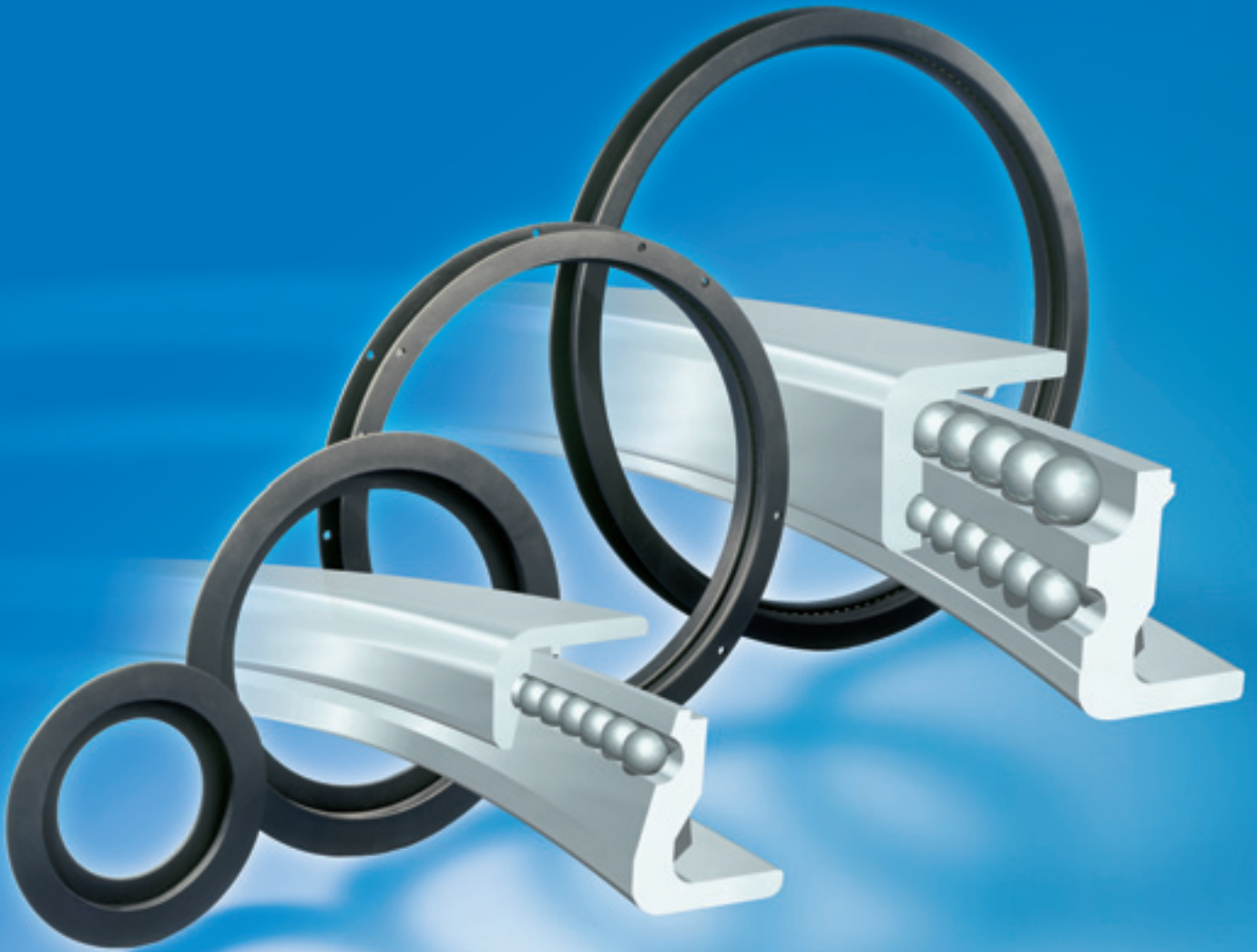


# Rothe Erde® turntables for vehicle trailers and trailer couplings. LK 254/16.



A ThyssenKrupp  
Technologies  
company

**Rothe Erde**



ThyssenKrupp

# Rothe Erde turntables.

## Technology made-to-measure.

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

We at 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 9001:2000,
- Environmental protection acc. to DIN ISO 14001 and
- Industrial safety acc. to OHSAS 18001.

### **Rothe Erde turntables – Products of proven quality**

Rothe Erde turntables have been developed for installation in vehicle trailers. Their purpose is to transmit both the axial load, thrust and traction forces.

The standard series turntables shown here are the result of many years' design and manufacturing experience in the field of trailer steering systems.

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.





