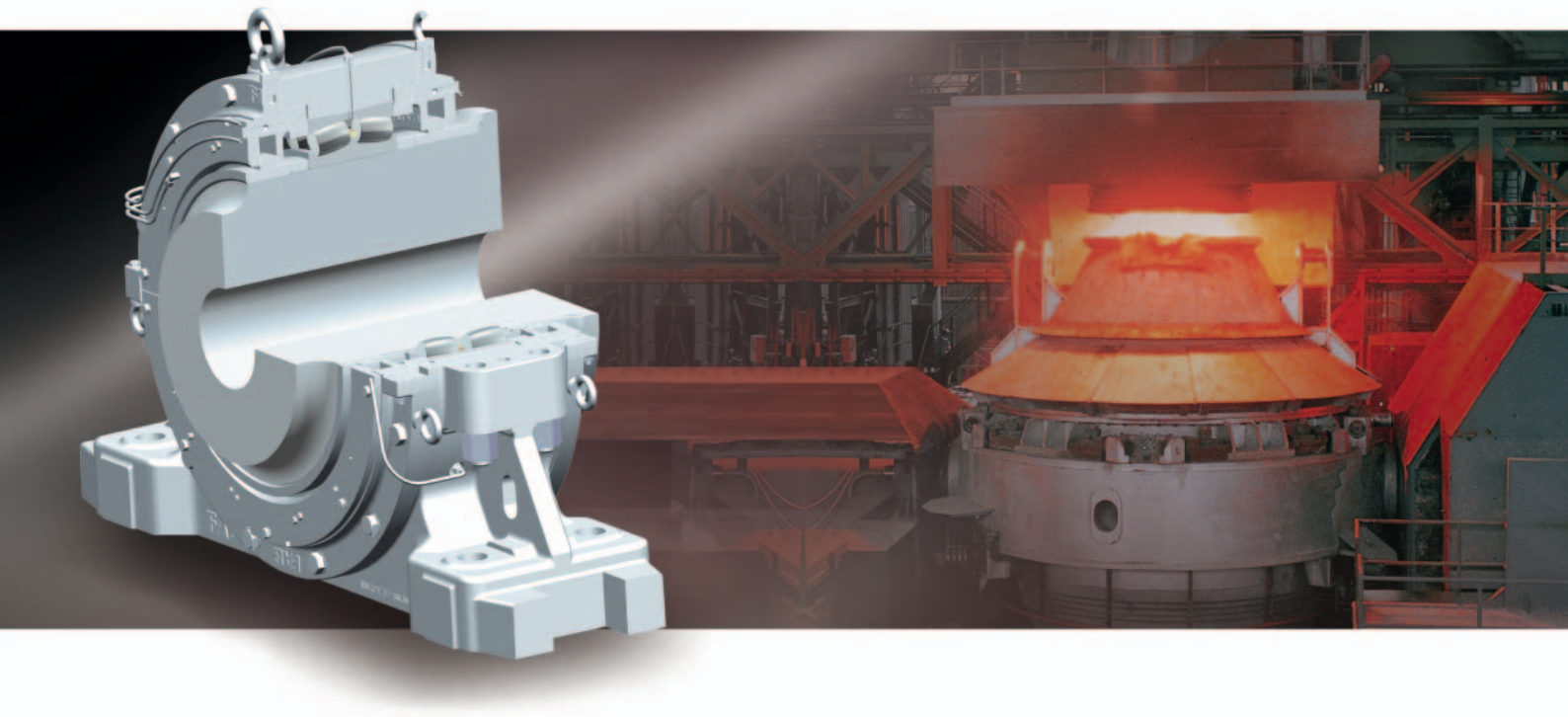
FAG



Rolling Bearing Mountings for Converters

SCHAEFFLER GROUP
INDUSTRIAL

Contents

Requirements on the trunnion bearings in converters

1 Requirements on the trunnion bearings in converters

When filled, large converter vessels weigh several hundred tons. The resulting loads must be supported by the trunnion bearing arrangement. As only slow swivel motions occur, the bearings must feature a high static load carrying capacity. Shock loads, which are an everyday occurrence in converters, must also be accommodated.

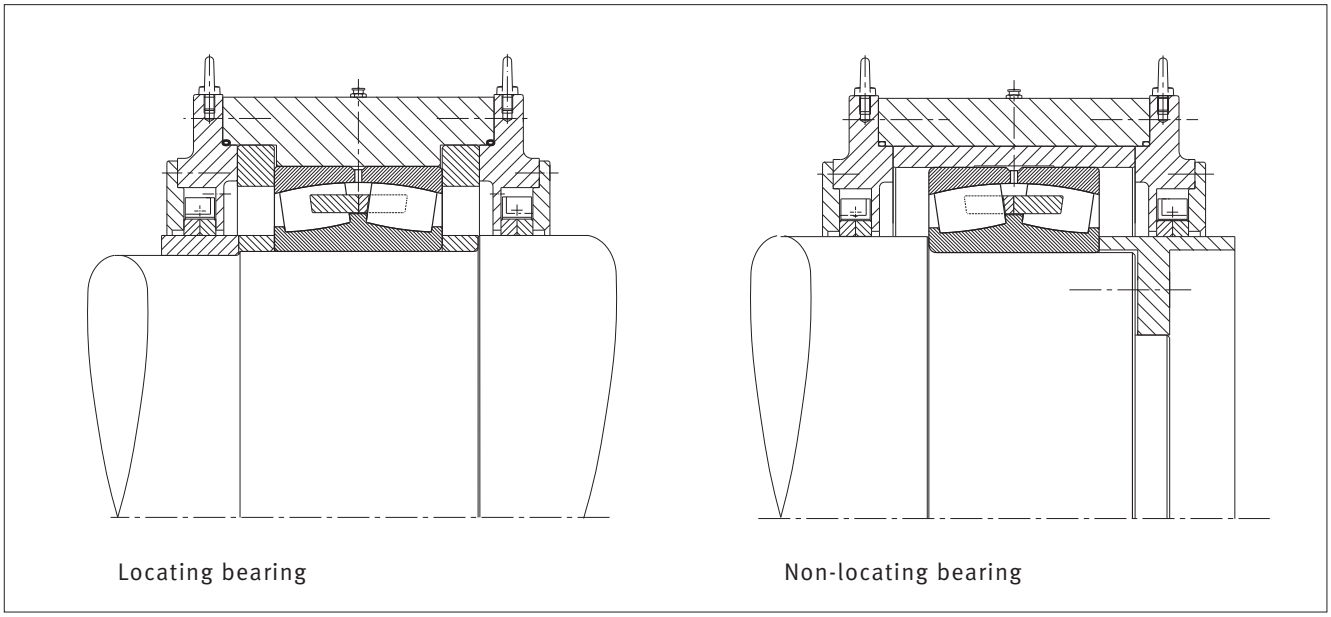
The bearing arrangement must also be able to compensate housing misalignments and deflections of the construction. In addition, considerable length variations caused by the temperature changes during heating and cooling of the converter must be compensated for, as well as dimensional changes to the supporting ring.

The spherical roller bearing has established itself as the rolling bearing type for converters. In addition to its high radial and axial load carrying capacity and its insensitivity to shocks, it also provides significant angular adjustability.

In the conventional design, the locating bearing on the drive side supports the axial guidance forces of the converter. A plain bush, in which the bearing outer ring can shift axially, is inserted in the housing on the non-locating bearing side, Figure 1.

Spherical roller bearings featuring the main dimensions of series 249 meet the demands on converter bearings. These bearings have proved to be particularly suitable in terms of axial displaceability.

Whereas unsplit bearings are used on the non-locating bearing side, the preferred choice for replacement bearings on the locating bearing side are split spherical roller bearings whose dimensions are matched to series 249. The split bearings facilitate bearing replacement without dismounting the drive, see section 2.2.



1: Trunnion bearing arrangement in a converter with two spherical roller bearings

Rolling bearings and housings for converters

Spherical roller bearings

2 Rolling bearings and housings for converters

The technical data relating to FAG spherical roller bearings and FAG plummer block housings for converters can be found in section 6.

2.1 Spherical roller bearings

The FAG spherical roller bearing is a rolling bearing designed for very demanding conditions.
It contains two rows of symmetrical barrel rollers which orient themselves freely in the concave outer ring raceway. As a result, shaft flexing and misalignment of the bearing seats are compensated.

FAG spherical roller bearings for converters usually feature the main dimensions of the standardised series 249.

Bearing components are bonderised and/or have a molybdenum disulphide coating, depending on the design.
The bearings are produced with a cylindrical or tapered bore (taper 1:30).

Spherical roller bearings with a cylindrical bore are located directly on the converter trunnion, Figure 1 on page 2. Bearings with a tapered bore are mounted on tapered sleeves, Figure 2.

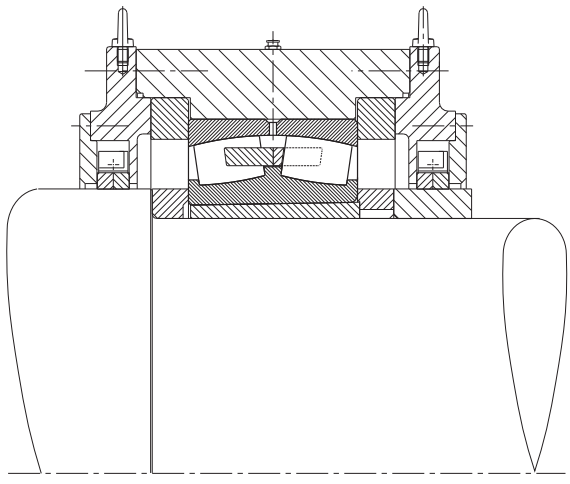
2.1.1 Aligning capability

Static angular misalignment

Over time, vertical or lateral offset of the housing can lead to misalignments, Figure 3.

These so-called static angular misalignments are, for example, caused by subsidence of the foundations. The bearing is not subjected to additional load provided that the rolling elements have full length contact with the outer ring raceway. In the case of all FAG spherical roller bearings for converters, the permissible adjustment angle specified for static angular misalignment is 1,5°.

It has, however, been proven that a static angular misalignment of just 10' should be permitted when mounting the housing. This value is set so low as it is anticipated that the position of the housing will increase considerably over time due to subsidence of the foundations or thermal influences.



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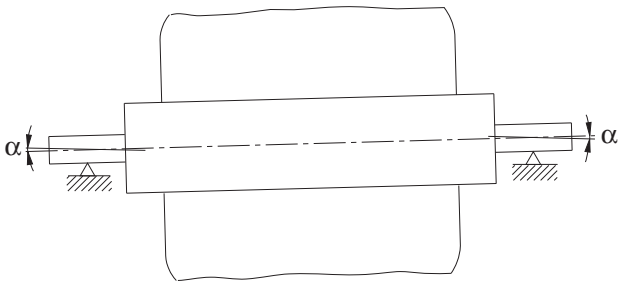


3

2: Spherical roller bearing as locating bearing on a sleeve

3: Static angular misalignment α

Rolling bearings and housings for converters

Spherical roller bearings

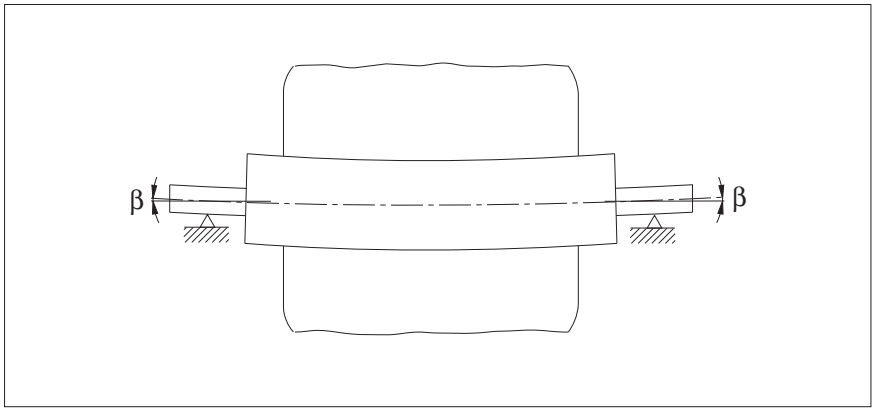
Dynamic angular misalignment

In large converters the bearing distances are between 7 and 12 m. Deflections of varying magnitude occur, depending on the operating position. However, the alignment motion that has to be supported by the bearing during swivelling is relatively small.

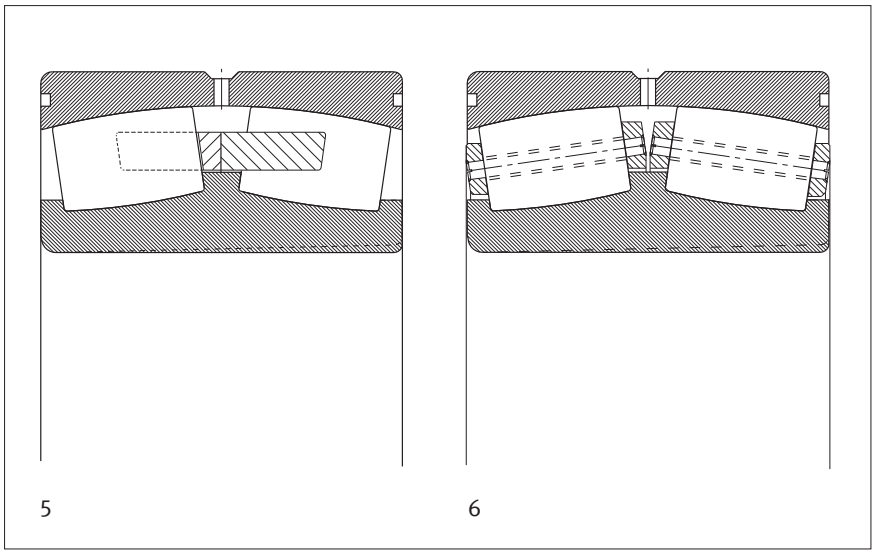
The irregular heating of the supporting ring has a greater effect. Depending on the design, the supporting ring distorts to a greater or lesser extent, so that the trunnions are no longer in alignment. The tumbling of the trunnions which occurs during swivel motion of the converter is known as dynamic angular misalignment, Figure 4.

In this instance, the bearings must adjust for each movement of the converter. Whilst the rolling elements roll in a circumferential direction, these are simultaneously displaced in an axial direction in the outer ring raceway. This is associated with sliding friction. To avoid placing an extra strain on the contact points in the bearing, distortion of the supporting ring should be minimised.

Practical experience has shown that the dynamic angular misalignment of converter bearings is between 20 and 50 angular minutes after several years of operation. In spite of these deviations from the theoretical axis, the additional forces can be accommodated as these have been taken into account in the internal design of the FAG rolling bearings. The outer ring raceways or the rollers have a special coating which reduces friction.



4: Dynamic angular misalignment β



5: Spherical roller bearing for converter with solid brass cage
6: Spherical roller bearing for converter with pin cage

2.1.2 Cages

Depending on the load, FAG spherical roller bearings for converters are fitted with solid brass cages, Figure 5, or with pin cages and through-drilled rollers, Figure 6. The pin cage consists of lateral cage washers to which the pins that pass through the rollers are attached. As a result of the pin cage, a larger number of rollers can be accommodated and consequently a higher basic load rating can be achieved. This cage also has particularly high strength properties.

Rolling bearings and housings for converters

2.1.3 Tolerances, internal clearance

FAG spherical roller bearings for converters have standard tolerances of radial bearings (tolerance class PN), also see Catalogue HR1, Rolling Bearings. Deviations for split bearings, see section 2.2. The radial internal clearance of spherical roller bearings is selected in accordance with the operating temperature and the mounting fits.

2.1.4 Lubrication groove, lubrication holes

To facilitate lubrication, FAG spherical roller bearings for converters have a circumferential lubrication groove and three lubrication holes in the outer ring, see Figures 5 and 6.

2.1.5 Heat treatment

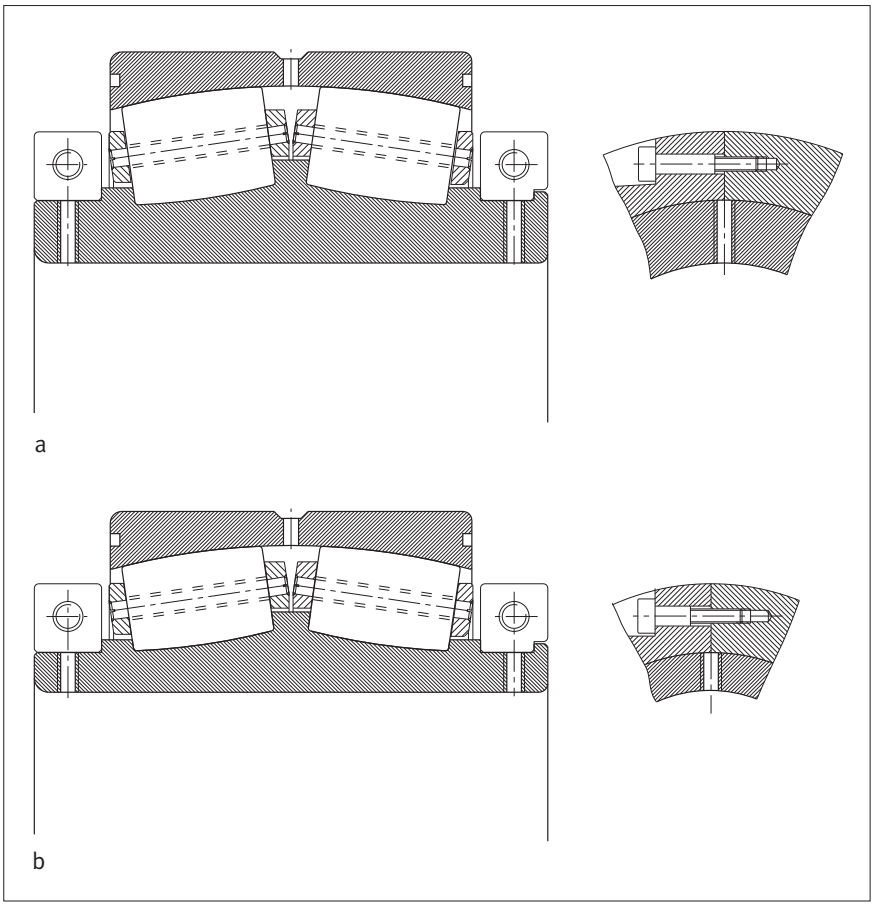
FAG spherical roller bearings for converters are heat treated such that they are dimensionally stable up to an operating temperature of +200 °C.

2.2 Split spherical roller bearings

Steel works frequently require the bearing on the drive side (locating bearing side) of a converter to be replaceable without dismantling the drive unit. This can be achieved with split spherical roller bearings, Figure 7. Due to cost reasons, split bearings are usually used as replacements.

