

Track Roller Guidance Systems

Track roller guidance systems
Track rollers, bolts, guideways
Accessories

SCHAEFFLER

The background of the page is a technical drawing of a track roller guidance system. It shows a cross-section of a track with rollers and a guide shoe. Dimensions are indicated with arrows and labels: '1', '2', '4' at the top; 'B' on the right; 'a2' and 'N3' in the lower left. The drawing uses hatching to indicate different materials or sections.

Track Roller Guidance Systems

Track roller guidance systems
Track rollers, bolts, guideways
Accessories

Foreword

Track roller guidance systems LF are highly suitable, due to their lightweight construction, for applications in handling systems where low-noise running, high speeds and long travel distances are required together with low, uniform displacement resistance.

Economical modular concept

In order to cover a wide range of requirements using standard components, the guidance systems are structured according to a modular concept. The system elements, namely carriages, composite guideways, track rollers and a precisely matched range of accessories can be combined to achieve designs that are precisely matched to the application.

Carriages

Carriages LF are supplied in the form of:

- economical, lightweight hollow section carriages
- robust open carriages for high performance guidance systems of a simple construction
- enclosed, compact carriages where guidance systems must operate in contaminated environments
- non-locating bearing carriages for locating and non-locating bearing applications with two guidance systems in a parallel arrangement
- bogie carriages for curved tracks or closed oval and circular guidance systems.

Guideways

Composite guideways are available as solid and hollow section guideways, with a support rail of high bending rigidity, as a half guideway, a curved guideway element or a flat design. Guideways with slots for toothed racks or toothed belts are also available.

Profiled track rollers

Profiled track rollers without filling slots are used to guide the carriages and support the forces. These double row angular contact ball bearings have an outer ring with a gothic arch profile raceway, are sealed on both sides and are greased for life. They can support axial loads from both sides and high radial forces due to the thick-walled outer ring.

Accessories

The spectrum of positive characteristics of our track roller guidance systems is completed by a comprehensive, precisely matched range of accessories for the system components.

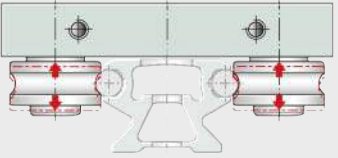
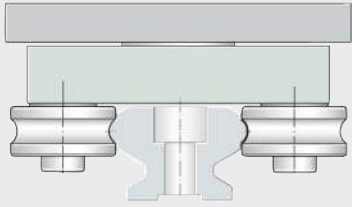
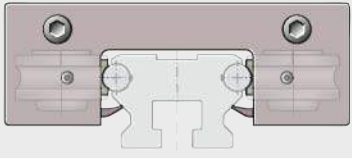
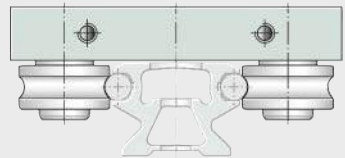
Contents

	Page
Product index	6
Tab index	8
Track roller guidance systems	
Technical principles	10
Track roller guidance systems	40
Track rollers, bolts, guideways	66
Accessories	104
Addresses	124

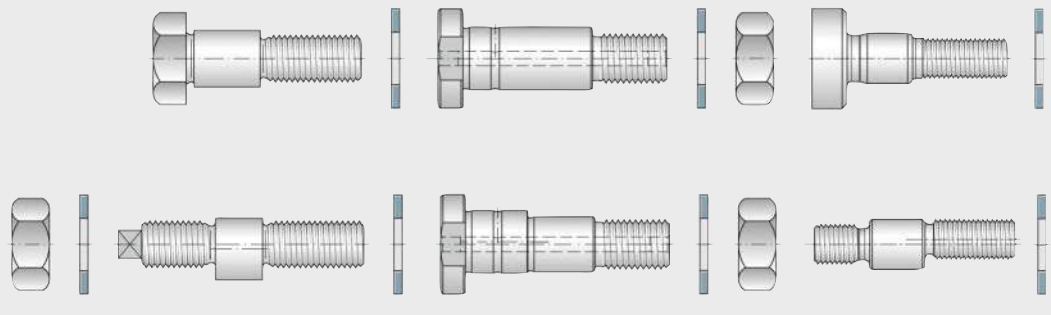
Product index

	Page
AB	Lubrication and wiper unit for LFL-SF 117
AB.LFR	Cap wiper for LFCL..... 118
AB.W	Lubrication and wiper unit for guideways..... 116
ABAL	Side plate for LFL-SF..... 119
ANS.LFS	End plate for solid profile guideway..... 115
ANS.LFS..-C	End plate for hollow section guideway..... 115
ANS.LFS..-F	End plate for flat guideway 115
ANS.LFS..-FH	End plate for flat half guideway 115
ANS.LFS..-NZZ	End plate for guideway with slots 115
KA.LFS..-C	End cover for hollow section guideway 122
KA.LFS..-M	End cover for profiled section guideway..... 122
LEIS	T-strip..... 113
LFCL	Hollow section carriage, clearance-free 56
LFDL..-B	Bogie carriage, adjustable clearance 64
LFDL..-SF	Bogie carriage, clearance-free 64
LFE	Eccentric bolt..... 88
LFE..-A1	Eccentric bolt with relubrication hole..... 88
LFKL..-SF	Compact carriage, clearance-free 58
LFKL..-E-SF	Compact carriage, clearance-free, with heavy duty track rollers 58
LFKL..-EE-SF	Compact carriage, clearance-free, with heavy duty track rollers 58
LFL..-SF	Open carriage, clearance-free..... 60
LFL..-E-SF	Open carriage, clearance-free, with heavy duty track rollers 60
LFL..-SF	Non-locating bearing carriage, clearance-free 62
LFR..-2RS-RB	Locating bearing profiled track roller 84
LFR..-2Z	Locating bearing profiled track roller 84
LFRI	Profiled track roller with extended inner ring..... 86
LFR..-2RSR-NA	Non-locating bearing track roller 90
LFR..-2RSR-RNA	Non-locating bearing profiled track roller without inner ring 90

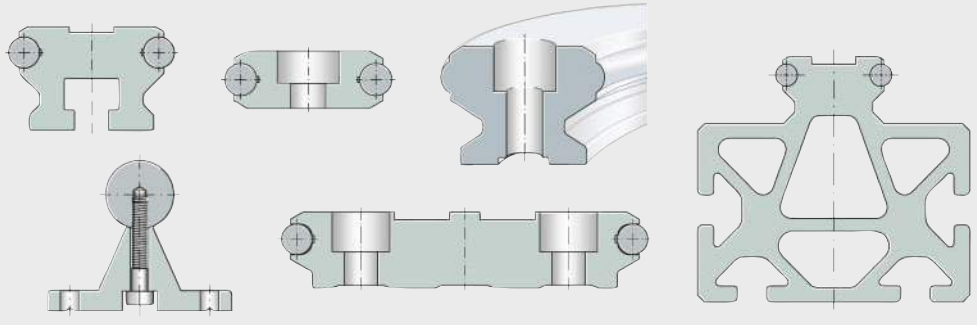
	Page
LFS	Guideway, solid profile 94
LFS..-C	Guideway, hollow section profile 94
LFS..-CE	Guideway, hollow section profile 94
LFS..-CEE	Guideway, hollow section profile 94
LFS..-E	Guideway, solid profile 94
LFS..-EE	Guideway, solid profile 94
LFS..-F	Guideway, flat guideway 94
LFS..-FE	Guideway, flat guideway 94
LFS..-FH	Guideway, flat half guideway 96
LFS..-FHE	Guideway, flat half guideway 96
LFS..-FHEE	Guideway, flat half guideway 96
LFS..-M	Guideway, profiled section guideway 98
LFS..-N	Guideway with slots..... 98
LFS..-NZZ	Guideway with slots..... 98
LFS..-RB	Guideway, corrosion-resistant design 94
LFSR..-ST	Guideway, curved guideway element 100
LFS..-OV../180-VBS	Closed oval track with 180° arcs and guideway connectors..... 102
LFS..-OV../90-VBS	Closed oval track with 90° arcs and guideway connectors..... 102
LFZ	Concentric bolt 88
LFZ..-A1	Concentric bolt with relubrication hole 88
MU	T-nut 113
MU..POS	Positionable T-nut 113
NAD	Slot closing strip for LFS..-M..... 123
PAH	Stop for guideways 121
PASTP	Stop for guideways 120
SHR	T-bolts..... 113
SPPR	Fixing lug..... 113
VBS	Guideway connector for guideways 114



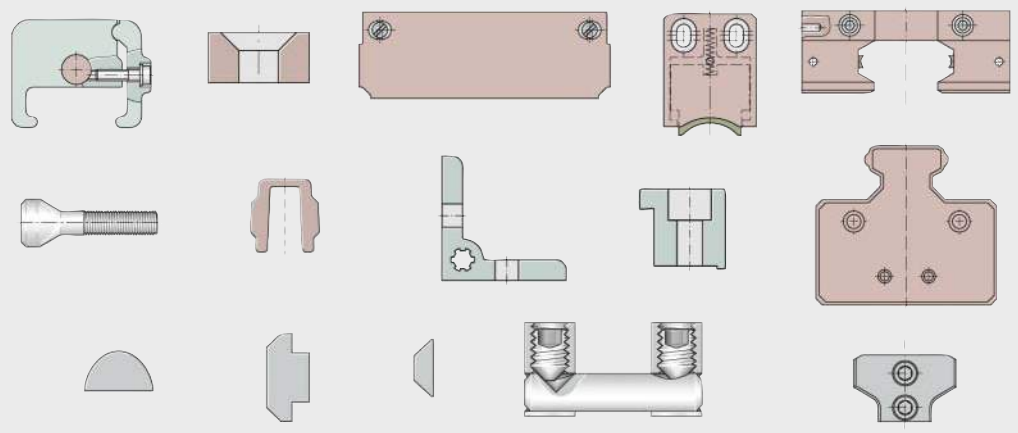
0001AC17



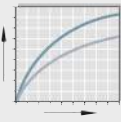
0001AD16



0001A400

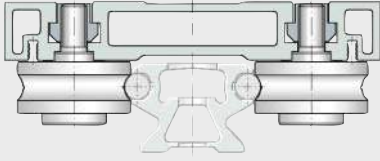


1211673



0001A282

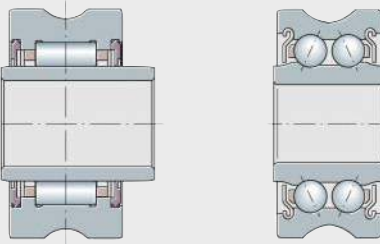
Technical principles



0001AC1B

Track roller guidance systems

- With hollow section carriage
- With compact carriage
- With open carriage
- With non-locating bearing carriage
- With bogie carriage



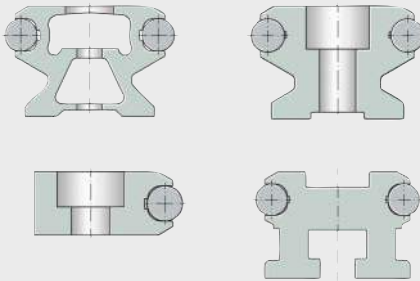
121 670

Track rollers

- Locating bearing track roller
- Non-locating bearing track roller

Bolts

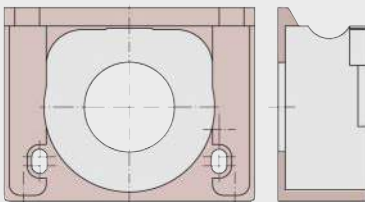
- Concentric
- Eccentric



0001A401

Guideways

- With solid or hollow section profile
- Flat design
- With support rail
- With slots
- Half guideway
- Curved guideway element



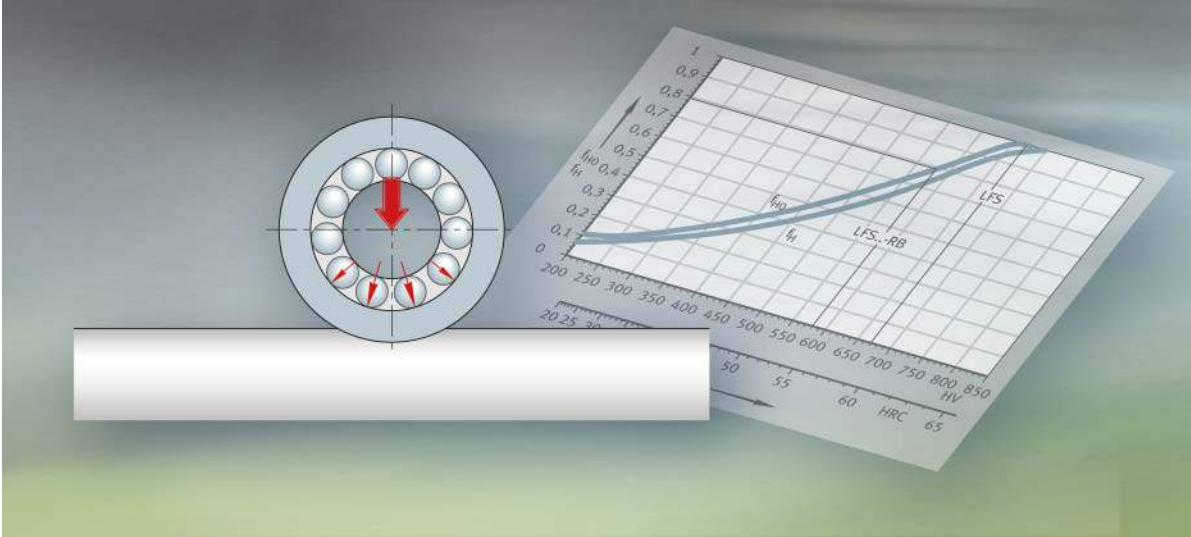
0001A402

Accessories



0001A281

Addresses



Technical principles

- Load carrying capacity and rating life
- Lubrication
- Design of bearing arrangements
- Mounting
- Accuracy
- Ordering designations
- Operating limits



Technical principles

	Page
Load carrying capacity and rating life	Permissible radial loads 12
	Permissible radial load under dynamic loading..... 12
	Permissible radial load under static loading 13
	Fatigue limit load 13
	Calculation of rating life..... 13
	Rating life of track rollers..... 14
	Operating life..... 16
	Static load safety factor..... 17
	Minimum load..... 18
	Differences in raceway hardness 18
Lubrication	Lubrication of guideway raceways 19
	Lubrication intervals 19
	Lubrication of track rollers..... 19
Design of bearing arrangements	Requirements for the adjacent construction 21
	Shaft creep 21
	Displacement force 21
	Location of carriages and guideways 22
	Track roller guidance systems in accordance with customer specifications..... 22
Mounting	Delivered condition 26
	Mounting of guidance system with one guideway 26
	Mounting of guidance system with two guideways..... 27
	Mounting of curved guideway elements and oval tracks 27
	Mounting of bogie carriages..... 27
Accuracy	Accuracy of guideways LFS..... 30
Ordering example, ordering designation	Ready-to-fit systems 34
	Closed oval tracks 36
	Oval track with two 180° arcs 36
	Oval track with four 90° arcs 37
	Individual components 38
Operating limits	Operating temperature 39
	Velocities 39
	Acceleration 39

Load carrying capacity and rating life

Permissible radial loads

The thick-walled outer rings of the track rollers can support high radial loads. If these track rollers are used against a shaft as a raceway, the outer rings undergo elastic deformation, *Figure 1*.

Compared to rolling bearings supported in a housing bore, track rollers have the following characteristics:

- modified load distribution in the bearing. This is taken into consideration by means of the basic load ratings C_{rw} and C_{Orw} used in the calculation of the rating life
- bending stress in the outer ring. This is taken into consideration by means of the permissible radial loads $F_{r\text{per}}$ and $F_{Or\text{per}}$. The bending stresses must not exceed the permissible strength values of the material (due to the risk of fracture).

Permissible radial load under dynamic loading



For rotating bearings under dynamic load, the effective dynamic load rating C_{rw} is used. C_{rw} is used to calculate the basic rating life.

The permissible dynamic radial load $F_{r\text{per}}$ must not be exceeded. If the basic static load rating C_{Orw} is lower than the basic dynamic load rating C_{rw} , C_{Orw} is used.

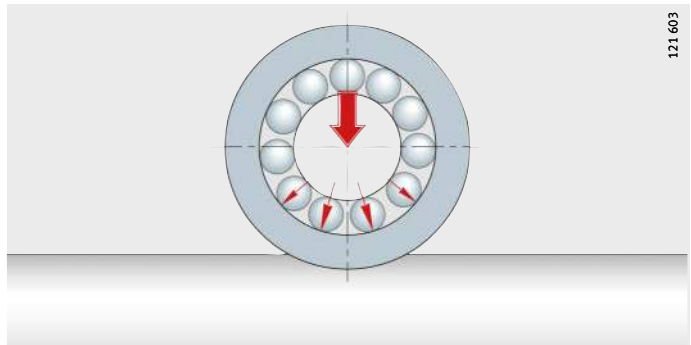


Figure 1
Deformation of the outer ring
when used against a flat raceway



Permissible radial load under static loading

For bearings under static load, when stationary or with only infrequent motion, the effective static load rating C_{OrW} is used. C_{OrW} is used to calculate the static load safety factor S_0 .



At the same time, the permissible static radial load $F_{Or\ per}$ must not be exceeded.

In addition to the permissible radial load of the bearing, the permissible radial load of the mating track must also be taken into consideration.

The basic load ratings stated are valid only in conjunction with a shaft as a mating track that is hardened (at least 670 HV) and ground (Ra 0,3).

Fatigue limit load

The fatigue limit load C_{UrW} is defined as the load below which – under laboratory conditions – no fatigue occurs in the material.

Calculation of the rating life

The general methods for calculating the rating life are:

- the basic rating life in accordance with DIN ISO 281
- the adjusted rating life in accordance with DIN ISO 281
- the expanded calculation of the adjusted reference rating life in accordance with DIN ISO 281-4.

These methods are described in Catalogue HR 1, Rolling Bearings, in the chapter Load carrying capacity and rating life.

Load carrying capacity and rating life

Rating life of track rollers

In comparison with Catalogue HR 1, Rolling Bearings, the following values must be exchanged:

- $C_r = C_{rw}$
- $C_{0r} = C_{0rw}$
- $C_{ur} = C_{urw}$

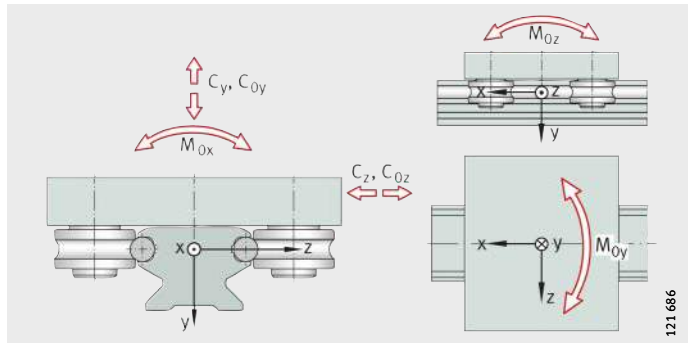
The carriages LFCL, LFL...SF, LFL, LFKL...SF and bogie carriage LF DL contain four track rollers LFR.

The equivalent principle applies here. The corresponding parameters are taken into consideration in the basic load ratings C_y , C_{0y} , C_z , C_{0z} and the permissible moment ratings M_{0x} , M_{0y} and M_{0z} .

C_y	N
Basic dynamic load rating in y direction	
C_{0y}	N
Basic static load rating in y direction	
C_z	N
Basic dynamic load rating in z direction	
C_{0z}	N
Basic static load rating in z direction	
M_{0x}	Nm
Static moment rating about x axis	
M_{0y}	Nm
Static moment rating about y axis	
M_{0z}	Nm
Static moment rating about z axis.	

In the case of track rollers with a profiled outer ring, calculation is carried out exclusively by means of the basic rating life to DIN ISO 281.

Figure 2
Load carrying capacity
and load directions





Other formulae for calculating the basic rating life

$$L_s = 0,0314 \cdot D_a \cdot \left(\frac{C_{rw}}{P_r} \right)^p$$

$$L_h = 26,18 \cdot \frac{D_a}{H \cdot n_{osc}} \cdot \left(\frac{C_{rw}}{P_r} \right)^p$$

$$L_h = 52,36 \cdot \frac{D_a}{\bar{v}} \cdot \left(\frac{C_{rw}}{P_r} \right)^p$$

Rating life for carriages with four track rollers

$$L_s = \left(\frac{C_y, C_z}{P} \right)^p$$

$$L_h = \frac{833}{H \cdot n_{osc}} \cdot \left(\frac{C_y, C_z}{P} \right)^p$$

$$L_h = \frac{1666}{\bar{v}} \cdot \left(\frac{C_y, C_z}{P} \right)^p$$

L_s 10^5 m

Basic rating life in metres

D_a mm

Rolling contact diameter of track roller, see dimension tables

C_{rw}, C_y, C_z N

Effective dynamic load rating

P_r N

Equivalent dynamic load (radial load)

p -

Ball: $p = 3$;

needle roller (non-locating bearing track roller or carriage): $p = 10/3$

L_h h

Basic rating life in operating hours

H m

Single stroke length for reciprocating motion

n_{osc} min^{-1}

Number of return strokes per minute

\bar{v} m/min

Mean travel velocity

P N.

Equivalent dynamic load in the corresponding load direction (for applications with combined loads, please contact us).

Load carrying capacity and rating life

Operating life

The operating life is the life actually achieved by a rolling bearing. It may differ significantly from the calculated rating life.

This may be due to wear or fatigue as a result of:

- deviations in the operating data
- insufficient or excessive operating clearance (track roller, guideway)
- contamination
- inadequate lubrication
- operating temperature too high or too low
- reciprocating motion with very small stroke length, which can lead to false brinelling
- high vibration load, leading to false brinelling
- very high shock loads (static overloading)
- prior damage during mounting.

Due to the variety of mounting and operating conditions, the operating life cannot be precisely calculated in advance. The most reliable way of arriving at a close estimate is by comparison with similar applications.



Static load safety factor

The indicator of static loading is the static load safety factor S_0 . This indicates the security against impermissible permanent deformations in the bearing and is determined by means of the following equation:

$$S_0 = \frac{C_{0r w}}{F_{0r}}$$

Static load safety factor for carriages with four track rollers

$$S_0 = \frac{C_0}{F_0}$$

$$S_0 = \frac{M_0}{M}$$

S_0	–
Static load safety factor	
$C_{0r w}$	N
Effective static load rating of track roller, see dimension tables	
F_{0r}	N
Static force acting in radial direction	
C_0	N
Basic static load rating of carriage, see dimension tables	
F_0	N
Static force acting in y and z direction	
M_0	Nm
Permissible static moment in x, y, z direction	
M	Nm
Moment acting in load direction (M_x, M_y, M_z).	

Track rollers are regarded as heavily loaded at a static load safety factor of $S_0 < 4$.

For applications with normal operating conditions, a value $S_0 > 4$ is required.

When using individual track rollers, for example in conjunction with guideways, the decisive factor where required is the permissible load of the guideway.



Static load safety factors $S_0 < 1$ cause plastic deformation of the rolling elements and the raceway, which can impair smooth running. This is only permissible for bearings with small rotary motions or in secondary applications.

Load carrying capacity and rating life

Minimum load

In order to ensure that the outer ring is driven, that no slippage occurs and that the track roller does not lift from the mating track, the track rollers must be subjected to a minimum load in dynamic operation.



In general, the minimum load is calculated using the ratio $C_{0rw}/F_r < 60$.

Differences in raceway hardness

If shafts with a lower surface hardness are used (such as X46, X90), a hardness factor must be applied, see equations and *Figure 3*.

$$C_H = f_H \cdot C$$

$$C_{0H} = f_{H0} \cdot C_0$$

C_H Effective dynamic load rating

f_H Dynamic hardness factor

C Basic dynamic load rating

C_{0H} Effective static load rating

f_{H0} Static hardness factor

C_0 Basic static load rating.

f_{H0}, f_H = hardness factor
HV, HRC = surface hardness

① LFS..-RB, W..-X90

② W..-X46

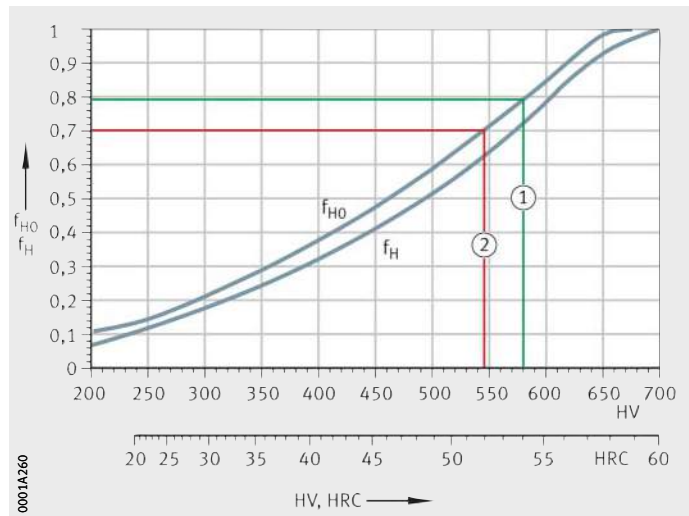


Figure 3

Static and dynamic hardness factors for lower hardness of raceways



Lubrication

Lubrication of guideway raceways

The guideway raceways must be lubricated (even before first use). Lubrication can be carried out by means of lubrication and wiper units.

These units are already integrated in the compact carriage LFKL...SF. For carriages LFL...SF and LFCL, the lubrication and wiper unit AB, see page 109, is available as an accessory.

The guideway raceway is lubricated by an oil-soaked felt insert. Oil can be fed to the felt inserts via lubrication nipples in the end faces. At delivery, the felt inserts are already soaked with oil (H1 approval for the food industry), where relubrication is to be carried out an oil of viscosity $\nu = 460 \text{ mm}^2/\text{s}$ is recommended.

Lubrication intervals

The lubrication intervals for guideway raceways are dependent on the environmental influences. The cleaner the environment, the smaller the quantity of lubricant required. The time and quantity can only be determined precisely under operating conditions since it is not possible to determine all the influences by calculation. An observation period of adequate length must be allowed.



Fretting corrosion is a consequence of inadequate lubrication and is visible as a reddish discolouration of the mating track or outer ring. Inadequate lubrication can lead to permanent system damage and therefore to failure. It must be ensured that the lubrication intervals are reduced accordingly in order to prevent fretting corrosion.

In general, a thin film of oil should always be present on the shaft.

Lubrication of track rollers

At delivery, track rollers LFR have an initial greasing of a high quality lithium soap grease.

From LFR5204-16, the inner ring has a relubrication hole. Track rollers of smaller diameters are lubricated for life.

Lubrication

Further information on lubrication

Further information can be found in Catalogue HR 1, Rolling Bearings, in the chapter Lubrication.

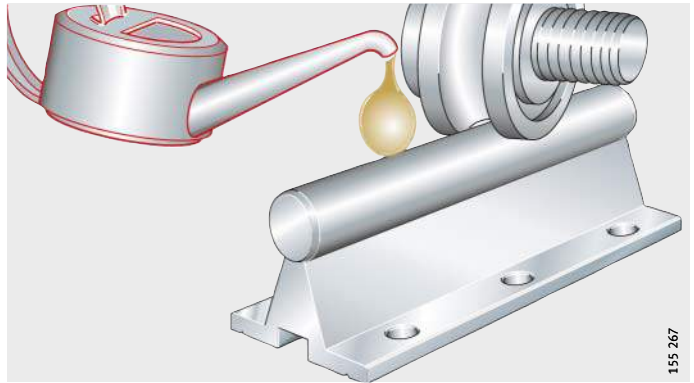


Figure 1
Lubrication of guideway raceways



Design of bearing arrangements

Requirements for the adjacent construction

The running accuracy of the linear guidance system is essentially dependent on the straightness, accuracy and rigidity of the mounting surfaces.

The higher the requirements for accuracy and smooth running of a track roller guidance system, the more attention must be paid to the geometrical and positional accuracy of the adjacent construction. The adjacent surfaces should be flat and have parallel faces.

For two guideways, we recommend a parallelism according to *Figure 1*.

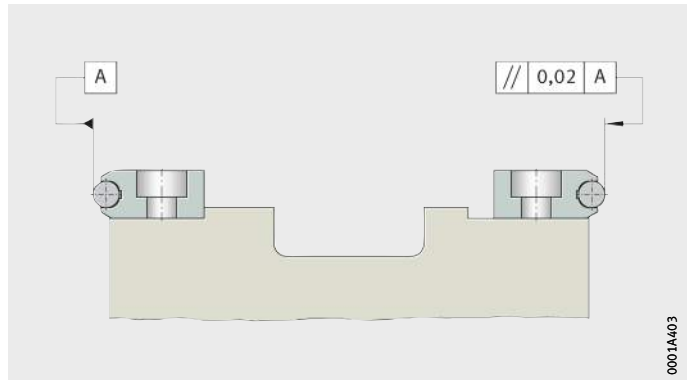


Figure 1
Parallelism of guideways

Shaft creep

Under unfavourable conditions, shaft creep of a few millimetres may occur in isolated cases. This creep may occur mainly in applications with high accelerations in conjunction with high alternating loads and guideways that are not completely supported. It may also be caused by an adjacent construction that is too soft.

In such cases, shaft creep can be prevented by the use of end plates ANS.LFS, see dimension table page 115. They can be supplied already mounted.

Displacement force

The displacement force is dependent on the preload, the lubrication and the particular application. It is therefore not possible to make generally valid statements.

Design of bearing arrangements

Location of carriages and guideways

If lateral loads are present, it is recommended that the guideways and carriages should be located against locating surfaces. In the case of guideways comprising multiple sections joined together, it is recommended that the guideways should be aligned by means of the shaft. If necessary, the shafts should be located on the adjacent construction by means of dowels.

If two guideways are arranged in parallel, the first guideway should be clamped against a stop, *Figure 1*, page 21. The second guideway should then be aligned accordingly. Any gaps between the guideway and the adjacent construction should be filled with synthetic resin.

Track roller guidance systems in accordance with customer specifications

The INA track roller guidance systems with curved guideway elements can be used to achieve an extremely wide variety of applications, *Figure 2* and *Figure 3*, page 23.

If the arrangement required cannot be represented using the standard ordering designation, a customer drawing must be submitted with the enquiry.

For arrangements with curved guideway elements, it is recommended that the guideway connectors VBS should be used at the joints, see page 114. This gives considerably easier mounting.



Standard oval tracks are always supplied with guideway connectors VBS, see page 102.

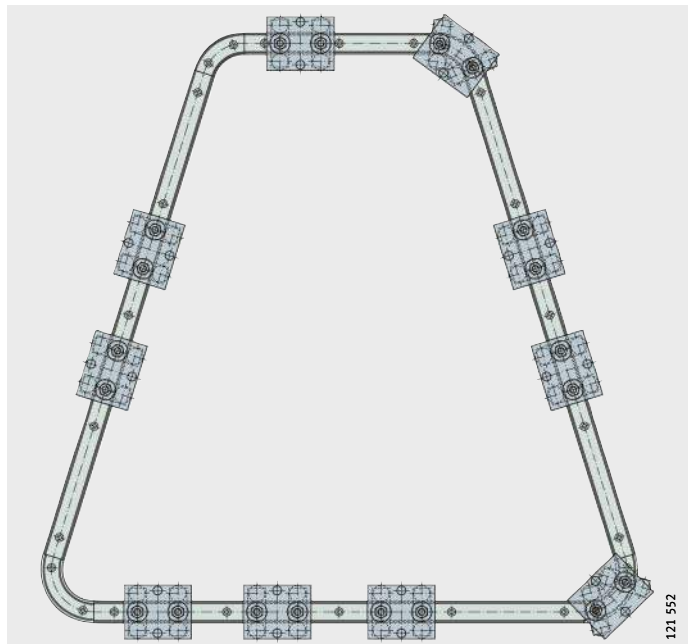


Figure 2
Arrangement according to customer requirements

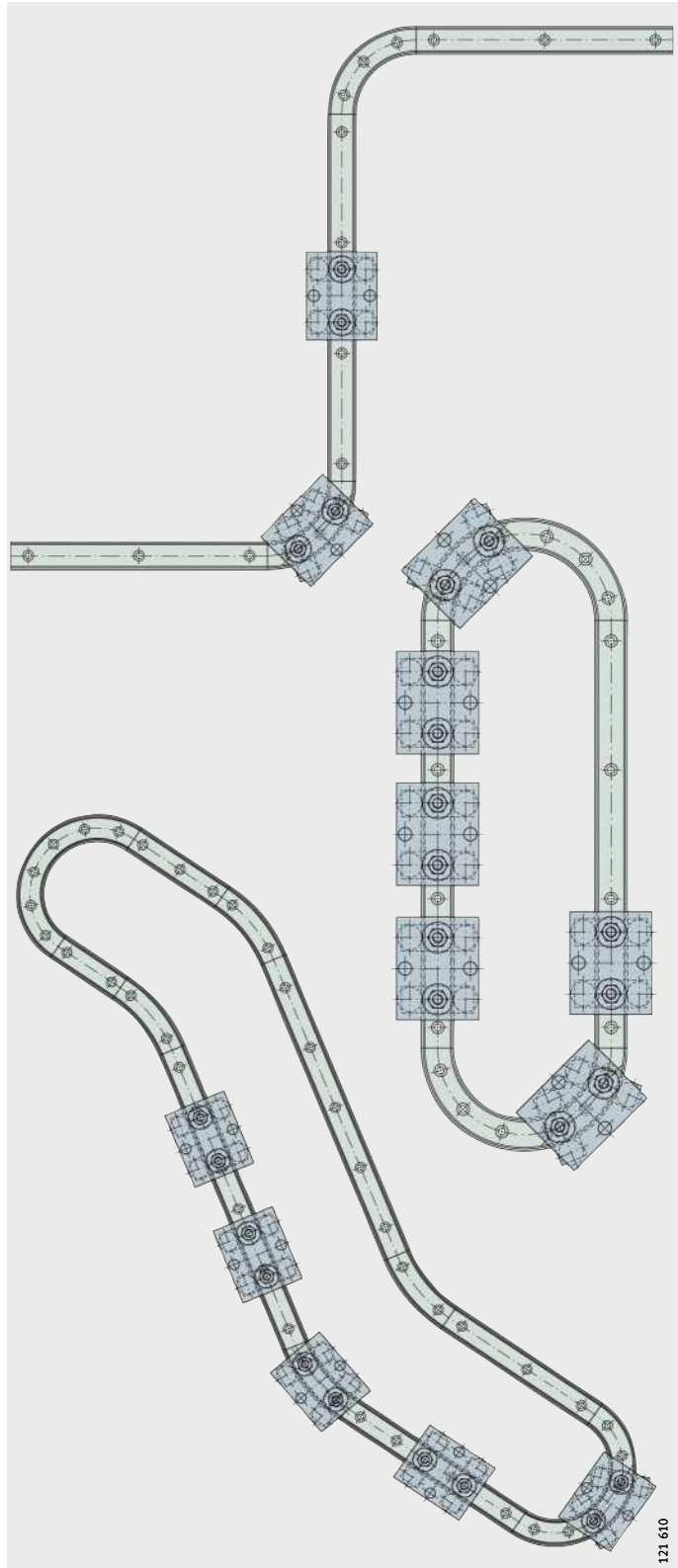
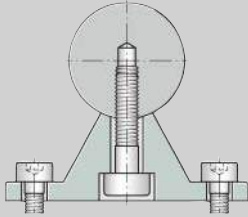


Figure 3
Closed and open applications
with guidance systems including
curved guideway elements

121 610

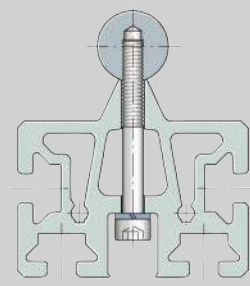
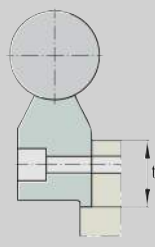
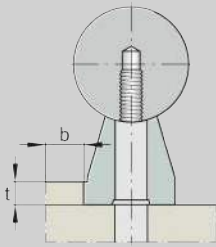
Design of bearing arrangements

Possible combinations of profiled track rollers with guideways

		Guideways			
					
Shaft diameter mm	TSNW, TSNW..-G4 (-G5) Fixing screw	Load case, <i>Figure 4</i>			
		I	II	III	
12	DIN ISO 4762	■	–	–	
	DIN 7984	■	■	■	
16	DIN ISO 4762	■	–	–	
	DIN 7984	■	–	–	
20	DIN ISO 4762	■	–	–	
	DIN 7984	■	–	–	
25	DIN ISO 4762	■	■	■	
	DIN 7984	■	■	■	
30	DIN ISO 4762	■	–	–	
	DIN 7984	■	■	■	
40	DIN ISO 4762	■	■	■	
	DIN 7984	■	■	■	
50	DIN ISO 4762	■	■	■	
	DIN 7984	■	■	■	

- combination possible if the rail is located using the stated screw
- combination possible
- combination possible if $t \leq t_{\max}$ and $b \leq b_{\max}$
- please contact us

1) With AB.W: $t_{\max} = 2,5$.



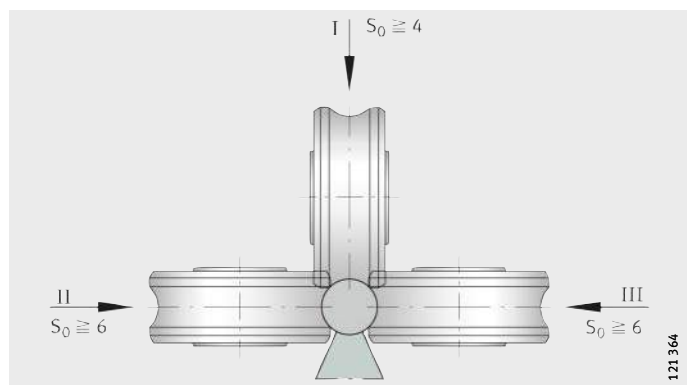
TSUW					TSSW				TSMW		
t _{max} mm	b _{max} mm	Load case, Figure 4			t _{max} mm ¹⁾	Load case, Figure 4			Load case, Figure 4		
		I	II	III		I	II	III	I	II	III
5	5	●		○ ¹⁾	-	-	-	-	-	-	-
-	-	●	-	-	-	-	-	-	-	-	-
-	-	●	-	-	-	●	-	-	●	-	-
10	12	●	●	○	36	●	●	●	●	●	●
12	16	●	●	○	42	●	●	●	●	●	●
10	-	●	●	○	50	●	●	●	-	-	-
13	-	●	●	○	70	●	●	●	-	-	-



- For the combination, take account of:
- the static load safety factor S_0 , see page 17
 - the load cases, Figure 4
 - a shaft hardness of 670 HV.

$$S_0 = C_{0w} / P_0$$

Figure 4
Load cases I, II and III



Mounting

Delivered condition

Carriages are delivered with the track rollers fitted. All the bolts are tightened to the required tightening torque.

Carriages

For carriages, this gives:

- hollow section carriage LFCL; clearance-free, with mounting of accessories as necessary
- compact carriage LFKL..-SF; clearance-free, with mounting of lubrication and wiper unit as necessary
- non-locating bearing carriage LFLL..-SF; clearance-free, with mounting of accessories as necessary
- open carriage LFL..-SF; clearance-free, with mounting of accessories as necessary
- bogie carriage LFDL..-SF (-B); LFDL..-SF clearance-free, with mounting of accessories as necessary. In the case of LFDL..-B, the clearance must be set by means of eccentrics.

Mounting of guidance system with one guideway

Mounting of guidance system with one guideway:

- Place the guideway on the adjacent construction and screw mount finger tight.
- Align the guideway; if necessary, clamp the shaft against the locating edge and screw mount firmly, observing the tightening torques.
- Clearance-free carriages: slide the carriage onto the guideway.
- Carriages with adjustable clearance: if lateral load is present, ensure that the principal load is supported by the concentric bolts.
- Position and screw mount the adjacent construction.



Mounting of guidance system with two guideways

Mounting of guidance system with two guideways:

- Position the first guideway, clamp it against the locating edge and tighten the screws.
- Position the second guideway and screw mount finger tight.
- Slide the carriage onto the guideway, set the clearance as necessary, *Figure 2*, page 28.
- Position the adjacent construction, align the carriage and screw mount firmly; observe the tightening torques M_A , see table, page 29.
- Align the second guideway with the aid of the table, move the table several times during this operation.
- Tighten the fixing screws in the guideway; tightening torques M_A , see table, page 29.

Where necessary, form fit can be achieved between the guideways and adjacent construction by means of synthetic resin or strips.

Mounting of curved guideway elements and oval tracks

Mounting of curved guideway elements and oval tracks:

- Assemble the curved guideway elements or oval tracks.
- Position the assembled elements precisely on the adjacent construction and fix in place by means of clamps.
- Transfer the hole pattern for the fixing holes to the adjacent construction.
- Remove the elements and make the fixing holes in the adjacent construction.
- Position the elements on the adjacent construction again and tighten the fixing screws; observe the tightening torques M_A , see table, page 29.

Mounting of bogie carriage

Slide the clearance-free carriage LFDL..-SF onto the guideway. No setting of clearance is required, *Figure 1*, page 28.



The bogie carriage LFDL..-SF cannot be mounted on closed ring systems, in this case use the clearance-free bogie carriage LFDL..-B.

Carriages with adjustable clearance

Slide the carriage LFDL..-B onto the guideway and set in position without load. Rotate the eccentric bolts using an open-end wrench or ring wrench so that the track rollers are set against the raceway, observing the direction of rotation, *Figure 2*, page 28.

Tighten the hexagon nuts to the tightening torque M_A ; tightening torques, see table, page 29.



The track rollers must be easily movable and clearance-free. If they are set in place too firmly, this will generate preload that reduces the life of the guidance system.

Mounting

Inspection

Check the adjustment. The guidance system is correctly adjusted if, when the carriages are moved, all the track rollers rotate and the carriages can be moved easily.

The concentric bolts are tightened to the necessary tightening torque, the eccentric bolts are tightened finger tight. When setting the preload, these must be tightened to the tightening torque M_A , see table Tightening torques for track roller bolts, page 29.



Figure 1
Clearance-free carriage LFDL...-SF

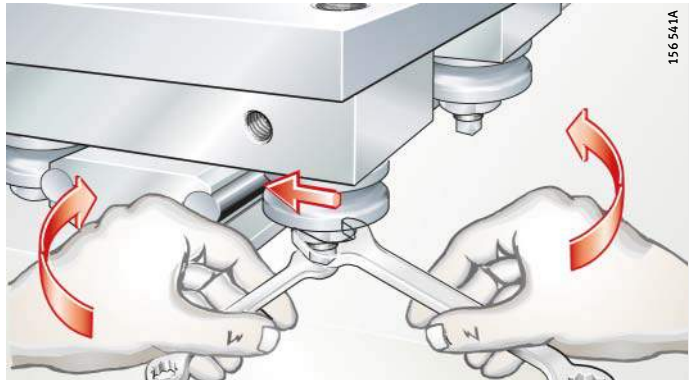


Figure 2
Carriage with adjustable
clearance LFDL...-B



**Tightening torques
for track roller bolts**

Track roller, profiled track roller	Bolt	Tightening torque M_A	
		Standard (-2Z) Nm	RB (-2RSR) Nm
LFR50/5-4	M4	2,5	2,5
LFR50/5-6	M4	2,5	2,5
LFR50/8-6	M8	15	12
LFR5201-10	M10	40	23
LFR5301-10	M10	40	23
LFR5302-10	M12	70	39
LFR5201-12	M10	40	23
LFR5204-16	M16×1,5	100	75
LFR5206-20	M20×1,5	200	100
LFR5206-25	M20×1,5	200	100
LFR5207-30	M24×1,5	300	150
LFR5208-40	M30×1,5	600	310
LFR5308-50	M30×1,5	800	410

**Tightening torques
for screws in carriage
according to DIN ISO 4762-8.8**

Screw	Tightening torque M_A Nm
M5	5,8
M6	9,9
M8	24
M10	48
M12	83

**Tightening torques
for screws in guideways LFS
according to DIN ISO 4762-8.8 or
DIN 7984-8.8**

Screw	Tightening torque M_A Nm
M5	5,8
M6	9,9
M8	24
M10	48
M12	83

Accuracy

Accuracy of guideways LFS

Data on the straightness, parallelism (differential measurement), length and positional tolerances of guideways are given in the following tables and figures, *Figure 1 to Figure 5*, page 32.

The guideways are precision straightened and the tolerances are better than DIN EN 12020.

Length tolerance

Length L mm		Tolerance mm
Single-piece guideways	$L < 1\,000$	± 2
	$1\,000 \leq L < 2\,000$	± 3
	$2\,000 \leq L < 4\,000$	± 4
	$4\,000 \leq L$	± 5
Multi-piece guideways	Total length L	$\pm 0,1\%$

Straightness tolerance for guideways

Length of guideway	Tolerance	
	t_1 (contact face) mm	t_2 (lateral) mm
$L < 1\,000$	0,5	0,2
$1\,000 \leq L < 2\,000$	1	0,3
$2\,000 \leq L < 3\,000$	1,5	0,4
$3\,000 \leq L < 4\,000$	2	0,5
$4\,000 \leq L < 5\,000$	2,5	0,6
$5\,000 \leq L < 6\,000$	3	0,7
$6\,000 \leq L < 7\,000$	3,5	0,8
$7\,000 \leq L < 8\,000$	4	0,9

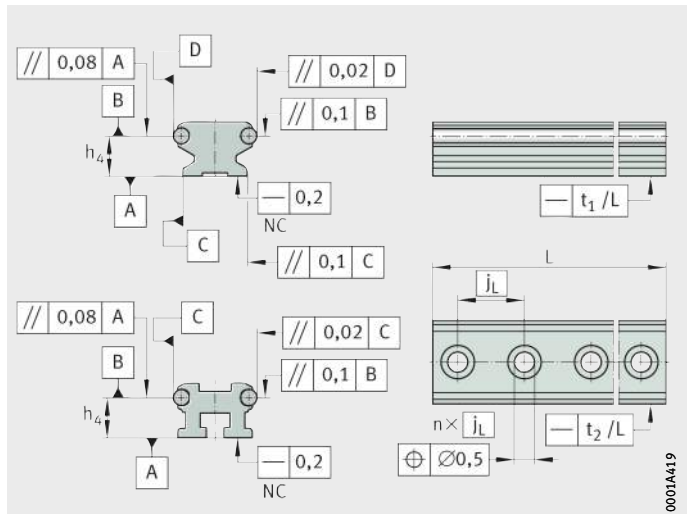
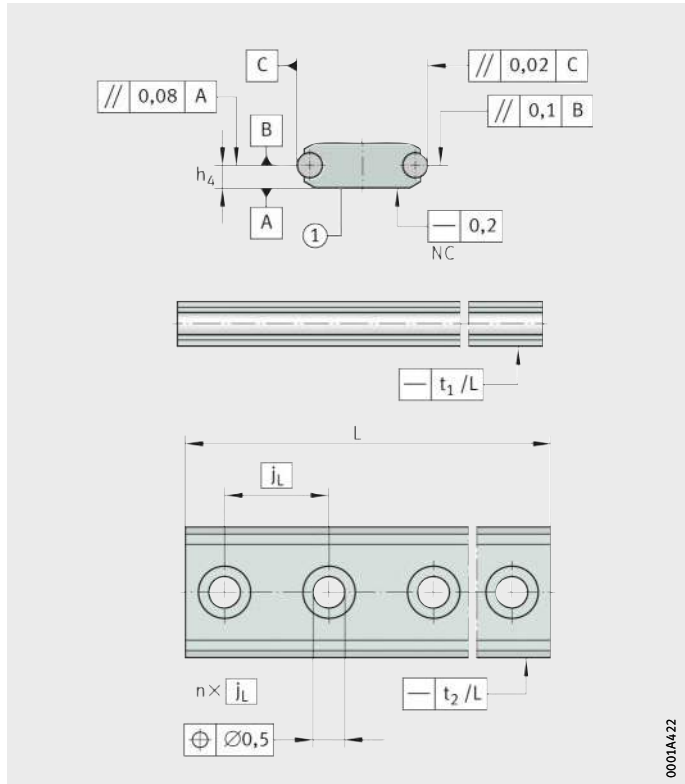


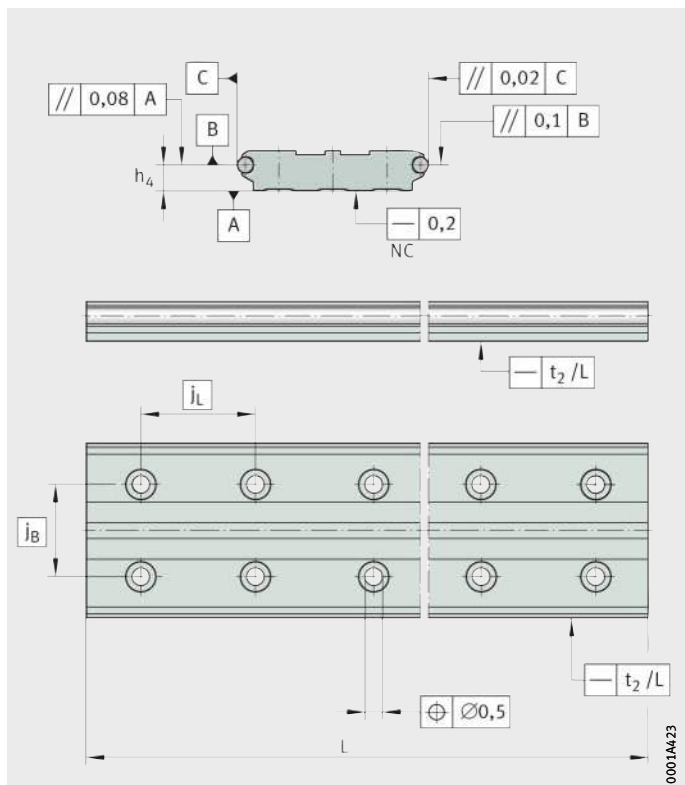
Figure 1
Tolerances for guideways
LFS, LFS..-C, LFS..-NZZ, LFSR..-ST



① Contact face indicated by slot

Figure 2
Guideway LFS..-F

0001A4.22



Parallelism determined
by differential measurement

Figure 3
Guideway LFS120

0001A4.23



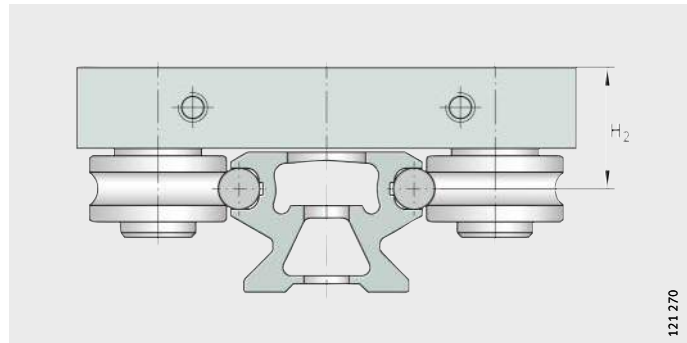
Tolerances for H_2 and h_4

Tolerances for H_2 and h_4 , see table, *Figure 6* and *Figure 7*.

Guideway	Tolerance for	
	H_2 mm	h_4 mm
LFS20	+0,3	-0,1
LFS25		-0,1
LFS25-M		$\pm 0,25$
LFS32		+0,2
LFS32-C		+0,2
LFS32-N		+0,2
LFS32-F		+0,1
LFS32-M		$\pm 0,25$
LFS32-FH		+0,1
LFS42-C		+0,2
LFS42-F		+0,1
LFS52		+0,2
LFS52-C		+0,2
LFS52-NZZ		+0,2
LFS52-F		+0,1
LFS52-M		+0,5
LFS52-FH		+0,1
LFS86-C		+0,25
LFS120		+0,2

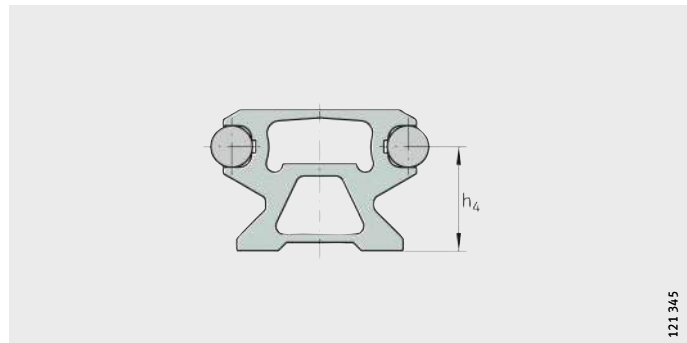
Tolerance for $H_2 = +0,3$ mm

Figure 6
Reference dimension for accuracy,
dimension H_2



121 270

Figure 7
Reference dimension for accuracy,
dimension h_4



121 345

Ordering example, ordering designation

Ready-to-fit systems

The elements of the track roller guidance systems (such as the carriage, guideway) must be ordered separately.

Carriages should be regarded as a unit, including the track rollers and bolts.

Carriages and guideways can be used in any combination and can be ordered independently of each other.

Ordering example

Track roller guidance system of corrosion-resistant design with open carriage LFL52-E-SF, *Figure 1* and *Figure 2*.

Carriage	Carriage	LFL
	Size	52-E
	Clearance-free	SF
	Corrosion-resistant	RB

Ordering designation **LFL52-E-SF-RB**

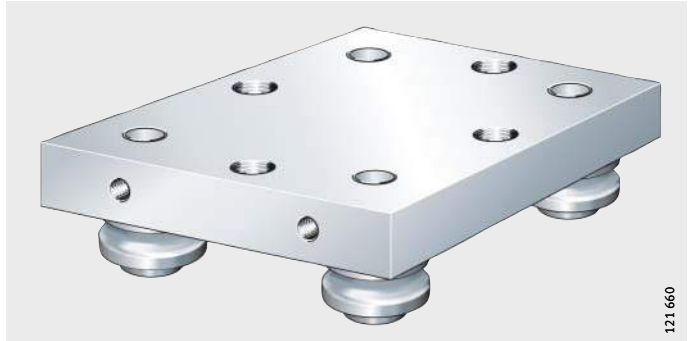


Figure 1
Open carriage LFL52-E-SF

121 660



Guideway Hollow section guideway LFS52-CE, length 1500 mm, $a_L = 50$ mm, $a_R = 75$ mm, corrosion-resistant design, *Figure 2*:

Guideways	LFS
Width of guideway	52 mm
Length of guideway l	1500 mm
Design	CE
Corrosion-resistant	RB
Spacing a_L	50 mm
Spacing a_R	75 mm

Ordering designation **LFS52×1500-CE-RB-50/75**

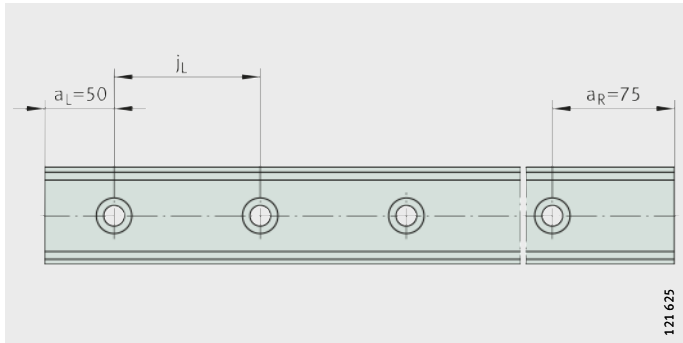


Figure 2
Guideway LFS52-CE

Ordering example, ordering designation

Closed oval tracks

Oval track with two 180° arcs

Guideways	LFS
Width of guideways b	52 mm
Length of straight guideways	2 000 mm
Closed oval track	OV
Radius of arc r	300 mm

Ordering designation

Without guideway connectors VBS, *Figure 3*

1×LFS52×2000-OV-300

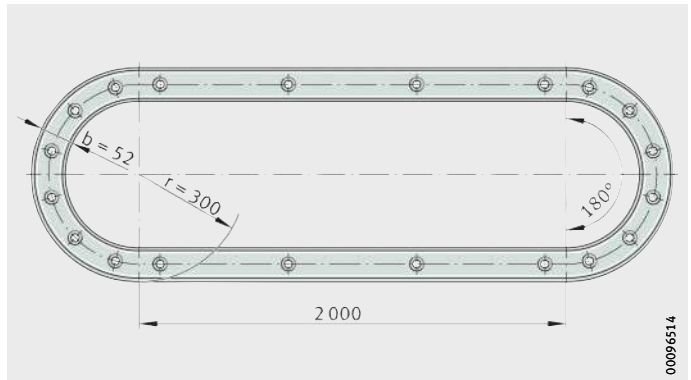
With guideway connectors VBS, *Figure 4*

1×LFS52×2000-OV-300-VBS

b = width of guideways
 r = radius of arc

Figure 3

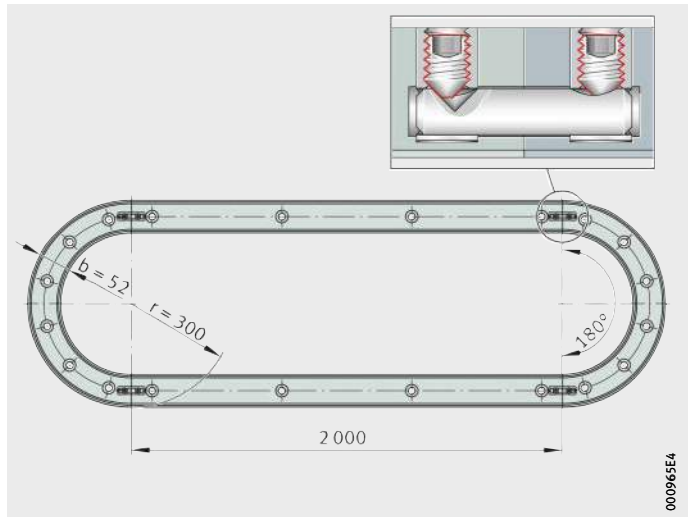
Closed oval track with 180° arcs
 LFS52×2000-OV-300



b = width of guideways
 r = radius of arc

Figure 4

Closed oval track with 180° arcs and
 guideway connectors VBS
 LFS52×2000-OV-300-VBS





Oval track with four 90° arcs

Guideways	LFS
Width of guideways b	52 mm
Length of straight guideways	
1st straight guideway	2 000 mm
2nd straight guideway	3 000 mm
Closed oval track	OV
Radius of arc r	300 mm

Ordering designation

Without guideway connectors VBS, *Figure 5*

1×LFS52×2000×3000-OV-300

With guideway connectors VBS, *Figure 6*

1×LFS52×2000×3000-OV-300-VBS

b = width of guideways
r = radius of arc

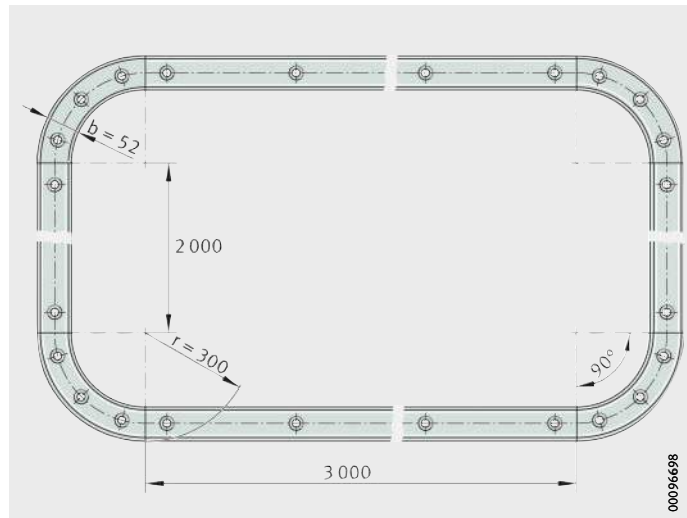


Figure 5
Closed oval track with 90° arcs
LFS52×2000×3000-OV-300

b = width of guideways
r = radius of arc

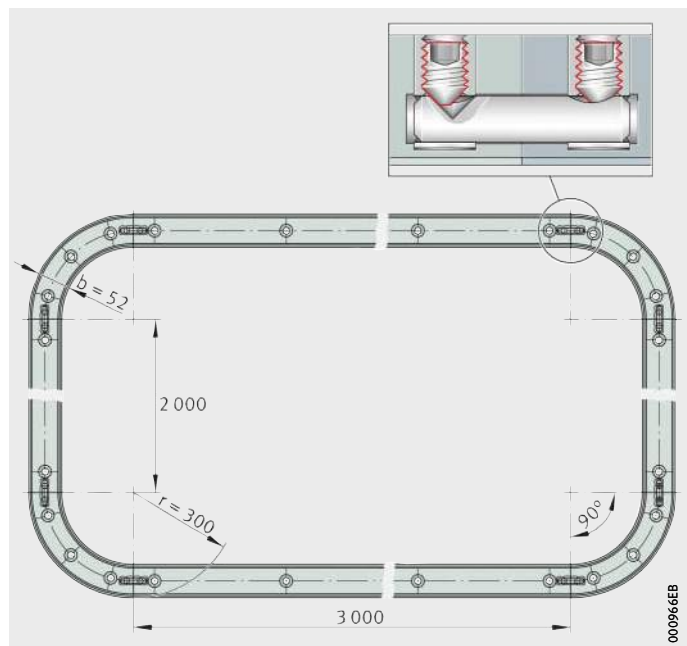


Figure 6
Closed oval track with 90° arcs and
guideway connectors VBS
LFS52×2000×3000-OV-300-VBS

Ordering example, ordering designation

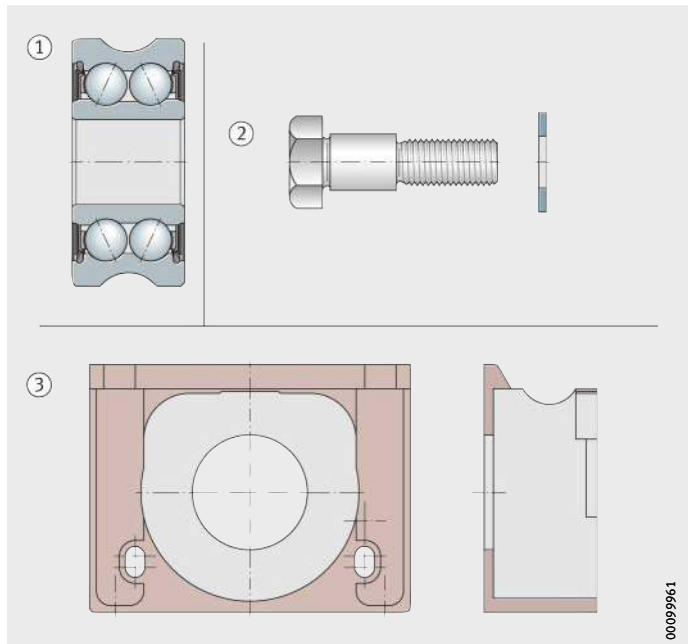
Individual components

In order to achieve versatile user designs, it is also possible to order individual components of the ready-to-fit systems; example, *Figure 7*.

Track roller	Series	LFR
	Size	50/8-6
	Sealing	2RS
	Corrosion-resistant	RB, <i>Figure 7</i>
Ordering designation	LFR50/8-6-2RS-RB	
Bolt	Series	LF
	Concentric	Z
	Size	8
	Corrosion-resistant	RB, <i>Figure 7</i>
Ordering designation	LFZ8-RB	
Cap wiper	Series	AB.LFR
	Size	50/8, <i>Figure 7</i>
Ordering designation	AB.LFR50/8	

- ① Track roller
- ② Bolt, concentric
- ③ Cap wiper

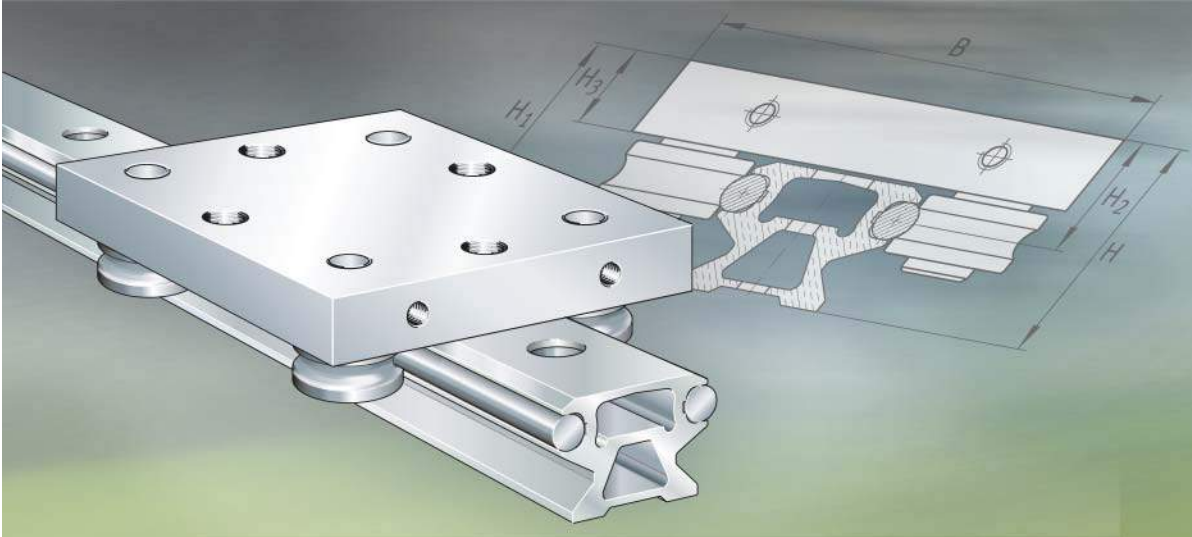
Figure 7
Track roller, bolt, wiper





Operating limits

- Operating temperature** Track roller guidance systems can be used at a temperature from -20 °C to $+80\text{ °C}$. For applications below -20 °C and above $+80\text{ °C}$, please contact us.
The area of application is restricted by the lubricant, the plastics used and the composite materials.
- Velocities** The maximum possible speed of track roller guidance systems is 10 m/s . Higher speeds may be possible by agreement.
- Acceleration** When using track roller guidance systems, accelerations of up to 50 m/s^2 can be achieved.



Track roller guidance systems


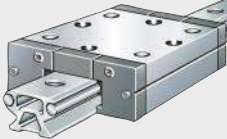



- With hollow section carriage
- With compact carriage
- With open carriage
- With non-locating bearing carriage
- With bogie carriage

Track roller guidance systems

	Page
Matrix	Matrix for preselection of track roller guidance systems..... 42
Product overview	Track roller guidance systems 44
Features	Track roller guidance systems
	With hollow section carriage 46
	With compact carriage..... 48
	With open carriage 50
	With non-locating bearing carriage 52
	With bogie carriage 54
Dimension tables	Track roller guidance systems
	With hollow section carriage 56
	With compact carriage..... 58
	With open carriage 60
	With non-locating bearing carriage 62
	With bogie carriage 64



**Matrix for preselection
of track roller guidance systems**

Track roller guidance systems with	Width of guideways						Corrosion- resistant
	20	25	32	42	52	86	
Hollow section carriage LFCL 	-	●	-	●	-	●	■
Compact carriage LFKL...-SF 	●	●	●	-	●	-	■
Open carriage LFL...-SF 	●	-	●	-	●	-	■
Non-locating bearing carriage LFL...-SF 	-	-	●	-	●	-	■
Bogie carriage LFDL...-SF LFDL...-B 	-	-	●	-	●	-	■

● available sizes

■ possible

1) The guideway LFS...-M can only be combined with carriages with adjustable clearance. If carriages LFCL and LFKL...-SF are to be used, please contact us in advance.

Special features of guidance systems	Sizes	Basic dimensions of guidance systems, dimensions, <i>Figure 1</i>									Description see page
		LFS (-C, -CE, -CEE, -E, -EE, -NZZ, -OV), LFSR..-ST			LFS..-F (-FE)			LFS..-M ¹⁾			
		H	B	L	H	B	L	H	B	L	
<ul style="list-style-type: none"> ■ economical ■ low mass ■ high moment load carrying capacity M_x 	25	32,1	80	110	–	80	110	63,1	80	110	46
	42	39	116	150	33,9	116	150	–	116	150	
	86	59	190	235	–	190	235	–	190	235	
<ul style="list-style-type: none"> ■ closed series ■ protected track rollers ■ integrated lubrication unit 	20	22	56	69	–	56	69	–	56	69	48
	25	25	65	85	–	65	85	56	65	85	
	32	35,5	86	112	25,5	86	112	–	86	112	
	52	54,3	13	136	38,2	130	136	118,9	130	136	
	52-E	60,4	145	186	44,3	145	186	125	145	186	
	52-EE	60,4	155	205	44,3	155	205	125	155	205	
<ul style="list-style-type: none"> ■ very robust ■ simple construction 	20	22	55	50	–	55	50	–	55	50	50
	32	35,5	80	90	25,5	80	90	81,5	80	90	
	52	54,3	120	100	38,2	120	100	118,9	120	100	
	52-E	60,4	135	150	44,3	135	150	125	135	150	
<ul style="list-style-type: none"> ■ locating and non-locating bearing arrangement ■ compensation of skewing in the adjacent construction up to ± 1 mm 	32	35,5	80	90	25,5	80	90	81,5	80	90	52
	52	54,3	120	100	38,2	120	100	118,9	120	100	
<ul style="list-style-type: none"> ■ oval track guidance systems for unlimited stroke length 	32-B	44,2	80	100	34,2	80	100	90,2	80	100	54
	32-SF	44,2	80	100	34,2	80	100	90,2	80	100	
	52-B	66,1	120	150	50	120	150	130,7	120	150	
	52-SF	60,1	120	150	50	120	150	130,7	120	150	

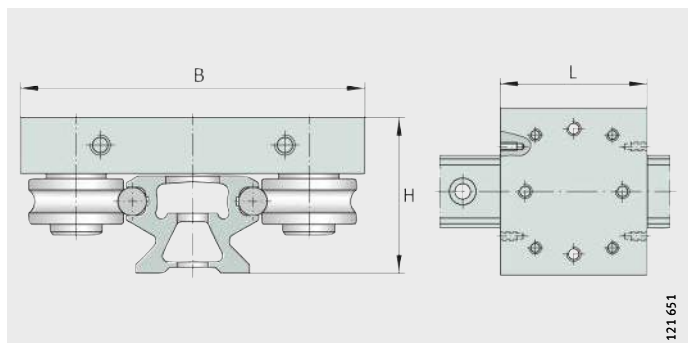


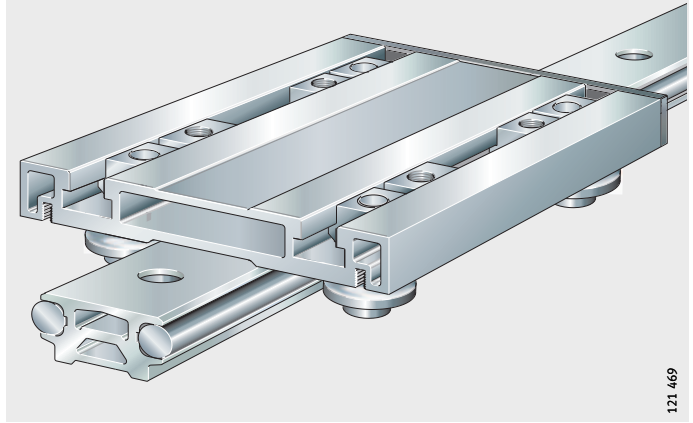
Figure 1
Dimensions H, B, L

121 651

Product overview Track roller guidance systems

With hollow section carriage
Clearance-free

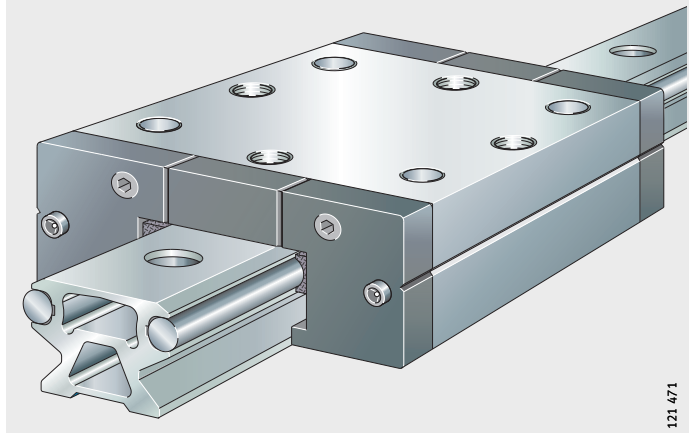
LFCL



121 469

With compact carriage
Clearance-free

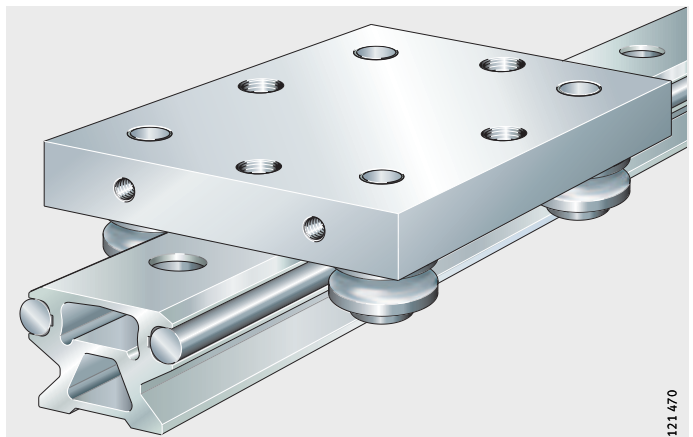
LFKL...SF



121 471

With open carriage
Clearance-free

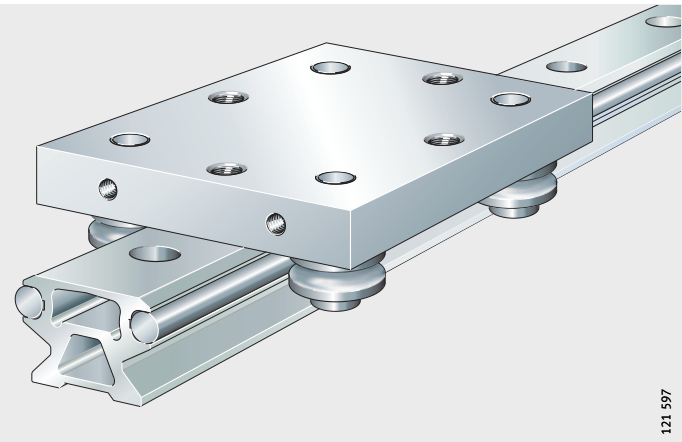
LFL...SF



121 470

With non-locating bearing carriage
Clearance-free

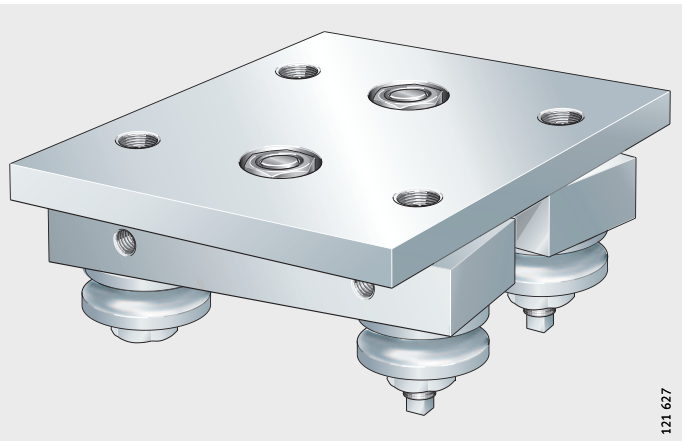
LFLL...-SF



121 597

With bogie carriage
Concentric and eccentric bolts,
adjustable clearance

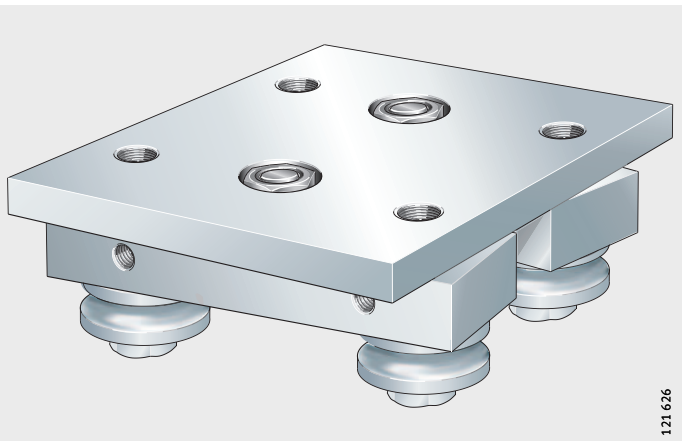
LFDL...-B



121 627

Concentric bolts
clearance-free

LFDL...-SF



121 626

Track roller guidance systems

Features

Track roller guidance systems are available with a hollow section carriage, compact carriage, open carriage, non-locating bearing carriage or bogie carriage.

Track roller guidance system with hollow section carriage

The economical series LFCL is characterised in particular by its low mass and its high moment load carrying capacity M_x . In addition, more individual design of the adjacent construction is possible by means of four T-bolts that can be moved in a longitudinal direction. A carriage comprises a carriage plate made from anodised aluminium, four concentric bolts, four track rollers, two end covers for the hollow sections and four T-nuts that can be used for the adjacent construction, *Figure 1*. The track rollers and end covers are already fitted.

- ① T-nut
- ② End cover
- ③ Carriage plate
- ④ Track roller
- ⑤ Concentric bolt

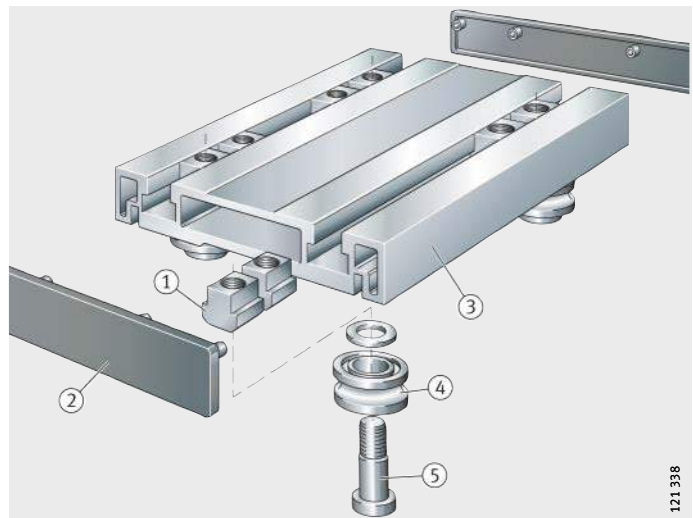
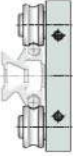


Figure 1
Hollow section carriage

121_338

Preload and clearance	The carriages run clearance-free on all INA guideways, see page 42, and can be combined with all guideways of the relevant size, but not with the curved guideway elements LFSR. Due to the highly accurate guideways, it is not necessary to set the clearance.
Sealing and lubrication	<p>The track rollers have gap seals on both sides, are greased for life and are therefore maintenance-free.</p> <p>The raceways can be lubricated using cap wipers AB.LFR. Their fixing screws pass into the screw mounting channels of the carriage plate.</p>
Corrosion-resistant design	All steel parts, the inner and outer rings of the track rollers and the bolts, washers and nuts are made from corrosion-resistant steel. The rolling elements are protected against corrosion by the grease. Corrosion-resistant designs have the suffix RB.
Further information	<p>Further information is given on the following pages:</p> <ul style="list-style-type: none"> ■ dimension table, see page 56 ■ track rollers, see page 68 ■ guideways, see page 76 ■ accessories, see page 106.



Track roller guidance systems

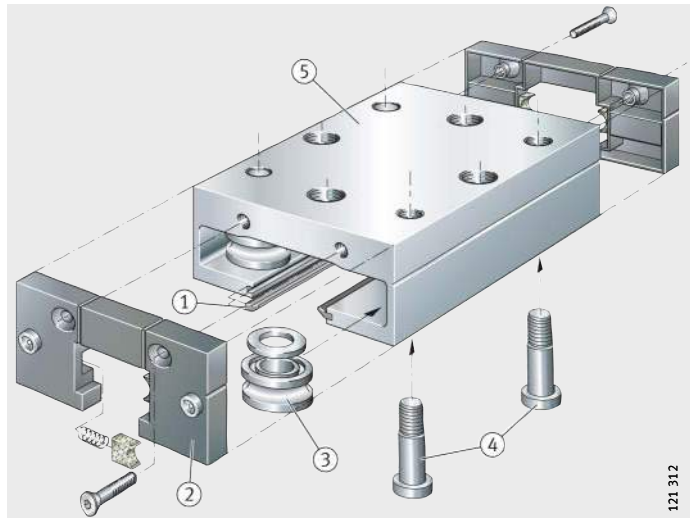
Track roller guidance system with compact carriage

The closed compact carriage LFKL...-SF gives a simple means of achieving track roller guidance systems for operation in contaminated environments. The track rollers are protected against contamination by the closed design. It has two integrated lubrication units for lubrication of the raceways.

A carriage comprises a saddle plate made from anodised, profiled aluminium, four concentric bolts, four track rollers, two sealing strips and two lubrication and wiper units, *Figure 2*. The track rollers are already fitted, the sealing strips as well as the lubrication and wiper units are included loose in the delivery.

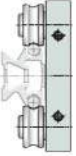
- ① Sealing strip
- ② Lubrication and wiper unit
- ③ Track roller
- ④ Concentric bolt
- ⑤ Saddle plate

Figure 2
Compact carriage



121 312

- Preload and clearance** The carriages run clearance-free on all INA guideways, see page 42, and can be combined with all guideways of the relevant size, but not with the curved guideway elements LFSR. Due to the highly accurate guideways, it is not necessary to set the clearance.
- Sealing and lubrication** The track rollers have gap seals on both sides, are greased for life and are therefore maintenance-free.
For lubrication of the raceways, the lubrication and wiper units have oil-soaked felt inserts that can be replenished with oil via lubrication nipples. In combination with the sealing strips (gap seals), these units protect the compact carriage on all sides against contamination.
- Corrosion-resistant design** All steel parts, the inner and outer rings of the track rollers and the bolts, washers and nuts are made from corrosion-resistant steel. The rolling elements are protected against corrosion by the grease. Corrosion-resistant designs have the suffix RB.
- Further information** Further information is given on the following pages:
 - dimension table, see page 58
 - track rollers, see page 68
 - guideways, see page 76
 - accessories, see page 106.



Track roller guidance systems

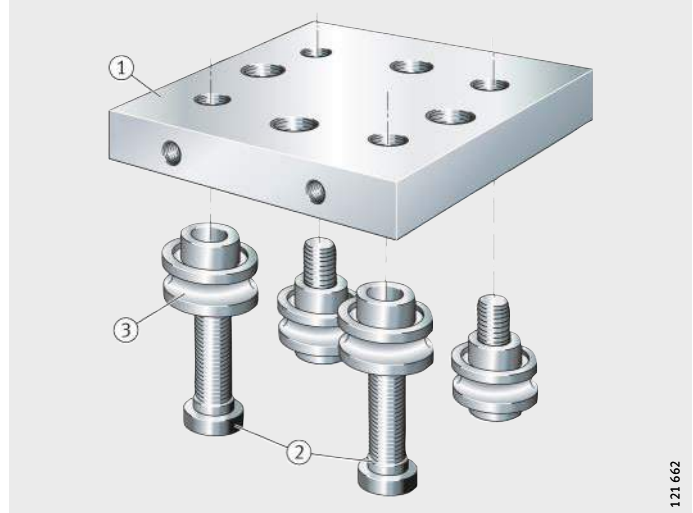
Track roller guidance system with open carriage

The robust, open carriage LFL..-SF is suitable where high performance linear guidance systems of a simple construction are required.

A carriage comprises a carriage plate made from anodised aluminium, four screws and four track rollers, *Figure 3*. The track rollers are already fitted.

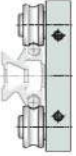
- ① Carriage plate
- ② Screws
- ③ Track roller

Figure 3
Open carriage



121 662

Preload and clearance	The carriages run clearance-free on all INA guideways, see page 42, and can be combined with all guideways of the relevant size, but not with the curved guideway elements LFSR. Due to the highly accurate guideways, it is not necessary to set the clearance.
Sealing and lubrication	<p>The track rollers have gap seals on both sides, are greased for life and are therefore maintenance-free.</p> <p>The raceways can be lubricated by means of lubrication and wiper units AB, see page 106. Their oil-soaked felt inserts can be replenished with oil via lubrication nipples. In combination with side plates ABAL, these units seal the end faces and longitudinal sides of the open carriage, see page 107.</p>
Corrosion-resistant design	<p>All steel parts, the inner and outer rings of the track rollers and the screws, washers and nuts are made from corrosion-resistant steel. The rolling elements are protected against corrosion by the grease.</p> <p>Corrosion-resistant designs have the suffix RB.</p>
Further information	<p>Further information is given on the following pages:</p> <ul style="list-style-type: none"> ■ dimension table, see page 60 ■ track rollers, see page 68 ■ guideways, see page 76 ■ accessories, see page 106.



Track roller guidance systems

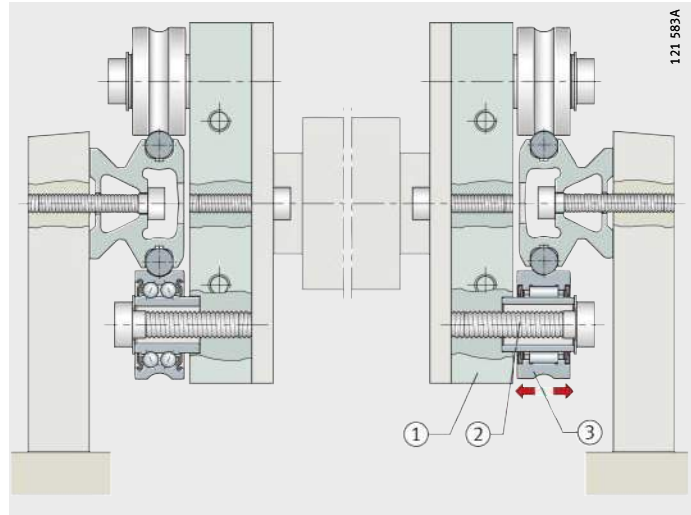
Track roller guidance system with non-locating bearing carriage


Non-locating bearing carriages LFL...-SF are robust, ready-to-fit linear guidance systems that are used exclusively in locating or non-locating bearing applications with two parallel guideway systems. The track rollers can be axially displaced. In this way, it is possible to compensate inaccuracies of ± 1 mm in relation to the spacing of the guideways.

A carriage comprises a carriage plate made from anodised aluminium, four screws and four non-locating bearing track rollers, *Figure 4*. The track rollers are already fitted.

- ① Carriage plate
- ② Screw
- ③ Non-locating bearing track roller

Figure 4
Non-locating bearing carriage



- Preload and clearance** The carriages run clearance-free on all INA guideways, see page 42, and can be combined with all guideways of the relevant size, but not with the curved guideway elements LFSR. Due to the highly accurate guideways, it is not necessary to set the clearance.
- Sealing and lubrication** The track rollers have gap seals on both sides, are greased for life and are therefore maintenance-free.
The contact zone between the raceways and track rollers must be lubricated via the shaft.
- Corrosion-resistant design** All steel parts, the inner and outer rings of the track rollers and the screws, washers and nuts are made from corrosion-resistant steel.
The rolling elements are protected against corrosion by the grease. Corrosion-resistant designs have the suffix RB (available by agreement only).
-  Non-locating bearing carriages must never be used on their own but only ever in combination with locating bearing carriages.
The track rollers can support loads in a radial direction only.
- Further information** Further information is given on the following pages:
- dimension table, see page 62
 - track rollers, see page 68
 - guideways, see page 76
 - accessories, see page 106.



Track roller guidance systems

Track roller guidance system with bogie carriage

Bogie carriages LFDL...-B and LFDL...-SF can be used in combination with curved guideway elements LFSR...-ST to achieve almost any variant of oval and circular track guidance systems. The straight guideway elements are precisely matched to the arc.

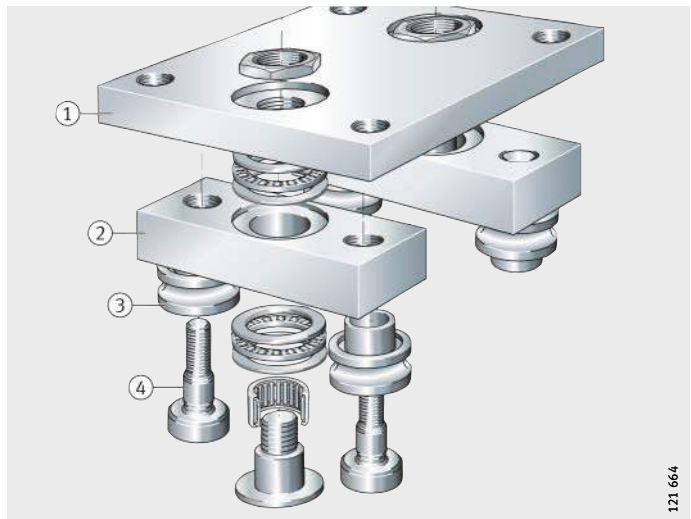
The carriages LFDL...-B and LFDL...-SF comprise a steel carriage plate, two aluminium swivel brackets (supported axially and radially by rolling bearings). In the case of LFDL...-B, the preload of the four profiled track rollers can be set by means of two concentric and two eccentric bolts. In the case of LFDL...-SF, the preload is already preset to the optimum value by means of four concentric bolts, *Figure 5*.



LFDL...-SF cannot be mounted on closed curved guideway systems.

- ① Carriage plate
- ② Bracket
- ③ Track roller
- ④ Concentric bolt

Figure 5
Bogie carriage



121 664

Sealing and lubrication The track rollers have gap seals on both sides, are greased for life and are therefore maintenance-free.

The contact zone between the raceways and track rollers must be lubricated via the shaft.

Corrosion-resistant design All steel parts, the inner and outer rings of the track rollers and the bolts, washers and nuts are made from corrosion-resistant steel. The rolling elements are protected against corrosion by the grease. Corrosion-resistant designs have the suffix RB (available by agreement only).



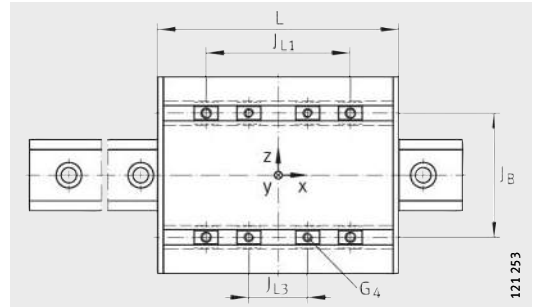
The adjustable carriage LFDL..-B must be used in combination with a 360° guideway.

Further information Further information is given on the following pages:

- dimension table, see page 64
- track rollers, see page 68
- guideways, see page 76
- accessories, see page 106.



Track roller guidance system with hollow section carriage



LFCL with LFS (-C, -CE, -CEE, -E, -EE, -NZZ, -M, -F)
View rotated 90°

Dimension table - Dimensions in mm

Carriage ¹⁾	Mass m ≈ kg	Track roller ²⁾	For shaft diameter	Dimensions			Mounting dimensions		
				H ₁	B	L	J _B	J _{B1}	J _{B2}
LFCL25	0,44	LFR50/8-6-2Z	6	30,5	80	110	47	47	69
LFCL42	1	LFR5201-10-2Z	10	38,1	116	150	73	73	98,5
LFCL86⁴⁾	2,2	LFR5301-10-2Z	10	48,4	190	235	124	124	151,5

Ordering designations

Corrosion-resistant design: LFCL...-RB, LFS...-RB with LFR...-2RSR-RB.
Guideways without holes: LFS...-OL.

① Threaded slot for screws M3.

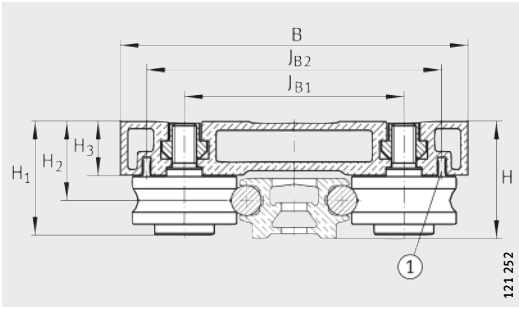
- 1) The design of the hollow sections is dependent on the size.
- 2) For ordering of replacement parts, please contact us.
- 3) The guideway LFS...-M can only be combined with carriages with adjustable clearance.
If SF and LFCL carriages are to be used, please contact us in advance.
- 4) Additional T-slot in the centre of the carriage.

Basic load ratings¹⁾

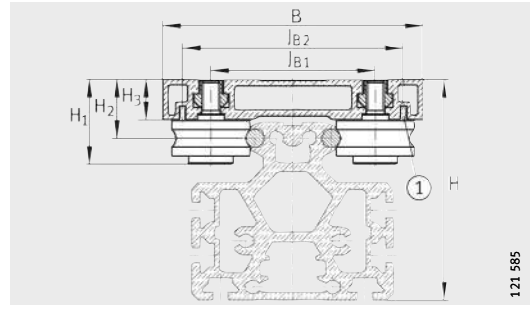
Carriage	Guideway	Track roller ²⁾	Basic load ratings						
			C _y N	C _{0y} N	C _z N	C _{0z} N	M _{0x} Nm	M _{0y} Nm	M _{0z} Nm
LFCL25	LFS25	LFR50/8-6-2Z	4 600	2 400	7 320	4 500	25	120	65
LFCL42	LFS42	LFR5201-10-2Z	10 200	5 480	16 900	10 000	85	425	230
LFCL86	LFS86	LFR5301-10-2Z	17 800	8 850	28 400	15 500	335	1 190	680

1) Basic load ratings in combination with LFS...-RB: see page 18.

2) For ordering of replacement parts, please contact us.



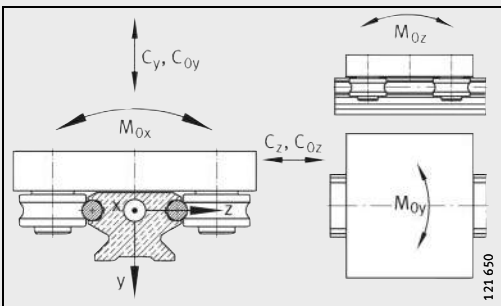
LFCL with LFS (-C, -CE, -CEE, -E, -EE, -N, -NZZ)



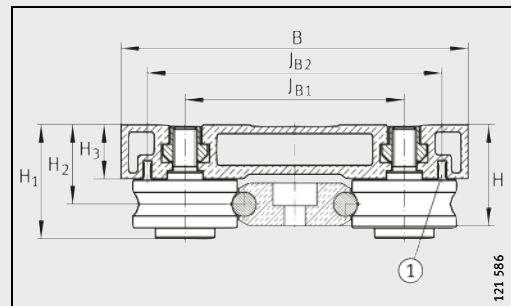
LFCL with LFS..-M³)



J _{L1}	J _{L3}		H ₂	H ₃	G ₄	Maximum screw depth for G ₄	Total height H of carriage and guideway		
	min.	max.					LFS (-C, -CE, -CEE, -E, -EE, -N, -NZZ)	LFS-F	LFS..-M ³)
58	13	32	+0,3	15,4	M6	10	32,1	—	63,1
85	15	55	26,4	18	M8	12	39	33,9	—
155	18	119	33,9	23,4	M10	14	59	—	—

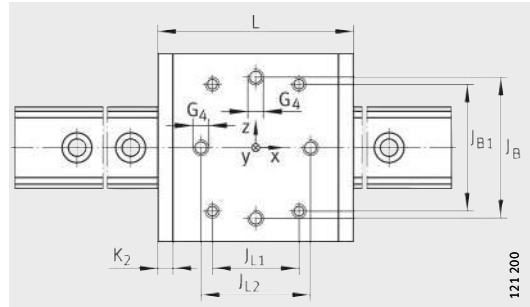


Load directions



LFCL with LFS..-F

Track roller guidance system with compact carriage



LFKL-SF with LFS (-C, -CE, -CEE, -E, -EE, -NZZ, -M, -F, -FE)
View rotated 90°

Dimension table - Dimensions in mm

Carriage	Mass m ≈ kg	Track roller ¹⁾	For shaft diameter	Dimensions			Mounting dimensions		
				H ₁	B	L	J _B ±0,2	J _{B1}	K ₂
LFKL20-SF	0,2	LFR50/5-4-2Z	4	20,5	56	69	39	34	5
LFKL25-SF	0,3	LFR50/5-6-2Z	6	23,5	65	85	50	40	5
LFKL32-SF	0,7	LFR50/8-6-2Z	6	32	86	112	59	54	7
LFKL52-SF	1,5	LFR5201-10-2Z	10	46,1	130	136	90	83	10
LFKL52-E-SF	2,9	LFR5301-10-2Z	10	53,8	145	186	105	90	10
LFKL52-EE-SF	4,3	LFR5302-10-2Z	10	55	155	205	115	95,2	10

Ordering designation

Corrosion-resistant design: LFKL..-SF-RB, LFS..-RB with LFR..-2RSR-RB.

Guideways without holes: LFS..-OL.

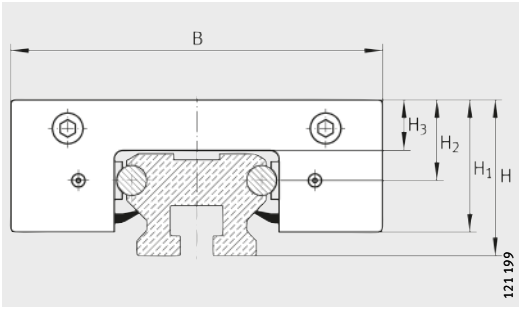
- 1) For ordering of replacement parts, please contact us.
- 2) Tightening torque for track roller bolts, concentric bolts are supplied tightened to M_A.
- 3) The guideway LFS..-M can only be combined with carriages with adjustable clearance. If these are to be used, please contact us in advance.

Basic load ratings¹⁾

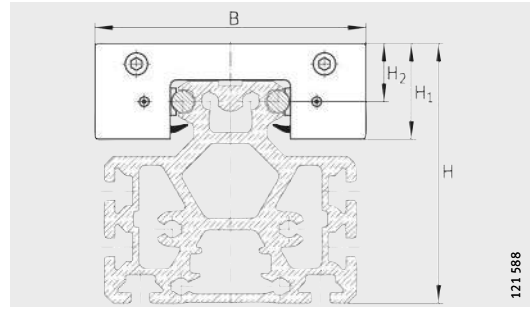
Carriage	Guideway	Track roller ²⁾	Basic load ratings						
			C _y N	C _{0y} N	C _z N	C _{0z} N	M _{0x} Nm	M _{0y} Nm	M _{0z} Nm
LFKL20-SF	LFS20	LFR50/5-4-2Z	1 350	870	2 400	1 700	7	28	15
LFKL25-SF	LFS25	LFR50/5-6-2Z	1 280	820	2 580	1 800	8	40	18
LFKL32-SF	LFS32	LFR50/8-6-2Z	4 100	2 400	6 600	4 200	30	130	70
LFKL52-SF	LFS52	LFR5201-10-2Z	10 000	5 200	16 800	10 000	110	290	150
LFKL52-E-SF	LFS52-E	LFR5301-10-2Z	17 800	8 900	28 400	15 500	180	800	460
LFKL52-EE-SF	LFS52-EE	LFR5302-10-2Z	20 000	10 000	32 400	18 200	215	1 100	620

1) Basic load ratings in combination with LFS..-RB: see page 18.

2) For ordering of replacement parts, please contact us.



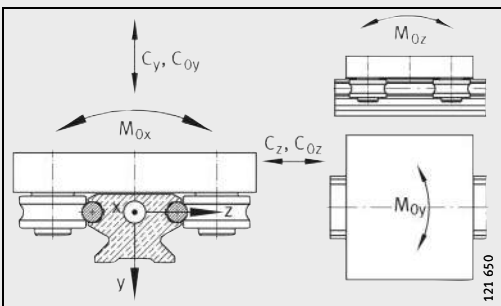
LFKL-SF with LFS (-C, -CE, -CEE, -E, -EE, -NZZ)



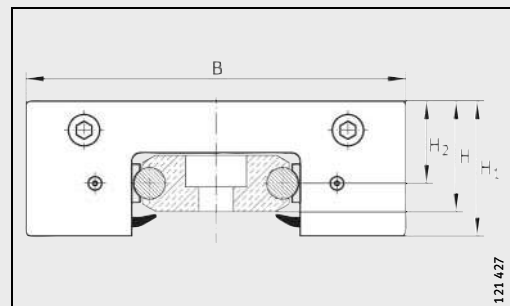
LFKL with LFS...M³⁾



J _{L1}	J _{L2}	H ₂	H ₃	G ₄	M _A ²⁾		Total height H of carriage and guideway		
					Standard Nm	Corrosion-resistant Nm	LFS (-C, -CE, -CEE, -E, -EE, -NZZ)	LFS-F (-FE)	LFS-M ³⁾
	±0,2	+0,3							
34	49	13	8,7	M5	2,5	2,5	22	-	-
45	60	14,4	9	M5	2,5	2,5	25	-	56
60	70	20,5	14	M8	15	12	35,5	25,5	81,5
60	70	29,2	19,4	M10	40	23	54,3	38,2	118,9
105	110	35,3	24	M10	40	23	60,4	44,3	125
120	140	35,3	24	M12	70	39	60,4	44,3	125

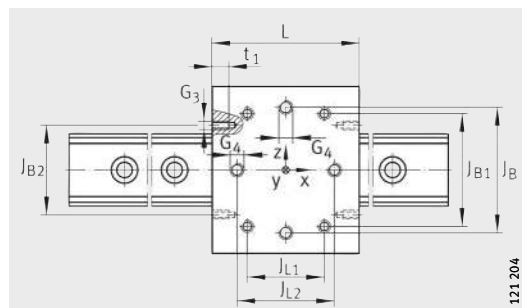


Load directions



LFKL-SF with LFS..-F (-FE)

Track roller guidance system with open carriage



LFL-SF with LFS (-C, -CE, -CEE, -E, -EE, -NZZ, -M, -F, -FE)
View rotated 90°

Dimension table - Dimensions in mm

Carriage	Mass m ≈ kg	Track roller ¹⁾	For shaft diameter	Dimensions			Mounting dimensions					
				H ₁	B	L	J _B	J _{B1}	J _{B2}	J _{L1}	J _{L2}	
LFL20-SF	0,16	LFR50/5-4-2Z	4	20,5	55	50	±0,2	40	34	-	24	38
LFL32-SF	0,4	LFRI50/8-6-2Z	6	30	80	90	59	54	56	60	70	
LFL52-SF	1	LFRI5201-10-2Z	10	43,2	120	100	90	83,2	65	60	70	
LFL52-E-SF	1,9	LFRI5301-10-2Z	10	53,8	135	150	105	90	65	105	110	

Ordering designation

Corrosion-resistant design: LFL...SF-RB, LFS...RB with LFR...2RSR-RB.

Guideways without holes: LFS...OL.

Corrosion-resistant design available by agreement.

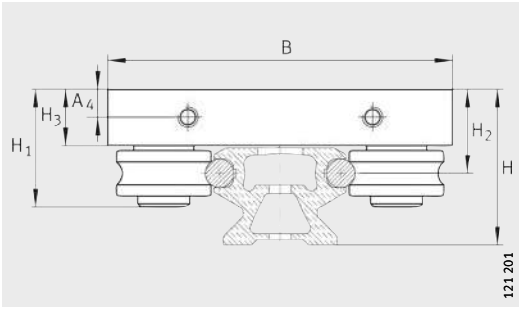
- 1) For ordering of replacement parts, please contact us.
- 2) Tightening torque for track roller bolts, concentric bolts are supplied tightened to M_A.
- 3) The guideway LFS...M can only be combined with carriages with adjustable clearance. If SF and LFCL carriages are to be used, please contact us in advance.

Basic load ratings¹⁾

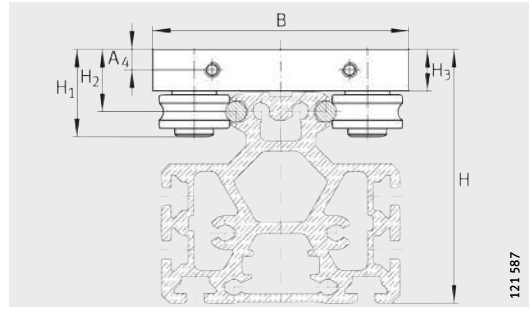
Carriage	Guideway	Track roller ²⁾	Basic load ratings						
			C _y N	C _{0y} N	C _z N	C _{0z} N	M _{0x} Nm	M _{0y} Nm	M _{0z} Nm
LFL20-SF	LFS20	LFR50/5-4-2Z	1 350	870	2 400	1 700	7	20	10
LFL32-SF	LFS32	LFR50/8-6-2Z	4 100	2 400	6 600	4 200	30	130	70
LFL52-SF	LFS52	LFRI5201-10-2Z	10 000	5 200	16 800	10 000	110	290	150
LFL52-E-SF	LFS52-E	LFRI5301-10-2Z	17 800	8 900	28 400	15 500	180	800	460

¹⁾ Basic load ratings in combination with LFS...RB: see page 18.

²⁾ For ordering of replacement parts, please contact us.



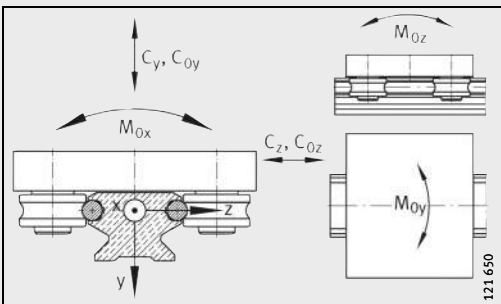
LFL-SF with LFS (-C, -CE, -CEE, -E, -EE, -NZZ)



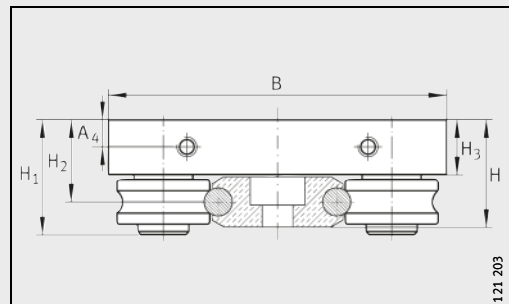
LFL with LFS..-M³)



t ₁	H ₂	H ₃	A ₄	G ₃	G ₄	M _A ²⁾		Total height H of carriage and guideway		
						Standard Nm	Corrosion-resistant Nm	LFS (-C, -CE, -CEE, -E, -EE, -NZZ)	LFS-F (-FE)	LFS-M ³⁾
-	+0,3	9	-	-	M5	2,5	2,5	22	-	-
7	20,5	14	7	M6	M8	15	12	35,5	25,5	81,5
12	29,2	19,5	9,75	M6	M10	40	23	54,3	38,2	118,9
12	35,3	24	12	M6	M10	40	23	60,4	44,3	125

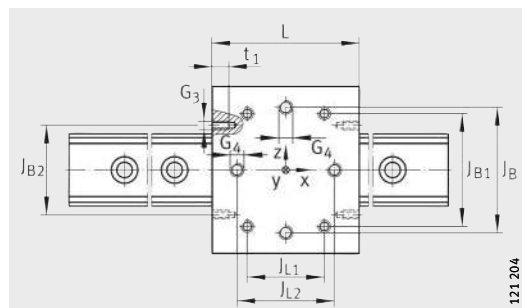


Load directions



LFL-SF with LFS..-F (-FE)

Track roller guidance system with non-locating bearing carriage



LFL with LFS (-C, -CE, -CEE, -E, -EE, -NZZ, -M, -F, -FE)
View rotated 90°

Dimension table - Dimensions in mm

Carriage	Mass m ≈ kg	For shaft diameter	Dimensions			Mounting dimensions			
			H ₁	B	L	J _B ±0,2	J _{B1}	J _{B2}	J _{L1}
LFL32-SF	0,4	6	32,5	80	90	59	54	56	60
LFL52-SF	1	10	45	120	100	90	83	65	60

Ordering designation

Guideways without holes: LFS..-OL.

Corrosion-resistant design available by agreement.

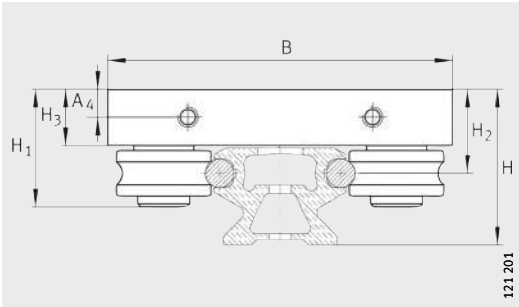
- 1) LFL32-SF: ±0,5 axial displacement capacity.
- 2) LFL52-SF: ±1 axial displacement capacity.

Basic load ratings¹⁾

Carriage	Guideway	Track roller ²⁾	Basic load ratings		
			C _z N	C _{0z} N	M _{0y} Nm
LFL32-SF	LFS32	LFR22/8-6-2RSR-RNA + IR.LFL32	9 000	8 000	250
LFL52-SF	LFS52	LFR2202-10-2RSR-RNA + IR.LFL52	17 000	19 000	550

1) Basic load ratings in combination with LFS..-RB: see page 18.

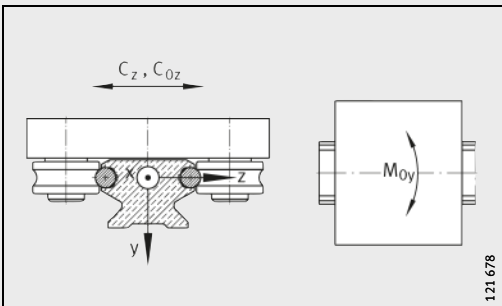
2) For ordering of replacement parts, please contact us.



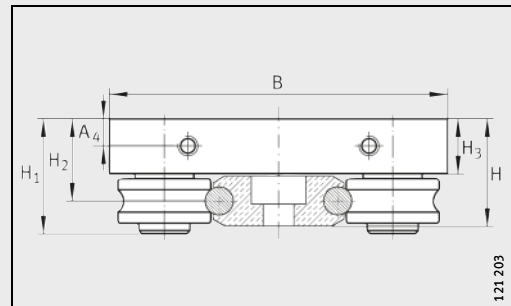
LFL with LFS (-C, -CE, -CEE, -E, -EE, -NZZ)



							Total height H of carriage and guideway	
l_{L2}	t_1	H_2	H_3	A_4	G_3	G_4	LFS (-C, -CE, -CEE, -E, -EE, -NZZ)	LFS-F (-FE)
$\pm 0,2$								
70	7	20,5 ¹⁾	13,75	7	M6	M8	35,5 ¹⁾	25,5 ¹⁾
70	12	29,2 ²⁾	19,5	9,75	M6	M10	54,3 ²⁾	38,2 ²⁾

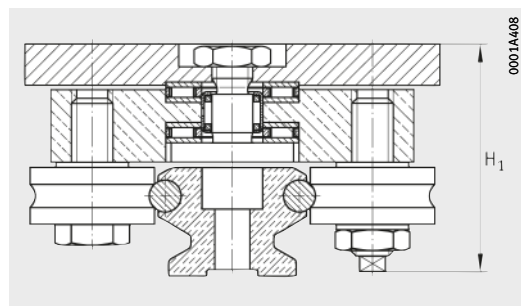


Load directions



LFL with LFS..-F (-FE)

Track roller guidance system with bogie carriage



LFDL...-B with LFS (-C, -CE, -CEE, -E, -EE, -NZZ)

Dimension table - Dimensions in mm

Carriage ¹⁾	Mass m ≈ kg	Track roller ²⁾	For shaft diameter	Dimensions			Mounting dimensions	
				H ₁	B	L	J _B	J _{B1}
LFDL32-B	1	LFR50/8-6-2Z	6	43	80	100	60	54
LFDL32-SF				37				
LFDL52-B	2,5	LFR5201-10-2Z	10	65,1	120	150	90	83
LFDL52-SF				55				

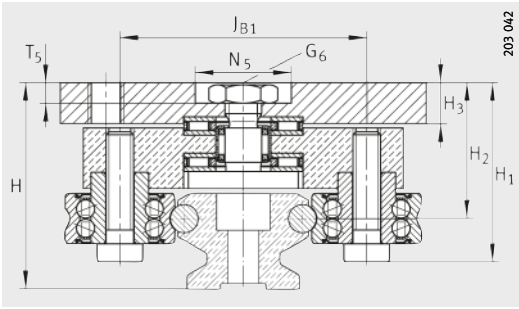
Corrosion-resistant design available by agreement.

- 1) In order to protect the raceways, the carriages can also be fitted with the lubrication and wiper unit AB (special accessory). Please contact us.
- 2) For ordering of replacement parts, please contact us.
- 3) Tightening torque for track roller bolts, concentric bolts are supplied tightened to M_A.

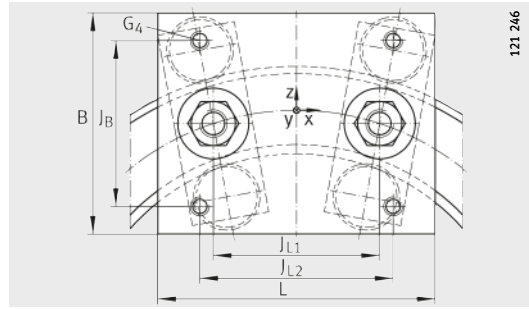
Basic load ratings¹⁾

Carriage	Guideway	Track roller ²⁾	Basic load ratings						
			C _y N	C _{0y} N	C _z N	C _{0z} N	M _{0x} Nm	M _{0y} Nm	M _{0z} Nm
LFDL32-B	LFS32	LFR50/8-6-2Z	4 100	2 400	6 600	4 200	30	130	70
LFDL32-SF	LFS32	LFR50/8-6-2Z							
LFDL52-B	LFS52	LFR5201-10-2Z	10 000	5 200	16 800	10 000	110	380	200
LFDL52-B-SF	LFS52	LFR5201-10-2Z							

- 1) Basic load ratings in combination with LFS...-RB: see page 18.
- 2) For ordering of replacement parts, please contact us.



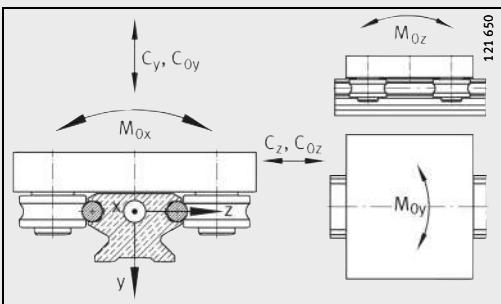
LFDL-SF with LFS (-C, -CE, -CEE, -E, -EE, -NZZ)



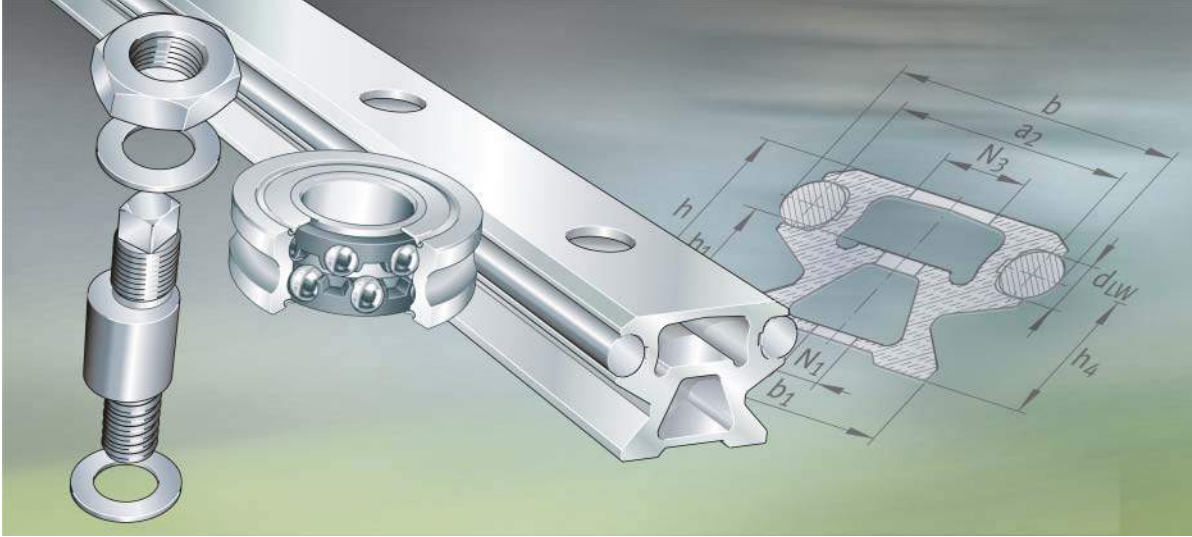
Top view



J_{L1}	J_{L2}	H_2 +0,3	H_3	T_5	G_4	N_5	G_6	$M_A^{(3)}$ Standard Nm	Total height H of carriage and guideway LFS (-C, -CE, -CEE, -E, -EE, -NZZ)
60	70	29,2	9	5	M8	21	M8	15	44,2
76	90	41	11	6	M10	26	M10	40	66,1



Load directions



Track rollers
Bolts
Guideways

Track rollers, bolts, guideways

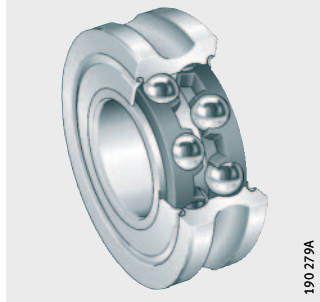
	Page
Product overview Track rollers	68
Features	69
Possible combinations of track rollers and guideways	71
Design and safety guidelines Adjacent construction for non-locating bearing track rollers.....	72
Product overview Bolts	73
Features	74
Product overview Guideways	76
Features	78
Design and safety guidelines Hole patterns of guideways.....	80
Dimension tables Locating bearing track rollers	84
Bolts	88
Non-locating bearing track rollers	90
Possible combinations of track rollers and bolts	91
Guideways	94
Closed oval tracks with guideway connectors VBS	102



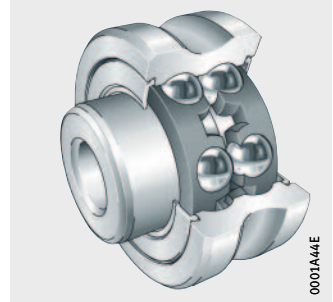
Product overview Track rollers

Locating bearing track roller

LFR

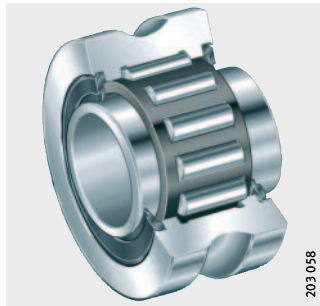


LFRI

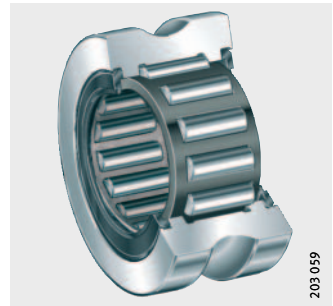


Non-locating bearing track roller

LFR..-2RSR-NA



LFR..-2RSR-RNA



Track rollers

Features

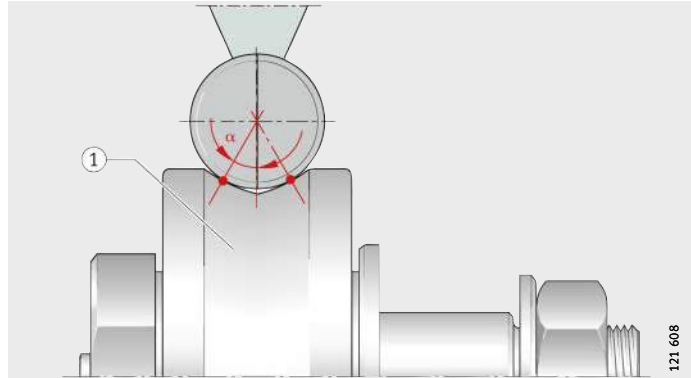
Track rollers LFR are double row angular contact ball bearings comprising an outer ring with a gothic arch profile, an inner ring and two ball and cage assemblies with plastic cages. The inner ring and outer ring are made from rolling bearing steel 100Cr6.

The special outer ring gives two point contact in the contact zone with the raceway, *Figure 1*. The contact angle α is a maximum of 30° .

The bearings can support axial forces from both directions as well as radial forces.

$\alpha = 30^\circ$
① Gothic arch raceway groove

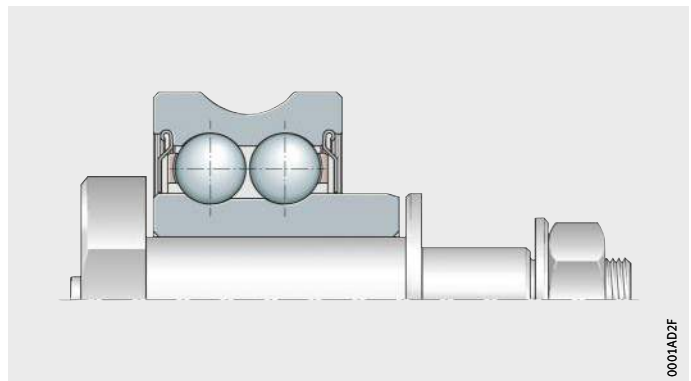
Figure 1
Gothic arch, two point contact, contact angle



Track roller with extended inner ring

Track rollers LFRI are double row angular contact ball bearings. They differ from track rollers LFR in that they have an extended inner ring. This allows exact positioning in the adjacent construction. The inner ring is mounted by means of a standard screw (for example ISO 4762) in a fit hole (preferably grade F6). The fixing screw is not included in the scope of delivery. The operating clearance of track rollers with an extended inner ring cannot be set by means of eccentric bolts.

Figure 2
Track roller LFRI with fixing screw



Track rollers

Sealing and lubrication

Gap seals on both sides protect the rolling element system against contamination. Bearings with this seal type have the suffix 2Z.

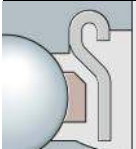
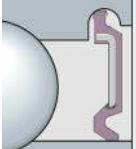
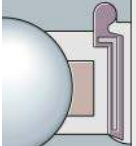
The track rollers are also available on request with contact seals on both sides, suffix 2RS and 2RSR.

The track rollers are greased for life and are therefore maintenance-free. From outside diameter ≥ 52 mm, the inner ring has a lubrication bore.

Seal types

Seal types and their specific features: see table.

Specific features

2Z seal	
	Gap seal: <ul style="list-style-type: none">■ not radially preloaded■ low friction■ to be used with low levels of contamination
2RSR seal	
	Contact seal: <ul style="list-style-type: none">■ radially preloaded■ to be used with higher requirements for sealing action and under heavy contamination
2RS seal	
	Contact seal: <ul style="list-style-type: none">■ axially preloaded■ to be used with higher requirements for sealing action and under heavy contamination

Corrosion-resistant design

The inner ring and outer ring are made from corrosion-resistant steel. The rolling elements are protected against corrosion by the grease.

Corrosion-resistant designs have contact seals and the suffix 2RS-RB or 2RSR-RB.

Accuracy and internal clearance

The dimensional and geometrical accuracies correspond to tolerance class PN to DIN 620.

The radial internal bearing clearance corresponds approximately to internal clearance group Group N in accordance with ISO 5753-1; internal clearance classes: see Catalogue HR 1, Rolling Bearings.

Further information

Further information is given on the following pages:

- dimension tables, see page 90 and page 91
- bolts, see page 73
- guideways, see page 76
- accessories, see page 106.

Possible combinations of track rollers and guideways

The tables show the possible combinations of track rollers with the guideways LFS and shaft and support rail unit TS.

Combinations with guideways LFS

Width and shaft diameter ¹⁾		Track roller LFR					
LFS	d _{LW}	50/5-4	50/5-6	50/8-6	5201-10	5301-10	5302-10
20	4	●	–	–	–	–	–
25	6	–	●	●	–	–	–
32	6	–	–	●	–	–	–
42	10	–	–	–	●	●	●
52	10	–	–	–	●	●	●
86	10	–	–	–	●	●	●
120	10	–	–	–	●	●	●

● available size

¹⁾ Width b and shaft diameter d_{LW}: see dimension tables for guideways.

Combinations with guideways LFS (continued)

Width and shaft diameter ¹⁾		Track roller LFR1	
LFS	d _{LW}	50/8-6	5201
20	4	–	–
25	6	●	–
32	6	●	–
42	10	–	●
52	10	–	●
86	10	–	●
120	10	–	●

● available size

¹⁾ Width b and shaft diameter d_{LW}: see dimension tables for guideways.



Combinations with shaft and support rail units TS¹⁾

Shaft diameter d _{LW} ¹⁾	Track roller LFR						
	5201-12	5204-16	5206-20	5206-25	5207-30	5208-40	5308-50
12	●	–	–	–	–	–	–
16	–	●	–	–	–	–	–
20	–	–	●	–	–	–	–
25	–	–	–	●	–	–	–
30	–	–	–	–	●	–	–
40	–	–	–	–	–	●	–
50	–	–	–	–	–	–	●

● available size

¹⁾ Shaft and support rail units TS and shaft diameter d_{LW}: see Catalogue WF 1, Shaft Guidance Systems.



Track rollers

Design and safety guidelines Adjacent construction for non-locating bearing track rollers

For non-locating bearing track rollers without an inner ring, the rolling element raceway on the shaft must be hardened and ground. The surface hardness must be 670 HV + 170 HV. The hardening depth CHD or SHD must be sufficiently large.

Design of the shaft: see table.

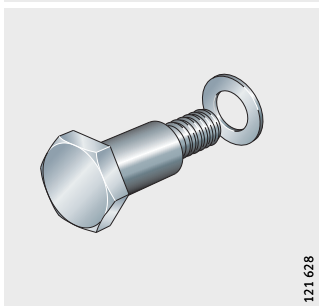
Tolerances and surface data for the shaft raceway

Diameter tolerance of shafts		Roughness	Roundness	Parallelism
without inner ring	with inner ring			
		max.	max.	max.
k5	g6 (under point load)	Ra 0,4 (Rz 2)	25% of diameter tolerance	50% of diameter tolerance

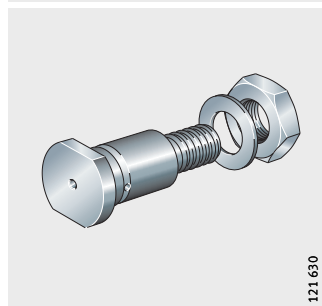
Product overview Bolts

Concentric

LFZ

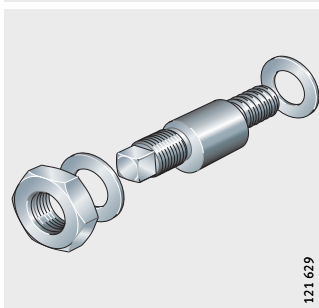


LFZ..-A1

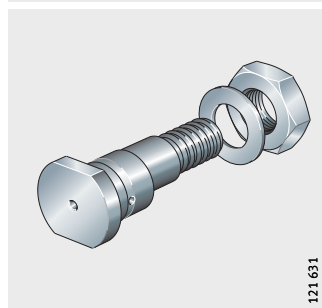


Eccentric

LFE



LFE..-A1



Bolts

Features

The bolts, which are made from high strength screw steel, are available with a concentric and eccentric collar; designation LFZ or LFE. Depending on their intended purpose, they are supplied with a washer, nut, drive fit lubrication nipple and sealing cap, see table. The eccentric designs LFE and LFE..-A1 allow the track roller guidance systems to be set clearance-free.

Delivered condition

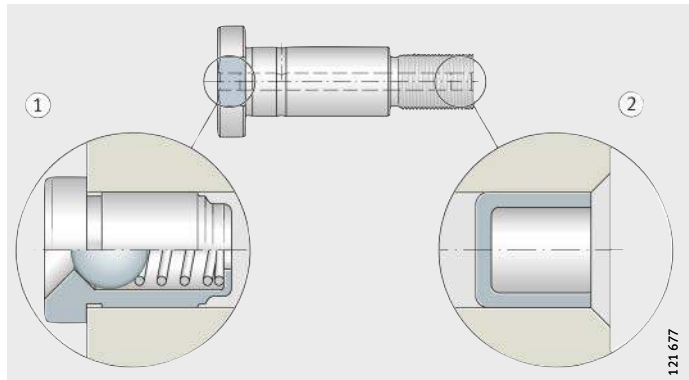
Designation and suffix	Scope of delivery	Design
LFZ	Concentric bolt with washer	Standard
LFE	Eccentric bolt with washer and nut	Standard
LFZ..-A1 LFE..-A1	Concentric or eccentric bolt with washer and nut, drive fit lubrication nipple and sealing cap	Standard
NIP-A2	Drive fit lubrication nipple	Accessory
VD2	Sealing cap	Accessory

Lubrication

Bolts LFZ..-A1 and LFE..-A1 (from size 20) have a lubrication hole. Track rollers of outside diameter ≥ 52 mm can be lubricated via this hole. A lubrication nipple NIP-A2 can be pressed into the hole, *Figure 1*. If the hole will not be used for relubrication, it must be closed off using the sealing cap VD2.

- ① Drive fit lubrication nipple NIP-A2
- ② Sealing cap VD2

Figure 1
Drive fit lubrication nipple
and sealing cap



Corrosion-resistant design

In this case, the bolts, washers and nuts are made from corrosion-resistant steel. These designs have the suffix RB.

Further information

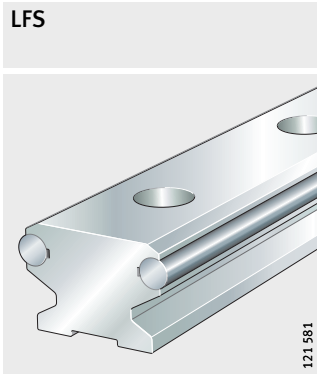
Further information is given on the following pages:

- dimension tables, see page 84
- track rollers, see page 68
- guideways, see page 76
- accessories, see page 106.

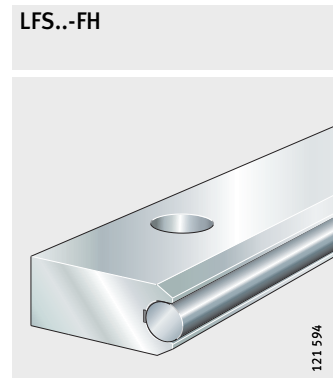
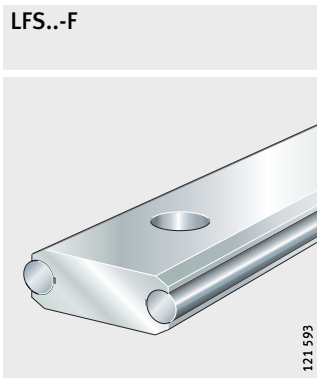


Product overview Guideways

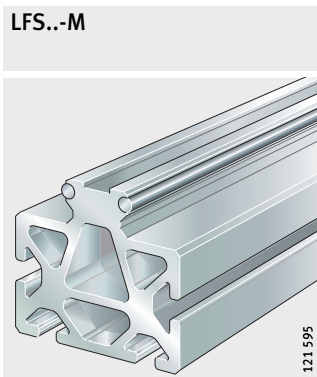
Solid profile
Hollow section profile



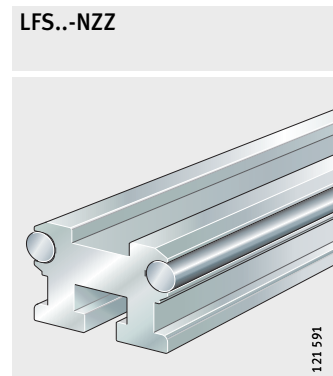
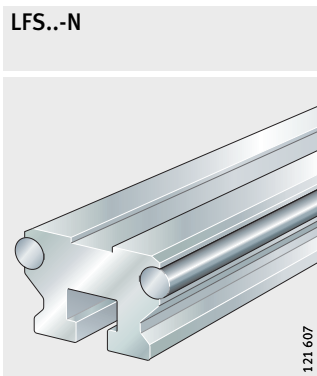
Flat design
Two raceways or one raceway



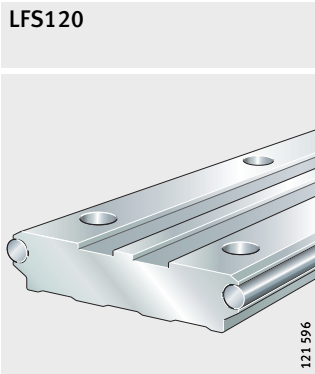
Profiled section support rail



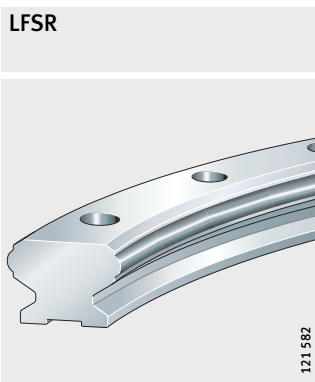
With slots
For toothed racks or toothed belts



Wide, flat design
For toothed racks or toothed belts



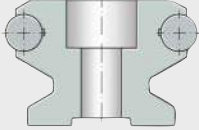
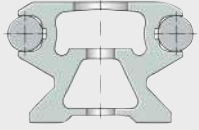

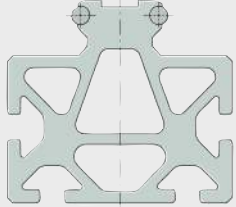
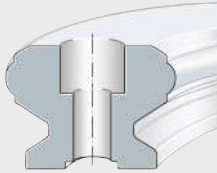
Curved guideway element





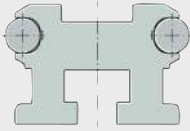
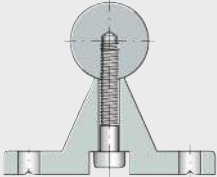
Guideways

Features Guideway designs: see table.

Designs

Guideway	Design
LFS 	<ul style="list-style-type: none"> ■ With solid profile for location from above through holes
LFS..-C 	<ul style="list-style-type: none"> ■ With hollow section profile (low mass) ■ Location from above through holes ■ The end faces of the hollow sections are closed off using plastic end covers
LFS..-F 	<ul style="list-style-type: none"> ■ Flat guideway ■ Preferably for applications with stationary carriage and moving guideway ■ Location from above through holes
LFS..-M 	<ul style="list-style-type: none"> ■ With support rail giving high bending rigidity ■ The guideway can be incorporated in modular constructions by means of slots. The slots are designed for nuts to DIN EN ISO 4032 and T-nuts to DIN 508 ■ The hollow sections are closed off using plastic end covers. Special plastic end covers are available for the slot closing strips
LFSR 	<ul style="list-style-type: none"> ■ Curved guideway element made from steel ■ Location from above through holes ■ Combinations of curved guideway elements or of curved guideway elements and straight guideways should be treated in the same way as multi-piece guideways and must always be ordered together

**Designs
continued**

Guideway	Design
<p>LFS120</p> 	<ul style="list-style-type: none"> ■ Wide, low guideway ■ With recesses for toothed racks or toothed belts ■ Location from above through holes
<p>LFS..-FH</p> 	<ul style="list-style-type: none"> ■ Flat guideway with only one shaft as raceway ■ Mainly for applications with increased support spacing ■ Location from above through holes
<p>LFS32-N, LFS..-NZZ</p> 	<ul style="list-style-type: none"> ■ With T-slot for location from below ■ The upper slot in the guideways and the lateral slots are suitable for toothed racks or toothed belts ■ Supplied with special support washers for the fixing screws; the quantity is based on the length of the guideway
<p>TSN</p> 	<ul style="list-style-type: none"> ■ Composite guideway, aluminium support rail with screw mounted raceway shaft ■ Location from above ■ See Catalogue WF 1, Shaft Guidance Systems



**Guideways
without fixing holes**

All LFS guidances with the exception of LFSR are also available without fixing holes; suffix OL.

Guideways

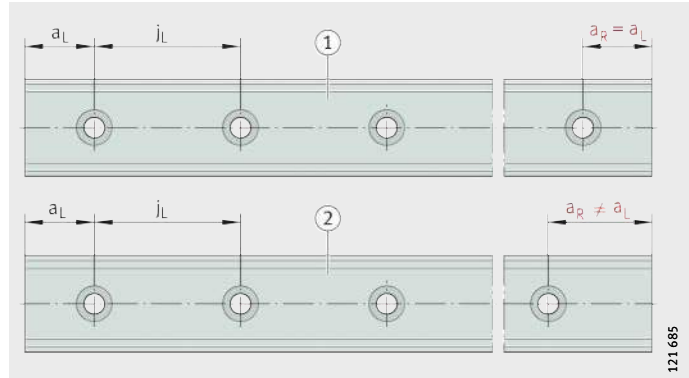
Design and safety guidelines Guideway hole patterns

Unless specified otherwise, guideways have a symmetrical hole pattern, *Figure 1*.

Upon request, an asymmetrical hole pattern may be available. In this case, $a_L \geq a_{L \min}$ and $a_R \geq a_{R \min}$.

- ① Symmetrical hole pattern
- ② Asymmetrical hole pattern

Figure 1
Hole patterns of guideways with one row of holes

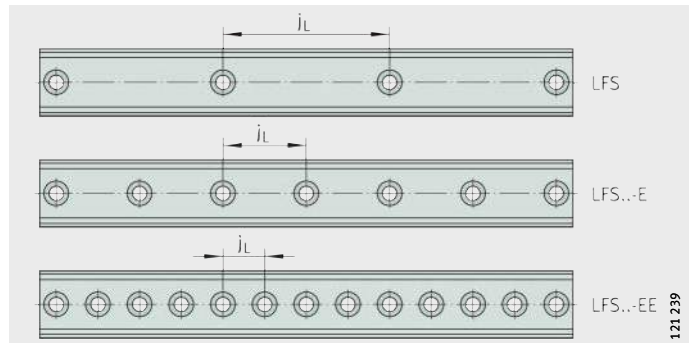


Hole pitch values

The hole pitch values j_L are stated in the dimension tables. For high loads, guideways are available with reduced hole pitch values j_L , *Figure 2*.

These guideways have the suffix E or EE; examples: LFS...-E, LFS...-EE.

Figure 2
Hole spacings j_L



Maximum number of pitches between holes

The number of pitches between holes is the rounded down whole number equivalent to:

$$n = \frac{l - 2 \cdot a_{L \min}}{j_L}$$

The spacings a_L and a_R are generally determined as follows:

$$a_L + a_R = l - n \cdot j_L$$

For guideways with a symmetrical hole pattern:

$$a_L = a_R = \frac{1}{2} \cdot (l - n \cdot j_L)$$

Number of holes:

$$x = n + 1$$

n	-
Maximum possible number of pitches between holes	
l	mm
Guideway length	
$a_{L \min}, a_{R \min}$	mm
Minimum values for a_L, a_R , see dimension tables	
j_L	mm
Spacing between holes	
a_L, a_R	mm
Spacing between start or end of guideway and nearest hole	
x	-
Number of holes.	



If the minimum values for a_L and a_R are not observed, the counter-boreds of the holes may be intersected.



Guideways

Guideways without holes All guideways LFS are also available without holes, with the exception of LFSR. These guideways have the suffix OL, for example LFS.-OL.

Multi-piece guideways If the guideway length required is greater than l_{max} , the guideways are assembled from two or more sections matched to each other and marked accordingly. The sections may be of different lengths. The guideway joint is always arranged centrally between the fixing holes, *Figure 3*.

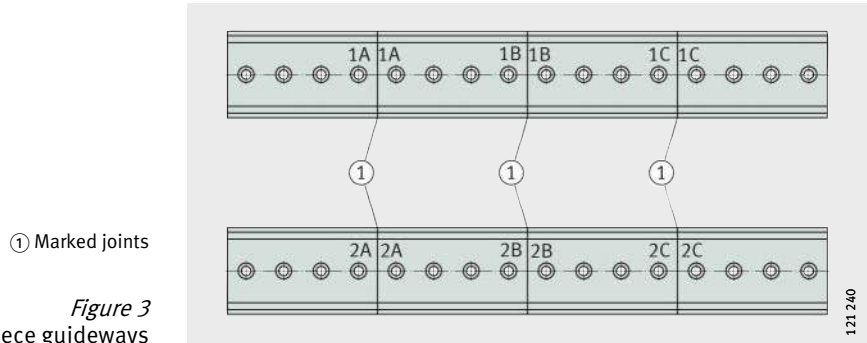


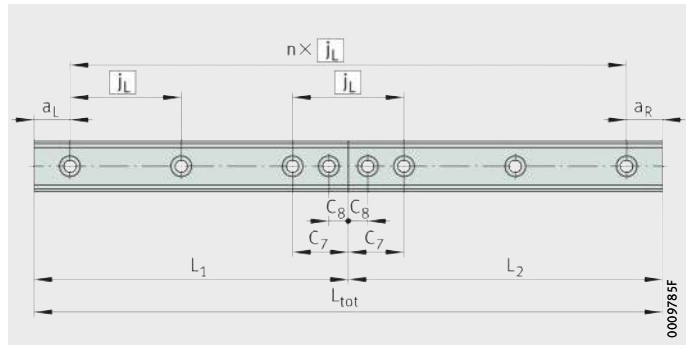
Figure 3
Multi-piece guideways

Accuracy of joint position In order to achieve accuracy of the joint position, additional fixing is recommended for guideways from size 32 if the spacing C7 is larger than the stated limit value, see table and *Figure 4*, page 83. In these cases, the guideways are supplied with the additional fixing hole already made.

Spacings for additional hole

Guideway	Spacing between hole and end of guideway	
	C7 Limit value mm	C8 Limit value mm
LFS32 (-C, -F)	30	11
LFS42-C	50	17
LFS52 (-C, -F)	50	17
LFS86-C	50	17
LFS120	50	17

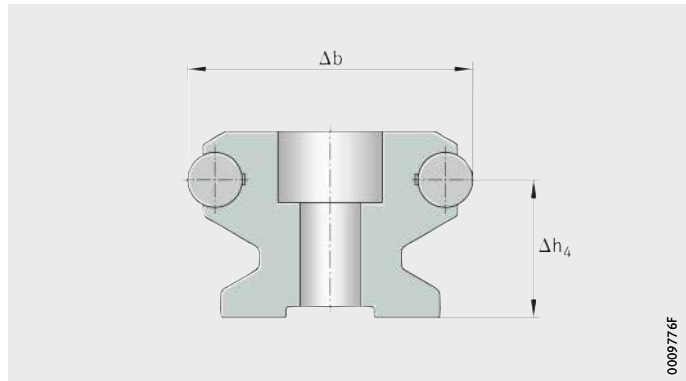
Figure 4
Additional hole



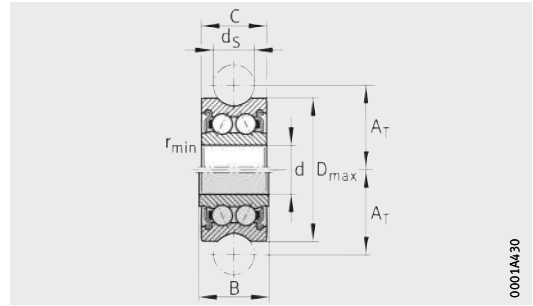
Two guideways LFS can have a deviation relative to each other at the joint position of:

- $\Delta b = \pm 0,01 \text{ mm}$
- $\Delta h_4 = \pm 0,05 \text{ mm}$, Figure 5.

Figure 5
Deviation at the joint position
on guideways assembled
from sections



Locating bearing track rollers



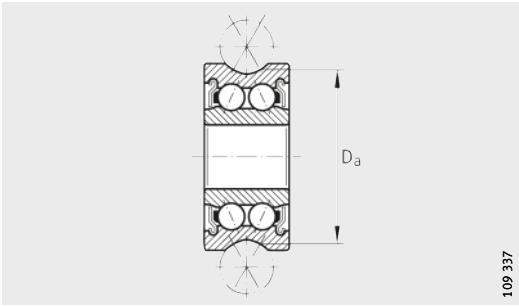
LFR..-2Z

Dimension table - Dimensions in mm

Designation	Mass m ≈ kg	Dimensions				
		d	D _{max}	B	A _T	C
LFR50/5-4-2Z-HLC ⁸⁾	0,01	5	16	8	9	7
LFR50/5-4-2RS-RB-HLC ⁸⁾						
LFR50/5-6-2Z-HLC ⁸⁾	0,01	5	17	8	10,5	7
LFR50/5-6-2RS-RB-HLC ⁸⁾						
LFR50/8-6-2Z ⁸⁾	0,02	8	24	11	14	11
LFR50/8-6-2RS-RB ⁸⁾						
LFR5201-10-2Z ⁸⁾	0,08	12	35	15,9	20,63	15,9
LFR5201-10-2RS-RB ⁸⁾						
LFR5301-10-2Z ⁸⁾	0,1	12	42	19	24	19
LFR5301-10-2RS-RB ⁸⁾						
LFR5302-10-2Z ⁸⁾	0,17	15	47	19	26,63	19
LFR5302-10-2RS-RB ⁸⁾						
LFR5201-12-2Z ⁸⁾	0,08	12	35	15,9	21,75	15,9
LFR5201-12-2RS-RB ⁸⁾						
LFR5204-16-2Z ⁹⁾	0,23	20	52	22,6	31,5	20,6
LFR5204-16-2RS-RB ⁹⁾						
LFR5206-20-2Z ⁹⁾	0,43	25	72	25,8	41	23,8
LFR5206-20-2RS-RB ⁷⁾⁹⁾						
LFR5206-25-2Z ⁹⁾	0,43	25	72	25,8	43,5	23,8
LFR5206-25-2RS-RB ⁹⁾						
LFR5207-30-2Z ⁹⁾	0,66	30	80	29	51	27
LFR5207-30-2RS-RB ⁷⁾⁹⁾						
LFR5208-40-2Z ⁹⁾	1,36	40	98	38	62,5	36
LFR5208-40-2RS-RB ⁷⁾⁹⁾						
LFR5308-50-2Z ⁹⁾	1,4	40	110	46	72,5	44
LFR5308-50-2Z-RB ⁷⁾⁹⁾						

Corrosion-resistant design with suffix ..-RB.

- 1) Rolling contact diameter.
- 2) Effective dynamic load rating as track roller (radial).
- 3) Effective static load rating as track roller (radial).
- 4) Fatigue limit load.
- 5) Permissible dynamic limit load.
- 6) Permissible static limit load.
- 7) Corrosion-resistant design available by agreement.
- 8) Lubricated for life, see page 19.
- 9) Relubrication facility via inner ring, see page 19.



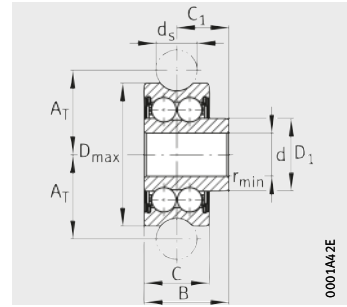
LFR...-2Z

d _s	D _a ¹⁾	r _{min}	Load carrying capacity				
			C _{rw} ²⁾ N	C _{0rw} ³⁾ N	C _{ur} ⁴⁾ N	F _{r per} ⁵⁾ N	F _{0r per} ⁶⁾ N
4	14,54	0,2	1 560	850	43	1 700	1 700
6	15,8	0,2	1 630	900	44,5	2 270	1 800
6	22,8	0,3	4 100	2 300	115	2 550	4 600
10	32,25	0,6	8 400	5 000	250	4 750	10 000
10	38,95	0,6	13 200	7 700	370	6 400	15 400
			13 900	8 200	390	19 600	16 400
10	44,25	1	14 500	9 100	455	9 400	18 200
12	33,1	0,6	8 300	5 000	250	4 650	10 000
16	49,14	1	15 300	10 100	520	10 500	20 200
20	64,68	1	23 100	16 400	870	21 100	33 000
25	65,35	1	22 700	16 100	850	18 800	32 000
30	76,02	1	23 100	16 400	1 100	18 500	41 500
40	90,36	1,1	38 500	29 000	1 480	51 000	58 000
50	101,7	1,1	54 000	40 500	2 000	69 000	81 000



Track rollers

With extended inner ring
Locating bearing track roller



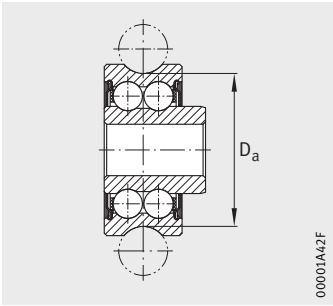
LFRI

Dimension table - Dimensions in mm

Designation	Mass m ≈ kg	Dimensions					
		d	D _{max}	B	A _T	C	C ₁
LFRI50/8-6-2Z	0,025	6,1	24	15,1	14	11	9,6
LFRI5201-10-2Z	0,09	10,5	35	20,7	20,63	15,9	12,75

Corrosion-resistant design available by agreement.

- 1) Rolling contact diameter.
- 2) Effective dynamic load rating as track roller (radial).
- 3) Effective static load rating as track roller (radial).
- 4) Fatigue limit load.
- 5) Permissible dynamic limit load.
- 6) Permissible static limit load.

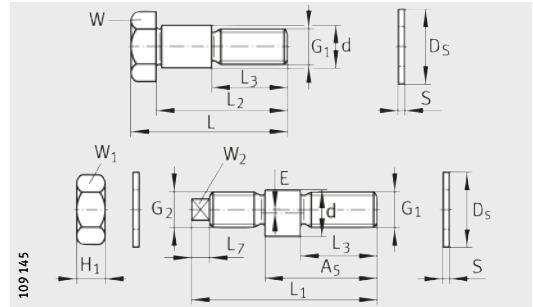


LFRI

				Load carrying capacity				
D_1	d_s	$D_a^{1)}$	r_{min}	$C_{rw}^{2)}$	$C_{Orw}^{3)}$	$C_{ur}^{4)}$	$F_{r\ per}^{5)}$	$F_{Or\ per}^{6)}$
j6				N	N	N	N	N
12,6	6	22,8	0,5	4 100	2 300	115	2 550	4 600
17,8	10	32,25	0,5	8 300	5 000	250	4 550	8 300



Bolts



LFZ, LFE

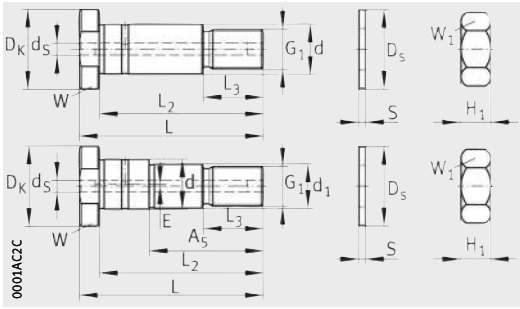
Dimension table - Dimensions in mm

Designation	Mass m ≈ kg	Dimensions							
		d	G ₁	G ₂	L	L ₂	L ₃	L ₁	A ₅
LFZ05	0,01	5	M4	–	19,5	16	9,5	–	–
LFE05-0,5				M4	–	–	9	20	15
LFZ08	0,02	8	M8	–	28,3	24,3	15	–	–
LFE08-1				M8×0,75	–	–	13	32,5	21,6
LFZ12	0,04	12	M10	–	43	36	22	–	–
LFE12-1				M10	–	–	19,5	50	33,5
LFZ12/M12	0,06		M12	–	50,8	43,8	24	–	–
LFE12-1/M12				M12	–	–		57	41
LFZ15	0,06	15	M12	–	50,8	43,8	23,8	–	–
LFE15-1				M12	–	–	24	57	41
LFZ12×45-A1²⁾	0,04	12	M10×1,5	–	50	45	16	–	–
LFE12×45-A1²⁾				–	–	–	–	–	30
LFZ20×67-A1	0,2	20	M16×1,5	–	75	67	23	–	–
LFE20×67-A1				–	–	–	–	–	45
LFZ25×82-A1	0,4	25	M20×1,5	–	92	82	30	–	–
LFE25×82-A1				–	–	–	–	–	57
LFZ30×95-A1	0,62	30	M24×1,5	–	107	95	32	–	–
LFE30×95-A1				–	–	–	–	–	67
LFZ40×107-A1	1,1	40	M30×1,5	–	117	107	42	–	–
LFE40×107-A1				–				–	–
LFZ40×115-A1	1,2			–	125	115		–	–
LFE40×115-A1				–	–	–		–	72

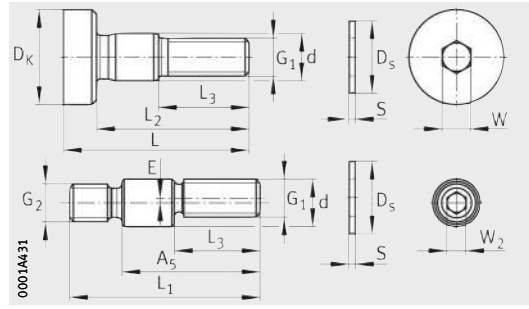
Corrosion-resistant design available by agreement.

¹⁾ No washer required.

²⁾ Without lubrication hole.



LFZ...A1, LFE...A1

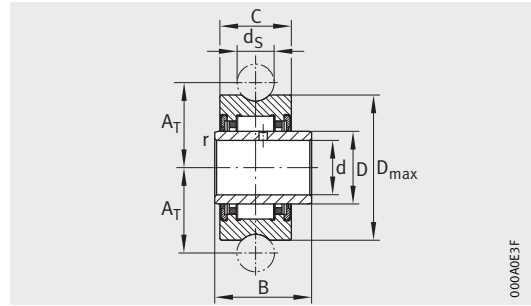


LFZ05 and LFE05-0,5

L ₇	D _s	E	H ₁	S	D _k	d _s	d ₁	Width across flats			
								W	W ₁	W ₂	
-	10	-	-	-1)	10	-	-	3	-	-	
		0,5	2,9		-			7	2		
-	14	-	-	1	-	-	-	13	-	-	
		1	4					-	13	5	
-	21	-	-	1,8	-	-	-	17	-	-	
		1	8,4					-	17	6	
-	19	-	-	-	-	-	-	17	-	-	
		1	6,5					-	17	6	
-	21	-	-	2	-	-	-	19	-	-	
		1	6,5					-	19	6	
-	21	-	8	2	20	-	-	17	17	-	
-	30	-	13	3	30	5,9	-	27	24	-	
		1						17	-	-	
-	37	-	16	3	40	5,9	-	36	30	-	
		1						22	-	-	
-	44	-	19	4	45	5,9	-	41	36	-	
		1						27	-	-	
-	56	-	24	4	55	5,9	-	46	46	-	
		1									36
		-									-
		1									36



Non-locating bearing track rollers



LFR..-2RSR-NA

Dimension table - Dimensions in mm

Designation	Inner ring ¹⁾	Mass m ≈ kg	Dimensions								Load carrying capacity		
			d	D _{max}	B ⁰ _{-0,12}	A _T	C	D	d _s	r _{min}	C _{rw} ²⁾ N	C _{0rw} ³⁾ N	C _{urw} ⁴⁾ N
LFR22/8-6-2RSR-NA	IR8×12×14	0,032	8	24	14	14	11,8	12	6	0,3	4 000	4 300	630
LFR2202-10-2RSR-NA	IR15×20×16	0,079	15	35	16	20,63	13,8	20	10	0,3	6 500	9 300	1 310
LFR2204-10-2RSR-NA	IR20×25×20	0,17	20	47	20	26,64	17,8	25	10	0,3	13 700	18 600	2 550

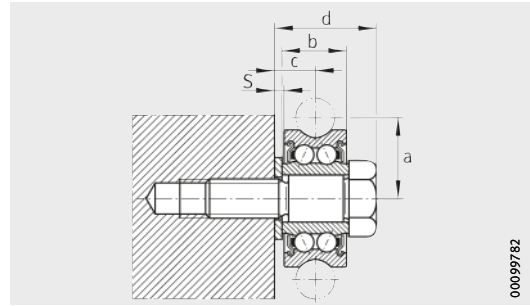
Non-locating bearing track rollers are also available without an inner ring: LFR..-2RSR-RNA.

Observe the guidelines relating to the adjacent construction, see page 72.

Corrosion-resistant design available by agreement.

- 1) Lubrication hole in inner ring (diameter) 2 mm.
- 2) Effective dynamic load rating as track roller (radial).
- 3) Effective static load rating as track roller (radial).
- 4) Fatigue limit load.

Possible combinations of track rollers and bolts



Mounting situation

00099782

Dimension table · Dimensions in mm						
Designation		Dimensions				
Locating bearing track roller	Bolt	a ¹⁾	b	S	c	d
LFR50/5-4-2Z ²⁾	LfZ05	9	8	–	4	11,5
	LfE05-0,5					
LFR50/5-6-2Z	LfZ05	10,5	8	1	5	11,5
	LfE05-0,5					
LFR50/8-6-2Z	LfZ08	14	12	1	6,5	16
	LfE08-1					20,5
LFR5201-10-2Z	LfZ12	20,65	17,7	1,8	9,7	24,7
	LfE12-1					32,3
LFR5301-10-2Z	LfZ12/M12	24	20,8	1,8	11,3	27,8
	LfE12-1/M12					34,8
LFR5302-10-2Z	LfZ15	26,65	21	2	11,5	28
	LfE15-1					35
LFR5201-12-2Z	LfZ12×45-A1	21,75	17,9	2	9,9	22,9
	LfE12×45-A1					
LFR5204-16-2Z	LfZ20×67-A1	31,5	25,6	3	14,3	33,6
	LfE20×67-A1					
LFR5206-20-2Z	LfZ25×82-A1	41	28,8	3	15,9	38,8
	LfE25×82-A1					
LFR5206-25-2Z	LfZ25×82-A1	43,5	28,8	3	15,9	38,8
	LfE25×82-A1					
LFR5207-30-2Z	LfZ30×95-A1	51	33	4	18,5	45
	LfE30×95-A1					
LFR5208-40-2Z	LfZ40×107-A1	62,5	42	4	23	52
	LfE40×107-A1					
LFR5308-50-2Z	LfZ40×115-A1	72,5	50	4	27	60
	LfE40×115-A1					

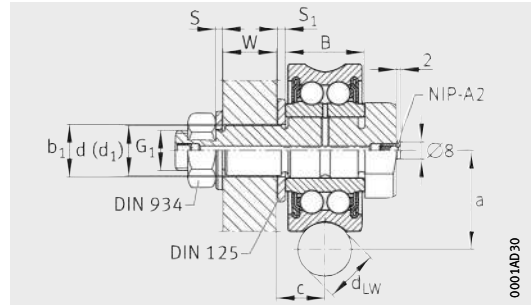
1) With eccentric bolts, the dimension a varies by $\pm E$ in accordance with the table, page 89.

2) No washer required.



Possible combinations of track rollers and bolts

Flying bearing arrangement with bolt ...-A1

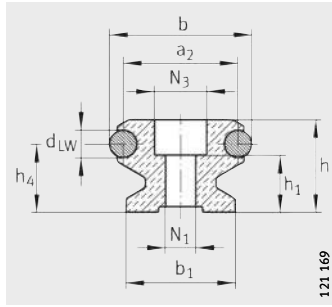


Bolt ...-A1

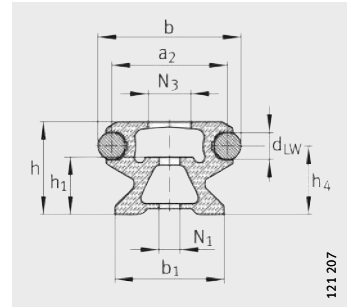
Dimension table - Dimensions in mm												
Designation		Dimensions										
Locating bearing track roller	Bolt	a	c	d	d ₁	G ₁ ¹⁾	S ²⁾	W ³⁾	Washer DIN 125-A		d _{LW}	B
									S ₁	b ₁		
LFR5201-12-2Z	LFZ12×45-A1	21,75	9,75	12	-	M10×1,5	2	12	2,5	13	12	15,9
	LFE12×45-A1			-	10				2	10,5		
LFR5204-16-2Z	LFZ20×67-A1	31,5	11,3	20	-	M16×1,5	3	20	3	21	20	22,6
	LFE20×67-A1			-	17				3	17		
LFR5206-20-2Z	LFZ25×82-A1	41	12,9	25	-	M20×1,5	3	25	4	27	20	25,8
	LFE25×82-A1			-	22				3	23		
LFR5206-25-2Z	LFZ25×82-A1	43,5	12,9	25	-	M20×1,5	3	25	4	27	25	25,8
	LFE25×82-A1			-	22				3	23		
LFR5207-30-2Z	LFZ30×95-A1	51	14,5	30	-	M24×1,5	4	32	4	31	30	29
	LFE30×95-A1			-	27				4	28		
LFR5208-40-2Z	LFZ40×107-A1	62,5	19	40	-	M30×1,5	4	40	6	41	40	38
	LFE40×107-A1			-	36				5	37		
LFR5308-50-2Z	LFZ40×115-A1	72,5	23	40	-	M30×1,5	4	40	6	41	40	46
	LFE40×115-A1			-	36				5	37		

- 1) For nuts in accordance with DIN 934, included in the scope of delivery.
- 2) For washers in accordance with DIN 125, included in the scope of delivery.
- 3) Recommended minimum wall thickness.

Guideways



LFS



LFS...C

Dimension table - Dimensions in mm

Designation	Mass m ≈ kg	Dimensions			Mounting dimensions						
		b	h	l _{max} ¹⁾	b ₁	a ₂	j _L	a _L ²⁾		a _R ²⁾	
								min.	max.	min.	max.
LFS20	0,6	20	12,2	2 400	17	16	62,5	9	54	9	54
LFS25	1,1	25	15	2 400	21	19	62,5	10	54	10	54
LFS32	1,6	32	20	6 000	24	26	125	11	116	11	116
LFS32-E							62,5		52		52
LFS32-C ⁴⁾	125						116		116		
LFS32-CE ⁴⁾	62,5						52		52		
LFS32-F	1		10	4 000	-		125		116		116
LFS42-C ⁴⁾	2,2	42	20	6 000	28	32	125	20	113	20	113
LFS42-CE ⁴⁾							62,5		51		51
LFS42-F							125		17		17
LFS52	4,4	52	34	6 000	40	42	250	17	235	17	235
LFS52-E							125		110		110
LFS52-EE	62,5						49		49		
LFS52-C ⁴⁾	250						235		235		
LFS52-CE ⁴⁾	125						110		110		
LFS52-CEE ⁴⁾	62,5						49		49		
LFS52-F	250						235		235		
LFS52-FE	125						110		110		
LFS86-C ⁴⁾	4,4	86	34	6 000	71	76	250	17	235	17	235
LFS86-CE ⁴⁾							125		110		110
LFS120	7,9	120	25	8 000	100	110	250	17	235	17	235
LFS120-E							125		110		110

Guideways of corrosion-resistant design: LFS...-RB, observe note on page 18.

Modulus of elasticity for LFS...-C (-CE, -CEE, -E, -EE, -F, -FE): 72 000 N/mm².

Guideways LFS, LFS...-C and LFS...-F available without holes: LFS...-OL (-C-OL, -F-OL).

① Underside marked

1) Maximum length of single-piece guideways; longer guideways are supplied in several sections and are marked accordingly. Observe the length tolerances, see page 30.

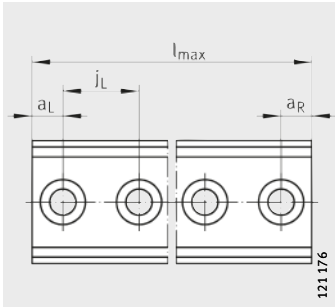
2) a_L and a_R are dependent on the guideway length l_{max}, calculation: see page 80.

3) Under maximum load F_Z and F_{0Z}, support washers to DIN 433 and the maximum tightening torque according to the table, page 29, are required.

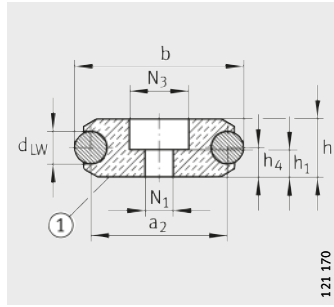
4) The design of the hollow sections is dependent on the size.

5) Counterbore depth for screws to DIN 7984.

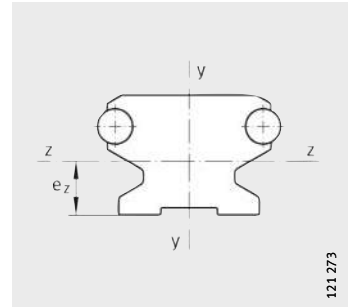
6) If support washers to DIN 433 are used, screws to DIN 7984 are recommended.



LFS, LFS...-C (-F)
View rotated 90°

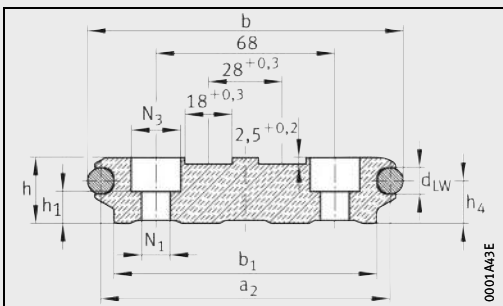


LFS...-F

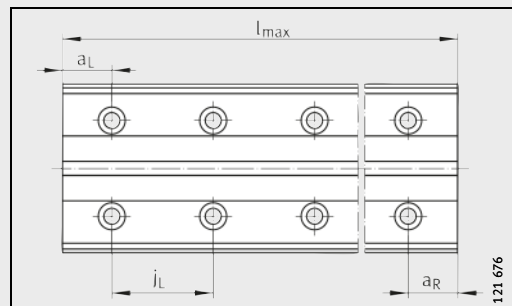


Bending axes

d _{LW}	h ₄	h ₁	N ₁	N ₃ ³⁾	Surface data					
					Cross-sectional area mm ²	y-y		z-z		
						l _y mm ⁴	W _y mm ³	e _z mm	I _z mm ⁴	W _z mm ³
4	9	7,6	4,5	8	165	3 065	362	6,4	2 053	324
6	10,6	8,5	5,5	10	237	6 390	608	7,5	4 510	600
6	15	12	6,5	12	440	20 100	1 440	10,4	14 100	1 360
					261	18 305	1 165	10,1	10 072	995
					5	3,5 ⁵⁾	230	11 300	810	5
10	12,6	12 ⁶⁾	9	15	358	33 929	1 858	10,1	14 052	1 391
	7,5	8 ⁵⁾			370	29 280	1 864	7,5	16 200	2 160
10	25,1	21	11	19	1 170	138 624	5 878	17,8	113 037	6 350
					649	113 821	4 896	17,1	74 878	4 378
					9	8 ⁵⁾	670	84 000	3 610	9
10	25,1	21 ⁶⁾	13	21	1 185	613 720	16 587	17,5	155 160	8 866
10	16,1	12	11	19	2 468	2 330 980	40 751	12,5	9 365	117 074

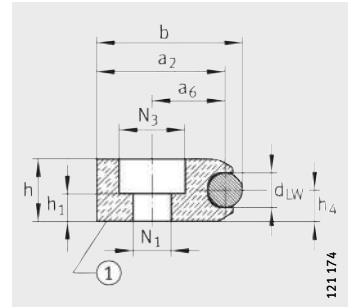


LFS120



LFS120

Guideways



LFS..-FH

Dimension table - Dimensions in mm

Designation	Mass m ≈ kg	Dimensions			Mounting dimensions						
		b	h	l _{max} ¹⁾	a ₂	a ₆	j _L	a _L ²⁾		a _R ²⁾	
								min.	max.	min.	max.
LFS32-FH	0,8	26	10	4 000	23	13	125	11	116	6	116
LFS32-FHE							62,5		52		52
LFS52-FH	2,3	42	18	6 000	37	21	250	17	235	10	235
LFS52-FHE							125		110		110
LFS52-FHEE							62,5		49		49

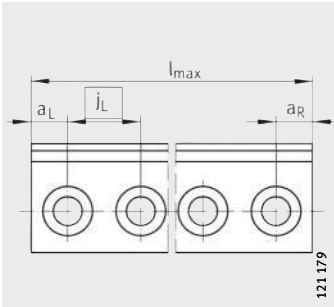
Guideways of corrosion-resistant design: LFS..-RB, observe note on page 18.

Guideways LFS..-FH available without holes: LFS..-FH-OL.

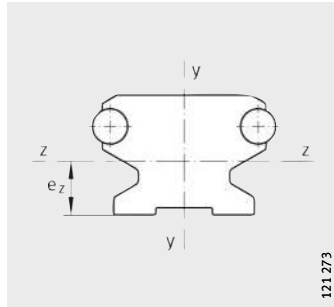
Modulus of elasticity for LFS..-FH (-FHE, -FHEE): 72 000 N/mm².

① Underside marked

- 1) Maximum length of single-piece guideways; longer guideways are supplied in several sections and are marked accordingly. Observe the length tolerances, see page 30.
- 2) a_L and a_R are dependent on the guideway length l_{max}, calculation: see page 80.
- 3) For screw to DIN 912-8.8 (DIN EN ISO 4762), under maximum load support washers to DIN 433 (DIN EN ISO 7092) are required.
- 4) Counterbore depth for screws to DIN 7984.



