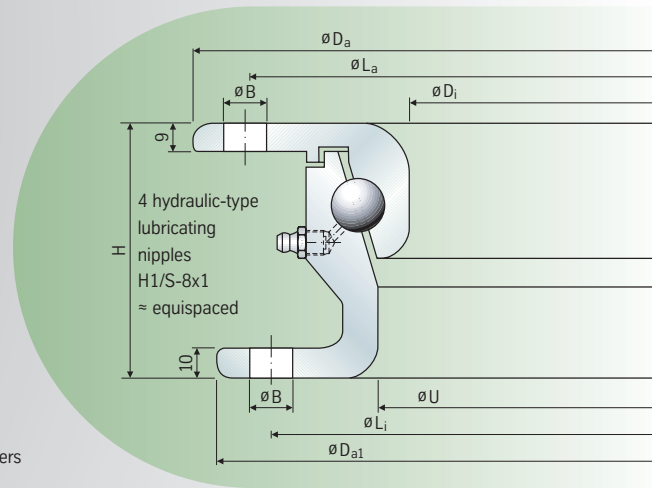
Diameter <b>U</b> mm	Ball diameter <b>d</b> mm	Trailer load Permissible axial load*		Permissible acceleration or deceleration m/s <sup>2</sup>	Maximum bearing clearances	
		2 axles kN	more than 2 axles kN		axial mm	radial mm
294	16	7.5	—	4	1.0	0.7
394	16	9.0	—	4	1.0	0.7
544	16	15.0	—	4	1.0	0.7
644	16	18.0	—	4	1.0	0.7
744	16	25.0	—	4	1.0	0.7
844	16	30.0	—	4	1.0	0.7
944	16	35.0	—	4	1.0	0.7
381	16	18.0	—	7	1.0	0.7
531	16	25.0	—	7	1.0	0.7
631	16	30.0	—	7	1.0	0.7
731	16	35.0	—	7	1.0	0.7
831	16	40.0	—	7	1.0	0.7
931	16	45.0	—	7	1.0	0.7
583	16	35.0	30.0	7	1.0	0.7
778	16	55.0	50.0	7	1.0	0.7
898	16	65.0	60.0	7	1.0	0.7
988	16	70.0	65.0	7	1.0	0.7
778	16	55.0	50.0	7	1.0	0.7
988	16	70.0	65.0	7	1.0	0.7
994	16/14	100.0	100.0	7	1.0	0.7
784	16/14	80.0	80.0	7	1.0	0.7
554	16/14	50.0	50.0	7	1.0	0.7
994	16/14	100.0	100.0	7	1.0	0.7
784	16/14	160.0**	160.0**	7	1.0	0.7
784	16/14	80.0	80.0	7	1.0	0.7
554	16/14	50.0	50.0	7	1.0	0.7



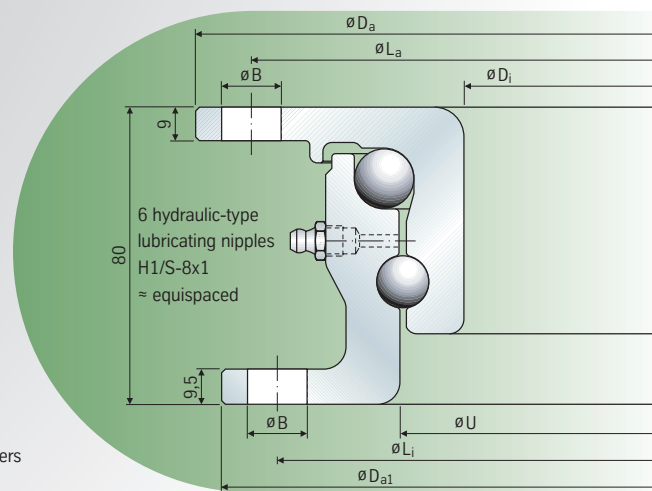
**Type 16 L**  
for farm trucks  
and carts