The main dimensions of the split spherical roller bearings are matched to those of the unsplit bearing with tapered bore and sleeve (Figure 7a) or with cylindrical bore (Figure 7b). The rings and cage of the split bearing are split horizontally. Due to the split locking rings, the split inner ring is considerably wider than the inner ring in the unsplit bearing.

The bore tolerance is defined such that a tight fit is achieved with trunnion tolerances of h7 to m6. In split bearings, not only the raceways of the outer ring are bonderised and have a molybdenum disulphide coating, but the rollers are bonderised as well.



7: Split spherical roller bearings
a: Replacement for unsplit bearing with tapered bore and sleeve;
b: Replacement for unsplit bearing with cylindrical bore

Rolling bearings and housings for converters

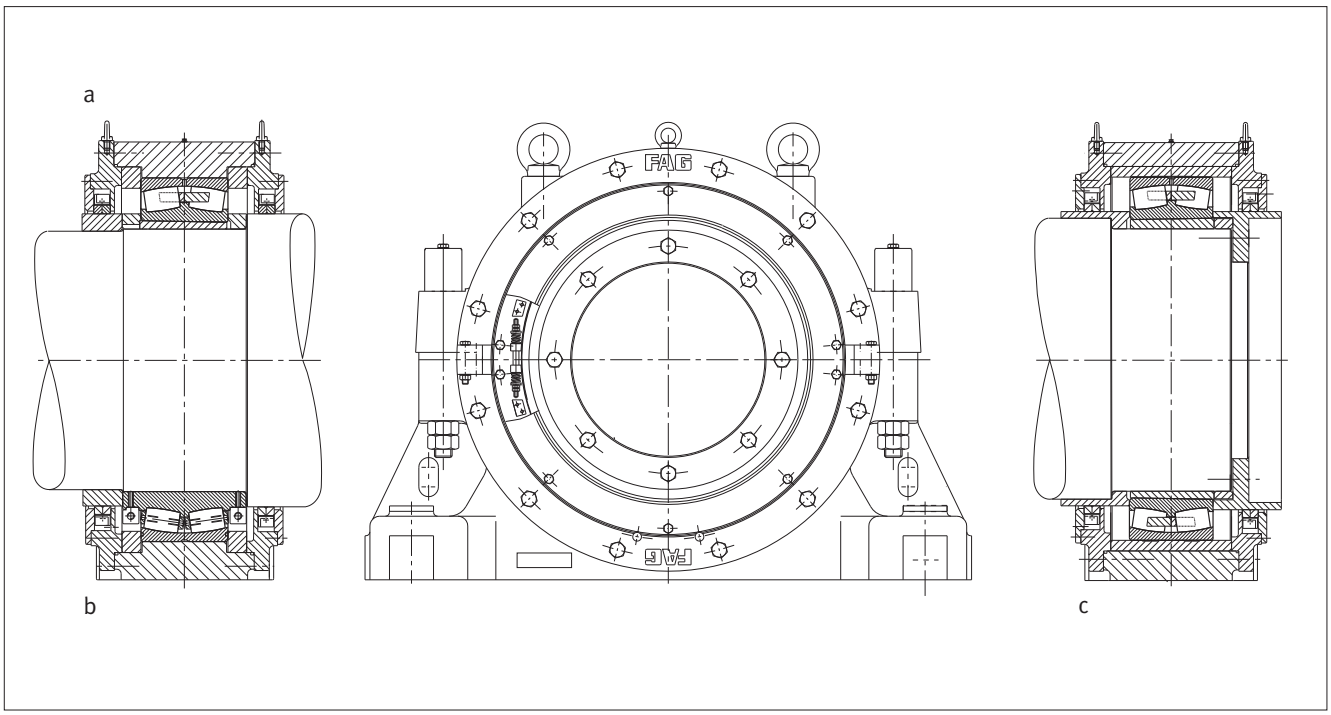
Housing KPG49

2.3 Housing KPG49

Split plummer block housings of the series KPG49 are made from cast iron and have a tensile strength ≧ 400 N/mm^2.
This provides good support for the bearing outer ring, which is important for achieving flawless pressure distribution within the bearing. The housings are available in a locating and non-locating bearing design.

In housings of the design KPG49...-F, the locating bearing is formed by fitting locating rings on both sides of the bearing outer ring. These housings are intended for the fitting of spherical roller bearings with a tapered bore, which are seated on the shaft with sleeves (Figure 8a).
Housings of the design KPG49...-F also accommodate split spherical roller bearings (Figure 8b), which replace unsplit bearings with tapered bore and sleeve.

In housings of the design KPG49...-L (Figure 8c), the outer ring of the non-locating bearing can be displaced axially in a bearing bush. Only spherical roller bearings with a tapered bore are fitted in these housings, which are seated on the shaft with sleeves.



8: Split plummer block housings KPG49 for converters
Locating bearing housing KPG49...-F with spherical roller bearing on sleeve (a) and with split spherical roller bearing (b), Non-locating bearing housing KPG49...-L (c)

Rolling bearings and housings for converters

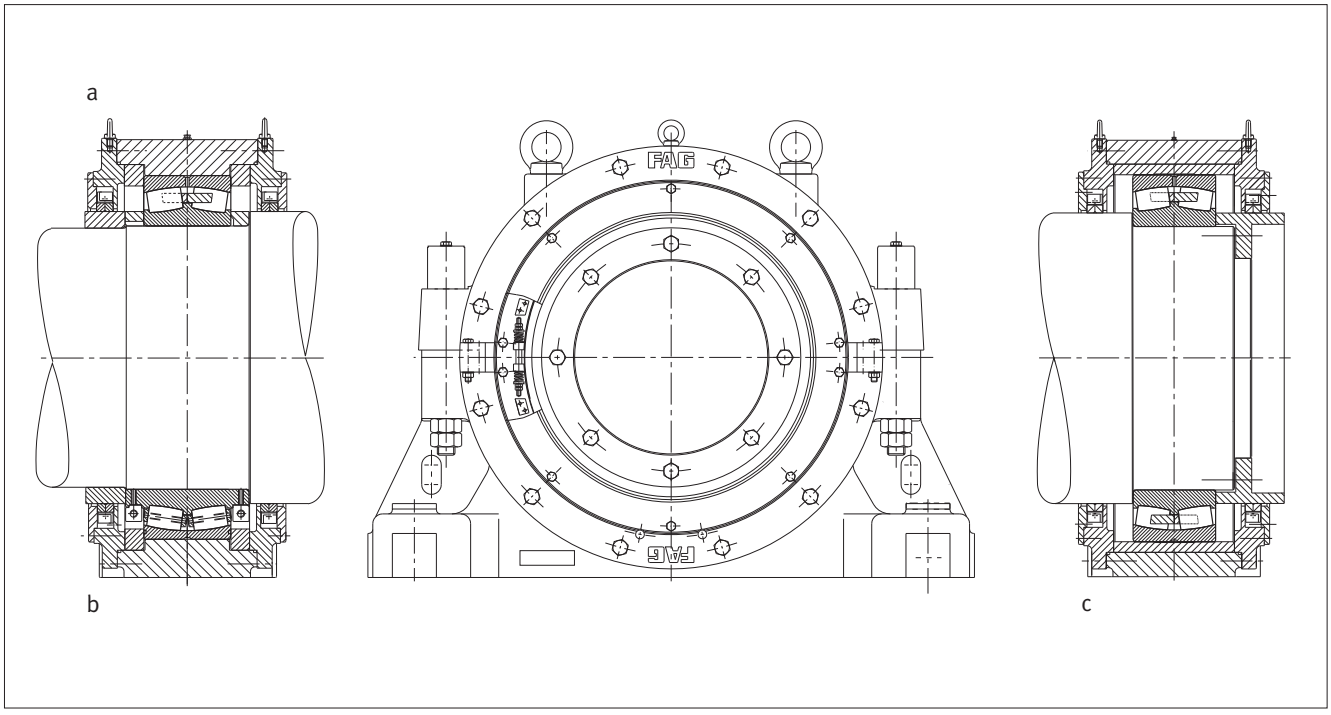
Housing KPGZ49

2.4 Housing KPGZ49

Unlike KPG49 housings, split plummer block housings of the series KPGZ49 are intended for bearings with a cylindrical bore which are seated directly on the shaft stud.

The housings are available in a locating bearing design F and a non-locating bearing design L. The locating bearing housings are suitable for unsplit spherical roller bearings (Figure 9a), but can also accommodate split spherical roller bearings (Figure 9b).

The non-locating bearing housings are intended solely for unsplit spherical roller bearings (Figure 9c).



9: Split plummer block housings KPGZ49 for converters
Locating bearing housing KPGZ49...-F with unsplit spherical roller bearing (a) and with split spherical roller bearing (b), Non-locating bearing housing KPGZ49...-L (c)

Dimensioning of rolling bearings

Static load safety factor · Dimensioning with BEARINX®

3 Dimensioning of rolling bearings

Converter bearings undergo swivel motion and rotate up to 360° only occasionally. The speed during swivel motion is 0,1 to 1 rpm.

During decarburisation the converter is at rest, vibrations occur as a result of the blowing process.

These conditions require bearing dimensioning that is based on **static** criteria.

The operating life of the bearings is determined by the wear period. Wear is caused by:

- deflection due to the large bearing distance or deformation of the supporting ring
- axial displacement due to temperature changes in the converter.

Wear can be reduced by phosphatising and/or adding a molybdenum disulphide coating to the bearing components.

3.1 Static load safety factor S_0

For converter bearings, the requirement is normally

$S_0 \geqq 2$

A higher S_0value means increased operational reliability. In particular, where load data has not been accurately defined, e.g. in the case of blowing process AOD, an S_0 value $\geqq 2{,}5$ should be aimed for.

$S_0 = C_{0r}/P_0$

C_{0r} basic static load rating [kN] from the bearing tables
P_0 equivalent static load [kN]

Locating bearing
$P_{0F} = F_{0rF} + Y_0 \cdot (F_{0a} + F_{0a1})$ [kN]

Non-locating bearing
$P_{0L} = F_{0rL} + Y_0 \cdot F_{0a1}$ [kN]

F_{0rF} = maximum radial load for locating bearings [kN] *
F_{0rL} = maximum radial load for non-locating bearings [kN] *
Y_0 = axial factor (bearing tables)
F_{0a} = maximum external axial load [kN] *
F_{0a1} = $\mu \cdot F_{0rL}$ reaction force due to non-locating bearing displacement [kN]
μ = 0,15 coefficient of friction for bush

* with possible shock loads

The results are entered in the calculation sheet (sheet B in section 5.8).

3.2 Dimensioning with BEARINX®

The internal loads on the rolling bearings and the most important calculation results are generated numerically and in graphs with the aid of our calculation program BEARINX®.

The following can be considered **influences**:
Shaft support in the form of bearings with non-linear elasticity (in detail, bearing geometry, bearing clearance, rolling element and raceway profiles, special conditions for load accommodation).

The following **calculation results** are generated:
Bearing elasticity, load conditions within the rolling bearings, distribution of pressure in the rolling contact areas of the individual rolling elements.

Dimensioning of rolling bearings

Dimensioning with BEARINX®

Example: Calculating the maximum pressure using calculation program BEARINX®

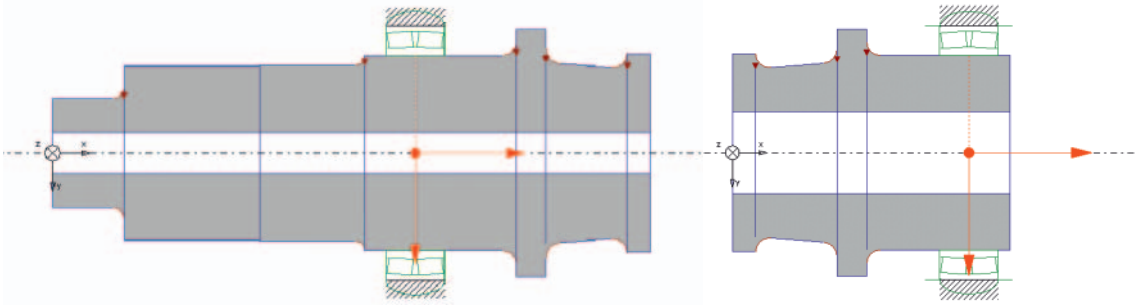
Subject: Converter vessel with capacity of 300 t

Bearing designation:	Z-541836.249/1180-B
Dimensions:	1 180×1 540×355 mm
Basic static load rating:	C_{0r} = 42 500 kN
Axial factor:	Y_0 = 3,34
Coefficient of friction:	μ = 0,15

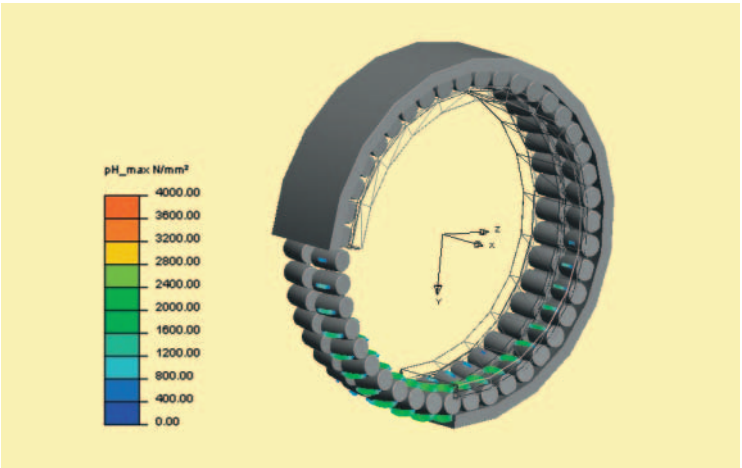
Input parameters:

Radial load on the non-locating bearing side, vertical:	F_{0rL} = 7 500 kN
Radial load on the locating bearing side, vertical:	F_{0rF} = 7 500 kN
Axial load from blowing operation:	F_{0a} = 750 kN
Axial load on non-locating bearing side:	F_{0a1} = 1 125 kN
Axial load on locating bearing side:	$F_{0a\ ges} = F_{0a} + F_{0a1}$ = 1 875 kN

a) Trunnion bearing arrangement on gearbox side (locating bearing) and non-locating bearing side



b) Visualisation of the pressures in the spherical roller bearing on the non-locating bearing side



Design of adjacent parts

Fits · Seals

4 Design of adjacent parts

4.1 Fits

4.1.1 Trunnions

Recommended machining tolerances:

h7 when using a tapered sleeve
m6 when the bearing is seated directly on the trunnion

Location with a tapered sleeve is beneficial in the case of heavy converter bearing arrangements. This makes mounting easier and reduces the demands on the seat quality. The out-of-roundness and taper should not exceed 40 % of tolerance field h7.

For a cylindrical bearing bore, the trunnion must be machined to m6 (tight fit). The large bearings must be heated in an oil bath prior to mounting; it is advisable to use the hydraulic method for dismantling. A sliding fit may also be chosen if the trunnion surface can withstand the resulting loads.

4.1.2 Housing bore

Recommended machining tolerances:

H7 for non-locating and locating bearings
D8 for the displacement bush bore in the non-locating bearing design

Roughness depth < 6 µm.

The unsplit bearing bush is roughly as thick as the outer ring.

The outside surface of the FAG spherical roller bearings is phosphatised and has a molybdenum disulphide coating, so that the frictional resistance during displacement is low.

The geometrical tolerances for bearing seats are described in Catalogue HR 1, Rolling Bearings.

4.2 Seals

Two types of seals have proven to be suitable. In Europe, high-pressure packings are mainly used whereas in America rubber profile seals are preferred.

4.2.1 High-pressure packings

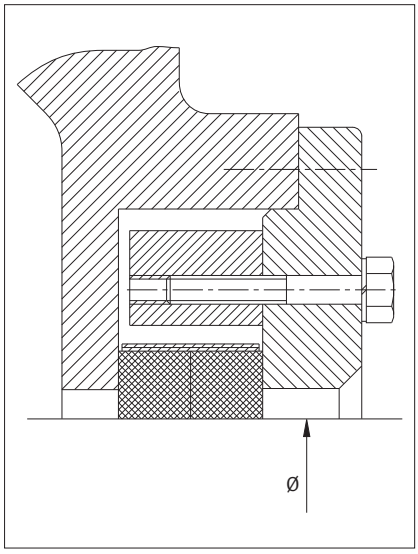
Ordering example:

PROF.1799-30X30X3850-Hecker or equivalent

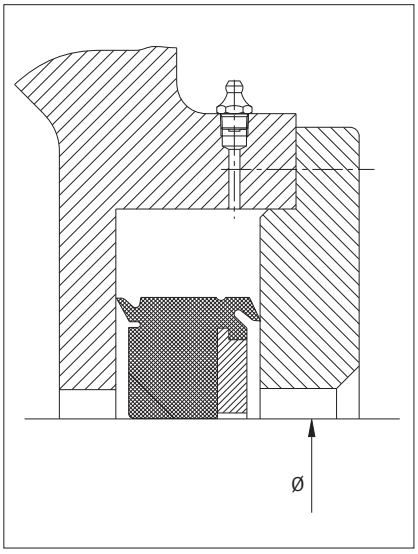
4.2.2 Rubber profile seals

Ordering examples (for d = 1135 mm):

- without wiper ring: Z-155330.04-0160.GHT.SPG
- with wiper ring: Z-155330.04.SPG



10: High-pressure packing



11: Rubber profile seal

5 Mounting, lubrication and maintenance

The service life of the bearings is largely dependent on correct mounting and maintenance.

Large bearings should be mounted by skilled personnel only.

A specialised bearing fitter should always be present to supervise the work and ensure that the fitting specifications are observed.

5.1 Preparations for fitting

Smooth mounting of converter bearings requires some preparation.

- Prepare tools
- Check hoisting equipment and position correctly (some bearings weigh several tons)
- Have a sufficient quantity of the specified lubricant ready (see section 5.5)
- Check adjacent parts (geometrical and dimensional accuracy, surface quality, cleanliness)
- Enter measured values (trunnion diameter, housing bore) in datasheet E or F (section 5.8).

Bearing mounting requires that

- the converter vessel and supporting ring are already suspended above the foundations at the installation site.
- the lower sections of the housing for locating and non-locating bearings are aligned on the foundations
- in special cases, the bearing arrangement can also be premounted in a workshop.

5.2 Fitting of unsplit bearings

5.2.1 Bearings with a cylindrical bore (Figure 1)

The tight fit (m6) on the cylindrical trunnion requires the bearing to be heated in an oil bath. At a temperature of +80 to +90 °C the inner ring expands sufficiently for the bearing to be pushed on unimpeded.
A temperature of +120 °C should not be exceeded under any circumstances, as this may lead to a change in the material structure.

For bearings with a **cylindrical bore** that are heated in an oil bath

- an oil container, which is appropriate to the size of the bearing, and a ring burner must be provided at the mounting site
- a device must be provided which clamps the warm bearing axially against the shaft collar on the shaft until it has cooled down.

For bearings with a **tapered bore** that are mounted on sleeves

- hydraulic tools are required (see section 5.2.2).