LFS...FH
View rotated 90°

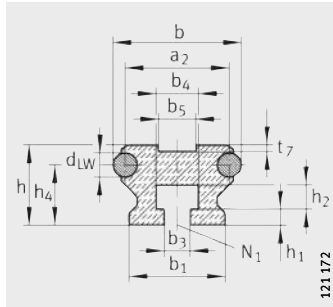


Bending axes

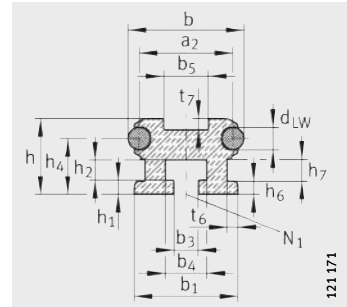
					Surface data					
d _{LW}	h ₁	h ₄	N ₁ ³⁾	N ₃	Cross-sectional area mm ²	y-y		z-z		
						l _y mm ⁴	W _y mm ³	e _z mm	I _z mm ⁴	W _z mm ³
6	3,5	5	6,5	12	216	8 681	790	5	1 897	379
10	8 ⁴⁾	9	11	19	629	66 642	3 765	9	17 798	1 977



Guideways



LFS32-N



LFS52-NZZ

Dimension table - Dimensions in mm

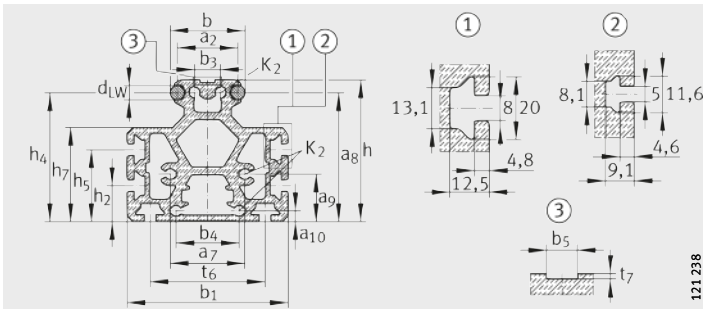
Designation	Mass m ≈ kg/m	Dimensions			Mounting dimensions												
		b	h	$l_{max}^{1)}$	b_1	a_2	$b_3^{2)}$	b_4	b_5	t_6	a_7	$j_L^{3)}$	d_{LW}	h_1	h_2	h_5	h_4
LFS25-M ⁵⁾	3,5	25	46	4 000	56	19	-	-	5,2	30	-	-	6	-	22	-	41,6
LFS32-M ⁵⁾	6,4	32	66,5	8 000	75	26	-	-	10,2	43	-	-	6	-	25	-	61
LFS32-N	1,4		20	4 000	24		6,5	10,5	10,5	-	-	125		4	6	-	15
LFS52-M ⁵⁾	11,2	52	98,6	8 000	112	42	18	44	10,2	80	52	-	10	-	25	50	89,7
LFS52-NZZ	3,9		34		46,5		11	18,5	18,5	4,7	-	250		6,4	9	-	25,1

Guideways of corrosion-resistant design: LFS..-RB, observe note on page 18.

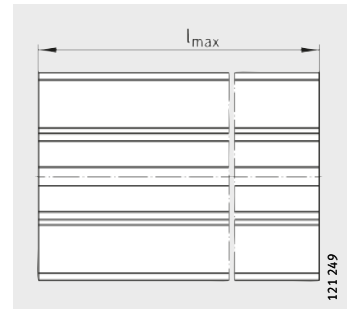
Modulus of elasticity for LFS..-M (-N, -NZZ, -ZZ): 72 000 N/mm².

① For LFS52-M and LFS32-M; ② For LFS25-M; ③ Detail of slot

- 1) Maximum length of single-piece guideways; longer guideways are supplied in several sections and are marked accordingly. Observe the length tolerances, see page 30.
- 2) For screw to DIN 931 (DIN EN ISO 4014), DIN 933-8.8 (DIN EN ISO 4017), special support washers included in scope of delivery for guideways LFS52-NZZ.
- 3) Recommended screw pitch (hole spacing), see page 80.
- 4) One core hole for non-cutting thread drill or self-tapping screws to DIN 7513.
- 5) The guideway LFS..-M can only be combined with carriages with adjustable clearance. If SF and LFCL carriages are to be used, please contact us in advance.

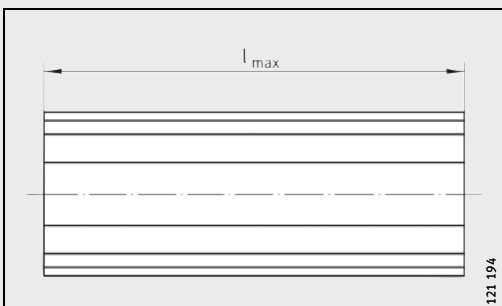


LFS...M

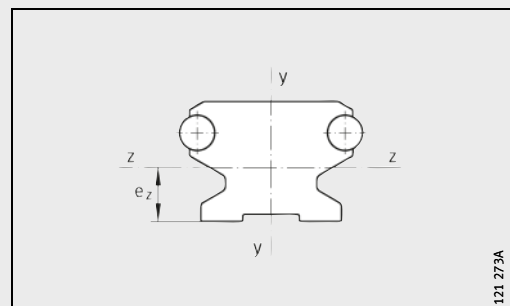


LFS...M
View rotated 90°

								Surface data					
h ₇	h ₆	t ₇	a ₁₀	a ₉	a ₈	N ₁	K ₂	Cross-sectional area	y-y		z-z		
									l _y	W _y	e _z	I _z	W _z
								mm ²	mm ⁴	mm ³	mm	mm ⁴	mm ³
31,5	-	1,6	-	-	-	-	4,65	1 156	314 429	11 230	19,4	186 693	9 623
47	-	1,6	-	-	-	-	-	2 206	1 000 234	26 672	36,8	762 105	20 707
-	-	1,6	-	-	-	M6	-	360	19 600	1 400	11,1	12 600	1 135
65,4	-	1,8	7,5	33	89,7	-	7,45	3 691	3 717 250	66 380	42,6	3 014 470	55 462
10	6	5	-	-	-	M10	-	994	170 350	7 327	16,8	82 786	4 927

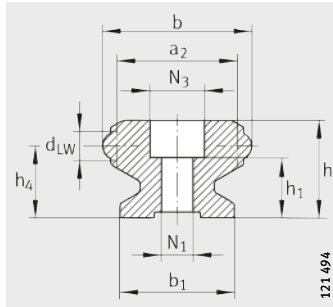


LSF52-NZZ
View rotated 90°

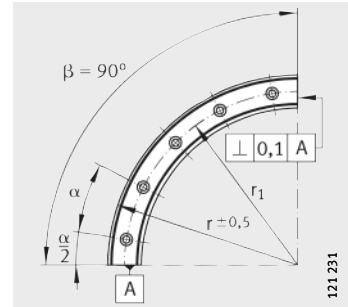


Bending axes

Guideways



LFSR...-ST



LFSR../90-ST

Dimension table - Dimensions in mm

Designation	Mass m ≈ kg	Dimensions					
		b	h	r	β °	b ₁	a ₂
LFSR32-100/90-ST	0,5	32	20	100	90	24	26
LFSR32-100/180-ST	1				180		
LFSR32-100/360-ST	2				360		
LFSR32-150/90-ST	0,8			150	90		
LFSR32-150/180-ST	1,6				180		
LFSR32-150/360-ST	3,2				360		
LFSR32-300/90-ST	1,7			300	90		
LFSR32-300/180-ST	3,4				180		
LFSR32-300/360-ST	6,8				360		
LFSR32-500/90-ST	2,9			500	90		
LFSR32-500/180-ST	5,8				180		
LFSR32-500/360-ST	11,6				360		
LFSR52-150/90-ST	2	52	34	150	90	40	42
LFSR52-150/180-ST	4				180		
LFSR52-150/360-ST	8				360		
LFSR52-300/90-ST	4,5			300	90		
LFSR52-300/180-ST	9				180		
LFSR52-300/360-ST	18				360		
LFSR52-500/90-ST	7,8			500	90		
LFSR52-500/180-ST	15,6				180		
LFSR52-500/360-ST	31,2				360		

Attention!

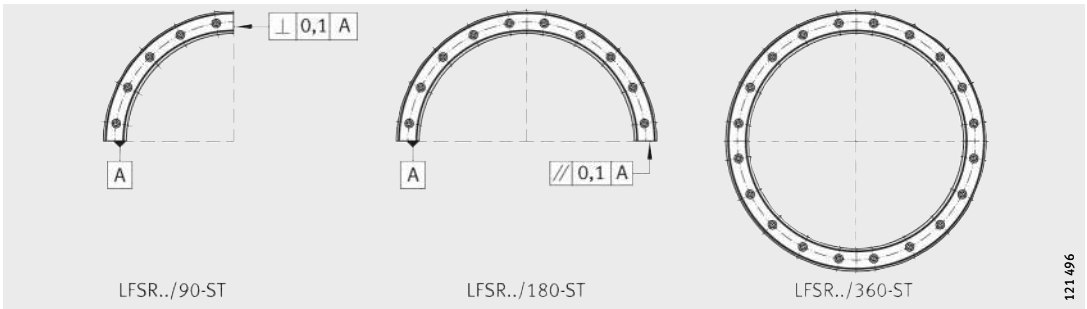
If curved guideway elements are required in combination with straight guideway sections, these must always be ordered together as a unit.

Note the guidelines relating to mounting of curved guideway elements, see page 27.

Corrosion-resistant design available by agreement.

1) For screw to DIN ISO 4762-8.8.

2) Number of holes on the pitch circle r_1 .

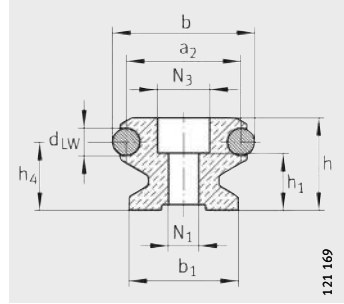


LFSR..-ST

d_{LW}	h_1	h_4	$N_1^{1)}$	N_3	$x^{2)}$	r_1	α_o	$\alpha/2_o$			
6	13,5	15	6,5	12	3	84	30	15			
					6						
					12						
					284	3	22,5	11,25			
						6					
						12					
						4					
						8					
						16					
					484	5	18	9			
						10					
						20					
10	21	25,1	11	19		3			124	30	15
						6					
						12					
					274	4	22,5	11,25			
						8					
						16					
						474			5	18	9
									10		
									20		



Closed oval tracks with guideway connectors VBS



LFS (section A-A)

Dimension table - Dimensions in mm

Closed oval tracks		Dimensions				Mounting dimensions	
Designation		b	h	β °	$l_{max}^{1)}$	b_1	a_2
with two 180° arcs	with four 90° arcs						
-	LFS32x...x...-OV-100-VBS	32	20	90	6 000	24	26
LFS32x...-OV-100-VBS	-			180			
-	LFS32x...x...-OV-150-VBS			90			
LFS32x...-OV-150-VBS	-			180			
-	LFS32x...x...-OV-300-VBS			90			
LFS32x...-OV-300-VBS	-			180			
-	LFS32x...x...-OV-500-VBS			90			
LFS32x...-OV-500-VBS	-			180			
-	LFS52x...x...-OV-150-VBS	52	34	90	6 000	40	42
LFS52x...-OV-150-VBS	-			180			
-	LFS52x...x...-OV-300-VBS			90			
LFS52x...-OV-300-VBS	-			180			
-	LFS52x...x...-OV-500-VBS			90			
LFS52x...-OV-500-VBS	-			180			

Attention!

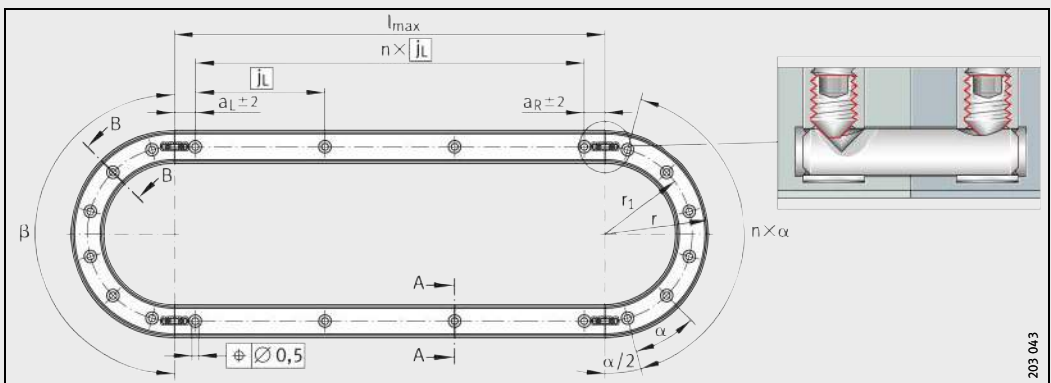
If curved guideway elements are required in combination with straight guideway sections, these must always be ordered together as a unit.

Closed oval tracks can only be ordered as a single unit.

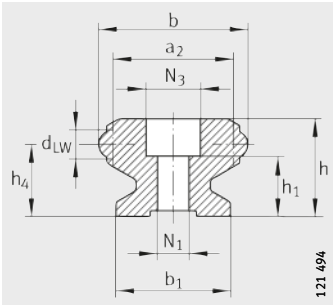
A unit consists of two curved guideway elements LFSR with an arc dimension 180° and two straight guideways LFS or a unit of four curved guideways LFSR with an arc dimension 90° and four straight guideways LFS.

Note the guidelines relating to mounting of curved guideway elements, see page 27.

- 1) Maximum length of single-piece guideways.
- 2) For screw to DIN ISO 4762-8.8.
- 3) Number of holes on the pitch circle r_1 .

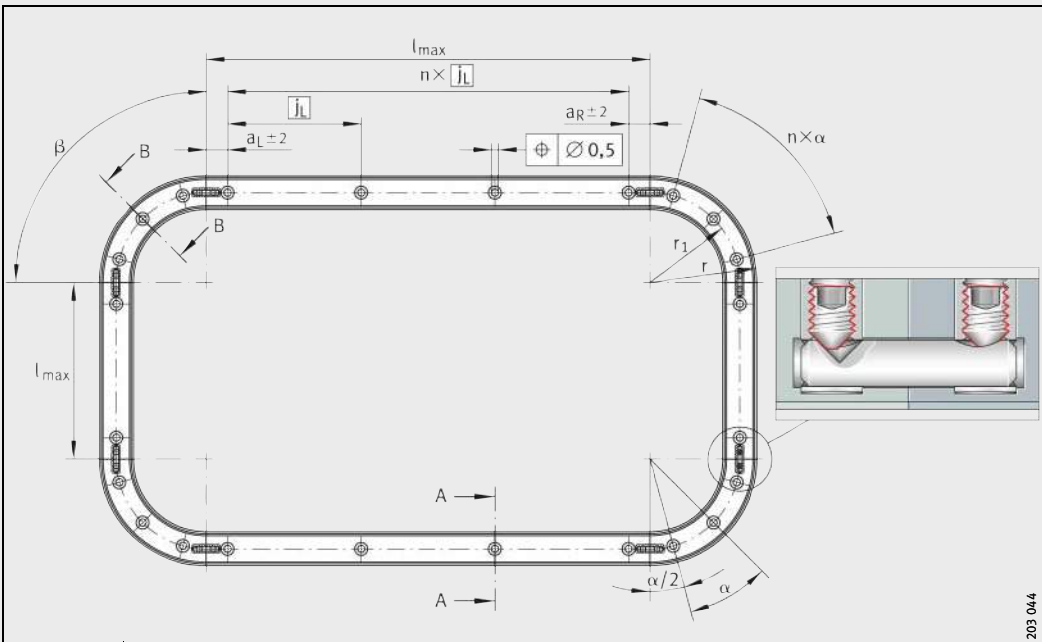


Closed oval track with two 180° arcs



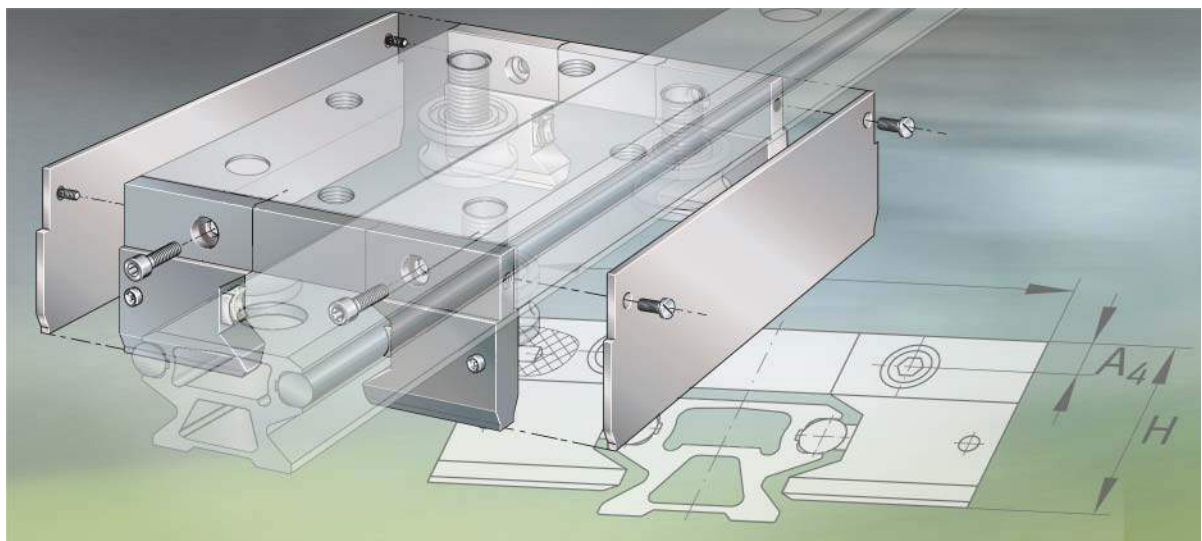
LFSR (section B-B)

j_L	a_L, a_R		d_{LW}	h_1	h_4	$N_1^{2)}$	N_3	$x^{3)}$	r	r_1	α °					
	min.	max.														
125	36	116	6	12	15	6,5	12	3	100	84	30					
								6								
	30	116						6	12	15	6,5	12	3	150	134	22,5
													6			
													4	300	284	18
250	49	235	10	21	25	11	19	3	150	124	30					
								6								
	41	235						10	21	25	11	19	4	300	274	22,5
													8			
													5	500	474	18



Closed oval track with four 90° arcs

203 044



Accessories

Accessories

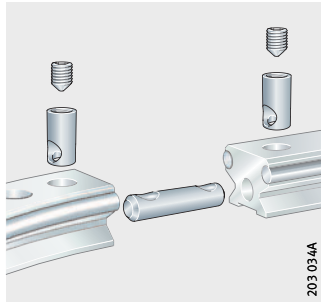
	Page
Product overview	
Accessories	106
Features	
Guideway connector for guideways	108
End plate.....	108
Lubrication and wiper units	109
Cap wipers	110
Side plate.....	111
Stops	111
End cover	111
Slot closing strip	111
Fasteners	112
Dimension tables	
Guideway connector for guideways LFS	114
End plate.....	115
Lubrication and wiper units	116
Cap wipers	118
Side plate.....	119
Stops	120
End cover	122
Slot closing strip	123



Product overview Accessories

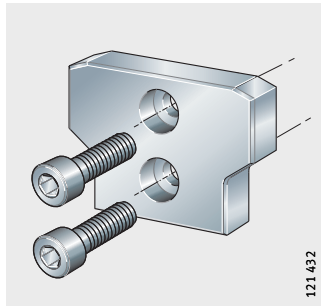
Guideway connector for guideways

VBS



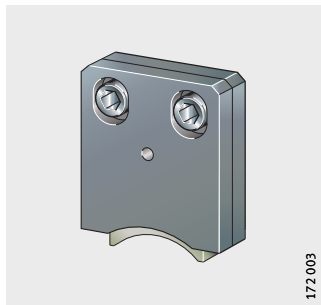
End plate

ANS.LFS

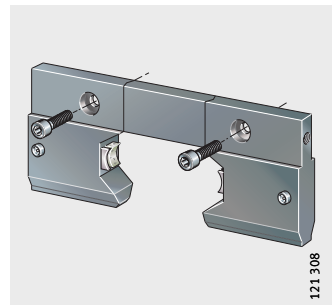


Lubrication and wiper units

AB.W

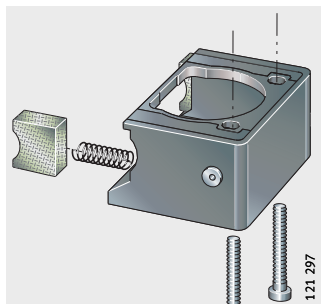


AB



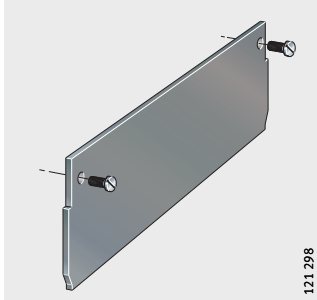
Cap wipers

AB.LFR



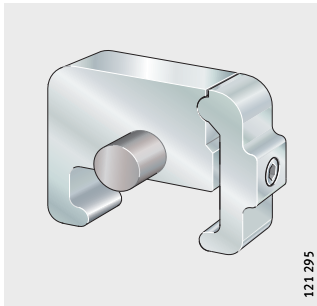
Side plate

ABAL

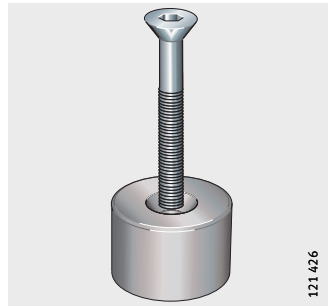


Stops

PAH

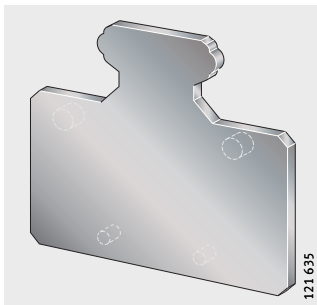


PASTP

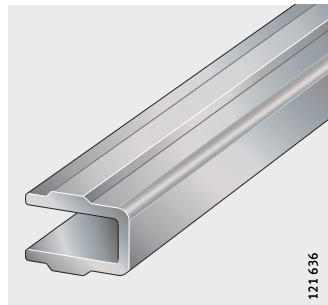


End cover Slot closing strip

KA.LFS



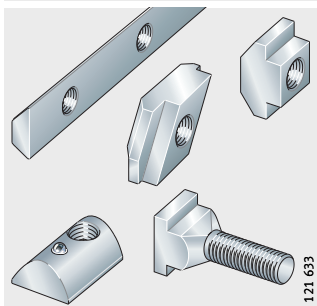
NAD



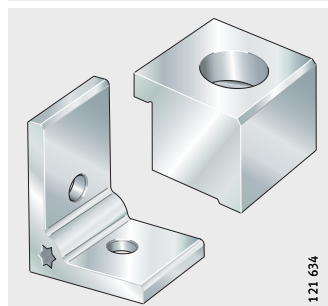
Fasteners

- Fixing screw
- T-nuts
- T-bolt
- T-strip
- Fixing bracket
- Fixing lug

MU, SHR, LEIS-M



WKL, SPPR



Accessories

Features

Guideway connector for guideways

Guideway connectors VBS are accessories for curved and straight LFS guideways.

They comprise:

- pins
- bushes
- grub screws.

The guideway connectors are suitable for all LF guideways. Joined curved guideways are supplied as standard with the guideway connector. Joined straight guideways are available as an option with the guideway connector.

The VBS reduces running noise at the joint, ensures an increased operating life for the guidance system and improves the operational reliability.

End plate

End plates ANS.LFS (also for use with hollow section guideways) are made from steel. They secure the rolled-in raceway shafts by means of form fit. In the case of solid section guideways, holes must be made in the end faces (by the customer) for screw mounting of the end plates.

The end plates prevent the shaft creep that can occur under unfavourable conditions on all guideways that comprise an aluminium support rail into which a steel shaft is rolled or pressed.



These can be supplied already fitted, but this must be indicated when ordering.

Lubrication and wiper units

Design AB.W

The lubrication and wiper unit AB.W comprises a plastic housing and is fixed to the adjacent construction. It contains a felt lubrication insert. This is supplied soaked with oil that has H1 approval and can be replenished with oil via a hole in the housing if necessary.

Lubrication and wiper units AB.W are supplied with fixing screws.

Design AB

The lubrication and wiper unit AB comprises a plastic housing and is screw mounted to the end of the carriage LFL-SF or LFDL. It contains felt lubrication inserts on both sides. These are supplied soaked with oil that has H1 approval and can be replenished with oil via lubrication nipples if necessary. The lubrication and wiper units AB can be fixed to carriages using two screws.

If the lubrication and wiper unit AB is used together with a stop PAH or PASTP, the central section must be removed, see *Figure 1*.

- ① Central section, supplied loose
- ② Felt lubrication inserts
- ③ Fixing screws, supplied loose

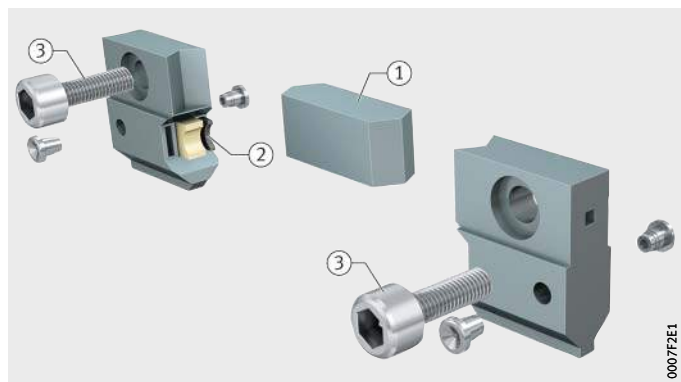


Figure 1
Lubrication and wiper unit AB



Accessories

Cap wipers

The cap wipers comprise a plastic housing and are slid over the track roller from below. They contain felt lubrication inserts on both sides. These are supplied soaked with oil that has H1 approval and can be replenished with oil via lubrication nipples if necessary.

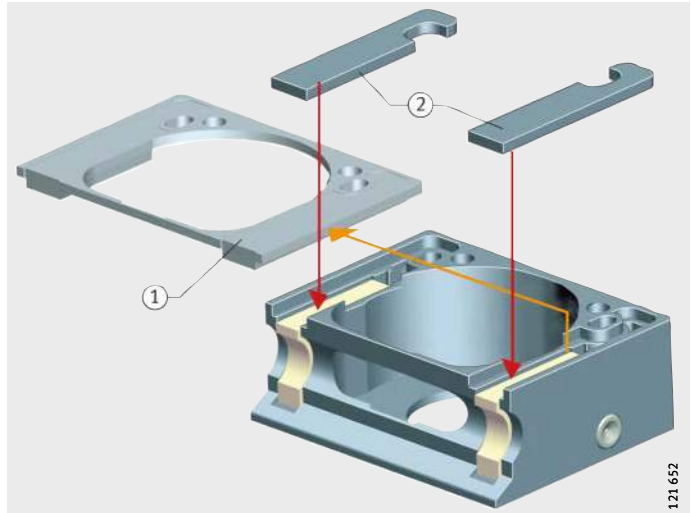
The cap wipers can be fixed using two screws to the screw mounting channels in the carriage LFCL and thus seal the track rollers from below at the screw head. When bolts LFZ and LFE are used in an application design, this gives a gap.

Cap wipers are supplied with fixing screws.

Design AB.LFR

If two or more AB.LFR are used per side, the displacement resistance can be reduced by removing the felt insert on the inner side.

AB.LFR are suitable for mounting on the carriage LFCL42 as well as customer designs. For mounting on the carriage LFCL42, the upper cover must be replaced by the two covers supplied, *Figure 2*.



- ① For mounting on the customer design
- ② For mounting on LFCL42

Figure 2
Mounting on carriage LFCL

Design AB.LFR5302

An exception is the cap wiper AB.LFR5302. This comprises an end cover and a relubrication and wiper unit AB.W10 that can be screw mounted to either the right or left of the end cover. Its function and location correspond to those of the other sizes.

- Side plate** The side plate ABAL is made from plastic and can be screw mounted to the sides of carriages LFL...SF. The side plates are used to supplement the lubrication and wiper units AB. The carriage can be sealed on all sides, with the exception of the underside, by means of two side plates and two lubrication and wiper units.
- The side plate is supplied with fixing screws.
- It can only be mounted in conjunction with the lubrication and wiper unit AB.
- Stops**
- Design PAH** The stop PAH comprises anodised aluminium and a buffer made from shock-absorbent plastic. The stop can be placed at any position on guideways. It is then clamped in place by means of a screw.
- The stop is used as an end stop or restricts the travel of the carriage.
- The central section of lubrication and wiper units must be removed if the carriage is to run up against a stop PAH, see page 109.
- Design PASTP** The stop PASTP is made from plastic. It can be screw mounted in a threaded hole (to be made by the customer) in guideways. This hole can be drilled at any position on guideways LFS. The stop is used as an end stop or restricts the travel of the carriage.
- The central section of lubrication and wiper units must be removed if the carriage is to run up against a stop PASTP, see page 109.
- End cover** End covers KA are made from plastic. The end covers close off the end faces of the hollow sections in guideways LFS...C and LFS...M as well as in the hollow section carriage LFCL.
- Slot closing strip** Slot closing strips NAD are made from plastic. They close off the slots in the guideway LFS...M. For information on NAD, see publication AL 1, Driven Linear Units.



Accessories

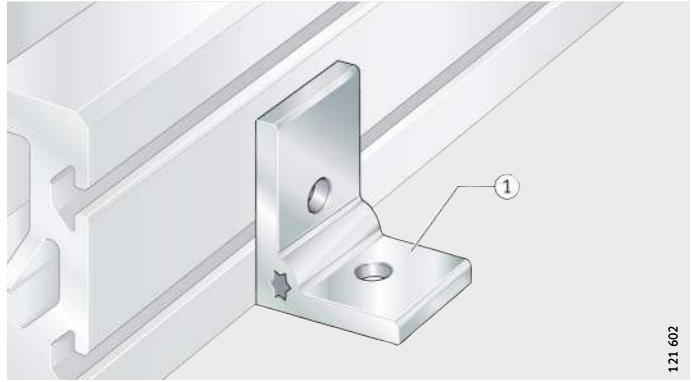
Fasteners

Fixing brackets, fixing lugs

For location of LFS-M with the integral profiled aluminium support rail, fixing brackets and fixing lugs are available, *Figure 3, Figure 4, Figure 5* and table, page 113.

① WKL

Figure 3
Fixing brackets



① SPPR

Figure 4
Fixing lug

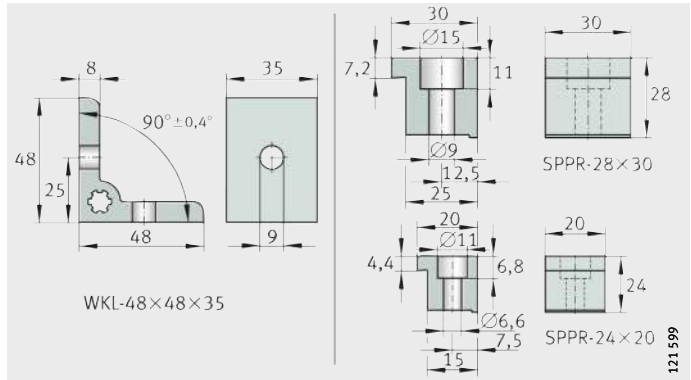
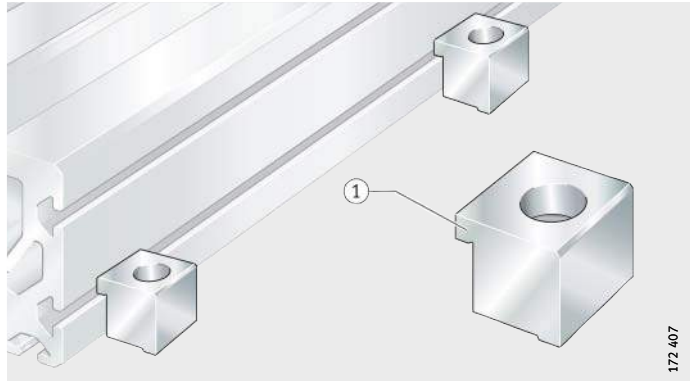


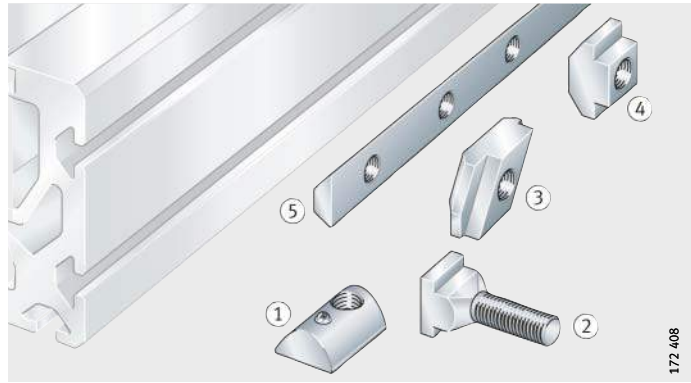
Figure 5
Fixing brackets and fixing lugs

T-strip, T-nuts, T-bolts

For integration in existing systems or for extension, T-strips, T-nuts and corresponding T-bolts are available, *Figure 6* and table.

- ① MU...-POS
- ② SHR-DIN787-M8×8×32
- ③ MU-M
- ④ MU-DIN508
- ⑤ LEIS-M, T-slot

Figure 6
Fixing screws and T-nuts



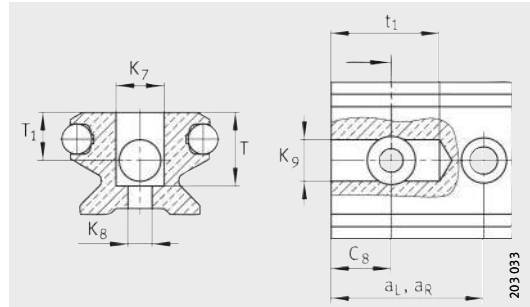
Fasteners and designations

Fastener	Designation
Fixing bracket	WKL-48×48×35
For slot width 8 mm (LFS32-M, LFS52-M)	
Clamping lug	SPPR-28×30
T-nut	MU-DIN508-M4×8 MU-DIN508-M6×8
Rotatable T-nut	MU-M4×8-Rhombus MU-M6×8-Rhombus
Positionable T-nut	MU-M6×8-POS MU-M8×8-POS
T-bolt	SHR-DIN787-M8×8×32
T-strip (steel) Hole spacing 50 mm	LEIS-M6/8-T-Nut (state length) ¹⁾ LEIS-M8/8-T-Nut (state length) ¹⁾
For slot width 5 mm (LFS25-M)	
Clamping lug	SPPR-24×20
T-nut	MU-DIN508-M4×5
Positionable T-nut	MU-M5×5-POS

¹⁾ Maximum single-piece length: 2 000 mm.



Guideway connectors for guideways LFS



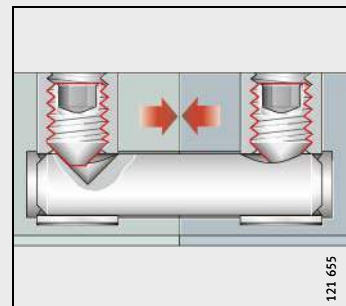
VBS

Dimension table - Dimensions in mm

Designation	Dimensions									For guideway
	T	T ₁ ±0,1	t ₁ +0,5	a _L min.	a _R min.	C ₈ ±0,1	K ₇ +0,2	K ₈	K ₉ +0,5	
VBS32	16,5	10	25	30	30	15	12	6,5	9	LFS32, LFS32-E
VBS32-R100			17	22		9				LFS32, LFS32-E
VBS42	16,5	10	25	30	30	15	12	6,5	9	LFS42-C, LFS42-CE
VBS52	30	22	30	40	40	20	16	8	13	LFS52, LFS52-E, LFS52-EE, LFS52-C, LFS52-CE, LFS52-CEE
VBS52-R150			23	33		14				LFS52, LFS52-E, LFS52-EE, LFS52-C, LFS52-CE, LFS52-CEE

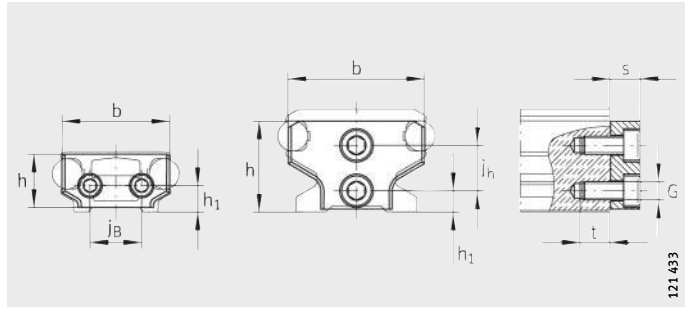
Attention!

If these are to be used with curved guideways LFSR or with straight guideways not included in the table, please contact us.



Guideway connector VBS

End plate



ANS.LFS, ANS.LFS42-C, ANS.LFS86-C, ANS.LFS..-NZZ

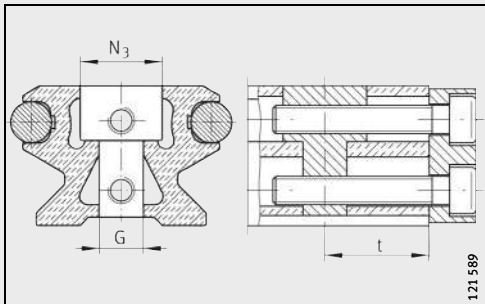
Dimension table · Dimensions in mm

Designation	Dimensions										For guideway
	b	j _B	a	s	t	N ₃ ∅	h	h ₁	j _h	G	
ANS.LFS20	15,4	-	-	6	12	-	11	6,2	-	M5	LFS20
ANS.LFS25	20	-	-	5	7	-	14	4	7	M3	LFS25
ANS.LFS32	30	-	-	8	7	-	19	5	10	M4	LFS32
ANS.LFS32-C					15	12H13	-	-	∅6,5H13		LFS32-C
ANS.LFS32-F	26	11	-	6	-	-	9	5	-	M4	LFS32-F
ANS.LFS32-FH	22	9	9		7	-		15	M3	LFS32-FH	
ANS.LFS32-N	26	11	-	-	-	-	15	-	-	M4	LFS32-N
ANS.LFS42-C	35,5	17	-	8	7	-	18	8	-	M4	LFS42-C
ANS.LFS52	45	-	-	10	10	-	30	7	15	M6	LFS52
ANS.LFS52-C					20	19H13	30	-	∅11H13		LFS52-C
ANS.LFS52-F	42	21	-	8	10	-	16	9	-	M5	LFS52-F
ANS.LFS52-FH	37	20	6,5					24	LFS52-FH		
ANS.LFS52-NZZ	42	21	-					LFS52-NZZ			
ANS.LFS86-C	80	54,1	-	9	20	-	30	17,5	-	M6	LFS86-C
ANS.LFS120	114	80	-	5	10	-	16	8	-	M6	LFS120

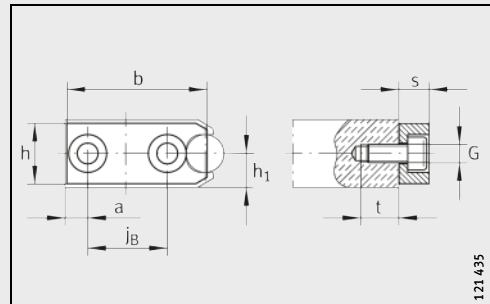
ANS cannot be mounted on:

LFS32-C: a_L, a_R < 28 mm

LFS52-C: a_L, a_R < 40 mm.



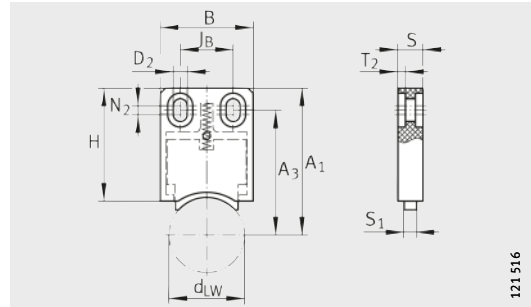
ANS.LFS32-C, ANS.LFS-52-C (hollow section)



ANS.LFS..-F (-FH)



Lubrication and wiper units



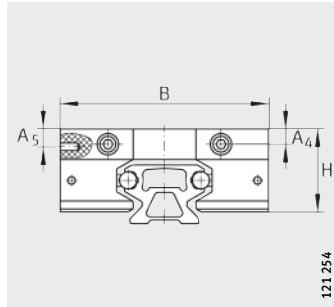
AB.W

121.516

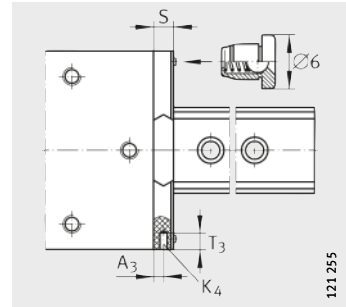
Dimension table - Dimensions in mm

Designation	Mass m ≈ kg	Dimensions											For track roller
		d _{LW}	B	S	H	J _B ±0,1	D ₂	T ₂	S ₁	A ₁	N ₂	A ₃	
AB.W10	0,03	10	22,5	10	45	10	4,5	3	5	49	4	40,3	LFR5201, LFR5301, LFR5302
AB.W12	0,03	12	22,5	10	45	10	4,5	3	5	51	4	42,3	LFR5201-12
AB.W16	0,03	16	22,5	10	45	10	4,5	3	5	52	4	43,3	LFR5204-16
AB.W20	0,03	20	22,5	10	45	10	4,5	3	5	54	4	45,3	LFR5206-20
AB.W25	0,03	25	37	10	45	21	5,5	3	5	54	3,5	45,3	LFR5206-25
AB.W30	0,03	30	37	10	45	21	5,5	3	5	59	3,5	50,3	LFR5207-30
AB.W40	0,03	45	37	10	45	21	5,5	3	5	71	3,5	62,3	LFR5208-40
AB.W50	0,03	50	37	10	45	21	5,5	3	5	76	3,5	67,3	LFR5308-50

Lubrication and wiper units



AB



AB
View rotated 90°

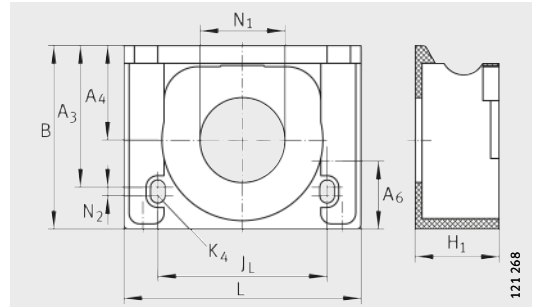
Dimension table · Dimensions in mm

Designation	Mass m ≈ kg	Dimensions								For carriage For screws to DIN 7972
		B	T ₃	S	A ₃	H	A ₄	A ₅	K ₄	
AB32	0,03	80	6	11	5	32	7	7	ST2,9	LFL32-SF, LFL52-SF, LFL52-E-SF, LFDL32-SF, LFDL32-B ¹⁾
AB52	0,1	120	20	18	8,5	45,5	9,7	15	ST4,8	LFL32-SF, LFL52-SF, LFL52-E-SF, LFDL32-SF, LFDL32-B
AB52-E	0,13	135	20	18	8,5	55	12	20,6	ST4,8	LFL32-SF, LFL52-SF, LFL52-E-SF
AB.LFLL32	0,03	80	6	11	5	32	7	7	ST2,9	LFLL32-SF ¹⁾
AB.LFLL52	0,1	120	20	18	8,5	45,5	9,7	15	ST4,8	LFLL52-SF

¹⁾ Please contact us.



Cap wipers



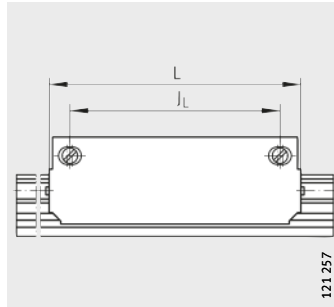
AB.LFR

Dimension table - Dimensions in mm

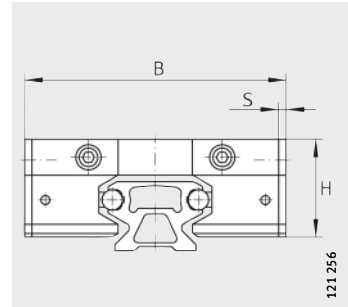
Designation	Mass m ≈ kg	Dimensions										For	
		B	A ₃	A ₄	N ₂	A ₆	L ±0,1	J _L	H ₁	K ₄	N ₁ +0,1	track roller	carriage
AB.LFR50/8	0,02	31,6	25,9	15,6	2	6,4	51	28,5	15	M3	15	LFR50/8	LFCL25
AB.LFR5201	0,02	43,3	33,4	22,3	2	16	56	40	21,3	M3	20	LFR5201	LFCL42
AB.LFR5301	0,03	50	38,7	26	2	10,4	76	46	25	M3	20	LFR5301	LFCL86
AB.LFR5302¹⁾	–	57	46	–	1,5	15,5	58	48	31	M3	–	LFR5302	–

¹⁾ Observe the note on page 110.

Side plate



ABAL



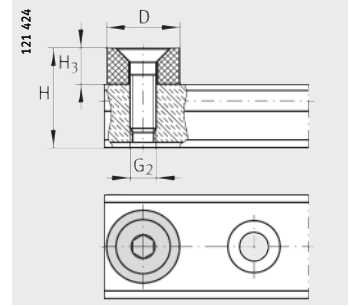
ABAL

Dimension table · Dimensions in mm

Designation	Mass m ≈ kg	Dimensions					For carriage
		B	S	L	J _L	H	
ABAL32	0,03	86	3	112	100	32	LFL32-SF
ABAL52	0,04	130	5	136	117	49,5	LFL52-SF
ABAL52-E	0,05	145	5	186	167	55	LFL52-E-SF



Stops

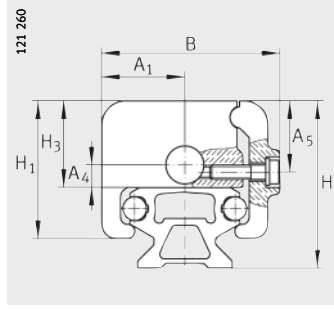


PASTP

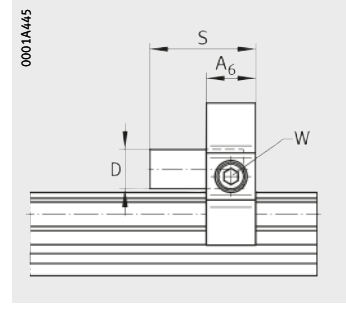
Dimension table - Dimensions in mm

Designation	Mass m ≈ kg	Dimensions				For guideway
		D	H ₃	G ₂	H	
PASTP20	0,008	14	7	M5	22,2	LFS20
PASTP25	0,008	14	7	M5	25	LFS25
PASTP32	0,01	16	11	M6	31	LFS32
PASTP42	0,01	16	11	M6	31	LFS42-C
PASTP52	0,01	20	11	M8	45	LFS52
PASTP86	0,01	20	11	M8	45	LFS86-C

Stops



PAH



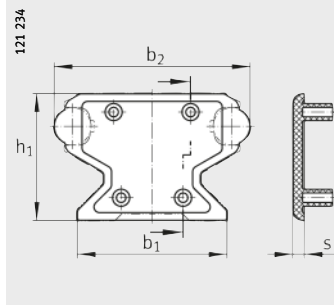
PAH
View rotated 90°

Dimension table · Dimensions in mm

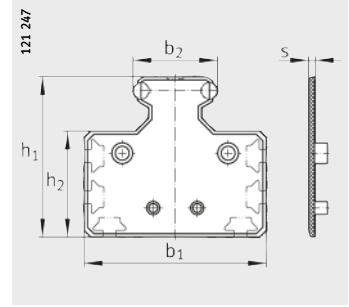
Designation	Mass m ≈ kg	Dimensions										For guideway	
		B	A ₁	S	A ₆	D	H	H ₁	H ₃	A ₄	A ₅		Width across flats W
PAH32	0,05	46	21	30	15	10	39	32	19	7	14	5	LFS32-C
PAH52	0,17	75	35	43	20	16	70,5	58	36,5	9,5	30	6	LFS52-C (-NZZ)



End cover



KA.LFS...-C

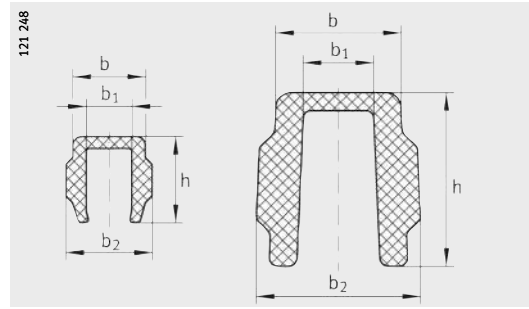


KA.LFS...-M

Dimension table - Dimensions in mm

Designation	Mass m ≈ kg	Dimensions					For guideway
		b ₂	b ₁	S	h ₁	h ₂	
KA.LFS25-M	0,01	24,4	55,4	3	45,4	30,9	LFS25-M
KA.LFS32-C	0,01	31,4	23,4	3	19,4	–	LFS32-C
KA.LFS32-M	0,012	31,4	75,4	3	59,9	46,4	LFS32-M
KA.LFS42-C	0,012	41,4	27,4	3	19,4	–	LFS42-C
KA.LFS52-C	0,013	51,6	39,5	3	33,4	–	LFS52-C
KA.LFS52-M	0,015	51,6	111,4	4	98	64,8	LFS52-M
KA.LFS86-C	0,015	85,6	70,4	3	33,4	–	LFS86-C

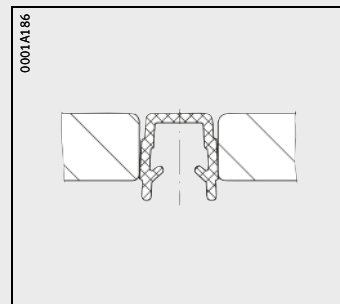
Slot closing strip



NAD

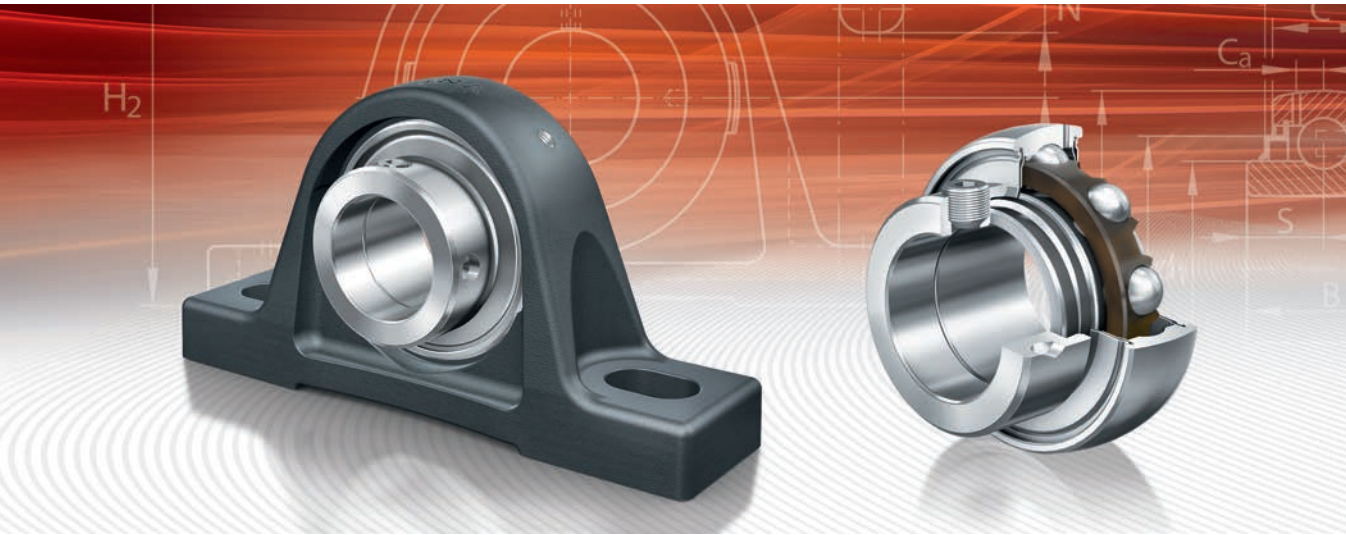
Dimension table · Dimensions in mm

Designation	Mass m ≈ kg	Dimensions				For guideway
		b	b ₁	b ₂	h	
NAD5×5,7	0,012	4,8	3	5,7	5,7	LFS25-M
NAD8×11,5	0,027	8,2	5,5	9,2	11,5	LFS32-M, LFS52-M



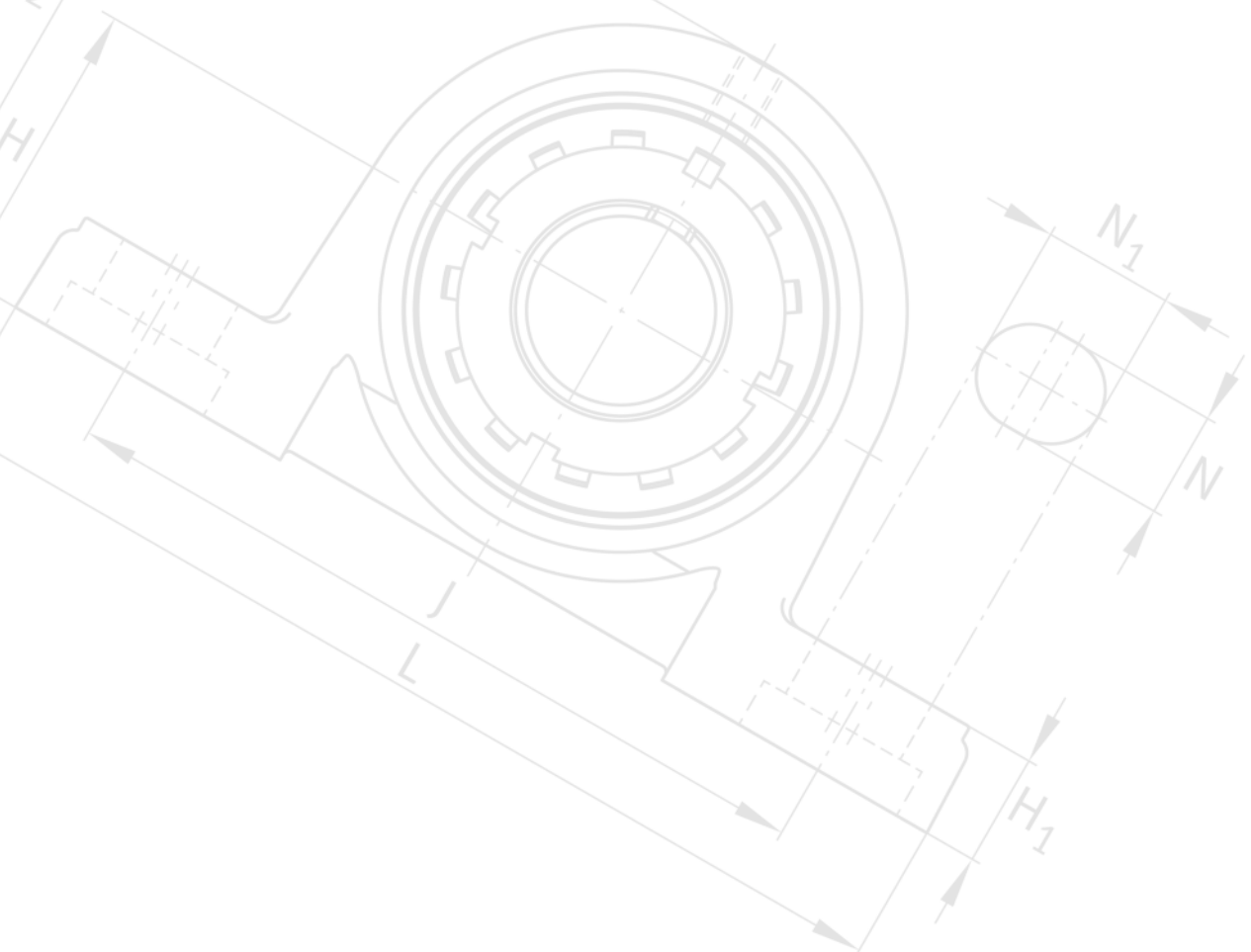
NAD5×5,7



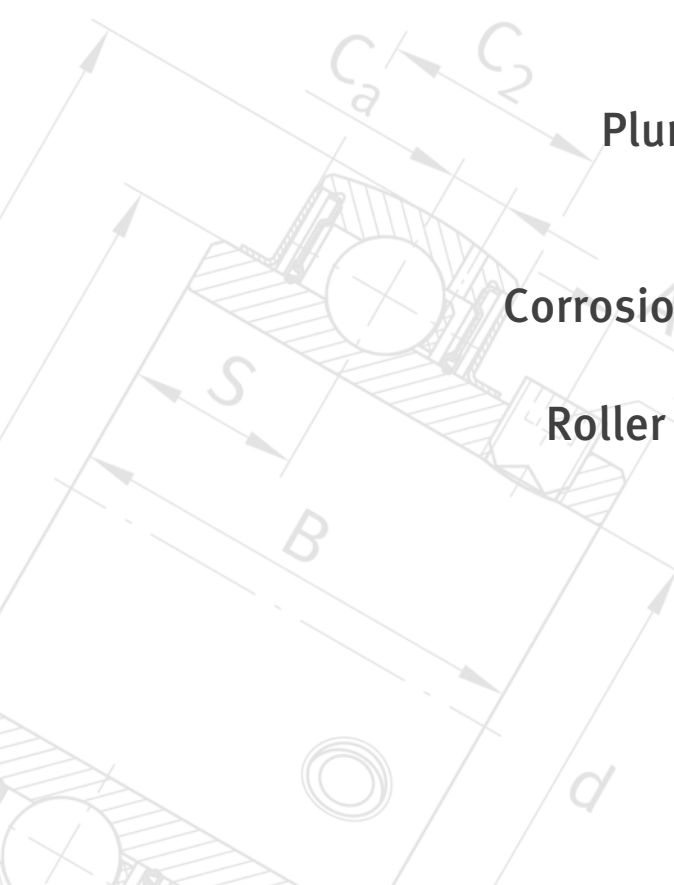


Radial Insert Ball Bearings and Housing Units

Plummer block housing units
Flanged housing units
Take-up housing units
Corrosion-resistant product range
Black Series
Roller chain idler sprocket units
Idler pulley units



Radial Insert Ball Bearings and Housing Units



Plummer block housing units

Flanged housing units

Take-up housing units

Corrosion-resistant product range

Black Series

Roller chain idler sprocket units

Idler pulley units

Foreword

Schaeffler Technologies

Schaeffler Technologies with its brands INA and FAG is a leading worldwide supplier of rolling bearings, spherical plain bearings, plain bearings, linear products, accessories specific to bearings and comprehensive maintenance products and services. Schaeffler has approximately 40 000 catalogue products manufactured as standard, providing an extremely wide portfolio that gives secure coverage of applications from 60 industrial market sectors.

The central factors responsible for this success are our outstanding strength in innovation, our global focus on local customer proximity, highly developed manufacturing methods, extremely high quality standards in all processes and our ability to transform specific customer requirements quickly and accurately into cost-effective solutions. Against this background of expertise, knowledge and experience together with our wide range of catalogue items, we see ourselves as a high performance, customer focussed partner.

Research and development

As a company looking to the future, we are especially active in the field of research and development. The key areas in this respect include not only research into fundamental principles, materials technology, tribology and calculation but also extensive inspection and test methods as well as activities to optimise manufacturing technology. This is oriented towards ensuring the continuous development, improvement and application of our products in the long term.

We carry out research and development on a global basis. Our development centres are linked with each other worldwide and are thus in a position to exchange current information on a very short timescale as well as access and communicate the most recent data. This ensures that a uniform level of knowledge and information is available worldwide.

In addition to continued development of standard products, we work closely in research and development activities with our customers where specific customer solutions are required. They can thus benefit from the best product for their application, with the maximum possible performance capacity at a cost-effective price.

Foreword

Quality, manufacturing technology, environmental protection

“Zero defects” is our quality objective. We have matched all our processes, both in product development and in manufacturing, to this target.

Our comprehensive know-how in forming, in forging, in heat treatment and surface technologies, in hard machining by means of grinding and honing and in assembly processes is applied in order to ensure that our products fulfil the required quality level.

Our manufacturing processes are monitored by means of systematic quality inspections. This ensures that all products continuously fulfil the same high standard of quality.

All Schaeffler sites worldwide are certified to ISO/TS 16949:2009 and DIN EN ISO 9001:2008.

With the validation and certification of our manufacturing sites, we are taking a pioneering role in environmental protection. All larger manufacturing sites are certified to ISO 14001 and are also validated in accordance with the more stringent EC ECO Management and Audit Scheme (EMAS).

Worldwide presence

Through a closely knit network of development and manufacturing sites, sales companies and an international distribution structure, we are represented throughout the world. This global presence ensures effective linkage between the major markets in Europe, India, South East Asia/Pacific Region, East Asia, North and South America.

As a result, we have an on-site presence with service and technical advice in close proximity to the customer.

We take orders from throughout the world and make deliveries worldwide too. Furthermore, we support our customers worldwide in resolving their bearing arrangement requirements, respond to technical queries and develop specific bearing arrangement solutions in local partnership with our customers.

Catalogue SG 1, Radial Insert Ball Bearings and Housing Units

Radial insert ball bearings and housing units are robust, ready-to-fit machine elements for the design of economical bearing arrangements. These products are available in many different series, have proven effective over many years and predominantly comprise a housing fitted with a radial insert ball bearing. The housing bore and the bearing outer ring have a spherical profile and are matched to each other. This allows the bearing ring in the housing to adapt to static angular misalignment of the shaft.

Due to their special locating methods, principally by eccentric locking collar or grub screws, the radial insert ball bearings can be easily located on the shaft. They are particularly easy to fit when they are used in combination with drawn shafts. Radial insert ball bearings are fitted with multi-piece seals that effectively protect the rolling element set against contamination and moisture, even under difficult and critical operating conditions.

Schaeffler offers a wide range of housing units with radial insert ball bearings. Radial insert ball bearings are based on single row deep groove ball bearings.

Radial insert ball bearings

The outer rings of radial insert ball bearings have a spherical or cylindrical outside surface. Radial insert ball bearings are available with a metric or inch size bore. Black Series radial insert ball bearings with a Durotect BS coating have basic anti-corrosion protection. Corrosion-resistant radial insert ball bearings are available in a high grade steel version or with the Corrotect coating.

Housing units

Housing units are available as plummer block, flanged and take-up housing units in numerous different designs. The units are ready-to-fit and comprise cast iron or sheet steel housings in which radial insert ball bearings are integrated. Corrosion-resistant units are available with the Corrotect coating, in a high grade steel version or made from plastic.

The dimensions of the FAG Black Series housing units with a primer paint coating correspond to JIS B 1557 and have basic anti-corrosion protection due to the Durotect BS coating.

Current level of technology

The data represent the current level of technology and manufacture as of October 2017. They reflect not only progress in bearing arrangement technology but also the experience gathered from numerous applications.

Any data in earlier publications that do not correspond to the data in this catalogue are therefore invalid.

Definition of the Attention symbol

This catalogue predominantly gives descriptions of standard housings. Since these are used in numerous applications, we cannot make a judgement as to whether any malfunctions will cause harm to persons or property.

Follow instructions

It is always and fundamentally the responsibility of the designer and user to ensure that all specifications are observed and that all necessary information is communicated to the end user. This applies in particular to applications in which product failure and malfunction may constitute a hazard to human beings.



If guidelines marked with the Attention symbol are not observed, damage or malfunctions in the product or the adjacent construction may occur.

Foreword

X-life

X-life is the premium brand that identifies particularly high performance products under the FAG and INA brands. They are characterised by longer rating life and operating life, due to higher basic dynamic load ratings compared to the previous standard.

X-life is an all-encompassing concept: advice, product development, service and sales are fully integrated with each other in all phases of the product cycle. As a service surround system, it includes a comprehensive lubrication concept. In addition, X-life stands for continuous quality improvement and local customer focus applied worldwide.

Advantages of X-life quality

The use of state of the art manufacturing technologies has resulted in a better, more uniform surface over the whole contact face between the rolling elements and raceway. As a result, under identical load there is a significant reduction in the stress conditions present on the rolling elements and raceway. The improved surface quality gives reduced friction and lower bearing temperatures, running resistance is lower and less strain is placed on the lubricant.

Thanks to such improvements, the basic dynamic load ratings are significantly higher than those of the previous design. As a result, the basic rating life is higher; i.e. the operating life of the bearings is considerably longer under the same operating conditions. Alternatively, higher loads can be applied while maintaining the same rating life values.

With their optimised characteristics, X-life bearings open up completely new application prospects, such as downsizing of the bearing arrangement. Furthermore, the improved price/performance ratio ultimately increases the overall cost-effectiveness of the bearing arrangement.

X-life bearings are indicated in the dimension tables.

medias professional
electronic information system

medias professional, the proven selection and information system, presents the INA and FAG catalogue products in electronic format. As with the printed catalogue, this gives our customers product information on both brands in a single data source. This saves time and gives easier handling.

medias professional is available online and in download form in several languages, is easy to navigate and is particularly clear thanks to the use of numerous images, diagrams and models. There are also highly representative application examples, classified by market sector.

Datasheets on the bearing series can be generated as PDF files. It includes a lubricant database and also the web2CAD link for direct download and integration of 3D models.

medias professional focusses on the individual bearing. The complete shaft can be simulated and any influences arising from its deformation on the bearings can be determined using the calculation program BEARINX. This program can also be made available to direct customers as BEARINX-online via the Internet (for conditions, see the INA/FAG homepage).

In conclusion, *medias professional* is a comprehensive, reliable system to help you help yourself answer many questions on rolling bearing technology by electronic means, quickly and at any location.



► <http://medias.schaeffler.de>

Foreword

Selection wizard for housing units in *medias professional*

The selection wizard for bearing housings in *medias professional* gives comprehensive assistance in the selection of housings and housing units. It takes account of the environmental conditions and the requirements placed on the bearing arrangement as well as the characteristics of the housings and the bearings suitable for the housings. Once the specified data has been inputted, the software generates detailed lists of results that also contain information on further accessories.

***medias* interchange**

medias interchange is available online and assists in the selection process where rolling bearings or housings from other manufacturers are to be replaced by products of the INA and FAG brands. If a rolling bearing and housing designation is entered in *medias* interchange, this will indicate the manufacturer and INA or FAG designations. A traffic light system will quickly indicate whether and to what extent the INA or FAG part is interchangeable. Green indicates fully interchangeable, yellow indicates conditional interchangeability and red indicates non-interchangeable.

Other technical publications

This catalogue contains the core range of radial insert ball bearings and housing units of the brands INA and FAG. Furthermore, we develop and manufacture many other products and systems that are of significant interest in terms of technical progress and cost-effectiveness for rotary and linear bearing arrangements as well as for the automotive sector. These are covered in separate technical publications that can be obtained upon request.

**INA and FAG,
when it comes to motion**

Catalogue SG 1 stands for pioneering bearing technology, application-focussed advice, the highest product and performance density and continuous development.

The benefits to you:

- selection of products from a vast product range
- the most suitable product in the right place
- worldwide availability of products
- short delivery times
- long term supply capability
- security of planning for the long view
- simplified stockholding
- market-competitive prices
- global service
- comprehensive, application-focussed advice.

**Together
we move the world**

For us, technical progress means never standing still. In partnership with you, we are continually working on new solutions so that your vision and our technical ideas can continue to become a reality, to your benefit.

With our products and our knowledge, we can together continue to fulfil the challenges of your market in relation to bearing arrangements. To this end, this catalogue is an important instrument.

Foreword

Catalogue GK 1 for bearing housings

In addition to the radial insert ball bearings and housing units described in this catalogue, Schaeffler offers a wide range of bearing housings. The bearing housings are subdivided into standard housings and housings for specific industrial and railway applications. Catalogue GK 1, Bearing Housings, describes the range of standard housings and gives essential information on special housings.

Standard housings

The standard housings comprise split and unsplit plummer block housings, take-up housings and flanged housings.

In the case of split plummer block housings, *Figure 1*, the upper section of the housing can be removed. This gives significantly simpler mounting and maintenance. Unsplit plummer block housings, *Figure 2*, are used where the bearing arrangement is subjected to very high loads.

Take-up housings, *Figure 3*, page 11, were developed specifically for tensioner drum bearing arrangements in belt conveyor plant. There is a yoke-shaped drawbar eye for attachment to the tensioning device.

Flanged housings, *Figure 4*, page 11, have a flange perpendicular to the shaft axis and thus offer the ideal adjacent construction for numerous machines and pieces of equipment where the use of plummer block housings would be too demanding.

- ① Split plummer block housing SNS
- ② Split plummer block housing LOE

Figure 1
Split plummer block housings
(examples)



- ① Plummer block housing unit VRE3
- ② Unsplit plummer block housing BND

Figure 2
Unsplit plummer block housings
(examples)

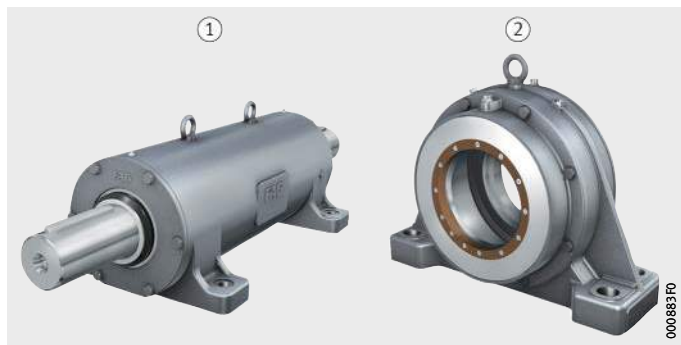
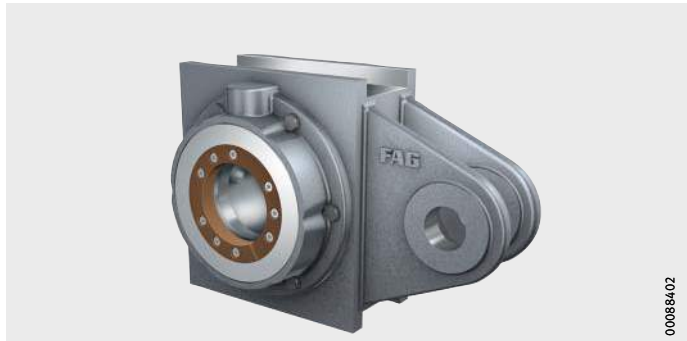


Figure 3
Take-up housing SPA



- ① Flanged housing F112
- ② Flanged housing F5

Figure 4
Flanged housings



Special housings

Special housings are used in particularly challenging applications where not all the requirements can be fulfilled by the use of standard housings. Apart from specific industrial applications, these are principally applications from the railway sector.

Special housings are developed in close cooperation and consultation with the customer. Schaeffler uses its comprehensive know-how of rolling bearing technology in order to ensure that every housing is optimally matched to the specific application.

Selected examples in Catalogue GK 1 give an insight into the diverse areas of application and possibilities of housings for specific industrial and railway applications.

Further information

- The complete catalogue range can be found in Catalogue GK 1, Bearing Housings.
- Download and ordering: <http://medien.schaeffler.de>
- Electronic selection wizard for bearing housings: <http://medias.schaeffler.de/medias/ga>.

Contents

	Page
Product index	14
Tab index	30
Technical principles.....	32
Radial insert ball bearings	143
Radial insert ball bearings with spherical outer ring	152
Radial insert ball bearings with cylindrical outer ring	194
Radial insert ball bearings with rubber interliner or steel aligning ring	212
Housing units.....	223
Housing units with flake graphite cast iron housing	226
Housing units with sheet steel housing	306
Roller chain idler sprocket units, idler pulley units	334
Radial insert ball bearings and housing units, corrosion-resistant	349
Radial insert ball bearings, corrosion-resistant	352
Flake graphite cast iron or sheet steel housing units, corrosion-resistant.....	376
High grade steel housing units, corrosion-resistant	396
Plastic housing units, corrosion-resistant	426
Black Series	467
Radial insert ball bearings.....	470
Housing units	488
Other products	551
Tillage and harvesting.....	554
Conveying equipment	568
Textile machinery.....	572
Food industry.....	578
Ventilators.....	584
Mounting and maintenance	587
Products and services	589
Mounting.....	592
Lubrication	596
Addresses	603

Product index

	Page
2..-XL-KRR	Deep groove ball bearings with extended inner ring, cylindrical outer ring and R type seal 197
2..-XL-NPP-B	Self-aligning deep groove ball bearings, spherical outer ring, P type seal..... 155
AY..-XL-NPP-B	Radial insert ball bearings, spherical outer ring, grub screws in inner ring and P type seal 154
BE..-XL	Radial insert ball bearings with steel aligning ring, with bore for fit and P type seal, no relubrication facility 214
BS	Back Seal 431
CC	Closed end cap 431
CO	Open end cap 431
CRB..-XL	Radial insert ball bearings with rubber interliner, eccentric locking collar 214
CUGPCTL	Two-bolt flanged housing units, plastic housing, eccentric locking collar and RSR type seal, Corrotect, relubrication facility 430
CUGPF	Four-bolt flanged housing units, plastic housing, eccentric locking collar and RSR type seal, Corrotect, relubrication facility 430
CUGPFL	Two-bolt flanged housing units, plastic housing, eccentric locking collar and RSR type seal, Corrotect, relubrication facility 430
CUGPHE	Take-up housing units, plastic housing, guidance surfaces on both sides, eccentric locking collar and RSR type seal, Corrotect, relubrication facility 430
CUGPP	Plummer block housing units with long base, plastic housing, eccentric locking collar and RSR type seal, Corrotect, relubrication facility 430
CUGPPA	Plummer block housing units with short base, plastic housing, eccentric locking collar and RSR type seal, Corrotect, relubrication facility 430
CUGPT	Take-up housing units, plastic housing, guidance slots on both sides, eccentric locking collar and RSR type seal, Corrotect, relubrication facility 430
CUGSF	Four-bolt flanged housing units, corrosion-resistant housing, eccentric locking collar and RSR type seal, Corrotect, relubrication facility 400

	Page	
CUGSFL	Two-bolt flanged housing units, corrosion-resistant housing, eccentric locking collar and RSR type seal, Corrotect, relubrication facility 400	400
CUGSP	Plummer block housing units with long base, corrosion-resistant housing, eccentric locking collar and RSR type seal, Corrotect, relubrication facility 400	400
CUGSPA	Plummer block housing units with short base, corrosion-resistant housing, eccentric locking collar and RSR type seal, Corrotect, relubrication facility 400	400
CUGST	Take-up housing units with guide slot, corrosion-resistant housing, eccentric locking collar and RSR type seal, Corrotect, relubrication facility 401	401
E..-XL-KLL	Radial insert ball bearings, cylindrical outer ring, eccentric locking collar and L type seal..... 196	196
E..-XL-KRR	Radial insert ball bearings, cylindrical outer ring, eccentric locking collar and R type seal 196	196
E..-XL-KRR-B	Radial insert ball bearings, spherical outer ring, eccentric locking collar and R type seal 154	154
FLCTE..-XL	Two-bolt flanged housing units, cast iron housing, eccentric locking collar and P type seal, no relubrication facility 230	230
FLCTEY..-XL	Two-bolt flanged housing units, cast iron housing, grub screws in inner ring and P type seal, no relubrication facility 230	230
G..-KRR-B-AS2/V	Radial insert ball bearings, spherical outer ring, eccentric locking collar and R type seal, inch size bore, relubrication facility..... 156	156
GAY..-XL-NPP-B	Radial insert ball bearings, spherical outer ring, grub screws in inner ring and P type seal, relubrication facility..... 154	154
GAY..-NPP-B(-AS2/V)	Radial insert ball bearings, spherical outer ring, grub screws in inner ring and P type seal, inch size bore, relubrication facility, with lubrication holes in outer ring on one side or offset on both sides..... 156	156
GAY..-XL-NPP-B-FA164	Radial insert ball bearings, spherical outer ring, grub screws in inner ring and P type seal, for high temperatures, relubrication facility 154	154

Product index

	Page
GE..-XL-KLL-B	Radial insert ball bearings, spherical outer ring, eccentric locking collar and L type seal, relubrication facility 154
GE..-XL-KRR-B	Radial insert ball bearings, spherical outer ring, eccentric locking collar and R type seal, relubrication facility 154
GE..-XL-KRR-B-2C	Radial insert ball bearings, spherical outer ring, eccentric locking collar and R type seal, flinger shields, relubrication facility..... 154
GE..-XL-KRR-B-FA101	Radial insert ball bearings, spherical outer ring, eccentric locking collar and R type seal, for high and low temperatures, relubrication facility 154
GE..-XL-KRR-B-FA125	Radial insert ball bearings, spherical outer ring, eccentric locking collar and R type seal, Corroctect, relubrication facility 356
GE..-XL-KRR-B-FA164	Radial insert ball bearings, spherical outer ring, eccentric locking collar and R type seal, for high temperatures, relubrication facility 154
GE..-XL-KTT-B	Radial insert ball bearings, spherical outer ring, eccentric locking collar and T type seal, relubrication facility 154
GLCTE..-XL	Two-bolt flanged housing units, cast iron housing, eccentric locking collar and P type seal, relubrication facility 230
GLE..-XL-KRR-B	Radial insert ball bearings, spherical outer ring, drive slot in inner ring and R type seal, relubrication facility 155
GENE..-XL-KRR-B	Radial insert ball bearings, spherical outer ring, eccentric locking collar and R type seal, heavy series, relubrication facility 154
GRA..-XL	Three-bolt or four-bolt flanged housing units, sheet steel housing, eccentric locking collar and P type seal, relubrication facility 309
GRA..-NPP-B-AS2/V	Radial insert ball bearings, spherical outer ring, eccentric locking collar and P type seal, inch size bore, relubrication facility 156

	Page
GRAE..-XL-NPP-B	Radial insert ball bearings, spherical outer ring, eccentric locking collar and P type seal, relubrication facility..... 154
GRAE..-XL-NPP-B-FA125	Radial insert ball bearings, spherical outer ring, eccentric locking collar and P type seal, Corrotect, relubrication facility..... 356
GRRY..-VA	Three-bolt or four-bolt flanged housing units, corrosion-resistant sheet steel housing, corrosion-resistant bearing, grub screws in inner ring and R type seal, relubrication facility..... 380
GSH..-XL-2RSR-B	Radial insert ball bearings, spherical outer ring, adapter sleeve and RSR type seal, relubrication facility..... 155
GVK..-KTT-B-AS2/V	Self-aligning deep groove ball bearings, spherical outer ring, square bore and T type seal, relubrication facility 156
GVKE..-KRR-B	Self-aligning deep groove ball bearings, spherical outer ring, metric square bore and R type seal, relubrication facility 156
GY..-KRR-B-AS2/V	Radial insert ball bearings, spherical outer ring, grub screws in inner ring and R type seal, inch size bore, relubrication facility..... 156
GYE..-XL-KRR-B	Radial insert ball bearings, spherical outer ring, grub screws in inner ring and R type seal, relubrication facility..... 154
H..X	Adapter sleeve for radial insert ball bearings UK, Black Series 486
IBBU..-IA03	Four-bolt flanged housing units, round version, for rolls, no relubrication facility..... 554
IBBU..-IA03	Four-bolt flanged housing units, square version, for rolls, no relubrication facility..... 554
IBBU..-IA03	Four-bolt flanged housing units, round version, for rolls, grub screws in inner ring, no relubrication facility 554
IBBU..-IA04	Flanged housing units, for harvesters, no relubrication facility 555
KASK	End caps for housings with one annular slot, suffix N 233
KSR..-B0	Roller chain idler sprocket units, with radial insert ball bearing..... 336
KSR..-L0	Roller chain idler sprocket units, with deep groove ball bearing 336
KSR..-L0..-22	Roller chain idler sprocket units, plastic sprocket, with deep groove ball bearing 336

Product index

	Page
LASE...-XL	Plummer block housing units, cast iron housing, eccentric locking collar and L type seal, relubrication facility 229
LCFTRY...-IT	Three-bolt flanged housing units for textile machinery, cast iron housing, grub screws in inner ring and R type seal, relubrication facility 572
LCJT...-XL	Two-bolt flanged housing units, cast iron housing, eccentric locking collar and L type seal, relubrication facility 230
LCJT...-IT	Two-bolt flanged housing units for textile machinery, cast iron housing, eccentric locking collar and L type seal, Corrotect, relubrication facility 572
MSTU...-XL	Take-up housing units, sheet steel housing, eccentric locking collar and P type seal, no relubrication facility 309
PASE...-XL	Plummer block housing units, cast iron housing, eccentric locking collar and P type seal, relubrication facility 229
PASE...-XL-N-FA125	Plummer block housing units, cast iron housing, eccentric locking collar and P type seal, Corrotect, relubrication facility 380
PASEY...-XL	Plummer block housing units, cast iron housing, grub screws in inner ring and P type seal, relubrication facility 229
PASEA...-IC	Plummer block housing units for conveying equipment, cast iron housing, adapter sleeve and P type seal, relubrication facility 568
PB...-XL	Plummer block housing units, sheet steel housing, eccentric locking collar and P type seal, no relubrication facility 308
PBS...-XL	Plummer block housing units, sheet steel housing, eccentric locking collar and P type seal, no relubrication facility 308
PBY...-XL	Plummer block housing units, sheet steel housing, grub screws in inner ring and P type seal, no relubrication facility 308

	Page
PCCJ	Four-bolt flanged housing units, cast iron housing, with centring spigot, double row angular contact ball bearing, P type seal, relubrication facility..... 231
PCF..-XL	Four-bolt flanged housing units, cast iron housing, eccentric locking collar and P type seal, relubrication facility..... 231
PCFT..-XL	Two-bolt flanged housing units, cast iron housing, eccentric locking collar and P type seal, relubrication facility..... 230
PCFTR..-XL	Three-bolt flanged housing units, cast iron housing, eccentric locking collar and P type seal, relubrication facility..... 230
PCJ..-XL	Four-bolt flanged housing units, cast iron housing, eccentric locking collar and P type seal, relubrication facility..... 231
PCJ..-XL-N-FA125	Four-bolt flanged housing units, cast iron housing, eccentric locking collar and P type seal, Corrotect, relubrication facility 380
PCJT..-XL	Two-bolt flanged housing units, cast iron housing, eccentric locking collar and P type seal, relubrication facility..... 230
PCJT..-XL-N-FA125	Two-bolt flanged housing units, cast iron housing, eccentric locking collar and P type seal, Corrotect, relubrication facility 380
PCJTY..-XL	Two-bolt flanged housing units, cast iron housing, grub screws in inner ring and P type seal, relubrication facility..... 230
PCJTZA..-IC	Two-bolt flanged housing units for conveying equipment, cast iron housing, eccentric locking collar and P type seal, relubrication facility..... 568
PCJY..-XL	Four-bolt flanged housing units, cast iron housing, grub screws in inner ring and P type seal, relubrication facility..... 231
PCSK	Four-bolt flanged housing units, plastic housing, eccentric locking collar and P type seal, Corrotect, relubrication facility..... 578
PCSLT..-XL	Two-bolt flanged housing units, sheet steel housing, eccentric locking collar and P type seal, no relubrication facility 309

Product index

	Page
PCSTK	Two-bolt flanged housing units, plastic housing, eccentric locking collar and P type seal, Corrotect, relubrication facility 578
PE..-XL	Radial insert ball bearings with steel aligning ring, eccentric locking collar and P type seal, no relubrication facility 214
PHE..-XL	Take-up housing units, cast iron housing, eccentric locking collar and P type seal, relubrication facility 232
PHEY..-XL	Take-up housing units, cast iron housing, grub screws in inner ring and P type seal, relubrication facility 232
PHUSE..-XL	Take-up housing units, cast iron and sheet steel, eccentric locking collar and P type seal, relubrication facility 232
PME..-XL	Four-bolt flanged housing units, cast iron housing, with wide centring spigot, eccentric locking collar and P type seal, relubrication facility 231
PMEY..-XL	Four-bolt flanged housing units, cast iron housing, with wide centring spigot, grub screws in inner ring and P type seal, relubrication facility 231
PSFT..-XL	Take-up housing units, cast iron housing, self-aligning, eccentric locking collar and P type seal, relubrication facility 232
PSHE..-XL	Plummer block housing units, cast iron housing, eccentric locking collar and P type seal, relubrication facility 229
PSHEY..-XL	Plummer block housing units, cast iron housing, grub screws in inner ring and P type seal, relubrication facility 229
PTUE..-XL	Take-up housing units, cast iron housing, eccentric locking collar and P type seal, relubrication facility 232
PTUE..-IC	Take-up housing units for conveying equipment, cast iron housing, self-aligning deep groove ball bearing with bore for fit, P type seal, no relubrication facility 568

	Page
PTUEY..-XL	Take-up housing units, cast iron housing, grub screws in inner ring and P type seal, relubrication facility..... 232
RA..-XL	Three-bolt or four-bolt flanged housing units, sheet steel housing, eccentric locking collar and P type seal, no relubrication facility 309
RA..-NPP	Radial insert ball bearings, cylindrical outer ring, eccentric locking collar and P type seal, inch size bore 197
RA..-NPP-B	Radial insert ball bearings, spherical outer ring, eccentric locking collar and P type seal, inch size bore 156
RABRA(B)..-XL-FA106	Radial insert ball bearings, with rubber interliner, eccentric locking collar and P type seal 214
RAE..-XL-NPP	Radial insert ball bearings, cylindrical outer ring, eccentric locking collar and P type seal 196
RAE..-XL-NPP-B	Radial insert ball bearings, spherical outer ring, eccentric locking collar and P type seal 154
RAE..-XL-NPP-NR	Radial insert ball bearings, cylindrical outer ring with two slots, eccentric locking collar and P type seal, snap ring 196
RAL..-NPP	Radial insert ball bearings, cylindrical outer ring, eccentric locking collar and P type seal, inch size bore, light series 197
RALE..-XL-NPP	Radial insert ball bearings, cylindrical outer ring, eccentric locking collar and P type seal, light series..... 196
RALE..-XL-NPP-B	Radial insert ball bearings, spherical outer ring, eccentric locking collar and P type seal, light series..... 154
RALT..-XL	Two-bolt flanged housing units, sheet steel housing, eccentric locking collar and P type seal, light series, no relubrication facility 309
RALTR..-XL	Three-bolt flanged housing units, sheet steel housing, eccentric locking collar and P type seal, light series, no relubrication facility 309
RASE..-XL-FA164	Plummer block housing units, cast iron housing, eccentric locking collar and R type seal, for high temperatures, relubrication facility 229
RASE..-XL	Plummer block housing units, cast iron housing, eccentric locking collar and R type seal, relubrication facility..... 229
RASE..-XL-N-FA125	Plummer block housing units, cast iron housing, eccentric locking collar and R type seal, Corrotect, relubrication facility 380

Product index

	Page
RASEA...-XL	Plummer block housing units, cast iron housing, adapter sleeve and R type seal, relubrication facility 229
RASEL...-XL	Plummer block housing units, cast iron housing, drive slot in inner ring and R type seal, relubrication facility 229
RASEY...-XL	Plummer block housing units, cast iron housing, grub screws in inner ring and R type seal, relubrication facility 229
RASEY...-IT	Plummer block housing units for textile machinery, cast iron housing, grub screws in inner ring and R type seal, relubrication facility 572
RAT...-XL	Two-bolt flanged housing units, sheet steel, eccentric locking collar and P type seal, no relubrication facility 309
RATR...-XL	Three-bolt flanged housing units, sheet steel, eccentric locking collar and P type seal, no relubrication facility 309
RATRY...-XL	Three-bolt flanged housing units, sheet steel, grub screws in inner ring and P type seal, no relubrication facility 309
RATY...-XL	Two-bolt flanged housing units, sheet steel housing, grub screws in inner ring and P type seal, no relubrication facility 309
RAY...-XL	Three-bolt or four-bolt flanged housing units, sheet steel housing, grub screws in inner ring and P type seal, no relubrication facility 309
RCJ...-XL-FA164	Four-bolt flanged housing units, cast iron housing, eccentric locking collar and R type seal, for high temperatures, relubrication facility 231
RCJ...-IA03	Four-bolt flanged housing units for rolls, no relubrication facility 554
RCJ...-XL	Four-bolt flanged housing units, cast iron housing, eccentric locking collar and R type seal, relubrication facility 231
RCJ...-XL-N-FA125	Four-bolt flanged housing units, cast iron housing, eccentric locking collar and R type seal, Corrotect, relubrication facility 380

	Page
RCJL..-XL	Four-bolt flanged housing units, cast iron housing, drive slot in inner ring and R type seal, relubrication facility..... 231
RCJO..-XL	Four-bolt flanged housing units, cast iron housing, eccentric locking collar and R type seal, heavy series, relubrication facility..... 231
RCJT..-XL-FA164	Two-bolt flanged housing units, cast iron housing, eccentric locking collar and R type seal, for high temperatures, relubrication facility 230
RCJT..-IA03	Two-bolt flanged housing units for rolls, no relubrication facility 554
RCJT..-XL	Two-bolt flanged housing units, cast iron housing, eccentric locking collar and R type seal, relubrication facility..... 230
RCJT..-XL-N-FA125	Two-bolt flanged housing units, cast iron housing, eccentric locking collar and R type seal, Corrotect, relubrication facility 380
RCJTA..-XL	Two-bolt flanged housing units, cast iron housing, adapter sleeve and R type seal, relubrication facility..... 230
RCJTY..-XL	Two-bolt flanged housing units, cast iron housing, grub screws in inner ring and R type seal, relubrication facility..... 230
RCJTZ..-XL	Two-bolt flanged housing units, cast iron housing, with centring spigot, eccentric locking collar and R type seal, relubrication facility..... 230
RCJY..-XL	Four-bolt flanged housing units, cast iron housing, grub screws in inner ring and R type seal, relubrication facility..... 231
RCRA(B)..-XL-FA106	Radial insert ball bearings, with rubber interliner, eccentric locking collar and P type seal, no relubrication facility 214
RCSKY..-VA	Four-bolt flanged housing units, plastic housing, grub screws in inner ring and RSR type seal, bearing rings and rolling bearing made from high grade steel, relubrication facility..... 578
RCSMA(B)..-XL-FA106	Radial insert ball bearings with rubber interliner, eccentric locking collar 214
RCSMF..-XL	Two-bolt flanged housing units, sheet steel housing, with rubber interliner, eccentric locking collar and P type seal, no relubrication facility 309

Product index

	Page
RCSTKY..VA	Two-bolt flanged housing units, plastic housing, grub screws in inner ring and RSR type seal, bearing rings and rolling bearing made from high grade steel, relubrication facility 578
RFE..-XL	Four-bolt flanged housing units, cast iron housing, with narrow centring spigot, eccentric locking collar and R type seal, relubrication facility 231
RHE..-XL	Take-up housing units, cast iron housing, eccentric locking collar and R type seal, relubrication facility 232
RME..-IA04	Flanged housing units for harvesters, relubrication facility 555
RME..-XL	Four-bolt flanged housing units, cast iron housing, with wide centring spigot, eccentric locking collar and R type seal, relubrication facility 231
RMEO..-XL	Four-bolt flanged housing units, cast iron housing, with wide centring spigot, eccentric locking collar and R type seal, heavy series, relubrication facility 231
RMEO..-IA04	Flanged housing units for harvesters, relubrication facility 555
RMEY..-IA04	Flanged housing units for harvesters, no relubrication facility 555
RMEY..-XL	Four-bolt flanged housing units, cast iron housing, with wide centring spigot, grub screws in inner ring and R type seal, relubrication facility 231
RPB..-XL	Plummer block housing units, sheet steel housing, with rubber interliner, eccentric locking collar and P type seal, no relubrication facility 308
RRTR..-XL	Three-bolt flanged housing units, sheet steel housing, eccentric locking collar and R type seal, no relubrication facility 309
RRY..-VA	Three-bolt or four-bolt flanged housing units, corrosion-resistant sheet steel housing, corrosion-resistant bearing, grub screws in inner ring and R type seal, no relubrication facility 380
RSAO..-XL	Plummer block housing units, cast iron housing, eccentric locking collar and R type seal, heavy series, relubrication facility 229

	Page
RSHE..-XL	Plummer block housing units, cast iron housing, eccentric locking collar and R type seal, relubrication facility..... 229
RSHEY..-XL	Plummer block housing units, cast iron housing, grub screws in inner ring and R type seal, relubrication facility..... 229
RTUE..-XL	Take-up housing units, cast iron housing, eccentric locking collar and R type seal, relubrication facility..... 232
RTUEO..-XL	Take-up housing units, cast iron housing, eccentric locking collar and R type seal, heavy series, relubrication facility..... 232
RTUEY..-XL	Take-up housing units, cast iron housing, grub screws in inner ring and R type seal, relubrication facility..... 232
SH	Radial insert ball bearings for textile machinery, spherical outer ring, adapter sleeve and BRS type seal, Corrotect, no relubrication facility 572
SK..-KRR	Self-aligning deep groove ball bearings, cylindrical outer ring, hexagonal bore and R type seal..... 197
SK..-KRR-B	Self-aligning deep groove ball bearings, spherical outer ring, hexagonal bore and R type seal 156
SK..-KTT	Self-aligning deep groove ball bearings, cylindrical outer ring, hexagonal bore and T type seal 197
SUB	Radial insert ball bearings, spherical outer ring, grub screws in narrow inner ring and RSR type seal, corrosion-resistant VA design 356
SUBPCTL	Two-bolt flanged housing units, plastic housing, grub screws in narrow inner ring and RSR type seal, corrosion-resistant VA design, relubrication facility 430
SUBPF	Four-bolt flanged housing units, plastic housing, grub screws in narrow inner ring and RSR type seal, corrosion-resistant VA design, relubrication facility 430
SUBPFL	Two-bolt flanged housing units, plastic housing, grub screws in narrow inner ring and RSR type seal, corrosion-resistant VA design, relubrication facility 430

Product index

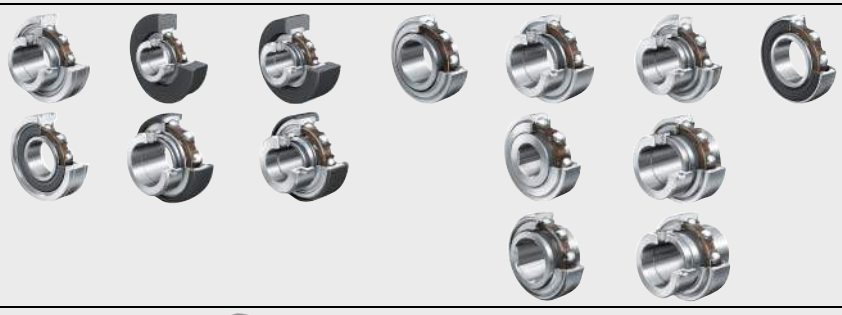
	Page
SUBPHE	Take-up housing units, plastic housing, grub screws in narrow inner ring and RSR type seal, corrosion-resistant VA design, relubrication facility 430
SUBPP	Plummer block housing units with long base, plastic housing, grub screws in narrow inner ring and RSR type seal, corrosion-resistant VA design, relubrication facility 430
SUBPPA	Plummer block housing units with short base, plastic housing, grub screws in narrow inner ring and RSR type seal, corrosion-resistant VA design, relubrication facility 430
SUBPT	Take-up housing units with guidance slot, plastic housing, grub screws in narrow inner ring and RSR type seal, corrosion-resistant VA design, relubrication facility 430
SUC	Radial insert ball bearings, spherical outer ring, grub screws in narrow inner ring and RSR type seal, flinger shields, corrosion-resistant VA design 356
SUCPF	Four-bolt flanged housing units, plastic housing, grub screws in wide inner ring and RSR type seal, corrosion-resistant VA design, relubrication facility 430
SUCPFL	Two-bolt flanged housing units, plastic housing, grub screws in wide inner ring and RSR type seal, corrosion-resistant VA design, relubrication facility 430
SUCPHE	Take-up housing units, plastic housing, grub screws in narrow inner ring and RSR type seal, corrosion-resistant VA design, relubrication facility 430
SUCPP	Plummer block housing units with long base, plastic housing, grub screws in wide inner ring and RSR type seal, corrosion-resistant VA design, relubrication facility 430
SUCPPA	Plummer block housing units with short base, plastic housing, grub screws in wide inner ring and RSR type seal, corrosion-resistant VA design, relubrication facility 430
SUCPT	Take-up housing units with guidance slot, plastic housing, grub screws in wide inner ring and RSR type seal, corrosion-resistant VA design, relubrication facility 430
SUCSF	Four-bolt flanged housing units, corrosion-resistant housing, grub screws in wide inner ring and RSR type seal, corrosion-resistant VA design, relubrication facility 400
SUCSFL	Two-bolt flanged housing units, corrosion-resistant housing, grub screws in wide inner ring and RSR type seal, corrosion-resistant VA design, relubrication facility 400

	Page
SUCSP	Plummer block housing units with long base, corrosion-resistant housing, grub screws in wide inner ring and RSR type seal, corrosion-resistant VA design, relubrication facility 400
SUCSPA	Plummer block housing units with short base, corrosion-resistant housing, grub screws in wide inner ring and RSR type seal, corrosion-resistant VA design, relubrication facility 400
SUCST	Take-up housing units with guide slot, corrosion-resistant housing, eccentric locking collar and RSR type seal, corrosion-resistant VA design, relubrication facility 401
SUG	Radial insert ball bearings, spherical outer ring, eccentric locking collar and RSR type seal, corrosion-resistant VA design 356
SUGPCTL	Two-bolt flanged housing units, plastic housing, eccentric locking collar and RSR type seal, corrosion-resistant VA design, relubrication facility 430
SUGPF	Four-bolt flanged housing units, plastic housing, eccentric locking collar and RSR type seal, corrosion-resistant VA design, relubrication facility 430
SUGPFL	Two-bolt flanged housing units, plastic housing, eccentric locking collar and RSR type seal, corrosion-resistant VA design, relubrication facility 430
SUGPHE	Take-up housing units, plastic housing, eccentric locking collar and RSR type seal, corrosion-resistant VA design, relubrication facility 430
SUGPP	Plummer block housing units with long base, plastic housing, eccentric locking collar and RSR type seal, corrosion-resistant VA design, relubrication facility 430
SUGPPA	Plummer block housing units with short base, plastic housing, eccentric locking collar and RSR type seal, corrosion-resistant VA design, relubrication facility 430
SUGPT	Take-up housing units with guide slot, plastic housing, eccentric locking collar and RSR type seal, corrosion-resistant VA design, relubrication facility 430
TASE..-XL	Plummer block housing units, cast iron housing, eccentric locking collar and T type seal, relubrication facility..... 229
TCJ..-XL	Four-bolt flanged housing units, cast iron housing, eccentric locking collar and T type seal, relubrication facility..... 231

Product index

	Page
TCJY.-IA03	Four-bolt flanged housing units for rolls, no relubrication facility 554
TCJT.-XL	Two-bolt flanged housing units, cast iron housing, eccentric locking collar and T type seal, relubrication facility 230
TFE.-XL	Four-bolt flanged housing units, cast iron housing, with narrow centring spigot, eccentric locking collar and T type seal, relubrication facility 231
THE.-XL	Take-up housing units, cast iron housing, eccentric locking collar and T type seal, relubrication facility 232
TME.-IA04	Flanged housing units for harvesters, no relubrication facility 555
TME.-XL	Four-bolt flanged housing units, cast iron housing, with wide centring spigot, eccentric locking collar and T type seal, relubrication facility 231
TRV.-IA02	Flanged housing units for plough discs, sheet steel housing, square bore and T type seal, no relubrication facility 554
TSHE.-XL	Plummer block housing units, cast iron housing, eccentric locking collar and T type seal, relubrication facility 229
TSHEV.-IA04	Flanged housing units for harvesters, relubrication facility 555
TTUE.-XL	Take-up housing units, cast iron housing, eccentric locking collar and T type seal, relubrication facility 232
UC	Radial insert ball bearings, spherical outer ring, with grub screws in inner ring, Durotect BS coating, relubrication facility 474
UCF	Four-bolt flanged housing units, cast iron housing, square version, with grub screws in inner ring, Durotect BS coating, relubrication facility 493
UCFA	Take-up housing units, cast iron housing for swivel motion, with grub screws in inner ring, Durotect BS coating, relubrication facility 493

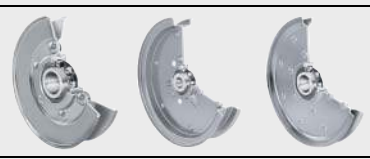
	Page
UCFC	Four-bolt flanged housing units, cast iron housing, round version, with grub screws in inner ring, Durotect BS coating, relubrication facility..... 493
UCFL	Two-bolt flanged housing units, cast iron housing, oval version, with grub screws in inner ring, Durotect BS coating, relubrication facility..... 492
UCP	Plummer block housing units, cast iron housing with long base, with grub screws in inner ring, Durotect BS coating, relubrication facility..... 492
UCPA	Plummer block housing units, cast iron housing with short base, with grub screws in inner ring, Durotect BS coating, relubrication facility..... 492
UCT	Take-up housing units, cast iron housing for linear motion, with grub screws in inner ring, Durotect BS coating, relubrication facility..... 493
UK	Radial insert ball bearings, spherical outer ring, with adapter sleeve, Durotect BS coating, relubrication facility..... 474
UKF	Four-bolt flanged housing units, cast iron housing, square version, with radial insert ball bearing, Durotect BS coating, relubrication facility..... 493
UKFC	Four-bolt flanged housing units, cast iron housing, round version, with radial insert ball bearing, Durotect BS coating, relubrication facility..... 493
UKFL	Two-bolt flanged housing units, cast iron housing, oval version, with radial insert ball bearing, Durotect BS coating, relubrication facility..... 492
UKP	Plummer block housing units, cast iron housing with long base, with radial insert ball bearing, Durotect BS coating, relubrication facility..... 492
UKT	Take-up housing units, cast iron housing for linear motion, with radial insert ball bearing, Durotect BS coating, relubrication facility..... 493
VK..-KTT-B	Self-aligning deep groove ball bearings, spherical outer ring, square bore and T type seal 156



0008C08E



0008C04A



0008C08C



0008C001



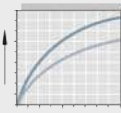
0008C0E6



0008C0F8



0008C10A



00015CE8

Technical principles



0008C092

Radial insert ball bearings

- Spherical outer ring
- Cylindrical outer ring
- Rubber interliner
- Steel aligning ring



0008COAE

INA units with flake graphite cast iron or sheet steel housing

- Plummer block housing units
- Flanged housing units
- Take-up housing units



0008C0C0

**Roller chain idler sprocket units
Idler pulley units**



0008C0D5

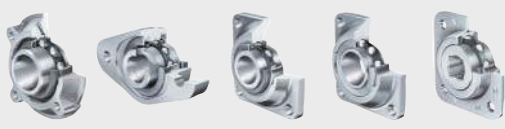
Corrosion-resistant radial insert ball bearings and housing units

- Flake graphite cast iron and sheet steel housings
- High grade steel housings
- Plastic housings



0008COEA

**FAG Black Series
Radial insert ball bearings and housing units**



0008C0FC

Market sectors



0008C10E

Mounting and maintenance

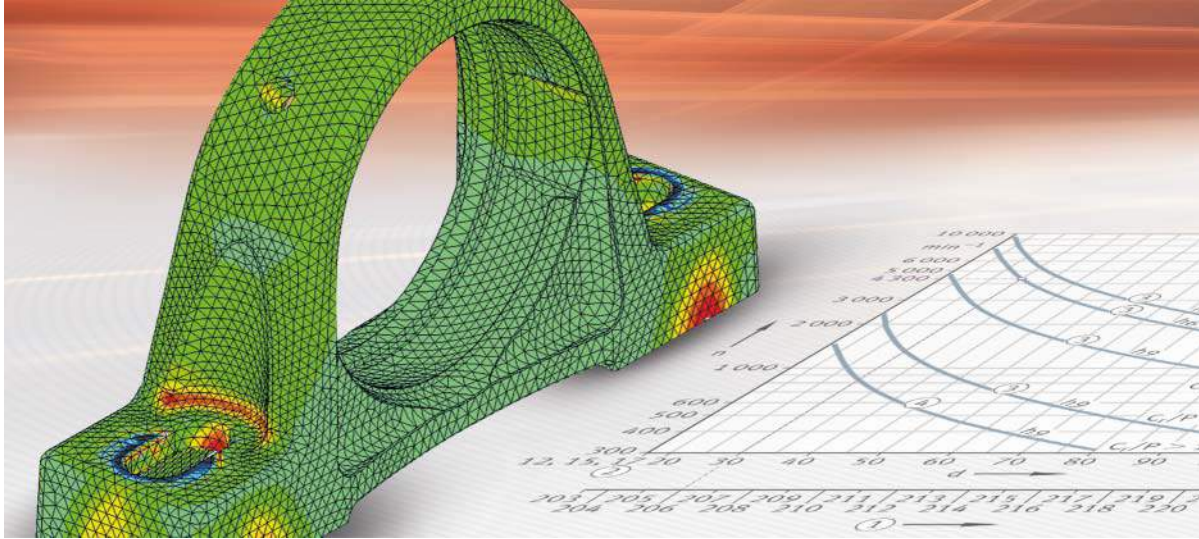


00018048

Addresses



FAG



Technical principles

- Load carrying capacity and life
- Friction and increases in temperature
- Speeds
- Lubrication
- Bearing data
- Design of bearing arrangements
- Sealing
- Mounting and dismounting



Technical principles

	Page
Load carrying capacity and life	Fatigue theory as a principle 36
	Dimensioning of rolling bearings..... 37
	Dynamic load carrying capacity and life..... 37
	Calculation of the rating life 38
	Basic rating life 38
	Adjusted rating life..... 42
	Expanded adjusted rating life..... 45
	Equivalent operating values..... 49
	Variable load and speed 49
	Requisite rating life 51
	Operating life 52
	Static load carrying capacity 53
	Static load safety factor..... 53
	Friction and increases in temperature
Heat dissipation 54	
Calculation of friction values 55	
Speeds	Criteria for speed limitation 57
	Limiting speed..... 57
	Thermal reference speed 57
	Reference conditions 58
	Thermally safe operating speed 58
	Limits of calculation method 59
Calculation of thermally safe operating speed 59	
Lubrication	Principles 62
	Functions of the lubricant..... 62
	Design of lubrication system 62
	Grease lubrication 63
	Composition of a grease..... 63
	Type of grease..... 64
	Consistency of greases..... 64
	Selection of suitable grease 65
	Greases with special suitability 68
	Grease operating life 70
	Relubrication intervals 76
	Miscibility..... 78
	Storage..... 78

Technical principles

	Page
Bearing data	
Radial internal clearance.....	79
Operating clearance.....	80
Operating clearance value	80
Calculation of operating clearance.....	80
Axial internal clearance.....	82
Calculation example.....	83
Bearing materials.....	84
Corrosion-resistant steels.....	84
Cages	85
Sheet metal cages.....	85
Solid cages made from polyamide PA66	86
Operating temperature.....	87
Sealed bearings	87
Anti-corrosion protection	88
Anti-corrosion coating system Corrotect.....	88
Dimensional and running tolerances	89
Radial bearings	96
Chamfer dimensions	99
Design of bearing arrangements	
Conditions of rotation	100
Point load	100
Circumferential load	100
Shaft and housing tolerances.....	101
Tolerance classes.....	101
Reference to tables of shaft and housing tolerances.....	101
Tables of shaft and housing fits	103
Geometrical and positional tolerances of bearing seating surfaces	116
Accuracy of bearing seating surfaces	117
Sealing	
Functions.....	119
Overview of seal types	119
BRS seals.....	121
Non-contact seals in the adjacent construction	121



	Page
Mounting and dismounting	
Handling and use	122
Storage of rolling bearings	122
Storage of Arcanol rolling bearing greases	124
Unpacking of rolling bearings.....	124
Compatibility, miscibility.....	124
Cleaning of rolling bearings.....	125
General guidelines for mounting	126
Mounting of housing units	127
Delivered condition, INA brand	127
Delivered condition, FAG brand.....	127
Storage and shelf life.....	127
Unpacking.....	127
Guidelines for mounting of housing units.....	128
Mounting of coated components.....	128
Mounting of cast units	129
Radial insert ball bearings with eccentric locking collar or grub screw in inner ring	129
Radial insert ball bearings with adapter sleeve	131
Fitting of bearing end caps	134
Mounting of sheet steel units.....	136
Mounting of rolling bearings with cylindrical seats	138
Non-separable bearings	138
Cold fitting of bearings by pressing.....	138
Heating of bearings.....	139
Guidelines for dismounting.....	140
Dismounting of rolling bearings on cylindrical seats	141
Removal of small bearings	141

Load carrying capacity and life

Schaeffler introduced the “Expanded calculation of the adjusted rating life” in 1997. This method was standardised for the first time in DIN ISO 281 Appendix 1 and has been a constituent part of the international standard ISO 281 since 2007.

As part of the international standardisation work, the life adjustment factor a_{DIN} was renamed as a_{ISO} but without any change to the calculation method.

Fatigue theory as a principle

The basis of the rating life calculation in accordance with ISO 281 is Lundberg and Palmgren's fatigue theory which always gives a final rating life.

However, modern, high quality bearings can exceed by a considerable margin the values calculated for the basic rating life under favourable operating conditions. Ioannides and Harris have developed a further model of fatigue in rolling contact that expands on the Lundberg/Palmgren theory and gives a better description of the performance capability of modern bearings.

The method “Expanded calculation of the adjusted rating life” takes account of the following influences:

- the bearing load
- the fatigue limit of the material
- the extent to which the surfaces are separated by the lubricant
- the cleanliness in the lubrication gap
- the additive package in the lubricant
- the internal load distribution and frictional conditions in the bearing.



The influencing factors, particularly those relating to contamination, are very complex. A great deal of experience is required in order to arrive at an accurate assessment. Further advice should therefore be sought from the Schaeffler engineering service.

The tables and diagrams can give guide values only.



Dimensioning of rolling bearings

The required size of a rolling bearing is dependent on the demands made on its:

- rating life
- load carrying capacity
- operational reliability.

Dynamic load carrying capacity and life

The dynamic load carrying capacity is described in terms of the basic dynamic load ratings. The basic dynamic load ratings are based on DIN ISO 281.

The basic dynamic load ratings for rolling bearings are matched to empirically proven performance standards and published in previous FAG and INA catalogues.

The dynamic load carrying capacity of the rolling bearing is determined by the fatigue behaviour of the material.

The dynamic load carrying capacity is described in terms of the basic dynamic load rating and the basic rating life.

The fatigue life is dependent on:

- the load
- the operating speed
- the statistical probability of the first appearance of failure.

In the case of rotating rolling bearings, the basic dynamic load rating C is:

- a constant radial load C_r for radial bearings
- a constant, concentrically acting axial load C_a for axial bearings.

The basic dynamic load rating C is that load of constant magnitude and direction which a sufficiently large number of apparently identical bearings can endure for a basic rating life of one million revolutions.

Load carrying capacity and life

Calculation of the rating life

The methods for calculating the rating life are:

- the basic rating life L_{10} and L_{10h} in accordance with ISO 281, see page 38
- the adjusted rating life L_{na} in accordance with DIN ISO 281:1990 (no longer a constituent part of ISO 281), see page 42
- the expanded adjusted rating life L_{nm} in accordance with ISO 281, see page 45.

Basic rating life

The basic rating life L_{10} and L_{10h} is determined as follows:

$$L_{10} = \left(\frac{C}{P} \right)^p$$

$$L_{10h} = \frac{16\,666}{n} \cdot \left(\frac{C}{P} \right)^p$$

L_{10} 10^6 revolutions

The basic rating life in millions of revolutions is the life reached or exceeded by 90% of a sufficiently large group of apparently identical bearings before the first evidence of material fatigue develops

C N
Basic dynamic load rating

P N

Equivalent dynamic bearing load for radial and axial bearings

p -

Life exponent;

for roller bearings: $p = 10/3$, for ball bearings: $p = 3$

L_{10h} h

The basic rating life in operating hours according to the definition for L_{10}

n min^{-1}

Operating speed.



Equivalent dynamic bearing load

The equivalent dynamic load P is a calculated value. This value is constant in magnitude and direction; it is a radial load for radial bearings and an axial load for axial bearings.

A load corresponding to P will give the same rating life as the combined load occurring in practice.

For bearings under dynamic loading, the following applies:

Load ratio and axial bearing load

Load ratio	Equivalent dynamic bearing load
$\frac{F_a}{F_r} \leq e$	$P = F_r$
$\frac{F_a}{F_r} > e$	$P = X \cdot F_r + Y \cdot F_a$

F_a N
Axial dynamic bearing load
 F_r N
Radial dynamic bearing load
e, X, Y –
Factors, see table Factors e, X and Y
P N
Equivalent dynamic bearing load for combined load.

Factors e, X and Y

$\frac{f_0 \cdot F_a}{C_{0r}}$	Factor for radial internal clearance								
	Group N			Group 3			Group 4		
	e	X	Y	e	X	Y	e	X	Y
0,3	0,22	0,56	2	0,32	0,46	1,7	0,4	0,44	1,4
0,5	0,24	0,56	1,8	0,35	0,46	1,56	0,43	0,44	1,31
0,9	0,28	0,56	1,58	0,39	0,46	1,41	0,45	0,44	1,23
1,6	0,32	0,56	1,4	0,43	0,46	1,27	0,48	0,44	1,16
3	0,36	0,56	1,2	0,48	0,46	1,14	0,52	0,44	1,08
6	0,43	0,56	1	0,54	0,46	1	0,56	0,44	1

f_0 –
Factor, see table Factor f_0 , page 40
 F_a N
Axial dynamic bearing load
 C_{0r} N
Basic static load rating, see dimension tables.

Load carrying capacity and life

The values in the following table are valid for normal fits:

■ shaft machined to j5 © or k5 ©, housing machined to J6 ©.

Factor f_0

Bore code	Factor f_0		
	60	62	63
3	–	12,9	–
4	–	12,2	12,4
5	–	13,2	12,2
6	–	13	–
7	13	12,4	–
8	12,4	13	–
9	13	12,4	–
00	12,4	12,1	11,3
01	13	12,3	11,1
02	13,9	13,1	12,1
03	14,3	13,1	12,3
04	13,9	13,1	12,4
05	14,5	13,8	12,4
06	14,8	13,8	13
07	14,8	13,8	13,1
08	15,3	14	13
09	15,4	14,3	13
10	15,6	14,3	13
11	15,4	14,3	12,9
12	15,5	14,3	13,1
13	15,7	14,3	13,2
14	15,5	14,4	13,2
15	15,7	14,7	13,2
16	15,6	14,6	13,2
17	15,7	14,7	13,1
18	15,6	14,5	13,9
19	15,7	14,4	13,9
20	15,9	14,4	13,8
21	15,8	14,3	13,8
22	15,6	14,3	13,8
24	15,9	14,8	13,5
26	15,8	14,5	13,6
28	16	14,8	13,6
30	16	15,2	13,7
32	16	15,2	13,9
34	15,7	15,3	13,9
36	15,6	15,3	13,9
38	15,8	15	14
40	15,6	15,3	14,1
44	15,6	15,2	14,1
48	15,8	15,2	14,2



Factor f_0
(continued)

Bore code	Factor f_0		
	60	62	63
52	15,7	15,2	–
56	15,9	15,3	–
60	15,7	–	–
64	15,9	–	–
68	15,8	–	–
72	15,9	–	–
76	–	–	–
80	–	–	–
84	–	–	–
88	–	–	–
92	–	–	–
96	–	–	–

Equivalent static load

The equivalent static load P_0 is a calculated value. It corresponds to a radial load in radial bearings and a concentric axial load in axial bearings.

P_0 induces the same load at the centre point of the most heavily loaded contact point between the rolling element and raceway as the combined load occurring in practice.

$$P_0 = X_0 \cdot F_{0r} + Y_0 \cdot F_{0a}$$

- P_0 N
Equivalent static bearing load
- X_0 –
Radial factor
- F_{0r} N
Radial static bearing load
- Y_0 –
Axial factor
- F_{0a} N
Axial static bearing load.

Load ratio and axial bearing load

For bearings under static loading, the following applies:

Load ratio	Equivalent static load
$\frac{F_{0a}}{F_{0r}} \leq 0,8$	$P_0 = F_{0r}$
$\frac{F_{0a}}{F_{0r}} > 0,8$	$P_0 = 0,6 \cdot F_{0r} + 0,5 \cdot F_{0a}$

- F_{0a} N
Axial static bearing load
- F_{0r} N
Radial static bearing load
- P_0 N
Equivalent static bearing load for combined load.

Load carrying capacity and life

Adjusted rating life

The adjusted rating life L_{na} can be calculated if, in addition to the load and speed, other influences are known:

- special material characteristics
- lubrication
- a requisite reliability other than 90%.

This calculation method was replaced in ISO 281:2007 by the calculation of the expanded adjusted rating life L_{nm} , see page 45.

$$L_{na} = a_1 \cdot a_2 \cdot a_3 \cdot L_{10}$$

L_{na} 10⁶ revolutions

Adjusted rating life for special material characteristics and operating conditions with a requisite reliability of (100 - n) %

a_1 -

Life adjustment factor for a requisite reliability other than 90%.

In ISO 281:2007, the values for the life adjustment factor a_1 have been redefined, see table Life adjustment factor a_1 , page 45

a_2 -

Life adjustment factor for special material characteristics.

For standard rolling bearing steels: $a_2 = 1$

a_3 -

Life adjustment factor for special operating conditions; in particular for the lubrication regime, *Figure 1*

L_{10} 10⁶ revolutions

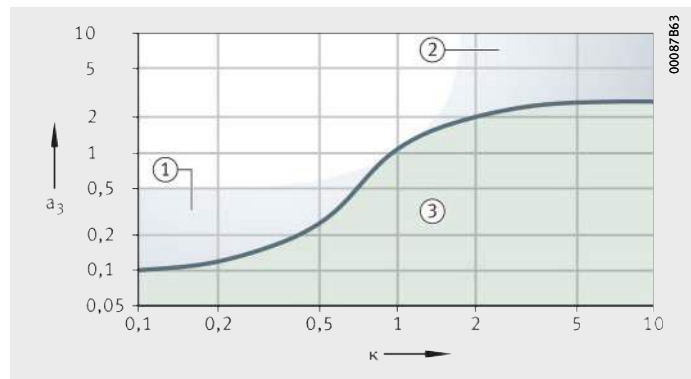
Basic rating life.

a_3 = life adjustment factor
 κ = viscosity ratio, see page 43

- ① Good cleanliness and suitable additives
- ② Very high cleanliness and low load
- ③ Contamination in the lubricant

Figure 1

Life adjustment factor a_3





Viscosity ratio The viscosity ratio κ is an indication of the quality of lubricant film formation.

The reference viscosity ν_1 is determined from the mean bearing diameter $d_M = (D + d)/2$ and the operating speed n , *Figure 2*, page 44.

The nominal viscosity of the oil at +40 °C is determined from the required operating viscosity ν and the operating temperature ϑ , *Figure 3*, page 44. In the case of greases, ν is the operating viscosity of the base oil.

In accordance with ISO 281, the equations can also be used in approximate terms for synthetic oils, such as those of the type synthetic hydrocarbons (SHC).

In the case of heavily loaded bearings with a high proportion of sliding contact, the temperature in the contact area of the rolling elements may be up to 20 K higher than the temperature measured on the stationary ring (without the influence of any external heat sources).



The influence of EP additives is taken into consideration in calculation of the expanded adjusted rating life L_{nm} , see page 47.

Viscosity ratio κ

$$\kappa = \frac{\nu}{\nu_1}$$

Reference viscosity ν_1

$\nu < 1000 \text{ min}^{-1}$:

$$\nu_1 = 4500 \cdot n^{-0,83} \cdot d_M^{-0,5}$$

$\nu > 1000 \text{ min}^{-1}$:

$$\nu_1 = 4500 \cdot n^{-0,5} \cdot d_M^{-0,5}$$

κ	–
Viscosity ratio	
ν	mm^2s^{-1}
Kinematic viscosity of the lubricant at operating temperature	
ν_1	mm^2s^{-1}
Reference viscosity of the lubricant at operating temperature	
n	min^{-1}
Reference speed.	

Load carrying capacity and life

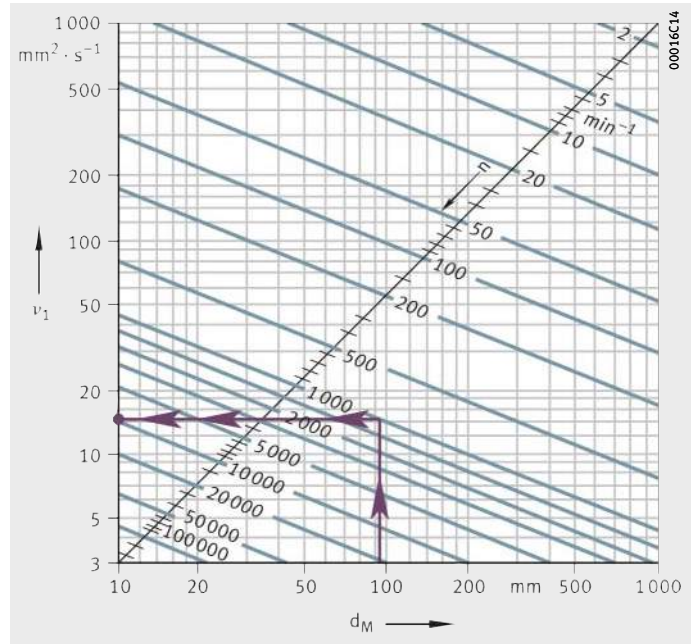


Figure 2
Reference viscosity v_1

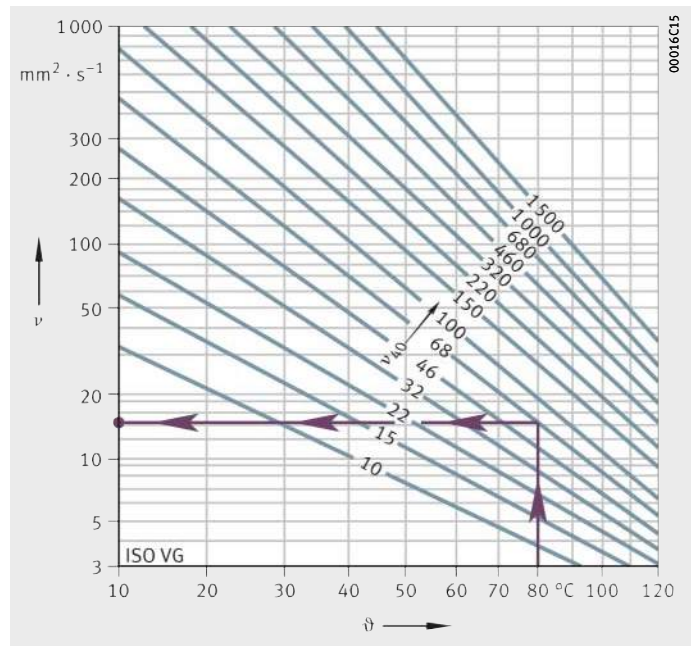


Figure 3
V/T diagram for mineral oils

Load carrying capacity and life

Life adjustment factor a_{ISO}

The standardised method for calculating the life adjustment factor a_{ISO} takes account of the following significant factors:

- the load on the bearing
- the lubrication conditions (viscosity and type of lubricant, speed, bearing size, additives)
- the fatigue limit of the material
- the type of bearing
- the fatigue limit of the material
- the ambient conditions
- contamination of the lubricant.

$$a_{ISO} = f \left[\frac{e_c \cdot C_u}{P}, \kappa \right]$$

a_{ISO}	–
Life adjustment factor for operating conditions, <i>Figure 4</i> , page 47	
e_c	–
Life adjustment factor for contamination, see table, page 48	
C_u	N
Fatigue limit load	
P	N
Equivalent dynamic bearing load	
κ	–
Viscosity ratio, see page 43	
For $\kappa > 4$, calculation should be carried out using $\kappa = 4$.	
For $\kappa < 0,1$, this calculation method cannot be used.	



Taking account of EP additives in the lubricant

In accordance with ISO 281, EP additives in the lubricant can be taken into consideration. At a viscosity ratio $\kappa < 1$ and a contamination factor $e_c \geq 0,2$, a value $\kappa = 1$ can be used in calculation in the case of lubricants with EP additives that have proven effective. If severe contamination is present (contamination factor $e_c < 0,2$), the effectiveness of the additives under these contamination conditions must be proven.

The effectiveness of the EP additives can be demonstrated in the actual application or on a rolling bearing test rig FE 8 to DIN 51819-1.

If the EP additives are proven effective and calculation is carried out using the value $\kappa = 1$, the life adjustment factor must be restricted to $a_{ISO} \leq 3$, *Figure 4*. If the calculated value a_{ISO} calculated for the actual κ is > 3 , this value can be used in calculation.

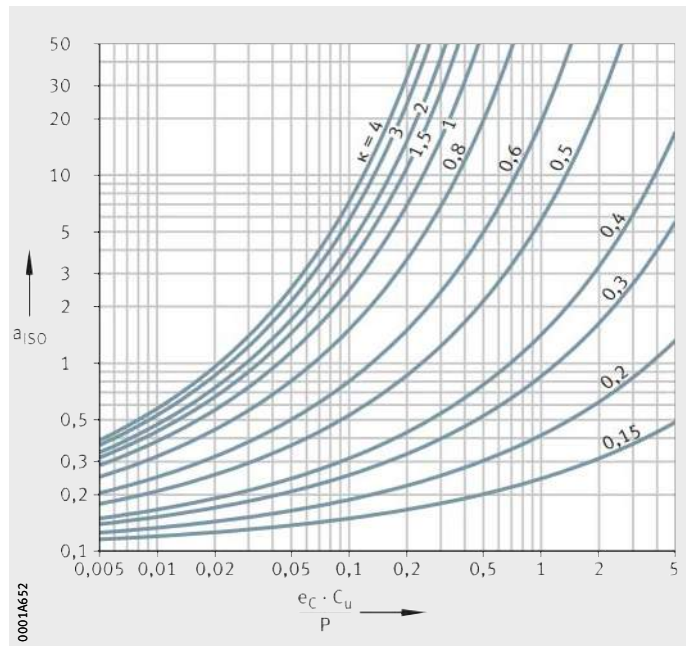


Figure 4
Life adjustment factor a_{ISO}
for radial ball bearings

Load carrying capacity and life

Fatigue limit load

The fatigue limit load C_U in accordance with ISO 281 is defined as the load below which, under laboratory conditions, no fatigue occurs in the material.

Life adjustment factor for contamination

The life adjustment factor for contamination e_C takes into consideration the influence of contamination in the lubrication gap on the rating life, see table.

The rating life is reduced by solid particles in the lubrication gap and is dependent on the following factors:

- the type, size, hardness and quantity of particles
- the relative lubricant film thickness
- the bearing size.

Due to the complex interactions between these influencing factors, it is only possible to give approximate guide values. The values in the tables are valid for contamination by solid particles (factor e_C). No account is taken of other contamination such as that caused by water or other fluids.



Under severe contamination ($e_C \rightarrow 0$), the bearings may fail due to wear. In this case, the operating life is substantially less than the calculated life.

Factor e_C

Contamination	Factor e_C			
	$d_M < 100 \text{ mm}^1$		$d_M \geq 100 \text{ mm}^1$	
	from	to	from	to
Extreme cleanliness: ■ particle size within lubricant film thickness ■ laboratory conditions	–	1	–	1
High cleanliness: ■ oil filtered through extremely fine filter ■ sealed, greased bearings	0,6	0,8	0,8	0,9
Standard cleanliness: ■ oil filtered through fine filter	0,5	0,6	0,6	0,8
Low contamination: ■ slight contamination of oil	0,3	0,5	0,4	0,6
Typical contamination: ■ bearing contaminated by wear debris from other machine elements	0,1	0,3	0,2	0,4
Heavy contamination: ■ bearing environment heavily contaminated ■ bearing arrangement inadequately sealed	0	0,1	0	0,1
Very heavy contamination	0	–	0	–

¹⁾ d_M = mean bearing diameter $(d + D)/2$.



Equivalent operating values

The rating life equations are based on the assumption that the bearing load P and bearing speed n are constant. If the load and speed are not constant, equivalent operating values can be determined that induce the same fatigue as the actual loading conditions.



The equivalent operating values calculated here already take account of the life adjustment factors a_3 or a_{ISO} . They must not be applied again when calculating the adjusted rating life.

Variable load and speed

If the load and speed vary over a time period T , the speed n and equivalent bearing load P are calculated as follows:

$$n = \frac{1}{T} \int_0^T n(t) \cdot dt$$

$$P = P \sqrt{\frac{\int_0^T \frac{1}{a(t)} \cdot n(t) \cdot F^P(t) \cdot dt}{\int_0^T n(t) \cdot dt}}$$

Variation in steps

If the load and speed vary in steps over a time period T , n and P are calculated as follows:

$$n = \frac{q_1 \cdot n_1 + q_2 \cdot n_2 + \dots + q_z \cdot n_z}{100}$$

$$P = P \sqrt{\frac{\frac{1}{a_i} \cdot q_i \cdot n_i \cdot F_i^P + \dots + \frac{1}{a_z} \cdot q_z \cdot n_z \cdot F_z^P}{q_i \cdot n_i + \dots + q_z \cdot n_z}}$$

Variable load at constant speed

If the function F describes the variation in the load over a time period T and the speed is constant, P is calculated as follows:

$$P = P \sqrt{\frac{1}{T} \int_0^T \frac{1}{a(t)} \cdot F^P(t) \cdot dt}$$

Load varying in steps at constant speed

If the load varies in steps over a time period T and the speed is constant, P is calculated as follows:

$$P = P \sqrt{\frac{\frac{1}{a_i} \cdot q_i \cdot F_i^P + \dots + \frac{1}{a_z} \cdot q_z \cdot F_z^P}{100}}$$

Constant load at variable speed

If the speed varies but the load remains constant, the following applies:

$$n = \frac{1}{T} \int_0^T \frac{1}{a(t)} \cdot n(t) \cdot dt$$

Load carrying capacity and life

Constant load at speed varying in steps

If the speed varies in steps, the following applies:

$$n = \frac{\frac{1}{a_i} \cdot q_i \cdot n_i + \dots + \frac{1}{a_z} \cdot q_z \cdot n_z}{100}$$

Oscillating bearing motion

The equivalent speed is calculated as follows:

$$n = n_{osc} \cdot \frac{\varphi}{180^\circ}$$



If the angle of oscillation is smaller than twice the pitch angle of the rolling elements, there is a risk of false brinelling.

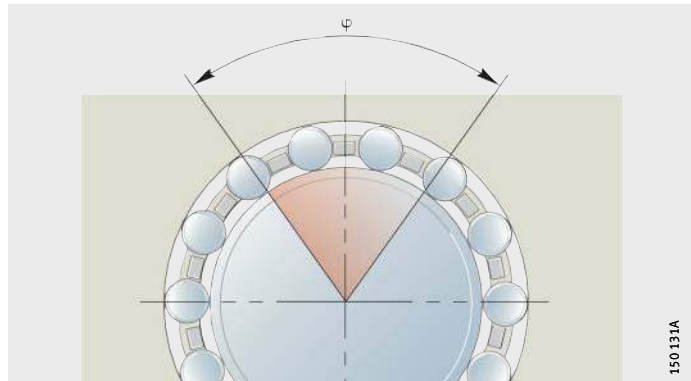


Figure 5
Angle of oscillation φ

Symbols, units and definitions

n	min^{-1}
Mean speed	
T	min
Time period under consideration	
$n_i, n(t)$	min^{-1}
Bearing speed for a particular operating condition	
P	N
Equivalent bearing load	
p	-
Life exponent;	
for roller bearings: $p = 10/3$	
for ball bearings: $p = 3$	
$a_i, a(t)$	-
Life adjustment factor a_{i50} for current operating condition, see page 46	
$F_i, F(t)$	N
Bearing load for a particular operating condition	
q_i	%
Duration of operating condition as a proportion of the total operating period;	
$q_i = (\Delta t_i / T) \cdot 100$	
n_{osc}	min^{-1}
Frequency of oscillating motion	
φ	$^\circ$
Angle of oscillation, Figure 5.	



Requisite rating life

If no information is available on the rating life, the guide values from the tables may be used.



Do not overspecify the bearings, otherwise it may not be possible to observe the minimum load, see the design and safety guidelines in the product sections.

Agricultural machinery

Mounting location	Recommended rating life h		Operating life h	
	Ball bearings		from	to
	from	to	from	to
Self-propelled machinery	1 700	4 000	2 000	6 000
Seasonal machinery	500	1 700	500	2 000

Construction machinery

Mounting location	Recommended rating life h		Operating life h	
	Ball bearings		from	to
	from	to	from	to
Dozers, loaders	4 000	7 800	5 000	10 000
Excavators, travelling gear	500	1 700	500	2 000
Excavators, slewing gear	1 700	4 000	2 000	5 000
Vibratory road rollers, unbalance generators	1 700	4 000	5 000	30 000
Vibrator bodies	500	1 700	500	2 000

Rolling mills, steelworks equipment

Mounting location	Recommended rating life h		Operating life h	
	Ball bearings		from	to
	from	to	from	to
Roll stands	500	14 000	2 000	10 000
Rolling mill gearboxes	14 000	32 000	20 000	40 000
Roller tables	7 800	21 000	20 000	40 000
Centrifugal casting machines	21 000	46 000	30 000	60 000

Conveying equipment

Mounting location	Recommended rating life h		Operating life h	
	Ball bearings		from	to
	from	to	from	to
Belt drives, opencast mining	–	–	10 000	30 000
Conveyor belt rollers, opencast mining	46 000	63 000	10 000	30 000
Conveyor belt rollers, general	7 800	21 000	10 000	30 000
Belt drums	–	–	10 000	30 000
Bucket wheel excavators, travel drive	7 800	21 000	5 000	15 000
Bucket wheel excavators, bucket wheel	–	–	30 000	50 000
Bucket wheel excavators, bucket wheel drive	46 000	83 000	30 000	50 000
Winding cable sheaves	32 000	46 000	50 000	80 000
Sheaves	7 800	21 000	8 000	30 000

Load carrying capacity and life

Fans

Mounting location	Recommended rating life h		Operating life h	
	Ball bearings			
	from	to	from	to
Ventilators, fans	21 000	46 000	20 000	100 000
Large fans	32 000	63 000	10 000	–

Textile machinery

Mounting location	Recommended rating life h		Operating life h	
	Ball bearings			
	from	to	from	to
Spinning machines, spinning spindles	21 000	46 000	10 000	50 000
Weaving and knitting machines	14 000	32 000	10 000	50 000

Plastics processing

Mounting location	Recommended rating life h		Operating life h	
	Ball bearings			
	from	to	from	to
Plastics worm extruders	14 000	21 000	20 000	100 000
Rubber and plastics calendars	21 000	46 000	20 000	100 000

Printing machinery

Mounting location	Recommended rating life h		Operating life h	
	Ball bearings			
	from	to	from	to
Printing machinery	32 000	46 000	30 000	60 000

Operating life

The operating life is defined as the life actually achieved by the bearing. It may differ significantly from the calculated value.

This may be due to wear or fatigue as a result of:

- deviations in the operating data
- misalignment between the shaft and housing
- insufficient or excessive operating clearance
- contamination
- inadequate lubrication
- excessive operating temperature
- oscillating bearing motion with very small angles of oscillation (false brinelling)
- high vibration and false brinelling
- very high shock loads (static overloading)
- prior damage during installation.



Due to the wide variety of possible mounting and operating conditions, it is not possible to precisely predetermine the operating life. The most reliable way of arriving at a close estimate is by comparison with similar applications.



Static load carrying capacity

If high, static or shock loads occur, the raceways and rolling elements may undergo plastic deformation. These deformations limit the static load carrying capacity of the rolling bearing with respect to the permissible noise level during operation of the bearing.

Rolling bearings that undergo rotary movement only rarely or not at all are specified in accordance with the basic static load rating C_0 . This is, according to DIN ISO 76, a constant radial load C_{0r} for radial bearings.

The basic static load rating C_0 is that load at which the Hertzian pressure between the rolling elements and the raceways reaches the following values at the most heavily loaded point:

- for ball bearings, 4 200 N/mm².

Under normal contact conditions, this load causes a permanent deformation at the contact points of approx. 1/10 000 of the rolling element diameter.

Static load safety factor

In addition to specification on the basis of the fatigue life, it is advisable to check the static load safety factor.

The static load safety factor S_0 is the ratio between the basic static load rating C_0 and the equivalent static load P_0 :

$$S_0 = \frac{C_0}{P_0}$$

S_0 – Static load safety factor

C_0 (C_{0r} , C_{0a}) N Basic static load rating

P_0 (P_{0r} , P_{0a}) N Equivalent static load on the radial or axial bearing, see page 41.



Guide values and shock loads occurring during operation must be taken into consideration, see table.

Guide values for the static load safety factor S_0

Operating conditions	Static load safety factor S_0 for ball bearings
Smooth, low-vibration, normal operation with minimal demands for smooth running; bearings with slight rotary motion	$\cong 0,5$
Normal operation with higher requirements for smooth running	$\cong 1$
Operation with pronounced shock loads	$\cong 2$
Bearing arrangement with high demands for running accuracy and smooth running	$\cong 3$

Friction and increases in temperature

Friction

The friction in a rolling bearing is made up of several components, see table. Due to the large number of influencing factors, such as dynamics in speed and load, tilting and skewing resulting from installation, actual frictional torques and frictional power may deviate significantly from the calculated values. If the frictional torque is an important design criterion, please consult the Schaeffler engineering service.

The idling friction is dependent on the lubricant quantity, speed, operating viscosity of the lubricant, seals and the running-in condition of the bearing.

Frictional component and influencing factor

Frictional component	Influencing factor
Rolling friction	Magnitude of load
Sliding friction of rolling elements, sliding friction of cage	Magnitude and direction of load Speed and lubrication conditions, running-in condition
Fluid friction (flow resistance)	Type and speed Type, quantity and operating viscosity of lubricant
Seal friction	Type and preload of seal

Heat dissipation

Friction is converted into heat. This must be dissipated from the bearing. The equilibrium between the frictional power and heat dissipation allows calculation of the thermally safe operating speed n_{θ} , see page 58.

Grease does not give dissipation of heat.

Heat dissipation via the shaft and housing

Heat dissipation via the shaft and housing is dependent on the temperature differential between the bearing and its environment, *Figure 1*.



Any additional adjacent sources of heat or thermal radiation must be taken into consideration.

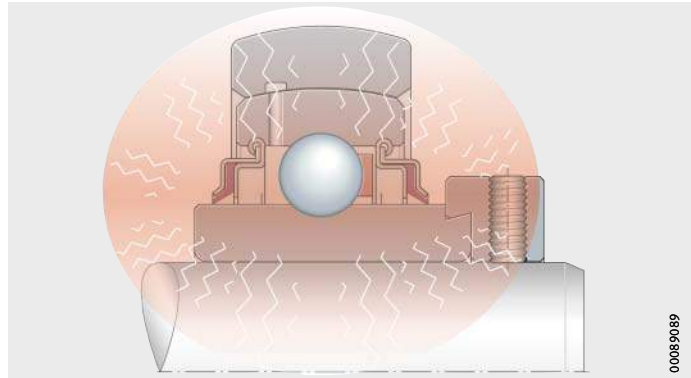


Figure 1
Temperature distribution between bearing, shaft and housing



Calculation of friction values

For this process, the speed and load must be known. The type of lubrication, lubrication method and viscosity of the lubricant at operating temperature are other factors necessary for calculation.

Total frictional torque M_R :

$$M_R = M_0 + M_1$$

Frictional power N_R :

$$N_R = M_R \cdot \frac{n}{9550}$$

Frictional torque as a function of speed for $\nu \cdot n \geq 2\,000$:

$$M_0 = f_0 \cdot (\nu \cdot n)^{2/3} \cdot d_M^3 \cdot 10^{-7}$$

Frictional torque as a function of speed for $\nu \cdot n < 2\,000$:

$$M_0 = f_0 \cdot 160 \cdot d_M^3 \cdot 10^{-7}$$

Frictional torque as a function of load for ball bearings:

$$M_1 = f_1 \cdot P_1 \cdot d_M$$

M_R Total frictional torque Nmm

M_0 Frictional torque as a function of speed Nmm

M_1 Frictional torque as a function of load Nmm

N_R Frictional power W

n Operating speed min^{-1}

f_0 Bearing factor for frictional torque as a function of speed, see tables, page 56

ν Kinematic viscosity of lubricant at operating temperature. In the case of grease, the decisive factor is the viscosity of the base oil at operating temperature

d_M Mean bearing diameter $(d + D)/2$ mm

f_1 Bearing factor for frictional torque as a function of load, see tables, page 56

P_1 Decisive load for frictional torque. N

Friction and increases in temperature

Bearing factors The bearing factors f_0 and f_1 are mean values from series of tests and correspond to the data in accordance with ISO 15312. They are valid for bearings after running-in and with uniform distribution of lubricant. In the freshly greased state, the bearing factor f_0 can be two to five times higher.

Bearing factors for deep groove ball bearings

Series	Bearing factor	
	f_0	f_1
	Grease	
60	1,1	$0,0007 \cdot (P_0/C_0)^{0,5}$
62	1,3	$0,0009 \cdot (P_0/C_0)^{0,5}$
63	1,5	$0,0009 \cdot (P_0/C_0)^{0,5}$

Bearing factors for double row angular contact ball bearings

Series	Bearing factor	
	f_0	f_1
	Grease	
30..-B, 30..-B-2RSR, 30..-B-2Z	2,3	$0,001 \cdot (P_0/C_0)^{0,33}$
32..-B, 32..-B-2RSR, 32..-B-2Z, 32	2,3	$0,001 \cdot (P_0/C_0)^{0,33}$
38..-B, 38..-B-2RSR, 38..-B-2Z	2,3	$0,001 \cdot (P_0/C_0)^{0,33}$
33..-B, 33..-B-2RSR, 33, 33..-DA	4	$0,001 \cdot (P_0/C_0)^{0,33}$

Decisive load for ball bearings

Bearing type	Load ¹⁾
	P_1
	Single bearing
Deep groove ball bearings	$3,3 \cdot F_a - 0,1 \cdot F_r$
Angular contact ball bearings, double row	$1,4 \cdot F_a - 0,1 \cdot F_r$

1) For $P_1 \leq F_r$, $P_1 = F_r$.



Speeds

Criteria for speed limitation

The highest permissible speed for a rolling bearing may be restricted by various criteria. The most frequent decisive factor is the increasing operating temperature with increasing speed.

The permissible speed is also dependent on the design of the entire bearing arrangement, in other words the rolling bearing itself, its type, size, accuracy and cage design as well as on the operating conditions. These comprise the magnitude and direction of the load, the lubrication method, the type and quantity of the lubricant, the environment (design layout and accuracy of the adjacent parts) as well as the dissipation of heat via the adjacent parts.

Limiting speed

The limiting speed n_G is based on practical experience and takes account of additional criteria such as smooth running, sealing function and centrifugal forces.



The limiting speeds indicated in the dimension tables should not be exceeded even under favourable operating conditions without prior consultation with Schaeffler.

Thermal reference speed

The thermal reference speed $n_{\vartheta r}$ was introduced as a parameter for the speed suitability of rolling bearings. On the basis of DIN 732, calculation of the thermal reference speed $n_{\vartheta r}$ has been standardised in ISO 15312.

The thermal reference speed $n_{\vartheta r}$ is used as an ancillary value when calculating the thermally safe operating speed n_{ϑ} . This is the speed at which, under defined reference conditions, the bearing temperature settles at +70 °C.

The thermal reference speed is not a speed limit for the application of a bearing. It is primarily for the purpose of comparing the speed suitability of different bearing types under defined reference conditions. A speed limit taking account of the thermal balance can be calculated using the thermally safe operating speed.

Speeds

Reference conditions

The reference conditions are based on the normal operating conditions of the most significant bearing types and sizes.

They are defined in ISO 15312 as follows:

- reference temperature of the environment of the rolling bearing $\vartheta_{Ar} = +20 \text{ °C}$
- reference temperature at the stationary outer ring $\vartheta_r = +70 \text{ °C}$
- radial bearings with nominal contact angle $0^\circ \leq \alpha_0 \leq 45^\circ$
 - The reference load P_{1r} is 5% of the basic static load rating C_0 as a pure constant radial load
 - $P_{1r} = 0,05 \cdot C_{0r}$
- kinematic viscosity of the lubricant under reference conditions (in the case of radial bearings) $\nu_r = 12 \text{ mm}^2\text{s}^{-1}$ (ISO VG 32)
- heat dissipation via the bearing seating surfaces, see equations:

Heat flow density

Radial bearing, bearing seat $A_r \leq 50\,000 \text{ mm}^2$:

$$q_r = 0,016 \text{ W/mm}^2$$

Radial bearing, bearing seat $A_r > 50\,000 \text{ mm}^2$:

$$q_r = 0,016 \cdot \left(\frac{A_r}{50\,000} \right)^{-0,34} \text{ W/mm}^2$$

Heat-dissipating reference surface

Bearing seating surface for radial bearings:

$$A_r = \pi \cdot B \cdot (D + d)$$

Thermally safe operating speed

If the operating conditions deviate from the reference conditions, there will be an increase in friction and thus in heat generation in the rolling bearing.

The method for calculating the thermally safe operating speed n_{ϑ} is standardised in DIN 732. On this basis, the thermally safe operating speed is the speed at which, under operating conditions, the mean bearing temperature reaches the permissible value.

Calculation of the thermally safe operating speed n_{ϑ} is based on the thermal balance in the rolling bearing. In accordance with the definition of the thermal reference speed according to ISO 15312, the speed is determined at which the rolling bearing reaches the permissible bearing temperature for the application.



For calculation, it is assumed that normal operating clearance and constant operating conditions are present.

In addition to the thermally safe operating speed, the limiting speed n_G must always be observed.



Limits of the calculation method

The calculation method is not valid for sealed rolling bearings with contact seals; the maximum speed is restricted by the permissible sliding velocity at the seal lip.

Calculation of the thermally safe operating speed

The thermally safe operating speed n_{ϑ} is a product of the reference speed $n_{\vartheta r}$ and the speed ratio f_n :

$$n_{\vartheta} = n_{\vartheta r} \cdot f_n$$

The speed ratio is derived from *Figure 1*, page 60:

$$K_L \cdot f_n^{5/3} + K_p \cdot f_n = 1$$

In the normal operating range of $0,01 < K_L < 10$ and $0,01 < K_p < 10$, f_n can be calculated using an approximation equation:

$$f_n = \frac{490,77}{1 + 498,78 \cdot K_L^{0,599} + 852,88 \cdot K_p^{0,963} - 504,5 \cdot K_L^{0,055} \cdot K_p^{0,832}}$$

Heat dissipation via the bearing seating surfaces \dot{Q}_S , *Figure 2*, page 60:

$$\dot{Q}_S = k_q \cdot A_r \cdot \Delta\vartheta_A$$

Heat dissipation by the lubricant \dot{Q}_L :

$$\dot{Q}_L = 0,0286 \frac{\text{kW}}{\text{l/min} \cdot \text{K}} \cdot \dot{V}_L \cdot \Delta\vartheta_L$$

Total dissipated heat flow \dot{Q} :

$$\dot{Q} = \dot{Q}_S + \dot{Q}_L - \dot{Q}_E$$

Lubricant film parameter k_L :

$$K_L = 10^{-6} \cdot \frac{\pi}{30} \cdot n_{\vartheta r} \cdot \frac{10^{-7} \cdot f_0 \cdot (v \cdot n_{\vartheta r})^2 \cdot d_M^3}{\dot{Q}}$$

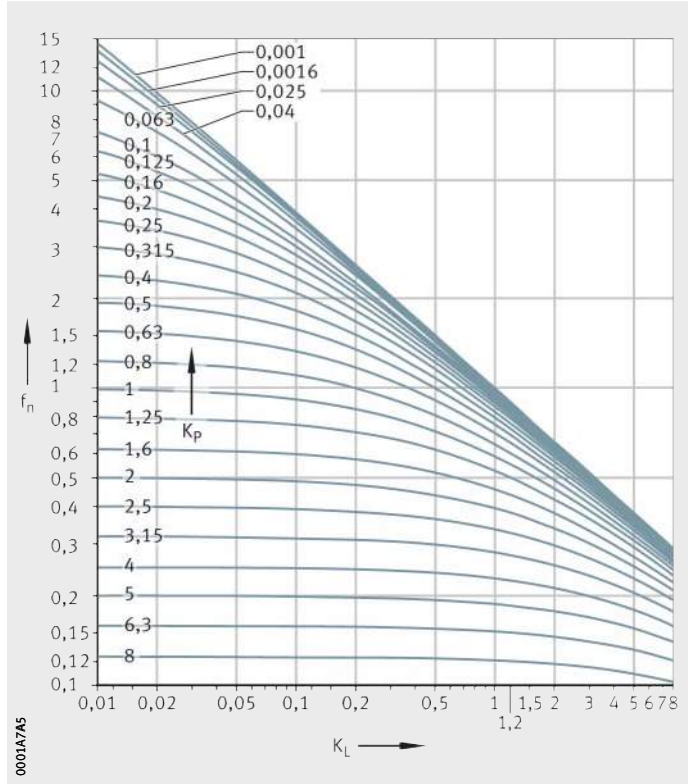
Load parameter k_p :

$$K_p = 10^{-6} \cdot \frac{\pi}{30} \cdot n_{\vartheta r} \cdot \frac{f_1 \cdot P_1 \cdot d_M}{\dot{Q}}$$

Speeds

f_n = speed ratio
 K_L = lubricant film parameter
 K_p = load parameter

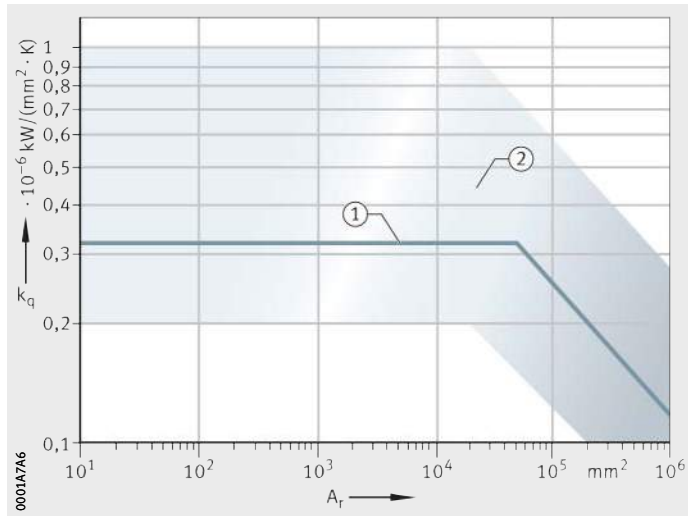
Figure 1
 Speed ratio as a function
 of lubricant film



k_q = heat transition coefficient
 A_r = bearing seating surface

- ① Reference condition for radial bearings
- ② Heat transition coefficient k_q for normal applications with bearing seating surfaces up to $A_r = 50\,000\text{ mm}^2$

Figure 2
 Heat transition coefficient,
 as a function
 of the bearing seating surface





Symbols, units and definitions

q_r	W/mm ²
Heat flow density	
A_r	mm ²
Bearing seating surface for radial bearings: $A_r = \pi \cdot B \cdot (D + d)$	
B	mm
Bearing width	
D	mm
Bearing outside diameter	
d	mm
Bearing bore diameter	
n_{ϑ}	min ⁻¹
Thermally safe operating speed	
$n_{\vartheta r}$	min ⁻¹
Reference speed	
f_n	–
Speed ratio, <i>Figure 1</i> , page 60	
K_L	–
Lubricant film parameter	
K_p	–
Load parameter	
\dot{Q}_S	kW
Heat flow dissipated via the bearing seating surfaces	
k_q	10 ⁻⁶ kW/(mm ² · K)
Heat transition coefficient of bearing seating surface, <i>Figure 2</i> , page 60. This is dependent on the housing design and size, the housing material and the mounting position. For normal applications, the heat transition coefficient for bearing seating surfaces up to 25 000 mm ² is between 0,2 · 10 ⁻⁶ kW/(mm ² · K) and 1,0 · 10 ⁻⁶ kW/(mm ² · K)	
$\Delta\vartheta_A$	K
Differential between mean bearing temperature and ambient temperature	
\dot{Q}_L	kW
Heat flow dissipated by the lubricant	
\dot{V}_L	l/min
Oil flow	
$\Delta\vartheta_L$	K
Differential between oil inlet temperature and oil outlet temperature	
\dot{Q}	kW
Total dissipated heat flow	
\dot{Q}_E	kW
Heat flow due to heating by external source	
ν	mm ² · s ⁻¹
Kinematic viscosity of lubricant at operating temperature	
d_M	mm
Mean bearing diameter $(D + d)/2$	
f_1	–
Bearing factor for frictional torque as a function of load, see section Friction and increases in temperature, page 54	
P_1	N
Radial load for radial bearings, axial load for axial bearings	
f_0	–
Bearing factor for frictional torque as a function of speed, see section Friction and increases in temperature, page 54.	

Lubrication

Principles

Lubrication and maintenance are important for the reliable operation and long operating life of rolling bearings.

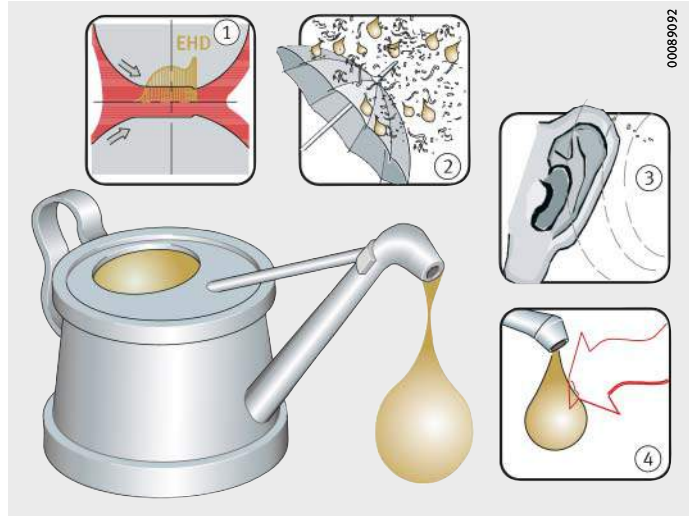
Functions of the lubricant

The functions of the lubricant are as follows, *Figure 1*:

- A lubricant film is formed on the contact surfaces that is sufficiently capable of supporting loads and thus preventing wear and premature fatigue ①.
- When grease lubrication is used, the bearing is additionally sealed against the entry of both solid and fluid contaminants ②.
- Running noise is damped ③.
- Protection is provided against corrosion ④.

- ① Lubricant film capable of supporting loads
- ② Sealing against contamination
- ③ Damping of noise
- ④ Protection against corrosion

Figure 1
Functions of the lubricant

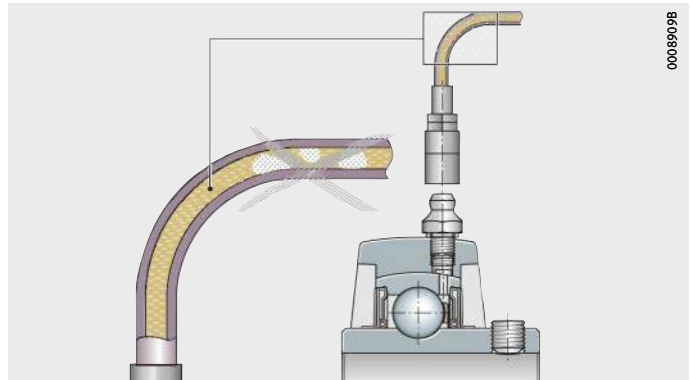


Design of lubrication system

Design guidelines for the feed ducts and lubrication holes in the housings and shafts, *Figure 2*:

- They should lead directly to the lubrication hole in the rolling bearing.
 - They should be as short as possible.
- ! Follow the guidelines provided by the manufacturers of the lubrication devices.

Figure 2
Design of the lubricant feed system





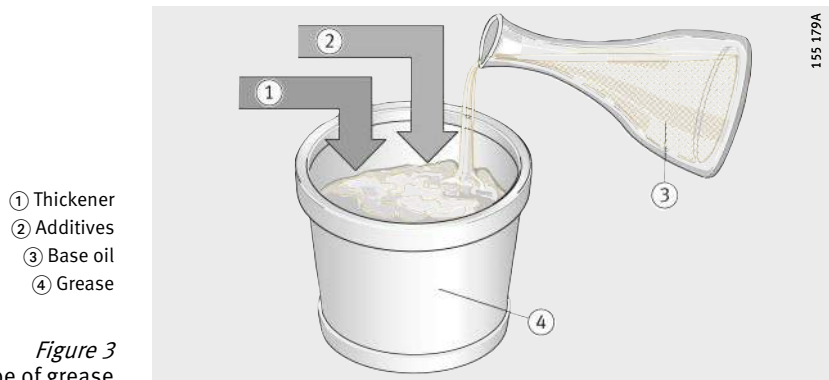
Grease lubrication

Greases can be differentiated in terms of their thickeners and base oils.

Composition of a grease

Conventional greases have metal soaps as thickeners and a mineral base oil, *Figure 3*. They also contain additives. These have a specific influence on, for example, the characteristics in relation to wear prevention, anti-corrosion protection or resistance to ageing. These combinations of additives are not, however, fully effective across every temperature and load range.

Greases exhibit widely varying behaviour in response to environmental influences such as temperature and moisture.



Lubricants must always be checked for their compatibility in relation to:

- other lubricants
- anti-corrosion agents
- thermoplastics, thermosets and elastomers
- light and non-ferrous metals
- coatings
- colouring agents and paints
- environmental compatibility:
 - toxicity
 - biological degradability
 - water pollution class.

Lubrication

Type of grease

The characteristics of a grease are influenced by:

- the base oil
- the viscosity of the base oil
(this is important for the speed range)
- the thickener
(the shear strength is important for the speed range)
- the additive package.

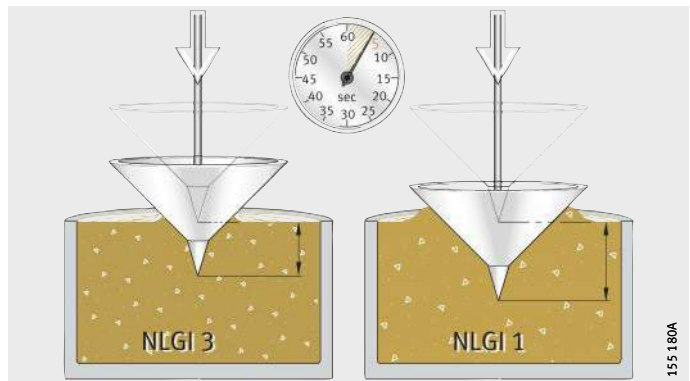
Consistency of greases

Greases are subdivided into consistency classes (NLGI grades in accordance with DIN 51818).

For rolling bearings, grades 1, 2, 3 should be used in preference, *Figure 4*.

NLGI grades

Figure 4
Consistency of greases





Selection of suitable grease

Rolling bearing greases K in accordance with DIN 51825 are suitable. Greases should be selected in accordance with the operating conditions of the bearing:

- temperature
- compressive load, see page 67
- speed, see page 67
- the presence of water and moisture, see page 67.

Operating temperature range

The operating temperature range of the grease must correspond to the range of possible operating temperatures in the rolling bearing.

Grease manufacturers indicate an operating temperature range for their rolling bearing greases K in accordance with DIN 51825.

The upper value is determined in accordance with DIN 51821 by means of testing on the FAG rolling bearing grease test rig FE 9. At the upper operating temperature, a 50% failure probability rate (F_{50}) of at least 100 hours must be achieved in this test.

The lower value is defined in accordance with DIN 51825 by means of flow pressure. The flow pressure of a grease is the pressure required to press a stream of grease through a defined nozzle. For greases of type K, the flow pressure at the lower operating temperature must be less than 1 400 mbar.

The use of flow pressure in determining the lower operating temperature only indicates, however, whether the grease can be moved at this temperature. This cannot be used to give an indication of its suitability for use in rolling bearings at low temperatures.

In addition to the lower operating temperature of a grease, therefore, the low temperature frictional torque is also determined in accordance with ASTM D 1478 or IP 186/93. At the lower operating temperature, the starting torque must not exceed 1 000 Nmm and the running torque must not exceed 100 Nmm.

Lubrication

Schaeffler recommends that greases should be used in accordance with the bearing temperature normally occurring in the standard operating range in order to achieve a reliable lubricating action and an acceptable grease operating life, *Figure 5*.

At low temperatures, greases release very little base oil. This can result in lubricant starvation. Schaeffler therefore recommends that greases are not used below the lower continuous limit temperature $\vartheta_{\text{lowerlimit}}$, *Figure 5*. This is approx. 20 K above the lower operating temperature of the grease as indicated by grease manufacturers.

The upper continuous limit temperature $\vartheta_{\text{upperlimit}}$ must not be exceeded if a temperature-induced reduction in the grease operating life is to be avoided, see page 70.



At consistently low temperatures (for example in cold store applications), it must be ensured that the grease releases sufficient oil in relation to the bearing type.

- ϑ = operating temperature
 ΔT = temperature differential
- ① Upper operating temperature according to grease manufacturer
 - ② $\vartheta_{\text{upperlimit}}$
 - ③ $\vartheta_{\text{lowerlimit}}$
 - ④ Lower operating temperature according to grease manufacturer
 - ⑤ Standard operating range

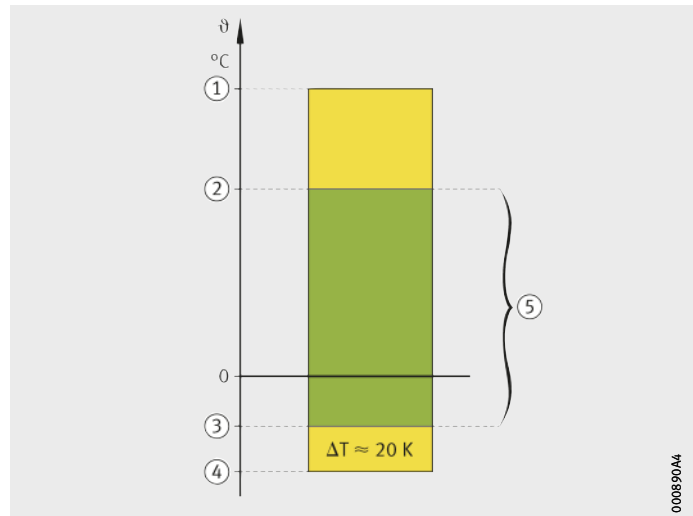


Figure 5
 Operating temperature range



Pressure capacity The viscosity at operating temperature must be sufficiently high for the formation of a lubricant film capable of supporting loads. At high loads, greases with EP characteristics (“extreme pressure”) and high base oil viscosity should be used (KP grease in accordance with DIN 51825). Such greases should also be used for bearings with a substantial sliding component and with line contact.



Silicone greases should only be used at low loads ($P \leq 3\% C$). Greases with solid lubricants should preferably be used for applications with mixed or boundary friction conditions. The solid lubricant particle size must not exceed $5 \mu\text{m}$.

Speed Greases should be selected in accordance with the speed parameter $n \cdot d_M$ for grease, see table, page 69:

- For rolling bearings running at high speeds or with a low starting torque, greases with a high speed parameter should be used.
- For bearings running at low speeds, greases with a low speed parameter should be used.

Under centrifugal accelerations $> 500 g$, separation (of the thickener and base oil) may occur. In this case, please consult the lubricant manufacturer.



The consistency of polycarbamide greases can be altered by shear stresses to a greater extent than that of metal soap greases.

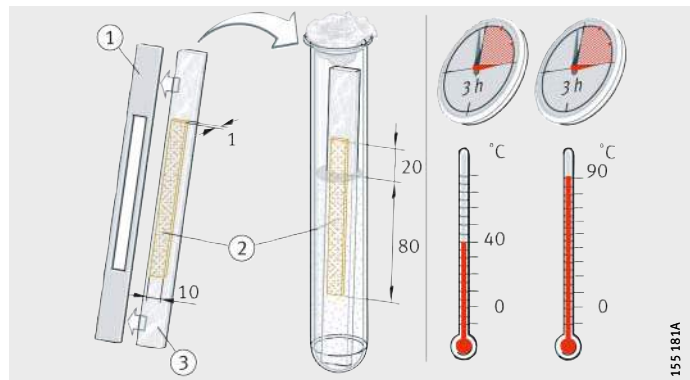
Water and moisture Water in the grease has a highly detrimental effect on the operating life of the bearing:

- The static behaviour of greases in the presence of water is assessed in accordance with DIN 51807, *Figure 6*.
- The anti-corrosion characteristics can be tested according to DIN 51802 (Emcor test) (information is given in the datasheets from the grease manufacturers).

- ① Blank
- ② Grease specimen
- ③ Glass slide

Figure 6

Behaviour in the presence of water in accordance with DIN 51807



Lubrication

Greases with special suitability



Many of the rolling bearings supplied by Schaeffler have a grease filling. The greases used have proved particularly suitable for the applications in mechanical-dynamic tests, see table.

When using bearings with plastic cages, compatibility between the lubricant and the cage material must be ensured if synthetic oils, lubricating greases with a synthetic oil base or lubricants containing a high proportion of EP additives are used.

Greases

Designation ¹⁾	Classification	Type of grease
GA13	Standard ball bearing and radial insert ball bearing grease for D > 62 mm	Lithium soap Mineral oil
GA22	Free-running grease with low frictional torque	Lithium soap Ester oil
L069⁴⁾	Radial insert ball bearing grease for wide temperature range	Polycarbamide Ester oil
GA11	Rolling bearing grease resistant to media for temperatures up to +250 °C	PTFE Alkoxyfluoroether
GA47	Rolling bearing grease resistant to media for temperatures up to +140 °C	Barium complex soap Mineral oil
L178	Rolling bearing grease for high speeds	Barium complex soap PAO oil

1) GA.. stands for **Grease Application Group**., based on Grease Spec 00.

2) The upper continuous limit temperature $\vartheta_{\text{upperlimit}}$ must not be exceeded if a temperature-induced reduction in grease operating life is to be avoided.

3) Dependent on bearing type.

4) Since January 2008, the grease L069 has been used in radial insert ball bearings instead of L014 and L086.



Operating temperature range °C		Upper continuous limit temperature $\vartheta_{upperlimit}^{2)}$ °C	NLGI grade		Speed parameter $n \cdot d_M$ $min^{-1} \cdot mm$	ISO-VG grade (base oil) ³⁾		Designation ¹⁾	Recommended Arcanol grease for relubrication
from	to		from	to		from	to		
-30	+120	+75	3	-	500 000	68	150	GA13	MULTI3
-50	+120	+70	2	-	1 500 000	10	22	GA22	-
-40	+180	+120	2	-	700 000	68	220	L069⁴⁾	-
-30	+260	+200	2	-	300 000	460	680	GA11	TEMP200
-20	+130	+70	1	2	350 000	150	320	GA47	-
-20	+142	+75	2	-	800 000	22	46	L178	-

Arcanol rolling bearing greases

For users who wish to charge their rolling bearings with grease themselves, there is a range of particularly suitable Arcanol rolling bearing greases.

These greases are graded in terms of their performance capability such that they can be used to cover almost all areas of application.

Lubrication

Grease operating life

The grease operating life t_{fG} describes the period over which the grease is capable, without relubrication, of lubricating the bearing to an adequate extent. Once the grease operating life has been reached, function of the bearing is only conditionally possible and the bearing will fail relatively quickly as a result of lubricant failure.

The grease operating life is therefore a decisive value if it is shorter than the calculated bearing life. It applies where rolling bearings cannot be relubricated.

It is influenced by the following factors:

- the grease quantity and distribution
- the type of grease (thickener, base oil, additives)
- the production process of the grease
- the bearing type and size
- the magnitude and type of load
- the speed parameter $n \cdot d_M$
- the bearing temperature
- the mounting conditions.

Approximation equation for grease operating life

A guide value for the grease operating life t_{fG} can be determined in approximate terms as follows:

$$t_{fG} = t_f \cdot K_T \cdot K_P \cdot K_R \cdot K_U$$

t_{fG} h

Guide value for grease operating life

t_f h

Basic grease operating life, see page 71

K_T –

Correction factor for temperature, see page 72

K_P –

Correction factor for load, see page 73

K_R –

Correction factor for oscillation, see page 74

K_U –

Correction factor for environment, see page 75.



If the outer ring rotates, there may be a reduction in the grease operating life. If a grease operating life > 3 years is required, this should be agreed in consultation with the lubricant manufacturer.

The grease operating life cannot be determined using the method described in the following cases:

- Air is sucked through the rolling bearing during operation
 - risk of increased grease oxidation.
- Contamination, water or other fluids enter the bearings.
- There is no bearing type factor k_f , see table, page 71.



Basic grease operating life

The basic grease operating life t_f is valid under the following preconditions and is dependent on the bearing-specific speed parameter $k_f \cdot n \cdot d_M$, see table and *Figure 7*.

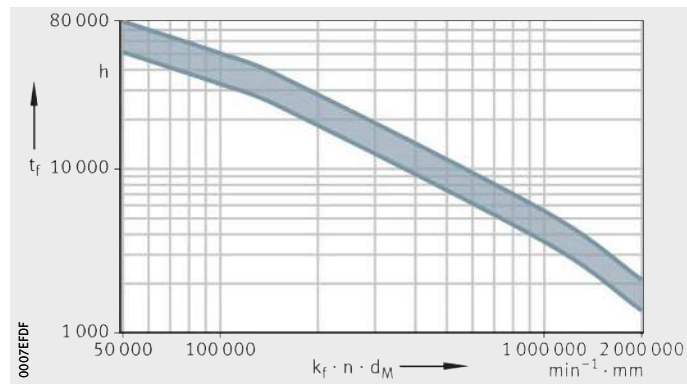
Preconditions for the basic grease operating life

	Precondition
Bearing temperature	< upper continuous limit temperature $\vartheta_{upperlimit}$
Load ratio	$C_0/P = 20$
Speed and load	Constant
Load in main direction	Radial bearing, radial
Axis of rotation	Horizontal for radial bearings
Inner ring	Rotating
Environmental influences	No disruptive influences

k_f – Bearing type factor, see table
 n min^{-1} – Operating speed or equivalent speed
 d_M mm – Mean bearing diameter $(d + D)/2$.

t_f = basic grease operating life
 $k_f \cdot n \cdot d_M$ = bearing-specific speed parameter

Figure 7
Calculation of basic grease operating life



Factor k_f , as a function of bearing type

Bearing type	Factor k_f
Deep groove ball bearings, single row	1
Angular contact ball bearings, double row	2
Radial insert ball bearings, housing units	1

Lubrication

Temperature correction factor K_T

The ageing rate of greases increases as the temperature increases above the continuous limit temperature. As a rule of thumb, the following applies: an increase in temperature of 15 K will reduce the grease operating life by half. In the case of high grade greases, however, this effect is only pronounced above the so-called upper continuous limit temperature $\vartheta_{upperlimit}$, *Figure 5*, page 66.

If the bearing temperature is above $\vartheta_{upperlimit}$, the reduction in the grease operating life due to temperature must be determined, *Figure 8*.