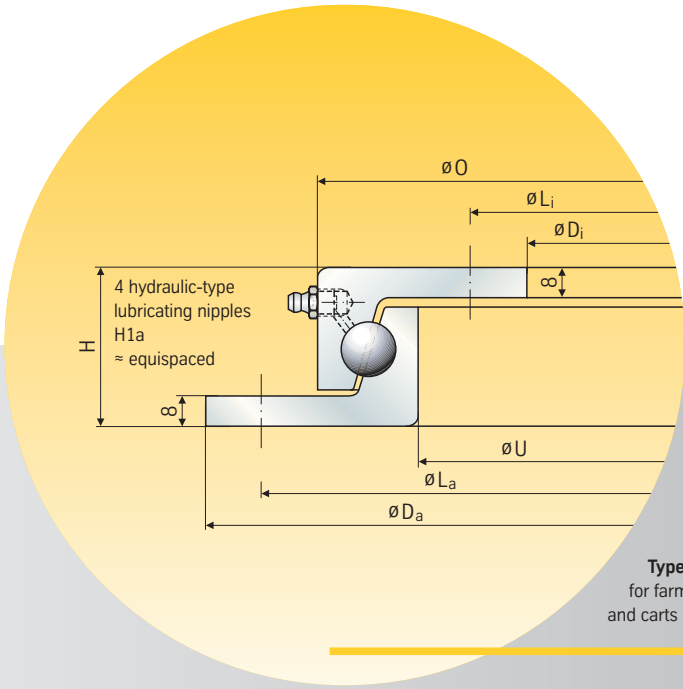
# Bearing configurations and bearing tables.

## Types 16 L – 16 – 80.

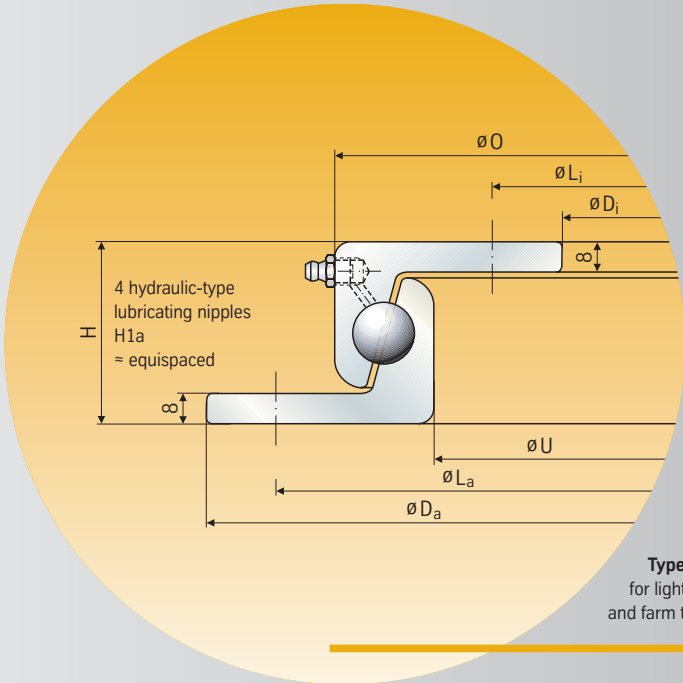
	Drawing No. · Type	Track diameter	Weight (approx.)	Outer diameter	Inner diameter	Overall height	Outer bolt circle diameter	Inner bolt circle diameter	Bore diameter	Number of grease nipples	Diameter	Diameter	Diameter	
		D <sub>L</sub> mm	kg	D <sub>a</sub> mm	D <sub>i</sub> mm	H mm	L <sub>a</sub> mm	L <sub>i</sub> mm	B mm	n <sub>1</sub> mm	D <sub>a1</sub> mm	O mm	U mm	
16 L	Type 16 L undrilled													
	310.16.0300.000 · Type 16 L/400	320.0	11	404	236	42	375	260	–	4	–	346	294	
	310.16.0400.000 · Type 16 L/500	420.0	15	504	336	42	475	360	–	4	–	446	394	
	310.16.0500.000 · Type 16 L/650	570.0	20	654	486	42	625	510	–	4	–	596	544	
	310.16.0600.000 · Type 16 L/750	670.0	23	754	586	42	725	610	–	4	–	696	644	
	310.16.0700.000 · Type 16 L/850	770.0	27	854	686	42	825	710	–	4	–	796	744	
	310.16.0800.000 · Type 16 L/950	870.0	30	954	786	42	925	810	–	4	–	896	844	
310.16.0900.000 · Type 16 L/1050	970.0	34	1054	886	42	1025	910	–	4	–	996	944		
16	Type 16 undrilled													
	320.16.0400.000 · Type 16/500	407.5	17	500	315	48	475	340	–	4	–	434	381	
	320.16.0500.000 · Type 16/650	557.5	23	650	465	48	625	490	–	4	–	584	531	
	320.16.0600.000 · Type 16/750	657.5	26	750	565	48	725	590	–	4	–	684	631	
	320.16.0700.000 · Type 16/850	757.5	30	850	665	48	825	690	–	4	–	784	731	
	320.16.0800.000 · Type 16/950	857.5	34	950	765	48	925	790	–	4	–	884	831	
	320.16.0900.000 · Type 16/1050	957.5	39	1050	865	48	1025	890	–	4	–	984	931	
80	Type 80 undrilled													
	330.16.0500.000 · Type 80/685	598.5	38	721	567	80	671	657	–	4	696	–	583	
	330.16.0700.000 · Type 80/880	793.5	48	916	762	80	866	852	–	4	891	–	778	
	330.16.0900.000 · Type 80/1000	913.5	58	1036	882	80	984	970	–	4	1011	–	898	
	330.16.1000.000 · Type 80/1090	1003.5	63	1126	972	80	1074	1060	–	4	1101	–	988	
	Type 80 drilled													
	330.16.0700.010 · Type 80/880	793.5	48	916	762	80	866	852	16	4	891	–	778	
330.16.1000.010 · Type 80/1090	1003.5	63	1126	972	80	1074	1060	18	4	1101	–	988		