**Type 16**  
for lightweight  
truck trailers  
and farm trucks



**Type 80**  
for two and  
three-axle trailers



**Type 80 S**  
for two and  
three-axle trailers

# Bearing configurations and bearing tables

## Types 90 – 90 WA – 90 S

Drawing No. · Type	Track diameter	Weight (approx.)	Outer diameter	Inner diameter	Overall height	Outer bolt circle diameter	Inner bolt circle diameter	Bore diameter	Number of grease nipples	Diameter	Diameter
	$D_L$ mm	kg	$D_a$ mm	$D_i$ mm	H mm	$L_a$ mm	$L_i$ mm	B mm	$n_1$ mm	$D_{a1}$ mm	O mm
<b>Type 90 undrilled</b>											
360.18.0800.000 · Typ 90/1000.18	894	64	1008	854	90	974	960	–	6	1000	–
360.20.0800.000 · Typ 90/1000.20	894	64	1008	854	90	974	960	–	6	1000	–
360.22.0800.000 · Typ 90/1000.22	894	64	1008	854	90	974	960	–	6	1000	–
360.24.0800.000 · Typ 90/1000.24	894	64	1008	854	90	974	960	–	6	1000	–
360.18.0900.000 · Typ 90/1100.18	994	71	1108	954	90	1074	1060	–	6	1100	–
360.20.0900.000 · Typ 90/1100.20	994	71	1108	954	90	1074	1060	–	6	1100	–
360.22.0900.000 · Typ 90/1100.22	994	71	1108	954	90	1074	1060	–	6	1100	–
360.24.0900.000 · Typ 90/1100.24	994	71	1108	954	90	1074	1060	–	6	1100	–
360.22.1000.000 · Typ 90/1200.22	1094	79	1208	1054	90	1174	1160	–	6	1200	–
360.24.1000.000 · Typ 90/1200.24	1094	79	1208	1054	90	1174	1160	–	6	1200	–
360.22.1100.000 · Typ 90/1300.22	1194	87	1308	1154	90	1274	1260	–	6	1300	–
<b>Type 90 drilled</b>											
360.18.0900.010 · Typ 90/1100.18	994	71	1108	954	90	1074	1060	18	6	1100	–
360.20.0900.010 · Typ 90/1100.20	994	71	1108	954	90	1074	1060	18	6	1100	–
360.22.0900.010 · Typ 90/1100.22	994	71	1108	954	90	1074	1060	18	6	1100	–
360.24.0900.010 · Typ 90/1100.24	994	71	1108	954	90	1074	1060	18	6	1100	–
360.22.1000.010 · Typ 90/1200.22	1094	79	1208	1054	90	1174	1160	18	6	1200	–
360.24.1000.010 · Typ 90/1200.24	1094	79	1208	1054	90	1174	1160	18	6	1200	–
360.22.1100.010 · Typ 90/1300.22	1194	87	1308	1154	90	1274	1260	18	6	1300	–
<b>Type 90 WA drilled</b>											
360.22.0955.010 · Typ 90/1100.22 WA	994	71	1108	954	90	1074	1060	18	6	1100	–
360.24.0955.010 · Typ 90/1100.24 WA	994	71	1108	954	90	1074	1060	18	6	1100	–
360.22.1055.010 · Typ 90/1200.22 WA	1094	79	1208	1054	90	1174	1160	18	6	1200	–
360.24.1055.010 · Typ 90/1200.24 WA	1094	79	1208	1054	90	1174	1160	18	6	1200	–
360.22.1155.010 · Typ 90/1300.22 WA	1194	87	1308	1154	90	1274	1260	18	6	1300	–
<b>Type 90 S undrilled</b>											
370.20.0804.000 · Typ 90 S/1000	880/870	82	1000	834	90	966	952	–	6	987	–
370.20.0904.000 · Typ 90 S/1100	988/978	92	1108	942	90	1074	1060	–	6	1095	–
370.20.1004.000 · Typ 90 S/1200	1088/1078	101	1208	1042	90	1174	1160	–	6	1195	–
370.24.1004.000 · Typ 90 S/1200.SP	1087/1078	101	1208	1042	90	1174	1160	–	6	1195	–
<b>Type 90 S drilled</b>											
370.20.0804.010 · Typ 90 S/1000	880/870	82	1000	834	90	966	952	18	6	987	–
370.20.0904.010 · Typ 90 S/1100	988/978	92	1108	942	90	1074	1060	18	6	1095	–
370.20.1004.010 · Typ 90 S/1200	1088/1078	101	1208	1042	90	1174	1160	18	6	1195	–
370.20.1004.030 · Typ 90 S/1200.12	1088/1078	101	1208	1042	90	1174	1160	18	6	1195	–
370.24.1004.010 · Typ 90 S/1200.SP	1087/1078	101	1208	1042	90	1174	1160	18	6	1195	–