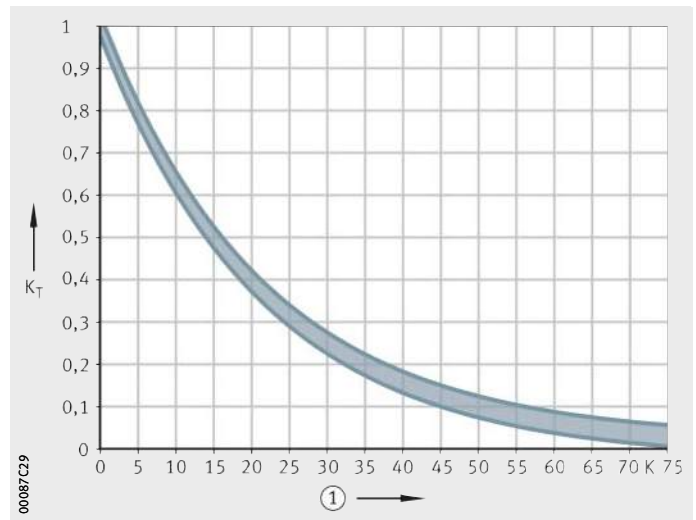


The diagram must not be used if the bearing temperature is higher than the upper operating temperature of the grease used, see table Greases, page 68. If necessary, a different grease must be selected or contact must be made with Schaeffler.

K_T = temperature factor

① K above $\vartheta_{upperlimit}$

Figure 8
Temperature factor K_T





Load correction factor K_p

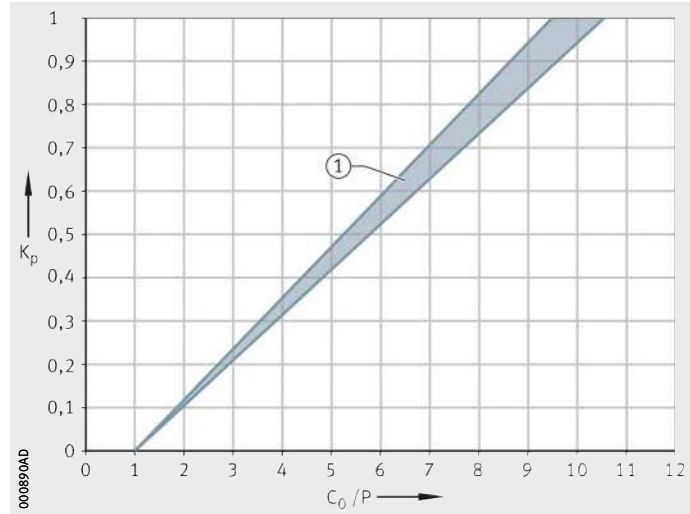
Under higher bearing load, greases are subjected to greater strain. As a function of the load ratio C_0/P and the bearing type, this influence can be taken into consideration using the factor K_p , *Figure 9* and table.

Basis:
lithium soap greases of high quality

K_p = load factor
 C_0/P = ratio between basic static load rating and equivalent dynamic bearing load

① Bearing type, see table

Figure 9
 K_p factor for bearings



K_p factor

Curve ¹⁾	Bearing type
①	Deep groove ball bearings, single row
	Angular contact ball bearings, double row
	Radial insert ball bearings, housing units

¹⁾ Curves, see *Figure 9*.

Lubrication

Oscillation correction factor K_R

Oscillating movements place a higher strain on the grease than continuously rotating bearings. The strain is placed continuously on the same grease volume, since no new grease can be drawn into the lubrication contact.



As a result, the grease at the contact becomes depleted. In order to reduce fretting corrosion, the lubrication interval should be reduced. The reduction-inducing influence can be taken into consideration using the oscillation factor K_R , *Figure 11*.

The factor K_R has an effect at or above an angle of oscillation $\varphi < 180^\circ$, *Figure 10*. At an angle of oscillation $\varphi < 5^\circ$, calculation is no longer possible. In this case, special lubricants must be used.

If the rolling elements do not undergo complete rotation, please contact Schaeffler.

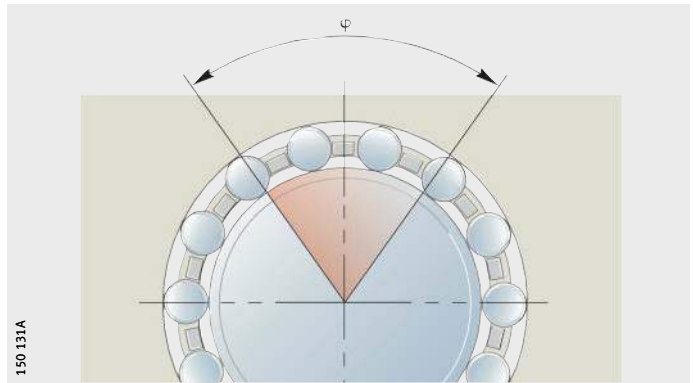


Figure 10
Angle of oscillation φ

K_R = oscillation factor
 φ = angle of oscillation

① Angle of oscillation $\varphi < 5^\circ$
requires special lubricants

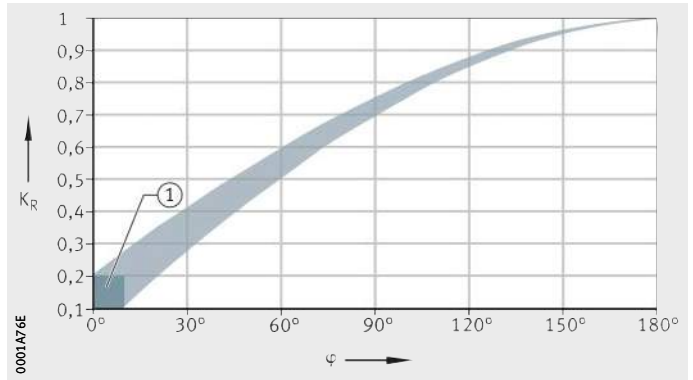


Figure 11
Oscillation factor K_R



Environmental correction factor K_U

The factor K_U takes account of the influences of moisture, shaking forces, slight vibration (leading to fretting corrosion) and shocks, see table.



It does not take account of extreme environmental influences such as water, aggressive media, contamination, radiation and extreme vibrations such as those occurring in vibratory machines.

In relation to contamination, the influence of contamination on rating life calculation must also be noted, see section Load carrying capacity and life, page 36.

Environmental factor K_U

Environmental influence	Environmental factor K_U
Slight	1
Moderate	0,8
Severe	0,5



Grease reservoir

The initial greasing quantity is between 30% and 50% of the available volume in the bearing, dependent on the bearing type and operating conditions.

A grease reservoir can extend the grease operating life. The grease in the reservoir must be in constant contact with the grease on the raceway. Increasing the size of the grease reservoir does not lead to a proportional increase in the grease operating life.

The volume of the grease reservoir should correspond to the volume within the bearing area between the inner and outer ring (not taking account of the cage and rolling elements), *Figure 12*.

Evaporation of the base oil should be prevented by design measures, for example by sealing washers.

- ① Sealing washer
- ② Grease reservoir

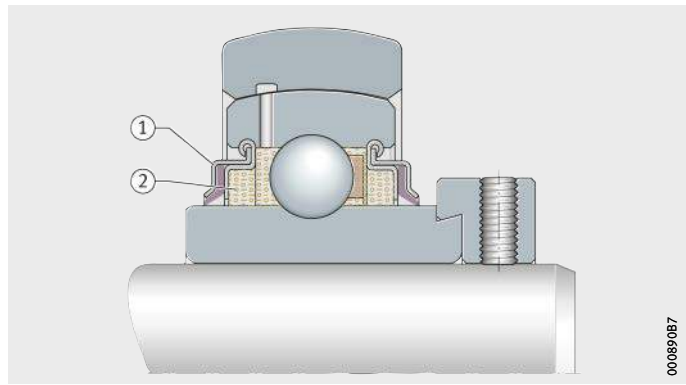


Figure 12
Grease reservoir on both sides

Lubrication

Miscibility Mixtures of greases should be avoided if at all possible.

Preconditions If they are unavoidable, the following preconditions must be fulfilled:

- The base oil must be the same.
- The thickener types must match.
- The base oil viscosities must be similar (they must not differ by more than one ISO-VG grade).
- The consistency must be identical (NLGI grade).



Miscibility of greases must be always be agreed in consultation with the lubricant manufacturer.

Even when these preconditions are fulfilled, impairment of the performance capability of the mixed grease cannot be ruled out.

If a decision is taken to change to a different grease grade, the grease should be rinsed out if this is possible. Further relubrication should be carried out after a shortened period.

If incompatible greases are mixed, this can lead to considerable structural changes. Substantial softening of the grease mixture may also occur.

Definite statements on miscibility can only be obtained by means of suitable tests.

Storage Lubricants age due to environmental influences. The information provided by lubricant manufacturers must always be observed.

Preconditions In general, the greases used can be stored for 3 years. The preconditions are:

- a closed room or store
- temperatures between 0 °C and +40 °C
- relative humidity no greater than 65%
- no influence of chemical agents (vapours, gases, fluids)
- sealed rolling bearings.



The start-up frictional torque of greased bearings can be temporarily higher than normal after long periods of storage. The lubricity of the grease may also have deteriorated.

Since the lubrication characteristics of greases vary and different raw materials may be used for greases of the same name, Schaeffler cannot offer any guarantees either for the lubricants used by customers for relubrication or for their characteristics.

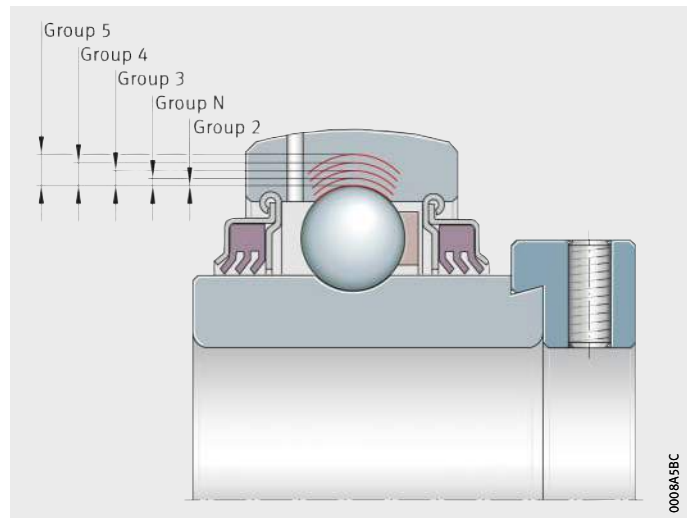


Bearing data

Radial internal clearance

The radial internal clearance applies to bearings with an inner ring and is determined on the unmounted bearing. It is defined as the amount by which the inner ring can be moved in a radial direction from one extreme position to the other in relation to the outer ring, *Figure 1*.

In accordance with ISO 5753-1 (DIN 620-4), the radial internal clearance is subdivided into groups, *Figure 1* and table.



Group N to Group 5 = internal clearance groups

Figure 1
Radial internal clearance

Radial internal clearance groups

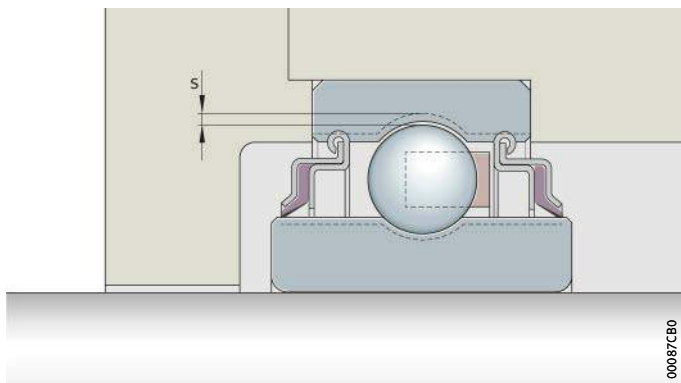
Internal clearance group		Description	Application
DIN 620-4	ISO 5753-1		
CN	Group N	Normal internal clearance; CN is not included in bearing designations	For normal operating conditions with shaft and housing tolerances, see Operating clearance and Design of bearing arrangements For heavy alternating loads combined with swivel motion For bearing rings with press fits and large temperature differential between the inner and outer ring
C2	Group 2	Internal clearance < CN	
C3	Group 3	Internal clearance > CN	
C4	Group 4	Internal clearance > C3	
C5	Group 5	Internal clearance > C4	

Bearing data

Operating clearance

The operating clearance is determined on a mounted bearing still warm from operation. It is defined as the amount by which the shaft can be moved in a radial direction from one extreme position to the other, *Figure 2*.

The operating clearance is derived from the radial internal clearance and the change in the radial internal clearance as a result of interference fit and thermal influences in the mounted condition.



s = operating clearance

Figure 2
Operating clearance

Operating clearance value

The size of the operating clearance is dependent on the installation and operating conditions of the bearing, see section Design of bearing arrangements, page 100.

A larger operating clearance is, for example, necessary if heat is transferred via the shaft, the shaft undergoes deflection or if misalignment occurs.

An operating clearance smaller than Group N should only be used in special cases, for example in high precision bearing arrangements.

The normal operating clearance is achieved with the internal clearance Group N or, in the case of larger bearings, predominantly with Group 3 if the recommended shaft and housing tolerances are observed, see section Design of bearing arrangements, page 100.

Calculation of operating clearance

The operating clearance is derived from:

$$s = s_r - \Delta s_p - \Delta s_T$$

s	μm
Radial operating clearance of mounted bearing warm from operation	
s _r	μm
Radial internal clearance	
Δs _p	μm
Reduction in radial internal clearance due to fit	
Δs _T	μm
Reduction in radial internal clearance due to temperature.	

Bearing data

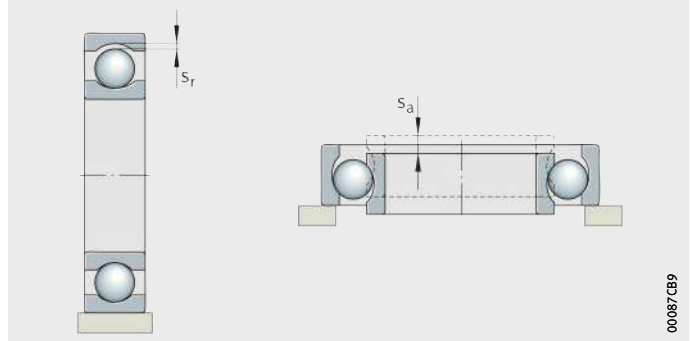
Axial internal clearance

The axial internal clearance s_a is defined as the amount by which one bearing ring can be moved relative to the other, without load, along the bearing axis, *Figure 3*.

With various bearing types, the radial internal clearance s_r and the axial internal clearance s_a are dependent on each other, see table.

s_a = axial internal clearance
 s_r = radial internal clearance

Figure 3
 Axial internal clearance
 in comparison
 with radial internal clearance



Correlation between axial internal clearance and radial internal clearance

Bearing type		Ratio between axial and radial internal clearance s_a/s_r
Angular contact ball bearings, double row	Series 32 and 33	1,4
	Series 32..-B and 33..-B	2



Calculation example

The calculation of axial internal clearance is shown in the following example:

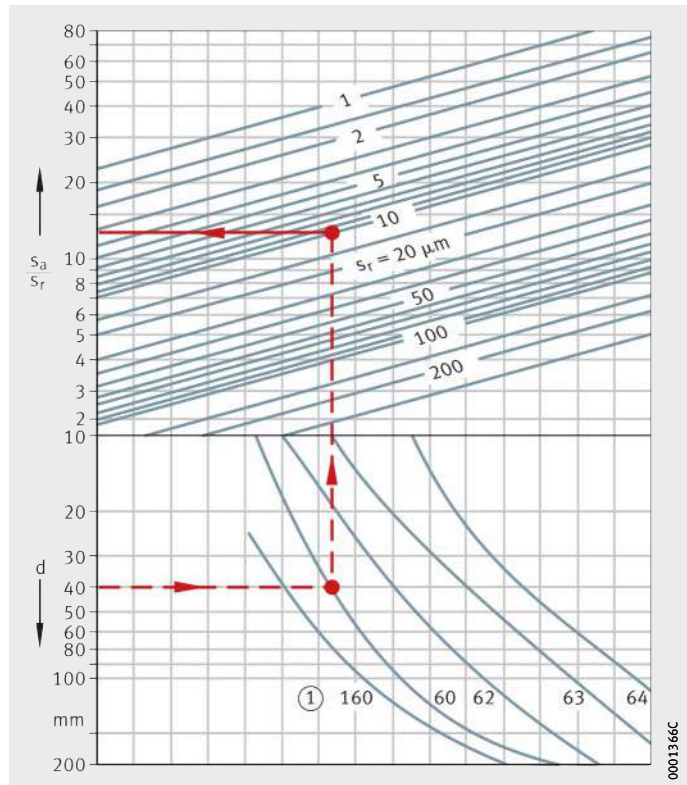
Deep groove ball bearing	6008
Radial internal clearance	Group 3
Bore diameter d	40 mm
Radial internal clearance before mounting	15 μm to 33 μm
Actual radial internal clearance	24 μm
Mounting tolerance Shaft	k5 Ⓢ
Housing	J6 Ⓢ
Reduction in radial internal clearance during mounting	14 μm
Radial internal clearance after mounting	24 μm - 14 μm = 10 μm
Ratio s_a/s_r , Figure 4	13

Axial internal clearance $s_a = 13 \cdot 10 \mu\text{m} = 130 \mu\text{m}$

s_a = axial internal clearance
 s_r = radial internal clearance
 d = bearing bore diameter

① Bearing series

Figure 4
 Relationship between radial and axial internal clearance in deep groove ball bearings



0001366C

Bearing data

Bearing materials

INA and FAG rolling bearings fulfil the requirements for fatigue strength, wear resistance, hardness, toughness and structural stability.

The material used for the rings and rolling elements is generally a low-alloy, through hardening chromium steel of high purity.

In recent years, the improved quality of rolling bearing steels has been the principal factor in achieving considerable increases in basic load ratings.

The results of research as well as practical experience confirm that bearings made from the steel currently used as standard can achieve their endurance limit if loads are not excessively high and the lubrication and cleanliness conditions are favourable.

Some suitable materials are listed as examples for some bearing components, see table.

Materials and bearing components

Material	Bearing component (example)
Through hardening chromium steel ■ Rolling bearing steel in accordance with ISO 683-17	Outer and inner ring, axial washer
Corrosion-resistant steel ■ Rolling bearing steel in accordance with ISO 683-17	Outer and inner ring
Case hardening steel	Locking collar
Polyamide (thermoplastic)	Cage
NBR, PTFE	Sealing ring

Corrosion-resistant steels

In addition to the standard rolling bearing steels, there is also a corrosion-resistant material for radial insert ball bearings operating in corrosive environments.

The steel SUS440C has been used as standard and proved effective in many applications. This material has adequate corrosion resistance in many media.



Cages Rolling bearing cages are subdivided into sheet metal and solid cages.

Both sheet metal and solid cages for radial insert ball bearings are exclusively ball-guided.

The most important functions of the cage are:

- to separate the rolling elements from each other, in order to minimise friction and heat generation
- to maintain the rolling elements at the same distance from each other, in order to ensure uniform load distribution
- to guide the rolling elements in the load zone of the bearing.

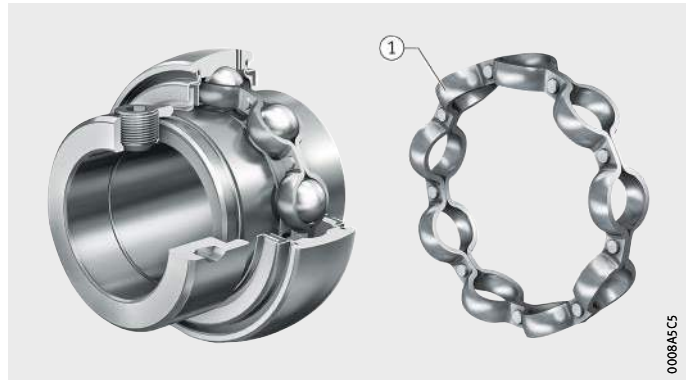
Sheet metal cages

These cages are predominantly made from steel, *Figure 5*. In comparison with solid cages made from metal, they are of lower mass.

Since a sheet metal cage only fills a small proportion of the gap between the inner and outer ring, lubricant can easily reach the interior of the bearing and is held on the cage.

① Riveted cage

Figure 5
Radial insert ball bearing
with sheet metal cages



Bearing data

Solid cages made from polyamide PA66

Solid cages made from polyamide PA66 are produced using the injection moulding process, *Figure 6*. As a result, cage types can generally be realised that allow designs with particularly high load carrying capacity. The elasticity and low mass of polyamide are favourable under shock type bearing loads, high accelerations and decelerations and tilting of the bearing rings in relation to each other. Polyamide cages have very good sliding and emergency running characteristics.

Cages made from glass fibre reinforced polyamide PA66 are suitable for continuous temperatures up to +120 °C.

① Polyamide cage

Figure 6
Solid cage
made from polyamide





Operating temperature

Radial insert ball bearings are heat treated such that, depending on their type, they are generally dimensionally stable up to +120 °C (certain series up to +250 °C).

Operating temperatures above +150 °C and up to +250 °C require special heat treatment. Bearings treated in this way are included in the catalogue range and are identified by the suffixes FA101, FA164, see table.



The temperature data in the product descriptions must be observed.

Suffixes for radial insert ball bearings for high temperatures

Suffix	FA101	FA164
Maximum operating temperature	-40 °C to +180 °C	+150 °C to +250 °C

Sealed bearings

The permissible temperature for sealed bearings is dependent on the requirements for the operating life of the grease filling and on the action of the contact seals.

Sealed bearings are greased with specially tested, high performance, high quality greases. These greases can withstand +120 °C for short periods. At or above continuous temperatures of +70 °C, a reduction in the operating life of standard greases with a lithium soap base must be expected.

In many cases, adequate operating life values are only achieved at high temperatures through the use of special greases. In these cases, it must also be checked whether seals made from especially heat-resistant materials must be used. The operating limit of normal contact seals is +100 °C.



If high temperature synthetic materials are used for seals and greases, it must be noted that the particularly high performance materials containing fluoride may give off harmful gases and vapours when heated to approx. +300 °C and above. This may occur, for example, if a welding torch is used in the dismantling of a bearing.

Bearing data

Anti-corrosion protection

Bearings are not resistant to corrosion by water or agents containing alkalis or acids but are often exposed to these corrosion-inducing agents. In these applications, anti-corrosion protection is therefore a decisive factor in achieving a long operating life of the bearings.

Anti-corrosion coating system Corrotect

Corrotect is an extremely thin, electroplated surface coating (coating thickness 2 μm to 5 μm). The coating is effective against moisture, contaminated water, salt spray and weakly alkaline and weakly acidic cleaning agents.



Before bearings with Corrotect coating are mounted, compatibility with media should always be checked.

For lower press-in forces, the surface of the parts should be lightly greased, the tolerances are increased by the thickness of the coating.

Advantages of the coating

The advantages of the special coating Corrotect are all-round rust protection, including the turned surfaces of chamfers and radii, *Figure 7*. It also gives long term prevention of rust penetration beneath seals and smaller bright spots are protected against rust by the cathodic protection effect. Anti-corrosion protection allows a significantly longer operating life compared to uncoated parts. Uncoated bearings can be easily replaced by coated bearings of the same dimensions and there is no decrease in load carrying capacity (such as occurs in the use of corrosion-resistant steels). During storage, there is no need to use organic-based preservatives.

Test time 24 h in salt spray

- ① With Corrotect coating
- ② Uncoated

Figure 7
Coated and uncoated part
after the salt spray test





Dimensional and running tolerances

Unless stated otherwise, the tolerances for radial bearings correspond to ISO 492, *Figure 8*. The rules in ISO 492 and ISO 199 apply.

The accuracy corresponds to the tolerance class Normal.

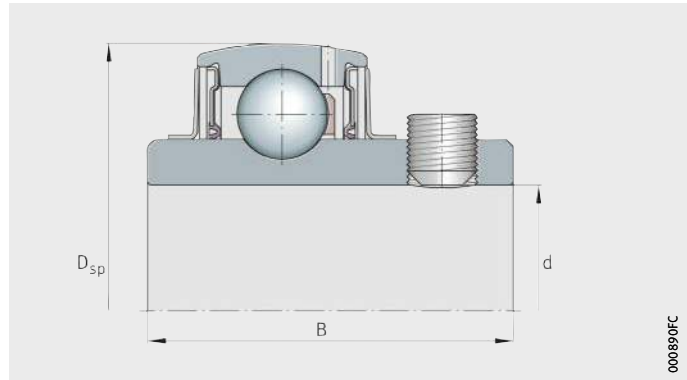


Figure 8
Nominal dimension symbols
in accordance with
ISO 492 and ISO 199

Measurement methods



The definition of the tolerances and the associated measurement principles are described in the following chapter.

The following restrictions apply to the stated specification modifiers:

- The specification modifier LP is not indicated on a drawing if the two-point size is defined as the default specification.
- The specification modifier GN is not suitable for cases where there is no opposing material, for example the outer ring of a tapered roller bearing with significant edge rounding on the back face and small front face. Solutions must be developed within the framework of the GPS system and taken into consideration in the future.

Bearing data

Symbols for nominal dimensions, characteristics and specification modifiers for radial rolling bearings in accordance with ISO 492:2014



Symbol for nominal dimension ^{1) 2)} Tolerance symbol for characteristic ²⁾	GPS symbol and specification modifier	Description for radial bearings	Old term
	Symbols in accordance with ISO 1101 and ISO 14405-1	In accordance with ISO 492:2014 (based on ISO 1101, ISO 5459 and ISO 14405-1)	In accordance with ISO 1132-1: 2000
Width			
B	–	Nominal inner ring width	Nominal inner ring width
$t_{\Delta B_s}$	(LP)	Symmetrical rings deviation of a two-point size of inner ring width from its nominal size $\Delta B_s = B_s - B$ B_s = single two-point size of inner ring width	Deviation of a single inner ring width
	(GN)ALS (LP) 	Asymmetrical rings, upper limit deviation of a minimum circumscribed size of inner ring width, between two opposite lines, in any longitudinal section which includes the inner ring bore axis, from its nominal size Asymmetrical rings, lower limit deviation of a two-point size of inner ring width from its nominal size	
$t_{V B_s}$	(LP) (SR)	Symmetrical rings range of two-point sizes of inner ring width $V B_s = B_s \text{ max} - B_s \text{ min}$	Variation of inner ring width
	(GN)ALS (SR) 	Asymmetrical rings range of minimum circumscribed sizes of inner ring width, between two opposite lines, obtained from any longitudinal section which includes the inner ring bore axis	

1) Symbols for the nominal dimension are printed bold; they indicate size dimensions and spacings.

2) Symbols in accordance with ISO 15241 (exception: font).



Symbols for nominal dimensions, characteristics and specification modifiers for radial rolling bearings in accordance with ISO 492:2014 (continued)

Symbol for nominal dimension^{1) 2)} Tolerance symbol for characteristic ²⁾	GPS symbol and specification modifier	Description for radial bearings	Old term
	Symbols in accordance with ISO 1101 and ISO 14405-1	In accordance with ISO 492:2014 (based on ISO 1101, ISO 5459 and ISO 14405-1)	In accordance with ISO 1132-1:2000
Width			
C	–	Nominal outer ring width	Nominal outer ring width
$t_{\Delta Cs}$	LP	Symmetrical rings deviation of a two-point size of outer ring width from its nominal size $\Delta Cs = Cs - C$ Cs = single two-point size of inner ring width	Deviation of a single outer ring width
	GN ALS  LP	Asymmetrical rings, upper limit deviation of a minimum circumscribed size of outer ring width, between two opposite lines, in any longitudinal section which includes the outer ring outside surface axis, from its nominal size	
		Asymmetrical rings, lower limit deviation of a two-point size of outer ring width from its nominal size	
t_{Vcs}	LP SR	Symmetrical rings range of two-point sizes of outer ring width $Vcs = Cs_{max} - Cs_{min}$	Variation of outer ring width
	GN ALS SR 	Asymmetrical rings range of minimum circumscribed sizes of outer ring width, between two opposite lines, obtained from any longitudinal section which includes the outer ring outside surface axis	

1) Symbols for the nominal dimension are printed bold; they indicate size dimensions and spacings.

2) Symbols in accordance with ISO 15241 (exception: font).

Bearing data

Symbols for nominal dimensions, characteristics and specification modifiers for radial rolling bearings in accordance with ISO 492:2014 (continued)

Symbol for nominal dimension^{1) 2)} Tolerance symbol for characteristic ²⁾	GPS symbol and specification modifier	Description for radial bearings	Old term
	Symbols in accordance with ISO 1101 and ISO 14405-1	In accordance with ISO 492:2014 (based on ISO 1101, ISO 5459 and ISO 14405-1)	In accordance with ISO 1132-1: 2000
Diameter			
d	–	Nominal bore diameter of a cylindrical bore or at the theoretical small end of a tapered bore	Nominal bore diameter
$t_{\Delta ds}$	(LP)	Deviation of a two-point size of the bore diameter from its nominal size $\Delta ds = ds - d$	Deviation of a single bore diameter
t_{Vdsp}	(LP) (SR) ACS	Range of two-point sizes of bore diameter in any cross-section of a cylindrical or tapered bore $Vdsp = ds_{max} - ds_{min}$	Variation of single bore diameter in a single plane
$t_{\Delta dmp}$	(LP) (SD) ACS	Cylindrical bore deviation of a mid-range size (out of two-point sizes) of bore diameter in any cross-section from its nominal size $dmp = (d_{max} + d_{min})/2$ $\Delta dmp = dmp - d$	Deviation of mean bore diameter in a single plane
	(LP) (SD) SCS	Tapered bore deviation of a mid-range size (out of two-point sizes) of bore diameter at the theoretical small end from its nominal size	
t_{Vdmp}	(LP) (SD) ACS (SR)	Range of mid-range sizes (out of two-point sizes) of bore diameter obtained from any cross-section of a cylindrical bore $Vdmp = dmp_{max} - dmp_{min}$	Variation of mean bore diameter

1) Symbols for the nominal dimension are printed bold; they indicate size dimensions and spacings.

2) Symbols in accordance with ISO 15241 (exception: font).









Symbols for nominal dimensions, characteristics and specification modifiers for radial rolling bearings in accordance with ISO 492:2014 (continued)

Symbol for nominal dimension^{1) 2)} Tolerance symbol for characteristic ²⁾	GPS symbol and specification modifier	Description for radial bearings	Old term
	Symbols in accordance with ISO 1101 and ISO 14405-1	In accordance with ISO 492:2014 (based on ISO 1101, ISO 5459 and ISO 14405-1)	In accordance with ISO 1132-1: 2000
d₁	–	Nominal diameter at the theoretical large end of a tapered bore	–
<i>t_{Δd1mp}</i>	(LP) (SD) SCS	Deviation of a mid-range size (out of two-point sizes) of bore diameter at the theoretical large end of a tapered bore from its nominal size	–
D	–	Nominal outside diameter	Nominal outside diameter
<i>t_{ΔDs}</i>	(LP)	Deviation of a two-point size of outside diameter from its nominal size	Deviation of a single outside diameter
<i>t_{VDsp}</i>	(LP) (SR) ACS	Range of two-point sizes of outside diameter in any cross-section	Variation of outside diameter in a single plane
<i>t_{ΔDmp}</i>	(LP) (SD) ACS	Deviation of a mid-range size (out of two-point sizes) of outside diameter in any cross-section from its nominal size Dmp = (D max + D min)/2 ΔDmp = Dmp – D	Deviation of mean outside diameter in a single plane
<i>t_{VDmp}</i>	(LP) (SD) ACS (SR)	Range of mid-range sizes (out of two-point sizes) of outside diameter obtained from any cross-section VDmp = Dmp max – Dmp min	Variation of mean outside diameter

- 1) Symbols for the nominal dimension are printed bold; they indicate size dimensions and spacings.
- 2) Symbols in accordance with ISO 15241 (exception: font).

Bearing data

Symbols for nominal dimensions, characteristics and specification modifiers for radial rolling bearings in accordance with ISO 492:2014 (continued)

Symbol for nominal dimension^{1) 2)} Tolerance symbol for characteristic ²⁾	GPS symbol and specification modifier Symbols in accordance with ISO 1101 and ISO 14405-1	Description for radial bearings In accordance with ISO 492:2014 (based on ISO 1101, ISO 5459 and ISO 14405-1)	Old term In accordance with ISO 1132-1: 2000
Running accuracy			
t_{Kea}	 ³⁾	Circular radial run-out of outer ring outside surface of assembled bearing with respect to datum, i.e. axis, established from the inner ring bore surface	Radial run-out of outer ring of assembled bearing
t_{Kia}	 ³⁾	Circular radial run-out of inner ring bore of assembled bearing with respect to datum, i.e. axis, established from the outer ring outside surface	Radial run-out of inner ring of assembled bearing
t_{Sd}	 ³⁾	Circular axial run-out of inner ring face with respect to datum, i.e. axis, established from the inner ring bore surface	Perpendicularity of inner ring face with respect to the bore
t_{SD}		Perpendicularity of outer ring outside surface axis with respect to datum established from the outer ring face	Perpendicularity of outer ring outside surface with respect to the face
t_{Sea}	 ³⁾	Circular axial run-out of outer ring face of assembled bearing with respect to datum, i.e. axis, established from the inner ring bore surface	Axial run-out of outer ring of assembled bearing
t_{Sia}	 ³⁾	Circular axial run-out of inner ring face of assembled bearing with respect to datum, i.e. axis, established from the outer ring outside surface	Axial run-out of inner ring of assembled bearing
Tapered bore			
SL	–	Taper slope: Taper slope is the difference between nominal diameters at the theoretical large end and small end of a tapered bore $SL = d_1 - d$ $SL = \text{spacing}$	–
$t_{\Delta SL}$	–	Deviation of taper slope of a tapered inner ring bore from its nominal size (description based on DIN EN ISO 1119) $\Delta SL = \Delta d_{1mp} - \Delta d_{mp}$	–
α	–	Frustum angle of tapered inner ring bore	–

1) Symbols for the nominal dimension are printed bold; they indicate size dimensions and spacings.

2) Symbols in accordance with ISO 15241 (exception: font).

3) Specification modifiers for the direction of action of the mass, as well as fixed and movable parts necessary in accordance with ISO/TS 17863.



Symbols for nominal dimensions, characteristics and specification modifiers for radial rolling bearings in accordance with ISO 492:2014 (continued)

Symbol for nominal dimension^{1) 2)} Tolerance symbol for characteristic ²⁾	GPS symbol and specification modifier	Description for radial bearings	Old term
	Symbols in accordance with ISO 1101 and ISO 14405-1	In accordance with ISO 492:2014 (based on ISO 1101, ISO 5459 and ISO 14405-1)	In accordance with ISO 1132-1: 2000
Width of assembled bearing			
T	–	Nominal assembled bearing width	Assembled bearing width
$t_{\Delta Ts}$	$\textcircled{GN}^3)$	Deviation of minimum circumscribed size of assembled bearing width from its nominal size	Deviation of the actual (assembled) bearing width
T₁	–	Nominal effective width of inner subunit assembled with a master outer ring	Effective width of the inner subunit assembled with a master outer ring
$t_{\Delta T1s}$	$\textcircled{GN}^3)$	Deviation of minimum circumscribed size of effective width (inner subunit assembled with a master outer ring) from its nominal size	Nominal effective width of outer ring assembled with a master inner subunit

1) Symbols for the nominal dimension are printed bold; they indicate size dimensions and spacings.

2) Symbols in accordance with ISO 15241 (exception: font).

3) Specification modifiers for the direction of action of the mass, as well as fixed and movable parts necessary in accordance with ISO/TS 17863.

Bearing data

Radial bearings

The normal tolerances of radial bearings correspond to ISO 492, see tables. In the case of radial insert ball bearings, only the outside diameter corresponds to the tolerance class Normal in accordance with ISO 492. The inner ring bore has a plus tolerance, see the product description.

Tolerance class Normal, Inner ring

d		t _{Δdmp}		t _{Vdsp}			t _{Vdmp}	t _{Kia}
				Diameter series				
mm		μm		9	0, 1	2, 3, 4	μm	μm
		Deviation		μm	μm	μm		
over	incl.	U	L	max.	max.	max.	max.	max.
0,6 ¹⁾	2,5	0	-8	10	8	6	6	10
2,5	10	0	-8	10	8	6	6	10
10	18	0	-8	10	8	6	6	10
18	30	0	-10	13	10	8	8	13
30	50	0	-12	15	12	9	9	15
50	80	0	-15	19	19	11	11	20
80	120	0	-20	25	25	15	15	25
120	180	0	-25	31	31	19	19	30
180	250	0	-30	38	38	23	23	40
250	315	0	-35	44	44	26	26	50
315	400	0	-40	50	50	30	30	60
400	500	0	-45	56	56	34	34	65
500	630	0	-50	63	63	38	38	70
630	800	0	-75	-	-	-	-	80
800	1 000	0	-100	-	-	-	-	90
1 000	1 250	0	-125	-	-	-	-	100
1 250	1 600	0	-160	-	-	-	-	120
1 600	2 000	0	-200	-	-	-	-	140

U = upper limit deviation

L = lower limit deviation

Tolerance symbols, see tables, page 90.

¹⁾ This diameter is included in the group.



**Tolerance class Normal,
Inner ring
(continued)**

d mm		t _{ΔBs} μm Deviation				t _{VBs} μm max.
		normal		modified ¹⁾		
over	incl.	U	L	U	L	
0,6 ²⁾	2,5	0	-40	0	-	12
2,5	10	0	-120	0	-250	15
10	18	0	-120	0	-250	20
18	30	0	-120	0	-250	20
30	50	0	-120	0	-250	20
50	80	0	-150	0	-380	25
80	120	0	-200	0	-380	25
120	180	0	-250	0	-500	30
180	250	0	-300	0	-500	30
250	315	0	-350	0	-500	35
315	400	0	-400	0	-630	40
400	500	0	-450	0	-	50
500	630	0	-500	0	-	60
630	800	0	-750	0	-	70
800	1 000	0	-1 000	0	-	80
1 000	1 250	0	-1 250	0	-	100
1 250	1 600	0	-1 600	0	-	120
1 600	2 000	0	-2 000	0	-	140

U = upper limit deviation

L = lower limit deviation

Tolerance symbols, see tables, page 90.

¹⁾ Only for bearings manufactured specifically for use as matched pairs.

²⁾ This diameter is included in the group.

Bearing data

Tolerance class Normal,
Outer ring¹⁾

D		t _{ΔDmp}		t _{ΔDsp}				t _{VDmp} ²⁾	t _{Kea}
				Open bearings Diameter series			Bearings with sealing shields or sealing washers		
				9	0, 1	2, 3, 4			
mm		μm Deviation		μm	μm	μm	μm	μm	
over	incl.	U	L	max.	max.	max.	max.	max.	
2,5 ³⁾	6	0	-8	10	8	6	10	6	15
6	18	0	-8	10	8	6	10	6	15
18	30	0	-9	12	9	7	12	7	15
30	50	0	-11	14	11	8	16	8	20
50	80	0	-13	16	13	10	20	10	25
80	120	0	-15	19	19	11	26	11	35
120	150	0	-18	23	23	14	30	14	40
150	180	0	-25	31	31	19	38	19	45
180	250	0	-30	38	38	23	-	23	50
250	315	0	-35	44	44	26	-	26	60
315	400	0	-40	50	50	30	-	30	70
400	500	0	-45	56	56	34	-	34	80
500	630	0	-50	63	63	38	-	38	100
630	800	0	-75	94	94	55	-	55	120
800	1 000	0	-100	125	125	75	-	75	140
1 000	1 250	0	-125	-	-	-	-	-	160
1 250	1 600	0	-160	-	-	-	-	-	190
1 600	2 000	0	-200	-	-	-	-	-	220
2 000	2 500	0	-250	-	-	-	-	-	250

U = upper limit deviation

L = lower limit deviation

Tolerance symbols, see tables, page 90.

¹⁾ t_{ΔCs}, t_{ΔC1s}, t_{VCs} and t_{VC1s} are identical to t_{ΔDBs} and t_{VBs} for the inner ring of the corresponding bearing, see table, page 96.

²⁾ Applies before assembly of the bearing and after removal of internal and/or external snap rings.

³⁾ This diameter is included in the group.



Chamfer dimensions

The chamfer dimensions correspond to DIN 620-6, *Figure 9* and table.

① Arc
(radius with nominal chamfer dimension)
beyond which material must not protrude

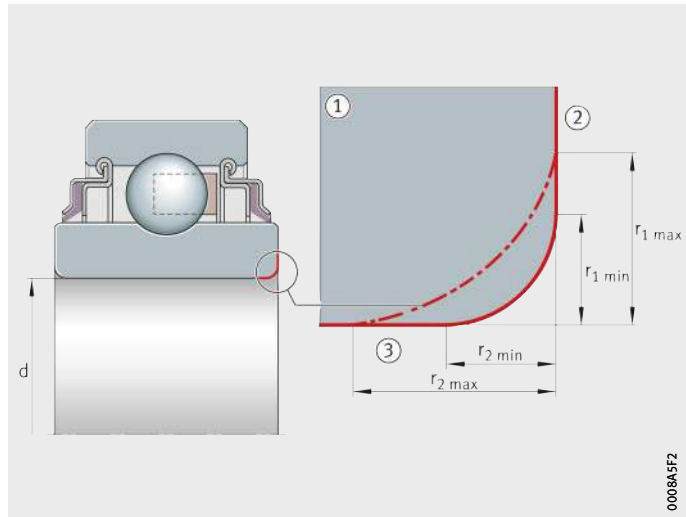
② Radial

③ Axial

d = inside diameter
 r_1, r_2 = chamfer dimensions

Figure 9

Symmetrical ring cross-section
with identical chamfer dimensions
on both rings



000845F2

Limit values for chamfer dimensions to DIN 620-6

Nominal chamfer dimension $r^{1)}$ mm	Nominal bearing bore diameter		Chamfer dimension		
	d mm	incl.	r_1, r_2	r_1	r_2
			mm	mm	mm
0,05	–	–	0,05	0,1	0,2
0,08	–	–	0,08	0,16	0,3
0,1	–	–	0,1	0,2	0,4
0,15	–	–	0,15	0,3	0,6
0,2	–	–	0,2	0,5	0,8
0,3	–	40	0,3	0,6	1
	40	–	0,3	0,8	1
0,5	–	40	0,5	1	2
	40	–	0,5	1,3	2
0,6	–	40	0,6	1	2
	40	–	0,6	1,3	2
1	–	50	1	1,5	3
	50	–	1	1,9	3
1,1	–	120	1,1	2	3,5
	120	–	1,1	2,5	4
1,5	–	120	1,5	2,3	4
	120	–	1,5	3	5
2	–	80	2	3	4,5
	80	220	2	3,5	5
	220	–	2	3,8	6

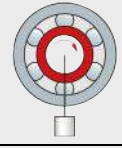
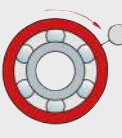
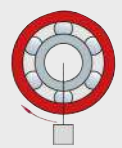
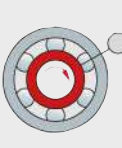
¹⁾ The nominal chamfer dimension r is identical to the smallest permissible chamfer dimension r_{\min} .

Design of bearing arrangements

Conditions of rotation

The conditions of rotation indicate the motion of one bearing ring with respect to the load direction and are expressed as either circumferential load or point load, see table.

Conditions of rotation

Conditions of motion	Example	Schematic	Load case	Fit
<ul style="list-style-type: none"> ■ Rotating inner ring ■ Stationary outer ring ■ Constant load direction 	Conveyor belts		Circumferential load on inner ring	Inner ring: tight fit necessary Outer ring: loose fit permissible
<ul style="list-style-type: none"> ■ Stationary inner ring ■ Rotating outer ring ■ Load direction rotates with outer ring 	Hub bearing arrangement with significant unbalance		and Point load on outer ring	
<ul style="list-style-type: none"> ■ Stationary inner ring ■ Rotating outer ring ■ Constant load direction 	Roller chain idler sprocket units		Point load on inner ring	Inner ring: loose fit permissible Outer ring: tight fit necessary
<ul style="list-style-type: none"> ■ Rotating inner ring ■ Stationary outer ring ■ Load direction rotates with inner ring 	Centrifuge, vibrating screen		and Circumferential load on outer ring	

Point load

If the ring remains stationary relative to the load direction, there are no forces that displace the ring relative to its seating surface. This type of loading is described as point load.

There is no risk that the seating surface will be damaged and a loose fit is possible.

Circumferential load

If forces are present that displace the ring relative to its seating surface, every point on the raceway is subjected to load over the course of one revolution of the bearing. A load with this characteristic is described as a circumferential load.



The following information on design of the bearing arrangement is only applicable to self-aligning deep groove ball bearings and deep groove ball bearings with a cylindrical outer ring.



Shaft and housing tolerances

The fit is determined by the ISO tolerances for shafts and housings (DIN EN ISO 286-2) in conjunction with the tolerances $t_{\Delta Dmp}$ for the bore and $t_{\Delta dmp}$ for the outside diameter of the bearings (ISO 5753-1).

Tolerance classes

The ISO tolerances are defined in the form of tolerance classes. They are determined by their position relative to the zero line (= tolerance position) and their size (= tolerance grade, see ISO 286-1). The tolerance position is indicated by letters (upper case for housings, lower case for shafts), *Figure 1*.

Reference to tables of shaft and housing tolerances

The tables contain recommendations for the selection of shaft and housing tolerances that are valid for normal mounting and operating conditions, see page 102.

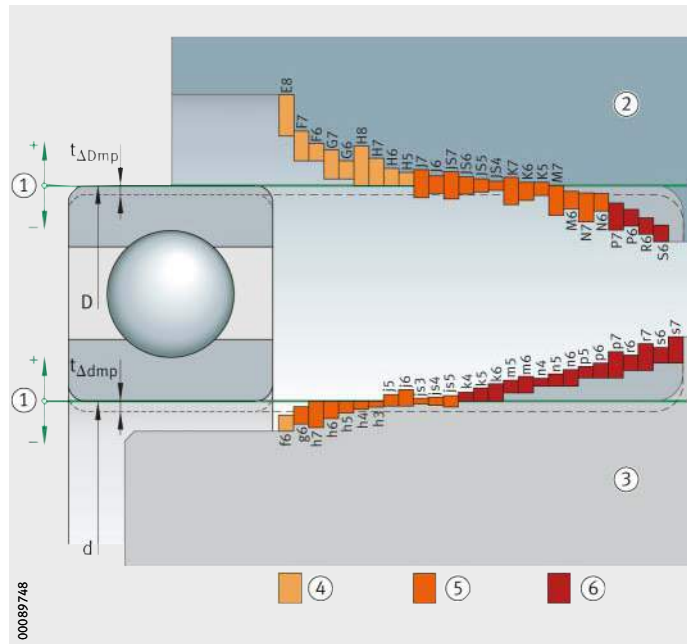
Deviations are possible if particular requirements apply, for example in relation to running accuracy, smooth running or operating temperature. Increased running accuracies thus require closer tolerances such as tolerance grade 5 instead of 6. If the inner ring is warmer than the shaft during operation, the seating may loosen to an impermissible extent. A tighter fit must then be selected, for example m6 instead of k6.

In such cases, the question of fits can only be resolved by a compromise. The individual requirements must be weighed against each other and those selected that give the best overall solution.

- D = nominal bearing outside diameter
- d = nominal bearing bore diameter
- $t_{\Delta Dmp}$ = deviation of mean bearing outside diameter (in accordance with ISO 492)
- $t_{\Delta dmp}$ = deviation of mean bearing bore diameter (in accordance with ISO 492)

- ① Zero line
- ② Housing
- ③ Shaft
- ④ Clearance fit
- ⑤ Transition fit
- ⑥ Interference fit

Figure 1
Shaft and housing fits for rolling bearings



Design of bearing arrangements

Shaft tolerances for radial bearings with cylindrical bore

Conditions of rotation	Bearing type	Shaft diameter mm	Displacement facility Load	Tolerance class ¹⁾
Point load on inner ring	Ball bearings	All sizes	Inner ring easily displaced	g6 (g5)
			Inner ring not easily displaced	h6 (j5)
Circumferential load on inner ring or indeterminate load direction	Ball bearings	up to 50	Normal loads ²⁾	j6 (j5)
		50 to 100	Low loads ³⁾	j6 (j5)
			Normal and high loads ⁴⁾	k6 (k5)
		100 to 200	Low loads ²⁾	k6 (m6)
			Normal and high loads ⁵⁾	m6 (m5)
		over 200	Low loads	m6 (m5)
Normal and high loads	n6 (n5)			

1) The envelope condition © applies here.

2) $C/P > 10$.

3) $C/P > 12$.

4) $C/P < 12$.

5) $C/P < 10$.

Housing tolerances for radial bearings

Conditions of rotation	Displacement facility Load	Operating conditions	Tolerance class ¹⁾
Point load on outer ring	Outer ring not easily displaced Housing unsplit	Normal running accuracy	H7 (j7)
Circumferential load on outer ring or indeterminate load direction	Low loads Outer ring cannot be displaced	For high running accuracy requirements: K6, M6, N6 and P6	K7

1) The envelope condition © applies here.



Tables of shaft and housing fits

The numerical values for the fits are valid for solid steel shafts and cast housings, see tables, page 104 to page 108. In the table header, below the nominal diameters, are the normal tolerances for the bore or outside diameters of radial bearings. Below these are the deviations for the most important tolerance classes for mounting of rolling bearings.

In each cell are five numbers in accordance with the following scheme, for example for shaft $\varnothing 40$ j5 $\text{\textcircled{E}}$, see table, page 104:

Example of table entry Shaft fit

Shaft deviation μm		Fit interference or fit clearance μm	
Maximum material value	+6	18 ¹⁾	Interference or fit clearance if the maximum material values are combined
		10 ¹⁾²⁾	Probable interference or fit clearance
Minimum material value	-5	5 ³⁾	Interference or fit clearance if the minimum material values are combined

1) Values printed in bold type indicate fit interference.

2) The probable interference or fit clearance is the value obtained if the actual dimensions are one third away from the maximum material values.

3) Values printed in regular type indicate fit clearance.

In each cell are five numbers in accordance with the following scheme, for example for housing $\varnothing 100$ K6 $\text{\textcircled{E}}$, see table, page 108:

Example of table entry Housing fit

Housing deviation μm		Fit interference or fit clearance μm	
Minimum material value	+4	18 ¹⁾	Interference or fit clearance if the maximum material values are combined
		6 ¹⁾²⁾	Probable interference or fit clearance
Maximum material value	-18	19 ³⁾	Interference or fit clearance if the minimum material values are combined

1) Values printed in bold type indicate fit interference.

2) The probable interference or fit clearance is the value obtained if the actual dimensions are one third away from the maximum material values.

3) Values printed in regular type indicate fit clearance.

Design of bearing arrangements

Shaft fits

Nominal shaft diameter in mm													
over incl.	3 6	6 10	10 18	18 30	30 50	50 65							
Deviation of bearing bore diameter in μm (tolerance class Normal)													
$t_{\Delta\text{dmp}}$	0 -8	0 -8	0 -8	0 -10	0 -12	0 -15							
Shaft deviation, fit interference or fit clearance in μm													
Clear- ance fit	f6	-10 -18	2 7 18	-13 -22	5 11 22	-16 -27	8 15 27	-20 -33	10 17 33	-25 -41	13 22 41	-30 -49	15 26 49
	g5	-4 -9	4 0 9	-5 -11	3 2 11	-6 -14	2 3 14	-7 -16	3 3 16	-9 -20	3 5 20	-10 -23	5 4 23
Transition fit	g6	-4 -12	4 1 12	-5 -14	3 3 14	-6 -17	2 4 17	-7 -20	3 5 20	-9 -25	3 6 25	-10 -29	5 6 29
	h5	0 -5	8 4 5	0 -6	8 3 6	0 -8	8 3 8	0 -9	10 4 9	0 -11	12 4 11	0 -13	15 6 13
	h6	0 -8	8 3 8	0 -9	8 2 9	0 -11	8 2 11	0 -13	10 2 13	0 -16	12 3 16	0 -19	15 4 19
	j5	+3 -2	11 7 2	+4 -2	12 7 2	+5 -3	13 7 3	+5 -4	15 9 4	+6 -5	18 10 5	+6 -7	21 12 7
	j6	+6 -2	14 8 2	+7 -2	15 9 2	+8 -3	16 10 3	+9 -4	19 11 4	+11 -5	23 14 5	+12 -7	27 16 7
	js5	+2,5 -2,5	11 6 3	+3 -3	11 6 3	+4 -4	12 6 4	+4,5 -4,5	15 9 5	+5,5 -5,5	18 10 6	+6,5 -6,5	22 13 7
	js6	+4 -4	12 7 4	+4,5 -4,5	13 7 5	+5,5 -5,5	14 8 6	+6,5 -6,5	17 9 7	+8 -8	20 11 8	+9,5 -9,5	25 13 10
	Interference fit	k5	+6 +1	14 9 1	+7 +1	15 10 1	+9 +1	17 12 1	+11 +2	21 15 2	+13 +2	25 17 2	+15 +2
k6		+9 +1	17 11 1	+10 +1	18 12 1	+12 +1	20 14 1	+15 +2	25 17 2	+18 +2	30 21 2	+21 +2	36 25 2
m5		+9 +4	17 13 4	+12 +6	20 15 6	+15 +7	23 18 7	+17 +8	27 21 8	+20 +9	32 24 9	+24 +11	39 30 11
m6		+12 +4	20 15 4	+15 +6	23 17 6	+18 +7	26 20 7	+21 +8	31 23 8	+25 +9	37 27 9	+30 +11	45 34 11

Example: shaft $\varnothing 40$ j5 \oplus

Maximum material value | +6 | **18** | Interference or fit clearance if the maximum material values are combined.
 Probable interference or fit clearance.
 Minimum material value | -5 | **5** | Interference or fit clearance if minimum material values are combined. Values **in bold type** in the group of three indicate fit interference, values in normal type indicate fit clearance.



65		80		100		120		140		160		180		200		220	
80		100		120		140		160		180		200		220		250	
0		0		0		0		0		0		0		0		0	
-15		-20		-20		-25		-25		-25		-30		-30		-30	
-30	15	-36	16	-36	16	-43	18	-43	18	-43	18	-50	20	-50	20	-50	20
-49	26	-58	30	-58	30	-68	34	-68	34	-68	34	-79	40	-79	40	-79	40
	49		58		58		68		68		68		79		79		79
-10	5	-12	8	-12	8	-14	11	-14	11	-14	11	-15	15	-15	15	-15	15
-23	4	-27	4	-27	4	-32	3	-32	3	-32	3	-35	2	-35	2	-35	2
	23		27		27		32		32		32		35		35		35
-10	5	-12	8	-12	8	-14	11	-14	11	-14	11	-15	15	-15	15	-15	15
-29	6	-34	6	-34	6	-39	6	-39	6	-39	6	-44	5	-44	5	-44	5
	29		34		34		39		39		39		44		44		44
0	15	0	20	0	20	0	25	0	25	0	25	0	30	0	30	0	30
-13	6	-15	8	-15	8	-18	11	-18	11	-18	11	-20	13	-20	13	-20	13
	13		15		15		18		18		18		20		20		20
0	15	0	20	0	20	0	25	0	25	0	25	0	30	0	30	0	30
-19	4	-22	6	-22	6	-25	8	-25	8	-25	8	-29	10	-29	10	-29	10
	19		22		22		25		25		25		29		29		29
+6	21	+6	26	+6	26	+7	32	+7	32	+7	32	+7	37	+7	37	+7	37
-7	12	-9	14	-9	14	-11	18	-11	18	-11	18	-13	20	-13	20	-13	20
	7		9		9		11		11		11		13		13		13
+12	27	+13	33	+13	33	+14	39	+14	39	+14	39	+16	46	+16	46	+16	46
-7	16	-9	19	-9	19	-11	22	-11	22	-11	22	-13	26	-13	26	-13	26
	7		9		9		11		11		11		13		13		13
+6,5	22	+7,5	28	+7,5	28	+9	34	+9	34	+9	34	+10	40	+10	40	+10	40
-6,5	13	-7,5	16	-7,5	16	-9	20	-9	20	-9	20	-10	23	-10	23	-10	23
	7		8		8		9		9		9		10		10		10
+9,5	25	+11	31	+11	31	+12,5	38	+12,5	38	+12,5	38	+14,5	45	+14,5	45	+14,5	45
-9,5	13	-11	17	-11	17	-12,5	21	-12,5	21	-12,5	21	-14,5	25	-14,5	25	-14,5	25
	10		11		11		13		13		13		15		15		15
+15	30	+18	38	+18	38	+21	46	+21	46	+21	46	+24	54	+24	54	+24	54
+2	21	+3	26	+3	26	+3	32	+3	32	+3	32	+4	37	+4	37	+4	37
	2		3		3		3		3		3		4		4		4
+21	36	+25	45	+25	45	+28	53	+28	53	+28	53	+33	63	+33	63	+33	63
+2	25	+3	31	+3	31	+3	36	+3	36	+3	36	+4	43	+4	43	+4	43
	2		3		3		3		3		3		4		4		4
+24	39	+28	48	+28	48	+33	58	+33	58	+33	58	+37	67	+37	67	+37	67
+11	30	+13	36	+13	36	+15	44	+15	44	+15	44	+17	50	+17	50	+17	50
	11		13		13		15		15		15		17		17		17
+30	45	+35	55	+35	55	+40	65	+40	65	+40	65	+46	76	+46	76	+46	76
+11	34	+13	42	+13	42	+15	48	+15	48	+15	48	+17	56	+17	56	+17	56
	11		13		13		15		15		15		17		17		17

Design of bearing arrangements

Shaft fits (continued)

Nominal shaft diameter in mm													
over incl.	3 6	6 10	10 18	18 30	30 50	50 65							
Deviation of bearing bore diameter in μm (tolerance class Normal)													
$t_{\Delta\text{dmp}}$	0 -8	0 -8	0 -8	0 -10	0 -12	0 -15							
Shaft deviation, fit interference or fit clearance in μm													
Interference fit	n5	+13 +8	21 17 8	+16 +10	24 19 10	+20 +12	28 23 12	+24 +15	34 28 15	+28 +17	40 32 17	+33 +20	48 39 20
		+16 +8	24 19 8	+19 +10	27 21 10	+23 +12	31 25 12	+28 +15	38 30 15	+33 +17	45 36 17	+39 +20	54 43 20
	p6	+20 +12	28 23 12	+24 +15	32 26 15	+29 +18	37 31 18	+35 +22	45 37 22	+42 +26	54 45 26	+51 +32	66 55 32
		+24 +12	32 25 12	+30 +15	38 30 15	+36 +18	44 35 18	+43 +22	53 43 22	+51 +26	63 51 26	+62 +32	77 62 32
	r6	+23 +15	31 25 15	+28 +19	36 30 19	+34 +23	42 35 23	+41 +28	51 44 28	+50 +34	62 53 34	+60 +41	75 64 41
		+27 +15	35 28 15	+34 +19	42 34 19	+41 +23	49 40 23	+49 +28	59 49 28	+59 +34	71 59 34	+71 +41	86 71 41
	s6	+27 +19	35 30 19	+32 +23	40 34 23	+39 +28	47 41 28	+48 +35	58 50 35	+59 +43	71 62 43	+72 +53	87 76 53

Values in **bold type** in the group of three indicate fit interference, values in normal type indicate fit clearance.



65		80		100		120		140		160		180		200		220	
80		100		120		140		160		180		200		220		250	
0		0		0		0		0		0		0		0		0	
-15		-20		-20		-25		-25		-25		-30		-30		-30	
+33	48	+38	58	+38	58	+45	70	+45	70	+45	70	+51	81	+51	81	+51	81
+20	39	+23	46	+23	46	+27	56	+27	56	+27	56	+31	64	+31	64	+31	64
	20		23		23		27		27		27		31		31		31
+39	54	+45	65	+45	65	+52	77	+52	77	+52	77	+60	90	+60	90	+60	90
+20	43	+23	51	+23	51	+27	60	+27	60	+27	60	+31	70	+31	70	+31	70
	20		23		23		27		27		27		31		31		31
+51	66	+59	79	+59	79	+68	93	+68	93	+68	93	+79	109	+79	109	+79	109
+32	55	+37	65	+37	65	+43	76	+43	76	+43	76	+50	89	+50	89	+50	89
	32		37		37		43		43		43		50		50		50
+62	77	+72	92	+72	92	+83	108	+83	108	+83	108	+96	126	+96	126	+96	126
+32	62	+37	73	+37	73	+43	87	+43	87	+43	87	+50	101	+50	101	+50	101
	32		37		37		43		43		43		50		50		50
+62	77	+73	93	+76	96	+88	113	+90	115	+93	118	+106	136	+109	139	+113	143
+43	66	+51	79	+54	82	+63	97	+65	99	+68	102	+77	116	+80	119	+84	123
	43		51		54		63		65		68		77		80		84
+73	88	+86	106	+89	109	+103	128	+105	130	+108	133	+123	153	+126	156	+130	160
+43	73	+51	87	+54	90	+63	107	+65	109	+68	112	+77	128	+80	131	+84	135
	43		51		54		63		65		68		77		80		84
+78	93	+93	113	+101	121	+117	142	+125	150	+133	158	+151	181	+159	189	+169	199
+59	82	+71	99	+79	107	+92	125	+100	133	+108	141	+122	161	+130	169	+140	179
	59		71		79		92		100		108		122		130		140

Design of bearing arrangements

Housing fits

Nominal housing bore diameter in mm							
over incl.	6 10		10 18		18 30		
Deviation of bearing outside diameter in μm (tolerance class Normal)							
$t_{\Delta\text{Dmp}}$	0 -8		0 -8		0 -9		
Housing deviation, fit interference or fit clearance in μm							
Clearance fit	E8	+47	25	+59	32	+73	40
		+25	35 55	+32	44 67	+40	54 82
	F7	+28	13	+34	16	+41	20
		+13	21 36	+16	25 42	+20	30 50
	G6	+14	5	+17	6	+20	7
		+5	11 22	+6	12 25	+7	14 29
	G7	+20	5	+24	6	+28	7
		+5	13 28	+6	15 32	+7	17 37
H6	+9	0	+11	0	+13	0	
	0	6 17	0	6 19	0	7 22	
H7	+15	0	+18	0	+21	0	
	0	8 23	0	9 26	0	10 30	
H8	+22	0	+27	0	+33	0	
	0	10 30	0	12 35	0	14 42	
Transition fit	J6	+5	4	+6	5	+8	5
		-4	2 13	-5	1 14	-5	2 17
	J7	+8	7	+10	8	+12	9
		-7	1 16	-8	1 18	-9	1 21
	JS6	+4,5	4,5	+5,5	5,5	+6,5	6,5
		-4,5	2 12,5	-5,5	1 13,5	-6,5	0 15,5
	JS7	+7,5	7,5	+9	9	+10,5	10,5
-7,5		1 15,5	-9	0 17	-10,5	1 19,5	
K6	+2	7	+2	9	+2	11	
	-7	1 10	-9	3 10	-11	4 11	
K7	+5	10	+6	12	+6	15	
	-10	2 13	-12	3 14	-15	5 15	

Example: housing $\varnothing 100 \text{ K6 } \textcircled{\text{C}}$

Minimum material value	+4	18	Interference or fit clearance if the maximum material values are combined. Probable interference or fit clearance.
Maximum material value	-18	6 19	



30		50		80		120		150	
50		80		120		150		180	
0		0		0		0		0	
-11		-13		-15		-18		-25	
+89	50	+106	60	+126	72	+148	85	+148	85
+50	67	+60	79	+72	85	+85	112	+85	114
	100		119		141		166		173
+50	25	+60	30	+71	36	+83	43	+83	43
+25	37	+30	44	+36	53	+43	62	+43	64
	61		73		86		101		108
+25	9	+29	10	+34	12	+39	14	+39	14
+9	18	+10	21	+12	24	+14	28	+14	31
	36		42		49		57		64
+34	9	+40	10	+47	12	+54	14	+54	14
+9	21	+10	24	+12	29	+14	33	+14	36
	45		53		62		72		79
+16	0	+19	0	+22	0	+25	0	+25	0
0	9	0	11	0	12	0	14	0	17
	27		32		37		43		50
+25	0	+30	0	+35	0	+40	0	+40	0
0	12	0	14	0	17	0	19	0	22
	36		43		50		58		65
+39	0	+46	0	+54	0	+63	0	+63	0
0	17	0	20	0	23	0	27	0	29
	50		59		69		81		88
+10	6	+13	6	+16	6	+18	7	+18	7
-6	3	-6	5	-6	6	-7	7	-7	10
	21		26		31		36		43
+14	11	+18	12	+22	13	+26	14	+26	14
-11	1	-12	2	-13	4	-14	5	-14	8
	25		31		37		44		51
+8	8	+9,5	9,5	+11	11	+12,5	12,5	+12,5	12,5
-8	1	-9,5	0	-11	1	-12,5	1	-12,5	3
	19		22,5		26		30,5		37,5
+12,5	12,5	+15	15	+17,5	17,5	+20	20	+20	20
-12,5	1	-15	1	-17,5	1	-20	1	-20	1
	23,5		28		32,5		38		45
+3	13	+4	15	+4	18	+4	21	+4	21
-13	4	-15	4	-18	6	-21	7	-21	4
	14		17		19		22		29
+7	18	+9	21	+10	25	+12	28	+12	28
-18	6	-21	7	-25	8	-28	9	-28	6
	18		22		25		30		37

Design of bearing arrangements

Housing fits (continued)

Nominal housing bore diameter in mm							
over incl.	180 250		250 315		315 400		
Deviation of bearing outside diameter in μm (tolerance class Normal)							
$t_{\Delta\text{Dmp}}$	0 -30		0 -35		0 -40		
Housing deviation, fit interference or fit clearance in μm							
Clearance fit	E8	+172 +100	100 134 202	+191 +110	110 149 226	+214 +125	125 168 254
	F7	+96 +50	50 75 126	+108 +56	56 85 143	+119 +62	62 94 159
	G6	+44 +15	15 35 74	+49 +17	17 39 84	+54 +18	18 43 94
	G7	+61 +15	15 40 91	+69 +17	17 46 104	+75 +18	18 50 115
	H6	+29 0	0 20 59	+32 0	0 22 67	+36 0	0 25 76
	H7	+46 0	0 25 76	+52 0	0 29 87	+57 0	0 32 97
	H8	+72 0	0 34 102	+81 0	0 39 116	+89 0	0 43 129
	Transition fit	J6	+22 -7	7 13 52	+25 -7	7 15 60	+29 -7
J7		+30 -16	16 9 60	+36 -16	16 13 71	+39 -18	18 14 79
JS6		+14,5 -14,5	14,5 5 44,5	+16 -16	16 7 51	+18 -18	18 6 58
JS7		+23 -23	23 2 53	+26 -26	26 3 61	+28,5 -28,5	28,5 3 68,5
K6		+5 -24	24 4 35	+5 -27	27 5 40	+7 -29	29 4 47
K7		+13 -33	33 8 43	+16 -36	36 7 51	+17 -40	40 8 57

Values in **bold type** in the group of three indicate fit interference, values in normal type indicate fit clearance.



400 500		500 630		630 800		800 1000		1000 1250	
0 -45		0 -50		0 -75		0 -100		0 -125	
+232 +135	135 182 277	+255 +145	145 199 305	+285 +160	160 227 360	+310 +170	170 250 410	+360 +195	195 292 485
+131 +68	68 104 176	+146 +76	76 116 196	+160 +80	80 132 235	+176 +86	86 149 276	+203 +98	98 175 328
+60 +20	20 48 105	+66 +22	22 54 116	+74 +24	24 66 149	+82 +26	26 78 182	+94 +28	28 93 219
+83 +20	20 56 128	+92 +22	22 62 142	+104 +24	24 76 179	+116 +26	26 89 216	+133 +28	28 105 258
+40 0	0 28 85	+44 0	0 32 94	+50 0	0 42 125	+56 0	0 52 156	+66 0	0 64 191
+63 0	0 36 108	+70 0	0 40 120	+80 0	0 52 155	+90 0	0 63 190	+105 0	0 77 230
+97 0	0 47 142	+110 0	0 54 160	+125 0	0 67 200	+140 0	0 80 240	+165 0	0 97 290
+33 -7	7 21 78	-	-	-	-	-	-	-	-
+43 -20	20 16 88	-	-	-	-	-	-	-	-
+20 -20	20 8 65	+22 -22	22 10 72	+25 -25	25 17 100	+28 -28	28 24 128	+33 -33	33 31 158
+31,5 -31,5	31,5 4 76,5	+35 -35	35 5 85	+40 -40	40 12 115	+45 -45	45 18 145	+52,5 -52,5	52 24 177
+8 -32	32 4 53	0 -44	44 12 50	0 -50	50 8 75	0 -56	56 4 100	0 -66	66 2 125
+18 -45	45 9 63	0 -70	70 30 50	0 -80	80 28 75	0 -90	90 27 100	0 -105	105 28 125

Design of bearing arrangements

Housing fits (continued)

Nominal housing bore diameter in mm							
over incl.	6 10	10 18	18 30				
Deviation of bearing outside diameter in μm (tolerance class Normal)							
$t_{\Delta D_{mp}}$	0 -8	0 -8	0 -9				
Housing deviation, fit interference or fit clearance in μm							
Transition fit	M6	-3 -12	12 6 5	-4 -15	15 9 4	-4 -17	17 10 5
	M7	0 -15	15 7 8	0 -18	18 9 8	0 -21	21 11 9
	N6	-7 -16	16 10 1	-9 -20	20 14 1	-11 -24	24 17 2
	N7	-4 -19	19 11 4	-5 -23	23 14 3	-7 -28	28 18 2
Interference fit	P6	-12 -21	21 15 4	-15 -26	26 20 7	-18 -31	31 24 9
	P7	-9 -24	24 16 1	-11 -29	29 20 3	-14 -35	35 25 5

Values **in bold type** in the group of three indicate fit interference, values in normal type indicate fit clearance.



30		50		80		120		150	
50		80		120		150		180	
0		0		0		0		0	
-11		-13		-15		-18		-25	
-4	20	-5	24	-6	28	-8	33	-8	33
-20	11	-24	13	-28	16	-33	19	-33	16
	7		8		9		10		17
0	25	0	30	0	35	0	40	0	40
-25	13	-30	16	-35	18	-40	21	-40	18
	11		13		15		18		25
-12	28	-14	33	-16	38	-20	45	-20	45
-28	19	-33	22	-38	26	-45	31	-45	28
	1		1		1		2		5
-8	33	-9	39	-10	45	-12	52	-12	52
-33	21	-39	25	-45	28	-52	33	-52	30
	3		4		5		3		13
-21	37	-26	45	-30	52	-36	61	-36	61
-37	28	-45	34	-52	40	-61	47	-61	44
	10		13		15		18		11
-17	42	-21	51	-24	59	-28	68	-28	68
-42	30	-51	37	-59	42	-68	49	-68	46
	6		8		9		10		3

Design of bearing arrangements

Housing fits (continued)

Nominal housing bore diameter in mm							
over incl.	180 250	250 315	315 400				
Deviation of bearing outside diameter in μm (tolerance class Normal)							
$t_{\Delta D_{mp}}$	0 -30	0 -35	0 -40				
Housing deviation, fit interference or fit clearance in μm							
Transition fit	M6	-8	37	-9	41	-10	46
		-37	17 22	-41	19 26	-46	21 30
	M7	0	46	0	52	0	57
		-46	21 30	-52	23 35	-57	25 40
N6	-22	51	-25	57	-26	62	
	-51	31 8	-57	35 10	-62	37 14	
N7	-14	60	-14	66	-16	73	
	-60	35 16	-66	37 21	-73	41 24	
Interference fit	P6	-41	70	-47	79	-51	87
		-70	50 11	-79	57 12	-87	62 11
P7	-33	79	-36	88	-41	98	
	-79	54 3	-88	59 1	-98	66 1	

Values in **bold type** in the group of three indicate fit interference, values in normal type indicate fit clearance.



400		500		630		800		1000	
500		630		800		1000		1250	
0		0		0		0		0	
-45		-50		-75		-100		-125	
-10	50	-26	70	-30	80	-34	90	-40	106
-50	22	-70	38	-80	38	-90	38	-106	45
	35		24		45		66		85
0	63	-26	96	-30	110	-34	124	-40	145
-63	27	-96	56	-110	58	-124	61	-145	68
	45		24		45		66		85
-27	67	-44	88	-50	100	-56	112	-66	132
-67	39	-88	56	-100	58	-112	60	-132	67
	18		6		25		44		59
-17	80	-44	114	-50	130	-56	146	-66	171
-80	44	-114	74	-130	78	-146	83	-171	94
	28		6		25		44		59
-55	95	-78	122	-88	138	-100	156	-120	186
-95	67	-122	90	-138	96	-156	104	-186	121
	10		28		13		0		5
-45	108	-78	148	-88	168	-100	190	-120	225
-108	72	-148	108	-168	126	-190	127	-225	148
	0		28		13		0		5

Design of bearing arrangements

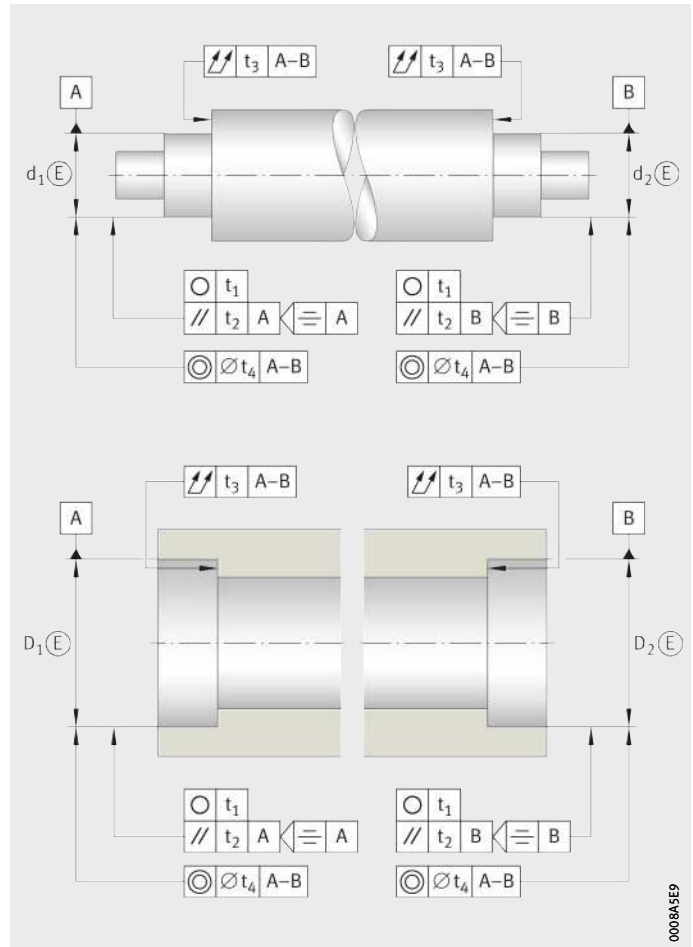
Geometrical and positional tolerances of bearing seating surfaces

In order to achieve the required fit, the bearing seats and fit surfaces of the shaft and housing bore must conform to certain tolerances, *Figure 2* and table, page 117.

The positional tolerances t_4 for a second bearing seat on the shaft (d_2) or in the housing (D_2) are dependent on the types of bearings used and the operating conditions. Values for the tolerances t_4 can be requested from Schaeffler.

- t_1 = roundness tolerance
- t_2 = parallelism tolerance
- t_3 = total axial runout tolerance of abutment shoulders
- t_4 = coaxiality tolerance

Figure 2
Guide values for geometrical and positional tolerances





Accuracy of bearing seating surfaces

The degree of accuracy for the bearing seat tolerances on the shaft and in the housing correspond to the fundamental tolerances in accordance with ISO 286-1, see table.



When using the fits in accordance with ISO 286-1, the envelope requirement \textcircled{E} always applies.

Geometrical and positional tolerances of bearing seating surfaces

Bearing tolerance class		Bearing seating surface	Fundamental tolerance grades ¹⁾				
ISO 492	DIN 620		Diameter tolerance	Roundness tolerance	Parallelism tolerance	Total axial runout tolerance of abutment shoulder	
				t_1	t_2	t_3	
Normal 6X	PN (P0) P6X	Shaft	IT6 (IT5)	Circumferential load IT4/2	IT4/2	IT4	
				Point load IT5/2			IT5/2
		Housing	IT7 (IT6)	Circumferential load IT5/2	IT5/2		IT5
				Point load IT6/2			
5	P5	Shaft	IT5	Circumferential load IT2/2	IT2/2	IT2	
				Point load IT3/2			IT3/2
		Housing	IT6	Circumferential load IT3/2	IT3/2		IT3
				Point load IT4/2			
4	P4 P4S ²⁾ SP ²⁾	Shaft	IT4	Circumferential load IT1/2	IT1/2	IT1	
				Point load IT2/2			IT2/2
		Housing	IT5	Circumferential load IT2/2	IT2/2		IT2
				Point load IT3/2			
	UP ²⁾	Shaft	IT3	Circumferential load IT0/2	IT0/2	IT0	
				Point load IT1/2			IT1/2
		Housing	IT4	Circumferential load IT1/2	IT1/2		IT1
				Point load IT2/2			

¹⁾ ISO fundamental tolerances (IT grades) in accordance with ISO 286:

²⁾ Not included in DIN 620.

Design of bearing arrangements

Roughness of bearing seats

The roughness of the bearing seats must be matched to the tolerance class of the bearings. The mean roughness value Ra must not be too high, in order to maintain the interference loss within limits. Shafts should be ground and bores should be precision turned, see table.

The bore and shaft tolerances and permissible roughness values are also given in the design and safety guidelines in the product sections.

Guide values for roughness of bearing seating surfaces

Diameter of bearing seat d (D) mm		Recommended mean roughness values Ra and roughness classes for ground bearing seats Diameter tolerance corresponding to ¹⁾			
		μm			
over	incl.	IT7	IT6	IT5	IT4
–	80	1,6 (N7)	0,8 (N6)	0,4 (N5)	0,2 (N4)
80	500	1,6 (N7)	1,6 (N7)	0,8 (N6)	0,4 (N5)

¹⁾ The values in brackets are roughness classes in accordance with DIN EN ISO 1302.



Sealing

Functions A basic distinction is made between contact and non-contact seals in the adjacent construction and the bearing.

The sealing arrangement has a considerable influence on the operating life of a bearing arrangement. Its function is to retain the lubricant in the bearing and prevent the ingress of contaminants into the bearing.

Contaminants may have various effects:

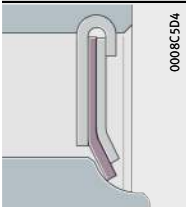
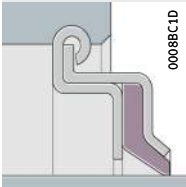
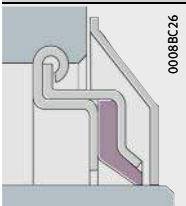
- A large quantity of very small, abrasive particles causes wear in the bearing. The increase in clearance or noise bring the operating life of the bearing to an end.
- Large, overrolled hard particles reduce the fatigue life since pittings occur at the indentation points under high bearing loads.

Overview of seal types

Seals for radial insert ball bearings are of a three-piece design. This concept offers, due to the rigidly rolled-in sheet steel washer, optimum seating in the bearing as well as concentric alignment of the seal lip to the inner ring.

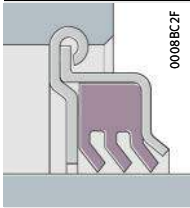
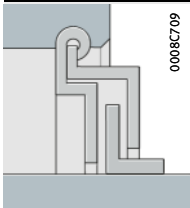
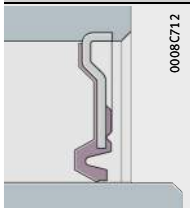
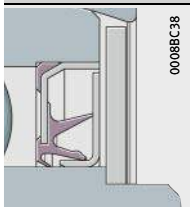
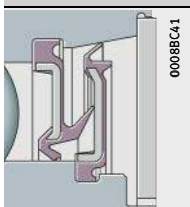
Seals for radial insert ball bearings are available in various designs, see table. The stated suffix is included in the ordering designation and explained in the table of suffixes.

Seal types

P seal (NPP)	
	<p style="text-align: center;">0008C5D4</p> <p>Two zinc-coated sheet steel washers with intermediate NBR part, seal lip axially preloaded.</p> <p>In order to protect the seal lip from mechanical damage, the outer sheet steel washer extends a considerable distance down towards the bearing inner ring.</p> <p>For use in narrow radial insert ball bearings with inner ring extended on one side.</p>
R seal (KRR)	
	<p style="text-align: center;">0008BC1D</p> <p>Two zinc-coated sheet steel washers extended outwards and angled downwards with intermediate NBR or PTFE part and radially preloaded seal lip. Improved protection against mechanical damage.</p> <p>Substantial grease reservoir due to the space between the extended and angled sheet steel washers. Used in radial insert ball bearings with inner ring extended on both sides.</p>
R seal with flinger shield (KRR...-2C)	
	<p style="text-align: center;">0008BC26</p> <p>As R seal, but with outer flinger shield with anti-corrosion protection.</p> <p>Additional sealing action without restriction on speed and with additional protection against mechanical damage.</p>

Sealing

Seal types (continued)

T seal (KTT)		
	0008BC2F	Two zinc-coated sheet steel washers with intermediate NBR part and three radially preloaded seal lips for heavily contaminated conditions. For better protection of the seal lip against mechanical damage, the outer sheet steel washer is angled outwards. Lower speeds due to higher friction.
L seal (labyrinth seal) (KLL)		
	0008C709	Two zinc-coated sheet steel washers extended outwards in the outer ring with a zinc-plated intermediate sheet steel L-section ring pressed onto the inner ring. Substantial grease reservoir due to the space between the extended and angled sheet steel washers. For use in bearings with inner ring extended on both sides. For increased temperatures and lower friction.
RSR seal (2RSR)		
	0008C712	Single piece, zinc-plated sheet steel washer with vulcanised and radially preloaded seal lip made from NBR. For use in radial insert ball bearings with integral adapter sleeve.
Sealing cartridge with flinger shield		
	0008BC38	Design identical to normal cartridge seal but supplemented by a flinger shield to protect the bearing against high pressure cleaning equipment and mechanical damage.
Combined sealing washer and flinger shield with protective shield		
	0008BC41	Design identical to normal sealing washer and flinger shield but supplemented by a protective shield to protect the bearing against high pressure cleaning equipment and mechanical damage.



BRS seals Bearings with BRS seals can be supplied by agreement, *Figure 1*. The friction in this case is as low as that in bearings with sealing shields. They have the advantage over these, however, that the outer elastic rim gives good sealing when fitted in the slot in the outer ring. This is important with a rotating outer ring since the base oil is separated from the soap suspension by centrifugal force and would escape through the unsealed metallic seat in the outer ring if sealing shields were fitted.

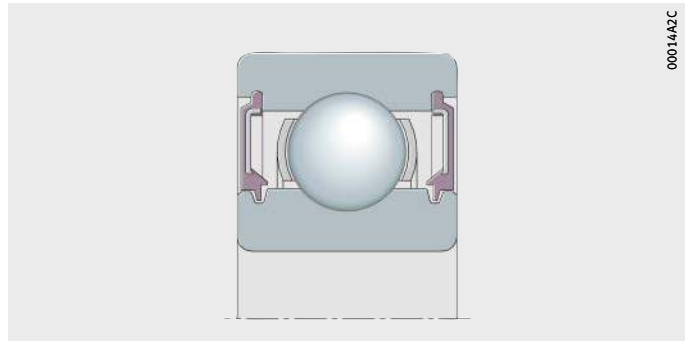


Figure 1
BRS seals

**Non-contact seals
in the adjacent construction**

With non-contact seals, only lubricant friction occurs in the lubrication gap. The seals do not undergo wear and remain capable of operation for a long period. Since they generate no heat, non-contact seals are also suitable for very high speeds.

Mounting and dismounting

Radial insert ball bearings must be handled with care before and during mounting. Their trouble-free operation is also dependent on the care taken during mounting.

Handling and use

Rolling bearings, rolling bearing parts and Arcanol rolling bearing greases are high quality goods and must therefore be handled with care.

Storage of rolling bearings

The performance capability of modern rolling bearings lies at the boundaries of what is technically achievable. The materials, dimensional and geometrical tolerances, surface quality and lubrication have been optimised for maximum levels of function, which means that even slight deviations in functional areas, such as those caused by corrosion, can impair the performance capacity. In order to realise the full performance capability of rolling bearings, it is essential to match the anti-corrosion protection, packaging, storage and handling to each other.

Anti-corrosion protection and packaging constitute part of the bearing and are optimised such that they preserve all characteristics of the product at the same time as far as possible. In addition to protecting the surface against corrosion, this includes emergency running lubrication, friction, lubricant compatibility, noise behaviour, resistance to ageing and compatibility with rolling bearing components (cage and seal material).

Since the packaging offers additional protection against contamination through dirt, foreign media and other environmental influences, we recommend that the components should not be unpacked until immediately prior to further processing.



Storage conditions for rolling bearings



As a basic prerequisite, parts must be stored in a closed storage area which cannot be affected by any aggressive media, such as exhaust gases from vehicles or gases, mist or aerosols of acids, lyes or salts. Direct sunlight should be avoided since, apart from the harmful effects of UV radiation, it can lead to wide temperature fluctuations in the packaging. The temperature should be constant and air humidity should be as low as possible. Jumps in temperature and increased humidity lead to condensation.

The following conditions must be fulfilled:

- frost-free storage, i.e. a temperature $> +5\text{ °C}$
(this prevents formation of white frost, up to a maximum of $+2\text{ °C}$ permissible up to 12 hours per day)
- maximum temperature $+40\text{ °C}$
(to prevent excessive drainage of anti-corrosion oils)
- relative humidity $< 65\%$
(with temperature changes up to 70% up to a maximum of 12 hours per day).

The temperature and humidity must be continuously monitored. This can be carried out using a datalogger. The measurements must be taken at intervals of no more than 2 hours.

At least 2 measurement points must be selected: the highest point and the lowest point in the vicinity of an external wall at which the goods can be stored.

Storage periods for rolling bearings

Empirical values show that corrosion protection is usually achieved for 3 years. In particular, greased rolling bearings should not be stored for longer, since the chemical-physical behaviour of greases may change during storage. Even if the minimum performance capacity remains, the safety reserves of the grease may have diminished. This also applies to greased bearings with sealing shields or washers.

In principle, rolling bearings can also be used beyond the storage period of 3 years. If this period is exceeded, an agreement must be reached with the lubricant manufacturer. The storage periods stated are empirical values based on practice. This is therefore not associated with any extension in the legal or contractually agreed warranty periods. Furthermore, these empirical values only relate to the component in its unopened original packaging.

If these periods are exceeded, it is recommended that the bearing should be checked for corrosion, the condition of the anti-corrosion oil, the lubricating grease and the plastic and elastomer components before it is used.

Mounting and dismounting

Storage of Arcanol rolling bearing greases

The information on storage of rolling bearings applies as appropriate to Arcanol rolling bearing greases. The precondition is that the grease is stored in closed, completely filled original containers.

Storage periods for Arcanol rolling bearing greases

Rolling bearing greases are mixtures of oil, thickener and additives. Such mixtures of liquid and solid substances do not have unlimited stability. During storage, their chemical-physical characteristics may change and they should therefore be used up as soon as possible.

If the storage conditions are observed, Arcanol greases can be stored without loss of performance for 3 years. As in the case of rolling bearings, however, the permissible storage period should not be seen as a rigid limit.

If storage is carried out as prescribed, most greases can also be used after 3 years, if allowances are made for small changes. If there is any doubt when using older greases, random sample checking of chemical-physical characteristics is recommended in order to determine any changes in the grease. It is therefore not possible to state storage periods for containers that have been opened. If containers are to be stored after opening, the grease surface should always be brushed flat, the container should be sealed airtight and it should be stored such that the empty space is upwards. High temperatures should be avoided in all cases.

Unpacking of rolling bearings

Perspiration leads to corrosion. Hands should be kept clean and dry and protective gloves worn if necessary. Bearings should only be removed from their original packaging immediately before assembly. If bearings are removed from multi-item packaging with dry preservation, the package must be closed again immediately, since the protective vapour phase is only effective in closed packaging. Bearings should be oiled or greased immediately after unpacking.

Compatibility, miscibility

The anti-corrosion agents in bearings with an oil-based preservative are compatible and miscible with oils and greases having a mineral oil base. Compatibility should be checked if synthetic lubricants or thickeners other than lithium or lithium complex soaps are used. If there is an incompatibility, the anti-corrosion oil should be washed out before greasing, especially in the case of lubricants with a PTFE/alkoxyfluoroether base and thickeners based on polycarbamide. Bearings should be washed out if the lubricant is changed or the bearings are contaminated. If in doubt, please contact the relevant lubricant manufacturer.



Cleaning of rolling bearings

The following are suitable for degreasing and washing of rolling bearings:

- aqueous neutral, acidic or alkaline cleaning agents. Check the compatibility of alkaline agents with aluminum components before cleaning
- organic cleaning agents such as paraffin oil free from water and acid, petroleum ether (not petrol), spirit, dewatering fluids, freon 12 substitutes, cleaning agents containing chlorinated hydrocarbons.

Cleaning should be carried out using brushes, paint brushes or lint-free cloths. In the case of resinous oil or grease residues, precleaning by mechanical means followed by treatment with an aqueous, strongly alkaline cleaning agent is recommended.



Legal regulations relating to handling, environmental protection and health and safety at work must be observed. The specifications of cleaning agent manufacturers must be observed.

Paraffin oil, petroleum ether, spirit and dewatering fluids are flammable, alkaline agents are corrosive. The use of chlorinated hydrocarbons is associated with the risk of fire, explosion and decomposition as well as with health hazards. These hazards and appropriate protective measures are described comprehensively in ZH1/425 of the German Federation of Institutions for Statutory Accident Insurance and Prevention (Hauptverband der gewerblichen Berufsgenossenschaften).

After cleaning, rolling bearings must be dried and preservative applied immediately (risk of corrosion).

Mounting and dismounting

General guidelines for mounting

The following guidelines must always be taken into account:

- The assembly area must be kept clean and free from dust.
- Protect bearings from dust, contaminants and moisture. Contaminants have a detrimental influence on the running and operating life of rolling bearings.
- Before mounting work is started, familiarise yourself with the design by means of the final assembly drawing.
- Before mounting, check whether the bearing presented for mounting corresponds to the data in the drawing.
- Check the housing bore and shaft seat for dimensional, geometrical and positional accuracy as well as cleanliness.
- Check that the shaft and housing bore have a lead chamfer of 10° to 15°.
- Wipe away any anti-corrosion agent from the seating and contact surfaces, wash anti-corrosion agent out of tapered bores.
- Lightly oil the bearing ring seating surfaces or rub with grease.
- Do not cool the bearings excessively. Moisture due to condensation can lead to corrosion in the bearings and bearing seatings.
- After mounting, supply the rolling bearings with lubricant.
- Check the correct functioning of the bearing arrangement.

**Mounting of housing units**

Radial insert ball bearings must be handled with care before and during mounting. Their trouble-free operation is also dependent on the care taken during mounting.

Delivered condition, INA brand

The housings have a coating of anthracite grey primer (\approx RAL 7016). The radial insert ball bearings are greased; for information on the grease used, see the features of the specific bearing. A standard kit is included, see page 238.

Delivered condition, FAG brand

The housings have a coating of black primer paint (RAL 9005). The radial insert ball bearings are greased using a grease in grease group GA13, see table, page 68. The housing units are supplied with a loose packed lubrication nipple and integrated end cap for the lubrication nipple as well as an Allen key.

Storage and shelf life

The units should be stored:

- in dry, clean rooms with the temperature as constant as possible
- at a relative humidity of max. 65%.

The storage period of radial insert ball bearings is limited by the storage life of the grease, see section Lubrication, page 62.

Unpacking

Perspiration causes corrosion. Hands must be kept clean and dry. Bearings should not be removed from their original packaging until immediately before mounting.

Mounting and dismounting

Guidelines for mounting of housing units



If flake graphite cast iron housings and bearings are not supplied by INA as ready-to-fit units but are instead combined by the customer, the following guidelines should be followed:

- If the fit is too loose, grease can escape between the housing and bearing and will not therefore reach the bearing during relubrication.
- If the fit is too tight, the bearing outer ring cannot align itself within the housing bore.

The assembly area should be as dry and clean as possible.

First, screw mount the housing on the adjacent construction, then locate the bearing inner ring on the shaft. If this sequence is applied, the bearing aligns itself to the shaft in such a way that no stresses occur.

Ensure that the fitting tools and fixing screws are present.

Clean the shaft and remove any burrs.

Inspect the bearing seating surfaces on the shaft.

Keep bearing seating surfaces clean, dry and free of grease.



The specified tolerances must be observed.

Mounting forces must never be directed through the rolling elements.

Blows should never be applied directly to the bearing rings and seals.

Mounting of coated components

Before the mounting of products with Corrotect coating, they should be checked for compatibility with the media.

The tolerances are increased by the thickness of the coating.

In order to reduce the forces involved in pressing-in, the surface of the parts should be lightly greased or a mounting paste used.



Mounting of cast units

Plummer block and flanged housing units have various options for location on the shaft. Housing units of the brand INA can be combined with bearing end caps, see page 134.

Radial insert ball bearings with eccentric locking collar or grub screw in inner ring

Housing units and radial insert ball bearings with eccentric locking collar or grub screw in inner ring, *Figure 1*:

- ▶ Push the housing unit onto the shaft and align it with the fixing holes in the adjacent construction.
- ▶ Fit dowel pins if necessary.
- ▶ Screw the housing to the adjacent construction by means of the fixing screws.



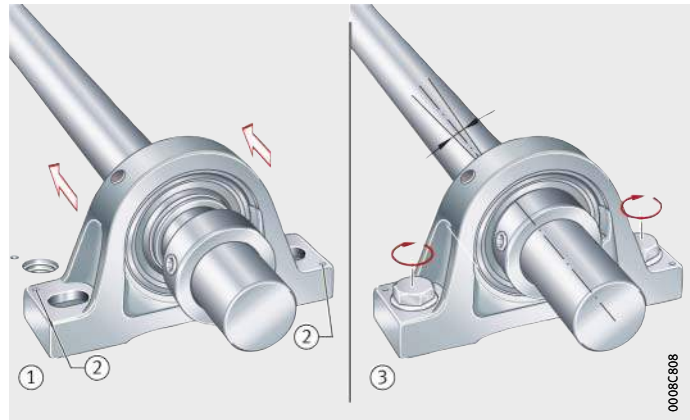
If the shaft is to be supported by several housing units, tighten the screws finger tight at first, align the shaft and then tighten the screws securely.

ASE

- ① Alignment
- ② Position of additional through hole for location of dowel pins in accordance with DIN EN ISO 8752 (in the event of high loads occurring parallel to the mounting surface of housings ASE, P and SP)
- ③ Screw mounting on the adjacent construction

Figure 1

Sliding the unit onto the shaft

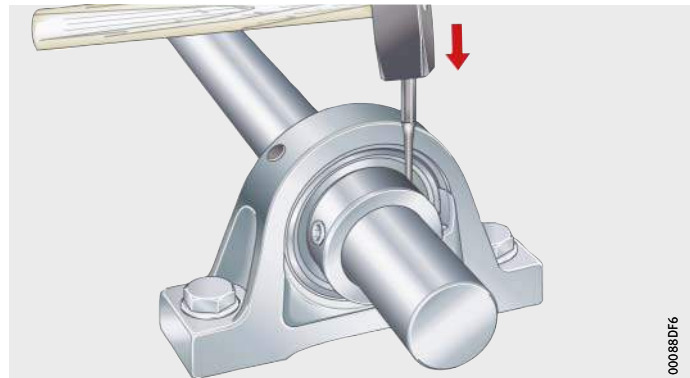


Location on the shaft by means of eccentric locking collar

- ▶ Slide the eccentric locking collar onto the collar seating on the bearing inner ring and rotate by hand, preferably in the direction of shaft rotation, *Figure 2*.
- ▶ Using a drift and hammer, tension the eccentric locking collar by means of one or two strong blows, *Figure 2*.
- ▶ For location using a locking collar, tighten the grub screw to the tightening torque M_A , *Figure 3*, page 130.

Figure 2

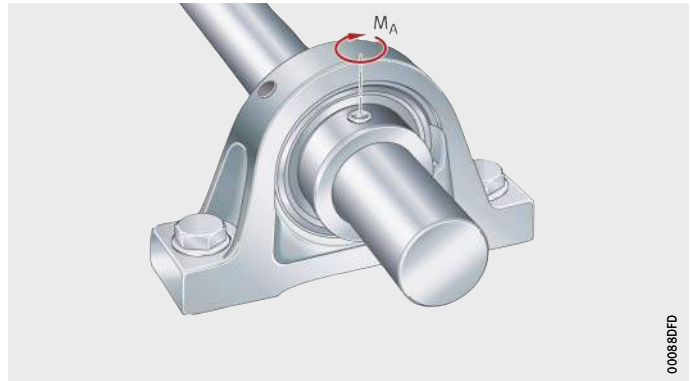
Tensioning the eccentric locking collar



Mounting and dismounting

Location on the shaft by means of grub screws in the inner ring

- ▶ For location using a locking collar, tighten both grub screws to the tightening torque M_A , see table.



M_A = tightening torque, see table

Figure 3

Tightening the grub screw in the eccentric locking collar or inner ring

Tightening torques for grub screws

Width across flats		Thread		Tightening torques ¹⁾ M_A Nm
W mm	inch	ISO	UNF	
2,5	$\frac{3}{32}$	M5	N10-32	3,6
3	$\frac{1}{8}$	M6×0,75	$\frac{1}{4}$ "-28	6
4	$\frac{5}{32}$	M8×1	$\frac{5}{16}$ "-24	14
5	$\frac{3}{16}$	M10×1,25	$\frac{3}{8}$ "-24	26
6	$\frac{1}{4}$	M12×1,5 M12×1,25 ²⁾	$\frac{1}{2}$ "-20	42

¹⁾ The tightening torques are valid for original INA or FAG grub screws only.

²⁾ GYE90-KRR-B.

Dismounting

Observe the correct sequence in dismounting:

- ▶ For bearings with an eccentric locking collar, undo the grub screw and rotate the locking collar in the opposite direction to the direction of shaft rotation.
- ▶ For bearings with grub screws in the inner ring, undo both grub screws.
- ▶ Unscrew the housing.



Radial insert ball bearings with adapter sleeve

The bearing seats on the shaft and the outside surface of the adapter sleeve must be dry and free of grease.

- ▶ Slide the housing unit onto the shaft and align it with the fixing holes in the adjacent construction, *Figure 4*.
- ▶ Fit dowel pins if necessary.
- ▶ Screw the housing to the adjacent construction using the fixing screws, *Figure 5*.



If the shaft is to be supported by several housing units, tighten the screws finger tight at first, align the shaft and then tighten the screws securely.

ASE

① Position of additional through hole for location of dowel pins in accordance with DIN EN ISO 8752 (in the event of high loads occurring parallel to the mounting surface of housings ASE, P and SP)

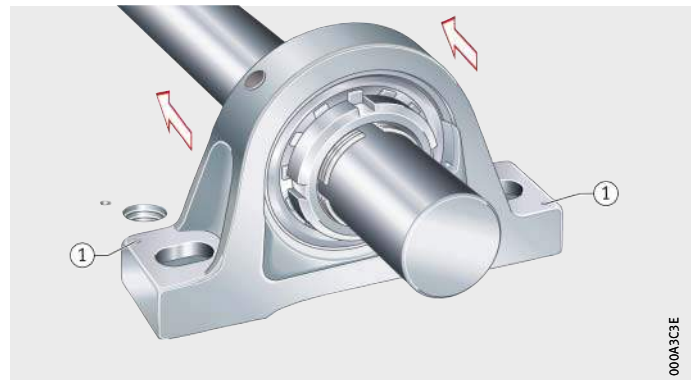


Figure 4
Sliding the unit onto the shaft

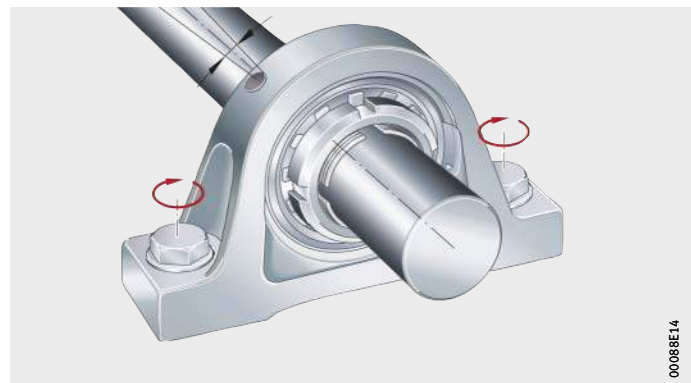


Figure 5
Screw mounting the housing finger tight

Mounting and dismounting

Tightening of locknut

► Tighten the locknut using 2 hook wrenches of type A to DIN 1810; during tightening, the adapter sleeve must be held in place using a second hook wrench, *Figure 6*. Wrenches for tightening and holding, see tables.



Do not exceed the maximum tightening torque M_A given in the table, otherwise the operating clearance in the bearing will become too small. Driving the locknut up will slightly displace the bearing in an axial direction.

The contact pressure at the end face of the inner ring should not exceed 10 N/mm^2 .

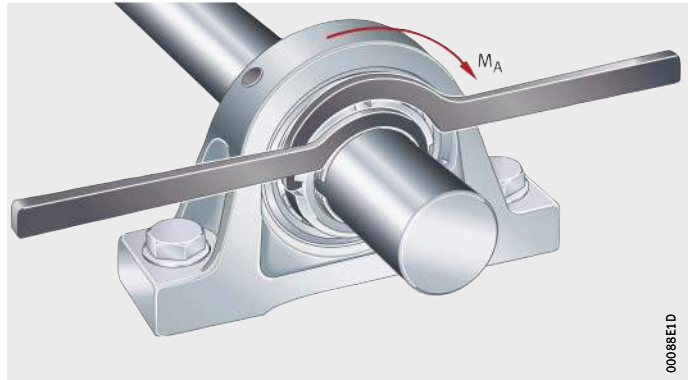


Figure 6
Tightening of locknut

Hook wrenches and tightening torques for housing units, INA brand

Shaft diameter d mm	Hook wrench, type A, to DIN 1810		Tightening torque Locknut	
	For tightening of locknut	For countertensioning of adapter sleeve	M_A	
			min. Nm	max. Nm
20	A 30–32 (HN 4)	A 25–28 (HN 2)	13	17
25	A 40–42 (HN 5)	A 30–32 (HN 3)	22	28
30	A 45–50 (HN 6)	A 34–36 (HN 4)	33	40
35	A 52–55 (HN 7)	A 40–42 (HN 5)	47	56
40	A 58–62 (HN 8)	A 45–50 (HN 6)	70	80
50	A 68–75 (HN 10)	A 52–55 (HN 7)	90	105



**Tightening torques for locknuts,
Black Series, FAG brand**

Shaft d mm	Locknut	Tightening torques M_A $\pm 5\%$ Nm
20	AN05	25
25	AN06	30
30	AN07	40
35	AN08	50
40	AN09	60
45	AN10	75
50	AN11	100
55	AN12	130
60	AN13	150
65	AN15	170
70	AN16	200
75	AN17	230
80	AN18	270

Securing of precision locknut

► Bend the tab on the tab washer into a groove in the locknut to secure the nut against loosening, *Figure 7*.



Ensure that the seal in the bearing is not damaged when bending the locking tab over.

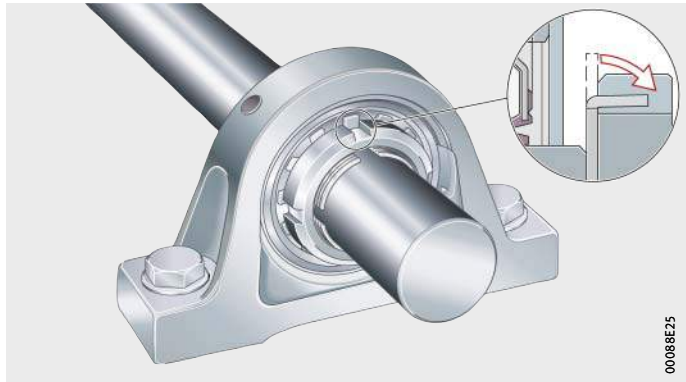


Figure 7
Securing of precision locknut

Dismounting

Observe the correct sequence in dismounting:

- Bend back the tab on the tab washer and undo the locknut by a few turns.
- Place the impact cap in front of the locknut and drive the adapter sleeve off the shaft seat using hammer blows.
- Unscrew the housing.

Mounting and dismounting

Fitting of bearing end caps



Bearing end caps are available for series of the INA brand.

Bearing end caps should only be fitted or removed while the shaft is stationary. There is a serious danger of injury if the shaft is rotating.

Fitting

- ▶ Position the tabs of the end cap in the locating slots, noting the position of the INA logo, *Figure 8*.
- ▶ Rotate the end cap clockwise by 90°, noting the position of the INA logo, *Figure 9*. Check that the end cap is secured properly in the housing.

- ① Annular slot
- ② Locating slots

Figure 8
Positioning of end cap

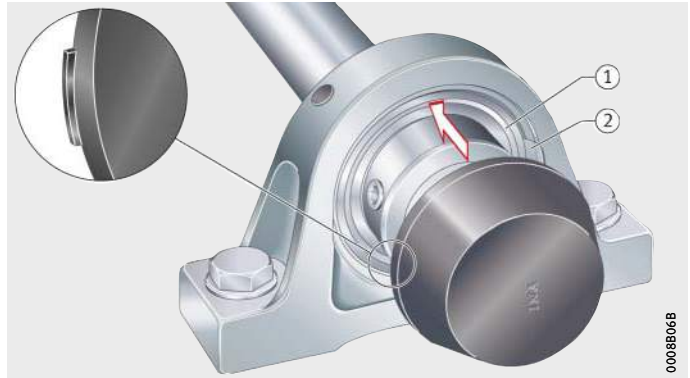
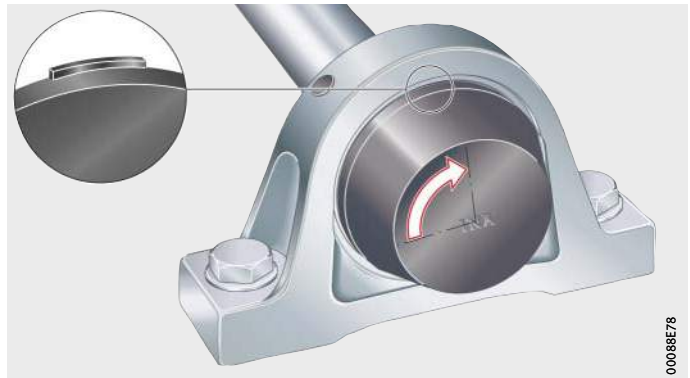


Figure 9
Locating end cap in annular slot





- Removal** Observe the correct sequence in removal:
- ▶ Loosen the end cap by rotating it anticlockwise (90°), noting the position of the INA logo, *Figure 10*.

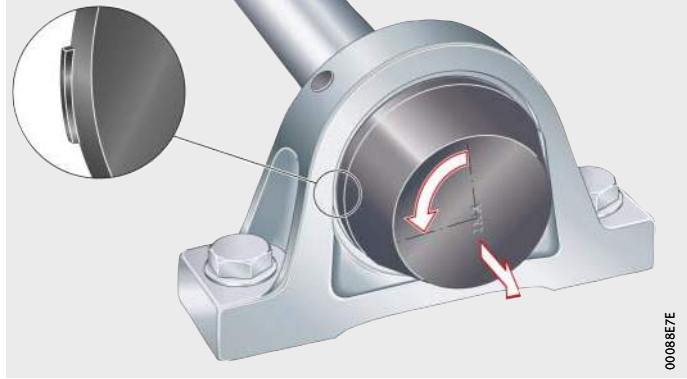


Figure 10
Removal of end cap

Mounting and dismounting

Mounting of sheet steel units

Sheet steel units with eccentric locking collar and grub screws in the inner ring:

- ▶ Slide the housing unit onto the shaft and align it with the fixing holes in the adjacent construction, *Figure 11*.
- ▶ Screw the housing to the adjacent construction using the fixing screws, *Figure 12*. If the shaft is to be supported by several housing units, tighten the screws finger tight at first, align the shaft and then tighten the screws securely.



With two-piece housings, the housing and radial insert ball bearing should be assembled first.



Figure 11
Sliding the unit onto the shaft



Figure 12
Screw mounting the housing
finger tight



Location on the shaft by means of eccentric locking collar

- ▶ Slide the eccentric locking collar onto the collar seating on the bearing inner ring and rotate by hand, preferably in the direction of shaft rotation.
- ▶ Using a drift and hammer, tension the eccentric locking collar by means of one or two strong blows, *Figure 13*.
- ▶ For location using a locking collar, tighten the grub screw to the tightening torque M_A , *Figure 14*.



Figure 13
Tensioning
the eccentric locking collar

Location on the shaft by means of grub screws in the inner ring



- ▶ For location using grub screws in the inner ring, tighten both grub screws by means of a torque wrench. Observe the tightening torque M_A , see table, page 130.



M_A = tightening torque, see table, page 130

Figure 14
Tightening the grub screw in the
eccentric locking collar or inner ring

Dismounting

- Observe the correct sequence in dismounting:
- ▶ For bearings with an eccentric locking collar, undo the grub screw and rotate the locking collar in the opposite direction to the direction of shaft rotation.
 - ▶ For bearings with grub screws in the inner ring, undo both grub screws.
 - ▶ Unscrew the housing.

Mounting and dismounting

Mounting of rolling bearings with cylindrical seats



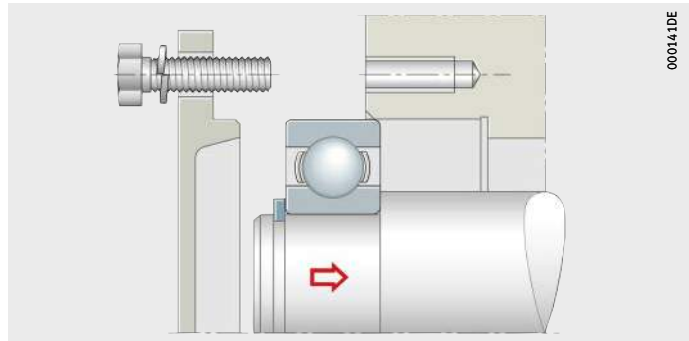
Avoid applying direct blows to the bearing rings with a hammer.

Non-separable bearings

In the case of non-separable bearings, apply the mounting forces to the ring with a tight fit, which should also be fitted first, *Figure 15*. If the inner ring of a non-separable bearing will have a tight fit, press the bearing onto the shaft first, *Figure 15*. The bearing together with the shaft is then pushed into the housing (fit clearance).

Tight fit of the inner ring, mount this ring first

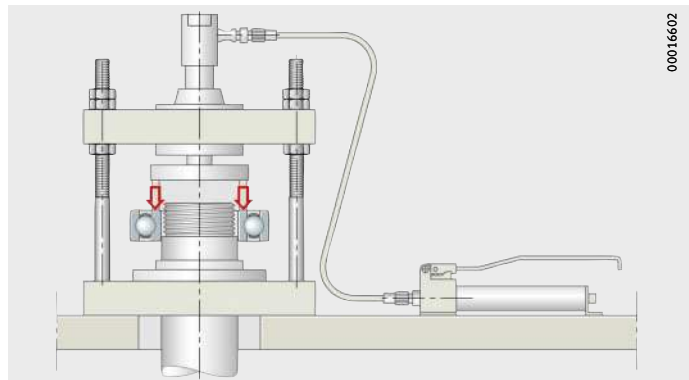
Figure 15
Non-separable bearing



Cold fitting of bearings by pressing

Bearings up to $d = 80$ mm can be pressed onto the shaft while cold for normal tight fits, *Figure 16*. Mechanical or hydraulic presses can be used for this purpose.

Figure 16
Mounting using hydraulic press





If a press is not available, the bearings can also be driven up by means of a hammer and a mounting sleeve.

In bearings with an angular adjustment facility, tilting of the outer ring is prevented by a mounting disc that is in contact with both bearing rings, *Figure 17*. In bearings with laterally protruding cages or balls, the disc must have a turned recess, *Figure 17*.

① Mounting disc with turned recess

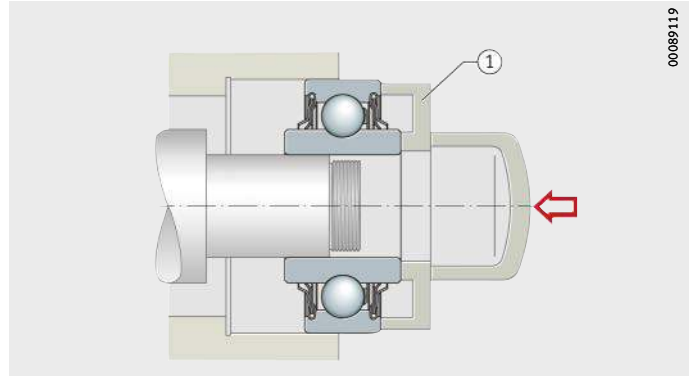


Figure 17
Mounting using mounting disc

Heating of bearings

Bearings with a cylindrical bore should be heated before mounting if a tight fit on the shaft is intended and excessive effort is required for pressing by mechanical means, *Figure 18*. The data are valid for maximum fit interference, a room temperature of +20 °C and an excess temperature safety margin of 30 K.

ϑ = heating temperature
d = bearing diameter

① Shaft tolerance (this is subject to the envelope requirement ©)

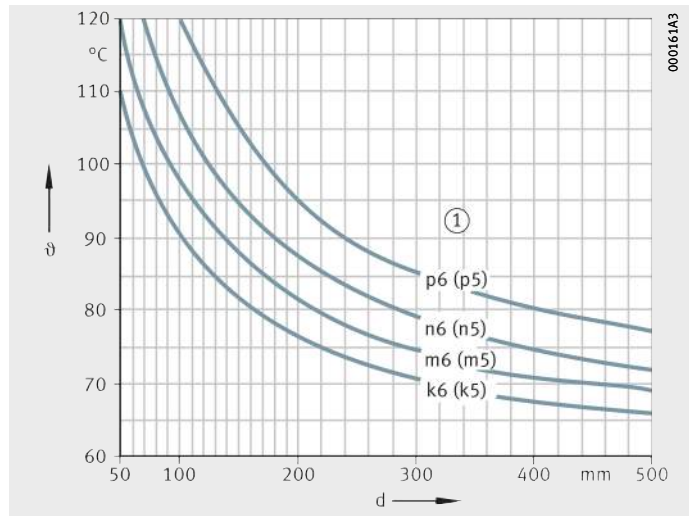


Figure 18
Heating temperature

Mounting and dismounting

Induction heating devices

Induction heating devices give rapid, safe and clean heating. The devices are used mainly in volume mounting work.

Heating plate

Individual bearings can be heated on an electric heating plate. A thermostatic controller must be always be used.

Heating cabinet

Thermostatically controlled hot air or heating cabinets are safe and clean. This method is mainly used for small and medium sized bearings. The heating times are relatively long.

Guidelines for dismounting

Information on mounting and dismounting is given in the publications WL 80 100, Mounting of Rolling Bearings and IS 1, Mounting and Maintenance of Rolling Bearings.

Dismounting should be taken into consideration in the original design of the bearing position. If bearing rings are to be mounted with a tight fit, slots should be provided in the shaft or housing bore, for example, to allow removal of the rings.



If the bearing is to be reused, the following guidelines should be taken into consideration:

- Do not use a concentrated or “hard” flame.
- Avoid direct blows on the bearing rings.
- Do not apply fitting forces through the rolling elements.
- Carefully clean the bearings after dismounting.



Dismounting of rolling bearings on cylindrical seats

If the bearings and adjacent parts are to be reused, the removal tool should be applied to the ring fitted with a tight fit. In non-separable bearings, the ring with a sliding fit is dismantled first and the ring with a tight fit is then removed.

Removal of small bearings

For the extraction of small bearings, mechanical extraction devices, *Figure 19*, or hydraulic presses are suitable. Dismounting is made easier if there are withdrawal slots on the shaft or housing so that the withdrawal tool can be applied directly to the bearing ring with a tight fit.

Special devices are available for cases where withdrawal slots are not present.

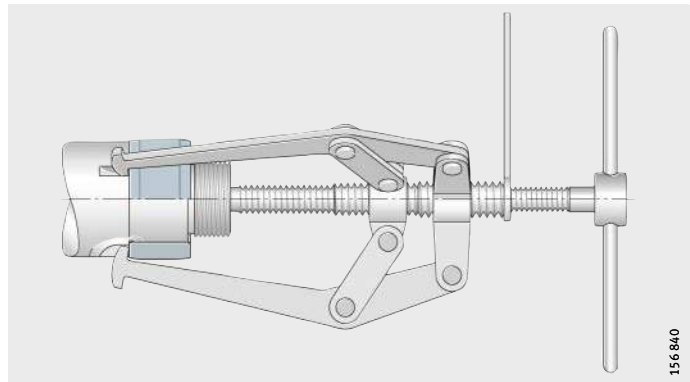


Figure 19
Removal device
with three adjustable arms

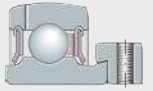


Radial insert ball bearings

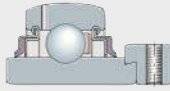
- Spherical outer ring
- Cylindrical outer ring
- Rubber interliner or steel aligning ring

Radial insert ball bearings

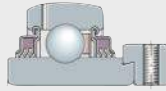
With eccentric locking collar Spherical or cylindrical outer ring 152
Radial insert ball bearings with spherical outer ring, for compensation of misalignments. Location on the shaft by means of a locking collar, which is preferably tightened in the direction of rotation and then secured.	
 194
Radial insert ball bearings with cylindrical outer ring, eccentric locking collar and two slots in the outer ring. Axial location in cylindrical bores by means of snap rings.	
With grub screws in inner ring 152
Radial insert ball bearings with spherical outer ring, for compensation of misalignments. Inner ring located on the shaft by means of grub screws. For bearing arrangements with a constant direction of rotation.	
With adapter sleeve 152
Radial insert ball bearings with spherical outer ring, for compensation of misalignments. The inner ring is located on the shaft by means of an adapter sleeve with a locknut and a tab washer.	
With drive slot 152
Radial insert ball bearings with spherical outer ring and drive slot in the inner ring. For compensation of misalignments. The slot prevents rotation.	
Self-aligning deep groove ball bearings 152
Radial insert ball bearings with spherical outer ring, for compensation of misalignments. With cylindrical bore for a fit seat or with profiled bore for square or hexagonal shafts.	
Deep groove ball bearings with extended inner ring 194
Radial insert ball bearings with cylindrical outer ring. Inner ring extended on both sides, which is located by means of a fit or hexagonal bore. Constant or alternating load.	
With rubber interliner 212
Radial insert ball bearings with rubber interliner. Location on the shaft by means of eccentric locking collar. The NBR interliner absorbs vibrations and shocks.	
With steel aligning ring 212
Radial insert ball bearings for mounting in cylindrical bores. Bearing with eccentric locking collar and additionally with an axially split outer ring as an aligning ring.	



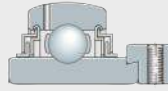
(G)RAE...XL-NPP-B
RALE...XL-NPP-B



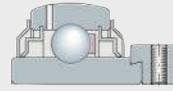
G(N)E...XL-KRR-B
(N)E...XL-KRR-B



GE...XL-KTT-B



GE...XL-KLL-B

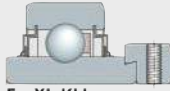


GE...XL-KRR-B-2C

0008B325



RAE...XL-NPP
RALE...XL-NPP



E...XL-KLL



E...XL-KRR

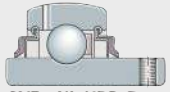


RAE...XL-NPP-NR

0008B32E

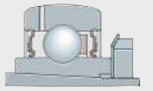


GAY...XL-NPP-B
AY...XL-NPP-B



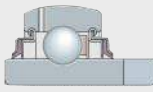
GYE...XL-KRR-B

0008B337



GSH...XL-2RSR-B

0008B341



GLE...XL-KRR-B

0008B34A



2...XL-NPP-B

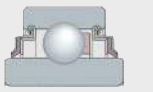


GVK...KTT-B-AS2/V
VK...KTT-B

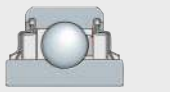


SK...KRR-B
SK...KTT-B

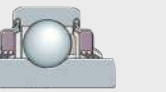
0008B353



2...XL-KRR
2...XL-KRR-AH



SK...KRR



SK...KTT

0008B35C



RABRA-XL
RABRB-XL



RCRA-XL
RCRB-XL

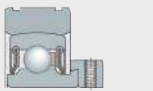


CRB-XL



RCSMA-XL
RCSMB-XL

0008B365



PE-XL



BE-XL

0008B36E



Features
of radial insert ball bearings,
comparison of series

Series	Shaft diameter				Location
	mm		inch		
	from	to	from	to	
GE...XL-KLL-B	20	50	–	–	Eccentric locking collar
E...XL-KLL	20	50	–	–	Eccentric locking collar
GRAE...XL-NPP-B	12	60	–	–	Eccentric locking collar
GRA...NPP-B-AS2/V	–	–	5/8	1 ¹⁵ /16	
RABRB...XL-FA106	12	50	–	–	Eccentric locking collar
RABRA...XL-FA106	30	–	–	–	
RAE...XL-NPP-B	12	50	–	–	Eccentric locking collar
RA...NPP-B	–	–	3/4	1 ¹ /2	
RALE...XL-NPP-B	20	30	–	–	
PE...XL	20	40	–	–	
RCSMB...XL-FA106	15	25	–	–	Eccentric locking collar
RCSMA...XL-FA106	30	–	–	–	
RCRA...XL-FA106	20	–	–	–	
RCRB...XL-FA106	20	–	–	–	
CRB...XL	20	35	–	–	
RAE...XL-NPP	12	60	–	–	Eccentric locking collar
RALE...XL-NPP	20	30	–	–	
RAE...XL-NPP-NR	20	40	–	–	
RA...NPP	–	–	5/8	1 ¹ /2	
RAL...NPP	–	–	3/4	–	
GE...XL-KRR-B	17	120	–	–	Eccentric locking collar
G...KRR-B-AS2/V	–	–	15/16	2 ¹⁵ /16	Eccentric locking collar
GE...XL-KRR-B-2C	25	40	–	–	
GNE...XL-KRR-B	30	100	–	–	
E...XL-KRR-B	25	40	–	–	Eccentric locking collar
NE...XL-KRR-B	50	–	–	–	
GE...XL-KRR-B-FA101	20	75	–	–	Eccentric locking collar
GE...XL-KRR-B-FA164	20	90	–	–	
E...XL-KRR	20	70	–	–	Eccentric locking collar
GE...XL-KTT-B	20	80	–	–	Eccentric locking collar
GAY...XL-NPP-B	12	60	–	–	Grub screws
GAY...NPP-B-AS2/V	–	–	5/8	1 ⁷ /16	
GYE...XL-KRR-B	12	90	–	–	
GY...KRR-B-AS2/V	–	–	1/2	2 ¹⁵ /16	
AY...XL-NPP-B	12	30	–	–	Grub screws
GAY...XL-NPP-B-FA164	12	15	–	–	Grub screws
GLE...XL-KRR-B	20	70	–	–	Drive slot
BE...XL	20	40	–	–	Fit
2...XL-NPP-B	12	50	–	–	Fit
2...XL-KRR(-AH)	13	60	–	–	
SK(E)...KRR-B	16,1	38,1	–	–	Hexagonal bore
SK...KRR	–	–	7/8	1 ¹ /4	
SK...KTT-B	–	–	7/8	1 ¹ /4	Hexagonal bore
SK...KTT	–	–	1 ¹ /4	1 ³ /4	
GSH...XL-2RSR-B	20	50	–	–	Adapter sleeve
GVK(E)...KRR-B-AS2/V	16,3	–	–	–	Square bore
VK(E)...KTT-B	25,4	38	1	–	
GVK(E)...KTT-B(-AS2/V)	25,4	39,7	1	1 ⁹ /16	

1) Further guidelines must be observed, see page 62.

2) Recommended operating temperature.

If temperatures exceed +100 °C, relubrication must be carried out regularly.

3) Temporary temperature peaks are possible up to +120 °C.

Accessories	Sealing	Compensation of misalignment	Internal clearance Group	Cage	Grease ¹⁾		Relubrication facility	Temperature ²⁾ °C		Comments	Dimension table Page
								from	to		
–	L	yes	5	Steel	L069		yes	–40	+180	–	166
–	L	no	3	PA66	GA13		no	–20	+100 ³⁾	–	202
–	P	yes	3	PA66	GA13		yes	–20	+100 ³⁾	–	166 188
Rubber interliner	P	yes	3	PA66	GA13		no	–20	+85	–	218
										Light series	218
–	P	yes	3	PA66	GA13		no	–20	+100 ³⁾	–	166
										–	188
										Light series	166
Aligning ring										Annular slots in aligning ring	220
Rubber interliner	P	no	3	PA66	GA13		no	–20	+85	–	218
										Light series	218
										Light series, mounting chamfer	218
										Mounting chamfer	218
										Abutment shoulder	218
–	P	no	3	PA66	GA13		no	–20	+100 ³⁾	–	202
										–	202
										Two slots, one snap ring	202
										–	210
										–	210
–	R	yes	3	PA66	GA13		yes	–20	+100 ³⁾	–	166
–	R	yes	3	PA66	GA13		yes	–20	+100 ³⁾	–	188
										Flinger shields	166
										Heavy series	168
–	R	yes	3	PA66	GA13		no	–20	+100 ³⁾	–	166
										Heavy series	170
–	R	yes	5	Steel	L069		yes	–40	+180	PTFE seal lip	166
					GA11			+150	+250		166
–	R	no	3	PA66	GA13		no	–20	+100 ³⁾	–	202
–	T	yes	3	PA66	GA13		yes	–20	+100 ³⁾	–	166
–	P	yes	3	PA66	GA13		yes	–20	+100 ³⁾	–	174 188 174 188
–	P	yes	3	PA66	GA13		no	–20	+100 ³⁾	–	174
–	P	yes	5	Steel	GA11		yes	+150	+250	PTFE seal lip	174
–	R	yes	5	Steel	L069		yes	–40	+180	PTFE seal lip	180
Aligning ring	P	yes	N	PA66	GA13		no	–20	+100 ³⁾	Annular slots in aligning ring	220
–	R	yes	N	PA66	GA13		no	–20	+100 ³⁾	–	182
		no									206
–	R	yes	3	PA66	GA13		no	–20	+100 ³⁾	Corrosion-resistant, maximum greasing	186
		no									208
–	T	yes	3	PA66	L402		no	–20	+100 ³⁾	Corrosion-resistant, maximum greasing	186
		no			GA13						208
–	RSR	yes	4	PA66	GA13		yes	–20	+100 ³⁾	–	178
–	R	yes	3	PA66	GA13		yes	–20	+100 ³⁾	Corrosion-resistant, maximum greasing	184
	T						no				184
	T						yes				184



Design and safety guidelines

The chapter Technical principles brings together the essential guidelines on the design of bearing arrangements, lubrication, mounting and dismounting and the operation of bearings, see page 32.

Compensation of static misalignments

Bearings with a spherical outer ring, fitted in housings with a concave bore, can compensate for static misalignment of the shaft, *Figure 1*.

For units with a lubrication groove in the housing and lubrication hole in the radial insert ball bearing, the following applies:

- Up to $\pm 2,5^\circ$, the units can be relubricated.
- Between $\pm 2,5^\circ$ and $\pm 5^\circ$, the possibility of relubrication is dependent on the specific unit. Please contact us in this case.
- Over $\pm 5^\circ$, relubrication is no longer possible.



The units must not be used to support swivelling or tumbling motion.

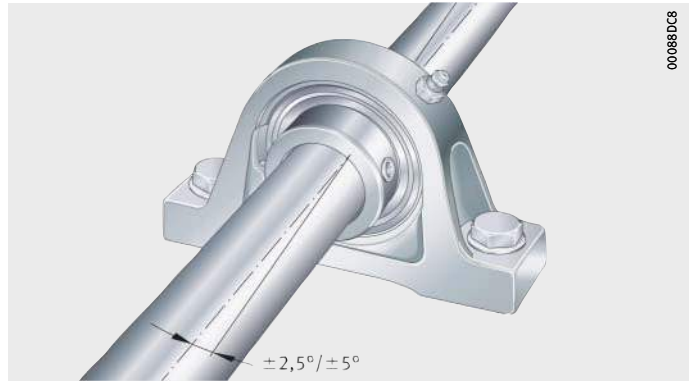


Figure 1
Compensation of static shaft misalignment

Minimum radial load

In order to ensure slippage-free operation, the bearings must be subjected to a minimum radial load. This applies particularly in the case of high speeds and high accelerations. In continuous operation, a minimum radial load of the order of $P \cong 0,01 \cdot C_r$ is necessary for ball bearings with cage.

Speed limits for radial insert ball bearings

The speed limits are dependent on the load, the clearance between the bearing bore and shaft and the friction of the seals in the case of bearings with contact seals.

Guide values for the permissible speeds can be derived from the diagram, *Figure 2*, page 149.

In the case of load ratios $C_r/P > 13$, the speeds can be increased. For $C_r/P < 5$, location by means of a fit with a shaft roughness of $R_a 0,3$ is recommended, see page 100. For both types of applications, please contact us. In order to ensure slippage-free operation, the minimum radial load must be observed.

Example of permissible speed calculation

Given:

- Shaft tolerance h6 Ⓞ
- Radial insert ball bearing GRAE30-XL-NPP-B
- Ball set 206
- Basic dynamic load rating C_r 20 700 N
- Load P 1 300 N
- Sealing Seals P.

Required:

- Load ratio $C_r/P = 20\,700\text{ N}/1\,300\text{ N}$ $C_r/P > 13$
- Permissible speed $n \approx 4\,300\text{ min}^{-1}$, Figure 2.



n = permissible speed
 h5, h6, h9 = shaft tolerance (this is subject to the envelope requirement Ⓞ)
 C_r/P = load ratio

- ① Ball set
- ② For d = 12 mm, 15 mm and 17 mm, identical ball set 203
- ③ For radial insert ball bearings with seals L, P or R
- ④ For radial insert ball bearings with seals T

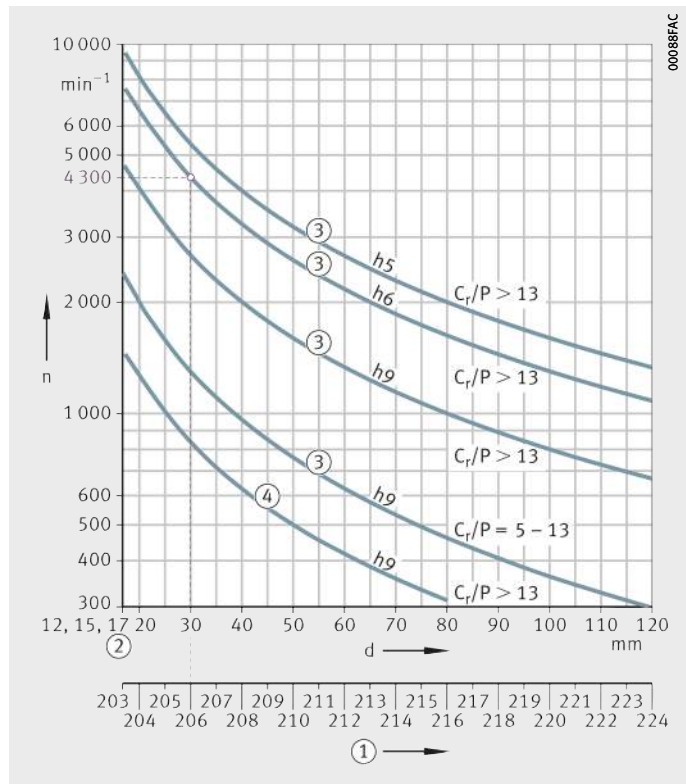


Figure 2 Permissible speeds for radial insert ball bearings

Shaft tolerances for radial insert ball bearings

The permissible shaft tolerance is dependent on the speed and load. Shafts up to tolerance class h9 Ⓞ can be used. Conventional drawn shafts will suffice for most applications.

Accuracy

Standard tolerances of radial insert ball bearings

The outside diameter of the bearings corresponds to tolerance class Normal in accordance with ISO 492, see table. The inner ring bore has a plus tolerance to facilitate mounting of the bearing.

Tolerances of radial insert ball bearings

Inner ring				Outer ring			
Nominal dimension Bore d mm		Deviation $t_{\Delta dmp}$ μm		Nominal dimension Outside diameter D mm		Deviation ¹⁾²⁾ $t_{\Delta Dmp}$ μm	
over	incl.	U	L	over	incl.	U	L
12	18	+18	0	30	50	0	-11
18	24	+18	0	50	80	0	-13
24	30	+18	0	80	120	0	-15
30	40	+18	0	120	150	0	-18
40	50	+18	0	150	180	0	-25
50	60	+18	0	180	250	0	-30
60	90	+25	0	-	-	-	-
90	120	+30	0	-	-	-	-

U = upper limit deviation

L = lower limit deviation

Tolerance symbols, see tables, page 90.

1) In the case of sealed bearings, the largest and smallest values of the outside diameter can deviate from the mean value by approximately 0,03 mm.

2) Outside diameter tolerances also valid for 2...-KRR and 2...-NPP-B.

Radial internal clearance of radial insert ball bearings

The radial internal clearance of most series is Group 3 to ISO 5753-1 and is thus larger than for normal deep groove ball bearings, see table and page 146.

The larger internal clearance allows better support of angular misalignment and shaft deflection.

Radial internal clearance

Bore d mm		Radial internal clearance							
		Group N μm		Group 3 μm		Group 4 μm		Group 5 μm	
over	incl.	min.	max.	min.	max.	min.	max.	min.	max.
2,5	6	2	13	8	23	-	-	-	-
6	10	2	13	8	23	14	29	20	37
10	18	3	18	11	25	18	33	25	45
18	24	5	20	13	28	20	36	28	48
24	30	5	20	13	28	23	41	30	53
30	40	6	20	15	33	28	46	40	64
40	50	6	23	18	36	30	51	45	73
50	65	8	28	23	43	38	61	55	90
65	80	10	30	25	51	46	71	65	105
80	100	12	36	30	58	53	84	75	120
100	120	15	41	36	66	61	97	90	140
120	140	18	48	41	81	71	114	105	160
140	160	18	53	46	91	81	130	120	180



Radial insert ball bearings with spherical outer ring

Radial insert ball bearings with spherical outer ring

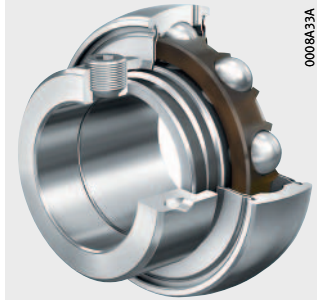
	Page
Product overview	
Radial insert ball bearings with spherical outer ring.....	154
Features	
X-life	157
Inch size designs.....	158
Corrosion-resistant radial insert ball bearings	158
Radial insert ball bearings for high and low temperatures.....	158
Radial insert ball bearings with eccentric locking collar	159
Radial insert ball bearings with grub screws in inner ring.....	160
Radial insert ball bearings with adapter sleeve.....	161
Radial insert ball bearings with drive slot.....	162
Self-aligning deep groove ball bearings with bore for fit.....	163
Self-aligning deep groove ball bearings with profiled bore.....	164
Suffixes.....	165
Dimension tables	
Radial insert ball bearings with eccentric locking collar	166
Radial insert ball bearings with grub screws in inner ring.....	174
Radial insert ball bearings with adapter sleeve.....	178
Radial insert ball bearings with drive slot, non-locating bearings.....	180
Self-aligning deep groove ball bearings, bore for fit.....	182
Self-aligning deep groove ball bearings, square bore	184
Self-aligning deep groove ball bearings, hexagonal bore	186
Inch size radial insert ball bearings.....	188



Product overview Radial insert ball bearings with spherical outer ring

With eccentric locking collar

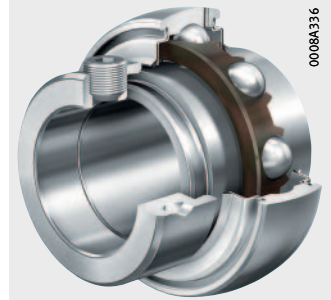
(G)RAE...-XL-NPP-B,
RALE...-XL-NPP-B



0008A33A

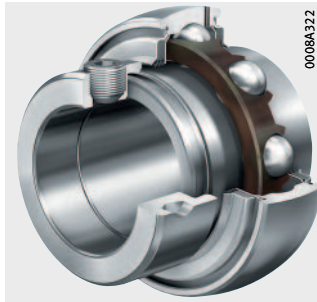
GE...-XL-KTT-B

G(N)E...-XL-KRR-B,
(N)E...-KRR-B



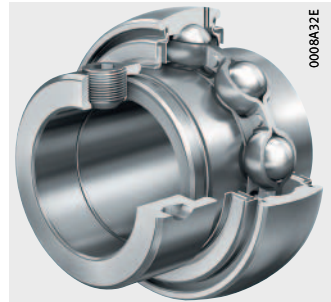
0008A336

GE...-XL-KLL-B

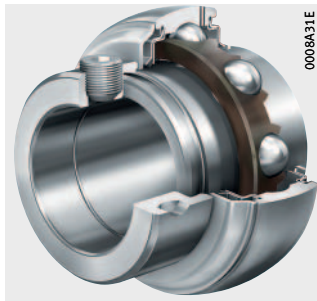


0008A322

GE...-XL-KRR-B-2C



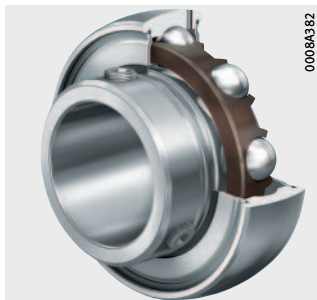
0008A32E



0008A31E

With grub screws in inner ring

GAY...-XL-NPP-B, AY...-XL-NPP-B



0008A382

GYE...-XL-KRR-B



0008A34B

With adapter sleeve

GSH..-XL-2RSR-B



With drive slot

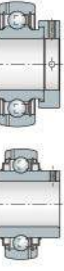
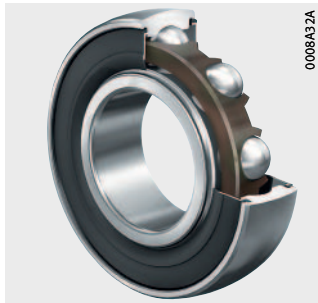
GLE..-XL-KRR-B



**Self-aligning
deep groove ball bearings**

With bore for fit

2..-XL-NPP-B

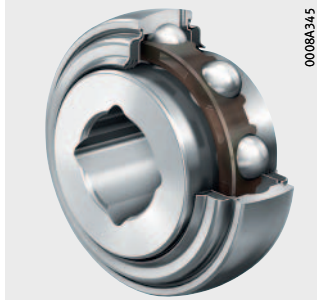


Product overview

Radial insert ball bearings with spherical outer ring

Self-aligning deep groove ball bearings with profiled bore
With square bore

GVK(E),
VK..-KTT-B

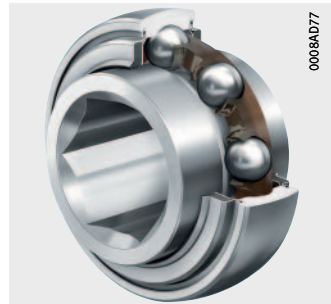


With hexagonal bore

SK..-KRR-B

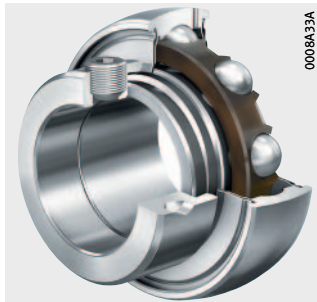


SK..-KTT-B

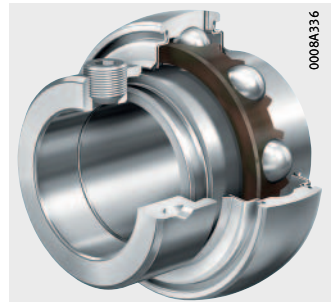


Inch size radial insert ball bearings
With eccentric locking collar

GRA..-NPP-B-AS2/V,
RA..-NPP-B

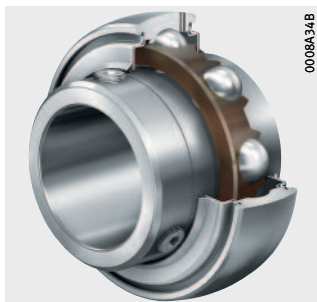


G..-KRR-B-AS2/V

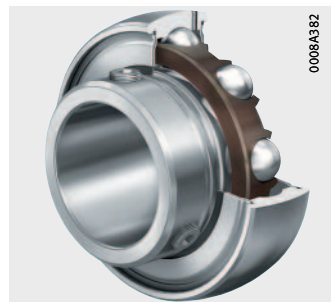


With grub screws in inner ring

GY..-KRR-B-AS2/V



GAY..-NPP-B(-AS2/V)



Radial insert ball bearings with spherical outer ring



Features Radial insert ball bearings with spherical outer ring are single row, ready-to-fit units comprising a solid outer ring, cages made from plastic or sheet steel and seals P, R, L or T. Bearings with an inner ring extended on both sides undergo less tilting of the inner ring and therefore run more smoothly.

The outer ring has a spherical outside surface. In combination with a housing matched to the design, bearings with a spherical outer ring can compensate for misalignment of the shaft, see section Compensation of static misalignments, page 148.

With only a few exceptions, radial insert ball bearings can be relubricated. For this purpose, they have two lubrication holes in one plane of the outer ring offset by 180°.

Radial insert ball bearings are particularly easy to fit and are preferentially suitable for drawn shafts of tolerance classes h6 \oplus to h9 \oplus . For non-locating bearings, shafts of tolerance class h5 \oplus to h7 \oplus are recommended. They are located on the shaft by means of an eccentric locking collar, grub screws in the inner ring, an adapter sleeve, a drive slot, fit or profiled bore.



The series comparison matrix presents the features of the series in detail, see table, page 146.

X-life

Numerous sizes are supplied in the X-life design. These products are indicated in the dimension tables.

Radial insert ball bearings of X-life quality have, for example, lower roughness Ra and higher geometrical accuracy of the raceways than comparable designs that are not X-life. As a result, these bearings have higher load carrying capacity and longer rating life although their dimensions are identical. In certain applications, this means that a smaller bearing arrangement can be designed.

Radial insert ball bearings of X-life quality have an eccentric locking collar of an improved design and the quantity and distribution of the lubricant has been optimised. Housings ASE have additional crosspieces on the underside. For extreme requirements, the cage and seal material in the high and low temperature designs (suffix FA101) has been significantly improved in comparison with earlier versions.

Radial insert ball bearings with spherical outer ring

Inch size designs

Some series with an eccentric locking collar or grub screws in the inner ring are also available with inch size bore dimensions, see page 188.

Corrosion-resistant radial insert ball bearings

For corrosion-resistant bearing arrangements and for applications in the food and drinks industry, bearings with a Corrotect coating under the suffix FA125 and bearings of a corrosion-resistant design are available. Corrosion-resistant radial insert ball bearings are suitable where moisture, contaminated water, salt spray mist or weakly alkaline and weakly acidic cleaning agents are present, see section Radial insert ball bearings and housing units, corrosion-resistant, page 349.

Radial insert ball bearings for high and low temperatures

At high temperatures, rolling bearings expand in volume due to a change in the material microstructure. Depending on the location of the heat source, there may also be a significant temperature differential between the inner and outer ring.

The radial insert ball bearings are not dimensionally stabilised but have an increased internal clearance Group 5. They have cages made from metal or a high temperature plastic, lubricants with improved thermal resistance and special seals.

These bearings have the suffix FA164 or FA101, see table, page 165. An extended temperature range can also be covered by using the series GLE...XL-KRR-B and GE...XL-KLL-B, see table, page 146.

Radial insert ball bearings with eccentric locking collar

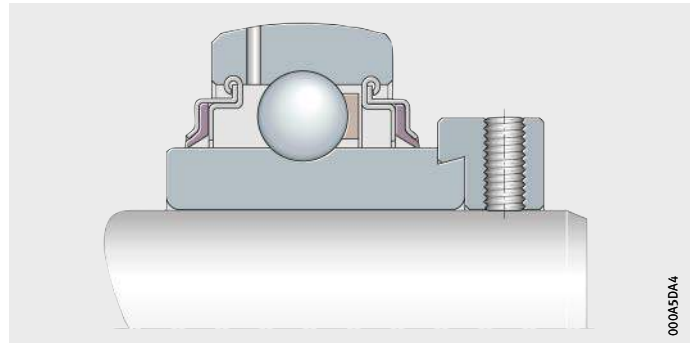
These “classic” INA radial insert ball bearings are located on the shaft by means of a locking collar, *Figure 1*. They are particularly suitable for bearing arrangements with a constant direction of rotation or, under low speed and load, for an alternating direction of rotation.

The locking collar is preferably tightened in the direction of rotation and secured by means of a grub screw. This location method prevents damage to the shaft and can be easily loosened again.



GE..-XL-KRR-B

Figure 1
Location
by means of eccentric locking collar



Sealing

The radial insert ball bearings are sealed by means of seals P, R, L or T, see page 119. In the case of series GE..-XL-KRR-B-2C, the seals R have outer flinger shields with Corroprotect coating for protection against mechanical damage.

Lubrication

With the exception of a few series, sealed bearings can be relubricated.

Anti-corrosion protection

Several series are also available in a corrosion-resistant design. These bearings have the suffix FA125.

The inner rings up to $d = 60$ mm and the locking collars in general have a Corroprotect coating and are thus protected against fretting corrosion. This is not valid for the series RALE..-XL-NPP(-B).

Radial insert ball bearings for high and low temperatures

The series for high or expanded temperature ranges have the suffixes FA164 or FA101, see table, page 146.

Cylindrical outer ring

In addition to the bearings with a spherical outer ring, there are also the following series with a cylindrical outer ring: RAE..-XL-NPP, RALE..-XL-NPP, E..-XL-KRR and E..-XL-KLL, see section Radial insert ball bearings with cylindrical outer ring, page 194.

Inch size designs

The series GRA..-NPP-B-AS2/V, RA..-NPP-B, G..-KRR-B-AS2/V have an inch size bore diameter, see page 188.

Tightening torques

The tightening torques for metric and inch size grub screws must be observed, see table, page 130.

Radial insert ball bearings with spherical outer ring

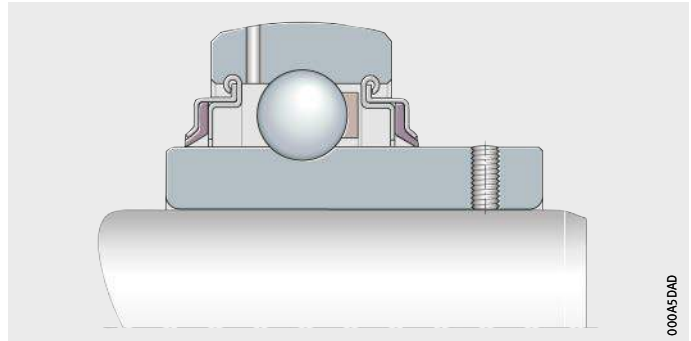
Radial insert ball bearings with grub screws in inner ring

In the case of these radial insert ball bearings, the inner ring is located on the shaft by means of two grub screws offset by 120°, *Figure 2*. This location method is suitable for bearing arrangements with a constant direction of rotation or, under low speed and load, for an alternating direction of rotation.

The grub screws are self-retaining and have a fine pitch thread with cup point for secure location of the bearings.

GYE..-XL-KRR-B

Figure 2
Location
by means of grub screws
in the inner ring



Sealing

The radial insert ball bearings are sealed on both sides by means of seals P or R, see page 119.

Lubrication

With the exception of series AY..-XL-NPP-B, the bearings can be relubricated.

Anti-corrosion protection

The radial insert ball bearings are also available in a corrosion-resistant design with bearing rings and rolling elements made from high alloy, corrosion-resistant rolling bearing steel with an increased chromium and molybdenum content. The steel cages are made from corrosion-resistant steel.

The bearings are sealed on both sides by means of seals RSR and have additional outer flinger shields made from corrosion-resistant steel, see section Radial insert ball bearings and housing units, corrosion-resistant, page 349.

Radial insert ball bearings for high temperatures

The radial insert ball bearings for high temperatures have the suffix FA164, see table, page 146.


Inch size designs

In the case of series GY..-KRR-B-AS2/V, the bore is of inch dimensions, see page 188.

Tightening torques

The tightening torques for metric and inch size grub screws must be observed, see table, page 130.

Radial insert ball bearings with adapter sleeve

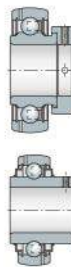
In the case of this series, the inner ring is located on the shaft by means of an adapter sleeve with a locknut and a tab washer, *Figure 3*. These radial insert ball bearings are suitable for shafts up to tolerance class h11 .

This location method is suitable for bearing arrangements with a constant or alternating direction of rotation and for high speeds.

The adapter sleeve and locknut give concentric, force locking location of the bearing inner ring on the shaft. As a result, the speeds that can be achieved are approximately the same as with deep groove ball bearings. These bearings also give quieter running than normal radial insert ball bearings. The adapter sleeve, locknut and tab washer are all zinc plated.

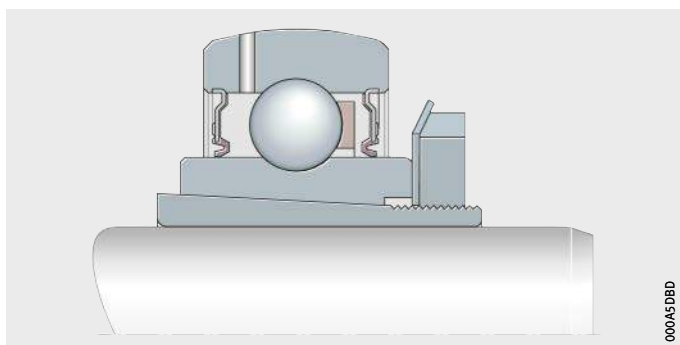
The bearings are highly suitable for reversing operation. As a result of the force locking connection, there is no occurrence of fretting corrosion between the shaft and the bore of the adapter sleeve.

Due to the integral adapter sleeve, the bearings have the same radial dimensions as and slightly lower basic load ratings than radial insert ball bearings with an eccentric locking collar or with grub screws in the inner ring and are interchangeable with these bearings.



GSH..-XL-2RSR-B

Figure 3
Location
using adapter sleeve and locknut



Sealing

Radial insert ball bearings with an integral adapter sleeve are sealed by means of seals RSR, see page 119.

Lubrication

The bearings can be relubricated.



Hook wrenches and tightening torques

The permissible tightening torques for the locknut must be observed, see table, page 132. Hook wrenches in accordance with DIN 1810 are available from the Industrial Service function of Schaeffler, see page 592.

Radial insert ball bearings with spherical outer ring

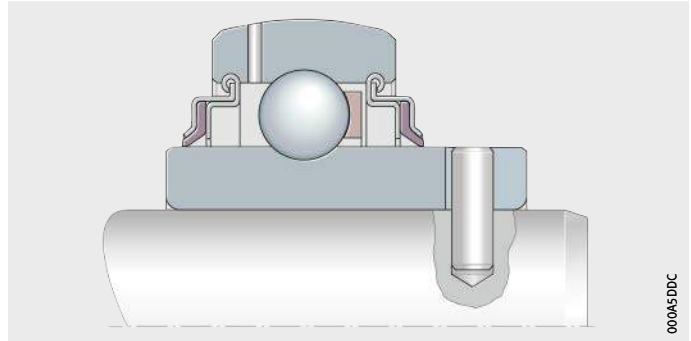
Radial insert ball bearings with drive slot

Radial insert ball bearings with a drive slot in the inner ring are non-locating bearings with good high temperature characteristics, *Figure 4*. Non-locating bearings are used at low speeds and loads to compensate for thermal elongation of the shaft.

Due to the slot, they are easy to locate in a radial direction. Rotation is prevented by means of a drive pin on the shaft or a set collar with a pin. The non-locating bearings are suitable for drawn shafts of tolerance classes h5  to h7 .

GLE..-XL-KRR-B

Figure 4
Location by means of drive slot



Anti-corrosion protection

The inner rings up to a bore diameter $d = 60$ mm have a Corrotect coating and are thus protected against fretting corrosion.

Sealing

Radial insert ball bearings with a drive slot have seals R with lip seals made from PTFE, see page 119.

Lubrication

The bearings can be relubricated.

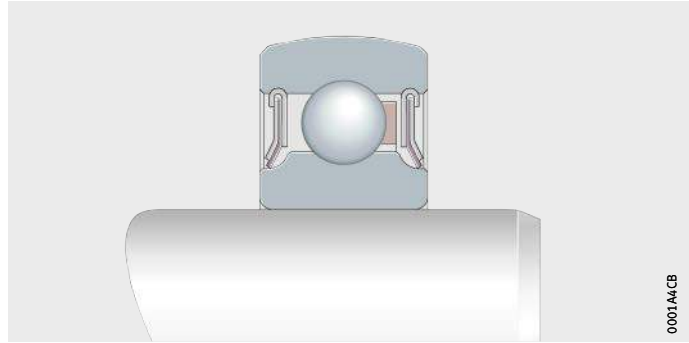
Self-aligning deep groove ball bearings with bore for fit

Self-aligning deep groove ball bearings are available with a cylindrical bore for a fit seat, *Figure 5*, or with a reamed square or hexagonal bore, *Figure 6*.

Bearings with a fit seat on the shaft can achieve the same speeds as standard ball bearings. These are suitable for bearings with an alternating direction of rotation and offer smooth running.

2..-XL-NPP-B

Figure 5
Self-aligning deep groove ball bearings with fit seat

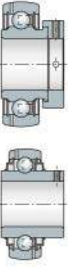


Sealing

The bearings are sealed on both sides using P seals with a vulcanised seal lip or three-piece designs, see page 119.



For self-aligning deep groove ball bearings with a fit seat, the fit data for ball bearings apply.



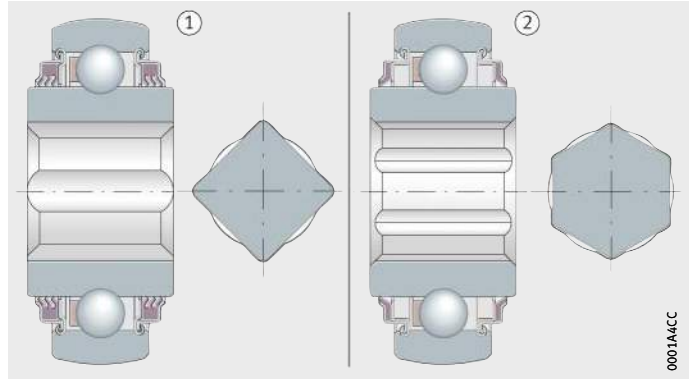
Radial insert ball bearings with spherical outer ring

Self-aligning deep groove ball bearings with profiled bore

Bearings with a profiled bore are used where shafts must transmit very high torques and this is only possible using square or hexagonal shafts, *Figure 6*. Rotation is prevented by form fit. Shafts of tolerance class h11 \oplus are recommended.

- VK.-KTT-B
SK.-KRR-B
- ① Square bore
② Hexagonal bore

Figure 6
Self-aligning deep groove ball bearings with profiled bore



Anti-corrosion protection

The bearings have a Corrotect coating.

Sealing

The self-aligning deep groove ball bearings are sealed using seals R or T, see page 119.

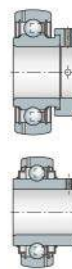
Lubrication

The bearings are greased to their maximum, some designs can also be relubricated.

Suffixes Suffixes for available designs, see table.

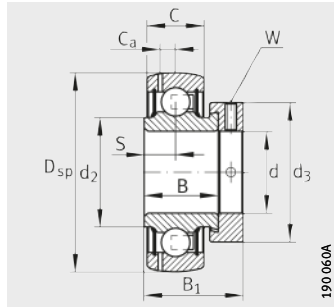
Available designs

Suffix	Description	Design
AS2/V	Bearing outer ring with two lubrication holes in offset planes	Standard
B	Bearing with spherical outer ring	
2C	Flinger shields on both sides	
FA101	High and low temperature design -40 °C to +180 °C	
FA106	Bearing subjected to special noise testing	
FA107	Bearing with lubrication holes on the locating side	
FA125	With Corrotect coating, corrosion-resistant	
FA164	High temperature design up to +250 °C	
KRR	Lip seals on both sides (seal R)	
KLL	Labyrinth seals on both sides (seal L)	
KTT	Triple lip seals on both sides (seal T)	
NR	Slot and snap ring for radial insert ball bearing with cylindrical outer ring	
NPP	Lip seals on both sides (seal P)	
OSE	Bearing without locking element (eccentric locking collar)	
2RSR	Lip seals on both sides (vulcanised)	

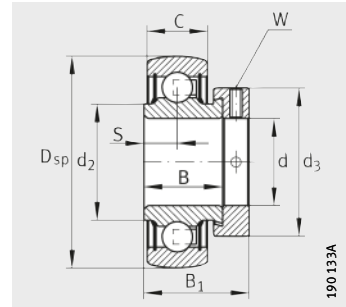


Radial insert ball bearings with eccentric locking collar

Spherical outer ring



GRAE..-XL-NPP-B



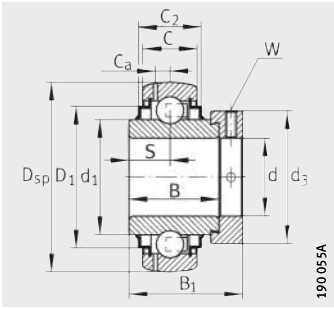
RAE..-XL-NPP-B, RALE..-XL-NPP-B

Dimension table - Dimensions in mm

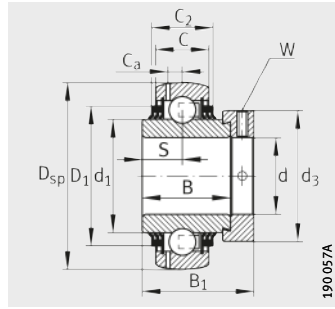
Designation ¹⁾	Mass m ≈ kg	Dimensions							
		d	D _{sp}	C	C ₂	B	S	d ₁	d ₂
GRAE12-XL-NPP-B	0,13	12	40	12	–	19	6,5	–	23
RAE12-XL-NPP-B	0,13	12	40	12	–	19	6,5	–	23
GRAE15-XL-NPP-B	0,11	15	40	12	–	19	6,5	–	23
RAE15-XL-NPP-B	0,12	15	40	12	–	19	6,5	–	23
GE17-XL-KRR-B	0,12	17	40	12	16,6	27,8	13,9	23,9	–
GRAE17-XL-NPP-B	0,12	17	40	12	–	19	6,5	–	23
RAE17-XL-NPP-B	0,1	17	40	12	–	19	6,5	–	23
GE20-XL-KLL-B	0,2	20	47	14	16,6	34,1	17,1	27,6	–
GE20-XL-KRR-B	0,19	20	47	14	16,6	34,1	17,1	27,6	–
GE20-XL-KRR-B-FA164	0,2	20	47	14	16,6	34,1	17,1	27,6	–
GE20-XL-KTT-B	0,19	20	47	14	16,6	34,1	17,1	27,6	–
GRAE20-XL-NPP-B	0,16	20	47	14	–	21,4	7,5	–	26,9
RAE20-XL-NPP-B	0,16	20	47	14	–	21,4	7,5	–	26,9
RALE20-XL-NPP-B	0,1	20	42	12	–	16,7	6	–	25,4
E25-XL-KRR-B	0,24	25	52	15	16,7	34,9	17,5	33,8	–
GE25-XL-KRR-B	0,25	25	52	15	16,7	34,9	17,5	33,8	–
GE25-XL-KRR-B-FA101	0,24	25	52	15	16,7	34,9	17,5	33,8	–
GE25-XL-KRR-B-FA164	0,25	25	52	15	16,7	34,9	17,5	33,8	–
GE25-XL-KLL-B	0,25	25	52	15	20,2	34,9	17,5	33,8	–
GE25-XL-KTT-B	0,24	25	52	15	20,2	34,9	17,5	33,8	–
GE25-XL-KRR-B-2C	0,26	25	52	15	24,6	34,9	17,5	33,8	–
GRAE25-XL-NPP-B	0,19	25	52	15	–	21,4	7,5	–	30,5
RAE25-XL-NPP-B	0,19	25	52	15	–	21,4	7,5	–	30,5
RALE25-XL-NPP-B	0,12	25	47	12	–	17,5	6	–	30

¹⁾ Permissible speeds of radial insert ball bearings: see page 148.

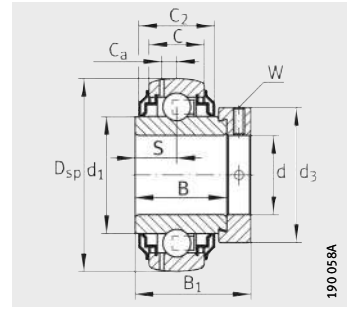
²⁾ Factor f_0 for determining equivalent bearing load, see table, page 40.



GE..-XL-KRR-B



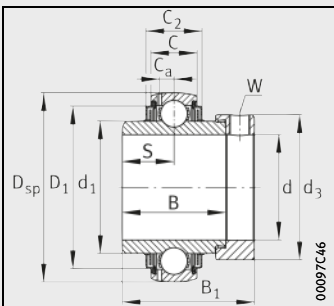
GE..-XL-KTT-B



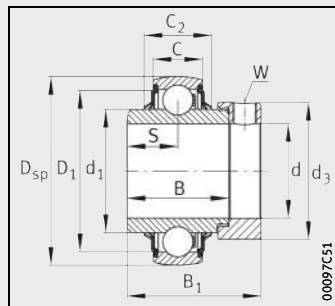
GE..-XL-KRR-B-2C



D ₁	C _a	B ₁	d ₃ max.	Width across flats W	Basic load ratings		Fatigue limit load C _{ur} N	Factor ²⁾ f ₀
					dyn. C _r N	stat. C _{0r} N		
-	3,4	28,6	28,4	3	10 100	4 750	241	13,1
-	-	28,6	28,4	3	10 100	4 750	241	13,1
-	3,4	28,6	28,4	3	10 100	4 750	241	13,1
-	-	28,6	28,4	3	10 100	4 750	241	13,1
31,6	3,4	37,4	28,4	3	10 100	4 750	241	13,1
-	3,4	28,6	28,4	3	10 100	4 750	241	13,1
-	-	28,6	28,4	3	10 100	4 750	241	13,1
37,4	4	43,7	33	3	13 600	6 600	335	13,1
37,4	4	43,7	33	3	13 600	6 600	335	13,1
37,4	4	43,7	33	3	13 600	6 600	335	13,1
37,4	4	43,7	33	3	13 600	6 600	335	13,1
-	4	31	33	3	13 600	6 600	335	13,1
-	-	31	33	3	13 600	6 600	335	13,1
-	-	24,5	30	2,5	10 000	5 000	255	13,9
42,5	-	44,5	37,5	3	14 900	7 800	395	13,8
42,5	4,1	44,5	37,5	3	14 900	7 800	395	13,8
42,5	4,1	44,5	37,5	3	14 900	7 800	395	13,8
42,5	4,1	44,5	37,5	3	14 900	7 800	395	13,8
42,5	4,1	44,5	37,5	3	14 900	7 800	395	13,8
42,5	4,1	44,5	37,5	3	14 900	7 800	395	13,8
-	4,1	44,5	37,5	3	14 900	7 800	395	13,8
-	4,1	31	37,5	3	14 900	7 800	395	13,8
-	-	31	37,5	3	14 900	7 800	395	13,8
-	-	25,5	36	2,5	10 700	5 900	295	13,8



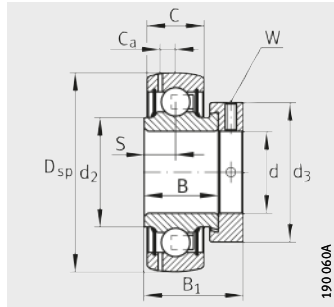
GE..-XL-KLL-B



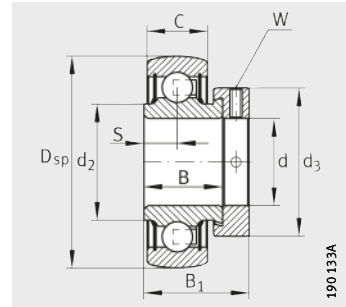
E..-XL-KRR-B

Radial insert ball bearings with eccentric locking collar

Spherical outer ring



GRAE..-XL-NPP-B



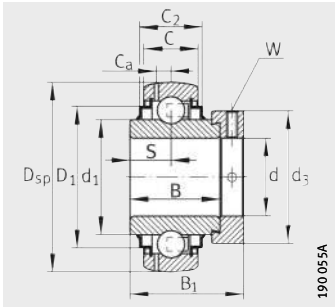
RAE..-XL-NPP-B, RALE..-XL-NPP-B

Dimension table (continued) · Dimensions in mm

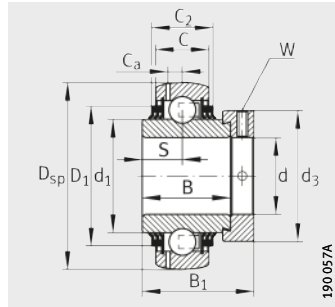
Designation ¹⁾	Mass m ≈ kg	Dimensions							
		d	D _{sp}	C	C ₂	B	S	d ₁	d ₂
GE30-XL-KLL-B	0,39	30	62	18	20,6	36,5	18,3	40,2	–
E30-XL-KRR-B	0,39	30	62	18	20,7	36,5	18,3	40,2	–
GE30-XL-KRR-B	0,39	30	62	18	20,7	36,5	18,3	40,2	–
GE30-XL-KRR-B-FA101	0,38	30	62	18	20,7	36,5	18,3	40,2	–
GE30-XL-KRR-B-FA164	0,39	30	62	18	20,7	36,5	18,3	40,2	–
GE30-XL-KTT-B	0,38	30	62	18	20,7	36,5	18,3	40,2	–
GNE30-XL-KRR-B	0,63	30	72	20	24	36,6	17,5	44	–
GE30-XL-KRR-B-2C	0,41	30	62	18	27,2	36,5	18,3	40,2	–
GRAE30-XL-NPP-B	0,32	30	62	18	–	23,8	9	–	37,4
RAE30-XL-NPP-B	0,32	30	62	18	–	23,8	9	–	37,4
RALE30-XL-NPP-B	0,18	30	55	13	–	18,5	6,5	–	35,7
E35-XL-KRR-B	0,59	35	72	19	22,5	37,7	18,8	46,8	–
GE35-XL-KRR-B	0,59	35	72	19	22,5	37,7	18,8	46,8	–
GE35-XL-KRR-B-FA164	0,61	35	72	19	22,5	37,7	18,8	46,8	–
GE35-XL-KTT-B	0,59	35	72	19	22,5	37,7	18,8	46,8	–
GNE35-XL-KRR-B	0,74	35	80	22	25	38,1	18,3	48	–
GE35-XL-KLL-B	0,6	35	72	19	25,4	37,7	18,8	46,8	–
GE35-XL-KRR-B-2C	0,63	35	72	19	29,2	37,7	18,8	46,8	–
GRAE35-XL-NPP-B	0,52	35	72	19	–	25,4	9,5	–	44,6
RAE35-XL-NPP-B	0,52	35	72	19	–	25,4	9,5	–	44,6

¹⁾ Permissible speeds of radial insert ball bearings: see page 148.

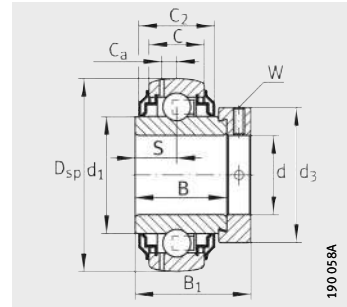
²⁾ Factor f_0 for determining equivalent bearing load, see table, page 40.