The bearings may only be unpacked once this work has been carried out.

The bearings must then be checked for transport damage.

Measure radial internal clearance over both rows of rollers using a feeler gauge and enter the value in data sheet E or F (section 5.8).

The bearing should be laid in the oil container on a grid. This prevents contaminants in the oil, which have deposited on the bottom, from penetrating the bearing. This also ensures that the bearing is heated uniformly.

When the bearing reaches a temperature of +80 to +90 °C, it is lifted out of the oil container. The oil drips off and the bearing bore is wiped until it is nearly dry.
The bearing is then pushed onto the trunnion. It is adjusted axially against the shaft shoulder until it has cooled down (retighten during this period). The bearing cavities are filled with grease.
When mounting the bearing at the opposite end, the already mounted bearing is wrapped in oiled paper to protect it from contamination.

For further measures see section 5.4.

Mounting, lubrication and maintenance

Mounting of unsplit bearings

5.2.2 Bearings with a tapered bore on sleeve (Figure 2)

The trunnion is machined to h7 at the bearing seat. A tight connection between bearing, sleeve and trunnion is achieved by pressing the tapered sleeved axially into the bearing bore by a specified amount. To prevent axial displacement, the bearing is located at both sides of the inner ring.

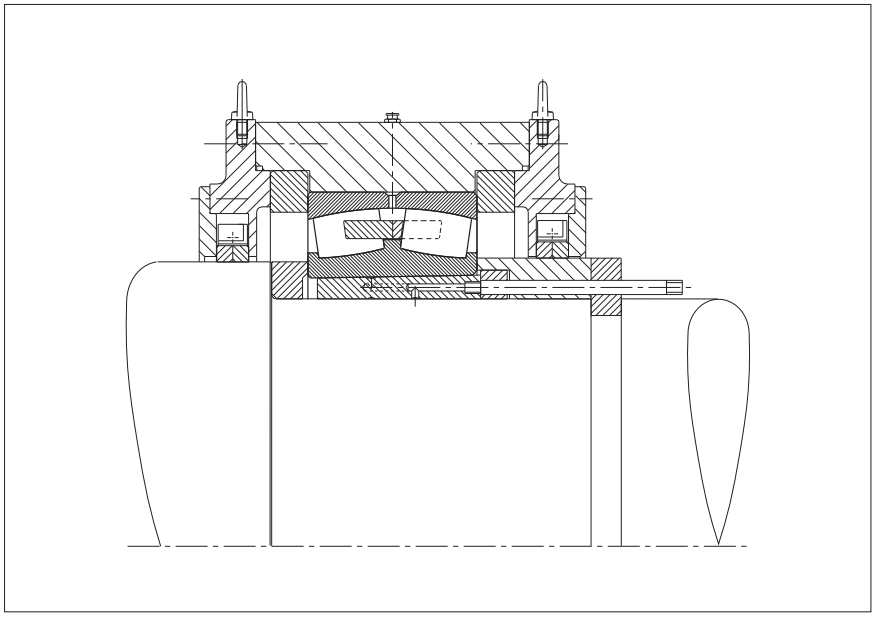
The tapered sleeves are essentially suitable for hydraulic mounting, as the required press-in force is only one fifth of the force that would be required for dry mounting.

Prior to mounting, the radial internal clearance is measured over both rows of rollers using a feeler gauge and the measured value is recorded in data sheet E or F (section 5.8).

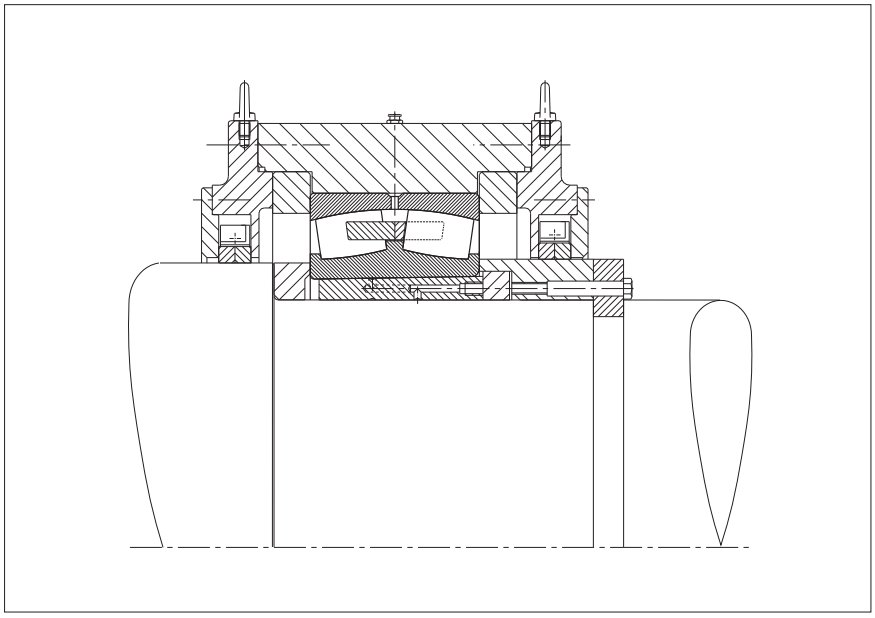
The bearing is then placed on the trunnion and the sleeve is inserted until the bearing is centred and the inner ring abuts the shaft collar or the intermediate sleeve.
Oil is pressed into the fitting joints using a pressure pump, Figure 12a, and the sleeve is simultaneously pressed into the bearing bore using several screws arranged in the end face, Figure 12b, until the specified reduction in radial internal clearance has been achieved (see project sheet A in section 5.8).
The remaining radial internal clearance is entered in data sheet E or F.

The mounting aids can be removed approximately 20 minutes after completing the pressing-in procedure. The bearing cavities are to be filled with grease.

Whilst mounting the second bearing, the already mounted bearing is wrapped in oiled paper to protect it from contamination.



12a: Oil supply via pressure oil lines



12b: Arrangement of the pressure screws for pressing in the sleeve

Mounting, lubrication and maintenance

Mounting of split bearings

5.3 Mounting of split bearings

These bearings are preferably used as replacement bearings on the drive side. As the drive is not dismounted, there is only limited space to work in. The bearing location is only accessible from above.

During mounting, it must be ensured that the correct bearing components are installed together. In addition to the bearing designation Z-5.... (six-digit number) on the stamped side, the components are marked with a production number, e.g. 501. The components assigned to the stamped side bear this number at the joints.
The components on the opposite side are additionally marked with an A, e.g. 501A.

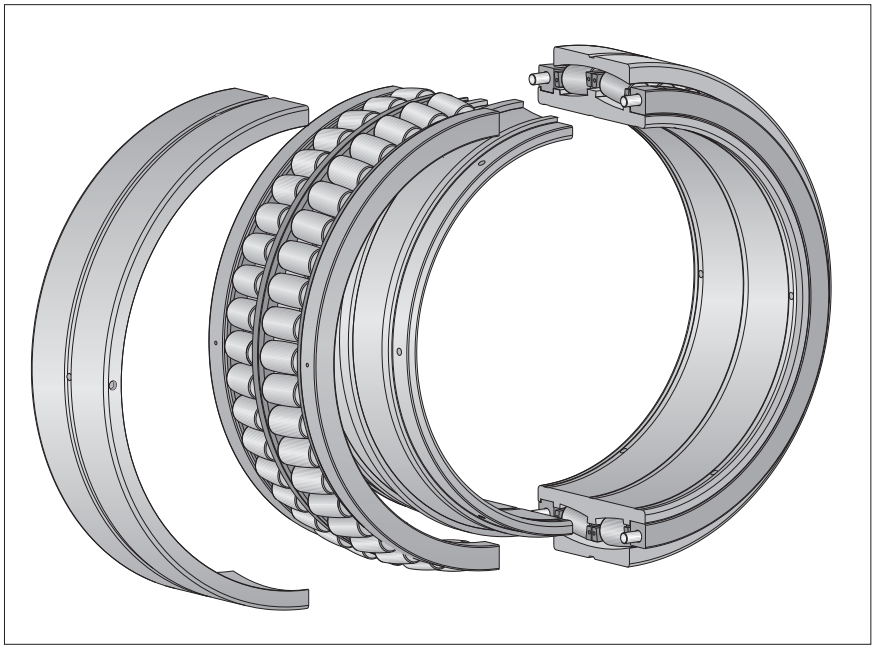
The bearing components are furnished with threaded holes for easier handling.

The inner ring is seated on the shaft with an interference fit, resulting in a gap at the separating joints of the inner ring halves.

Before the replacement bearing can be fitted, the unsplit bearing must be removed (recommendations, see 5.7.1). The bearing seat on the trunnion must then be checked and the trunnion diameter must be measured. The measured values are recorded in the data sheet.

Local irregularities on the trunnion surface (fretting corrosion, cold weldings) must be reworked. At any rate, the seat for the split bearing must exhibit an interference fit in relation to the bearing bore.

The inner ring halves are mounted first (fitting diagram, Figures a – d).



The locking rings are mounted in the same way (Figure e). The gaps between the two separating joints on the inner ring must be horizontal (Figure d) and identical in size.
The joints in the locking rings (Figure e) should only be offset to such an extent that the connecting screws for the locking rings can be easily tightened from above (for tightening torque see project sheet A in section 5.8).

The remaining bearing components are mounted in accordance with Figures f – i. It must be ensured that the bore for the anti-rotation device in the lateral faces of the outer ring is exactly vertical.
As shown in Figure h, the halves of the roller and cage assembly must be braced against the inner ring raceways using strong wire before the converter is lowered into the lower sections of the housing.

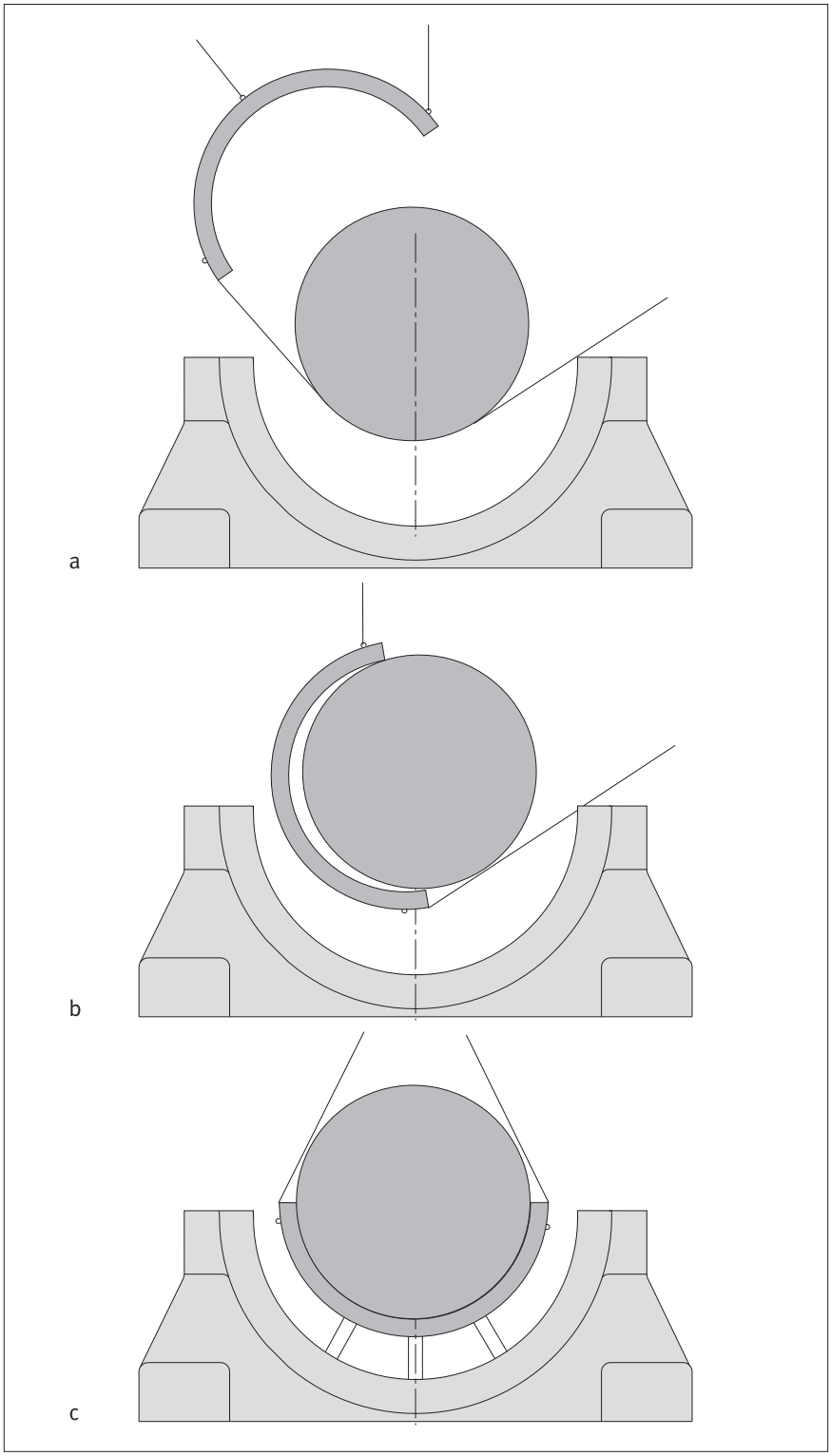
Before lowering it is assumed that
- the bearing on the opposite side is mounted
- the lower sections of the housing are positioned correctly in relation to the trunnions.

Then
- the two remaining halves of the roller cage assembly must be inserted (remove wire and eye bolts from the other halves first)
- lubricant must be added
- the second outer ring half must be mounted.

Further measures are taken in accordance with section 5.4.

Mounting, lubrication and maintenance

Mounting of split bearings



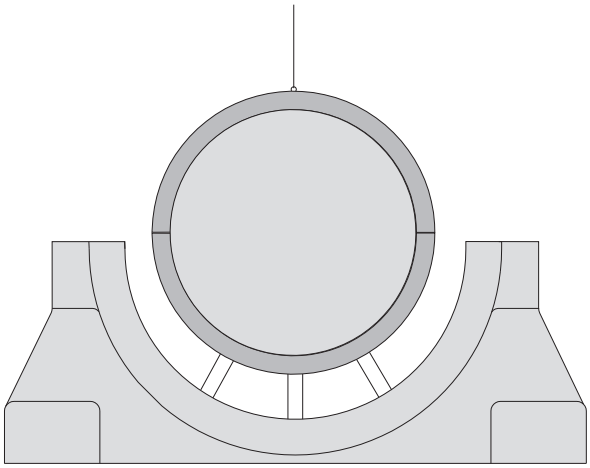
Mounting sketch for split replacement bearings

a – c Position inner ring half around the trunnion and adjust against the trunnion from below using wooden wedges. Ensure that the wooden wedges do not cover the seats for the locking rings.

Mounting, lubrication and maintenance

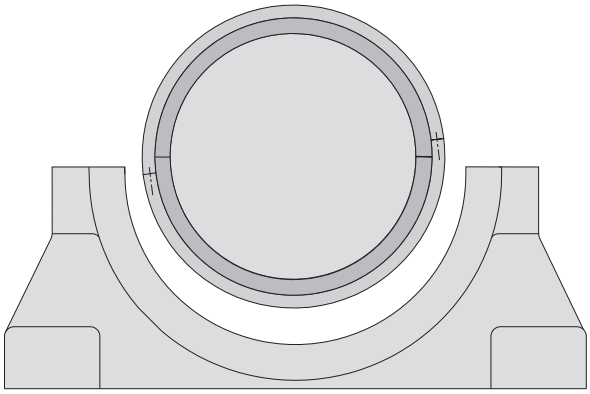
Mounting of split bearings

d



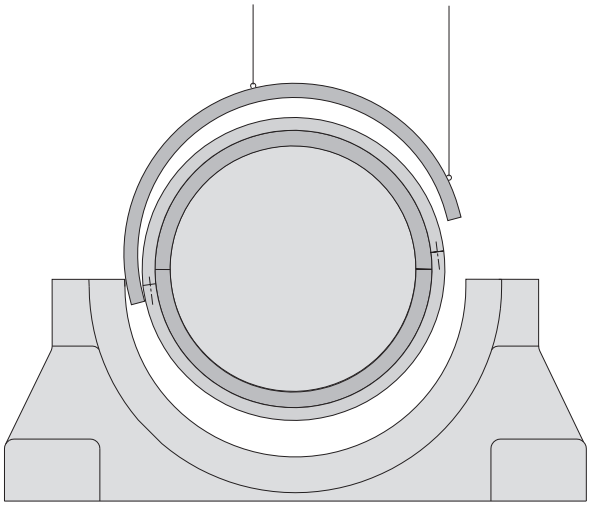
d Position second inner ring half.

e



e Insert locking rings in the same way as the inner ring halves. Then wedge and bolt together. The joints of the locking rings should be slightly offset against the joints of the inner ring.

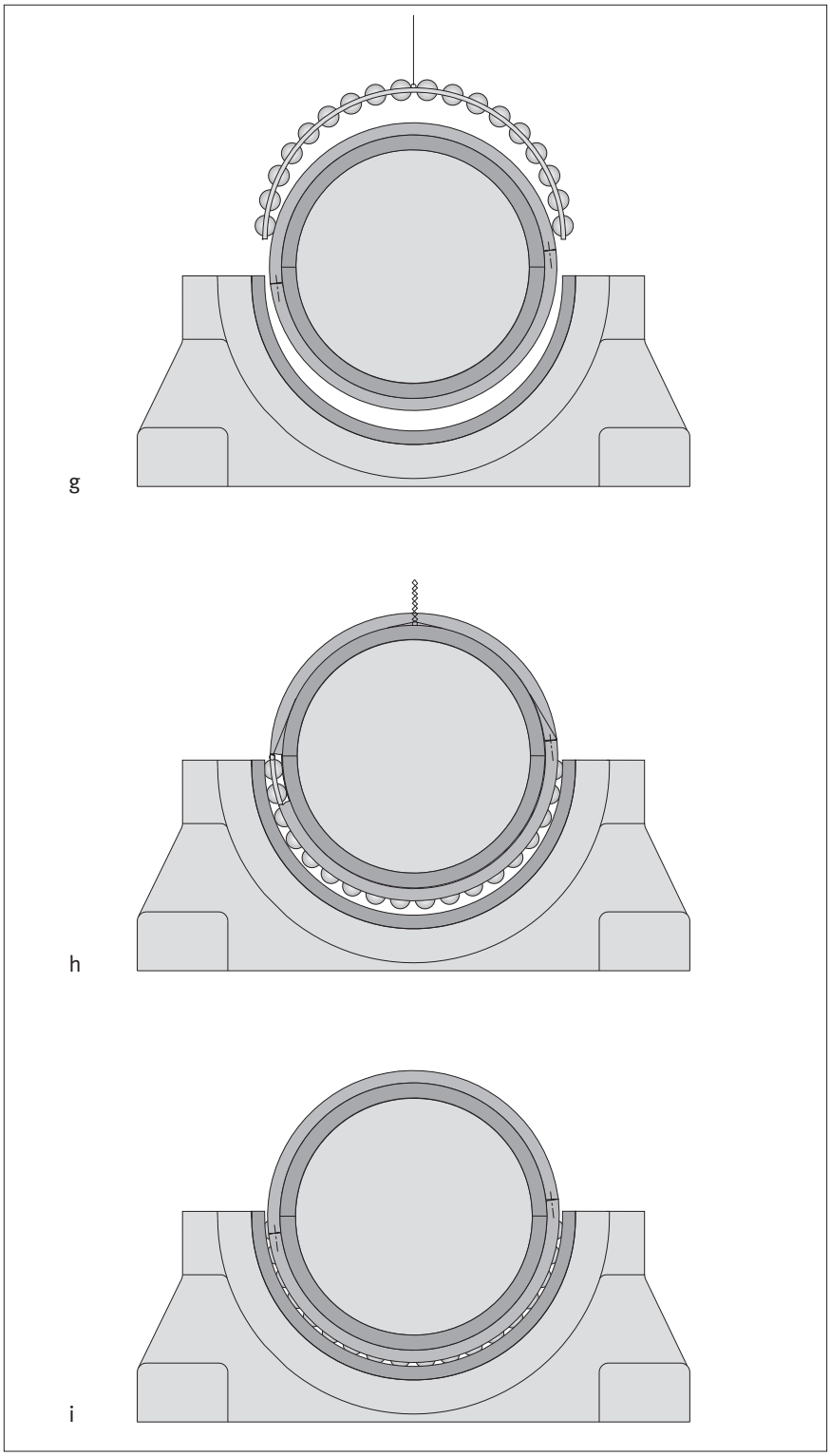
f



f Insert outer ring half and lower into the lower section of the housing.