\* Please do not hesitate to ask us about other axle combinations.

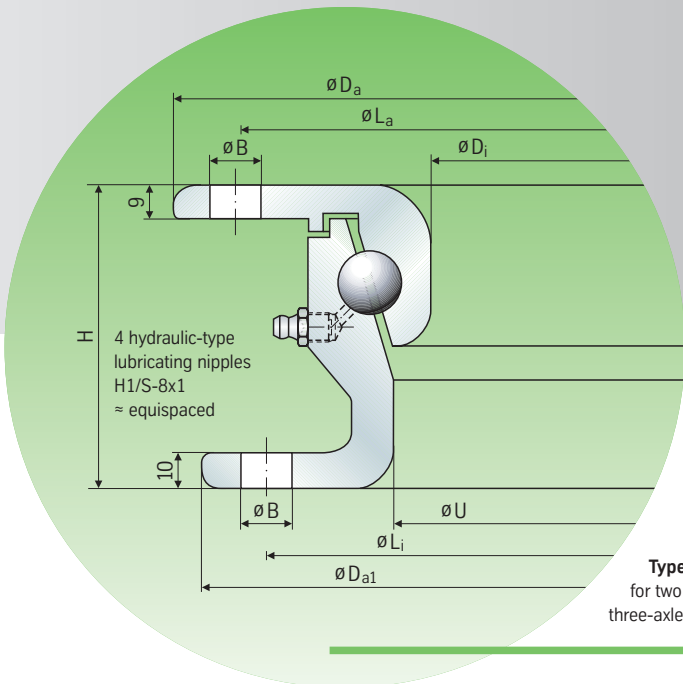
Ball diameter d mm	Trailer load		Permissible acceleration or deceleration m/s <sup>2</sup>	Maximum bearing clearances	
	Permissible axial load* 2 axles kN	Permissible axial load* more than 2 axles kN		axially mm	radially mm
16	7.5	–	4	1	0.7
16	9.0	–	4	1	0.7
16	15.0	–	4	1	0.7
16	18.0	–	4	1	0.7
16	25.0	–	4	1	0.7
16	30.0	–	4	1	0.7
16	35.0	–	4	1	0.7
16	18.0	–	7	1	0.7
16	25.0	–	7	1	0.7
16	30.0	–	7	1	0.7
16	35.0	–	7	1	0.7
16	40.0	–	7	1	0.7
16	45.0	–	7	1	0.7
16	35.0	30	7	1	0.7
16	55.0	50	7	1	0.7
16	65.0	60	7	1	0.7
16	70.0	65	7	1	0.7
16	55.0	50	7	1	0.7
16	70.0	65	7	1	0.7