GE..-XL-KRR-B, GNE..-XL-KRR-B



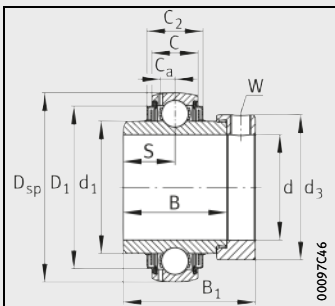
GE..-XL-KTT-B



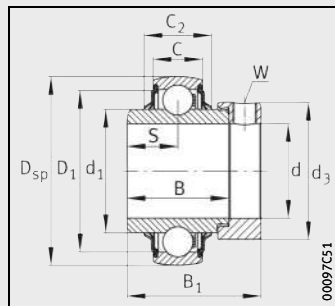
GE..-XL-KRR-B-2C



D ₁	C _a	B ₁	d ₃ max.	Width across flats W	Basic load ratings		Fatigue limit load C _{ur} N	Factor ²⁾ f ₀
					dyn. C _r N	stat. C _{0r} N		
52	4,7	48,5	44	4	20 700	11 300	570	13,8
52	–	48,5	44	4	20 700	11 300	570	13,8
52	4,7	48,5	44	4	20 700	11 300	570	13,8
52	4,7	48,5	44	4	20 700	11 300	570	13,8
52	4,7	48,5	44	4	20 700	11 300	570	13,8
52	4,7	48,5	44	4	20 700	11 300	570	13,8
60,2	6,2	50,2	51	5	31 500	16 700	840	13
–	4,7	48,5	44	4	20 700	11 300	570	13,8
–	4,7	35,8	44	4	20 700	11 300	570	13,8
–	–	35,8	44	4	20 700	11 300	570	13,8
–	–	26,5	42,5	2,5	14 100	8 300	420	13,8
60,3	–	51,3	55	5	27 500	15 300	770	13,8
60,3	5,6	51,3	55	5	27 500	15 300	770	13,8
60,3	5,6	51,3	55	5	27 500	15 300	770	13,8
60,3	5,6	51,3	55	5	27 500	15 300	770	13,8
66,6	6,9	51,6	55	5	39 000	20 900	1 060	13,1
60,3	5,6	51,3	55	5	27 500	15 300	770	13,8
–	5,6	51,3	55	5	27 500	15 300	770	13,8
–	5,6	39	55	5	27 500	15 300	770	13,8
–	–	39	55	5	27 500	15 300	770	13,8



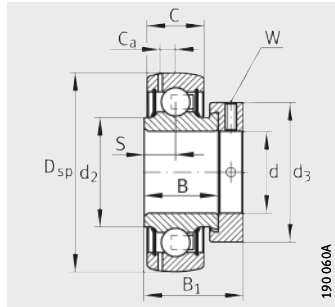
GE..-XL-KLL-B



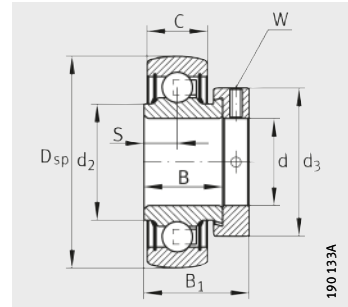
E..-XL-KRR-B

Radial insert ball bearings with eccentric locking collar

Spherical outer ring



GRAE..-XL-NPP-B



RAE..-XL-NPP-B

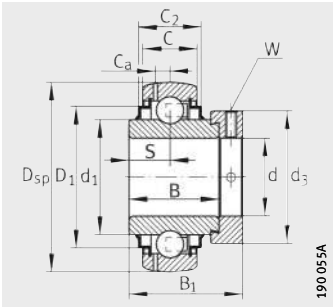
Dimension table (continued) · Dimensions in mm

Designation ¹⁾	Mass m ≈ kg	Dimensions							
		d	D _{sp}	C	C ₂	B	S	d ₁	d ₂
E40-XL-KRR-B	0,73	40	80	21	23,5	42,9	21,4	52,3	–
GE40-XL-KRR-B	0,73	40	80	21	23,5	42,9	21,4	52,3	–
GE40-XL-KRR-B-FA101	0,74	40	80	21	23,5	42,9	21,4	52,3	–
GE40-XL-KRR-B-FA164	0,75	40	80	21	23,5	42,9	21,4	52,3	–
GNE40-XL-KRR-B	1,02	40	90	23	26	41	18	53,8	–
GE40-XL-KLL-B	0,75	40	80	21	28,1	42,9	21,4	52,3	–
GE40-XL-KTT-B	0,75	40	80	21	28,1	42,9	21,4	52,3	–
GE40-XL-KRR-B-2C	0,78	40	80	21	31,9	42,9	21,4	52,3	–
GRAE40-XL-NPP-B	0,62	40	80	21	–	30,2	11	–	49,4
RAE40-XL-NPP-B	0,63	40	80	21	–	30,2	11	–	49,4
GE45-XL-KLL-B	0,84	45	85	22	26,4	42,9	21,4	57,9	–
GE45-XL-KRR-B	0,83	45	85	22	26,4	42,9	21,4	57,9	–
GE45-XL-KTT-B	0,83	45	85	22	26,4	42,9	21,4	57,9	–
GRAE45-XL-NPP-B	0,7	45	85	22	–	30,2	11	–	54,3
GE50-XL-KLL-B	1	50	90	22	26,4	49,2	24,6	62,8	–
GE50-XL-KRR-B	0,99	50	90	22	26,4	49,2	24,6	62,8	–
GE50-XL-KRR-B-FA101	0,99	50	90	22	26,4	49,2	24,6	62,8	–
GE50-XL-KRR-B-FA164	0,99	50	90	22	26,4	49,2	24,6	62,8	–
GE50-XL-KTT-B	0,98	50	90	22	26,4	49,2	24,6	62,8	–
GNE50-XL-KRR-B	1,82	50	110	29	–	49,2	24,6	68,8	–
GRAE50-XL-NPP-B	0,77	50	90	22	–	30,2	11	–	59,4
NE50-XL-KRR-B³⁾	1,82	50	110	29	–	49,2	24,6	68,8	–
RAE50-XL-NPP-B	0,77	50	90	22	–	30,2	11	–	59,4

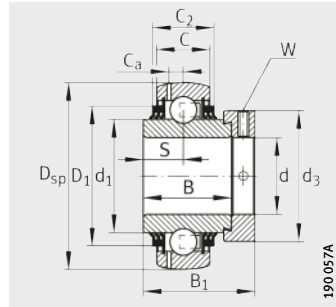
¹⁾ Permissible speeds of radial insert ball bearings: see page 148.

²⁾ Factor f_0 for determining equivalent bearing load, see table, page 40.

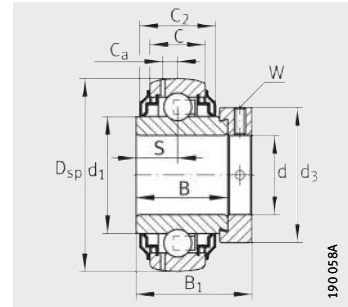
³⁾ No relubrication facility.



GE..-XL-KRR-B, GNE..-XL-KRR-B



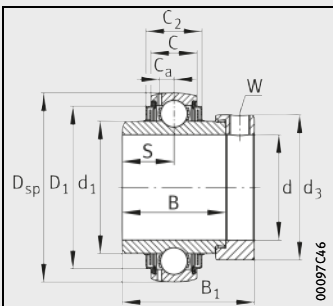
GE..-XL-KTT-B



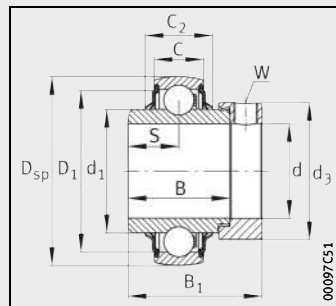
GE..-XL-KRR-B-2C



D ₁	C _a	B ₁	d ₃ max.	Width across flats W	Basic load ratings		Fatigue limit load C _{ur} N	Factor ²⁾ f ₀
					dyn. C _r N	stat. C _{0r} N		
68,3	–	56,5	58	5	34 500	19 800	1 010	14
68,3	6,4	56,5	58	5	34 500	19 800	1 010	14
68,3	6,4	56,5	58	5	34 500	19 800	1 010	14
68,3	6,4	56,5	58	5	34 500	19 800	1 010	14
74,5	7,5	54,6	63	5	47 000	26 000	1 320	13
68,3	6,4	56,5	58	5	34 500	19 800	1 010	14
68,3	6,4	56,5	58	5	34 500	19 800	1 010	14
–	6,4	56,5	58	5	34 500	19 800	1 010	14
–	6,4	43,8	58	5	34 500	19 800	1 010	14
–	–	43,8	58	5	34 500	19 800	1 010	14
72,3	6,4	56,5	63	5	34 500	20 400	1 030	14,3
72,3	6,4	56,5	63	5	34 500	20 400	1 030	14,3
72,3	6,4	56,5	63	5	34 500	20 400	1 030	14,3
–	6,4	43,8	63	5	34 500	20 400	1 030	14,3
77,3	6,9	62,8	69	5	37 500	23 200	1 180	14,3
77,3	6,9	62,8	69	5	37 500	23 200	1 180	14,3
77,3	6,9	62,8	69	5	37 500	23 200	1 180	14,3
77,3	6,9	62,8	69	5	37 500	23 200	1 180	14,3
77,3	6,9	62,8	69	5	37 500	23 200	1 180	14,3
92,7	8,7	66,75	75,8	5	66 000	38 000	1 920	13
–	6,9	43,8	69	5	37 500	23 200	1 180	14,3
–	–	66,75	75,8	5	66 000	38 000	1 920	13
–	–	43,8	69	5	37 500	23 200	1 180	14,3



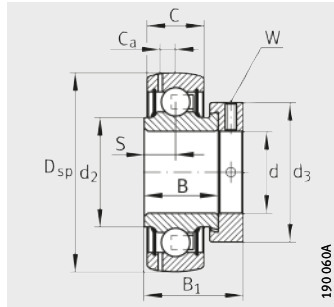
GE..-XL-KLL-B



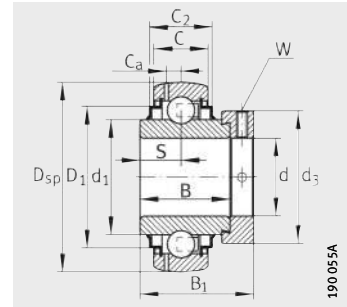
E..-XL-KRR-B, NE..-XL-KRR-B

Radial insert ball bearings with eccentric locking collar

Spherical outer ring



GRAE..XL-NPP-B

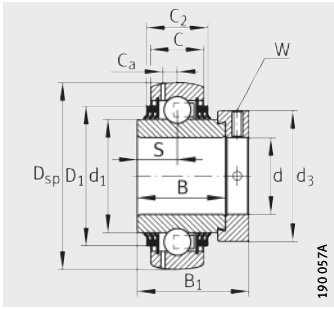


GE..XL-KRR-B, GNE..XL-KRR-B

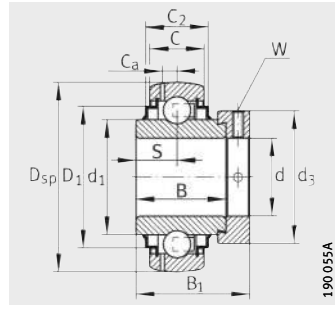
Dimension table (continued) · Dimensions in mm

Designation ¹⁾	Mass m ≈ kg	Dimensions							
		d	D _{sp}	C	C ₂	B	S	d ₁	d ₂
GE55-XL-KRR-B	1,37	55	100	25	29	55,5	27,8	69,8	–
GE55-XL-KTT-B	1,37	55	100	25	29	55,5	27,8	69,8	–
GRAE55-XL-NPP-B	1,06	55	100	25	–	32,5	12	–	66
GE60-XL-KRR-B	1,8	60	110	24	29	61,9	31	76,5	–
GE60-XL-KRR-B-FA101	1,8	60	110	24	29	61,9	31	76,5	–
GE60-XL-KRR-B-FA164	1,8	60	110	24	29	61,9	31	76,5	–
GE60-XL-KTT-B	1,8	60	110	24	29	61,9	31	76,5	–
GNE60-XL-KRR-B	2,97	60	130	33	37,2	52	23	79,4	–
GRAE60-XL-NPP-B	1,4	60	110	24	–	37,1	13,5	–	72
GE65-214-XL-KRR-B ³⁾	2,71	65	125	28	32	48,5	21,5	85,2	–
GE65-214-XL-KRR-B-FA164 ³⁾	2,71	65	125	28	32	48,5	21,5	85,2	–
GE65-214-XL-KTT-B ³⁾	2,71	65	125	28	32	48,5	21,5	85,2	–
GE70-XL-KRR-B	2,15	70	125	28	32	48,5	21,5	85,2	–
GE70-XL-KRR-B-FA101	2,15	70	125	28	32	48,5	21,5	85,2	–
GE70-XL-KRR-B-FA164	2,15	70	125	28	32	48,5	21,5	85,2	–
GE70-XL-KTT-B	2,15	70	125	28	32	48,5	21,5	85,2	–
GNE70-XL-KRR-B	3,81	70	150	37	41	58	26	92,2	–
GE75-XL-KRR-B	2,14	75	130	28	30,5	49,5	21,5	90	–
GE75-XL-KRR-B-FA101	2,14	75	130	28	30,5	49,5	21,5	90	–
GE75-XL-KTT-B	2,14	75	130	28	30,5	49,5	21,5	90	–
GE80-XL-KRR-B	2,79	80	140	30	38	53,2	23,4	97	–
GE80-XL-KRR-B-AH01-FA164	2,95	80	140	30	38	53,2	23,4	97	–
GE80-XL-KTT-B	2,79	80	140	30	38	53,2	23,4	97	–
GNE80-XL-KRR-B ⁴⁾	7,1	80	170	41	51	73	34	109	–
GE90-XL-KRR-B ⁴⁾	3,56	90	160	32	35	52	23	109,4	–
GE90-XL-KRR-B-FA164 ⁴⁾	3,68	90	160	32	35	52	23	109,4	–
GNE90-XL-KRR-B ⁴⁾	8,07	90	190	45	52,6	77,5	35,5	122,2	–
GE100-XL-KRR-B ⁴⁾	5	100	180	36	39	57,5	25,5	122,2	–
GNE100-XL-KRR-B ⁴⁾	11,41	100	215	49	59,4	86	39,5	137,1	–
GE120-XL-KRR-B ⁴⁾	7,49	120	215	40	45	63,5	28,5	146,4	–

1) Permissible speeds of radial insert ball bearings: see page 148.
 2) Factor f₀ for determining equivalent bearing load, see table, page 40.
 3) Alternative ball set 6214.
 4) Lubrication groove in outer ring.



GE..-XL-KTT-B



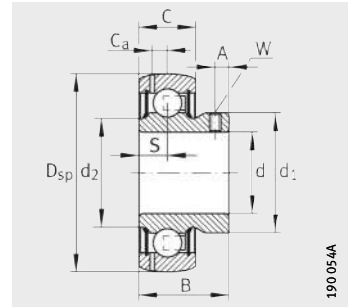
GNE..-XL-KRR-B



				Width across flats W	Basic load ratings		Fatigue limit load C _{ur} N	Factor ²⁾ f ₀
D ₁	C _a	B ₁	d ₃ max.		dyn. C _r N	stat. C _{0r} N		
85,9	7	71,4	76	5	46 000	29 000	1 480	14,3
85,9	7	71,4	76	5	46 000	29 000	1 480	14,3
–	7	48,4	76	5	46 000	29 000	1 480	14,3
94,5	7,2	77,9	84	5	56 000	36 000	1 820	14,3
94,5	7,2	77,9	84	5	56 000	36 000	1 820	14,3
94,5	7,2	77,9	84	5	56 000	36 000	1 820	14,3
94,5	7,2	77,9	84	5	56 000	36 000	1 820	14,3
109	11,2	68	89	5	87 000	52 000	2 650	13,1
–	7,2	53,1	84	5	56 000	36 000	1 820	14,3
109	8,9	66	96	6	66 000	44 000	2 230	14,4
109	8,9	66	96	6	66 000	44 000	2 230	14,4
109	8,9	66	96	6	66 000	44 000	2 230	14,4
109	8,9	66	96	6	66 000	44 000	2 230	14,4
109	8,9	66	96	6	66 000	44 000	2 230	14,4
109	8,9	66	96	6	66 000	44 000	2 230	14,4
109	8,9	66	96	6	66 000	44 000	2 230	14,4
127	12	75,5	102	6	111 000	68 000	3 300	13,2
113	8,5	67	100	6	66 000	44 500	2 240	14,4
113	8,5	67	100	6	66 000	44 500	2 240	14,4
113	8,5	67	100	6	66 000	44 500	2 240	14,4
120	8,8	70,7	108	6	76 000	54 000	2 600	14,6
120	8,8	70,7	108	6	76 000	54 000	2 600	14,6
120	8,8	70,7	108	6	76 000	54 000	2 600	14,6
142,8	13,2	93,6	118	6	131 000	87 000	3 950	13,2
138	10	69,5	118	6	109 000	79 000	3 550	14,5
138	10	69,5	118	6	109 000	79 000	3 550	14,5
161,3	14,3	101	132	6	151 000	107 000	4 600	13,9
155,5	11,2	75	132	6	130 000	93 000	4 000	14,4
182,8	16,7	109,4	145	6	184 000	141 000	5 700	13,8
186,5	12,8	81	152	6	165 000	131 000	5 100	14,8

Radial insert ball bearings with grub screws in inner ring

Spherical outer ring



GAY...XL-NPP-B, AY...XL-NPP-B

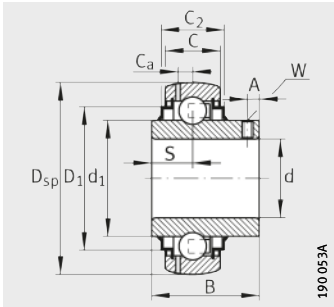
X-life

Dimension table - Dimensions in mm

Designation ¹⁾	Mass m ≈ kg	Dimensions					
		d	D _{sp}	C	C ₂	B	S
GYE12-XL-KRR-B	0,11	12	40	12	16,6	27,4	11,5
AY12-XL-NPP-B	0,1	12	40	12	–	22	6
GAY12-XL-NPP-B	0,1	12	40	12	–	22	6
GAY12-XL-NPP-B-FA164	0,1	12	40	12	–	22	6
GYE15-XL-KRR-B	0,1	15	40	12	16,6	27,4	11,5
AY15-XL-NPP-B	0,09	15	40	12	–	22	6
GAY15-XL-NPP-B	0,09	15	40	12	–	22	6
GAY15-XL-NPP-B-FA164	0,09	15	40	12	–	22	6
GYE16-XL-KRR-B	0,09	16	40	12	16,6	27,4	11,5
GYE17-XL-KRR-B	0,09	17	40	12	16,6	27,4	11,5
AY17-XL-NPP-B	0,08	17	40	12	–	22	6
GAY17-XL-NPP-B	0,08	17	40	12	–	22	6
GYE20-XL-KRR-B	0,14	20	47	14	16,6	31	12,7
AY20-XL-NPP-B	0,13	20	47	14	–	25	7
GAY20-XL-NPP-B	0,13	20	47	14	–	25	7
GYE25-XL-KRR-B	0,19	25	52	15	16,7	34,1	14,3
AY25-XL-NPP-B	0,16	25	52	15	–	27	7,5
GAY25-XL-NPP-B	0,16	25	52	15	–	27	7,5
GYE30-XL-KRR-B	0,31	30	62	18	20,7	38,1	15,9
AY30-XL-NPP-B	0,25	30	62	18	–	30	9
GAY30-XL-NPP-B	0,26	30	62	18	–	30	9
GYE35-XL-KRR-B	0,46	35	72	19	22,5	42,9	17,5
GAY35-XL-NPP-B	0,41	35	72	19	–	35	9,5

¹⁾ Permissible speeds of radial insert ball bearings: see page 148.

²⁾ Factor f_0 for determining equivalent bearing load, see table, page 40.



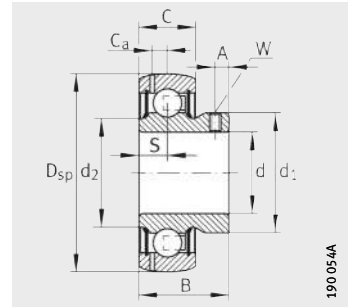
GYE...XL-KRR-B



					Width across flats W	Basic load ratings		Fatigue limit load C _{ur} N	Factor ²⁾ f ₀
d ₁	d ₂	D ₁	C _a	A		dyn. C _r N	stat. C _{0r} N		
23,9	-	31,6	3,4	4	2,5	10 100	4 750	241	13,1
23,9	22,9	-	-	4	2,5	10 100	4 750	241	13,1
23,9	22,9	-	3,4	4	2,5	10 100	4 750	241	13,1
23,9	22,9	-	3,4	4	2,5	10 100	4 750	241	13,1
23,9	-	31,6	3,4	4	2,5	10 100	4 750	241	13,1
23,9	22,9	-	-	4	2,5	10 100	4 750	241	13,1
23,9	22,9	-	3,4	4	2,5	10 100	4 750	241	13,1
23,9	22,9	-	3,4	4	2,5	10 100	4 750	241	13,1
23,9	-	31,6	3,4	4	2,5	10 100	4 750	241	13,1
23,9	-	31,6	3,4	4	2,5	10 100	4 750	241	13,1
23,9	22,9	-	-	4	2,5	10 100	4 750	241	13,1
23,9	22,9	-	3,4	4	2,5	10 100	4 750	241	13,1
27,6	-	37,4	4	4,5	2,5	13 600	6 600	335	13,1
28,3	26,7	-	-	4,5	2,5	13 600	6 600	335	13,1
28,3	26,7	-	4	4,5	2,5	13 600	6 600	335	13,1
33,8	-	42,5	3,9	5	2,5	14 900	7 800	395	13,8
33,5	30,4	-	-	5	2,5	14 900	7 800	395	13,8
33,5	30,4	-	3,9	5	2,5	14 900	7 800	395	13,8
40,2	-	52	4,7	5,8	3	20 700	11 300	570	13,8
39,4	37,3	-	-	5,8	3	20 700	11 300	570	13,8
39,4	37,3	-	4,7	5,8	3	20 700	11 300	570	13,8
46,8	-	60,3	5,6	6	3	27 500	15 300	770	13,8
46,9	44,5	-	5,6	6	3	27 500	15 300	770	13,8

Radial insert ball bearings with grub screws in inner ring

Spherical outer ring



GAY...XL-NPP-B

X-life

Dimension table (continued) · Dimensions in mm

Designation ¹⁾	Mass m ≈ kg	Dimensions					
		d	D _{sp}	C	C ₂	B	S
GYE40-XL-KRR-B	0,62	40	80	21	23,5	49,2	19
GAY40-XL-NPP-B	0,53	40	80	21	–	39,5	10,5
GYE45-210-XL-KRR-B³⁾	0,8	45	90	22	26,4	51,6	19
GYE45-XL-KRR-B	0,71	45	85	22	26,4	49,2	19
GAY45-XL-NPP-B	0,6	45	85	22	–	41,5	11
GYE50-XL-KRR-B	0,79	50	90	22	26,4	51,6	19
GAY50-XL-NPP-B	0,67	50	90	22	–	43	11
GYE55-XL-KRR-B	1,08	55	100	25	29	55,6	22,2
GYE60-XL-KRR-B	1,46	60	110	24	29	65,1	25,4
GAY60-XL-NPP-B	1,17	60	110	24	–	47	13
GYE65-214-XL-KRR-B⁴⁾	2,25	65	125	28	32	74,6	30,2
GYE70-XL-KRR-B	1,95	70	125	28	32	74,6	30,2
GYE75-XL-KRR-B	2,07	75	130	28	30,5	77,8	33,3
GYE80-XL-KRR-B	2,7	80	140	30	38	82,6	33,3
GYE90-XL-KRR-B⁵⁾	3,93	90	160	32	35	96	39,7

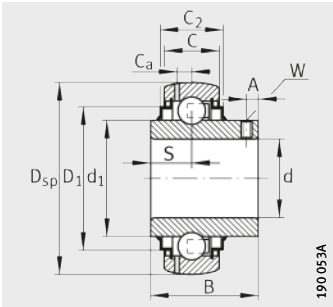
¹⁾ Permissible speeds of radial insert ball bearings: see page 148.

²⁾ Factor f_0 for determining equivalent bearing load, see table, page 40.

³⁾ Alternative ball set 6210.

⁴⁾ Alternative ball set 6214.

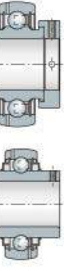
⁵⁾ Lubrication groove in outer ring.



GYE...XL-KRR-B



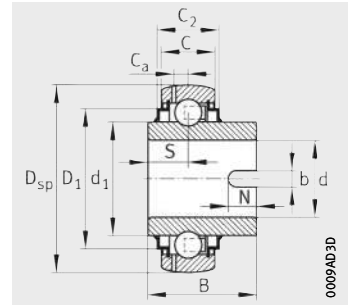
					Width across flats W	Basic load ratings		Fatigue limit load C _{ur} N	Factor ²⁾ f ₀
d ₁	d ₂	D ₁	C _a	A		dyn. C _r N	stat. C _{0r} N		
52,3	–	68,3	6,4	8	4	34 500	19 800	1 010	14
52,4	49,3	–	6,4	8	4	34 500	19 800	1 010	14
62,9	–	77,3	6,9	8,5	4	37 500	23 200	1 180	14,3
57	–	72,3	6,4	8	4	34 500	20 400	1 030	14,3
57	54,3	–	6,4	8	4	34 500	20 400	1 030	14,3
62,8	–	77,3	6,9	8,5	4	37 500	23 200	1 180	14,3
62	59,3	–	6,9	9	4	37 500	23 200	1 180	14,3
69,8	–	85,9	7	9	4	46 000	29 000	1 480	14,3
76,5	–	94,5	7,2	10,1	5	56 000	36 000	1 820	14,3
76	73,6	–	7,2	10	5	56 000	36 000	1 820	14,3
85,2	–	109	8,9	12,1	5	66 000	44 000	2 230	14,4
85,2	–	109	8,9	12	5	66 000	44 000	2 230	14,4
90	–	113	8,5	12,7	5	66 000	44 500	2 240	14,7
97	–	120	8,8	12	5	76 000	54 000	2 600	14,6
109,4	–	138	10	12	6	109 000	79 000	3 550	14,6



			Limiting speed ¹⁾ n _{G grease} min ⁻¹	Basic load ratings		Fatigue limit load C _{ur} N	Factor ²⁾ f ₀
b	t	d ₃ max.		dyn. C _r N	stat. C _{0r} N		
5	5	32	8 700	13 400	7 000	355	13,1
5	5	38	7 500	14 400	8 100	410	13,8
5	5	45	6 200	20 100	11 600	590	13,8
5	5	52	5 500	26 500	15 700	800	13,8
5	5	58	4 850	31 000	19 700	1 000	14
5	5	62	4 500	31 000	20 100	1 020	14,3
5	5	70	4 150	35 000	23 100	1 170	14,3

Radial insert ball bearings with drive slot

Non-locating bearings
Spherical outer ring



GLE..-XL-KRR-B

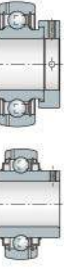


Dimension table - Dimensions in mm

Designation ¹⁾	Mass m ≈ kg	Dimensions						
		d	D _{sp}	C	C ₂	B	S	d ₁
GLE20-XL-KRR-B	0,15	20	47	14	16,6	34,1	15,6	27,6
GLE25-XL-KRR-B	0,19	25	52	15	16,7	34,9	14,7	33,8
GLE30-XL-KRR-B	0,3	30	62	18	20,7	36,5	14,5	40,2
GLE35-XL-KRR-B	0,43	35	72	19	22,5	37,7	15,7	46,8
GLE40-XL-KRR-B	0,57	40	80	21	23,5	42,9	15,9	52,3
GLE45-XL-KRR-B	0,66	45	85	22	26,4	42,9	17,4	57,9
GLE50-XL-KRR-B	0,76	50	90	22	26,4	49,2	19	62,8
GLE60-XL-KRR-B	1,46	60	110	24	29	61,9	24,6	76,5
GLE70-XL-KRR-B	1,9	70	125	28	32	68,2	27	85,2

¹⁾ Permissible speeds of radial insert ball bearings: see page 148.

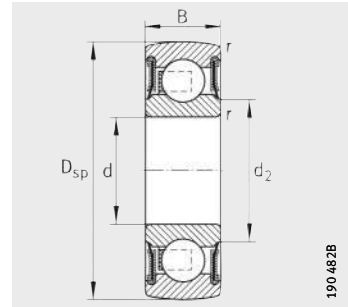
²⁾ Factor f_0 for determining equivalent bearing load, see table, page 40.



				Basic load ratings		Fatigue limit load C_{ur} N	Factor ²⁾ f_0
D_1	C_a	N	b H11	dyn. C_r N	stat. C_{0r} N		
37,4	4	7	7	13 600	6 600	335	13,1
42,5	3,9	8	7	14 900	7 800	395	13,8
52	4,7	8	7	20 700	11 300	570	13,8
60,3	5,6	8	7	27 500	15 300	770	13,8
68,3	6,4	9	7	34 500	19 800	1 010	14
72,3	6,4	9	7	34 500	20 400	1 030	14,3
77,3	6,9	10	7	37 500	23 200	1 180	14,3
95,9	7,2	12	9	56 000	36 000	1 820	14,3
109	8,9	12	9	66 000	44 000	2 230	14,4

Self-aligning deep groove ball bearings

Spherical outer ring
Bore for fit



2..-XL-NPP-B



190.4828

Dimension table - Dimensions in mm

Designation	Mass m ≈ kg	Dimensions					Limiting speed n_G grease min^{-1}	Basic load ratings		Fatigue limit load C_{ur} N	Factor ¹⁾ f_0
		d	D_{sp}	B	d_2	r_{min}		dyn. C_r N	stat. C_{Or} N		
201-XL-NPP-B²⁾	0,04	12	32	10	17,1	0,6	14 600	7 200	3 050	154	12,3
203-XL-NPP-B³⁾	0,06	17	40	12	22,5	0,6	11 100	10 100	4 750	241	13,1
204-XL-NPP-B³⁾	0,11	20	47	14	26,5	1	9 300	13 600	6 600	335	13,1
205-XL-NPP-B³⁾	0,13	25	52	15	30,3	1	8 000	14 900	7 800	395	13,8
206-XL-NPP-B²⁾	0,2	30	62	16	37,4	1	6 700	20 700	11 300	570	13,8
207-XL-NPP-B²⁾	0,29	35	72	17	42,4	1	5 700	27 500	15 300	770	13,8
208-XL-NPP-B²⁾	0,37	40	80	18	48,4	1,1	5 000	34 500	19 800	1 010	14
209-XL-NPP-B²⁾	0,41	45	85	19	53,2	1,1	4 650	34 500	20 400	1 030	14,3
210-XL-NPP-B³⁾	0,46	50	90	20	58,2	1,1	4 300	37 500	23 200	1 180	14,3

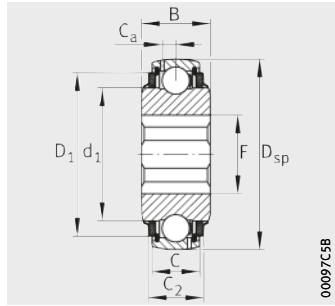
1) Factor f_0 for determining equivalent bearing load, see table, page 40.

2) One-piece seal with moulded seal lip.

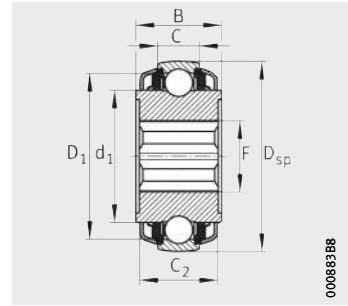
3) Three-piece P seal.

Self-aligning deep groove ball bearings

Spherical outer ring
Square bore



GVK(E)..-KTT-B(-AS2/V)(-AH)



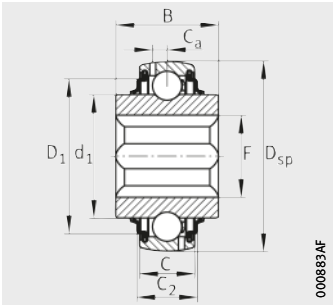
VKE..-KTT-B-2C

Dimension table - Dimensions in mm

Width across flats of shaft d		Designation	Mass m ≈ kg	Dimensions					
				d	D _{sp}	C	C ₂	d ₁	
inch	mm								
–	16,3	GVKE16-205-KRR-B-AS2/V-AH01	0,22	16,3	+0,2 0	52	15	16,5	33,8
		GVKE16-205-KRR-B-2C-AS2/V-AH01	0,24	16,3	+0,2 0	52	15	24,8 ²⁾	33,8
1	25,4	VK100-208-KTT-B-AH10	0,67	25,4	+0,9 +0,6	80	18	25,2	52,3
		GVK100-208-KTT-B-AS2/V	0,74	25,4	+0,9 +0,6	80	21	28,1	52,3
–	28	VKE28-209-KTT-B-GA47/70	0,89	28	+0,9 +0,6	85	22	25,4	57,9
1 ¹ / ₈	28,575	GVK102-208-KTT-B-AH10	0,62	28,575	+0,9 +0,6	80	18	25	52,3
–	30	VKE30-212-KTT-B-2C	2,02	30	+0,13 0	110	24	45,4 ²⁾	74,8
		GVKE30-211-KTT-B-AS2/V	1,23	30	+0,9 +0,6	100	25	27,4	69,7
1 ¹ / ₄	31,75	GVK104-209-KTT-B	0,72	31,75	+0,9 +0,6	85	22	26,3	57,9
–	38	VKE38-211-KTT-B-GA47/70-AH01	1,42	38	+0,9 +0,6	100	25	27,4	69,7
1 ¹ / ₂	38,1	GVK108-211-KTT-B-AS2/V	1,08	38,1	+0,9 +0,6	100	25	27,4	69,7
1 ⁹ / ₁₆	39,6875	GVK109-211-KTT-B	1,07	39,6875	+0,3 0	100	25	28,9	69,8

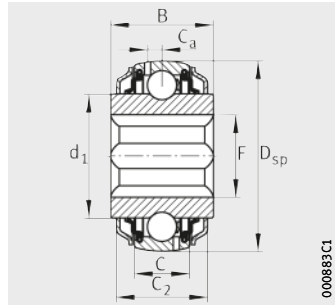
1) Factor f_0 for determining equivalent bearing load, see table, page 40.

2) Dimension for flinger shield.



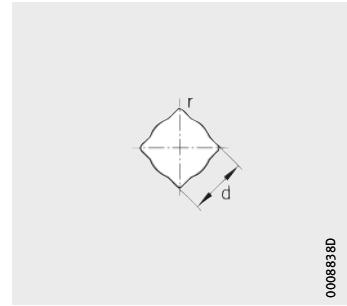
GVKE...KRR-B-AS2/V-AH

000883AF



GVKE...KRR-B-2C-AS2/V-AH

000883C1

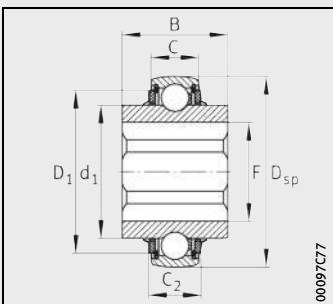


Design of bore

000883BD



F	D ₁	C _a	B	r	Basic load ratings		Fatigue limit load C _{ur} N	Factor ¹⁾ f ₀	Width across flats of shaft d	
					dyn. C _r N	stat. C _{0r} N			inch	mm
					22,4	42,5	3,9	28	0,7	14 900
22,4	–	3,9	28	0,7	14 900	7 800	395	13,8	–	
33,8	68,4	–	36,5	2,5	34 500	19 800	1 010	14	1	25,4
35,4	68,3	6,4	36,5	2,5	34 500	19 800	1 010	14		
37,5	71,7	–	42,9	2,5	34 500	20 400	1 030	14,3	–	28
38,3	67,8	5,8	36,5	2,5	34 500	19 800	1 010	14	1^{1/8}	28,575
41,2	–	–	49,2	2,5	56 000	36 000	1 820	14,3	–	30
40,3	85,3	7,1	36	2,5	46 000	29 000	1 480	14,3		
36,4	72,2	6,4	36,5	2,5	34 500	20 400	1 030	14,3	1^{1/4}	31,75
51,8	85,3	–	55,2	2,5	46 000	29 000	1 480	14,3	–	38
43,9	85,3	7,1	36	2,5	46 000	29 000	1 480	14,3	1^{1/2}	38,1
55,1	85,8	7	36	2,5	46 000	29 000	1 480	14,3	1^{9/16}	39,6875

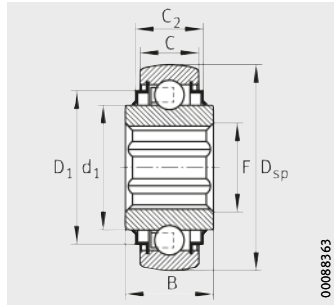


VK...-KTT-B(-AH),
VKE...-KTT-B-G47/70(-AH)

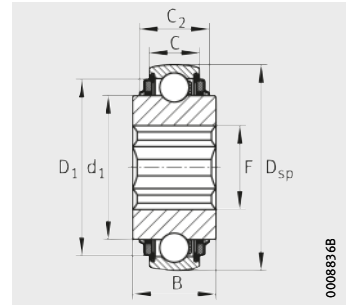
00097C77

Self-aligning deep groove ball bearings

Spherical outer ring
Hexagonal bore



SK...KRR-B(-L402/70)(-AH),
SKE...KRR-B

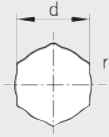


SK...KTT-B(-L402/70)(-AH)

Dimension table - Dimensions in mm

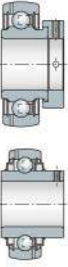
Width across flats of shaft d		Designation	Mass m ≈ kg	Dimensions					
				d	D _{sp}	C	C ₂	d ₁	
inch	mm								
–	16,1	SK010-204-KRR-B	0,12	16,1 ^{+0,15} _{+0,05}	47	14	–	27,6	
–	17	SKE17-204-KRR-B	0,12	17 ^{+0,15} _{+0,05}	47	14	–	28,7	
7/8	22,225	SK014-205-KRR-B	0,2	22,225 ^{+0,15} _{+0,05}	52	15	16,7	33,8	
		SK014-205-KTT-B-L402/70	0,18	22,225 ^{+0,15} _{+0,05}	52	15	19	33,8	
1	25,4	SK100-206-KRR-B-AH11	0,32	25,4 ^{+0,15} _{+0,03}	62	16	18,7	40,2	
1 1/8	28,575	SK102-207-KRR-B-L402/70-AH11	0,38	28,575 ^{+0,13} ₀	72	17	18,7	46,8	
		SK102-207-KRR-B-AH10	0,45	28,575 ^{+0,175} _{+0,03}	72	17	20,5	46,8	
1 1/4	31,75	SK104-207-KRR-B-L402/70-AH12	0,35	31,75 ^{+0,15} _{+0,05}	72	17	18,7	46,8	
		SK104-208-KTT-B-AH10	0,65	31,75 ^{+0,15} _{+0,05}	80	18	25	52,3	
		SK104-208-KTT-B-L402/70-AH10	0,6	31,75 ^{+0,15} _{+0,05}	80	18	25	52,3	
		SK104-207-KTT-B-L402/70	0,45	31,75 ^{+0,15} _{+0,05}	72	19	22,7	46,8	
		SK104-207-KTT-B	0,48	31,75 ^{+0,15} _{+0,05}	72	19	23,7	46,8	
		SK104-210-KTT-B-L402/70	0,98	31,75 ^{+0,15} _{+0,05}	90	22	25,5	62,8	
1 3/8	34,925	SK106-208-KRR-B-L402/70	0,59	34,925 ^{+0,15} ₀	80	20,9	22,4	52,3	
1 1/2	38,1	SK108-209-KRR-B-L402/70-AH11	0,59	38,1 ^{+0,12} ₀	85	19	23,9	57,9	
		SK108-210-KRR-B	0,78	38,1 ^{+0,12} ₀	90	22	26	62,8	
		SK108-210-KRR-B-AH01	0,75	38,1 ^{+0,1} ₀	90	22	27,1	62,8	

¹⁾ Factor f_0 for determining equivalent bearing load, see table, page 40.



00088367

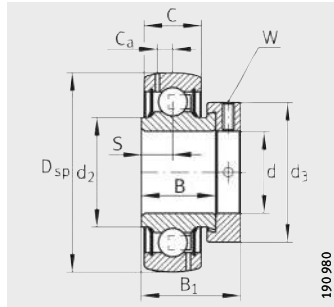
Design of bore



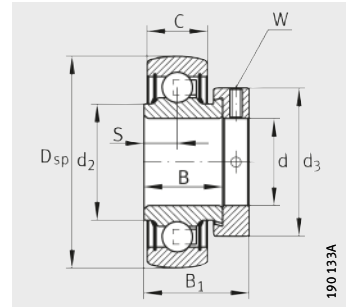
F	D ₁	B	r	Basic load ratings		Fatigue limit load C _{ur} N	Factor ¹⁾ f ₀	Width across flats of shaft d			
				dyn. C _r N	stat. C _{0r} N			inch	mm		
				19,7	–	17,7	0,13	13 600	6 600	335	13,1
20,2	–	17,7	0,13	13 600	6 600	335	13,1	–	17		
26,2	42,6	25,4	0,13	14 900	7 800	395	13,8	⁷ / ₈	22,225		
26,6	42,5	25,4	0,12	14 900	7 800	395	13,8				
30,5	52	24	0,13	20 700	11 300	570	13,8	1	25,4		
34,2	60	25	0,25	27 500	15 300	770	13,8	¹¹ / ₈	28,575		
38	60,3	37,7	0,25	27 500	15 300	770	13,8				
38	60	25	0,12	27 500	15 300	770	13,8	¹¹ / ₄	31,75		
38	68,4	36,5	0,12	34 500	19 800	1 010	14				
38	68,4	36,5	0,12	34 500	19 800	1 010	14				
37,2	60	37,9	0,13	27 500	15 300	770	13,8				
38	60	37,9	0,12	27 500	15 300	770	13,8				
36,8	77,2	36,5	0,12	37 500	23 200	1 180	14,3				
41,5	67,7	36,5	0,12	34 500	19 800	1 010	14			¹³ / ₈	34,925
45,1	71,7	30	0,13	34 500	20 400	1 030	14,3				
43,6	76,7	30	0,13	37 500	23 200	1 180	14,3				
43,7	77,2	32	0,13	37 500	23 200	1 180	14,3				
								¹¹ / ₂	38,1		

Inch size radial insert ball bearings

Spherical outer ring



GRA...-NPP-B-AS2/V



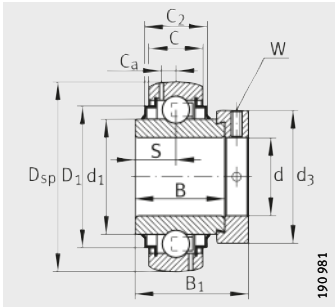
RA...-NPP-B

Dimension table - Dimensions in mm

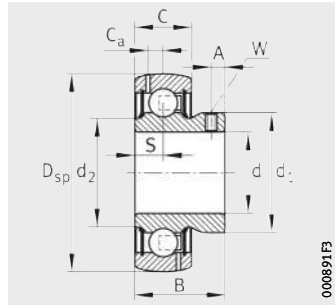
Shaft diameter		Designation ¹⁾	Mass	Dimensions						
				D _{sp}	C	C ₂	B	S	d ₁	d ₂
inch	mm		m							
1/2	12,7	GY1008-KRR-B-AS2/V	0,11	40	12	–	27,3	11,5	23,9	–
5/8	15,875	GRA010-NPP-B-AS2/V	0,11	40	12	–	19	6,5	–	23
		GAY010-NPP-B-AS2/V	0,09	40	12	–	22	6	23	23
		GY1010-KRR-B-AS2/V	0,1	40	12	–	27,3	11,5	23,9	–
		G1010-KRR-B-AS2/V	0,13	40	12	–	27,7	13,9	23,9	–
3/4	19,05	GRA012-NPP-B-AS2/V	0,16	47	14	–	21,4	7,5	–	26,9
		GAY012-NPP-B-AS2/V	0,13	47	14	–	25	7	27,8	26,9
		GY1012-KRR-B-AS2/V	0,15	47	14	16,2	31	12,7	27,6	–
		G1012-KRR-B-AS2/V	0,21	47	14	16,2	34,1	17,1	27,6	–
7/8	22,225	GRA014-NPP-B-AS2/V	0,21	52	15	–	21,4	7,5	–	30,3
		GY1014-KRR-B-AS2/V	0,21	52	15	16,5	34,1	14,3	33,8	–
		G1014-KRR-B-AS2/V	0,27	52	15	16,5	34,9	17,5	33,8	–
15/16	23,8125	GY1015-KRR-B-AS2/V	0,2	52	15	16,5	34,1	14,3	33,8	–
		G1015-KRR-B-AS2/V	0,25	52	15	16,5	34,9	17,5	33,8	–
1	25,4	RA100-NPP-B	0,19	52	15	–	21,4	7,5	–	30,5
		GRA100-NPP-B-AS2/V	0,18	52	15	–	21,4	7,5	–	30,3
		GAY100-NPP-B-AS2/V	0,15	52	15	–	27	7,5	33,6	30,4
		GY1100-KRR-B-AS2/V	0,18	52	15	16,5	34,1	14,3	33,8	–
		G1100-KRR-B-AS2/V	0,23	52	15	16,5	34,9	17,5	33,8	–

¹⁾ Permissible speeds of radial insert ball bearings: see page 148.

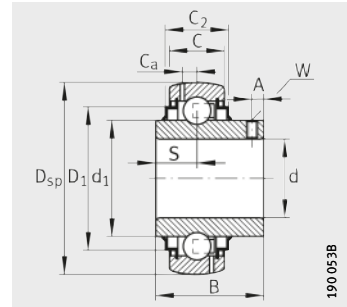
²⁾ Factor f_0 for determining equivalent bearing load, see table, page 40.



G...KRR-B-AS2/V



GAY...NPP-B(-AS2/V)



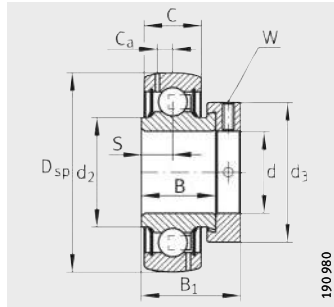
GY...KRR-B-AS2/V



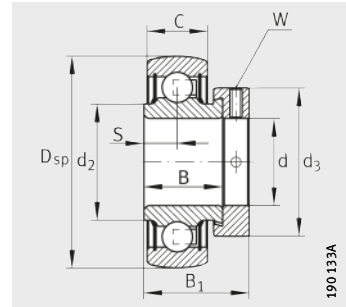
D ₁	C _a	B ₁	d ₃	A	Width across flats W inch	Basic load ratings		Fatigue limit load C _{ur} N	Factor ²⁾ f ₀	Shaft diameter d	
						dyn. C _r N	stat. C _{0r} N			inch	mm
						-	3,4	-	-	4	3/32
-	3,4	28,6	28	-	1/8	10 100	4 750	241	13,1	5/8	15,875
-	3,4	-	-	4	3/32	10 100	4 750	241	13,1		
-	3,4	-	-	4	3/32	10 100	4 750	241	13,1		
-	3,4	37,3	28	-	1/8	10 100	4 750	241	13,1		
-	3,9	31	33	-	1/8	13 600	6 600	335	13,1	3/4	19,05
-	3,9	-	-	4,5	3/32	13 600	6 600	335	13,1		
37,4	3,9	-	-	4,5	3/32	13 200	6 100	310	13,1		
37,4	3,9	43,7	33	-	1/8	13 600	6 600	335	13,1		
-	3,9	31	37,5	-	1/8	14 900	7 800	395	13,8	7/8	22,225
42,5	3,9	-	-	4,9	3/32	14 900	7 800	395	13,8		
42,5	3,9	44,5	37,5	-	1/8	14 900	7 800	395	13,8		
42,5	3,9	-	-	4,9	3/32	14 900	7 800	395	13,8		
42,5	3,9	44,5	37,5	-	1/8	14 900	7 800	395	13,8	1	25,4
-	-	31	37,5	-	1/8	14 900	7 800	395	13,8		
-	3,9	31	37,5	-	1/8	14 900	7 800	395	13,8		
-	3,9	-	-	5	3/32	14 900	7 800	395	13,8		
42,5	3,9	-	-	5	3/32	14 900	7 800	395	13,8		
42,5	3,9	44,5	37,5	-	1/8	14 900	7 800	395	13,8		
42,5	3,9	-	-	5	3/32	14 900	7 800	395	13,8		
42,5	3,9	44,5	37,5	-	1/8	14 900	7 800	395	13,8		

Inch size radial insert ball bearings

Spherical outer ring



GRA...NPP-B-AS2/V



RA...NPP-B

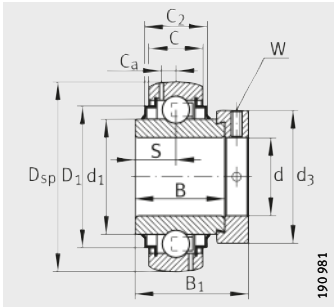
Dimension table (continued) · Dimensions in mm

Shaft diameter		Designation ¹⁾	Mass	Dimensions						
				D _{sp}	C	C ₂	B	S	d ₁	d ₂
inch	mm		m							
			≈ kg							
1 ¹ / ₈	28,575	GRA102-NPP-B-AS2/V	0,32	62	18	–	23,8	9	–	37,3
		G1102-KRR-B-AS2/V	0,4	62	18	20,7	36,5	18,3	40,2	–
		GY1102-KRR-B-AS2/V	0,32	62	18	20	38,1	15,9	40,2	–
1 ³ / ₁₆	30,1625	GRA103-NPP-B-AS2/V	0,3	62	18	–	23,8	9	–	37,3
		G1103-KRR-B-AS2/V	0,37	62	18	20,7	36,5	18,3	40,2	–
		GY1103-KRR-B-AS2/V	0,3	62	18	20	38,1	15,9	40,2	–
1 ¹ / ₄	31,75	RA104-206-NPP-B	0,31	62	18	–	23,8	9	–	37,4
		GRA104-206-NPP-B-AS2/V	0,28	62	18	–	23,8	9	–	37,3
		G1104-206-KRR-B-AS2/V	0,34	62	18	20,7	36,5	18,3	40,2	–
		GY1104-206-KRR-B-AS2/V	0,27	62	18	20	38,1	15,9	40,2	–
		RA104-NPP-B	0,48	72	19	–	25,4	9,5	–	44,6
		GRA104-NPP-B-AS2/V	0,5	72	19	–	25,4	9,5	–	44,5
		GAY104-NPP-B-AS2/V ³⁾	0,44	72	19	–	35	9,5	47,1	44,5
		G1104-KRR-B-AS2/V	0,65	72	19	22,5	37,7	18,8	46,8	–
1 ³ / ₈	34,925	GY1104-KRR-B-AS2/V	0,5	72	19	20,7	42,9	17,5	46,8	–
		GRA106-NPP-B-AS2/V	0,45	72	19	–	25,4	9,5	–	44,5
		G1106-KRR-B-AS2/V	0,54	72	19	22,5	37,7	18,8	46,8	–
1 ⁷ / ₁₆	36,5125	GY1106-KRR-B-AS2/V	0,45	72	19	20,7	42,9	17,5	46,8	–
		GRA107-NPP-B-AS2/V	0,43	72	19	–	25,4	9,5	–	44,5
		GAY107-NPP-B-AS2/V	0,37	72	19	–	35	9,5	47,1	44,5
		G1107-KRR-B-AS2/V	0,5	72	19	20,7	37,7	18,8	46,8	–
		GY1107-KRR-B-AS2/V	0,42	72	19	20,7	42,9	17,5	46,8	–

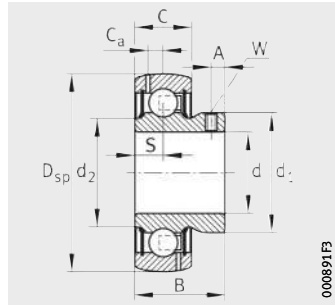
¹⁾ Permissible speeds of radial insert ball bearings: see page 148.

²⁾ Factor f_0 for determining equivalent bearing load, see table, page 40.

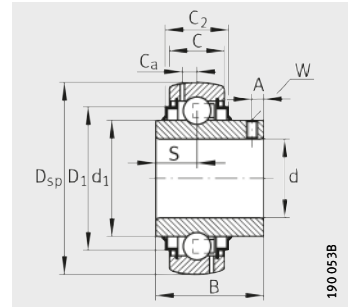
³⁾ Available by agreement.



G...KRR-B-AS2/V



GAY...NPP-B-AS2/V



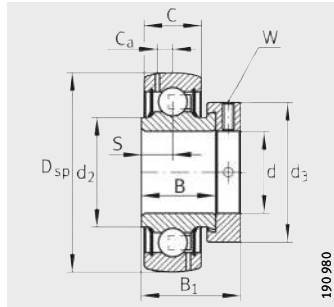
GY...KRR-B-AS2/V



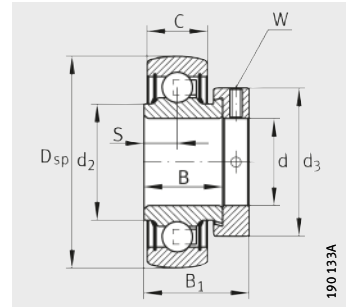
					Width across flats W inch	Basic load ratings		Fatigue limit load C _{ur} N	Factor ²⁾ f ₀	Shaft diameter d	
D ₁	C _a	B ₁	d ₃	A		dyn. C _r N	stat. C _{0r} N			inch	mm
–	5	35,8	44	–	5/32	20 700	11 300	570	13,8	1 1/8	28,575
52	5	48,5	44	–	5/32	20 700	11 300	570	13,8		
51,8	5	–	–	5,6	1/8	20 700	11 300	570	13,8		
–	4,9	35,8	44	–	5/32	20 700	11 300	570	13,8	1 3/16	30,1625
52	5	48,35	44	–	5/32	20 700	11 300	570	13,8		
51,8	5	–	–	5,6	1/8	20 700	11 300	570	13,8		
–	–	35,8	44	–	5/32	20 700	11 300	570	13,8	1 1/4	31,75
–	5	35,8	44	–	5/32	20 700	11 300	570	13,8		
52	5	48,5	44	–	5/32	20 700	11 300	570	13,8		
51,8	5	–	–	5,6	1/8	20 700	11 300	570	13,8		
–	–	39	51	–	3/16	27 500	15 300	770	13,8		
–	5,7	39	51	–	3/16	27 500	15 300	770	13,8		
–	5,7	–	–	8	1/8	27 500	15 300	770	13,8		
60,3	5,7	51,3	51	–	5/32	27 500	15 300	770	13,8		
60,2	5,7	–	–	5,9	1/8	27 500	15 300	770	13,8		
–	5,7	39	51	–	3/16	27 500	15 300	770	13,8		
60,3	5,7	51,3	51	–	3/16	27 500	15 300	770	13,8	1 3/8	34,925
60	5,7	–	–	7,9	1/8	27 500	15 300	770	13,8		
–	5,7	39	51	–	3/16	27 500	15 300	770	13,8		
–	5,7	–	–	8	1/8	27 500	15 300	770	13,8	1 7/16	36,5125
60,3	5,7	51,3	51	–	3/16	27 500	15 300	770	13,8		
60	5,7	–	–	6	1/8	27 500	15 300	770	13,8		
–	5,7	39	51	–	3/16	27 500	15 300	770	13,8		

Inch size radial insert ball bearings

Spherical outer ring



GRA...NPP-B-AS2/V



RA...NPP-B

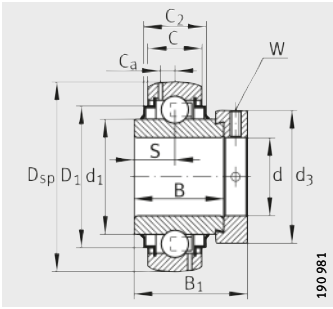
Dimension table (continued) · Dimensions in mm

Shaft diameter		Designation ¹⁾	Mass	Dimensions						
				D _{sp}	C	C ₂	B	S	d ₁	d ₂
d			m							
inch	mm		≈ kg							
1 ¹ / ₂	38,1	RA108-NPP-B	0,62	80	21	–	30,2	11	–	49,4
		GRA108-NPP-B-AS2/V	0,64	80	21	–	30,2	11	–	49,3
		G1108-KRR-B-AS2/V	0,76	80	21	22,5	42,9	21,4	52,3	–
1 ⁵ / ₈	41,275	G1110-KRR-B-AS2/V	0,9	85	22	25,7	42,9	21,4	57,9	–
1 ¹¹ / ₁₆	42,8625	G1111-KRR-B-AS2/V	0,85	85	22	25,7	42,9	21,4	57,9	–
1 ³ / ₄	44,45	G1112-KRR-B-AS2/V	0,81	85	22	25,7	42,9	21,4	57,9	–
		GY1112-KRR-B-AS2/V	0,68	85	22	25,7	49,2	19	57,9	–
1 ¹⁵ / ₁₆	49,2125	GRA115-NPP-B-AS2/V ³⁾	0,75	90	22	–	30,2	11	–	59,3
		G1115-KRR-B-AS2/V	1,01	90	22	26,1	49,2	24,6	62,8	–
		GY1115-KRR-B-AS2/V	0,82	90	22	26	51,6	19	62,8	–
2	50,8	G1200-KRR-B-AS2/V	1,51	100	25	28,4	55,5	27,8	69,8	–
		GY1200-KRR-B-AS2/V	1,18	100	25	28,4	55,6	22,2	69,8	–
2 ³ / ₁₆	55,5625	G1203-KRR-B-AS2/V	1,28	100	25	28,4	55,5	27,8	69,8	–
		GY1203-KRR-B-AS2/V	1,01	100	25	28,4	55,5	22,2	69,8	–
2 ⁷ / ₁₆	61,912	G1207-KRR-B-AS2/V	1,59	110	24	29,3	61,9	31	76,5	–
2 ¹⁵ / ₁₆	74,6125	G1215-KRR-B-AS2/V	2,09	130	28	30,5	49,5	21,5	99	–
		GY1215-KRR-B-AS2/V	2,01	130	28	31,5	77,8	33,4	90	–

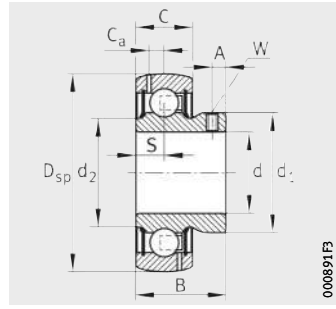
1) Permissible speeds of radial insert ball bearings: see page 148.

2) Factor f₀ for determining equivalent bearing load, see table, page 40.

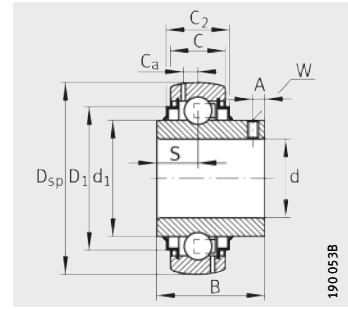
3) Available by agreement.



G...KRR-B-AS2/V



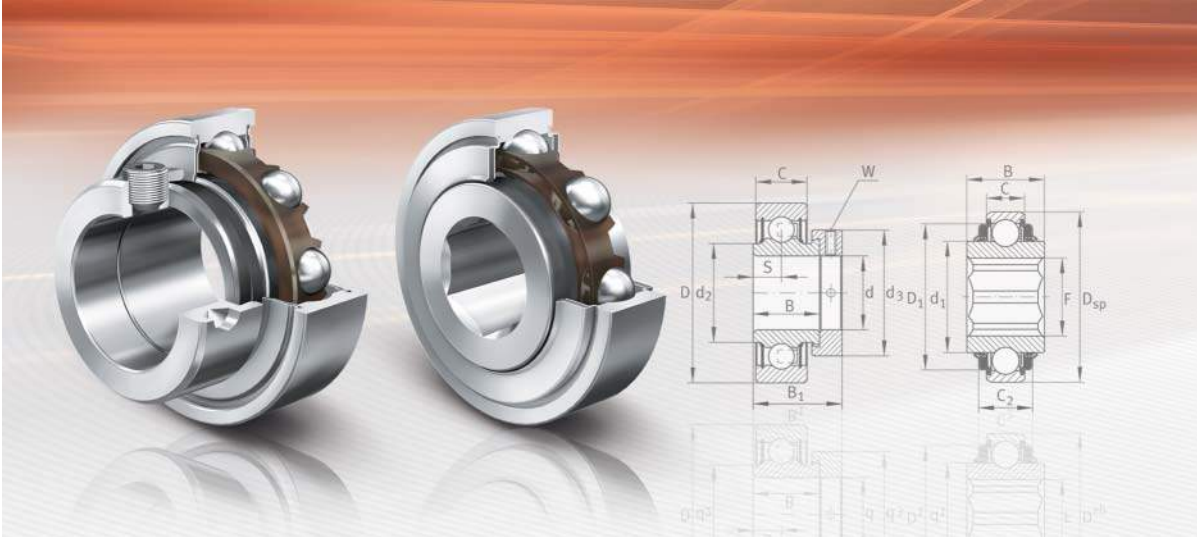
GAY...NPP-B-AS2/V



GY...KRR-B-AS2/V



					Width across flats W inch	Basic load ratings		Fatigue limit load Cur N	Factor ²⁾ f0	Shaft diameter d	
D1	Ca	B1	d3	A		dyn. Cr N	stat. Cor N			inch	mm
-	-	43,8	58	-	3/16	34 500	19 800	1 010	14	1 1/2	38,1
-	6,5	43,8	58	-	3/16	34 500	19 800	1 010	14		
68,3	6,5	56,5	58	-	3/16	34 500	19 800	1 010	14		
72,3	6,4	56,5	63	-	3/16	34 500	20 400	1 030	14,3	1 5/8	41,275
72,3	6,4	56,5	63	-	3/16	34 500	20 400	1 030	14,3	1 11/16	42,8625
72,3	6,4	56,5	63	-	3/16	34 500	20 400	1 030	14,3	1 3/4	44,45
71,7	6,4	-	-	8	5/32	34 500	20 400	1 030	14,3		
-	6,8	43,8	69	-	3/16	37 500	23 200	1 180	14,3	1 15/16	49,2125
77,3	6,8	62,75	69	-	3/16	37 500	23 200	1 180	14,3		
76,7	6,8	-	-	10	5/32	37 500	23 200	1 180	14,3		
85,9	7,1	71,4	76	-	3/16	46 000	29 000	1 480	14,3	2	50,8
85,3	7,1	-	-	9,1	5/32	46 000	29 000	1 480	14,3		
85,3	7,08	71,4	76	-	3/16	46 000	29 000	1 480	14,3	2 3/16	55,5625
85,3	7,1	-	-	10	5/32	46 000	29 000	1 480	14,3		
95,3	7,8	77,9	84	-	3/16	56 000	36 000	1 820	14,3	2 7/16	61,912
112,9	8,56	67	100,5	-	1/4	66 000	44 500	2 240	14,7	2 15/16	74,6125
113	8,5	-	-	12,6	3/16	66 000	44 500	2 240	14,7		



Radial insert ball bearings with cylindrical outer ring

Radial insert ball bearings with cylindrical outer ring

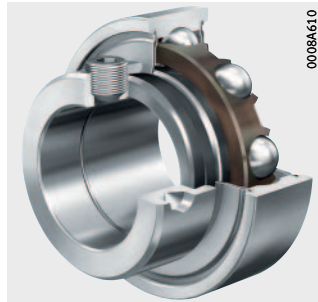
		Page
Product overview	Radial insert ball bearings with cylindrical outer ring	196
Features	X-life	198
	Radial insert ball bearings with eccentric locking collar and slots in outer ring	199
	Inch size designs	199
	Deep groove ball bearings with bore for fit	200
	Deep groove ball bearings with profiled bore.....	201
	Suffixes.....	201
Dimension tables	Radial insert ball bearings with eccentric locking collar	202
	Deep groove ball bearings with extended inner ring, bore for fit	206
	Deep groove ball bearings with extended inner ring, hexagonal bore	208
	Inch size radial insert ball bearings.....	210



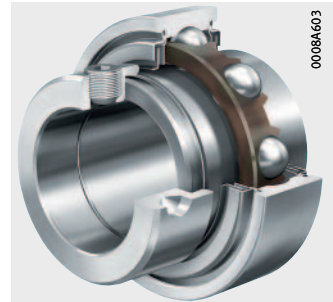
Product overview Radial insert ball bearings with cylindrical outer ring

With eccentric locking collar

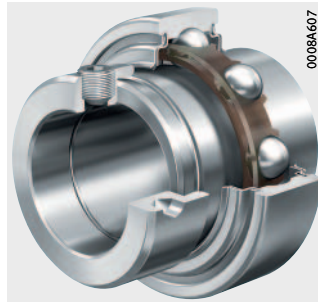
RAE...XL-NPP, RALE...XL-NPP



E...XL-KLL

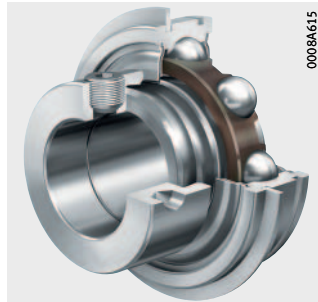


E...XL-KRR



One snap ring in outer ring

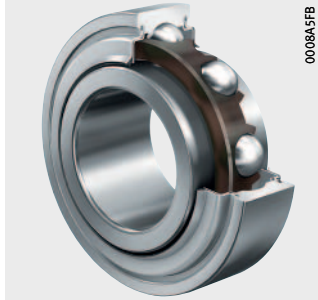
RAE...XL-NPP-NR



**Deep groove ball bearings
with extended inner ring**

With bore for fit

2..-XL-KRR, 2..-XL-KRR-AH

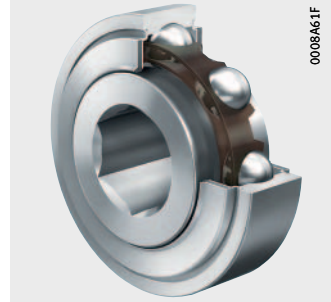


With hexagonal bore

SK..-KRR



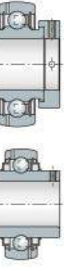
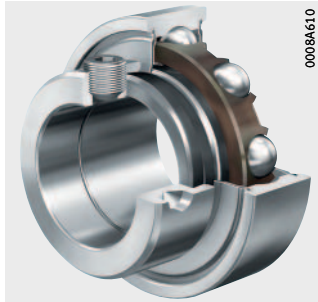
SK..-KTT



**Inch size
radial insert ball bearings**

With eccentric locking collar

RA..-NPP, RAL..-NPP



Radial insert ball bearings with cylindrical outer ring

Features

Radial insert ball bearings with cylindrical outer ring are single row, ready-to-fit units comprising a solid outer ring, an inner ring extended on one or both sides, cages made from plastic and seals of type P or R. Bearings with an inner ring extended on both sides undergo less tilting of the inner ring and therefore run more smoothly.

The radial insert ball bearings are greased and cannot be relubricated.

Radial insert ball bearings are particularly easy to fit and are preferentially suitable for drawn shafts of tolerance classes h6 \oplus to h9 \oplus . They are located on the shaft by means of an eccentric locking collar or a location fit.



The series comparison matrix presents the features of the series in detail, see table, page 146.

X-life

Numerous sizes are supplied in the X-life design. These products are indicated in the dimension tables.

Radial insert ball bearings of X-life quality have, for example, lower roughness Ra and higher geometrical accuracy of the raceways than comparable designs that are not X-life. As a result, these bearings have higher load carrying capacity and longer rating life although their dimensions are identical. In certain applications, this means that a smaller bearing arrangement can be designed.

Radial insert ball bearings of X-life quality have an eccentric locking collar of an improved design and the quantity and distribution of the lubricant has been optimised. Housings ASE have additional crosspieces on the underside. For extreme requirements, the cage and seal material in the high and low temperature designs (suffix FA101) has been significantly improved in comparison with earlier versions.

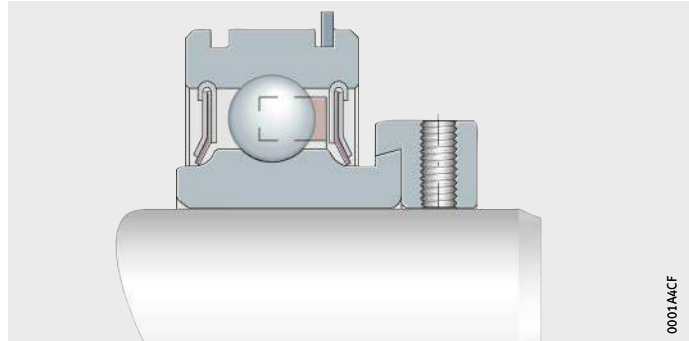
Radial insert ball bearings with eccentric locking collar and slots in outer ring

The basic design of series RAE...XL-NPP-NR is a radial insert ball bearing with an eccentric locking collar and an inner ring extended on one side, *Figure 1*. The outer ring has a cylindrical outside surface and two slots to DIN 616 and ISO 464. The bearings are fitted in cylindrical bores and axially located by easy-to-fit snap rings. The bearing is supplied with one snap ring to DIN 5417 already fitted.



RAE...XL-NPP-NR

Figure 1
Radial insert ball bearing with cylindrical outer ring and two slots in outer ring



Seals The bearings are sealed on both sides using P type seals, see page 119.

Lubrication The radial insert ball bearings are greased and cannot be relubricated.

Inch size designs Some series with an eccentric locking collar are also available with inch size bore dimensions, see page 210.

Radial insert ball bearings with cylindrical outer ring

Deep groove ball bearings with bore for fit

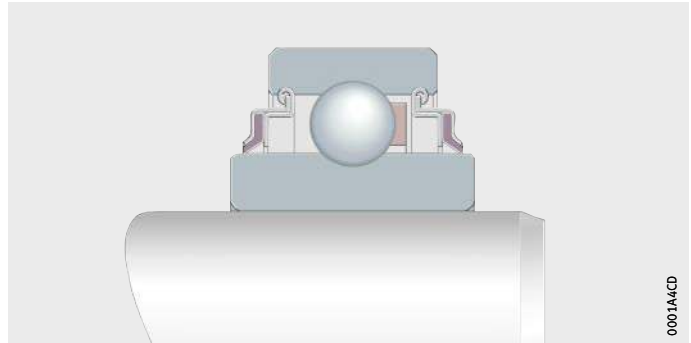
These bearings have a cylindrical outer ring and are fitted in cylindrical bores, *Figure 2*. The inner ring is extended on both sides and is located on the shaft using a location fit. Due to the extended inner ring, additional axial spacer rings are not required.

The concentric seat allows speeds equivalent to those of standard ball bearings, while the load can be either constant or alternating. Smooth running is also achieved.

The tolerance of the inner ring bore corresponds to tolerance class Normal to ISO 492.

2...XL-KRR
2...XL-KRR-AH

Figure 2
Deep groove ball bearing with extended inner ring and bore for fit



Seals

The bearings are sealed on both sides using R type seals, see page 119.

Lubrication

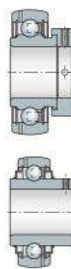
The sheet steel washers extended outwards and angled downwards form a large grease reservoir.

Deep groove ball bearings with profiled bore

Bearings with a profiled bore are used where shafts must transmit very high torques and this is only possible using hexagonal shafts, *Figure 3*. Rotation is prevented by form fit.

These bearings have a cylindrical outer ring and an inner ring that is extended on both sides.

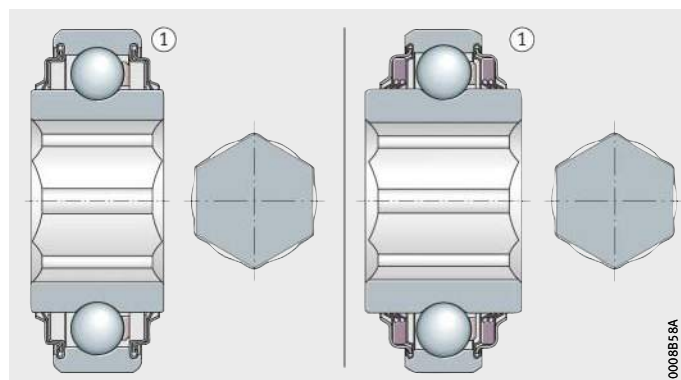
Shafts of tolerance class h11 © are recommended.



SK...KRR
SK...KTT

① Hexagonal bore

Figure 3
Deep groove ball bearings with extended inner ring and profiled bore



Anti-corrosion protection

The bearings have a Corrotect coating.

Seals

The self-aligning deep groove ball bearings are sealed using seals R or T, see page 119.

Lubrication

The bearings contain the maximum quantity of grease.

Suffixes

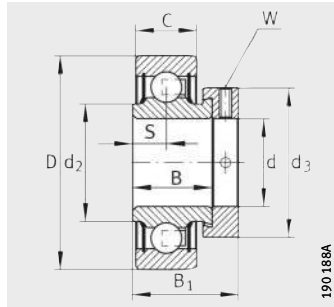
Suffixes for available designs, see table.

Available designs

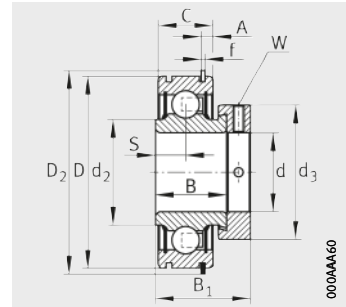
Suffix	Description	Design
FA106	Bearing subjected to special noise testing	Standard
KRR	Lip seals on both sides (R type seal)	
KLL	Labyrinth seals on both sides (L type seal)	
NR	Slot and snap ring for radial insert ball bearing with cylindrical outer ring	
NPP	Lip seals on both sides (P seal)	

Radial insert ball bearings with eccentric locking collar

Cylindrical outer ring



RAE...-XL-NPP-FA106,
RALE...-XL-NPP



RAE...-XL-NPP-NR

Dimension table - Dimensions in mm

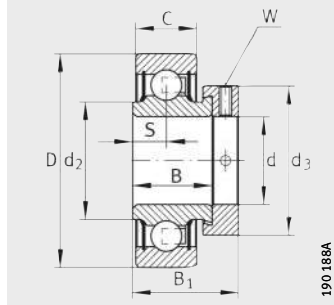
Designation ¹⁾	Mass m ≈ kg	Dimensions							
		d	D	D ₂	C	C ₂	A	f	B
RAE12-XL-NPP-FA106	0,13	12	40	–	12	–	–	–	19
RAE15-XL-NPP-FA106	0,12	15	40	–	12	–	–	–	19
RAE17-XL-NPP-FA106	0,11	17	40	–	12	–	–	–	19
RALE20-XL-NPP-FA106	0,1	20	42	–	12	–	–	–	16,7
RAE20-XL-NPP-FA106	0,17	20	47	–	14	–	–	–	21,4
RAE20-XL-NPP-NR	0,17	20	47	52,7	14	–	3,58 ⁰ _{-0,25}	1,12 ⁰ _{-0,1}	21,4
E20-XL-KLL	0,2	20	47	–	14	16,6	–	–	34,1
E20-XL-KRR	0,2	20	47	–	14	16,6	–	–	34,1
RALE25-XL-NPP	0,13	25	47	–	12	–	–	–	17,5
RAE25-XL-NPP-FA106	0,2	25	52	–	15	–	–	–	21,4
RAE25-XL-NPP-NR	0,2	25	52	57,9	15	–	3,58 ⁰ _{-0,25}	1,12 ⁰ _{-0,1}	21,4
E25-XL-KLL	0,25	25	52	–	15	20,2	–	–	34,9
E25-XL-KRR	0,25	25	52	–	15	16,7	–	–	34,9
RALE30-XL-NPP-FA106	0,18	30	55	–	13	–	–	–	18,5
RAE30-XL-NPP-FA106	0,33	30	62	–	18	–	–	–	23,8
RAE30-XL-NPP-NR	0,33	30	62	67,7	18	–	4,98 ⁰ _{-0,3}	1,7 ⁰ _{-0,1}	23,8
E30-XL-KLL	0,39	30	62	–	18	20,6	–	–	36,5
E30-XL-KRR	0,4	30	62	–	18	20,7	–	–	36,5
RAE35-XL-NPP-FA106	0,54	35	72	–	19	–	–	–	25,4
RAE35-XL-NPP-NR	0,53	35	72	78,6	19	–	4,98 ⁰ _{-0,3}	1,7 ⁰ _{-0,1}	25,4
E35-XL-KLL	0,6	35	72	–	19	25,4	–	–	37,7
E35-XL-KRR	0,61	35	72	–	19	21,7	–	–	37,7

¹⁾ Permissible speeds of radial insert ball bearings: see page 148.

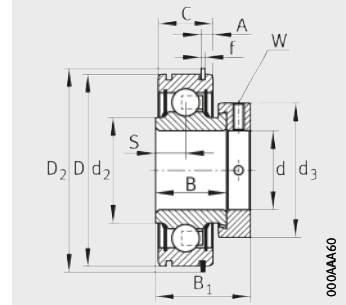
²⁾ Factor f_0 for determining equivalent bearing load, see table, page 40.

Radial insert ball bearings with eccentric locking collar

Cylindrical outer ring



RAE...-XL-NPP(-FA106),
RALE..-XL-NPP



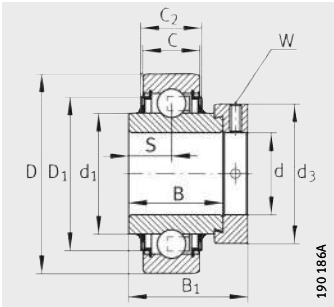
RAE...-XL-NPP-NR

Dimension table (continued) · Dimensions in mm

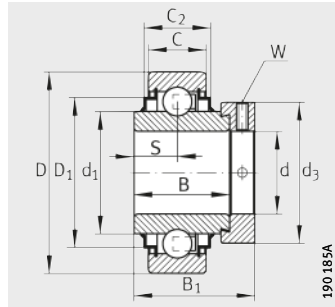
Designation ¹⁾	Mass m ≈ kg	Dimensions							
		d	D	D ₂	C	C ₂	A	f	B
RAE40-XL-NPP-FA106	0,64	40	80	–	21	–	–	–	30,2
RAE40-XL-NPP-NR	0,64	40	80	86,6	21	–	4,98 ⁰ _{-0,3}	1,7 ⁰ _{-0,1}	30,2
E40-XL-KLL	0,76	40	80	–	21	28,1	–	–	42,9
E40-XL-KRR	0,75	40	80	–	21	23,5	–	–	42,9
RAE45-XL-NPP-FA106	0,72	45	85	–	22	–	–	–	30,2
E45-XL-KLL	0,85	45	85	–	22	26,4	–	–	42,9
E45-XL-KRR	0,85	45	85	–	22	26,4	–	–	42,9
RAE50-XL-NPP-FA106	0,79	50	90	–	22	–	–	–	30,2
E50-XL-KLL	1	50	90	–	22	26,4	–	–	49,2
E50-XL-KRR	1	50	90	–	22	26,4	–	–	49,2
RAE60-XL-NPP	1,43	60	110	–	24	–	–	–	37,1
E60-XL-KRR	1,82	60	110	–	24	29	–	–	61,9
E70-XL-KRR	2,45	70	125	–	28	32	–	–	48,5

¹⁾ Permissible speeds of radial insert ball bearings: see page 148.

²⁾ Factor f_0 for determining equivalent bearing load, see table, page 40.



E..-XL-KLL



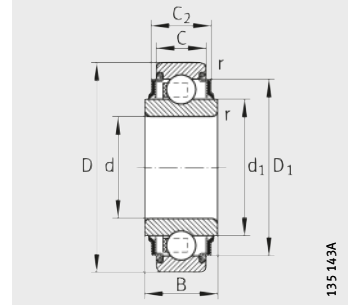
E..-XL-KRR



S	d ₁	d ₂	D ₁	B ₁	d ₃ max.	Width across flats W	Basic load ratings		Fatigue limit load C _{ur} N	Factor ²⁾ f ₀
							dyn. C _r N	stat. C _{0r} N		
11	–	49,4	–	43,8	58	5	34 500	19 800	1 010	14
11	–	49,4	–	43,8	58	5	34 500	19 800	1 010	14
21,4	52,3	–	68,3	56,5	58	5	34 500	19 800	1 010	14
21,4	52,3	–	68,3	56,5	58	5	34 500	19 800	1 010	14
11	–	54,5	–	43,8	63	5	34 500	20 400	1 030	14,3
21,4	57,9	–	72,3	56,5	63	5	34 500	20 400	1 030	14,3
21,4	57,9	–	72,3	56,5	63	5	34 500	20 400	1 030	14,3
11	–	59,4	–	43,8	69	5	37 500	23 200	1 180	14,3
24,6	62,8	–	77,3	62,8	69	5	37 500	23 200	1 180	14,3
24,6	62,8	–	77,3	62,8	69	5	37 500	23 200	1 180	14,3
13,5	–	72	–	53,1	84	5	56 000	36 000	1 820	14,3
31	76,5	–	94,5	77,9	84	5	56 000	36 000	1 820	14,3
21,5	85,2	–	109	66	96	6	66 000	44 000	2 230	14,4

Deep groove ball bearings with extended inner ring

Cylindrical outer ring
Bore for fit



2..-XL-KRR, 2..-XL-KRR-AH..



Dimension table - Dimensions in mm

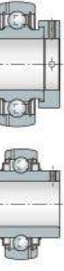
Designation ¹⁾	Mass m ≈ kg	Dimensions								
		d	D	C	C ₂	d ₁	D ₁	B	r _{min}	
203-XL-KRR-AH05 ³⁾	0,09	13 $\begin{matrix} +0,08 \\ -0,05 \end{matrix}$	40	12	12	24,2	40	18,3	0,6	
202-XL-KRR	0,05	15	35	11	11	21,5	28,8	14,4	0,6	
203-XL-KRR-AH02	0,07	16,2 $\begin{matrix} +0,1 \\ 0 \end{matrix}$	40	12	12	24,2	32,6	18,3	0,6	
203-XL-KRR	0,07	17	40	12	12	24,2	32,9	18,3	0,6	
204-XL-KRR	0,12	20	47	14	14	28,7	38,7	17,7	1	
205-XL-KRR	0,16	25	52	15	16,7	33,8	42,6	21	1	
206-XL-KRR	0,24	30	62	16	19,6	40,2	52	24	1	
207-XL-KRR-AH03 ⁴⁾	0,35	35	72	17	19,7	46,8	60,3	25	2	
208-XL-KRR-AH04 ⁴⁾	0,48	38,892	80	21	21,2	52,3	68,2	27,5	1	
208-XL-KRR	0,44	40	80	18	20,5	52,3	68,2	27	1,1	
209-XL-KRR	0,53	45	85	19	26,4	57,9	72,3	30	1,1	
210-XL-KRR	0,58	50	90	20	24	62,8	77,6	30	1,1	
211-XL-KRR	0,85	55	100	21	27,5	69,8	85,9	36	1,5	
212-XL-KRR	1,1	60	110	22	30	76,5	94,7	36	1,5	

1) Internal clearance Group N.

2) Factor f_0 for determining equivalent bearing load, see table, page 40.

3) Greased with L114 (GA47).

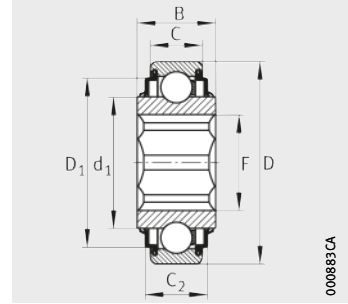
4) With steel cage.



Limiting speed n_G grease min^{-1}	Basic load ratings		Fatigue limit load C_{ur} N	Factor ²⁾ f_0
	dyn. C_r N	stat. C_{0r} N		
11 100	10 100	4 750	241	13,1
12 700	8 100	3 700	187	13,1
11 100	10 100	4 750	241	13,1
11 100	10 100	4 750	241	13,1
9 300	13 600	6 600	335	13,1
8 000	14 900	7 800	395	13,8
6 700	20 700	11 300	570	13,8
5 700	27 500	15 300	770	13,8
5 000	34 500	19 800	1 010	14
5 000	34 500	19 800	1 010	14
4 650	34 500	20 400	1 030	14,3
4 300	37 500	23 200	1 180	14,3
3 900	46 000	29 000	1 480	14,3
3 550	56 000	36 000	1 820	14,3

Deep groove ball bearings with extended inner ring

Cylindrical outer ring
Hexagonal bore

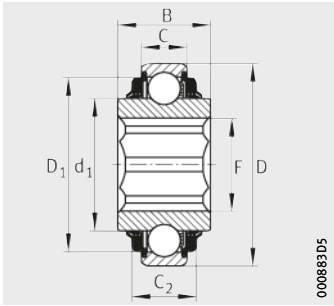


SK...KRR(-L402/70)(-AH)

Dimension table - Dimensions in mm

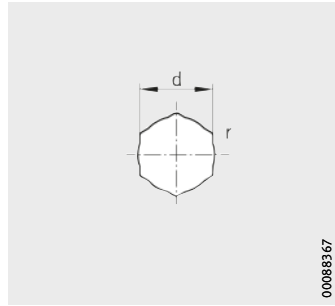
Width across flats of shaft d		Designation	Mass m ≈ kg	Dimensions			
				d	D	C	C ₂
inch	mm						
7/8	22,225	SK014-205-KRR	0,18	22,225 ^{+0,15} / _{+0,05}	52	15	16,5
1	25,4	SK100-206-KRR-AH11	0,27	25,4 ^{+0,15} / _{+0,05}	62	16	19
1 1/4	31,75	SK104-207-KRR-L402/70-AH12	0,35	31,75 ^{+0,15} / _{+0,05}	72	17	18,7
		SK104-208-KTT-L402/70-AH10	0,62	31,75 ^{+0,15} / _{+0,05}	80	18	25
1 3/4	44,45	SK112-312-KTT-L402/70	2,62	44,45 ^{+0,127} / ₀	130	33	41,3

¹⁾ Factor f₀ for determining equivalent bearing load, see table, page 40.



SK..-KTT-L402/70(-AH)

000883D5



Design of bore

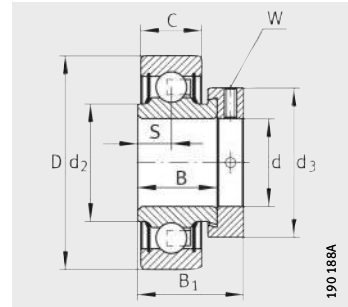
000883E7



d ₁	F	D ₁	B	r	Basic load ratings		Fatigue limit load C _{ur} N	Factor ¹⁾ f ₀	Width across flats of shaft d	
					dyn. C _r N	stat. C _{0r} N			inch	mm
					33,8	26,5	42,5	25,4	0,12	14 900
40,2	30	52	24	0,12	20 700	11 300	570	13,8	1	25,4
46,8	38	60	25	0,12	27 500	15 300	770	13,8	1¹/₄	31,75
52,3	38	68,4	36,5	0,12	34 500	19 800	1 010	14		
79,4	51,6	108,9	48	0,13	87 000	52 000	2 650	13,1	1³/₄	44,45

Inch size radial insert ball bearings

Cylindrical outer ring



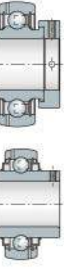
RA..-NPP, RAL..-NPP

Dimension table - Dimensions in mm

Shaft diameter		Designation ¹⁾	Mass	Dimensions				
				D	C	B	B ₁	S
d			m					
inch	mm		≈ kg					
3/4	19,05	RAL012-NPP	0,09	42	12	16,7	24,6	6
7/8	22,225	RA014-NPP	0,19	52	15	21,4	31	7,5
1	25,4	RA100-NPP	0,19	52	15	21,4	31	7,5
1 ¹ / ₈	28,575	RA102-NPP	0,31	62	18	23,8	35,8	9
1 ³ / ₁₆	30,1625	RA103-NPP	0,31	62	18	23,8	35,8	9
1 ¹ / ₄	31,75	RA104-206-NPP	0,31	62	18	23,8	35,8	9
		RA104-NPP	0,48	72	19	25,4	39	9,5
1 ⁷ / ₁₆	36,5125	RA107-NPP	0,48	72	19	25,4	39	9,5
1 ¹ / ₂	38,1	RA108-NPP	0,62	80	21	30,2	43,8	11

1) Permissible speeds of radial insert ball bearings: see page 148.

2) Factor f_0 for determining equivalent bearing load, see table, page 40.



		Width across flats W inch	Basic load ratings		Fatigue limit load C _{ur} N	Factor ²⁾ f ₀	Shaft diameter d	
d ₂	d ₃ max.		dyn. C _r N	stat. C _{0r} N			inch	mm
25,4	30	1/8	10 000	5 000	255	13,9	3/4	19,05
30,5	37,5	1/8	14 900	7 800	395	13,8	7/8	22,225
30,5	37,5	1/8	14 900	7 800	395	13,8	1	25,4
37,4	44	5/32	20 700	11 300	570	13,8	1 1/8	28,575
37,4	44	5/32	20 700	11 300	570	13,8	1 3/16	30,1625
37,4	44	5/32	20 700	11 300	570	13,8	1 1/4	31,75
44,6	51	3/16	27 500	15 300	770	13,8		
44,6	51	3/16	27 500	15 300	770	13,8	1 7/16	36,5125
49,4	58	3/16	34 500	19 800	1 010	14	1 1/2	38,1



**Radial insert ball bearings
with rubber interliner or
steel aligning ring**

Radial insert ball bearings with rubber interliner or steel aligning ring

		Page
Product overview	Radial insert ball bearings with rubber interliner or steel aligning ring	214
Features	X-life	215
	Radial insert ball bearings with rubber interliner	216
	Radial insert ball bearings with steel aligning ring	217
	Suffixes	217
Dimension tables	Radial insert ball bearings with rubber interliner, spherical or cylindrical outside surface of interliner.....	218
	Radial insert ball bearings with steel aligning ring.....	220

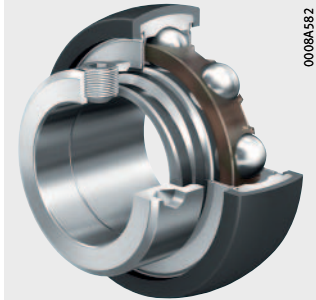


Product overview

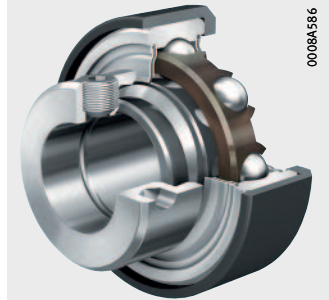
Radial insert ball bearings with rubber interliner or steel aligning ring

With rubber interliner
With spherical or cylindrical
outside surface

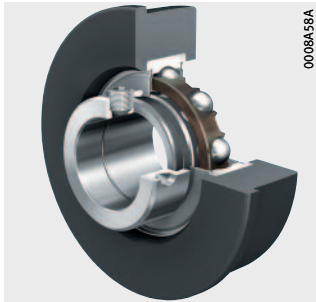
RABRA..-XL-FA106,
RABRB..-XL-FA106



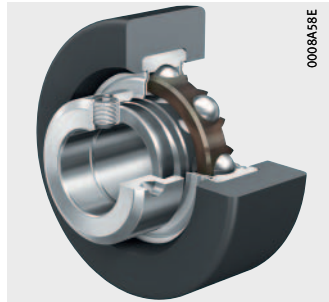
RCRA..-XL-FA106,
RCRB..-XL-FA106



CRB..-XL

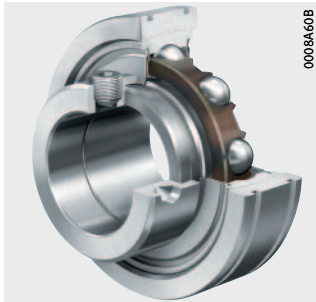


RCSMA..-XL-FA106,
RCSMB..-XL-FA106

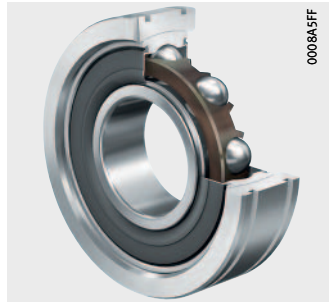


With steel aligning ring

PE..-XL



BE..-XL



Radial insert ball bearings with rubber interliner or steel aligning ring

Features Radial insert ball bearings are particularly easy to fit and are preferentially suitable for drawn shafts of tolerance classes h6 \oplus to h9 \oplus . For non-locating bearings, shafts of tolerance class h7 \oplus are recommended. They are located on the shaft by means of an eccentric locking collar.

X-life Numerous sizes are supplied in the X-life design. These products are indicated in the dimension tables.

Radial insert ball bearings of X-life quality have, for example, lower roughness Ra and higher geometrical accuracy of the raceways than comparable designs that are not X-life. As a result, these bearings have higher load carrying capacity and longer rating life although their dimensions are identical. In certain applications, this means that a smaller bearing arrangement can be designed.

Radial insert ball bearings of X-life quality have an eccentric locking collar of an improved design and the quantity and distribution of the lubricant has been optimised. Housings ASE have additional crosspieces on the underside. For extreme requirements, the cage and seal material in the high and low temperature designs (suffix FA101) has been significantly improved in comparison with earlier versions.



Radial insert ball bearings with rubber interliner or steel aligning ring

Radial insert ball bearings with rubber interliner

Radial insert ball bearings with a rubber interliner are located on the shaft using an eccentric locking collar. The outer ring is encased in a thick-walled NBR interliner, *Figure 1*.

The interliner absorbs vibrations and shocks and thus gives damping of running noises.

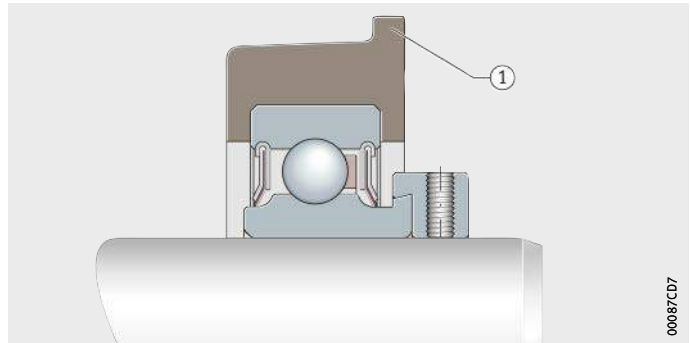
The interliners have a spherical or cylindrical outside surface.

For roll bearing arrangements, one series has a locating shoulder on the rubber ring.

CRB..-XL

① Locating shoulder

Figure 1
Radial insert ball bearing with rubber interliner



Anti-corrosion protection

The inner ring and locking collar have a Corrotect coating and are thus protected against fretting corrosion. This is not valid for series with the radial insert ball bearing RALE..-XL-NPP(-B).

Seals

The bearings are sealed on both sides using P type seals, see page 119.

Lubrication



Bearings with rubber interliners cannot be lubricated.

Note the tube and housing diameters for radial insert ball bearings with rubber interliner:

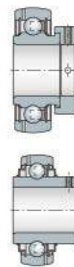
- CRB: tube inside diameter $D - 0,6$ to $-1,6$
- RABR, RCR, RCSM: housing diameter $D - 0,25$ to $-0,35$.

Radial insert ball bearings with steel aligning ring

These bearings are based on radial insert ball bearings with an eccentric locking collar or on self-aligning deep groove ball bearings, but additionally have an axially split outer ring as an aligning ring, *Figure 2*. They are mounted in cylindrical bores and can compensate for static misalignment of the shaft up to $\pm 5^\circ$.

Due to the annular slots in the outer ring to DIN 616, they are highly suitable for sheet metal constructions. In this case, they are axially located using snap rings to DIN 5417.

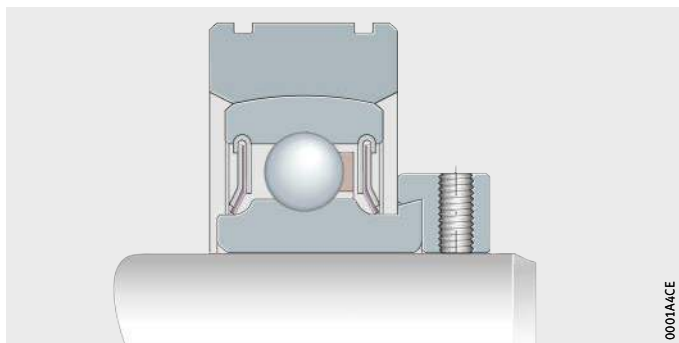
The inner ring is located on the shaft by means of a locking collar in the case of series PE and by a location fit in the case of series BE.



PE...XL

Figure 2

Radial insert ball bearing with steel aligning ring



Anti-corrosion protection

The aligning ring has a Corroprotect coating and is thus protected against fretting corrosion. In the case of series PE...XL, the inner ring and locking collar also have a coating.

Seals

The bearings are sealed on both sides using P type seals, see page 119.

Lubrication

Radial insert ball bearings with an aligning ring cannot be relubricated.



The fit tolerances of the aligning rings are those of the deep groove ball bearings. Select the fit for the shaft and housing such that the outer ring of the radial insert ball bearing can undergo self-alignment.

Suffix

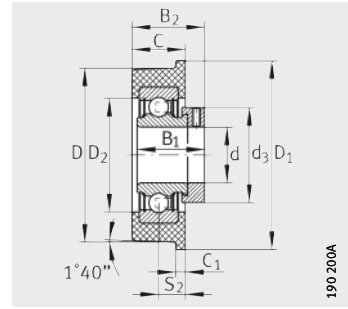
Suffixes for available designs, see table.

Available designs

Suffix	Description	Design
FA106	Bearing subjected to special noise testing	Standard

Radial insert ball bearings with rubber interliner

Spherical or cylindrical outside surface of the interliner



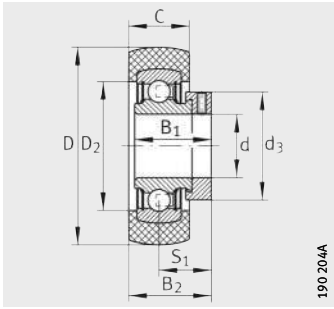
CRB..-XL



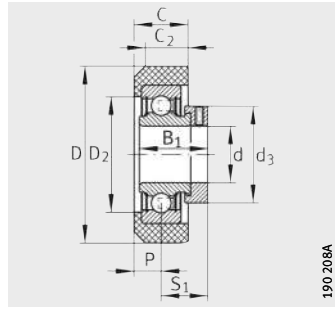
Dimension table - Dimensions in mm

Designation		Mass	Dimensions						
Unit ¹⁾	Radial insert ball bearing ²⁾		d	D	D ₁	C	C ₂	C ₁	S ₁
		m							
		≈ kg							
RABRB12/47-XL-FA106	RAE12-XL-NPP-B-FA106	0,15	12	47,3	–	17,6	–	–	22,1
RABRB15/47-XL-FA106	RAE15-XL-NPP-B-FA106	0,15	15	47,3	–	18	–	–	22,1
RCSMB15/65-XL-FA106	RAE15-XL-NPP-FA106	0,18	15	65,1	–	25,4	–	–	22,1
RCSMB17/65-XL-FA106	RAE17-XL-NPP-FA106	0,18	17	65,1	–	25,4	–	–	22,1
RCRA20/46-XL-FA106	RAE20-XL-NPP-FA106	0,14	20	46	–	18,3	16	–	18,6
RABRB20/52-XL-FA106	RAE20-XL-NPP-B-FA106	0,2	20	52,3	–	17,6	–	–	23,5
RCSMB20/65-XL-FA106	RAE20-XL-NPP-FA106	0,22	20	65,1	–	25,4	–	–	23,5
CRB20/76-XL	RAE20-XL-NPP	0,3	20	77,5	80	25,4	–	5	–
CRB20/83-XL	RAE20-XL-NPP	0,3	20	83,6	87,4	25,4	–	4,8	–
RCRB25/57-XL-FA106	RAE25-XL-NPP-FA106	0,21	25	57,3	–	19,8	17,5	–	23,5
RABRB25/62-XL-FA106	RAE25-XL-NPP-B-FA106	0,24	25	62,2	–	20,8	–	–	23,5
RCSMB25/65-XL-FA106	RAE25-XL-NPP-FA106	0,24	25	65,1	–	25,4	–	–	23,5
CRB25/70-XL	RAE25-XL-NPP	0,32	25	71,5	76	25	–	5	–
CRB25/72-XL	RAE25-XL-NPP	0,32	25	73	80	25	–	5	–
CRB25/83-XL	RAE25-XL-NPP	0,32	25	83,6	87,4	25,4	–	4,8	–
RABRA30/62-XL-FA106	RAE30-XL-NPP-B-FA106	0,3	30	62,2	–	20,8	–	–	20
RCSMA30/65-XL-FA106	RAE30-XL-NPP-FA106	0,32	30	65,1	–	25,4	–	–	20
RABRB30/72-XL-FA106	RAE30-XL-NPP-B-FA106	0,38	30	72,2	–	23	–	–	26,7
CRB30/83-XL	RAE30-XL-NPP	0,41	30	83,6	87,4	28	–	4,8	–
CRB30/92-XL	RAE30-XL-NPP	0,41	30	93	98	28	–	5	–
RABRB35/80-XL-FA106	RAE35-XL-NPP-B-FA106	0,62	35	80,2	–	24	–	–	29,4
CRB35/110-XL	RAE35-XL-NPP	0,61	35	112,3	120	30	–	5	–
RABRB40/85-XL-FA106	RAE40-XL-NPP-B-FA106	0,73	40	85	–	27	–	–	32,7
RABRB50/100-XL-FA106	RAE50-XL-NPP-B-FA106	0,92	50	100,2	–	30	–	–	32,7

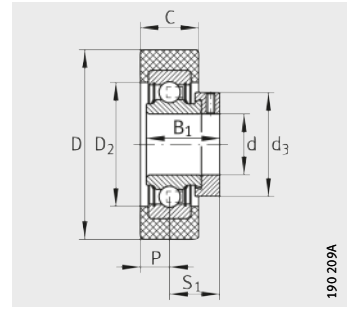
- 1) Operating temperature from –20 °C to +85 °C.
- 2) Permissible speeds of radial insert ball bearings: see page 148.
- 3) Factor f_0 for determining equivalent bearing load, see table, page 40.
- 4) Also available by agreement in NBR80.



RABRA...XL-FA106,
RABRB...XL-FA106



RARA...XL-FA106,
RARB...XL-FA106

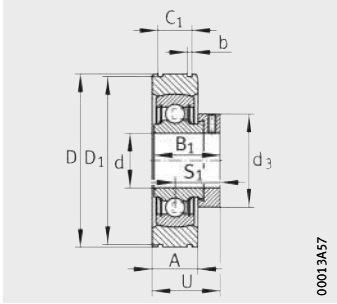


RCSMA...XL-FA106,
RCSMB...XL-FA106



D ₂	B ₁	P	d ₃ max.	S ₂	B ₂	Rubber ring		Basic load ratings		Fatigue limit load	Factor ³⁾ f ₀
						Hard-ness Shore A °	Load carrying capacity C _G N	dyn. C _r N	stat. C _{0r} N	C _{ur} N	
33,5	28,6	–	28,4	–	30,9	70	840	10 100	4 750	241	13,1
33,5	28,6	–	28,4	–	31,1	70	840	10 100	4 750	241	13,1
35	28,6	12,7	28,4	–	–	70	900	10 100	4 750	241	13,1
35	28,6	12,7	28,4	–	–	70	900	10 100	4 750	241	13,1
35	24,5	10	30	–	–	70	900	10 000	5 000	255	13,9
39	31	–	33	–	32,3	70	1 160	13 600	6 600	335	13,1
40	31	12,7	33	–	–	70	1 200	13 600	6 600	335	13,1
40	31	–	33	12,5	36	80	750	13 600	6 600	335	13,1
40	31	–	33	12,7	36,2	80	750	13 600	6 600	335	13,1
44,5	31	9,8	37,5	–	–	70	1 400	14 900	7 800	395	13,8
44,5	31	–	37,5	–	33,9	70 ⁴⁾	1 390	14 900	7 800	395	13,8
46	31	12,7	37,5	–	–	70	1 400	14 900	7 800	395	13,8
46	31	–	37,5	12,5	36	80	1 000	14 900	7 800	395	13,8
46	31	–	37,5	12,5	36	80	1 000	14 900	7 800	395	13,8
46	31	–	37,5	12,7	36,2	80	1 000	14 900	7 800	395	13,8
47	26,5	–	42,5	–	30,4	70	1 390	14 100	8 300	420	14,8
47,6	26,5	15	42,5	–	–	70	1 400	14 100	8 300	420	14,8
54	35,8	–	44	–	38,2	70 ⁴⁾	1 980	20 700	11 300	570	13,8
56	35,8	–	44	14	40,7	80	1 400	20 700	11 300	570	13,8
56	35,8	–	44	14	40,7	80	1 400	20 700	11 300	570	13,8
62	39	–	55	–	41,4	70	2 700	27 500	15 300	770	13,8
64	39	–	55	15	44,4	80	1 500	27 500	15 300	770	13,8
70	43,8	–	58	–	46,3	70 ⁴⁾	3 500	34 500	19 800	1 010	14
80	43,8	–	69	–	47,7	70 ⁴⁾	4 100	37 500	23 200	1 180	14,3

Radial insert ball bearings with steel aligning ring



PE..-XL



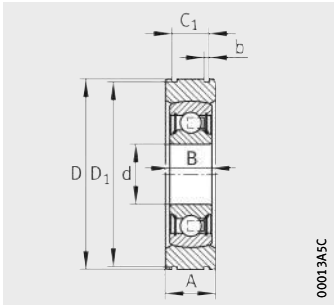
Dimension table - Dimensions in mm

Designation		Mass m ≈ kg	Dimensions				
Unit ²⁾	Radial insert ball bearing		d	D ³⁾	A	C ₁ ⁴⁾ +0,2	b ⁴⁾ +0,3
PE20-XL	RAE20-XL-NPP-B	0,24	20	55	16	11,2	1,35
PE25-XL	RAE25-XL-NPP-B	0,31	25	62	17	11,2	1,9
PE30-XL	RAE30-XL-NPP-B	0,48	30	72	21	14,4	1,9
PE35-XL	RAE35-XL-NPP-B	0,69	35	80	21	14,4	1,9
PE40-XL	RAE40-XL-NPP-B	0,88	40	90	25	15,4	2,7

Dimension table - Dimensions in mm

Designation		Mass m ≈ kg	Dimensions				
Unit ⁵⁾	Radial insert ball bearing		d	D ³⁾	A	C ₁ ⁴⁾ +0,2	b ⁴⁾ +0,3
BE20-XL	204-XL-NPP-B	0,19	20	55	16	11,2	1,35
BE25-XL	205-XL-NPP-B	0,25	25	62	17	11,2	1,9
BE30-XL	206-XL-NPP-B	0,37	30	72	21	14,4	1,9
BE35-XL	207-XL-NPP-B	0,45	35	80	21	14,4	1,9
BE40-XL	208-XL-NPP-B	0,63	40	90	25	15,4	2,7

- 1) Factor f_0 for determining equivalent bearing load, see table, page 40.
- 2) Permissible speeds of radial insert ball bearings RAE..NPP-B: see page 148.
- 3) Before splitting, dimension D corresponds to tolerance class Normal in accordance with ISO 492.
- 4) Annular slot tolerances to DIN 616 (for snap rings to DIN 5417).
- 5) Permissible speeds of self-aligning deep groove ball bearings 2..NPP-B: see page 182.



BE..-XL



					Basic load ratings		Fatigue limit load C_{ur} N	Factor ¹⁾ f_0
$D_1^{4)}$ -0,5	B_1	S_1	d_3 max.	U	dyn. C_r N	stat. C_{0r} N		
52,6	31	23,5	33	31,5	13 600	6 600	335	13,1
59,6	31	23,5	37,5	32	14 900	7 800	395	13,8
68,8	35,8	26,8	44	37,2	20 700	11 300	570	13,8
76,8	39	29,5	55	40	27 500	15 300	770	13,8
86,8	43,8	32,8	58	45,2	34 500	19 800	1 010	14

			Basic load ratings		Fatigue limit load C_{ur} N	Factor ¹⁾ f_0
$D_1^{4)}$ -0,5	B	U	dyn. C_r N	stat. C_{0r} N		
52,6	14	-	13 600	6 600	335	13,1
59,6	15	-	14 900	7 800	395	13,8
68,8	16	-	20 700	11 300	570	13,8
76,8	17	-	27 500	15 300	770	13,8
86,8	18	-	34 500	19 800	1 010	14



Housing units

Flake graphite cast iron housings
Sheet steel housings

Units with flake graphite cast iron or sheet steel housing

Plummer block housing units 226

The single-piece flake graphite cast iron housings have a long or short base and a high load carrying capacity. They can compensate for static misalignment of the shaft.

..... 306

The two-piece sheet steel housings are made from steel strip of deep drawn quality. They are suitable for moderate loads and can compensate for static misalignment of the shaft.

Two-bolt flanged housing units 226

The single-piece, oval flake graphite cast iron housings are available in a narrow or wide version with or without a centring spigot.

..... 306

The predominantly two-piece, oval sheet steel housings are suitable for lightweight constructions with moderate loads. The units cannot be relubricated.

Three-bolt flanged housing units 226

The single-piece, triangular flake graphite cast iron housings have a high load carrying capacity. The units have three through holes.

..... 306

The two-piece sheet steel housings are suitable for lightweight constructions with moderate loads. The flanged housing units GRA and GRRY can be relubricated.

Four-bolt flanged housing units 226

The single-piece flake graphite cast iron housings are available in a square or round version with or without a centring spigot. The units have four through holes.

..... 306

The two-piece, round sheet steel housings are suitable for lightweight constructions with moderate loads. The flanged housing units GRA can be relubricated.

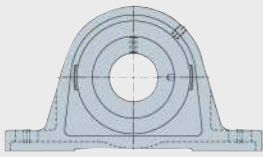
Take-up housing units 226

The single-piece flake graphite cast iron housings have guide slots on both sides, guide surfaces on both sides or additionally a sheet steel guide tube. They are used where shafts must undergo substantial displacement travel.

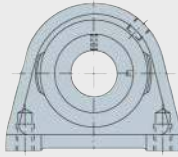
..... 306

The two-piece sheet steel housings are suitable for lightweight constructions with moderate loads. The units cannot be relubricated.

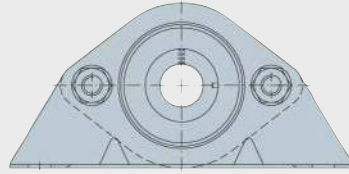
0008E47B



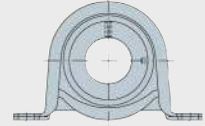
ASE
SAO



SHE



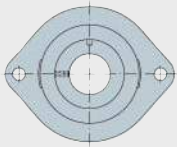
GEH...PBS



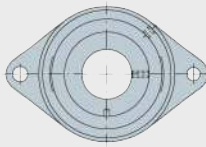
GEH...BT



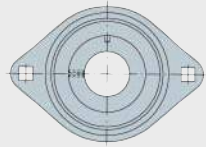
0008E483



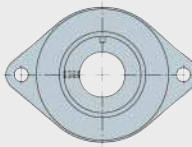
LCTE
GLCTE



CJT
CFT
CJTZ

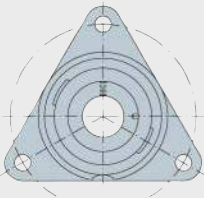


FLAN...MST
FLAN...LST
FLAN...CS(LT)

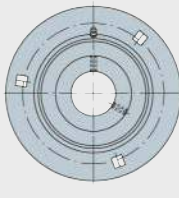


FLAN...RCSMF
GRG...RCSM

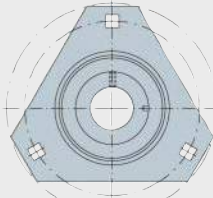
0008E488



CFTR

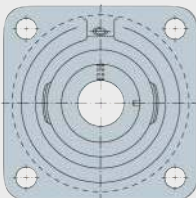


FLAN...MSA
FLAN...MSB

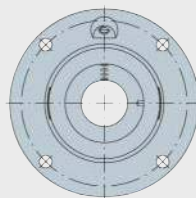


FLAN...LSTR
FLAN...MSTR

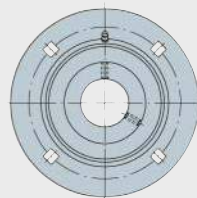
0008E49C



CJ
CJO
CF

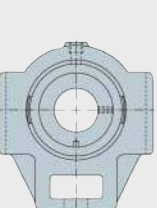


ME
MEO
FE

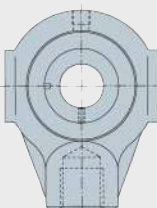


FLAN...MSA
FLAN...MSB

0008E490



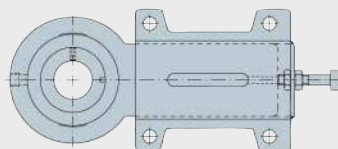
TUE
TUEO



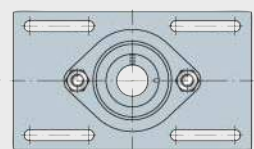
HE



SFT



HUE
GEH...HUSE



GEH...MSTU



Housing units with flake graphite cast iron housing

Plummer block housing units

Flanged housing units

Take-up housing units

Housing units with flake graphite cast iron housing

	Page
Product overview	Housing units with flake graphite cast iron housing..... 229
Matrix	Possible combinations of radial insert ball bearings with cast iron housings..... 234
Features	X-life 236 Plummer block housing units..... 236 Flanged housing units 237 Take-up housing units 237 Housing materials 237 Bearing end caps..... 237 Operating temperature 238 Lubrication 238 Corrosion-resistant units 239 Units for high and low temperatures..... 239 Market sectors..... 239 Suffixes..... 239
Design and safety guidelines	Compensation of static misalignments..... 240 Speed limits for radial insert ball bearings 240 Load carrying capacity of housings 241 Design of adjacent construction..... 241 Bearing end caps..... 242
Accuracy	Dimensional tolerances 243
Dimension tables	Plummer block housing units, with long base, eccentric locking collar..... 244 Plummer block housing units, with long base, grub screws in inner ring..... 250 Plummer block housing units, with long base, adapter sleeve or drive slot..... 252 Plummer block housing units, with short base 254



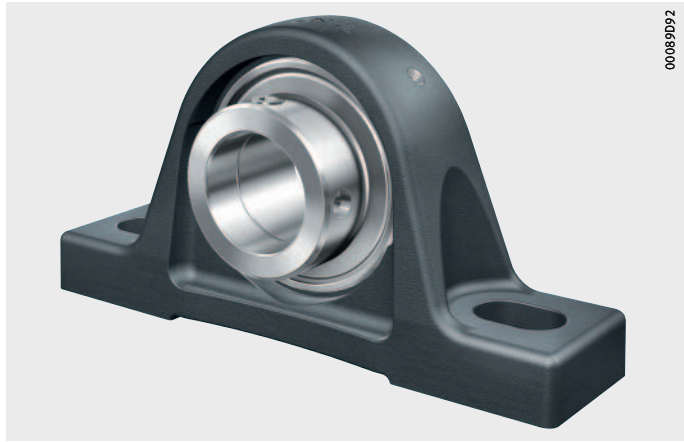
Housing units with flake graphite cast iron housing

	Page
Two-bolt flanged housing units, oval wide version	258
Two-bolt flanged housing units, oval narrow version, eccentric locking collar	262
Two-bolt flanged housing units, oval narrow version, grub screws in inner ring or adapter sleeve	266
Two-bolt flanged housing units, oval narrow version, with centring spigot	270
Three-bolt flanged housing units	272
Four-bolt flanged housing units, square version, eccentric locking collar	274
Four-bolt flanged housing units, square version, grub screws in inner ring or drive slot	280
Four-bolt flanged housing units, round version, with wide centring spigot	284
Four-bolt flanged housing units, round version, with narrow centring spigot	290
Four-bolt flanged housing units, with double row angular contact ball bearing	292
Take-up housing units, guide slots on both sides, hole for threaded rod	294
Take-up housing units, guide surfaces on both sides, with threaded hole	300
Take-up housing units, guide tube, with adjusting screw	302
Take-up housing units, self-aligning	304

Product overview **Housing units with flake graphite cast iron housing**

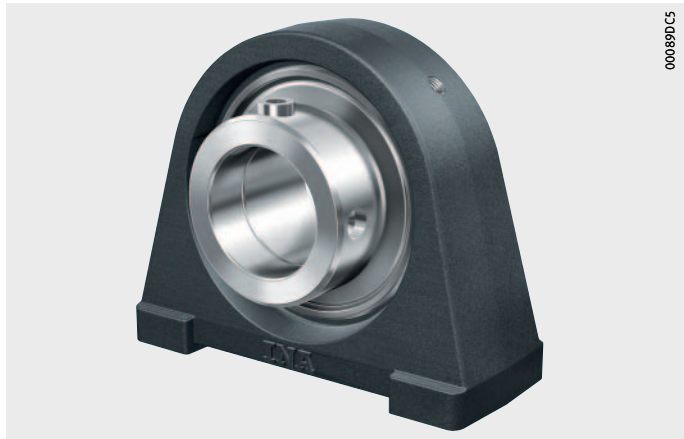
Plummer block housing units With long base

PASE..-XL, PASEY..-XL, RASE..-XL, RASEL..-XL, RASEA..-XL,
RASEY..-XL, TASE..-XL, LASE..-XL, RSAO..-XL



With short base

PSHE..-XL, PSHEY..-XL, RSHE..-XL, RSHEY..-XL, TSHE..-XL



Product overview

Housing units with flake graphite cast iron housing

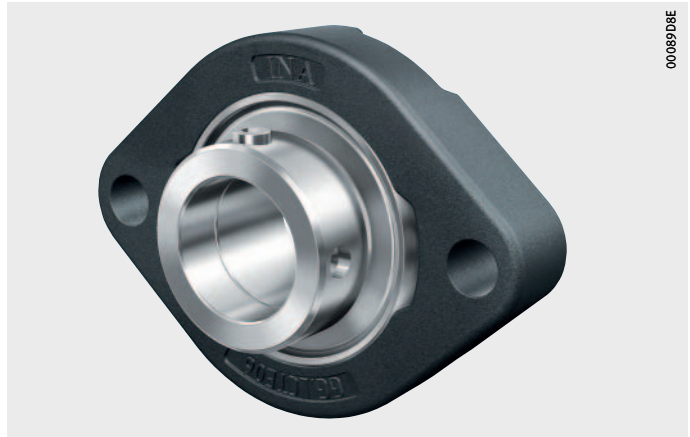
Two-bolt flanged housing units

PCJT..-XL, PCJTY..-XL, RCJTZ..-XL, RCJT..-XL, RCJTA..-XL, RCJTY..-XL,
PCFT..-XL, TCJT..-XL, LCJT..-XL



00089D1A5

FLCTE..-XL, FLCTEY..-XL, GLCTE..-XL



00089D1B6

Three-bolt flanged housing units

PCFTR..-XL



00089D1B8

**Four-bolt
flanged housing units**

PCJ..-XL, PCJY..-XL, RCJ..-XL, RCJY..-XL,
RCJL..-XL, RCJO..-XL, TCJ..-XL, PCF..-XL



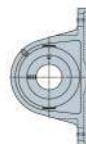
PME(Y)..-XL, RME(Y)..-XL,
RMEO..-XL, TME..-XL



RFE..-XL, TFE..-XL



PCCJ



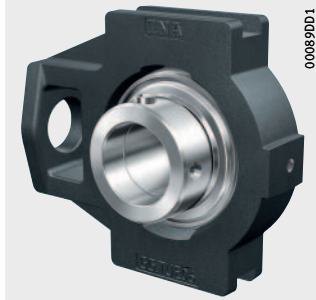
Product overview

Housing units with flake graphite cast iron housing

Take-up housing units

For linear motion or swivel motion

PTUE(Y)..-XL, RTUE(Y)..-XL,
RTUEO..-XL, TTUE..-XL



PHE..-XL, PHEY..-XL, RHE..-XL,
THE..-XL

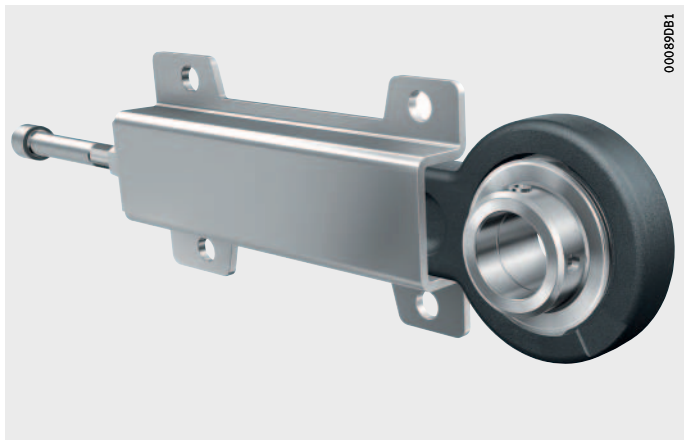


PSFT..-XL



Guide tube, with adjusting screw

PHUSE..-XL

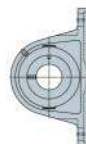


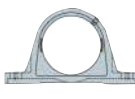




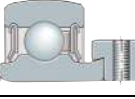
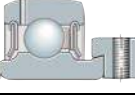
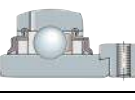
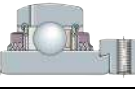
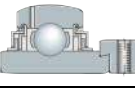
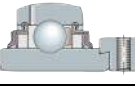
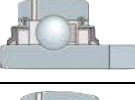
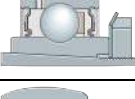
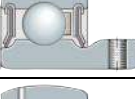
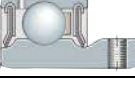
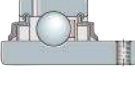



Accessories
End caps

KASK




0008C1F8



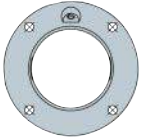
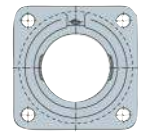
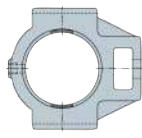
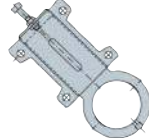
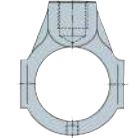

Possible combinations Radial insert ball bearings with cast iron housings		Housing				
		Plummer block housing		Two-bolt flanged housing		Three-bolt flanged housing
						
Designation		ASE	SHE	LCTE¹⁾	CJT	CFTR
Shaft diameter d		SAO²⁾		GLCTE	CFT	
					CJTZ	
RAE...-XL-NPP-B 12 mm – 50 mm				FLCTE...-XL¹⁾ page 258		
GRAE...-XL-NPP-B 12 mm – 60 mm		PASE...-XL page 244	PSHE...-XL page 254	GLCTE...-XL page 258	PC(J, F)T...-XL page 262	PCFTR...-XL page 272
GRA...-NPP-B-AS2/V <i>5/8" – 1 15/16"</i>		Available by agreement	Available by agreement	Available by agreement	Available by agreement	Available by agreement
GE...-XL-KRR-B 17 mm – 120 mm		RASE...-XL page 244	RSHE...-XL page 254		RCJT(Z)...-XL page 262, 270	Available by agreement
G...-KRR-B-AS2/V <i>5/8" – 2 15/16"</i>		Available by agreement	Available by agreement		Available by agreement	
GE...-XL-KTT-B 20 mm – 80 mm		TASE...-XL page 244	TSHE...-XL page 254		TCJT...-XL page 262	Available by agreement
GE...-XL-KLL-B 20 mm – 50 mm		LASE...-XL page 244	Available by agreement		LCJT...-XL page 262	Available by agreement
GNE...-XL-KRR-B²⁾ 30 mm – 100 mm		RSAO...-XL page 246				
GLE...-XL-KRR-B 20 mm – 70 mm		RASEL...-XL page 244	Available by agreement		Available by agreement	Available by agreement
GSH...-XL-2RSR-B 20 mm – 50 mm		RASEA...-XL page 244	Available by agreement		RCJTA...-XL page 262	Available by agreement
AY...-XL-NPP-B 12 mm – 30 mm				FLCTEY...-XL¹⁾ page 258		
GAY...-XL-NPP-B 12 mm – 60 mm		PASEY...-XL page 244	PSHEY...-XL page 254	FLCTEY...-XL¹⁾ page 258	PCJTY...-XL page 262	Available by agreement
GAY...-NPP-B-(AS2/V) <i>1 1/2" – 1 7/16"</i>		Available by agreement	Available by agreement	Available by agreement	Available by agreement	
GYE...-XL-KRR-B 12 mm – 90 mm		RASEY...-XL page 244	RSHEY...-XL page 254		RCJTY...-XL page 262	Available by agreement
GY...-KRR-B-AS2/V <i>1 1/2" – 2 15/16"</i>		Available by agreement	Available by agreement		Available by agreement	

Catalogue range, dimension table, see pages indicated.
Other dimensions and combinations available by agreement.

 Combinations not possible or not advisable.

1) Without lubrication hole.

2) Heavy series.

Four-bolt flanged housing		Take-up housing			
					
ME	CJ	TUE	HUE GEH..-HUSE	HE	SFT
MEO²⁾	CJO²⁾	TUEO²⁾			
FE	CF				
PME..-XL page 284	PCJ..-XL, PCF..-XL page 274	PTUE..-XL page 294	PHUSE..-XL page 302	PHE..-XL page 300	PSFT...-XL page 304
Available by agreement	Available by agreement	Available by agreement	Available by agreement	Available by agreement	Available by agreement
RME..-XL, RFE..-XL page 284, 290	RCJ..-XL page 274	RTUE..-XL page 294	Available by agreement	RHE..-XL page 300	Available by agreement
Available by agreement	Available by agreement	Available by agreement	Available by agreement	Available by agreement	Available by agreement
TME..-XL page 284	TCJ..-XL page 274	TTUE..-XL page 294		THE..-XL page 300	
TFE..-XL page 290			Available by agreement		Available by agreement
Available by agreement	Available by agreement	Available by agreement	Available by agreement	Available by agreement	Available by agreement
RMEO..-XL page 284	RCJO..-XL page 278	RTUEO..-XL page 296			
Available by agreement	RCJL..-XL page 278	Available by agreement	Available by agreement	Available by agreement	Available by agreement
Available by agreement	Available by agreement	Available by agreement	Available by agreement	Available by agreement	Available by agreement
PMEY..-XL page 284	PCJY..-XL page 274	PTUEY..-XL page 294	Available by agreement	PHEY..-XL page 300	Available by agreement
Available by agreement	Available by agreement	Available by agreement	Available by agreement	Available by agreement	Available by agreement
RMEY..-XL page 284	RCJY..-XL page 274	RTUEY..-XL page 294		PHEY..-XL page 300	
Available by agreement	Available by agreement	Available by agreement	Available by agreement	Available by agreement	Available by agreement



Housing units with flake graphite cast iron housing

Features

INA housing units are available as plummer block, flanged and take-up housing units in numerous different designs. The units are ready-to-fit and comprise INA flake graphite cast iron housings in which INA radial insert ball bearings are fitted.

Due to the spherical bearing outer ring and the concave housing bore, housing units can compensate for static angular misalignment of the shaft, see page 240.

The housings are screw mounted on the adjacent construction. Less stringent tolerances are sufficient for the screw mounting surfaces, see page 241.

Cast iron housings are single-piece units with high load carrying capacity, see page 241.



In order to ensure function and reliability under all operating conditions, the bearings and housings are matched to each other with a defined swivel moment after mounting.

All catalogue cast iron units have a mean swivel moment (as standard); further designs with a smaller or greater swivel moment, depending on their application, are available by agreement.

X-life

Numerous sizes are supplied in the X-life design. These products are indicated in the dimension tables.

Radial insert ball bearings of X-life quality have, for example, lower roughness Ra and higher geometrical accuracy of the raceways than comparable designs that are not X-life. As a result, these bearings have higher load carrying capacity and longer rating life although their dimensions are identical. In certain applications, this means that a smaller bearing arrangement can be designed.

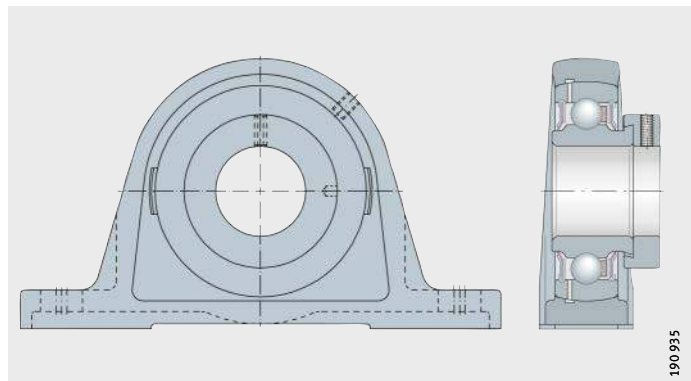
Radial insert ball bearings of X-life quality have an eccentric locking collar of an improved design and the quantity and distribution of the lubricant has been optimised. Housings ASE have additional crosspieces on the underside. For extreme requirements, the cage and seal material in the high and low temperature designs (suffix FA101) has been significantly improved in comparison with earlier versions.

Plummer block housing units

Plummer block housing units have a long or a short base, *Figure 1*. Housings with a long base are screw mounted to the adjacent construction by means of slots, housings with a short base by blind threaded holes.

PASE..-XL

Figure 1
Plummer block housing unit,
flake graphite cast iron housing,
with long base

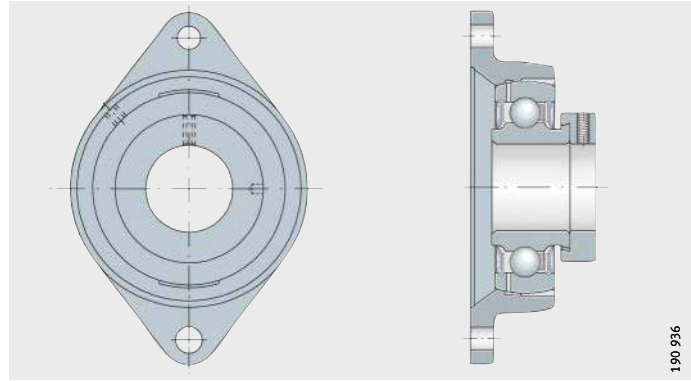


Flanged housing units

Flanged housing units are available as two-bolt, three-bolt and four-bolt units, *Figure 2*. The housings are oval, triangular, square or round in shape. The housings have through holes for location purposes. Some series also have a centring spigot. The centring spigot is mounted in a turned recess in the machine structure. This gives concentric alignment of the housings and relieves the fixing screws of any radial forces.

PCJT...XL

Figure 2
Flanged housing unit,
flake graphite cast iron housing

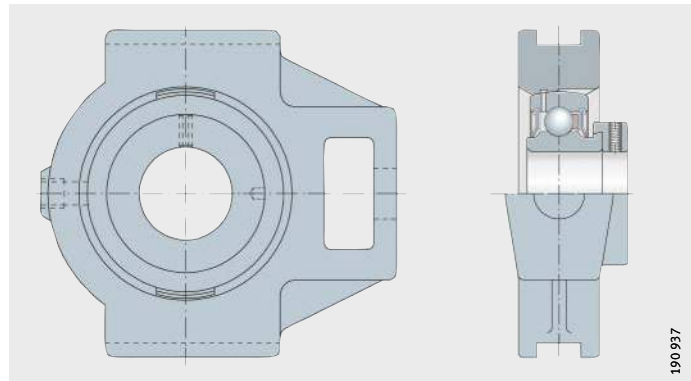


Take-up housing units

Take-up housing units have facilities for sliding or swivel motion, *Figure 3*. They are used where shafts must undergo substantial displacement travel.

PTUE...XL

Figure 3
Take-up housing unit,
flake graphite cast iron housing



Housing materials

The material used for the flake graphite cast iron housings is cast iron in accordance with DIN EN 1561. Housings are also available by agreement in spheroidal graphite cast iron in accordance with DIN EN 1563.

Bearing end caps

In order to cover the exposed ends of rotating shafts, cast iron housings with the suffix N can also be fitted with bearing end caps, see page 242.

Housing units with flake graphite cast iron housing

Operating temperature

Housing units with bearing end caps are suitable for operating temperatures from $-20\text{ }^{\circ}\text{C}$ to $+80\text{ }^{\circ}\text{C}$.

Housing units without bearing end caps are suitable for operating temperatures from $-20\text{ }^{\circ}\text{C}$ to $+100\text{ }^{\circ}\text{C}$. Temporary temperature peaks are possible up to $+120\text{ }^{\circ}\text{C}$.

Lubrication

For the relubrication of radial insert ball bearings, the housing bore has a radial groove and a lubrication hole suitable for conventional taper type lubrication nipples in accordance with DIN 71412. The housing units are supplied with a kit or a lubrication nipple with a thread $\text{Rp}^{1/8}$.

The kit contains a lubrication nipple with a thread M6, a plastic end cap for the lubrication nipple and a plastic plug for the lubrication hole in the housing, *Figure 4*. Other kits are available by agreement.



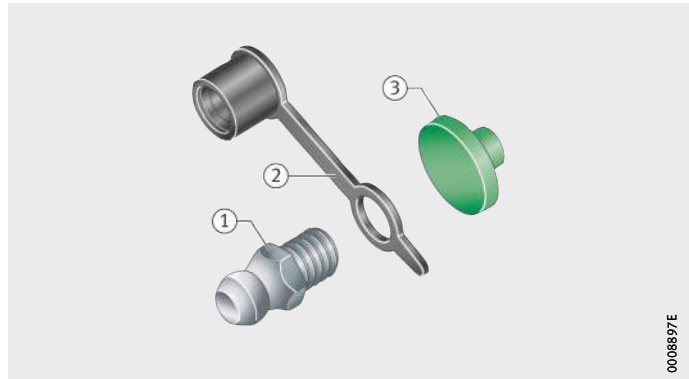
For a lubrication nipple with thread M6, the maximum tightening torque $M_A = 6\text{ Nm}$ must be observed.

In the case of housing units with the suffix FA125, FA101 and FA164, the lubrication nipple with the thread M6 is already fitted.

An additional kit is not included. This is also the case for radial insert ball bearings that have a labyrinth seal KLL and for radial insert ball bearings GLE that are used as non-locating bearings.

- ① Lubrication nipple
- ② Plastic end cap
- ③ Plastic plug

Figure 4
Lubrication kit



Corrosion-resistant units

Corrosion-resistant units are available as plummer block and flanged housing units. The housings and radial insert ball bearings have a Corrotect coating and the suffix FA125, see section Radial insert ball bearings and housing units, corrosion-resistant, page 349.

The units are used if moisture, contaminated water, salt spray mist, weakly alkaline or weakly acidic cleaning agents are present.

Units for high and low temperatures

These units are available as plummer block and flanged housing units. The housings correspond to the cast iron housings described above. In addition, the high temperature design FA164 has a taper type lubrication nipple to DIN 71412 screwed into the housing.

Units for high temperatures have the suffix FA164 and units for the extended temperature range have the suffix FA101, see table, page 239, and table, page 146.

Market sectors

In addition to the comprehensive catalogue range, we also supply housing units for special applications.

Examples include:

- corrosion-resistant flanged housing units with a two-piece housing
 - polypropylene flange, combined with corrosion-resistant high grade steel flange, see page 578
- units with plastic housings combined with radial insert ball bearings in a corrosion-resistant (VA) design or with bearings with a Corrotect coating, see page 426
- other designs with special greases or seals. Please contact us as necessary.

Suffixes

Suffixes for available designs: see table.

Available designs

Suffix	Description	Design
2C	Radial insert ball bearing with flinger shields on both sides	Standard
FA101	High and low temperature design –40 °C to +180 °C	
FA106	Bearing subjected to special noise testing	
FA107	Bearing with lubrication holes on the locating side	
FA125	With Corrotect coating	
FA164	High temperature design up to +250 °C	
N	Cast iron housing with undercut slot for end caps	
OSE	Bearing without clamping element	



Housing units with flake graphite cast iron housing

Design and safety guidelines

The chapter Technical principles brings together the essential guidelines on the design of bearing arrangements, lubrication, mounting and dismounting and the operation of bearings, see page 32.

INA radial insert ball bearings and INA housings are matched to each other and, as a unit, give particularly robust and economical bearing arrangements.

Compensation of static misalignments

Bearings with a spherical outer ring, fitted in housings with a concave bore, can compensate for static misalignment of the shaft, *Figure 5*.

For units with a lubrication groove in the housing and lubrication hole in the radial insert ball bearing, the following applies:

- Up to $\pm 2,5^\circ$, the units can be relubricated.
- Between $\pm 2,5^\circ$ and $\pm 5^\circ$, the possibility of relubrication is dependent on the specific unit. Please contact us in this case.
- Over $\pm 5^\circ$, relubrication is no longer possible.



The units must not be used to support swivelling or tumbling motion.



Figure 5
Compensation
of static shaft misalignment

Speed limits for radial insert ball bearings

The speed limits are dependent on the load, the clearance between the bearing bore and shaft and the friction of the seals in bearings with contact seals, see page 148.

Load carrying capacity of housings

Due to their versatile characteristics, INA housing units can be easily used in almost all industrial sectors.



If bearing arrangements are planned for equipment in which a malfunction could be hazardous to persons or an unplanned stoppage of the machine could cause major disruption, it is essential that you consult us before proceeding with the design.

Radial load carrying capacity

Flake graphite cast iron housings can support the same radial loads as the radial insert ball bearings fitted. The static load carrying capacity C_{0r} of the radial insert ball bearings is stated in the dimension tables.





Where shock loads are present, appropriate safety factors must be applied. In this case, please contact us.

In the case of TUE...XL and TUEO...XL, the maximum radial tensile loading is only $0,25 \times C_{0r}$ (higher loads by agreement only).

Axial load carrying capacity

The axial load carrying capacity of flake graphite cast iron housings is restricted to $0,5 \times C_{0r}$.

Design of adjacent construction

The permissible shaft tolerance is dependent on the speed, load and the radial insert ball bearing fitted. Shafts of the tolerance classes h6  to h9  can be used. Conventional drawn shafts will suffice for most applications.

Screw mounting surfaces

Recommendations for the screw mounting surfaces are as follows:

- roughness of the screw mounting surface max. Ra 12,5 (Rzmax 63)
- geometrical and positional tolerance 0,04/100 concave, spherical not permissible.
- In the event of high loads occurring parallel to the mounting surface of plummer block housing units (in the case of cast iron housings with long base), the use of additional dowel pins to DIN EN ISO 8752 is recommended. In this case, through holes (see centre punch mark for housing ASE) must be applied, see *Figure 1*, page 129.

Fixing screws

The screw connection should be designed in accordance with VDI 2230; friction coefficient $\mu = 0,12$ (90%).

Screws of grade 8.8 or better can be used for fixing.

The maximum tightening torques applicable to this screw grade must not be exceeded even if screws of a higher grade are used.

In principle, we recommend that the screw connection should only be tightened to 70% of the values stated in the standard.

For fixing, hexagonal socket head screws in accordance with DIN EN ISO 4762 or hexagonal socket head screws with a coarse pitch full thread in accordance with DIN EN ISO 4017 should be used. The screws should be combined as a minimum with a washer in accordance with DIN EN ISO 7089 or DIN EN ISO 7090.

Screws and accessories for location are not included in the delivery.



Housing units with flake graphite cast iron housing

Bearing end caps

The ends of shafts can be covered using bearing end caps made from acrylonitrile styrene acrylate copolymer (ASA), see table and *Figure 6*. The caps are suitable for temperatures from $-20\text{ }^{\circ}\text{C}$ to $+80\text{ }^{\circ}\text{C}$. They protect against injury due to rotating shafts and also protect the bearings against contamination.

For location of the caps, housings with the suffix N have an annular slot on the entry side, see page 134.

The series for which end caps are supplied are indicated in the dimension tables. Bearing end caps are accessories and must always be ordered separately.



Housing units with the suffixes FA101 and FA164 are not suitable for combination with bearing end caps.

End caps

Designation	Dimensions mm				
	d	D	H	L	E max.
KASK04	20	48	31	36	30
KASK05	25	54	33	38	30
KASK06	30	63	37	44	35
KASK07	35	73	39	47	39
KASK08	40	82	42	51	42
KASK10	50	92	47	56	46
KASK12	60	112	55	65	55

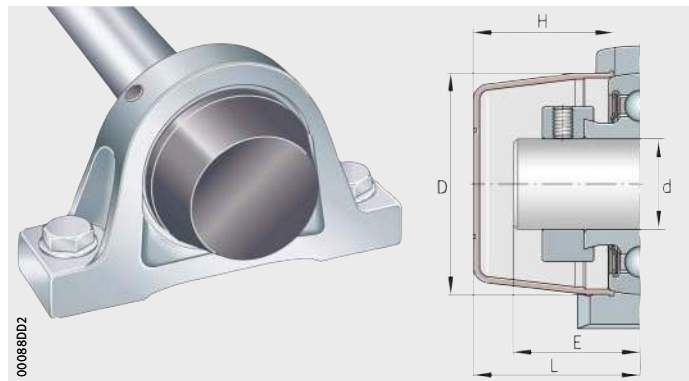


Figure 6
Housing unit with bearing end cap

Accuracy The cast housings correspond predominantly to DIN 626-2 and ISO 3228, insofar as they are described therein.

The accuracy of the radial insert ball bearings fitted must be observed, see page 150.

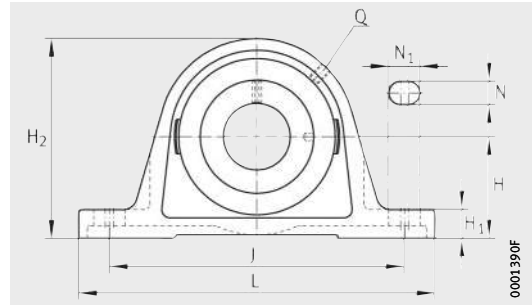
Dimensional tolerances The dimensional tolerances for the machined surfaces of the flake graphite cast iron housings are $\pm 0,25$ mm.

The dimensional tolerances for unmachined as well as machined to unmachined surfaces correspond to ISO 8062-3 (dimensional tolerance grade DCTG 9).



Plummer block housing units

Flake graphite cast iron housing
With long base
Eccentric locking collar



PASE...-XL(-N), RASE...-XL(-N,-FA164), TASE...-XL-N,
LASE...-XL-N, RSAO...-XL

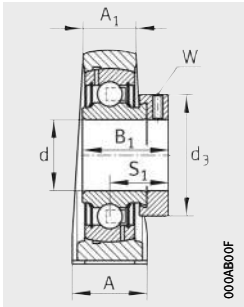


Dimension table - Dimensions in mm

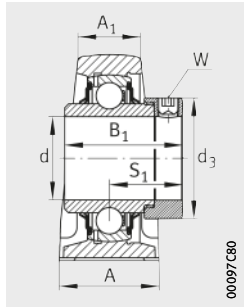
Designation			Mass	Dimensions							
Unit	Housing	Radial insert ball bearing		d	H	J	L	A	A ₁	H ₁	H ₂
			m								
			≈ kg								
PASE12-XL	ASE03	GRAE12-XL-NPP-B	0,46	12	30,2	95	125	30	18	10	57
PASE15-XL	ASE03	GRAE15-XL-NPP-B	0,46	15	30,2	95	125	30	18	10	57
PASE17-XL	ASE03	GRAE17-XL-NPP-B	0,46	17	30,2	95	125	30	18	10	57
RASE17-XL	ASE03	GE17-XL-KRR-B	0,5	17	30,2	95	125	30	18	10	57
PASE20-XL-N	ASE04	GRAE20-XL-NPP-B	0,6	20	33,3	97	130	32	19	14,5	64
LASE20-XL-N²⁾	ASE04	GE20-XL-KLL-B	0,63	20	33,3	97	130	32	19	14,5	64
RASE20-XL-FA164²⁾	ASE04	GE20-XL-KRR-B-FA164	0,64	20	33,3	97	130	32	19	14,5	64
RASE20-XL-N	ASE04	GE20-XL-KRR-B	0,63	20	33,3	97	130	32	19	14,5	64
TASE20-XL-N	ASE04	GE20-XL-KTT-B	0,63	20	33,3	97	130	32	19	14,5	64
PASE25-XL-N	ASE05	GRAE25-XL-NPP-B	0,7	25	36,5	103	130	36	21	14,5	70
LASE25-XL-N²⁾	ASE05	GE25-XL-KLL-B	0,76	25	36,5	103	130	36	21	14,5	70
RASE25-XL-FA164²⁾	ASE05	GE25-XL-KRR-B-FA164	0,75	25	36,5	103	130	36	21	14,5	70
RASE25-XL-N	ASE05	GE25-XL-KRR-B	0,75	25	36,5	103	130	36	21	14,5	70
TASE25-XL-N	ASE05	GE25-XL-KTT-B	0,75	25	36,5	103	130	36	21	14,5	70
PASE30-XL-N	ASE06	GRAE30-XL-NPP-B	1,13	30	42,9	118	158	40	25	17	82
LASE30-XL-N²⁾	ASE06	GE30-XL-KLL-B	1,2	30	42,9	118	158	40	25	17	82
RASE30-XL-FA164²⁾	ASE06	GE30-XL-KRR-B-FA164	1,21	30	42,9	118	158	40	25	17	82
RASE30-XL-N	ASE06	GE30-XL-KRR-B	1,11	30	42,9	118	158	40	25	17	82
TASE30-XL-N	ASE06	GE30-XL-KTT-B	1,2	30	42,9	118	158	40	25	17	82
RSAO30-XL	SAO06	GNE30-XL-KRR-B	1,8	30	50	140	180	50	28	18	95
PASE35-XL-N	ASE07	GRAE35-XL-NPP-B	1,61	35	47,6	126	163	45	27	19	93
LASE35-XL-N²⁾	ASE07	GE35-XL-KLL-B	1,64	35	47,6	126	163	45	27	19	93
RASE35-XL-FA164²⁾	ASE07	GE35-XL-KRR-B-FA164	1,66	35	47,6	126	163	45	27	19	93
RASE35-XL-N	ASE07	GE35-XL-KRR-B	1,69	35	47,6	126	163	45	27	19	93
TASE35-XL-N	ASE07	GE35-XL-KTT-B	1,69	35	47,6	126	163	45	27	19	93
RSAO35-XL	SAO07	GNE35-XL-KRR-B	2,79	35	56	160	210	56	30	20	106

1) To be ordered separately.
The caps are suitable for temperatures from -20 °C to +80 °C.

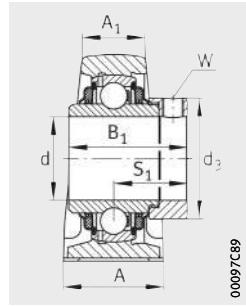
2) With fitted lubrication nipple.



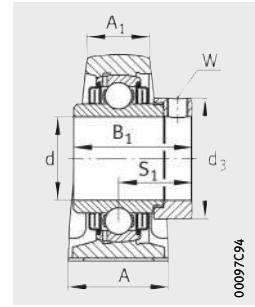
PASE...XL(-N)



RASE..-XL(-N,-FA164),
RSAO...XL



TASE...XL-N



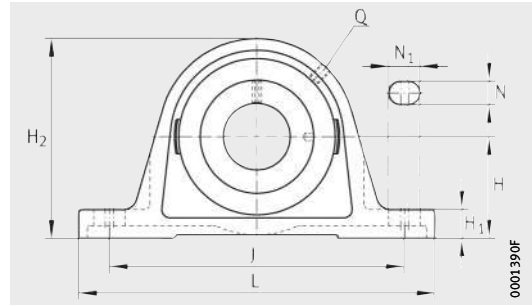
LASE...XL-N

N	N ₁	B ₁	S ₁	Q	d ₃ max.	W	Load carrying capacity Bearing			End cap ¹⁾
							Basic load ratings		Fatigue limit load C _{ur} N	
							dyn. C _r N	stat. C _{0r} N		
11	19	28,6	22,1	M6	28,4	3	10 100	4 750	241	–
11	19	28,6	22,1	M6	28,4	3	10 100	4 750	241	–
11	19	28,6	22,1	M6	28,4	3	10 100	4 750	241	–
11	19	37,4	23,5	M6	28,4	3	10 100	4 750	241	–
11	19	31	23,5	Rp ^{1/8}	33	3	13 600	6 600	335	KASK04
11	19	43,7	26,6	Rp ^{1/8}	33	3	13 600	6 600	335	KASK04
11	19	43,7	26,6	Rp ^{1/8}	33	3	13 600	6 600	335	–
11	19	43,7	26,6	Rp ^{1/8}	33	3	13 600	6 600	335	KASK04
11	19	43,7	26,6	Rp ^{1/8}	33	3	13 600	6 600	335	KASK04
11	19	31	23,5	Rp ^{1/8}	37,5	3	14 900	7 800	395	KASK05
11	19	44,5	27	Rp ^{1/8}	37,5	3	14 900	7 800	395	KASK05
11	19	44,5	27	Rp ^{1/8}	37,5	3	14 900	7 800	395	–
11	19	44,5	27	Rp ^{1/8}	37,5	3	14 900	7 800	395	KASK05
11	19	44,5	27	Rp ^{1/8}	37,5	3	14 900	7 800	395	KASK05
14	22	35,8	26,8	Rp ^{1/8}	44	4	20 700	11 300	570	KASK06
14	22	48,5	30,2	Rp ^{1/8}	44	4	20 700	11 300	570	KASK06
14	22	48,5	30,2	Rp ^{1/8}	44	4	20 700	11 300	570	–
14	22	48,5	30,2	Rp ^{1/8}	44	4	20 700	11 300	570	KASK06
14	22	48,5	30,2	Rp ^{1/8}	44	4	20 700	11 300	570	KASK06
17,5	20,5	50,2	32,7	M6	51	5	31 500	16 700	840	–
14	21	39	29,5	Rp ^{1/8}	55	5	27 500	15 300	770	KASK07
14	21	51,3	32,5	Rp ^{1/8}	55	5	27 500	15 300	770	KASK07
14	21	51,3	32,5	Rp ^{1/8}	55	5	27 500	15 300	770	–
14	21	51,3	32,5	Rp ^{1/8}	55	5	27 500	15 300	770	KASK07
14	21	51,3	32,5	Rp ^{1/8}	55	5	27 500	15 300	770	KASK07
17,5	25,5	51,6	33,3	M6	55	5	39 000	20 900	1 060	–



Plummer block housing units

Flake graphite cast iron housing
 With long base
 Eccentric locking collar



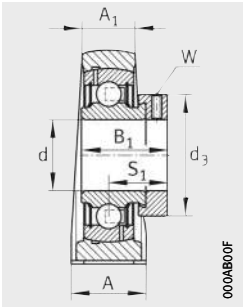
PASE...XL(-N), RASE...XL(-N,-FA164), TASE...XL(-N),
 LASE...XL(-N), RSAO...XL



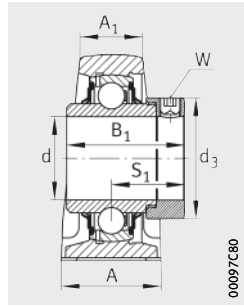
Dimension table (continued) · Dimensions in mm

Designation			Mass	Dimensions							
Unit	Housing	Radial insert ball bearing		d	H	J	L	A	A ₁	H ₁	H ₂
			m								
			≈ kg								
PASE40-XL-N	ASE08	GRAE40-XL-NPP-B	1,84	40	49,2	138	179	48	30	19	99
RSAO40-XL	SAO08	GNE40-XL-KRR-B	3,18	40	60	170	220	60	31	22	116
LASE40-XL-N²⁾	ASE08	GE40-XL-KLL-B	1,97	40	49,2	138	179	48	30	19	99
RASE40-XL-FA164²⁾	ASE08	GE40-XL-KRR-B-FA164	1,97	40	49,2	138	179	48	30	19	99
RASE40-XL-N	ASE08	GE40-XL-KRR-B	1,95	40	49,2	138	179	48	30	19	99
TASE40-XL-N	ASE08	GE40-XL-KTT-B	1,96	40	49,2	138	179	48	30	19	99
PASE45-XL	ASE09	GRAE45-XL-NPP-B	2,15	45	54	150	192	48	32	21,5	107
LASE45-XL²⁾	ASE09	GE45-XL-KLL-B	2,3	45	54	150	192	48	32	21,5	107
RASE45-XL	ASE09	GE45-XL-KRR-B	2,28	45	54	150	192	48	32	21,5	107
TASE45-XL	ASE09	GE45-XL-KTT-B	2,28	45	54	150	192	48	32	21,5	107
PASE50-XL-N	ASE10	GRAE50-XL-NPP-B	2,59	50	57,2	158	200	54	34	21,5	115
LASE50-XL-N²⁾	ASE10	GE50-XL-KLL-B	2,82	50	57,2	158	200	54	34	21,5	115
RASE50-XL-FA164²⁾	ASE10	GE50-XL-KRR-B-FA164	2,82	50	57,2	158	200	54	34	21,5	115
RASE50-XL-N	ASE10	GE50-XL-KRR-B	2,8	50	57,2	158	200	54	34	21,5	115
TASE50-XL-N	ASE10	GE50-XL-KTT-B	2,8	50	57,2	158	200	54	34	21,5	115
RSAO50-XL	SAO10	GNE50-XL-KRR-B	6,1	50	75	212	275	75	39	27	143
PASE55-XL	ASE11	GRAE55-XL-NPP-B	2,79	55	63,5	176	222	60	35	22,5	124,5
RASE55-XL	ASE11	GE55-XL-KRR-B	3,4	55	63,5	176	222	60	35	22,5	124,5
TASE55-XL	ASE11	GE55-XL-KTT-B	3,51	55	63,5	176	222	60	35	22,5	124,5
PASE60-XL-N	ASE12	GRAE60-XL-NPP-B	4,35	60	69,9	190	240	60	42	25	140
RSAO60-XL	SAO12	GNE60-XL-KRR-B	9	60	85	250	330	85	46	32	165
RASE60-XL-FA164²⁾	ASE12	GE60-XL-KRR-B-FA164	4,79	60	69,9	190	240	60	42	25	140
RASE60-XL-N	ASE12	GE60-XL-KRR-B	4,79	60	69,9	190	240	60	42	25	140
TASE60-XL-N	ASE12	GE60-XL-KTT-B	4,77	60	69,9	190	240	60	42	25	140
RASE65-214-XL³⁾	ASE14	GE65-214-XL-KRR-B	6,41	65	79,4	203	260	65	44	27,5	156
TASE65-214-XL³⁾	ASE14	GE65-214-XL-KTT-B	6,41	65	79,4	203	260	65	44	27,5	156

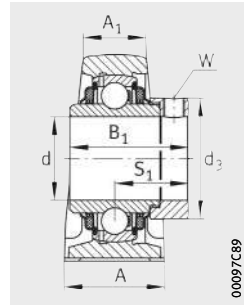
1) To be ordered separately.
 The caps are suitable for temperatures from -20 °C to +80 °C.
 2) With fitted lubrication nipple.
 3) Alternative ball set 6214.



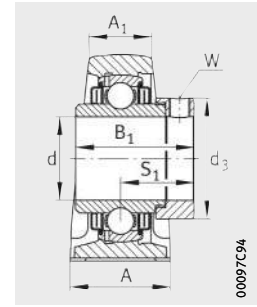
PASE...XL(-N)



RASE..-XL(-N,-FA164),
RSAO...-XL



TASE...XL(-N)



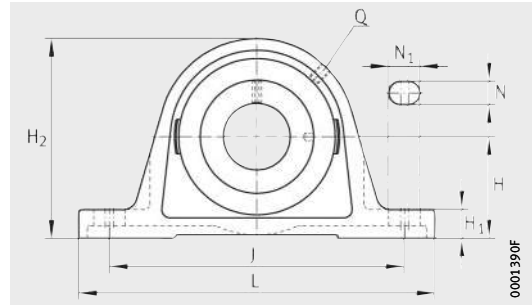
LASE...XL(-N)

N	N ₁	B ₁	S ₁	Q	d ₃ max.	W	Load carrying capacity Bearing			End cap ¹⁾
							Basic load ratings		Fatigue limit load C _{ur} N	
							dyn. C _r N	stat. C _{0r} N		
14	26	43,8	32,8	Rp ^{1/8}	58	5	34 500	19 800	1 010	KASK08
17,5	27,5	54,6	36,6	M6	63	5	47 000	26 000	1 320	-
14	26	56,5	35,1	Rp ^{1/8}	58	5	34 500	19 800	1 010	KASK08
14	26	56,5	35,1	Rp ^{1/8}	58	5	34 500	19 800	1 010	-
14	26	56,5	35,1	Rp ^{1/8}	58	5	34 500	19 800	1 010	KASK08
14	26	56,5	35,1	Rp ^{1/8}	58	5	34 500	19 800	1 010	KASK08
14	29	43,8	32,8	M6	63	5	34 500	20 400	1 030	-
14	29	56,5	35,1	M6	63	5	34 500	20 400	1 030	-
14	29	56,5	35,1	M6	63	5	34 500	20 400	1 030	-
14	29	56,5	35,1	M6	63	5	34 500	20 400	1 030	-
18	23	43,8	32,8	Rp ^{1/8}	69	5	37 500	23 200	1 180	KASK10
18	23	62,8	38,2	Rp ^{1/8}	69	5	37 500	23 200	1 180	KASK10
18	23	62,8	38,2	Rp ^{1/8}	69	5	37 500	23 200	1 180	-
18	23	62,8	38,2	Rp ^{1/8}	69	5	37 500	23 200	1 180	KASK10
18	23	62,8	38,2	Rp ^{1/8}	69	5	37 500	23 200	1 180	KASK10
20	35	66,75	42,15	M6	75,8	5	66 000	38 000	1 920	-
18	30	48,4	36,4	M6	76	5	46 000	29 000	1 480	-
18	30	71,4	43,6	M6	76	5	46 000	29 000	1 480	-
18	30	71,4	43,6	M6	76	5	46 000	29 000	1 480	-
18	28	53,1	39,6	Rp ^{1/8}	84	5	56 000	36 000	1 820	KASK12
25	38	68	45	Rp ^{1/8}	89	5	87 000	52 000	2 650	-
18	28	77,9	46,9	Rp ^{1/8}	84	5	56 000	36 000	1 820	-
18	28	77,9	46,9	Rp ^{1/8}	84	5	56 000	36 000	1 820	KASK12
18	28	77,9	46,9	Rp ^{1/8}	84	5	56 000	36 000	1 820	KASK12
22	28	66	44,5	Rp ^{1/8}	96	6	66 000	44 000	2 230	-
22	28	66	44,5	Rp ^{1/8}	96	6	66 000	44 000	2 230	-



Plummer block housing units

Flake graphite cast iron housing
 With long base
 Eccentric locking collar



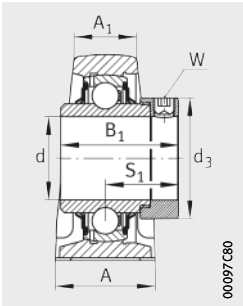
RASE...XL(-FA164), TASE...XL, RSAO...XL



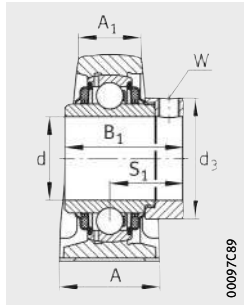
Dimension table (continued) · Dimensions in mm

Designation			Mass m ≈ kg	Dimensions					
Unit	Housing	Radial insert ball bearing		d	H	J	L	A	A ₁
RASE70-XL	ASE14	GE70-XL-KRR-B	6,15	70	79,4	203	260	65	44
RASE70-XL-FA164¹⁾	ASE14	GE70-XL-KRR-B-FA164	6,15	70	79,4	203	260	65	44
TASE70-XL	ASE14	GE70-XL-KTT-B	6,09	70	79,4	203	260	65	44
RSAO70-XL	SAO14	GNE70-XL-KRR-B	11	70	95	282	360	90	54
RASE75-XL	ASE15	GE75-XL-KRR-B	6,58	75	82,5	210	265	66	48
RASE75-XL-FA164¹⁾	ASE15	GE75-XL-KRR-B-FA164	7,65	75	82,5	210	265	66	48
TASE75-XL	ASE15	GE75-XL-KTT-B	7,65	75	82,5	210	265	66	48
RASE80-XL	ASE16	GE80-XL-KRR-B	8,65	80	89	232	290	78	55
RASE80-XL-AH01-FA164¹⁾	ASE16	GE80-XL-KRR-B-AH01-FA164	8,65	80	89	232	290	78	55
TASE80-XL	ASE16	GE80-XL-KTT-B	8,49	80	89	232	290	78	55
RSAO80-XL	SAO16	GNE80-XL-KRR-B	22,5	80	116	315	390	110	76
RASE90-XL	ASE18	GE90-XL-KRR-B	12,12	90	101,6	268	330	85	55
RASE90-XL-FA164¹⁾	ASE18	GE90-XL-KRR-B-FA164	12,12	90	101,6	268	330	85	55
RSAO90-XL	SAO18	GNE90-XL-KRR-B	29,5	90	130	340	410	120	84
RASE100-XL	ASE20	GE100-XL-KRR-B	15,85	100	115	308	380	95	62
RSAO100-XL	SAO20	GNE100-XL-KRR-B	41	100	145	375	440	130	94
RASE120-XL	ASE24	GE120-XL-KRR-B	26,52	120	135	358	440	105	70

¹⁾ With fitted lubrication nipple.



RASE...XL(-FA164),
RSAO...XL



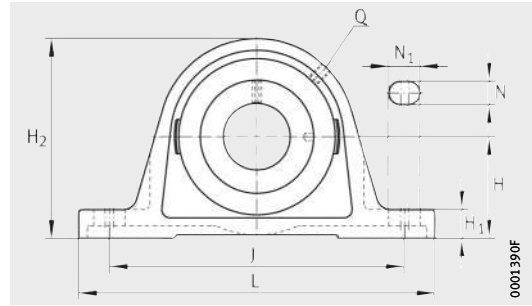
TASE...XL

								Width across flats W	Load carrying capacity Bearing		
									Basic load ratings		Fatigue limit load C_{ur} N
									dyn. C_r N	stat. C_{Or} N	
H_1	H_2	N	N_1	B_1	S_1	Q	d_3 max.				
27,5	156	22	28	66	44,5	Rp1/8	96	6	66 000	44 000	2 230
27,5	156	22	28	66	44,5	Rp1/8	96	6	66 000	44 000	2 230
27,5	156	22	28	66	44,5	Rp1/8	96	6	66 000	44 000	2 230
35	187	27	42	75,5	49,5	M6	102	6	111 000	68 000	3 300
27,5	164	22	30	67	45,5	M6	100	6	66 000	44 500	2 240
27,5	164	22	30	67	45,5	M6	100	6	66 000	44 500	2 240
27,5	164	22	30	67	45,5	M6	100	6	66 000	44 500	2 240
30	175	26	34	70,7	47,3	Rp1/8	108	6	76 000	54 000	2 600
30	175	26	34	70,7	47,3	Rp1/8	108	6	76 000	54 000	2 600
30	175	26	34	70,7	47,3	Rp1/8	108	6	76 000	54 000	2 600
50	226	25,5	44,5	93,6	59,6	M6	118	6	131 000	87 000	3 950
35	200	27	35	69,5	46,5	M6	118	6	109 000	79 000	3 550
35	200	27	35	69,5	46,5	M6	118	6	109 000	79 000	3 550
57	250	28	54	101	65,5	M6	132	6	151 000	107 000	4 600
40	225	30	38	75	49,5	M6	132	6	130 000	93 000	4 000
65	280	32	47	109,4	69,9	Rp1/8	145	6	184 000	141 000	5 700
45	265	33	41	81	52,5	M6	152	6	165 000	131 000	5 100



Plummer block housing units

Flake graphite cast iron housing
 With long base
 Grub screws in inner ring



PASEY..-XL(-N), RASEY..-XL(-N)

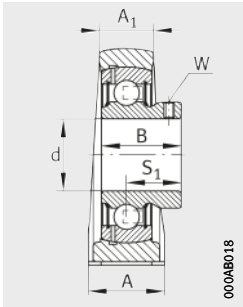


Dimension table - Dimensions in mm

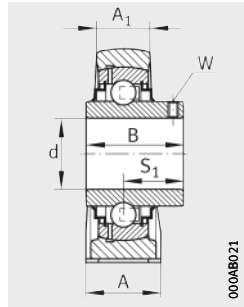
Designation			Mass m ≈ kg	Dimensions						
Unit	Housing	Radial insert ball bearing		d	H	J	L	A	A ₁	H ₁
PASEY12-XL	ASE03	GAY12-XL-NPP-B	0,44	12	30,2	95	125	30	18	10
RASEY12-XL	ASE03	GYE12-XL-KRR-B	0,45	12	30,2	95	125	30	18	10
PASEY15-XL	ASE03	GAY15-XL-NPP-B	0,43	15	30,2	95	125	30	18	10
RASEY15-XL	ASE03	GYE15-XL-KRR-B	0,45	15	30,2	95	125	30	18	10
RASEY16-XL	ASE03	GYE16-XL-KRR-B	0,45	16	30,2	95	125	30	18	10
PASEY17-XL	ASE03	GAY17-XL-NPP-B	0,42	17	30,2	95	125	30	18	10
RASEY17-XL	ASE03	GYE17-XL-KRR-B	0,45	17	30,2	95	125	30	18	10
PASEY20-XL-N	ASE04	GAY20-XL-NPP-B	0,56	20	33,3	97	130	32	19	14,5
RASEY20-XL-N	ASE04	GYE20-XL-KRR-B	0,58	20	33,3	97	130	32	19	14,5
PASEY25-XL-N	ASE05	GAY25-XL-NPP-B	0,61	25	36,5	103	130	36	21	14,5
RASEY25-XL-N	ASE05	GYE25-XL-KRR-B	0,7	25	36,5	103	130	36	21	14,5
PASEY30-XL-N	ASE06	GAY30-XL-NPP-B	1,07	30	42,9	118	158	40	25	17
RASEY30-XL-N	ASE06	GYE30-XL-KRR-B	1,13	30	42,9	118	158	40	25	17
PASEY35-XL-N	ASE07	GAY35-XL-NPP-B	1,45	35	47,6	126	163	45	27	19
RASEY35-XL-N	ASE07	GYE35-XL-KRR-B	1,55	35	47,6	126	163	45	27	19
PASEY40-XL-N	ASE08	GAY40-XL-NPP-B	1,75	40	49,2	138	179	48	30	19
RASEY40-XL-N	ASE08	GYE40-XL-KRR-B	1,84	40	49,2	138	179	48	30	19
PASEY45-XL	ASE09	GAY45-XL-NPP-B	2,06	45	54	150	192	48	32	21,5
RASEY45-XL	ASE09	GYE45-XL-KRR-B	2,16	45	54	150	192	48	32	21,5
PASEY50-XL-N	ASE10	GAY50-XL-NPP-B	2,49	50	57,2	158	200	54	34	21,5
RASEY50-XL-N	ASE10	GYE50-XL-KRR-B	2,6	50	57,2	158	200	54	34	21,5
RASEY55-XL	ASE11	GYE55-XL-KRR-B	3,22	55	63,5	176	222	60	35	22,5
PASEY60-XL-N	ASE12	GAY60-XL-NPP-B	4,15	60	69,9	190	240	60	42	25
RASEY60-XL-N	ASE12	GYE60-XL-KRR-B	4,27	60	69,9	190	240	60	42	25
RASEY65-214-XL²⁾	ASE14	GYE65-214-XL-KRR-B	5,95	65	79,4	203	260	65	44	27,5
RASEY70-XL	ASE14	GYE70-XL-KRR-B	5,93	70	79,4	203	260	65	44	27,5
RASEY75-XL	ASE15	GYE75-XL-KRR-B	6,51	75	82,5	210	265	66	48	27,5
RASEY80-XL	ASE16	GYE80-XL-KRR-B	8,41	80	89	232	290	78	55	30
RASEY90-XL	ASE18	GYE90-XL-KRR-B	12,6	90	101,6	268	330	85	55	35

1) To be ordered separately.
 The caps are suitable for temperatures from -20 °C to +80 °C.

2) Alternative ball set 6214.



PASEY..XL(-N)



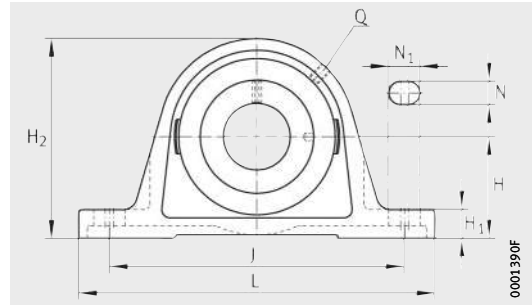
RASEY..XL(-N)

						Width across flats	Load carrying capacity Bearing			End cap ¹⁾
							Basic load ratings		Fatigue limit load	
H ₂	N	N ₁	B	S ₁	Q	W	dyn. C _r N	stat. C _{0r} N	C _{ur} N	
57	11	19	22	16	M6		2,5	10 100	4 750	241
57	11	19	27,4	15,9	M6	2,5	10 100	4 750	241	–
57	11	19	22	16	M6	2,5	10 100	4 750	241	–
57	11	19	27,4	15,9	M6	2,5	10 100	4 750	241	–
57	11	19	27,4	15,9	M6	2,5	10 100	4 750	241	–
57	11	19	22	16	M6	2,5	10 100	4 750	241	–
57	11	19	27,4	15,9	M6	2,5	10 100	4 750	241	–
64	11	19	25	18	Rp ^{1/8}	2,5	13 600	6 600	335	KASK04
64	11	19	31	18,3	Rp ^{1/8}	2,5	13 600	6 600	335	KASK04
70	11	19	27	19,5	Rp ^{1/8}	2,5	14 900	7 800	395	KASK05
70	11	19	34,1	19,8	Rp ^{1/8}	2,5	14 900	7 800	395	KASK05
82	14	22	30	21	Rp ^{1/8}	3	20 700	11 300	570	KASK06
82	14	22	38,1	22,2	Rp ^{1/8}	3	20 700	11 300	570	KASK06
93	14	21	35	25,5	Rp ^{1/8}	3	27 500	15 300	770	KASK07
93	14	21	42,9	25,4	Rp ^{1/8}	3	27 500	15 300	770	KASK07
99	14	26	39,5	29	Rp ^{1/8}	4	34 500	19 800	1 010	KASK08
99	14	26	49,2	30,2	Rp ^{1/8}	4	34 500	19 800	1 010	KASK08
107	14	29	41,5	30,5	M6	4	34 500	20 400	1 030	–
107	14	29	49,2	30,2	M6	4	34 500	20 400	1 030	–
115	18	23	43	32	Rp ^{1/8}	4	37 500	23 200	1 180	KASK10
115	18	23	51,6	32,6	Rp ^{1/8}	4	37 500	23 200	1 180	KASK10
124,5	18	30	55,6	33,4	M6	4	46 000	29 000	1 480	–
140	18	28	47	34	Rp ^{1/8}	5	56 000	36 000	1 820	KASK12
140	18	28	65,1	39,7	Rp ^{1/8}	5	56 000	36 000	1 820	KASK12
156	22	28	74,6	44,4	Rp ^{1/8}	5	66 000	44 000	2 230	–
156	22	28	74,6	44,4	Rp ^{1/8}	5	66 000	44 000	2 230	–
164	22	30	77,8	44,5	M6	5	66 000	44 500	2 240	–
175	26	35	82,6	49,3	Rp ^{1/8}	5	76 000	54 000	2 600	–
200	27	35	96	56,3	M6	6	109 000	79 000	3 550	–



Plummer block housing units

Flake graphite cast iron housing
 With long base
 Adapter sleeve or drive slot



RASEA...-XL-N, RASEL...-XL(-N)



Dimension table - Dimensions in mm

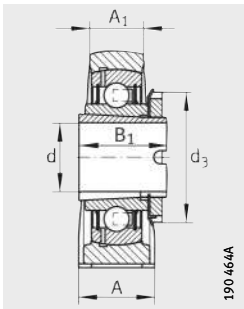
Designation			Mass m ≈ kg	Dimensions					
Unit	Housing	Radial insert ball bearing		d	H	J	L	A	A ₁
RASEA20-XL-N	ASE04	GSH20-XL-2RSR-B	0,51	20	33,3	97	130	32	19
RASEA25-XL-N	ASE05	GSH25-XL-2RSR-B	0,6	25	36,5	103	130	36	21
RASEA30-XL-N	ASE06	GSH30-XL-2RSR-B	1	30	42,9	118	158	40	25
RASEA35-XL-N	ASE07	GSH35-XL-2RSR-B	1,48	35	47,6	126	163	45	27
RASEA40-XL-N	ASE08	GSH40-XL-2RSR-B	1,71	40	49,2	138	179	48	30
RASEA50-XL-N	ASE10	GSH50-XL-2RSR-B	2,09	50	57,2	158	200	54	34

Dimension table - Dimensions in mm

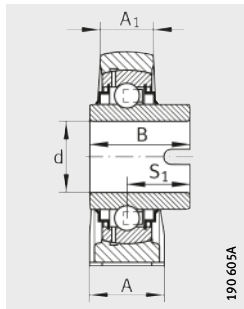
Designation			Mass m ≈ kg	Dimensions					
Unit ²⁾	Housing	Radial insert ball bearing		d	H	J	L	A	A ₁
RASEL20-XL-N	ASE04	GLE20-XL-KRR-B	0,58	20	33,3	97	130	32	19
RASEL25-XL-N	ASE05	GLE25-XL-KRR-B	0,7	25	36,5	103	130	36	21
RASEL30-XL-N	ASE06	GLE30-XL-KRR-B	1,1	30	42,9	118	158	40	25
RASEL40-XL-N	ASE08	GLE40-XL-KRR-B	1,79	40	49,2	138	179	48	30
RASEL45-XL	ASE09	GLE45-XL-KRR-B	2,1	45	54	150	192	48	32
RASEL50-XL-N	ASE10	GLE50-XL-KRR-B	2,6	50	57,2	158	200	54	34
RASEL60-XL-N	ASE12	GLE60-XL-KRR-B	4,43	60	69,9	190	240	60	42
RASEL70-XL	ASE14	GLE70-XL-KRR-B	5,87	70	79,4	203	260	65	44

1) To be ordered separately.
 The caps are suitable for temperatures from -20 °C to +80 °C.