\* For other axle combinations or other uses, please ask us

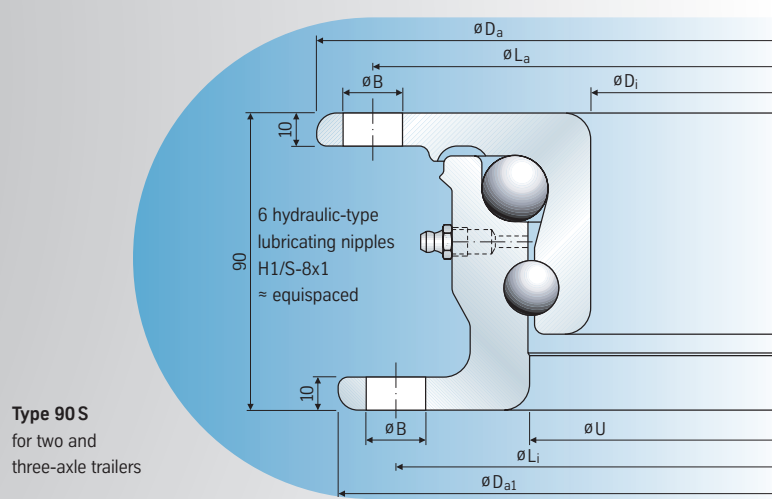
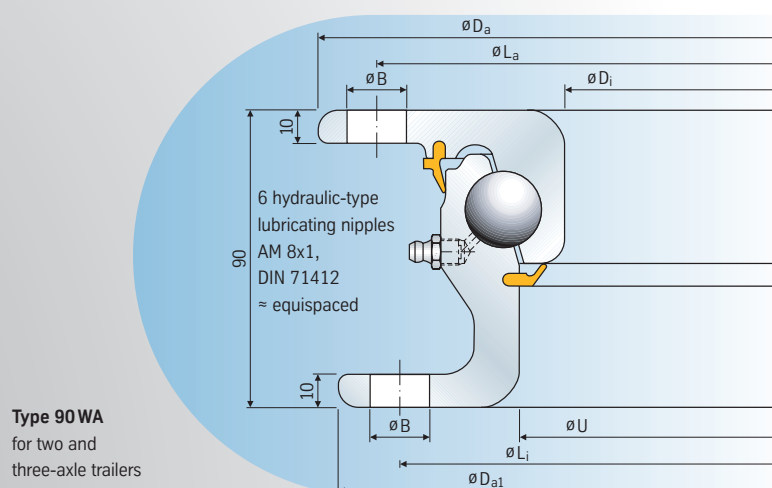
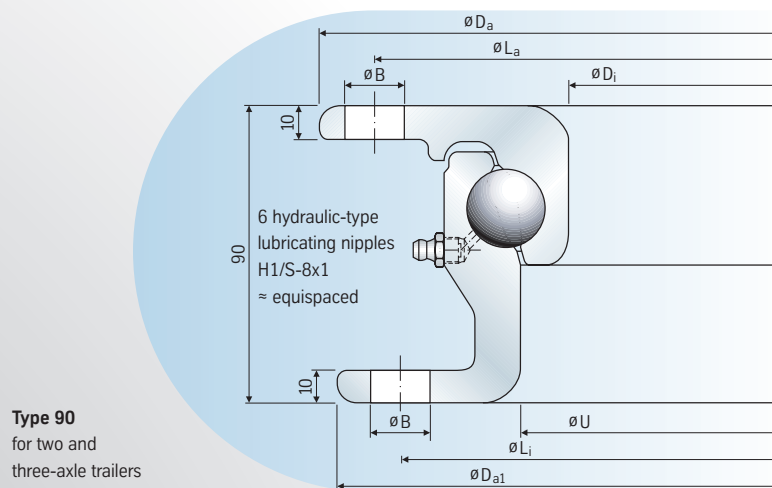
### Type 90 WA: Low-maintenance version

- Raceway system protected by seals at upper and lower bearing gap.
- Low-maintenance for a minimum of 3 years or a mileage of 300,000 kms under normal operating conditions. Should exceptional environmental conditions prevail or should the turntable be

Diameter	Ball diameter	Trailer load		Permissible acceleration or deceleration	Maximum bearing clearances	
		Permissible axial load*			axial	radial
U	d	2 axles	more than 2 axles	m/s <sup>2</sup>	mm	mm
mm	mm	kN	kN			
885	18	75	70	7	1.0	0.7
885	20	90	80	7	1.0	0.7
885	22	110	100	7	1.0	0.7
885	24	160	140	7	1.0	0.7
985	18	90	80	7	1.0	0.7
985	20	110	100	7	1.0	0.7
985	22	130	120	7	1.0	0.7
985	24	180	160	7	1.0	0.7
1085	22	160	140	7	1.0	0.7
1085	24	200	180	7	1.0	0.7
1185	22	180	160	7	1.0	0.7
985	18	90	80	7	1.0	0.7
985	20	110	100	7	1.0	0.7
985	22	130	120	7	1.0	0.7
985	24	180	160	7	1.0	0.7
1085	22	160	140	7	1.0	0.7
1085	24	200	180	7	1.0	0.7
1185	22	180	160	7	1.0	0.7
985	22	130	120	7	0.8	0.6
985	24	180	160	7	0.8	0.6
1085	22	160	140	7	0.8	0.6
1085	24	200	180	7	0.8	0.6
1185	22	180	160	7	0.8	0.6
871	20/16	160	160	7	1.0	0.7
979	20/16	200	200	7	1.0	0.7
1079	20/16	200	200	7	1.0	0.7
1079	24/16	300	300	7	1.0	0.7
871	20/16	160	160	7	1.0	0.7
979	20/16	200	200	7	1.0	0.7
1079	20/16	200	200	7	1.0	0.7
1079	20/16	200	200	7	1.0	0.7
1079	24/16	300	300	7	1.0	0.7

directly cleaned with a high-pressure equipment, it is necessary to re-grease the turntable immediately. Take also care that the companion structure protects the turntable either so as to prevent any water and dirt from entering the race system.