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



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



**Type 80**  
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	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	U mm
<b>90</b>												
Type 90 undrilled												
360.18.0800.000 · Type 90/1000.18	894	64	1008	854	90	974	960	–	6	1000	–	885
360.20.0800.000 · Type 90/1000.20	894	64	1008	854	90	974	960	–	6	1000	–	885
360.22.0800.000 · Type 90/1000.22	894	64	1008	854	90	974	960	–	6	1000	–	885
360.24.0800.000 · Type 90/1000.24	894	64	1008	854	90	974	960	–	6	1000	–	885
360.18.0900.000 · Type 90/1100.18	994	71	1108	954	90	1074	1060	–	6	1100	–	985
360.20.0900.000 · Type 90/1100.20	994	71	1108	954	90	1074	1060	–	6	1100	–	985
360.22.0900.000 · Type 90/1100.22	994	71	1108	954	90	1074	1060	–	6	1100	–	985
360.24.0900.000 · Type 90/1100.24	994	71	1108	954	90	1074	1060	–	6	1100	–	985
360.22.1000.000 · Type 90/1200.22	1094	79	1208	1054	90	1174	1160	–	6	1200	–	1085
360.24.1000.000 · Type 90/1200.24	1094	79	1208	1054	90	1174	1160	–	6	1200	–	1085
360.22.1100.000 · Type 90/1300.22	1194	87	1308	1154	90	1274	1260	–	6	1300	–	1185
Type 90 drilled												
360.18.0900.010 · Type 90/1100.18	994	71	1108	954	90	1074	1060	18	6	1100	–	985
360.20.0900.010 · Type 90/1100.20	994	71	1108	954	90	1074	1060	18	6	1100	–	985
360.22.0900.010 · Type 90/1100.22	994	71	1108	954	90	1074	1060	18	6	1100	–	985
360.24.0900.010 · Type 90/1100.24	994	71	1108	954	90	1074	1060	18	6	1100	–	985
360.22.1000.010 · Type 90/1200.22	1094	79	1208	1054	90	1174	1160	18	6	1200	–	1085
360.24.1000.010 · Type 90/1200.24	1094	79	1208	1054	90	1174	1160	18	6	1200	–	1085
360.22.1100.010 · Type 90/1300.22	1194	87	1308	1154	90	1274	1260	18	6	1300	–	1185
<b>90 WA</b>												
Type 90 WA drilled												
360.22.0955.010 · Type 90/1100.22 WA	994	71	1108	954	90	1074	1060	18	6	1100	–	985
360.24.0955.010 · Type 90/1100.24 WA	994	71	1108	954	90	1074	1060	18	6	1100	–	985
360.22.1055.010 · Type 90/1200.22 WA	1094	79	1208	1054	90	1174	1160	18	6	1200	–	1085
360.24.1055.010 · Type 90/1200.24 WA	1094	79	1208	1054	90	1174	1160	18	6	1200	–	1085
360.22.1155.010 · Type 90/1300.22 WA	1194	87	1308	1154	90	1274	1260	18	6	1300	–	1185
<b>90 S</b>												
Type 90 S undrilled												
370.20.0804.000 · Type 90 S/1000	880/870	82	1000	834	90	966	952	–	6	987	–	871
370.20.0904.000 · Type 90 S/1100	988/978	92	1108	942	90	1074	1060	–	6	1095	–	979
370.20.1004.000 · Type 90 S/1200	1088/1078	101	1208	1042	90	1174	1160	–	6	1195	–	1079
370.24.1004.000 · Type 90 S/1200.SP	1087/1078	101	1208	1042	90	1174	1160	–	6	1195	–	1079
Type 90 S drilled												
370.20.0804.010 · Type 90 S/1000	880/870	82	1000	834	90	966	952	18	6	987	–	871
370.20.0904.010 · Type 90 S/1100	988/978	92	1108	942	90	1074	1060	18	6	1095	–	979
370.20.1004.010 · Type 90 S/1200	1088/1078	101	1208	1042	90	1174	1160	18	6	1195	–	1079
370.20.1004.030 · Type 90 S/1200.12	1088/1078	101	1208	1042	90	1174	1160	18	6	1195	–	1079
370.24.1004.010 · Type 90 S/1200.SP	1087/1078	101	1208	1042	90	1174	1160	18	6	1195	–	1079

\* Please do not hesitate to ask us about other axle combinations.