2) With fitted lubrication nipple.



RASEA..XL-N



RASEL..XL(-N)

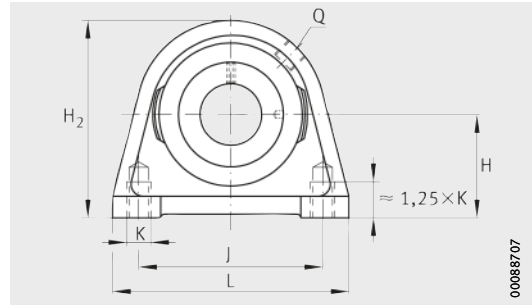
								Load carrying capacity Bearing			End cap ¹⁾
								Basic load ratings		Fatigue limit load C _{ur} N	
H ₁	H ₂	N	N ₁	B ₁	S ₁	Q	d ₃ max.	dyn. C _r N	stat. C _{0r} N		
14,5	64	11	19	28	20,5	Rp ^{1/8}	32	13 400	7 000	355	KASK04
14,5	70	11	19	28	20,5	Rp ^{1/8}	38	14 400	8 100	410	KASK05
17	82	14	22	32	23	Rp ^{1/8}	45	20 100	11 600	590	KASK06
19	93	14	21	34	24,5	Rp ^{1/8}	52	26 500	15 700	800	KASK07
19	99	14	26	38	27	Rp ^{1/8}	58	31 000	19 700	1 000	KASK08
21,5	115	18	23	40	29	Rp ^{1/8}	70	35 000	23 100	1 170	KASK10

								Load carrying capacity Bearing			End cap ¹⁾
								Basic load ratings		Fatigue limit load C _{ur} N	
H ₁	H ₂	N	N ₁	B	S ₁	Q	dyn. C _r N	stat. C _{0r} N			
14,5	64	11	19	34,1	18,5	Rp ^{1/8}	13 600	6 600	335	KASK04	
14,5	70	11	19	34,9	20,2	Rp ^{1/8}	14 900	7 800	395	KASK05	
17	82	14	22	36,5	22	Rp ^{1/8}	20 700	11 300	570	KASK06	
19	99	14	26	42,9	27	Rp ^{1/8}	34 500	19 800	1 010	KASK08	
21,5	107	14	29	42,9	25,5	M6	34 500	20 400	1 030	-	
21,5	115	18	23	49,2	30,2	Rp ^{1/8}	37 500	23 200	1 180	KASK10	
25	140	18	28	61,9	37,3	Rp ^{1/8}	56 000	36 000	1 820	KASK12	
27,5	156	22	28	68,2	41,2	Rp ^{1/8}	66 000	44 000	2 230	-	



Plummer block housing units

Flake graphite cast iron housing
 With short base
 With eccentric locking collar



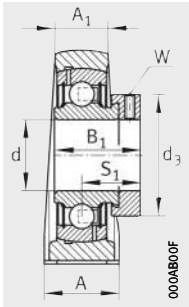
PSHE...XL, RSHE...XL, TSHE...XL



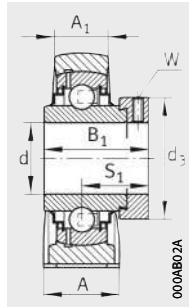
Dimension table - Dimensions in mm

Designation			Mass m ≈ kg	Dimensions						
Unit	Housing	Radial insert ball bearing		d	H	J	L	A	A ₁	H ₂
PSHE12-XL	SHE03	GRAE12-XL-NPP-B	0,44	12	30,2	47	63	30	18	57
PSHE15-XL	SHE03	GRAE15-XL-NPP-B	0,44	15	30,2	47	63	30	18	57
PSHE17-XL	SHE03	GRAE17-XL-NPP-B	0,44	17	30,2	47	63	30	18	57
RSHE17-XL	SHE03	GE17-XL-KRR-B	0,48	17	30,2	47	63	30	18	57
PSHE20-XL-N	SHE04	GRAE20-XL-NPP-B	0,46	20	33,3	50,8	65	32	19	64
RSHE20-XL-N	SHE04	GE20-XL-KRR-B	0,49	20	33,3	50,8	65	32	19	64
TSHE20-XL-N	SHE04	GE20-XL-KTT-B	0,49	20	33,3	50,8	65	32	19	64
PSHE25-XL-N	SHE05	GRAE25-XL-NPP-B	0,54	25	36,5	50,8	70	36	21	70
RSHE25-XL-N	SHE05	GE25-XL-KRR-B	0,6	25	36,5	50,8	70	36	21	70
TSHE25-XL-N	SHE05	GE25-XL-KTT-B	0,66	25	36,5	50,8	70	36	21	70
PSHE30-XL-N	SHE06	GRAE30-XL-NPP-B	0,94	30	42,9	76,2	98	40	25	82
RSHE30-XL-N	SHE06	GE30-XL-KRR-B	1,01	30	42,9	76,2	98	40	25	82
TSHE30-XL-N	SHE06	GE30-XL-KTT-B	1,01	30	42,9	76,2	98	40	25	82
PSHE35-XL-N	SHE07	GRAE35-XL-NPP-B	1,3	35	47,6	82,6	103	45	27	93
RSHE35-XL-N	SHE07	GE35-XL-KRR-B	1,38	35	47,6	82,6	103	45	27	93
TSHE35-XL-N	SHE07	GE35-XL-KTT-B	1,38	35	47,6	82,6	103	45	27	93
PSHE40-XL-N	SHE08	GRAE40-XL-NPP-B	1,84	40	49,2	88,9	116	48	30	99
RSHE40-XL-N	SHE08	GE40-XL-KRR-B	1,96	40	49,2	88,9	116	48	30	99
TSHE40-XL-N	SHE08	GE40-XL-KTT-B	1,66	40	49,2	88,9	116	48	30	99
PSHE45-XL	SHE09	GRAE45-XL-NPP-B	2,14	45	54	95,3	120	48	32	107
RSHE45-XL	SHE09	GE45-XL-KRR-B	2,26	45	54	95,3	120	48	32	107
TSHE45-XL	SHE09	GE45-XL-KTT-B	2,31	45	54	95,3	120	48	32	107
PSHE50-XL-N	SHE10	GRAE50-XL-NPP-B	2,79	50	57,2	101,6	135	54	34	115
RSHE50-XL-N	SHE10	GE50-XL-KRR-B	3,02	50	57,2	101,6	135	54	34	115
TSHE50-XL-N	SHE10	GE50-XL-KTT-B	2,47	50	57,2	101,6	135	54	34	115
PSHE55-XL	SHE11	GRAE55-XL-NPP-B	2,91	55	64	118	150	60	35	125
RSHE55-XL	SHE11	GE55-XL-KRR-B	3,52	55	64	118	150	60	35	125
TSHE55-XL	SHE11	GE55-XL-KTT-B	3,59	55	64	118	150	60	35	125
PSHE60-XL-N	SHE12	GRAE60-XL-NPP-B	4,1	60	69,9	118	150	60	42	140
RSHE60-XL-N	SHE12	GE60-XL-KRR-B	4,54	60	69,9	118	150	60	42	140
TSHE60-XL-N	SHE12	GE60-XL-KTT-B	4,22	60	69,9	118	150	60	42	140

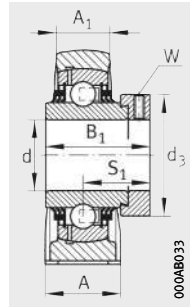
1) To be ordered separately.
 The caps are suitable for temperatures from -20 °C to +80 °C.



PSHE..XL



RSHE..XL



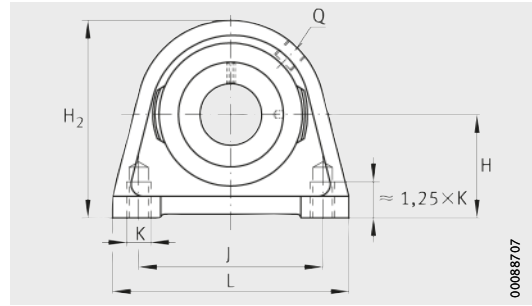
TSHE..XL

K	B ₁	S ₁	Q	d ₃ max.	Width across flats W	Load carrying capacity Bearing			End cap ¹⁾
						Basic load ratings		Fatigue limit load C _{ur} N	
						dyn. C _r N	stat. C _{0r} N		
M8	28,6	22,1	M6	28,41	3	10 100	4 750	241	–
M8	28,6	22,1	M6	28,4	3	10 100	4 750	241	–
M8	28,6	22,1	M6	28,4	3	10 100	4 750	241	–
M8	37,4	23,5	M6	28,4	3	10 100	4 750	241	–
M8	31	23,5	Rp ^{1/8}	33	3	13 600	6 600	335	KASK04
M8	43,7	26,6	Rp ^{1/8}	33	3	13 600	6 600	335	KASK04
M8	43,7	26,6	Rp ^{1/8}	33	3	13 600	6 600	335	KASK04
M10	31	23,5	M6	37,5	3	14 900	7 800	395	KASK05
M10	44,5	27	M6	37,5	3	14 900	7 800	395	KASK05
M10	44,5	27	M6	37,5	3	14 900	7 800	395	KASK05
M10	35,8	26,8	Rp ^{1/8}	44	4	20 700	11 300	570	KASK06
M10	48,5	30,2	Rp ^{1/8}	44	4	20 700	11 300	570	KASK06
M10	48,5	30,2	Rp ^{1/8}	44	4	20 700	11 300	570	KASK06
M10	39	29,5	Rp ^{1/8}	55	5	27 500	15 300	770	KASK07
M10	51,3	32,5	Rp ^{1/8}	55	5	27 500	15 300	770	KASK07
M10	51,3	32,5	Rp ^{1/8}	55	5	27 500	15 300	770	KASK07
M12	43,8	32,8	Rp ^{1/8}	58	5	34 500	19 800	1 010	KASK08
M12	56,5	35,1	Rp ^{1/8}	58	5	34 500	19 800	1 010	KASK08
M12	56,5	35,1	Rp ^{1/8}	58	5	34 500	19 800	1 010	KASK08
M12	43,8	32,8	M6	63	5	34 500	20 400	1 030	–
M12	56,5	35,1	M6	63	5	34 500	20 400	1 030	–
M12	56,5	35,1	M6	63	5	34 500	20 400	1 030	–
M16	43,8	32,8	M6	69	5	37 500	23 200	1 180	KASK10
M16	62,8	38,2	M6	69	5	37 500	23 200	1 180	KASK10
M16	62,8	38,2	M6	69	5	37 500	23 200	1 180	KASK10
M16	48,4	36,4	M6	76	5	46 000	29 000	1 480	–
M16	71,4	43,6	M6	76	5	46 000	29 000	1 480	–
M16	71,4	43,6	M6	76	5	46 000	29 000	1 480	–
M16	53,1	39,6	Rp ^{1/8}	84	5	56 000	36 000	1 820	KASK12
M16	77,9	46,9	Rp ^{1/8}	84	5	56 000	36 000	1 820	KASK12
M16	77,9	46,9	Rp ^{1/8}	84	5	56 000	36 000	1 820	KASK12



Plummer block housing units

Flake graphite cast iron housing
 With short base
 With grub screws



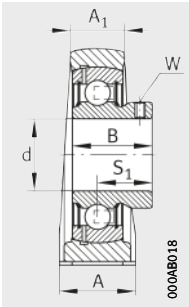
PSHEY..-XL, RSHEY..-XL



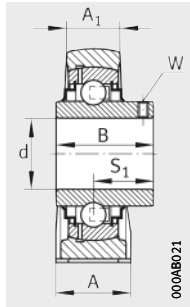
Dimension table - Dimensions in mm

Designation			Mass m ≈ kg	Dimensions					
Unit	Housing	Radial insert ball bearing		d	H	J	L	A	A ₁
PSHEY12-XL	SHE03	GAY12-XL-NPP-B	0,42	12	30,2	47	63	30	18
PSHEY15-XL	SHE03	GAY15-XL-NPP-B	0,41	15	30,2	47	63	30	18
RSHEY15-XL	SHE03	GYE15-XL-KRR-B	0,42	15	30,2	47	63	30	18
PSHEY17-XL	SHE03	GAY17-XL-NPP-B	0,4	17	30,2	47	63	30	18
RSHEY17-XL	SHE03	GAY17-XL-KRR-B	0,41	17	30,2	47	63	30	18
PSHEY20-XL-N	SHE04	GAY20-XL-NPP-B	0,42	20	33,3	50,8	65	32	19
RSHEY20-XL-N	SHE04	GYE20-XL-KRR-B	0,43	20	33,3	50,8	65	32	19
PSHEY25-XL-N	SHE05	GAY25-XL-NPP-B	0,57	25	36,5	50,8	70	36	21
RSHEY25-XL-N	SHE05	GYE25-XL-KRR-B	0,54	25	36,5	50,8	70	36	21
PSHEY30-XL-N	SHE06	GAY30-XL-NPP-B	0,88	30	42,9	76,2	98	40	25
RSHEY30-XL-N	SHE06	GYE30-XL-KRR-B	0,94	30	42,9	76,2	98	40	25
PSHEY35-XL-N	SHE07	GAY35-XL-NPP-B	1,19	35	47,6	82,6	103	45	27
RSHEY35-XL-N	SHE07	GYE35-XL-KRR-B	1,25	35	47,6	82,6	103	45	27
PSHEY40-XL-N	SHE08	GAY40-XL-NPP-B	1,73	40	49,2	88,9	116	48	30
RSHEY40-XL-N	SHE08	GYE40-XL-KRR-B	1,53	40	49,2	88,9	116	48	30
PSHEY45-XL	SHE09	GAY45-XL-NPP-B	1,91	45	54	95,3	120	48	32
RSHEY45-XL	SHE09	GYE45-XL-KRR-B	2,15	45	54	95,3	120	48	32
PSHEY50-XL-N	SHE10	GAY50-XL-NPP-B	2,64	50	57,2	101,6	135	54	34
RSHEY50-XL-N	SHE10	GYE50-XL-KRR-B	2,82	50	57,2	101,6	135	54	34
RSHEY55-XL	SHE11	GYE55-XL-KRR-B	3,29	55	64	118	150	60	35
PSHEY60-XL-N	SHE12	GAY60-XL-NPP-B	3,6	60	69,9	118	150	60	42
RSHEY60-XL-N	SHE12	GYE60-XL-KRR-B	3,9	60	69,9	118	150	60	42

1) To be ordered separately.
 The caps are suitable for temperatures from -20 °C to +80 °C.



PSHEY..-XL



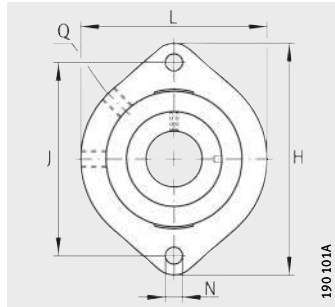
RSHEY..-XL

					Width across flats W	Load carrying capacity Bearing			End cap ¹⁾
						Basic load ratings		Fatigue limit load C _{ur} N	
H ₂	K	B	S ₁	Q		dyn. C _r N	stat. C _{0r} N		
57	M8	22	16	M6	2,5	10 100	4 750	241	–
57	M8	22	16	M6	2,5	10 100	4 750	241	–
57	M8	27,4	15,9	M6	2,5	10 100	4 750	241	–
57	M8	22	16	M6	2,5	10 100	4 750	241	–
57	M8	27,4	15,9	M6	2,5	10 100	4 750	241	–
64	M8	25	18	Rp ^{1/8}	2,5	13 600	6 600	335	KASK04
64	M8	31	18,3	Rp ^{1/8}	2,5	13 600	6 600	335	KASK04
70	M10	27	19,5	M6	2,5	14 900	7 800	395	KASK05
70	M10	34,1	19,8	M6	2,5	14 900	7 800	395	KASK05
82	M10	30	21	Rp ^{1/8}	3	20 700	11 300	570	KASK06
82	M10	38,1	22,2	Rp ^{1/8}	3	20 700	11 300	570	KASK06
93	M10	35	25,5	Rp ^{1/8}	3	27 500	15 300	770	KASK07
93	M10	42,9	25,4	Rp ^{1/8}	3	27 500	15 300	770	KASK07
99	M12	39,5	29	Rp ^{1/8}	4	34 500	19 800	1 010	KASK08
99	M12	49,2	30,2	Rp ^{1/8}	4	34 500	19 800	1 010	KASK08
107	M12	41,5	30,5	M6	4	34 500	20 400	1 030	–
107	M12	49,2	30,2	M6	4	34 500	20 400	1 030	–
115	M16	43	32	M6	4	37 500	23 200	1 180	KASK10
115	M16	51,6	32,6	M6	4	37 500	23 200	1 180	KASK10
125	M16	55,6	33,4	M6	4	46 000	29 000	1 480	–
140	M16	47	34	Rp ^{1/8}	5	56 000	36 000	1 820	KASK12
140	M16	65,1	39,7	Rp ^{1/8}	5	56 000	36 000	1 820	KASK12

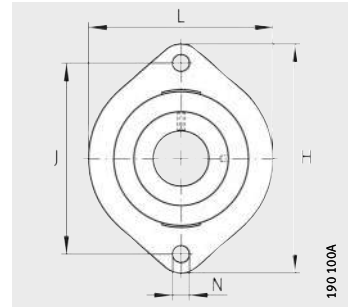


Two-bolt flanged housing units

Flake graphite cast iron
housing
Oval, wide version
With eccentric locking collar



GLCTE..-XL



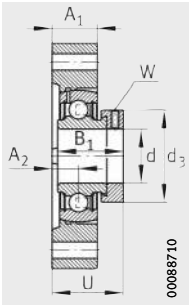
FLCTE..-XL

Dimension table - Dimensions in mm

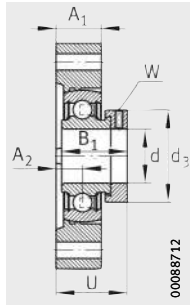
Designation			Mass m ≈ kg	Dimensions				
Unit	Housing	Radial insert ball bearing		d	H	J	L	A ₁
FLCTE12-XL	LCTE03	RAE12-XL-NPP-B	0,3	12	81	63,5	58,7	15
GLCTE12-XL¹⁾	GLCTE03	GRAE12-XL-NPP-B	0,3	12	81	63,5	58,7	15
FLCTE15-XL	LCTE03	RAE15-XL-NPP-B	0,3	15	81	63,5	58,7	15
GLCTE15-XL¹⁾	GLCTE03	GRAE15-XL-NPP-B	0,3	15	81	63,5	58,7	15
FLCTE17-XL	LCTE03	RAE17-XL-NPP-B	0,3	17	81	63,5	58,7	15
GLCTE17-XL¹⁾	GLCTE03	GRAE17-XL-NPP-B	0,3	17	81	63,5	58,7	15
FLCTE20-XL	LCTE04	RAE20-XL-NPP-B	0,39	20	90,5	71,4	66,5	17
GLCTE20-XL²⁾	GLCTE04	GRAE20-XL-NPP-B	0,39	20	90,5	71,4	66,5	17
FLCTE25-XL	LCTE05	RAE25-XL-NPP-B	0,47	25	97	76,2	71	17,5
GLCTE25-XL²⁾	GLCTE05	GRAE25-XL-NPP-B	0,47	25	97	76,2	71	17,5
FLCTE30-XL	LCTE06	RAE30-XL-NPP-B	0,76	30	112,5	90,5	84	20,5
GLCTE30-XL²⁾	GLCTE06	GRAE30-XL-NPP-B	0,76	30	112,5	90,5	84	20,5
FLCTE35-XL	LCTE07	RAE35-XL-NPP-B	1,02	35	126	100	94	22
GLCTE35-XL¹⁾	GLCTE07	GRAE35-XL-NPP-B	1,01	35	126	100	94	22
FLCTE40-XL	LCTE08	RAE40-XL-NPP-B	1,32	40	150	119	100	24
GLCTE40-XL¹⁾	GLCTE08	GRAE40-XL-NPP-B	1,3	40	150	119	100	24

¹⁾ Lubrication hole 90°.

²⁾ Lubrication hole 45°.



GLCTE..XL



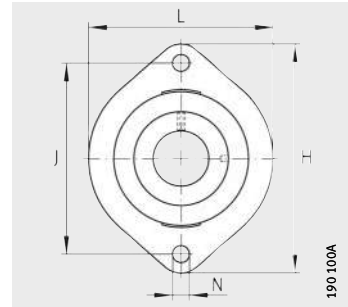
FLCTE..XL

						Width across flats W	Load carrying capacity Bearing		
							Basic load ratings		Fatigue limit load C _{ur} N
A ₂	N	B ₁	U	Q	d ₃ max.	dyn. C _r N	stat. C _{0r} N		
8,4	6,6	28,6	30,5	–	28,4	3	10 100	4 750	241
8,4	6,6	28,6	30,5	M6 ¹⁾	28,4	3	10 100	4 750	241
8,4	6,6	28,6	30,5	–	28,4	3	10 100	4 750	241
8,4	6,6	28,6	30,5	M6 ¹⁾	28,4	3	10 100	4 750	241
8,4	6,6	28,6	30,5	–	28,4	3	10 100	4 750	241
8,4	6,6	28,6	30,5	M6 ¹⁾	28,4	3	10 100	4 750	241
9,5	9	31	33	–	33	3	13 600	6 600	335
9,5	9	31	33	M6 ²⁾	33	3	13 600	6 600	335
9,9	9	31	33,4	–	37,5	3	14 900	7 800	395
9,9	9	31	33,4	M6 ²⁾	37,5	3	14 900	7 800	395
11,4	11,5	35,8	38,1	–	44	4	20 700	11 300	570
11,4	11,5	35,8	38,1	M6 ²⁾	44	4	20 700	11 300	570
12,4	11,5	39	42	–	55	5	27 500	15 300	770
12,4	11,5	39	42	M6 ¹⁾	55	5	27 500	15 300	770
13,5	14	43,8	46,3	–	58	5	34 500	19 800	1 010
13,5	14	43,8	46,3	M6 ¹⁾	58	5	34 500	19 800	1 010



Two-bolt flanged housing units

Flake graphite cast iron housing
 Oval, wide version
 With grub screws

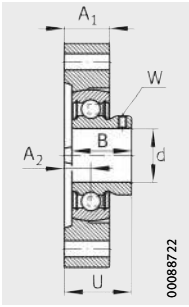


FLCTEY..-XL



Dimension table - Dimensions in mm

Designation			Mass m ≈ kg	Dimensions			
Unit	Housing	Radial insert ball bearing		d	H	J	L
FLCTEY12-XL	LCTE03	AY12-XL-NPP-B	0,28	12	81	63,5	58,7
FLCTEY15-XL	LCTE03	AY15-XL-NPP-B	0,27	15	81	63,5	58,7
FLCTEY17-XL	LCTE03	AY17-XL-NPP-B	0,26	17	81	63,5	58,7
FLCTEY20-XL	LCTE04	AY20-XL-NPP-B	0,36	20	90,5	71,4	66,5
FLCTEY25-XL	LCTE05	AY25-XL-NPP-B	0,44	25	97	76,2	71
FLCTEY30-XL	LCTE06	AY30-XL-NPP-B	0,7	30	112,5	90,5	84
FLCTEY35-XL	LCTE07	GAY35-XL-NPP-B	0,93	35	126	100	94
FLCTEY40-XL	LCTE08	GAY40-XL-NPP-B	1,18	40	150	119	100



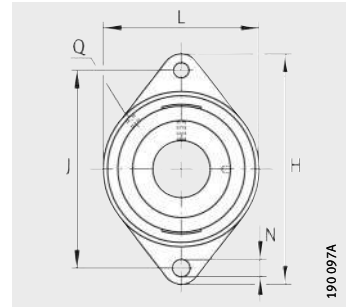
FLCTEY..-XL

					Width across flats W	Load carrying capacity Bearing		
						Basic load ratings		Fatigue limit load
A ₁	A ₂	N	B	U	dyn. C _r N	stat. C _{0r} N	C _{ur} N	
15	8,4	6,6	22	24,4	2,5	10 100	4 750	241
15	8,4	6,6	22	24,4	2,5	10 100	4 750	241
15	8,4	6,6	22	24,4	2,5	10 100	4 750	241
17	9,5	9	25	27	2,5	13 600	6 600	335
17,5	9,9	9	27	29,4	2,5	14 900	7 800	395
20,5	11,4	11,5	30	32,4	3	20 700	11 300	570
22	12,4	11,5	35	37,9	3	27 500	15 300	770
24	13,5	14	39,5	42,5	4	34 500	19 800	1 010



Two-bolt flanged housing units

Flake graphite cast iron housing
 Oval, narrow version
 Eccentric locking collar



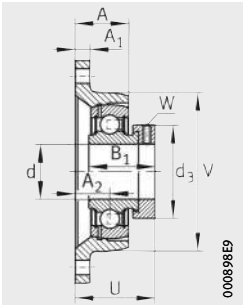
PCFT..-XL, PCJT..-XL(-N),
 RCJT..-XL(-N,-FA164), TCJT..-XL-N,
 LCJT..-XL-N



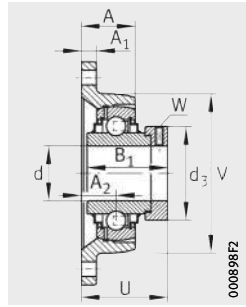
Dimension table - Dimensions in mm

Designation			Mass m ≈ kg	Dimensions					
Unit	Housing	Radial insert ball bearing		d	H	J	L	A	A ₁
PCFT12-XL	CFT03	GRAE12-XL-NPP-B	0,39	12	99	76,5	57	18	9,5
PCJT12-XL	CJT03	GRAE12-XL-NPP-B	0,37	12	99	76,5	57	25	9,5
PCFT15-XL	CFT03	GRAE15-XL-NPP-B	0,39	15	99	76,5	57	18	9,5
PCJT15-XL	CJT03	GRAE15-XL-NPP-B	0,37	15	99	76,5	57	25	9,5
PCFT17-XL	CFT03	GRAE17-XL-NPP-B	0,39	17	99	76,5	57	18	9,5
PCJT17-XL	CJT03	GRAE17-XL-NPP-B	0,37	17	99	76,5	57	25	9,5
RCJT17-XL	CJT03	GE17-XL-KRR-B	0,41	17	99	76,5	57	25	9,5
PCFT20-XL	CFT04	GRAE20-XL-NPP-B	0,4	20	112	90	61	17,5	10
PCJT20-XL-N	CJT04	GRAE20-XL-NPP-B	0,48	20	112	90	61	28	10
LCJT20-XL-N ²⁾	CJT04	GE20-XL-KLL-B	0,52	20	112	90	61	28	10
RCJT20-XL-N	CJT04	GE20-XL-KRR-B	0,52	20	112	90	61	28	10
TCJT20-XL-N	CJT04	GE20-XL-KTT-B	0,48	20	112	90	61	28	10
PCFT25-XL	CFT05	GRAE25-XL-NPP-B	0,52	25	124	99	70	20	11
PCJT25-XL-N	CJT05	GRAE25-XL-NPP-B	0,58	25	124	99	70	26,5	11
LCJT25-XL-N ²⁾	CJT05	GE25-XL-KLL-B	0,62	25	124	99	70	26,5	11
RCJT25-XL-N	CJT05	GE25-XL-KRR-B	0,62	25	124	99	70	26,5	11
TCJT25-XL-N	CJT05	GE25-XL-KTT-B	0,64	25	124	99	70	26,5	11
PCFT30-XL	CFT06	GRAE30-XL-NPP-B	0,77	30	142	116,5	80	22,3	12
PCJT30-XL-N	CJT06	GRAE30-XL-NPP-B	0,81	30	142	116,5	80	29	12
LCJT30-XL-N ²⁾	CJT06	GE30-XL-KLL-B	0,9	30	142	116,5	80	29	12
RCJT30-XL-FA164 ²⁾	CJT06	GE30-XL-KRR-B-FA164	0,88	30	142	116,5	80	29	12
RCJT30-XL-N	CJT06	GE30-XL-KRR-B	0,88	30	142	116,5	80	29	12
TCJT30-XL-N	CJT06	GE30-XL-KTT-B	0,9	30	142	116,5	80	29	12
PCFT35-XL	CFT07	GRAE35-XL-NPP-B	1,04	35	155	130	92	25	12,5
PCJT35-XL-N	CJT07	GRAE35-XL-NPP-B	1,11	35	155	130	92	30,5	12,5
LCJT35-XL-N ²⁾	CJT07	GE35-XL-KLL-B	1,19	35	155	130	92	30,5	12,5
RCJT35-XL-FA164 ²⁾	CJT07	GE35-XL-KRR-B-FA164	1,2	35	155	130	92	30,5	12,5
RCJT35-XL-N	CJT07	GE35-XL-KRR-B	1,19	35	155	130	92	30,5	12,5
TCJT35-XL-N	CJT07	GE35-XL-KTT-B	1,17	35	155	130	92	30,5	12,5

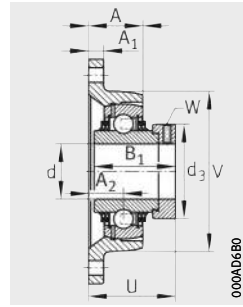
1) To be ordered separately.
 The caps are suitable for temperatures from -20 °C to +80 °C.
 2) With fitted lubrication nipple.



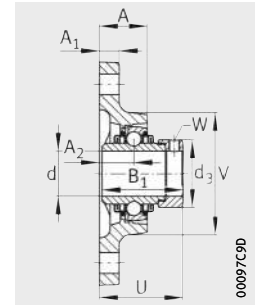
PCFT..XL, PCJT..XL(-N)



RCJT..XL(-N, -FA164)



TCJT..XL-N



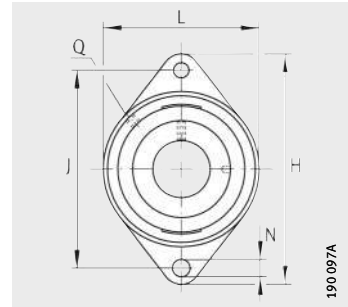
LCJT..XL-N

A ₂	N	B ₁	U	V	Q	d ₃ max.	W	Load carrying capacity Bearing			End cap ¹⁾
								Basic load ratings		Fatigue limit load C _{ur} N	
								dyn. C _r N	stat. C _{0r} N		
10	11,5	28,6	32,1	57	M6	28,4	3	10 100	4 750	241	-
17	11,5	28,6	39,1	57	M6	28,4	3	10 100	4 750	241	-
10	11,5	28,6	32,1	57	M6	28,4	3	10 100	4 750	241	-
17	11,5	28,6	39,1	57	M6	28,4	3	10 100	4 750	241	-
10	11,5	28,6	32,1	57	M6	28,4	3	10 100	4 750	241	-
17	11,5	28,6	39,1	57	M6	28,4	3	10 100	4 750	241	-
17	11,5	37,4	40,4	57	M6	28,4	3	10 100	4 750	241	-
10,5	11,5	31	34	61	M6	33	3	13 600	6 600	335	-
19	11,5	31	42,5	61	M6	33	3	13 600	6 600	335	KASK04
19	11,5	43,7	45,6	61	M6	33	3	13 600	6 600	335	KASK04
19	11,5	43,7	45,6	61	M6	33	3	13 600	6 600	335	KASK04
19	11,5	43,7	45,6	61	M6	33	3	13 600	6 600	335	KASK04
12,5	11,5	31	36	70	M6	37,5	3	14 900	7 800	395	-
19	11,5	31	42,5	70	M6	37,5	3	14 900	7 800	395	KASK05
19	11,5	44,5	46	70	M6	37,5	3	14 900	7 800	395	KASK05
19	11,5	44,5	46	70	M6	37,5	3	14 900	7 800	395	KASK05
19	11,5	44,5	46	70	M6	37,5	3	14 900	7 800	395	KASK05
13,3	11,5	35,8	40	80	M6	44	4	20 700	11 300	570	-
20	11,5	35,8	46,8	80	M6	44	4	20 700	11 300	570	KASK06
20	11,5	48,5	50,2	80	M6	44	4	20 700	11 300	570	KASK06
20	11,5	48,5	50,2	80	M6	44	4	20 700	11 300	570	-
20	11,5	48,5	50,2	80	M6	44	4	20 700	11 300	570	KASK06
20	11,5	48,5	50,2	80	M6	44	4	20 700	11 300	570	KASK06
15,5	14	39	44,9	92	M6	55	5	27 500	15 300	770	-
21	14	39	50,5	92	M6	55	5	27 500	15 300	770	KASK07
21	14	51,3	53,5	92	M6	55	5	27 500	15 300	770	KASK07
21	14	51,3	53,5	92	M6	55	5	27 500	15 300	770	-
21	14	51,3	53,5	92	M6	55	5	27 500	15 300	770	KASK07
21	14	51,3	53,5	92	M6	55	5	27 500	15 300	770	KASK07



Two-bolt flanged housing units

Flake graphite cast iron housing
 Oval, narrow version
 Eccentric locking collar



PCFT..-XL, PCJT..-XL(-N),
 RCJT..-XL(-N,-FA164),
 TCJT..-XL(-N), LCJT..-XL(-N)

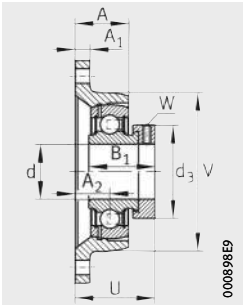


Dimension table (continued) · Dimensions in mm

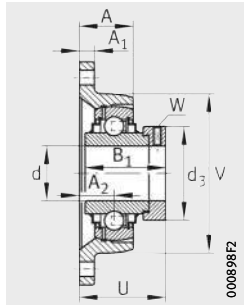
Designation			Mass	Dimensions					
Unit	Housing	Radial insert ball bearing		m ≈ kg	d	H	J	L	A
PCFT40-XL	CFT08	GRAE40-XL-NPP-B	1,42	40	172	143,5	105	28,8	13
PCJT40-XL-N	CJT08	GRAE40-XL-NPP-B	1,54	40	172	143,5	105	34,5	13
LCJT40-XL-N²⁾	CJT08	GE40-XL-KLL-B	1,66	40	172	143,5	105	34,5	13
RCJT40-XL-FA164²⁾	CJT08	GE40-XL-KRR-B-FA164	1,66	40	172	143,5	105	34,5	13
RCJT40-XL-N	CJT08	GE40-XL-KRR-B	1,66	40	172	143,5	105	34,5	13
TCJT40-XL-N	CJT08	GE40-XL-KTT-B	1,7	40	172	143,5	105	34,5	13
PCFT45-XL	CFT09	GRAE45-XL-NPP-B	1,59	45	180	148,5	111	30,2	13
PCJT45-XL	CJT09	GRAE45-XL-NPP-B	1,69	45	180	148,5	111	35	13
LCJT45-XL²⁾	CJT09	GE45-XL-KLL-B	1,81	45	180	148,5	111	35	13
RCJT45-XL	CJT09	GE45-XL-KRR-B	1,81	45	180	148,5	111	35	13
TCJT45-XL	CJT09	GE45-XL-KTT-B	1,92	45	180	148,5	111	35	13
PCFT50-XL	CFT10	GRAE50-XL-NPP-B	1,82	50	190	157	116	30,2	13
PCJT50-XL-N	CJT10	GRAE50-XL-NPP-B	1,97	50	190	157	116	39	13
LCJT50-XL-N²⁾	CJT10	GE50-XL-KLL-B	2,21	50	190	157	116	39	13
RCJT50-XL-FA164²⁾	CJT10	GE50-XL-KRR-B-FA164	2,2	50	190	157	116	39	13
RCJT50-XL-N	CJT10	GE50-XL-KRR-B	2,2	50	190	157	116	39	13
TCJT50-XL-N	CJT10	GE50-XL-KTT-B	2,19	50	190	157	116	39	13
PCJT55-XL	CJT11	GRAE55-XL-NPP-B	2,31	55	222	184	134	43,5	15
RCJT55-XL	CJT11	GE55-XL-KRR-B	2,92	55	222	184	134	43,5	15
TCJT55-XL	CJT11	GE55-XL-KTT-B	3,15	55	222	184	134	43,5	15
PCJT60-XL-N	CJT12	GRAE60-XL-NPP-B	3,25	60	238	202	138	46	16
RCJT60-XL-N	CJT12	GE60-XL-KRR-B	3,69	60	238	202	138	46	16
RCJT65-214-XL²⁾	CJT13/14	GE65-214-XL-KRR-B	6,41	65	258	216	160	57	18
TCJT65-214-XL²⁾	CJT13/14	GE65-214-XL-KTT-B	6,41	65	258	216	160	57	18
RCJT70-XL	CJT13/14	GE70-XL-KRR-B	6,15	70	258	216	160	57	18
RCJT75-XL	CJT15	GE75-XL-KRR-B	6	75	258	216	160	57	18

¹⁾ To be ordered separately.
 The caps are suitable for temperatures from -20 °C to +80 °C.

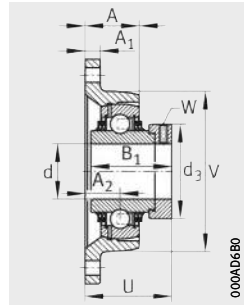
²⁾ With fitted lubrication nipple.



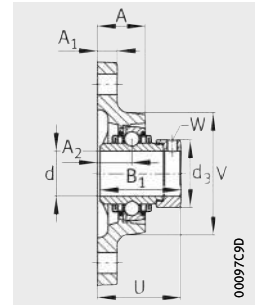
PCFT..XL, PCJT..XL(-N)



RCJT..XL(-N, -FA164)



TCJT..XL(-N)



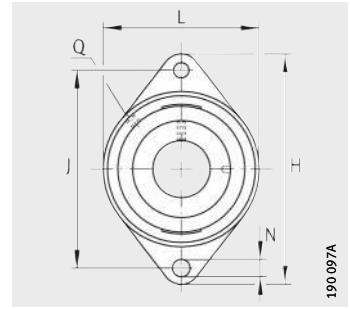
LCJT..XL(-N)

A ₂	N	B ₁	U	V	Q	d ₃ max.	W	Load carrying capacity Bearing			End cap ¹⁾
								Basic load ratings		Fatigue limit load C _{ur} N	
								dyn. C _r N	stat. C _{0r} N		
18,3	14	43,8	51	105	M6	58	5	34 500	19 800	1 010	-
24	14	43,8	56,7	105	Rp ^{1/8}	58	5	34 500	19 800	1 010	KASK08
24	14	56,5	59,1	105	Rp ^{1/8}	58	5	34 500	19 800	1 010	KASK08
24	14	56,5	59,1	105	Rp ^{1/8}	58	5	34 500	19 800	1 010	-
24	14	56,5	59,1	105	Rp ^{1/8}	58	5	34 500	19 800	1 010	KASK08
24	14	56,5	59,1	105	Rp ^{1/8}	58	5	34 500	19 800	1 010	KASK08
19,2	14	43,8	51,9	111	M6	63	5	34 500	20 400	1 030	-
24	14	43,8	56,7	111	Rp ^{1/8}	63	5	34 500	20 400	1 030	-
24	14	56,5	59,1	111	Rp ^{1/8}	63	5	34 500	20 400	1 030	-
24	14	56,5	59,1	111	Rp ^{1/8}	63	5	34 500	20 400	1 030	-
24	14	56,5	59,1	111	Rp ^{1/8}	63	5	34 500	20 400	1 030	-
19,2	14	43,8	51,9	116	Rp ^{1/8}	69	5	37 500	23 200	1 180	-
28	18	43,8	60,7	116	Rp ^{1/8}	69	5	37 500	23 200	1 180	KASK10
28	18	62,8	66,2	116	Rp ^{1/8}	69	5	37 500	23 200	1 180	KASK10
28	18	62,8	66,2	116	Rp ^{1/8}	69	5	37 500	23 200	1 180	-
28	18	62,8	66,2	116	Rp ^{1/8}	69	5	37 500	23 200	1 180	KASK10
28	18	62,8	66,2	116	Rp ^{1/8}	69	5	37 500	23 200	1 180	KASK10
31	18	48,4	67,4	134	M6	76	5	46 000	29 000	1 480	-
31	18	71,4	74,6	134	M6	76	5	46 000	29 000	1 480	-
31	18	71,4	74,6	134	M6	76	5	46 000	29 000	1 480	-
34	18	53,1	73,6	138	Rp ^{1/8}	84	5	56 000	36 000	1 820	KASK12
34	18	77,9	80,8	138	Rp ^{1/8}	84	5	56 000	36 000	1 820	KASK12
38	21	66	82,6	160	M6	96	6	66 000	44 000	2 230	-
38	21	66	82,6	160	M6	96	6	66 000	44 000	2 230	-
38	21	66	82,6	160	M6	96	6	66 000	44 000	2 230	-
38	21	67	83,6	160	M6	100	6	66 000	44 500	2 240	-



Two-bolt flanged housing units

Flake graphite cast iron housing
 Oval, narrow version
 Grub screws in inner ring



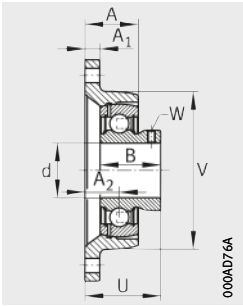
PCJTY...-XL(-N), RCJTY...-XL(-N)



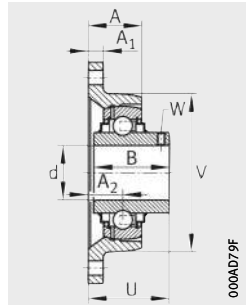
Dimension table - Dimensions in mm

Designation			Mass m ≈ kg	Dimensions					
Unit	Housing	Radial insert ball bearing		d	H	J	L	A	A ₁
PCJTY12-XL	CJT03	GAY12-XL-NPP-B	0,35	12	99	76,5	57	25	9,5
RCJTY12-XL	CJT03	GYE12-XL-KRR-B	0,36	12	99	76,5	57	25	9,5
PCJTY15-XL	CJT03	GAY15-XL-NPP-B	0,34	15	99	76,5	57	25	9,5
RCJTY15-XL	CJT03	GYE15-XL-KRR-B	0,35	15	99	76,5	57	25	9,5
RCJTY16-XL	CJT03	GAY16-XL-KRR-B	0,34	16	99	76,5	57	25	9,5
PCJTY17-XL	CJT03	GAY17-XL-NPP-B	0,33	17	99	76,5	57	25	9,5
RCJTY17-XL	CJT03	GYE17-XL-KRR-B	0,34	17	99	76,5	57	25	9,5
PCJTY20-XL-N	CJT04	GAY20-XL-NPP-B	0,41	20	112	90	61	28	10
RCJTY20-XL-N	CJT04	GYE20-XL-KRR-B	0,42	20	112	90	61	28	10
PCJTY25-XL-N	CJT05	GAY25-XL-NPP-B	0,48	25	124	99	70	26,5	11
RCJTY25-XL-N	CJT05	GYE25-XL-KRR-B	0,57	25	124	99	70	26,5	11
PCJTY30-XL-N	CJT06	GAY30-XL-NPP-B	0,77	30	142	116,5	80	29	12
RCJTY30-XL-N	CJT06	GYE30-XL-KRR-B	0,88	30	142	116,5	80	29	12
PCJTY35-XL-N	CJT07	GAY35-XL-NPP-B	1,05	35	155	130	92	30,5	12,5
RCJTY35-XL-N	CJT07	GYE35-XL-KRR-B	1,13	35	155	130	92	30,5	12,5
PCJTY40-XL-N	CJT08	GAY40-XL-NPP-B	1,48	40	172	143,5	105	34,5	13
RCJTY40-XL-N	CJT08	GYE40-XL-KRR-B	1,57	40	172	143,5	105	34,5	13
PCJTY45-XL	CJT09	GAY45-XL-NPP-B	1,69	45	180	148,5	111	35	13
RCJTY45-XL	CJT09	GYE45-XL-KRR-B	1,7	45	180	148,5	111	35	13
PCJTY50-XL-N	CJT10	GAY50-XL-NPP-B	1,82	50	190	157	116	39	13
RCJTY50-XL-N	CJT10	GYE50-XL-KRR-B	2	50	190	157	116	39	13
RCJTY55-XL	CJT11	GYE55-XL-KRR-B	2,86	55	222	184	134	43,5	15
PCJTY60-XL-N	CJT12	GAY60-XL-NPP-B	2,92	60	238	202	138	46	16
RCJTY60-XL-N	CJT12	GYE60-XL-KRR-B	3,46	60	238	202	138	46	16
RCJTY65-214-XL ²⁾	CJT13/14	GYE65-214-XL-KRR-B	5,95	65	258	216	160	57	18
RCJTY70-XL	CJT13/14	GYE70-XL-KRR-B	5,65	70	258	216	160	57	18
RCJTY75-XL	CJT15	GYE75-XL-KRR-B	5,53	75	258	216	160	57	18

1) To be ordered separately.
 The caps are suitable for temperatures from -20 °C to +80 °C.
 2) Alternative ball set 6214.



PCJTY..-XL(-N)



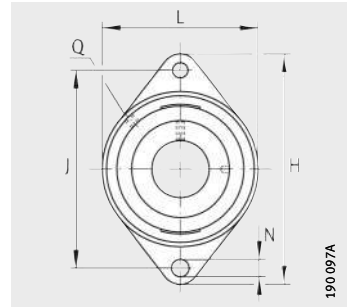
RCJTY..-XL(-N)

						Width across flats W	Load carrying capacity Bearing			End cap ¹⁾
							Basic load ratings		Fatigue limit load C _{ur} N	
A ₂	N	B	U	V	Q		dyn. C _r N	stat. C _{0r} N		
17	11,5	22	33	57	M6	2,5	10 100	4 750	241	-
17	11,5	27,4	32,9	57	M6	2,5	10 100	4 750	241	-
17	11,5	22	33	57	M6	2,5	10 100	4 750	241	-
17	11,5	27,4	32,9	57	M6	2,5	10 100	4 750	241	-
17	11,5	27,4	32,9	57	M6	2,5	10 100	4 750	241	-
17	11,5	22	33	57	M6	2,5	10 100	4 750	241	-
17	11,5	27,4	32,9	57	M6	2,5	10 100	4 750	241	-
19	11,5	25	37	61	M6	2,5	13 600	6 600	335	KASK04
19	11,5	31	37,3	61	M6	2,5	13 600	6 600	335	KASK04
19	11,5	27	38,5	70	M6	2,5	14 900	7 800	395	KASK05
19	11,5	34,1	38,8	70	M6	2,5	14 900	7 800	395	KASK05
20	11,5	30	41	80	M6	3	20 700	11 300	570	KASK06
20	11,5	38,1	42,2	80	M6	3	20 700	11 300	570	KASK06
21	14	35	46,45	92	M6	3	27 500	15 300	770	KASK07
21	14	42,9	46,4	92	M6	3	27 500	15 300	770	KASK07
24	14	39,5	52,95	105	Rp ^{1/8}	4	34 500	19 800	1 010	KASK08
24	14	49,2	54,2	105	Rp ^{1/8}	4	34 500	19 800	1 010	KASK08
24	14	41,5	54,5	111	Rp ^{1/8}	4	34 500	20 400	1 030	-
24	14	49,2	54,2	111	Rp ^{1/8}	4	34 500	20 400	1 030	-
28	18	43	60	116	Rp ^{1/8}	4	37 500	23 200	1 180	KASK10
28	18	51,6	60,6	116	Rp ^{1/8}	4	37 500	23 200	1 180	KASK10
31	18	55,6	64,4	134	M6	4	46 000	29 000	1 480	-
34	18	47	68	138	Rp ^{1/8}	5	56 000	36 000	1 820	KASK12
34	18	65,1	73,7	138	Rp ^{1/8}	5	56 000	36 000	1 820	KASK12
38	21	74,6	82,4	160	M6	5	66 000	44 000	2 230	-
38	21	74,6	82,4	160	M6	5	66 000	44 000	2 230	-
38	21	77,8	82,5	160	M6	5	66 000	44 500	2 240	-



Two-bolt flanged housing units

Flake graphite cast iron housing
 Oval, narrow version
 Adapter sleeve



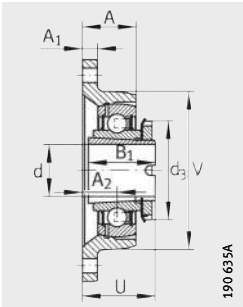
RCJTA...-XL-N



Dimension table - Dimensions in mm

Designation			Mass m ≈ kg	Dimensions					
Unit	Housing	Radial insert ball bearing		d	H	J	L	A	A ₁
RCJTA20-XL-N	CJT04	GSH20-XL-2RSR-B	0,52	20	112	90	61	28	10
RCJTA25-XL-N	CJT05	GSH25-XL-2RSR-B	0,54	25	124	99	70	26,5	11
RCJTA30-XL-N	CJT06	GSH30-XL-2RSR-B	0,77	30	142	116,5	80	29	12
RCJTA35-XL-N	CJT07	GSH35-XL-2RSR-B	1,06	35	155	130	92	30,5	12,5
RCJTA40-XL-N	CJT08	GSH40-XL-2RSR-B	1,46	40	172	143,5	105	34,5	13

¹⁾ To be ordered separately.
 The caps are suitable for temperatures from -20 °C to +80 °C.



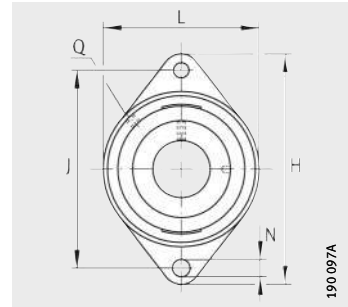
RCJTA...-XL-N

							Load carrying capacity Bearing			End cap ¹⁾
							Basic load ratings		Fatigue limit load	
A ₂	N	B ₁	U	V	Q	d ₃ max.	dyn. C _r N	stat. C _{0r} N	C _{ur} N	
19	11,5	28	42,5	61	M6	32	13 400	7 000	355	KASK04
19	11,5	28	42,5	70	M6	38	14 400	8 100	410	KASK05
20	11,5	32	44	80	M6	45	20 100	11 600	590	KASK06
21	14	34	46	92	M6	52	26 500	15 700	800	KASK07
24	14	38	51	105	Rp ^{1/8}	58	31 000	19 700	1 000	KASK08



Two-bolt flanged housing units

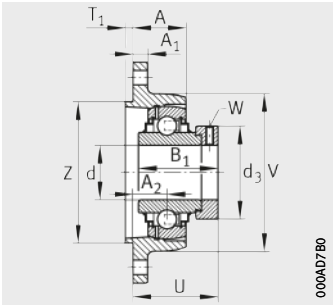
Flake graphite cast iron housing
Oval, narrow version
With centring spigot



RCJTZ...XL

Dimension table - Dimensions in mm

Designation			Mass m ≈ kg	Dimensions						
Unit	Housing	Radial insert ball bearing		d	H	J	L	A	A ₁	A ₂
RCJTZ20-XL	CJTZ04	GE20-XL-KRR-B	0,61	20	112,5	90	60,5	31,7	11	19
RCJTZ25-XL	CJTZ05	GE25-XL-KRR-B	0,76	25	124	99	70	26,5	12	19
RCJTZ30-XL	CJTZ06	GE30-XL-KRR-B	0,98	30	142	116,5	83	26	12	17
RCJTZ35-XL	CJTZ07	GE35-XL-KRR-B	1,32	35	155	130	94	26,5	12,5	17
RCJTZ40-XL	CJTZ08	GE40-XL-KRR-B	1,72	40	172	143,5	105	30,5	13	20
RCJTZ45-XL	CJTZ09	GE45-XL-KRR-B	1,94	45	180	148,5	111	31	13	20
RCJTZ50-XL	CJTZ10	GE50-XL-KRR-B	2,32	50	190	157	116	35	13	24
RCJTZ60-XL	CJTZ12	GE60-XL-KRR-B	3,9	60	238	202	138	42	16	30



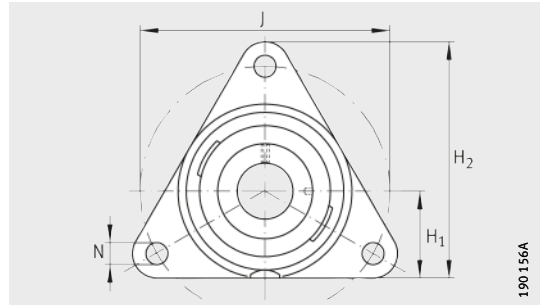
RCJTZ..XL

								Width across flats W	Load carrying capacity Bearing		
									Basic load ratings		Fatigue limit load
N	B ₁	T ₁	U	V	Z	Q	d ₃	dyn. C _r N	stat. C _{0r} N	C _{ur} N	
11,5	43,7	3,5	45,6	60,5	55	Rp ^{1/8}	33	13 600	6 600	335	
11,5	44,5	3,5	46	70	60	Rp ^{1/8}	37,5	14 900	7 800	395	
11,5	48,5	3	47,2	83	80	M6	44	20 700	11 300	570	
14	51,3	4	49,5	94	90	Rp ^{1/8}	55	27 500	15 300	770	
14	56,5	4	55,1	105	100	Rp ^{1/8}	58	34 500	19 800	1 010	
14	56,5	4	55,1	111	105	Rp ^{1/8}	63	34 500	20 400	1 030	
14	62,8	4	62,2	116	105	M6	69	37 500	23 200	1 180	
18	77,9	4	76,9	138	130	Rp ^{1/8}	84	56 000	36 000	1 820	



Three-bolt flanged housing units

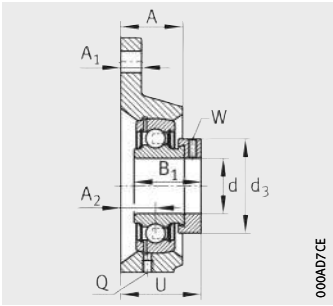
Flake graphite cast iron housing



PCFTR...-XL

Dimension table - Dimensions in mm

Designation			Mass m ≈ kg	Dimensions					
Unit	Housing	Radial insert ball bearing		d	J	A	A ₁	A ₂	H ₁
PCFTR15-XL	CFTR03	GRAE15-XL-NPP-B	0,4	15	76,1	20	11	10	31
PCFTR17-XL	CFTR03	GRAE17-XL-NPP-B	0,4	17	76,1	20	11	10	31
PCFTR20-XL	CFTR04	GRAE20-XL-NPP-B	0,56	20	89,5	20	11	10,5	35
PCFTR25-XL	CFTR05	GRAE25-XL-NPP-B	0,71	25	96	22	12	12,5	36
PCFTR30-XL	CFTR06	GRAE30-XL-NPP-B	0,99	30	116	24	12	13,3	44
PCFTR35-XL	CFTR07	GRAE35-XL-NPP-B	1,39	35	129,7	27	14	15,6	48
PCFTR40-XL	CFTR08	GRAE40-XL-NPP-B	1,83	40	140	30	16	18,3	51
PCFTR45-XL	CFTR09	GRAE45-XL-NPP-B	2	45	160	33	16	19,2	55
PCFTR50-XL	CFTR10	GRAE50-XL-NPP-B	2,15	50	160	33	16	19,2	55



000A07CE

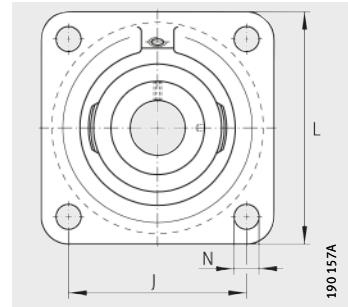
PCFTR..-XL

						Width across flats W	Load carrying capacity Bearing		
							Basic load ratings		Fatigue limit load C _{ur} N
H ₂	N	B ₁	U	Q	d ₃ max.		dyn. C _r N	stat. C _{0r} N	
81	11,5	28,6	32,1	M6	28,4	3	10 100	4 750	241
81	11,5	28,6	32,1	M6	28,4	3	10 100	4 750	241
92	11,5	31	34	M6	33	3	13 600	6 600	335
97	11,5	31	36	M6	37,5	3	14 900	7 800	395
117	11,5	35,8	40	M6	44	4	20 700	11 300	570
128	14	39	45,1	M6	55	5	27 500	15 300	770
137	14	43,8	51	M6	58	5	34 500	19 800	1 010
150	14	43,8	51,9	M6	63	5	34 500	20 400	1 030
150	14	43,8	51,9	M6	69	5	37 500	23 200	1 180



Four-bolt flanged housing units

Flake graphite cast iron housing
 Square version
 Eccentric locking collar



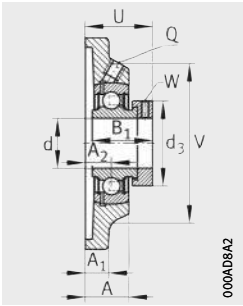
PCF...XL, PCJ...XL(-N),
 RCJ...XL(-N,-FA164),
 TCJ...XL-N, RCJO...XL

X-life

Dimension table - Dimensions in mm

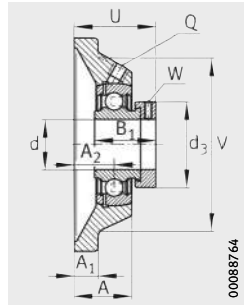
Designation			Mass m ≈ kg	Dimensions					
Unit	Housing	Radial insert ball bearing		d	J	L	A	A ₁	A ₂
PCJ12-XL	CJ03	GRAE12-XL-NPP-B	0,52	12	54	76	27	9,5	17
PCJ15-XL	CJ03	GRAE15-XL-NPP-B	0,52	15	54	76	27	9,5	17
PCJ17-XL	CJ03	GRAE17-XL-NPP-B	0,52	17	54	76	27	9,5	17
RCJ17-XL	CJ03	GE17-XL-KRR-B	0,56	17	54	76	27	9,5	17
PCF20-XL	CF04	GRAE20-XL-NPP-B	0,55	20	63,5	86	20	10	10,5
PCJ20-XL-N	CJ04	GRAE20-XL-NPP-B	0,6	20	63,5	86	29	10	19
RCJ20-XL-N	CJ04	GE20-XL-KRR-B	0,65	20	63,5	86	29	10	19
TCJ20-XL-N	CJ04	GE20-XL-KTT-B	0,65	20	63,5	86	29	10	19
PCF25-XL	CF05	GRAE25-XL-NPP-B	0,71	25	70	95	22	11	12,5
PCJ25-XL-N	CJ05	GRAE25-XL-NPP-B	0,76	25	70	95	29	11	19
RCJ25-XL-FA164²⁾	CJ05	GE25-XL-KRR-B-FA164	0,82	25	70	95	29	11	19
RCJ25-XL-N	CJ05	GE25-XL-KRR-B	0,82	25	70	95	29	11	19
TCJ25-XL-N	CJ05	GE25-XL-KTT-B	0,81	25	70	95	29	11	19
PCF30-XL	CF06	GRAE30-XL-NPP-B	1,01	30	82,5	108	22,3	12	13,3
PCJ30-XL-N	CJ06	GRAE30-XL-NPP-B	1,11	30	82,5	108	29	12	20
RCJ30-XL-N	CJ06	GE30-XL-KRR-B	1,16	30	82,5	108	29	12	20
RCJO30-XL	CJO06	GNE30-XL-KRR-B	1,75	30	95	125	30,6	15	20,6
TCJ30-XL-N	CJ06	GE30-XL-KTT-B	1,17	30	82,5	108	29	12	20
PCF35-XL	CF07	GRAE35-XL-NPP-B	1,34	35	92	118	25	12,5	15,5
PCJ35-XL-N	CJ07	GRAE35-XL-NPP-B	1,47	35	92	118	30,5	12,5	21
RCJ35-XL-FA164²⁾	CJ07	GE35-XL-KRR-B-FA164	1,57	35	92	118	30,5	12,5	21
RCJ35-XL-N	CJ07	GE35-XL-KRR-B	1,55	35	92	118	30,5	12,5	21
RCJO35-XL	CJO07	GNE35-XL-KRR-B	2,55	35	100	135	31	16	20
TCJ35-XL-N	CJ07	GE35-XL-KTT-B	1,53	35	92	118	30,5	12,5	21

1) To be ordered separately.
 The caps are suitable for temperatures from -20 °C to +80 °C.
 2) With fitted lubrication nipple.



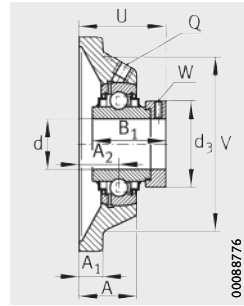
00040842

PCF..-XL

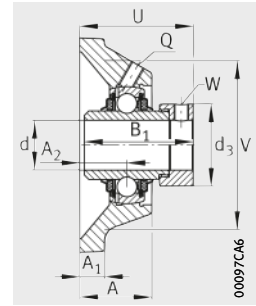


00088764

PCJ..-XL(-N)



00088776

RCJ..-XL(-N,-FA164),
RCJO..-XL

00097C46

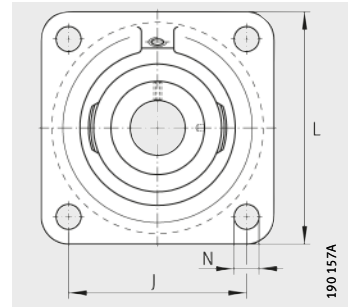
TCJ..-XL-N

N	B ₁	U	V	Q	d ₃ max.	W	Load carrying capacity Bearing			End cap ¹⁾
							Basic load ratings		Fatigue limit load C _{ur} N	
							dyn. C _r N	stat. C _{0r} N		
11,5	28,6	39,1	58	M6	28,4	3	10 100	4 750	241	–
11,5	28,6	39,1	58	M6	28,4	3	10 100	4 750	241	–
11,5	28,6	39,1	58	M6	28,4	3	10 100	4 750	241	–
11,5	37,4	40,4	58	M6	28,4	3	10 100	4 750	241	–
11,5	31	34	68	M6	33	3	13 600	6 600	335	–
11,5	31	42,5	68	M6	33	3	13 600	6 600	335	KASK04
11,5	43,7	45,6	68	M6	33	3	13 600	6 600	335	KASK04
11,5	43,7	45,6	68	M6	33	3	13 600	6 600	335	KASK04
11,5	31	36	74	M6	37,5	3	14 900	7 800	395	–
11,5	31	42,5	74	M6	37,5	3	14 900	7 800	395	KASK05
11,5	44,5	46	74	M6	37,5	3	14 900	7 800	395	–
11,5	44,5	46	74	M6	37,5	3	14 900	7 800	395	KASK05
11,5	44,5	46	74	M6	37,5	3	14 900	7 800	395	KASK05
11,5	35,8	40	85	M6	44	4	20 700	11 300	570	–
11,5	35,8	46,8	85	M6	44	4	20 700	11 300	570	KASK06
11,5	48,5	50,2	85	M6	44	4	20 700	11 300	570	KASK06
14,5	50,2	53,1	98	M6	51	5	31 500	16 700	840	–
11,5	48,5	50,2	85	M6	44	4	20 700	11 300	570	KASK06
14	39	45	100	M6	55	5	27 500	15 300	770	–
14	39	50,5	100	M6	55	5	27 500	15 300	770	KASK07
14	51,3	53,5	100	M6	55	5	27 500	15 300	770	–
14	51,3	53,5	100	M6	55	5	27 500	15 300	770	KASK07
19	51,6	53,4	104	M6	55	5	39 000	20 900	1 060	–
14	51,3	53,5	100	M6	55	5	27 500	15 300	770	KASK07



Four-bolt flanged housing units

Flake graphite cast iron housing
 Square version
 Eccentric locking collar



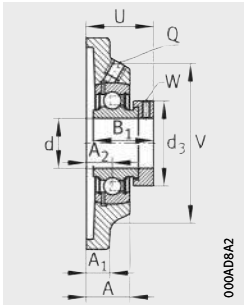
PCF..-XL, PCJ..-XL(-N),
 RCJ..-XL(-N,-FA164),
 TCJ..-XL-N, RCJO..-XL



Dimension table (continued) · Dimensions in mm

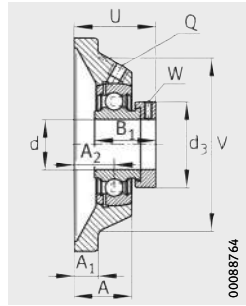
Designation			Mass m ≈ kg	Dimensions					
Unit	Housing	Radial insert ball bearing		d	J	L	A	A ₁	A ₂
PCF40-XL	CF08	GRAE40-XL-NPP-B	1,72	40	101,5	130	28,8	13	18,3
PCJ40-XL-N	CJ08	GRAE40-XL-NPP-B	1,89	40	101,5	130	34,5	13	24
RCJ40-XL-FA164²⁾	CJ08	GE40-XL-KRR-B-FA164	2,02	40	101,5	130	34,5	13	24
RCJ40-XL-N	CJ08	GE40-XL-KRR-B	2,02	40	101,5	130	34,5	13	24
RCJO40-XL	CJO08	GE40-XL-KRR-B	3,1	40	112	150	34,5	17	23
TCJ40-XL-N	CJ08	GE40-XL-KTT-B	2,02	40	101,5	130	34,5	13	24
PCF45-XL	CF09	GRAE45-XL-NPP-B	1,99	45	105	137	30,2	13	19,2
PCJ45-XL	CJ09	GRAE45-XL-NPP-B	2,22	45	105	137	35	13	24
RCJ45-XL	CJ09	GE45-XL-KRR-B	2,26	45	105	137	35	13	24
TCJ45-XL	CJ09	GE45-XL-KTT-B	2,37	45	105	137	35	13	24
PCF50-XL	CF10	GRAE50-XL-NPP-B	2,2	50	111	143	30,2	13	19,2
PCJ50-XL-N	CJ10	GRAE50-XL-NPP-B	2,3	50	111	143	41	13	28
RCJ50-XL-FA164²⁾	CJ10	GE50-XL-KRR-B-FA164	2,53	50	111	143	41	13	28
RCJ50-XL-N	CJ10	GE50-XL-KRR-B	2,53	50	111	143	41	13	28
RCJO50-XL	CJO10	GNE50-XL-KRR-B	4,9	50	132	175	42,5	19	28
TCJ50-XL-N	CJ10	GE50-XL-KTT-B	2,53	50	111	143	41	13	28
PCJ55-XL	CJ11	GRAE55-XL-NPP-B	2,91	55	130	162	43,5	15	31
RCJ55-XL	CJ11	GE55-XL-KRR-B	3,52	55	130	162	43,5	15	31
TCJ55-XL	CJ11	GE55-XL-KTT-B	3,57	55	130	162	43,5	15	31
PCJ60-XL-N	CJ12	GRAE60-XL-NPP-B	4,1	60	143	175	47,5	16	34
RCJ60-XL-FA164²⁾	CJ12	GE60-XL-KRR-B-FA164	4,26	60	143	175	47,5	16	34
RCJ60-XL-N	CJ12	GE60-XL-KRR-B	4,21	60	143	175	47,5	16	34
RCJO60-XL	CJO12	GNE60-XL-KRR-B	6,8	60	150	195	49,5	22	33
TCJ60-XL-N	CJ12	GE60-XL-KTT-B	4,21	60	143	175	47,5	16	34

1) To be ordered separately.
 The caps are suitable for temperatures from -20 °C to +80 °C.
 2) With fitted lubrication nipple.



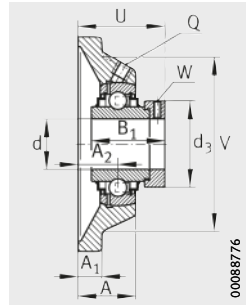
00040842

PCF..-XL

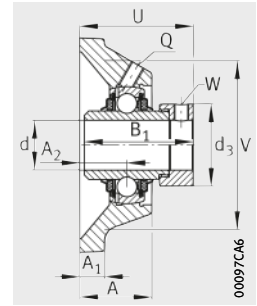


00088764

PCJ..-XL(-N)



00088776

RCJ..-XL(-N,-FA164),
RCJO..-XL

00097C46

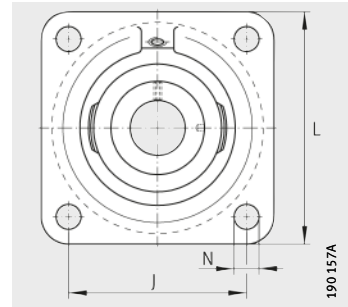
TCJ..-XL-N

N	B ₁	U	V	Q	d ₃ max.	W	Load carrying capacity Bearing			End cap ¹⁾
							Basic load ratings		Fatigue limit load C _{ur} N	
							dyn. C _r N	stat. C _{0r} N		
14	43,8	51	110	M6	58	5	34 500	19 800	1 010	–
14	43,8	56,8	110	M6	58	5	34 500	19 800	1 010	KASK08
14	56,5	59,1	110	M6	58	5	34 500	19 800	1 010	–
14	56,5	59,1	110	M6	58	5	34 500	19 800	1 010	KASK08
19	54,6	59,6	121	M6	63	5	47 000	26 000	1 320	–
14	56,5	59,1	110	M6	58	5	34 500	19 800	1 010	KASK08
14	43,8	51,9	116	M6	63	5	34 500	20 400	1 030	–
14	43,8	56,7	116	Rp ^{1/8}	63	5	34 500	20 400	1 030	–
14	56,5	59,1	116	Rp ^{1/8}	63	5	34 500	20 400	1 030	–
14	56,5	59,1	116	Rp ^{1/8}	63	5	34 500	20 400	1 030	–
14	43,8	51,4	125	Rp ^{1/8}	69	5	37 500	23 200	1 180	–
18	43,8	60,8	119	M6	69	5	37 500	23 200	1 180	KASK10
18	62,8	66,2	119	M6	69	5	37 500	23 200	1 180	–
18	62,8	66,2	119	M6	69	5	37 500	23 200	1 180	KASK10
23	66,75	70,1	144	M6	75,8	5	66 000	38 000	1 920	–
18	62,8	66,2	119	M6	69	5	37 500	23 200	1 180	KASK10
18	48,4	67,4	140	Rp ^{1/8}	76	5	46 000	29 000	1 480	–
18	71,4	74,6	140	Rp ^{1/8}	76	5	46 000	29 000	1 480	–
18	71,4	74,6	140	Rp ^{1/8}	76	5	46 000	29 000	1 480	–
18	53,1	73,6	150	Rp ^{1/8}	84	5	56 000	36 000	1 820	KASK12
18	77,9	80,9	150	Rp ^{1/8}	84	5	56 000	36 000	1 820	–
18	77,9	80,9	150	Rp ^{1/8}	84	5	56 000	36 000	1 820	KASK12
23	68	78,4	170	M6	89	5	87 000	52 000	2 650	–
18	77,9	80,9	150	Rp ^{1/8}	84	5	56 000	36 000	1 820	KASK12



Four-bolt flanged housing units

Flake graphite cast iron housing
 Square version
 Eccentric locking collar



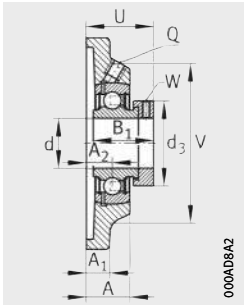
PCF..-XL, PCJ..-XL(-N),
 RCJ..-XL(-N,-FA164), TCJ..-XL-N,
 RCJO..-XL



Dimension table (continued) · Dimensions in mm

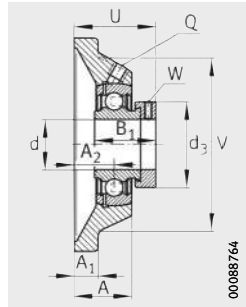
Designation			Mass m ≈ kg	Dimensions				
Unit	Housing	Radial insert ball bearing		d	J	L	A	A ₁
RCJ65-214-XL ³⁾	CJ14	GE65-214-XL-KRR-B	6,11	65	150	188	52	18
RCJ65-214-XL-FA164 ²⁾³⁾	CJ14	GE65-214-XL-KRR-B-FA164	6,11	65	150	188	52	18
TCJ65-214-XL ³⁾	CJ14	GE65-214-XL-KTT-B	6,11	65	150	188	52	18
RCJ70-XL	CJ14	GE70-XL-KRR-B	5,85	70	150	188	52	18
RCJO70-XL	CJO14	GNE70-XL-KRR-B	10	70	178	226	54,5	25
TCJ70-XL	CJ14	GE70-XL-KTT-B	5,85	70	150	188	52	18
RCJ75-XL	CJ15	GE75-XL-KRR-B	6,5	75	153	197	55,8	20
TCJ75-XL	CJ15	GE75-XL-KTT-B	6,5	75	153	197	55,8	20
RCJ80-XL	CJ16	GE80-XL-KRR-B	6,85	80	153	197	55,8	20
RCJO80-XL	CJO16	GNE80-XL-KRR-B	17,15	80	196	250	80	25
TCJ80-XL	CJ16	GE80-XL-KTT-B	6,85	80	153	197	55,8	20
RCJ90-XL	CJ18	GE90-XL-KRR-B	9	90	187	235	39,8	22
RCJO90-XL	CJO18	GNE90-XL-KRR-B	21,6	90	216	280	85	28,5
RCJ100-XL	CJ20	GE100-XL-KRR-B	12,25	100	210	265	46	25
RCJO100-XL	CJO20	GNE100-XL-KRR-B	33,6	100	242	310	97	32
RCJ120-XL	CJ24	GE120-XL-KRR-B	18	120	240	305	51	28

- 1) To be ordered separately.
The caps are suitable for temperatures from -20 °C to +80 °C.
- 2) With fitted lubrication nipple.
- 3) Alternative ball set 6214.



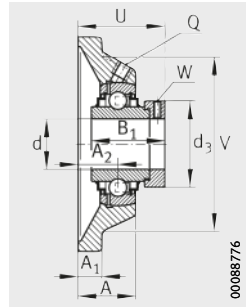
000408A2

PCF..-XL

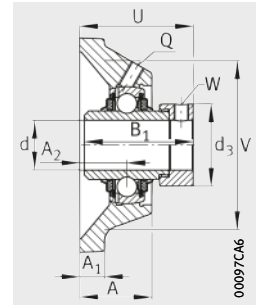


00088764

PCJ..-XL(-N)



00088776

RCJ..-XL(-N,-FA164),
RCJO..-XL

00097CA6

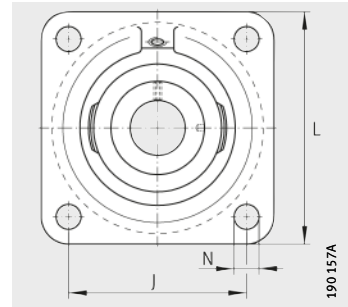
TCJ..-XL-N

A ₂ N B ₁ U V Q d ₃							Width across flats W	Load carrying capacity Bearing			End cap ¹⁾
								Basic load ratings		Fatigue limit load C _{ur} N	
								dyn. C _r N	stat. C _{0r} N		
						max.					
38	18	66	82,6	165	Rp ^{1/8}	96	6	66 000	44 000	2 230	–
38	18	66	82,6	165	Rp ^{1/8}	96	6	66 000	44 000	2 230	–
38	18	66	82,6	165	Rp ^{1/8}	96	6	66 000	44 000	2 230	–
38	18	66	82,5	165	Rp ^{1/8}	96	6	66 000	44 000	2 230	–
36	25	75,5	85,4	196	M6	102	6	111 000	68 000	3 300	–
38	18	66	82,6	165	Rp ^{1/8}	96	6	66 000	44 000	2 230	–
41,3	23	67	86,9	170	M6	100	6	66 000	44 500	2 240	–
41,3	23	67	86,9	170	M6	100	6	66 000	44 500	2 240	–
41,3	23	70,7	88,9	180	Rp ^{1/8}	108	6	76 000	54 000	2 600	–
50	28	93,6	109,7	210	M6	118	6	131 000	87 000	3 950	–
41,3	23	70,7	88,9	180	Rp ^{1/8}	108	6	76 000	54 000	2 600	–
23,8	23	69,5	70,3	200	Rp ^{1/8}	118	6	109 000	79 000	3 550	–
48,5	28	101	114	230	M6	132	6	151 000	107 000	4 600	–
28	27	75	77,5	230	M6	132	6	130 000	93 000	4 000	–
55	32	109,4	125	268	Rp ^{1/8}	145	6	184 000	141 000	5 700	–
31	30	81	83	270	Rp ^{1/8}	152	6	165 000	131 000	5 100	–



Four-bolt flanged housing units

Flake graphite cast iron housing
 Square version
 Grub screws in inner ring or drive slot



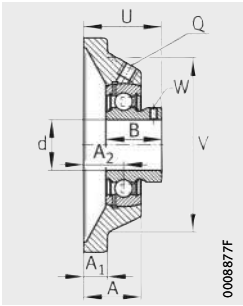
PCJY...-XL(-N), RCJY...-XL(-N),
 RCJL...-XL-N

X-life

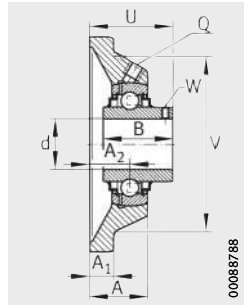
Dimension table - Dimensions in mm

Designation			Mass m ≈ kg	Dimensions					
Unit	Housing	Radial insert ball bearing		d	J	L	A	A ₁	A ₂
PCJY12-XL	CJ03	GAY12-XL-NPP-B	0,5	12	54	76	27	9,5	17
RCJY12-XL	CJ03	GYE12-XL-KRR-B	0,51	12	54	76	27	9,5	17
PCJY15-XL	CJ03	GAY15-XL-NPP-B	0,49	15	54	76	27	9,5	17
RCJY15-XL	CJ03	GYE15-XL-KRR-B	0,51	15	54	76	27	9,5	17
RCJY16-XL	CJ03	GYE16-XL-KRR-B	0,51	16	54	76	27	9,5	17
PCJY17-XL	CJ03	GAY17-XL-NPP-B	0,48	17	54	76	27	9,5	17
RCJY17-XL	CJ03	GYE17-XL-KRR-B	0,51	17	54	76	27	9,5	17
PCJY20-XL-N	CJ04	GAY20-XL-NPP-B	0,56	20	63,5	86	29	10	19
RCJY20-XL-N	CJ04	GYE20-XL-KRR-B	0,62	20	63,5	86	29	10	19
PCJY25-XL-N	CJ05	GAY25-XL-NPP-B	0,72	25	70	95	29	11	19
RCJY25-XL-N	CJ05	GYE25-XL-KRR-B	0,77	25	70	95	29	11	19
PCJY30-XL-N	CJ06	GAY30-XL-NPP-B	1,03	30	82,5	108	29	12	20
RCJL30-XL-N²⁾	CJ06	GLE30-XL-KRR-B	1,08	30	82,5	108	29	12	20
RCJY30-XL-N	CJ06	GYE30-XL-KRR-B	1,1	30	82,5	108	29	12	20
PCJY35-XL-N	CJ07	GAY35-XL-NPP-B	1,38	35	92	118	30,5	12,5	21
RCJL35-XL-N²⁾	CJ07	GLE35-XL-KRR-B	1,4	35	92	118	30,5	12,5	21
RCJY35-XL-N	CJ07	GYE35-XL-KRR-B	1,44	35	92	118	30,5	12,5	21
PCJY40-XL-N	CJ08	GAY40-XL-NPP-B	1,81	40	101,5	130	34,5	13	24
RCJL40-XL-N²⁾	CJ08	GLE40-XL-KRR-B	1,84	40	101,5	130	34,5	13	24
RCJY40-XL-N	CJ08	GYE40-XL-KRR-B	1,93	40	101,5	130	34,5	13	24
PCJY45-XL	CJ09	GAY45-XL-NPP-B	2	45	105	137	35	13	24
RCJY45-XL	CJ09	GYE45-XL-KRR-B	2,15	45	105	137	35	13	24

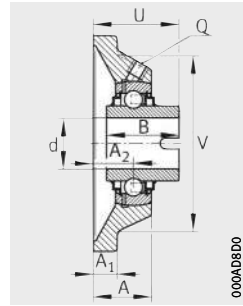
1) To be ordered separately.
 The caps are suitable for temperatures from -20 °C to +80 °C.
 2) With fitted lubrication nipple.



PCJY..-XL(-N)



RCJY..-XL(-N)



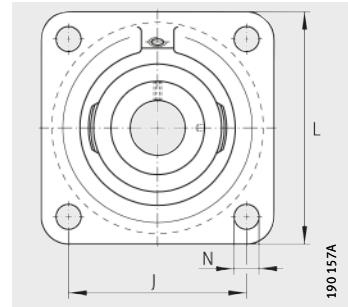
RCJL..-XL-N

					Width across flats W	Load carrying capacity Bearing			End cap ¹⁾
						Basic load ratings		Fatigue limit load C _{ur} N	
N	B	U	V	Q		dyn. C _r N	stat. C _{0r} N		
11,5	22	33	58	M6	2,5	10 100	4 750	241	–
11,5	27,4	32,9	58	M6	2,5	10 100	4 750	241	–
11,5	22	33	58	M6	2,5	10 100	4 750	241	–
11,5	27,4	32,9	58	M6	2,5	10 100	4 750	241	–
11,5	27,4	32,9	58	M6	2,5	10 100	4 750	241	–
11,5	22	33	58	M6	2,5	10 100	4 750	241	–
11,5	27,4	32,9	58	M6	2,5	10 100	4 750	241	–
11,5	25	37	68	M6	2,5	13 600	6 600	335	KASK04
11,5	31	37,3	68	M6	2,5	13 600	6 600	335	KASK04
11,5	27	38,5	74	M6	2,5	14 900	7 800	395	KASK05
11,5	34,1	38,8	74	M6	2,5	14 900	7 800	395	KASK05
11,5	30	41	85	M6	3	20 700	11 300	570	KASK06
11,5	36,5	42	85	M6	–	20 700	11 300	570	KASK06
11,5	38,1	42,2	85	M6	3	20 700	11 300	570	KASK06
14	35	46,45	100	M6	3	27 500	15 300	770	KASK07
14	37,7	43	100	M6	–	27 500	15 300	770	KASK07
14	42,9	46,4	100	M6	3	27 500	15 300	770	KASK07
14	39,5	52,95	110	M6	4	34 500	19 800	1 010	KASK08
14	42,9	51	110	M6	–	34 500	19 800	1 010	KASK08
14	49,2	54,2	110	M6	4	34 500	19 800	1 010	KASK08
14	41,5	54,5	116	Rp ^{1/8}	4	34 500	20 400	1 030	–
14	49,2	54,2	116	Rp ^{1/8}	4	34 500	20 400	1 030	–



Four-bolt flanged housing units

Flake graphite cast iron housing
 Square version
 Grub screws in inner ring or drive slot



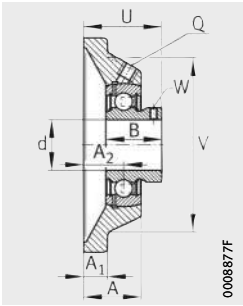
PCJY...-XL-N, RCJY...-XL(-N),
 RCJL...-XL(-N)



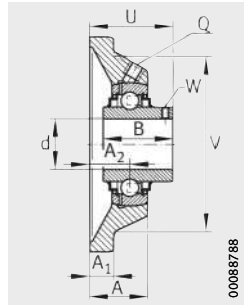
Dimension table (continued) · Dimensions in mm

Designation			Mass m ≈ kg	Dimensions				
Unit	Housing	Radial insert ball bearing		d	J	L	A	A ₁
PCJY50-XL-N	CJ10	GAY50-XL-NPP-B	2,2	50	111	143	41	13
RCJL50-XL-N ²⁾	CJ10	GLE50-XL-KRR-B	2,29	50	111	143	41	13
RCJY50-XL-N	CJ10	GYE50-XL-KRR-B	2,33	50	111	143	41	13
RCJY55-XL	CJ11	GYE55-XL-KRR-B	3,41	55	130	162	43,5	15
PCJY60-XL-N	CJ12	GAY60-XL-NPP-B	3,59	60	143	175	47,5	16
RCJL60-XL-N ²⁾	CJ12	GLE60-XL-KRR-B	4,22	60	143	175	47,5	16
RCJY60-XL-N	CJ12	GYE60-XL-KRR-B	4,22	60	143	175	47,5	16
RCJY65-214-XL ³⁾	CJ14	GYE65-214-XL-KRR-B	5,65	65	150	188	52	18
RCJL70-XL ²⁾	CJ14	GLE70-XL-KRR-B	5,65	70	150	188	52	18
RCJY70-XL	CJ14	GYE70-XL-KRR-B	5,35	70	150	188	52	18
RCJY75-XL	CJ15	GYE75-XL-KRR-B	6,04	75	153	197	55,8	20
RCJY80-XL	CJ16	GYE80-XL-KRR-B	6,82	80	153	197	55,8	20
RCJY90-XL	CJ18	GYE90-XL-KRR-B	9,48	90	187	235	39,8	22

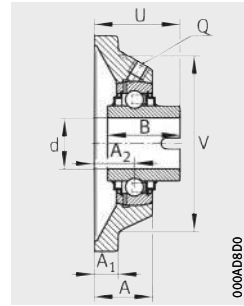
- 1) To be ordered separately.
The caps are suitable for temperatures from -20 °C to +80 °C.
- 2) With fitted lubrication nipple.
- 3) Alternative ball set 6214.



PCJY..-XL-N



RCJY..-XL(-N)



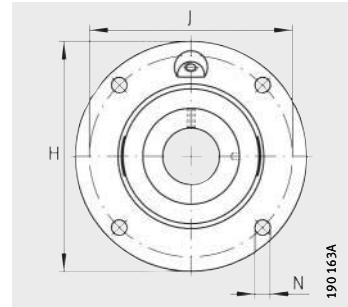
RCJL..-XL(-N)

						Width across flats W	Load carrying capacity Bearing			End cap ¹⁾
							Basic load ratings		Fatigue limit load C _{ur} N	
A ₂	N	B	U	V	Q		dyn. C _r N	stat. C _{0r} N		
28	18	43	60	119	M6	4	37 500	23 200	1 180	KASK10
28	18	49,2	58,2	119	M6	–	37 500	23 200	1 180	KASK10
28	18	51,6	60,6	119	M6	4	37 500	23 200	1 180	KASK10
31	18	55,6	64,4	140	Rp ^{1/8}	4	46 000	29 000	1 480	–
34	18	47	68	150	Rp ^{1/8}	5	56 000	36 000	1 820	KASK12
34	18	61,9	71,3	150	Rp ^{1/8}	–	56 000	36 000	1 820	KASK12
34	18	65,1	73,7	150	Rp ^{1/8}	5	56 000	36 000	1 820	KASK12
38	18	74,6	82,4	165	Rp ^{1/8}	5	66 000	44 000	2 230	–
38	18	68,2	79,2	165	Rp ^{1/8}	–	66 000	44 000	2 230	–
38	18	74,6	82,4	165	Rp ^{1/8}	5	66 000	44 000	2 230	–
41,3	23	77,8	85,8	170	M6	5	66 000	44 500	2 240	–
41,3	23	82,6	90,6	180	Rp ^{1/8}	5	76 000	54 000	2 600	–
23,8	23	96	80,1	200	Rp ^{1/8}	6	109 000	79 000	3 550	–



Four-bolt flanged housing units

Flake graphite cast iron housing
 Round version
 With wide centring spigot
 Eccentric locking collar



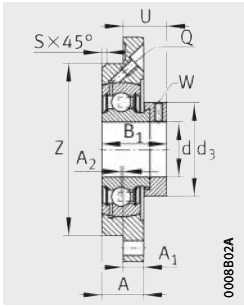
PME..-XL, RME..-XL, RMEO..-XL,
 TME..-XL



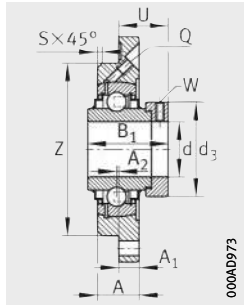
Dimension table - Dimensions in mm

Designation			Mass	Dimensions						
Unit	Housing	Radial insert ball bearing		m ≈ kg	d	H	J	A	A ₁	A ₂
PME20-XL-N	ME04	GRAE20-XL-NPP-B	0,53	20	100	78	17	8	2	9
RME20-XL-N	ME04	GE20-XL-KRR-B	0,57	20	100	78	17	8	2	9
TME20-XL-N	ME04	GE20-XL-KTT-B	0,56	20	100	78	17	8	2	9
PME25-XL-N	ME05	GRAE25-XL-NPP-B	0,73	25	115	90	19	9	2,5	9
RME25-XL-N	ME05	GE25-XL-KRR-B	0,8	25	115	90	19	9	2,5	9
TME25-XL-N	ME05	GE25-XL-KTT-B	0,8	25	115	90	19	9	2,5	9
PME30-XL-N	ME06	GRAE30-XL-NPP-B	0,97	30	125	100	20,5	9,5	2	11,5
RME30-XL-N	ME06	GE30-XL-KRR-B	1,04	30	125	100	20,5	9,5	2	11,5
TME30-XL-N	ME06	GE30-XL-KTT-B	1,05	30	125	100	20,5	9,5	2	11,5
PME35-XL-N	ME07	GRAE35-XL-NPP-B	1,26	35	135	110	20,5	10	1	11,5
RME35-XL-N	ME07	GE35-XL-KRR-B	1,34	35	135	110	20,5	10	1	11,5
RMEO35-XL	ME007	GNE35-XL-KRR-B	2,4	35	174	141	25	16	-2	19
TME35-XL-N	ME07	GE35-XL-KTT-B	1,34	35	135	110	20,5	10	1	11,5
PME40-XL-N	ME08	GRAE40-XL-NPP-B	1,62	40	145	120	23	11,5	1	11,5
RME40-XL-N	ME08	GE40-XL-KRR-B	1,74	40	145	120	23	11,5	1	11,5
RMEO40-XL	ME008	GNE40-XL-KRR-B	3,4	40	194	158	27	17	-2,5	19
TME40-XL-N	ME08	GE40-XL-KTT-B	1,77	40	145	120	23	11,5	1	11,5
PME45-XL	ME09	GRAE45-XL-NPP-B	1,93	45	155	130	25	12	2	14
RME45-XL	ME09	GE45-XL-KRR-B	2,05	45	155	130	25	12	2	14
TME45-XL	ME09	GE45-XL-KTT-B	2,1	45	155	130	25	12	2	14
PME50-XL-N	ME10	GRAE50-XL-NPP-B	2,13	50	165	135	25	13	1	14
RME50-XL-N	ME10	GE50-XL-KRR-B	2,53	50	165	135	25	13	1	14
RMEO50-XL	ME010	GNE50-XL-KRR-B	4,6	50	230	187	31	19	-2,5	23
TME50-XL-N	ME10	GE50-XL-KTT-B	2,59	50	165	135	25	13	1	14
PME55-XL	ME11	GRAE55-XL-NPP-B	2,76	55	185	150	27,5	15	-	18
RME55-XL	ME11	GE55-XL-KRR-B	3,37	55	185	150	27,5	15	-	18
TME55-XL	ME11	GE55-XL-KTT-B	3,38	55	185	150	27,5	15	-	18

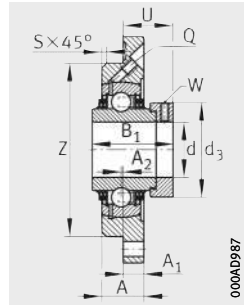
1) To be ordered separately.
 The caps are suitable for temperatures from -20 °C to +80 °C.



PME..-XL



RME..-XL, RMEO..-XL



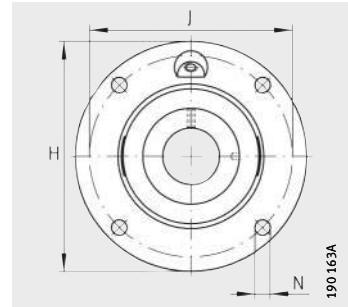
TME..-XL

B ₁	S	U	Z	Q	d ₃ max.	W	Load carrying capacity Bearing			End cap ¹⁾
							Basic load ratings		Fatigue limit load C _{ur} N	
							dyn. C _r N	stat. C _{0r} N		
31	2	21,5	62	M6	33	3	13 600	6 600	335	KASK04
43,7	2	24,6	62	M6	33	3	13 600	6 600	335	KASK04
43,7	2	24,6	62	M6	33	3	13 600	6 600	335	KASK04
31	2	21	70	M6	37,5	3	14 900	7 800	395	KASK05
44,5	2	24,4	70	M6	37,5	3	14 900	7 800	395	KASK05
44,5	2	24,4	70	M6	37,5	3	14 900	7 800	395	KASK05
35,8	2	24,7	80	M6	44	4	20 700	11 300	570	KASK06
48,5	2	28,1	80	M6	44	4	20 700	11 300	570	KASK06
48,5	2	28,1	80	M6	44	4	20 700	11 300	570	KASK06
39	2	28,5	90	M6	55	5	27 500	15 300	770	KASK07
51,3	2	31,3	90	M6	55	5	27 500	15 300	770	KASK07
51,6	2	35,35	100	M6	55	5	39 000	20 900	1 060	-
51,3	2	31,3	90	M6	55	5	27 500	15 300	770	KASK07
43,8	2	31,7	100	M6	58	5	34 500	19 800	1 010	KASK08
56,5	2	33,9	100	M6	58	5	34 500	19 800	1 010	KASK08
54,6	2	39,1	115	M6	63	5	47 000	26 000	1 320	-
56,5	2	33,9	100	M6	58	5	34 500	19 800	1 010	KASK08
43,8	2	30,7	105	M6	63	5	34 500	20 400	1 030	-
56,5	2	32,9	105	M6	63	5	34 500	20 400	1 030	-
56,5	2	32,9	105	M6	63	5	34 500	20 400	1 030	-
43,8	3	31,8	110	M8×1	69	5	37 500	23 200	1 180	KASK10
62,8	3	37,1	110	M8×1	69	5	37 500	23 200	1 180	KASK10
66,75	2	44,6	140	M6	75,8	5	66 000	38 000	1 920	-
62,8	3	37,1	110	M8×1	69	5	37 500	23 200	1 180	KASK10
48,4	3	36,4	125	M6	76	5	46 000	29 000	1 480	-
71,4	3	43,6	125	M6	76	5	46 000	29 000	1 480	-
71,4	3	43,6	125	M6	76	5	46 000	29 000	1 480	-



Four-bolt flanged housing units

Flake graphite cast iron housing
 Round version
 With wide centring spigot
 Eccentric locking collar



PME..-XL, RME..-XL, RMEO..-XL,
 TME..-XL

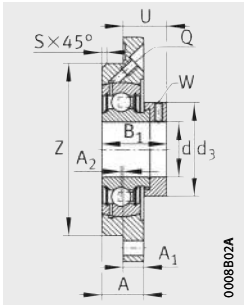


Dimension table (continued) · Dimensions in mm

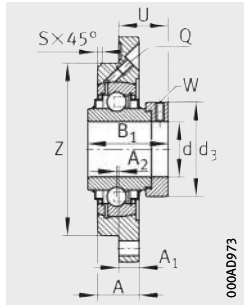
Designation			Mass m ≈ kg	Dimensions					
Unit	Housing	Radial insert ball bearing		d	H	J	A	A ₁	A ₂
PME60-XL-N	ME12	GRAE60-XL-NPP-B	3,65	60	195	160	29	16	1
RME60-XL-N	ME12	GE60-XL-KRR-B	4,04	60	195	160	29	16	1
RMEO60-XL	MEO12	GNE60-XL-KRR-B	6	60	256	212	36	22	-2,5
TME60-XL-N	ME12	GE60-XL-KTT-B	4,04	60	195	160	29	16	1
RME65-214-XL²⁾	ME14	GE65-214-XL-KRR-B	5,81	65	215	177	32	18	-
TME65-214-XL²⁾	ME14	GE65-214-XL-KTT-B	5,81	65	215	177	32	18	-
RME70-XL	ME14	GE70-XL-KRR-B	5,55	70	215	177	32	18	-
RMEO70-XL	MEO14	GNE70-XL-KRR-B	9	70	300	252	43	25	-0,5
TME70-XL	ME14	GE70-XL-KTT-B	5,03	70	215	177	32	18	-
RME75-XL	ME15	GE75-XL-KRR-B	5,65	75	220	184	32	18	-
TME75-XL	ME15	GE75-XL-KTT-B	5,76	75	220	184	32	18	-
RME80-XL	ME16	GE80-XL-KRR-B	5,75	80	220	184	31	18	-2
RMEO80-XL	MEO16	GNE80-XL-KRR-B-FA107	12,7	80	275	235	51	12	3
TME80-XL	ME16	GE80-XL-KTT-B	5,51	80	220	184	31	18	-2
RME90-XL	ME18	GE90-XL-KRR-B	8,5	90	265	220	32	20	-4
RMEO90-XL	MEO18	GNE90-XL-KRR-B-FA107	12,7	90	300	260	50	22	3
RME100-XL	ME20	GE100-XL-KRR-B	11,45	100	295	245	36	22	-4
RMEO100-XL	MEO20	GNE100-XL-KRR-B-FA107	22,3	100	340	295	57	27	1,5
RME120-XL	ME24	GE120-XL-KRR-B	17,43	120	350	295	40	24	-4

¹⁾ To be ordered separately.
 The caps are suitable for temperatures from -20 °C to +80 °C.

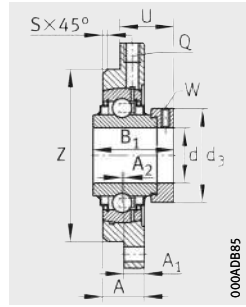
²⁾ Alternative ball set 6214.



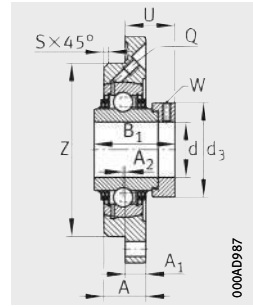
PME..-XL



RME..-XL, RMEO..-XL
(up to d = 70 mm)



RMEO..-XL
(from d = 80 mm)



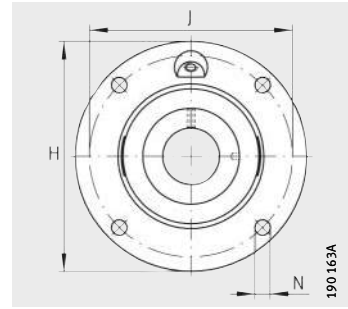
TME..-XL

N	B ₁	S	U	Z	Q	d ₃ max.	W	Load carrying capacity Bearing			End cap ¹⁾
								Basic load ratings		Fatigue limit load C _{ur} N	
								dyn. C _r N	stat. C _{0r} N		
18	53,1	3	38,6	135	M6	84	5	56 000	36 000	1 820	KASK12
18	77,9	3	45,9	135	M6	84	5	56 000	36 000	1 820	KASK12
23	68	3	47,5	160	Rp ^{1/8}	89	5	87 000	52 000	2 650	–
18	77,9	3	45,9	135	M6	84	5	56 000	36 000	1 820	KASK12
18	66	6	44,5	150	Rp ^{1/8}	96	6	66 000	44 000	2 230	–
18	66	6	44,5	150	Rp ^{1/8}	96	6	66 000	44 000	2 230	–
18	66	6	44,5	150	Rp ^{1/8}	96	6	66 000	44 000	2 230	–
25	75,5	4	49,9	185	M6	102	6	111 000	68 000	3 300	–
18	66	6	44,5	150	Rp ^{1/8}	96	6	66 000	44 000	2 230	–
18	67	6	45,6	160	M6	100	6	66 000	44 500	2 240	–
18	67	6	45,6	160	M6	100	6	66 000	44 500	2 240	–
18	70,7	6	49,3	160	M6	108	6	76 000	54 000	2 600	–
22	93,6	6	56,6	200	Rp ^{1/8}	118	6	131 000	87 000	3 950	–
18	70,7	6	49,3	160	M6	108	6	76 000	54 000	2 600	–
23	69,5	3	50,5	190	Rp ^{1/8}	118	6	109 000	79 000	3 550	–
22	101	6	62,5	220	Rp ^{1/8}	132	6	151 000	107 000	4 600	–
23	75	3	53,4	210	M6	132	6	130 000	93 000	4 000	–
26	109,4	8	68,5	250	Rp ^{1/8}	145	6	184 000	141 000	5 700	–
27	81	3	56,5	250	M6	152	6	165 000	131 000	5 100	–



Four-bolt flanged housing units

Flake graphite cast iron housing
Round version
With wide centring spigot
Grub screws in inner ring



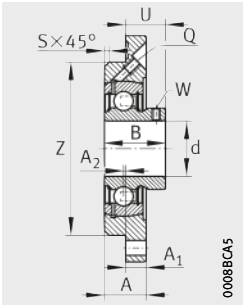
PMEY...-XL, RMEY...-XL

Dimension table - Dimensions in mm

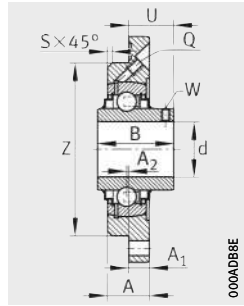
Designation			Mass m ≈ kg	Dimensions					
Unit	Housing	Radial insert ball bearing		d	H	J	A	A ₁	A ₂
PMEY20-XL-N	ME04	GAY20-XL-NPP-B	0,5	20	100	78	17	8	2
RMEY20-XL-N	ME04	GYE20-XL-KRR-B	0,54	20	100	78	17	8	2
PMEY25-XL-N	ME05	GAY25-XL-NPP-B	0,7	25	115	90	19	9	2,5
RMEY25-XL-N	ME05	GYE25-XL-KRR-B	0,75	25	115	90	19	9	2,5
PMEY30-XL-N	ME06	GAY30-XL-NPP-B	0,9	30	125	100	20,5	9,5	2
RMEY30-XL-N	ME06	GYE30-XL-KRR-B	0,99	30	125	100	20,5	9,5	2
PMEY35-XL-N	ME07	GAY35-XL-NPP-B	1,15	35	135	110	20,5	10	1
RMEY35-XL-N	ME07	GYE35-XL-KRR-B	1,28	35	135	110	20,5	10	1
PMEY40-XL-N	ME08	GAY40-XL-NPP-B	1,51	40	145	120	23	11,5	1
RMEY40-XL-N	ME08	GYE40-XL-KRR-B	1,65	40	145	120	23	11,5	1
PMEY45-XL	ME09	GAY45-XL-NPP-B	1,77	45	155	130	25	12	2
RMEY45-XL	ME09	GYE45-XL-KRR-B	1,94	45	155	130	25	12	2
PMEY50-XL-N	ME10	GAY50-XL-NPP-B	2,03	50	165	135	25	13	1
RMEY50-XL-N	ME10	GYE50-XL-KRR-B	2,16	50	165	135	25	13	1
RMEY55-XL	ME11	GYE55-XL-KRR-B	3,05	55	185	150	27,5	15	-
PMEY60-XL-N	ME12	GAY60-XL-NPP-B	3,41	60	195	160	29	16	1
RMEY60-XL-N	ME12	GYE60-XL-KRR-B	3,71	60	195	160	29	16	1
RMEY65-214-XL²⁾	ME14	GYE65-214-XL-KRR-B	5,35	65	215	177	32	18	-
RMEY70-XL	ME14	GYE70-XL-KRR-B	5,29	70	215	177	32	18	-
RMEY75-XL	ME15	GYE75-XL-KRR-B	5,19	75	220	184	32	18	-
RMEY80-XL	ME16	GYE80-XL-KRR-B	5,43	80	220	184	31	18	-2
RMEY90-XL	ME18	GYE90-XL-KRR-B	8,86	90	265	220	32	20	-4

1) To be ordered separately.
The caps are suitable for temperatures from -20 °C to +80 °C.

2) Alternative ball set 6214.



PMEY..-XL



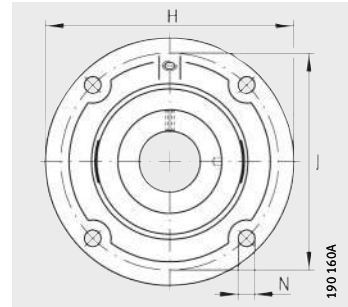
RMEY..-XL

N	B	S	U	Z	Q	W	Load carrying capacity Bearing			End cap ¹⁾
							Basic load ratings		Fatigue limit load C _{ur} N	
							dyn. C _r N	stat. C _{0r} N		
9	25	2	16	62	M6	2,5	13 600	6 600	335	KASK04
9	31	2	16,3	62	M6	2,5	13 600	6 600	335	KASK04
9	27	2	17	70	M6	2,5	14 900	7 800	395	KASK05
9	34,1	2	17,3	70	M6	2,5	14 900	7 800	395	KASK05
11,5	30	2	19	80	M6	3	20 700	11 300	570	KASK06
11,5	38,1	2	20,2	80	M6	3	20 700	11 300	570	KASK06
11,5	35	2	24,45	90	M6	3	27 500	15 300	770	KASK07
11,5	42,9	2	24,4	90	M6	3	27 500	15 300	770	KASK07
11,5	39,5	2	28	100	M6	4	34 500	19 800	1 010	KASK08
11,5	49,2	2	29,2	100	M6	4	34 500	19 800	1 010	KASK08
14	41,5	2	28,5	105	M6	4	34 500	20 400	1 030	–
14	49,2	2	28,2	105	M6	4	34 500	20 400	1 030	–
14	43	3	31	110	M8×1	4	37 500	23 200	1 180	KASK10
14	51,6	3	31,6	110	M8×1	4	37 500	23 200	1 180	KASK10
18	55,6	3	33,4	125	M6	4	46 000	29 000	1 480	–
18	47	3	33	135	M6	5	56 000	36 000	1 820	KASK12
18	65,1	3	38,7	135	M6	5	56 000	36 000	1 820	KASK12
18	74,6	6	44,4	150	Rp ^{1/8}	5	66 000	44 000	2 230	–
18	74,6	6	44,4	150	Rp ^{1/8}	5	66 000	44 000	2 230	–
18	77,8	6	44,5	160	M6	5	66 000	44 500	2 240	–
18	82,6	6	51,3	160	M6	5	76 000	54 000	2 600	–
23	96	3	60,3	190	Rp ^{1/8}	6	109 000	79 000	3 550	–



Four-bolt flanged housing units

Flake graphite cast iron housing
 Round version
 With narrow centring spigot



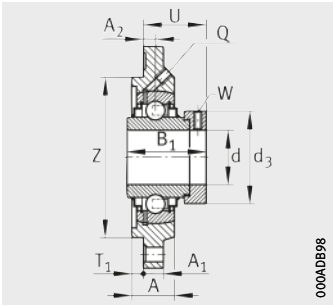
RFE...-XL, TFE...-XL



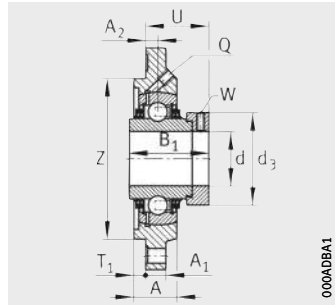
Dimension table - Dimensions in mm

Designation			Mass m ≈ kg	Dimensions						
Unit	Housing	Radial insert ball bearing		d	H	J	A	A ₁	A ₂	N
RFE25-XL	FE05	GE25-XL-KRR-B	0,8	25	115	92	22	9	9,5	9
TFE25-XL	FE05	GE25-XL-KTT-B	0,8	25	115	92	22	9	9,5	9
RFE30-XL	FE06	GE30-XL-KRR-B	1,08	30	127	105	22,5	9,5	10,5	9
TFE30-XL	FE06	GE30-XL-KTT-B	1,08	30	127	105	22,5	9,5	10,5	9
RFE35-XL	FE07	GE35-XL-KRR-B	1,33	35	135	110	22,5	10	9	11,5
TFE35-XL	FE07	GE35-XL-KTT-B	1,31	35	135	110	22,5	10	9	11,5
RFE40-XL	FE08	GE40-XL-KRR-B	1,72	40	145	120	26	11,5	11,5	11,5
TFE40-XL	FE08	GE40-XL-KTT-B	1,72	40	145	120	26	11,5	11,5	11,5
RFE45-XL	FE09	GE45-XL-KRR-B	2,06	45	155	130	26,5	12	11,5	14
RFE50-XL-N¹⁾	FE10	GE50-XL-KRR-B	2,48	50	165	136	27,5	13	12,5	14
TFE50-XL-N¹⁾	FE10	GE50-XL-KTT-B	2,48	50	165	136	27,5	13	12,5	14
RFE60-XL	FE12	GE60-XL-KRR-B	3,99	60	195	165	33	16	17	14
TFE60-XL	FE12	GE60-XL-KTT-B	3,99	60	195	165	33	16	17	14

¹⁾ End cap KASK10 must be ordered separately.
 The cap is suitable for temperatures from -20 °C to +80 °C.



RFE..-XL



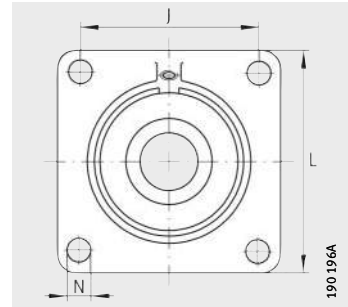
TFE..-XL

						Width across flats W	Load carrying capacity Bearing			End cap ¹⁾
							Basic load ratings		Fatigue limit load C _{ur} N	
B ₁	T ₁	U	Z h8	Q	d ₃ max.		dyn. C _r N	stat. C _{0r} N		
44,5	3	36,4	75	M6	37,5	3	14 900	7 800	395	–
44,5	3	36,4	75	M6	37,5	3	14 900	7 800	395	–
48,5	3	40,6	85	M6	44	4	20 700	11 300	570	–
48,5	3	40,6	85	M6	44	4	20 700	11 300	570	–
51,3	4	41,3	90	M6	55	5	27 500	15 300	770	–
51,3	4	41,3	90	M6	55	5	27 500	15 300	770	–
56,5	4	46,4	100	Rp ^{1/8}	58	5	34 500	19 800	1 010	–
56,5	4	46,4	100	Rp ^{1/8}	58	5	34 500	19 800	1 010	–
56,5	4	46,4	105	M6	63	5	34 500	20 400	1 030	–
62,8	4	50,6	115	Rp ^{1/8}	69	5	37 500	23 200	1 180	KASK10
62,8	4	50,6	115	Rp ^{1/8}	69	5	37 500	23 200	1 180	KASK10
77,9	4	63,8	140	Rp ^{1/8}	84	5	56 000	36 000	1 820	–
77,9	4	63,8	140	Rp ^{1/8}	84	5	56 000	36 000	1 820	–



Four-bolt flanged housing units

Flake graphite cast iron housing
With double row angular contact ball bearing



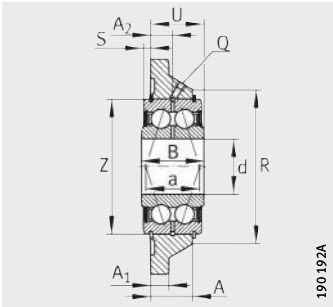
PCCJ

Dimension table - Dimensions in mm

Designation			Mass m ≈ kg	Dimensions					
Unit	Housing	Bearing ¹⁾		d	J	L	A	A ₁	A ₂
PCCJ25	CCJ05	G5205-2RS-N	0,79	25	70	95	22,1	12	11,7
PCCJ30	CCJ06	G5206-2RS-N	1,12	30	82,5	108	24	12	13
PCCJ35	CCJ07	G5207-2RS-N	1,48	35	92	118	26	14	14
PCCJ40	CCJ08	G5208-2RS-N	1,8	40	101,5	130	28	14	15

¹⁾ For general guidelines on double row angular contact ball bearings, see Catalogue HR 1, Rolling Bearings.

²⁾ Tolerance class Normal of bearing outside diameter to ISO 492.



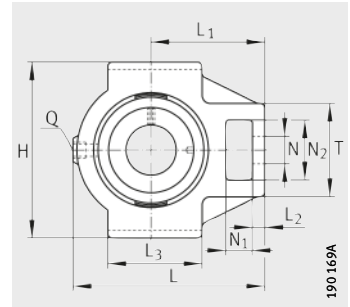
PCCJ

								Load carrying capacity Bearing		
								Basic load ratings		Fatigue limit load
a	N	B	R	S	U	Z ²⁾	Q	dyn. C _r N	stat. C _{0r} N	C _{ur} N
			max.			h5				
24	11,5	30	64	2,4	26,7	52	M6	21 600	14 900	750
28,9	11,5	34	76	3,2	29,7	62	M6	30 000	21 400	1 080
33,8	14	36	88	3	31,7	72	M6	39 500	29 000	1 470
38,8	14	38	98	3,2	33,7	80	M6	50 000	38 000	1 910



Take-up housing units

- Flake graphite cast iron housing
- Guide slots on both sides
- Hole for threaded rod
- Eccentric locking collar

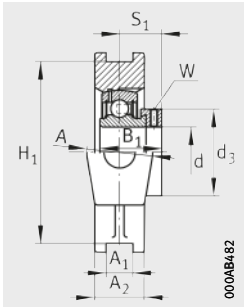


PTUE...XL, RTUE...XL, TTUE...XL

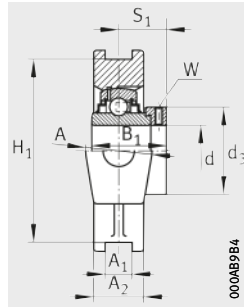


Dimension table - Dimensions in mm

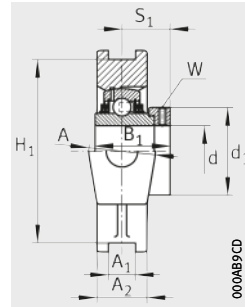
Designation			Mass m ≈ kg	Dimensions								
Unit	Housing	Radial insert ball bearing		d	H	L	L ₁	L ₂	L ₃	A	A ₁ H13	A ₂
PTUE20-XL	TUE04	GRAE20-XL-NPP-B	0,83	20	90	94,5	60	9	50	37	12	25
RTUE20-XL	TUE04	GE20-XL-KRR-B	0,9	20	90	94,5	60	9	50	37	12	25
PTUE25-XL	TUE05	GRAE25-XL-NPP-B	0,85	25	90	98,5	62	10	50	37	12	25
RTUE25-XL	TUE05	GE25-XL-KRR-B	0,91	25	90	98,5	62	10	50	37	12	25
TTUE25-XL	TUE05	GE25-XL-KTT-B	0,91	25	90	98,5	62	10	50	37	12	25
PTUE30-XL	TUE06	GRAE30-XL-NPP-B	1,19	30	102	114,5	70	10	57	37	12	25
RTUE30-XL	TUE06	GE30-XL-KRR-B	1,24	30	102	114,5	70	10	57	37	12	25
TTUE30-XL	TUE06	GE30-XL-KTT-B	1,25	30	102	114,5	70	10	57	37	12	25
PTUE35-XL	TUE07	GRAE35-XL-NPP-B	1,69	35	102	131,5	80	13	63	40	12	30
RTUE35-XL	TUE07	GE35-XL-KRR-B	1,77	35	102	131,5	80	13	63	40	12	30
TTUE35-XL	TUE07	GE35-XL-KTT-B	1,75	35	102	131,5	80	13	63	40	12	30
PTUE40-XL	TUE08	GRAE40-XL-NPP-B	2,43	40	115	141	88	16	82	50	16	35
RTUE40-XL	TUE08	GE40-XL-KRR-B	2,52	40	115	141	88	16	82	50	16	35
TTUE40-XL	TUE08	GE40-XL-KTT-B	2,55	40	115	141	88	16	82	50	16	35
PTUE45-XL	TUE09	GRAE45-XL-NPP-B	2,32	45	115	141	88	16	82	50	16	35
RTUE45-XL	TUE09	GE45-XL-KRR-B	2,61	45	115	141	88	16	82	50	16	35
TTUE45-XL	TUE09	GE45-XL-KTT-B	2,45	45	115	141	88	16	82	50	16	35
PTUE50-XL	TUE10	GRAE50-XL-NPP-B	2,42	50	115	148	90	16	85	50	16	35
RTUE50-XL	TUE10	GE50-XL-KRR-B	2,57	50	115	148	90	16	85	50	16	35
TTUE50-XL	TUE10	GE50-XL-KTT-B	2,56	50	115	148	90	16	85	50	16	35
PTUE55-XL	TUE11	GRAE55-XL-NPP-B	3,99	55	145	169	104	17	95	60	22	42
RTUE55-XL	TUE11	GE55-XL-KRR-B	4,6	55	145	169	104	17	95	60	22	42
TTUE55-XL	TUE11	GE55-XL-KTT-B	4,72	55	145	169	104	17	95	60	22	42



PTUE...XL



RTUE...XL



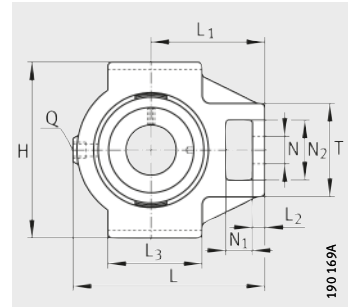
TTUE...XL

H ₁ ±0,15	N	N ₁	N ₂	B ₁	S ₁	T	Q	d ₃ max.	W	Load carrying capacity Bearing		
										Basic load ratings		Fatigue limit load C _{ur} N
										dyn. C _r N	stat. C _{0r} N	
76	19	18	32	31	23,5	51	Rp ^{1/8}	33	3	13 600	6 600	335
76	19	18	32	43,7	26,6	51	Rp ^{1/8}	33	3	13 600	6 600	335
76	19	18	32	31	23,5	51	M6	37,5	3	14 900	7 800	395
76	19	18	32	44,5	27	51	M6	37,5	3	14 900	7 800	395
76	19	18	32	44,5	27	51	M6	37,5	3	14 900	7 800	395
89	22	18	36,5	35,8	26,8	56	Rp ^{1/8}	44	4	20 700	11 300	570
89	22	18	36,5	48,5	30,2	56	Rp ^{1/8}	44	4	20 700	11 300	570
89	22	18	36,5	48,5	30,2	56	Rp ^{1/8}	44	4	20 700	11 300	570
89	22	18	36,5	39	29,5	64	M6	55	5	27 500	15 300	770
89	22	18	36,5	51,3	32,5	64	M6	55	5	27 500	15 300	770
89	22	18	36,5	51,3	32,5	64	M6	55	5	27 500	15 300	770
102	29	20	49	43,8	32,8	82	Rp ^{1/8}	58	5	34 500	19 800	1 010
102	29	20	49	56,5	35,1	82	Rp ^{1/8}	58	5	34 500	19 800	1 010
102	29	20	49	56,5	35,1	82	Rp ^{1/8}	58	5	34 500	19 800	1 010
102	29	20	49	43,8	32,8	82	M6	63	5	34 500	20 400	1 030
102	29	20	49	56,5	35,1	82	M6	63	5	34 500	20 400	1 030
102	29	20	49	56,5	35,1	82	M6	63	5	34 500	20 400	1 030
102	29	20	49	43,8	32,8	83	Rp ^{1/8}	69	5	37 500	23 200	1 180
102	29	20	49	62,8	38,2	83	Rp ^{1/8}	69	5	37 500	23 200	1 180
102	29	20	49	62,8	38,2	83	Rp ^{1/8}	69	5	37 500	23 200	1 180
130	35	26	63,5	48,4	36,4	102	M6	76	5	46 000	29 000	1 480
130	35	26	63,5	71,4	43,6	102	M6	76	5	46 000	29 000	1 480
130	35	26	63,5	71,4	43,6	102	M6	76	5	46 000	29 000	1 480



Take-up housing units

- Flake graphite cast iron housing
- Guide slots on both sides
- Hole for threaded rod
- Eccentric locking collar



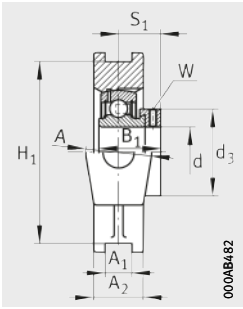
PTUE...XL, RTUE...XL, TTUE...XL, RTUEO...XL



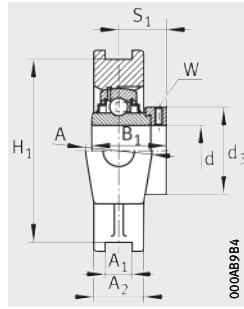
Dimension table (continued) · Dimensions in mm

Designation			Mass	Dimensions								
Unit	Housing	Radial insert ball bearing		m ≈ kg	d	H	L	L ₁	L ₂	L ₃	A	A ₁ H13
PTUE60-XL	TUE12	GRAE60-XL-NPP-B	4,21	60	146	186	118	19	100	60	22	44
RTUE60-XL	TUE12	GE60-XL-KRR-B	4,77	60	146	186	118	19	100	60	22	44
TTUE60-XL	TUE12	GE60-XL-KTT-B	4,76	60	146	186	118	19	100	60	22	44
RTUE65-214-XL¹⁾	TUE13/14	GE65-214-XL-KRR-B	7,46	65	166	214	135	20	120	70	25	50
RTUE70-XL	TUE13/14	GE70-XL-KRR-B	6,82	70	166	214	135	20	120	70	25	50
TTUE70-XL	TUE13/14	GE70-XL-KTT-B	6,85	70	166	214	135	20	120	70	25	50
RTUE75-XL	TUE15	GE75-XL-KRR-B	6,44	75	166	214	135	20	120	70	25	50
TTUE75-XL	TUE15	GE75-XL-KTT-B	7,13	75	166	214	135	20	120	70	25	50
RTUE80-XL	TUE16	GE80-XL-KRR-B	8,4	80	184	230	140	20	120	70	28	50
RTUEO80-XL	TUEO16	GNE80-XL-KRR-B	17,25	80	230	282	174	28	150	102	30	60
TTUE80-XL	TUE16	GE80-XL-KTT-B	7,7	80	184	230	140	20	120	70	28	50
RTUE90-XL	TUE18	GE90-XL-KRR-B	11,87	90	215	275	170	30	140	80	28	55
RTUEO90-XL	TUEO18	GNE90-XL-KRR-B	22,9	90	255	312	192	30	165	110	32	66
RTUE100-XL	TUE20	GE100-XL-KRR-B	14,55	100	240	295	180	30	160	90	28	60
RTUE120-XL	TUE24	GE120-XL-KRR-B	23,89	120	285	345	210	35	190	100	32	70

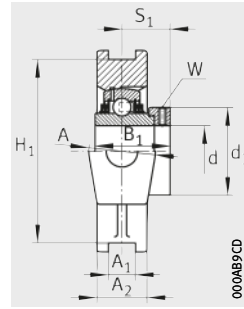
¹⁾ Alternative ball set 6214.



PTUE...XL



RTUE...XL, RTUEO...XL



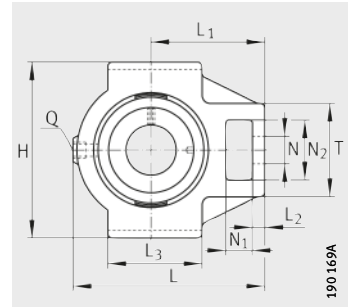
TTUE...XL

H ₁	N	N ₁	N ₂	B ₁	S ₁	T	Q	d ₃ max.	W	Load carrying capacity Bearing		
										Basic load ratings		Fatigue limit load C _{ur} N
										dyn. C _r N	stat. C _{0r} N	
130 ^{+0,15} _{-0,15}	35	32	63,5	53,1	39,6	102	M6	84	5	56 000	36 000	1 820
130 ^{+0,15} _{-0,15}	35	32	63,5	77,9	46,9	102	M6	84	5	56 000	36 000	1 820
130 ^{+0,15} _{-0,15}	35	32	63,5	77,9	46,9	102	M6	84	5	56 000	36 000	1 820
151 ^{+0,25} _{-0,25}	41	35	70	66	44,5	110	M6	96	6	66 000	44 000	2 230
151 ^{+0,25} _{-0,25}	41	35	70	66	44,5	110	M6	96	6	66 000	44 000	2 230
151 ^{+0,25} _{-0,25}	41	35	70	66	44,5	110	M6	96	6	66 000	44 000	2 230
151 ^{+0,25} _{-0,25}	41	35	70	67	45,5	110	M6	100	6	66 000	44 500	2 240
151 ^{+0,25} _{-0,25}	41	35	70	67	45,5	110	M6	100	6	66 000	44 500	2 240
165 ^{+0,25} _{-0,25}	41	35	70	70,7	47,3	110	M6	108	6	76 000	54 000	2 600
204 ⁰ _{-0,6}	53	42	98	93,6	59,6	150	M6	118	6	131 000	87 000	3 950
165 ^{+0,25} _{-0,25}	41	35	70	70,7	47,3	110	M6	108	6	76 000	54 000	2 600
190 ^{+0,25} _{-0,25}	47	40	80	69,5	46,5	130	Rp ¹ / ₈	118	6	109 000	79 000	3 550
228 ⁰ _{-0,6}	57	46	106	101	65,5	160	M6	132	6	151 000	107 000	4 600
215 ^{+0,25} _{-0,25}	47	40	80	75	49,5	130	M6	132	6	130 000	93 000	4 000
255 ^{+0,25} _{-0,25}	55	45	95	81	52,5	150	Rp ¹ / ₈	152	6	165 000	131 000	5 100



Take-up housing units

- Flake graphite cast iron housing
- Guide slots on both sides
- Hole for threaded rod
- Grub screws in inner ring

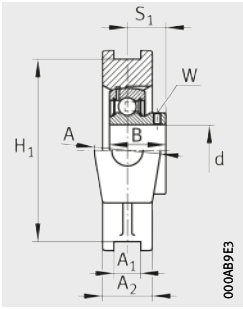


PTUEY..-XL, RTUEY..-XL

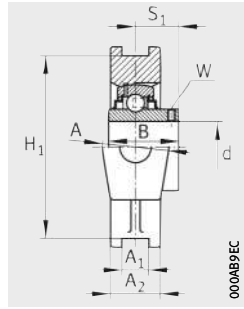
Dimension table - Dimensions in mm

Designation			Mass	Dimensions							
Unit	Housing	Radial insert ball bearing		m ≈ kg	d	H	L	L ₁	L ₂	L ₃	A
PTUEY20-XL	TUE04	GAY20-XL-NPP-B	0,8	20	90	94,5	60	9	50	37	12
RTUEY20-XL	TUE04	GYE20-XL-KRR-B	0,84	20	90	94,5	60	9	50	37	12
PTUEY25-XL	TUE05	GAY25-XL-NPP-B	0,82	25	90	98,5	62	10	50	37	12
RTUEY25-XL	TUE05	GYE25-XL-KRR-B	0,86	25	90	98,5	62	10	50	37	12
PTUEY30-XL	TUE06	GAY30-XL-NPP-B	1,11	30	102	114,5	70	10	57	37	12
RTUEY30-XL	TUE06	GYE30-XL-KRR-B	1,19	30	102	114,5	70	10	57	37	12
PTUEY35-XL	TUE07	GAY35-XL-NPP-B	1,64	35	102	131,5	80	13	63	40	12
RTUEY35-XL	TUE07	GYE35-XL-KRR-B	1,74	35	102	131,5	80	13	63	40	12
RTUEY40-XL	TUE08	GYE40-XL-KRR-B	2,43	40	115	141	88	16	82	50	16
PTUEY50-XL	TUE10	GAY50-XL-NPP-B	2,25	50	115	148	90	16	85	50	16
RTUEY50-XL	TUE10	GYE50-XL-KRR-B	2,38	50	115	148	90	16	85	50	16
PTUEY60-XL	TUE12	GAY60-XL-NPP-B	4,14	60	146	186	118	19	100	60	22
RTUEY60-XL	TUE12	GYE60-XL-KRR-B	4,44	60	146	186	118	19	100	60	22
RTUEY65-214-XL¹⁾	TUE13/14	GYE65-214-XL-KRR-B	7	65	166	214	135	20	120	70	25
RTUEY70-XL	TUE13/14	GYE70-XL-KRR-B	6,69	70	166	214	135	20	120	70	25
RTUEY75-XL	TUE15	GYE75-XL-KRR-B	6,38	75	166	214	135	20	120	70	25
RTUEY80-XL	TUE16	GYE80-XL-KRR-B	7,63	80	184	230	140	20	120	70	28

¹⁾ Alternative ball set 6214.



PTUEY..-XL



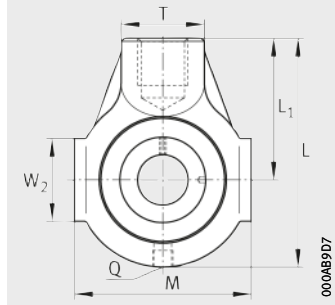
RTUEY..-XL

										Width across flats W	Load carrying capacity Bearing		
											Basic load ratings		Fatigue limit load C _{ur} N
A ₂	H ₁	N	N ₁	N ₂	B	S ₁	T	Q	dyn. C _r N		stat. C _{0r} N		
25	76 ^{+0,15} _{-0,15}	19	18	32	25	18	51	Rp ^{1/8}	2,5	13 600	6 600	335	
25	76 ^{+0,15} _{-0,15}	19	18	32	31	18,3	51	Rp ^{1/8}	2,5	13 600	6 600	335	
25	76 ^{+0,15} _{-0,15}	19	18	32	27	19,5	51	M6	2,5	14 900	7 800	395	
25	76 ^{+0,15} _{-0,15}	19	18	32	34,1	19,8	51	M6	2,5	14 900	7 800	395	
25	89 ^{+0,15} _{-0,15}	22	18	36,5	30	21	56	Rp ^{1/8}	3	20 700	11 300	570	
25	89 ^{+0,15} _{-0,15}	22	18	36,5	38,1	22,2	56	Rp ^{1/8}	3	20 700	11 300	570	
30	89 ^{+0,15} _{-0,15}	22	18	36,5	35	25,5	64	M6	3	27 500	15 300	770	
30	89 ^{+0,15} _{-0,15}	22	18	36,5	42,9	25,4	64	M6	3	27 500	15 300	770	
35	102 ^{+0,15} _{-0,15}	29	20	49	49,2	30,2	82	Rp ^{1/8}	4	34 500	19 800	1 010	
35	102 ^{+0,15} _{-0,15}	29	20	49	43	32	83	Rp ^{1/8}	4	37 500	23 200	1 180	
35	102 ^{+0,15} _{-0,15}	29	20	49	51,6	32,6	83	Rp ^{1/8}	4	37 500	23 200	1 180	
44	130 ^{+0,15} _{-0,15}	35	32	63,5	47	34	102	M6	5	56 000	36 000	1 820	
44	130 ^{+0,15} _{-0,15}	35	32	63,5	65,1	39,7	102	M6	5	56 000	36 000	1 820	
50	151 ^{+0,25} _{-0,25}	41	35	70	74,6	44,4	110	M6	5	66 000	44 000	2 230	
50	151 ^{+0,25} _{-0,25}	41	35	70	74,6	44,4	110	M6	5	66 000	44 000	2 230	
50	151 ^{+0,25} _{-0,25}	41	35	70	77,8	44,5	110	M6	5	66 000	44 500	2 240	
50	165 ^{+0,25} _{-0,25}	41	35	70	82,6	49,3	110	M6	5	76 000	54 000	2 600	

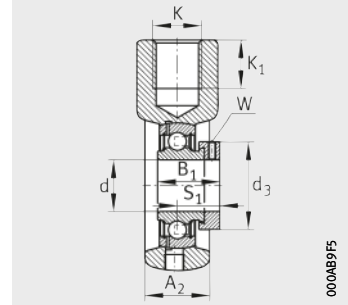


Take-up housing units

Flake graphite cast iron housing
Guide surfaces on both sides
With threaded hole



PHE...-XL, RHE...-XL, THE...-XL, PHEY...-XL



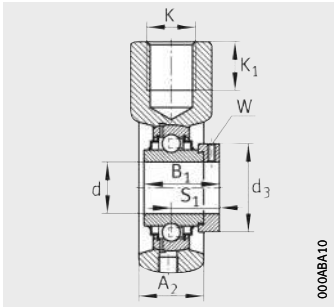
PHE...-XL

Dimension table - Dimensions in mm

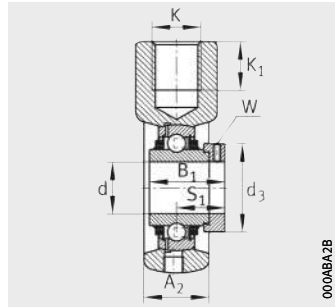
Designation			Mass m ≈ kg	Dimensions					
Unit	Housing	Radial insert ball bearing		d	L	L ₁	A ₂	K	K ₁
PHE20-XL	HE04	GRAE20-XL-NPP-B	0,54	20	91	58	25	M16	21
RHE20-XL	HE04	GE20-XL-KRR-B	0,58	20	91	58	25	M16	21
PHE25-XL	HE05	GRAE25-XL-NPP-B	0,71	25	99	64	28	M20	22
RHE25-XL	HE05	GE25-XL-KRR-B	0,77	25	99	64	28	M20	22
THE25-XL	HE05	GE25-XL-KTT-B	0,75	25	99	64	28	M20	22
PHE30-XL	HE06	GRAE30-XL-NPP-B	1,09	30	114	72	32	M24	24
RHE30-XL	HE06	GE30-XL-KRR-B	1,16	30	114	72	32	M24	24
THE30-XL	HE06	GE30-XL-KTT-B	1,17	30	114	72	32	M24	24
PHE35-XL	HE07	GRAE35-XL-NPP-B	1,32	35	122	76	32	M24	24
RHE35-XL	HE07	GE35-XL-KRR-B	1,39	35	122	76	32	M24	24
THE35-XL	HE07	GE35-XL-KTT-B	1,36	35	122	76	32	M24	24
PHE40-XL	HE08	GRAE40-XL-NPP-B	1,65	40	135	85	36	M24	24
RHE40-XL	HE08	GE40-XL-KRR-B	1,77	40	135	85	36	M24	24
THE40-XL	HE08	GE40-XL-KTT-B	1,8	40	135	85	36	M24	24
PHE45-XL	HE09	GRAE45-XL-NPP-B	1,89	45	145	90	40	M24	24
RHE45-XL	HE09	GE45-XL-KRR-B	2,01	45	145	90	40	M24	24
THE45-XL	HE09	GE45-XL-KTT-B	2,13	45	145	90	40	M24	24
PHE50-XL	HE10	GRAE50-XL-NPP-B	1,92	50	145	90	40	M24	24
RHE50-XL	HE10	GE50-XL-KRR-B	2,15	50	145	90	40	M24	24
THE50-XL	HE10	GE50-XL-KTT-B	2,08	50	145	90	40	M24	24

Dimension table - Dimensions in mm

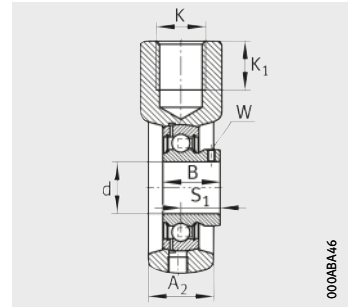
Designation			Mass m ≈ kg	Dimensions					
Unit	Housing	Radial insert ball bearing		d	L	L ₁	A ₂	K	K ₁
PHEY20-XL	HE04	GAY20-XL-NPP-B	0,51	20	91	58	25	M16	21
PHEY25-XL	HE05	GAY25-XL-NPP-B	0,68	25	99	64	28	M20	22
PHEY30-XL	HE06	GAY30-XL-NPP-B	1,03	30	114	72	32	M24	24
PHEY35-XL	HE07	GAY35-XL-NPP-B	1,23	35	122	76	32	M24	24
PHEY40-XL	HE08	GAY40-XL-NPP-B	1,5	40	135	85	36	M24	24
PHEY45-XL	HE09	GAY45-XL-NPP-B	1,91	45	145	90	40	M24	24



RHE..-XL



THE..-XL



PHEY..-XL

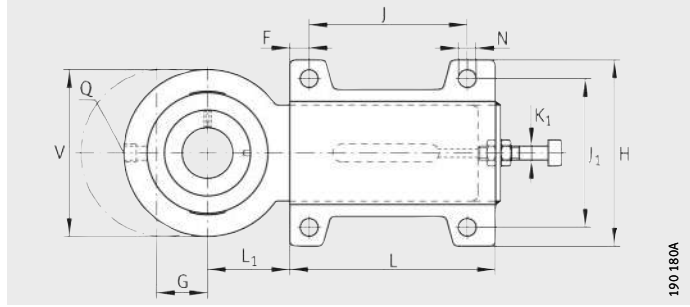
B ₁	M	S ₁	T	W ₂	Q	d ₃ max.	W	Load carrying capacity Bearing		
								Basic load ratings		Fatigue limit load C _{ur} N
								dyn. C _r N	stat. C _{0r} N	
31	65	23,5	30	38	M6	33	3	13 600	6 600	335
43,7	65	26,6	30	38	M6	33	3	13 600	6 600	335
31	70	23,5	35	38	M6	37,5	3	14 900	7 800	395
44,5	70	27	35	38	M6	37,5	3	14 900	7 800	395
44,5	70	27	35	38	M6	37,5	3	14 900	7 800	395
35,8	85	26,8	40	40	Rp ^{1/8}	44	4	20 700	11 300	570
48,5	85	30,2	40	40	Rp ^{1/8}	44	4	20 700	11 300	570
48,5	85	30,2	40	40	Rp ^{1/8}	44	4	20 700	11 300	570
39	90	29,5	40	49	M6	55	5	27 500	15 300	770
51,3	90	32,5	40	49	M6	55	5	27 500	15 300	770
51,3	90	32,5	40	49	M6	55	5	27 500	15 300	770
43,8	100	32,8	40	45	M6	58	5	34 500	19 800	1 010
56,5	100	35,1	40	45	M6	58	5	34 500	19 800	1 010
56,5	100	35,1	40	45	M6	58	5	34 500	19 800	1 010
43,8	110	32,8	40	45	M6	63	5	34 500	20 400	1 030
56,5	110	35,1	40	45	M6	63	5	34 500	20 400	1 030
56,5	110	35,1	40	45	M6	63	5	34 500	20 400	1 030
43,8	110	32,8	40	46	M6	69	5	37 500	23 200	1 180
62,8	110	38,2	40	46	M6	69	5	37 500	23 200	1 180
62,8	110	38,2	40	46	M6	69	5	37 500	23 200	1 180

B	M	S ₁	T	W ₂	Q	W	Load carrying capacity Bearing		
							Basic load ratings		Fatigue limit load C _{ur} N
							dyn. C _r N	stat. C _{0r} N	
25	65	18	30	38	M6	2,5	13 600	6 600	335
27	70	19,5	35	38	M6	2,5	14 900	7 800	395
30	85	21	40	40	Rp ^{1/8}	3	20 700	11 300	570
35	90	25,5	40	49	M6	3	27 500	15 300	770
39,5	100	29	40	45	M6	4	34 500	19 800	1 010
41,5	110	30,5	40	45	M6	4	34 500	20 400	1 030



Take-up housing units

Flake graphite
cast iron housing
Guide tube
With adjusting screw

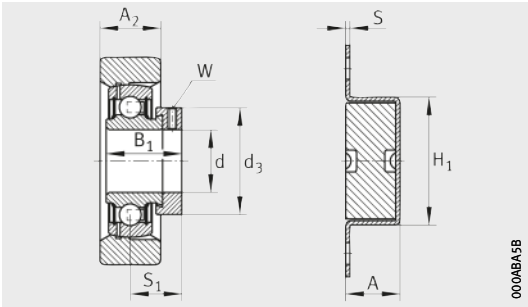


PHUSE...XL(-N)

Dimension table - Dimensions in mm

Designation				Mass m ≈ kg	Dimensions									
Unit	Housing	Guide tube	Radial insert ball bearing		d	H	J	J ₁	L	L ₁	A	A ₂	H ₁	N
PHUSE25-XL	HUE05	HUSE07	GRAE25-XL-NPP-B	2,07	25	103	140	80	187	50	28	22	52	11,5
PHUSE30-XL	HUE06	HUSE07	GRAE30-XL-NPP-B	2,22	30	103	140	80	187	50	28	22	52	11,5
PHUSE35-XL	HUE07	HUSE07	GRAE35-XL-NPP-B	2,46	35	103	140	80	187	50	28	22	52	11,5
PHUSE40-XL	HUE08	HUSE10	GRAE40-XL-NPP-B	4,89	40	130	180	100	256	60	36	30	60	14
PHUSE50-XL-N	HUE10	HUSE10	GRAE50-XL-NPP-B	5,25	50	130	180	100	256	60	36	30	60	14

1) End cap KASK10 must be ordered separately.
The cap is suitable for temperatures from -20 °C to +80 °C.



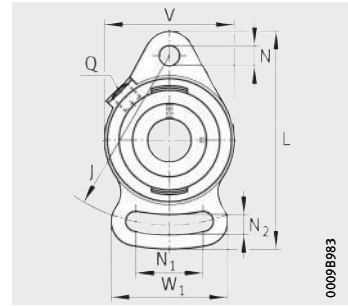
PHUSE..XL(-N)

										Load carrying capacity				End cap ¹⁾
										Bearing			Housing	
										Basic load ratings		Fatigue limit load		
B ₁	K ₁	S	F	G	S ₁	V	Q	d ₃	W	dyn. C _r	stat. C _{0r}	C _{ur}	C _{0rG}	
								max.		N	N	N	N	
31	M12	4	20	65	23,5	78	M6	37,5	3	14 900	7 800	395	7 800	–
35,8	M12	4	20	65	26,8	88	M6	44	4	20 700	11 300	570	11 300	–
39	M12	4	20	65	29,5	98	Rp ^{1/8}	55	5	27 500	15 300	770	15 300	–
43,8	M16	4	20	80	32,8	108	M6	58	5	34 500	19 800	1 010	19 800	–
43,8	M16	4	20	80	32,8	120	M6	69	5	37 500	23 200	1 180	23 200	KASK10



Take-up housing units

Flake graphite cast iron housing
Self-aligning

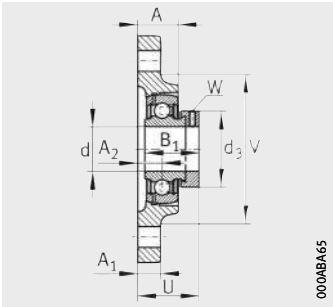


PSFT..-XL



Dimension table - Dimensions in mm

Designation			Mass m ≈ kg	Dimensions						
Unit	Housing	Radial insert ball bearing		d	J	L	A	A ₁	A ₂	N
PSFT20-XL	SFT04	GRAE20-XL-NPP-B	0,41	20	90	112	18	10	10,5	11,5
PSFT25-XL	SFT05	GRAE25-XL-NPP-B	0,52	25	99	124	20	11	12,5	11,5
PSFT30-XL	SFT06	GRAE30-XL-NPP-B	0,77	30	117	142	22	12	13	11,5
PSFT35-XL	SFT07	GRAE35-XL-NPP-B	1,1	35	128	155	25	12,5	15	14



PSFT..XL

								Width across flats W	Load carrying capacity Housing		
									Basic load ratings		Fatigue limit load
N ₁	N ₂	B ₁	U	V	W ₁	Q	d ₃ max.	dyn. C _r N	stat. C _{0r} N	C _{ur} N	
30	11,5	31	34	61	52	M6	33	13 600	6 600	335	
37,5	11,5	31	36	70	63	M6	37,5	14 900	7 800	395	
40	11,5	35,8	39,7	80	65	M6	44	20 700	11 300	570	
45	14	39	44,5	90	75	M6	55	27 500	15 300	770	





Housing units with sheet steel housing

Plummer block housing units

Flanged housing units

Take-up housing units

Housing units with sheet steel housing

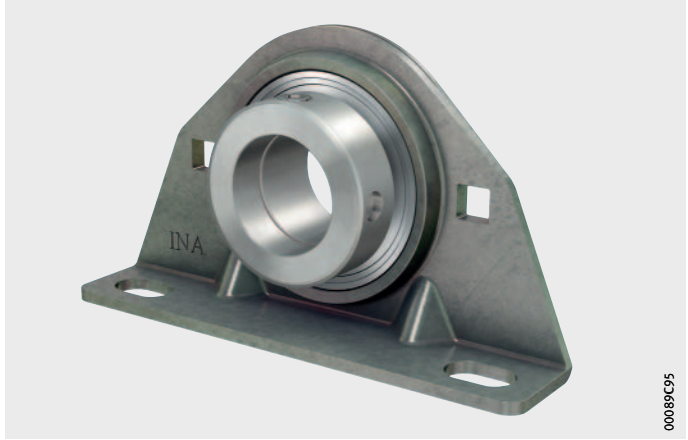
	Page
Product overview	Housing units with sheet steel housing..... 308
Matrix	Possible combinations Radial insert ball bearings with sheet steel housings..... 310
Features	X-life 312 Plummer block and flanged housing units..... 313 Plummer block and flanged housing units with rubber interliner..... 313 Take-up housing units 314 Operating temperature 314 Lubrication 314 Corrosion-resistant units 314 Market sectors..... 314 Suffixes..... 314
Design and safety guidelines	Compensation of static misalignments..... 315 Speed limits for radial insert ball bearings 316 Load carrying capacity of housings 316 Design of adjacent construction..... 317
Accuracy	Dimensional tolerances 317
Dimension tables	Plummer block housing units, with or without rubber interliner..... 318 Two-bolt flanged housing units 322 Two-bolt flanged housing units, with rubber interliner 324 Three-bolt flanged housing units..... 326 Three-bolt and four-bolt flanged housing units 328 Take-up housing units 332



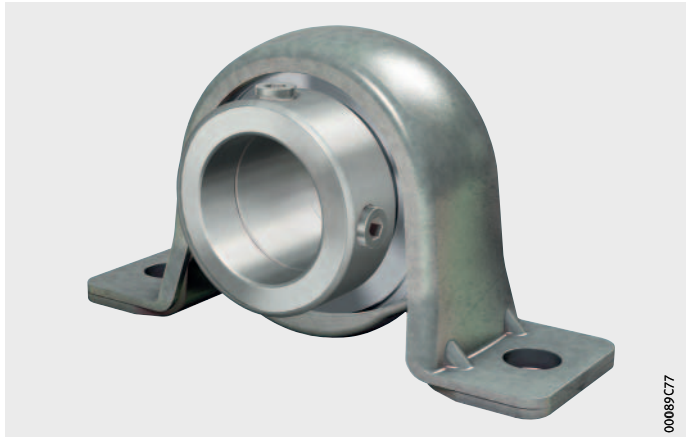
Product overview Housing units with sheet steel housing

Plummer block housing units

PBS..-XL

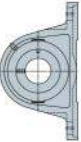
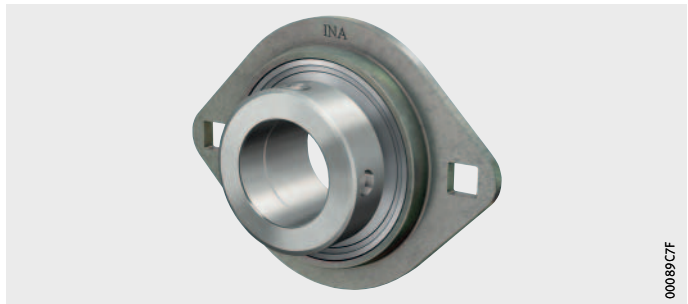


PB..-XL, PBY..-XL, RPB..-XL



Two-bolt and three-bolt flanged housing units

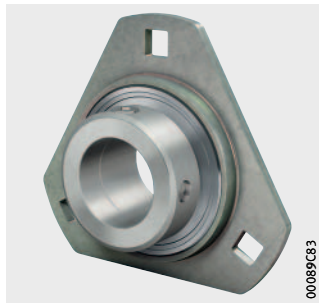
RAT..-XL, RATY..-XL, RALT..-XL, PCSLT..-XL



RCSMF..-XL



RATR..-XL, RALTR..-XL,
RRTR..-XL, RATRY..-XL

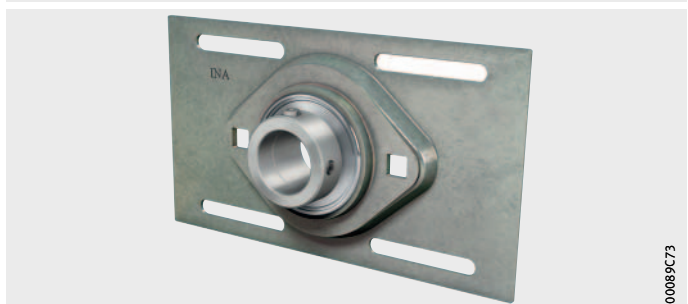


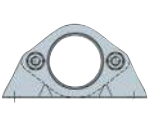
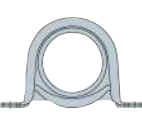
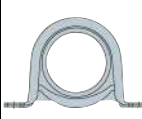


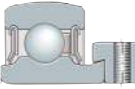
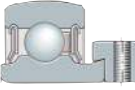
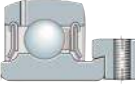
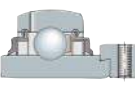
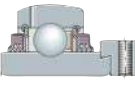
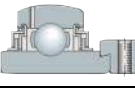
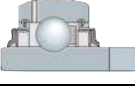
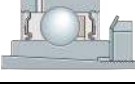
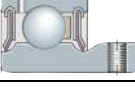
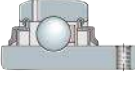
RA..-XL, RAY..-XL, GRA..-XL




Take-up housing units

MSTU..-XL



Possible combinations Radial insert ball bearings with sheet steel housings	Housing ¹⁾				
	Plummer block housing			Two-bolt flanged housing	
					
Designation	GEH...PBS	GEH...BT	GEH...BT GRG...RABR	FLAN...LST (2 pieces)	FLAN...MST (2 pieces)
Shaft diameter d					
RAE...-XL-NPP(-B) 20 mm – 30 mm			RPB...-XL page 318 d = 30 mm	RALT...-XL page 322	
RAE...-XL-NPP(-B) 12 mm – 40 mm		PBS...-XL page 318	PB...-XL page 318	RPB...-XL page 318	RAT...-XL page 322
GRAE...-XL-NPP-B 20 mm – 60 mm					
(G)E...-XL-KRR-B 17 mm – 60 mm		To be ordered separately	To be ordered separately	To be ordered separately	To be ordered separately
GE...-XL-KTT-B 20 mm – 60 mm		To be ordered separately	To be ordered separately		To be ordered separately
GE...-XL-KLL-B 20 mm – 50 mm		To be ordered separately	To be ordered separately		To be ordered separately
GLE...-XL-KRR-B 20 mm – 60 mm		To be ordered separately	To be ordered separately		To be ordered separately
GSH...-XL-2RSR-B 20 mm – 50 mm		To be ordered separately	To be ordered separately		To be ordered separately
(G)AY...-XL-NPP-B 12 mm – 60 mm		To be ordered separately	PBY...-XL page 318		RATY...-XL page 322
GYE...-XL-KRR-B 12 mm – 60 mm		To be ordered separately	To be ordered separately		To be ordered separately

Catalogue range, for dimension table see page number specified.
Please contact us for details about other sizes and combinations.

 Combinations not possible or not advisable.

¹⁾ Housings have a Corrotect coating, suffix FA125.

Three-bolt flanged housing						Take-up housing
						
FLAN...CSLT FLAN...CST	FLAN...RCSMF GRG...RCSM	FLAN...MSB (2 pieces)	FLAN...MSA FLAN...MSB	FLAN...LSTR (2 pieces)	FLAN...MSTR (2 pieces)	GEH...MSTU
PCSLT...XL page 322	RCSMF...XL page 324 d = 30 mm			RALTR...XL page 326		
	RCSMF...XL page 324	RA...XL page 328			RATR...XL page 326	MSTU...XL page 332
		RA...XL page 328	GRA...XL page 328			
		To be ordered separately	To be ordered separately		RRTR...XL page 326	To be ordered separately
		To be ordered separately	To be ordered separately		To be ordered separately	To be ordered separately
		To be ordered separately	To be ordered separately		To be ordered separately	To be ordered separately
		To be ordered separately	To be ordered separately		To be ordered separately	To be ordered separately
		To be ordered separately	To be ordered separately		To be ordered separately	To be ordered separately
		RAY...XL page 328			RATRY...XL page 326	To be ordered separately
					To be ordered separately	To be ordered separately



Housing units with sheet steel housing

Features

INA housing units are available as plummer block, flanged and take-up housing units in numerous different designs. The units are ready-to-fit and comprise INA sheet steel housings in which INA radial insert ball bearings are fitted.

Due to the spherical outside surface of the bearing outer ring and the concave housing bore, housing units can compensate for static angular misalignment of the shaft, see page 315.

The housings are screw mounted on the adjacent construction. Less stringent tolerances are sufficient for the screw mounting surfaces, see page 317.



In order to ensure function and reliability under all operating conditions, the bearings and housings are matched to each other with a defined swivel moment after mounting.

The swivel moment can be requested from Schaeffler.

X-life

Numerous sizes are supplied in the X-life design. These products are indicated in the dimension tables.

Radial insert ball bearings of X-life quality have, for example, lower roughness Ra and higher geometrical accuracy of the raceways than comparable designs that are not X-life. As a result, these bearings have higher load carrying capacity and longer rating life although their dimensions are identical. In certain applications, this means that a smaller bearing arrangement can be designed.

Radial insert ball bearings of X-life quality have an eccentric locking collar of an improved design and the quantity and distribution of the lubricant has been optimised. Housings ASE have additional crosspieces on the underside. For extreme requirements, the cage and seal material in the high and low temperature designs (suffix FA101) has been significantly improved in comparison with earlier versions.

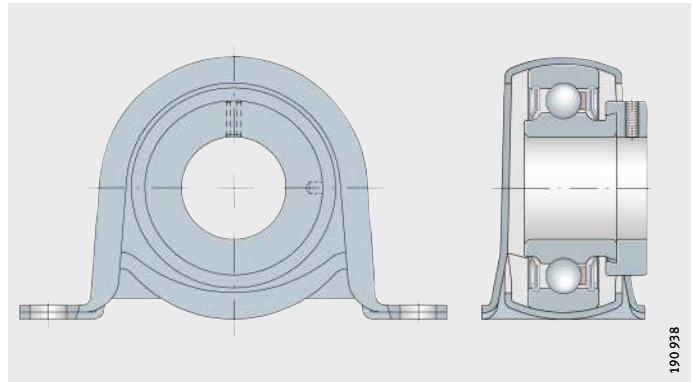
Plummer block and flanged housing units

Sheet steel housings are two-piece units made from steel strip of deep drawn quality and as standard have a Corrotect coating, *Figure 1* and *Figure 2*. Corrosion-resistant sheet steel housing units RRY..-VA and GRRY..-VA are made from corrosion-resistant steel, see page 380.

Units with sheet steel housings are suitable for moderate loads and lightweight constructions.

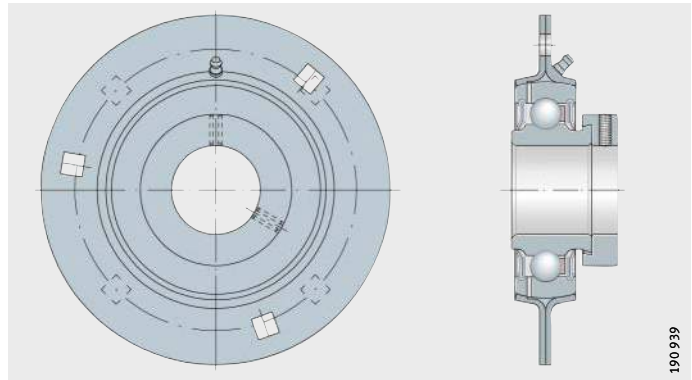
PB..-XL

Figure 1
Plummer block housing unit,
sheet steel housing



GRA..-XL

Figure 2
Flanged housing unit,
sheet steel housing

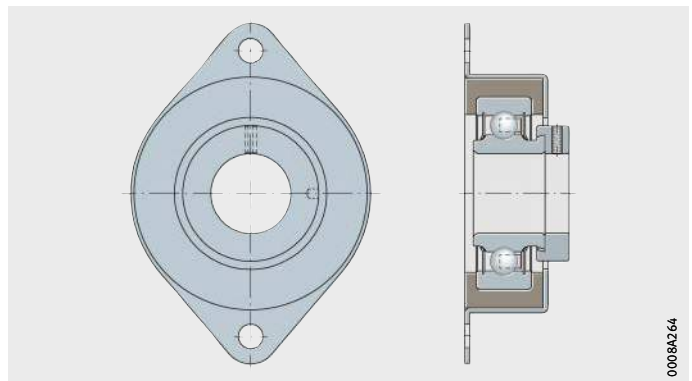


Plummer block and flanged housing units with rubber interliner

In addition to the normal plummer block and flanged housing units, there is also a design with a rubber interliner on the bearing outer ring, *Figure 3*. This interliner absorbs shocks and vibrations and thus gives damping of running noises.

RCSMF..-XL

Figure 3
Flanged housing unit
with rubber interliner



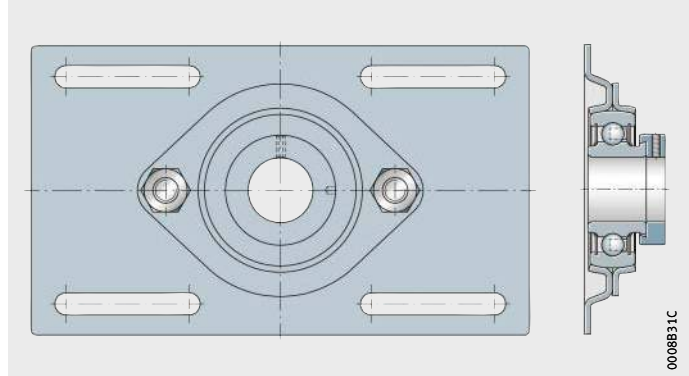
Housing units with sheet steel housing

Take-up housing units

The units are two-piece sheet steel housings and have a displacement facility, *Figure 4*. They are used where shafts must carry out long displacement motions.

MSTU..-XL

Figure 4
Take-up housing unit,
sheet steel housing



Operating temperature

Housing units with a rubber interliner are suitable for operating temperatures from $-20\text{ }^{\circ}\text{C}$ to $+85\text{ }^{\circ}\text{C}$.

Housing units without a rubber interliner are suitable for operating temperatures from $-20\text{ }^{\circ}\text{C}$ to $+100\text{ }^{\circ}\text{C}$. Temporary temperature peaks are possible up to $+120\text{ }^{\circ}\text{C}$.

Lubrication

The flanged housing unit GRA..-XL can be relubricated by means of a lubrication nipple.

Corrosion-resistant units

The housing units are also available in a corrosion-resistant design. The two-piece sheet steel housings have the suffix VA and are also available in a design with a relubrication facility, see section Radial insert ball bearings and housing units, corrosion-resistant, page 349.

They are used where moisture, contaminated water, salt spray mist, weakly alkaline or weakly acidic cleaning agents are present.

Market sectors

In addition to the comprehensive catalogue range, we also supply housing units for special applications.

Examples include:

- specially sealed flanged housing units for plough discs
- other designs with special greases or seals are available. Please contact us if necessary.

Suffixes

Suffixes for available designs: see table.

Available designs

Suffix	Description	Design
FA106	Bearing subjected to special noise testing	Standard
FA125	With Corrotect coating	

Design and safety guidelines

The chapter Technical principles brings together the essential guidelines on the design of bearing arrangements, lubrication, mounting and dismantling and the operation of bearings, see page 32.

INA radial insert ball bearings and INA housings are matched to each other and, as a unit, give particularly robust and economical bearing arrangements.

Compensation of static misalignments

Bearings with a spherical outer ring, fitted in housings with a concave bore, can compensate for static misalignment of the shaft or housing, *Figure 5* and *Figure 6*. In the case of flanged housing units GRA with a relubrication facility, the functional capability of lubrication must be taken into consideration. Please contact us in this case.



The units must not be used to support swivelling or tumbling motion.

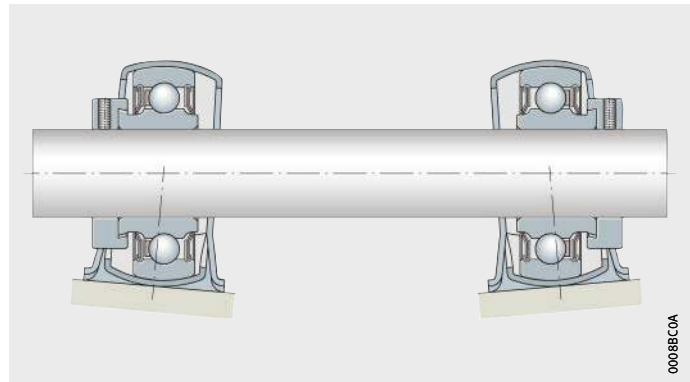


Figure 5
Compensation of static housing misalignment

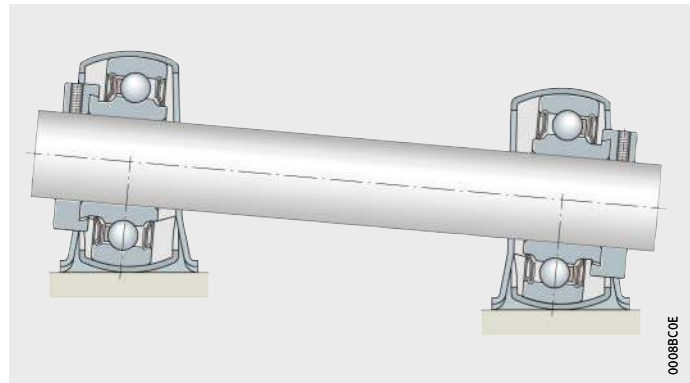


Figure 6
Compensation of static shaft misalignment



Housing units with sheet steel housing

Speed limits for radial insert ball bearings

The speed limits are dependent on the load, the clearance between the bearing bore and shaft and the friction of the seals in bearings with contact seals, see page 148.

Load carrying capacity of housings



Due to their versatile characteristics, INA housing units can be easily used in almost all industrial sectors.

If bearing arrangements are planned for equipment in which a malfunction could be hazardous to persons or an unplanned stoppage of the machine could cause major disruption, it is essential that you consult us before proceeding with the design.

Radial load carrying capacity

Sheet steel housings are suitable for moderate loads.

The permissible radial load carrying capacity C_{0rG} of sheet steel housings is given in the dimension tables.

Axial load carrying capacity

The permissible axial load carrying capacity of sheet steel housings is dependent on the value for the radial load carrying capacity, see table.

Permissible axial load carrying capacity

Units with sheet steel housings	Axial load carrying capacity ¹⁾
MSTU	$0,20 \times C_{0rG}$
PHUSE	$0,25 \times C_{0rG}$
PB, PBY, RPB	$0,33 \times C_{0rG}$
PBS	$0,20 \times C_{0rG}$
RALTR, RATR, RATRY, RRTR	$0,50 \times C_{0rG}$
PCSLT, RAT, RATY, RALT	$0,50 \times C_{0rG}$
RCSMF	$0,33 \times C_{0rG}$
RA, RAY, GRA, RRY, GRRY	$0,50 \times C_{0rG}$

¹⁾ C_{0rG} is the permissible radial load carrying capacity of the sheet steel housing according to the dimension table.

Design of adjacent construction

The permissible shaft tolerance is dependent on the speed, load and the radial insert ball bearing fitted. Shafts of the tolerance classes h6 \oplus to h9 \oplus can be used. Conventional drawn shafts will suffice for most applications.

Screw mounting surfaces

Recommendations for the screw mounting surfaces are as follows:

- roughness of the screw mounting surface max. Ra 12,5 (Rzmax 63)
- geometrical and positional tolerance 0,04/100 concave, spherical not permissible.

Fixing screws

The screw connection should be designed in accordance with VDI 2230; friction coefficient $\mu = 0,12$ (90%).

Screws of grade 8.8 or better can be used for fixing.

The maximum tightening torques applicable to this screw grade must not be exceeded even if screws of a higher grade are used.

In principle, we recommend that the screw connection should only be tightened to 70% of the values stated in the standard.

For fixing, hexagonal socket head screws in accordance with DIN EN ISO 4762 or hexagonal socket head screws with a coarse pitch full thread in accordance with DIN EN ISO 4017 should be used. The screws should be combined as a minimum with a washer in accordance with DIN EN ISO 7089 or DIN EN ISO 7090.

Screws and accessories for location are not included in the delivery.

Accuracy

The sheet steel housings correspond predominantly to DIN 626-2 and ISO 3228, insofar as they are described therein.

The accuracy of the radial insert ball bearings mounted must be observed, see page 150.

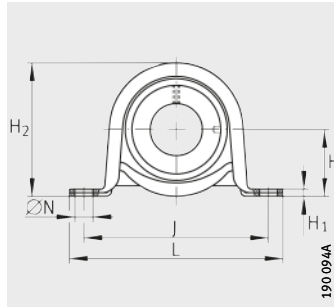
Dimensional tolerances

The dimensional tolerances for the sheet steel housings correspond to DIN 6930. For location of sheet steel housings with a square bore, the use of mushroom head bolts with a square neck (DIN 603) or a short square neck (DIN 11015) is recommended.

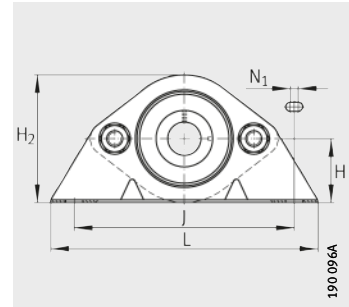


Plummer block housing units

Sheet steel housing
With or without rubber interliner



PB..-XL, RPB..-XL

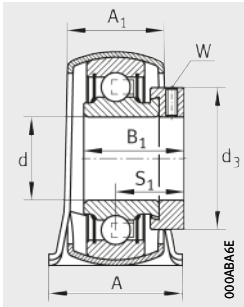


PBS..-XL

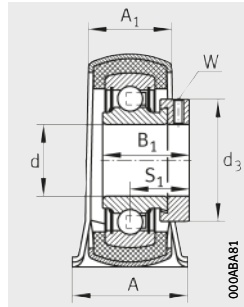
Dimension table - Dimensions in mm

Designation				Mass m ≈ kg	Dimensions					
Unit	Housing ¹⁾	Rubber interliner	Radial insert ball bearing		d	H	J	L	A	A ₁
PB12-XL	GEH40-BT	–	RAE12-XL-NPP-B	0,17	12	22,2	68	85,7	25,4	18,4
RPB12-XL	GEH47-BT	GRG.RABR40/47	RAE12-XL-NPP-B	0,23	12	25,4	76	98,7	31,8	22,3
PBS12-XL	GEH40-PBS	–	RAE12-XL-NPP-B	0,32	12	30,2	92	123,8	32,5	14,2
PB15-XL	GEH40-BT	–	RAE15-XL-NPP-B	0,17	15	22,2	68	85,7	25,4	18,4
RPB15-XL	GEH47-BT	GRG.RABR40/47	RAE15-XL-NPP-B	0,23	15	25,4	76	98,4	31,8	22,3
PBS15-XL	GEH40-PBS	–	RAE15-XL-NPP-B	0,32	15	30,2	92	123,8	32,5	14,2
PB17-XL	GEH40-BT	–	RAE17-XL-NPP-B	0,17	17	22,2	68	85,7	25,4	18,4
RPB17-XL	GEH47-BT	GRG.RABR40/47	RAE17-XL-NPP-B	0,23	17	25,4	76	98,4	31,8	22,3
PBS17-XL	GEH40-PBS	–	RAE17-XL-NPP-B	0,32	17	30,2	92	123,8	32,5	14,2
PB20-XL	GEH47-BT	–	RAE20-XL-NPP-B	0,27	20	25,4	76	98,4	31,8	22,3
RPB20-XL	GEH52-BT	GRG.RABR47/52-AH01	RAE20-XL-NPP-B	0,28	20	28,6	86	108	31,8	23,5
PBS20-XL	GEH47-PBS	–	RAE20-XL-NPP-B	0,45	20	33,6	97	127	33	15,8
PB25-XL	GEH52-BT	–	RAE25-XL-NPP-B	0,3	25	28,6	86	108	31,8	23,5
RPB25-XL	GEH62-BT	GRG.RABR52/62-AH01	RAE25-XL-NPP-B	0,38	25	33,3	95	117,5	38	26,5
PBS25-XL	GEH52-PBS	–	RAE25-XL-NPP-B	0,49	25	36,5	95,5	133,5	34,1	17,4
PB30-XL	GEH62-BT	–	RAE30-XL-NPP-B	0,5	30	33,3	95	117,5	38	26,5
RPB30-XL	GEH62-BT	GRG.RABR55/62	RAE30-XL-NPP-B	0,45	30	33,3	95	117,5	38	26,5
PBS30-XL	GEH62-PBS	–	RAE30-XL-NPP-B	0,79	30	42,9	119	159	38,9	17,4
PBS35-XL	GEH72-PBS	–	RAE35-XL-NPP-B	1,05	35	47,6	127	165	46,1	22,2
PBS40-XL	GEH80-PBS	–	RAE40-XL-NPP-B	1,33	40	55	136,5	180	53,5	23

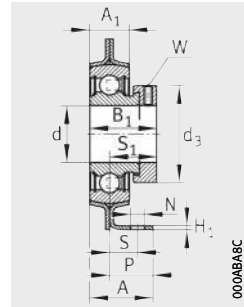
¹⁾ Housing with Corrotect coating, suffix FA125.