- Re-greasing and inspection is necessary after the low-maintenance operating period has elapsed.



- Frictional torque: As a consequence of the double seal at the bearing gaps a somewhat increased frictional torque may develop in comparison with the normal version. Operation is not impaired by this when used in vehicle trailers.
- Mounting dimensions, permissible loads, weights, and drilling plans are as for standard design type 90.

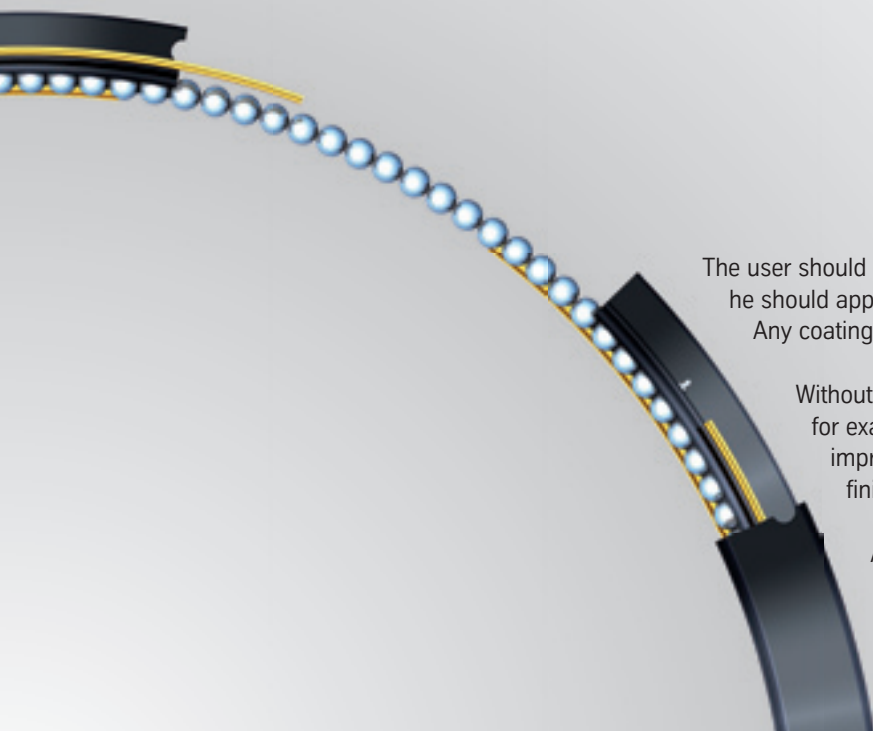
# Delivery



The turntables are supplied as standard type being filled with lithium-saponified grease of penetration grade 2 and as low-maintenance type being filled with Gleitmo 585 K.

The turntables are supplied with a surface preservative. This preservation is only a temporary protection against corrosion which can principally be overpainted with all commercial finishing paints (such as acrylic resins, one-component and two-component acrylic varnishes, two-component PU varnishes, two-component epoxy varnishes) and with bituminous paint. (Attention: Do not overpaint the seals.)





The user should check in each individual case if overpainting is possible, he should apply a trial coat and make an intermediate adherence test. Any coating older than 3 months must be sanded down first.

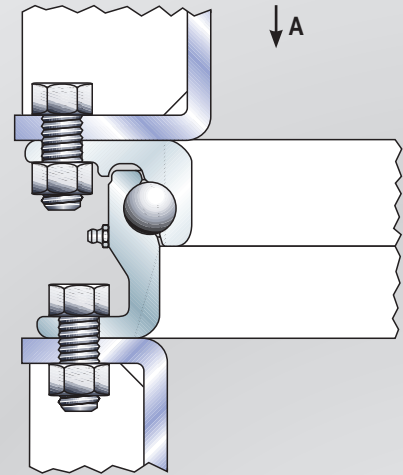
Without pretreatment of the turntable outer surface – sandblasting for example – the applied protective painting does not provide an improved protection against corrosion even in connection with finishing paints either. Specific surface treatments can be agreed.

A storage of the turntables up to 6 months requires roofed storage areas. Up to 12 months storage the turntables should be kept in enclosed temperature-controlled rooms.