### Type 90 WA: Low-maintenance version

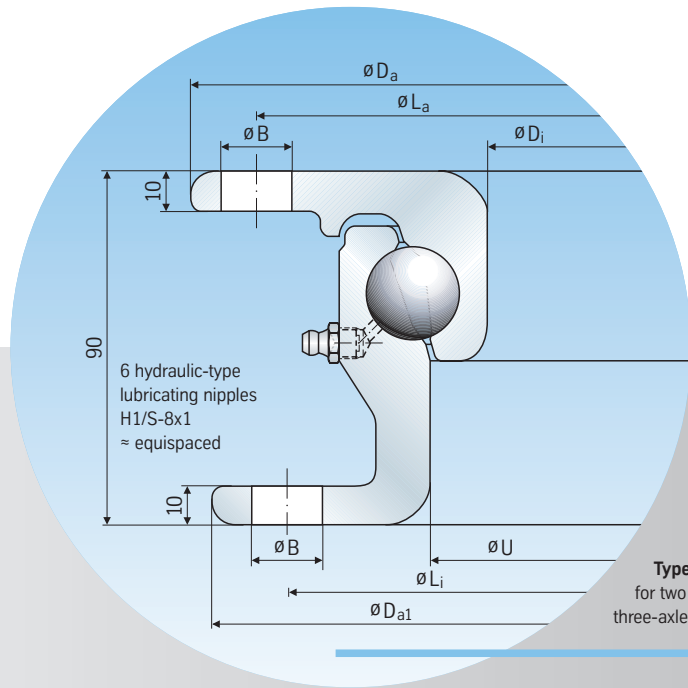
- Raceway system protected by seals at upper and lower bearing gap.
- Low-maintenance for a minimum of 3 years or a mileage of 300,000 kms under normal operating conditions. Should exceptional environmental conditions prevail or should the turntable be directly cleaned with a high-pressure equipment,

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.

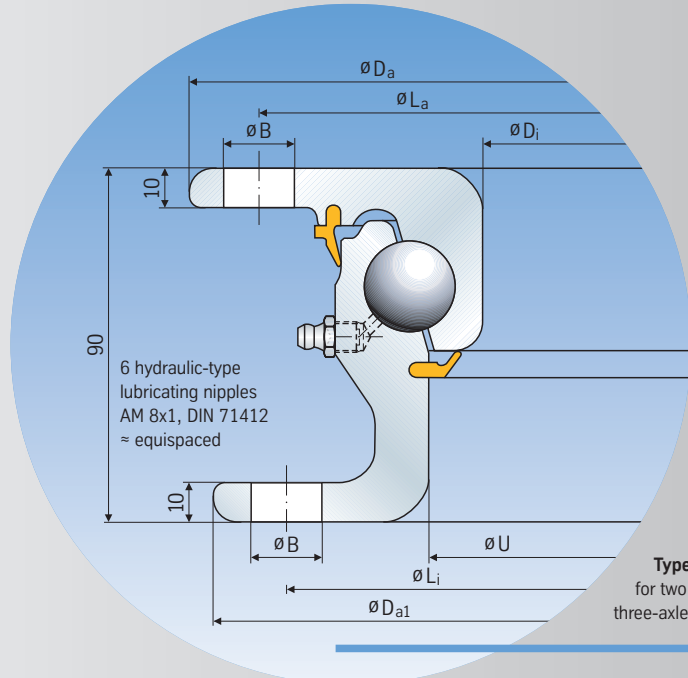
- Re-greasing and inspection is necessary after the low-maintenance operating period has elapsed.

Ball diameter <b>d</b> mm	Trailer load		Permissible acceleration or deceleration m/s <sup>2</sup>	Maximum bearing clearances	
	Permissible axial load* 2 axles kN	Permissible axial load* more than 2 axles kN		axially mm	radially mm
18	75	70	7	1.0	0.7
20	90	80	7	1.0	0.7
22	110	100	7	1.0	0.7
24	160	140	7	1.0	0.7
18	90	80	7	1.0	0.7
20	110	100	7	1.0	0.7
22	130	120	7	1.0	0.7
24	180	160	7	1.0	0.7
22	160	140	7	1.0	0.7
24	200	180	7	1.0	0.7
22	180	160	7	1.0	0.7
18	90	80	7	1.0	0.7
20	110	100	7	1.0	0.7
22	130	120	7	1.0	0.7
24	180	160	7	1.0	0.7
22	160	140	7	1.0	0.7
24	200	180	7	1.0	0.7
22	180	160	7	1.0	0.7
22	130	120	7	0.8	0.6
24	180	160	7	0.8	0.6
22	160	140	7	0.8	0.6
24	200	180	7	0.8	0.6
22	180	160	7	0.8	0.6
20/16	160	160	7	1.0	0.7
20/16	200	200	7	1.0	0.7
20/16	200	200	7	1.0	0.7
24/16	300	300	7	1.0	0.7
20/16	160	160	7	1.0	0.7
20/16	200	200	7	1.0	0.7
20/16	200	200	7	1.0	0.7
20/16	200	200	7	1.0	0.7
24/16	300	300	7	1.0	0.7