PB..-XL



RPB..-XL



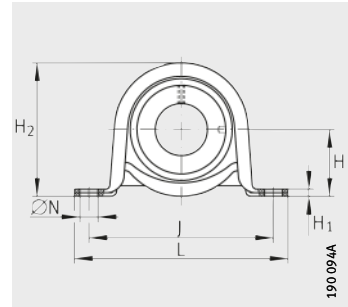
PBS..-XL

										Width across flats W	Load carrying capacity			
											Bearing			Housing C _{OrG} N
											Basic load ratings		Fatigue limit load C _{Ur} N	
H ₁	H ₂	N		N ₁	B ₁	S ₁	S	P	d ₃ max.	dyn. C _r N	stat. C _{Or} N	C _{Ur} N		
2,6	43,2	9,5	-	-	28,6	22,1	-	-	28,4	3	10 100	4 750	241	1 350
3,3	50,1	9,5	-	-	28,6	22,1	-	-	28,4	3	10 100	4 750	241	900
2,6	59,6	-	10,5	5,6	28,6	22,1	15	25,4	28,4	3	10 100	4 750	241	2 700
2,6	43,2	9,5	-	-	28,6	22,1	-	-	28,4	3	10 100	4 750	241	1 350
3,3	50,1	9,5	-	-	28,6	22,1	-	-	28,4	3	10 100	4 750	241	900
2,6	59,6	-	10,5	5,6	28,6	22,1	15	25,4	28,4	3	10 100	4 750	241	2 700
2,6	43,2	9,5	-	-	28,6	22,1	-	-	28,4	3	10 100	4 750	241	1 350
3,3	50,1	9,5	-	-	28,6	22,1	-	-	28,4	3	10 100	4 750	241	900
2,6	59,6	-	10,5	5,6	28,6	22,1	15	25,4	28,4	3	10 100	4 750	241	2 700
3,3	50,1	9,5	-	-	31	23,5	-	-	33	3	13 600	6 600	335	1 600
4	56,5	11,5	-	-	31	23,5	-	-	33	3	13 600	6 600	335	1 100
3	66,8	-	10,5	5,6	31	23,5	15	25,4	33	3	13 600	6 600	335	3 200
4	56,5	11,5	-	-	31	23,5	-	-	37,5	3	14 900	7 800	395	1 800
4	66,1	11,5	-	-	31	23,5	-	-	37,5	3	14 900	7 800	395	1 400
3,4	72	-	10,5	9,5	31	23,5	14,3	25,4	37,5	3	14 900	7 800	395	3 600
4	66,1	11,5	-	-	35,8	26,8	-	-	44	4	20 700	11 300	570	2 700
4	66,1	11,5	-	-	26,5	20	-	-	42,5	2,5	14 100	8 300	420	1 400
3,4	85	-	13,5	8	35,8	26,8	16	30,2	44	4	20 700	11 300	570	3 600
4	94,4	-	13,5	8	39	29,5	20,7	35	55	5	27 500	15 300	770	4 100
4	106	-	13,5	8	43,8	32,8	25	40	58	5	34 500	19 800	1 010	4 500



Plummer block housing units

Sheet steel housing
Without rubber interliner



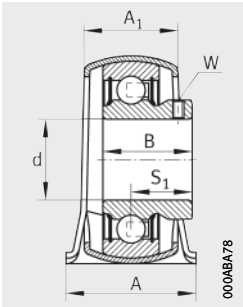
PBY..-XL



Dimension table - Dimensions in mm

Designation			Mass m ≈ kg	Dimensions					
Unit	Housing ¹⁾	Radial insert ball bearing		d	H	J	L	A	A ₁
PBY12-XL	GEH40-BT	AY12-XL-NPP-B	0,15	12	22,2	68	85,7	25,4	18,4
PBY15-XL	GEH40-BT	AY15-XL-NPP-B	0,15	15	22,2	68	85,7	25,4	18,4
PBY17-XL	GEH40-BT	AY17-XL-NPP-B	0,15	17	22,2	68	85,7	25,4	18,4
PBY20-XL	GEH47-BT	AY20-XL-NPP-B	0,22	20	25,4	76	98,4	31,8	22,3
PBY25-XL	GEH52-BT	AY25-XL-NPP-B	0,26	25	28,6	86	108	31,8	23,5
PBY30-XL	GEH62-BT	AY30-XL-NPP-B	0,4	30	33,3	95	117,5	38	26,5

¹⁾ Housing with Corrotect coating, suffix FA125.



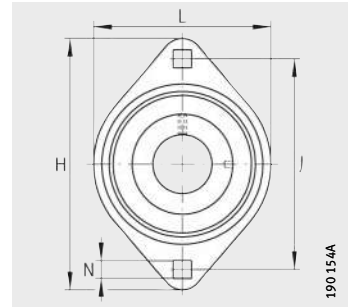
PBY..-XL

					Width across flats W	Load carrying capacity			
						Bearing			Housing C _{0rG} N
						Basic load ratings		Fatigue limit load	
H ₁	H ₂	N	B	S ₁		dyn. C _r N	stat. C _{0r} N	C _{ur} N	C _{0rG} N
2,6	43,2	9,5	22	16	2,5	10 100	4 750	241	1 350
2,6	43,2	9,5	22	16	2,5	10 100	4 750	241	1 350
2,6	43,2	9,5	22	16	2,5	10 100	4 750	241	1 350
3,3	50,1	9,5	25	18	2,5	13 600	6 600	335	1 600
4	56,5	11,5	27	19,5	2,5	14 900	7 800	395	1 800
4	66,1	11,5	30	21	3	20 700	11 300	570	2 700



Two-bolt flanged housing units

Sheet steel housing



RAT...-XL, RALT...-XL, PCSLT...-XL,
RATY...-XL

Dimension table - Dimensions in mm

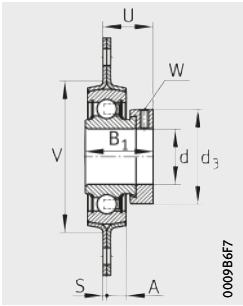
Designation			Mass	Dimensions				
Unit	Housing ¹⁾	Radial insert ball bearing		d	H	J	L	A
			m ≈ kg					
RAT12-XL	2× FLAN40-MST	RAE12-XL-NPP-B	0,19	12	81	63,5	58,7	7
RAT15-XL	2× FLAN40-MST	RAE15-XL-NPP-B	0,19	15	81	63,5	58,7	7
RAT17-XL	2× FLAN40-MST	RAE17-XL-NPP-B	0,19	17	81	63,5	58,7	7
RALT20-XL-FA125.8	2× FLAN42-LST	RALE20-XL-NPP-B	0,17	20	81	63,5	58,7	7
PCSLT20-XL	1× FLAN42-CSLT, 1× FLAN42-CST	RALE20-XL-NPP-B	0,22	20	90,5	71,4	66	14
RAT20-XL	2× FLAN47-MST	RAE20-XL-NPP-B	0,27	20	90,5	71,5	66	8
PCSLT25-XL	1× FLAN47-CSLT, 1× FLAN47-CST	RALE25-XL-NPP-B	0,25	25	95,2	76,2	71	16
RALT25-XL	2× FLAN47-LST	RALE25-XL-NPP-B	0,22	25	95,2	76	71	7,1
RAT25-XL	2× FLAN52-MST	RAE25-XL-NPP-B	0,34	25	95,2	76,2	71	8,7
PCSLT30-XL	1× FLAN55-CSLT, 1× FLAN55-CST	RALE30-XL-NPP-B	0,3	30	112,5	90,5	84	16
RAT30-XL	2× FLAN62-MST	RAE30-XL-NPP-B	0,49	30	112,7	90,5	84	8,7
RAT35-XL	2× FLAN72-MST	RAE35-XL-NPP-B	0,72	35	123	100	93,7	10,5
RAT40-XL	2× FLAN80-MST	RAE40-XL-NPP-B	0,98	40	151	119	100	11,5

Dimension table - Dimensions in mm

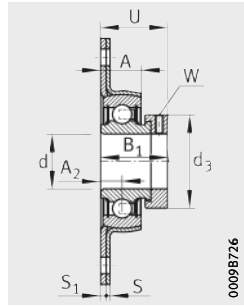
Designation			Mass	Dimensions				
Unit	Housing ¹⁾	Radial insert ball bearing		d	H	J	L	A
			m ≈ kg					
RATY12-XL	2× FLAN40-MST	AY12-XL-NPP-B	0,14	12	81	63,5	58,7	7
RATY15-XL	2× FLAN40-MST	AY15-XL-NPP-B	0,13	15	81	63,5	58,7	7
RATY17-XL	2× FLAN40-MST	AY17-XL-NPP-B	0,12	17	81	63,5	58,7	7
RATY20-XL	2× FLAN47-MST	AY20-XL-NPP-B	0,22	20	90,5	71,5	66	8
RATY25-XL	2× FLAN52-MST	AY25-XL-NPP-B	0,26	25	95,2	76,2	71	8,7
RATY30-XL	2× FLAN62-MST	AY30-XL-NPP-B	0,41	30	112,7	90,5	84	8,7
RATY35-XL	2× FLAN72-MST	GAY35-XL-NPP-B	0,56	35	123	100	93,7	10,5
RATY40-XL	2× FLAN80-MST	GAY40-XL-NPP-B	0,85	40	151	119	100	11,5

¹⁾ Housing with Corrotect coating, suffix FA125.

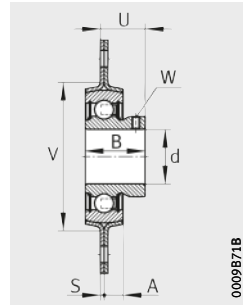
²⁾ Includes radial insert ball bearing with relubrication facility.



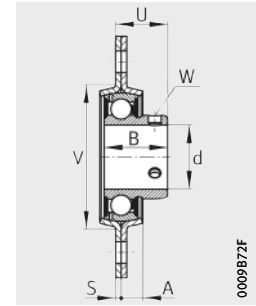
RAT..-XL, RALT..-XL



PCSLT..-XL



RATY..-XL



RATY35-XL²⁾,
RATY40-XL²⁾

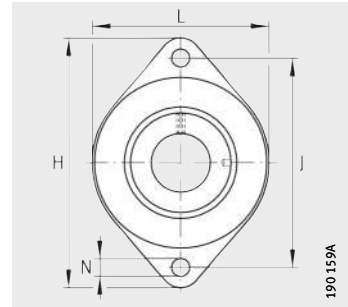
								Width across flats W	Load carrying capacity			
									Bearing			Housing C _{Or G} N
									Basic load ratings		Fatigue limit load C _{ur} N	
A ₂	N	B ₁	S ₁	S	U	V	d ₃ max.	dyn. C _r N	stat. C _{Or} N	C _{ur} N		C _{Or G} N
-	7,1	28,6	-	2	24	48	28,4	3	10 100	4 750	241	2 700
-	7,1	28,6	-	2	24	48	28,4	3	10 100	4 750	241	2 700
-	7,1	28,6	-	2	24	48	28,4	3	10 100	4 750	241	2 700
-	7	24,5	-	2	20,46	48	30	2,5	10 000	5 000	255	2 700
7,5	-	24,5	3	2	26,1	-	30	2,5	10 000	5 000	255	4 200
-	8,7	31	-	2	25,5	55	33	3	13 600	6 600	335	3 200
8,5	-	25,5	3	2	28	-	36	2,5	10 700	5 900	295	4 500
-	8,7	25,5	-	2	21,4	55	36	2,5	10 700	5 900	295	3 000
-	8,7	31	-	2	25,5	60	37,5	3	14 900	7 800	395	3 650
9	-	26,5	3,5	2,5	29	-	42,5	2,5	14 100	8 300	420	6 000
-	10,5	35,8	-	2,5	29,2	71	44	4	20 700	11 300	570	5 000
-	10,5	39	-	2,5	31,5	81	55	5	27 500	15 300	770	6 300
-	13,5	43,8	-	3,5	36,2	90	58	5	34 500	19 800	1 010	7 000

					Width across flats W	Load carrying capacity			
						Bearing			Housing C _{Or G} N
						Basic load ratings		Fatigue limit load C _{ur} N	
N	B	S	U	V	dyn. C _r N	stat. C _{Or} N	C _{ur} N		C _{Or G} N
7,1	22	2	18	48	2,5	10 100	4 750	241	2 700
7,1	22	2	18	48	2,5	10 100	4 750	241	2 700
7,1	22	2	18	48	2,5	10 100	4 750	241	2 700
8,7	25	2	20	55	2,5	13 600	6 600	335	3 200
8,7	27	2	21,5	60	2,5	14 900	7 800	395	3 650
10,5	30	2,5	23,5	71	3	20 700	11 300	570	5 000
10,5	35	2,5	28	81	3	27 500	15 300	770	6 300
13,5	39,5	3,5	32,5	90	4	34 500	19 800	1 010	7 000



Two-bolt flanged housing units

Sheet steel housing
With rubber interliner

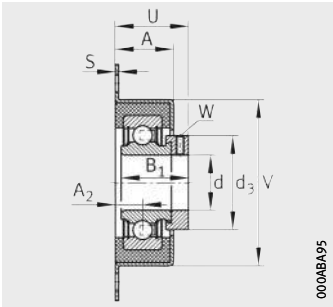


RCSMF..-XL

Dimension table - Dimensions in mm

Designation				Mass m ≈ kg	Dimensions				
Unit	Housing ¹⁾	Rubber interliner	Radial insert ball bearing		d	H	J	L	A
RCSMF12-XL	FLAN65-RCSMF	GRG.RCSM40/65	RAE12-XL-NPP-FA106	0,27	12	114	92	70	27
RCSMF15-XL	FLAN65-RCSMF	GRG.RCSM40/65	RAE15-XL-NPP-FA106	0,27	15	114	92	70	27
RCSMF17-XL	FLAN65-RCSMF	GRG.RCSM40/65	RAE17-XL-NPP-FA106	0,27	17	114	92	70	27
RCSMF20-XL	FLAN65-RCSMF	GRG.RCSM47/65	RAE20-XL-NPP-FA106	0,32	20	114	92	70	27
RCSMF25-XL	FLAN65-RCSMF	GRG.RCSM52/65	RAE25-XL-NPP-FA106	0,33	25	114	92	70	27
RCSMF30-XL	FLAN65-RCSMF	GRG.RCSM55/65	RAE30-XL-NPP-FA106	0,32	30	114	92	70	27

¹⁾ Housing with Corrotect coating, suffix FA125.



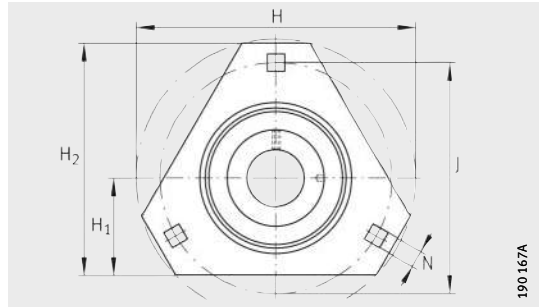
RCSMF..XL

							Width across flats W	Load carrying capacity			
								Bearing			Housing C _{0r G} N
								Basic load ratings		Fatigue limit load	
A ₂	N	B ₁	S	U	V	d ₃ max.		dyn. C _r N	stat. C _{0r} N	C _{ur} N	
12,7	10,5	28,6	1,5	34,8	68	28,4	3	10 100	4 750	241	900
12,7	10,5	28,6	1,5	34,8	68	28,4	3	10 100	4 750	241	900
12,7	10,5	28,6	1,5	34,8	68	28,4	3	10 100	4 750	241	900
12,7	10,5	31	1,5	36,2	68	33	3	13 600	6 600	335	1 100
12,7	10,5	31	1,5	36,2	68	37,5	3	14 900	7 800	395	1 400
15	10,5	26,5	1,5	35	68	42,5	2,5	14 100	8 300	420	1 400



Three-bolt flanged housing units

Sheet steel housing



RATR...XL, RALTR...XL, RRTR...XL, RATRY...XL

Dimension table - Dimensions in mm

Designation			Mass m ≈ kg	Dimensions				
Unit	Housing ¹⁾	Radial insert ball bearing		d	H	J	A	H ₁
RALTR20-XL	2× FLAN42-LSTR ²⁾	RALE20-XL-NPP-B	0,21	20	90,5	71,5	7,2	33,3
RATR20-XL	2× FLAN47-MSTR	RAE20-XL-NPP-B	0,28	20	90,5	71,5	8	33,3
RALTR25-XL ³⁾	2× FLAN47-LSTR ²⁾	RALE25-XL-NPP-B	0,23	25	95,3	76	7,2	34,9
RATR25-XL	2× FLAN52-MSTR	RAE25-XL-NPP-B	0,32	25	95,3	76	8,7	34,9
RRTR25-XL ³⁾	2× FLAN52-MSTR	E25-XL-KRR-B	0,37	25	95,3	76	8,7	34,9
RATR30-XL	2× FLAN62-MSTR	RAE30-XL-NPP-B	0,43	30	112,7	90,5	8,7	38,1
RRTR30-XL ³⁾	2× FLAN62-MSTR	E30-XL-KRR-B	0,5	30	112,7	90,5	8,7	38,1
RATR35-XL	2× FLAN72-MSTR	RAE35-XL-NPP-B	0,75	35	122	100	9,5	44,5
RRTR35-XL	2× FLAN72-MSTR	E35-XL-KRR-B	0,83	35	122	100	9,5	44,5

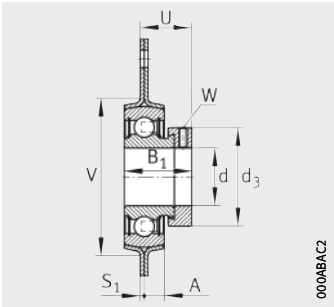
Dimension table - Dimensions in mm

Designation			Mass m ≈ kg	Dimensions				
Unit	Housing ¹⁾	Radial insert ball bearing		d	H	J	A	H ₁
RATRY30-XL	2× FLAN62-MSTR	AY30-XL-NPP-B	0,41	30	112,7	90,5	8,7	38,1
RATRY35-XL	2× FLAN72-MSTR	GAY35-XL-NPP-B	0,47	35	122	100	9,5	44,5

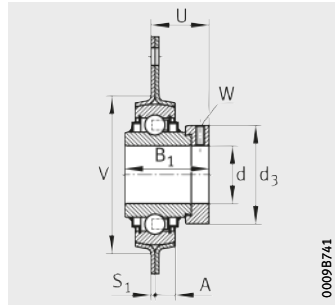
¹⁾ Housing with Corrotect coating, suffix FA125.

²⁾ Light series.

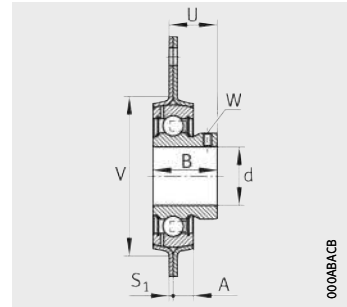
³⁾ Housing and radial insert ball bearing must be ordered separately.



RATR...XL, RALTR...XL



RRTR...XL



RATRY...XL

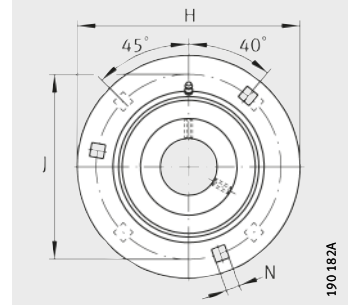
							Width across flats W	Load carrying capacity			
								Bearing			Housing C _{0rG} N
								Basic load ratings		Fatigue limit load	
H ₂	N	B ₁	S ₁	U	V	d ₃ max.	dyn. C _r N	stat. C _{0r} N	C _{ur} N	C _{0rG} N	
76,2	8,7	24,5	2	20,6	49	30	2,5	10 000	5 000	255	2 600
76,2	8,7	31	2	25,5	55	33	3	13 600	6 600	335	3 200
80,5	8,7	25,5	2	21,4	54	36	2,5	10 700	5 900	295	3 000
80,5	8,7	31	2	25,5	60	37,5	3	14 900	7 800	395	3 650
80,5	8,7	44,5	2	28,9	60	37,5	3	14 900	7 800	395	3 650
93	10,5	35,8	2,5	29,2	71	44	4	20 700	11 300	570	5 000
93	10,5	48,5	2,5	32,6	71	44	4	20 700	11 300	570	5 000
105,6	10,5	39	2,5	31,9	81	55	5	27 500	15 300	770	6 400
105,6	10,5	51,3	2,5	34,8	81	55	5	27 500	15 300	770	6 400



						Width across flats W	Load carrying capacity			
							Bearing			Housing C _{0rG} N
							Basic load ratings		Fatigue limit load	
H ₂	N	B	S ₁	U	V	dyn. C _r N	stat. C _{0r} N	C _{ur} N	C _{0rG} N	
93	10,5	30	2,5	23,5	71	3	20 700	11 300	570	5 000
105,6	10,5	35	2,5	28	81	3	27 500	15 300	770	6 400

Three-bolt and four-bolt flanged housing units

Sheet steel housing
Eccentric locking collar



GRA...XL



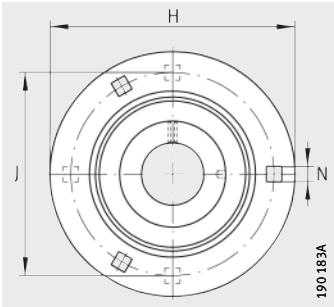
Dimension table - Dimensions in mm

Designation			Mass m ≈ kg	Dimensions			
Unit	Housing ¹⁾	Radial insert ball bearing		d	H	J	A
RA12-XL²⁾	2×FLAN40-MSB	RAE12-XL-NPP-B	0,23	12	81	63,5	7
RA15-XL	2×FLAN40-MSB	RAE15-XL-NPP-B	0,23	15	81	63,5	7
RA17-XL	2×FLAN40-MSB	RAE17-XL-NPP-B	0,23	17	81	63,5	7
GRA20-XL³⁾	1×FLAN47-MSB, 1×FLAN47-MSA	GRAE20-XL-NPP-B	0,32	20	90,5	71,5	8
RA20-XL	2×FLAN47-MSB	RAE20-XL-NPP-B	0,32	20	90,5	71,5	8
GRA25-XL³⁾	1×FLAN52-MSB, 1×FLAN52-MSA	GRAE25-XL-NPP-B	0,37	25	95	76	8,7
RA25-XL	2×FLAN52-MSB	RAE25-XL-NPP-B	0,37	25	95	76	8,7
GRA30-XL³⁾	1×FLAN62-MSB, 1×FLAN62-MSA	GRAE30-XL-NPP-B	0,61	30	112,7	90,5	8,7
RA30-XL	2×FLAN62-MSB	RAE30-XL-NPP-B	0,61	30	112,7	90,5	8,7
GRA35-XL³⁾	1×FLAN72-MSB, 1×FLAN72-MSA	GRAE35-XL-NPP-B	0,85	35	122	100	9,5
RA35-XL	2×FLAN72-MSB	RAE35-XL-NPP-B	0,85	35	122	100	9,5
GRA40-XL³⁾	1×FLAN80-MSB, 1×FLAN80-MSA	GRAE40-XL-NPP-B	1,36	40	147,5	119	10,3
RA40-XL	2×FLAN80-MSB	RAE40-XL-NPP-B	1,36	40	147,5	119	10,3
GRA45-XL³⁾	1×FLAN85-MSB, 1×FLAN85-MSA	GRAE45-XL-NPP-B	1,41	45	149,2	120,5	11,1
RA45-XL	2×FLAN85-MSB	RAE45-XL-NPP-B	1,41	45	149,2	120,5	11,1
GRA50-XL³⁾	1×FLAN90-MSB, 1×FLAN90-MSA	GRAE50-XL-NPP-B	1,68	50	155,5	127	11,1
RA50-XL	2×FLAN90-MSB	GRAE50-XL-NPP-B	1,68	50	155,5	127	11,1
RA55-XL²⁾	2×FLAN100-MSB	GRAE55-XL-NPP-B	1,39	55	167	138	12,5
RA60-XL²⁾	2×FLAN110-MSB	GRAE60-XL-NPP-B	2,54	60	176	148	12

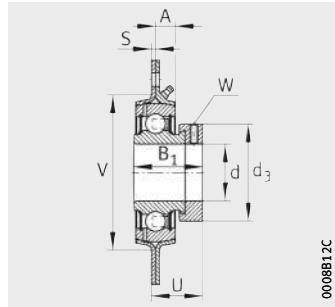
1) Housing with Corrotect coating, suffix FA125.

2) Housing and radial insert ball bearing must be ordered separately.

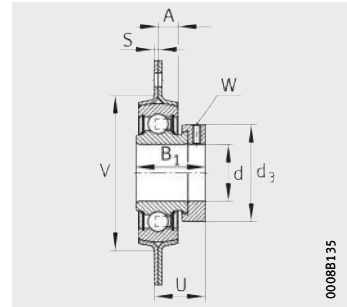
3) Units with relubrication facility.



RA..-XL



GRA..-XL



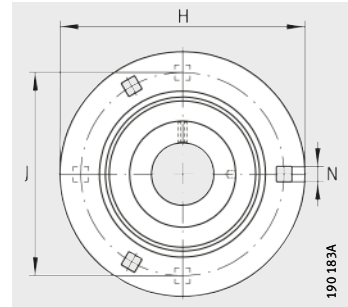
RA..-XL

						Number of screw mounting holes n	Width across flats W	Load carrying capacity			
								Bearing			Housing C _{0rG} N
								Basic load ratings		Fatigue limit load C _{ur} N	
N	B ₁	S	U	V	d ₃ max.	dyn. C _r N	stat. C _{0r} N				
7,1	28,6	2	24	48	28,4	3	3	10 100	4 750	241	2 700
7,1	28,6	2	24	48	28,4	3	3	10 100	4 750	241	2 700
7,1	28,6	2	24	48	28,4	3	3	10 100	4 750	241	2 700
8,7	31	2	25,5	55	33	3	3	13 600	6 600	335	3 200
8,7	31	2	25,5	55	33	3	3	13 600	6 600	335	3 200
8,7	31	2	25,5	60	37,5	3	3	14 900	7 800	395	3 650
8,7	31	2	25,5	60	37,5	3	3	14 900	7 800	395	3 650
10,5	35,8	2,5	29,2	71	44	3	4	20 700	11 300	570	5 000
10,5	35,8	2,5	29,2	71	44	3	4	20 700	11 300	570	5 000
10,5	39	2,5	32	81	55	3	5	27 500	15 300	770	6 400
10,5	39	2,5	31,9	81	55	3	5	27 500	15 300	770	6 400
13,5	43,8	3,5	36,2	90	58	4	5	34 500	19 800	1 010	7 700
13,5	43,8	3,5	36,2	90	58	4	5	34 500	19 800	1 010	7 700
13,5	43,8	3,5	36,2	95	63	4	5	34 500	20 400	1 030	7 700
13,5	43,8	3,5	36,2	95	63	4	5	34 500	20 400	1 030	7 700
13,5	43,8	4	36,7	100	69	4	5	37 500	23 200	1 180	8 600
13,5	43,8	4	36,7	100	69	4	5	37 500	23 200	1 180	8 600
13,5	48,4	4	40,4	110	76	4	5	46 000	29 000	1 480	9 500
13,5	53,1	4	43,6	120	84	4	5	56 000	36 000	1 820	11 200



Three-bolt and four-bolt flanged housing units

Sheet steel housing
Grub screws in inner ring



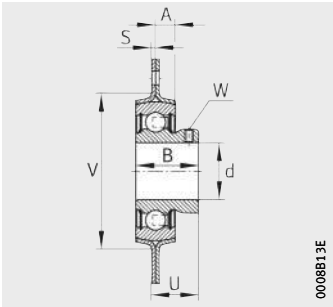
RAY..-XL

Dimension table - Dimensions in mm

Designation			Mass m ≈ kg	Dimensions			
Unit	Housing ¹⁾	Radial insert ball bearing		d	H	J	A
RAY12-XL²⁾	2× FLAN40-MSB	AY12-XL-NPP-B	0,17	12	81	63,5	7
RAY15-XL	2× FLAN40-MSB	AY15-XL-NPP-B	0,16	15	81	63,5	7
RAY17-XL²⁾	2× FLAN40-MSB	AY17-XL-NPP-B	0,15	17	81	63,5	7
RAY20-XL	2× FLAN47-MSB	AY20-XL-NPP-B	0,3	20	90,5	71,5	8
RAY25-XL	2× FLAN52-MSB	AY25-XL-NPP-B	0,34	25	95	76	8,7
RAY30-XL	2× FLAN62-MSB	AY30-XL-NPP-B	0,45	30	112,7	90,5	8,7
RAY35-XL	2× FLAN72-MSB	GAY35-XL-NPP-B	0,78	35	122	100	9,5
RAY40-XL²⁾	2× FLAN80-MSB	GAY40-XL-NPP-B	1,25	40	147,5	119	10,3
RAY50-XL²⁾	2× FLAN90-MSB	GAY50-XL-NPP-B	1,68	50	155,5	127	11,1
RAY60-XL²⁾	2× FLAN110-MSB	GAY60-XL-NPP-B	2,13	60	176	148	12

¹⁾ Housing with Corrotect coating, suffix FA125.

²⁾ Housing and radial insert ball bearing must be ordered separately.



0008813E

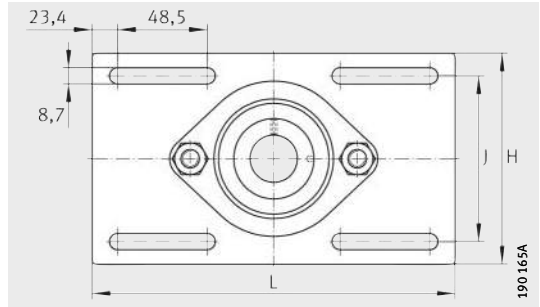
RAY..-XL

N					Number of screw mounting holes n	Width across flats W	Load carrying capacity			
							Bearing			Housing C _{0rG} N
							Basic load ratings		Fatigue limit load	
							dyn. C _r N	stat. C _{0r} N	C _{ur} N	
7,1	22	2	18	48	3	2,5	10 100	4 750	241	2 700
7,1	22	2	18	48	3	2,5	10 100	4 750	241	2 700
7,1	22	2	18	48	3	2,5	10 100	4 750	241	2 700
8,7	25	2	20	55	3	2,5	13 600	6 600	335	3 200
8,7	27	2	21,5	60	3	2,5	14 900	7 800	395	3 650
10,5	30	2,5	23,5	71	3	3	20 700	11 300	570	5 000
10,5	35	2,5	28	81	3	3	27 500	15 300	770	6 400
13,5	39,5	3,5	32,5	90	4	4	34 500	19 800	1 010	7 700
13,5	43	4	36	100	4	4	37 500	23 200	1 180	8 600
13,5	47	4	38	120	4	5	56 000	36 000	1 820	11 200



Take-up housing units

Sheet steel housing

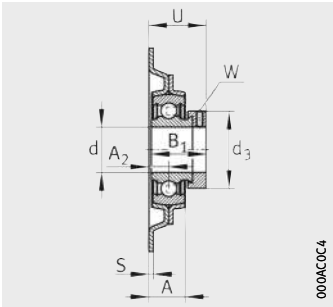


MSTU..-XL

Dimension table - Dimensions in mm

Designation			Mass m ≈ kg	Dimensions			
Unit	Housing ¹⁾	Radial insert ball bearing		d	H	J	L
MSTU25-XL	GEH52-MSTU	RAE25-XL-NPP-B	0,58	25	104,8	80,2	203,2
MSTU30-XL	GEH62-MSTU	RAE30-XL-NPP-B	0,84	30	114,3	89,2	203,2

¹⁾ Housing with Corrotect coating, suffix FA125.

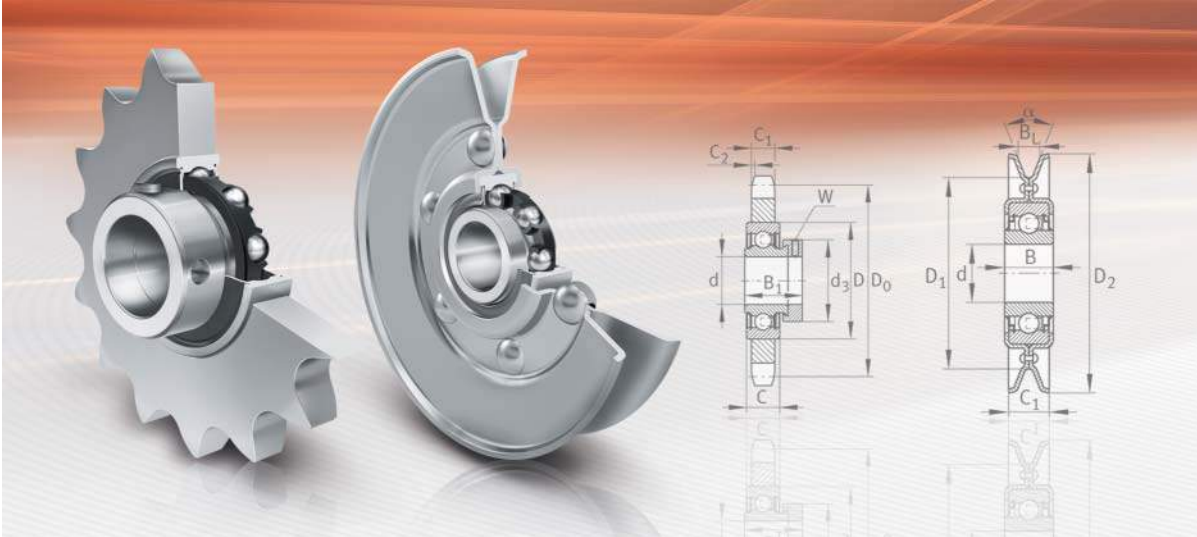


000AC0C4

MSTU..-XL

						Width across flats W	Load carrying capacity			
							Bearing			Housing
							Basic load ratings		Fatigue limit load	
A	A ₂	B ₁	S	U	d ₃ max.	dyn. C _r N	stat. C _{0r} N	C _{ur} N	C _{0rG} N	
19	10,3	31	2	33,8	37,5	14 900	7 800	395	3 900	
21,1	12,1	35,8	2,5	37,8	44	20 700	11 300	570	3 900	





Roller chain idler sprocket units Idler pulley units

Roller chain idler sprocket units, idler pulley units

	Page
Product overview	Roller chain idler sprocket units, idler pulley units 336
Features	Roller chain idler sprocket units 337
	Idler pulley units..... 337
	Operating temperature 338
	Designation structure 338
	Material codes..... 338
Design and safety guidelines	Roller chain idler sprocket units 339
	Idler pulley units..... 340
Accuracy	Tolerances of radial insert ball bearing bore 341
	Radial internal clearance 341
Dimension tables	Roller chain idler sprocket units..... 342
	Idler pulley units..... 346

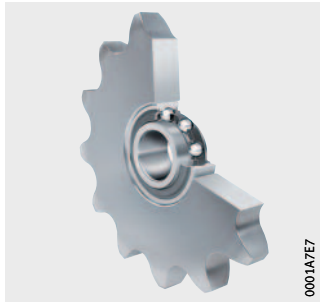


Product overview **Roller chain idler sprocket units, idler pulley units**

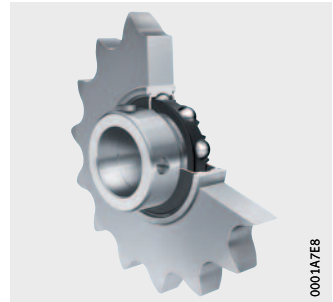
Roller chain idler sprocket units

Sprocket made from steel or sintered iron

KSR..-L0

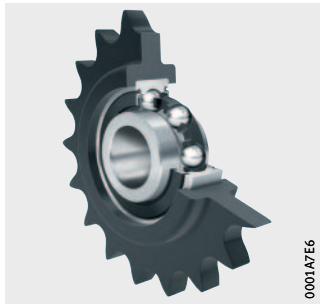


KSR..-B0



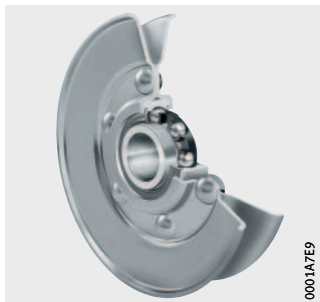
Sprocket made from plastic

KSR..-L0..-22

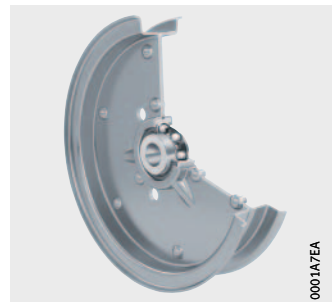


Idler pulley units

RSRA..-L0, RSRA..-K0



RSRB..-L0



RSRD..-L0



Roller chain idler sprocket units, idler pulley units

Features Roller chain idler sprocket units and idler pulley units are robust, economical tensioning elements. These proven machine elements are available in various series and are suitable for a wide range of diverse applications.

Roller chain idler sprocket units

Roller chain idler sprocket units are guidance and return units for roller bush chains and roller chains. They can compensate for chain stretch resulting from operation and give smoother system running under high loads and speeds.

The ready-to-fit units comprise sprockets and deep groove ball bearings or radial insert ball bearings. The sprockets are made from high strength steel, sintered iron or plastic (polyamide). Sprockets made from plastic give particularly smooth running and generate very little noise. Since the inner ring of the deep groove ball bearing is extended on both sides, no additional spacer rings are required.

In series KSR...-B0, the inner ring is located on the shaft by means of a locking collar. The bearing bore of this series has a plus tolerance. As a result, unmachined shafts up to tolerance class h9 \oplus can be used under moderate loads and speeds.

Sealing The deep groove ball bearings are sealed on both sides.

Lubrication They are greased using a lithium soap grease to GA13 and are maintenance-free.

Idler pulley units

Idler pulley units are tensioning systems for belt drives and idler units:

- They increase the wrap angle in belt drives and can therefore support higher power levels or allow smaller units to be used.
- They compensate for belt stretch resulting from operation.
- They allow shorter centre distances.
- They reduce the wear on the belt drive.

The ready-to-fit units comprise deep drawn, profiled sheet steel pulley halves riveted together and deep groove ball bearings. Pulleys of larger diameters are additionally welded together. A lead chamfer on the pulley profile prevents damage to the belt. Due to the sheet steel construction, the additional rotating masses and the unbalance masses generated are low.

Type A is suitable for vee belts, type B for flat, vee and round belts, type D for round belts, steel cables and hemp ropes.

Sealing The deep groove ball bearings are sealed on both sides.

Lubrication They are greased using a lithium soap grease to GA13 and are maintenance-free.



Roller chain idler sprocket units, idler pulley units

Operating temperature

Roller chain idler sprocket units with steel or sintered iron sprockets are suitable for operating temperatures from $-20\text{ }^{\circ}\text{C}$ to $+100\text{ }^{\circ}\text{C}$. Temporary temperature peaks are possible up to $+120\text{ }^{\circ}\text{C}$.

Roller chain idler sprocket units with plastic sprockets are suitable for operating temperatures from $-20\text{ }^{\circ}\text{C}$ to $+80\text{ }^{\circ}\text{C}$.

Idler pulley units are suitable for operating temperatures from $-20\text{ }^{\circ}\text{C}$ to $+100\text{ }^{\circ}\text{C}$, limited by the grease and seal material. Temporary temperature peaks are possible up to $+120\text{ }^{\circ}\text{C}$.

Designation structure

Units with the suffix L0 contain deep groove ball bearings with inner rings extended on both sides. Units with the suffix B0 contain radial insert ball bearings with eccentric locking collars, *Figure 1*.

- ① Design (KSR or RSR)
- ② Bore diameter of bearing
- ③ Radial insert ball bearing with eccentric locking collar
- ④ Pitch p of sprocket in $1/16''$, code
- ⑤ Chain number in accordance with DIN ISO 606
- ⑥ Number of teeth z
- ⑦ Material code, see table
- ⑧ Outside diameter of pulley
- ⑨ Inner ring extended on both sides

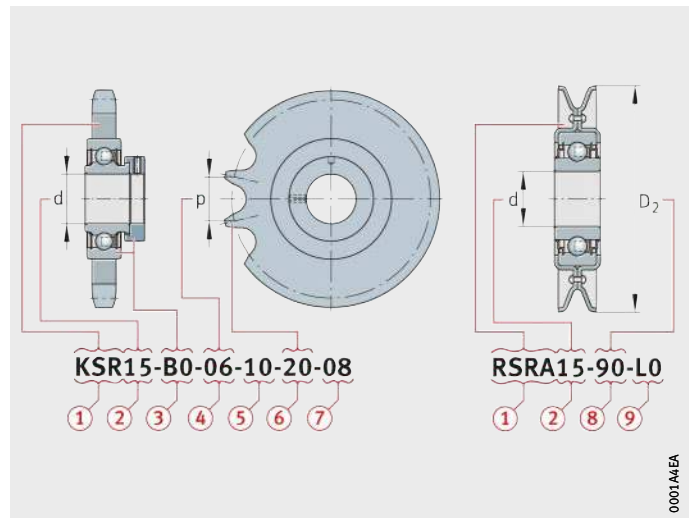


Figure 1
Structure of the designation

Material codes

The materials used for the sprockets are classified by means of material codes, see table.

Classification of materials

Code	Material	Hardness to DIN EN ISO 6506-1	
		from	to
08	Sintered iron C 10	40 HBW	60 HBW
09	Sintered iron D 39	90 HBW	120 HBW
15	Steel St 52	–	–
16	Steel C 45	45 HRC	55 HRC
		Tooth flanks hardened	
22	Plastic PA	–	–

Design and safety guidelines

Roller chain idler sprocket units

The chapter Technical principles brings together the essential guidelines on the design of bearing arrangements, lubrication, mounting and dismantling and the operation of bearings, see page 32.

Roller chain idler sprocket units should always be mounted on the slack side of the chain, *Figure 2*.

The wrap angle on the idler sprocket unit should be selected such that at least three teeth are engaged simultaneously.

For grease lubrication, a grease with good adhesion characteristics should be used.

Roller chain idler sprocket units of bore $d = 16$ mm are tolerated so that they can be fitted using fixing screws M16.



The contact pressure at the end face of the inner ring should not exceed 10 N/mm^2 .

The minimum press-out force of the deep groove ball bearings is 700 N. This value must not be exceeded during operation.

The preload on the slack side should not be less than 1% of the tractive force on the taut side.

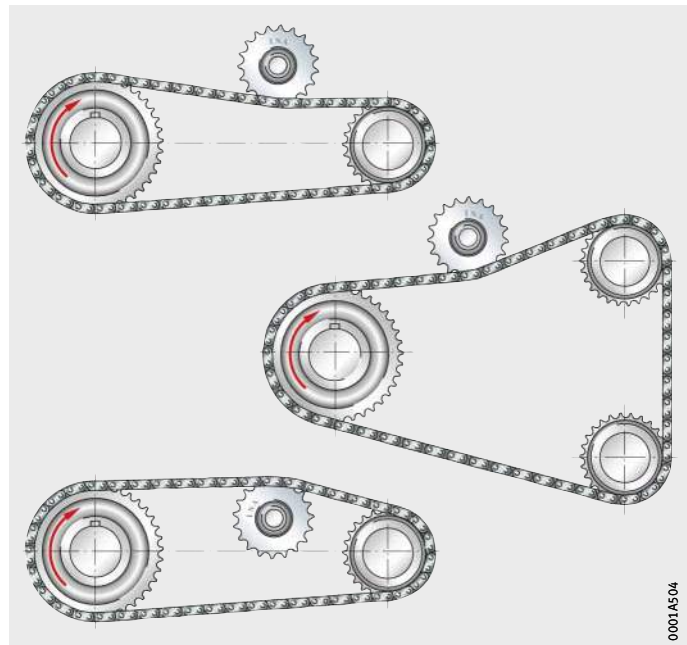


Figure 2
Arrangement
on slack side of chain drive

Roller chain idler sprocket units, idler pulley units

Idler pulley units

Idler pulley units should only be positioned on the slack side of the drive, *Figure 3*.

For normal loads, a light fit for the inner ring combined with axial clamping is sufficient.

If idler pulley units with a flat profile are to be used for tensioning via the back of a vee belt, check the suitability of the vee belt for this arrangement.



The permissible belt speed of 40 m/s must not be exceeded.

Check the permissible belt tension and operating life of the ball bearing for each individual application.

Preload force

The following is an approximate guide value for the preload force S_v between the shafts:

- for flat belts $S_v = 2$ to $3 \times F_u$ (circumferential force)
- for vee belts $S_v = 1,7$ to $2,5 \times F_u$ (circumferential force).

Checking of belt tension

Measure the speed ratio without load at low speed. Then measure the speed ratio at operating speed and under operating load. If the difference in speed due to slippage is $> 2\%$, retension the belt.

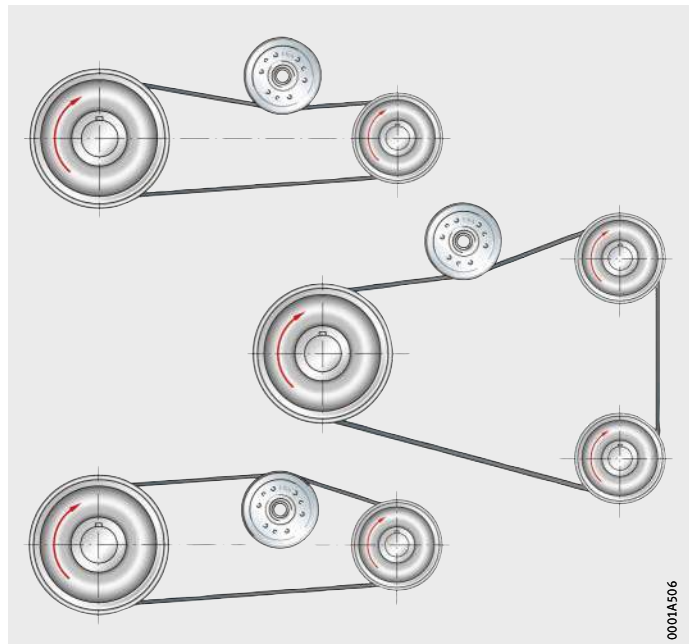


Figure 3
Arrangement on slack side of belt
drive

Accuracy

In the case of idler pulley units for vee belts, the groove angles are slightly larger due to the small wrap than recommended according to DIN 2211 and DIN 2217.

Tolerances of radial insert ball bearing bore

The tolerances of the inner ring bore of roller chain idler sprocket units KSR...-L0 are dependent on the diameter, see table.

The inner ring bore of roller chain idler sprocket units KSR...-B0 has a plus tolerance to allow easier mounting of the bearing, see dimension table.

Bore tolerances

Series	Bore d mm	Deviation mm
KSR...-L0	16,2	+0,1 0
	20	0 -0,01
	25	0 -0,01
RSR...-L0	13	+0,08 -0,05
	15	+0,08 -0,05
	16	+0,26 +0,13
	17	0 -0,008
	20	0 -0,01
	25	0 -0,01

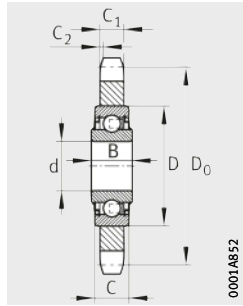
Radial internal clearance

The radial internal clearance of mounted roller chain idler sprocket units corresponds to Group 5 in accordance with ISO 5753-1.

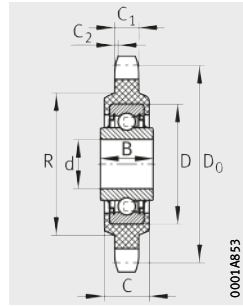


Roller chain idler sprocket units

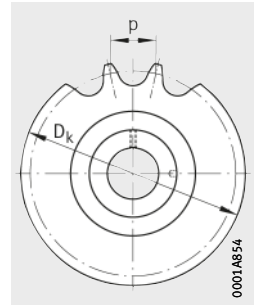
With extended inner ring



KSR..-L0



KSR..-L0..-22



Dimension table - Dimensions in mm

Tooth set		Designation ¹⁾	Mass m ≈ kg	Dimensions										Chain to DIN ISO 606	
p ²⁾ "	z ³⁾			d ⁴⁾	C ₁	D ₀	D _k	C ₂ min.	D	B	C	R	ISO chain	ANSI chain	
3/8	20	KSR16-L0-06-10-20-08	0,14	16,2	5,2	60,9	65	0,8	40	18,3	12	-	x	-	
	16	KSR16-L0-08-10-16-08	0,16	16,2	7	65,1	70,5	1,1	40	18,3	12	-	x	-	
1/2		KSR16-L0-08-10-16-15	0,14	16,2	7	65,1	70,5	1,1	40	18,3	12	-	x	x	
		KSR16-L0-08-10-16-22	0,1	16,2	7	65,1	70,5	1,1	40	18,3	18,1	48	x	x	
	18	KSR16-L0-08-10-18-08	0,21	16,2	7	73,1	78,6	1,1	40	18,3	12	-	x	-	
		KSR16-L0-08-10-18-09	0,21	16,2	7	73,1	78,6	1,1	40	18,3	12	-	x	x	
		KSR16-L0-08-10-18-16	0,21	16,2	7	73,1	78,6	1,1	40	18,3	12	-	x	x	
		KSR16-L0-08-10-18-22	0,23	16,2	7	65,1	70,5	1,1	40	18,3	18	48	x	x	
5/8	14	KSR16-L0-10-10-14-08	0,21	16,2	8,7	71,3	78	1,3	40	18,3	12	-	x	x	
		KSR16-L0-10-10-14-08-FA101	0,21	16,2	8,7	71,3	78	1,3	40	18,3	12	-	x	x	
		KSR16-L0-10-10-14-08-L091	0,24	16,2	8,7	71,3	78	1,3	40	18,3	12	-	x	x	
	17	KSR16-L0-10-10-17-08	0,32	16,2	8,7	86,4	93,1	1,3	40	18,3	12	-	x	x	
		KSR16-L0-10-10-17-09	0,32	16,2	8,7	86,4	93,1	1,3	40	18,3	12	-	x	x	
		KSR16-L0-10-10-17-22	0,26	16,2	8,7	86,4	93,1	1,3	40	18,3	18	48	x	x	
3/4	19	KSR16-L0-10-10-19-15-FA101	0,45	16,2	9,15	96,4	103,5	1,5	40	18,3	12	-	x	-	
	13	KSR16-L0-12-10-13-08	0,33	16,2	10,5	79,6	87	1,5	40	18,3	12	-	x	x	
		KSR16-L0-12-10-13-16	0,33	16,2	10,5	79,6	87	1,5	40	18,3	12	-	x	x	
	15	KSR16-L0-12-10-15-08	0,42	16,2	10,5	91,6	99,2	1,5	40	18,3	12	-	x	x	
		KSR16-L0-12-10-15-09	0,42	16,2	10,5	91,6	99,2	1,5	40	18,3	12	-	x	-	
		KSR16-L0-12-10-15-22	0,36	16,2	10,5	91,6	99,2	1,5	40	18,3	18	48	x	x	
	17	KSR16-L0-12-10-17-15	0,58	16,2	10,5	103,7	111,4	1,5	40	18,3	12	-	x	x	
		KSR16-L0-12-10-17-16	0,58	16,2	10,5	103,7	111,4	1,5	40	18,3	12	-	x	x	
	20	KSR16-L0-12-10-20-15	0,86	16,2	10,5	121,78	130	1,5	40	18,3	12	-	x	-	
	1	12	KSR20-L0-16-10-12-15	0,7	20	15,3	98,1	107,6	2	47	17,7	14	-	x	x
		KSR20-L0-16-10-12-16	0,7	20	15,3	98,1	107,6	2	47	17,7	14	-	x	-	
1 1/4	9	KSR25-L0-20-10-09-16	0,8	25	17,6	92,8	103	2,5	52	21	15	-	x	x	
	13	KSR25-L0-20-10-13-15	1,6	25	17,6	132,7	144	2,5	52	21	15	-	x	x	

x suitable

1) Composition of designation, see page 338.

2) p = pitch.

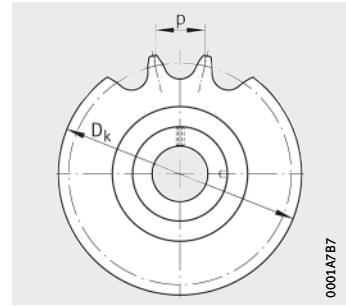
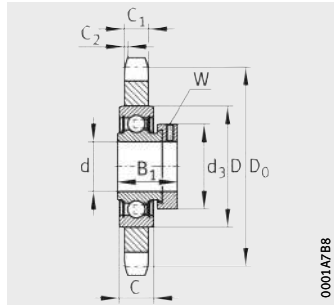
3) z = number of teeth.

4) Tolerance of bore d, see page 341.

Inner rings of d = Ø16,2 are designed for fixing holes M16.

Roller chain idler sprocket units

With eccentric locking collar



KSR...B0

Dimension table - Dimensions in mm

Tooth set		Designation ¹⁾	Mass m ≈ kg	Dimensions				
p ²⁾	z ³⁾			d ^{+0,018} ₀	C ₁	D ₀	D _k	C ₂ min.
3/8	20	KSR15-B0-06-10-20-08	0,18	15	5,2	60,9	65	0,8
	1/2	16	KSR15-B0-08-10-16-08	0,21	15	7	65,1	70,5
		KSR15-B0-08-10-16-08-AH01	0,22	15	7	65,1	70,5	1,1
18		KSR20-B0-08-10-18-08	0,32	20	7	73,1	78,6	1,1
		KSR20-B0-08-10-18-15	0,32	20	7	73,1	78,6	1,1
19		KSR25-B0-08-10-19-08	0,29	25	7	77,1	82,5	1,1
5/8	14	KSR15-B0-10-10-14-08	0,26	15	8,7	71,3	78	1,3
	17	KSR20-B0-10-10-17-15	0,41	20	8,7	86,3	93,1	1,3
3/4	13	KSR15-B0-12-10-13-08	0,4	15	10,5	79,6	87	1,5
	15	KSR20-B0-12-10-15-16	0,47	20	10,5	91,6	99,2	1,5
1	10	KSR20-B0-16-10-10-15	0,5	20	15,3	82,3	89,4	2
	15	KSR30-B0-16-10-15-15	1,34	30	15,3	122,2	131	2

x suitable

¹⁾ Composition of designation, see page 338.

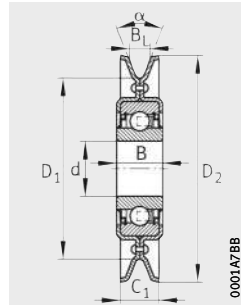
²⁾ p = pitch.

³⁾ z = number of teeth.

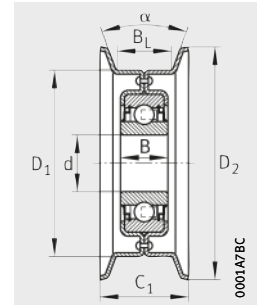
D	B ₁	C	d ₃ max.	Width across flats	Chain to DIN ISO 606	
				W	ISO chain	ANSI chain
40	28,6	12	28,4	3	x	–
40	28,6	12	28,4	3	x	–
40	28,6	12	28,4	3	x	–
47	31	14	33	3	x	x
47	31	14	33	3	x	x
52	31	15	37,3	3	x	x
40	28,3	12	28,4	3	x	x
47	31	14	33	3	x	x
40	28,6	12	28,4	3	x	x
47	31	14	33	3	x	x
47	31	14	33	3	x	–
62	35,7	18	44	4	x	–



Idler pulley units



RSRA...-L0, RSRA...-K0
Type A



RSRB...-L0
Type B

Dimension table - Dimensions in mm

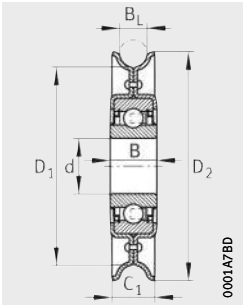
Type	Designation	Mass m ≈ kg	Dimensions			
			d ¹⁾	D ₁	D ₂	B
A	RSRA15-90-L0	0,24	15	61,6	90	14,4
	RSRA17-102-K0-AH01	0,42	17	70,8	102	12
	RSRA13-129-L0-L114⁴⁾	0,56	13	73,7	129	18,3
	RSRA13-186-L0	1,13	13	130,8	186	18,3
	RSRA16-129-L0	0,54	16	73,7	129	18,3
	RSRA16-186-L0	1,11	16	130,8	186	18,3
B	RSRB13-117-L0	0,5	13	101	117	18,3
	RSRB13-159-L0	0,8	13	139,7	159	18,3
	RSRB15-92-L0	0,31	15	76,2	92	14,4
	RSRB16-117-L0	0,48	16	101	117	18,3
	RSRB16-159-L0	0,78	16	139,7	159	18,3
	RSRB16-222-L0	1,45	16	203	222	18,3
D	RSRD20-160-L0	0,75	20	136,5	155,8	17,7
	RSRD25-150-L0	0,83	25	133	154	21

¹⁾ Tolerance of bore d, see table, page 341.

²⁾ Vee belt size according to DIN 2215 (ISO 1081, ISO 4183, ISO 4184) and DIN 7753-1 (ISO 4184).

³⁾ Basic load rating of bearing.

⁴⁾ The bearing is greased with L114 (GA47).



RSRD...L0
Type D

C ₁	B _L	Angle	Vee belt size ²⁾	Basic load ratings ³⁾		Fatigue limit load
		α °		dyn. C _r N	stat. C _{0r} N	C _{ur} N
20	12,4	32	8, 10, (12,5)	8 100	3 700	187
22,2	12,7	34	8, 10, (12,5)	9 600	4 750	239
32	22,1	32	13, 17, 20, 22	10 100	4 750	241
32	22,1	32	13, 17, 20, 22	10 100	4 750	241
32	22,1	32	13, 17, 20, 22	10 100	4 750	241
32	22,1	32	13, 17, 20, 22	10 100	4 750	241
36	25,4	10	–	10 100	4 750	241
36,5	25,4	10	–	10 100	4 750	241
31	22,2	10	–	8 100	3 700	187
36	25,4	10	–	10 100	4 750	241
36,5	25,4	10	–	10 100	4 750	241
50	38	10	–	10 100	4 750	241
17,5	13,5	–	–	13 600	6 600	335
24	17	–	–	14 900	7 800	395





Radial insert ball bearings and housing units, corrosion-resistant

Radial insert ball bearings with Corrotect coating or
in corrosion-resistant VA design
Flake graphite cast iron and sheet steel housings
High grade steel housings
Plastic housings



Radial insert ball bearings and housing units, corrosion-resistant

Radial insert ball bearings 352

Corrosion-resistant VA design With Corrotect coating

Corrosion-resistant radial insert ball bearings are designed for particularly humid environments. The bearings are available either with the anti-corrosion coating Corrotect or in the corrosion-resistant VA design.

Typical areas of application include the agricultural and mining sector, conveying equipment, textile, paper and woodworking machinery as well as machinery for the food and drinks industry.

Flake graphite cast iron housings 376

With Corrotect coating

Due to the anti-corrosion coating Corrotect, corrosion-resistant flake graphite cast iron housings are specially designed for humid environments.

The housings are single-piece components, have high load carrying capacity and are screw mounted to the adjacent construction by means of fixing holes.

The housings correspond in their design to standard housings and can be combined with end caps KASK.

Sheet steel housings 376

Corrosion-resistant VA design

The sheet steel housings are made from corrosion-resistant, austenitic chromium-nickel steel and are designed for moderate loads and lightweight constructions.

High grade steel housings 396

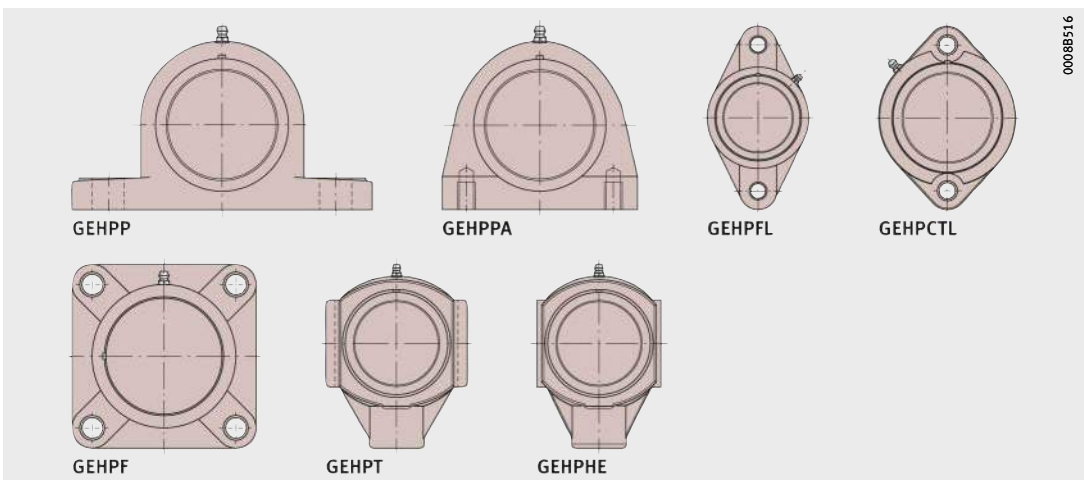
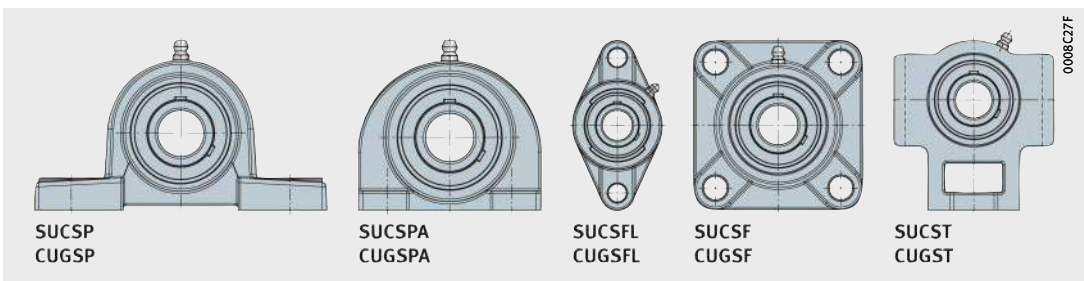
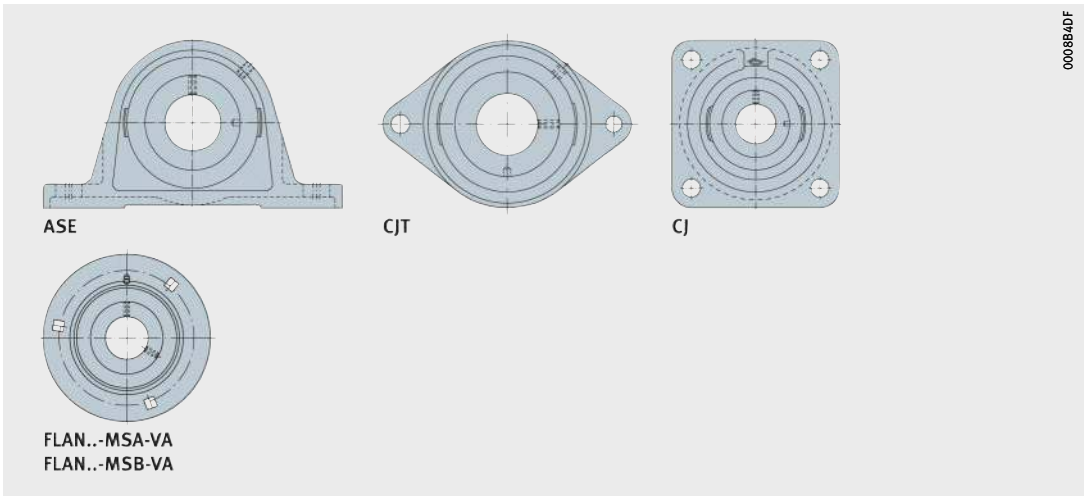
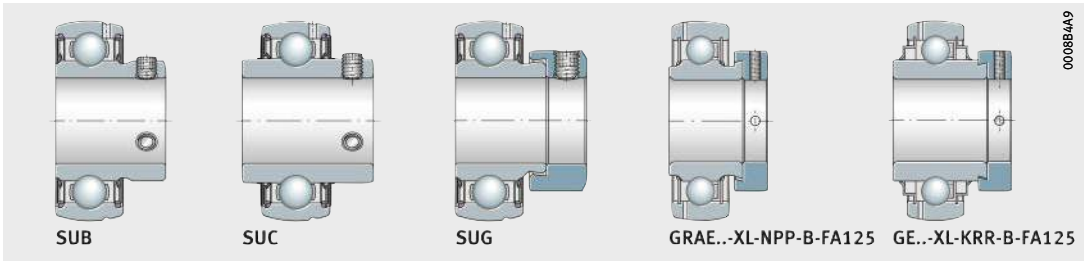
High grade steel housings are suitable for extremely high humidity, heavily contaminated water, salt spray and weakly alkaline and weakly acidic cleaning agents.

The housings do not have annular slots and cannot therefore be combined with end caps.

Plastic housings 426

Plastic housings made from the glass fibre reinforced material PBT are resistant not only to humidity but also to numerous chemical agents.

The housings are used in preference in foods and drinks industry. They have annular slots and are supplied with a closed end cap CC.





**Radial insert ball bearings,
corrosion-resistant**

Radial insert ball bearings, corrosion-resistant

	Page
Matrix	Features of radial insert ball bearings, comparison of series.... 354
Product overview	Radial insert ball bearings, corrosion-resistant..... 356
Features	X-life 357
	Corrosion-resistant VA design or with Corrotect coating..... 357
	Radial insert ball bearings in corrosion-resistant VA design 357
	Radial insert ball bearings with Corrotect coating 360
	Sealing..... 362
	Suffixes..... 362
Design and safety guidelines	Compensation of static misalignments..... 363
	Minimum radial load 363
	Speed limits for radial insert ball bearings 363
	Shaft tolerances for radial insert ball bearings 364
Accuracy	Standard tolerances of radial insert ball bearings..... 365
	Radial internal clearance of radial insert ball bearings..... 366
Dimension tables	Radial insert ball bearings, corrosion-resistant VA design, grub screws in inner ring..... 368
	Radial insert ball bearings, with Corrotect coating, with eccentric locking collar..... 374



**Features
of radial insert ball bearings,
comparison of series**

Series	Shaft diameter		Location
	mm		
	from	to	
GRAE..-XL-NPP-B-FA125	20	60	Eccentric locking collar
GE..-XL-KRR-B-FA125	20	50	Eccentric locking collar
SUB	20	50	Grub screws
SUC	12	50	Grub screws
SUG	20	50	Eccentric locking collar

- 1) Further guidelines must be observed, see section Lubrication, page 62.
- 2) Attention!
Recommended operating temperature of bearing series.
In the case of temperatures over +100 °C, relubrication must be carried out regularly.
- 3) Temporary temperature peaks are possible up to 120 °C.

Sealing	Compensation of misalignment	Internal clearance Group	Cage	Grease ¹⁾	Relubrication facility	Temperature ²⁾		Comments	Dimension table Page
						°C			
						from	to		
P	yes	3	PA66	GA47	yes	-20	+100 ³⁾	Corrosion-resistant	374
R	yes	3	PA66	GA47	yes	-20	+100 ³⁾	Corrosion-resistant	374
RSR	yes	3	Corrosion-resistant VA steel	FM222	yes	-35	+100	Corrosion-resistant	368
RSR	yes	3	Corrosion-resistant VA steel	FM222	yes	-35	+100	Corrosion-resistant, flinger shield	370
RSR	yes	3	Corrosion-resistant VA steel	FM222	yes	-35	+100	Corrosion-resistant	372



Product overview Radial insert ball bearings, corrosion-resistant

With grub screws in inner ring
Corrosion-resistant VA design



With eccentric locking collar
Corrosion-resistant VA design



With Corrotect coating



Radial insert ball bearings, corrosion-resistant

Features The radial insert ball bearings SUB, SUC and SUG as well as the radial insert ball bearings with the suffix FA125 are designed for corrosion-resistant bearing arrangements. They are therefore equally suitable for applications involving humidity, contaminated water, salt spray mist and for cleaning agents. Their classic areas of application include the agricultural, construction and mining sector, conveying equipment, textile, paper and woodworking machinery as well as machinery for the food and drink industry.

X-life Numerous sizes are supplied in the X-life design. These products are indicated in the dimension tables.

Radial insert ball bearings of X-life quality have, for example, lower roughness Ra and higher geometrical accuracy of the raceways than comparable designs that are not X-life. As a result, these bearings have higher load carrying capacity and longer rating life although their dimensions are identical. In certain applications, this means that a smaller bearing arrangement can be designed.

Radial insert ball bearings of X-life quality have an eccentric locking collar of an improved design and the quantity and distribution of the lubricant has been optimised. Housings ASE have additional crosspieces on the underside. For extreme requirements, the cage and seal material in the high and low temperature designs (suffix FA101) has been significantly improved in comparison with earlier versions.

Corrosion-resistant VA design or with Corrotect coating

The bearings are available in the corrosion-resistant VA design or with the Corrotect thin film coating. They correspond in their design to single row deep groove ball bearings 62, are ready to fit, particularly easy to fit and allow robust, economical bearing arrangements with a long operating life. They are located on the shaft by means of grub screws in the extended inner ring or by means of an eccentric locking collar.

Operation even under difficult conditions is ensured by seals and greases that are matched to the application.

Radial insert ball bearings in corrosion-resistant VA design

In the case of radial insert ball bearings SUB, SUC and SUG, the bearing rings, eccentric locking collar and rolling elements are made from high alloy, corrosion-resistant rolling bearing steel with an increased chromium and molybdenum content, material number 1.4125.

Sheet steel cages made from corrosion-resistant steel, material number 1.4301, retain and guide the rolling elements.



Radial insert ball bearings, corrosion-resistant

Media resistance

In the food industry in particular, the resistance of the material in relation to various cleaning agents is of increasing importance.

Resistance to media

Medium	Concentration %	X5CrNi18-10 (1.4301)		440C (1.4125)	
		+20 °C	+80 °C	+20 °C	+80 °C
Hydrochloric acid HCl	0,1	+	+	–	–
	1	(+)	–	–	–
	18	–	–	–	–
Hydrofluoric acid HF	1	–	–	–	–
	5	– ¹⁾	–	– ¹⁾	–
Sulphuric acid H ₂ SO ₄	1	+	–	–	–
	10	(+)	–	–	–
	96	+	(+)	–	–
Sulphurous acid H ₂ SO ₃	1	+	+	–	–
Nitric acid HNO ₃	5	+	+	–	–
	25	+	+	+	(+)
	65	+	+	+	(+)
Phosphoric acid H ₃ PO ₄	1	+	+	+	+
	10	+	+	(+)	+
	85	+	+	+	–
Formic acid HCOOH	5	+	+	–	–
	25	+	+	–	–
Acetic acid CH ₃ COOH	5	+	+	+	–
	25	+	+	+	–
Citric acid	5	+	+	+	+
	25	+	+	–	–
Chloroacetic acid	5	+	+	(+)	–
Sodium chloride NaCl	10	+	+	(–)	(–)
Sea water	4	+	+	(–)	(–)
Distilled water	–	+	+	+	+
Ammonium hydroxide NH ₄ OH	1	+	+	+	+
	10	+	+	+	+
Potassium hydroxide solution KOH	0,1	+	+	+	+
	1	+	+	+	+
	10	+	+	+	+
Sodium hypochlorite solution	1	+ ¹⁾	+	²⁾	(–)
Hydrogen peroxide H ₂ O ₂	5	+	+	+	+

+ Resistant
 (+) Moderately resistant
 (–) Barely resistant
 – Not resistant

¹⁾ Not tested.
 Estimate generated from remaining test series.

²⁾ Not tested.
 No estimate possible.

Location by means of corrosion-resistant VA grub screws

The inner ring is located axially on the shaft by means of two corrosion-resistant VA grub screws, material number 1.4301, offset by 120°. This location method is suitable for bearing arrangements with a constant direction of rotation or, under low speed and load, for an alternating direction of rotation.

The grub screws are self-retaining and have a fine pitch thread with cup point for secure location of the bearings when taking account of the stated tightening torques, see table.

Tightening torques for metric grub screws, corrosion-resistant VA design

Width across flats W mm	Thread	Tightening torque ¹⁾ M _A Nm
2,5	M5	2,4
3	M6×0,75	3,9
4	M8×1	8,3
5	M10×1,25	16

¹⁾ The tightening torques are only valid for grub screws from Schaeffler.

Location by means of corrosion-resistant VA eccentric locking collar

The bearings are located on the shaft by a corrosion-resistant VA locking collar. They are thus particularly suitable for bearing arrangements with a constant direction of rotation or, under low speed and load, for an alternating direction of rotation.

The locking collar is preferably tightened in the direction of rotation and must be secured by means of a grub screw. This location method prevents damage to the shaft and can be easily loosened again.

Sealing

Single-piece seals RSR seal the radial insert ball bearings on both sides. Additional outer flinger shields made from corrosion-resistant steel, material number 1.4301, protect the seals against mechanical damage.

Lubrication

Initial greasing is carried out with an aluminium complex soap grease with food applications approval to NSF-H1 that is sufficient in many case for the entire operating life of the bearings. For relubrication, the outer rings have lubrication holes on their circumference.

Operating temperature

Radial insert ball bearings in the corrosion-resistant VA design are suitable for operating temperatures from -35 °C to +100 °C.



Radial insert ball bearings, corrosion-resistant

Radial insert ball bearings with Corrotect coating

The radial insert ball bearings GRAE..-XL-NPP-B-FA125 and GE..-XL-KRR-B-FA125 have a Corrotect thin film coating on all surfaces.

Plastic cages made from polyamide PA66 retain and guide the rolling elements.

Anti-corrosion coating system Corrotect

The Corrotect thin film coating technology is an economical alternative to radial insert ball bearings with conventional anti-corrosion protection, see page 88. The thickness of the coating film is between 2 µm and 5 µm.

Advantages of the anti-corrosion coating

The advantages of the Corrotect thin film coating are:

- All surfaces are protected against corrosion, including the machined surfaces of chamfers and radii.
- Rust beneath seals is prevented in the long term.
- Smaller spots that are damaged by the application and are bright as a result remain protected against corrosion by the cathodic protection effect.
- Operating life is significantly longer compared to uncoated parts due to the anti-corrosion protection.
- Uncoated bearings and housings are fully interchangeable with the coated versions of the same design.
- Bearings and housings made of corrosion-resistant rolling bearing steel are often no longer required.

Media resistance

The resistance of the Corrotect thin film coating to various media must be noted, see table.



The use of the Corrotect thin film coating is not permitted for direct contact with foodstuffs.

Resistance to media

Chemicals	Corrotect coating ¹⁾
Neutral, organic fluids (oil, brake fluid, petrol)	Resistant
Aqueous salt solutions in the neutral range $6 \leq \text{pH} \leq 8$ (table salt NaCl, seawater applications)	Conditionally resistant
Acidic liquids ($\text{pH} \leq 6$)	Not resistant
Alkaline liquids ($\text{pH} \geq 8$)	Not resistant
Oxidising substances (ozone, chlorine, peroxides, hypochlorides)	Not resistant

¹⁾ Valid for Corrotect coatings based on zinc and zinc alloy.

Location by means of locking collar	<p>The bearings are located on the shaft by a locking collar. They are thus particularly suitable for bearing arrangements with a constant direction of rotation or, under low speed and load, for an alternating direction of rotation.</p> <p>The locking collar is preferably tightened in the direction of rotation and must be secured by means of a grub screw. This location method prevents damage to the shaft and can be easily loosened again.</p>
Sealing	<p>Three-piece seals P or R seal the bearings on both sides. The NBR part is protected against mechanical damage by zinc plated sheet steel shields. In seals P, the seal lip is axially preloaded, in seals R it is radially preloaded.</p>
Lubrication	<p>Initial greasing is carried out using the grease GA47, which is sufficient in many cases for the entire operating life of the bearings. GA47 is a barium complex soap grease with a mineral oil base, see page 68.</p> <p>In order to increase the grease quantity, radial insert ball bearings with seals R have sheet steel shields that are angled and extended outwards. This provides more space for the grease. This extends the bearing operating life and the relubrication intervals. For relubrication, the outer rings have lubrication holes on their circumference.</p>
Operating temperature	<p>Corrosion-resistant radial insert ball bearings with a Corrotect coating are suitable for operating temperatures from -20 °C to $+100\text{ °C}$.</p> <p>Temporary temperature peaks are possible up to $+120\text{ °C}$.</p>

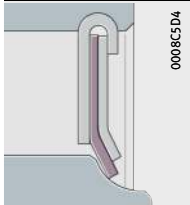
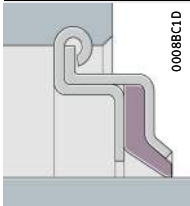
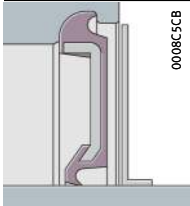


Radial insert ball bearings, corrosion-resistant

Sealing

Seals for radial insert ball bearings are of a three-piece design. This concept offers, due to the rigidly rolled-in sheet steel washer, optimum seating in the bearing as well as concentric alignment of the seal lip to the inner ring.

Seal types

P type seal (NPP), only for bearings with Corrotect coating	
	<p>0008C5D4</p> <p>Two zinc-coated sheet steel washers (or in a corrosion-resistant VA design) with intermediate NBR part, seal lip axially preloaded.</p> <p>In order to protect the seal lip from mechanical damage, the outer sheet steel washer extends a considerable distance down towards the bearing inner ring.</p> <p>For use in narrow radial insert ball bearings with inner ring extended on one side.</p>
R type seal (KRR), only for bearings with Corrotect coating	
	<p>0008BCTD</p> <p>Two zinc-coated sheet steel washers extended outwards and angled downwards with intermediate NBR part and radially preloaded seal lip. Improved protection against mechanical damage.</p> <p>Substantial grease reservoir due to the space between the extended and angled sheet steel washers.</p> <p>Used in radial insert ball bearings with inner ring extended on both sides.</p>
RSR type seal with flinger shield in corrosion-resistant VA design	
	<p>0008C5CB</p> <p>Single piece, sheet steel washer in corrosion-resistant VA design with vulcanised and radially preloaded seal lip made from NBR and additional flinger shield.</p>

Suffixes

Suffixes for available designs, see table.

Available designs

Suffix	Description	Design
B	Bearing with spherical outside surface of outer ring	Standard
FA125	With Corrotect coating, corrosion-resistant	
KRR	Lip seals on both sides (seal R, three-piece)	
NPP	Lip seals on both sides (seal P, three-piece)	
FA107	Bearing with lubrication holes on the locating side	

Design and safety guidelines

The chapter Technical principles brings together the essential guidelines on the design of bearing arrangements, lubrication, mounting and dismounting and the operation of bearings, see page 32.

Compensation of static misalignments

Bearings with a spherical outer ring, fitted in housings with a concave bore, can compensate for static misalignment of the shaft, *Figure 1*.

For units with a lubrication groove in the housing and lubrication hole in the radial insert ball bearing, the following applies:

- Up to $\pm 2,5^\circ$, the units can be relubricated.
- Between $\pm 2,5^\circ$ and $\pm 5^\circ$, the possibility of relubrication is dependent on the specific unit. Please contact us in this case.
- Over $\pm 5^\circ$, relubrication is no longer possible.



The units must not be used to support swivelling or tumbling motion.

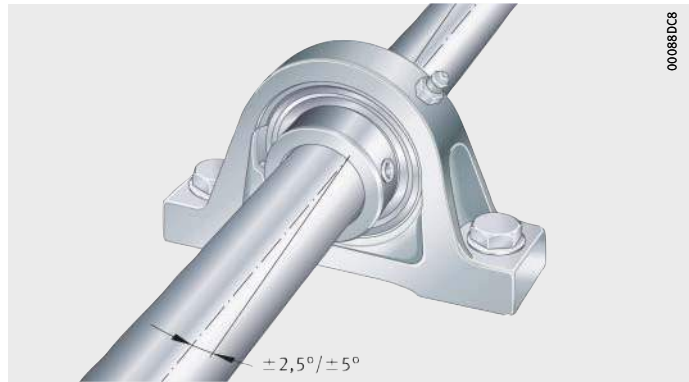


Figure 1
Compensation
of static shaft misalignment

Minimum radial load

In order to ensure slippage-free operation, the bearings must be subjected to a minimum radial load. This applies particularly in the case of high speeds and high accelerations. In continuous operation, a minimum radial load of the order of $P \geq 0,01 \cdot C_r$ is necessary for ball bearings with cage.

Speed limits for radial insert ball bearings

The speed limits are dependent on the load, the clearance between the bearing bore and shaft and the friction of the seals in the case of bearings with contact seals.

Guide values for the permissible speeds can be derived from the diagram, *Figure 2*, page 364.

In the case of load ratios $C_r/P > 13$, the speeds can be increased. For $C_r/P < 5$, location by means of a fit with a shaft roughness of Ra 0,3 is recommended, see page 100. For both types of applications, please contact us. In order to ensure slippage-free operation, the minimum radial load must be observed.



Radial insert ball bearings, corrosion-resistant

Example of permissible speed calculation

Given:

- Shaft tolerance h6 Ⓢ
- Radial insert ball bearing GRAE30-XL-NPP-B-FA125
- Ball set 206
- Basic dynamic load rating C_r 20 700 N
- Load P 1 300 N
- Sealing Seals P.

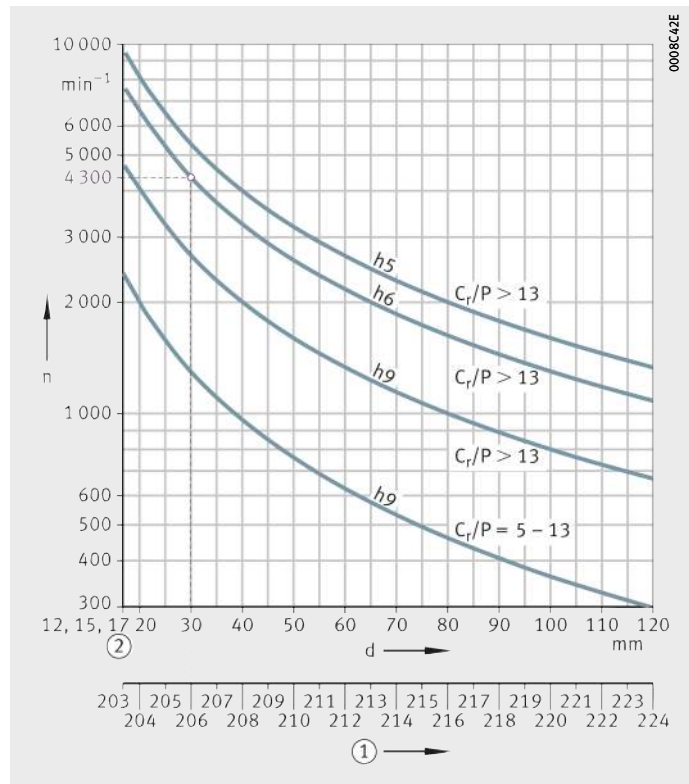
Required:

- Load ratio $C_r/P = 20\,700\text{ N}/1\,300\text{ N}$ $C_r/P > 13$
- Permissible speed $n \approx 4\,300\text{ min}^{-1}$, Figure 2.

n = permissible speed
 h5, h6, h9 = shaft tolerance
 (this is subject to the envelope requirement Ⓢ)
 C_r/P = load ratio

- ① Ball set
- ② For d = 12 mm, 15 mm and 17 mm, identical ball set 203

Figure 2
 Permissible speed for radial insert ball bearings with seal RSR



Shaft tolerances for radial insert ball bearings

The permissible shaft tolerance is dependent on the speed and load. Shafts of the tolerance classes h6 Ⓢ to h9 Ⓢ can be used. Conventional drawn shafts will suffice for most applications.

**Accuracy
Standard tolerances
of radial insert ball bearings**

The outside diameter of the bearings corresponds to tolerance class Normal in accordance with ISO 492, see tables. The inner ring bore has a plus tolerance to facilitate mounting of the bearing.

**Tolerances
of radial insert ball bearings,
with Corrotect coating**

Inner ring				Outer ring			
Nominal dimension Bore d mm		Variation ¹⁾ $t_{\Delta dmp}$ μm		Nominal dimension Outside diameter D mm		Variation ²⁾ $t_{\Delta Dmp}$ μm	
over	incl.	min.	max.	over	incl.	max.	min.
12	18	0	+18	30	50	0	-11
18	24	0	+18	50	80	0	-13
24	30	0	+18	80	120	0	-15
30	40	0	+18	120	150	0	-18
40	50	0	+18	150	180	0	-25
50	60	0	+18	180	250	0	-30
60	90	0	+25	-	-	-	-
90	120	0	+30	-	-	-	-

¹⁾ This corresponds to the arithmetic mean value derived from the largest and smallest diameters (measured using a two-point measuring device).

²⁾ In the case of sealed bearings, the largest and smallest values of the outside diameter can deviate from the mean value by approx. 0,03 mm.

**Tolerances
of radial insert ball bearings,
corrosion-resistant VA design**

Inner ring				Outer ring			
Nominal dimension Bore d mm		Variation ¹⁾ $t_{\Delta dmp}$ μm		Nominal dimension Outside diameter D mm		Variation ²⁾ $t_{\Delta Dmp}$ μm	
over	incl.	min.	max.	over	incl.	max.	min.
18	24	0	+25	50	80	0	-13
24	30	0	+25	80	120	0	-13
30	40	0	+25	120	150	0	-13
40	50	0	+25	150	180	0	-13
50	60	0	+25	180	250	0	-13

¹⁾ This corresponds to the arithmetic mean value derived from the largest and smallest diameters (measured using a two-point measuring device).

²⁾ In the case of sealed bearings, the largest and smallest values of the outside diameter can deviate from the mean value by approx. 0,03 mm.



Radial insert ball bearings, corrosion-resistant

Radial internal clearance of radial insert ball bearings

The radial internal clearance of most series is Group 3 to ISO 5753-1 and is thus larger than for normal deep groove ball bearings, see table and page 146.

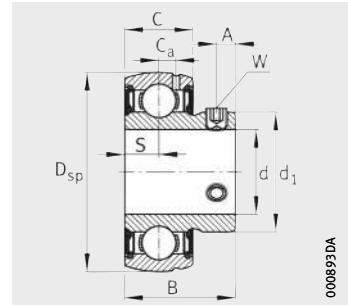
The larger internal clearance allows better support of angular misalignment and shaft deflection.

Radial internal clearance

Bore d mm		Radial internal clearance							
		Group N μm		Group 3 μm		Group 4 μm		Group 5 μm	
over	incl.	min.	max.	min.	max.	min.	max.	min.	max.
2,5	6	2	13	8	23	–	–	–	–
6	10	2	13	8	23	14	29	20	37
10	18	3	18	11	25	18	33	25	45
18	24	5	20	13	28	20	36	28	48
24	30	5	20	13	28	23	41	30	53
30	40	6	20	15	33	28	46	40	64
40	50	6	23	18	36	30	51	45	73
50	65	8	28	23	43	38	61	55	90
65	80	10	30	25	51	46	71	65	105
80	100	12	36	30	58	53	84	75	120
100	120	15	41	36	66	61	97	90	140
120	140	18	48	41	81	71	114	105	160
140	160	18	53	46	91	81	130	120	180

Radial insert ball bearings with grub screws in inner ring

Spherical outer ring
Corrosion-resistant VA design



SUB

Dimension table - Dimensions in mm

Designation ¹⁾²⁾	Mass m ≈ kg	Dimensions					
		d	D _{sp}	C	B	S	d ₁
SUB204	0,14	20	47	16	26	8	29,05
SUB205	0,17	25	52	17	28	8,5	34,03
SUB206	0,26	30	62	19	30,5	9,5	40,31
SUB207	0,41	35	72	20	35,45	10	47,4
SUB208	0,52	40	80	21	39,45	10,5	52,83
SUB209	0,6	45	85	22	41,5	11	57,3
SUB210	0,67	50	90	23	43,5	11,5	62,92

¹⁾ Speed limits for radial insert ball bearings, see page 363.

²⁾ Lubrication groove and two lubrication holes in the outer ring.

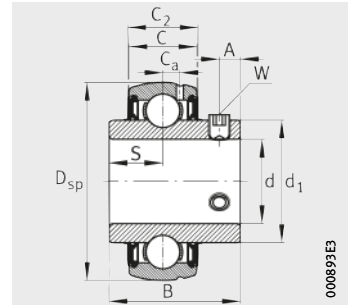
³⁾ Factor f_0 for determining equivalent bearing load, see table, page 40.

		Width across flats W	Basic load ratings		Fatigue limit load C _{ur} N	Factor ³⁾ f ₀
C _a	A		dyn. C _r N	stat. C _{0r} N		
4	4,5	2,5	12 300	6 300	300	13,1
4,15	5	2,5	13 400	7 500	360	13,8
5	5,8	3	18 700	10 700	510	13,8
5,7	6,1	3	24 600	14 600	700	13,8
5,9	8	4	31 500	18 900	910	14
6,5	8	4	31 500	19 400	930	14,3
6,5	9	5	33 500	22 100	1 060	14,3



Radial insert ball bearings with grub screws in inner ring

Spherical outer ring
Corrosion-resistant VA design
With extended inner ring



SUC

Dimension table - Dimensions in mm

Designation ¹⁾	Mass m ≈ kg	Dimensions					
		d	D _{sp}	C	C ₂ max.	B	S
SUC201 ³⁾	0,11	12	40	12	12,6	25	9,6
SUC202 ³⁾	0,1	15	40	12	12,6	25	9,6
SUC203 ³⁾	0,08	17	40	12	12,6	25	9,6
SUC204 ⁴⁾	0,16	20	47	16	16,6	31	12,7
SUC205 ⁴⁾	0,2	25	52	17	17,6	34,1	14,3
SUC206 ⁴⁾	0,31	30	62	19	19,6	38,1	15,9
SUC207 ⁴⁾	0,47	35	72	20	20,6	42,9	17,5
SUC208 ⁴⁾	0,62	40	80	21	21,6	49,2	19
SUC209 ⁴⁾	0,67	45	85	22	22,6	49,2	19
SUC210 ⁴⁾	0,78	50	90	23	23,6	51,6	19

1) Speed limits for radial insert ball bearings, see page 363.

2) Factor f_0 for determining equivalent bearing load, see table, page 40.

3) Two lubrication holes in the outer ring.

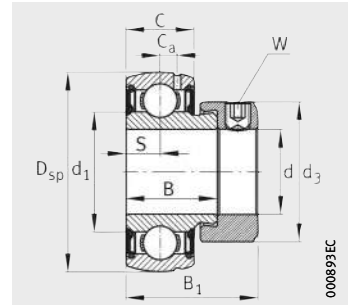
4) Lubrication groove and two lubrication holes in the outer ring.

			Width across flats W	Basic load ratings		Fatigue limit load C _{ur} N	Factor ²⁾ f ₀
d ₁	C _a	A		dyn. C _r N	stat. C _{0r} N		
23,9	3,4	4	2,5	9 200	4 550	218	13,1
23,9	3,4	4	2,5	9 200	4 550	218	13,1
23,9	3,4	4	2,5	9 200	4 550	218	13,1
29,05	4	5	2,5	12 300	6 300	300	13,1
34,03	4,15	5	2,5	13 400	7 500	360	13,8
40,31	5	6	3	18 700	10 700	510	13,8
47,4	5,7	6,5	3	24 600	14 600	700	13,8
52,83	5,9	8	4	31 500	18 900	910	14
57,3	6,5	8	4	31 500	19 400	930	14,3
62,92	6,5	9	5	33 500	22 100	1 060	14,3



Radial insert ball bearings with eccentric locking collar

Spherical outer ring
Corrosion-resistant VA design



SUG

Dimension table - Dimensions in mm

Designation ¹⁾²⁾	Mass m ≈ kg	Dimensions					
		d	D _{sp}	C	B	S	d ₁
SUG204	0,17	20	47	16	21,9	8	29,05
SUG205	0,2	25	52	17	22,4	8,5	34,03
SUG206	0,31	30	62	19	24,3	9,5	40,31
SUG207	0,51	35	72	20	25,9	10	47,4
SUG208	0,6	40	80	21	30,2	11	52,83
SUG209	0,7	45	85	22	30,2	11	57,3
SUG210	0,77	50	90	23	30,7	11	62,92

¹⁾ Speed limits for radial insert ball bearings, see page 363.

²⁾ Lubrication groove and two lubrication holes in the outer ring.

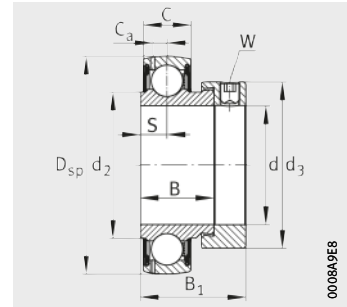
³⁾ Factor f_0 for determining equivalent bearing load, see table, page 40.

			Width across flats W	Basic load ratings		Fatigue limit load C _{ur} N	Factor ³⁾ f ₀
C _a	B ₁	d ₃ max.		dyn. C _r N	stat. C _{0r} N		
4	31,5	33	3	12 300	6 300	300	13,1
4,15	32	37,5	3	13 400	7 500	360	13,8
5	36,3	44	4	18 700	10 700	510	13,8
5,7	39,5	55	5	24 600	14 600	700	13,8
5,9	43,8	58	5	31 500	18 900	910	14
6,5	43,8	63	5	31 500	19 400	930	14,3
6,5	44,3	69	5	33 500	22 100	1 060	14,3



Radial insert ball bearings with eccentric locking collar

Spherical outer ring
With Corrotect coating



GRAE...XL-NPP-B-FA125

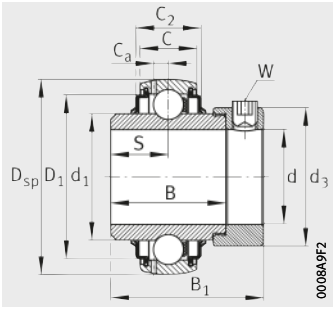


Dimension table - Dimensions in mm

Designation ¹⁾	Mass m ≈ kg	Dimensions						
		d	D _{sp}	C	C ₂	B	S	d ₁
GRAE20-XL-NPP-B-FA125	0,16	20	47	14	–	21,4	7,5	–
GE20-XL-KRR-B-FA125	0,19	20	47	14	16,6	34,1	17,1	27,6
GRAE25-XL-NPP-B-FA125	0,19	25	52	15	–	21,4	7,5	–
GE25-XL-KRR-B-FA125	0,25	25	52	15	16,7	34,9	17,5	33,8
GRAE30-XL-NPP-B-FA125	0,32	30	62	18	–	23,8	9	–
GE30-XL-KRR-B-FA125	0,39	30	62	18	20,7	36,5	18,3	40,2
GRAE35-XL-NPP-B-FA125	0,48	35	72	19	–	25,4	9,5	–
GE35-XL-KRR-B-FA125	0,55	35	72	19	22,5	37,7	18,8	46,8
GRAE40-XL-NPP-B-FA125	0,62	40	80	21	–	30,2	11	–
GE40-XL-KRR-B-FA125	0,73	40	80	21	23,5	42,9	21,4	52,3
GRAE45-XL-NPP-B-FA125	0,69	45	85	22	–	30,2	11	–
GE45-XL-KRR-B-FA125	0,83	45	85	22	26,4	42,9	21,4	57,9
GRAE50-XL-NPP-B-FA125	0,77	50	90	22	–	30,2	11	–
GE50-XL-KRR-B-FA125	0,99	50	90	22	26,4	49,2	24,6	62,8
GRAE60-XL-NPP-B-FA125	1,4	60	110	24	–	37,1	13,5	–

¹⁾ Speed limits for radial insert ball bearings, see page 363.

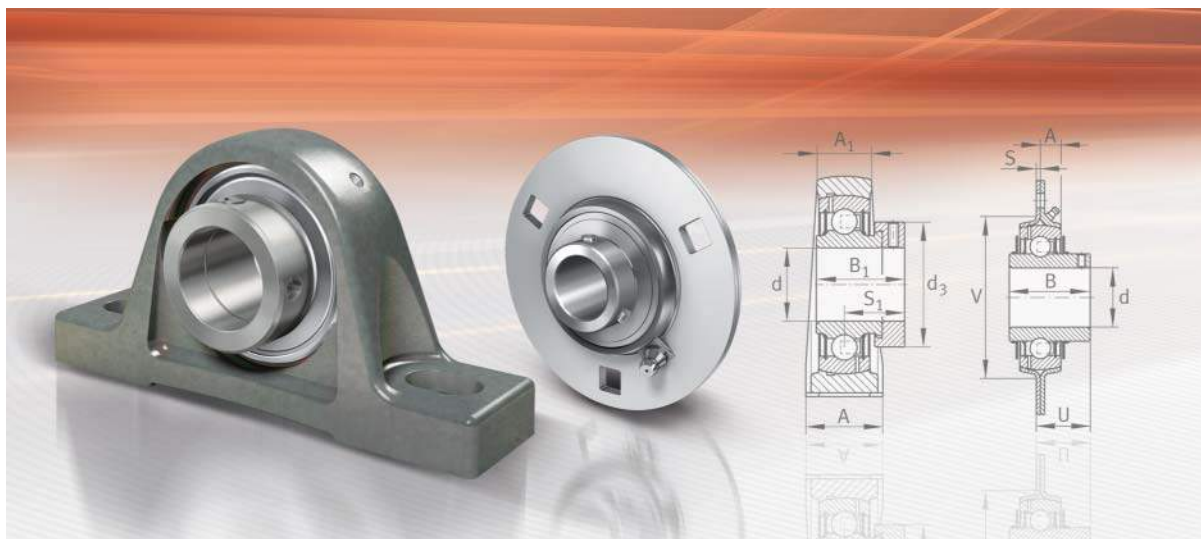
²⁾ Factor f_0 for determining equivalent bearing load, see table, page 40.



GE..-XL-KRR-B-FA125

					Width across flats W	Basic load ratings		Fatigue limit load C _{ur} N	Factor ²⁾ f ₀
d ₂	D ₁	C _a	B ₁	d ₃ max.		dyn. C _r N	stat. C _{0r} N		
26,9	-	4	31	33	3	13 600	6 600	335	13,1
-	37,4	4	43,7	33	3	13 600	6 600	335	13,1
30,5	-	3,9	31	37,5	3	14 900	7 800	395	13,8
-	42,5	4,1	44,5	37,5	3	14 900	7 800	395	13,8
37,4	-	4,7	35,8	44	4	20 700	11 300	570	13,8
-	52	4,7	48,5	44	4	20 700	11 300	570	13,8
44,6	-	5,6	39	55	5	27 500	15 300	770	13,8
-	60,3	5,6	51,3	55	5	27 500	15 300	770	13,8
49,4	-	6,4	43,8	58	5	34 500	19 800	1 010	14
-	68,3	6,4	56,5	58	5	34 500	19 800	1 010	14
54,3	-	6,4	43,8	63	5	34 500	20 400	1 030	14,3
-	72,3	6,4	56,5	63	5	34 500	20 400	1 030	14,3
59,4	-	6,9	43,8	69	5	37 500	23 200	1 180	14,3
-	77,3	6,9	62,8	69	5	37 500	23 200	1 180	14,3
72	-	7,2	53,1	84	5	56 000	36 000	1 820	14,3





Flake graphite cast iron or sheet steel housing units, corrosion-resistant

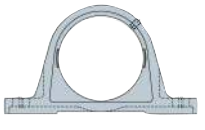
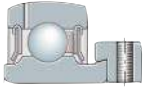

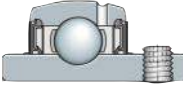
With Corrotect coating
Corrosion-resistant VA design

Flake graphite cast iron or sheet steel housing units, corrosion-resistant


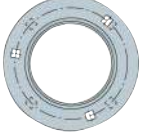

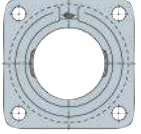
	Page
Matrix Possible combinations of radial insert ball bearings with flake graphite cast iron or sheet steel housings, corrosion-resistant	378
Product overview Flake graphite cast iron or sheet steel housing units, corrosion-resistant	380
Features X-life	381
Housings with integral radial insert ball bearing.....	381
Units with flake graphite cast iron housing.....	382
Units with sheet steel housing	382
Operating temperature	383
Suffixes.....	384
Design and safety guidelines Compensation of static misalignments.....	384
Speed limits for radial insert ball bearings	385
Radial load carrying capacity	385
Axial load carrying capacity.....	385
Design of adjacent construction.....	385
Bearing end caps.....	386
Accuracy Dimensional tolerances	387
Dimension tables Plummer block housing units, flake graphite cast iron housing, with Corrotect coating.....	388
Two-bolt flanged housing units, flake graphite cast iron housing, oval version, with Corrotect coating.....	390
Three-bolt flanged housing units, sheet steel housing, round version, corrosion-resistant VA design	392
Four-bolt flanged housing units, flake graphite cast iron housing, square version, with Corrotect coating.....	394



Possible combinations
 Radial insert ball bearings
 with flake graphite cast iron or
 sheet steel housings,
 corrosion-resistant

Radial insert ball bearing		Housing
		Plummer block housing
		
Designation		ASE
Shaft diameter d		
GRAE..-XL-NPP-B-FA125 20 mm – 60 mm		PASE..-XL-N-FA125 page 388
GE..-XL-KRR-B-FA125 20 mm – 50 mm		RASE..-XL-N-FA125 page 388
SUC 12 mm – 30 mm		Available by agreement

Catalogue range, dimension table, see pages indicated.
 Other dimensions and combinations available by agreement.

Two-bolt flanged housing	Three-bolt flanged housing		Four-bolt flanged housing
			
CJT	FLAN..-MSB-VA (2 pieces)	FLAN..-MSA-VA FLAN..-MSB-VA	CJ
PCJT..-XL-N-FA125 page 390	Available by agreement	Available by agreement	PCJ..-XL-N-FA125 page 394
RCJT..-XL-N-FA125 page 390	Available by agreement	Available by agreement	RCJ..-XL-N-FA125 page 394
Available by agreement	RRY..-VA page 392	GRRY..-VA page 392	Available by agreement

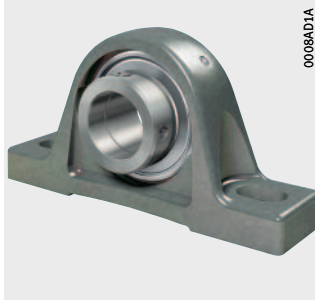


Product overview **Flake graphite cast iron or sheet steel housing units, corrosion-resistant**

Flake graphite cast iron housing units

With Corrotect coating

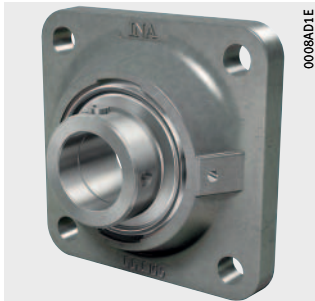
PASE..-XL-N-FA125,
RASE..-XL-N-FA125



PCJT..-XL-N-FA125,
RCJT..-XL-N-FA125



PCJ..-XL-N-FA125,
RCJ..-XL-N-FA125



Sheet steel housing units

Corrosion-resistant VA design

GRRY..-VA,
RRY..-VA



Flake graphite cast iron or sheet steel housing units, corrosion-resistant

Features Corrosion-resistant flake graphite cast iron and sheet steel housings are available as plummer block and flanged housing units. The areas of application of the housings correspond to that of the radial insert ball bearings. They are suitable where humidity, contaminated water, salt spray mist, weakly alkaline or weakly acidic cleaning agents are present.

Further information Further information on Corrotect

- TPI 64, Corrosion-resistant Products
- TPI 67, Special Coating Corrotect, Anti-corrosion Protection for Rolling Bearings and Precision Components
- TPI 186, Higher Performance Capacity Through the Use of Coatings, Coated Rolling Bearings and Precision Components, functional coatings for Automotive and Industrial applications
- Download and ordering: <http://medien.schaeffler.de>.

X-life Numerous sizes are supplied in the X-life design. These products are indicated in the dimension tables.

Radial insert ball bearings of X-life quality have, for example, lower roughness Ra and higher geometrical accuracy of the raceways than comparable designs that are not X-life. As a result, these bearings have higher load carrying capacity and longer rating life although their dimensions are identical. In certain applications, this means that a smaller bearing arrangement can be designed.

Radial insert ball bearings of X-life quality have an eccentric locking collar of an improved design and the quantity and distribution of the lubricant has been optimised. Housings ASE have additional crosspieces on the underside. For extreme requirements, the cage and seal material in the high and low temperature designs (suffix FA101) has been significantly improved in comparison with earlier versions.

Housings with integral radial insert ball bearing

The units are ready-to-fit and comprise INA sheet steel or INA flake graphite cast iron housings in which INA radial insert ball bearings are integrated, see page 357.

Due to the spherical outside surface of the bearing outer ring and the concave housing bore, housing units can compensate for static angular misalignment of the shaft.

The units are used predominantly as locating bearings, but are also suitable as non-locating bearings under low loads and speeds.

The housings are screw mounted on the adjacent construction. Less stringent tolerances are sufficient for the screw mounting surfaces.



Flake graphite cast iron or sheet steel housing units, corrosion-resistant

Units with flake graphite cast iron housing

Cast iron units are available as plummer block housing units PASE...XL-N-FA125 and RASE...XL-N-FA125, as well as flanged housing units PCJT...XL-N-FA125, RCJT...XL-N-FA125, PCJ...XL-N-FA125 and RCJ...XL-N-FA125.

The housings and radial insert ball bearings have a Corrotect coating and the suffix FA125. The housings are single-piece components, have high load carrying capacity and are screw mounted to the adjacent construction by means of fixing holes. For location, screws in accordance with DIN EN ISO 4762 are suitable.



In order to ensure function and reliability under all operating conditions, the bearings and housings are matched to each other with a defined swivel moment after mounting.

All catalogue cast iron units have a mean swivel moment (as standard); further designs with a smaller or greater swivel moment, depending on their application, are available by agreement.

Lubrication

For the relubrication of radial insert ball bearings, the housing bore has a lubrication groove and a lubrication hole suitable for conventional taper type lubrication nipples to DIN 71412. When the housing units are supplied, a taper type lubrication nipple with a thread M6 is already fitted.

Units with sheet steel housing

These units are available in their preferred versions as series GRRY...VA and RRY...VA.

The units comprise radial insert ball bearings in a corrosion-resistant VA design, see page 357, and two-piece sheet steel housings made from corrosion-resistant steel, material number 1.4301. The units have the suffix VA.

The units are designed for moderate loads and lightweight constructions.



In order to ensure function and reliability under all operating conditions, the bearings and housings are matched to each other with a defined swivel moment after mounting.

The swivel moment can be requested from Schaeffler.

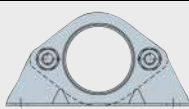
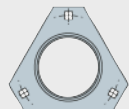
Lubrication

GRRY can be relubricated via a lubrication nipple.

Further possible combinations

In addition to the sheet steel housings in corrosion-resistant VA design, sheet steel housings with Corrotect coating are also possible in combination with the radial insert ball bearing GRAE...XL-NPP-B-FA125. Housings and bearings in the following possible combinations must be ordered separately, see table.

Possible combinations for available diameters

Combination Radial insert ball bearing with sheet steel housing ¹⁾		GRAE...XL-NPP-B-FA125  00081619	
		mm	
		min.	max.
Plummer block housing			
GEH...PBS-FA125	 190 941A	20	40
GEH...BT-FA125	 190 942A	20	30
Two-bolt flanged housing			
FLAN...MST-FA125 (2 pieces)	 0008C5DD	20	40
Three-bolt flanged housing			
FLAN...MSB-FA125 (2 pieces)	 0008C5E6	20	55
FLAN...MSA-FA125²⁾ FLAN...MSB-FA125²⁾	 0008C5E6	25	45
FLAN...MSTR-FA125	 0008C5EF	20	35

¹⁾ For housing code and bearing bore, see table.

²⁾ Relubrication facility.



Housing code and bearing bore

Housing code	47	52	62	72	80	85	90	100
Bearing bore $\varnothing d$ mm	20	25	30	35	40	45	50	55

Operating temperature

Housing units with bearing end caps are suitable for operating temperatures from $-20\text{ }^{\circ}\text{C}$ to $+80\text{ }^{\circ}\text{C}$.

Housing units without bearing end caps are suitable for operating temperatures from $-20\text{ }^{\circ}\text{C}$ to $+100\text{ }^{\circ}\text{C}$. Temporary temperature peaks are possible up to $+120\text{ }^{\circ}\text{C}$.

Sheet steel housing units in the corrosion-resistant VA design without bearing end caps are suitable for operating temperatures from $-35\text{ }^{\circ}\text{C}$ to $+100\text{ }^{\circ}\text{C}$.

Flake graphite cast iron or sheet steel housing units, corrosion-resistant

Suffixes

Suffixes for available designs, see table.

Available designs

Suffix	Design	Design
FA125	With Corrotect coating, corrosion-resistant	Standard
VA	Made from corrosion-resistant steel	

Design and safety guidelines

The chapter Technical principles brings together the essential guidelines on the design of bearing arrangements, lubrication, mounting and dismounting and the operation of bearings, see page 32.

Due to their versatile characteristics, INA housing units can be easily used in almost all industrial sectors.



It is always and fundamentally the responsibility of the designer of a machine to ensure that a malfunction of housing units cannot be hazardous to persons. An unplanned stoppage of the machine should not cause major disruptions in operation. In both cases, it is therefore essential that you contact us before design work is carried out.

Compensation of static misalignments

Bearings with a spherical outer ring, fitted in housings with a concave bore, can compensate for static misalignment of the shaft, *Figure 1*.

For units with a lubrication groove in the housing and lubrication hole in the radial insert ball bearing, the following applies:

- Up to $\pm 2,5^\circ$, the units can be relubricated.
- Between $\pm 2,5^\circ$ and $\pm 5^\circ$, the possibility of relubrication is dependent on the specific unit. Please contact us in this case.
- Over $\pm 5^\circ$, relubrication is no longer possible.



The units must not be used to support swivelling or tumbling motion.

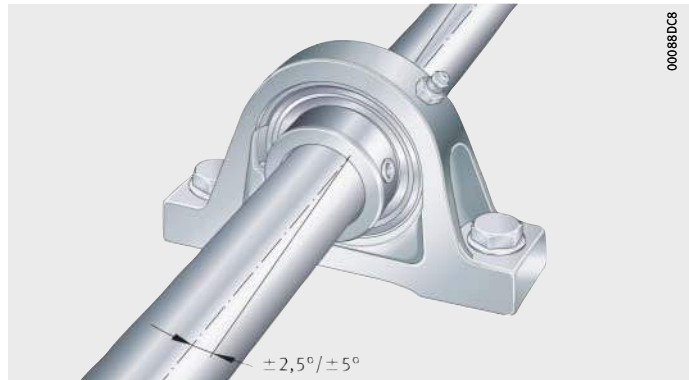


Figure 1
Compensation
of static shaft misalignment

Speed limits for radial insert ball bearings

The speed limits are dependent on the load, the clearance between the bearing bore and shaft and the friction of the seals, see page 363.

Radial load carrying capacity

Flake graphite cast iron housings can support the same radial loads as the radial insert ball bearings fitted.

Sheet steel housings are suitable for moderate loads. The permissible radial load carrying capacity C_{0rG} of sheet steel housings is given in the dimension tables.

The static load carrying capacity C_{0r} of the radial insert ball bearings is stated in the dimension tables.



Where shock loads are present, appropriate safety factors must be applied. In this case, please contact us.



Axial load carrying capacity

The axial operating load of the unit must not exceed the axial load carrying capacity of the housing.

The axial load carrying capacity of flake graphite cast iron housings is $C_{0aG} = 0,5 \cdot C_{0r}$

The permissible axial load carrying capacity of sheet steel housings for three-bolt flanged housing units RRY..-VA and GRRY..-VA is $C_{0aG} = 0,5 \cdot C_{0rG}$.

Design of adjacent construction

The permissible shaft tolerance is dependent on the speed, load and the radial insert ball bearing fitted. Shafts of the tolerance classes h6  to h9  can be used. Conventional drawn shafts will suffice for most applications.

Screw mounting surfaces

Recommendations for the screw mounting surfaces are as follows:

- roughness of the screw mounting surface max. Ra 12,5 (Rzmax 63)
- geometrical and positional tolerance 0,04/100 concave, spherical not permissible.
- In the event of high loads occurring parallel to the mounting surface of plummer block housing units (in the case of cast iron housings with long base), the use of additional dowel pins to DIN EN ISO 8752 is recommended. In this case, through holes (see centre punch mark for housing ASE) must be applied, see *Figure 1*, page 129.

Fixing screws

The screw connection should be designed in accordance with VDI 2230; friction coefficient $\mu = 0,12$ (90%).

Screws of grade 8.8 or better can be used for fixing.

The maximum tightening torques applicable to this screw grade must not be exceeded even if screws of a higher grade are used.

In principle, we recommend that the screw connection should only be tightened to 70% of the values stated in the standard.

For fixing, hexagonal socket head screws in accordance with DIN EN ISO 4762 or hexagonal socket head screws with a coarse pitch full thread in accordance with DIN EN ISO 4017 should be used. The screws should be combined as a minimum with a washer in accordance with DIN EN ISO 7089 or DIN EN ISO 7090.

Screws and accessories for location are not included in the delivery.

All screws and other accessories used for location of the units GRRY..-VA and RRY..-VA should be in the corrosion-resistant VA design.



Flake graphite cast iron or sheet steel housing units, corrosion-resistant

Bearing end caps

The ends of shafts can be covered using bearing end caps made from acrylonitrile styrene acrylate copolymer (ASA), see table and *Figure 2*. The caps are suitable for temperatures from $-20\text{ }^{\circ}\text{C}$ to $+80\text{ }^{\circ}\text{C}$. They protect against injury due to rotating shafts and also protect the bearings against contamination.

For location of the caps, housings with the suffix N have an annular slot on the entry side, see page 134.

The series for which end caps are supplied are indicated in the dimension tables. Bearing end caps are accessories and must always be ordered separately.

End caps

Designation	Dimensions mm				
	d	D	H	L	E max.
KASK04	20	48	31	36	30
KASK05	25	54	33	38	30
KASK06	30	63	37	44	35
KASK07	35	73	39	47	39
KASK08	40	82	42	51	42
KASK10	50	92	47	56	46
KASK12	60	112	55	65	55

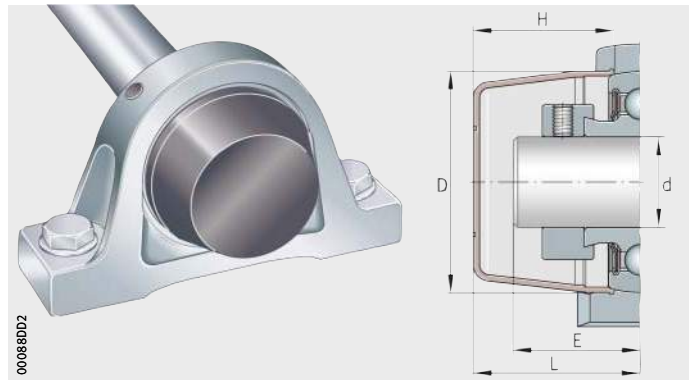


Figure 2
Housing unit with bearing end cap

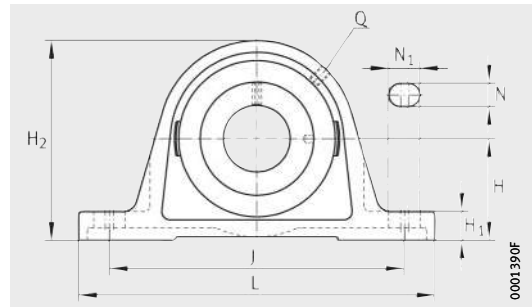
Accuracy The housings correspond predominantly to DIN 626-2 and ISO 3228, insofar as they are described therein.

Dimensional tolerances The dimensional tolerances for the machined surfaces of the flake graphite cast iron housings are $\pm 0,25$ mm.
The dimensional tolerances for the unmachined surfaces of flake graphite cast iron housings as well as machined to unmachined cast surfaces correspond to ISO 8062-3 (dimensional tolerance grade DCTG 9).
The bearing seat of sheet steel housings is designed such that the bearing is seated in the housing with a defined swivel moment once the housing parts are bolted together.



Plummer block housing units

Flake graphite cast iron housing
With Corrotect coating



PASE...XL(-N)-FA125, RASE...XL(-N)-FA125



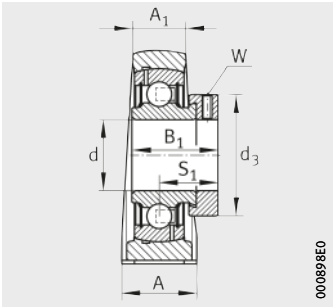
Dimension table - Dimensions in mm

Designation			Mass m ≈ kg	Dimensions					
Unit	Housing ²⁾	Radial insert ball bearing		d	H	J	L	A	A ₁
PASE20-XL-N-FA125	ASE04	GRAE20-XL-NPP-B-FA125	0,58	20	33,3	97	130	32	19
RASE20-XL-N-FA125	ASE04	GE20-XL-KRR-B-FA125	0,61	20	33,3	97	130	32	19
PASE25-XL-N-FA125	ASE05	GRAE25-XL-NPP-B-FA125	0,72	25	36,5	103	130	36	21
RASE25-XL-N-FA125	ASE05	GE25-XL-KRR-B-FA125	0,75	25	36,5	103	130	36	21
PASE30-XL-N-FA125	ASE06	GRAE30-XL-NPP-B-FA125	1,11	30	42,9	118	158	40	25
RASE30-XL-N-FA125	ASE06	GE30-XL-KRR-B-FA125	1,18	30	42,9	118	158	40	25
PASE35-XL-N-FA125	ASE07	GRAE35-XL-NPP-B-FA125	1,6	35	47,6	126	163	45	27
RASE35-XL-N-FA125	ASE07	GE35-XL-KRR-B-FA125	1,69	35	47,6	126	163	45	27
PASE40-XL-N-FA125	ASE08	GRAE40-XL-NPP-B-FA125	1,84	40	49,2	138	179	48	30
RASE40-XL-N-FA125	ASE08	GE40-XL-KRR-B-FA125	1,95	40	49,2	138	179	48	30
PASE45-XL-FA125	ASE09	GRAE45-XL-NPP-B-FA125	2,12	45	54	150	192	48	32
RASE45-XL-FA125	ASE09	GE45-XL-KRR-B-FA125	2,21	45	54	150	192	48	32
PASE50-XL-N-FA125	ASE10	GRAE50-XL-NPP-B-FA125	2,55	50	57,2	158	200	54	34
RASE50-XL-N-FA125	ASE10	GE50-XL-KRR-B-FA125	2,7	50	57,2	158	200	54	34
PASE60-XL-N-FA125	ASE12	GRAE60-XL-NPP-B-FA125	4,35	60	69,9	190	240	60	42

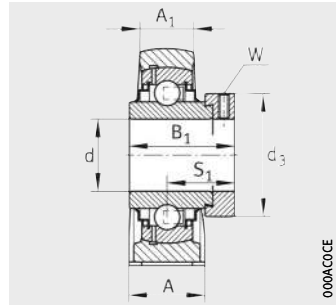
¹⁾ To be ordered separately.
For a description of the end caps, see page 386.

²⁾ The housings have the Corrotect coating.

³⁾ Lubrication nipple M6 fitted.



PASE...XL(N)-FA125



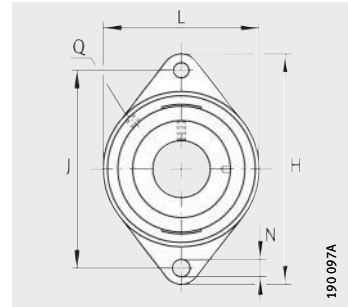
RASE...XL(N)-FA125

H ₁	H ₂	N	N ₁	B ₁	S ₁	Q ³⁾	d ₃ max.	W	Load carrying capacity Bearing			End cap ¹⁾
									Basic load ratings		Fatigue limit load C _{ur} N	
									dyn. C _r N	stat. C _{0r} N		
14,5	64	11	19	31	23,5	Rp ^{1/8}	33	3	13 600	6 600	335	KASK04
14,5	64	11	19	43,7	26,6	Rp ^{1/8}	33	3	13 600	6 600	335	KASK04
14,5	70	11	19	31	23,5	Rp ^{1/8}	37,5	3	14 900	7 800	395	KASK05
14,5	70	11	19	44,5	27	Rp ^{1/8}	37,5	3	14 900	7 800	395	KASK05
17	82	14	22	35,8	26,8	Rp ^{1/8}	44	4	20 700	11 300	570	KASK06
17	82	14	22	48,5	30,2	Rp ^{1/8}	44	4	20 700	11 300	570	KASK06
19	93	14	21	39	29,5	Rp ^{1/8}	55	5	27 500	15 300	770	KASK07
19	93	14	21	51,3	32,5	Rp ^{1/8}	55	5	27 500	15 300	770	KASK07
19	99	14	26	43,8	32,8	M6	58	5	34 500	19 800	1 010	KASK08
19	99	14	26	56,5	35,1	M6	58	5	34 500	19 800	1 010	KASK08
21,5	107	14	29	43,8	32,8	M6	63	5	34 500	20 400	1 030	–
21,5	107	14	29	56,5	35,1	M6	63	5	34 500	20 400	1 030	–
21,5	115	18	23	43,8	32,8	Rp ^{1/8}	69	5	37 500	23 200	1 180	KASK10
21,5	115	18	23	62,8	38,2	Rp ^{1/8}	69	5	37 500	23 200	1 180	KASK10
25	140	18	28	53,1	39,6	Rp ^{1/8}	84	5	56 000	36 000	1 820	KASK12



Two-bolt flanged housing units

Flake graphite cast iron housing
 Oval version
 With Corrotect coating



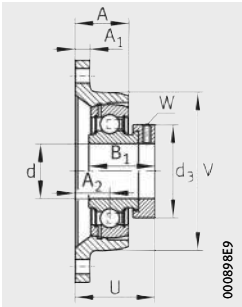
PCJT...-XL-N-FA125,
 RCJT...-XL-N-FA125



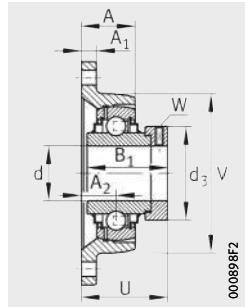
Dimension table - Dimensions in mm

Designation			Mass	Dimensions				
Unit	Housing ²⁾	Radial insert ball bearing		d	H	J	L	A
			m					
			≈ kg					
PCJT20-XL-N-FA125	CJT04	GRAE20-XL-NPP-B-FA125	0,45	20	112	90	61	28
RCJT20-XL-N-FA125	CJT04	GE20-XL-KRR-B-FA125	0,48	20	112	90	61	28
PCJT25-XL-N-FA125	CJT05	GRAE25-XL-NPP-B-FA125	0,58	25	124	99	70	26,5
RCJT25-XL-N-FA125	CJT05	GE25-XL-KRR-B-FA125	0,64	25	124	99	70	26,5
PCJT30-XL-N-FA125	CJT06	GRAE30-XL-NPP-B-FA125	0,84	30	142	116,5	80	29
RCJT30-XL-N-FA125	CJT06	GE30-XL-KRR-B-FA125	0,9	30	142	116,5	80	29
PCJT35-XL-N-FA125	CJT07	GRAE35-XL-NPP-B-FA125	1,18	35	155	130	92	30,5
RCJT35-XL-N-FA125	CJT07	GE35-XL-KRR-B-FA125	1,25	35	155	130	92	30,5
PCJT40-XL-N-FA125	CJT08	GRAE40-XL-NPP-B-FA125	1,57	40	172	143,5	105	34,5
RCJT40-XL-N-FA125	CJT08	GE40-XL-KRR-B-FA125	1,68	40	172	143,5	105	34,5
PCJT50-XL-N-FA125	CJT10	GRAE50-XL-NPP-B-FA125	1,98	50	190	157	116	39
RCJT50-XL-N-FA125	CJT10	GE50-XL-KRR-B-FA125	2,2	50	190	157	116	39
PCJT60-XL-N-FA125	CJT12	GRAE60-XL-NPP-B-FA125	3,37	60	238	202	138	46

- 1) To be ordered separately.
For a description of the end caps, see page 386.
- 2) The housings have the Corrotect coating.
- 3) Lubrication nipple M6 fitted.



PCJT..-XL-N-FA125



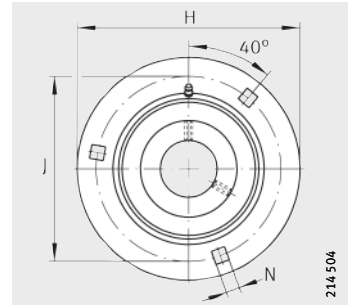
RCJT..-XL-N-FA125

A ₁	A ₂	N	B ₁	U	V	Q ³⁾	d ₃ max.	W	Load carrying capacity Bearing			End cap ¹⁾
									Basic load ratings		Fatigue limit load C _{ur} N	
									dyn. C _r N	stat. C _{0r} N		
10	19	11,5	31	42,5	61	M6	33	3	13 600	6 600	335	KASK04
10	19	11,5	43,7	45,6	61	M6	33	3	13 600	6 600	335	KASK04
11	19	11,5	31	42,5	70	Rp ^{1/8}	37,5	3	14 900	7 800	395	KASK05
11	19	11,5	44,5	46	70	Rp ^{1/8}	37,5	3	14 900	7 800	395	KASK05
12	20	11,5	35,8	46,8	80	Rp ^{1/8}	44	4	20 700	11 300	570	KASK06
12	20	11,5	48,5	50,2	80	Rp ^{1/8}	44	4	20 700	11 300	570	KASK06
12,5	21	14	39	50,5	92	M6	55	5	27 500	15 300	770	KASK07
12,5	21	14	51,3	53,5	92	M6	55	5	27 500	15 300	770	KASK07
13	24	14	43,8	56,8	105	M6	58	5	34 500	19 800	1 010	KASK08
13	24	14	56,5	59,1	105	M6	58	5	34 500	19 800	1 010	KASK08
13	28	18	43,8	60,8	116	Rp ^{1/8}	69	5	37 500	23 200	1 180	KASK10
13	28	18	62,8	66,2	116	Rp ^{1/8}	69	5	37 500	23 200	1 180	KASK10
16	34	18	53,1	73,6	138	Rp ^{1/8}	84	5	56 000	36 000	1 820	KASK12



Three-bolt flanged housing units

Sheet steel housing
 Round version
 Corrosion-resistant VA design



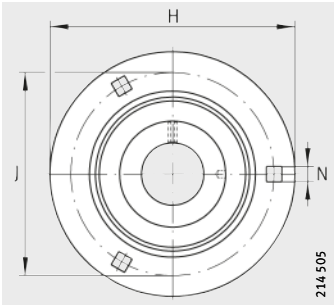
GRRY..-VA

Dimension table - Dimensions in mm

Designation			Mass m ≈ kg	Dimensions		
Unit	Housing	Radial insert ball bearing		d	H	J
RRY12-VA ¹⁾	2× FLAN40-MSB-VA	SUC201	0,21	12	81	63,5
RRY15-VA ¹⁾	2× FLAN40-MSB-VA	SUC202	0,2	15	81	63,5
RRY17-VA ¹⁾	2× FLAN40-MSB-VA	SUC203	0,19	17	81	63,5
GRRY20-VA ²⁾	1× FLAN47-MSB-VA, 1× FLAN47-MSA-VA	SUC204	0,34	20	90,5	71,5
RRY20-VA	2× FLAN47-MSB-VA	SUC204	0,34	20	90,5	71,5
GRRY25-VA ²⁾	1× FLAN52-MSB-VA, 1× FLAN52-MSA-VA	SUC205	0,38	25	95	76
RRY25-VA	2× FLAN52-MSB-VA	SUC205	0,38	25	95	76
GRRY30-VA ²⁾	1× FLAN62-MSB-VA, 1× FLAN62-MSA-VA	SUC206	0,63	30	112,7	90,5
RRY30-VA	2× FLAN62-MSB-VA	SUC206	0,63	30	112,7	90,5

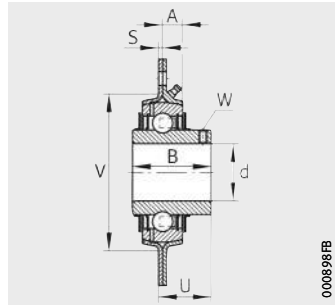
¹⁾ Housing and radial insert ball bearing must be ordered separately.

²⁾ Bearing can be relubricated.



RRY..-VA

214 505



GRRY..-VA, RRY..-VA

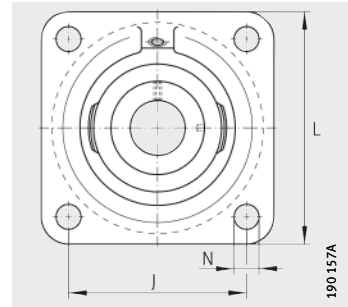
000896B

						Number of screw mounting holes n	Width across flats W	Load carrying capacity			
								Bearing			Housing C _{0rG} N
A	N	B	S	U	V	dyn. C _r N	stat. C _{0r} N	Basic load ratings		Fatigue limit load C _{ur} N	
7	7,1	25	2	17,4	48	3	2,5	9 200	4 550	218	2 700
7	7,1	25	2	17,4	48	3	2,5	9 200	4 550	218	2 700
7	7,1	25	2	17,4	48	3	2,5	9 200	4 550	218	2 700
8	8,7	31	2	20,3	55	3	2,5	12 300	6 300	300	3 200
8	8,7	31	2	20,3	55	3	2,5	12 300	6 300	300	3 200
8,7	8,7	34,1	2	21,7	60	3	2,5	13 400	7 500	360	3 650
8,7	8,7	34,1	2	21,7	60	3	2,5	13 400	7 500	360	3 650
9	10,5	38,1	2,5	24,7	71	3	3	18 700	10 700	510	5 000
9	10,5	38,1	2,5	24,7	71	3	3	18 700	10 700	510	5 000



Four-bolt flanged housing units

Flake graphite cast iron housing
Square version
With Corrotect coating



PCJ...XL(-N)-FA125,
RCJ...XL(-N)-FA125

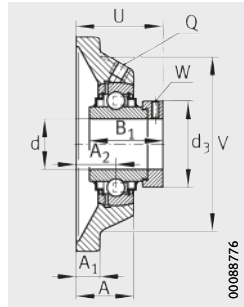
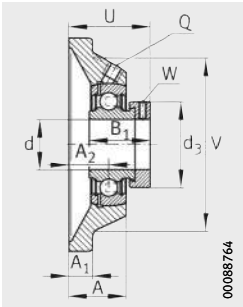
Dimension table - Dimensions in mm

Designation			Mass	Dimensions				
Unit	Housing ²⁾	Radial insert ball bearing		d	J	L	A	A ₁
			m					
			≈ kg					
PCJ20-XL-N-FA125	CJ04	GRAE20-XL-NPP-B-FA125	0,6	20	63,5	86	29	10
RCJ20-XL-N-FA125	CJ04	GE20-XL-KRR-B-FA125	0,65	20	63,5	86	29	10
PCJ25-XL-N-FA125	CJ05	GRAE25-XL-NPP-B-FA125	0,76	25	70	95	29	11
RCJ25-XL-N-FA125	CJ05	GE25-XL-KRR-B-FA125	0,82	25	70	95	29	11
PCJ30-XL-N-FA125	CJ06	GRAE30-XL-NPP-B-FA125	1,11	30	82,5	108	29	12
RCJ30-XL-N-FA125	CJ06	GE30-XL-KRR-B-FA125	1,17	30	82,5	108	29	12
PCJ35-XL-N-FA125	CJ07	GRAE35-XL-NPP-B-FA125	1,5	35	92	118	30,5	12,5
RCJ35-XL-N-FA125	CJ07	GE35-XL-KRR-B-FA125	1,58	35	92	118	30,5	12,5
PCJ40-XL-N-FA125	CJ08	GRAE40-XL-NPP-B-FA125	1,9	40	101,5	130	34,5	13
RCJ40-XL-N-FA125	CJ08	GE40-XL-KRR-B-FA125	2,02	40	101,5	130	34,5	13
PCJ45-XL-FA125	CJ09	GRAE45-XL-NPP-B-FA125	2,22	45	105	137	35	13
RCJ45-XL-FA125	CJ09	GE45-XL-KRR-B-FA125	2,26	45	105	137	35	13
PCJ50-XL-N-FA125	CJ10	GRAE50-XL-NPP-B-FA125	2,3	50	111	143	41	13
RCJ50-XL-N-FA125	CJ10	GE50-XL-KRR-B-FA125	2,53	50	111	143	41	13

¹⁾ To be ordered separately.
For a description of the end caps, see page 386.

²⁾ The housings have the Corrotect coating.

³⁾ Lubrication nipple fitted.



PCJ...XL(-N)-FA125

RCJ...XL(-N)-FA125

A ₂	N	B ₁	U	V	Q ³⁾	d ₃ max.	W	Load carrying capacity Bearing			End cap ¹⁾
								Basic load ratings		Fatigue limit load C _{ur} N	
								dyn. C _r N	stat. C _{0r} N		
19	11,5	31	42,5	68	M6	33	3	13 600	6 600	335	KASK04
19	11,5	43,7	45,6	68	M6	33	3	13 600	6 600	335	KASK04
19	11,5	31	42,5	74	M6	37,5	3	14 900	7 800	395	KASK05
19	11,5	44,5	46	74	M6	37,5	3	14 900	7 800	395	KASK05
20	11,5	35,8	46,8	85	Rp ^{1/8}	44	4	20 700	11 300	570	KASK06
20	11,5	48,5	50,2	85	Rp ^{1/8}	44	4	20 700	11 300	570	KASK06
21	14	39	50,5	100	M6	55	5	27 500	15 300	770	KASK07
21	14	51,3	53,5	100	M6	55	5	27 500	15 300	770	KASK07
24	14	43,8	56,8	110	M6	58	5	34 500	19 800	1 010	KASK08
24	14	56,5	59,1	110	M6	58	5	34 500	19 800	1 010	KASK08
24	14	43,8	56,7	116	Rp ^{1/8}	63	5	34 500	20 400	1 030	–
24	14	56,5	59,1	116	Rp ^{1/8}	63	5	34 500	20 400	1 030	–
28	18	43,8	60,8	119	Rp ^{1/8}	69	5	37 500	23 200	1 180	KASK10
28	18	62,8	66,2	119	Rp ^{1/8}	69	5	37 500	23 200	1 180	KASK10





High grade steel housing units, corrosion-resistant

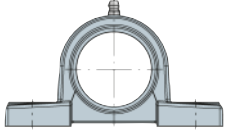

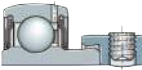
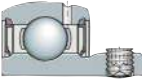
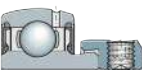
Radial insert ball bearings
in corrosion-resistant VA design or
with Corrotect coating

High grade steel housing units, corrosion-resistant

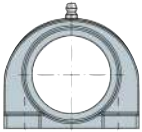
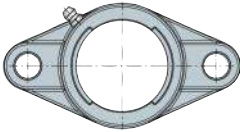
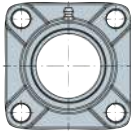
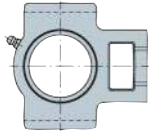
	Page
Matrix	Possible combinations of radial insert ball bearings and high grade steel housings..... 398
Product overview	High grade steel housing units, corrosion-resistant 400
Features	Housings with integral radial insert ball bearing 402 Lubrication 402 Operating temperature 402 Suffixes 402
Design and safety guidelines	Compensation of static misalignments..... 403 Speed limits for radial insert ball bearings 403 Load carrying capacity of housings 404 Design of adjacent construction 404
Accuracy	Dimensional tolerances 405
Dimension tables	Plummer block housing units, high grade steel housings With long base, radial insert ball bearing in corrosion-resistant VA design, with grub screws in inner ring..... 406 With long base, radial insert ball bearing with Corrotect coating, with eccentric locking collar 408 With short base, radial insert ball bearing in corrosion-resistant VA design, with grub screws in inner ring 410 With short base, radial insert ball bearing with Corrotect coating, with eccentric locking collar 412 Two-bolt flanged housing units, high grade steel housings Radial insert ball bearing in corrosion-resistant VA design, with grub screws in inner ring 414 Radial insert ball bearing with Corrotect coating, with eccentric locking collar 416 Four-bolt flanged housing units, high grade steel housings Radial insert ball bearing in corrosion-resistant VA design, with grub screws in inner ring 418 Radial insert ball bearing with Corrotect coating, with eccentric locking collar 420 Take-up housing units, sheet steel housings Radial insert ball bearing in corrosion-resistant VA design, with grub screws in inner ring 422 Radial insert ball bearing with Corrotect coating, with eccentric locking collar 424



**Possible combinations
Radial insert ball bearings and
high grade steel housings**

Radial insert ball bearing		Housing
		Plummer block housing
		
Designation Shaft diameter d		GEHSP
SUC 20 mm – 50 mm		SUCSP page 406
GRAE..-XL-NPP-B-FA107/125 20 mm – 50 mm		CUGSP page 408
SUB 20 mm – 50 mm		SUBSP Available by agreement
SUG 20 mm – 50 mm		SUGSP Available by agreement

Catalogue range, dimension table, see pages indicated.
Other dimensions and combinations available by agreement.

	Two-bolt flanged housing	Four-bolt flanged housing	Take-up housing
			
GEHSPA	GEHSFL	GEHSF	GEHST
SUCSPA page 410	SUCSFL page 414	SUCSF page 418	SUCST page 422
CUGSPA page 412	CUGSFL page 416	CUGSF page 420	CUGST page 424
SUBSPA Available by agreement	SUBSFL Available by agreement	SUBSF Available by agreement	SUBST Available by agreement
SUGSPA Available by agreement	SUGSFL Available by agreement	SUGSF Available by agreement	SUGST Available by agreement



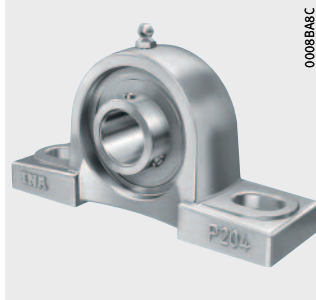
Product overview

High grade steel housing units, corrosion-resistant

Plummer block housing units

Radial insert ball bearing
in corrosion-resistant VA design
With grub screws and
extended inner ring

SUCSP

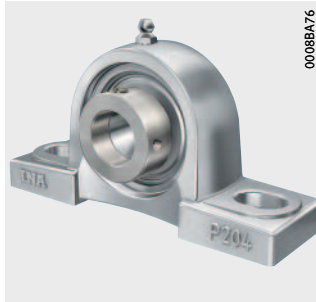


SUCSPA



Radial insert ball bearing
with Corrotect coating
With eccentric locking collar

CUGSP



CUGSPA



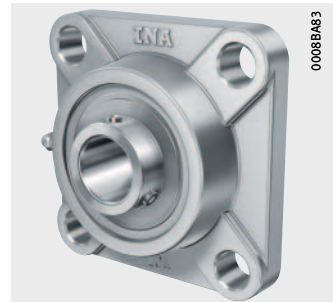
Flanged housing units

Radial insert ball bearing
in corrosion-resistant VA design
With grub screws and
extended inner ring

SUCSFL



SUCSF

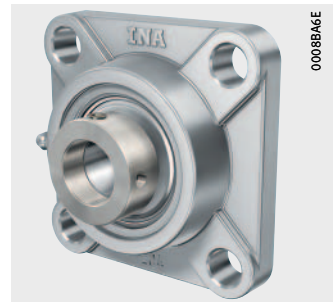


Radial insert ball bearing
with Corrotect coating
With eccentric locking collar

CUGSFL



CUGSF



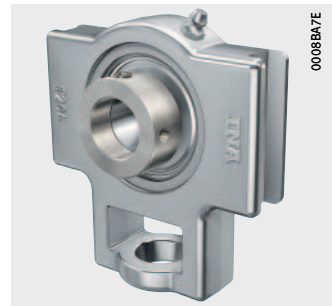
Take-up housing units

Radial insert ball bearings
in corrosion-resistant VA design or
with Corrotect coating

SUCST



CUGST



High grade steel housing units, corrosion-resistant

Features

Housing units with high grade steel housings are available as plummer block and flanged housing units as well as take-up housing units.

Plummer block housing units SUCSP and CUGSP have a long base. Plummer block housing units SUCSPA and CUGSPA have a short base.

Flanged housing units are available as two-bolt and four-bolt flanged housing units.

Take-up housing units have facilities for sliding motion. They are used where shafts must undergo substantial radial displacement travel.

The area of application of the housings correspond to that of the radial insert ball bearings fitted. They are suitable where humidity, contaminated water, salt spray mist, weakly alkaline or weakly acidic cleaning agents are present.

High grade steel housings do not have annular slots and cannot therefore be combined with end caps.

Housings with integral radial insert ball bearing

The units are ready-to-fit and comprise high grade steel housings in which INA radial insert ball bearings are fitted.

The housings are single-piece components, have high load carrying capacity and are screw mounted to the adjacent construction by means of slots or threaded holes. For location, screws in accordance with DIN EN ISO 4762 are suitable. Less stringent tolerances are sufficient for the screw mounting surfaces.



In order to ensure function and reliability under all operating conditions, the bearings and housings are matched to each other with a defined swivel moment after mounting.

The swivel moment can be requested from Schaeffler.

Radial insert ball bearings in corrosion-resistant VA design or with Corrotect coating

The units comprise high grade steel housings and radial insert ball bearings with a spherical outer ring in a corrosion-resistant VA design or with Corrotect coating.

Location on the shaft in the case of housing units SUCS and SUBS is by means of grub screws and in the case of housing units SUGS by means of an eccentric locking collar. Housing units CUGS with the radial insert ball bearing GRAE...-FA125 have an eccentric locking collar.

Lubrication

For relubrication of radial insert ball bearings, the housing bore has a lubrication groove and the housing has a lubrication hole suitable for conventional lubrication nipples with a precision thread $1/4'' - 28$ UNF in accordance with ANSI B1.1. The lubrication nipple is already fitted at the time of delivery.

Operating temperature

Units with a high grade steel housing are suitable for operating temperatures from -35 °C to $+100$ °C.

Suffixes

Suffixes for available designs, see table.

Available designs

Suffix	Design	Design
FA125	Bearing with Corrotect coating, corrosion-resistant	Standard

Design and safety guidelines

The chapter Technical principles brings together the essential guidelines on the design of bearing arrangements, lubrication, mounting and dismantling and the operation of bearings, see page 32.

Compensation of static misalignments

Bearings with a spherical outer ring, fitted in housings with a concave bore, can compensate for static misalignment of the shaft, *Figure 1*.

For units with a lubrication groove in the housing and lubrication hole in the radial insert ball bearing, the following applies:

- Up to $\pm 2,5^\circ$, the units can be relubricated.
- Between $\pm 2,5^\circ$ and $\pm 5^\circ$, the possibility of relubrication is dependent on the specific unit. Please contact us in this case.
- Over $\pm 5^\circ$, relubrication is no longer possible.



The units must not be used to support swivelling or tumbling motion.



Figure 1
Compensation
of static shaft misalignment

Speed limits for radial insert ball bearings

The speed limits are dependent on the load, the clearance between the bearing bore and shaft and the friction of the seals, see page 363.



High grade steel housing units, corrosion-resistant

Load carrying capacity of housings

Due to their versatile characteristics, INA housing units can be easily used in almost all industrial sectors.



If bearing arrangements are planned for equipment in which a malfunction could be hazardous to persons or an unplanned stoppage of the machine could cause major disruption, it is essential that you consult us before proceeding with the design.

Radial load carrying capacity

High grade steel housings can support the same radial loads as the radial insert ball bearings fitted.

The static load carrying capacity C_{0r} of the radial insert ball bearings is stated in the dimension tables.



Where shock loads are present, appropriate safety factors must be applied. In this case, please contact us.

Axial load carrying capacity

The axial load carrying capacity of radial insert ball bearings must not exceed the axial load carrying capacity of the housing.

The axial load carrying capacity of high grade steel housings is $0,5 \cdot C_{0r}$.

Design of adjacent construction

The permissible shaft tolerance is dependent on the speed, load and the radial insert ball bearing fitted. Shafts of the tolerance classes h6 @ to h9 @ can be used. Conventional drawn shafts will suffice for most applications.

Screw mounting surfaces

Recommendations for the screw mounting surfaces are as follows:

- roughness of the screw mounting surface max. Ra 12,5 (Rzmax 63)
- geometrical and positional tolerance 0,04/100 concave, spherical not permissible.
- In the event of high loads occurring parallel to the mounting surface of plummer block housing units (in the case of high grade steel housings with long base), the use of additional dowel pins to DIN EN ISO 8752 is recommended. In this case, through holes (see centre punch mark for housing ASE) must be applied, see *Figure 1*, page 129.

Fixing screws

The screw connection should be designed in accordance with VDI 2230; friction coefficient $\mu = 0,12$ (90%).

Screws of grade 8.8 or better can be used for fixing.

The maximum tightening torques applicable to this screw grade must not be exceeded even if screws of a higher grade are used.

In principle, we recommend that the screw connection should only be tightened to 70% of the values stated in the standard.

For fixing, hexagonal socket head screws in accordance with DIN EN ISO 4762 or hexagonal socket head screws with a coarse pitch full thread in accordance with DIN EN ISO 4017 should be used. The screws should be combined as a minimum with a washer in accordance with DIN EN ISO 7089 or DIN EN ISO 7090.

Screws and accessories for location are not included in the delivery.

All screws and other accessories used for location should be in the corrosion-resistant VA design.

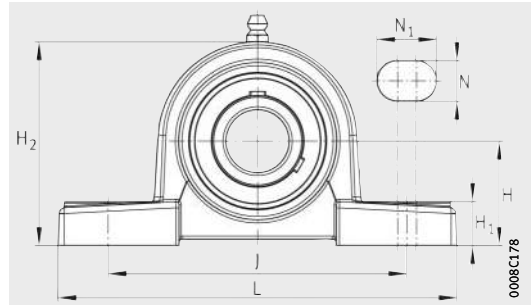
Accuracy The dimensions of high grade steel housings conform to JIS B 1559.

Dimensional tolerances The dimensional tolerances for the machined surfaces of the high grade steel housings are $\pm 0,25$ mm.
The dimensional tolerances for unmachined as well as machined to unmachined surfaces correspond to JIS B 0403 (dimensional tolerance grade CT 10).



Plummer block housing units

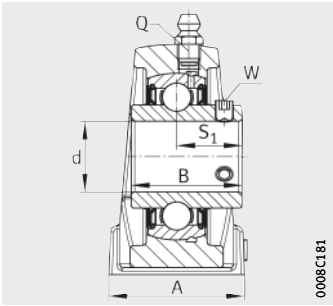
- High grade steel housing
- With long base
- Radial insert ball bearing in corrosion-resistant VA design
- With grub screws in inner ring



SUCSP

Dimension table - Dimensions in mm

Designation			Mass m ≈ kg	Dimensions					
Unit	Housing	Radial insert ball bearing		d	H	J	L	A	H ₁
SUCSP204	GEHSP204	SUC204	0,9	20	33,3	95	127	38	14
SUCSP205	GEHSP205	SUC205	0,95	25	36,5	105	140	38	15
SUCSP206	GEHSP206	SUC206	1,6	30	42,9	121	165	48	17
SUCSP207	GEHSP207	SUC207	1,9	35	47,6	127	167	48	18
SUCSP208	GEHSP208	SUC208	2,4	40	49,2	137	184	54	18
SUCSP209	GEHSP209	SUC209	2,7	45	54	146	190	54	20
SUCSP210	GEHSP210	SUC210	3,1	50	57,2	159	206	60	21



0008C181

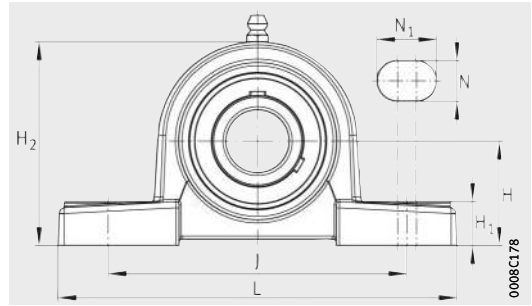
SUCSP

						Width across flats W	Load carrying capacity Bearing		
							Basic load ratings		Fatigue limit load C _{ur} N
H ₂	N	N ₁	B	S ₁	Q		dyn. C _r N	stat. C _{0r} N	
65	13	19	31	18,3	1/4" - 28 UNF	2,5	12 300	6 300	300
71	13	19	34,1	19,8	1/4" - 28 UNF	2,5	13 400	7 500	360
83	17	21	38,1	22,2	1/4" - 28 UNF	3	18 700	10 700	510
93	17	21	42,9	25,4	1/4" - 28 UNF	3	24 600	14 600	700
98	17	21	49,2	30,2	1/4" - 28 UNF	4	31 500	18 900	910
106	17	21	49,2	30,2	1/4" - 28 UNF	4	31 500	19 400	930
114	20	25	51,6	32,6	1/4" - 28 UNF	5	33 500	22 100	1 060



Plummer block housing units

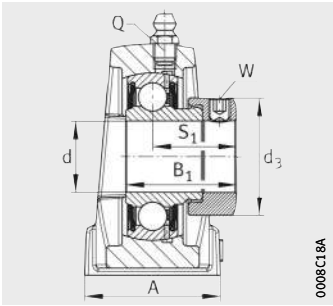
- High grade steel housing
- With long base
- Radial insert ball bearing with Corrotect coating
- With eccentric locking collar



CUGSP

Dimension table - Dimensions in mm

Designation			Mass m ≈ kg	Dimensions					
Unit	Housing	Radial insert ball bearing		d	H	J	L	A	H ₁
CUGSP204	GEHSP204	GRAE20-XL-NPP-B-FA107/125	0,9	20	33,3	95	127	38	14
CUGSP205	GEHSP205	GRAE25-XL-NPP-B-FA107/125	0,94	25	36,5	105	140	38	15
CUGSP206	GEHSP206	GRAE30-XL-NPP-B-FA107/125	1,61	30	42,9	121	165	48	17
CUGSP207	GEHSP207	GRAE35-XL-NPP-B-FA107/125	1,95	35	47,6	127	167	48	18
CUGSP208	GEHSP208	GRAE40-XL-NPP-B-FA107/125	2,4	40	49,2	137	184	54	18
CUGSP209	GEHSP209	GRAE45-XL-NPP-B-FA107/125	2,72	45	54	146	190	54	20
CUGSP210	GEHSP210	GRAE50-XL-NPP-B-FA107/125	3,05	50	57,2	159	206	60	21



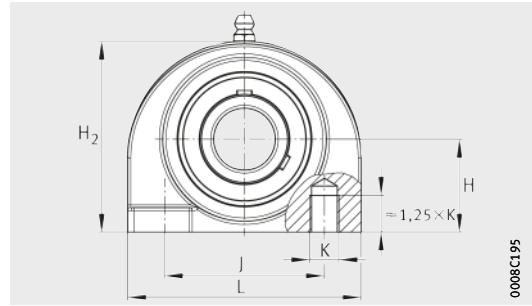
CUGSP

							Width across flats W	Load carrying capacity Bearing		
								Basic load ratings		Fatigue limit load
H ₂	N	N ₁	B ₁	S ₁	Q	d ₃ max.	dyn. C _r N	stat. C _{0r} N	C _{ur} N	
65	13	19	31	23,5	1/4" - 28 UNF	33	3	13 600	6 600	335
71	13	19	31	23,5	1/4" - 28 UNF	37,5	3	14 900	7 800	395
83	17	21	35,8	26,8	1/4" - 28 UNF	44	4	20 700	11 300	570
93	17	21	39	29,5	1/4" - 28 UNF	55	5	27 500	15 300	770
98	17	21	43,8	32,8	1/4" - 28 UNF	58	5	34 500	19 800	1 010
106	17	21	43,8	32,8	1/4" - 28 UNF	63	5	34 500	20 400	1 030
114	20	25	43,8	32,8	1/4" - 28 UNF	69	5	37 500	23 200	1 180



Plummer block housing units

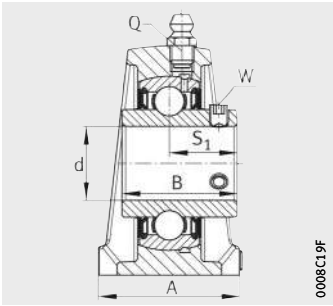
- High grade steel housing
- With short base
- Radial insert ball bearing in corrosion-resistant VA design
- With grub screws in inner ring



SUCSPA

Dimension table - Dimensions in mm

Designation			Mass m ≈ kg	Dimensions				
Unit	Housing	Radial insert ball bearing		d	H	J	L	A
SUCSPA204	GEHSPA204	SUC204	0,68	20	30,2	52	76	38
SUCSPA205	GEHSPA205	SUC205	0,85	25	36,5	56	84	38
SUCSPA206	GEHSPA206	SUC206	1,1	30	42,9	66	94	48
SUCSPA207	GEHSPA207	SUC207	1,4	35	47,6	80	110	48
SUCSPA208	GEHSPA208	SUC208	1,8	40	49,2	84	116	54
SUCSPA209	GEHSPA209	SUC209	2,5	45	54,2	90	120	54
SUCSPA210	GEHSPA210	SUC210	3,1	50	57,2	94	130	60



0008C19F

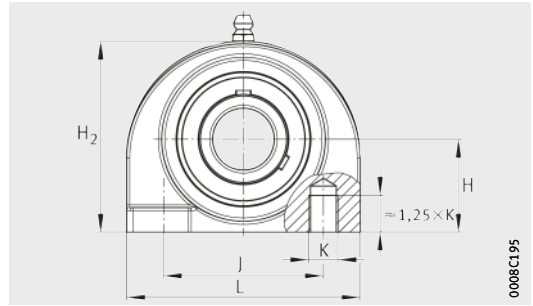
SUCSPA

					Width across flats W	Load carrying capacity Bearing		
						Basic load ratings		Fatigue limit load C _{ur} N
H ₂	B	S ₁	K	Q		dyn. C _r N	stat. C _{0r} N	
62	31	18,3	M10	1/4" – 28 UNF	2,5	12 300	6 300	300
72	34,1	19,8	M10	1/4" – 28 UNF	2,5	13 400	7 500	360
84	38,1	22,2	M14	1/4" – 28 UNF	3	18 700	10 700	510
95	42,9	25,4	M14	1/4" – 28 UNF	3	24 600	14 600	700
100	49,2	30,2	M14	1/4" – 28 UNF	4	31 500	18 900	910
108	49,2	30,2	M14	1/4" – 28 UNF	4	31 500	19 400	930
116	51,6	32,6	M16	1/4" – 28 UNF	5	33 500	22 100	1 060



Plummer block housing units

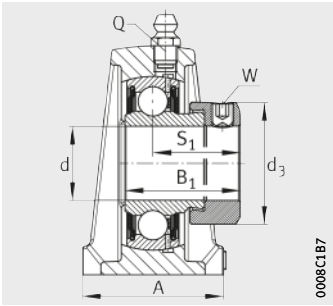
- High grade steel housing
- With short base
- Radial insert ball bearing with Corrotect coating
- With eccentric locking collar



CUGSPA

Dimension table - Dimensions in mm

Designation			Mass m ≈ kg	Dimensions				
Unit	Housing	Radial insert ball bearing		d	H	J	L	A
CUGSPA204	GEHSPA204	GRAE20-XL-NPP-B-FA107/125	0,68	20	30,2	52	76	38
CUGSPA205	GEHSPA205	GRAE25-XL-NPP-B-FA107/125	0,84	25	36,5	56	84	38
CUGSPA206	GEHSPA206	GRAE30-XL-NPP-B-FA107/125	1,11	30	42,9	66	94	48
CUGSPA207	GEHSPA207	GRAE35-XL-NPP-B-FA107/125	1,45	35	47,6	80	110	48
CUGSPA208	GEHSPA208	GRAE40-XL-NPP-B-FA107/125	1,8	40	49,2	84	116	54
CUGSPA209	GEHSPA209	GRAE45-XL-NPP-B-FA107/125	2,52	45	54,2	90	120	54
CUGSPA210	GEHSPA210	GRAE50-XL-NPP-B-FA107/125	3,05	50	57,2	94	130	60



0008C1B7

CUGSPA

						Width across flats W	Load carrying capacity Bearing		
							Basic load ratings		Fatigue limit load
H ₂	B ₁	S ₁	K	Q	d ₃ max.	dyn. C _r N	stat. C _{0r} N	C _{ur} N	
62	31	23,5	M10	1/4" - 28 UNF	33	3	13 600	6 600	335
72	31	23,5	M10	1/4" - 28 UNF	37,5	3	14 900	7 800	395
84	35,8	26,8	M14	1/4" - 28 UNF	44	4	20 700	11 300	570
95	39	29,5	M14	1/4" - 28 UNF	55	5	27 500	15 300	770
100	43,8	32,8	M14	1/4" - 28 UNF	58	5	34 500	19 800	1 010
108	43,8	32,8	M14	1/4" - 28 UNF	63	5	34 500	20 400	1 030
116	43,8	32,8	M16	1/4" - 28 UNF	69	5	37 500	23 200	1 180

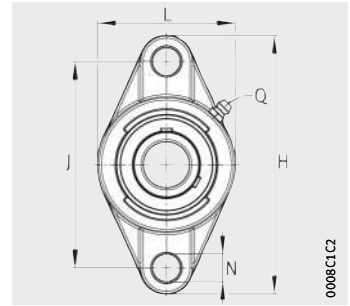


Two-bolt flanged housing units

High grade steel housing

Radial insert ball bearing in corrosion-resistant VA design

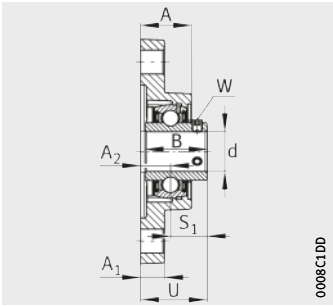
With grub screws in inner ring



SUCSFL

Dimension table - Dimensions in mm

Designation			Mass m ≈ kg	Dimensions					
Unit	Housing	Radial insert ball bearing		d	H	J	L	A	A ₁
SUCSFL204	GEHSFL204	SUC204	0,5	20	113	90	60	25,5	12
SUCSFL205	GEHSFL205	SUC205	0,65	25	130	99	68	27	15
SUCSFL206	GEHSFL206	SUC206	0,9	30	148	117	80	31	14
SUCSFL207	GEHSFL207	SUC207	1,2	35	161	130	90	34	16
SUCSFL208	GEHSFL208	SUC208	1,6	40	175	144	100	36	16
SUCSFL209	GEHSFL209	SUC209	1,8	45	188	148	108	38	18
SUCSFL210	GEHSFL210	SUC210	2,1	50	197	157	115	40	18



0008C1DD

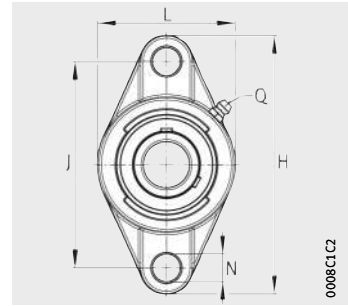
SUCSFL

						Width across flats W	Load carrying capacity Bearing		
							Basic load ratings		Fatigue limit load C _{ur} N
A ₂	N	B	S ₁	U	Q	dyn. C _r N	stat. C _{0r} N		
15	12	31	18,3	33,3	1/4" - 28 UNF	2,5	12 300	6 300	300
16	16	34,1	19,8	35,8	1/4" - 28 UNF	2,5	13 400	7 500	360
18	16	38,1	22,2	40,2	1/4" - 28 UNF	3	18 700	10 700	510
19	16	42,9	25,4	44,4	1/4" - 28 UNF	3	24 600	14 600	700
21	16	49,2	30,2	51,2	1/4" - 28 UNF	4	31 500	18 900	910
22	19	49,2	30,2	52,2	1/4" - 28 UNF	4	31 500	19 400	930
22	19	51,6	32,6	54,6	1/4" - 28 UNF	5	33 500	22 100	1 060



Two-bolt flanged housing units

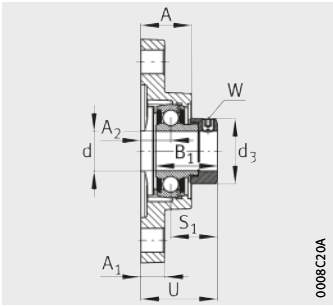
High grade steel housing
 Radial insert ball bearing with Corrotect coating
 With eccentric locking collar



CUGSFL

Dimension table - Dimensions in mm

Designation			Mass m ≈ kg	Dimensions					
Unit	Housing	Radial insert ball bearing		d	H	J	L	A	A ₁
CUGSFL204	GEHSFL204	GRAE20-XL-NPP-B-FA107/125	0,5	20	113	90	60	25,5	12
CUGSFL205	GEHSFL205	GRAE25-XL-NPP-B-FA107/125	0,64	25	130	99	68	27	15
CUGSFL206	GEHSFL206	GRAE30-XL-NPP-B-FA107/125	0,91	30	148	117	80	31	14
CUGSFL207	GEHSFL207	GRAE35-XL-NPP-B-FA107/125	1,25	35	161	130	90	34	16
CUGSFL208	GEHSFL208	GRAE40-XL-NPP-B-FA107/125	1,6	40	175	144	100	36	16
CUGSFL209	GEHSFL209	GRAE45-XL-NPP-B-FA107/125	1,82	45	188	148	108	38	18
CUGSFL210	GEHSFL210	GRAE50-XL-NPP-B-FA107/125	2,05	50	197	157	115	40	18



CUGSFL

							Width across flats W	Load carrying capacity Bearing		
								Basic load ratings		Fatigue limit load
A ₂	N	B ₁	S ₁	U	Q	d ₃ max.	dyn. C _r N	stat. C _{0r} N	C _{ur} N	
15	12	31	23,5	38,5	1/4" – 28 UNF	33	3	13 600	6 600	335
16	16	31	23,5	39,5	1/4" – 28 UNF	37,5	3	14 900	7 800	395
18	16	35,8	26,8	44,8	1/4" – 28 UNF	44	4	20 700	11 300	570
19	16	39	29,5	48,5	1/4" – 28 UNF	55	5	27 500	15 300	770
21	16	43,8	32,8	53,8	1/4" – 28 UNF	58	5	34 500	19 800	1 010
22	19	43,8	32,8	54,8	1/4" – 28 UNF	63	5	34 500	20 400	1 030
22	19	43,8	32,8	54,8	1/4" – 28 UNF	69	5	37 500	23 200	1 180

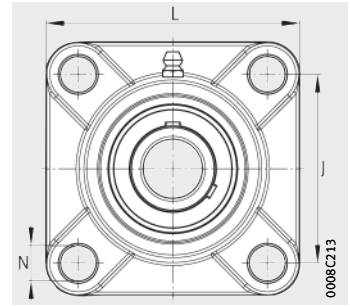


Four-bolt flanged housing units

High grade steel housing

Radial insert ball bearing in corrosion-resistant VA design

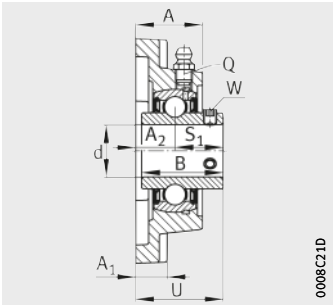
With grub screws in inner ring



SUCSF

Dimension table - Dimensions in mm

Designation			Mass m ≈ kg	Dimensions					
Unit	Housing	Radial insert ball bearing		d	J	L	A	A ₁	A ₂
SUCSF204	GEHSF204	SUC204	0,63	20	64	86	25,5	12	15
SUCSF205	GEHSF205	SUC205	0,85	25	70	95	27	14	16
SUCSF206	GEHSF206	SUC206	1,17	30	83	108	31	14	18
SUCSF207	GEHSF207	SUC207	1,51	35	92	117	34	16	19
SUCSF208	GEHSF208	SUC208	2	40	102	130	36	16	21
SUCSF209	GEHSF209	SUC209	2,2	45	105	137	38	18	22
SUCSF210	GEHSF210	SUC210	2,4	50	111	143	40	18	22



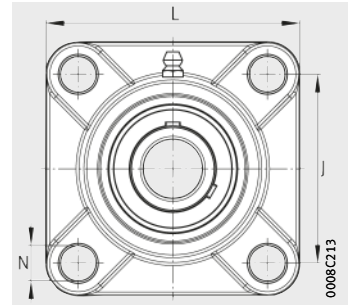
SUCSF

					Width across flats W	Load carrying capacity Bearing		
						Basic load ratings		Fatigue limit load
N	B	S ₁	U	Q	dyn. C _r N	stat. C _{0r} N	C _{ur} N	
12	31	18,3	33,3	1/4" - 28 UNF	2,5	12 300	6 300	300
12	34,1	19,8	35,8	1/4" - 28 UNF	2,5	13 400	7 500	360
12	38,1	22,2	40,2	1/4" - 28 UNF	3	18 700	10 700	510
14	42,9	25,4	44,4	1/4" - 28 UNF	3	24 600	14 600	700
16	49,2	30,2	51,2	1/4" - 28 UNF	4	31 500	18 900	910
16	49,2	30,2	52,2	1/4" - 28 UNF	4	31 500	19 400	930
16	51,6	32,6	54,6	1/4" - 28 UNF	5	33 500	22 100	1 060



Four-bolt flanged housing units

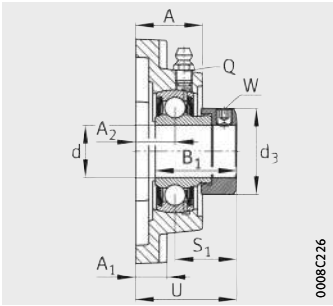
High grade steel housing
 Radial insert ball bearing with Corrotect coating
 With eccentric locking collar



CUGSF

Dimension table - Dimensions in mm

Designation			Mass m ≈ kg	Dimensions				
Unit	Housing	Radial insert ball bearing		d	J	L	A	A ₁
CUGSF204	GEHSF204	GRAE20-XL-NPP-B-FA107/125	0,63	20	64	86	25,5	12
CUGSF205	GEHSF205	GRAE25-XL-NPP-B-FA107/125	0,84	25	70	95	27	14
CUGSF206	GEHSF206	GRAE30-XL-NPP-B-FA107/125	1,18	30	83	108	31	14
CUGSF207	GEHSF207	GRAE35-XL-NPP-B-FA107/125	1,56	35	92	117	34	16
CUGSF208	GEHSF208	GRAE40-XL-NPP-B-FA107/125	2	40	102	130	36	16
CUGSF209	GEHSF209	GRAE45-XL-NPP-B-FA107/125	2,22	45	105	137	38	18
CUGSF210	GEHSF210	GRAE50-XL-NPP-B-FA107/125	2,35	50	111	143	40	18



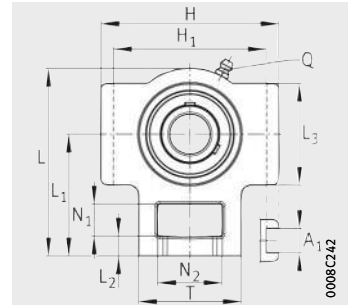
CUGSF

							Width across flats W	Load carrying capacity Bearing		
								Basic load ratings		Fatigue limit load
A ₂	N	B ₁	S ₁	U	Q	d ₃ max.	dyn. C _r N	stat. C _{0r} N	C _{ur} N	
15	12	31	23,5	38,5	1/4" – 28 UNF	33	13 600	6 600	335	
16	12	31	23,5	39,5	1/4" – 28 UNF	37,5	14 900	7 800	395	
18	12	35,8	26,8	44,8	1/4" – 28 UNF	44	20 700	11 300	570	
19	14	39	29,5	48,5	1/4" – 28 UNF	55	27 500	15 300	770	
21	16	43,8	32,8	53,8	1/4" – 28 UNF	58	34 500	19 800	1 010	
22	16	43,8	32,8	54,8	1/4" – 28 UNF	63	34 500	20 400	1 030	
22	16	43,8	32,8	54,8	1/4" – 28 UNF	69	37 500	23 200	1 180	



Take-up housing units

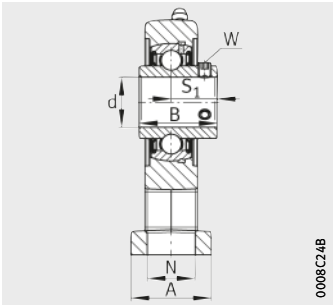
High grade steel housing
 Radial insert ball bearing in corrosion-resistant VA design
 With grub screws in inner ring



SUCST

Dimension table - Dimensions in mm

Designation			Mass m ≈ kg	Dimensions							
Unit	Housing	Radial insert ball bearing		d	H	H ₁	L	L ₁	L ₂	L ₃	N
SUCST204	GEHST204	SUC204	0,9	20	89	76	94	61	10	51	19
SUCST205	GEHST205	SUC205	1	25	89	76	97	62	10	51	19
SUCST206	GEHST206	SUC206	1,4	30	102	89	113	70	10	57	22
SUCST207	GEHST207	SUC207	1,8	35	102	89	129	78	13	64	22
SUCST208	GEHST208	SUC208	2,7	40	114	102	144	88	16	83	29
SUCST209	GEHST209	SUC209	2,9	45	117	102	144	87	16	83	29
SUCST210	GEHST210	SUC210	3	50	117	102	149	90	16	86	29



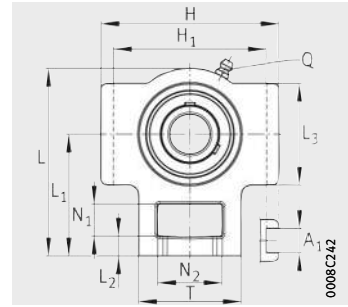
SUCST

N ₁	N ₂	A	A ₁	B	S ₁	T	Q	Width across flats W	Load carrying capacity Bearing		
									Basic load ratings		Fatigue limit load C _{ur} N
									dyn. C _r N	stat. C _{0r} N	
16	32	32	12	31	18,3	51	1/4" - 28 UNF	2,5	12 300	6 300	300
16	32	32	12	34,1	19,8	51	1/4" - 28 UNF	2,5	13 400	7 500	360
16	37	37	12	38,1	22,2	56	1/4" - 28 UNF	3	18 700	10 700	510
16	37	37	12	42,9	25,4	64	1/4" - 28 UNF	3	24 600	14 600	700
19	49	49	16	49,2	30,2	83	1/4" - 28 UNF	4	31 500	18 900	910
19	49	49	16	49,2	30,2	83	1/4" - 28 UNF	4	31 500	19 400	930
19	49	49	16	51,6	32,6	83	1/4" - 28 UNF	5	33 500	22 100	1 060



Take-up housing units

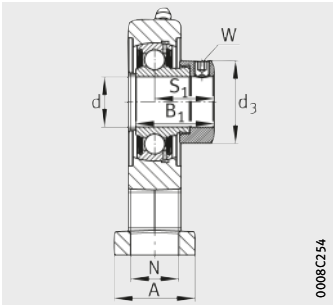
High grade steel housing
 Radial insert ball bearing with Corrotect coating
 With eccentric locking collar



CUGST

Dimension table - Dimensions in mm

Designation			Mass m ≈ kg	Dimensions							
Unit	Housing	Radial insert ball bearing		d	H	H ₁	L	L ₁	L ₂	L ₃	N
CUGST204	GEHST204	GRAE20-XL-NPP-B-FA107/125	0,9	20	89	76	94	61	10	51	19
CUGST205	GEHST205	GRAE25-XL-NPP-B-FA107/125	0,99	25	89	76	97	62	10	51	19
CUGST206	GEHST206	GRAE30-XL-NPP-B-FA107/125	1,41	30	102	89	113	70	10	57	22
CUGST207	GEHST207	GRAE35-XL-NPP-B-FA107/125	1,85	35	102	89	129	78	13	64	22
CUGST208	GEHST208	GRAE40-XL-NPP-B-FA107/125	2,7	40	114	102	144	88	16	83	29
CUGST209	GEHST209	GRAE45-XL-NPP-B-FA107/125	2,92	45	117	102	144	87	16	83	29
CUGST210	GEHST210	GRAE50-XL-NPP-B-FA107/125	2,95	50	117	102	149	90	16	86	29



0008C254

CUGST

									Width across flats W	Load carrying capacity Bearing		
										Basic load ratings		Fatigue limit load
N ₁	N ₂	A	A ₁	B ₁	S ₁	T	Q	d ₃ max.	d ₃	dyn. C _r N	stat. C _{0r} N	C _{ur} N
16	32	32	12	31	23,5	51	1/4" – 28 UNF	33	3	13 600	6 600	335
16	32	32	12	31	23,5	51	1/4" – 28 UNF	37,5	3	14 900	7 800	395
16	37	37	12	35,8	26,8	56	1/4" – 28 UNF	44	4	20 700	11 300	570
16	37	37	12	39	29,5	64	1/4" – 28 UNF	55	5	27 500	15 300	770
19	49	49	16	43,8	32,8	83	1/4" – 28 UNF	58	5	34 500	19 800	1 010
19	49	49	16	43,8	32,8	83	1/4" – 28 UNF	63	5	34 500	20 400	1 030
19	49	49	16	43,8	32,8	83	1/4" – 28 UNF	69	5	37 500	23 200	1 180





Plastic housing units, corrosion-resistant

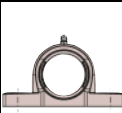
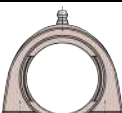
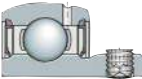
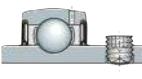
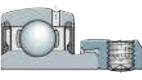
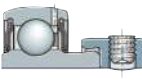
Radial insert ball bearings
in corrosion-resistant VA design or
with Corrotect coating

Plastic housing units, corrosion-resistant


	Page
Matrix	Possible combinations of radial insert ball bearings and plastic housings..... 428
Product overview	Plastic housing units, corrosion-resistant..... 430
Features	Housings with integral radial insert ball bearing..... 432 Radial insert ball bearings in corrosion-resistant VA design or with Corrotect coating 433 Operating temperature 433 Suffixes 433
Design and safety guidelines	Compensation of static misalignments..... 433 Speed limits for radial insert ball bearings 433 Radial load carrying capacity 434 Axial load carrying capacity..... 434 Design of adjacent construction..... 434 Bearing end caps..... 435 Back Seal component 436
Accuracy	Tolerances of plastic housings 437 Shaft tolerances for radial insert ball bearings 437
Dimension tables	Plummer block housing units, with long or short base Radial insert ball bearings in corrosion-resistant VA design, with grub screws or eccentric locking collar 438 Radial insert ball bearings with Corrotect coating, with eccentric locking collar 440 Two-bolt flanged housing units, narrow or wide version Radial insert ball bearings in corrosion-resistant VA design, with grub screws or eccentric locking collar 446 Radial insert ball bearings with Corrotect coating, with eccentric locking collar 448 Four-bolt flanged housing units Radial insert ball bearings in corrosion-resistant VA design, with grub screws or eccentric locking collar 454 Radial insert ball bearings with Corrotect coating, with eccentric locking collar 456 Take-up housing units, guide slots or guide surfaces on both sides, hole for threaded rod Radial insert ball bearings in corrosion-resistant VA design, with grub screws or eccentric locking collar 458 Radial insert ball bearings with Corrotect coating, with eccentric locking collar 460

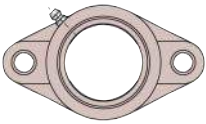

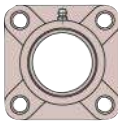
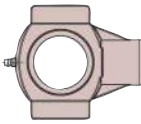
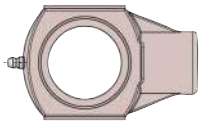


**Possible combinations
Radial insert ball bearings and
plastic housings**

Radial insert ball bearing		Housing	
		Plummer block housing	
			
Designation Shaft diameter d		GEHPP	GEHPPA
SUB 20 mm – 50 mm		SUBPP page 438	SUBPPA page 442
SUC 20 mm – 50 mm		SUCPP page 438	SUCPPA page 442
SUG 20 mm – 50 mm		SUGPP page 438	SUGPPA page 442
GRAE..-XL-NPP-B-FA107/125 20 mm – 50 mm		CUGPP page 440	CUGPPA page 444

Catalogue range, dimension table, see pages indicated.
Other dimensions and combinations available by agreement.