Mounting, lubrication and maintenance

Mounting of split bearings



g

h

i

g Suspend roller and cage assembly halves and roll into place over outer ring.

h – i Brace roller and cage assembly halves against the inner ring raceway. The converter can now be lowered. All remaining components are mounted later.

Mounting, lubrication and maintenance

Measures to be taken after mounting

5.4 Measures to be taken after mounting

Once both bearings are fitted, the following measures must be taken:

- Check position of the lower sections of the housing in relation to the trunnion and correct if necessary (static angular misalignment, see 5.4.1)
- Check position of non-locating bearing housing in relation to the trunnion and correct if necessary (displacement possible?)
- Lower converter
- Measure internal clearance of unsplit bearings
- Position the upper section of the housing
- Insert lubricant (fill approx. 60% of the cavities to the left and right of the bearing)
- Screw lateral cover on
- Correct dynamic angular misalignment in accordance with 5.4.2 (vertical error compensated and housing not rotated in relation to trunnion, see 5.4.1) and enter values in data sheet (section 5.8)
- Determine axial elongation in operation (1st campaign) and enter value in the data sheet (section 5.8) (displacement for non-locating bearings, see 5.4.3).

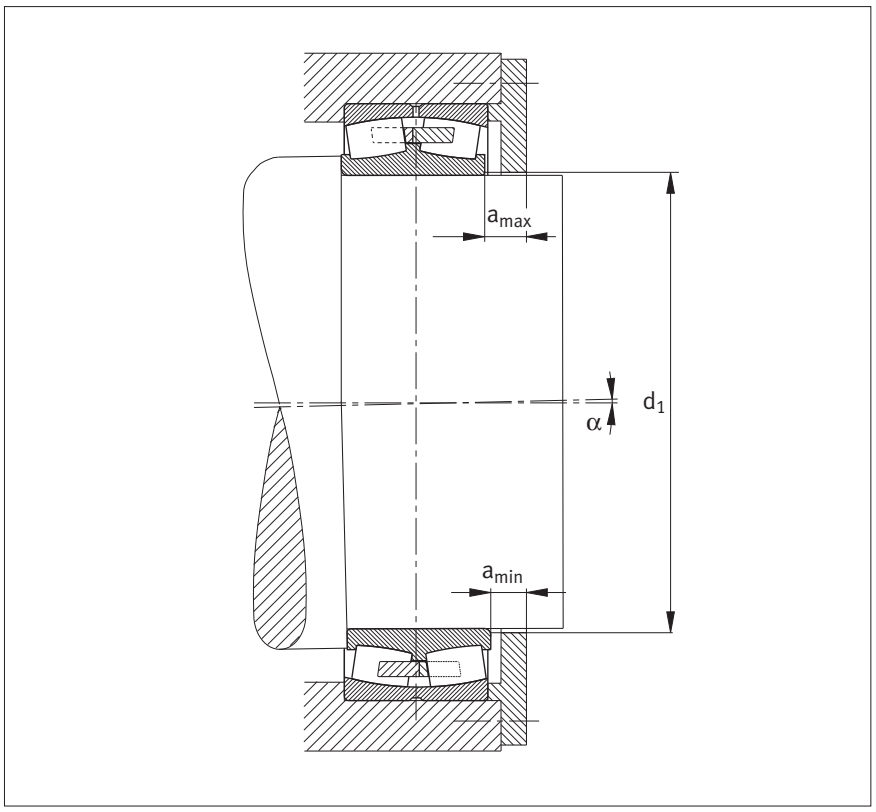
5.4.1 Checking the static angular misalignment (vessel is at rest)

The maximum and minimum distances between the lateral face of the bearing inner ring and a machined lateral face of the housing cover are measured.
The static angular misalignment is calculated from the difference between these distances and the diameter on which the values were measured:

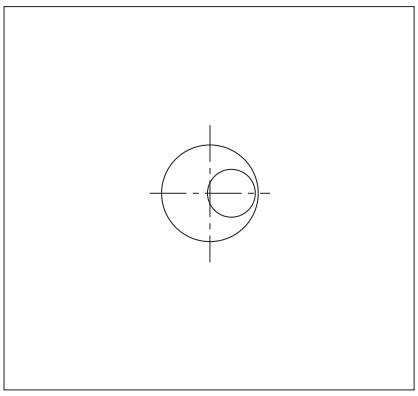
$\tan \alpha = (a_{max} - a_{min})/d_1$

Required: $\alpha \leqq 10$ min,
i.e. $\tan \alpha \leqq 0{,}003$ and consequently

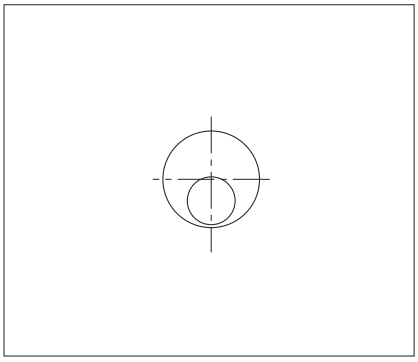
$(a_{max} - a_{min})/d_1 \leqq 0{,}003$



Measuring the static angular misalignment



Housing rotated in relation to trunnion



Vertical error

Mounting, lubrication and maintenance

Measures to be taken after mounting

5.4.2 Checking the dynamic angular misalignment (vessel swivelling)

A dial gauge is applied to the housing in accordance with the diagram and the stylus is placed on the trunnion at a distance l from the centre of the bearing.
The converter is then swivelled by 360° and the maximum deflection b is read off the dial gauge.
The dynamic angular misalignment is derived from

$$\tan \beta = b/(2 \cdot l)$$

The out-of-roundness of the trunnion is included in the measured values. The permissible out-of-roundness is, however, considerably less than the deviation from the nominal axis of rotation.

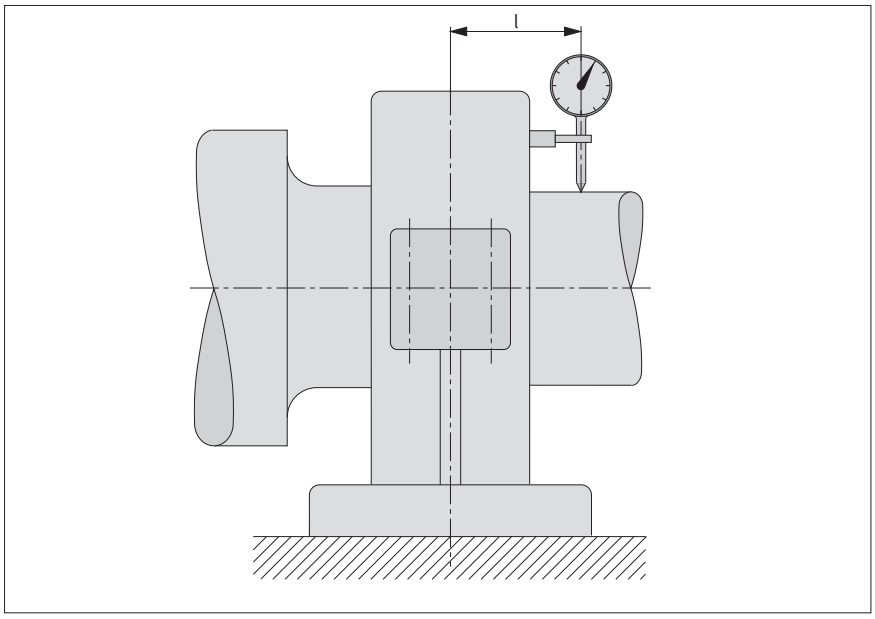
The measured values should be entered in the ***data sheet***.

Based on the latest production developments, it is almost impossible to detect deviations greater than 10 angular minutes for new plants.
By repeating the measurements it is possible to determine whether the position of the trunnion has changed over time. As the deviations are small, measurements are often dispensed with during set-up.

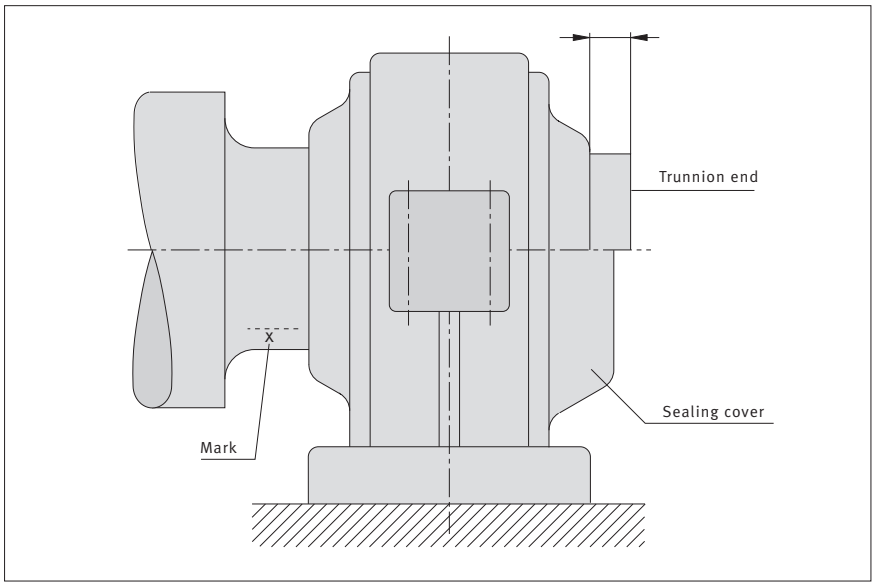
5.4.3 Checking the displacement of the non-locating bearing

The displacement of the non-locating bearing should be determined during the first campaign of the converter. Working from the position of the non-locating bearing when the converter is cold, the displacement is measured after several days of operation, in a warm state.
With an open end trunnion (in the top picture), the displacement can be determined from the distance between the trunnion end and the lateral face of the cover.

If the housing is closed, a mark is applied to the converter side of the trunnion (bottom picture).
The measured values are entered in data sheet E (see 5.8), so that comparisons can be made at a later stage during inspections.



Measuring the dynamic angular misalignment



Measuring the axial displacement of the non-locating bearing

Mounting, lubrication and maintenance

Lubrication · Maintenance

5.5 Lubrication

FAG spherical roller bearings for converters have a lubricating groove and lubricating holes in the middle of the outer ring. During relubrication, lubricant is then fed directly into the bearings.

Lithium soap greases which contain effective EP and anti-corrosion additives and, where possible, an MoS_2 additive, should be used.

A high base oil viscosity combined with a consistency that is not too soft (NLGI class 2) ensures a good lubricating condition.

Where possible, relubrication should be carried out using the same grease as for initial lubrication (see project sheet A in section 5.8).

The bearing lubricant should also be used to relubricate the seal, if grease chambers are provided.

The grease quantity for initial lubrication and relubrication and the lubrication intervals can be found in project sheet A in section 5.8.

5.6 Maintenance

Maintenance of the converter bearing arrangements follows the pattern below:

a ... a b a ... a c a ... a b a etc.

a Activities following initial start-up and during operation, see 5.6.1

b Minor inspection after 1 – 1½ years

c Major inspection after 2 – 3 years

5.6.1 Following initial start-up/ between inspections:

1 Measure displacement of non-locating bearing after first "campaign"

2 Relubricate seal after each "campaign" (depending on plant)

3 Lubricate displacement sleeve (non-locating bearing side) after each "campaign"

4 Lubricate bearings every 2 to 3 months

5.6.2 Minor inspection after 1 – 1½ years:

1 Remove lateral covers and spent lubricant

2 Check lubricant for contaminants on the spot

3 Check seals, replace if necessary

4 Replenish lubricant

5.6.3 Major inspection after 2 – 3 years:

1 Remove lateral covers and upper section of the housing and remove spent lubricant

2 Take lubricant samples at different distances from the bearing and analyse them

3 Remove remaining lubricant

4 Determine possible axial displacement of the non-locating bearing (inwards and outwards), compare with the values recorded during initial assembly and enter in the data sheet

5 Measure radial internal clearance and enter value in the data sheet (old bearing position)

6 Lift converter until the bearing outer rings are exposed

7 Check surfaces of raceways and rolling elements (record condition in data sheet)

8 Mark four arcs, each at 90°, on the outer rings of the unsplit bearings

9 Rotate outer rings and roller and cage assemblies by 180° (then 90° and subsequently 180°) and enter the old and new position of the outer rings in the data sheet

10 Rotate outer ring halves and roller and cage assembly halves of split bearings by 180°

11 Lubricate displacement sleeve

12 Lower converter in this position

13 Measure radial internal clearance and enter value in the "new bearing position" column

14 Fill bearing and seal with fresh lubricant

15 If necessary, use new seals

16 Measure angular misalignment, compare with the values recorded when the converter was started up and enter in the data sheet.

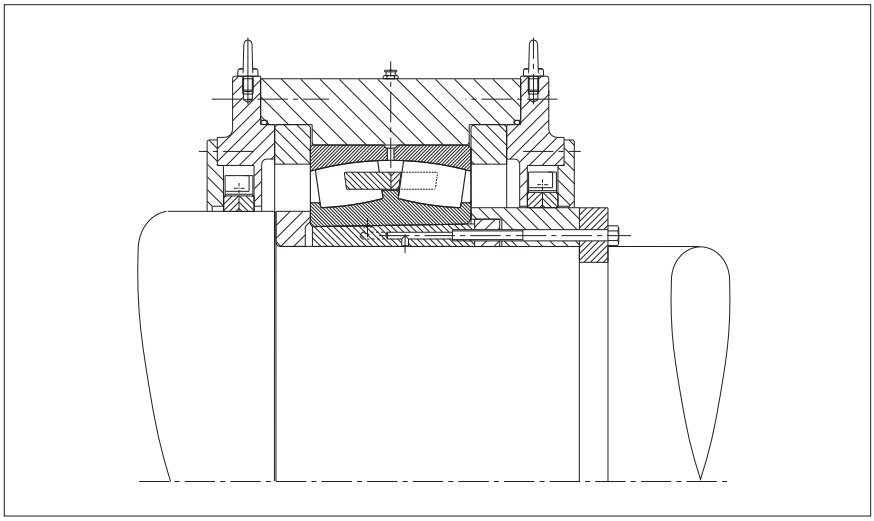
Mounting, lubrication and maintenance

5.7 Dismounting

In principle, the procedure described for mounting should be followed in reverse.

5.7.1 Bearings with a cylindrical bore

Bearings with a cylindrical bore, which are seated securely on the trunnion, cannot be dismounted by conventional means.
Suitable methods include, for example, hydraulic dismounting using additional auxiliary extraction tools. However, this requires holes and ring grooves in the trunnions for pressing in the pressure oil.
The design featuring a cylindrical seat is intended for installation of a split replacement bearing (locating bearing on the drive side).
As the gearbox is not dismounted, the hydraulic method cannot be used for locating bearings.
Due to the considerable amount of work involved, this method is also unsuitable for the non-locating bearing side.
As a rule, converter bearings with a cylindrical bore are destroyed during dismounting as fatigue has rendered them unusable. Outer rings and cages are cut up with a cutting torch. However, it is essential that attempts are made to split the inner ring. Should it be necessary to split the inner ring using the cutting torch, tangential cuts are required to ensure that the trunnion is not damaged.
Once the outer ring and the two cages have been cut and dismounted, a welding torch is used to heat the inner ring thoroughly (approx. +300 C°) in succession at two opposite points over the entire width of the ring. This is then quenched with a jet of cold water. It is important that a significant temperature difference is achieved between the surface and the core of the material with the jet of water, as the resulting tensile stresses will cause the ring to crack.



Arrangement of the extraction bolts for the dismantling process

Due to the risk of injury, the splitting area must be covered.
Caution: The ring parts are under significant stress and may explode. For the purposes of disposal, store the ring parts in a secure, covered crate.

5.7.2 Bearings with a tapered bore on a hydraulic sleeve

In this instance, it is necessary to loosen the press fit between trunnion, sleeve and bearing.
First, the parts which axially locate the bearing toward the trunnion end are loosened and arranged such that the sleeve can shift 0,008 · d with taper 1:12 or 0,02 · d with taper 1:30 (d = nominal diameter of bearing bore).
The pressure pumps are then attached, via the extreme-pressure hoses and adapters, to the connections in the hydraulic sleeve.
The sleeve is loosened and removed from the bearing bore by means of the pressure oil, which is then pressed into the fit joints, and using the extraction bolts.
The position of the extraction bolts is shown in the picture.

5.8 Maintenance forms

A Project sheet

B Calculation sheet

C Original equipment

D Sequence of mounting work

E Data sheet (initial fitting)

F Data sheet (major inspection)

Mounting, lubrication and maintenance

Maintenance forms

A Project sheet

Manufacturer: .....

Project: .....

Code word: .....

Installation site: .....

Capacity: .....

Blowing process: .....

Original equipment: *Locating bearing side*

Housing FAG .....
Data, see drawing no. .....
Bearing FAG .....
Data, see drawing no. .....

Non-locating bearing side

Housing FAG .....
Data, see drawing no. .....
Bearing FAG .....
Data, see drawing no. .....

Replacement:

Locating bearing	FAG	.....
Split spherical roller bearing	Data, see drawing no.	.....
Non-locating bearing	FAG	.....
Spherical roller bearing	Data, see drawing no.	.....