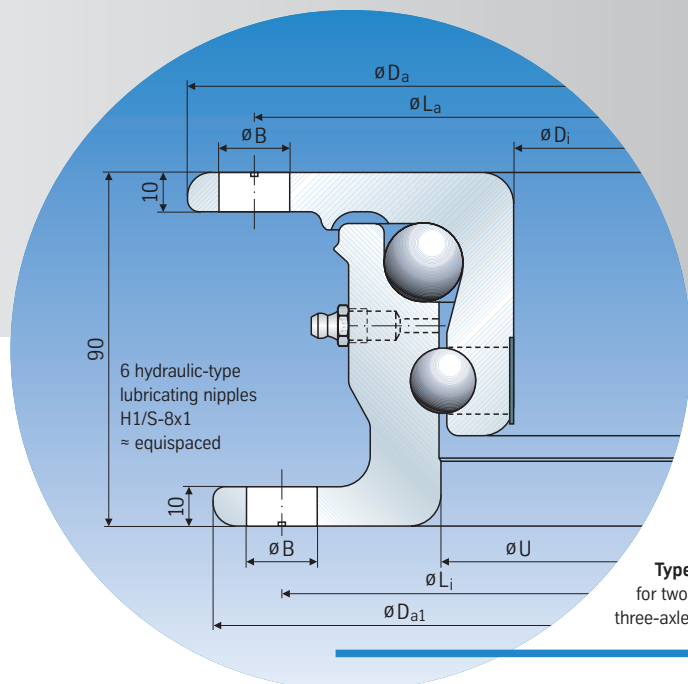
- Frictional torque: As a consequence of the double seal at the bearing gaps a somewhat increased frictional torque may develop in comparison with the normal version. Operation is not impaired by this when used in vehicle trailers.
- Mounting dimensions, permissible loads, weights, and drilling plans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



**Type 90**  
for two and three-axle trailers



**Type 90 WA**  
for two and three-axle trailers



**Type 90 S**  
for two and three-axle trailers

# Delivery.

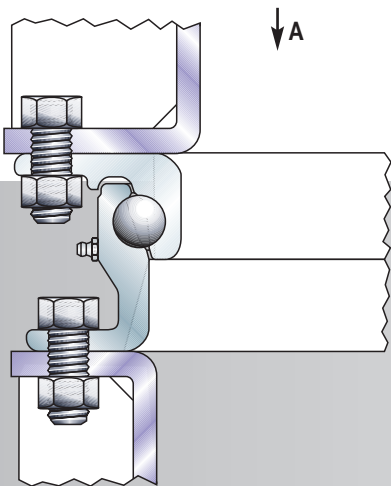
The turntables are supplied as standard type being filled with lithium-saponified grease of penetration grade 2 and as low-maintenance type being filled with Gleitmo 585 K.

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 paint 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.

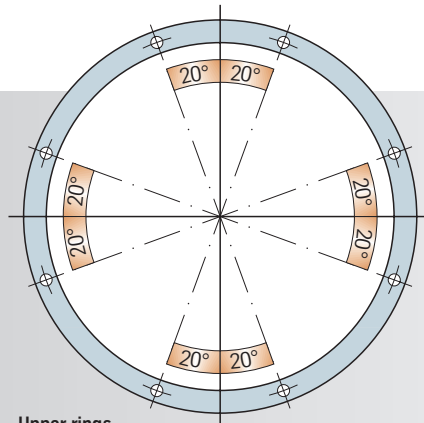
Without pretreatment of the turntable outer surface – sandblasting for example – the applied protective painting does not provide an improved protection against corrosion even in connection with finishing paints either.

The turntables should always be stored in dry indoor locations.

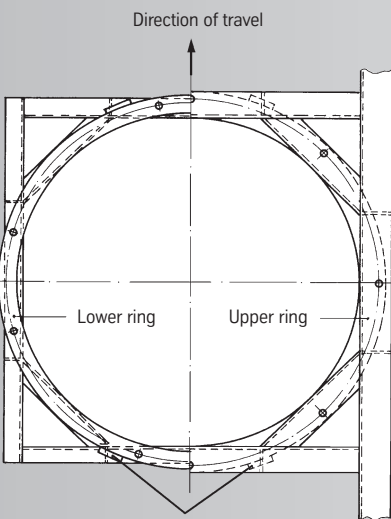
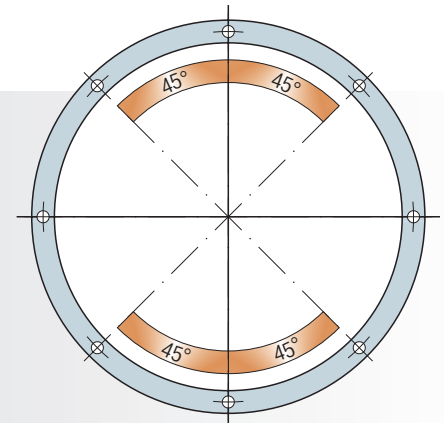