 Combinations not possible or not advisable.

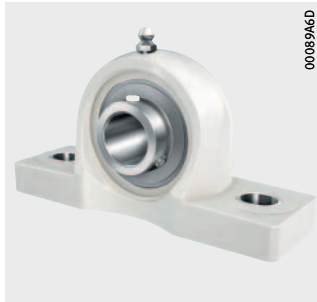
Two-bolt flanged housing		Four-bolt flanged housing	Take-up housing	
				
GEHPFL	GEHPCTL	GEHPF	GEHPT	GEHPHE
SUBPFL page 446	SUBPCTL page 450	SUBPF page 454	SUBPT page 458	SUBPHE page 462
SUCPFL page 446		SUCPF page 454	SUCPT page 458	SUCPHE page 462
SUGPFL page 446	SUGPCTL page 450	SUGPF page 454	SUGPT page 458	SUGPHE page 462
CUGPFL page 448	CUGPCTL page 452	CUGPF page 456	CUGPT page 460	CUGPHE page 464



Product overview Plastic housing units, corrosion-resistant

Plummer block housing units

SUBPP, SUCPP,
SUGPP, CUGPP



SUBPPA, SUCPPA,
SUGPPA, CUGPPA

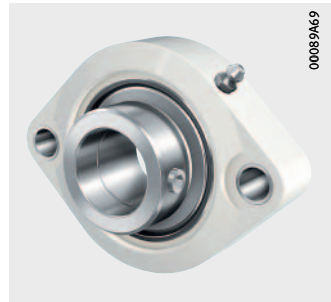


Flanged housing units

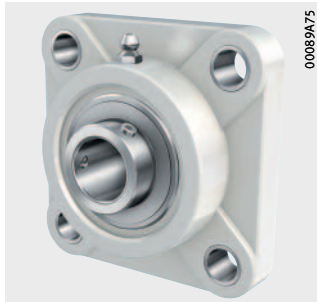
SUBPFL, SUCPFL,
SUGPFL, CUGPFL



SUBPCTL, SUGPCTL,
CUGPCTL

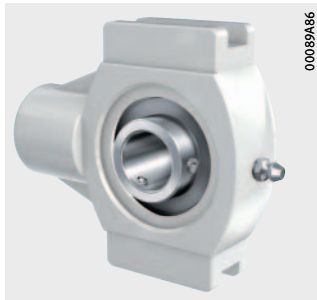


SUBPF, SUCPF
SUGPF, CUGPF



Take-up housing units

SUBPT, SUCPT,
SUGPT, CUGPT



SUBPHE, SUCPHE,
SUGPHE, CUGPHE



Accessories

Back Seal component



End caps
Open or closed design



Plastic housing units, corrosion-resistant

Features

Housing units with plastic housings made from PBT are available as plummer block and flanged housing units as well as take-up housing units.

The glass fibre reinforced material PBT is highly resistant to humidity, UV radiation, bacterial and fungal attacks as well as many chemical agents.

Housings with integral radial insert ball bearing

The units are ready-to-fit and comprise plastic housings in which INA radial insert ball bearings are fitted.

Location on the shaft in the case of housing units SUC and SUB is by means of grub screws and in the case of housing units SUG by means of an eccentric locking collar. Housing units with radial insert ball bearing GRAE and the suffix FA125 have an eccentric locking collar.

The units are used predominantly as locating bearings, but are also suitable as non-locating bearings under low loads and speeds.

The housings are screw mounted on the adjacent construction. Less stringent tolerances are sufficient for the screw mounting surfaces.



In order to ensure function and reliability under all operating conditions, the bearings and housings are matched to each other with a defined swivel moment after mounting.

The swivel moment can be requested from Schaeffler.

Plummer block housing units

Plummer block housing units are available with a long base or short base. The housings are made from glass fibre reinforced plastic PBT, are not split and are screw mounted to the adjacent construction by means of slots or threaded holes. Fixing screws to DIN EN ISO 4762 are suitable.

For relubrication of radial insert ball bearings, the housing bore has a lubrication groove and the housing has a lubrication hole suitable for conventional lubrication nipples with a precision thread $1/4'' - 28$ UNF in accordance with ANSI B1.1. The lubrication nipple is supplied already fitted, a bearing end cap is supplied loose at the time of delivery.

Flanged housing units

Flanged housing units are available as two-bolt and four-bolt flanged housing units. For location, the housings have through holes for screws to DIN EN ISO 4762.

The housing material, the design of lubrication arrangements and the delivered condition correspond to those of plummer block housing units.

Take-up housing units

Take-up housing units have facilities for sliding motion. They are used where shafts must undergo substantial radial displacement travel.

The housing material, the design of lubrication arrangements and the delivered condition correspond to those of plummer block housing units.

**Radial insert ball bearings
in corrosion-resistant
VA design or
with Corrotect coating**

The housing units are available with radial insert ball bearings in the corrosion-resistant VA design or with Corrotect coating, suffix FA125.

Operating temperature

Housing units with or without a Back Seal component are suitable for operating temperatures from -20 °C to +100 °C. If bearing end caps are used, the maximum temperature is reduced to +80 °C.

Suffixes

Suffixes for available designs, see table.

Available designs

Suffix	Design	Design
FA107	Units CUG have radial insert ball bearings with lubrication holes on the locating side	Standard
FA125	Units CUG have radial insert ball bearings with Corrotect coating, corrosion-resistant	

**Design and
safety guidelines**

The chapter Technical principles brings together the essential guidelines on the design of bearing arrangements, lubrication, mounting and dismantling and the operation of bearings, see page 32.

Due to their versatile characteristics, INA housing units can be easily used in almost all industrial sectors.



It is always and fundamentally the responsibility of the designer of a machine to ensure that a malfunction of housing units cannot be hazardous to persons. An unplanned stoppage of the machine should not cause major disruptions in operation. In both cases, it is therefore essential that you contact us before design work is carried out.

**Compensation
of static misalignments**

Due to the spherical outer ring of the bearing and the concave housing bore, housing units can compensate for static misalignments of the shaft, see page 363.

**Speed limits
for radial insert ball bearings**

The speed limits are dependent on the load, the clearance between the bearing bore and shaft and the friction of the seals, see page 363.



Plastic housing units, corrosion-resistant

Radial load carrying capacity

Plastic housings are suitable for moderate loads. The radial static load carrying capacity C_{0rG} of plastic housings and the static load carrying capacity C_{0r} of the radial insert ball bearings is stated in the relevant dimension tables.

Axial load carrying capacity

The axial operating load of the unit must not exceed the axial load carrying capacity of the housing.

The axial load carrying capacity of plastic housings is $C_{0aG} = 0,25 \cdot C_{0rG}$.

Design of adjacent construction

The permissible shaft tolerance is dependent on the speed, load and the radial insert ball bearing fitted. Shafts of the tolerance classes h6 © to h9 © can be used. Conventional drawn shafts will suffice for most applications.

Screw mounting surfaces

Recommendations for the screw mounting surfaces are as follows:

- roughness of the screw mounting surface max. Ra 12,5 (Rzmax 63)
- geometrical and positional tolerance 0,04/100 concave, spherical not permissible.
- For high loads occurring parallel to the mounting surface of plummer block housing units (in the case of plastic housings with long base), please contact Schaeffler.

Fixing screws

The screw connection should be designed in accordance with VDI 2230; friction coefficient $\mu = 0,12$ (90%).

Screws of grade 8.8 or better can be used for fixing.

The maximum tightening torques applicable to this screw grade must not be exceeded even if screws of a higher grade are used.

In principle, we recommend that the screw connection should only be tightened to 70% of the values stated in the standard.

For fixing, hexagonal socket head screws in accordance with DIN EN ISO 4762 or hexagonal socket head screws with a coarse pitch full thread in accordance with DIN EN ISO 4017 should be used. The screws should be combined as a minimum with a washer in accordance with DIN EN ISO 7089 or DIN EN ISO 7090.

Screws and accessories for location are not included in the delivery.

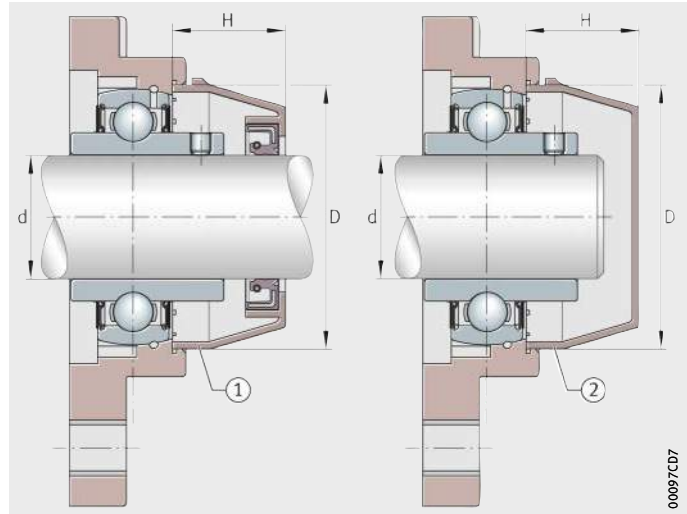
All screws and other accessories used for location should be in the corrosion-resistant VA design.

Bearing end caps

Each housing unit is supplied with a closed end cap CC. For all units, open end caps CO with an integral rotary shaft seal are available by agreement, *Figure 1* and table.

- ① Open end cap with integral rotary shaft seal
- ② Closed end cap

Figure 1
Open or closed end caps



Bearing end caps for plastic housing units

Designation		Dimensions mm		
Closed end cap	Open end cap	d	D	H
CC204	CO204	20	50,1	23
CC205	CO205	25	55	25
CC206	CO206	30	64	30
CC207	CO207	35	74,6	32
CC208	CO208	40	84	37
CC209	CO209	45	89,2	41
CC210	CO210	50	94,2	47



Plastic housing units, corrosion-resistant

Back Seal component

For flanged housing units SUBPFL, SUGPFL, CUGPFL, SUBPF, SUGPF and CUGPF, a Back Seal component BS from NBR is available with a spring washer made from corrosion-resistant steel, material number 1.4301, that closes off the rear face of the housing, *Figure 2, Figure 3* and table.

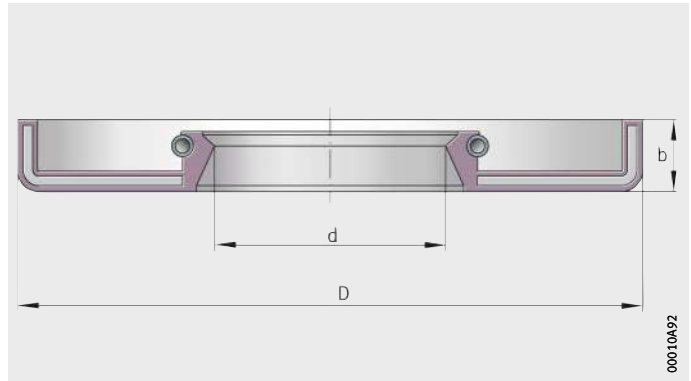
CUGPF
CUGPFL

① Back Seal component

Figure 2
Flanged housing units
with Back Seal component



Figure 3
Dimensions
of Back Seal component



Designations and dimensions of Back Seal components

Designation	Dimensions mm		
	d	b	D
BS204	20	6	52
BS205	25	6	62
BS206	30	6	72
BS207	35	6	82
BS208	40	6	88
BS209	45	6	93
BS210	50	6	98

**Accuracy
Tolerances
of plastic housings**

The dimensional, geometrical and positional tolerances of plastic housings correspond to DIN 16742.

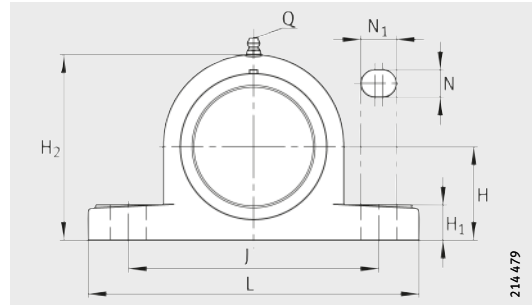
**Shaft tolerances
for insert bearings**

Shafts of the tolerance classes h6 \oplus to h9 \oplus can be used.
Conventional drawn shafts will suffice for most applications.



Plummer block housing units

Plastic housing
 With long base
 Radial insert ball bearing
 in corrosion-resistant VA design
 With grub screw or eccentric locking collar



SUBPP, SUCPP, SUGPP

Dimension table - Dimensions in mm

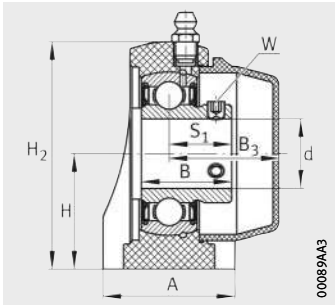
Designation			Mass m ≈ kg	Dimensions								
Unit ¹⁾	Housing	Radial insert ball bearing		d	H	J	L	A	H ₁	H ₂	N	N ₁
SUBPP204	GEHPP204	SUB204	0,28	20	33,3	95	127	38	14,2	65,5	11	14
SUCPP204	GEHPP204	SUC204	0,3	20	33,3	95	127	38	14,2	65,5	11	14
SUBPP205	GEHPP205	SUB205	0,33	25	36,5	105	140	38	14,5	71	11	14
SUCPP205	GEHPP205	SUC205	0,36	25	36,5	105	140	38	14,5	71	11	14
SUBPP206	GEHPP206	SUB206	0,5	30	42,9	119	162	46	17,8	83	14	18
SUCPP206	GEHPP206	SUC206	0,55	30	42,9	119	162	46	17,8	83	14	18
SUBPP207	GEHPP207	SUB207	0,7	35	47,6	127	167	48	18	94	14	18
SUCPP207	GEHPP207	SUC207	0,77	35	47,6	127	167	48	18	94	14	18
SUBPP208	GEHPP208	SUB208	0,89	40	49,2	137	184	54	19,5	98	14	18
SUCPP208	GEHPP208	SUC208	0,98	40	49,2	137	184	54	19,5	98	14	18
SUBPP209	GEHPP209	SUB209	1,02	45	54	146	192	54	23	106	17	20
SUCPP209²⁾	GEHPP209	SUC209	1,08	45	54	146	192	54	23	106	17	20
SUBPP210	GEHPP210	SUB210	1,21	50	57,2	159	206	60	23	114	17	20
SUCPP210²⁾	GEHPP210	SUC210	1,32	50	57,2	159	206	60	23	114	17	20

Dimension table - Dimensions in mm

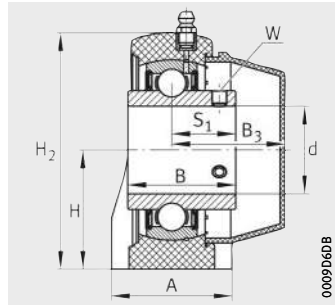
Designation			Mass m ≈ kg	Dimensions								
Unit ¹⁾	Housing	Radial insert ball bearing		d	H	J	L	A	H ₁	H ₂	N	N ₁
SUGPP204	GEHPP204	SUG204	0,31	20	33,3	95	127	38	14,2	65,5	11	14
SUGPP205	GEHPP205	SUG205	0,37	25	36,5	105	140	38	14,5	71	11	14
SUGPP206	GEHPP206	SUG206	0,56	30	42,9	119	162	46	17,8	83	14	18
SUGPP207	GEHPP207	SUG207	0,81	35	47,6	127	167	48	18	94	14	18
SUGPP208	GEHPP208	SUG208	0,97	40	49,2	137	184	54	19,5	98	14	18
SUGPP209	GEHPP209	SUG209	1,12	45	54	146	192	54	23	106	17	20
SUGPP210²⁾	GEHPP210	SUG210	1,31	50	57,2	159	206	60	23	114	17	20

¹⁾ Available end caps, see page 435.

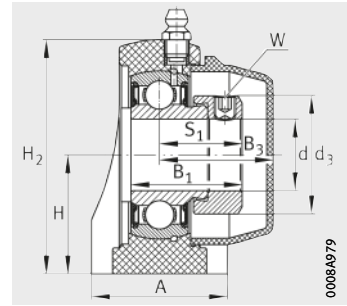
²⁾ Available by agreement.



SUBPP



SUCPP



SUGPP

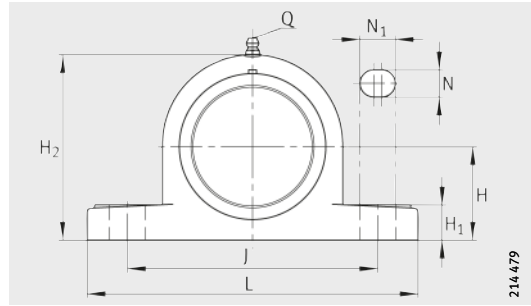
				Width across flats W	Load carrying capacity			
					Bearing			Housing
				Basic load ratings		Fatigue limit load C _{ur} N	C _{0rG} N	
B	B ₃	S ₁	Q	dyn. C _r N	stat. C _{0r} N			
26	31,65	18	1/4" - 28 UNF	2,5	12 300	6 300	300	7 700
31	31,65	18,3	1/4" - 28 UNF	2,5	12 300	6 300	300	7 700
28	34,05	19,5	1/4" - 28 UNF	2,5	13 400	7 500	360	10 000
34,1	34,05	19,8	1/4" - 28 UNF	2,5	13 400	7 500	360	10 000
30,5	39,95	21	1/4" - 28 UNF	3	18 700	10 700	510	10 600
38,1	39,95	22,2	1/4" - 28 UNF	3	18 700	10 700	510	10 600
35,45	44,85	25,45	1/4" - 28 UNF	3	24 600	14 600	700	10 800
42,9	44,85	25,4	1/4" - 28 UNF	3	24 600	14 600	700	10 800
39,45	51,5	28,95	1/4" - 28 UNF	4	31 500	18 900	910	11 100
49,2	51,5	30,2	1/4" - 28 UNF	4	31 500	18 900	910	11 100
41,5	53,7	30,5	1/4" - 28 UNF	4	31 500	19 400	930	11 400
49,2	53,7	30,2	1/4" - 28 UNF	4	31 500	19 400	930	11 400
43,5	60,9	32	1/4" - 28 UNF	5	33 500	22 100	1 060	11 700
51,6	60,9	32,6	1/4" - 28 UNF	5	33 500	22 100	1 060	11 700

					Width across flats W	Load carrying capacity			
						Bearing			Housing
					Basic load ratings		Fatigue limit load C _{ur} N	C _{0rG} N	
B ₁	B ₃	S ₁	Q	d ₃ max.	dyn. C _r N	stat. C _{0r} N			
31,5	31,65	23,5	1/4" - 28 UNF	33	3	12 300	6 300	300	7 700
32	34,05	23,5	1/4" - 28 UNF	37,5	3	13 400	7 500	360	10 000
36,3	39,95	26,8	1/4" - 28 UNF	44	4	18 700	10 700	510	10 600
39,5	44,85	29,5	1/4" - 28 UNF	55	5	24 600	14 600	700	10 800
43,8	51,5	32,8	1/4" - 28 UNF	58	5	31 500	18 900	910	11 100
43,8	53,7	32,8	1/4" - 28 UNF	63	5	31 500	19 400	930	11 400
44,3	60,9	32,8	1/4" - 28 UNF	69	5	33 500	22 100	1 060	11 700



Plummer block housing units

- Plastic housing
- With long base
- Radial insert ball bearing with Corrotect coating
- With eccentric locking collar



214.479

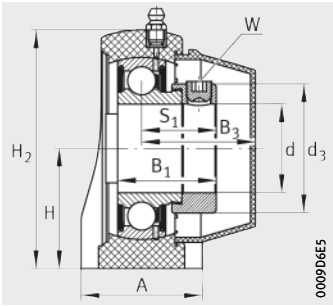
CUGPP

Dimension table - Dimensions in mm

Designation			Mass m ≈ kg	Dimensions						
Unit ¹⁾	Housing	Radial insert ball bearing		d	H	J	L	A	H ₁	H ₂
CUGPP204	GEHPP204	GRAE20-XL-NPP-B-FA107/125	0,32	20	33,3	95	127	38	14,2	65,5
CUGPP205	GEHPP205	GRAE25-XL-NPP-B-FA107/125	0,37	25	36,5	105	140	38	14,5	71
CUGPP206	GEHPP206	GRAE30-XL-NPP-B-FA107/125	0,61	30	42,9	119	162	46	17,8	83
CUGPP207	GEHPP207	GRAE35-XL-NPP-B-FA107/125	0,87	35	47,6	127	167	48	18	94
CUGPP208	GEHPP208	GRAE40-XL-NPP-B-FA107/125	1,06	40	49,2	137	184	54	19,5	98
CUGPP209²⁾	GEHPP209	GRAE45-XL-NPP-B-FA107/125	1,19	45	54	146	192	54	23	106
CUGPP210²⁾	GEHPP210	GRAE50-XL-NPP-B-FA107/125	1,37	50	57,2	159	206	60	23	114

¹⁾ Available end caps, see page 435.

²⁾ Available by agreement.



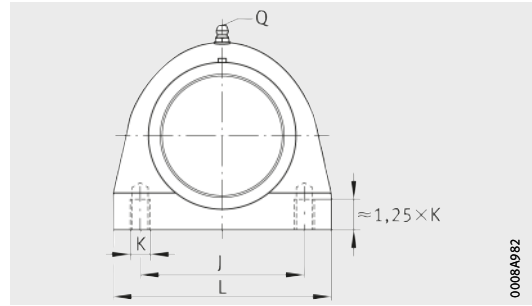
CUGPP

							Width across flats W	Load carrying capacity			
								Bearing			Housing C_{0rG} N
								Basic load ratings		Fatigue limit load	
N	N_1	B_1	B_3	S_1	Q	d_3 max.	dyn. C_r N	stat. C_{0r} N	C_{ur} N	C_{0rG} N	
11	14	31	31,65	23,5	$1/4'' - 28 UNF$	33	3	13 600	6 600	335	7 700
11	14	31	34,05	23,5	$1/4'' - 28 UNF$	37,5	3	14 900	7 800	395	10 000
14	18	35,8	39,95	26,8	$1/4'' - 28 UNF$	44	4	20 700	11 300	570	10 600
14	18	39	44,85	29,5	$1/4'' - 28 UNF$	55	5	27 500	15 300	770	10 800
14	18	43,8	51,5	32,8	$1/4'' - 28 UNF$	58	5	34 500	19 800	1 010	11 100
17	20	43,8	53,7	32,8	$1/4'' - 28 UNF$	63	5	34 500	20 400	1 030	11 400
17	20	43,8	60,9	32,8	$1/4'' - 28 UNF$	69	5	37 500	23 200	1 180	11 700



Plummer block housing units

Plastic housing
 With short base
 Radial insert ball bearing
 in corrosion-resistant VA design
 With grub screw or eccentric locking collar



SUBPPA, SUCPPA, SUGPPA

Dimension table - Dimensions in mm

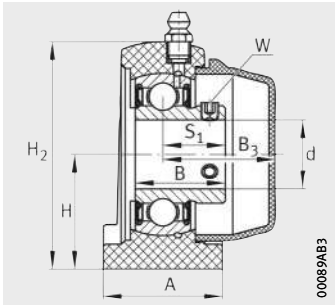
Designation			Mass m ≈ kg	Dimensions					
Unit ¹⁾	Housing	Radial insert ball bearing		d	H	J	L	A	H ₂
SUBPPA204	GEHPPA204	SUB204	0,26	20	33,3	50,8	72,8	34,5	66
SUCPPA204	GEHPPA204	SUC204	0,28	20	33,3	50,8	72,8	34,5	66
SUBPPA205	GEHPPA205	SUB205	0,31	25	36,5	50,8	76,2	39,5	73,5
SUCPPA205	GEHPPA205	SUC205	0,34	25	36,5	50,8	76,2	39,5	73,5
SUBPPA206	GEHPPA206	SUB206	0,47	30	42,9	76,2	101	42,5	84
SUCPPA206	GEHPPA206	SUC206	0,52	30	42,9	76,2	101	42,5	84
SUBPPA207	GEHPPA207	SUB207	0,7	35	47,6	82,6	110	47,5	95
SUCPPA207	GEHPPA207	SUC207	0,76	35	47,6	82,6	110	47,5	95
SUBPPA208	GEHPPA208	SUB208	0,83	40	49,2	88,9	120	48	100,5
SUCPPA208	GEHPPA208	SUC208	0,92	40	49,2	88,9	120	48	100,5
SUBPPA209²⁾	GEHPPA209	SUB209	0,97	45	54	95,3	124	50	108,5
SUCPPA209²⁾	GEHPPA209	SUC209	1,03	45	54	95,3	124	50	108,5
SUBPPA210²⁾	GEHPPA210	SUB210	1,15	50	57,2	101,6	135	54	115
SUCPPA210²⁾	GEHPPA210	SUC210	1,26	50	57,2	101,6	135	54	115

Dimension table - Dimensions in mm

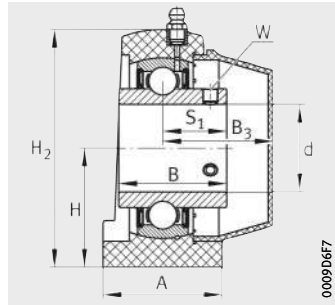
Designation			Mass m ≈ kg	Dimensions					
Unit ¹⁾	Housing	Radial insert ball bearing		d	H	J	L	A	H ₂
SUGPPA204	GEHPPA204	SUG204	0,29	20	33,3	50,8	72,8	34,5	66
SUGPPA205	GEHPPA205	SUG205	0,35	25	36,5	50,8	76,2	39,5	73,5
SUGPPA206	GEHPPA206	SUG206	0,52	30	42,9	76,2	101	42,5	84
SUGPPA207	GEHPPA207	SUG207	0,8	35	47,6	82,6	110	47,5	95
SUGPPA208	GEHPPA208	SUG208	0,91	40	49,2	88,9	120	48	100,5
SUGPPA209²⁾	GEHPPA209	SUG209	1,07	45	54	95,3	124	50	108,5
SUGPPA210²⁾	GEHPPA210	SUG210	1,25	50	57,2	101,6	135	54	115

¹⁾ Available end caps, see page 435.

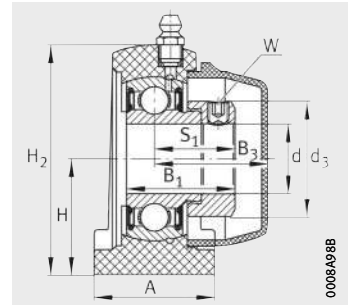
²⁾ Available by agreement.



SUBPPA



SUCPPA



SUGPPA

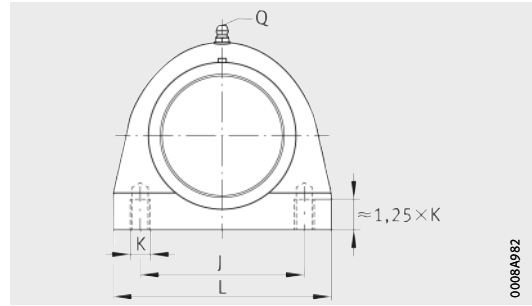
					Width across flats W	Load carrying capacity			
						Bearing			Housing C _{0rG} N
B	B ₃	K	S ₁	Q		Basic load ratings		Fatigue limit load	
					dyn. C _r N	stat. C _{0r} N	C _{ur} N		
26	31,65	M8	18	1/4" - 28 UNF	2,5	12 300	6 300	300	6 900
31	31,65	M8	18,3	1/4" - 28 UNF	2,5	12 300	6 300	300	6 900
28	34,05	M10	19,5	1/4" - 28 UNF	2,5	13 400	7 500	360	7 000
34,1	34,05	M10	19,8	1/4" - 28 UNF	2,5	13 400	7 500	360	7 000
30,5	39,95	M10	21	1/4" - 28 UNF	3	18 700	10 700	510	6 500
38,1	39,95	M10	22,2	1/4" - 28 UNF	3	18 700	10 700	510	6 500
35,45	44,85	M10	25,45	1/4" - 28 UNF	3	24 600	14 600	700	8 000
42,9	44,85	M10	25,4	1/4" - 28 UNF	3	24 600	14 600	700	8 000
39,45	51,5	M12	28,95	1/4" - 28 UNF	4	31 500	18 900	910	9 100
49,2	51,5	M12	30,2	1/4" - 28 UNF	4	31 500	18 900	910	9 100
41,5	53,7	M12	30,5	1/4" - 28 UNF	4	31 500	19 400	930	10 400
49,2	53,7	M12	30,2	1/4" - 28 UNF	4	31 500	19 400	930	10 400
43,5	60,9	M16	32	1/4" - 28 UNF	5	33 500	22 100	1 060	11 000
51,6	60,9	M16	32,6	1/4" - 28 UNF	5	33 500	22 100	1 060	11 000



						Width across flats W	Load carrying capacity			
							Bearing			Housing C _{0rG} N
B ₁	B ₃	K	S ₁	Q	d ₃ max.		Basic load ratings		Fatigue limit load	
						dyn. C _r N	stat. C _{0r} N	C _{ur} N		
31,5	31,65	M8	23,5	1/4" - 28 UNF	33	3	12 300	6 300	300	6 900
32	34,05	M10	23,5	1/4" - 28 UNF	37,5	3	13 400	7 500	360	7 000
36,3	39,95	M10	26,8	1/4" - 28 UNF	44	4	18 700	10 700	510	6 500
39,5	44,85	M10	29,5	1/4" - 28 UNF	55	5	24 600	14 600	700	8 000
43,8	51,5	M12	32,8	1/4" - 28 UNF	58	5	31 500	18 900	910	9 100
43,8	53,7	M12	32,8	1/4" - 28 UNF	63	5	31 500	19 400	930	10 400
44,3	60,9	M16	32,8	1/4" - 28 UNF	69	5	33 500	22 100	1 060	11 000

Plummer block housing units

- Plastic housing
- With short base
- Radial insert ball bearing with Corrotect coating
- With eccentric locking collar



CUGPPA

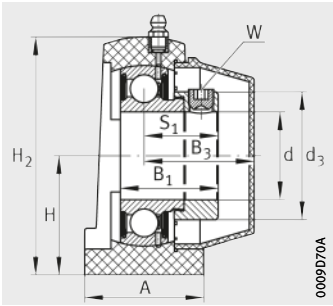
00084982

Dimension table - Dimensions in mm

Designation			Mass m ≈ kg	Dimensions				
Unit ¹⁾	Housing	Radial insert ball bearing		d	H	J	L	A
CUGPPA204	GEHPPA204	GRAE20-XL-NPP-B-FA107/125	0,3	20	33,3	50,8	72,8	34,5
CUGPPA205	GEHPPA205	GRAE25-XL-NPP-B-FA107/125	0,35	25	36,5	50,8	76,2	39,5
CUGPPA206	GEHPPA206	GRAE30-XL-NPP-B-FA107/125	0,57	30	42,9	76,2	101	42,5
CUGPPA207	GEHPPA207	GRAE35-XL-NPP-B-FA107/125	0,85	35	47,6	82,6	110	47,5
CUGPPA208	GEHPPA208	GRAE40-XL-NPP-B-FA107/125	0,99	40	49,2	88,9	120	48
CUGPPA209²⁾	GEHPPA209	GRAE45-XL-NPP-B-FA107/125	1,12	45	54	95,3	124	50
CUGPPA210²⁾	GEHPPA210	GRAE50-XL-NPP-B-FA107/125	1,22	50	57,2	101,6	135	54

¹⁾ Available end caps, see page 435.

²⁾ Available by agreement.



CUGPPA

							Width across flats W	Load carrying capacity			
								Bearing			Housing C _{0rG} N
								Basic load ratings		Fatigue limit load	
H ₂	B ₁	B ₃	K	S ₁	Q	d ₃ max.	dyn. C _r N	stat. C _{0r} N	C _{ur} N	C _{0rG} N	
66	31	31,65	M8	23,5	1/4" - 28 UNF	33	3	13 600	6 600	335	6 900
73,5	31	34,05	M10	23,5	1/4" - 28 UNF	37,5	3	14 900	7 800	395	7 000
84	35,8	39,95	M10	26,8	1/4" - 28 UNF	44	4	20 700	11 300	570	6 500
95	39	44,85	M10	29,5	1/4" - 28 UNF	55	5	27 500	15 300	770	8 000
100,5	43,8	51,5	M12	32,8	1/4" - 28 UNF	58	5	34 500	19 800	1 010	9 100
108,5	43,8	53,7	M12	32,8	1/4" - 28 UNF	63	5	34 500	20 400	1 030	10 400
115	43,8	60,9	M16	32,8	1/4" - 28 UNF	69	5	37 500	23 200	1 180	11 000



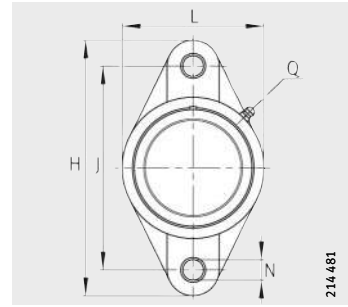
Two-bolt flanged housing units

Plastic housing

Narrow version

Radial insert ball bearing in corrosion-resistant VA design

With grub screw or eccentric locking collar



SUBPFL, SUCPFL, SUGPFL

Dimension table - Dimensions in mm

Designation			Mass m ≈ kg	Dimensions							
Unit ¹⁾	Housing	Radial insert ball bearing		d	H	J	L	A	A ₁	A ₂	N
SUBPFL204	GEHPFL204	SUB204	0,23	20	114	90	64,8	26,5	11,4	15,4	11
SUCPFL204	GEHPFL204	SUC204	0,26	20	114	90	64,8	26,5	11,4	15,4	11
SUBPFL205	GEHPFL205	SUB205	0,29	25	130	99	70	29,1	13,5	17	11
SUCPFL205	GEHPFL205	SUC205	0,32	25	130	99	70	29,1	13,5	17	11
SUBPFL206	GEHPFL206	SUB206	0,41	30	148	117	80	30,5	13,3	18	11
SUCPFL206	GEHPFL206	SUC206	0,45	30	148	117	80	30,5	13,3	18	11
SUBPFL207	GEHPFL207	SUB207	0,6	35	163	130	90	32,8	16,1	18	13
SUCPFL207	GEHPFL207	SUC207	0,66	35	163	130	90	32,8	16,1	18	13
SUBPFL208	GEHPFL208	SUB208	0,78	40	175	144	100	37,5	20	21,5	14
SUCPFL208	GEHPFL208	SUC208	0,88	40	175	144	100	37,5	20	21,5	14
SUBPFL209	GEHPFL209	SUB209	0,91	45	188,5	148,5	108	41	21	24	17
SUCPFL209²⁾	GEHPFL209	SUC209	1	45	188,5	148,5	108	41	21	24	17
SUBPFL210	GEHPFL210	SUB210	1,02	50	197	157	115	43	21	25	17
SUCPFL210²⁾	GEHPFL210	SUC210	1,16	50	197	157	115	43	21	25	17

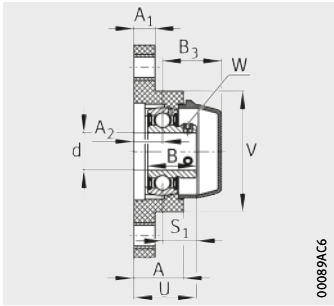
Dimension table - Dimensions in mm

Designation			Mass m ≈ kg	Dimensions							
Unit ¹⁾³⁾	Housing	Radial insert ball bearing		d	H	J	L	A	A ₁	A ₂	N
SUGPFL204	GEHPFL204	SUG204	0,27	20	114	90	64,8	26,5	11,4	15,4	11
SUGPFL205	GEHPFL205	SUG205	0,31	25	130	99	70	29,1	13,5	17	11
SUGPFL206	GEHPFL206	SUG206	0,45	30	148	117	80	30,5	13,3	18	11
SUGPFL207	GEHPFL207	SUG207	0,68	35	163	130	90	32,8	16,1	18	13
SUGPFL208	GEHPFL208	SUG208	0,84	40	175	144	100	37,5	20	21,5	14
SUGPFL209²⁾	GEHPFL209	SUG209	1,01	45	188,5	148,5	108	41	21	24	17
SUGPFL210²⁾	GEHPFL210	SUG210	1,12	50	197	157	115	43	21	25	17

¹⁾ Available end caps, see page 435.

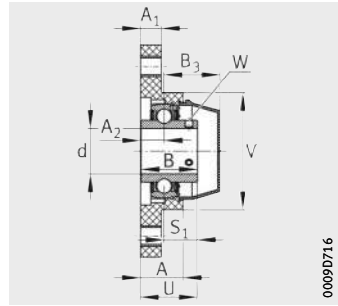
²⁾ Available by agreement.

³⁾ For these series, Back Seal components are also available, see page 436.



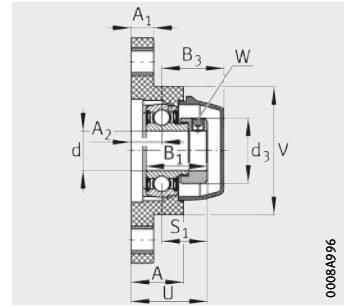
SUBPFL

00089AC6



SUCPFL

0009D716



SUGPFL

0008A996

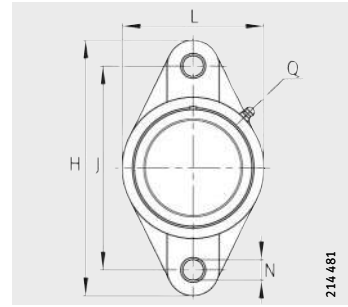
						Width across flats	Load carrying capacity			
							W	Bearing		
						Basic load ratings		Fatigue limit load	C _{OrG}	
B	B ₃	S ₁	U	V	Q	dyn. C _r				stat. C _{Or}
						N	N	N	N	
26	31,4	18	33,4	64,8	1/4" - 28 UNF	2,5	12 300	6 300	300	8 500
31	31,4	18,3	33,7	64,8	1/4" - 28 UNF	2,5	12 300	6 300	300	8 500
28	34,1	19,5	36,5	70	1/4" - 28 UNF	2,5	13 400	7 500	360	11 100
34,1	34,1	19,8	36,8	70	1/4" - 28 UNF	2,5	13 400	7 500	360	11 100
30,5	38,5	21	39	80	1/4" - 28 UNF	3	18 700	10 700	510	14 200
38,1	38,5	22,2	40,2	80	1/4" - 28 UNF	3	18 700	10 700	510	14 200
35,45	43,6	25,45	43,45	90	1/4" - 28 UNF	3	24 600	14 600	700	14 900
42,9	43,6	25,4	43,4	90	1/4" - 28 UNF	3	24 600	14 600	700	14 900
39,45	49,5	28,95	50,45	100	1/4" - 28 UNF	4	31 500	18 900	910	14 900
49,2	49,5	30,2	51,7	100	1/4" - 28 UNF	4	31 500	18 900	910	14 900
41,5	53,7	30,5	54,5	108	1/4" - 28 UNF	4	31 500	19 400	930	15 100
49,2	53,7	30,2	54,2	108	1/4" - 28 UNF	4	31 500	19 400	930	15 100
43,5	60,3	32	57	115	1/4" - 28 UNF	5	33 500	22 100	1 060	15 600
51,6	60,3	32,6	57,6	115	1/4" - 28 UNF	5	33 500	22 100	1 060	15 600

							Width across flats	Load carrying capacity			
								W	Bearing		
							Basic load ratings		Fatigue limit load	C _{OrG}	
B ₁	B ₃	S ₁	U	V	Q	d ₃	dyn. C _r				stat. C _{Or}
							max.	N	N	N	N
31,5	31,4	23,5	38,9	64,8	1/4" - 28 UNF	33	3	12 300	6 300	300	8 500
32	34,1	23,5	40,5	70	1/4" - 28 UNF	37,5	3	13 400	7 500	360	11 100
36,3	38,5	26,8	44,8	80	1/4" - 28 UNF	44	4	18 700	10 700	510	14 200
39,5	43,6	29,5	47,5	90	1/4" - 28 UNF	55	5	24 600	14 600	700	14 900
43,8	49,5	32,8	54,3	100	1/4" - 28 UNF	58	5	31 500	18 900	910	14 900
43,8	53,7	32,8	56,8	108	1/4" - 28 UNF	63	5	31 500	19 400	930	15 100
44,3	60,3	32,8	57,8	115	1/4" - 28 UNF	69	5	33 500	22 100	1 060	15 600



Two-bolt flanged housing units

Plastic housing
 Narrow version
 Radial insert ball bearing with Corrotect coating
 With eccentric locking collar



CUGPFL

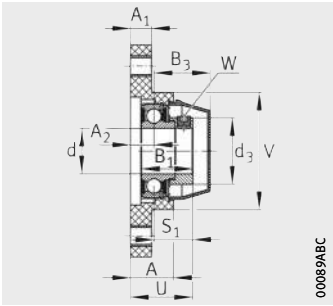
Dimension table - Dimensions in mm

Designation			Mass m ≈ kg	Dimensions						
Unit ¹⁾²⁾	Housing	Radial insert ball bearing		d	H	J	L	A	A ₁	A ₂
CUGPFL204	GEHPFL204	GRAE20-XL-NPP-B-FA107/125	0,27	20	114	90	64,8	26,5	11,4	15,4
CUGPFL205	GEHPFL205	GRAE25-XL-NPP-B-FA107/125	0,33	25	130	99	70	29,1	13,5	17
CUGPFL206	GEHPFL206	GRAE30-XL-NPP-B-FA107/125	0,49	30	148	117	80	30,5	13,3	18
CUGPFL207	GEHPFL207	GRAE35-XL-NPP-B-FA107/125	0,74	35	163	130	90	32,8	16,1	18
CUGPFL208	GEHPFL208	GRAE40-XL-NPP-B-FA107/125	0,93	40	175	144	100	37,5	20	21,5
CUGPFL209³⁾	GEHPFL209	GRAE45-XL-NPP-B-FA107/125	1,09	45	188,5	148,5	108	41	21	24
CUGPFL210³⁾	GEHPFL210	GRAE50-XL-NPP-B-FA107/125	1,18	50	197	157	115	43	21	25

¹⁾ Available end caps, see page 435.

²⁾ For these series, Back Seal components are also available, see page 436.

³⁾ Available by agreement.



CUGPFL

								Width across flats W	Load carrying capacity			
									Bearing			Housing C_{OrG} N
									Basic load ratings		Fatigue limit load	
N	B_1	B_3	S_1	U	V	Q	d_3 max.		dyn. C_r N	stat. C_{Or} N	C_{Ur} N	
11	31	31,4	23,5	38,9	64,8	$1/4'' - 28 UNF$	33	3	13 600	6 600	335	8 500
11	31	34,1	23,5	40,5	70	$1/4'' - 28 UNF$	37,5	3	14 900	7 800	395	11 100
11	35,8	38,5	26,8	44,8	80	$1/4'' - 28 UNF$	44	4	20 700	11 300	570	14 200
13	39	43,6	29,5	47,5	90	$1/4'' - 28 UNF$	55	5	27 500	15 300	770	14 900
14	43,8	49,5	32,8	54,3	100	$1/4'' - 28 UNF$	58	5	34 500	19 800	1 010	14 900
17	43,8	53,7	32,8	56,8	108	$1/4'' - 28 UNF$	63	5	34 500	20 400	1 030	15 100
17	43,8	60,3	32,8	57,8	115	$1/4'' - 28 UNF$	69	5	37 500	23 200	1 180	15 600



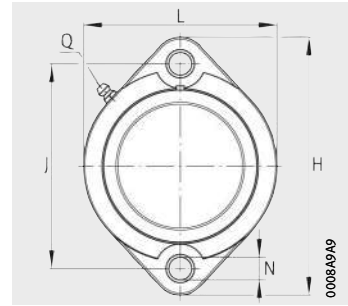
Two-bolt flanged housing units

Plastic housing

Wide version

Radial insert ball bearing in corrosion-resistant VA design

With grub screw or eccentric locking collar



SUBPCTL, SUGPCTL

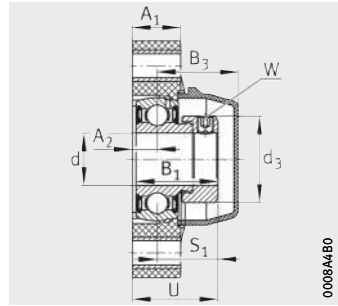
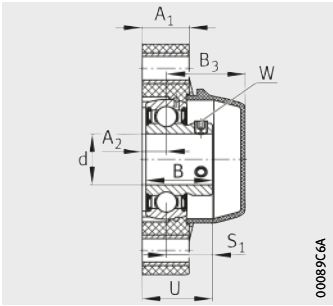
Dimension table - Dimensions in mm

Designation			Mass m ≈ kg	Dimensions						
Unit ¹⁾	Housing	Radial insert ball bearing		d	H	J	L	A ₁	A ₂	N
SUBPCTL204	GEHPCTL204	SUB204	0,22	20	90,5	71,4	66,5	18,4	9,5	9,2
SUBPCTL205	GEHPCTL205	SUB205	0,25	25	97	76,2	71	18,4	9,9	9,2
SUBPCTL206	GEHPCTL206	SUB206	0,37	30	112	90,5	84	20,5	11,4	11
SUBPCTL207	GEHPCTL207	SUB207	0,55	35	126	100	94	22,5	12,4	11
SUBPCTL208	GEHPCTL208	SUB208	0,7	40	150	119	100	24	13,5	14

Dimension table - Dimensions in mm

Designation			Mass m ≈ kg	Dimensions						
Unit ¹⁾	Housing	Radial insert ball bearing		d	H	J	L	A ₁	A ₂	N
SUGPCTL204	GEHPCTL204	SUG204	0,25	20	90,5	71,4	66,5	18,4	9,5	9,2
SUGPCTL205	GEHPCTL205	SUG205	0,28	25	97	76,2	71	18,4	9,9	9,2
SUGPCTL206	GEHPCTL206	SUG206	0,42	30	112	90,5	84	20,5	11,4	11
SUGPCTL207	GEHPCTL207	SUG207	0,66	35	126	100	94	22,5	12,4	11
SUGPCTL208	GEHPCTL208	SUG208	0,79	40	150	119	100	24	13,5	14

¹⁾ Available end caps, see page 435.



SUBPCTL

SUGPCTL

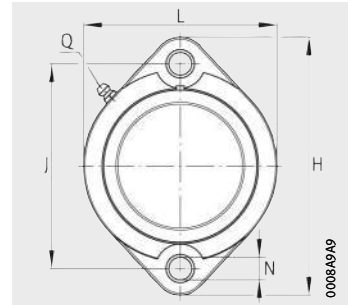
					Width across flats	Load carrying capacity			
						W	Bearing		
					Basic load ratings		Fatigue limit load	C_{0rG}	
B	B_3	S_1	U	Q	dyn. C_r		stat. C_{0r}		C_{ur}
26	30,8	18	27,5	1/4" - 28 UNF	2,5	12 300	6 300	300	7 200
28	33,5	19,5	29,4	1/4" - 28 UNF	2,5	13 400	7 500	360	9 400
30,5	38,6	21	32,4	1/4" - 28 UNF	3	18 700	10 700	510	12 000
35,45	41,1	25,45	37,85	1/4" - 28 UNF	3	24 600	14 600	700	12 600
39,45	47,5	28,95	42,45	1/4" - 28 UNF	4	31 500	18 900	910	12 800

						Width across flats	Load carrying capacity			
							W	Bearing		
						Basic load ratings		Fatigue limit load	C_{0rG}	
B_1	B_3	S_1	U	Q	d_3	dyn. C_r		stat. C_{0r}		C_{ur}
31,5	30,8	23,5	33	1/4" - 28 UNF	33	3	12 300	6 300	300	7 200
32	33,5	23,5	33,4	1/4" - 28 UNF	37,5	3	13 400	7 500	360	9 400
36,3	38,6	26,8	38,2	1/4" - 28 UNF	44	4	18 700	10 700	510	12 000
39,5	41,1	29,5	41,9	1/4" - 28 UNF	55	5	24 600	14 600	700	12 600
43,8	47,5	32,8	46,3	1/4" - 28 UNF	58	5	31 500	18 900	910	12 800



Two-bolt flanged housing units

- Plastic housing
- Wide version
- Radial insert ball bearing with Corrotect coating
- With eccentric locking collar

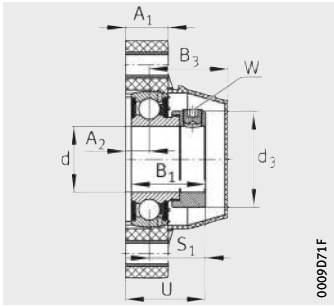


CUGPCTL

Dimension table - Dimensions in mm

Designation			Mass m ≈ kg	Dimensions					
Unit ¹⁾	Housing	Radial insert ball bearing		d	H	J	L	A ₁	A ₂
CUGPCTL204	GEHPCTL204	GRAE20-XL-NPP-B-FA107/125	0,26	20	90,5	71,4	66,5	18,4	9,5
CUGPCTL205	GEHPCTL205	GRAE25-XL-NPP-B-FA107/125	0,29	25	97	76,2	71	18,4	9,9
CUGPCTL206	GEHPCTL206	GRAE30-XL-NPP-B-FA107/125	0,47	30	112	90,5	84	20,5	11,4
CUGPCTL207	GEHPCTL207	GRAE35-XL-NPP-B-FA107/125	0,71	35	126	100	94	22,5	12,4
CUGPCTL208	GEHPCTL208	GRAE40-XL-NPP-B-FA107/125	0,86	40	150	119	100	24	13,5

¹⁾ Available end caps, see page 435.



CUGPCTL

							Width across flats W	Load carrying capacity			
								Bearing			Housing C _{0rG} N
								Basic load ratings		Fatigue limit load C _{ur} N	
N	B ₁	B ₃	S ₁	U	Q	d ₃ max.	dyn. C _r N	stat. C _{0r} N			
9,2	31	30,8	23,5	33	1/4" – 28 UNF	33	3	13 600	6 600	335	7 200
9,2	31	33,5	23,5	33,4	1/4" – 28 UNF	37,5	3	14 900	7 800	395	9 400
11	35,8	38,6	26,8	38,2	1/4" – 28 UNF	44	4	20 700	11 300	570	12 000
11	39	41,1	29,5	41,9	1/4" – 28 UNF	55	5	27 500	15 300	770	12 600
14	43,8	47,5	32,8	46,3	1/4" – 28 UNF	58	5	34 500	19 800	1 010	12 800

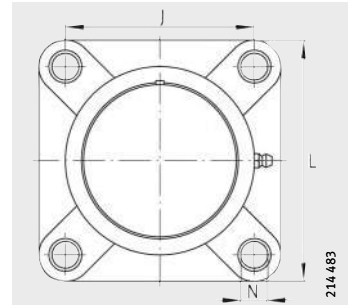


Four-bolt flanged housing units

Plastic housing

Radial insert ball bearing in corrosion-resistant VA design

With grub screw or eccentric locking collar



SUBPF, SUCPF, SUGPF

Dimension table - Dimensions in mm

Designation			Mass	Dimensions							
Unit ¹⁾	Housing	Radial insert ball bearing		d	J	L	A	A ₁	A ₂	N	B
			m ≈ kg								
SUBPF204	GEHPF204	SUB204	0,29	20	63,5	87	27,8	13,4	18	11	26
SUCPF204	GEHPF204	SUC204	0,31	20	63,5	87	27,8	13,4	18	11	31
SUBPF205	GEHPF205	SUB205	0,34	25	70	94,5	27,9	14,3	17	11	28
SUCPF205	GEHPF205	SUC205	0,38	25	70	94,5	27,9	14,3	17	11	34,1
SUBPF206	GEHPF206	SUB206	0,48	30	83	107	31,5	14,3	19,2	11	30,5
SUCPF206	GEHPF206	SUC206	0,52	30	83	107	31,5	14,3	19,2	11	38,1
SUBPF207	GEHPF207	SUB207	0,68	35	92	117	34,8	15,5	21,5	13	35,45
SUCPF207	GEHPF207	SUC207	0,74	35	92	117	34,8	15,5	21,5	13	42,9
SUBPF208	GEHPF208	SUB208	0,89	40	102	130	37,5	17	23	14	39,45
SUCPF208	GEHPF208	SUC208	0,98	40	102	130	37,5	17	23	14	49,2
SUBPF209²⁾	GEHPF209	SUB209	1	45	105	137	41	19	24	17	41,5
SUCPF209²⁾	GEHPF209	SUC209	1,1	45	105	137	41	19	24	17	49,2
SUBPF210²⁾	GEHPF210	SUB210	1,16	50	111	143	43	21	25	17	43,5
SUCPF210²⁾	GEHPF210	SUC210	1,31	50	111	143	43	21	25	17	51,6

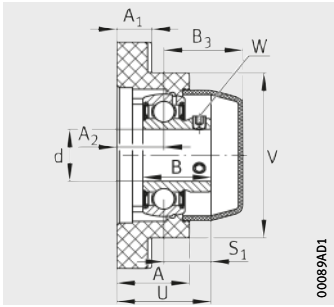
Dimension table - Dimensions in mm

Designation			Mass	Dimensions							
Unit ¹⁾³⁾	Housing	Radial insert ball bearing		d	J	L	A	A ₁	A ₂	N	B ₁
			m ≈ kg								
SUGPF204	GEHPF204	SUG204	0,32	20	63,5	87	27,8	13,4	18	11	31,5
SUGPF205	GEHPF205	SUG205	0,36	25	70	94,5	27,9	14,3	17	11	32
SUGPF206	GEHPF206	SUG206	0,51	30	83	107	31,5	14,3	19,2	11	36,3
SUGPF207	GEHPF207	SUG207	0,76	35	92	117	34,8	15,5	21,5	13	39,5
SUGPF208	GEHPF208	SUG208	0,94	40	102	130	37,5	17	23	14	43,8
SUGPF209²⁾	GEHPF209	SUG209	1,1	45	105	137	41	19	24	17	43,8
SUGPF210²⁾	GEHPF210	SUG210	1,26	50	111	143	43	21	25	17	44,3

1) Available end caps, see page 435.

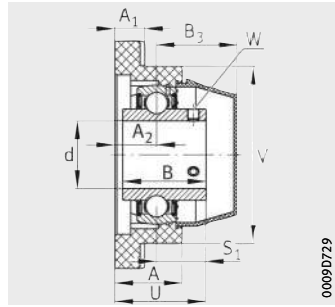
2) Available by agreement.

3) For these series, Back Seal components are also available, see page 436.



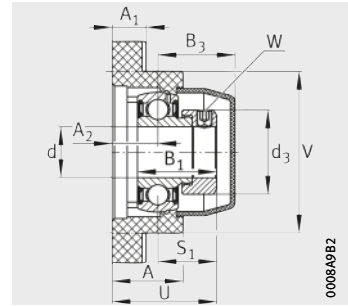
SUBPF

00089AD1



SUCPF

0009D729



SUGPF

0008A9B2

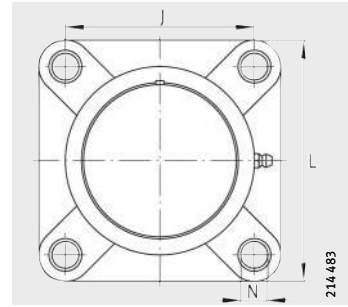
					Width across flats W	Load carrying capacity			
						Bearing			Housing C _{0rG} N
					Basic load ratings		Fatigue limit load C _{ur} N		
B ₃	S ₁	U	V	Q	dyn. C _r N	stat. C _{0r} N			
30,2	18	36	63,5	1/4" - 28 UNF	2,5	12 300	6 300	300	10 200
30,2	18,3	36,3	63,5	1/4" - 28 UNF	2,5	12 300	6 300	300	10 200
33,1	19,5	36,5	70	1/4" - 28 UNF	2,5	13 400	7 500	360	12 100
33,1	19,8	36,8	70	1/4" - 28 UNF	2,5	13 400	7 500	360	12 100
39,5	21	40,2	80	1/4" - 28 UNF	3	18 700	10 700	510	17 700
39,5	22,2	41,4	80	1/4" - 28 UNF	3	18 700	10 700	510	17 700
42,1	25,45	46,95	90	1/4" - 28 UNF	3	24 600	14 600	700	18 500
42,1	25,4	46,9	90	1/4" - 28 UNF	3	24 600	14 600	700	18 500
48	28,95	51,95	99	1/4" - 28 UNF	4	31 500	18 900	910	19 200
48	30,2	53,2	99	1/4" - 28 UNF	4	31 500	18 900	910	19 200
53,7	30,5	54,5	105	1/4" - 28 UNF	4	31 500	19 400	930	19 300
53,7	30,2	54,2	105	1/4" - 28 UNF	4	31 500	19 400	930	19 300
60,7	32	57	115	1/4" - 28 UNF	5	33 500	22 100	1 060	19 600
60,7	32,6	57,6	115	1/4" - 28 UNF	5	33 500	22 100	1 060	19 600



						Width across flats W	Load carrying capacity			
							Bearing			Housing C _{0rG} N
						Basic load ratings		Fatigue limit load C _{ur} N		
B ₃	S ₁	U	V	Q	d ₃ max.	dyn. C _r N	stat. C _{0r} N			
30,2	23,5	41,5	63,5	1/4" - 28 UNF	33	3	12 300	6 300	300	10 200
33,1	23,5	40,5	70	1/4" - 28 UNF	37,5	3	13 400	7 500	360	12 100
39,5	26,8	46	80	1/4" - 28 UNF	44	4	18 700	10 700	510	17 700
42,1	29,5	51	90	1/4" - 28 UNF	55	5	24 600	14 600	700	18 500
48	32,8	55,8	99	1/4" - 28 UNF	58	5	31 500	18 900	910	19 200
53,7	32,8	56,8	105	1/4" - 28 UNF	63	5	31 500	19 400	930	19 300
60,7	32,8	57,8	115	1/4" - 28 UNF	69	5	33 500	22 100	1 060	19 600

Four-bolt flanged housing units

Plastic housing
 Radial insert ball bearing with Corrotect coating
 With eccentric locking collar



CUGPF

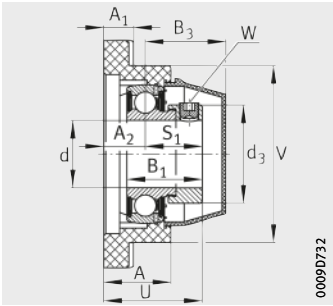
Dimension table - Dimensions in mm

Designation			Mass	Dimensions						
Unit ¹⁾²⁾	Housing	Radial insert ball bearing		m ≈ kg	d	J	L	A	A ₁	A ₂
CUGPF204	GEHPF204	GRAE20-XL-NPP-B-FA107/125	0,33	20	63,5	87	27,8	13,4	18	11
CUGPF205	GEHPF205	GRAE25-XL-NPP-B-FA107/125	0,39	25	70	94,5	27,9	14,3	17	11
CUGPF206	GEHPF206	GRAE30-XL-NPP-B-FA107/125	0,57	30	83	107	31,5	14,3	19,2	11
CUGPF207	GEHPF207	GRAE35-XL-NPP-B-FA107/125	0,85	35	92	117	34,8	15,5	21,5	13
CUGPF208	GEHPF208	GRAE40-XL-NPP-B-FA107/125	1,07	40	102	130	37,5	17	23	14
CUGPF209³⁾	GEHPF209	GRAE45-XL-NPP-B-FA107/125	1,2	45	105	137	41	19	24	17
CUGPF210³⁾	GEHPF210	GRAE50-XL-NPP-B-FA107/125	1,32	50	111	143	43	21	25	17

1) Available end caps, see page 435.

2) For these series, Back Seal components are also available, see page 436.

3) Available by agreement.



00090732

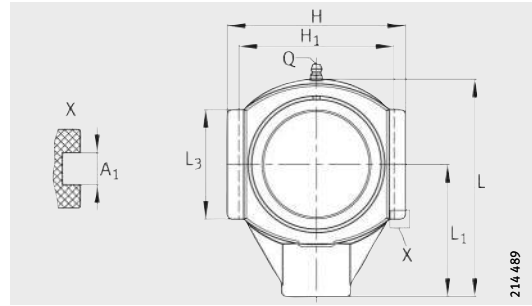
CUGPF

							Width across flats W	Load carrying capacity			
								Bearing			Housing C _{0rG} N
								Basic load ratings		Fatigue limit load	
B ₁	B ₃	S ₁	U	V	Q	d ₃ max.	dyn. C _r N	stat. C _{0r} N	C _{ur} N		
31	30,2	23,5	41,5	63,5	1/4" - 28 UNF	33	3	13 600	6 600	335	10 200
31	33,1	23,5	40,5	70	1/4" - 28 UNF	37,5	3	14 900	7 800	395	12 100
35,8	39,5	26,8	46	80	1/4" - 28 UNF	44	4	20 700	11 300	570	17 700
39	42,1	29,5	51	90	1/4" - 28 UNF	55	5	27 500	15 300	770	18 500
43,8	48	32,8	55,8	99	1/4" - 28 UNF	58	5	34 500	19 800	1 010	19 200
43,8	53,7	32,8	56,8	105	1/4" - 28 UNF	63	5	34 500	20 400	1 030	19 300
43,8	60,7	32,8	57,8	115	1/4" - 28 UNF	69	5	37 500	23 200	1 180	19 600



Take-up housing units

- Plastic housing
- Guide slots on both sides
- Hole for threaded rod
- Radial insert ball bearing in corrosion-resistant VA design
- With grub screw or eccentric locking collar



SUBPT, SUCPT, SUGPT

Dimension table - Dimensions in mm

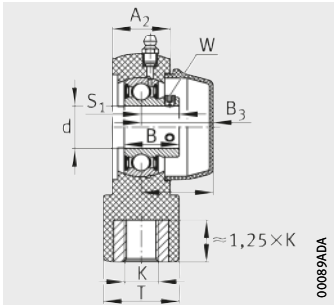
Designation			Mass	Dimensions							
Unit ¹⁾	Housing	Radial insert ball bearing		m ≈ kg	d	H	L	L ₁	L ₃	A ₁	A ₂
SUBPT204	GEHPT204	SUB204	0,35	20	89	99	64	46	12	27,5	76
SUCPT204	GEHPT204	SUC204	0,37	20	89	99	64	46	12	27,5	76
SUBPT205	GEHPT205	SUB205	0,37	25	89	99	64	46	12	27,5	76
SUCPT205	GEHPT205	SUC205	0,4	25	89	99	64	46	12	27,5	76
SUBPT206	GEHPT206	SUB206	0,62	30	102,5	125	76	63,5	12	34	89
SUCPT206	GEHPT206	SUC206	0,65	30	102,5	125	76	63,5	12	34	89
SUBPT207	GEHPT207	SUB207	0,71	35	102,5	125	76	63,5	12	34	89
SUCPT207	GEHPT207	SUC207	0,77	35	102,5	125	76	63,5	12	34	89
SUBPT208	GEHPT208	SUB208	0,9	40	114	140	85	80	16	34	102
SUCPT208	GEHPT208	SUC208	1	40	114	140	85	80	16	34	102
SUBPT209²⁾	GEHPT209	SUB209	1,09	45	117	149	90	85	16	40	102
SUCPT209²⁾	GEHPT209	SUC209	1,16	45	117	149	90	85	16	40	102
SUBPT210²⁾	GEHPT210	SUB210	1,21	50	117	149	90	85	16	40	102
SUCPT210²⁾	GEHPT210	SUC210	1,32	50	117	149	90	85	16	40	102

Dimension table - Dimensions in mm

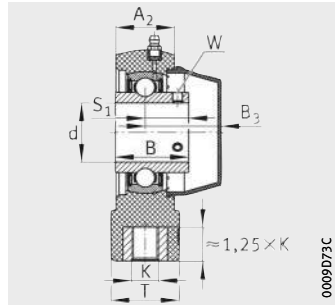
Designation			Mass	Dimensions							
Unit ¹⁾	Housing	Radial insert ball bearing		m ≈ kg	d	H	L	L ₁	L ₃	A ₁	A ₂
SUGPT204	GEHPT204	SUG204	0,38	20	89	99	64	46	12	27,5	76
SUGPT205	GEHPT205	SUG205	0,4	25	89	99	64	46	12	27,5	76
SUGPT206	GEHPT206	SUG206	0,67	30	102,5	125	76	63,5	12	34	89
SUGPT207	GEHPT207	SUG207	0,81	35	102,5	125	76	63,5	12	34	89
SUGPT208	GEHPT208	SUG208	0,98	40	114	140	85	80	16	34	102
SUGPT209²⁾	GEHPT209	SUG209	1,19	45	117	149	90	85	16	40	102
SUGPT210²⁾	GEHPT210	SUG210	1,31	50	117	149	90	85	16	40	102

¹⁾ Available end caps, see page 435.

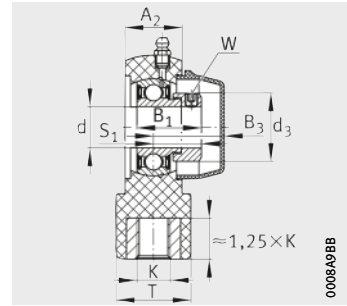
²⁾ Available by agreement.



SUBPT



SUCPT



SUGPT

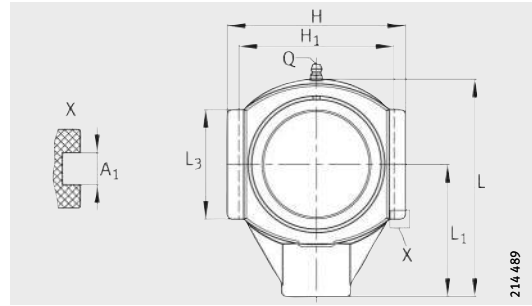
						Width across flats W	Load carrying capacity			
							Bearing			Housing C _{OrG} N
						Basic load ratings		Fatigue limit load C _{ur} N		
B	B ₃	K	T	S ₁	Q	dyn. C _r N	stat. C _{Or} N			
26	34,05	M16	36	18	1/4" – 28 UNF	2,5	12 300	6 300	300	9 600
31	34,05	M16	36	18,3	1/4" – 28 UNF	2,5	12 300	6 300	300	9 600
28	35,95	M16	36	19,5	1/4" – 28 UNF	2,5	13 400	7 500	360	10 000
34,1	35,95	M16	36	19,8	1/4" – 28 UNF	2,5	13 400	7 500	360	10 000
30,5	43,5	M16	40	21	1/4" – 28 UNF	3	18 700	10 700	510	10 200
38,1	43,5	M16	40	22,2	1/4" – 28 UNF	3	18 700	10 700	510	10 200
35,45	45,2	M16	40	25,45	1/4" – 28 UNF	3	24 600	14 600	700	10 700
42,9	45,2	M16	40	25,4	1/4" – 28 UNF	3	24 600	14 600	700	10 700
39,45	50,6	M16	40	28,95	1/4" – 28 UNF	4	31 500	18 900	910	11 200
49,2	50,6	M16	40	30,2	1/4" – 28 UNF	4	31 500	18 900	910	11 200
41,5	57,6	M20	50	30,5	1/4" – 28 UNF	4	31 500	19 400	930	11 800
49,2	57,6	M20	50	30,2	1/4" – 28 UNF	4	31 500	19 400	930	11 800
43,5	63,6	M20	50	32	1/4" – 28 UNF	5	33 500	22 100	1 060	12 200
51,6	63,6	M20	50	32,6	1/4" – 28 UNF	5	33 500	22 100	1 060	12 200



							Width across flats W	Load carrying capacity			
								Bearing			Housing C _{OrG} N
							Basic load ratings		Fatigue limit load C _{ur} N		
B ₁	B ₃	K	T	S ₁	Q	d ₃ max.	dyn. C _r N	stat. C _{Or} N			
31,5	34,05	M16	36	23,5	1/4" – 28 UNF	33	3	12 300	6 300	300	9 600
32	35,95	M16	36	23,5	1/4" – 28 UNF	37,5	3	13 400	7 500	360	10 000
36,3	43,5	M16	40	26,8	1/4" – 28 UNF	44	4	18 700	10 700	510	10 200
39,5	45,2	M16	40	29,5	1/4" – 28 UNF	55	5	24 600	14 600	700	10 700
43,8	50,6	M16	40	32,8	1/4" – 28 UNF	58	5	31 500	18 900	910	11 200
43,8	57,6	M20	50	32,8	1/4" – 28 UNF	63	5	31 500	19 400	930	11 800
44,3	63,6	M20	50	32,8	1/4" – 28 UNF	69	5	33 500	22 100	1 060	12 200

Take-up housing units

- Plastic housing
- Guide slots on both sides
- Hole for threaded rod
- Radial insert ball bearing with Corrotect coating
- With eccentric locking collar



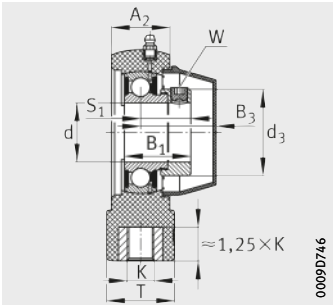
CUGPT

Dimension table - Dimensions in mm

Designation			Mass m ≈ kg	Dimensions						
Unit ¹⁾	Housing	Radial insert ball bearing		d	H	L	L ₁	L ₃	A ₁	A ₂
CUGPT204	GEHPT204	GRAE20-XL-NPP-B-FA107/125	0,4	20	89	99	64	46	12	27,5
CUGPT205	GEHPT205	GRAE25-XL-NPP-B-FA107/125	0,41	25	89	99	64	46	12	27,5
CUGPT206	GEHPT206	GRAE30-XL-NPP-B-FA107/125	0,72	30	102,5	125	76	63,5	12	34
CUGPT207	GEHPT207	GRAE35-XL-NPP-B-FA107/125	0,87	35	102,5	125	76	63,5	12	34
CUGPT208	GEHPT208	GRAE40-XL-NPP-B-FA107/125	1,05	40	114	140	85	80	16	34
CUGPT209²⁾	GEHPT209	GRAE45-XL-NPP-B-FA107/125	1,19	45	117	149	90	85	16	40
CUGPT210	GEHPT210	GRAE50-XL-NPP-B-FA107/125	1,28	50	117	149	90	85	16	40

¹⁾ Available end caps, see page 435.

²⁾ Available by agreement.



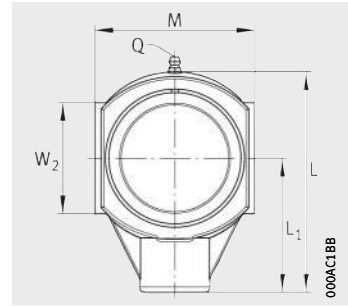
CUGPT

								Width across flats W	Load carrying capacity			
									Bearing			Housing C _{OrG} N
									Basic load ratings		Fatigue limit load	
H ₁	B ₁	B ₃	K	T	S ₁	Q	d ₃ max.	dyn. C _r N	stat. C _{Or} N	C _{ur} N	C _{OrG} N	
76	31	34,05	M16	36	23,5	1/4" - 28 UNF	33	3	13 600	6 600	335	9 600
76	31	35,95	M16	36	23,5	1/4" - 28 UNF	37,5	3	14 900	7 800	395	10 000
89	35,8	43,5	M16	40	26,8	1/4" - 28 UNF	44	4	20 700	11 300	570	10 200
89	39	45,2	M16	40	29,5	1/4" - 28 UNF	55	5	27 500	15 300	770	10 700
102	43,8	50,6	M16	40	32,8	1/4" - 28 UNF	58	5	34 500	19 800	1 010	11 200
102	43,8	57,6	M20	50	32,8	1/4" - 28 UNF	63	5	34 500	20 400	1 030	11 800
102	43,8	63,6	M20	50	32,8	1/4" - 28 UNF	69	5	37 500	23 200	1 180	12 200



Take-up housing units

- Plastic housing
- Guide surfaces on both sides
- Hole for threaded rod
- Radial insert ball bearing in corrosion-resistant VA design
- With grub screw or eccentric locking collar



SUBPHE, SUCPHE, SUGPHE

Dimension table - Dimensions in mm

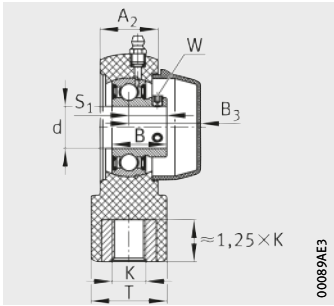
Designation			Mass m ≈ kg	Dimensions						
Unit ¹⁾	Housing	Radial insert ball bearing		d	M	L	L ₁	W ₂	A ₂	B
SUBPHE204	GEHPHE204	SUB204	0,32	20	65	99	64	46	27,5	26
SUCPHE204	GEHPHE204	SUC204	0,35	20	65	99	64	46	27,5	31
SUBPHE205	GEHPHE205	SUB205	0,35	25	74	99	64	46	27,5	28
SUCPHE205	GEHPHE205	SUC205	0,39	25	74	99	64	46	27,5	34,1
SUBPHE206	GEHPHE206	SUB206	0,6	30	90	125	76	63,5	34	30,5
SUCPHE206	GEHPHE206	SUC206	0,63	30	90	125	76	63,5	34	38,1
SUBPHE207	GEHPHE207	SUB207	0,69	35	90	125	76	63,5	34	35,45
SUCPHE207	GEHPHE207	SUC207	0,75	35	90	125	76	63,5	34	42,9
SUBPHE208	GEHPHE208	SUB208	0,87	40	100	140	85	80	34	39,45
SUCPHE208	GEHPHE208	SUC208	0,97	40	100	140	85	80	34	49,2
SUBPHE209²⁾	GEHPHE209	SUB209	1,07	45	110	149	90	85	40	41,5
SUCPHE209²⁾	GEHPHE209	SUC209	1,13	45	110	149	90	85	40	49,2
SUBPHE210²⁾	GEHPHE210	SUB210	1,17	50	110	149	90	85	40	43,5
SUCPHE210²⁾	GEHPHE210	SUC210	1,28	50	110	149	90	85	40	51,6

Dimension table - Dimensions in mm

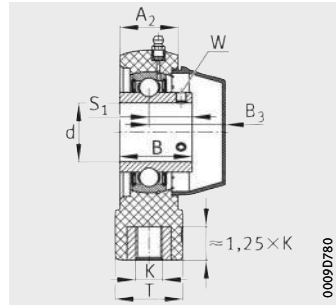
Designation			Mass m ≈ kg	Dimensions						
Unit ¹⁾	Housing	Radial insert ball bearing		d	M	L	L ₁	W ₂	A ₂	B ₁
SUGPHE204	GEHPHE204	SUG204	0,35	20	65	99	64	46	27,5	31,5
SUGPHE205	GEHPHE205	SUG205	0,38	25	74	99	64	46	27,5	32
SUGPHE206	GEHPHE206	SUG206	0,65	30	90	125	76	63,5	34	36,3
SUGPHE207	GEHPHE207	SUG207	0,79	35	90	125	76	63,5	34	39,5
SUGPHE208	GEHPHE208	SUG208	0,95	40	100	140	85	80	34	43,8
SUGPHE209²⁾	GEHPHE209	SUG209	1,16	45	110	149	90	85	40	43,8
SUGPHE210²⁾	GEHPHE210	SUG210	1,27	50	110	149	90	85	40	44,3

¹⁾ Available end caps, see page 435.

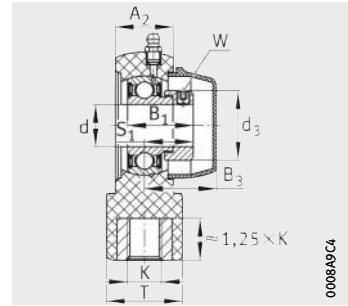
²⁾ Available by agreement.



SUBPHE



SUCPHE



SUGPHE

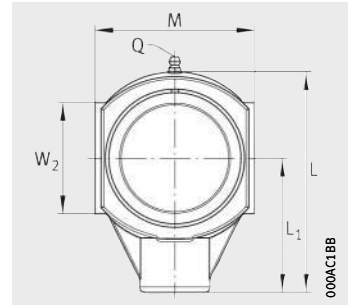
					Width across flats	Load carrying capacity			
						W	Bearing		
					W		Basic load ratings		Fatigue limit load
B ₃	K	T	S ₁	Q		dyn. C _r	stat. C _{0r}	C _{ur}	
						N	N	N	N
34,05	M16	36	18	1/4" - 28 UNF	2,5	12 300	6 300	300	9 600
34,05	M16	36	18,3	1/4" - 28 UNF	2,5	12 300	6 300	300	9 600
35,95	M16	36	19,5	1/4" - 28 UNF	2,5	13 400	7 500	360	10 000
35,95	M16	36	19,8	1/4" - 28 UNF	2,5	13 400	7 500	360	10 000
43,5	M16	40	21	1/4" - 28 UNF	3	18 700	10 700	510	10 200
43,5	M16	40	22,2	1/4" - 28 UNF	3	18 700	10 700	510	10 200
45,2	M16	40	25,45	1/4" - 28 UNF	3	24 600	14 600	700	10 700
45,2	M16	40	25,4	1/4" - 28 UNF	3	24 600	14 600	700	10 700
50,6	M16	40	28,95	1/4" - 28 UNF	4	31 500	18 900	910	11 200
50,6	M16	40	30,2	1/4" - 28 UNF	4	31 500	18 900	910	11 200
57,6	M20	50	30,5	1/4" - 28 UNF	4	31 500	19 400	930	11 800
57,6	M20	50	30,2	1/4" - 28 UNF	4	31 500	19 400	930	11 800
63,6	M20	50	32	1/4" - 28 UNF	5	33 500	22 100	1 060	12 200
63,6	M20	50	32,6	1/4" - 28 UNF	5	33 500	22 100	1 060	12 200



						Width across flats	Load carrying capacity			
							W	Bearing		
						W		Basic load ratings		Fatigue limit load
B ₃	K	T	S ₁	Q	d ₃		dyn. C _r	stat. C _{0r}	C _{ur}	
					max.	N	N	N	N	
34,05	M16	36	23,5	1/4" - 28 UNF	33	3	12 300	6 300	300	9 600
35,95	M16	36	23,5	1/4" - 28 UNF	37,5	3	13 400	7 500	360	10 000
43,5	M16	40	26,8	1/4" - 28 UNF	44	4	18 700	10 700	510	10 200
45,2	M16	40	29,5	1/4" - 28 UNF	55	5	24 600	14 600	700	10 700
50,6	M16	40	32,8	1/4" - 28 UNF	58	5	31 500	18 900	910	11 200
57,6	M20	50	32,8	1/4" - 28 UNF	63	5	31 500	19 400	930	11 800
63,6	M20	50	32,8	1/4" - 28 UNF	69	5	33 500	22 100	1 060	12 200

Take-up housing units

- Plastic housing
- Guide surfaces on both sides
- Hole for threaded rod
- Radial insert ball bearing with Corrotect coating
- With eccentric locking collar



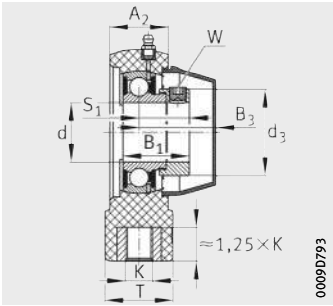
CUGPHE

Dimension table - Dimensions in mm

Designation			Mass m ≈ kg	Dimensions					
Unit ¹⁾	Housing	Radial insert ball bearing		d	M	L	L ₁	W ₂	A ₂
CUGPHE204	GEHPHE204	GRAE20-XL-NPP-B-FA107/125	0,37	20	65	99	64	46	27,5
CUGPHE205	GEHPHE205	GRAE25-XL-NPP-B-FA107/125	0,39	25	74	99	64	46	27,5
CUGPHE206	GEHPHE206	GRAE30-XL-NPP-B-FA107/125	0,69	30	90	125	76	63,5	34
CUGPHE207	GEHPHE207	GRAE35-XL-NPP-B-FA107/125	0,84	35	90	125	76	63,5	34
CUGPHE208	GEHPHE208	GRAE40-XL-NPP-B-FA107/125	1,02	40	100	140	85	80	34
CUGPHE209²⁾	GEHPHE209	GRAE45-XL-NPP-B-FA107/125	1,16	45	110	149	90	85	40
CUGPHE210²⁾	GEHPHE210	GRAE50-XL-NPP-B-FA107/125	1,24	50	110	149	90	85	40

¹⁾ Available end caps, see page 435.

²⁾ Available by agreement.



CUGPHE

							Width across flats W	Load carrying capacity			
								Bearing			Housing C _{0rG} N
								Basic load ratings		Fatigue limit load C _{ur} N	
B ₁	B ₃	K	T	S ₁	Q	d ₃ max.	dyn. C _r N	stat. C _{0r} N			
31	34,05	M16	36	23,5	1/4" - 28 UNF	33	3	13 600	6 600	335	9 600
31	35,95	M16	36	23,5	1/4" - 28 UNF	37,5	3	14 900	7 800	395	10 000
35,8	43,5	M16	40	26,8	1/4" - 28 UNF	44	4	20 700	11 300	570	10 200
39	45,2	M16	40	29,5	1/4" - 28 UNF	55	5	27 500	15 300	770	10 700
43,8	50,6	M16	40	32,8	1/4" - 28 UNF	58	5	34 500	19 800	1 010	11 200
43,8	57,6	M20	50	32,8	1/4" - 28 UNF	63	5	34 500	20 400	1 030	11 800
43,8	63,6	M20	50	32,8	1/4" - 28 UNF	69	5	37 500	23 200	1 180	12 200





Black Series

Radial insert ball bearings and housing units



FAG Black Series, radial insert ball bearings and housing units

Radial insert ball bearings 470

Black Series

The new radial insert ball bearing and housing units FAG Black Series from Schaeffler give easy mounting, smooth running and high reliability and thus allow particularly economical bearing arrangements.

FAG radial insert ball bearings with a spherical outer ring are based on single row deep groove ball bearings 62 and are designed in accordance with JIS B 1558. The outer and inner rings as well as the flinger shields of the radial insert ball bearings are provided with the Durotect BS coating in order to offer basic protection against corrosion. The Black Series radial insert ball bearings are available with two location methods and one type of seal. They can be relubricated and are particularly easy to install.

Housing units 488

Black Series

The dimensions of the FAG housings, made from flake graphite cast iron and with a primer paint coating, conform to JIS B 1559. These single piece cast housings can support moderate to high radial and axial loads. The radial insert ball bearings have basic protection against corrosion due to the Durotect BS coating.

The bearing units are particularly suitable for applications with moderate to high loads.

Typical areas of application for these bearings include the agricultural, construction and mining sector, power transmission and conveying equipment as well as in pumps, textile, paper and woodworking machinery, in machinery for the timber, filling and packaging industries and in the steel industry.

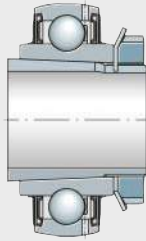
Housing units in accordance with JIS B 1557 comprise FAG flake graphite cast iron housings with a concave bore in which FAG radial insert ball bearings are fitted. These units are matched to each other and are available as plummer block housing units, flanged housing units and take-up housing units.

Radial insert ball bearings with a spherical outer ring, when fitted in housings with a concave bore, can compensate for static misalignment of the shaft.

Housing units are supplied with a loose packed lubrication nipple and integrated end cap for the lubrication nipple as well as an Allen key.

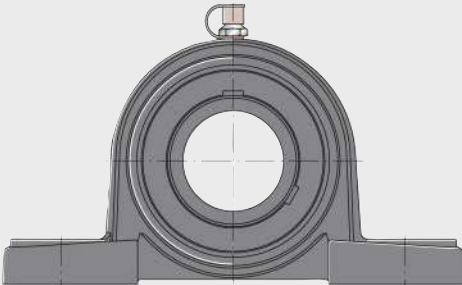


UC

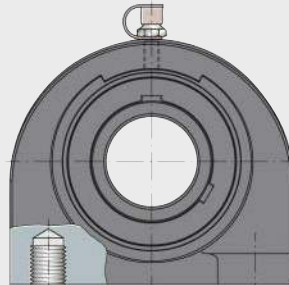


UK

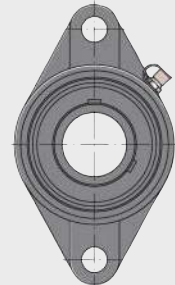
0008B528



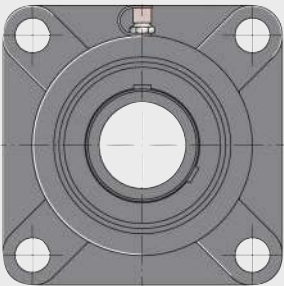
P



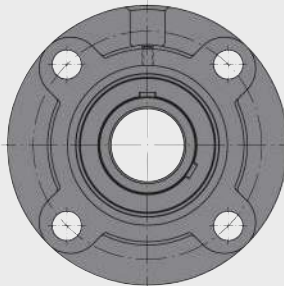
PA



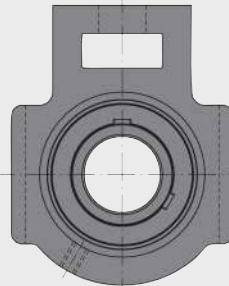
FL



F



FC



T



FA



0008B531



Radial insert ball bearings

Radial insert ball bearings

	Page
Matrix	Features of radial insert ball bearings, comparison of series 472
Product overview	Radial insert ball bearings 474
Features	Anti-corrosion protection 475 Location on shaft..... 475 Sealing..... 476 Operating temperature 476
Design and safety guidelines	Compensation of static misalignments..... 477 Minimum radial load 477 Speed limits for radial insert ball bearings 478 Shaft tolerances for radial insert ball bearings 479
Accuracy	Standard tolerances of radial insert ball bearings..... 479 Radial internal clearance of radial insert ball bearings..... 480
Dimension tables	Radial insert ball bearings with grub screws in inner ring, spherical outer ring 482 Radial insert ball bearings with adapter sleeve, spherical outer ring 486



**Features of
radial insert ball bearings,
comparison of series**

Series	Shaft diameter				Location
	mm		inch		
	from	to	from	to	
UC	12	90	1/2	3 1/2	Grub screw
UK	20	80	–	–	Adapter sleeve to JIS B 1552

- 1) Attention!
Recommended operating temperature of bearing series.
If temperatures exceed +100 °C, relubrication must be carried out regularly.
- 2) Temperature peaks of up to +120 °C possible for short periods.

Seal	Compensation of misalignment	Internal clearance	Cage	Grease	Relubrication facility	Temperature ¹⁾ °C		Comments	Dimension table
						from	up to		Page
RSR	yes	C3	PA66	GA13	yes	-20	+100 ²⁾	Corrosion-resistant	482
RSR	yes	C4	PA66	GA13	yes	-20	+100 ²⁾	Corrosion-resistant	486



Product overview Radial insert ball bearings

**With grub screws
in inner ring**
Spherical outer ring



With adapter sleeve
Spherical outer ring



Radial insert ball bearings

Features These radial insert ball bearings are based on single row deep groove ball bearings 62 and comprise a solid section outer ring and an inner ring extended on both sides.

The bearings have plastic cages and are sealed on both sides by single piece seals RSR with a vulcanised seal lip and an outer flinger shield.

The honed raceways of the bearing rings, in conjunction with the high ball grade, ensure quiet running and a reduced frictional torque.

The outer ring has a spherical outside surface. In combination with a housing matched to the design, bearings with a spherical outer ring can compensate static misalignments of the shaft, see page 477.

The radial insert ball bearings are pregreased and can be relubricated by means of two lubrication holes in the outer ring.

Inch size designs The radial insert ball bearings are also available with inch size bore dimensions, see dimension table.

Anti-corrosion protection The inner and outer rings as well as the flinger shields of the radial insert ball bearings are provided with the black Durotect BS coating in order to offer basic protection against corrosion.

Adapter sleeves have a Durotect BS or phosphate coating.

Location on shaft Radial insert ball bearings are particularly easy to fit and are preferentially suitable for drawn shafts with the tolerances h6 \oplus to h9 \oplus .

In the radial insert ball bearings UC, the inner ring is located on the shaft by means of two grub screws offset by 120°, *Figure 1*, page 476. They are suitable for bearing arrangements with a constant direction of rotation or, under low speed and load, for an alternating direction of rotation.

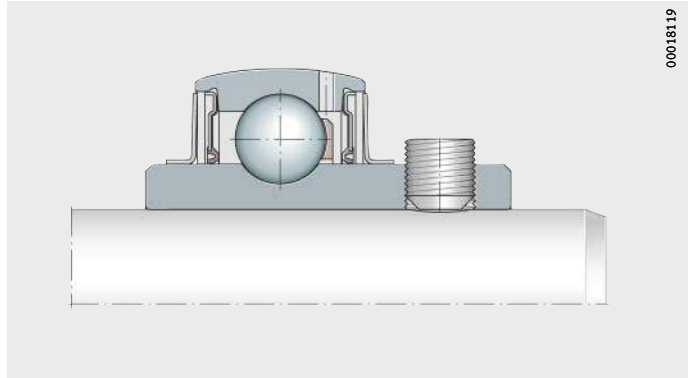
The grub screws are self-retaining and have a fine pitch thread with cup point for secure location of the bearings. In order to allow better differentiation, the metric grub screws have a Durotect BS coating while the inch size grub screws are zinc plated.

In the case of radial insert ball bearings UK, the inner ring is located on the shaft by means of a concentric adapter sleeve in accordance with JIS B 1552, *Figure 2*, page 476. The roughness of the adapter sleeve on the inside and outside is Ra 2,5. They are suitable for bearing arrangements with an alternating direction of rotation, even under high speed and load.



Radial insert ball bearings

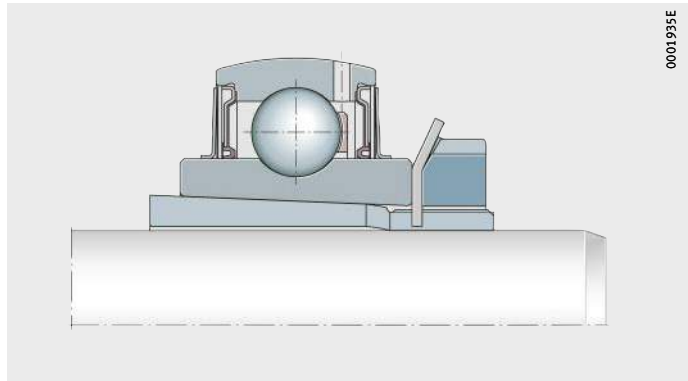
UC



00018119

Figure 1
Location by grub screws
in the inner ring

UK



0001935E

Figure 2
Location by adapter sleeve

Tightening torques

Tightening torques for metric and inch size grub screws, see table, page 500.
Tightening torques for locknuts, see table, page 501.

Sealing

FAG Black Series radial insert ball bearings are supplied with seals RSR, see table.

Seal types

Seal RSR	
	<p>0001811A</p> <p>Single piece, zinc plated sheet steel washer with vulcanised and radially preloaded seal lip made from NBR and additional flinger shield</p>

Operating temperature

The insert bearings are suitable for operating temperatures of $-20\text{ }^{\circ}\text{C}$ to $+100\text{ }^{\circ}\text{C}$. Temperature peaks of up to $+120\text{ }^{\circ}\text{C}$ are possible for short periods.



In the case of temperatures over $\vartheta = +100\text{ }^{\circ}\text{C}$, relubrication must be carried out regularly.

Design and safety guidelines

Compensation of static misalignments

Bearings with a spherical outer ring, fitted in housings with a concave bore, can compensate for static misalignment of the shaft, *Figure 3*:

For units with a lubrication groove in the housing and a lubrication hole in the radial insert ball bearing, the following applies:

- Up to $\pm 2,5^\circ$, the units can be relubricated.
- Between $\pm 2,5^\circ$ and $\pm 5^\circ$, the facility for relubrication is dependent on the specific unit. Please contact us in this case.
- Above $\pm 5^\circ$, relubrication is no longer possible.



The units must not be used to support swivelling or tumbling motion.

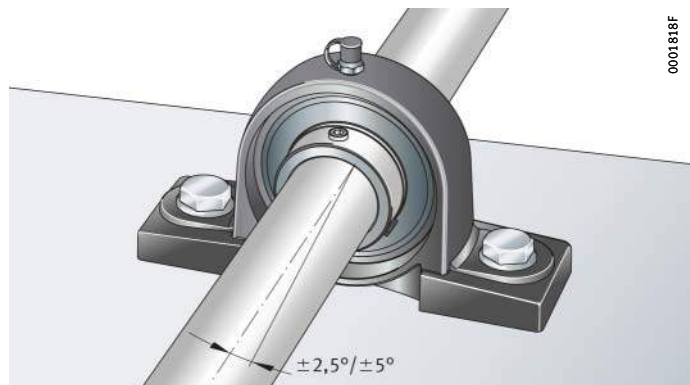


Figure 3
Compensation of static shaft misalignment

Minimum radial load

In order to ensure slippage-free operation, the bearings must be subjected to a minimum radial load. This applies particularly in the case of high speeds and high accelerations. In continuous operation, a minimum radial load of the order of $P \cong 0,01 \cdot C_r$ is necessary for ball bearings with cage.



Radial insert ball bearings

Speed limits for radial insert ball bearings

The speed limits are dependent on the load, the clearance between the bearing bore and shaft and the friction of the seals in the case of bearings with contact seals.

Guide values for the permissible speeds can be derived from the diagram, *Figure 4*.

In the case of load ratios $C_r/P > 13$, the speeds can be increased. At $C_r/P < 5$, location by means of a fit is recommended, see section Conditions of rotation, chapter Technical principles, Catalogue HR 1, Rolling Bearings. For both types of applications, please contact us.

Example of permissible speed calculation

Given:

- Shaft tolerance h6 ©
- Radial insert ball bearing UC206
- Basic dynamic load rating C_r 20 700 N
- Load P 1 300 N
- Sealing Seals RSR.

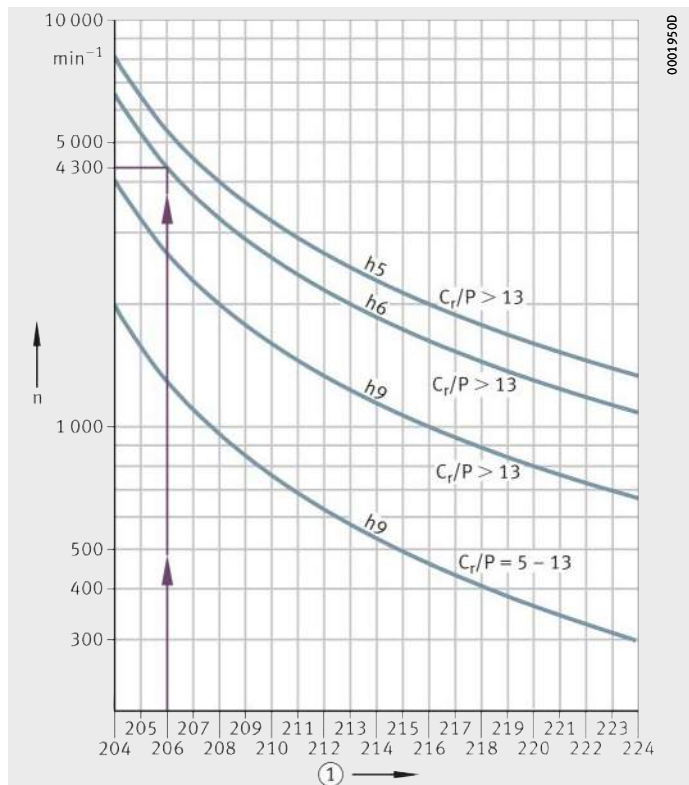
Required:

- Load ratio $C_r/P = 20\,700\text{ N}/1\,300\text{ N}$ $C_r/P > 13$
- Permissible speed $n \approx 4\,300\text{ min}^{-1}$, *Figure 4*.

n = permissible speed
 h5, h6, h9 = shaft tolerance
 (this is subject to the envelope requirement ©)
 C_r/P = load ratio

① Ball set
 (bearings of sizes 201, 202, 203 and 204 all have the ball set 204)

Figure 4
 Permissible speeds for radial insert ball bearings with seals RSR



Shaft tolerances for radial insert ball bearings

The permissible shaft tolerance is dependent on the speed and load. Tolerances h6 \oplus to h9 \oplus are recommended.

Conventional drawn shafts will suffice for most applications.

Accuracy Standard tolerances of radial insert ball bearings

The outside diameter tolerances of the bearings conform to the tolerances in accordance with JIS B 1558. The inner ring bore has a plus tolerance to allow easier mounting of the bearing, see tables.

Inner ring tolerances

Nominal bearing bore diameter d mm		Variation ¹⁾ Δ_{dmp} μm		Width deviation Δ_{Bs} μm	
over	incl.	min.	max.	min.	max.
10	18	0	+15	-120	0
18	31,75	0	+18	-120	0
31,75	50,8	0	+21	-120	0
50,8	80,962	0	+24	-150	0
80,962	120	0	+28	-200	0

¹⁾ This corresponds to the arithmetic mean value derived from the largest and smallest diameters (measured using a two-point measuring device).

Outer ring tolerances

Nominal outside diameter D_{sp} mm		Variation ¹⁾ Δ_{Dm} μm	
over	incl.	min.	max.
30	50	-11	0
50	80	-13	0
80	120	-15	0
120	150	-18	0
150	180	-25	0
180	250	-30	0

¹⁾ In the case of sealed bearings, the largest and smallest values of the outside diameter can deviate from the mean value by approx. 0,03 mm.



Radial insert ball bearings

Radial internal clearance of radial insert ball bearings

The radial internal clearance in accordance with JIS B 1520 is C3 for radial insert ball bearings UC and C4 for radial insert ball bearings UK. It is thus larger than in the case of normal deep groove ball bearings, see table.

The larger internal clearance allows better support of misalignments and shaft deflection.

Radial internal clearance

Bore		Ball set	Outside diameter D mm	Radial internal clearance			
d mm	inch			C3 μm		C4 μm	
				min.	max.	min.	max.
12	–	204	47	13	28	20	36
12,7	1/2						
14,288	9/16						
15	–						
15,875	5/8						
17	–						
17,462	11/16						
19,05	3/4						
20	–						
20,638	13/16	205	52	13	28	23	41
22,225	7/8						
23,812	15/16						
25	–						
25,4	1						
26,988	11/16						
28,575	11/8	206	62	13	28	23	41
30	–						
30,162	13/16						
31,75	11/4						
31,75	11/4						
33,338	15/16						
34,925	13/8	207	72	15	33	28	46
35	–						
36,512	17/16						
38,1	11/2						
39,688	19/16						
40	–						
41,275	15/8	209	85	18	36	30	51
42,862	111/16						
44,45	13/4						
45	–						
46,038	113/16						
47,625	17/8						
49,212	115/16	210	90	18	36	30	51
50	–						
50,8	2						

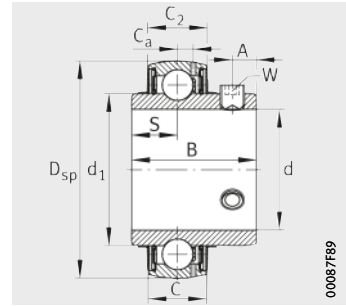
Radial internal clearance
(continued)

Bore		Ball set	Outside diameter D mm	Radial internal clearance			
d mm	inch			C3 μm		C4 μm	
				min.	max.	min.	max.
50,8	2	211	100	23	43	38	61
52,388	2 ¹ / ₁₆						
53,975	2 ¹ / ₈						
55	–						
55,562	2 ³ / ₁₆						
57,15	2 ¹ / ₄	212	110	23	43	38	61
58,738	2 ⁵ / ₁₆						
60	–						
60,325	2 ³ / ₈						
61,912	2 ⁷ / ₁₆						
63,5	2 ¹ / ₂	213	120	23	43	38	61
65	–						
65,09	2 ⁹ / ₁₆						
66,675	2 ⁵ / ₈	214	125	23	43	38	61
68,262	2 ¹¹ / ₁₆						
69,85	2 ³ / ₄						
70	–						
71,438	2 ¹³ / ₁₆						
73,025	2 ⁷ / ₈	215	130	25	51	46	71
74,612	2 ¹⁵ / ₁₆						
75	–						
76,2	3						
77,787	3 ¹ / ₁₆						
79,375	3 ¹ / ₈	216	140	25	51	46	71
80	–						
80,962	3 ³ / ₁₆						
82,55	3 ¹ / ₄						
84,137	3 ⁵ / ₁₆						
85	–	217	150	25	51	46	71
87,312	3 ⁷ / ₁₆						
88,9	3 ¹ / ₂						
90	–	218	160	30	58	53	84
93,662	3 ¹¹ / ₁₆						
95	–	219	170	30	58	53	84
100	–						
100,012	3 ¹⁵ / ₁₆	220	180	30	58	53	84
101,6	4						



Radial insert ball bearings with grub screws in inner ring

Spherical outer ring



UC

Dimension table - Dimensions in mm and inch

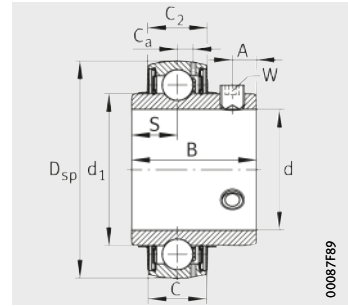
Designation	Mass m ≈ kg	Dimensions						
		d		D _{sp}	C	C ₂	B	S
		mm	inch					
UC201	0,2	12	–	47	17	16,8	31	12,7
UC201-08	0,2	12,7	1/2	47	17	16,8	31	12,7
UC202-09	0,19	14,288	9/16	47	17	16,8	31	12,7
UC202	0,18	15	–	47	17	16,8	31	12,7
UC202-10	0,18	15,875	5/8	47	17	16,8	31	12,7
UC203	0,17	17	–	47	17	16,8	31	12,7
UC203-11	0,17	17,463	11/16	47	17	16,8	31	12,7
UC204-12	0,16	19,05	3/4	47	17	16,8	31	12,7
UC204	0,15	20	–	47	17	16,8	31	12,7
UC205-13	0,24	20,638	13/16	52	17	17,6	34,1	14,3
UC205-14	0,22	22,225	7/8	52	17	17,6	34,1	14,3
UC205-15	0,21	23,813	15/16	52	17	17,6	34,1	14,3
UC205	0,2	25	–	52	17	17,6	34,1	14,3
UC205-16	0,19	25,4	1	52	17	17,6	34,1	14,3
UC206-17	0,35	26,988	11/16	62	19	19,6	38,1	15,9
UC206-18	0,33	28,575	11/8	62	19	19,6	38,1	15,9
UC206	0,31	30	–	62	19	19,6	38,1	15,9
UC206-19	0,31	30,163	13/16	62	19	19,6	38,1	15,9
UC206-20	0,29	31,75	11/4	62	19	19,6	38,1	15,9
UC207-20	0,52	31,75	11/4	72	20	20,6	42,9	17,5
UC207-21	0,5	33,338	15/16	72	20	20,6	42,9	17,5
UC207-22	0,47	34,925	13/8	72	20	20,6	42,9	17,5
UC207	0,47	35	–	72	20	20,6	42,9	17,5
UC207-23	0,44	36,513	17/16	72	20	20,6	42,9	17,5
UC208-24	0,66	38,1	11/2	80	21	21,6	49,2	19
UC208-25	0,63	39,688	19/16	80	21	21,6	49,2	19
UC208	0,62	40	–	80	21	21,6	49,2	19
UC209-26	0,79	41,275	15/8	85	22	22,6	49,2	19
UC209-27	0,75	42,863	111/16	85	22	22,6	49,2	19
UC209-28	0,71	44,45	13/4	85	22	22,6	49,2	19
UC209	0,69	45	–	85	22	22,6	49,2	19
UC210-29	0,92	46,038	113/16	90	24	24,6	51,6	19
UC210-30	0,87	47,625	17/8	90	24	24,6	51,6	19
UC210-31	0,82	49,213	115/16	90	24	24,6	51,6	19
UC210	0,8	50	–	90	24	24,6	51,6	19
UC210-32	0,77	50,8	2	90	24	24,6	51,6	19

			Width across flats		Basic load ratings		Fatigue limit load	Factor
d ₁	C _a	A	W		dyn. C _r	stat. C _{0r}	C _{ur}	f ₀
			mm	inch	N	N		
27,56	4,2	5	3	–	13 600	6 600	335	13,1
27,56	4,2	5	–	1/8	13 600	6 600	335	13,1
27,56	4,2	5	–	1/8	13 600	6 600	335	13,1
27,56	4,2	5	3	–	13 600	6 600	335	13,1
27,56	4,2	5	–	1/8	13 600	6 600	335	13,1
27,56	4,2	5	3	–	13 600	6 600	335	13,1
27,56	4,2	5	–	1/8	13 600	6 600	335	13,1
27,56	4,2	5	–	1/8	13 600	6 600	335	13,1
27,56	4,2	5	3	–	13 600	6 600	335	13,1
33,83	4,2	5	–	1/8	14 900	7 800	395	13,8
33,83	4,2	5	–	1/8	14 900	7 800	395	13,8
33,83	4,2	5	–	1/8	14 900	7 800	395	13,8
33,83	4,2	5	3	–	14 900	7 800	395	13,8
33,83	4,2	5	–	1/8	14 900	7 800	395	13,8
40,2	5	5	–	1/8	20 700	11 300	570	13,8
40,2	5	5	–	1/8	20 700	11 300	570	13,8
40,2	5	5	3	–	20 700	11 300	570	13,8
40,2	5	5	–	1/8	20 700	11 300	570	13,8
40,2	5	5	–	1/8	20 700	11 300	570	13,8
46,84	5,7	7	–	5/32	27 500	15 300	770	13,8
46,84	5,7	7	–	5/32	27 500	15 300	770	13,8
46,84	5,7	7	–	5/32	27 500	15 300	770	13,8
46,84	5,7	7	4	–	27 500	15 300	770	13,8
46,84	5,7	7	–	5/32	27 500	15 300	770	13,8
52,27	6,2	8	–	5/32	34 500	19 800	1 010	14
52,27	6,2	8	–	5/32	34 500	19 800	1 010	14
52,27	6,2	8	4	–	34 500	19 800	1 010	14
57,91	6,3	8	–	5/32	34 500	20 400	1 030	14,3
57,91	6,3	8	–	5/32	34 500	20 400	1 030	14,3
57,91	6,3	8	–	5/32	34 500	20 400	1 030	14,3
57,91	6,3	8	4	–	34 500	20 400	1 030	14,3
62,84	6,5	10	–	3/16	37 500	23 200	1 180	14,3
62,84	6,5	10	–	3/16	37 500	23 200	1 180	14,3
62,84	6,5	10	–	3/16	37 500	23 200	1 180	14,3
62,84	6,5	10	5	–	37 500	23 200	1 180	14,3
62,84	6,5	10	–	3/16	37 500	23 200	1 180	14,3



Radial insert ball bearings with grub screws in inner ring

Spherical outer ring



UC

Dimension table (continued) · Dimensions in mm and inch

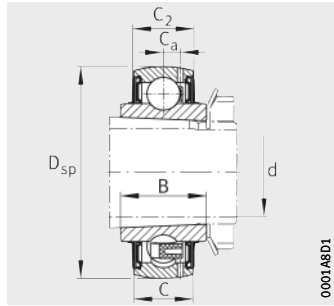
Designation	Mass m ≈ kg	Dimensions						
		d		D _{sp}	C	C ₂	B	S
		mm	inch					
UC211-32	1,22	50,8	2	100	25	25,6	55,6	22,2
UC211-33	1,17	52,388	2 ¹ / ₁₆	100	25	25,6	55,6	22,2
UC211-34	1,11	53,975	2 ¹ / ₈	100	25	25,6	55,6	22,2
UC211	1,07	55	–	100	25	25,6	55,6	22,2
UC211-35	1,05	55,563	2 ³ / ₁₆	100	25	25,6	55,6	22,2
UC212-36	1,62	57,15	2 ¹ / ₄	110	27	27,6	65,1	25,4
UC212-37	1,55	58,738	2 ⁵ / ₁₆	110	27	27,6	65,1	25,4
UC212	1,49	60	–	110	27	27,6	65,1	25,4
UC212-38	1,48	60,325	2 ³ / ₈	110	27	27,6	65,1	25,4
UC212-39	1,4	61,913	2 ⁷ / ₁₆	110	27	27,6	65,1	25,4
UC213-40	1,79	63,5	2 ¹ / ₂	120	28	29,4	65,1	25,4
UC213	1,72	65	–	120	28	29,4	65,1	25,4
UC213-41	1,71	65,088	2 ⁹ / ₁₆	120	28	29,4	65,1	25,4
UC214-42	2,17	66,675	2 ⁵ / ₈	125	30	31,4	74,6	30,2
UC214-43	2,07	68,263	2 ¹¹ / ₁₆	125	30	31,4	74,6	30,2
UC214-44	1,97	69,85	2 ³ / ₄	125	30	31,4	74,6	30,2
UC214	1,96	70	–	125	30	31,4	74,6	30,2
UC215-45	2,39	71,438	2 ¹³ / ₁₆	130	32	33,4	77,8	33,3
UC215-46	2,28	73,025	2 ⁷ / ₈	130	32	33,4	77,8	33,3
UC215-47	2,17	74,613	2 ¹⁵ / ₁₆	130	32	33,4	77,8	33,3
UC215	2,14	75	–	130	32	33,4	77,8	33,3
UC215-48	2,06	76,2	3	130	32	33,4	77,8	33,3
UC216-49	2,88	77,788	3 ¹ / ₁₆	140	33	34,4	82,6	33,3
UC216-50	2,76	79,375	3 ¹ / ₈	140	33	34,4	82,6	33,3
UC216	2,71	80	–	140	33	34,4	82,6	33,3
UC216-51	2,63	80,963	3 ³ / ₁₆	140	33	34,4	82,6	33,3
UC217-52	3,62	82,55	3 ¹ / ₄	150	35	36,4	85,7	34,1
UC217-53	3,48	84,138	3 ⁵ / ₁₆	150	35	36,4	85,7	34,1
UC217	3,41	85	–	150	35	36,4	85,7	34,1
UC217-55	3,2	87,313	3 ⁷ / ₁₆	150	35	36,4	85,7	34,1
UC218-56	4,2	88,9	3 ¹ / ₂	160	38	39,4	96	39,7
UC218	4,08	90	–	160	38	39,4	96	39,7

			Width across flats		Basic load ratings		Fatigue limit load	Factor
d ₁	C _a	A	W		dyn. C _r	stat. C _{0r}	C _{ur}	f ₀
			mm	inch	N	N		
69,77	7	10	–	3/16	46 000	29 000	1 480	14,3
69,77	7	10	–	3/16	46 000	29 000	1 480	14,3
69,77	7	10	–	3/16	46 000	29 000	1 480	14,3
69,77	7	10	5	–	46 000	29 000	1 480	14,3
69,77	7	10	–	3/16	46 000	29 000	1 480	14,3
76,48	7,4	10	–	3/16	56 000	36 000	1 820	14,3
76,48	7,4	10	–	3/16	56 000	36 000	1 820	14,3
76,48	7,4	10	5	–	56 000	36 000	1 820	14,3
76,48	7,4	10	–	3/16	56 000	36 000	1 820	14,3
76,48	7,4	10	–	3/16	56 000	36 000	1 820	14,3
80,85	8,2	12	–	1/4	61 000	40 000	2 030	14,3
80,85	8,2	12	6	–	61 000	40 000	2 030	14,3
80,85	8,2	12	–	1/4	61 000	40 000	2 030	14,3
85,2	8,5	12	–	1/4	66 000	44 000	2 230	14,4
85,2	8,5	12	–	1/4	66 000	44 000	2 230	14,4
85,2	8,5	12	–	1/4	66 000	44 000	2 230	14,4
85,2	8,5	12	6	–	66 000	44 000	2 230	14,4
90	8,5	12	–	1/4	66 000	44 500	2 240	14,7
90	8,5	12	–	1/4	66 000	44 500	2 240	14,7
90	8,5	12	–	1/4	66 000	44 500	2 240	14,7
90	8,5	12	6	–	66 000	44 500	2 240	14,7
90	8,5	12	–	1/4	66 000	44 500	2 240	14,7
97	9,3	14	–	1/4	76 000	54 000	2 600	14,6
97	9,3	14	–	1/4	76 000	54 000	2 600	14,6
97	9,3	14	6	–	76 000	54 000	2 600	14,6
97	9,3	14	–	1/4	76 000	54 000	2 600	14,6
104,09	10	14	–	1/4	88 000	64 000	2 950	14,7
104,09	10	14	–	1/4	88 000	64 000	2 950	14,7
104,09	10	14	6	–	88 000	64 000	2 950	14,7
104,09	10	14	–	1/4	88 000	64 000	2 950	14,7
109,4	11	15	–	1/4	102 000	72 000	3 250	14,5
109,4	11	15	6	–	102 000	72 000	3 250	14,5

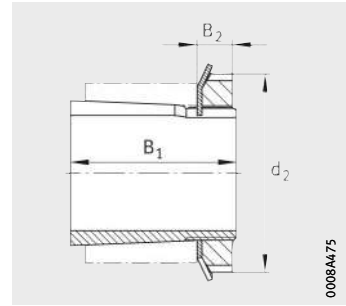


Radial insert ball bearings with adapter sleeve

Spherical outer ring



UK



Complete adapter sleeve¹⁾

Dimension table - Dimensions in mm

Designation	Mass m ≈ kg	Dimensions						Basic load ratings		Fatigue limit load	Factor f ₀
		d	D _{sp}	C	C ₂	B	C _a	dyn. C _r N	stat. C _{0r} N	C _{ur} N	
UK205	0,25	20	52	17	17,6	23	4,2	14 900	7 800	395	13,8
UK206	0,37	25	62	19	19,6	26	5	20 700	11 300	570	13,8
UK207	0,54	30	72	20	20,6	29	5,7	27 500	15 300	770	13,8
UK208	0,7	35	80	21	21,6	31	6,2	34 500	19 800	1 010	14
UK209	0,83	40	85	22	22,6	32	6,3	34 500	20 400	1 030	14,3
UK210	0,98	45	90	24	24,6	34	6,5	37 500	23 200	1 180	14,3
UK211	1,24	50	100	25	25,6	36	7	46 000	29 000	1 480	14,3
UK212	1,58	55	110	27	27,6	40	7,4	56 000	36 000	1 820	14,3
UK213	1,88	60	120	28	29,4	41	8,2	61 000	40 000	2 030	14,3
UK215	2,62	65	130	32	33,4	44,5	8,5	66 000	44 500	2 240	14,7
UK216	3,23	70	140	33	34,4	46	9,3	76 000	54 000	2 600	14,6
UK217	3,9	75	150	35	36,4	48	10	88 000	64 000	2 950	14,7
UK218	4,62	80	160	38	39,4	51	11	102 000	72 000	3 250	14,5

¹⁾ Radial insert ball bearings UK are supplied with an adapter sleeve H..X.

Designation					Mass m ≈ kg	Dimensions		
Complete adapter sleeve	Sleeve	Locknut	Tab washer	Matching bearing		B ₁	B ₂	d ₂ max.
H2305X	A2305X	AN05	AW05X	UK205	0,1	35	8	38
H2306X	A2306X	AN06	AW06X	UK206	0,13	38	8	45
H2307X	A2307X	AN07	AW07X	UK207	0,18	43	9	52
H2308X	A2308X	AN08	AW08X	UK208	0,23	46	10	58
H2309X	A2309X	AN09	AW09X	UK209	0,31	50	11	65
H2310X	A2310X	AN10	AW10X	UK210	0,38	55	12	70
H2311X	A2311X	AN11	AW11X	UK211	0,45	59	12	75
H2312X	A2312X	AN12	AW12X	UK212	0,5	62	13	80
H2313X	A2313X	AN13	AW13X	UK213	0,58	65	14	85
H2315X	A2315X	AN15	AW15X	UK215	1,1	73	15	98
H2316X	A2316X	AN16	AW16X	UK216	1,33	78	17	105
H2317X	A2317X	AN17	AW17X	UK217	1,51	82	18	110
H2318X	A2318X	AN18	AW18X	UK218	1,77	86	18	120



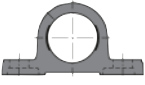
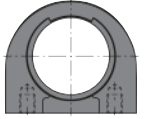

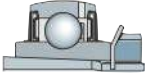
Housing units

Housing units

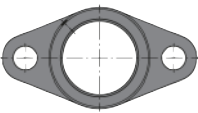
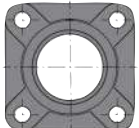
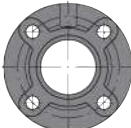
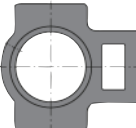

	Page
Matrix	Possible combinations of radial insert ball bearings and housings..... 490
Product overview	Housing units..... 492
Features	Housing units with flake graphite cast iron housing..... 494
	Operating temperature 496
Design and safety guidelines	Compensation of static misalignments..... 497
	Load carrying capacity of housings 497
	Load carrying capacity and speed limits of radial insert ball bearings 497
	Design of adjacent construction..... 497
	Mounting and dismounting..... 498
Accuracy	Dimensional tolerances 501
Dimension tables	Plummer block housing units, flake graphite cast iron housing with long base
	with grub screws in inner ring..... 502
	with adapter sleeve..... 508
	Plummer block housing units, flake graphite cast iron housing with short base
	with grub screws in inner ring..... 510
	Two-bolt flanged housing units, oval version
	with grub screws in inner ring..... 514
	with adapter sleeve..... 520
	Four-bolt flanged housing units, square version
	with grub screws in inner ring..... 522
	with adapter sleeve..... 528
	Four-bolt flanged housing units, round version
	with grub screws in inner ring..... 530
	with adapter sleeve..... 536
	Take-up housing units, for linear motion
	with grub screws in inner ring..... 538
	with adapter sleeve..... 544
	Take-up housing units, for swivel motion
	with grub screws in inner ring..... 546



Possible combinations of radial insert ball bearings and housings

Radial insert ball bearing		Housing	
		Plummer block housing	
			
Designation		P	PA
Shaft diameter d			
UC 12 mm – 90 mm <i>1/2" – 3 1/2"</i>		UCP page 502	UCPA page 510
UK 20 mm – 80 mm		UKP page 508	Available by agreement

Catalogue range, for dimension tables see pages indicated.
Other dimensions and combinations available by agreement.

Two-bolt flanged housing	Four-bolt flanged housing		Take-up housing	
				
FL	F	FC	T	FA
UCFL page 514	UCF page 522	UCFC page 530	UCT page 538	UCFA page 546
UKFL page 520	UKF page 528	UKFC page 536	UKT page 544	Available by agreement



Product overview Housing units

Plummer block housing units

Flake graphite cast iron housing with long base



Flake graphite cast iron housing with short base



Two-bolt flanged housing units

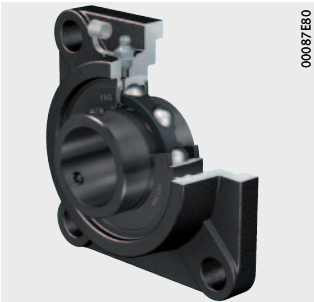
Flake graphite cast iron housing



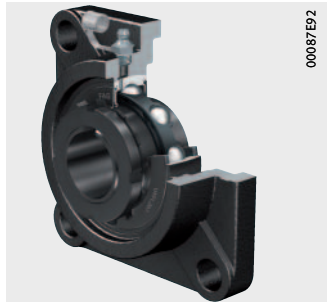
Four-bolt flanged housing units

Flake graphite cast iron housing

UCF



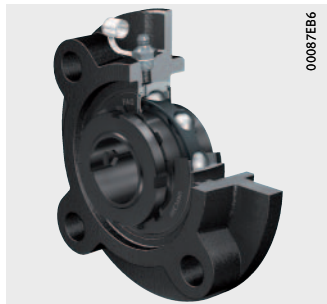
UKF



UCFC



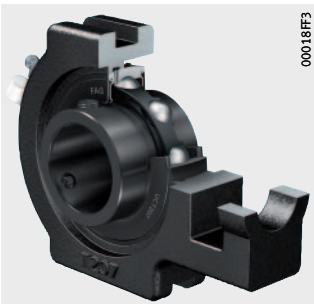
UKFC



Take-up housing units

Flake graphite cast iron housing

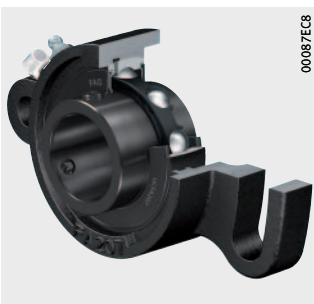
UCT



UKT



UCFA



Housing units

Features

These housing units are available as plummer block housing units, flanged housing units and take-up housing units. The units are ready-to-fit and comprise FAG flake graphite cast iron housings in which FAG Black Series radial insert ball bearings are fitted.

Due to the spherical outer ring of the bearing and the concave housing bore, housing units can compensate for static misalignments of the shaft, see page 497.

The housings are screw mounted on the adjacent construction. Less stringent tolerances are sufficient for the screw mounting surfaces, see page 497.

Housing units with flake graphite cast iron housing

The flake graphite cast iron housings are single piece components in accordance with JIS B 1559 and have high radial and axial load carrying capacity, see page 497.

The housing has a lubrication groove for relubrication of the radial insert ball bearing. The housing has a lubrication hole with an M6 thread for a lubrication nipple.

The housings have a primer paint coating as anti-corrosion protection of colour RAL 9005 (black).



In order to ensure function and reliability under all operating conditions, the bearings and housings are matched to each other with a defined swivel moment after mounting.

All catalogue cast iron units have a mean swivel moment (as standard); further designs with a smaller or greater swivel moment, depending on their application, are available by agreement.

Housing material

The material used for the flake graphite cast iron housings is cast iron in accordance with JIS G 5501.

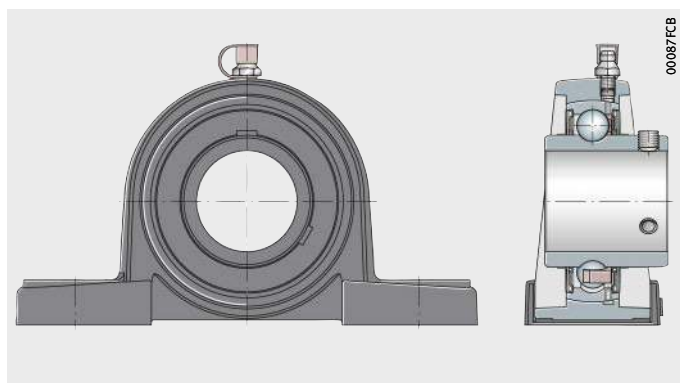
Plummer block housing units

Plummer block housing units have a housing with a short or long base and are screw mounted to the adjacent construction through slot holes or fixing holes, *Figure 1* and *Figure 2*, page 495.

Plummer block housing units with a long base are available either with radial insert ball bearings UC with grub screws or with radial insert ball bearings UK with adapter sleeves, see dimension table.

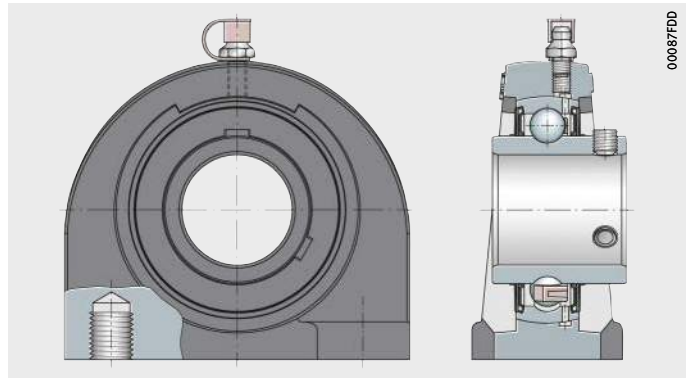
UCP

Figure 1
Plummer block housing unit,
flake graphite cast iron housing
with long base



UCPA

Figure 2
Plummer block housing unit
with short base



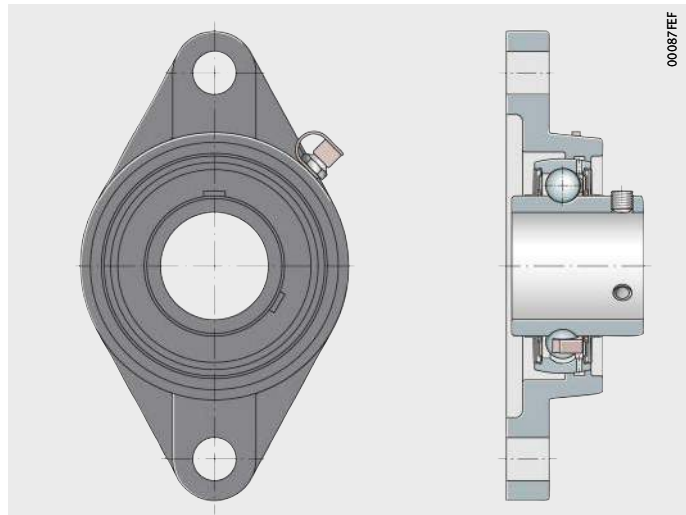
Flanged housing units

Flanged housing units are available as two-bolt and four-bolt units, *Figure 3 to Figure 5*, page 496. The housings are oval, square or round in shape. The housings have through holes for location purposes.

Flanged housing units are available either with radial insert ball bearings UC with grub screws or with radial insert ball bearings UK with adapter sleeves, see dimension table.

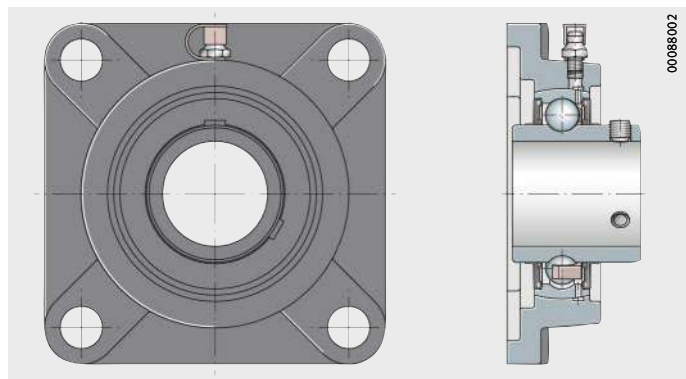
UCFL

Figure 3
Two-bolt flanged housing unit,
oval version



UCF

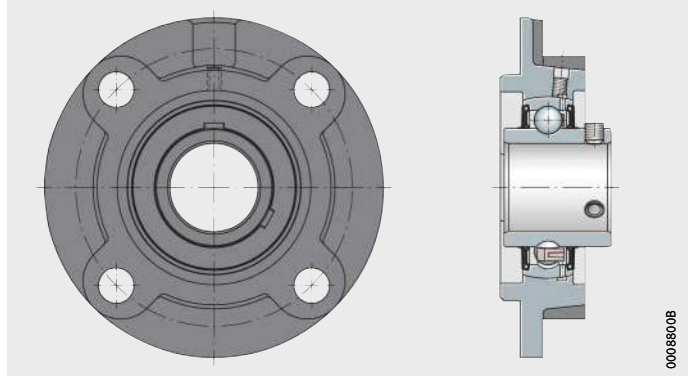
Figure 4
Four-bolt flanged housing unit,
square version



Housing units

UCFC

Figure 5
Four-bolt flanged housing unit,
round version

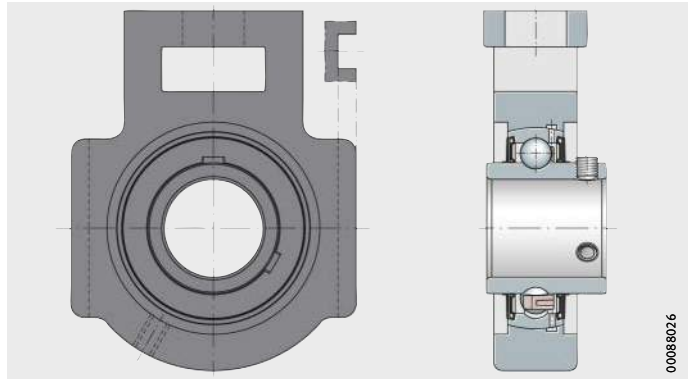


Take-up housing units

Take-up housing units can be moved or swivelled, *Figure 6* and *Figure 7*. They are used where shafts must carry out long displacement motions.

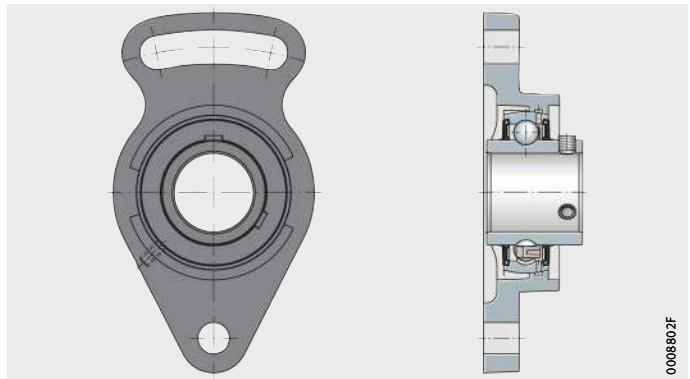
UCT

Figure 6
Take-up housing unit
for linear motion



UCFA

Figure 7
Take-up housing unit
for swivel motion



Operating temperature

Housing units are suitable for operating temperatures of $-20\text{ }^{\circ}\text{C}$ to $+100\text{ }^{\circ}\text{C}$. Temperature peaks of up to $+120\text{ }^{\circ}\text{C}$ are possible for short periods.

Design and safety guidelines

Compensation of static misalignments

Units with a spherical outer ring and concave housing bore can compensate static misalignments of the shaft, see page 477.

Load carrying capacity of housings

Due to their versatile characteristics, FAG housing units can be easily used in almost all industrial sectors.

Radial load carrying capacity

Flake graphite cast iron housings can support the same radial loads as the radial insert ball bearings fitted. The static load carrying capacity C_{0r} of the radial insert ball bearings is stated in the dimension tables.



Where shock loads are present, appropriate safety factors must be applied. In this case, please contact us.

Axial load carrying capacity

The axial load carrying capacity of flake graphite cast iron housings is restricted to $0,5 \times C_{0r}$.

Load carrying capacity and speed limits of radial insert ball bearings



In the design of housing units, attention must be paid to the load carrying capacity and speed limits of the radial insert ball bearings fitted:

- speed limits, see page 478
- dimension table, see page 482.

Design of adjacent construction

The permissible shaft tolerance is dependent on the speed and load. Shafts of the tolerance classes h6 © to h9 © can be used.

Screw mounting surfaces

Recommendations for the screw mounting surfaces are as follows:

- roughness of the screw mounting surface max. Ra 12,5 (Rzmax 63)
- geometrical and positional tolerance 0,04/100 concave, spherical not permissible.
- In the event of high loads occurring parallel to the mounting surface of plummer block housing units (in the case of cast iron housing with long base), the use of additional dowel pins to DIN EN ISO 8752 is recommended. In this case, through holes (see centre punch mark for housing ASE) must be applied, see *Figure 8*, page 499.



Housing units

Fixing screws	<p>The screw connection should be designed in accordance with the state of the art; friction coefficient $\mu = 0,12$ (90%).</p> <p>Screws of grade 8.8 or better can be used for fixing. The maximum tightening torques applicable to this screw grade must not be exceeded even if screws of a higher grade are used.</p> <p>In principle, we recommend that the screw connection should only be tightened to 70% of the values stated in the standard.</p> <p>For fixing, hexagonal socket head screws in accordance with DIN EN ISO 4762 or hexagonal socket head screws with a coarse pitch full thread in accordance with DIN EN ISO 4017 should be used. The screws should be combined as a minimum with a washer in accordance with DIN EN ISO 7089 or DIN EN ISO 7090.</p> <p>Screws and accessories for location are not included in the delivery.</p>
Mounting and dismounting	<p>Radial insert ball bearings must be handled with care before and during mounting. Their trouble-free operation is also dependent on the care taken during mounting.</p>
Delivered condition	<p>The housings have a coating of black primer paint (RAL 9005).</p> <p>The radial insert ball bearings are greased using a grease in grease group GA13, see Catalogue HR 1, Rolling Bearings.</p> <p>The housing units are supplied with a loose packed lubrication nipple and integrated end cap for the lubrication nipple as well as an Allen key.</p>
Storage and shelf life	<p>The units should be stored in dry, clean rooms with a temperature as constant as possible and at a relative humidity of max. 65%.</p> <p>The storage life of radial insert ball bearings is limited by the shelf life of the grease, see chapter Technical principles in Catalogue HR 1, Rolling Bearings.</p>
Removal from packaging	<p>Perspiration causes corrosion. Hands must therefore be kept clean and dry. Bearings should not be removed from their original packaging until immediately before mounting.</p>
Preparation for mounting	<p>The following preparatory measures for mounting should be taken:</p> <ul style="list-style-type: none">■ Ensure that the mounting tools and fixing screws are present.■ Clean the shaft and remove any burrs.■ Inspect the bearing seating surfaces on the shaft.■ Keep bearing seating surfaces clean, dry and free of grease.

Mounting of plummer block and flanged housing units



The assembly area should be as dry and clean as possible:

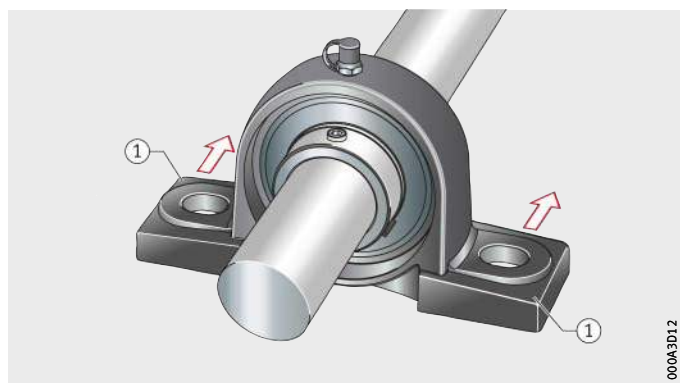
- The specified shaft tolerances must be observed, see page 497.
- Mounting forces must never be directed through the rolling elements.
- Blows should never be applied directly to the bearing rings and flinger shields or seals.
- Observe the tightening torques M_A for grub screws and adapter sleeve, see tables, page 500.

If the following sequence is observed, the bearing will align itself on the shaft in such a way that no undesirable stresses occur:

- ▶ Slide the housing unit onto the shaft and align it with the fixing holes in the adjacent construction, *Figure 8*.
- ▶ Fit dowel pins if necessary.
- ▶ Tighten the fixing screws for all housings finger tight in the adjacent construction as far as possible and align the shaft, *Figure 9*, page 500.
- ▶ Tighten both grub screws in the inner ring (for radial insert ball bearing UC) or the locknut of the adapter sleeve (for radial insert ball bearing UK) using a tightening torque (with an additional adapter if necessary) to the specified tightening torque, *Figure 10*, page 500.
- ▶ Locate the housings on the adjacent construction using the recommended tightening torque, see page 497.

① Position of additional through hole for location of dowel pins in accordance with DIN EN ISO 8752 (in the event of high loads occurring parallel to the mounting surface; for housing P)

Figure 8
Sliding the unit onto the shaft



Housing units

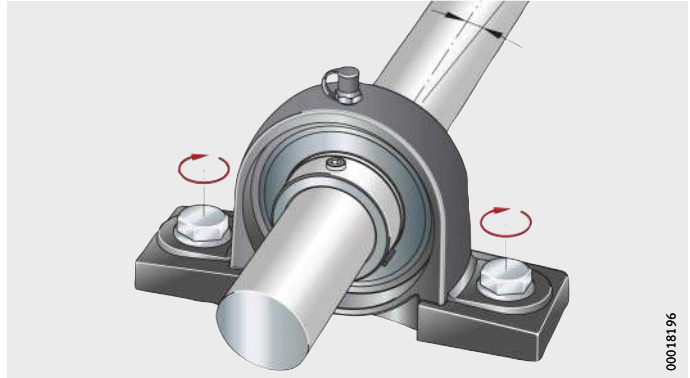


Figure 9
Screw mounting
the housing finger tight

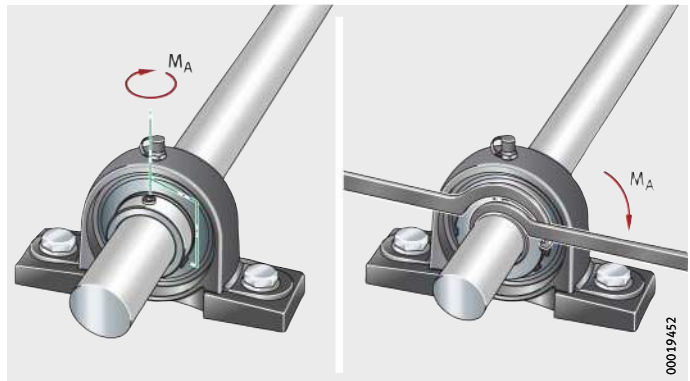


Figure 10
Fully tightening the grub screws or
locknut in the inner ring

Tightening torques for grub screws

Width across flats W		Thread		Tightening torque ¹⁾ M _A Nm
mm	inch	ISO	UNF	
3	1/8	M6×0,75	1/4"-28	6
4	5/32	M8×1	5/16"-24	14
5	3/16	M10×1,25	3/8"-24	26
6	1/4	M12×1,5	1/2"-20	42

¹⁾ The tightening torques are valid for original FAG grub screws only.

Tightening torques for locknut

Locknut	Tightening torque M_A Nm
AN05	25
AN06	30
AN07	40
AN08	50
AN09	60
AN10	75
AN11	100
AN12	130
AN13	150
AN15	170
AN16	200
AN17	230
AN18	270

Dismounting

The units are dismantled in the reverse sequence.

- ▶ Loosen the grub screws in the inner ring or the locknut of the adapter sleeve.
- ▶ Unscrew the housing.

Accuracy

The flake graphite cast iron housings conform to JIS B 1559.
Accuracy of fitted radial insert ball bearings: see page 479.

Dimensional tolerances

The dimensional tolerances for the machined surfaces of the flake graphite cast iron housings are $\pm 0,25$ mm.

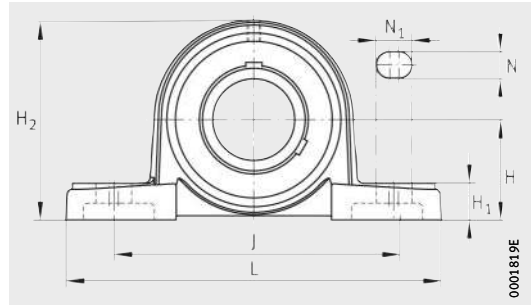
Dimensions without tolerance conform to JIS B 0403:

- unfinished dimensions to Table 1, class CT 10
- finished dimensions to Table 5.



Plummer block housing units

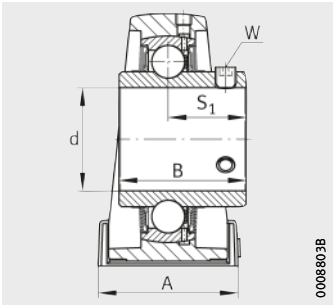
Flake graphite cast iron housing
with long base
With grub screws in inner ring



UCP

Dimension table - Dimensions in mm and inch

Designation			Mass m ≈ kg	Dimensions					
Unit	Housing	Radial insert ball bearing		d		H	J	L	A
				mm	inch				
UCP201	P203	UC201	0,7	12	–	30,2	95	127	38
UCP201-08	P203	UC201-08	0,69	12,7	1/2	30,2	95	127	38
UCP202-09	P203	UC202-09	0,69	14,288	9/16	30,2	95	127	38
UCP202	P203	UC202	0,68	15	–	30,2	95	127	38
UCP202-10	P203	UC202-10	0,68	15,875	5/8	30,2	95	127	38
UCP203	P203	UC203	0,67	17	–	30,2	95	127	38
UCP203-11	P203	UC203-11	0,67	17,463	11/16	30,2	95	127	38
UCP204-12	P204	UC204-12	0,66	19,05	3/4	33,3	95	127	38
UCP204	P204	UC204	0,65	20	–	33,3	95	127	38
UCP205-13	P205	UC205-13	0,83	20,638	13/16	36,5	105	140	38
UCP205-14	P205	UC205-14	0,82	22,225	7/8	36,5	105	140	38
UCP205-15	P205	UC205-15	0,81	23,813	15/16	36,5	105	140	38
UCP205	P205	UC205	0,79	25	–	36,5	105	140	38
UCP205-16	P205	UC205-16	0,79	25,4	1	36,5	105	140	38
UCP206-17	P206	UC206-17	1,33	26,988	11/16	42,9	121	165	48
UCP206-18	P206	UC206-18	1,31	28,575	11/8	42,9	121	165	48
UCP206	P206	UC206	1,29	30	–	42,9	121	165	48
UCP206-19	P206	UC206-19	1,29	30,163	13/16	42,9	121	165	48
UCP206-20	P206	UC206-20	1,27	31,75	11/4	42,9	121	165	48
UCP207-20	P207	UC207-20	1,6	31,75	11/4	47,6	127	167	48
UCP207-21	P207	UC207-21	1,58	33,338	15/16	47,6	127	167	48
UCP207-22	P207	UC207-22	1,55	34,925	13/8	47,6	127	167	48
UCP207	P207	UC207	1,55	35	–	47,6	127	167	48
UCP207-23	P207	UC207-23	1,52	36,513	17/16	47,6	127	167	48
UCP208-24	P208	UC208-24	1,89	38,1	11/2	49,2	137	184	54
UCP208-25	P208	UC208-25	1,85	39,688	19/16	49,2	137	184	54
UCP208	P208	UC208	1,84	40	–	49,2	137	184	54



UCP

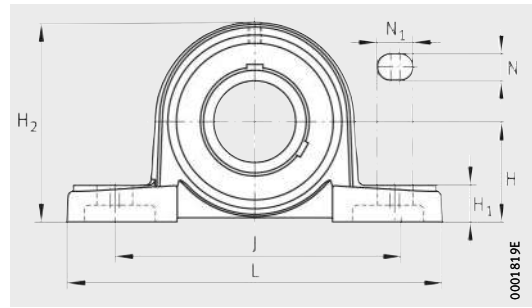
0008803B

H ₁	H ₂	N	N ₁	B	S ₁	Width across flats		Load carrying capacity Bearing		
						W		Basic load ratings		Fatigue limit load
						mm	inch	dyn. C _r N	stat. C _{0r} N	C _{ur} N
14	62	13	19	31	18,3	3	–	13 600	6 600	335
14	62	13	19	31	18,3	–	1/8	13 600	6 600	335
14	62	13	19	31	18,3	–	1/8	13 600	6 600	335
14	62	13	19	31	18,3	3	–	13 600	6 600	335
14	62	13	19	31	18,3	–	1/8	13 600	6 600	335
14	62	13	19	31	18,3	3	–	13 600	6 600	335
14	62	13	19	31	18,3	–	1/8	13 600	6 600	335
14	65	13	19	31	18,3	–	1/8	13 600	6 600	335
14	65	13	19	31	18,3	3	–	13 600	6 600	335
15	71	13	19	34,1	19,8	–	1/8	14 900	7 800	395
15	71	13	19	34,1	19,8	–	1/8	14 900	7 800	395
15	71	13	19	34,1	19,8	–	1/8	14 900	7 800	395
15	71	13	19	34,1	19,8	3	–	14 900	7 800	395
15	71	13	19	34,1	19,8	–	1/8	14 900	7 800	395
17	83	17	21	38,1	22,2	–	1/8	20 700	11 300	570
17	83	17	21	38,1	22,2	–	1/8	20 700	11 300	570
17	83	17	21	38,1	22,2	3	–	20 700	11 300	570
17	83	17	21	38,1	22,2	–	1/8	20 700	11 300	570
17	83	17	21	38,1	22,2	–	1/8	20 700	11 300	570
18	93	17	21	42,9	25,4	–	5/32	27 500	15 300	770
18	93	17	21	42,9	25,4	–	5/32	27 500	15 300	770
18	93	17	21	42,9	25,4	–	5/32	27 500	15 300	770
18	93	17	21	42,9	25,4	4	–	27 500	15 300	770
18	93	17	21	42,9	25,4	–	5/32	27 500	15 300	770
18	98	17	21	49,2	30,2	–	5/32	34 500	19 800	1010
18	98	17	21	49,2	30,2	–	5/32	34 500	19 800	1010
18	98	17	21	49,2	30,2	4	–	34 500	19 800	1010



Plummer block housing units

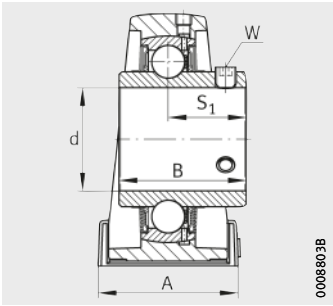
Flake graphite cast iron housing
with long base
With grub screws in inner ring



UCP

Dimension table (continued) · Dimensions in mm and inch

Designation			Mass m ≈ kg	Dimensions					
Unit	Housing	Radial insert ball bearing		d		H	J	L	A
				mm	inch				
UCP209-26	P209	UC209-26	2,29	41,275	15/8	54	146	190	54
UCP209-27	P209	UC209-27	2,25	42,863	111/16	54	146	190	54
UCP209-28	P209	UC209-28	2,21	44,45	13/4	54	146	190	54
UCP209	P209	UC209	2,2	45	–	54	146	190	54
UCP210-29	P210	UC210-29	2,89	46,038	113/16	57,2	159	206	60
UCP210-30	P210	UC210-30	2,85	47,625	17/8	57,2	159	206	60
UCP210-31	P210	UC210-31	2,8	49,213	115/16	57,2	159	206	60
UCP210	P210	UC210	2,77	50	–	57,2	159	206	60
UCP210-32	P210	UC210-32	2,75	50,8	2	57,2	159	206	60
UCP211-32	P211	UC211-32	3,56	50,8	2	63,5	171	219	60
UCP211-33	P211	UC211-33	3,5	52,388	21/16	63,5	171	219	60
UCP211-34	P211	UC211-34	3,44	53,975	21/8	63,5	171	219	60
UCP211	P211	UC211	3,41	55	–	63,5	171	219	60
UCP211-35	P211	UC211-35	3,39	55,563	23/16	63,5	171	219	60
UCP212-36	P212	UC212-36	4,75	57,15	21/4	69,8	184	241	70
UCP212-37	P212	UC212-37	4,68	58,738	25/16	69,8	184	241	70
UCP212	P212	UC212	4,62	60	–	69,8	184	241	70
UCP212-38	P212	UC212-38	4,6	60,325	23/8	69,8	184	241	70
UCP212-39	P212	UC212-39	4,53	61,913	27/16	69,8	184	241	70
UCP213-40	P213	UC213-40	5,63	63,5	21/2	76,2	203	265	70
UCP213	P213	UC213	5,55	65	–	76,2	203	265	70
UCP213-41	P213	UC213-41	5,55	65,088	29/16	76,2	203	265	70
UCP214-42	P214	UC214-42	6,29	66,675	25/8	79,4	210	266	72
UCP214-43	P214	UC214-43	6,2	68,263	211/16	79,4	210	266	72
UCP214-44	P214	UC214-44	6,1	69,85	23/4	79,4	210	266	72
UCP214	P214	UC214	6,1	70	–	79,4	210	266	72



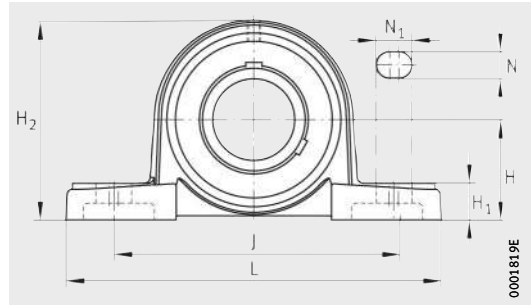
UCP

UCP						Width across flats		Load carrying capacity Bearing		
								Basic load ratings		Fatigue limit load C_{ur} N
						H_1	H_2	N	N_1	
20	106	17	21	49,2	30,2	-	5/32	34 500	20 400	1 030
20	106	17	21	49,2	30,2	-	5/32	34 500	20 400	1 030
20	106	17	21	49,2	30,2	-	5/32	34 500	20 400	1 030
20	106	17	21	49,2	30,2	4	-	34 500	20 400	1 030
21	114	20	25	51,6	32,6	-	3/16	37 500	23 200	1 180
21	114	20	25	51,6	32,6	-	3/16	37 500	23 200	1 180
21	114	20	25	51,6	32,6	-	3/16	37 500	23 200	1 180
21	114	20	25	51,6	32,6	5	-	37 500	23 200	1 180
21	114	20	25	51,6	32,6	-	3/16	37 500	23 200	1 180
23	126	20	25	55,6	33,4	-	3/16	46 000	29 000	1 480
23	126	20	25	55,6	33,4	-	3/16	46 000	29 000	1 480
23	126	20	25	55,6	33,4	-	3/16	46 000	29 000	1 480
23	126	20	25	55,6	33,4	5	-	46 000	29 000	1 480
23	126	20	25	55,6	33,4	-	3/16	46 000	29 000	1 480
25	138	20	25	65,1	39,7	-	3/16	56 000	36 000	1 820
25	138	20	25	65,1	39,7	-	3/16	56 000	36 000	1 820
25	138	20	25	65,1	39,7	5	-	56 000	36 000	1 820
25	138	20	25	65,1	39,7	-	3/16	56 000	36 000	1 820
25	138	20	25	65,1	39,7	-	3/16	56 000	36 000	1 820
27	151	25	29	65,1	39,7	-	1/4	61 000	40 000	2 030
27	151	25	29	65,1	39,7	6	-	61 000	40 000	2 030
27	151	25	29	65,1	39,7	-	1/4	61 000	40 000	2 030
27	157	25	31	74,6	44,4	-	1/4	66 000	44 000	2 230
27	157	25	31	74,6	44,4	-	1/4	66 000	44 000	2 230
27	157	25	31	74,6	44,4	-	1/4	66 000	44 000	2 230
27	157	25	31	74,6	44,4	6	-	66 000	44 000	2 230



Plummer block housing units

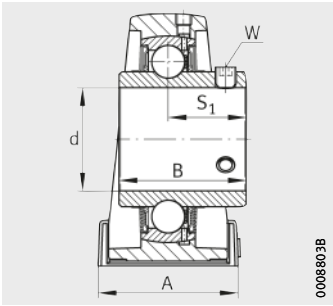
Flake graphite cast iron housing
with long base
With grub screws in inner ring



UCP

Dimension table (continued) · Dimensions in mm and inch

Designation			Mass m ≈ kg	Dimensions					
Unit	Housing	Radial insert ball bearing		d		H	J	L	A
				mm	inch				
UCP215-45	P215	UC215-45	6,9	71,438	2 ¹³ / ₁₆	82,6	217	275	74
UCP215-46	P215	UC215-46	6,81	73,025	2 ⁷ / ₈	82,6	217	275	74
UCP215-47	P215	UC215-47	6,7	74,613	2 ¹⁵ / ₁₆	82,6	217	275	74
UCP215	P215	UC215	6,67	75	–	82,6	217	275	74
UCP215-48	P215	UC215-48	6,58	76,2	3	82,6	217	275	74
UCP216-49	P216	UC216-49	8,53	77,788	3 ¹ / ₁₆	88,9	232	292	78
UCP216-50	P216	UC216-50	8,4	79,375	3 ¹ / ₈	88,9	232	292	78
UCP216	P216	UC216	8,4	80	–	88,9	232	292	78
UCP216-51	P216	UC216-51	8,28	80,963	3 ³ / ₁₆	88,9	232	292	78
UCP217-52	P217	UC217-52	10,3	82,55	3 ¹ / ₄	95,2	247	310	83
UCP217-53	P217	UC217-53	10,17	84,138	3 ⁵ / ₁₆	95,2	247	310	83
UCP217	P217	UC217	10,1	85	–	95,2	247	310	83
UCP217-55	P217	UC217-55	9,9	87,313	3 ⁷ / ₁₆	95,2	247	310	83
UCP218-56	P218	UC218-56	12,3	88,9	3 ¹ / ₂	101,6	262	327	88
UCP218	P218	UC218	12,2	90	–	101,6	262	327	88



UCP

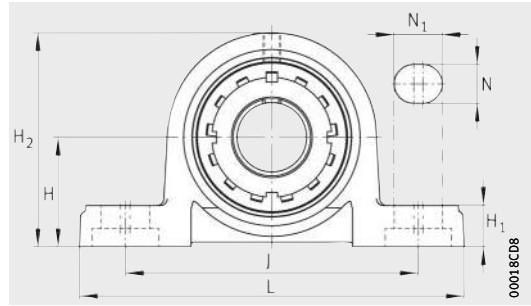
0008803B

						Width across flats		Load carrying capacity Bearing		
										Basic load ratings
H ₁	H ₂	N	N ₁	B	S ₁	W		dyn. C _r	stat. C _{0r}	C _{ur}
						mm	inch	N	N	N
28	163	25	31	77,8	44,5	–	1/4	66 000	44 500	2 240
28	163	25	31	77,8	44,5	–	1/4	66 000	44 500	2 240
28	163	25	31	77,8	44,5	–	1/4	66 000	44 500	2 240
28	163	25	31	77,8	44,5	6	–	66 000	44 500	2 240
28	163	25	31	77,8	44,5	–	1/4	66 000	44 500	2 240
30	175	25	31	82,6	49,3	–	1/4	76 000	54 000	2 600
30	175	25	31	82,6	49,3	–	1/4	76 000	54 000	2 600
30	175	25	31	82,6	49,3	6	–	76 000	54 000	2 600
30	175	25	31	82,6	49,3	–	1/4	76 000	54 000	2 600
32	187	25	31	85,7	51,6	–	1/4	88 000	64 000	2 950
32	187	25	31	85,7	51,6	–	1/4	88 000	64 000	2 950
32	187	25	31	85,7	51,6	6	–	88 000	64 000	2 950
32	187	25	31	85,7	51,6	–	1/4	88 000	64 000	2 950
33	200	27	33	96	56,3	–	1/4	102 000	72 000	3 250
33	200	27	33	96	56,3	6	–	102 000	72 000	3 250



Plummer block housing units

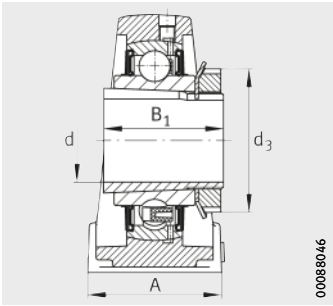
Flake graphite cast iron housing
with long base
With adapter sleeve



UKP

Dimension table - Dimensions in mm

Designation			Mass	Dimensions				
Unit	Housing	Radial insert ball bearing		d	H	J	L	A
			m					
			≈ kg					
UKP205	P205	UK205	0,84	20	36,5	105	140	38
UKP206	P206	UK206	1,36	25	42,9	121	165	48
UKP207	P207	UK207	1,63	30	47,6	127	167	48
UKP208	P208	UK208	1,92	35	49,2	137	184	54
UKP209	P209	UK209	2,33	40	54	146	190	54
UKP210	P210	UK210	2,95	45	57,2	159	206	60
UKP211	P211	UK211	3,58	50	63,5	171	219	60
UKP212	P212	UK212	4,71	55	69,8	184	241	70
UKP213	P213	UK213	5,71	60	76,2	203	265	70
UKP215	P215	UK215	7,11	65	82,6	217	275	74
UKP216	P216	UK216	8,86	70	88,9	232	292	78
UKP217	P217	UK217	10,58	75	95,2	247	310	83
UKP218	P218	UK218	12,71	80	101,6	262	327	88



00088046

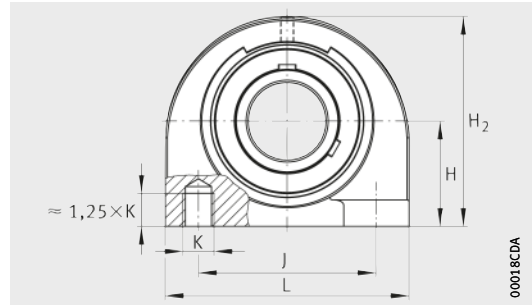
UKP

						Load carrying capacity Bearing		
						Basic load ratings		Fatigue limit load
H ₁	H ₂	N	N ₁	B ₁	d ₃ max.	dyn. C _r N	stat. C _{0r} N	C _{ur} N
15	71	13	19	35	38	14 900	7 800	395
17	83	17	21	38	45	20 700	11 300	570
18	93	17	21	43	52	27 500	15 300	770
18	98	17	21	46	58	34 500	19 800	1 010
20	106	17	21	50	65	34 500	20 400	1 030
21	114	20	25	55	70	37 500	23 200	1 180
23	126	20	25	59	75	46 000	29 000	1 480
25	138	20	25	62	80	56 000	36 000	1 820
27	151	25	29	65	85	61 000	40 000	2 030
28	163	25	31	73	98	66 000	44 500	2 240
30	175	25	31	78	105	76 000	54 000	2 600
32	187	25	31	82	110	88 000	64 000	2 950
33	200	27	33	86	120	102 000	72 000	3 250



Plummer block housing units

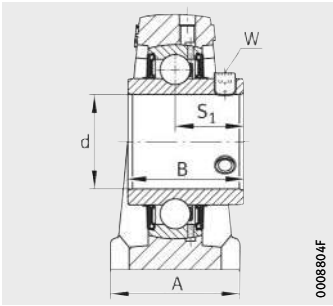
Flake graphite cast iron housing
with short base
With grub screws in inner ring



UCPA

Dimension table - Dimensions in mm and inch

Designation			Mass m ≈ kg	Dimensions				
Unit	Housing	Radial insert ball bearing		d		H	J	L
				mm	inch			
UCPA201	PA204	UC201	0,65	12	–	30,2	52	76
UCPA201-08	PA204	UC201-08	0,65	12,7	1/2	30,2	52	76
UCPA202-09	PA204	UC202-09	0,64	14,288	9/16	30,2	52	76
UCPA202	PA204	UC202	0,64	15	–	30,2	52	76
UCPA202-10	PA204	UC202-10	0,63	15,875	5/8	30,2	52	76
UCPA203	PA204	UC203	0,63	17	–	30,2	52	76
UCPA203-11	PA204	UC203-11	0,63	17,463	11/16	30,2	52	76
UCPA204-12	PA204	UC204-12	0,62	19,05	3/4	30,2	52	76
UCPA204	PA204	UC204	0,61	20	–	30,2	52	76
UCPA205-13	PA205	UC205-13	0,87	20,638	13/16	36,5	56	84
UCPA205-14	PA205	UC205-14	0,86	22,225	7/8	36,5	56	84
UCPA205-15	PA205	UC205-15	0,84	23,813	15/16	36,5	56	84
UCPA205	PA205	UC205	0,83	25	–	36,5	56	84
UCPA205-16	PA205	UC205-16	0,83	25,4	1	36,5	56	84
UCPA206-17	PA206	UC206-17	1,26	26,988	11/16	42,9	66	94
UCPA206-18	PA206	UC206-18	1,24	28,575	11/8	42,9	66	94
UCPA206	PA206	UC206	1,22	30	–	42,9	66	94
UCPA206-19	PA206	UC206-19	1,22	30,163	13/16	42,9	66	94
UCPA206-20	PA206	UC206-20	1,2	31,75	11/4	42,9	66	94



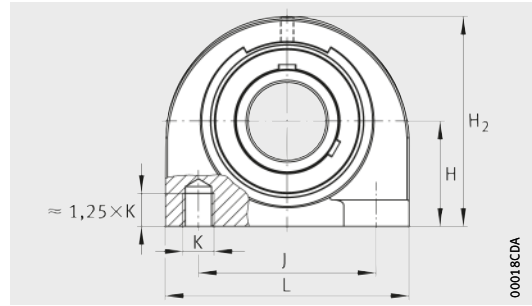
UCPA

					Width across flats		Load carrying capacity Bearing		
					W		Basic load ratings		Fatigue limit load
A	H ₂	K	B	S ₁			dyn. C _r	stat. C _{0r}	C _{ur}
					mm	inch	N	N	N
38	62	M10	31	18,3	3	–	13 600	6 600	335
38	62	M10	31	18,3	–	1/8	13 600	6 600	335
38	62	M10	31	18,3	–	1/8	13 600	6 600	335
38	62	M10	31	18,3	3	–	13 600	6 600	335
38	62	M10	31	18,3	–	1/8	13 600	6 600	335
38	62	M10	31	18,3	3	–	13 600	6 600	335
38	62	M10	31	18,3	–	1/8	13 600	6 600	335
38	62	M10	31	18,3	–	1/8	13 600	6 600	335
38	62	M10	31	18,3	3	–	13 600	6 600	335
38	72	M10	34,1	19,8	–	1/8	14 900	7 800	395
38	72	M10	34,1	19,8	–	1/8	14 900	7 800	395
38	72	M10	34,1	19,8	–	1/8	14 900	7 800	395
38	72	M10	34,1	19,8	3	–	14 900	7 800	395
38	72	M10	34,1	19,8	–	1/8	14 900	7 800	395
48	84	M14	38,1	22,2	–	1/8	20 700	11 300	570
48	84	M14	38,1	22,2	–	1/8	20 700	11 300	570
48	84	M14	38,1	22,2	3	–	20 700	11 300	570
48	84	M14	38,1	22,2	–	1/8	20 700	11 300	570
48	84	M14	38,1	22,2	–	1/8	20 700	11 300	570



Plummer block housing units

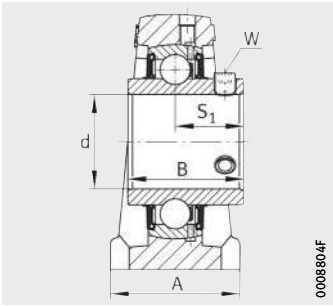
Flake graphite cast iron housing
with short base
With grub screws in inner ring



UCPA

Dimension table (continued) · Dimensions in mm and inch

Designation			Mass m ≈ kg	Dimensions				
Unit	Housing	Radial insert ball bearing		d		H	J	L
				mm	inch			
UCPA207-20	PA207	UC207-20	1,75	31,75	1 1/4	47,6	80	110
UCPA207-21	PA207	UC207-21	1,73	33,338	1 5/16	47,6	80	110
UCPA207-22	PA207	UC207-22	1,7	34,925	1 3/8	47,6	80	110
UCPA207	PA207	UC207	1,7	35	–	47,6	80	110
UCPA207-23	PA207	UC207-23	1,67	36,513	1 7/16	47,6	80	110
UCPA208-24	PA208	UC208-24	1,96	38,1	1 1/2	49,2	84	116
UCPA208-25	PA208	UC208-25	1,92	39,688	1 9/16	49,2	84	116
UCPA208	PA208	UC208	1,91	40	–	49,2	84	116
UCPA209-26	PA209	UC209-26	2,28	41,275	1 5/8	54,2	90	120
UCPA209-27	PA209	UC209-27	2,24	42,863	1 11/16	54,2	90	120
UCPA209-28	PA209	UC209-28	2,2	44,45	1 3/4	54,2	90	120
UCPA209	PA209	UC209	2,19	45	–	54,2	90	120
UCPA210-29	PA210	UC210-29	2,9	46,038	1 13/16	57,2	94	130
UCPA210-30	PA210	UC210-30	2,85	47,625	1 7/8	57,2	94	130
UCPA210-31	PA210	UC210-31	2,8	49,213	1 15/16	57,2	94	130
UCPA210	PA210	UC210	2,78	50	–	57,2	94	130
UCPA210-32	PA210	UC210-32	2,76	50,8	2	57,2	94	130



UCPA

0008804F

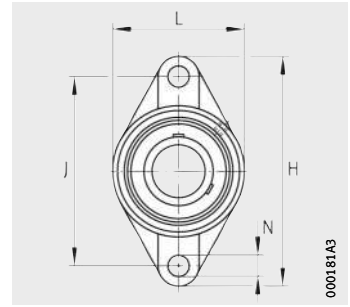
					Width across flats		Load carrying capacity Bearing		
					W		Basic load ratings		Fatigue limit load
A	H ₂	K	B	S ₁			dyn. C _r	stat. C _{0r}	C _{ur}
					mm	inch	N	N	N
48	95	M14	42,9	25,4	–	5/32	27 500	15 300	770
48	95	M14	42,9	25,4	–	5/32	27 500	15 300	770
48	95	M14	42,9	25,4	–	5/32	27 500	15 300	770
48	95	M14	42,9	25,4	4	–	27 500	15 300	770
48	95	M14	42,9	25,4	–	5/32	27 500	15 300	770
54	100	M14	49,2	30,2	–	5/32	34 500	19 800	1010
54	100	M14	49,2	30,2	–	5/32	34 500	19 800	1010
54	100	M14	49,2	30,2	4	–	34 500	19 800	1010
54	108	M14	49,2	30,2	–	5/32	34 500	20 400	1030
54	108	M14	49,2	30,2	–	5/32	34 500	20 400	1030
54	108	M14	49,2	30,2	–	5/32	34 500	20 400	1030
54	108	M14	49,2	30,2	4	–	34 500	20 400	1030
60	116	M16	51,6	32,6	–	3/16	37 500	23 200	1180
60	116	M16	51,6	32,6	–	3/16	37 500	23 200	1180
60	116	M16	51,6	32,6	–	3/16	37 500	23 200	1180
60	116	M16	51,6	32,6	5	–	37 500	23 200	1180
60	116	M16	51,6	32,6	–	3/16	37 500	23 200	1180