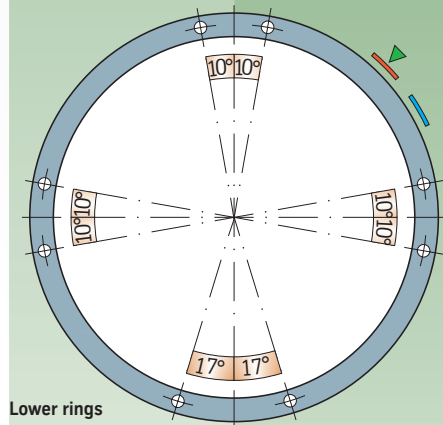
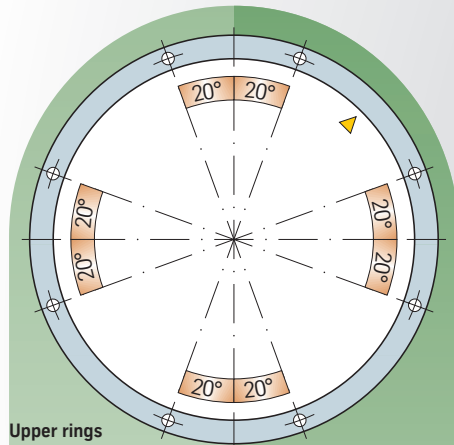


# Mounting holes





Turntables can be delivered either drilled or undrilled. If the customer drills the holes himself, he must allow for positioning of the nameplate/filler plug lateral to the direction of travel outside the main load-carrying area. It is furthermore necessary to drill one fastening hole approx. 70 mm right or left off the type plate.



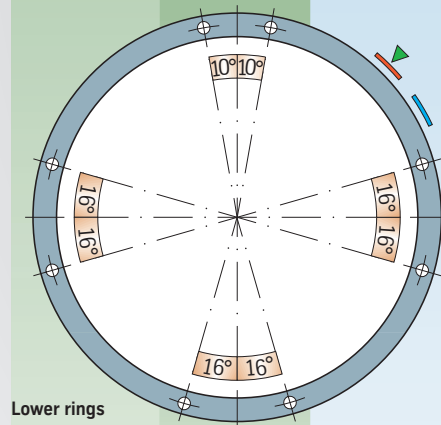
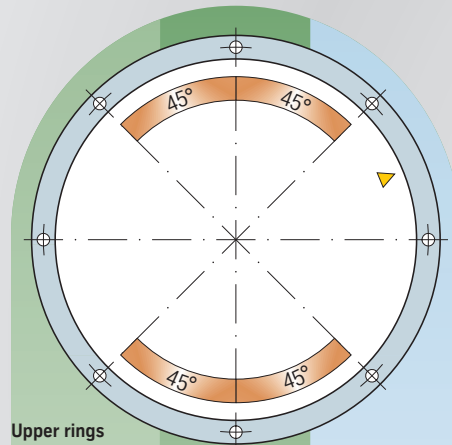
Views in direction **A**







**Type 80/880**  
**Type 80 S/890**  
 Drilled holes according to the table  
 Special drilled holes upon request

-  Filler plug
-  Nameplate
-  Filler plug (applies to Type 80S)
-  Nameplate (applies to Type 80S)

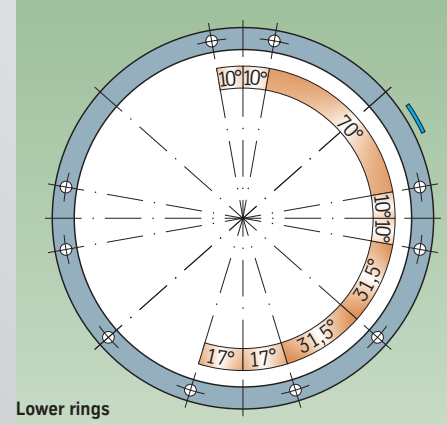
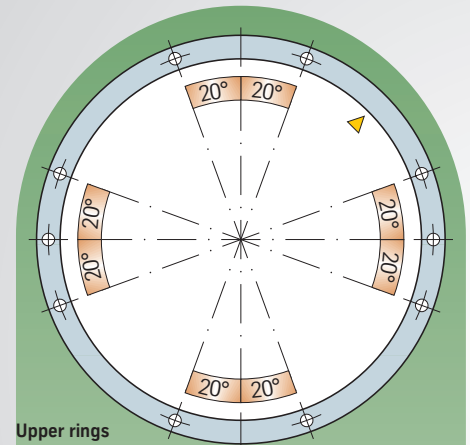
Views in direction **A**



**Type 80/1090**  
**Type 80S/660**  
**Type 80S/1100**  
**Type 90/1100.18 to Type 90/1300.22**  
 Drilled holes according to the table  
 Special drilled holes upon request