↓ A

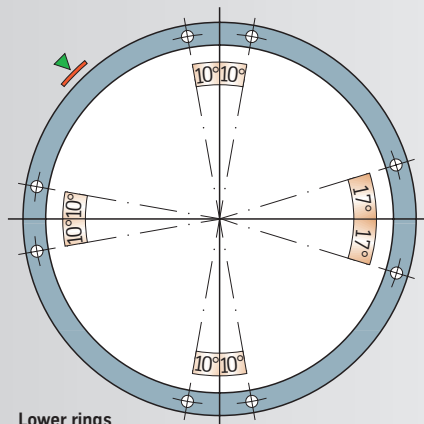
Views in direction A



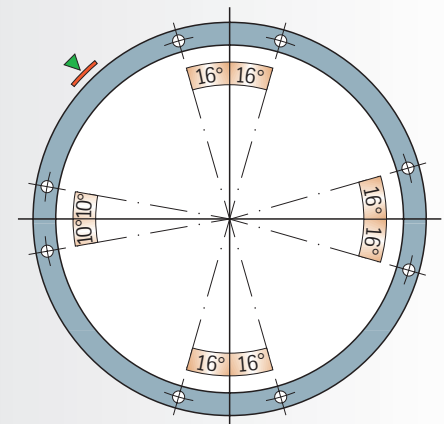
Upper rings



Welded plate (upper and lower)  
See note on page 10



Lower rings



**Type 80/880**  
Drilled hole diameter 16 mm.  
Special drilled holes upon request

**Type 80/1090**  
**Type 90/1100.18 to Type 90/1300.22**  
Drilled hole diameter 18 mm.  
Special drilled holes upon request.