Fit:

Trunnion diameter .....
Housing diameter, locating bearing .....
Housing diameter, non-locating bearing .....
Displacement in the housing .....

Lubrication:

FAG rolling bearing grease Arcanol .....
Relubricate with the same lubricant used for initial greasing

Lubrication:

Initial filling

Bearing 100 %
Housing 60 %
Non-locating bearing housing [kg] .....
Locating bearing housing [kg] .....

Relubrication

Bearing	approx. 8 % of the initial fill quantity of the bearings
	..... kg every 3 months
Sliding surface for axial displacement	approx. 0,8 % of the initial fill quantity of the bearings after every campaign
Seal	after every campaign until fresh grease is supplied (depending on specific plant)

Equipment: .....

Mounting, lubrication and maintenance

Maintenance forms

B Calculation sheet

Manufacturer: .....

Project: .....

Code word: .....

Installation site: .....

Design: .....

Calculation of the static load safety factor S_0 for trunnion bearings

Input parameters: .....

Bearing designation: .....

Dimensions:	.....		mm
Basic static load rating:	C_{0r}	=	kN
Axial factor:	Y_0	=	
Radial load on the non-locating bearing side, vertical:	F_{0rL1}	=	kN
Radial load on the non-locating bearing side, horizontal:	F_{0rL2}	=	kN
Radial load on the locating bearing side, vertical:	F_{0rF1}	=	kN
Radial load on the locating bearing side, horizontal:	F_{0rF2}	=	kN
Axial load from blowing operation:	F_{0a}	=	kN
Coefficient of friction:	μ	=	

Calculation result

Spherical roller bearing on non-locating bearing side:	S_0	=	
	P_{0L}	=	kN
	F_{0a1}	=	kN

Calculation result

Spherical roller bearing on locating bearing side:	S_0	=	
	P_{0F}	=	kN
	F_{0ages}	=	kN

Mounting, lubrication and maintenance

Maintenance forms

C Original equipment

Original equipment, non-locating bearing

1 - FAG	Spherical roller bearing, unsplit
1 - GHRG.	Displacement sleeve

Original equipment, locating bearing

1 - FAG	Spherical roller bearing, split

Replacement equipment, seal/housing

4 - PROF.	Seal
2 - GHT.	Parts for tensioning band
2 - GHT.	
8 - GHT.	
4 - GHT.	
16 - MU	
8 - SHB	
2 - DFED	

Mounting, lubrication and maintenance

Maintenance forms

D Sequence of mounting work

	Locating bearing	Non-locating bearing
Measure the trunnion diameter or manufacturer's acceptance report	☐	☐
Measure the housing bores	☐	☐
Check the radii (bearing and shaft collar)	☐	☐
Check fitted parts		
Dimensional and geometrical accuracy	☐	☐
Surface quality	☐	☐
Cleanliness	☐	☐
Measure radial internal clearance of bearing (enter in datasheet)	☐	☐
Mount bearings on trunnion	☐	☐
Grease bearings	☐	☐
Mount housings and accessories	☐	☐
Check position of housings in relation to trunnion and adjust accordingly (take into account permissible angular misalignment; vertical error, housing rotated in relation to trunnion)	☐	☐
Height must be recorded	☐	☐
Check position of non-locating bearing housing in relation to the trunnion, correct if necessary (displacement possible?)	☐	☐
Lower vessel until it is suspended approx. 2 mm above the platform, check again	☐	☐
Grease bearing location	☐	☐
Insert seal	☐	☐
Close bearing housing	☐	☐
Measure angular misalignment (static) **and adjust** (trunnion diameter concentric with cover bore?)	☐	☐

Mounting, lubrication and maintenance

Maintenance forms

E Data sheet (initial fitting)

Bearings Locating bearing .....
Non-locating bearing .....

		Locating bearing	Non-locating bearing
Radial internal clearance before fitting	[mm]	.....	.....
Actual dimension of the trunnion	[mm]	.....	.....
Installed radial internal clearance[*1]	[mm]	.....	.....
Actual dimension of the housing	[mm]	.....	.....
Angular misalignment resulting from housing being rotated in relation to trunnion		.....	.....
Angular misalignment resulting from vertical error		.....	.....
Total static angular misalignment		.....	.....
Axial displacement capacity of the non-locating bearing			
inwards	[mm]	.....	.....
outwards	[mm]	.....	.....
Grease used		.....	.....

Comments: .....

[*1] calculated value .....

Mounting, lubrication and maintenance

Maintenance forms

F Data sheet (major inspection)

Total static angular misalignment (old position of the outer rings) ....

Remove spent lubricant from the housing and check for contaminants on the spot.
Result of grease analysis .....

Axial displacement capacity of the non-locating bearing
inwards [mm] .....
outwards [mm] .....

Bearings Locating bearing .....
Non-locating bearing .....

Radial internal clearance, old position [mm] .....

Lift converter until bearing outer rings are exposed

Check surfaces (raceway and rolling elements)
Condition .....
.....

The service life can be increased by rotating the outer rings and roller and cage assemblies by 180° (for unsplit bearings, subsequently 90° and then 180°).
Old position, outer ring ....
New position, outer ring ....
Where applicable, radial internal clearance
of new bearing position [mm] ....

Lower converter

Replenish lubricant .....

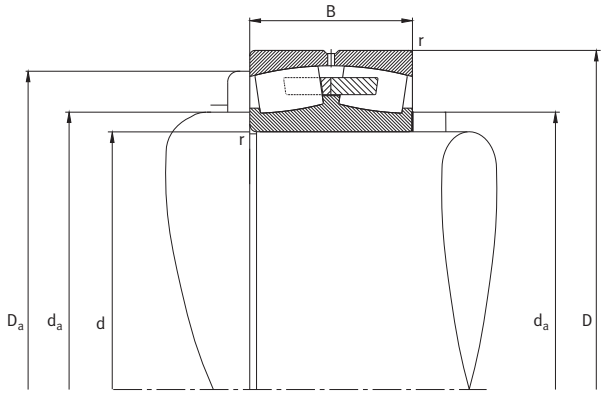
Check seal ..... **Replace if necessary** .....

Total static angular misalignment (new position of the outer rings) ....

Dimension tables for rolling bearings and housings for converters

FAG spherical roller bearings for converters

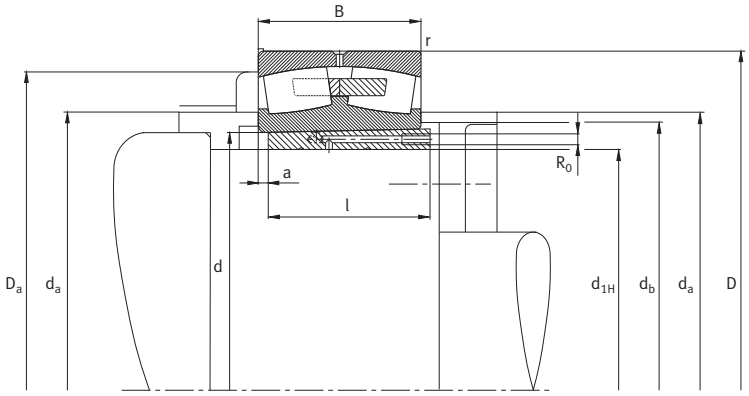
Bearings of dimension series 49 with solid brass cage (MB)
with cylindrical bore
with tapered bore and sleeve



Design 1
with cylindrical bore

Dimension table · Dimensions in mm

Designation		Design	Mass m		Grease quantity for initial filling	Dimensions Bearing			
Bearing	Sleeve		Bearing	Sleeve		d	D	B	r
			≈kg	≈kg	≈kg				min.
Z-528741.PRL	**–**	1	167	–	5	**500**	670	170	5
Z-528741.PRL-K30	**Z-524974.KH**	2	167	33	5	**500**	670	170	5
Z-528742.PRL	**–**	1	208	–	5	**530**	710	180	5
Z-528742.PRL-K30	**Z-524976.KH**	2	208	38	5	**530**	710	180	5
Z-528743.PRL	**–**	1	235	–	6	**560**	750	190	6
Z-528743.PRL-K30	**Z-524978.KH**	2	235	44	6	**560**	750	190	5
Z-528744.PRL	**–**	1	281	–	7	**600**	800	200	5
Z-528744.PRL-K30	**Z-524980.KH**	2	281	48	7	**600**	800	200	5
Z-528746.PRL	**–**	1	418	–	9	**670**	900	230	7,5
Z-528746.PRL-K30	**Z-524984.KH**	2	418	78	10	**670**	900	230	7,5
Z-528747.PRL	**–**	1	491	–	10	**710**	950	243	6
Z-528747.PRL-K30	**Z-524986.KH**	2	491	95	12	**710**	950	243	6
Z-528748.PRL	**–**	1	549	–	12	**750**	1 000	250	6
Z-528748.PRL-K30	**Z-524988.KH**	2	549	105	14	**750**	1 000	250	6
Z-528749.PRL	**–**	1	621	–	14	**800**	1 060	258	7,5
Z-528749.PRL-K30	**Z-524990.KH**	2	621	140	15	**800**	1 060	258	7,5
Z-528750.PRL	**–**	1	719	–	15	**850**	1 120	272	6
Z-528750.PRL-K30	**Z-524992.KH**	2	719	155	18	**850**	1 120	272	6
Z-528751.PRL	**–**	1	816	–	18	**900**	1 180	280	6
Z-528751.PRL-K30	**Z-524994.KH**	2	816	175	20	**900**	1 180	280	6
Z-528752.PRL	**–**	1	1 000	–	20	**950**	1 250	300	7,5
Z-528752.PRL-K30	**Z-524996.KH**	2	1 000	200	25	**950**	1 250	300	7,5
Z-528753.PRL	**–**	1	1 120	–	25	**1 000**	1 320	315	7,5
Z-528753.PRL-K30	**Z-524998.KH**	2	1 120	225	30	**1 000**	1 320	315	7,5

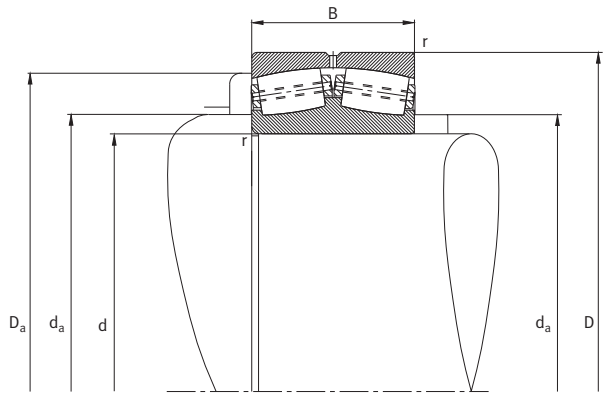


Design 2
with tapered bore and sleeve, K30 = taper 1:30

Sleeve				Mounting dimensions			Basic load rating	Calculation factor
d_{1H}	l	a	R_0	d_a	D_a	d_b	stat. C_{0r}	Y_0
		≈				min.	kN	
–	–	–	–	540	640	–	7 200	3,07
470	170	20	G⅛	540	640	515	7 200	3,07
–	–	–	–	570	675	–	8 150	3,07
500	180	20	G⅛	570	675	545	8 150	3,07
–	–	–	–	600	710	–	10 000	3,13
530	190	20	G⅛	600	710	575	10 000	3,13
–	–	–	–	645	755	–	10 800	3,13
570	200	20	G¼	645	755	615	10 800	3,13
–	–	–	–	720	850	–	13 700	3,03
630	230	22	G¼	720	850	685	13 700	3,03
–	–	–	–	760	900	–	15 600	3,07
670	243	22	G¼	760	900	725	15 600	3,07
–	–	–	–	800	950	–	17 000	3,13
710	250	22	G¼	800	950	765	17 000	3,13
–	–	–	–	860	1 010	–	18 600	3,23
750	258	22	G¼	860	1 010	820	18 600	3,23
–	–	–	–	910	1 070	–	20 400	3,2
800	272	22	G¼	910	1 070	870	20 400	3,2
–	–	–	–	960	1 120	–	22 400	3,3
850	280	25	G¼	960	1 120	920	22 400	3,3
–	–	–	–	1 015	1 190	–	25 500	3,2
900	300	25	G¼	1 015	1 190	970	25 500	3,2
–	–	–	–	1 065	1 250	–	28 000	3,34
950	315	25	G¼	1 065	1 250	1 025	28 000	3,34

FAG spherical roller bearings for converters

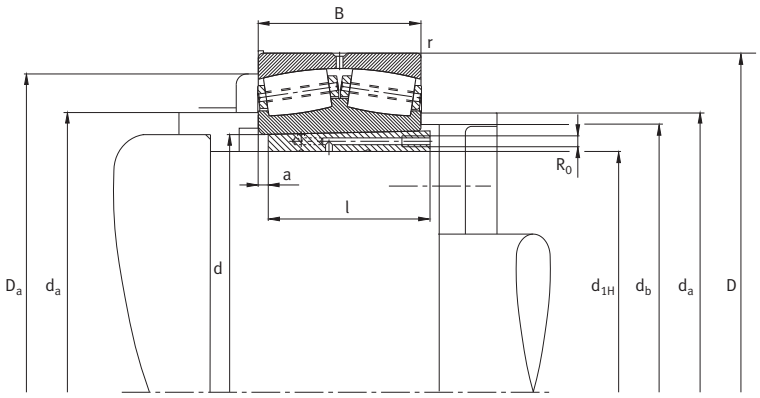
Bearings of dimension series 49 with pin cage
with cylindrical bore
with tapered bore and sleeve



Design 1
with cylindrical bore

Dimension table · Dimensions in mm

Designation		Design	Mass m		Grease quantity for	Dimensions Bearing			
Bearing	Sleeve		Bearing	Sleeve	initial filling	d	D	B	r
			≈kg	≈kg	≈kg				min.
Z-541821.249/500	–	1	177	–	5	**500**	670	170	5
Z-541821.249/500-K30	Z-524974.KH	2	177	33	5	**500**	670	170	5
Z-541822.249/530	–	1	209	–	5	**530**	710	180	5
Z-541822.249/530-K30	Z-524976.KH	2	209	38	5	**530**	710	180	5
Z-541823.249/560-B	–	1	247	–	6	**560**	750	190	5
Z-541823.249/560-B-K30	Z-524978.KH	2	247	44	6	**560**	750	190	5
Z-541824.249/600-B	–	1	294	–	7	**600**	800	200	5
Z-541824.249/600-B-K30	Z-524980.KH	2	294	48	7	**600**	800	200	5
Z-541825.249/630	–	1	375	–	9	**630**	850	218	6
Z-541825.249/630-K30	Z-524982.KH	2	375	60	9	**630**	850	218	6
Z-541826.249/670	–	1	435	–	10	**670**	900	230	6
Z-541826.249/670-K30	Z-524984.KH	2	435	78	10	**670**	900	230	6
Z-541827.249/710-B	–	1	526	–	12	**710**	950	243	6
Z-541827.249/710-B-K30	Z-524986.KH	2	526	95	12	**710**	950	243	6
Z-541828.249/750-B	–	1	572	–	14	**750**	1 000	250	6
Z-541828.249/750-B-K30	Z-524988.KH	2	572	105	14	**750**	1 000	250	6
Z-541829.249/800-B	–	1	646	–	15	**800**	1 060	258	7,5
Z-541829.249/800-B-K30	Z-524990.KH	2	646	140	15	**800**	1 060	258	7,5
Z-541830.249/850-B	–	1	695	–	18	**850**	1 120	272	6
Z-541830.249/850-B-K30	Z-524992.KH	2	695	155	18	**850**	1 120	272	6
Z-541831.249/900-B	–	1	849	–	20	**900**	1 180	280	6
Z-541831.249/900-B-K30	Z-524994.KH	2	849	175	20	**900**	1 180	280	6
Z-541832.249/950-B	–	1	1 040	–	25	**950**	1 250	300	7,5
Z-541832.249/950-B-K30	Z-524996.KH	2	1 040	200	25	**950**	1 250	300	7,5
Z-541833.249/1000-B	–	1	1 230	–	30	**1 000**	1 320	315	7,5
Z-541833.249/1000-B-K30	Z-524998.KH	2	1 230	225	30	**1 000**	1 320	315	7,5
Z-541834.249/1060-B	–	1	1 470	–	35	**1 060**	1 400	335	7,5
Z-541834.249/1060-B-K30	Z-525500.KH	2	1 470	290	35	**1 060**	1 400	335	7,5
Z-541835.249/1120-B	–	1	1 520	–	37	**1 120**	1 460	335	7,5
Z-541835.249/1120-B-K30	Z-525001.KH	2	1 520	305	37	**1 120**	1 460	335	7,5
Z-541836.249/1180-B	–	1	1 750	–	43	**1 180**	1 540	355	7,5
Z-541836.249/1180-B-K30	Z-525003.KH	2	1 750	340	43	**1 180**	1 540	355	7,5
Z-541837.249/1250-B	–	1	2 160	–	50	**1 250**	1 630	375	7,5
Z-541837.249/1250-B-K30	Z-525005.KH	2	2 160	390	50	**1 250**	1 630	375	7,5
Z-541838.249/1320-B	–	1	2 530	–	60	**1 320**	1 720	400	7,5
Z-541838.249/1320-B-K30	Z-525007.KH	2	2 530	485	60	**1 320**	1 720	400	7,5