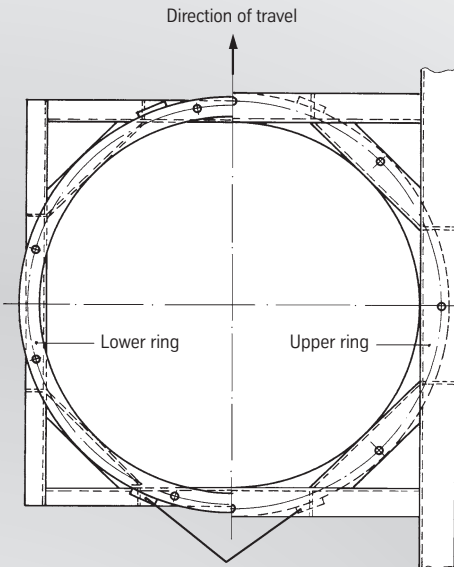
-  Filler plug
-  Nameplate
-  Filler plug (applies to Type 80S)
-  Nameplate (applies to Type 80S)

Views in direction **A**



**Type 80S/890 A**  
 Drilled holes according to the table  
 Special drilled holes upon request

-  Filler plug
-  Nameplate

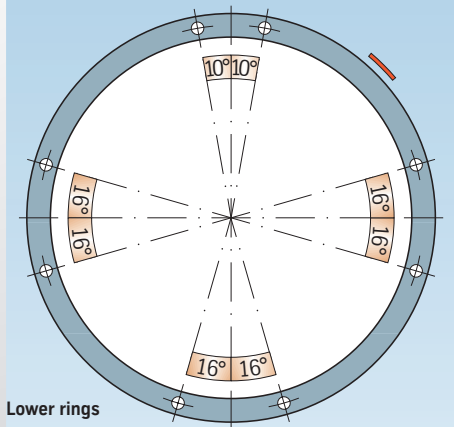
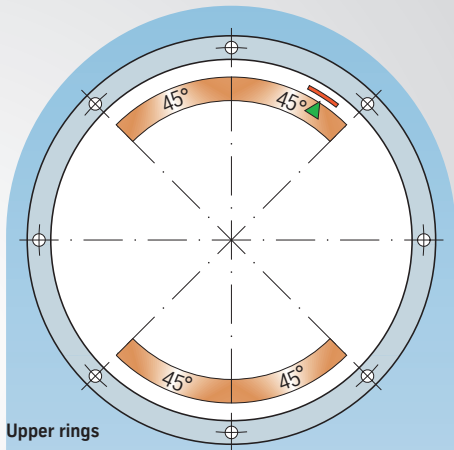


Welded plate (upper and lower)  
See note on page 12

This type plate is fixed at the upper ring (inner diameter) of bearing type 90S and 90WA. When using undrilled types take care to prevent any chips from entering the raceway system and that the turntable as well as the seals (WA types) are not damaged when introducing the fastening holes.

Holes adjacent to the type plate are not permitted.

Views in direction **A**

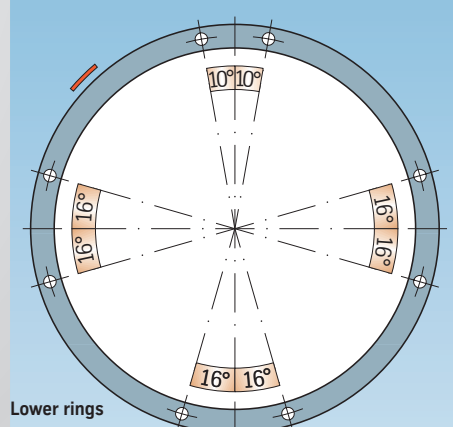
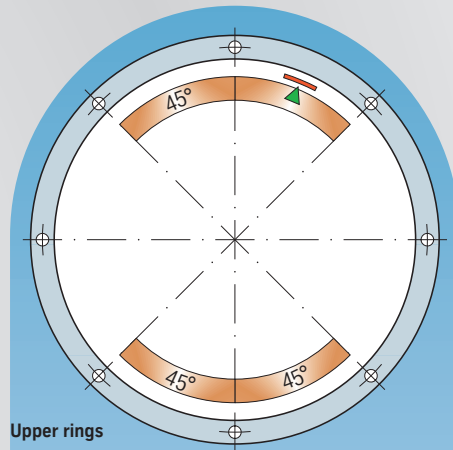