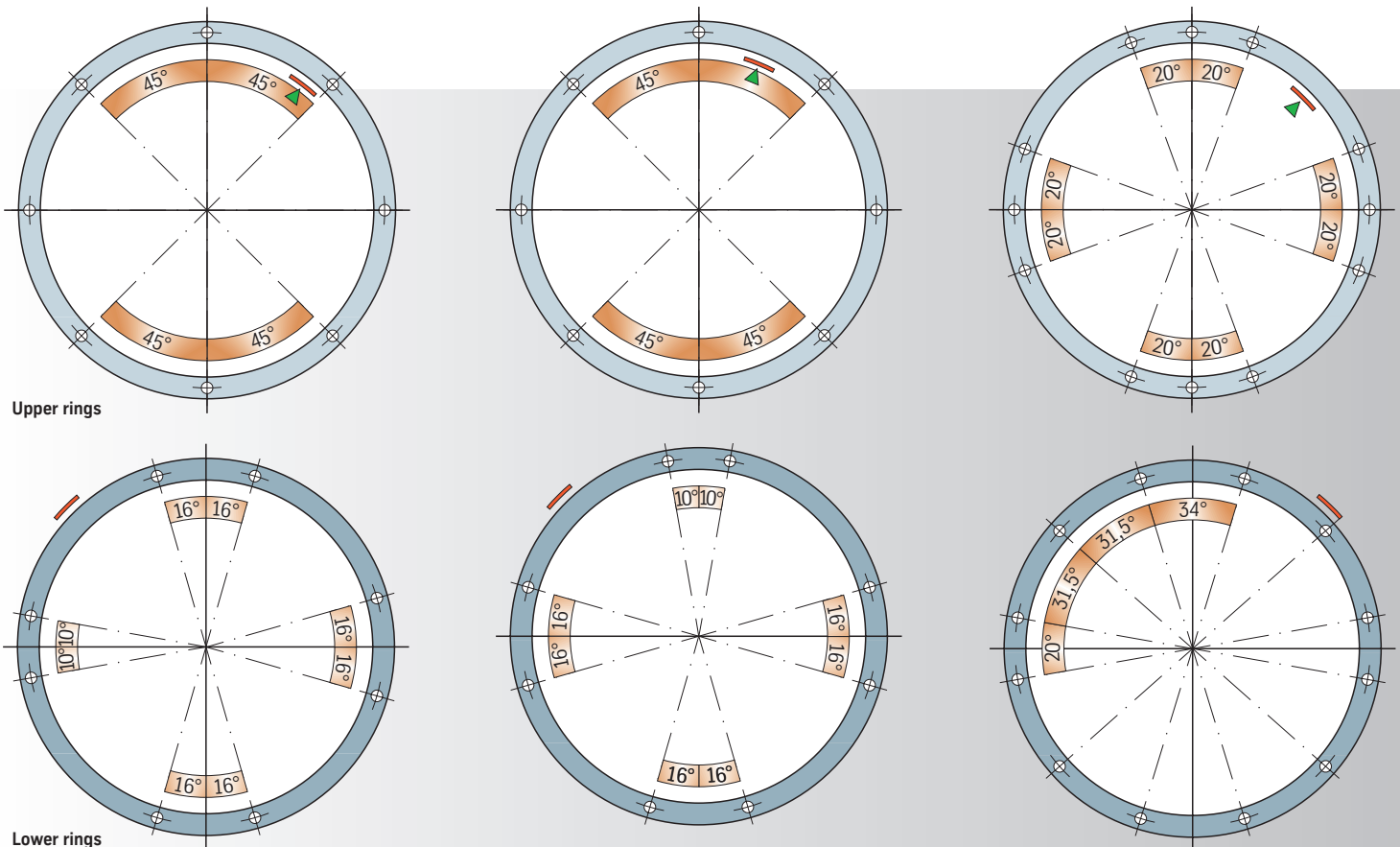
▼ Filler plug  
— Nameplate



Turntables can be delivered either drilled or undrilled. When the holes are introduced by the customer himself, pay attention to place the type plate sideways to the direction of travel. It is furthermore necessary to drill one fastening hole approx. 70 mm right or left of the type plate. This type plate is fixed at the upper ring (inner diameter) of bearing type 90S and 90 WA. Take care to prevent any chips from entering the raceway system and the turntable from being damaged when introducing the fastening holes.

Holes adjacent to the type plate are not permitted.

Views in direction **A**



Upper rings

Lower rings

**Type 90/1100.22 WA to Type 90/1300.22 WA**  
 Drilled hole diameter 18 mm.  
 Special drilled holes upon request.

**Type 90S/1000**  
**Type 90S/1100**  
**Type 90S/1200**  
 Drilled hole diameter 18 mm.  
 Special drilled holes upon request.

**Type 90S/1200.12**  
**Type 90S/1200.SP**  
 Drilled hole diameter 18 mm.  
 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).

The turntable must be fastened using at least 8 grade 8.8 bolts per ring. The bolt locking system must comply with the TÜV's (German Technical Control Board's) requirements or with the prevailing approval regulations.

The bearing must be fixed form-close to the companion structures to enable for example welded plates, block shear connectors or pins to transmit horizontal forces from acceleration or deceleration, thus relieving the bolts 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 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	
16 L	Type 16 L/400 and Type 16 L/500	±3	±2	+8 -5	–	+4 -10	±3	±3
	Type 16 L/650 up to Type 16 L/1050	±3	±1.5	+8 -4	–	+4 -10	±3	±3
16	Type 16/500	±3	±2	+8 -5	–	+4 -10	±3	±3
	Type 16/650 up to Type 16/1050	±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
90	Type 90/1000.18 up to Type 90/1300.22	±3	±1.5	+8 -4	+8 -4	±3	–	±3
90 WA	Type 90/1100.22 WA up to Type 90/1300.22 WA	±3	±1.5	+8 -4	+8 -4	±3	–	±3
90 S	Type 90 S/1000 up to Type 90 S/1200 SP	±3	±1.5	-1.6	-1.6	±3	–	±3

# Lubrication and maintenance. Special applications. 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. Re-greasing should also be carried out after installation, rotating or slewing the turntable through at least  $\pm 30^\circ$  to achieve uniform grease distribution. Re-greasing 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 90 WA turntables – low-maintenance design

90 WA 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). 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.

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.

## Special applications

Should turntables of types 16, 80, and 90 be applied in vehicles with less accelerations or decelerations than indicated, the permissible axial load can be increased. Please contact Rothe Erde.

Details of turntables for non-standard applications and load cases are available upon special request. Please also refer to our catalogue "Rothe Erde slewing bearings, KD 210 series".

## Warranty

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.

## Head Office

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Fax: +49 (2 31) 186-25 00  
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## Offices in Germany

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