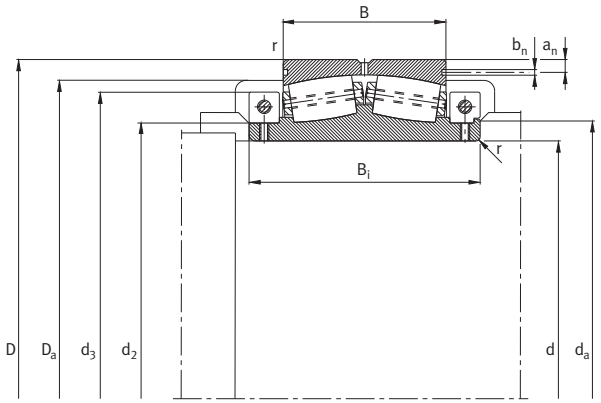


Design 2
with tapered bore and sleeve, K30 = taper 1:30

Sleeve				Mounting dimensions			Basic load rating	Calculation factor
d_{1H}	l	a	R_0	d_a	D_a	d_b	stat. C_{0r}	Y_0
		≈				min.	kN	
–	–	–	–	540	640	–	9 300	2,97
470	170	20	G⅛	540	640	515	9 300	2,97
–	–	–	–	570	675	–	10 200	2,97
500	180	20	G⅛	570	675	545	10 200	2,97
–	–	–	–	600	710	–	11 600	3
530	190	20	G⅛	600	710	575	11 600	3
–	–	–	–	645	755	–	12 900	3
570	200	20	G¼	645	755	615	12 900	3
–	–	–	–	675	805	–	15 600	2,94
600	218	22	G¼	675	805	645	15 600	2,94
–	–	–	–	720	850	–	17 000	2,97
630	230	22	G¼	720	850	685	17 000	2,97
–	–	–	–	760	900	–	18 000	2,97
670	243	22	G¼	760	900	725	18 000	2,97
–	–	–	–	800	950	–	19 600	3,23
710	250	22	G¼	800	950	765	19 600	3,23
–	–	–	–	860	1 010	–	22 800	3,1
750	258	22	G¼	860	1 010	820	22 800	3,1
–	–	–	–	910	1 070	–	22 400	3,2
800	272	22	G¼	910	1 070	870	22 400	3,2
–	–	–	–	960	1 120	–	27 000	3,34
850	280	25	G¼	960	1 120	920	27 000	3,34
–	–	–	–	1 015	1 190	–	29 000	3,3
900	300	25	G¼	1 015	1 190	970	29 000	3,3
–	–	–	–	1 065	1 250	–	35 500	3,16
950	315	25	G¼	1 065	1 250	1 025	35 500	3,16
–	–	–	–	1 135	1 325	–	36 500	3,23
1 000	335	25	G¼	1 135	1 325	1 085	36 500	3,23
–	–	–	–	1 195	1 385	–	41 500	3,3
1 060	335	27	G¼	1 195	1 385	1 145	41 500	3,3
–	–	–	–	1 260	1 460	–	42 500	3,34
1 120	355	27	G¼	1 260	1 460	1 205	42 500	3,34
–	–	–	–	1 330	1 550	–	50 000	3,42
1 180	375	27	G¼	1 330	1 550	1 275	50 000	3,42
–	–	–	–	1 400	1 640	–	52 000	3,46
1 250	400	28	G¼	1 400	1 640	1 350	52 000	3,46

Split FAG spherical roller bearings for converters

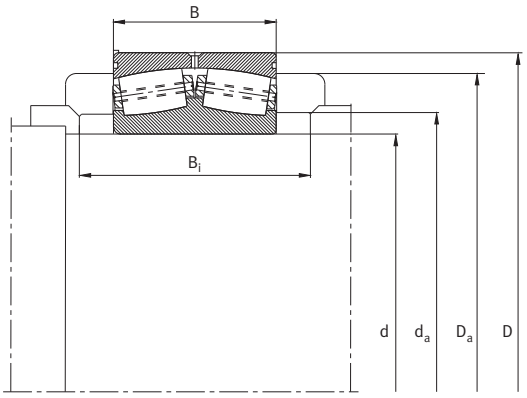
Main dimensions matched to
spherical roller bearings of series 249
with cylindrical bore



split spherical roller bearings

Dimension table · Dimensions in mm

Designation	Mass m	Grease quantity for initial filling	Dimensions d	D	B	B_i	r
	≈kg	≈kg					min.
Z-537276.PRL	225	5	**500**	670	170	250	5
Z-537277.PRL	264	5	**530**	710	180	260	5
Z-537278.PRL	305	6	**560**	750	190	270	5
Z-533761.PRL	377	7	**600**	800	200	290	6
Z-537279.PRL	460	9	**630**	850	218	310	6
Z-537280.PRL	528	10	**670**	900	230	325	7,5
Z-526073.PRL	570	12	**710**	950	243	350	7,5
Z-533414.01.PRL	707	14	**750**	1 000	250	355	7,5
Z-532063.PRL	840	15	**800**	1 060	258	370	7,5
Z-537281.PRL	1 030	18	**850**	1 120	272	385	6
Z-537282.PRL	1 050	20	**900**	1 180	280	390	6
Z-534826.PRL	1 270	25	**950**	1 250	300	410	7,5
Z-533567.PRL	1 565	30	**1 000**	1 320	315	450	7,5
Z-537283.PRL	1 750	35	**1 060**	1 400	335	475	7,5
Z-537284.PRL	1 930	37	**1 120**	1 460	335	475	7,5
Z-536806.PRL	2 280	43	**1 180**	1 540	355	500	7,5
Z-537285.PRL	2 800	50	**1 250**	1 630	375	545	7,5

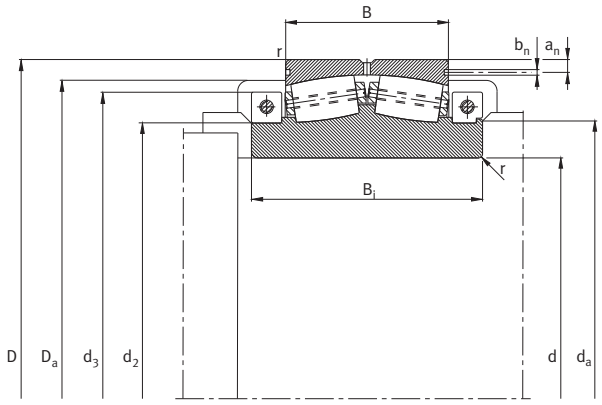


replaces unsplit spherical roller bearings
with lateral spacer rings

Mounting dimensions						Basic load rating	Calculation factor
d_2	d_3	a_n	b_n	d_a	D_a	stat. C_{0r} kN	Y_0
534	608	13	14	540	620	7 800	3,07
566	644	15	15	570	660	8 800	3,07
600	678	15	15	600	695	10 400	3,07
636	724	15	15	645	745	11 600	3,13
678	768	18	18	675	785	13 700	3
724	818	18	18	720	830	15 300	3,03
760	860	18	20	760	880	16 600	3,07
800	900	15	13	800	930	19 600	3
856	960	17,5	16	860	980	20 400	3,23
910	1 020	20	20	910	1 040	22 400	3,2
960	1 070	22,5	20	960	1 100	24 000	3,3
1 020	1 130	20	20	1 015	1 160	28 500	3,3
1 075	1 205	17,5	13	1 065	1 230	32 500	3,2
1 134	1 268	25	20	1 135	1 300	36 500	3,23
1 194	1 328	25	20	1 195	1 360	36 500	3,5
1 256	1 400	25	25	1 260	1 440	41 500	3,34
1 336	1 498	25	20	1 330	1 530	49 000	3,42

Split FAG spherical roller bearings for converters

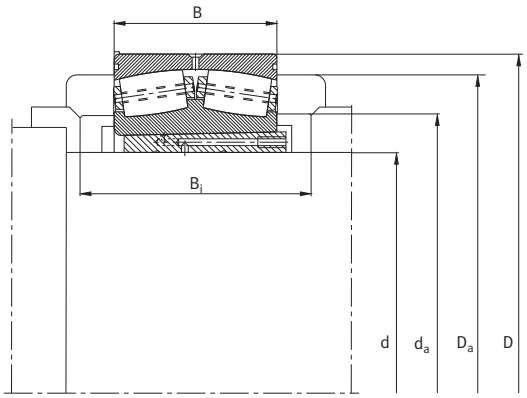
Main dimensions matched to
spherical roller bearings of series 249
with tapered bore and sleeve



split spherical roller bearings

Dimension table · Dimensions in mm

Designation	Mass m	Grease quantity for initial filling	Dimensions d	D	B	B_i	r
	≈kg	≈kg					min.
Z-529173.PRL	265	5	**470**	670	170	250	5
Z-528441.PRL	310	5	**500**	710	180	260	5
Z-529223.PRL	355	6	**530**	750	190	270	5
Z-529224.PRL	410	7	**570**	800	200	290	5
Z-529225.PRL	525	9	**600**	850	218	310	6
Z-529226.PRL	630	10	**630**	900	230	330	6
Z-529227.PRL	740	12	**670**	950	243	350	6
Z-527943.PRL	850	14	**710**	1 000	250	360	6
Z-529228.PRL	950	15	**750**	1 060	258	370	6
Z-529229.PRL	1 100	18	**800**	1 120	272	390	6
Z-529230.PRL	1 250	20	**850**	1 180	280	400	6
Z-527254.PRL	1 490	25	**900**	1 250	300	420	7,5
Z-529231.PRL	1 800	30	**950**	1 320	315	460	7,5
Z-529232.PRL	2 180	35	**1 000**	1 400	335	490	7,5
Z-529233.01.PRL	2 300	37	**1 060**	1 460	335	490	7,5
Z-529234.PRL	2 650	43	**1 120**	1 540	355	520	7,5
Z-529215.PRL	3 800	60	**1 250**	1 720	400	580	7,5

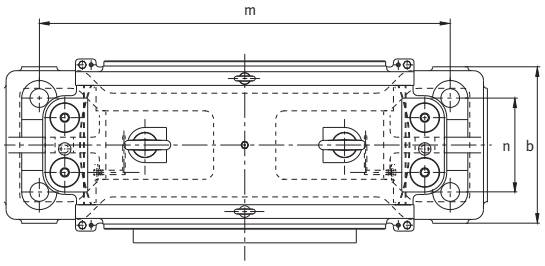


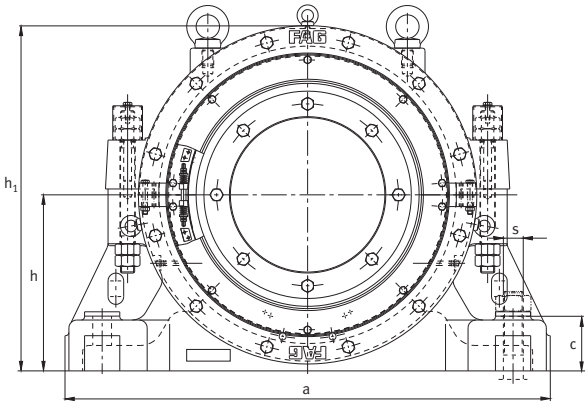
replaces unsplit spherical roller bearings
with sleeve and lateral spacer rings

				Mounting dimensions		Basic load rating	Calculation factor
d_2	d_3	a_n	b_n	d_a	D_a	stat. C_{0r} kN	Y_0
515	595	15	15	540	620	7 500	3
545	630	15	15	570	660	8 800	2,94
580	665	15	15	600	695	9 650	2,94
625	710	15	15	645	745	10 800	2,94
660	752	18	20	675	785	12 500	2,89
690	790	20	20	720	830	13 400	2,89
740	842	20	20	760	880	15 600	2,94
765	895	18	20	800	930	17 600	3,13
825	940	20	20	860	980	19 300	3
870	990	20	20	910	1 040	20 800	3,07
925	1 050	22	25	960	1 100	23 600	3,13
980	1 115	22	25	1 015	1 160	26 000	3,13
1 040	1 180	25	25	1 065	1 230	29 000	3,13
1 105	1 255	25	25	1 135	1 300	33 500	3,07
1 160	1 315	25	25	1 195	1 360	41 500	3,3
1 220	1 385	25	25	1 260	1 440	37 500	3,3
1 370	1 545	25	25	1 400	1 610	49 000	3,34

Split FAG plummer block housings for converters

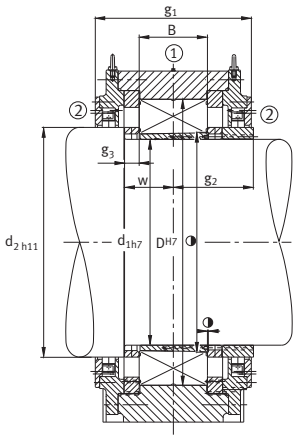
Locating bearing housing KPG49..-F,
Non-locating bearing housing KPG49..-L,
for spherical roller bearings with tapered bore and sleeve
for split spherical roller bearings



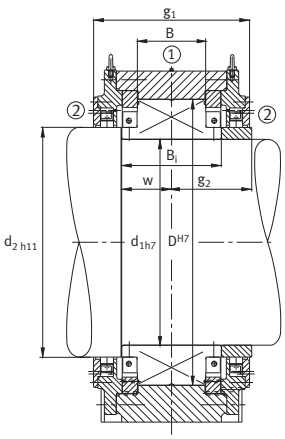


Dimension table · Dimensions in mm

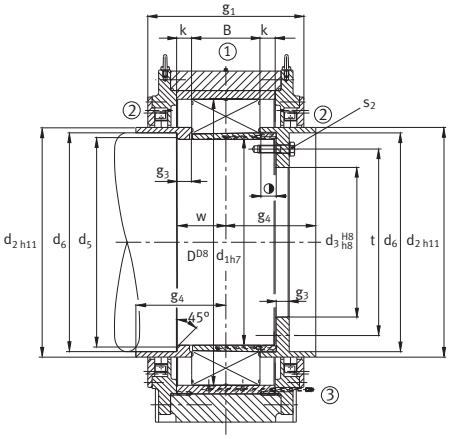
Housing	Bearing			Sleeve	Grease quantity for initial filling ≈kg	Mass m Housing ≈kg	Dimensions d_1	D	B	B_i
	MB cage	Pin cage	Split							
KPG49/470-F-S	**Z-528741.PRL-K30**	**Z-541821.249/500-K30**	**–**	**Z-524974.KH**	10	945	**470**	670	170	–
KPG49/470-L-S	**Z-528741.PRL-K30**	**Z-541821.249/500-K30**	**–**	**Z-524974.KH**	14	945	**470**	670	170	–
KPG49/470-F-S	**–**	**–**	**Z-529173.PRL**	**–**	8	945	**470**	670	170	250
KPG49/500-F-S	**Z-528742.PRL-K30**	**Z-541822.249/530-K30**	**–**	**Z-524976.KH**	10	1 050	**500**	710	180	–
KPG49/500-L-S	**Z-528742.PRL-K30**	**Z-541822.249/530-K30**	**–**	**Z-524976.KH**	14	1 050	**500**	710	180	–
KPG49/500-F-S	**–**	**–**	**Z-528441.PRL**	**–**	8	1 050	**500**	710	180	260
KPG49/530-F-S	**Z-528743.PRL-K30**	**Z-541823.249/560-B-K30**	**–**	**Z-524978.KH**	13	1 365	**530**	750	190	–
KPG49/530-L-S	**Z-528743.PRL-K30**	**Z-541823.249/560-B-K30**	**–**	**Z-524978.KH**	15	1 365	**530**	750	190	–
KPG49/530-F-S	**–**	**–**	**Z-529223.PRL**	**–**	10	1 365	**530**	750	190	270
KPG49/570-F-S	**Z-528744.PRL-K30**	**Z-541824.249/600-B-K30**	**–**	**Z-524980.KH**	15	1 575	**570**	800	200	–
KPG49/570-L-S	**Z-528744.PRL-K30**	**Z-541824.249/600-B-K30**	**–**	**Z-524980.KH**	20	1 575	**570**	800	200	–
KPG49/570-F-S	**–**	**–**	**Z-529224.PRL**	**–**	12	1 575	**570**	800	200	290
KPG49/600-F-S	**–**	**Z-541825.249/630-K30**	**–**	**Z-524982.KH**	20	2 205	**600**	850	218	–
KPG49/600-L-S	**–**	**Z-541825.249/630-K30**	**–**	**Z-524982.KH**	24	2 205	**600**	850	218	–
KPG49/600-F-S	**–**	**–**	**Z-529225.PRL**	**–**	15	2 205	**600**	850	218	310
KPG49/630-F-S	**Z-528746.PRL-K30**	**Z-541826.249/670-K30**	**–**	**Z-524984.KH**	22	2 625	**630**	900	230	–
KPG49/630-L-S	**Z-528746.PRL-K30**	**Z-541826.249/670-K30**	**–**	**Z-524984.KH**	25	2 625	**630**	900	230	–
KPG49/630-F-S	**–**	**–**	**Z-529226.PRL**	**–**	18	2 625	**630**	900	230	330
KPG49/670-F-S	**Z-528747.PRL-K30**	**Z-541827.249/710-B-K30**	**–**	**Z-524986.KH**	26	2 835	**670**	950	243	–
KPG49/670-L-S	**Z-528747.PRL-K30**	**Z-541827.249/710-B-K30**	**–**	**Z-524986.KH**	30	2 835	**670**	950	243	–
KPG49/670-F-S	**–**	**–**	**Z-529227.PRL**	**–**	20	2 835	**670**	950	243	350
KPG49/710-F-S	**Z-528748.PRL-K30**	**Z-541828.249/750-B-K30**	**–**	**Z-524988.KH**	30	2 940	**710**	1 000	250	–
KPG49/710-L-S	**Z-528748.PRL-K30**	**Z-541828.249/750-B-K30**	**–**	**Z-524988.KH**	35	2 940	**710**	1 000	250	–
KPG49/710-F-S	**–**	**–**	**Z-527943.PRL**	**–**	24	2 940	**710**	1 000	250	360
KPG49/750-F-S	**Z-528749.PRL-K30**	**Z-541829.249/800-B-K30**	**–**	**Z-524990.KH**	35	3 465	**750**	1 060	258	–
KPG49/750-L-S	**Z-528749.PRL-K30**	**Z-541829.249/800-B-K30**	**–**	**Z-524990.KH**	40	3 465	**750**	1 060	258	–
KPG49/750-F-S	**–**	**–**	**Z-529228.PRL**	**–**	26	3 465	**750**	1 060	258	370