**Type 90/1100.22 WA to Type 90/1300.22 WA**

Drilled holes according to the table  
Special drilled holes upon request

- Filler plug
- Nameplate

Views in direction **A**



**Type 90S/1000**

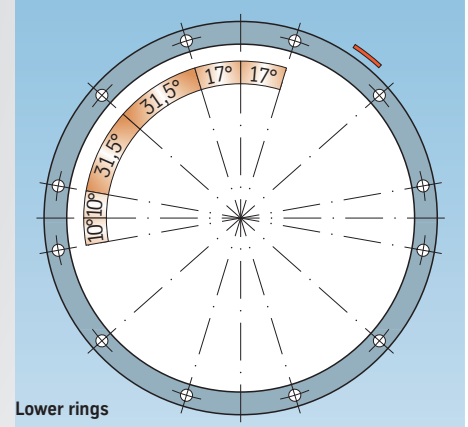
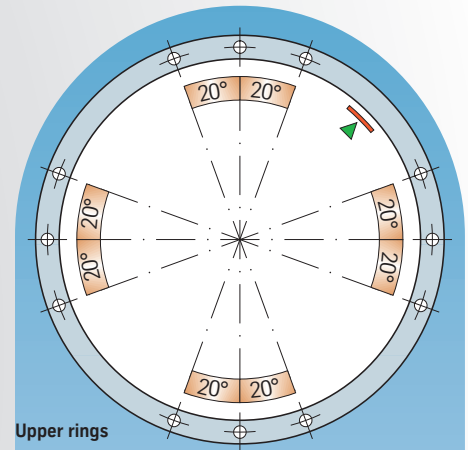
**Type 90S/1100**

**Type 90S/1200**

Drilled holes according to the table  
Special drilled holes upon request

- Filler plug
- Nameplate

Views in direction **A**



**Type 90S/1200.12**

**Type 90S/1200 SP**

Drilled holes according to the table  
Special drilled holes upon request

- Filler plug
- Nameplate

# Installation

Turntables must be mounted on a flat and torsion-resistant frame structure. It is essential that at least 50% of the peripheral surface of the flanges are supported load-bearing zones and that these latter are roughly equispaced in the direction of travel and at right angles to this.

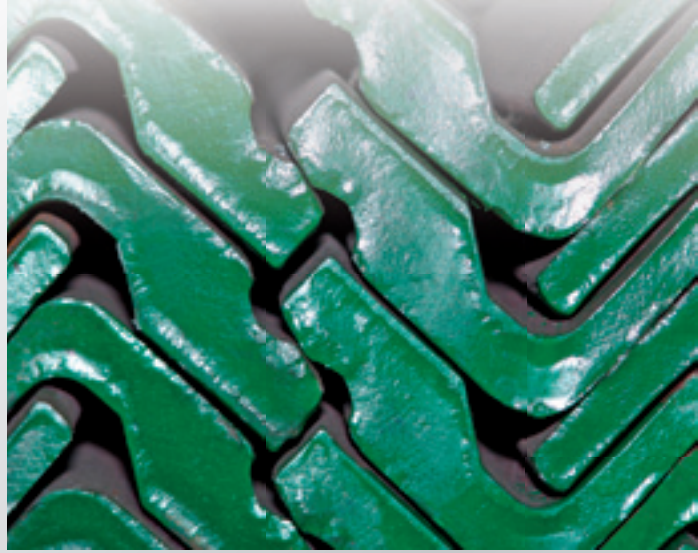
The essential factor here is to support the profiled webs of the turntable thus assuring direct force transmission into the ball raceways. Total out-of-flatness 1.3 mm, permissible are for example 0.8 mm up and 0.5 mm down. Larger out-of-flatnesses have to be compensated by suitable measures (machining of the contact surfaces or captive shims in the respective contact area).

To secure drilled versions of the turntable, high-strength bolts of quality grade 10.9 as well as high tensile washers must be used in all the mounting holes.

On undrilled versions we recommend using at least 8 high-strength bolts of quality grade 10.9 as well as high tensile washers for optimum load introduction.

Take care to prevent any chips from entering the raceway system and that the turntable as well as the seals (WA types) are not damaged when introducing the fastening holes.

The size and distribution of the bolts must be calculated on the basis of the load. The bolt locking system must comply with the TÜV's (German Technical Control Board's) requirements or with the prevailing approval regulations.



The turntable must be form-fitted to the connection structures so that the horizontal forces from acceleration and deceleration are transmitted and the bolts are relieved in radial direction. To prevent distortion from occurring, turntables must never be attached to the companion structure by welding.

The load details and bolt connections are only valid for operation on paved roads and under transport conditions as usual in Western Europe.

Under special operating conditions, e.g. forestry work, the companion structure has to protect the turntable in a way that it cannot be damaged by branches etc.

The nameplate/filler plug has to be positioned 90 degrees to the direction of travel, i.e. outside the main load-carrying area.