KPG49..-F (unsplit bearing)
Locating bearing
① Bearing relubrication



KPG49..-F (split bearing)
Locating bearing
② Seal relubrication

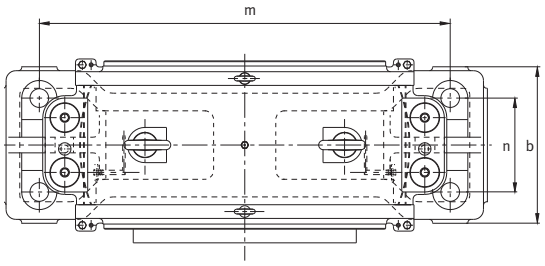


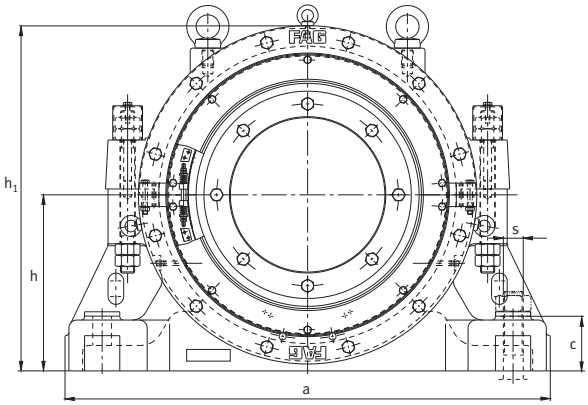
KPG49..-L (unsplit bearing)
Non-locating bearing
③ Sleeve relubrication

d_2	d_3	d_5	d_6	w	a	b	c	g_1	g_2	g_3	g_4	h	h_1	k	m	n	s	t	s_2 DIN931	s_2 Number
540	–	–	–	125	1 170	375	130	400	210	40	–	425	820	–	975	230	M42	–	–	–
540	375	480	505	125	1 170	375	130	400	–	40	230	425	820	40	975	230	M42	437,5	M20×70	8
540	–	–	–	125	1 170	375	130	400	210	–	–	425	820	–	975	230	M42	–	–	–
570	–	–	–	130	1 240	400	140	410	215	40	–	450	875	–	1 050	240	M42	–	–	–
570	400	510	535	130	1 240	400	140	410	–	40	235	450	875	40	1 050	240	M42	465	M20×70	8
570	–	–	–	130	1 240	400	140	410	215	–	–	450	875	–	1 050	240	M42	–	–	–
600	–	–	–	135	1 320	420	145	420	220	40	–	475	930	–	1 100	255	M48	–	–	–
600	420	540	565	135	1 320	420	145	420	–	40	240	475	930	40	1 100	255	M48	490	M20×70	8
600	–	–	–	135	1 320	420	145	420	220	–	–	475	930	–	1 100	255	M48	–	–	–
645	–	–	–	145	1 400	440	155	460	240	45	–	500	980	–	1150	270	M52	–	–	–
645	450	580	610	145	1 400	440	155	460	–	45	260	500	980	40	1 150	270	M52	525	M20×80	8
645	–	–	–	145	1 400	440	155	460	240	–	–	500	980	–	1 150	270	M52	–	–	–
675	–	–	–	155	1 500	480	165	480	250	46	–	535	1 040	–	1 225	295	M56	–	–	–
675	475	612	640	155	1 500	480	165	480	–	46	270	535	1 040	40	1225	295	M56	552,5	M20×80	8
675	–	–	–	155	1 500	480	165	480	250	–	–	535	1 040	–	1225	295	M56	–	–	–
720	–	–	–	165	1 570	500	175	500	260	50	–	570	1 110	–	1 300	310	M56	–	–	–
720	505	642	675	165	1 570	500	175	500	–	50	280	570	1 110	40	1 300	310	M56	587,5	M24×90	8
720	–	–	–	165	1 570	500	175	500	260	–	–	570	1 110	–	1 300	310	M56	–	–	–
760	–	–	–	175	1 660	535	185	560	290	53,5	–	600	1 170	–	1 375	325	M64	–	–	–
760	535	682	715	175	1 660	535	185	560	–	53,5	317,5	600	1 170	50	1 375	325	M64	622,5	M24×90	8
760	–	–	–	175	1 660	535	185	560	290	–	–	600	1 170	–	1 375	325	M64	–	–	–
800	–	–	–	180	1 750	550	195	590	305	55	–	630	1 240	–	1 450	335	M64	–	–	–
800	565	722	755	180	1 750	550	195	590	–	55	332,5	630	1 240	50	1 450	335	M64	657,5	M30×100	8
800	–	–	–	180	1750	550	195	590	305	–	–	630	1 240	–	1450	335	M64	–	–	–
860	–	–	–	185	1 850	570	205	600	310	56	–	670	1 310	–	1 550	345	M72	–	–	–
860	600	762	805	185	1 850	570	205	600	–	56	337,5	670	1 310	50	1 550	345	M72	700	M30×100	8
860	–	–	–	185	1 850	570	205	600	310	–	–	670	1 310	–	1 550	345	M72	–	–	–

Split FAG plummer block housings for converters

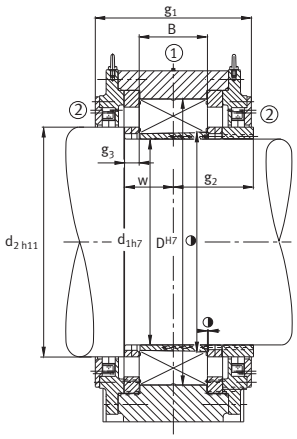
Locating bearing housing KPG49..-F,
Non-locating bearing housing KPG49..-L,
for spherical roller bearings with tapered bore and sleeve
for split spherical roller bearings



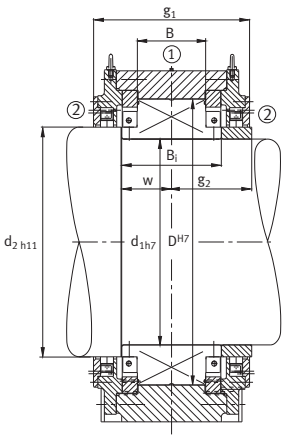


Dimension table · Dimensions in mm

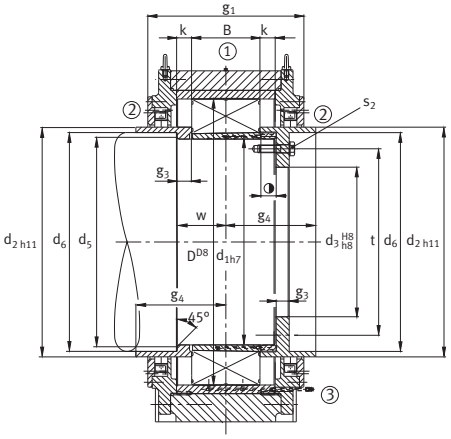
Housing	Bearing			Sleeve	Grease quantity for initial filling ≈kg	Mass m Housing ≈kg	Dimensions d_1	D	B	B_i
	MB cage	Pin cage	Split							
KPG49/800-F-S	**Z-528750.PRL-K30**	**Z-541830.249/850-B-K30**	**–**	**Z-524992.KH**	40	3 885	**800**	1 120	272	–
KPG49/800-L-S	**Z-528750.PRL-K30**	**Z-541830.249/850-B-K30**	**–**	**Z-524992.KH**	50	3 885	**800**	1 120	272	–
KPG49/800-F-S	**–**	**–**	**Z-529229.PRL**	**–**	30	3 885	**800**	1 120	272	390
KPG49/850-F-S	**Z-528751.PRL-K30**	**Z-541831.249/900-B-K30**	**–**	**Z-524994.KH**	45	4 515	**850**	1 180	280	–
KPG49/850-L-S	**Z-528751.PRL-K30**	**Z-541831.249/900-B-K30**	**–**	**Z-524994.KH**	55	4 515	**850**	1 180	280	–
KPG49/850-F-S	**–**	**–**	**Z-529230.PRL**	**–**	35	4 515	**850**	1 180	280	400
KPG49/900-F-S	**Z-528752.PRL-K30**	**Z-541832.249/950-B-K30**	**–**	**Z-524996.KH**	55	5 460	**900**	1 250	300	–
KPG49/900-L-S	**Z-528752.PRL-K30**	**Z-541832.249/950-B-K30**	**–**	**Z-524996.KH**	65	5 460	**900**	1 250	300	–
KPG49/900-F-S	**–**	**–**	**Z-527254.PRL**	**–**	45	5 460	**900**	1 250	300	420
KPG49/950-F-S	**Z-528753.PRL-K30**	**Z-541833.249/1000-B-K30**	**–**	**Z-524998.KH**	65	5 660	**950**	1 320	315	–
KPG49/950-L-S	**Z-528753.PRL-K30**	**Z-541833.249/1000-B-K30**	**–**	**Z-524998.KH**	80	5 660	**950**	1 320	315	–
KPG49/950-F-S	**–**	**–**	**Z-529231.PRL**	**–**	50	5 660	**950**	1 320	315	460
KPG49/1000-F-S	**–**	**Z-541834.249/1060-B-K30**	**–**	**Z-525000.KH**	75	7 140	**1 000**	1 400	335	–
KPG49/1000-L-S	**–**	**Z-541834.249/1060-B-K30**	**–**	**Z-525000.KH**	95	7 140	**1 000**	1 400	335	–
KPG49/1000-F-S	**–**	**–**	**Z-529232.PRL**	**–**	60	7 140	**1 000**	1 400	335	490
KPG49/1060-F-S	**–**	**Z-541835.249/1120-B-K30**	**–**	**Z-525001.KH**	80	8 400	**1 060**	1 460	335	–
KPG49/1060-L-S	**–**	**Z-541835.249/1120-B-K30**	**–**	**Z-525001.KH**	100	8 400	**1 060**	1 460	335	–
KPG49/1060-F-S	**–**	**–**	**Z-529233.01.PRL**	**–**	65	8 400	**1 060**	1 460	335	490
KPG49/1120-F-S	**–**	**Z-541836.249/1180-B-K30**	**–**	**Z-525003.KH**	95	9 450	**1 120**	1 540	355	–
KPG49/1120-L-S	**–**	**Z-541836.249/1180-B-K30**	**–**	**Z-525003.KH**	110	9 450	**1 120**	1 540	355	–
KPG49/1120-F-S	**–**	**–**	**Z-529234.PRL**	**–**	75	9 450	**1 120**	1 540	355	520
KPG49/1180-F-S	**–**	**Z-541837.249/1250-B-K30**	**–**	**Z-525005.KH**	110	11 550	**1 180**	1 630	375	–
KPG49/1180-L-S	**–**	**Z-541837.249/1250-B-K30**	**–**	**Z-525005.KH**	130	11 550	**1 180**	1 630	375	–
KPG49/1250-F-S	**–**	**Z-541838.249/1320-B-K30**	**–**	**Z-525007.KH**	125	13 440	**1 250**	1 720	400	–
KPG49/1250-L-S	**–**	**Z-541838.249/1320-B-K30**	**–**	**Z-525007.KH**	170	13 440	**1 250**	1 720	400	–
KPG49/1250-F-S	**–**	**–**	**Z-529215.PRL**	**–**	100	13 440	**1 250**	1 720	400	580



KPG49..-F (unsplit bearing)
Locating bearing
① Bearing relubrication



KPG49..-F (split bearing)
Locating bearing
② Seal relubrication

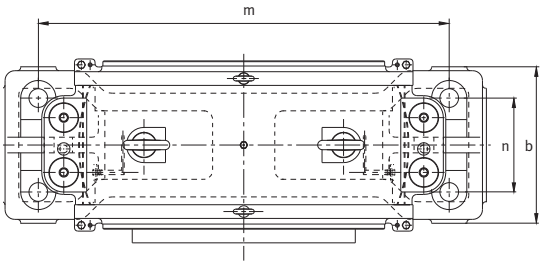


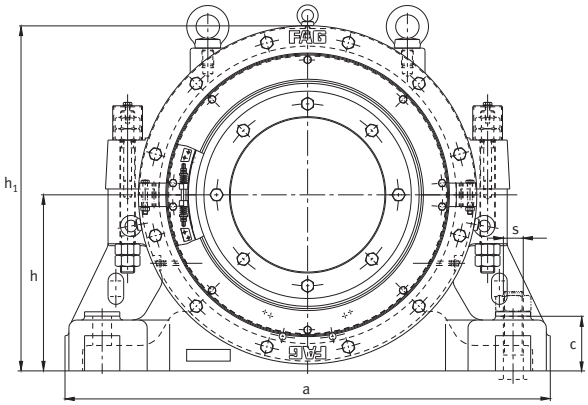
KPG49..-L (unsplit bearing)
Non-locating bearing
③ Sleeve relubrication

d_2	d_3	d_5	d_6	w	a	b	c	g_1	g_2	g_3	g_4	h	h_1	k	m	n	s	t	s_2 DIN931	s_2 Number
910	–	–	–	195	1 960	600	220	630	325	59	–	710	1 390	–	1 600	360	M72	–	–	–
910	640	812	855	195	1 960	600	220	630	–	59	352,5	710	1 390	50	1 600	360	M72	745	M30×110	8
910	–	–	–	195	1 960	600	220	630	325	–	–	710	1 390	–	1 600	360	M72	–	–	–
960	–	–	–	200	2 060	620	230	660	340	60	–	740	1 450	–	1 700	370	M80	–	–	–
960	675	862	905	200	2 060	620	230	660	–	60	375	740	1 450	60	1 700	370	M80	787,5	M30×110	8
960	–	–	–	200	2 060	620	230	660	340	–	–	740	1 450	–	1 700	370	M80	–	–	–
1 015	–	–	–	210	2 200	660	250	680	350	60	–	800	1 550	–	1 820	390	M90	–	–	–
1 015	715	915	960	210	2 200	660	250	680	–	60	385	800	1 550	60	1 820	390	M90	832,5	M36×110	8
1 015	–	–	–	210	2 200	660	250	680	350	–	–	800	1 550	–	1 820	390	M90	–	–	–
1 065	–	–	–	230	2 330	650	255	720	370	72,5	–	830	1 620	–	1 980	360	M90	–	–	–
1 065	750	965	1 010	230	2 330	650	255	720	–	72,5	412,5	830	1 620	70	1 980	360	M90	875	M36×130	8
1 065	–	–	–	230	2 330	650	255	720	370	–	–	830	1 620	–	1 980	360	M90	–	–	–
1 135	–	–	–	245	2 450	740	275	780	400	77,5	–	880	1 710	–	2 000	460	M100	–	–	–
1 135	795	1 015	1 070	245	2 450	740	275	780	–	77,5	435	880	1 710	60	2 000	460	M100	927,5	M36×130	8
1 135	–	–	–	245	2 450	740	275	780	400	–	–	880	1 710	–	2 000	460	M100	–	–	–
1 195	–	–	–	245	2 560	740	285	800	410	77,5	–	920	1 780	–	2 150	460	M100	–	–	–
1 195	840	1 075	1 130	245	2 560	740	285	800	–	77,5	452,5	920	1 780	70	2 150	460	M100	980	M42×140	8
1 195	–	–	–	245	2 560	740	285	800	410	–	–	920	1 780	–	2 150	460	M100	–	–	–
1 260	–	–	–	260	2 700	780	300	820	420	82,5	–	970	1 880	–	2 300	480	M110	–	–	–
1 260	885	1 135	1 190	260	2 700	780	300	820	–	82,5	462,5	970	1 880	70	2 300	480	M110	1 032,5	M42×140	8
1 260	–	–	–	260	2 700	780	300	820	420	–	–	970	1 880	–	2 300	480	M110	–	–	–
1 330	–	–	–	275	2 850	820	320	850	435	87,5	–	1 010	1 985	–	2 400	510	M110	–	–	–
1 330	940	1 195	1 255	275	2 850	820	320	850	–	87,5	477,5	1 010	1 985	70	2 400	510	M110	1 095	M42×150	8
1 400	–	–	–	290	3 000	850	340	900	460	90	–	1 080	2 100	–	2 500	520	M125	–	–	–
1 400	990	1 265	1 325	290	3 000	850	340	900	–	90	502,5	1 080	2 100	70	2 500	520	M125	1 155	M48×180	8
1 400	–	–	–	290	3 000	850	340	900	460	–	–	1 080	2 100	–	2 500	520	M125	–	–	–

Split FAG plummer block housings for converters

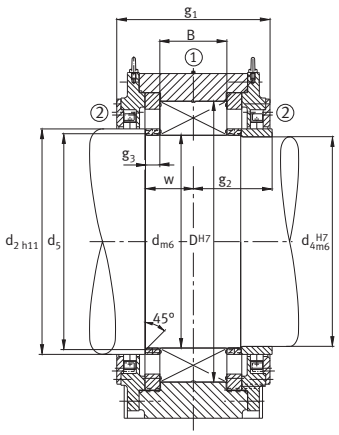
Locating bearing housing KPGZ49..-F,
Non-locating bearing housing KPGZ49..-L,
for spherical roller bearings with cylindrical bore
for split spherical roller bearings



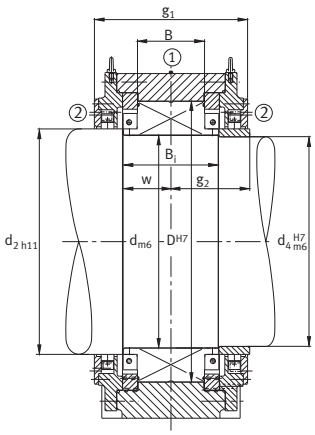


Dimension table · Dimensions in mm

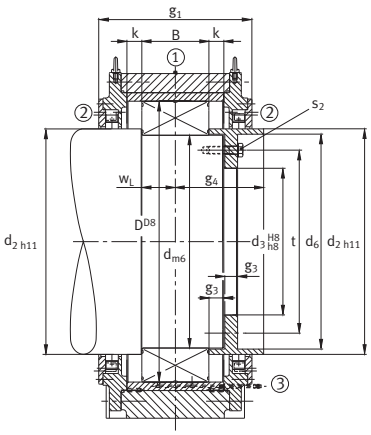
Housing	Bearing			Grease quantity for initial filling	Mass m	Dimensions								
	MB cage	Pin cage	Split		Housing	d	D	B	B_i	d_2	d_3	d_4	d_5	d_6
				≈kg	≈kg									
KPGZ49/500-F-S	**Z-528741.PRL**	**Z-541821.249/500**	**–**	10	900	**500**	670	170	–	540	–	495	510	–
KPGZ49/500-L-S	**Z-528741.PRL**	**Z-541821.249/500**	**–**	14	900	**500**	670	170	–	540	375	–	–	505
KPGZ49/500-F-S	**–**	**–**	**Z-537276.PRL**	8	900	**500**	670	170	250	540	–	495	–	–
KPGZ49/530-F-S	**Z-528742.PRL**	**Z-541822.249/530**	**–**	10	1 000	**530**	710	180	–	570	–	525	540	–
KPGZ49/530-L-S	**Z-528742.PRL**	**Z-541822.249/530**	**–**	14	1 000	**530**	710	180	–	570	400	–	–	535
KPGZ49/530-F-S	**–**	**–**	**Z-537277.PRL**	8	1 000	**530**	710	180	260	570	–	525	–	–
KPGZ49/560-F-S	**Z-528743.PRL**	**Z-541823.249/560-B**	**–**	13	1 300	**560**	750	190	–	600	–	555	570	–
KPGZ49/560-L-S	**Z-528743.PRL**	**Z-541823.249/560-B**	**–**	15	1 300	**560**	750	190	–	600	420	–	–	565
KPGZ49/560-F-S	**–**	**–**	**Z-537278.PRL**	10	1 300	**560**	750	190	270	600	–	555	–	–
KPGZ49/600-F-S	**Z-528744.PRL**	**Z-541824.249/600-B**	**–**	15	1 500	**600**	800	200	–	645	–	595	610	–
KPGZ49/600-L-S	**Z-528744.PRL**	**Z-541824.249/600-B**	**–**	20	1 500	**600**	800	200	–	645	450	–	–	610
KPGZ49/600-F-S	**–**	**–**	**Z-533761.PRL**	12	1 500	**600**	800	200	290	645	–	595	–	–
KPGZ49/630-F-S	**–**	**Z-541825.249/630**	**–**	20	2 100	**630**	850	218	–	675	–	625	642	–
KPGZ49/630-L-S	**–**	**Z-541825.249/630**	**–**	24	2 100	**630**	850	218	–	675	475	–	–	640
KPGZ49/630-F-S	**–**	**–**	**Z-537279.PRL**	15	2 100	**630**	850	218	310	675	–	625	–	–
KPGZ49/670-F-S	**Z-528746.PRL**	**Z-541826.249/670-B**	**–**	22	2 500	**670**	900	230	–	720	–	665	682	–
KPGZ49/670-L-S	**Z-528746.PRL**	**Z-541826.249/670-B**	**–**	25	2 500	**670**	900	230	–	720	505	–	–	675
KPGZ49/670-F-S	**–**	**–**	**Z-537280.PRL**	18	2 500	**670**	900	230	325	720	–	665	–	–
KPGZ49/710-F-S	**Z-528747.PRL**	**Z-541827.249/710-B**	**–**	26	2 700	**710**	950	243	–	760	–	695	722	–
KPGZ49/710-L-S	**Z-528747.PRL**	**Z-541827.249/710-B**	**–**	30	2 700	**710**	950	243	–	760	535	–	–	715
KPGZ49/710-F-S	**–**	**–**	**Z-526073.PRL**	20	2 700	**710**	950	243	350	760	–	695	–	–
KPGZ49/750-F-S	**Z-528748.PRL**	**Z-541828.249/750-B**	**–**	30	2 800	**750**	1 000	250	–	800	–	745	762	–
KPGZ49/750-L-S	**Z-528748.PRL**	**Z-541828.249/750-B**	**–**	35	2 800	**750**	1 000	250	–	800	565	–	–	755
KPGZ49/750-F-S	**–**	**–**	**Z-533414.01.PRL**	24	2 800	**750**	1 000	250	355	800	–	745	–	–
KPGZ49/800-F-S	**Z-528749.PRL**	**Z-541829.249/800-B**	**–**	35	3 300	**800**	1 060	258	–	860	–	795	812	–
KPGZ49/800-L-S	**Z-528749.PRL**	**Z-541829.249/800-B**	**–**	40	3 300	**800**	1 060	258	–	860	600	–	–	805
KPGZ49/800-F-S	**–**	**–**	**Z-532063.PRL**	26	3 300	**800**	1 060	258	370	860	–	795	–	–



KPGZ49..-F (unsplit bearing)
Locating bearing
① Bearing relubrication



KPGZ49..-F (split bearing)
Locating bearing
② Seal relubrication



KPGZ49..-L (unsplit bearing)
Non-locating bearing
③ Sleeve relubrication

w	w_L	a	b	c	g_1	g_2	g_3	g_4	h	h_1	k	m	n	s	t	s_2 DIN931	s_2 Number
125	–	1 170	375	130	400	210	40	–	425	820	–	975	230	M42	–	–	–
–	85	1 170	375	130	400	–	40	230	425	820	40	975	230	M42	437,5	M20×70	8
125	–	1 170	375	130	400	210	–	–	425	820	–	975	230	M42	–	–	–
130	–	1 240	400	140	410	215	40	–	450	875	–	1 050	240	M42	–	–	–
–	90	1 240	400	140	410	–	40	235	450	875	40	1 050	240	M42	465	M20×70	8
130	–	1 240	400	140	410	215	–	–	450	875	–	1 050	240	M42	–	–	–
135	–	1 320	420	145	420	220	40	–	475	930	–	1 100	255	M48	–	–	–
–	95	1 320	420	145	420	–	40	240	475	930	40	1 100	255	M48	490	M20×70	8
135	–	1 320	420	145	420	220	–	–	475	930	–	1 100	255	M48	–	–	–
145	–	1 400	440	155	460	240	45	–	500	980	–	1 150	270	M52	–	–	–
–	100	1 400	440	155	460	–	45	260	500	980	40	1 150	270	M52	525	M20×80	8
145	–	1 400	440	155	460	240	–	–	500	980	–	1 150	270	M52	–	–	–
155	–	1 500	480	165	480	250	46	–	535	1 040	–	1 225	295	M56	–	–	–
–	109	1 500	480	165	480	–	46	270	535	1 040	40	1 225	295	M56	552,5	M20×80	8
155	–	1 500	480	165	480	250	–	–	535	1 040	–	1 225	295	M56	–	–	–
162,5	–	1 570	500	175	500	260	47,5	–	570	1 110	–	1 300	310	M56	–	–	–
–	115	1 570	500	175	500	–	47,5	280	570	1 110	40	1 300	310	M56	587,5	M24×90	8
162,5	–	1 570	500	175	500	260	–	–	570	1 110	–	1 300	310	M56	–	–	–
175	–	1 660	535	185	560	290	53,5	–	600	1 170	–	1 375	325	M64	–	–	–
–	121,5	1 660	535	185	560	–	53,5	317,5	600	1 170	50	1 375	325	M64	622,5	M24×90	8
175	–	1 660	535	185	560	290	–	–	600	1 170	–	1 375	325	M64	–	–	–
177,5	–	1 750	550	195	590	305	52,5	–	630	1 240	–	1 450	335	M64	–	–	–
–	125	1 750	550	195	590	–	52,5	332,5	630	1 240	50	1 450	335	M64	657,5	M30×100	8
177,5	–	1 750	550	195	590	305	–	–	630	1 240	–	1 450	335	M64	–	–	–
185	–	1 850	570	205	600	310	56	–	670	1 310	–	1 550	345	M72	–	–	–
–	129	1 850	570	205	600	–	56	337,5	670	1 310	50	1 550	345	M72	700	M30×100	8
185	–	1 850	570	205	600	310	–	–	670	1 310	–	1 550	345	M72	–	–	–

Split FAG plummer block housings for converters

Locating bearing housing KPGZ49..-F,
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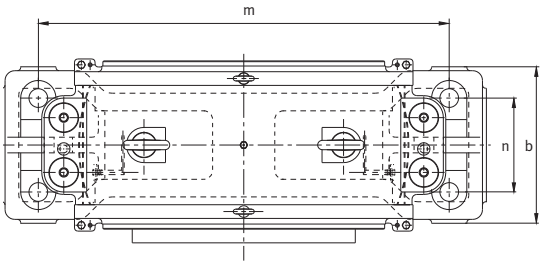
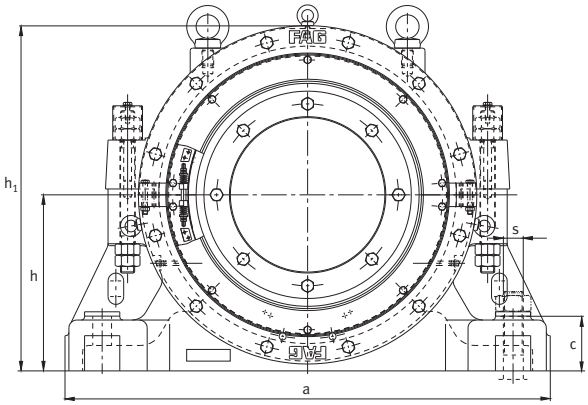
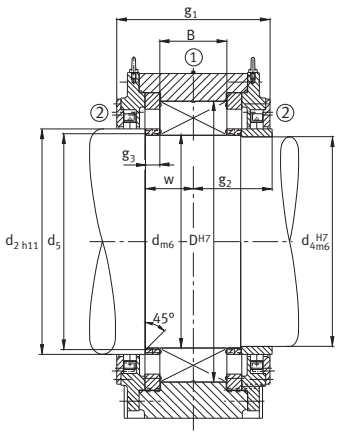
for split spherical roller bearings



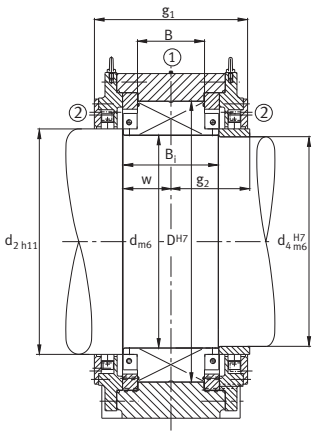


Dimension table · Dimensions in mm

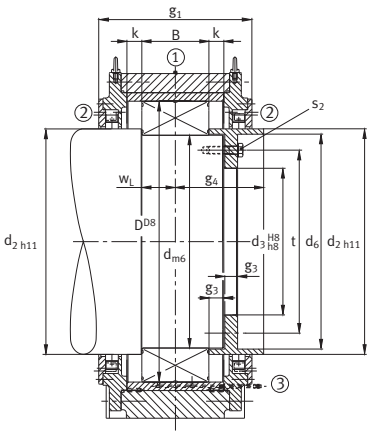
Housing	Bearing			Grease quantity for initial filling	Mass m	Dimensions								
	MB cage	Pin cage	Split		Housing	d	D	B	B_i	d_2	d_3	d_4	d_5	d_6
				≈kg	≈kg									
KPGZ49/850-F-S	**Z-528750.PRL**	**Z-541830.249/850-B**	**–**	40	3 700	**850**	1 120	272	–	910	–	845	862	–
KPGZ49/850-L-S	**Z-528750.PRL**	**Z-541830.249/850-B**	**–**	50	3 700	**850**	1 120	272	–	910	640	–	–	855
KPGZ49/850-F-S	**–**	**–**	**Z-537281.PRL**	30	3 700	**850**	1 120	272	385	910	–	845	–	–
KPGZ49/900-F-S	**Z-528751.PRL**	**Z-541831.249/900-B**	**–**	45	4 300	**900**	1 180	280	–	960	–	895	912	–
KPGZ49/900-L-S	**Z-528751.PRL**	**Z-541831.249/900-B**	**–**	55	4 300	**900**	1 180	280	–	960	675	–	–	905
KPGZ49/900-F-S	**–**	**–**	**Z-537282.PRL**	35	4 300	**900**	1 180	280	390	960	–	895	–	–
KPGZ49/950-F-S	**Z-528752.PRL**	**Z-541832.249/950-B**	**-**	55	5 200	**950**	1 250	300	–	1 015	–	945	965	–
KPGZ49/950-L-S	**Z-528752.PRL**	**Z-541832.249/950-B**	**–**	65	5 200	**950**	1 250	300	–	1 015	715	–	–	960
KPGZ49/950-F-S	**–**	**–**	**Z-534826.PRL**	45	5 200	**950**	1 250	300	410	1 015	–	945	–	–
KPGZ49/1000-F-S	**Z-528753.PRL**	**Z-541833.249/1000-B**	**–**	65	5 770	**1 000**	1 320	315	–	1 065	–	985	1 015	–
KPGZ49/1000-L-S	**Z-528753.PRL**	**Z-541833.249/1000-B**	**–**	80	5 770	**1 000**	1 320	315	–	1 065	750	–	–	1 010
KPGZ49/1000-F-S	**–**	**–**	**Z-533567.PRL**	50	5 770	**1 000**	1 320	315	450	1 065	–	985	–	–
KPGZ49/1060-F-S	**–**	**Z-541834.249/1060-B**	**–**	75	6 800	**1 060**	1 400	335	–	1 135	–	1 055	1 075	–
KPGZ49/1060-L-S	**–**	**Z-541834.249/1060-B**	**–**	95	6 800	**1 060**	1 400	335	–	1 135	795	–	–	1 070
KPGZ49/1060-F-S	**–**	**–**	**Z-537283.PRL**	60	6 800	**1 060**	1 400	335	475	1 135	–	1 055	–	–
KPGZ49/1120-F-S	**–**	**Z-541835.249/1120-B**	**–**	80	8 000	**1 120**	1 460	335	–	1 195	–	1 115	1 135	–
KPGZ49/1120-L-S	**–**	**Z-541835.249/1120-B**	**–**	100	8 000	**1 120**	1 460	335	–	1 195	840	–	–	1 130
KPGZ49/1120-F-S	**–**	**–**	**Z-537284.PRL**	65	8 000	**1 120**	1 460	335	475	1 195	–	1 115	–	–
KPGZ49/1180-F-S	**–**	**Z-541836.249/1180-B**	**–**	95	9 000	**1 180**	1 540	355	–	1 260	–	1 175	1 195	–
KPGZ49/1180-L-S	**–**	**Z-541836.249/1180-B**	**–**	110	9 000	**1 180**	1 540	355	–	1 260	885	–	–	1 190
KPGZ49/1180-F-S	**–**	**–**	**Z-536806.PRL**	75	9 000	**1 180**	1 540	355	500	1 260	–	1 175	–	–
KPGZ49/1250-F-S	**–**	**Z-541837.249/1250-B**	**–**	110	11 000	**1 250**	1 630	375	–	1 330	–	1 245	1 265	–
KPGZ49/1250-L-S	**–**	**Z-541837.249/1250-B**	**–**	130	11 000	**1 250**	1 630	375	–	1 330	940	–	–	1 255
KPGZ49/1250-F-S	**–**	**–**	**Z-537285.PRL**	85	11 000	**1 250**	1 630	375	545	1 330	–	1 245	–	–
KPGZ49/1320-F-S	**–**	**Z-541838.249/1320-B**	**–**	125	12 800	**1 320**	1 720	400	–	1 400	–	1 315	1 335	–
KPGZ49/1320-L-S	**–**	**Z-541838.249/1320-B**	**–**	170	12 800	**1 320**	1 720	400	–	1 400	990	–	–	1 325
KPGZ49/1320-F-S	**–**	**–**	**Z-545161.PRL**	100	12 800	**1 320**	1 720	400	580	1 400	–	1 315	–	–



KPGZ49..-F (unsplit bearing)
Locating bearing
① Bearing relubrication



KPGZ49..-F (split bearing)
Locating bearing
② Seal relubrication



KPGZ49..-L (unsplit bearing)
Non-locating bearing
③ Sleeve relubrication

w	w_L	a	b	c	g_1	g_2	g_3	g_4	h	h_1	k	m	n	s	t	s_2 DIN931	s_2 Number
192,5	–	1 960	600	220	630	325	56,5	–	710	1 390	–	1 600	360	M72	–	–	–
–	136	1 960	600	220	630	–	56,5	352,5	710	1 390	50	1 600	360	M72	745	M30×110	8
192,5	–	1 960	600	220	630	325	–	–	710	1 390	–	1 600	360	M72	–	–	–
195	–	2 060	620	230	660	340	55	–	740	1 450	–	1 700	370	M80	–	–	–
–	140	2 060	620	230	660	–	55	375	740	1 450	60	1 700	370	M80	787,5	M30×110	8
195	–	2 060	620	230	660	340	–	–	740	1 450	–	1 700	370	M80	–	–	–
205	–	2 200	660	250	680	350	55	–	800	1 550	–	1 820	390	M90	–	–	–
–	150	2 200	660	250	680	–	55	385	800	1 550	60	1 820	390	M90	832,5	M36×110	8
205	–	2 200	660	250	680	350	55	–	800	1 550	–	1 820	390	M90	–	–	–
225	–	2 330	650	255	720	370	67,5	–	830	1 620	–	1 980	360	M90	–	–	–
–	157,5	2 330	650	255	720	–	67,5	412,5	830	1 620	70	1 980	360	M90	875	M36×130	8
225	–	2 330	650	255	720	370	–	–	830	1 620	–	1 980	360	M90	–	–	–
237,5	–	2 450	740	275	780	400	70	–	880	1 710	–	2 000	460	M100	–	–	–
–	167,5	2 450	740	275	780	–	70	435	880	1 710	60	2 000	460	M100	927,5	M36×130	8
237,5	–	2 450	740	275	780	400	–	–	880	1 710	–	2 000	460	M100	–	–	–
237,5	–	2 560	740	285	800	410	70	–	920	1 780	–	2 150	460	M100	–	–	–
–	167,5	2 560	740	285	800	–	70	452,5	920	1 780	70	2 150	460	M100	980	M42×140	8
237,5	–	2 560	740	285	800	410	–	–	920	1 780	–	2 150	460	M100	–	–	–
250	–	2 700	780	300	820	420	72,5	–	970	1 880	–	2 300	480	M110	–	–	–
–	177,5	2 700	780	300	820	–	72,5	462,5	970	1 880	70	2 300	480	M110	1 032,5	M42×140	8
250	–	2 700	780	300	820	420	–	–	970	1 880	–	2 300	480	M110	–	–	–
272,5	–	2 850	820	320	850	435	85	–	1 010	1 985	–	2 400	510	M110	–	–	–
–	187,5	2 850	820	320	850	–	85	477,5	1 010	1 985	70	2 400	510	M110	1 095	M42×150	8
272,5	–	2 850	820	320	850	435	–	–	1 010	1 985	–	2 400	510	M110	–	–	–
290	–	3 000	850	340	900	460	90	–	1 080	2 100	–	2 500	520	M125	–	–	–
–	200	3 000	850	340	900	–	90	502,5	1 080	2 100	70	2 500	520	M125	1 155	M48×180	8
290	–	3 000	850	340	900	460	–	–	1 080	2 100	–	2 500	520	M125	–	–	–

References · Other publications

7 References

We work together with all manufacturers of converter plants. To date, more than 200 converters worldwide have been fitted with FAG bearings and housings. Examples of new converters fitted with FAG rolling bearings and housings can be found in “Examples from Application Engineering”, which we will send to you on request.
Furthermore, we supply replacement bearings for existing converter plants on an ongoing basis.

8 Other publications

Catalogue HR 1	Rolling Bearings
Catalogue GL1	Large Size Bearings
WL 80 100	Mounting of rolling bearings
WL 80 250	FAG equipment and services for the mounting and maintenance of rolling bearings
WL 81 115	Lubrication of rolling bearings
WL 82 102	Rolling bearing damage
TPI WL 80-50	FAG pressure generators
TPI WL 80-72	Reconditioning and repair of rolling bearings
TPI 168	Arcanol rolling bearing greases
CD-***medias***®	Electronic INA/FAG bearing catalogue

Design brief

9 Design brief

Original equipment	For which operator	
Replacement	Built by; year of construction	
Code word		
Converter size		
Design	– Supporting ring	Single-piece/multi-piece/closed/open
	– Slag removal	By burning off/knocking off
	– Drive	Unilateral/bilateral
Systems	– Oxygen top blowing	
	– Oxygen bottom blowing	
	– Combined blowing process	
	– Special developments	
Sub-assembly	– Housing – With displacement sleeve	KPG49/KPGZ49
	– With linear bearing	
	– Other (double displacement sleeve, cylindrical roller bearing)	
	– Bearing – Spherical roller bearing	
	– Spherical roller bearing, split	
Load collective	(Bearing loads F_{0r} and F_{0a} must be determined for every bearing location)	
	– Maximum radial load for locating bearing	F_{0rF} =
	– Maximum radial load for non-locating bearing	F_{0rL} =
	– Maximum external axial load	F_{0a} =
Conditions of motion	Speed; swivel angle; numver of swivels	
Environmental influences	Bearing ambient temperature, moisture, dust etc.	
Lubrication	Grease lubrication	– Grease grade
		– Relubrication quantity
		– Relubrication interval
Sealing	– High-pressure packing	
	– US rubber profile	
Installation space	(if possible, enclose fitting drawing or sketch)	
	– Fitting location	Locating bearing/non-locating bearing
	– Bearing seat	Cylindrical/location on sleeve
	– Seat diameter	Shaft/housing/fits
	– Bearing design	Split/unsplit
Other requirements	– Design	– Max. angular misalignment
		– Mounting requirements
		– Max. axial displacement capacity
		– Lubricant distribution
		– Wearing parts
		– Required housing material
		– Temperature of trunnion and housing
	– Technical specifications	– Packaging
		– Housing design
		– Preservation
		– Measurement record
		– Acceptance inspection certificates
		– Plant certificates
	– Other	– Warranty
		– Mounting instruction
		– Language

Notes

Notes

Notes

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