**Table of tolerances**

Type	H mm	Flange thickness mm	D <sub>a</sub> mm	D <sub>a1</sub> mm	D <sub>i</sub> mm	O mm	U mm
16L Type 16 L/400 and Type 16 L/500	± 3	± 2.0	+ 8 - 5	-	+ 4 - 10	± 3	± 3
	± 3	± 1.5	+ 8 - 4	-	+ 4 - 10	± 3	± 3
16 Type 16/500 up to Type 16/1050	± 3	± 2.0	+ 8 - 5	-	+ 4 - 10	± 3	± 3
	± 3	± 1.5	+ 8 - 4	-	+ 4 - 10	± 3	± 3
80 Type 80/685 up to Type 80/1090	± 3	± 1.5	+ 8 - 4	+ 8 - 4	± 3	-	± 3
	± 3	± 1.5	- 0.8 - 0.9 - 1.1	- 0.8 - 0.9 - 1.1	± 3	-	± 3
90 Type 90/1000.18 up to Type 90/1300.22	± 3	± 1.5	+ 8 - 4	+ 8 - 4	± 3	-	± 3
	± 3	± 1.5	+ 8 - 4	+ 8 - 4	± 3	-	± 3
90WA Type 90/1100.22 WA up to Type 90/1300.22 WA	± 3	± 1.5	+ 8 - 4	+ 8 - 4	± 3	-	± 3
90S Type 90 S/1000 up to Type 90 S/1200.SP	± 3	± 1.5	- 1.6 - 1.6	- 1.6 - 1.6	± 3	-	± 3



# Lubrication and maintenance

## Other conditions of use

## Warranty

### Lubrication and maintenance of standard turntables

Prior to installation, the turntable has to be re-greased while turning the upper ring until a grease collar appears at all bearing gaps around the entire circumference. A penetration grade 2 lithium-saponified grease should be used for re-greasing. Regreasing should also be carried out after installation, rotating or slewing the turntable through at least  $\pm 30^\circ$  to achieve uniform grease distribution. Regreasing is required at least once a month. It must be warranted that a sufficient amount of bolt preload is maintained throughout the complete life time of the turntable. Practical experience has shown that it is necessary to re-tighten the bolts with the required tightening torque in order to compensate the settling phenomenon.

The “as-supplied” bearing clearances shown in the bearing tables are permitted to increase through wear by a maximum of 3 mm axially and radially. Thereafter, the turntable must be replaced.

### Maintenance of type 90WA turntables – low-maintenance design

90WA turntables are provided with a long-term lubrication for a low-maintenance period of at least 3 years or a mileage of 300,000 kms. The precondition is a protection at the companion structure to prevent water from entering there. Should exceptional environmental conditions prevail or should the turntable be directly cleaned with a high-pressure equipment, it is necessary to re-grease the turntable immediately. Take also care that the companion structure protects the turntable either so as to prevent any water and dirt from entering the race system.

This service period can be extended by relubrication with Gleitmo 585 K (Fuchs Lubritech, Weilerbach). Regreasing should be carried out while turning or slewing the turntable through at least  $\pm 30^\circ$  in order to guarantee a uniform distribution of the grease.

In case of applications with extreme environmental conditions specific maintenance instructions have to be established for each individual case.

The turntables are equipped with lubricating nipples. Once the low-maintenance operating period has elapsed, it is necessary to re-grease through all lubricating nipples. Re-greasing should be carried out while turning or slewing the turntable through at least  $\pm 30^\circ$  in order to guarantee a uniform distribution of the grease.

It must be warranted that a sufficient amount of bolt preload is maintained throughout the complete life time of the turntable. Practical experience has shown that it is necessary to re-tighten the bolts with the required tightening torque in order to compensate the settling phenomenon.

We recommend that axial movement measurements are undertaken in conjunction with acceptance procedures by the German TÜV or other accredited testing agencies. If the measurement shows an axial or radial clearance in excess of 3 mm, the turntable will have to be replaced.

### Brief description of the axial movement measurement

- Check the bolt connections.
- Position the dial gauge with integrated magnets between the superstructure and the undercarriage in axial direction close to the raceway and a bolted area.
- Set the dial gauge to zero.
- Lift the superstructure by a forklift or lifting tackle until the undercarriage is freely suspended.
- Read the dial gauge.
- Position the dial gauge on the other side and repeat the above sequence of steps.

### Other conditions of use

- Should turntables be applied in vehicles with less accelerations or decelerations than indicated, the permissible axial load can be increased.
- Rothe Erde<sup>®</sup> turntables are suitable only for turning movements of  $\pm 180^\circ$ .

For other fields of application and load scenarios you must ask ThyssenKrupp Rothe Erde.

### Warranty

ThyssenKrupp Rothe Erde warrants that the products and material characteristics will be free from defects for a period of 12 months as from commissioning or, as applicable, a maximum period of 18 months as from delivery.

This depends on proper installation, observance of the applicable maintenance instructions as well as on the suitability of the product for the selected application.

Our General Terms of Sale are generally applicable.

The warranty claims cover rework or substitute delivery. Consequential damages due to defects are excluded.

Damage resulting from product modifications or improper cleaning is not covered by this warranty.

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