Two-bolt flanged housing units

Oval version

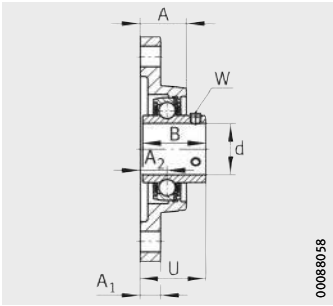
With grub screws in inner ring



UCFL

Dimension table - Dimensions in mm and inch

Designation			Mass m ≈ kg	Dimensions				
Unit	Housing	Radial insert ball bearing		d		H	J	L
				mm	inch			
UCFL201	FL204	UC201	0,47	12	–	113	90	60
UCFL201-08	FL204	UC201-08	0,47	12,7	1/2	113	90	60
UCFL202-09	FL204	UC202-09	0,46	14,288	9/16	113	90	60
UCFL202	FL204	UC202	0,46	15	–	113	90	60
UCFL202-10	FL204	UC202-10	0,45	15,875	5/8	113	90	60
UCFL203	FL204	UC203	0,44	17	–	113	90	60
UCFL203-11	FL204	UC203-11	0,44	17,463	11/16	113	90	60
UCFL204-12	FL204	UC204-12	0,43	19,05	3/4	113	90	60
UCFL204	FL204	UC204	0,42	20	–	113	90	60
UCFL205-13	FL205	UC205-13	0,68	20,638	13/16	130	99	68
UCFL205-14	FL205	UC205-14	0,67	22,225	7/8	130	99	68
UCFL205-15	FL205	UC205-15	0,65	23,813	15/16	130	99	68
UCFL205	FL205	UC205	0,64	25	–	130	99	68
UCFL205-16	FL205	UC205-16	0,64	25,4	1	130	99	68
UCFL206-17	FL206	UC206-17	0,92	26,988	11/16	148	117	80
UCFL206-18	FL206	UC206-18	0,9	28,575	11/8	148	117	80
UCFL206	FL206	UC206	0,88	30	–	148	117	80
UCFL206-19	FL206	UC206-19	0,88	30,163	13/16	148	117	80
UCFL206-20	FL206	UC206-20	0,85	31,75	11/4	148	117	80
UCFL207-20	FL207	UC207-20	1,27	31,75	11/4	161	130	90
UCFL207-21	FL207	UC207-21	1,24	33,338	15/16	161	130	90
UCFL207-22	FL207	UC207-22	1,21	34,925	13/8	161	130	90
UCFL207	FL207	UC207	1,21	35	–	161	130	90
UCFL207-23	FL207	UC207-23	1,18	36,513	17/16	161	130	90
UCFL208-24	FL208	UC208-24	1,53	38,1	11/2	175	144	100
UCFL208-25	FL208	UC208-25	1,49	39,688	19/16	175	144	100
UCFL208	FL208	UC208	1,48	40	–	175	144	100



UCFL

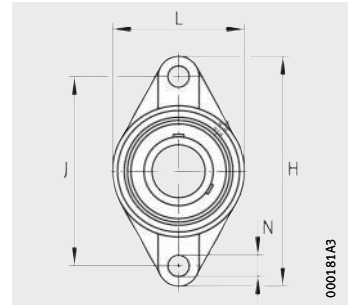
UCFL						Width across flats		Load carrying capacity Bearing		
								Basic load ratings		Fatigue limit load C_{ur} N
						A	A_1	A_2	N	
25,5	12	15	12	31	33,3	3	–	13 600	6 600	335
25,5	12	15	12	31	33,3	–	1/8	13 600	6 600	335
25,5	12	15	12	31	33,3	–	1/8	13 600	6 600	335
25,5	12	15	12	31	33,3	3	–	13 600	6 600	335
25,5	12	15	12	31	33,3	–	1/8	13 600	6 600	335
25,5	12	15	12	31	33,3	3	–	13 600	6 600	335
25,5	12	15	12	31	33,3	–	1/8	13 600	6 600	335
25,5	12	15	12	31	33,3	–	1/8	13 600	6 600	335
25,5	12	15	12	31	33,3	3	–	13 600	6 600	335
27	15	16	16	34,1	35,8	–	1/8	14 900	7 800	395
27	15	16	16	34,1	35,8	–	1/8	14 900	7 800	395
27	15	16	16	34,1	35,8	–	1/8	14 900	7 800	395
27	15	16	16	34,1	35,8	3	–	14 900	7 800	395
27	15	16	16	34,1	35,8	–	1/8	14 900	7 800	395
31	14	18	16	38,1	40,2	–	1/8	20 700	11 300	570
31	14	18	16	38,1	40,2	–	1/8	20 700	11 300	570
31	14	18	16	38,1	40,2	3	–	20 700	11 300	570
31	14	18	16	38,1	40,2	–	1/8	20 700	11 300	570
31	14	18	16	38,1	40,2	–	1/8	20 700	11 300	570
34	16	19	16	42,9	44,4	–	5/32	27 500	15 300	770
34	16	19	16	42,9	44,4	–	5/32	27 500	15 300	770
34	16	19	16	42,9	44,4	–	5/32	27 500	15 300	770
34	16	19	16	42,9	44,4	4	–	27 500	15 300	770
34	16	19	16	42,9	44,4	–	5/32	27 500	15 300	770
36	16	21	16	49,2	51,2	–	5/32	34 500	19 800	1010
36	16	21	16	49,2	51,2	–	5/32	34 500	19 800	1010
36	16	21	16	49,2	51,2	4	–	34 500	19 800	1010



Two-bolt flanged housing units

Oval version

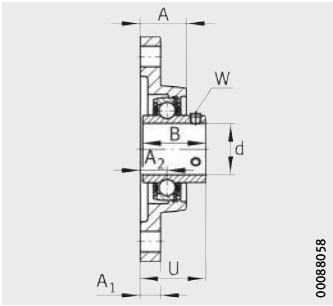
With grub screws in inner ring



UCFL

Dimension table (continued) · Dimensions in mm and inch

Designation			Mass m ≈ kg	Dimensions				
Unit	Housing	Radial insert ball bearing		d		H	J	L
				mm	inch			
UCFL209-26	FL209	UC209-26	2,05	41,275	1⁵/₈	188	148	108
UCFL209-27	FL209	UC209-27	2,01	42,863	1¹¹/₁₆	188	148	108
UCFL209-28	FL209	UC209-28	1,97	44,45	1³/₄	188	148	108
UCFL209	FL209	UC209	1,95	45	–	188	148	108
UCFL210-29	FL210	UC210-29	2,34	46,038	1¹³/₁₆	197	157	115
UCFL210-30	FL210	UC210-30	2,3	47,625	1⁷/₈	197	157	115
UCFL210-31	FL210	UC210-31	2,25	49,213	1¹⁵/₁₆	197	157	115
UCFL210	FL210	UC210	2,23	50	–	197	157	115
UCFL210-32	FL210	UC210-32	2,2	50,8	2	197	157	115
UCFL211-32	FL211	UC211-32	3,02	50,8	2	224	184	130
UCFL211-33	FL211	UC211-33	2,96	52,388	2¹/₁₆	224	184	130
UCFL211-34	FL211	UC211-34	2,91	53,975	2¹/₈	224	184	130
UCFL211	FL211	UC211	2,87	55	–	224	184	130
UCFL211-35	FL211	UC211-35	2,85	55,563	2³/₁₆	224	184	130
UCFL212-36	FL212	UC212-36	4,1	57,15	2¹/₄	250	202	140
UCFL212-37	FL212	UC212-37	4,02	58,738	2⁵/₁₆	250	202	140
UCFL212	FL212	UC212	3,96	60	–	250	202	140
UCFL212-38	FL212	UC212-38	3,95	60,325	2³/₈	250	202	140
UCFL212-39	FL212	UC212-39	3,87	61,913	2⁷/₁₆	250	202	140
UCFL213-40	FL213	UC213-40	4,78	63,5	2¹/₂	258	210	155
UCFL213	FL213	UC213	4,69	65	–	258	210	155
UCFL213-41	FL213	UC213-41	4,68	65,088	2⁹/₁₆	258	210	155



UCFL

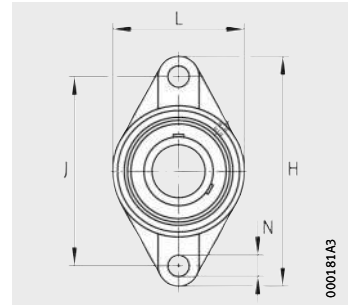
						Width across flats		Load carrying capacity Bearing		
						W		Basic load ratings		Fatigue limit load
A	A ₁	A ₂	N	B	U			dyn. C _r	stat. C _{0r}	C _{ur}
						mm	inch	N	N	N
38	18	22	19	49,2	52,2	-	5/32	34 500	20 400	1 030
38	18	22	19	49,2	52,2	-	5/32	34 500	20 400	1 030
38	18	22	19	49,2	52,2	-	5/32	34 500	20 400	1 030
38	18	22	19	49,2	52,2	4	-	34 500	20 400	1 030
40	18	22	19	51,6	54,6	-	3/16	37 500	23 200	1 180
40	18	22	19	51,6	54,6	-	3/16	37 500	23 200	1 180
40	18	22	19	51,6	54,6	-	3/16	37 500	23 200	1 180
40	18	22	19	51,6	54,6	5	-	37 500	23 200	1 180
40	18	22	19	51,6	54,6	-	3/16	37 500	23 200	1 180
43	20	25	19	55,6	58,4	-	3/16	46 000	29 000	1 480
43	20	25	19	55,6	58,4	-	3/16	46 000	29 000	1 480
43	20	25	19	55,6	58,4	-	3/16	46 000	29 000	1 480
43	20	25	19	55,6	58,4	5	-	46 000	29 000	1 480
43	20	25	19	55,6	58,4	-	3/16	46 000	29 000	1 480
48	20	29	23	65,1	68,7	-	3/16	56 000	36 000	1 820
48	20	29	23	65,1	68,7	-	3/16	56 000	36 000	1 820
48	20	29	23	65,1	68,7	5	-	56 000	36 000	1 820
48	20	29	23	65,1	68,7	-	3/16	56 000	36 000	1 820
48	20	29	23	65,1	68,7	-	3/16	56 000	36 000	1 820
50	24	30	23	65,1	69,7	-	1/4	61 000	40 000	2 030
50	24	30	23	65,1	69,7	6	-	61 000	40 000	2 030
50	24	30	23	65,1	69,7	-	1/4	61 000	40 000	2 030



Two-bolt flanged housing units

Oval version

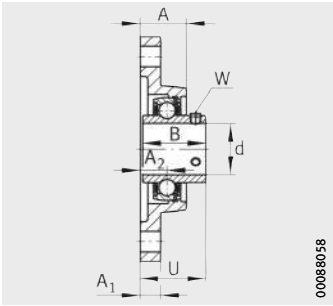
With grub screws in inner ring



UCFL

Dimension table (continued) · Dimensions in mm and inch

Designation			Mass m ≈ kg	Dimensions				
Unit	Housing	Radial insert ball bearing		d		H	J	L
				mm	inch			
UCFL214-42	FL214	UC214-42	5,45	66,675	2⁵/₈	265	216	160
UCFL214-43	FL214	UC214-43	5,35	68,263	2¹¹/₁₆	265	216	160
UCFL214-44	FL214	UC214-44	5,25	69,85	2³/₄	265	216	160
UCFL214	FL214	UC214	5,25	70	–	265	216	160
UCFL215-45	FL215	UC215-45	5,94	71,438	2¹³/₁₆	275	225	165
UCFL215-46	FL215	UC215-46	5,82	73,025	2⁷/₈	275	225	165
UCFL215-47	FL215	UC215-47	5,72	74,613	2¹⁵/₁₆	275	225	165
UCFL215	FL215	UC215	5,69	75	–	275	225	165
UCFL215-48	FL215	UC215-48	5,61	76,2	3	275	225	165
UCFL216-49	FL216	UC216-49	7,41	77,788	3¹/₁₆	290	233	180
UCFL216-50	FL216	UC216-50	7,29	79,375	3¹/₈	290	233	180
UCFL216	FL216	UC216	7,24	80	–	290	233	180
UCFL216-51	FL216	UC216-51	7,16	80,963	3³/₁₆	290	233	180
UCFL217-52	FL217	UC217-52	9,01	82,55	3¹/₄	305	248	190
UCFL217-53	FL217	UC217-53	8,85	84,138	3⁵/₁₆	305	248	190
UCFL217	FL217	UC217	8,77	85	–	305	248	190
UCFL217-55	FL217	UC217-55	8,54	87,313	3⁷/₁₆	305	248	190
UCFL218-56	FL218	UC218-56	10,51	88,9	3¹/₂	320	265	205
UCFL218	FL218	UC218	10,4	90	–	320	265	205



00080000

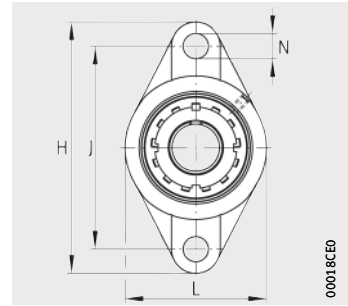
UCFL

UCFL						Width across flats		Load carrying capacity Bearing		
								Basic load ratings		Fatigue limit load C_{ur} N
						A	A_1	A_2	N	
54	24	31	23	74,6	75,4	-	1/4	66 000	44 000	2 230
54	24	31	23	74,6	75,4	-	1/4	66 000	44 000	2 230
54	24	31	23	74,6	75,4	-	1/4	66 000	44 000	2 230
54	24	31	23	74,6	75,4	6	-	66 000	44 000	2 230
56	24	34	23	77,8	78,5	-	1/4	66 000	44 500	2 240
56	24	34	23	77,8	78,5	-	1/4	66 000	44 500	2 240
56	24	34	23	77,8	78,5	-	1/4	66 000	44 500	2 240
56	24	34	23	77,8	78,5	6	-	66 000	44 500	2 240
56	24	34	23	77,8	78,5	-	1/4	66 000	44 500	2 240
58	24	34	25	82,6	83,3	-	1/4	76 000	54 000	2 600
58	24	34	25	82,6	83,3	-	1/4	76 000	54 000	2 600
58	24	34	25	82,6	83,3	6	-	76 000	54 000	2 600
58	24	34	25	82,6	83,3	-	1/4	76 000	54 000	2 600
63	26	36	25	85,7	87,6	-	1/4	88 000	64 000	2 950
63	26	36	25	85,7	87,6	-	1/4	88 000	64 000	2 950
63	26	36	25	85,7	87,6	6	-	88 000	64 000	2 950
63	26	36	25	85,7	87,6	-	1/4	88 000	64 000	2 950
68	26	40	25	96	96,3	-	1/4	102 000	72 000	3 250
68	26	40	25	96	96,3	6	-	102 000	72 000	3 250



Two-bolt flanged housing units

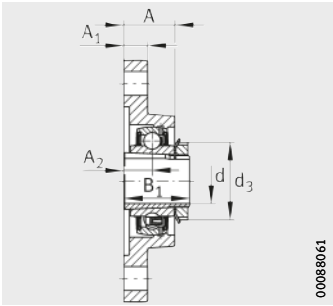
Oval version
With adapter sleeve



UKFL

Dimension table - Dimensions in mm

Designation			Mass m ≈ kg	Dimensions			
Unit	Housing	Radial insert ball bearing		d	H	J	L
UKFL205	FL205	UK205	0,69	20	130	99	68
UKFL206	FL206	UK206	0,94	25	148	117	80
UKFL207	FL207	UK207	1,29	30	161	130	90
UKFL208	FL208	UK208	1,56	35	175	144	100
UKFL209	FL209	UK209	2,08	40	188	148	108
UKFL210	FL210	UK210	2,4	45	197	157	115
UKFL211	FL211	UK211	3,04	50	224	184	130
UKFL212	FL212	UK212	4,05	55	250	202	140
UKFL213	FL213	UK213	4,84	60	258	210	155
UKFL215	FL215	UK215	6,14	65	275	225	165
UKFL216	FL216	UK216	7,74	70	290	233	180
UKFL217	FL217	UK217	9,02	75	305	248	190
UKFL218	FL218	UK218	10,91	80	320	265	205



UKFL

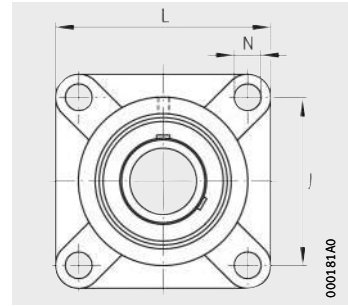
						Load carrying capacity		
						Bearing		Fatigue limit load
						Basic load ratings		
A	A ₁	A ₂	N	B ₁	d ₃ max.	dyn. C _r N	stat. C _{0r} N	C _{ur} N
27	15	16	16	35	38	14 900	7 800	395
31	14	18	16	38	45	20 700	11 300	570
34	16	19	16	43	52	27 500	15 300	770
36	16	21	16	46	58	34 500	19 800	1 010
38	18	22	19	50	65	34 500	20 400	1 030
40	18	22	19	55	70	37 500	23 200	1 180
43	20	25	19	59	75	46 000	29 000	1 480
48	20	29	23	62	80	56 000	36 000	1 820
50	24	30	23	65	85	61 000	40 000	2 030
56	24	34	23	73	98	66 000	44 500	2 240
58	24	34	25	78	105	76 000	54 000	2 600
63	26	36	25	82	110	88 000	64 000	2 950
68	26	40	25	86	120	102 000	72 000	3 250



Four-bolt flanged housing units

Square version

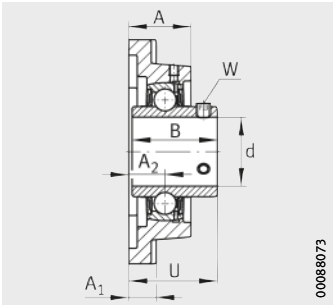
With grub screws in inner ring



UCF

Dimension table - Dimensions in mm and inch

Designation			Mass m ≈ kg	Dimensions				
Unit	Housing	Radial insert ball bearing		d		J	L	A
				mm	inch			
UCF201	F204	UC201	0,62	12	–	64	86	25,5
UCF201-08	F204	UC201-08	0,62	12,7	1/2	64	86	25,5
UCF202-09	F204	UC202-09	0,61	14,288	9/16	64	86	25,5
UCF202	F204	UC202	0,6	15	–	64	86	25,5
UCF202-10	F204	UC202-10	0,6	15,875	5/8	64	86	25,5
UCF203	F204	UC203	0,59	17	–	64	86	25,5
UCF203-11	F204	UC203-11	0,59	17,463	11/16	64	86	25,5
UCF204-12	F204	UC204-12	0,58	19,05	3/4	64	86	25,5
UCF204	F204	UC204	0,57	20	–	64	86	25,5
UCF205-13	F205	UC205-13	0,89	20,638	13/16	70	95	27
UCF205-14	F205	UC205-14	0,87	22,225	7/8	70	95	27
UCF205-15	F205	UC205-15	0,86	23,813	15/16	70	95	27
UCF205	F205	UC205	0,85	25	–	70	95	27
UCF205-16	F205	UC205-16	0,84	25,4	1	70	95	27
UCF206-17	F206	UC206-17	1,15	26,988	11/16	83	108	31
UCF206-18	F206	UC206-18	1,13	28,575	11/8	83	108	31
UCF206	F206	UC206	1,11	30	–	83	108	31
UCF206-19	F206	UC206-19	1,11	30,163	13/16	83	108	31
UCF206-20	F206	UC206-20	1,09	31,75	11/4	83	108	31
UCF207-20	F207	UC207-20	1,55	31,75	11/4	92	117	34
UCF207-21	F207	UC207-21	1,53	33,338	15/16	92	117	34
UCF207-22	F207	UC207-22	1,5	34,925	13/8	92	117	34
UCF207	F207	UC207	1,5	35	–	92	117	34
UCF207-23	F207	UC207-23	1,47	36,513	17/16	92	117	34
UCF208-24	F208	UC208-24	1,95	38,1	11/2	102	130	36
UCF208-25	F208	UC208-25	1,92	39,688	19/16	102	130	36
UCF208	F208	UC208	1,91	40	–	102	130	36



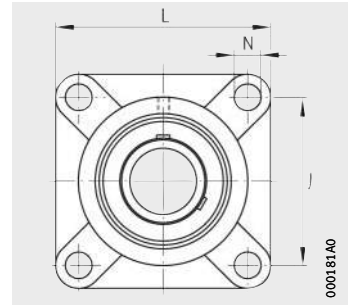
UCF

UCF					Width across flats		Load carrying capacity Bearing		
							Basic load ratings		Fatigue limit load C_{ur} N
					A_1	A_2	N	B	
									mm
12	15	12	31	33,3	3	–	13 600	6 600	335
12	15	12	31	33,3	–	1/8	13 600	6 600	335
12	15	12	31	33,3	–	1/8	13 600	6 600	335
12	15	12	31	33,3	3	–	13 600	6 600	335
12	15	12	31	33,3	–	1/8	13 600	6 600	335
12	15	12	31	33,3	3	–	13 600	6 600	335
12	15	12	31	33,3	–	1/8	13 600	6 600	335
12	15	12	31	33,3	–	1/8	13 600	6 600	335
12	15	12	31	33,3	3	–	13 600	6 600	335
14	16	12	34,1	35,8	–	1/8	14 900	7 800	395
14	16	12	34,1	35,8	–	1/8	14 900	7 800	395
14	16	12	34,1	35,8	–	1/8	14 900	7 800	395
14	16	12	34,1	35,8	3	–	14 900	7 800	395
14	16	12	34,1	35,8	–	1/8	14 900	7 800	395
14	18	12	38,1	40,2	–	1/8	20 700	11 300	570
14	18	12	38,1	40,2	–	1/8	20 700	11 300	570
14	18	12	38,1	40,2	3	–	20 700	11 300	570
14	18	12	38,1	40,2	–	1/8	20 700	11 300	570
14	18	12	38,1	40,2	–	1/8	20 700	11 300	570
16	19	14	42,9	44,4	–	5/32	27 500	15 300	770
16	19	14	42,9	44,4	–	5/32	27 500	15 300	770
16	19	14	42,9	44,4	–	5/32	27 500	15 300	770
16	19	14	42,9	44,4	4	–	27 500	15 300	770
16	19	14	42,9	44,4	–	5/32	27 500	15 300	770
16	21	16	49,2	51,2	–	5/32	34 500	19 800	1 010
16	21	16	49,2	51,2	–	5/32	34 500	19 800	1 010
16	21	16	49,2	51,2	4	–	34 500	19 800	1 010



Four-bolt flanged housing units

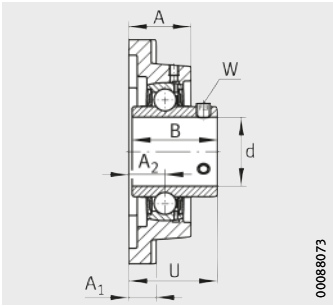
Square version
With grub screws in inner ring



UCF

Dimension table (continued) · Dimensions in mm and inch

Designation			Mass m ≈ kg	Dimensions				
Unit	Housing	Radial insert ball bearing		d		J	L	A
				mm	inch			
UCF209-26	F209	UC209-26	2,4	41,275	1 ⁵ / ₈	105	137	38
UCF209-27	F209	UC209-27	2,36	42,863	1 ¹¹ / ₁₆	105	137	38
UCF209-28	F209	UC209-28	2,32	44,45	1 ³ / ₄	105	137	38
UCF209	F209	UC209	2,3	45	–	105	137	38
UCF210-29	F210	UC210-29	2,67	46,038	1 ¹³ / ₁₆	111	143	40
UCF210-30	F210	UC210-30	2,63	47,625	1 ⁷ / ₈	111	143	40
UCF210-31	F210	UC210-31	2,58	49,213	1 ¹⁵ / ₁₆	111	143	40
UCF210	F210	UC210	2,56	50	–	111	143	40
UCF210-32	F210	UC210-32	2,53	50,8	2	111	143	40
UCF211-32	F211	UC211-32	3,46	50,8	2	130	163	43
UCF211-33	F211	UC211-33	3,4	52,388	2 ¹ / ₁₆	130	163	43
UCF211-34	F211	UC211-34	3,35	53,975	2 ¹ / ₈	130	163	43
UCF211	F211	UC211	3,31	55	–	130	163	43
UCF211-35	F211	UC211-35	3,29	55,563	2 ³ / ₁₆	130	163	43
UCF212-36	F212	UC212-36	4,38	57,15	2 ¹ / ₄	143	175	48
UCF212-37	F212	UC212-37	4,31	58,738	2 ⁵ / ₁₆	143	175	48
UCF212	F212	UC212	4,25	60	–	143	175	48
UCF212-38	F212	UC212-38	4,23	60,325	2 ³ / ₈	143	175	48
UCF212-39	F212	UC212-39	4,15	61,913	2 ⁷ / ₁₆	143	175	48
UCF213-40	F213	UC213-40	4,98	63,5	2 ¹ / ₂	149	187	50
UCF213	F213	UC213	4,9	65	–	149	187	50
UCF213-41	F213	UC213-41	4,9	65,088	2 ⁹ / ₁₆	149	187	50
UCF214-42	F214	UC214-42	6,19	66,675	2 ⁵ / ₈	152	193	54
UCF214-43	F214	UC214-43	6,09	68,263	2 ¹¹ / ₁₆	152	193	54
UCF214-44	F214	UC214-44	5,99	69,85	2 ³ / ₄	152	193	54
UCF214	F214	UC214	5,99	70	–	152	193	54



UCF

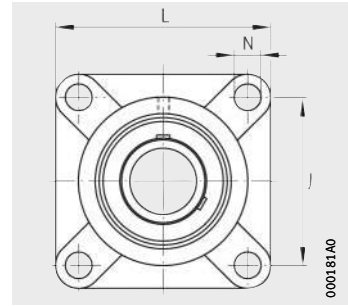
					Width across flats		Load carrying capacity		
							Bearing		Fatigue limit load
A ₁	A ₂	N	B	U	W		Basic load ratings		C _{ur} N
							dyn. C _r N	stat. C _{0r} N	
18	22	16	49,2	52,2	–	5/32	34 500	20 400	1 030
18	22	16	49,2	52,2	–	5/32	34 500	20 400	1 030
18	22	16	49,2	52,2	–	5/32	34 500	20 400	1 030
18	22	16	49,2	52,2	4	–	34 500	20 400	1 030
18	22	16	51,6	54,6	–	3/16	37 500	23 200	1 180
18	22	16	51,6	54,6	–	3/16	37 500	23 200	1 180
18	22	16	51,6	54,6	–	3/16	37 500	23 200	1 180
18	22	16	51,6	54,6	5	–	37 500	23 200	1 180
18	22	16	51,6	54,6	–	3/16	37 500	23 200	1 180
20	25	19	55,6	58,4	–	3/16	46 000	29 000	1 480
20	25	19	55,6	58,4	–	3/16	46 000	29 000	1 480
20	25	19	55,6	58,4	–	3/16	46 000	29 000	1 480
20	25	19	55,6	58,4	5	–	46 000	29 000	1 480
20	25	19	55,6	58,4	–	3/16	46 000	29 000	1 480
20	29	19	65,1	68,7	–	3/16	56 000	36 000	1 820
20	29	19	65,1	68,7	–	3/16	56 000	36 000	1 820
20	29	19	65,1	68,7	5	–	56 000	36 000	1 820
20	29	19	65,1	68,7	–	3/16	56 000	36 000	1 820
20	29	19	65,1	68,7	–	3/16	56 000	36 000	1 820
20	30	19	65,1	69,7	–	1/4	61 000	40 000	2 030
20	30	19	65,1	69,7	6	–	61 000	40 000	2 030
20	30	19	65,1	69,7	–	1/4	61 000	40 000	2 030
24	31	19	74,6	75,4	–	1/4	66 000	44 000	2 230
24	31	19	74,6	75,4	–	1/4	66 000	44 000	2 230
24	31	19	74,6	75,4	–	1/4	66 000	44 000	2 230
24	31	19	74,6	75,4	6	–	66 000	44 000	2 230



Four-bolt flanged housing units

Square version

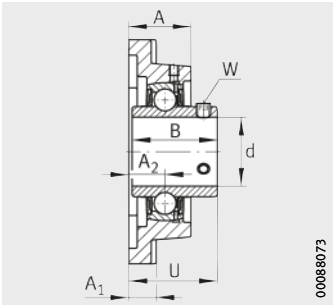
With grub screws in inner ring



UCF

Dimension table (continued) · Dimensions in mm and inch

Designation			Mass m ≈ kg	Dimensions				
Unit	Housing	Radial insert ball bearing		d		J	L	A
				mm	inch			
UCF215-45	F215	UC215-45	6,9	71,438	2¹³/₁₆	159	200	56
UCF215-46	F215	UC215-46	6,8	73,025	2⁷/₈	159	200	56
UCF215-47	F215	UC215-47	6,7	74,613	2¹⁵/₁₆	159	200	56
UCF215	F215	UC215	6,7	75	–	159	200	56
UCF215-48	F215	UC215-48	6,6	76,2	3	159	200	56
UCF216-49	F216	UC216-49	7,6	77,788	3¹/₁₆	165	208	58
UCF216-50	F216	UC216-50	7,5	79,375	3¹/₈	165	208	58
UCF216	F216	UC216	7,4	80	–	165	208	58
UCF216-51	F216	UC216-51	7,3	80,963	3³/₁₆	165	208	58
UCF217-52	F217	UC217-52	9,3	82,55	3¹/₄	175	220	63
UCF217-53	F217	UC217-53	9,1	84,138	3⁵/₁₆	175	220	63
UCF217	F217	UC217	9,1	85	–	175	220	63
UCF217-55	F217	UC217-55	8,8	87,313	3⁷/₁₆	175	220	63
UCF218-56	F218	UC218-56	10,8	88,9	3¹/₂	187	235	68
UCF218	F218	UC218	10,7	90	–	187	235	68



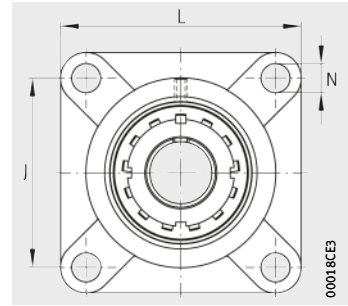
UCF

					Width across flats		Load carrying capacity Bearing		
							Basic load ratings		Fatigue limit load
A ₁	A ₂	N	B	U	W		dyn. C _r	stat. C _{0r}	C _{ur}
					mm	inch	N	N	N
24	34	19	77,8	78,5	–	1/4	66 000	44 500	2 240
24	34	19	77,8	78,5	–	1/4	66 000	44 500	2 240
24	34	19	77,8	78,5	–	1/4	66 000	44 500	2 240
24	34	19	77,8	78,5	6	–	66 000	44 500	2 240
24	34	19	77,8	78,5	–	1/4	66 000	44 500	2 240
24	34	23	82,6	83,3	–	1/4	76 000	54 000	2 600
24	34	23	82,6	83,3	–	1/4	76 000	54 000	2 600
24	34	23	82,6	83,3	6	–	76 000	54 000	2 600
24	34	23	82,6	83,3	–	1/4	76 000	54 000	2 600
26	36	23	85,7	87,6	–	1/4	88 000	64 000	2 950
26	36	23	85,7	87,6	–	1/4	88 000	64 000	2 950
26	36	23	85,7	87,6	6	–	88 000	64 000	2 950
26	36	23	85,7	87,6	–	1/4	88 000	64 000	2 950
26	40	23	96	96,3	–	1/4	102 000	72 000	3 250
26	40	23	96	96,3	6	–	102 000	72 000	3 250



Four-bolt flanged housing units

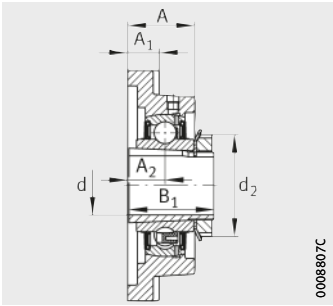
Square version
With adapter sleeve



UKF

Dimension table - Dimensions in mm

Designation			Mass	Dimensions			
Unit	Housing	Radial insert ball bearing		d	J	L	A
			m				
			≈ kg				
UKF205	F205	UK205	0,9	20	70	95	27
UKF206	F206	UK206	1,18	25	83	108	31
UKF207	F207	UK207	1,58	30	92	117	34
UKF208	F208	UK208	1,99	35	102	130	36
UKF209	F209	UK209	2,44	40	105	137	38
UKF210	F210	UK210	2,73	45	111	143	40
UKF211	F211	UK211	3,48	50	130	163	43
UKF212	F212	UK212	4,34	55	143	175	48
UKF213	F213	UK213	5,06	60	149	187	50
UKF215	F215	UK215	7,13	65	159	200	56
UKF216	F216	UK216	7,9	70	165	208	58
UKF217	F217	UK217	9,55	75	175	220	63
UKF218	F218	UK218	11,16	80	187	235	68



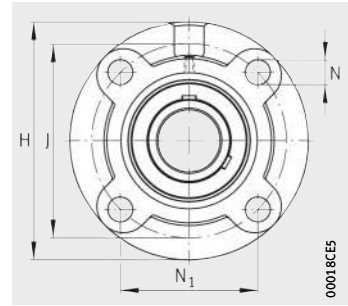
UKF

					Load carrying capacity Bearing		
					Basic load ratings		Fatigue limit load C _{ur} N
A ₁	A ₂	N	B ₁	d ₂ max.	dyn. C _r N	stat. C _{0r} N	
14	16	12	35	38	14 900	7 800	395
14	18	12	38	45	20 700	11 300	570
16	19	14	43	52	27 500	15 300	770
16	21	16	46	58	34 500	19 800	1 010
18	22	16	50	65	34 500	20 400	1 030
18	22	16	55	70	37 500	23 200	1 180
20	25	19	59	75	46 000	29 000	1 480
20	29	19	62	80	56 000	36 000	1 820
20	30	19	65	85	61 000	40 000	2 030
24	34	19	73	98	66 000	44 500	2 240
24	34	23	78	105	76 000	54 000	2 600
26	36	23	82	110	88 000	64 000	2 950
26	40	23	86	120	102 000	72 000	3 250



Four-bolt flanged housing units

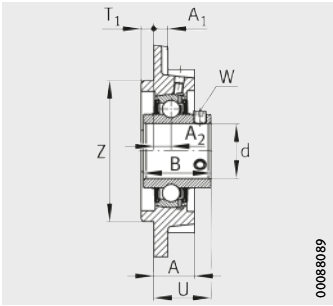
Round version
With grub screws in inner ring



UCFC

Dimension table - Dimensions in mm and inch

Designation			Mass m ≈ kg	Dimensions						
Unit	Housing	Radial insert ball bearing		d		H	J	A	A ₁	A ₂
				mm	inch					
UCFC201	FC204	UC201	0,77	12	–	100	78	20,5	8	10
UCFC201-08	FC204	UC201-08	0,77	12,7	1/2	100	78	20,5	8	10
UCFC202-09	FC204	UC202-09	0,76	14,288	9/16	100	78	20,5	8	10
UCFC202	FC204	UC202	0,76	15	–	100	78	20,5	8	10
UCFC202-10	FC204	UC202-10	0,75	15,875	5/8	100	78	20,5	8	10
UCFC203	FC204	UC203	0,74	17	–	100	78	20,5	8	10
UCFC203-11	FC204	UC203-11	0,74	17,463	11/16	100	78	20,5	8	10
UCFC204-12	FC204	UC204-12	0,73	19,05	3/4	100	78	20,5	8	10
UCFC204	FC204	UC204	0,72	20	–	100	78	20,5	8	10
UCFC205-13	FC205	UC205-13	0,98	20,638	13/16	115	90	21	7	10
UCFC205-14	FC205	UC205-14	0,97	22,225	7/8	115	90	21	7	10
UCFC205-15	FC205	UC205-15	0,95	23,813	15/16	115	90	21	7	10
UCFC205	FC205	UC205	0,94	25	–	115	90	21	7	10
UCFC205-16	FC205	UC205-16	0,94	25,4	1	115	90	21	7	10
UCFC206-17	FC206	UC206-17	1,29	26,988	11/16	125	100	23	8	10
UCFC206-18	FC206	UC206-18	1,27	28,575	1 1/8	125	100	23	8	10
UCFC206	FC206	UC206	1,25	30	–	125	100	23	8	10
UCFC206-19	FC206	UC206-19	1,25	30,163	13/16	125	100	23	8	10
UCFC206-20	FC206	UC206-20	1,23	31,75	1 1/4	125	100	23	8	10
UCFC207-20	FC207	UC207-20	1,76	31,75	1 1/4	135	110	26	9	11
UCFC207-21	FC207	UC207-21	1,73	33,338	15/16	135	110	26	9	11
UCFC207-22	FC207	UC207-22	1,7	34,925	1 3/8	135	110	26	9	11
UCFC207	FC207	UC207	1,7	35	–	135	110	26	9	11
UCFC207-23	FC207	UC207-23	1,67	36,513	17/16	135	110	26	9	11



00086089

UCFC

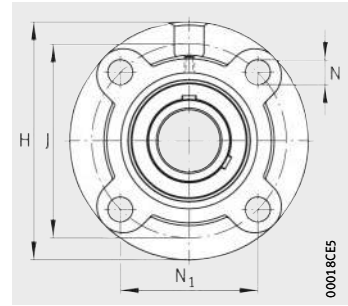
N	N ₁	B	T ₁	U	Z	Width across flats		Load carrying capacity Bearing		
						W		Basic load ratings		Fatigue limit load C _{ur} N
						mm	inch	dyn. C _r N	stat. C _{0r} N	
12	55,1	31	5	28,3	62	3	–	13 600	6 600	335
12	55,1	31	5	28,3	62	–	1/8	13 600	6 600	335
12	55,1	31	5	28,3	62	–	1/8	13 600	6 600	335
12	55,1	31	5	28,3	62	3	–	13 600	6 600	335
12	55,1	31	5	28,3	62	–	1/8	13 600	6 600	335
12	55,1	31	5	28,3	62	3	–	13 600	6 600	335
12	55,1	31	5	28,3	62	–	1/8	13 600	6 600	335
12	55,1	31	5	28,3	62	–	1/8	13 600	6 600	335
12	55,1	31	5	28,3	62	3	–	13 600	6 600	335
12	63,6	34,1	6	29,8	70	–	1/8	14 900	7 800	395
12	63,6	34,1	6	29,8	70	–	1/8	14 900	7 800	395
12	63,6	34,1	6	29,8	70	–	1/8	14 900	7 800	395
12	63,6	34,1	6	29,8	70	3	–	14 900	7 800	395
12	63,6	34,1	6	29,8	70	–	1/8	14 900	7 800	395
12	70,7	38,1	8	32,2	80	–	1/8	20 700	11 300	570
12	70,7	38,1	8	32,2	80	–	1/8	20 700	11 300	570
12	70,7	38,1	8	32,2	80	3	–	20 700	11 300	570
12	70,7	38,1	8	32,2	80	–	1/8	20 700	11 300	570
12	70,7	38,1	8	32,2	80	–	1/8	20 700	11 300	570
14	77,8	42,9	8	36,4	90	–	5/32	27 500	15 300	770
14	77,8	42,9	8	36,4	90	–	5/32	27 500	15 300	770
14	77,8	42,9	8	36,4	90	–	5/32	27 500	15 300	770
14	77,8	42,9	8	36,4	90	4	–	27 500	15 300	770
14	77,8	42,9	8	36,4	90	–	5/32	27 500	15 300	770



Four-bolt flanged housing units

Round version

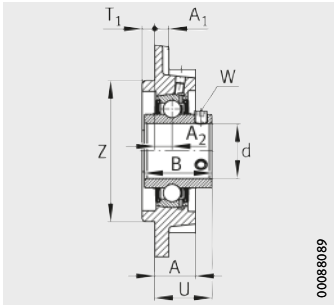
With grub screws in inner ring



UCFC

Dimension table (continued) · Dimensions in mm and inch

Designation			Mass m ≈ kg	Dimensions						
Unit	Housing	Radial insert ball bearing		d		H	J	A	A ₁	A ₂
				mm	inch					
UCFC208-24	FC208	UC208-24	2,08	38,1	1 1/2	145	120	26	9	11
UCFC208-25	FC208	UC208-25	2,04	39,688	1 9/16	145	120	26	9	11
UCFC208	FC208	UC208	2,03	40	–	145	120	26	9	11
UCFC209-26	FC209	UC209-26	2,78	41,275	1 5/8	160	132	26	14	10
UCFC209-27	FC209	UC209-27	2,74	42,863	1 11/16	160	132	26	14	10
UCFC209-28	FC209	UC209-28	2,7	44,45	1 3/4	160	132	26	14	10
UCFC209	FC209	UC209	2,69	45	–	160	132	26	14	10
UCFC210-29	FC210	UC210-29	3,08	46,038	1 13/16	165	138	28	14	10
UCFC210-30	FC210	UC210-30	3,03	47,625	1 7/8	165	138	28	14	10
UCFC210-31	FC210	UC210-31	2,98	49,213	1 15/16	165	138	28	14	10
UCFC210	FC210	UC210	2,96	50	–	165	138	28	14	10
UCFC210-32	FC210	UC210-32	2,94	50,8	2	165	138	28	14	10
UCFC211-32	FC211	UC211-32	4,13	50,8	2	185	150	31	15	13
UCFC211-33	FC211	UC211-33	4,07	52,388	2 1/16	185	150	31	15	13
UCFC211-34	FC211	UC211-34	4,02	53,975	2 1/8	185	150	31	15	13
UCFC211	FC211	UC211	3,98	55	–	185	150	31	15	13
UCFC211-35	FC211	UC211-35	3,96	55,563	2 3/16	185	150	31	15	13
UCFC212-36	FC212	UC212-36	5	57,15	2 1/4	195	160	36	15	17
UCFC212-37	FC212	UC212-37	4,92	58,738	2 5/16	195	160	36	15	17
UCFC212	FC212	UC212	4,86	60	–	195	160	36	15	17
UCFC212-38	FC212	UC212-38	4,85	60,325	2 3/8	195	160	36	15	17
UCFC212-39	FC212	UC212-39	4,77	61,913	2 7/16	195	160	36	15	17



00085089

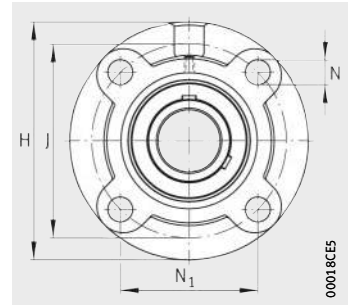
UCFC

N	N ₁	B	T ₁	U	Z	Width across flats		Load carrying capacity Bearing		
						W		Basic load ratings		Fatigue limit load C _{ur} N
						mm	inch	dyn. C _r N	stat. C _{0r} N	
14	84,8	49,2	10	41,2	100	–	5/32	34 500	19 800	1 010
14	84,8	49,2	10	41,2	100	–	5/32	34 500	19 800	1 010
14	84,8	49,2	10	41,2	100	4	–	34 500	19 800	1 010
16	93,3	49,2	12	40,2	105	–	5/32	34 500	20 400	1 030
16	93,3	49,2	12	40,2	105	–	5/32	34 500	20 400	1 030
16	93,3	49,2	12	40,2	105	–	5/32	34 500	20 400	1 030
16	93,3	49,2	12	40,2	105	4	–	34 500	20 400	1 030
16	97,6	51,6	12	42,6	110	–	3/16	37 500	23 200	1 180
16	97,6	51,6	12	42,6	110	–	3/16	37 500	23 200	1 180
16	97,6	51,6	12	42,6	110	–	3/16	37 500	23 200	1 180
16	97,6	51,6	12	42,6	110	5	–	37 500	23 200	1 180
16	97,6	51,6	12	42,6	110	–	3/16	37 500	23 200	1 180
19	106,1	55,6	12	46,4	125	–	3/16	46 000	29 000	1 480
19	106,1	55,6	12	46,4	125	–	3/16	46 000	29 000	1 480
19	106,1	55,6	12	46,4	125	–	3/16	46 000	29 000	1 480
19	106,1	55,6	12	46,4	125	5	–	46 000	29 000	1 480
19	106,1	55,6	12	46,4	125	–	3/16	46 000	29 000	1 480
19	113,1	65,1	12	56,7	135	–	3/16	56 000	36 000	1 820
19	113,1	65,1	12	56,7	135	–	3/16	56 000	36 000	1 820
19	113,1	65,1	12	56,7	135	5	–	56 000	36 000	1 820
19	113,1	65,1	12	56,7	135	–	3/16	56 000	36 000	1 820
19	113,1	65,1	12	56,7	135	–	3/16	56 000	36 000	1 820



Four-bolt flanged housing units

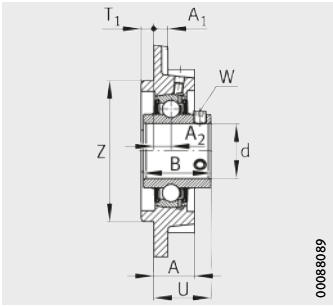
Round version
With grub screws in inner ring



UCFC

Dimension table (continued) · Dimensions in mm and inch

Designation			Mass m ≈ kg	Dimensions						
Unit	Housing	Radial insert ball bearing		d		H	J	A	A ₁	A ₂
				mm	inch					
UCFC213-40	FC213	UC213-40	5,55	63,5	2 ¹ / ₂	205	170	36	15	16
UCFC213	FC213	UC213	5,47	65	–	205	170	36	15	16
UCFC213-41	FC213	UC213-41	5,44	65,088	2 ⁹ / ₁₆	205	170	36	15	16
UCFC214-42	FC214	UC214-42	6,84	66,675	2 ⁵ / ₈	215	177	40	18	17
UCFC214-43	FC214	UC214-43	6,74	68,263	2 ¹¹ / ₁₆	215	177	40	18	17
UCFC214-44	FC214	UC214-44	6,64	69,85	2 ³ / ₄	215	177	40	18	17
UCFC214	FC214	UC214	6,63	70	–	215	177	40	18	17
UCFC215-45	FC215	UC215-45	7,47	71,438	2 ¹³ / ₁₆	220	184	40	18	18
UCFC215-46	FC215	UC215-46	7,36	73,025	2 ⁷ / ₈	220	184	40	18	18
UCFC215-47	FC215	UC215-47	7,25	74,613	2 ¹⁵ / ₁₆	220	184	40	18	18
UCFC215	FC215	UC215	7,22	75	–	220	184	40	18	18
UCFC215-48	FC215	UC215-48	7,13	76,2	3	220	184	40	18	18
UCFC216-49	FC216	UC216-49	8,95	77,788	3 ¹ / ₁₆	240	200	42	18	18
UCFC216-50	FC216	UC216-50	8,82	79,375	3 ¹ / ₈	240	200	42	18	18
UCFC216	FC216	UC216	8,8	80	–	240	200	42	18	18
UCFC216-51	FC216	UC216-51	8,69	80,963	3 ³ / ₁₆	240	200	42	18	18
UCFC217-52	FC217	UC217-52	10,59	82,55	3 ¹ / ₄	250	208	45	20	18
UCFC217-53	FC217	UC217-53	10,46	84,138	3 ⁵ / ₁₆	250	208	45	20	18
UCFC217	FC217	UC217	10,38	85	–	250	208	45	20	18
UCFC217-55	FC217	UC217-55	10,17	87,313	3 ⁷ / ₁₆	250	208	45	20	18
UCFC218-56	FC218	UC218-56	12,33	88,9	3 ¹ / ₂	265	220	50	20	22
UCFC218	FC218	UC218	12,21	90	–	265	220	50	20	22



00085089

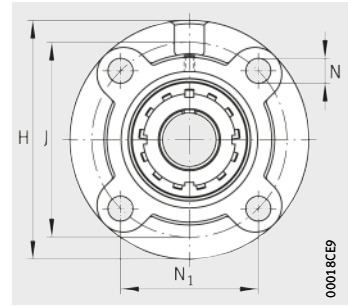
UCFC

N	N ₁	B	T ₁	U	Z	Width across flats		Load carrying capacity Bearing		
						W		Basic load ratings		Fatigue limit load C _{ur} N
						mm	inch	dyn. C _r N	stat. C _{0r} N	
19	120,2	65,1	14	55,7	145	-	1/4	61 000	40 000	2 030
19	120,2	65,1	14	55,7	145	6	-	61 000	40 000	2 030
19	120,2	65,1	14	55,7	145	-	1/4	61 000	40 000	2 030
19	125,15	74,6	14	61,4	150	-	1/4	66 000	44 000	2 230
19	125,15	74,6	14	61,4	150	-	1/4	66 000	44 000	2 230
19	125,15	74,6	14	61,4	150	-	1/4	66 000	44 000	2 230
19	125,15	74,6	14	61,4	150	6	-	66 000	44 000	2 230
19	130,1	77,8	16	62,5	160	-	1/4	66 000	44 500	2 240
19	130,1	77,8	16	62,5	160	-	1/4	66 000	44 500	2 240
19	130,1	77,8	16	62,5	160	-	1/4	66 000	44 500	2 240
19	130,1	77,8	16	62,5	160	6	-	66 000	44 500	2 240
19	130,1	77,8	16	62,5	160	-	1/4	66 000	44 500	2 240
23	141,4	82,6	16	67,3	170	-	1/4	76 000	54 000	2 600
23	141,4	82,6	16	67,3	170	-	1/4	76 000	54 000	2 600
23	141,4	82,6	16	67,3	170	6	-	76 000	54 000	2 600
23	141,4	82,6	16	67,3	170	-	1/4	76 000	54 000	2 600
23	147,1	85,7	18	69,6	180	-	1/4	88 000	64 000	2 950
23	147,1	85,7	18	69,6	180	-	1/4	88 000	64 000	2 950
23	147,1	85,7	18	69,6	180	6	-	88 000	64 000	2 950
23	147,1	85,7	18	69,6	180	-	1/4	88 000	64 000	2 950
23	155,55	96	18	78,3	190	-	1/4	102 000	72 000	3 250
23	155,55	96	18	78,3	190	6	-	102 000	72 000	3 250



Four-bolt flanged housing units

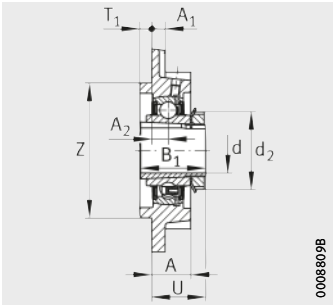
Round version
With adapter sleeve



UKFC

Dimension table - Dimensions in mm

Designation			Mass m ≈ kg	Dimensions				
Unit	Housing	Radial insert ball bearing		d	H	J	A	A ₁
UKFC205	FC205	UK205	0,99	20	115	90	21	7
UKFC206	FC206	UK206	1,31	25	125	100	23	8
UKFC207	FC207	UK207	1,78	30	135	110	26	9
UKFC208	FC208	UK208	2,12	35	145	120	26	9
UKFC209	FC209	UK209	2,82	40	160	132	26	14
UKFC210	FC210	UK210	3,14	45	165	138	28	14
UKFC211	FC211	UK211	4,15	50	185	150	31	15
UKFC212	FC212	UK212	4,95	55	195	160	36	15
UKFC213	FC213	UK213	5,62	60	205	170	36	15
UKFC215	FC215	UK215	7,7	65	220	184	40	18
UKFC216	FC216	UK216	9,33	70	240	200	42	18
UKFC217	FC217	UK217	10,87	75	250	208	45	20
UKFC218	FC218	UK218	12,76	80	265	220	50	20



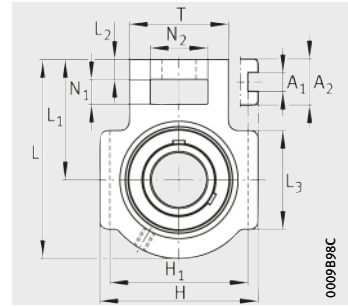
UKFC

								Load carrying capacity Bearing		
								Basic load ratings		Fatigue limit load
A ₂	N	N ₁	B ₁	T ₁	U	Z	d ₂	dyn. C _r N	stat. C _{0r} N	C _{ur} N
						h8	max.			
10	12	63,6	35	6	30,7	70	38	14 900	7 800	395
10	12	70,7	38	8	32,2	80	45	20 700	11 300	570
11	14	77,8	43	8	35,7	90	52	27 500	15 300	770
11	14	84,8	46	10	37,7	100	58	34 500	19 800	1 010
10	16	93,3	50	12	38,2	105	65	34 500	20 400	1 030
10	16	97,6	55	12	40,2	110	70	37 500	23 200	1 180
13	19	106,1	59	12	44,2	125	75	46 000	29 000	1 480
17	19	113,1	62	12	51,2	135	80	56 000	36 000	1 820
16	19	120,2	65	14	51,2	145	85	61 000	40 000	2 030
18	19	130,1	73	16	55	160	98	66 000	44 500	2 240
18	23	141,4	78	16	58,2	170	105	76 000	54 000	2 600
18	23	147,1	82	18	60,2	180	110	88 000	64 000	2 950
22	23	155,55	86	18	65,7	190	120	102 000	72 000	3 250



Take-up housing units

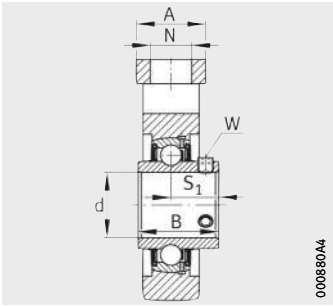
For linear motion
With grub screws in inner ring



UCT

Dimension table - Dimensions in mm and inch

Designation			Mass m ≈ kg	Dimensions							
Unit	Housing	Radial insert ball bearing		d	H	L	L ₁	L ₂	L ₃	A	
											mm
UCT201	T204	UC201	0,77	12	–	89	94	61	10	51	32
UCT201-08	T204	UC201-08	0,77	12,7	1/2	89	94	61	10	51	32
UCT202-09	T204	UC202-09	0,76	14,288	9/16	89	94	61	10	51	32
UCT202	T204	UC202	0,75	15	–	89	94	61	10	51	32
UCT202-10	T204	UC202-10	0,75	15,875	5/8	89	94	61	10	51	32
UCT203	T204	UC203	0,74	17	–	89	94	61	10	51	32
UCT203-11	T204	UC203-11	0,74	17,463	11/16	89	94	61	10	51	32
UCT204-12	T204	UC204-12	0,73	19,05	3/4	89	94	61	10	51	32
UCT204	T204	UC204	0,72	20	–	89	94	61	10	51	32
UCT205-13	T205	UC205-13	0,84	20,638	13/16	89	97	62	10	51	32
UCT205-14	T205	UC205-14	0,83	22,225	7/8	89	97	62	10	51	32
UCT205-15	T205	UC205-15	0,81	23,813	15/16	89	97	62	10	51	32
UCT205	T205	UC205	0,8	25	–	89	97	62	10	51	32
UCT205-16	T205	UC205-16	0,8	25,4	1	89	97	62	10	51	32
UCT206-17	T206	UC206-17	1,27	26,988	11/16	102	113	70	10	57	37
UCT206-18	T206	UC206-18	1,25	28,575	11/8	102	113	70	10	57	37
UCT206	T206	UC206	1,23	30	–	102	113	70	10	57	37
UCT206-19	T206	UC206-19	1,23	30,163	13/16	102	113	70	10	57	37
UCT206-20	T206	UC206-20	1,2	31,75	11/4	102	113	70	10	57	37
UCT207-20	T207	UC207-20	1,64	31,75	11/4	102	129	78	13	64	37
UCT207-21	T207	UC207-21	1,61	33,338	15/16	102	129	78	13	64	37
UCT207-22	T207	UC207-22	1,58	34,925	13/8	102	129	78	13	64	37
UCT207	T207	UC207	1,58	35	–	102	129	78	13	64	37
UCT207-23	T207	UC207-23	1,55	36,513	17/16	102	129	78	13	64	37



00088044

UCT

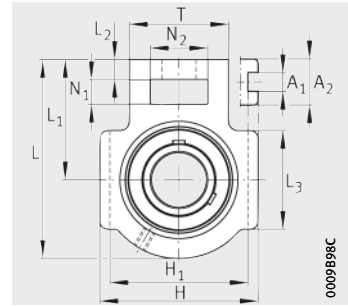
A ₁	A ₂	H ₁	N	N ₁	N ₂	B	S ₁	T	Width across flats		Load carrying capacity Bearing		
									W		Basic load ratings		Fatigue limit load C _{ur} N
									mm	inch	dyn. C _r N	stat. C _{0r} N	
+0,2/0		0/-0,5											
12	21	76	19	16	32	31	18,3	51	3	–	13 600	6 600	335
12	21	76	19	16	32	31	18,3	51	–	1/8	13 600	6 600	335
12	21	76	19	16	32	31	18,3	51	–	1/8	13 600	6 600	335
12	21	76	19	16	32	31	18,3	51	3	–	13 600	6 600	335
12	21	76	19	16	32	31	18,3	51	–	1/8	13 600	6 600	335
12	21	76	19	16	32	31	18,3	51	3	–	13 600	6 600	335
12	21	76	19	16	32	31	18,3	51	–	1/8	13 600	6 600	335
12	21	76	19	16	32	31	18,3	51	–	1/8	13 600	6 600	335
12	21	76	19	16	32	31	18,3	51	3	–	13 600	6 600	335
12	24	76	19	16	32	34,1	19,8	51	–	1/8	14 900	7 800	395
12	24	76	19	16	32	34,1	19,8	51	–	1/8	14 900	7 800	395
12	24	76	19	16	32	34,1	19,8	51	–	1/8	14 900	7 800	395
12	24	76	19	16	32	34,1	19,8	51	3	–	14 900	7 800	395
12	24	76	19	16	32	34,1	19,8	51	–	1/8	14 900	7 800	395
12	28	89	22	16	37	38,1	22,2	56	–	1/8	20 700	11 300	570
12	28	89	22	16	37	38,1	22,2	56	–	1/8	20 700	11 300	570
12	28	89	22	16	37	38,1	22,2	56	3	–	20 700	11 300	570
12	28	89	22	16	37	38,1	22,2	56	–	1/8	20 700	11 300	570
12	28	89	22	16	37	38,1	22,2	56	–	1/8	20 700	11 300	570
12	30	89	22	16	37	42,9	25,4	64	–	5/32	27 500	15 300	770
12	30	89	22	16	37	42,9	25,4	64	–	5/32	27 500	15 300	770
12	30	89	22	16	37	42,9	25,4	64	–	5/32	27 500	15 300	770
12	30	89	22	16	37	42,9	25,4	64	4	–	27 500	15 300	770
12	30	89	22	16	37	42,9	25,4	64	–	5/32	27 500	15 300	770



Take-up housing units

For linear motion

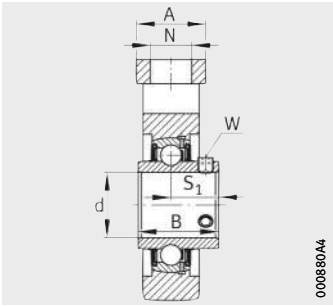
With grub screws in inner ring



UCT

Dimension table (continued) · Dimensions in mm and inch

Designation			Mass m ≈ kg	Dimensions							
Unit	Housing	Radial insert ball bearing		d	H	L	L ₁	L ₂	L ₃	A	
											mm
UCT208-24	T208	UC208-24	2,36	38,1	1¹/₂	114	144	88	16	83	49
UCT208-25	T208	UC208-25	2,33	39,688	1⁹/₁₆	114	144	88	16	83	49
UCT208	T208	UC208	2,32	40	–	114	144	88	16	83	49
UCT209-26	T209	UC209-26	2,46	41,275	1⁵/₈	117	144	87	16	83	49
UCT209-27	T209	UC209-27	2,42	42,863	1¹¹/₁₆	117	144	87	16	83	49
UCT209-28	T209	UC209-28	2,38	44,45	1³/₄	117	144	87	16	83	49
UCT209	T209	UC209	2,37	45	–	117	144	87	16	83	49
UCT210-29	T210	UC210-29	2,64	46,038	1¹³/₁₆	117	149	90	16	86	49
UCT210-30	T210	UC210-30	2,59	47,625	1⁷/₈	117	149	90	16	86	49
UCT210-31	T210	UC210-31	2,54	49,213	1¹⁵/₁₆	117	149	90	16	86	49
UCT210	T210	UC210	2,52	50	–	117	149	90	16	86	49
UCT210-32	T210	UC210-32	2,5	50,8	2	117	149	90	16	86	49
UCT211-32	T211	UC211-32	3,98	50,8	2	146	171	106	19	95	64
UCT211-33	T211	UC211-33	3,93	52,388	2¹/₁₆	146	171	106	19	95	64
UCT211-34	T211	UC211-34	3,87	53,975	2¹/₈	146	171	106	19	95	64
UCT211	T211	UC211	3,83	55	–	146	171	106	19	95	64
UCT211-35	T211	UC211-35	3,81	55,563	2³/₁₆	146	171	106	19	95	64
UCT212-36	T212	UC212-36	4,84	57,15	2¹/₄	146	194	119	19	102	64
UCT212-37	T212	UC212-37	4,77	58,738	2⁵/₁₆	146	194	119	19	102	64
UCT212	T212	UC212	4,71	60	–	146	194	119	19	102	64
UCT212-38	T212	UC212-38	4,69	60,325	2³/₈	146	194	119	19	102	64
UCT212-39	T212	UC212-39	4,61	61,913	2⁷/₁₆	146	194	119	19	102	64



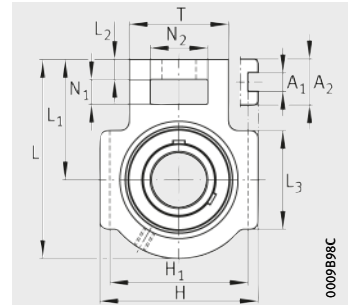
UCT

									Width across flats		Load carrying capacity Bearing		
											Basic load ratings		Fatigue limit load C _{ur} N
A ₁	A ₂	H ₁	N	N ₁	N ₂	B	S ₁	T	W	dyn. C _r N	stat. C _{0r} N	C _{ur} N	
+0,3/0		0/-0,8											mm
16	33	102	29	19	49	49,2	30,2	83	-	5/32	34 500	19 800	1 010
16	33	102	29	19	49	49,2	30,2	83	-	5/32	34 500	19 800	1 010
16	33	102	29	19	49	49,2	30,2	83	4	-	34 500	19 800	1 010
16	35	102	29	19	49	49,2	30,2	83	-	5/32	34 500	20 400	1 030
16	35	102	29	19	49	49,2	30,2	83	-	5/32	34 500	20 400	1 030
16	35	102	29	19	49	49,2	30,2	83	-	5/32	34 500	20 400	1 030
16	35	102	29	19	49	49,2	30,2	83	4	-	34 500	20 400	1 030
16	37	102	29	19	49	51,6	32,6	83	-	3/16	37 500	23 200	1 180
16	37	102	29	19	49	51,6	32,6	83	-	3/16	37 500	23 200	1 180
16	37	102	29	19	49	51,6	32,6	83	-	3/16	37 500	23 200	1 180
16	37	102	29	19	49	51,6	32,6	83	5	-	37 500	23 200	1 180
16	37	102	29	19	49	51,6	32,6	83	-	3/16	37 500	23 200	1 180
22	38	130	35	25	64	55,6	33,4	102	-	3/16	46 000	29 000	1 480
22	38	130	35	25	64	55,6	33,4	102	-	3/16	46 000	29 000	1 480
22	38	130	35	25	64	55,6	33,4	102	-	3/16	46 000	29 000	1 480
22	38	130	35	25	64	55,6	33,4	102	5	-	46 000	29 000	1 480
22	38	130	35	25	64	55,6	33,4	102	-	3/16	46 000	29 000	1 480
22	42	130	35	32	64	65,1	39,7	102	-	3/16	56 000	36 000	1 820
22	42	130	35	32	64	65,1	39,7	102	-	3/16	56 000	36 000	1 820
22	42	130	35	32	64	65,1	39,7	102	5	-	56 000	36 000	1 820
22	42	130	35	32	64	65,1	39,7	102	-	3/16	56 000	36 000	1 820
22	42	130	35	32	64	65,1	39,7	102	-	3/16	56 000	36 000	1 820



Take-up housing units

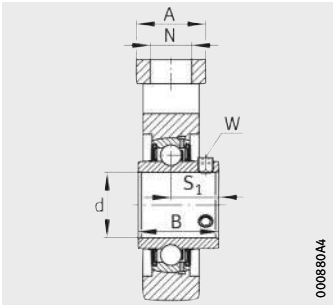
For linear motion
With grub screws in inner ring



UCT

Dimension table (continued) · Dimensions in mm and inch

Designation			Mass m ≈ kg	Dimensions							
Unit	Housing	Radial insert ball bearing		d	H	L	L ₁	L ₂	L ₃	A	
											mm
UCT213-40	T213	UC213-40	6,68	63,5	2¹/₂	167	224	137	21	121	70
UCT213	T213	UC213	6,61	65	–	167	224	137	21	121	70
UCT213-41	T213	UC213-41	6,61	65,088	2⁹/₁₆	167	224	137	21	121	70
UCT214-42	T214	UC214-42	6,99	66,675	2⁵/₈	167	224	137	21	121	70
UCT214-43	T214	UC214-43	6,89	68,263	2¹¹/₁₆	167	224	137	21	121	70
UCT214-44	T214	UC214-44	6,79	69,85	2³/₄	167	224	137	21	121	70
UCT214	T214	UC214	6,78	70	–	167	224	137	21	121	70
UCT215-45	T215	UC215-45	7,45	71,438	2¹³/₁₆	167	232	140	21	121	70
UCT215-46	T215	UC215-46	7,34	73,025	2⁷/₈	167	232	140	21	121	70
UCT215-47	T215	UC215-47	7,23	74,613	2¹⁵/₁₆	167	232	140	21	121	70
UCT215	T215	UC215	7,2	75	–	167	232	140	21	121	70
UCT215-48	T215	UC215-48	7,12	76,2	3	167	232	140	21	121	70
UCT216-49	T216	UC216-49	8,27	77,788	3¹/₁₆	184	235	140	21	121	70
UCT216-50	T216	UC216-50	8,15	79,375	3¹/₈	184	235	140	21	121	70
UCT216	T216	UC216	8,09	80	–	184	235	140	21	121	70
UCT216-51	T216	UC216-51	8,01	80,963	3³/₁₆	184	235	140	21	121	70
UCT217-52	T217	UC217-52	10,9	82,55	3¹/₄	198	260	162	29	157	73
UCT217-53	T217	UC217-53	10,8	84,138	3⁵/₁₆	198	260	162	29	157	73
UCT217	T217	UC217	10,7	85	–	198	260	162	29	157	73
UCT217-55	T217	UC217-55	10,5	87,313	3⁷/₁₆	198	260	162	29	157	73
UCT218-56	T218	UC218-56	12,37	88,9	3¹/₂	215	275	170	30	140	80
UCT218	T218	UC218	12,26	90	–	215	275	170	30	140	80



00088044

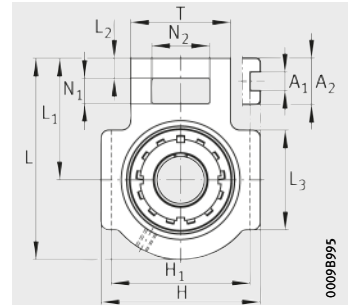
UCT

									Width across flats		Load carrying capacity Bearing		
											Basic load ratings		Fatigue limit load
A ₁	A ₂	H ₁	N	N ₁	N ₂	B	S ₁	T	W		dyn. C _r	stat. C _{0r}	C _{ur}
+0,3/0		0/-0,8							mm	inch	N	N	N
26	44	151	41	32	70	65,1	39,7	111	-	1/4	61 000	40 000	2 030
26	44	151	41	32	70	65,1	39,7	111	6	-	61 000	40 000	2 030
26	44	151	41	32	70	65,1	39,7	111	-	1/4	61 000	40 000	2 030
26	46	151	41	32	70	74,6	44,4	111	-	1/4	66 000	44 000	2 230
26	46	151	41	32	70	74,6	44,4	111	-	1/4	66 000	44 000	2 230
26	46	151	41	32	70	74,6	44,4	111	-	1/4	66 000	44 000	2 230
26	46	151	41	32	70	74,6	44,4	111	6	-	66 000	44 000	2 230
26	48	151	41	32	70	77,8	44,5	111	-	1/4	66 000	44 500	2 240
26	48	151	41	32	70	77,8	44,5	111	-	1/4	66 000	44 500	2 240
26	48	151	41	32	70	77,8	44,5	111	-	1/4	66 000	44 500	2 240
26	48	151	41	32	70	77,8	44,5	111	6	-	66 000	44 500	2 240
26	48	151	41	32	70	77,8	44,5	111	-	1/4	66 000	44 500	2 240
26	51	165	41	32	70	82,6	49,3	111	-	1/4	76 000	54 000	2 600
26	51	165	41	32	70	82,6	49,3	111	-	1/4	76 000	54 000	2 600
26	51	165	41	32	70	82,6	49,3	111	6	-	76 000	54 000	2 600
26	51	165	41	32	70	82,6	49,3	111	-	1/4	76 000	54 000	2 600
30	54	173	48	38	73	85,7	51,6	124	-	1/4	88 000	64 000	2 950
30	54	173	48	38	73	85,7	51,6	124	-	1/4	88 000	64 000	2 950
30	54	173	48	38	73	85,7	51,6	124	6	-	88 000	64 000	2 950
30	54	173	48	38	73	85,7	51,6	124	-	1/4	88 000	64 000	2 950
28	55	190	47	40	80	96	56,3	130	-	1/4	102 000	72 000	3 250
28	55	190	47	40	80	96	56,3	130	6	-	102 000	72 000	3 250



Take-up housing units

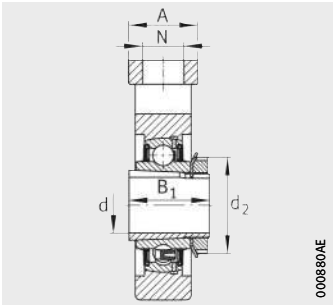
For linear motion
With adapter sleeve



UKT

Dimension table - Dimensions in mm

Designation			Mass m ≈ kg	Dimensions						
Unit	Housing	Radial insert ball bearing		d	H	L	L ₁	L ₂	L ₃	A
UKT205	T205	UK205	0,85	20	89	97	62	10	51	32
UKT206	T206	UK206	1,29	25	102	113	70	10	57	37
UKT207	T207	UK207	1,66	30	102	129	78	13	64	37
UKT208	T208	UK208	2,4	35	114	144	88	16	83	49
UKT209	T209	UK209	2,5	40	117	144	87	16	83	49
UKT210	T210	UK210	2,7	45	117	149	90	16	86	49
UKT211	T211	UK211	4	50	146	171	106	19	95	64
UKT212	T212	UK212	4,79	55	146	194	119	19	102	64
UKT213	T213	UK213	6,76	60	167	224	137	21	121	70
UKT215	T215	UK215	7,69	65	167	232	140	21	121	70
UKT216	T216	UK216	8,6	70	184	235	140	21	121	70
UKT217	T217	UK217	11,2	75	198	260	162	29	157	73
UKT218	T218	UK218	12,78	80	215	275	170	30	140	80



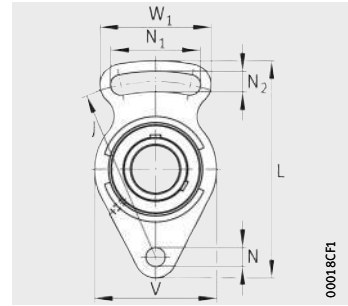
UKT

									Load carrying capacity Bearing		
									Basic load ratings		Fatigue limit load
A ₁	A ₂	H ₁	N	N ₁	N ₂	B ₁	T	d ₂ max.	dyn. C _r N	stat. C _{0r} N	C _{ur} N
12 ^{+0,2} ₀	24	76 ⁰ _{-0,5}	19	16	32	35	51	38	14 900	7 800	395
12 ^{+0,2} ₀	28	89 ⁰ _{-0,5}	22	16	37	38	56	45	20 700	11 300	570
12 ^{+0,2} ₀	30	89 ⁰ _{-0,5}	22	16	37	43	64	52	27 500	15 300	770
16 ^{+0,2} ₀	33	102 ⁰ _{-0,5}	29	19	49	46	83	58	34 500	19 800	1 010
16 ^{+0,2} ₀	35	102 ⁰ _{-0,5}	29	19	49	50	83	65	34 500	20 400	1 030
16 ^{+0,2} ₀	37	102 ⁰ _{-0,5}	29	19	49	55	83	70	37 500	23 200	1 180
22 ^{+0,3} ₀	38	130 ⁰ _{-0,8}	35	25	64	59	102	75	46 000	29 000	1 480
22 ^{+0,3} ₀	42	130 ⁰ _{-0,8}	35	32	64	62	102	80	56 000	36 000	1 820
26 ^{+0,3} ₀	44	151 ⁰ _{-0,8}	41	32	70	65	111	85	61 000	40 000	2 030
26 ^{+0,3} ₀	48	151 ⁰ _{-0,8}	41	32	70	73	111	98	66 000	44 500	2 240
26 ^{+0,3} ₀	51	165 ⁰ _{-0,8}	41	32	70	78	111	105	76 000	54 000	2 600
30 ^{+0,3} ₀	54	173 ⁰ _{-0,8}	48	38	73	82	124	110	88 000	64 000	2 950
28 ^{+0,3} ₀	55	190 ⁰ _{-0,8}	47	40	80	86	130	120	102 000	72 000	3 250



Take-up housing units

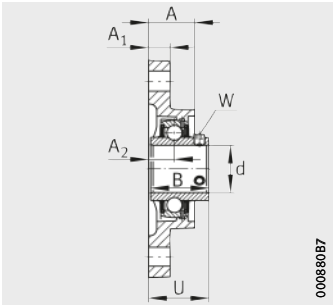
For swivel motion
With grub screws in inner ring



UCFA

Dimension table - Dimensions in mm and inch

Designation			Mass m ≈ kg	Dimensions						
Unit	Housing	Radial insert ball bearing		d		J	L	A	A ₁	A ₂
				mm	inch					
UCFA201	FA204	UC201	0,45	12	–	78	98	25,5	12	15
UCFA201-08	FA204	UC201-08	0,44	12,7	1/2	78	98	25,5	12	15
UCFA202-09	FA204	UC202-09	0,43	14,288	9/16	78	98	25,5	12	15
UCFA202	FA204	UC202	0,43	15	–	78	98	25,5	12	15
UCFA202-10	FA204	UC202-10	0,43	15,875	5/8	78	98	25,5	12	15
UCFA203	FA204	UC203	0,42	17	–	78	98	25,5	12	15
UCFA203-11	FA204	UC203-11	0,42	17,463	11/16	78	98	25,5	12	15
UCFA204-12	FA204	UC204-12	0,41	19,05	3/4	78	98	25,5	12	15
UCFA204	FA204	UC204	0,41	20	–	78	98	25,5	12	15
UCFA205-13	FA205	UC205-13	0,67	20,638	13/16	98	125	27	14	16
UCFA205-14	FA205	UC205-14	0,66	22,225	7/8	98	125	27	14	16
UCFA205-15	FA205	UC205-15	0,64	23,813	15/16	98	125	27	14	16
UCFA205	FA205	UC205	0,63	25	–	98	125	27	14	16
UCFA205-16	FA205	UC205-16	0,62	25,4	1	98	125	27	14	16
UCFA206-17	FA206	UC206-17	0,94	26,988	11/16	117	144	31	14	18
UCFA206-18	FA206	UC206-18	0,92	28,575	11/8	117	144	31	14	18
UCFA206	FA206	UC206	0,9	30	–	117	144	31	14	18
UCFA206-19	FA206	UC206-19	0,9	30,163	13/16	117	144	31	14	18
UCFA206-20	FA206	UC206-20	0,88	31,75	11/4	117	144	31	14	18



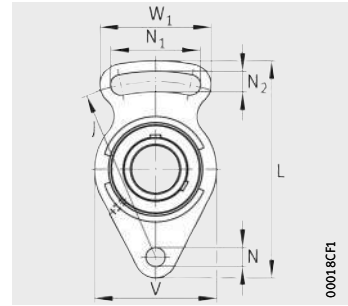
UCFA

N	N ₁	N ₂	B	U	V	W ₁	Width across flats		Load carrying capacity Bearing		
							W		Basic load ratings		Fatigue limit load
							mm	inch	dyn. C _r N	stat. C _{0r} N	C _{ur} N
10	40	10	31	33,3	60	50	3	–	13 600	6 600	335
10	40	10	31	33,3	60	50	–	1/8	13 600	6 600	335
10	40	10	31	33,3	60	50	–	1/8	13 600	6 600	335
10	40	10	31	33,3	60	50	3	–	13 600	6 600	335
10	40	10	31	33,3	60	50	–	1/8	13 600	6 600	335
10	40	10	31	33,3	60	50	3	–	13 600	6 600	335
10	40	10	31	33,3	60	50	–	1/8	13 600	6 600	335
10	40	10	31	33,3	60	50	–	1/8	13 600	6 600	335
10	40	10	31	33,3	60	50	3	–	13 600	6 600	335
12	51	12	34,1	35,8	68	66	–	1/8	14 900	7 800	395
12	51	12	34,1	35,8	68	66	–	1/8	14 900	7 800	395
12	51	12	34,1	35,8	68	66	–	1/8	14 900	7 800	395
12	51	12	34,1	35,8	68	66	3	–	14 900	7 800	395
12	51	12	34,1	35,8	68	66	–	1/8	14 900	7 800	395
12	58	12	38,1	40,2	80	72	–	1/8	20 700	11 300	570
12	58	12	38,1	40,2	80	72	–	1/8	20 700	11 300	570
12	58	12	38,1	40,2	80	72	3	–	20 700	11 300	570
12	58	12	38,1	40,2	80	72	–	1/8	20 700	11 300	570
12	58	12	38,1	40,2	80	72	–	1/8	20 700	11 300	570



Take-up housing units

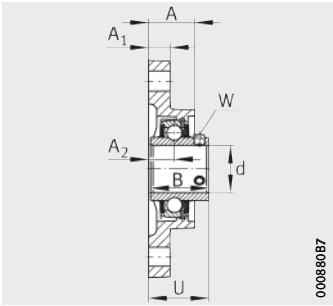
For swivel motion
With grub screws in inner ring



UCFA

Dimension table (continued) · Dimensions in mm and inch

Designation			Mass m ≈ kg	Dimensions						
Unit	Housing	Radial insert ball bearing		d		J	L	A	A ₁	A ₂
				mm	inch					
UCFA207-20	FA207	UC207-20	1,29	31,75	1¹/₄	130	161	34	16	19
UCFA207-21	FA207	UC207-21	1,26	33,338	1⁵/₁₆	130	161	34	16	19
UCFA207-22	FA207	UC207-22	1,24	34,925	1³/₈	130	161	34	16	19
UCFA207	FA207	UC207	1,23	35	–	130	161	34	16	19
UCFA207-23	FA207	UC207-23	1,21	36,513	1⁷/₁₆	130	161	34	16	19
UCFA208-24	FA208	UC208-24	1,58	38,1	1¹/₂	144	175	36	16	21
UCFA208-25	FA208	UC208-25	1,54	39,688	1⁹/₁₆	144	175	36	16	21
UCFA208	FA208	UC208	1,53	40	–	144	175	36	16	21
UCFA209-26	FA209	UC209-26	1,99	41,275	1⁵/₈	148	181	38	18	22
UCFA209-27	FA209	UC209-27	1,95	42,863	1¹¹/₁₆	148	181	38	18	22
UCFA209-28	FA209	UC209-28	1,91	44,45	1³/₄	148	181	38	18	22
UCFA209	FA209	UC209	1,9	45	–	148	181	38	18	22
UCFA210-29	FA210	UC210-29	2,2	46,038	1¹³/₁₆	157	190	37,5	18	22
UCFA210-30	FA210	UC210-30	2,16	47,625	1⁷/₈	157	190	37,5	18	22
UCFA210-31	FA210	UC210-31	2,11	49,213	1¹⁵/₁₆	157	190	37,5	18	22
UCFA210	FA210	UC210	2,08	50	–	157	190	37,5	18	22
UCFA210-32	FA210	UC210-32	2,06	50,8	2	157	190	37,5	18	22
UCFA211-32	FA211	UC211-32	3,1	50,8	2	184	219	43	20	25
UCFA211-33	FA211	UC211-33	3,05	52,388	2¹/₁₆	184	219	43	20	25
UCFA211-34	FA211	UC211-34	2,99	53,975	2¹/₈	184	219	43	20	25
UCFA211	FA211	UC211	2,95	55	–	184	219	43	20	25
UCFA211-35	FA211	UC211-35	2,93	55,563	2³/₁₆	184	219	43	20	25



000880B7

UCFA

N	N ₁	N ₂	B	U	V	W ₁	Width across flats		Load carrying capacity Bearing		
							W		Basic load ratings		Fatigue limit load
							mm	inch	dyn. C _r N	stat. C _{0r} N	C _{ur} N
14	66	14	42,9	44,4	90	82	–	5/32	27 500	15 300	770
14	66	14	42,9	44,4	90	82	–	5/32	27 500	15 300	770
14	66	14	42,9	44,4	90	82	–	5/32	27 500	15 300	770
14	66	14	42,9	44,4	90	82	4	–	27 500	15 300	770
14	66	14	42,9	44,4	90	82	–	5/32	27 500	15 300	770
14	71	14	49,2	51,2	100	87	–	5/32	34 500	19 800	1010
14	71	14	49,2	51,2	100	87	–	5/32	34 500	19 800	1010
14	71	14	49,2	51,2	100	87	4	–	34 500	19 800	1010
16	72	16	49,2	52,2	108	90	–	5/32	34 500	20 400	1030
16	72	16	49,2	52,2	108	90	–	5/32	34 500	20 400	1030
16	72	16	49,2	52,2	108	90	–	5/32	34 500	20 400	1030
16	72	16	49,2	52,2	108	90	4	–	34 500	20 400	1030
16	76	16	51,6	54,6	115	94	–	3/16	37 500	23 200	1 180
16	76	16	51,6	54,6	115	94	–	3/16	37 500	23 200	1 180
16	76	16	51,6	54,6	115	94	–	3/16	37 500	23 200	1 180
16	76	16	51,6	54,6	115	94	5	–	37 500	23 200	1 180
16	76	16	51,6	54,6	115	94	–	3/16	37 500	23 200	1 180
16	86	16	55,6	58,4	130	104	–	3/16	46 000	29 000	1 480
16	86	16	55,6	58,4	130	104	–	3/16	46 000	29 000	1 480
16	86	16	55,6	58,4	130	104	–	3/16	46 000	29 000	1 480
16	86	16	55,6	58,4	130	104	5	–	46 000	29 000	1 480
16	86	16	55,6	58,4	130	104	–	3/16	46 000	29 000	1 480





Other products

Tillage and harvesting
Conveying equipment
Textile machinery
Food industry
Ventilators



Other products

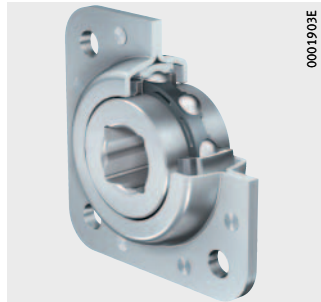
	Page
Bearing arrangements for tillage and harvesting	
Product overview	554
Features	
Flanged housing units with sheet steel housing	556
Flanged housing units for drums	557
Flanged housing units for harvesters	558
Sealing	559
Lubrication	560
Operating temperature	560
Suffixes	560
Design and safety guidelines	
Compensation of static misalignments	561
Dimension tables	562
Bearing arrangements for conveying equipment	
Product overview	568
Features	
Location on shaft	569
Anti-corrosion protection	569
Sealing	569
Lubrication	569
Operating temperature	569
Suffixes	569
Dimension tables	570
Bearing arrangements for textile machinery	
Product overview	572
Features	
Radial insert ball bearings	573
Plummer block housing units	574
Flanged housing units	575
Anti-corrosion protection	575
Operating temperature	575
Suffixes	575
Dimension tables	576
Flanged housing units for the food industry	
Product overview	578
Features	
Location on shaft	579
Location on adjacent construction	579
Anti-corrosion protection	580
Sealing	580
Lubrication	580
Operating temperatures	580
Suffixes	580
Design and safety guidelines	
Axial load carrying capacity	581
Bearing end caps	581
Dimension tables	582
Take-up housing units for ventilators	
Product overview	584
Features	585



Product overview **Bearing arrangements for tillage and harvesting**

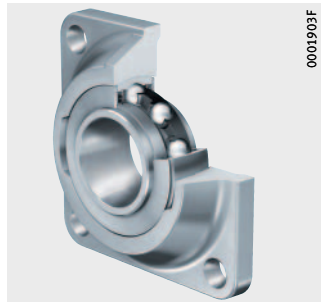
Flanged housing units for plough discs

TRV..-IA02

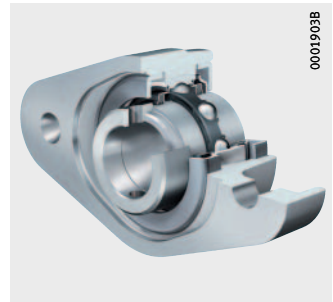


Flanged housing units for drums

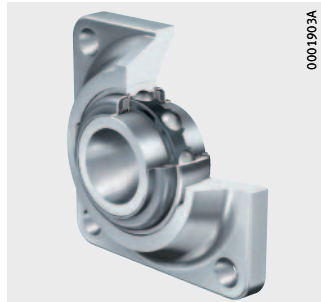
IBBU..-IA03



RCJT..-IA03

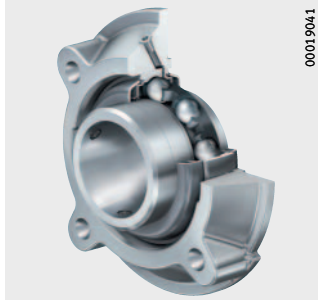


RCJ..-IA03, TCJY..-IA03

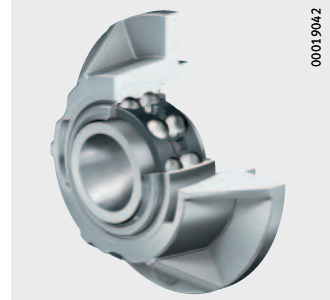


**Flanged housing units
for harvesters**

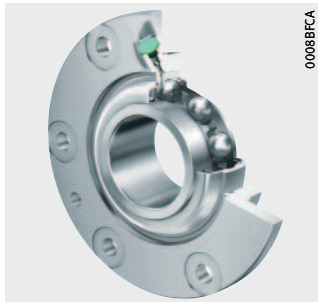
RMEY..-IA04



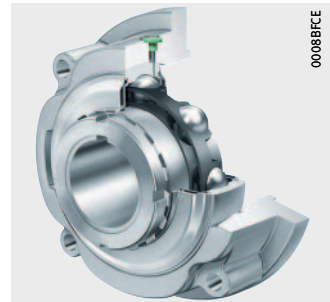
TME..-IA04



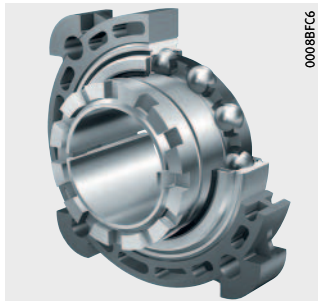
RME..-IA04



RMEO..-IA04



IBBU..-IA04



**Plummer block housing units
for harvesters**

TSHEV..-IA04



Bearing arrangements for tillage and harvesting

Features

The following sections describe selected bearing arrangements for use in machinery for tillage and harvesting. Bearing arrangements for seed discs, plough discs, drums and harvesters require seals, see page 559, that give complete protection of the rolling elements against the environmental conditions in agricultural operations.

In addition, Schaeffler develops and manufactures further products for agricultural engineering use in consultation with the customer.

Further information

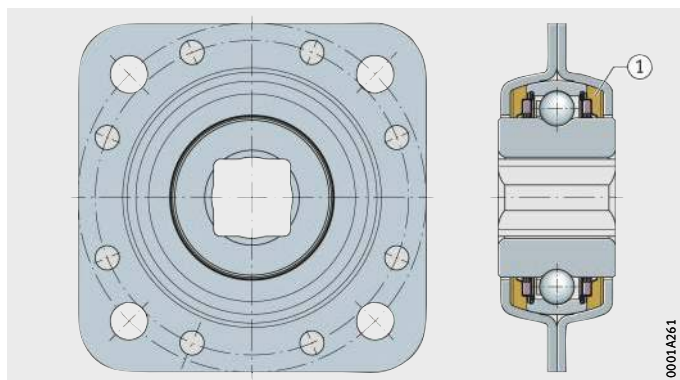
- TPI 220, Bearing arrangements for tillage and harvesting
- Download and ordering: <http://medien.schaeffler.de>.

Flanged housing units with sheet steel housing

The two sheet steel halves are riveted together, *Figure 1*. The unit is positioned on a square section shaft by means of spacers. The sheet steel halves protect the seal system against mechanical damage and, in addition, form a prechamber for grease.

① Prechamber greased

Figure 1
Four-bolt flanged housing unit with sheet steel housing and square bore



Preload

Once the bearing system is mounted, it operates almost free from clearance.

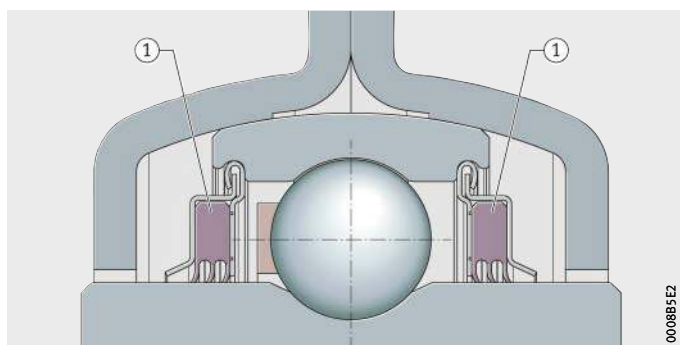
Sealing

Housing units for plough discs are sealed on both sides by means of a triple lip seal, *Figure 2*.

The seals are additionally protected by a steel plate against mechanical damage and high pressure cleaning equipment.

① T seal

Figure 2
Sealing of bearing



Lubrication

Grease prechambers provide lubrication of the seal lips and thus prevent dry running.

Flanged housing units for drums

Flanged housing units for drums comprise a machined cast housing and a self-aligning bearing as well as additional flinger shields, *Figure 3*.

In general, the housings are made from spheroidal graphite cast iron. They are designed for the high requirements present at the operating location. They can securely support shock loads.

Due to the spherical shape of the outer ring, the bearing can align itself during mounting of the unit. As a result, small misalignments can be compensated.

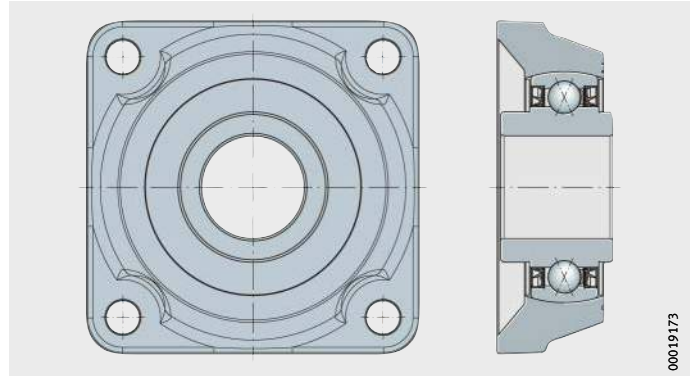


Figure 3
Flanged housing unit for drums

Corrotect coating

In order that the seal can remain effective in the long term, the inner ring has a Corrotect coating. This prevents penetration of rust under the seal due to corrosion of the inner ring.

Sealing

Housing units for drums are sealed on both sides by means of a triple lip seal. In addition, the seals are protected by flinger shields against mechanical damage and high pressure cleaning equipment, which means that it is possible to operate these units without maintenance.

Lubrication

The flinger shields are either pressed onto the inner ring or are staked with the inner ring or housing. They are fitted such that there is a narrow gap and a prechamber of a labyrinth design for the grease. The seal is lubricated by the grease and the friction is reduced at the same time.



Bearing arrangements for tillage and harvesting

Flanged housing units for harvesters

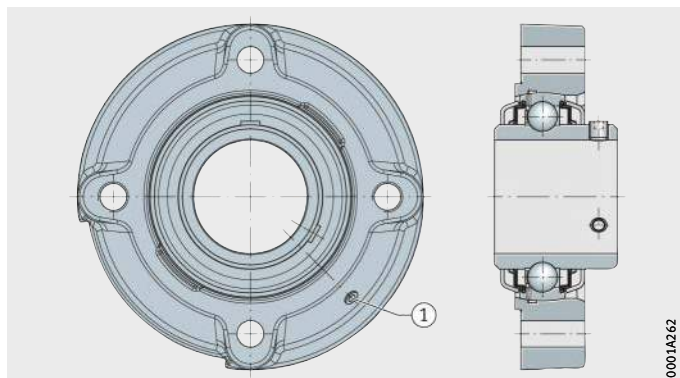
Flanged housing units for harvesting generally comprise a machined cast housing and a self-aligning bearing, *Figure 4*.

The housings are normally made from spheroidal graphite cast iron. They are designed for the high requirements present at the operating location. They can securely support shock loads.

Due to the spherical shape of the outer ring, the bearing can align itself during mounting of the unit. Slight misalignments can thus be compensated.

① Threaded hole in housing

Figure 4
Flanged housing unit for harvesting



Corrotect coating

In order that the seal can remain effective in the long term, the inner ring has a Corrotect coating. This prevents penetration of rust under the seal due to corrosion of the inner ring.

Sealing

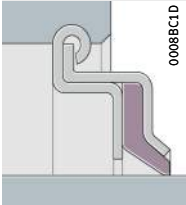
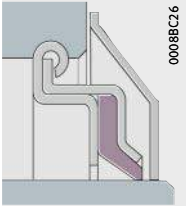
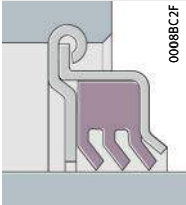
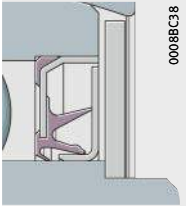
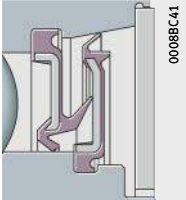
Housing units for harvesters are normally sealed on both sides by means of a triple lip seal. In addition, the seals are normally protected by flinger shields against mechanical damage and high pressure cleaning equipment.

Lubrication

Most units are designed with a threaded hole in the housing and can thus be relubricated by means of an appropriate lubrication nipple. Relubrication of the bearing is facilitated where necessary by means of two lubrication holes offset by 180° in the outer ring.

Sealing Some seals for agricultural engineering are of a multi-piece design, see table. This concept offers, due to the rigidly rolled-in sheet steel washer, optimum seating in the bearing as well as concentric alignment of the seal lip to the inner ring.

Seal types

R seal	
 <p>0008BC1D</p>	<p>Two zinc-coated sheet steel washers extended outwards and angled downwards with intermediate NBR part and radially preloaded seal lip. Improved protection against mechanical damage.</p> <p>Large grease reservoir due to the space between the extended and angled sheet steel washers. For use in radial insert ball bearings with inner ring extended on both sides.</p>
R seal with flinger shield	
 <p>0008BC76</p>	<p>As R seal, but with outer flinger shield with anti-corrosion protection.</p> <p>Additional sealing action without restriction on speed and with additional protection against mechanical damage and high pressure cleaning equipment.</p>
T seal	
 <p>0008BC7F</p>	<p>Two zinc-plated sheet steel washers with intermediate NBR part and three radially preloaded seal lips for protection against extreme contamination.</p> <p>For better protection of the seal lip against mechanical damage, the outer sheet steel washer is extended outwards and angled downwards.</p> <p>Lower speeds due to higher friction.</p>
Sealing cartridge with flinger shield	
 <p>0008BC38</p>	<p>Design identical to normal cartridge seal but supplemented by a flinger shield to protect the bearing against high pressure cleaning equipment and mechanical damage.</p>
Combined sealing washer and flinger shield with protective shield	
 <p>0008BC41</p>	<p>Design identical to normal sealing washer and flinger shield but supplemented by a protective shield to protect the bearing against high pressure cleaning equipment and mechanical damage.</p>



Bearing arrangements for tillage and harvesting

Lubrication

In general, bearing arrangements in the tillage sector cannot be relubricated. However, relubrication of the bearings in the harvesting sector may be necessary. A suitable solution is a lithium soap grease with a base oil viscosity ISO VG 68 or higher, for example the rolling bearing grease MULTITOP or MULTI2.

Relubrication should be carried out with the bearing rotating and still warm from operation in order to achieve good replacement and distribution of grease.

Operating temperature

Open bearings can be used at operating temperatures from $-20\text{ }^{\circ}\text{C}$ to $+120\text{ }^{\circ}\text{C}$.



Sealed bearings are suitable for operating temperatures from $-20\text{ }^{\circ}\text{C}$ to $+100\text{ }^{\circ}\text{C}$, restricted by the grease and seal material.

Suffixes

Suffixes for available designs, see table.

Available designs

Suffix	Description	Design
IA02	Flanged housing units for plough discs	Standard
IA03	Flanged housing units for drums	
IA04	Flanged housing units for harvesters	

Design and safety guidelines

Compensation of static misalignments

Bearings with a spherical outside surface of the bearing outer ring, fitted in housings with a concave bore, can compensate for static misalignment of the shaft or housing, *Figure 5* and *Figure 6*:

For units with a lubrication groove in the housing and a lubrication hole in the radial insert ball bearing, the following applies:

- Up to $\pm 2,5^\circ$, the units can be relubricated.
- Between $\pm 2,5^\circ$ and $\pm 5^\circ$, the facility for relubrication is dependent on the specific unit. Please contact us in this case.
- Above $\pm 5^\circ$, relubrication is no longer possible.



The units must not be used to support swivelling or tumbling motion in dynamic operation.

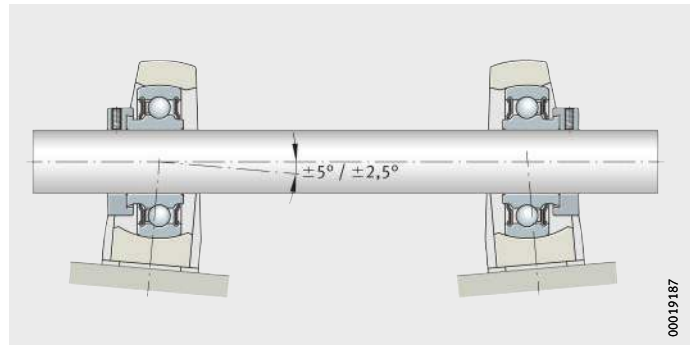


Figure 5
Compensation of static housing misalignment

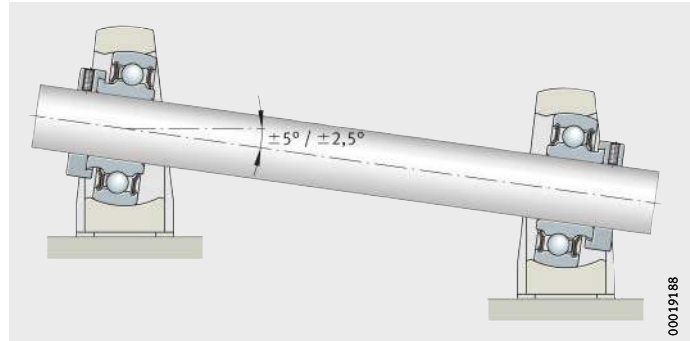
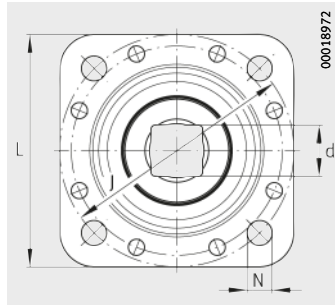


Figure 6
Compensation of static shaft misalignment

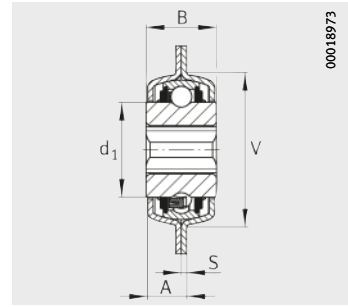


Flanged housing units for plough discs

Sheet steel housing and square bore



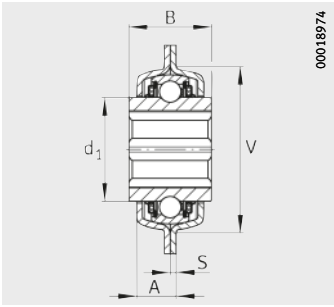
TRV



TRV-28X127X42,9

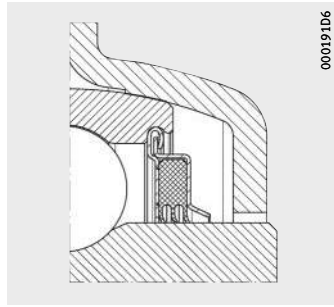
Dimension table - Dimensions in mm

Designation	Mass m ≈kg	Dimensions					
		d	L	J	N	S	B
TRV-28X127X42,9-IA02	1,28	28	127	127	13,5	3,4	42,9
TRV-38X140X55,2-IA02	2,5	38	140	140	13,6	4	55,2



00018974

TRV-38X140X55,2



00019106

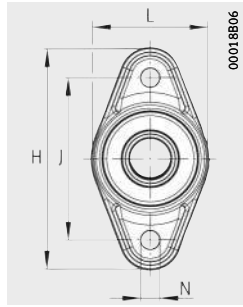
With T seal

			Load carrying capacity Housing	Basic load ratings	
V	A	d ₁		C _{0rG} N	dyn. C _r N
95	23,8	57,9	7 700	32 500	20 400
113	26,4	69,77	9 800	43 500	29 000

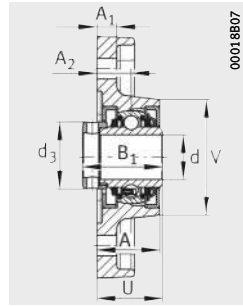


Flanged housing units for drums

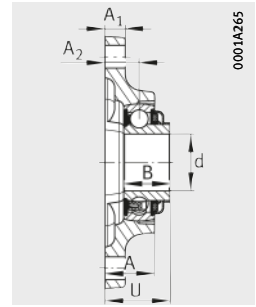
Two-bolt and four-bolt flanged housing units



RCJT-25X134X44,6
RCJT-35X155X39,9



RCJT-25X134X44,6

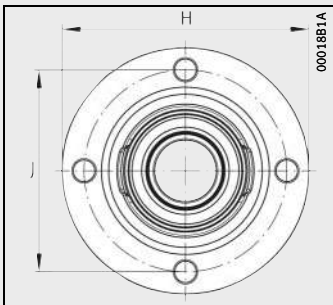


RCJT-35X155X39,9

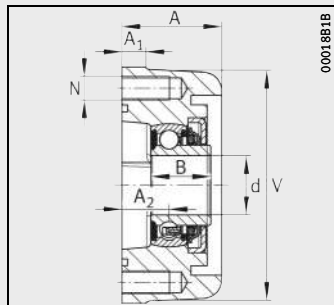
Dimension table - Dimensions in mm

Designation	Mass m ≈kg	Dimensions						
		d	L	H	A ₁	N	B	U
IBBU-25X100X42-IA03	1,6	25	–	100	10	M10	25	–
RCJT-25X134X44,6-IA03	0,89	25	70	134	11	11,5	–	36,5
IBBU-35X125X40-IA03	1,83	35	–	125	20	M12	28,4	–
RCJT-35X155X39,9-IA03	1,05	35	92	155	12,5	14	28,4	39,9
RCJ-35X118X39,1-IA03	1,45	35	118	–	12,5	14	37,7	39,9
IBBU-40X143X38,4-IA03	2,91	40	143	–	13	17	38,4	38,4
IBBU-50X143X38,4-IA03	2,5	50	143	–	13	17	38,4	–
TCJY-60X175X73,8-IA03	4	60	175	–	16	18	65,1	73,7
IBBU-60X175X73,8-IA03 ¹⁾	4,1	60	175	–	16	18	65,1	73,7

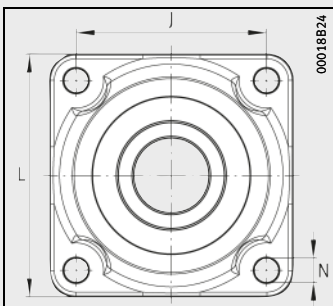
¹⁾ Available by agreement only.



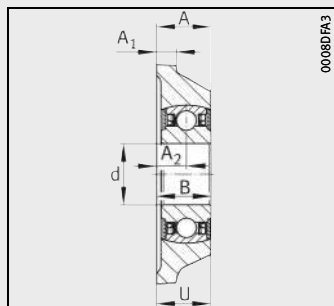
IBBU-25X100X42



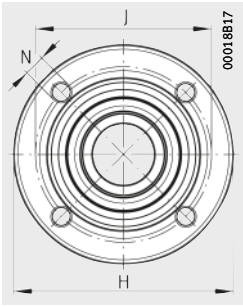
IBBU-25X100X42



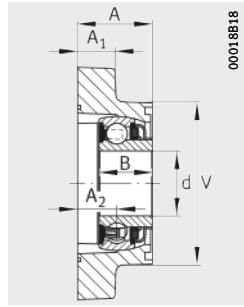
IBBU-40X143X38,4
IBBU-50X143X38,4



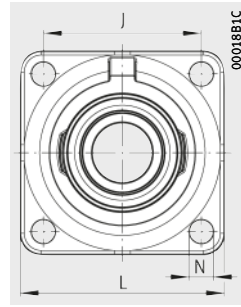
IBBU-40X143X38,4
IBBU-50X143X38,4



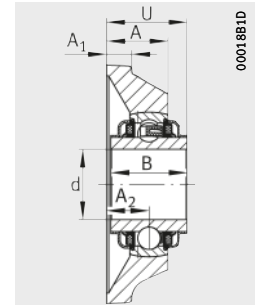
IBBU-35X125X40



IBBU-35X125X40

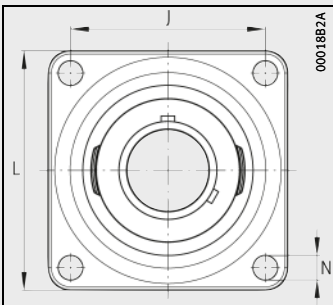


TCJY-60X175X73,8
RCJ-35X118X39,1

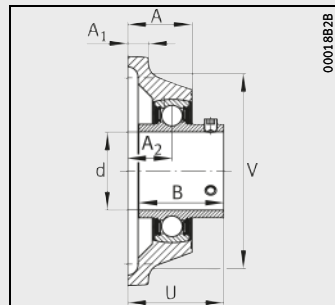


TCJY-60X175X73,8
RCJ-35X118X39,1

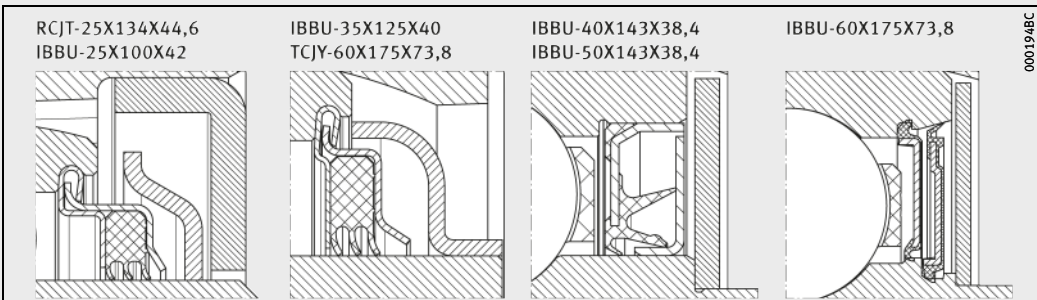
B ₁	J	A ₂	d ₃	A	V	Basic load ratings	
						dyn. C _r N	stat. C _{0r} N
-	82	19,8	-	42	98	14 000	7 800
44,5	99	19	37,5	35	65	14 000	7 800
-	100	21	-	40	88	25 500	15 300
-	130	21	-	30,5	-	25 500	15 300
-	92	21	-	30,5	-	25 500	15 300
-	111	19,2	-	35	-	56 000	45 500
-	111	19,2	-	35	-	56 000	45 500
-	143	34	-	46	150	52 000	36 000
-	143	34	-	49,5	150	79 000	67 000



IBBU-60X175X73,8



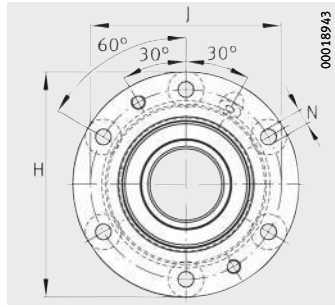
IBBU-60X175X73,8



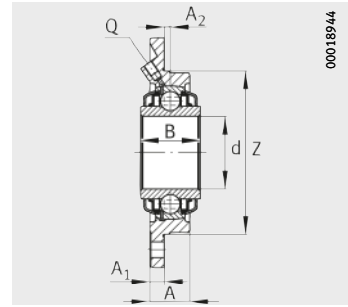
Selection of sealing concepts



Flanged housing units for harvesters



RME, RMEO



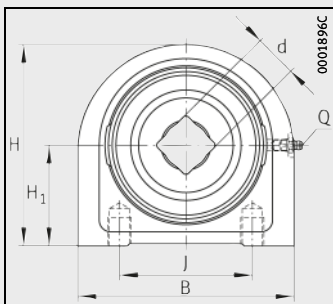
RME, RMEO

Dimension table - Dimensions in mm

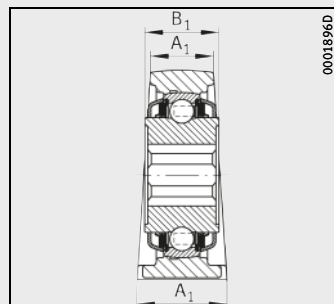
Designation	Mass m ≈ kg	Dimensions				
		d	H	H ₁	A ₁	N
TSHEV-30X150X140-IA04	4	30	140	69,9	60 / 42 ¹⁾	–
TME-40X150X60-IA04	2,64	40	150	–	10	13
IBBU-42X124X48-IA04	0,71	42	124	–	–	–
RMEO-50X190X49,3-IA04	3,59	50	190	–	12	13
RMEO-55X200X49,2-IA04	4,5	55	200	–	13	13
RMEY-60X173X65,2-IA04	4,1	60	183	–	34	14 / M16 ²⁾
RME-60X190X49,3-IA04	3,46	60	190	–	12	13
RMEO-60X217X98,6-IA04	10,12	60	217	–	18	13

1) Base width = 60, head width = 42.

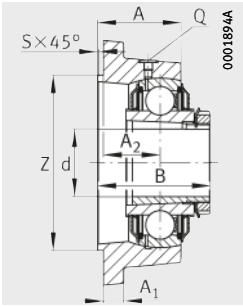
2) Fixing holes: 2×Ø14 and 2×M16.



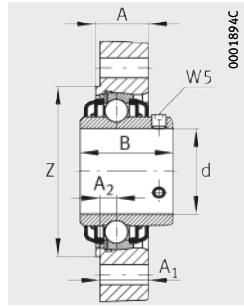
Cast iron housing TSHEV with short base



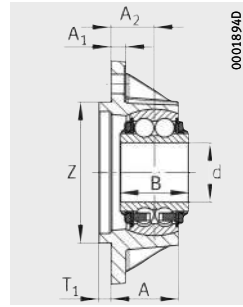
TSHEV



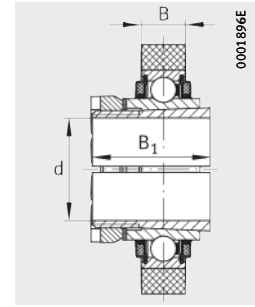
RMEO-60X217X98,6



RMEY-60X173X65,2

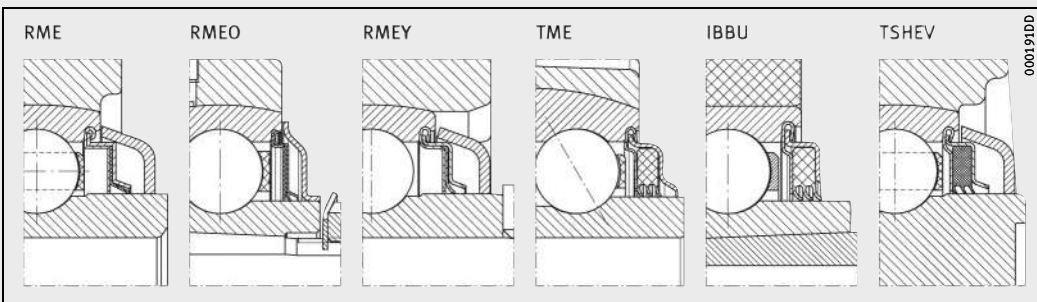


TME-40X150X60



IBBU-42X124X48

								Basic load ratings	
B	B ₁	J	A ₂	Q	A	T ₁	Z	dyn. C _r N	stat. C _{0r} N
150	49,2	92	-	M8×1	-	-	-	52 000	36 000
46	-	119	29	-	45,25	8	94,7	50 000	37 500
18	48	-	-	-	-	-	-	43 000	37 000
49,2	-	160	5	M8×1	33	-	135	62 000	38 000
49,2	-	170	5	M8×1	36	-	145	72 000	44 500
65,1	-	145	11,5	-	37	-	119,5	52 000	36 000
49,2	-	160	5	M8×1	33	-	135	52 000	36 000
100	-	186	50	M8×1	73,5	-	155,5	104 000	68 000



Selection of sealing concepts



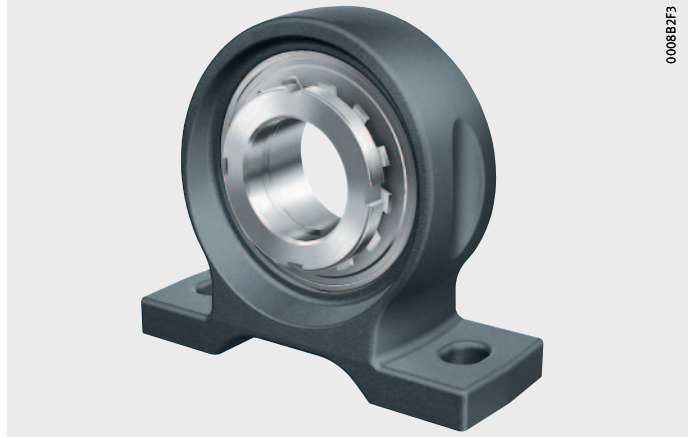
Product overview

Bearing arrangements for conveying equipment

Plummer block housing units

Radial insert ball bearing
with adapter sleeve

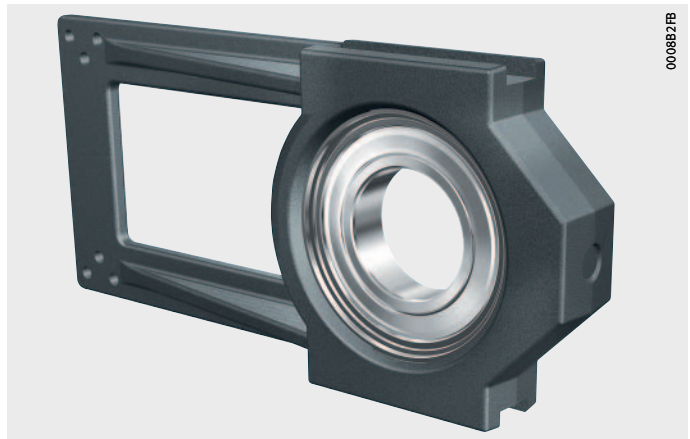
PASEA...-IC



Take-up housing units

Self-aligning
deep groove ball bearing
with bore for fit

PTUE...-IC



Two-bolt flanged housing units

PCJTZA...-IC



Bearing arrangements for conveying equipment

Features Radial insert ball bearings and housing units are used in the conveying equipment sector predominantly for the transport of materials, parts or passengers.

This involves continuous conveying within transport and logistics systems:

- workpieces
- products in industrial production
- package or luggage conveying systems
- passenger transport by means of lifts and moving stairways.

In order to ensure steady flow of goods and people, these conveying systems place heavy demands on reliable and low-friction functioning of the radial insert ball bearings and housing units fitted.

Accordingly, the following products are characterised by low maintenance requirements and high corrosion resistance as well as user-friendly mounting. The units can compensate for static misalignment.

Location on shaft The radial insert ball bearings can be located on the shaft by means of an eccentric locking collar or two grub screws in the inner ring. For an alternating direction of rotation and smooth running, a self-aligning deep groove ball bearing can be located on the shaft by means of a fit seat.

The take-up housing unit PTUE..-IC has a bore designed for a fit seat. For high speeds or very high requirements for smooth running, radial insert ball bearings with adapter sleeves are used. Typical areas of application for plummer block housing units PASEA..-IC include glass transport systems in industrial production.

Anti-corrosion protection The radial insert ball bearings in two-bolt flanged housing units PCJTZA have a Corrotect coating.

Sealing Most conveying equipment is operated in an environment protected against the weather and is subjected to only slight or moderate contamination. As a result, standard seals are absolutely sufficient. Radial insert ball bearings for conveying equipment are therefore sealed by means of seals P or R.

Lubrication The radial insert ball bearings are greased and can be relubricated via the holes in the housing.

Operating temperature The units are suitable for operating temperatures from $-20\text{ }^{\circ}\text{C}$ to $+100\text{ }^{\circ}\text{C}$.

Suffixes Suffixes for available designs: see table.

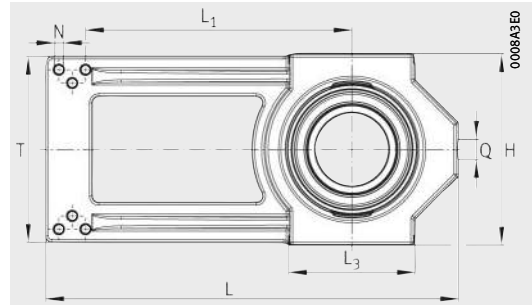
Available designs

Suffix	Description	Design
IC	Design matched to conveying equipment (Industry Conveyors)	Standard



Housing units for conveying equipment

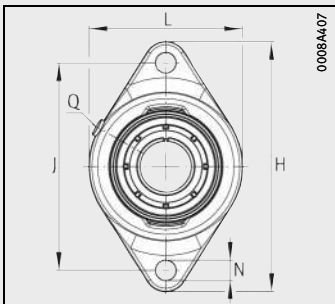
- Plummer block housing units
- Two-bolt flanged housing units
- Take-up housing units



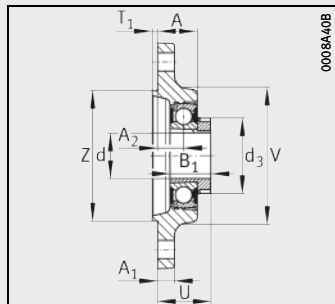
PTUE-55×310×146

Dimension table - Dimensions in mm

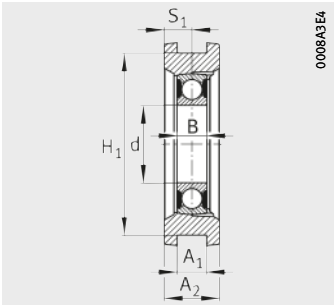
Designation	Mass m ≈ kg	Dimensions								
		d	H	J	L	L ₁	L ₃	A	A ₁	A ₂
PASEA-35×132×114,2-IC	1,72	35	64,2	100	132	–	–	50	30	–
PCJTZA-35×172×45-IC	1,54	35	172	143,5	105	–	–	30,5	13	20
PTUE-55×310×146-IC	4,1	55	146	–	310	200	95	–	20,5 ^{+0,2}	39



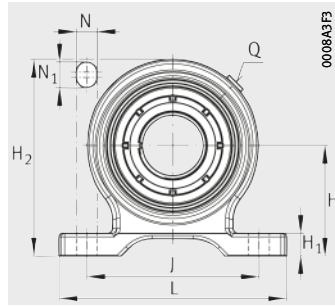
PCJTZA-35×172×45



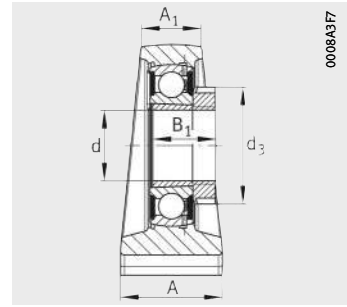
PCJTZA-35×172×45



PTUE-55×310×146



PASEA-35×132×114,2



PASEA-35×132×114,2

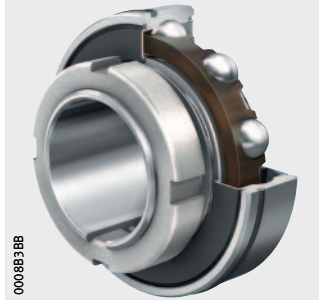
														Basic load ratings	
H ₁	H ₂	N	N ₁	B	B ₁	S ₁	T	T ₁	U	V	Z	Q	d ₃	dyn. C _r	stat. C _{0r}
											h8		max.	N	N
13,2	114,2	12	17	–	31	–	–	–	–	–	–	R _p 1/8	58	32 500	19 800
–	–	14	–	–	31	–	–	4	41	105	100	R _p 1/8	58	32 500	19 800
129,5	–	M8	–	21	–	19,5	140	–	–	–	–	13	–	43 500	29 000



Product overview Bearing arrangements for textile machinery

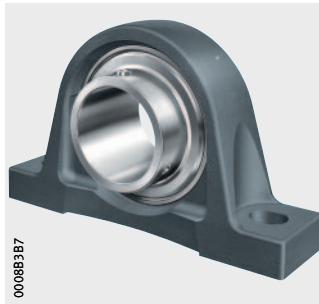
Radial insert ball bearings With adapter sleeve

SH



Plummer block housing units

RASEY..-IT

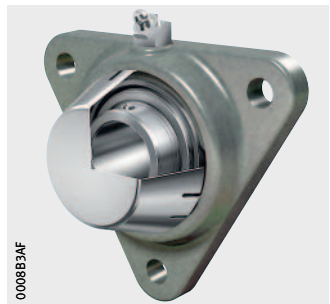


Two-bolt or three-bolt flanged housing units

LCJT..-IT



LCFTRY..-IT



Bearing arrangements for textile machinery

Features Whether it is spinning or weaving, finishing or processing, modern textile machines are highly automated and must run with high material throughput and without malfunctions, right around the clock.

The decisive features of bearing arrangements for textile machinery are:

- high precision
- low friction
- energy efficiency
- ease of mounting
- ease of maintenance
- reliability.

Further information ■ Bearing arrangements for textile machinery based on various products are compiled in publication TMB, Rolling Bearings for Textile Machinery.
■ Download and ordering: <http://medien.schaeffler.de>.

Radial insert ball bearings

The radial insert ball bearing SH30-2BRS-AH05 is used to support the delivery shaft in texturing machines, *Figure 1*. It is characterised by particularly low running friction and smooth running. Location on the shaft is by means of an adapter sleeve and locknut.



Figure 1
Radial insert ball bearings
in texturing machinery

Sealing The BRS seal integrated in the bearing acts as a gap seal and ensures not only low-friction running but also good sealing action due to the elastic rim in the outer ring slot.

Lubrication The radial insert ball bearing SH30-2BRS-AH05 is greased by means of a barium complex soap grease L178 and lubricated for life.



Bearing arrangements for textile machinery

Plummer block housing units

The plummer block housing unit RASEY70..-IT is used as a bearing arrangement for dryer rolls, *Figure 2*. The dryer rolls are driven by means of flat belts. The locating bearing is arranged on the side with the belt pulley. Location on the shaft is by means of two grub screws. On the non-locating bearing side, the unit is used as a non-locating bearing. A grub screw on the radial insert ball bearing engages in a slot on the shaft without clamping against the shaft. As a result, the shaft can be displaced axially in the inner ring. Static misalignments can be compensated by the self-alignment facility of the cast iron housing units.

- ① Non-locating bearing RASEY70
- ② Locating bearing RASEY70

Figure 2
Dryer roll
for removing residual moisture
from processed material



Sealing

Sealing is carried out by means of an R seal, as is typical for a radial insert ball bearing.

Lubrication

The unit is relubricated via holes in the housing.

Flanged housing units Two-bolt flanged housing units are used for the bearing arrangement of the straightening shaft in a straightening machine. In order to prevent corrosion, the entire unit has a Corrotect coating. Location on the shaft is by means of an eccentric locking collar. Three-bolt flanged housing units with a corrosion-resistant steel end cap are specially matched to use in ink cylinders. The housings are made corrosion-resistant by means of an iron-zinc coating.

Sealing Sealing with reduced friction is ensured by means of labyrinth seals.

Lubrication The flanged housing units can be relubricated by means of a lubrication nipple.

Anti-corrosion protection The radial insert ball bearing and eccentric locking collar have a Corrotect coating.

Operating temperature Radial insert ball bearings and housing units for textile machinery are suitable for a temperature range from $-20\text{ }^{\circ}\text{C}$ to $+100\text{ }^{\circ}\text{C}$. In the case of the plummer block housing unit RASEY-70 \times 260 \times 156-IT, the upper limit is $+160\text{ }^{\circ}\text{C}$.

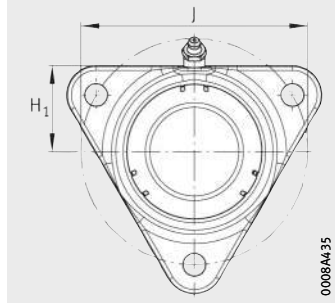
Suffixes Suffixes for available designs: see table.

Available designs

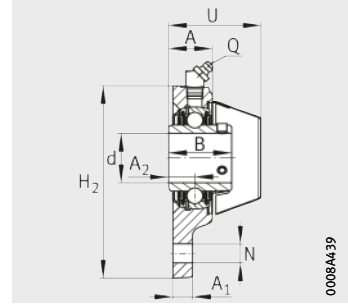
Suffix	Description	Design
IT	Design matched to textile machinery (Industry Textile)	Standard



Radial insert ball bearings and units for textile machinery



LCFTY-30×116×56-IT



LCFTY-30×116×56-IT

Dimension table - Dimensions in mm

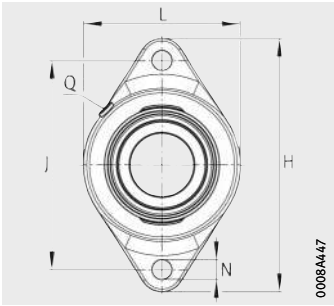
Designation	Mass m ≈ kg	Dimensions						
		d	H	J	L	A	A ₁	A ₂
LCFTY-30×116×56-IT	1,11	30	–	116	–	26,6	12	15,9
LCJT-45×180×59,1-IT	2,2	45	180	148,5	111	35	13	24
RASEY-70×260×156-IT	5,9	70	79,4	203	260	65	44	–

Dimension table - Dimensions in mm

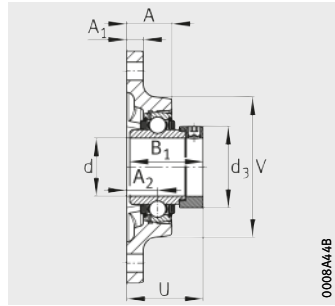
Designation	Mass m ≈ kg	Dimensions						Limiting speed ¹⁾ n _G grease min ⁻¹	Basic load ratings		Factor ²⁾ f ₀
		d	B	B ₁	S	D _{sp}	C		dyn. C _r N	stat. C _{0r} N	
SH30-2BRS-AH05	0,26	30	16	31	8	62	16	17 900	18 900	11 300	13,8

1) Preferably for shafts of tolerance classes h6 @ h11 @.

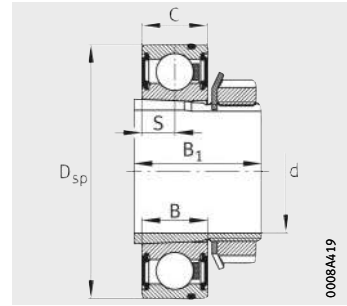
2) Factor f₀ for determining equivalent bearing load, see table, page 40.



LCJT-45×180×59,1-IT

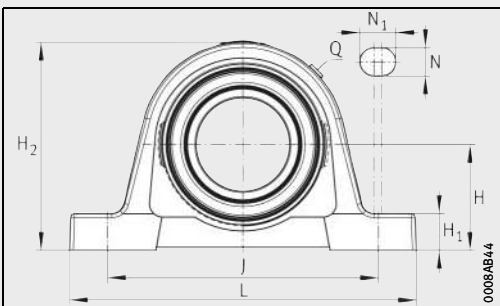


LCJT-45×180×59,1-IT

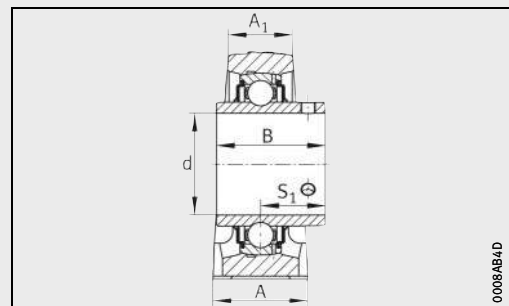


SH30-2BRS-AH05

N	N ₁	H ₁	H ₂	B	B ₁	S ₁	U	V	Q	d ₃	Basic load ratings	
											dyn. C _r N	stat. C _{0r} N
11	-	44	117	38,1	-	-	56	-	R _p 1/8	-	19 500	11 300
14	-	-	-	-	56,5	-	59,1	111	R _p 1/8	63	32 500	20 400
22	28	27,5	156	74,6	-	44,4	-	-	R _p 1/8	-	62 000	44 000



RASEY-70×260×156-IT



RASEY-70×260×156-IT



Product overview Flanged housing units for the food industry

Two-bolt flanged housing units

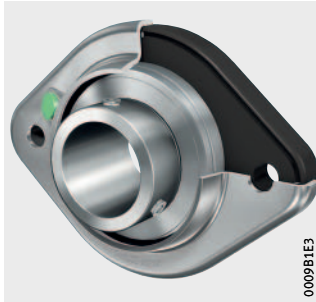
Eccentric locking collar
With Corrotect coating

PCSTK



Grub screws in inner ring
VA steel

RCSTKY...-VA



Four-bolt flanged housing units

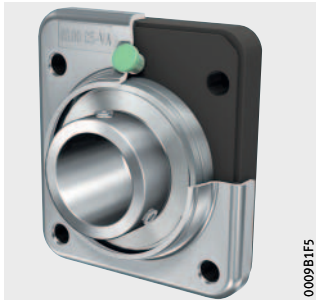
Eccentric locking collar
With Corrotect coating

PCSK



Grub screws in inner ring
VA steel

RCSKY...-VA



Flanged housing units for the food industry

Features	<p>Flanged housing units are ready-to-fit units comprising a two-piece, two-bolt or four-bolt housing fitted with a radial insert ball bearing. The bearings are particularly easy to mount and compensate static shaft misalignment. With regular relubrication, misalignments of up to $\pm 2,5^\circ$ are possible.</p> <p>The flanged housing units are resistant to moisture, contaminated water and weakly alkaline or weakly acidic cleaning agents. They are also resistant to mould and fungal attack.</p> <p>The ends of shafts can be covered by means of bearing end caps KASK, giving protection against injury due to the rotating shaft. The bearing end caps, which are ordered separately, also protect the bearing against contamination, see page 435.</p>
Location on shaft	<p>The radial insert ball bearings are located on the shaft by means of an eccentric locking collar or two grub screws. They are preferably suitable for shafts up to tolerance class h9 $\text{\textcircled{E}}$.</p>
Tightening torques	<p>The tightening torques for the grub screws must be observed, see table, page 130.</p>
Location on adjacent construction	<p>The flanged housings are of a two-piece design and comprise a polypropylene flange combined with a corrosion-resistant, high grade steel flange. The housing is screw mounted on the adjacent construction.</p>
Fixing screws	<p>The screw connection should be designed in accordance with VDI 2230; friction coefficient $\mu = 0,12$ (90%).</p> <p>Screws of grade 8.8 or better can be used for fixing. The maximum tightening torques applicable to this screw grade must not be exceeded even if screws of a higher grade are used. In principle, we recommend that the screw connection should only be tightened to 70% of the values stated in the standard.</p> <p>For fixing, hexagonal socket head screws in accordance with DIN EN ISO 4762 or hexagonal socket head screws with a coarse pitch full thread in accordance with DIN EN ISO 4017 should be used. The screws should be combined as a minimum with a washer in accordance with DIN EN ISO 7089 or DIN EN ISO 7090.</p> <p>Screws and accessories for location are not included in the delivery. All screws and other accessories used for location should be in the corrosion-resistant VA design.</p>



Flanged housing units for the food industry

Anti-corrosion protection The radial insert ball bearing and eccentric locking collar have a Corrotect coating. In the case of flanged housing units with the suffix VA, the bearing rings and rolling elements are made from corrosion-resistant, high alloy rolling bearing steel.

Sealing The flanged housing units PCSTK and PCSK with eccentric locking collar have zinc plated P seals on both sides.
The flanged housing units RCSTKY..-VA and RCSKY..-VA with grub screws have RSR seals and additional outer filinger shields on both sides.

Lubrication The radial insert ball bearings GRAE..-XL-NPP-B-FA107/125 are greased by means of a barium complex soap grease KP2N-20 with a mineral oil base in accordance with DIN 51825.
The radial insert ball bearings SUC are greased by means of the grease FM222 of grease class KPF2K-20 in accordance with DIN 51825.

Relubrication The housings have a threaded hole with a Whitworth pipe thread $R_p^{1/8}$ in accordance with DIN 3858 and DIN EN ISO 228-1 for conventional lubrication connectors. The hole is closed off using a plastic plug.
The radial insert ball bearings GRAE can be relubricated by means of two lubrication holes offset by 180° in the outer ring. In the case of radial insert ball bearings SUC, the two lubrication holes are offset by 120°.

Operating temperature Housing units with bearing end caps are suitable for operating temperatures from -20 °C to +80 °C.
Housing units without bearing end caps are suitable for operating temperatures from -20 °C to +100 °C.

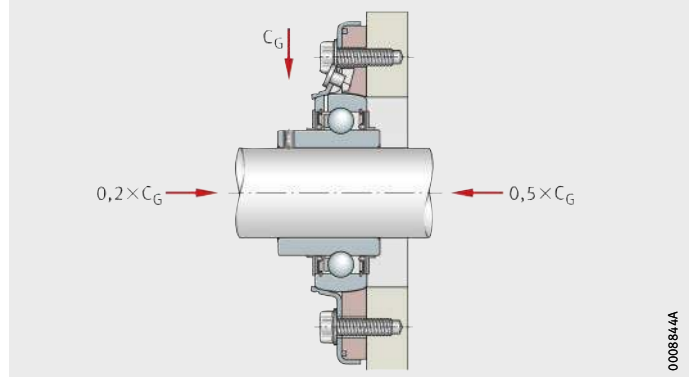
Suffixes Suffixes for available designs: see table.

Available designs

Suffix	Description	Design
FA107	Bearing with lubrication holes on the locating side	Standard
FA125	With Corrotect coating, corrosion-resistant	
VA	Corrosion-resistant design made from high alloy rolling bearing steel	

Design and safety guidelines
Axial load carrying capacity

The axial load carrying capacity is restricted by the load carrying capacity C_G of the housing and the mounting connection between the shaft and inner ring, *Figure 1*.



C_G = load carrying capacity of housing

Figure 1
 Axial load carrying capacity of housing

Bearing end caps

The ends of shafts can be covered using bearing end caps made from acrylonitrile styrene acrylate copolymer (ASA), see table and *Figure 2*. The end caps are suitable for temperatures from $-20\text{ }^{\circ}\text{C}$ to $+80\text{ }^{\circ}\text{C}$. They protect against injury due to rotating shafts and also protect the bearings against contamination.

The end caps have a breakout section that allows the shaft to pass through if necessary.

Bearing end caps are accessories and must always be ordered separately.

End caps

Designation	Dimensions				
	d	D	H	L	E max.
KASK08-S	30	84,6	35	44,8	40,05
	40				

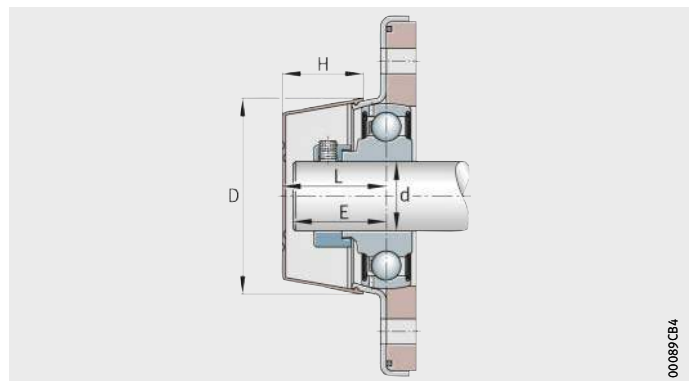
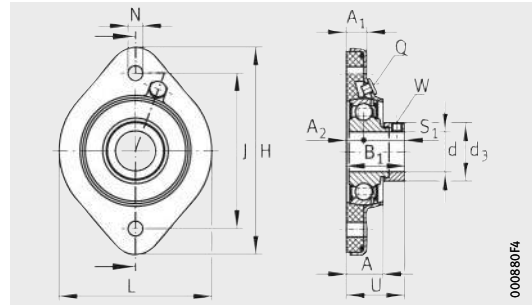


Figure 2
 Housing unit with bearing end cap



Flanged housing units for the food industry

Two-bolt and four-bolt flanged housing units
Corrosion-resistant



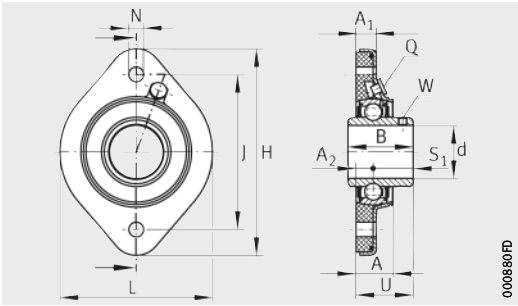
PCSTK

Dimension table - Dimensions in mm

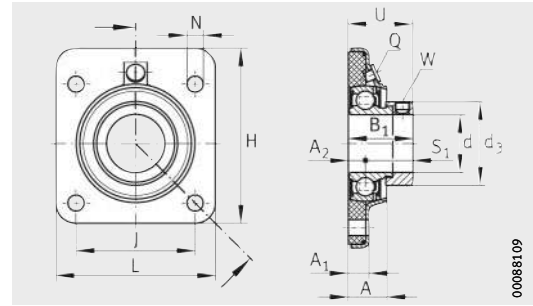
Designation ¹⁾	Housing	Radial insert ball bearing	Mass m ≈ kg	Dimensions						
				d	H	J	L	A	A ₁	A ₂
PCSK30-208	GEH80-CSK	GRAE30-208-XL-NPP-B-FA107/125	0,94	30	121	82	110	27	14,5	12
PCSTK30-208	GEH80-CSTK	GRAE30-208-XL-NPP-B-FA107/125	0,93	30	156	117	115	28	15,5	13
PCSK40	GEH80-CSK	GRAE40-XL-NPP-B-FA107/125	0,93	40	121	82	110	27	14,5	12
PCSTK40	GEH80-CSTK	GRAE40-XL-NPP-B-FA107/125	0,92	40	156	117	115	28	15,5	13
RCSKY40-VA	GEH80-CSK	SUC208	0,93	40	121	82	110	27	14,5	12
RCSTKY40-VA	GEH80-CSTK	SUC208	0,93	40	156	117	115	28	15,5	13

¹⁾ Fixing screws in accordance with DIN EN ISO 4762 are not included in the scope of delivery.
Note maximum tightening torque $M_A = 50 \text{ Nm}$.

²⁾ Tightening torque for grub screws, see table, page 130.

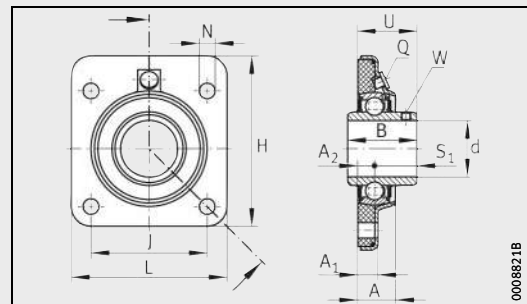


RCSTKY..-VA



PCSK

N	B	B ₁	U	S ₁	Q	d ₃ max.	Width across flats ²⁾ W	Load carrying capacity Housing C _{0rG} N	Basic load ratings		Fatigue limit load C _{ur} N
									dyn. C _r N	stat. C _{0r} N	
11	-	42,1	42,1	31,05	Rp ¹ / ₈	44	4	10 000	34 500	19 800	1 010
11	-	42,1	44	31,05	Rp ¹ / ₈	44	4	6 000	34 500	19 800	1 010
11	-	43,8	44,8	32,8	Rp ¹ / ₈	58	5	10 000	34 500	19 800	1 010
11	-	43,8	45,8	32,8	Rp ¹ / ₈	58	5	6 000	34 500	19 800	1 010
11	49,2	-	42,2	30,2	Rp ¹ / ₈	-	4	10 000	31 500	18 900	910
11	49,2	-	43,2	30,2	Rp ¹ / ₈	-	4	6 000	31 500	18 900	910



RCSKY..-VA



Product overview Take-up housing units for ventilators

Hanger bearing
Take-up housing unit

PGVE..-XL, RGVE..-XL, RGVEA..-XL



00044F65

Take-up housing units for ventilators

Features

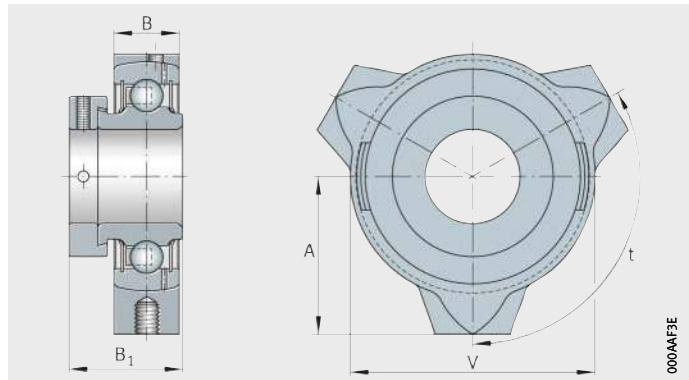
The single piece take-up housing units PGVE..-XL, RGVE..-XL, RGVEA..-XL for ventilators are hanger bearings with housings made from flake graphite cast iron. They have three fixing holes with a pitch of $t = 120^\circ$, *Figure 1*. Relubrication is carried out via a conventional lubrication nipple in accordance with DIN 71412.

Location is carried out by means of eccentric locking collar, grub screws, adapter sleeve or drive slot, see tables.


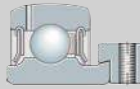
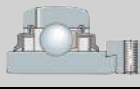
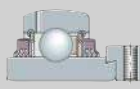
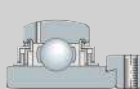
The outer ring has a spherical outside surface. In combination with a housing matched to the design, the units can compensate for possible misalignments of the shaft.

$t = 120^\circ$

Figure 1
Take-up housing unit
as hanger bearing for ventilators




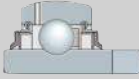
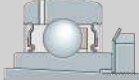

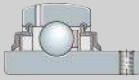
Possible combinations

Radial insert ball bearing	Take-up housing
	
Designation	GVE
Shaft diameter d	
GRAE..-XL-NPP-B 12 mm – 60 mm	 PGVE..-XL Available by agreement
GE..-XL-KRR-B 17 mm – 120 mm	 RGVE..-XL Available by agreement
GE..-XL-KTT-B 20 mm – 80 mm	 TGVE..-XL Available by agreement
GE..-XL-KLL-B 20 mm – 50 mm	 LGVE..-XL Available by agreement



Take-up housing units for ventilators

Possible combinations (continued)

Spannlager	Take-up housing  0004AF5B
Designation Shaft diameter d	GVE
GLE..-XL-KRR-B 20 mm – 70 mm 	RGVEL..-XL Available by agreement
GSH..-XL-2RSR-B 20 mm – 50 mm 	RGVEA..-XL Available by agreement
GAY..-XL-NPP-B 12 mm – 60 mm 	PGVEY..-XL Available by agreement
GYE..-XL-KRR-B 12 mm – 90 mm 	RGVEY..-XL Available by agreement



FAG



Mounting and maintenance



Mounting and maintenance

	Page
Features	
Products and services	589
Industrial Aftermarket	590
Sales partners	590
Mounting Toolbox, mounting made easy.....	591
Product overview	
Mounting.....	592
Features	
Mounting.....	593
Mounting services	593
Hook and pin wrenches	594
Product overview	
Lubrication	596
Features	
Lubrication	597
Services	597
Lubricants.....	597
Lubrication devices	598

Products and services

Features Within its Industrial Service concept, Schaeffler offers high quality products, services and training, *Figure 1*.

Portfolio This chapter gives an overview of the portfolio:

- Mounting
- Lubrication
- Condition Monitoring
- Reconditioning.

The employees of Schaeffler worldwide will be pleased to help you select the ideal products, services and training courses, *Figure 1*.



Figure 1
Portfolio



Products and services

Industrial Aftermarket

Schaeffler Industrial Aftermarket (IAM) is responsible for replacement parts and service business for end customers and sales partners in all significant industrial sectors. On the basis of innovative solutions, products and services relating to rolling and plain bearings, the service function of Schaeffler Industrial Aftermarket offers a comprehensive portfolio that covers all phases in the life-cycle of the bearing and takes account of the total costs (TCO).

The aim is to help customers save on maintenance costs, optimise plant availability and avoid unforeseen machine downtime. Schaeffler Industrial Aftermarket offers each customer an individual concept solution.

Schaeffler has centres of competence all around the world. This means we can provide customers worldwide with products, services and training quickly and professionally. All service employees worldwide undergo a comprehensive training programme and are audited regularly by officially certified specialists. This ensures that services throughout the world conform to a uniformly high standard of quality.

Sales partners

In order to achieve this objective, we have established a network of Schaeffler sales partners. This network makes it possible to service all end customers worldwide to the same high level of competence and is thus the optimum delivery strategy.

Mounting Toolbox, mounting made easy

The Schaeffler Mounting Toolbox, *Figure 2*, brings together valuable knowledge relating to mounting and dismounting. In individual video sequences, the service experts present step by step the points that must be paid close attention for correct mounting, lubrication and alignment.

The interface is a “Virtual Plant” and offers the user easy, rapid navigation. With just a few clicks of the mouse, it is possible to gain an overview of the tools and accessories as well as to select individual video sequences. Internet access is all that is needed to enter the “Virtual Plant” and watch the Schaeffler fitting personnel at work.

<http://mtb.schaeffler.de>

Figure 2
Mounting Toolbox



Product overview Mounting

Hook and pin wrenches

Hook wrench

LOCKNUT-HOOK



LOCKNUT-HOOK-KM0-16-SET



Jointed hook wrench

Jointed pin wrench

LOCKNUT-FLEXIHOOK



LOCKNUT-FLEXIPIN



Mounting

Features The Schaeffler industrial service experts offer mounting services for rolling and plain bearings that are applicable across industrial sectors. They have detailed knowledge and extensive experience in all industrial sectors.

The mounting personnel in the Industrial Service function are trained and skilled personnel who can provide reliable, rapid and competent assistance. The services are provided either at the customer's location or in the Schaeffler workshop facilities.

These mechanical tools are designed for the mounting and dismounting of bearings. The mounting forces are transmitted by the form fit effect.

Further information ■ Detailed information on mechanical tools can be found in Catalogue IS 1, Mounting and Maintenance of Rolling Bearings.

Mounting services The mounting services, *Figure 1*, include:

- mounting and dismounting of rolling bearings of all types
- approval inspection of adjacent parts (shafts and housings)
- measurement and production inspection of tapered shaft seats, together with provision of the necessary measuring equipment
- maintenance and inspection of bearing arrangements
- support in achieving optimum mounting operations
- use of modern mounting tools, such as heating by means of versatile medium frequency technology
- design and manufacture of special tools.



Figure 1
Mounting services

Advantages The mounting services give the following advantages:

- extended bearing life
- considerable cost reductions
- less unplanned downtime
- increased plant availability
- correct use of rolling bearings.

Further information ■ Enquiries:
tel. +49 9721 91-3142, fax +49 9721 91-3639.



Mounting

Hook and pin wrenches

These wrenches can be used for the mounting and dismounting of small bearings on shaft seats, adapter sleeves or withdrawal sleeves. In addition to the sizes named here, other sizes are available by agreement.

Hook wrench

The hook wrench LOCKNUT-HOOK can be used to dismount not only bearings but also withdrawal sleeves with the aid of extraction nuts. Hook wrenches are available in sizes suitable for locknuts KM to KM40, suitable for diameters from 16 mm to 245 mm.

Ordering example
Ordering designation

Hook wrench, suitable for locknuts KM18, KM19 and KM20
LOCKNUT-HOOK-KM18-20

Hook wrenches can also be ordered as a set. The set comprises ten hook wrenches of sizes KM0 to KM16 in a roll-up pouch and is suitable for diameters from 16 mm to 100 mm.

Ordering example
Ordering designation

Set of ten hook wrenches
LOCKNUT-HOOK-KM0-16-SET

Jointed hook wrench

The joint allows one hook wrench LOCKNUT-FLEXIHOOK to be used for the mounting or dismounting of locknuts of various sizes. Jointed hook wrenches are available in sizes for locknuts KM1 to KM36, suitable for diameters from 20 mm to 230 mm.

Ordering example
Ordering designation

Jointed hook wrench, suitable for locknuts KM14 to KM24
LOCKNUT-FLEXIHOOK-KM14-24

Jointed pin wrench

The jointed pin wrench LOCKNUT-FLEXIPIN is hooked into radially arranged holes in the nut. Jointed pin wrenches are available in sizes for locknuts AM15 to AM90, suitable for diameters from 35 mm to 155 mm.

Ordering example
Ordering designation

Jointed pin wrench, suitable for precision locknuts AM35 to AM60
LOCKNUT-FLEXIPIN-AM35-60

Further information

■ For detailed information, see TPI 216, FAG Tools for Mechanical Mounting and Dismounting of Rolling Bearings.

Product overview Lubrication

Arcanol greases

ARCANOL



Lubricators

CONCEPT2



Lubrication system

CONCEPT8



Lubrication

Features In more than half of all cases, inadequate lubrication is the cause of unplanned machine downtime. The life of machine elements undergoing swivel, rotary or linear motion can be significantly extended by the use of greases appropriate to the different operating and environmental conditions as well as the definition of and adherence to lubrication intervals and quantities.

Services Services relating to lubrication include:

- selection of lubricants and lubrication systems
- preparation of lubrication and maintenance plans
- lubrication point management
- consultancy on lubricants
- lubricant investigations and tests.

Advantages The Schaeffler lubrication service helps to:

- prevent failures involving components undergoing swivel, rotary or linear motion
- increase productivity
- reduce lubrication costs.

Lubricants An extensive selection of high quality Arcanol greases is available. Several greases were specially tested and selected for use in rolling bearings, see table. For advice on selection, please consult the Schaeffler engineering service.

Greases recommended for radial insert ball bearings

Designation	Thickener	Base oil viscosity at +40 °C mm ² /s	Consistency NLGI	Operating temperature °C	
				over	incl.
MULTITOP	Lithium soap	≧ ISO VG 68	2	-40	+140
MULTI2	Lithium soap	≧ ISO VG 68	2	-30	+120
MULTI3	Lithium soap	≧ ISO VG 68	3	-30	+120
TEMP90	Mixed thickener	≧ ISO VG 100	2	-30	+140
TEMP110	Lithium complex	≧ ISO VG 68	2 – 3	-40	+160
TEMP120	Polycarbamide	≧ ISO VG 460	2	-30	+180
TEMP200	PTFE	≧ ISO VG 220 – 460	2	-30	+250
FOOD2	Aluminium complex	≧ ISO VG 100	2	-30	+120



Lubrication

Lubrication devices

Lubricators and lubrication systems automatically provide rolling bearings with the correct quantity of lubricant. This prevents the most frequent cause of rolling bearing failure: inadequate or incorrect lubrication. Approximately 90% of bearings are lubricated with grease. Relubrication with the correct quantity of grease at the appropriate intervals gives a significant increase in the life of bearings.

For manual relubrication, grease guns are suitable.

Further information

■ For information on products for the supply of lubricant, see Catalogue IS 1, Mounting and Maintenance of Rolling Bearings.

Automatic relubrication devices

Automatic relubrication devices convey fresh grease in the defined quantity at the correct time to the contact points of the rolling bearing.

The devices adhere to the lubrication and maintenance intervals and prevent undersupply or oversupply of grease. Plant downtime and maintenance costs are reduced as a result.

The relubrication devices are matched to the bearing position. They have a wide range of applications, for example in electric motors, gearboxes, pumps, compressors and fans, in linear systems, conveying equipment or machine tools.

Lubricator CONCEPT2

This lubricator of protection class IP54 has a very compact design. It has one or two pump bodies that can be individually controlled, depending on the design. This means it can supply one or two lubrication points with lubricant. LC units are available in the size 250 cm³. The lubricator is supplied with voltage either from a battery or via a mains power pack, see table, page 599. It can work independently or can be optionally controlled by an external control system.

- Advantages** The advantages of the lubricator are as follows:
- easy operation and good overview
 - supply of up to two lubrication points
 - facility for setting different lubrication intervals for each lubrication point
 - supply of set lubricant quantity independent of temperature
 - counterpressure measurement up to the lubrication point
 - reliable piston pump as delivery pump
 - low ongoing maintenance costs
 - favourable price/performance ratio
 - operating temperature from –20 °C to +70 °C
 - battery or mains operation (DC 24 V) possible
 - pressure build-up to 50 bar (mains operation) or 30 bar (battery operation)
 - differentiated alarm messages
 - simple coupling with machine operation possible
 - suitable for control via an external control system.

**Available lubricators
CONCEPT2**

Designation	Design
CONCEPT2-1P	Battery version with one outlet
CONCEPT2-2P	Battery version with two outlets
CONCEPT2-1P-24VDC	24-V version with one outlet
CONCEPT2-2P-24VDC	24-V version with two outlets

Available LC units

Designation	
ARCALUB-C2.LC250-MULTITOP	ARCALUB-C2.LC250-TEMP90
ARCALUB-C2.LC250-MULTI2	ARCALUB-C2.LC250-TEMP110
ARCALUB-C2.LC250-LOAD150	ARCALUB-C2.LC250-TEMP120
ARCALUB-C2.LC250-LOAD220	ARCALUB-C2.LC250-TEMP200
ARCALUB-C2.LC250-LOAD400	ARCALUB-C2.LC250-SPEED2,6
ARCALUB-C2.LC250-LOAD460	ARCALUB-C2.LC250-MOTION2
ARCALUB-C2.LC250-LOAD1000	ARCALUB-C2.LC250-FOOD2
–	ARCALUB-C2.LC250-CLEAN-M

Further information LC units are also available by agreement with other greases.



Lubrication

Lubrication system CONCEPT8

This single-point and multi-point lubrication system offers high flexibility. It has one, two, three or four pump bodies that can be individually controlled, depending on the design. Each pump body has two outlets and, as a result, up to eight lubrication points can be flexibly provided with the required quantity of lubricant in the correct lubrication interval using just one lubrication system.

The lubrication system CONCEPT8 is designed for a wide variety of operating conditions. Designs for linear systems, the use of oils as lubricant or with an internal heating facility are also available, see table Available lubrication systems, page 601.

Lubricant cartridges (LC units) provide the device with lubricant, see table Available LC units, page 601. LC units are available in the size 800 cm³.

The lubrication system is supplied with voltage from a mains power pack. Coupling with machine operation is possible if the voltage supply to machine and lubrication system is coupled, then the relubrication interval will always be dependent on the number of operating hours.

Advantages

The advantages of the lubrication system are as follows:

- easy operation and good overview
- suitable for oil and grease up to NLGI 3
- supply of up to eight lubrication points
- supply of set lubricant quantity independent of temperature
- counterpressure measurement up to the lubrication point
- reliable piston pump as delivery pump
- favourable price/performance ratio
- operating temperature from -20 °C to +70 °C
- facility for setting different lubrication intervals and lubricant quantities for each pump body
- low operating voltage of DC 24 V
- pressure build-up to 70 bar
- differentiated alarm messages
- simple coupling with machine operation possible
- suitable for control via an external control system.

**Available lubrication systems
CONCEPT8**

Designation	
CONCEPT8-1P	CONCEPT8-1P-CC
CONCEPT8-2P	CONCEPT8-2P-CC
CONCEPT8-3P	CONCEPT8-3P-CC
CONCEPT8-4P	CONCEPT8-4P-CC
CONCEPT8-1P-LIN	CONCEPT8-1P-OIL
CONCEPT8-2P-LIN	CONCEPT8-2P-OIL
CONCEPT8-3P-LIN	CONCEPT8-3P-OIL
CONCEPT8-4P-LIN	CONCEPT8-4P-OIL

LIN = for linear applications
 CC = with internal heating facility
 OIL = oil version

Available LC units

Designation	
ARCALUB-C8.LC800-MULTITOP	ARCALUB-C8.LC800-TEMP90
ARCALUB-C8.LC800-MULTI2	ARCALUB-C8.LC800-TEMP110
ARCALUB-C8.LC800-MULTI3	ARCALUB-C8.LC800-TEMP120
ARCALUB-C8.LC800-LOAD150	ARCALUB-C8.LC800-TEMP200
ARCALUB-C8.LC800-LOAD220	ARCALUB-C8.LC800-SPEED2,6
ARCALUB-C8.LC800-LOAD400	ARCALUB-C8.LC800-VIB3
ARCALUB-C8.LC800-LOAD460	ARCALUB-C8.LC800-MOTION2
ARCALUB-C8.LC800-LOAD1000	ARCALUB-C8.LC800-FOOD2
–	ARCALUB-C8.LC800-CLEAN-M

Further information

- LC units are also available by agreement with other greases or with oils
- Other accessories available by agreement



Lubrication

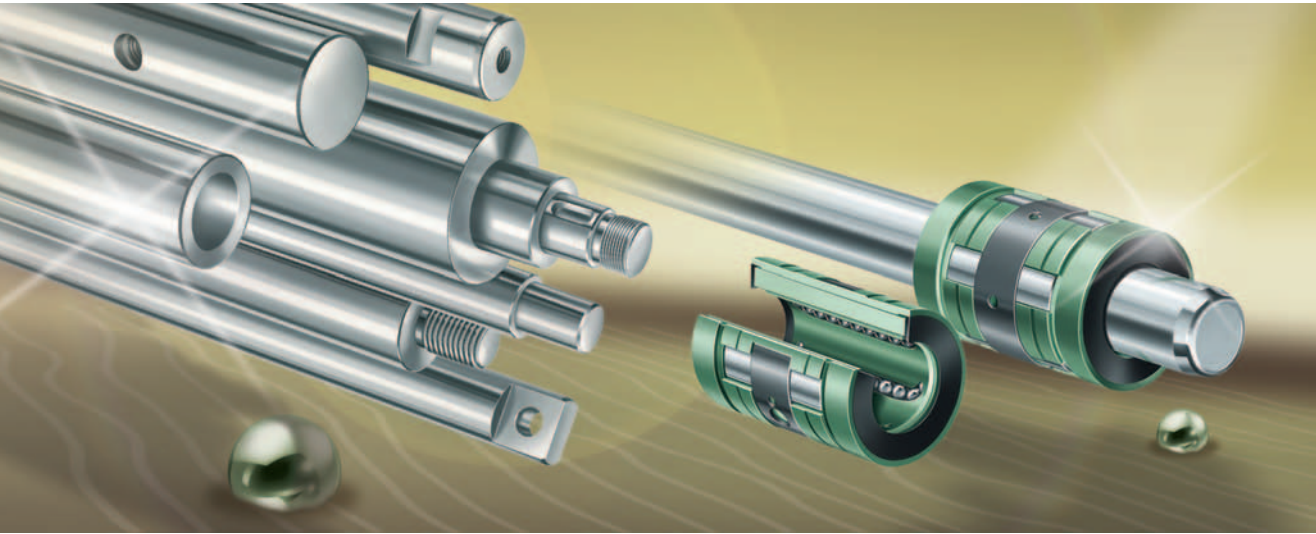
Lever grease gun The lever grease gun, see table, can be used to manually relubricate radial insert ball bearings via lubrication nipples.
 The container on the lever grease gun can be filled with 500 g loose grease or with a 400-g cartridge. The cartridge must conform to DIN 1284 (diameter 53,5 mm, length 235 mm).
 The lever grease gun is connected to the lubrication nipple via a reinforced hose. The reinforced hose must be ordered separately, see table.

Available lever grease guns

Designation	Maximum delivery pressure bar	Delivery quantity per stroke cm ³
ARCA-GREASE-GUN	800	2

Available reinforced hoses

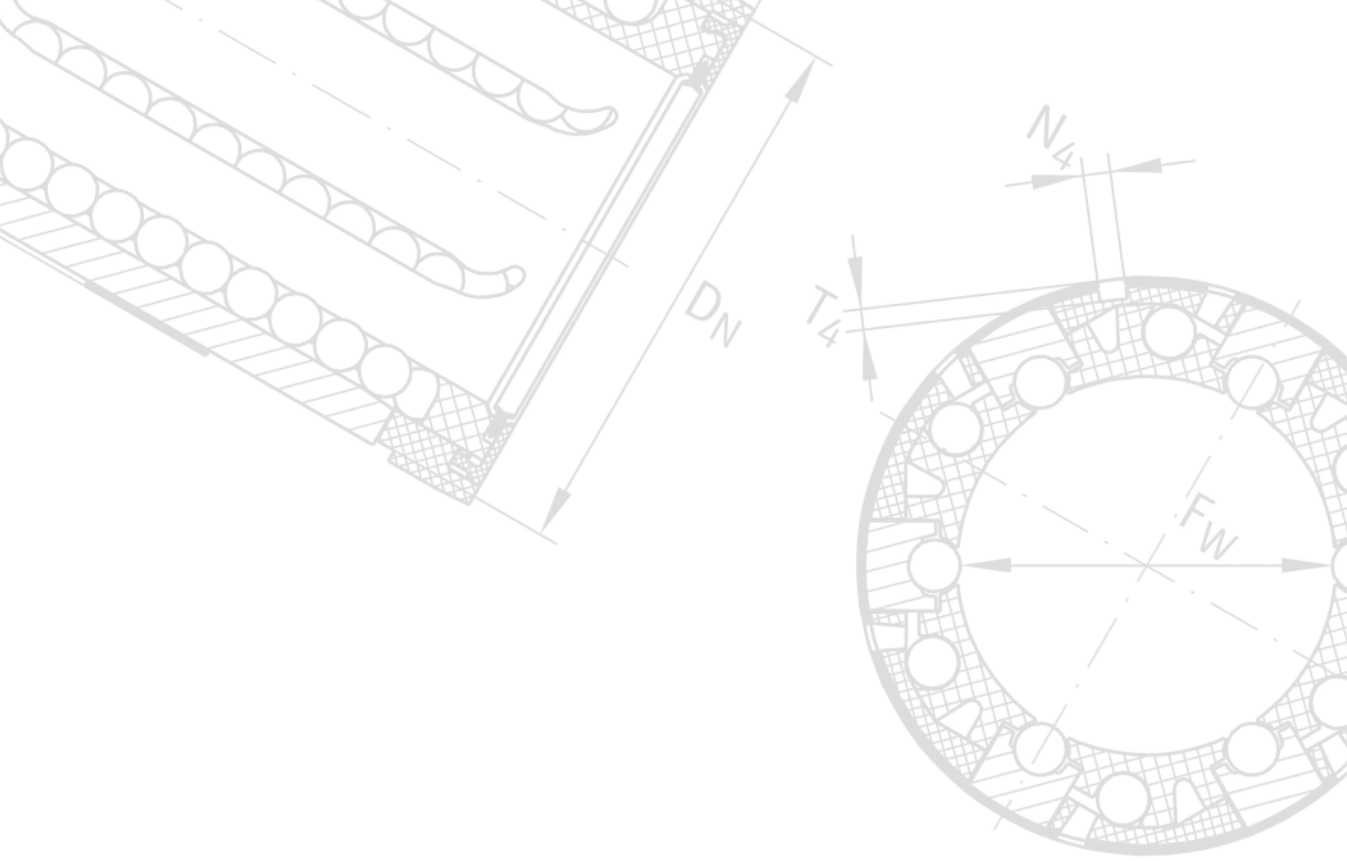
Designation	Length mm	Connector
ARCA-GREASE-GUN.HOOK-ON-HOSE	300	Cylindrical lubrication nipple with head 16 mm to DIN 3404
ARCA-GREASE-GUN.HOSE	300	Taper type lubrication nipple to DIN 71412



Shaft Guidance Systems

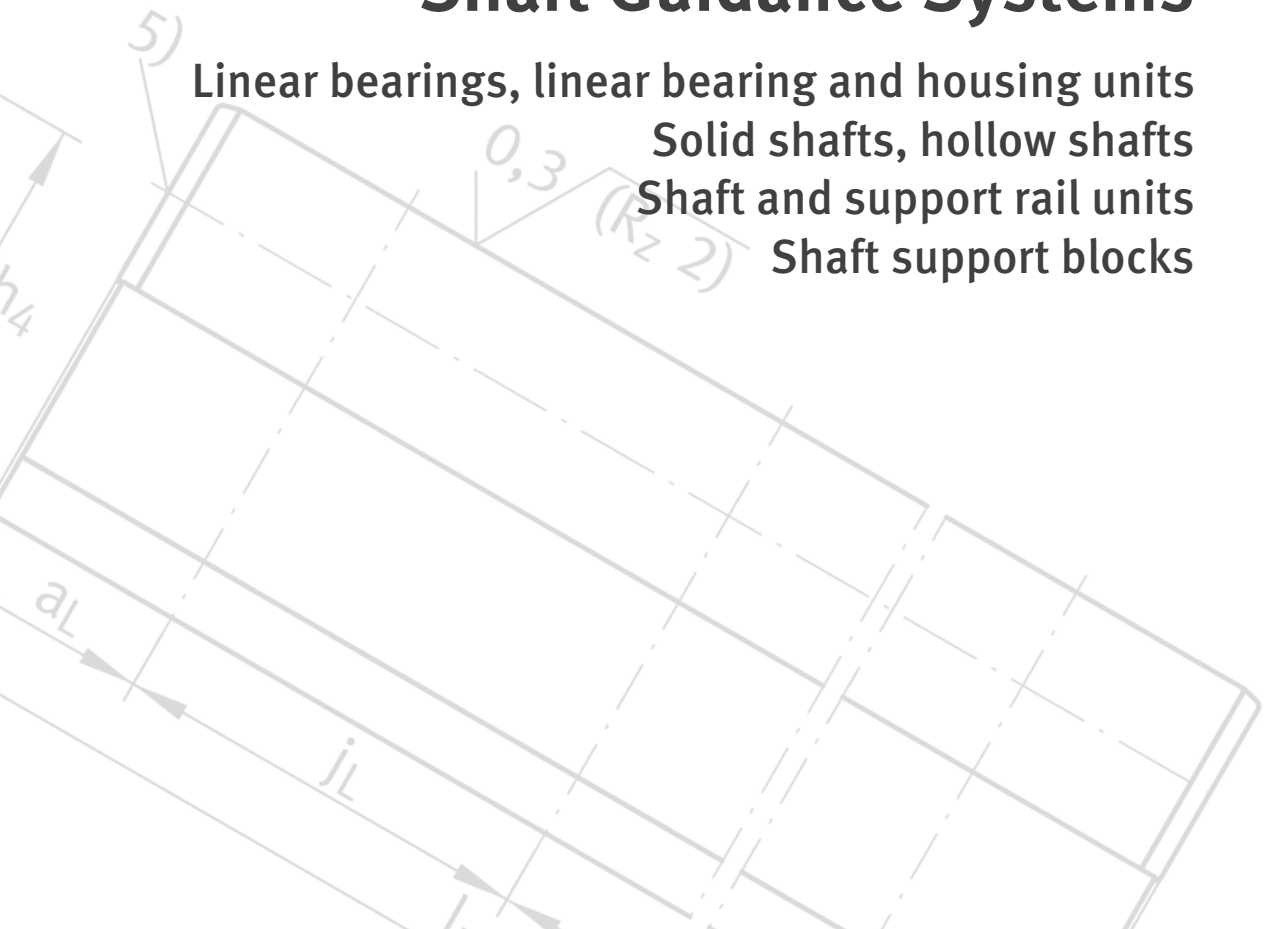
Linear bearings, linear bearing and housing units
Solid shafts, hollow shafts
Shaft and support rail units
Shaft support blocks

SCHAEFFLER



Shaft Guidance Systems

- Linear bearings, linear bearing and housing units
- Solid shafts, hollow shafts
- Shaft and support rail units
- Shaft support blocks



Foreword

Shaft guidance systems comprise shafts or shaft and support rail units combined with low-friction linear ball or plain bearings. The shafts can be either solid or hollow shafts, shaft and support rail units are always solid. For ease of fixing to the adjacent construction, the guidance systems are also available as complete linear bearing and housing units.

Economical due to modular concept

The complete range, structured according to a modular concept, allows particularly application-oriented, technically up-to-date and highly economical linear bearing guidance systems with a long, maintenance-free operating life.

Bearings and units are available in the compact, light, heavy duty, machined and plain bearing range. Each series has highly specific characteristics that precisely define it as suitable for particular applications.

Linear bearings

Linear ball bearings can support high radial loads while having a relatively low mass and allow the construction of linear guidance systems with unlimited travel. The bearings are available in closed versions and with a segment cutout for supported shafts. In some series, the radial clearance can be adjusted. This makes it possible to achieve clearance-free or preloaded guidance systems. Depending on the application, the linear bearings do not have seals or are fitted with contact seals on both sides.

Linear bearing and housing units

In the case of the linear bearing and housing units, the bearing is integrated in a strong, rigid housing. The housings are available in closed, open, slotted and tandem versions. Due to their low total mass, the units are particularly suitable for reduced mass designs with high loads and where higher accelerations and travel velocities are required. As a result of volume production in large quantities, the complete units are normally considerably more economical than customers' own designs.

Contents

	Page
Product index	6
Product overview	10
Shaft guidance systems	
Technical principles	12
Linear bearings, linear bearing and housing units	44
Solid shafts, hollow shafts	104
Shaft and support rail units	128
Shaft support blocks	144
Addresses	156

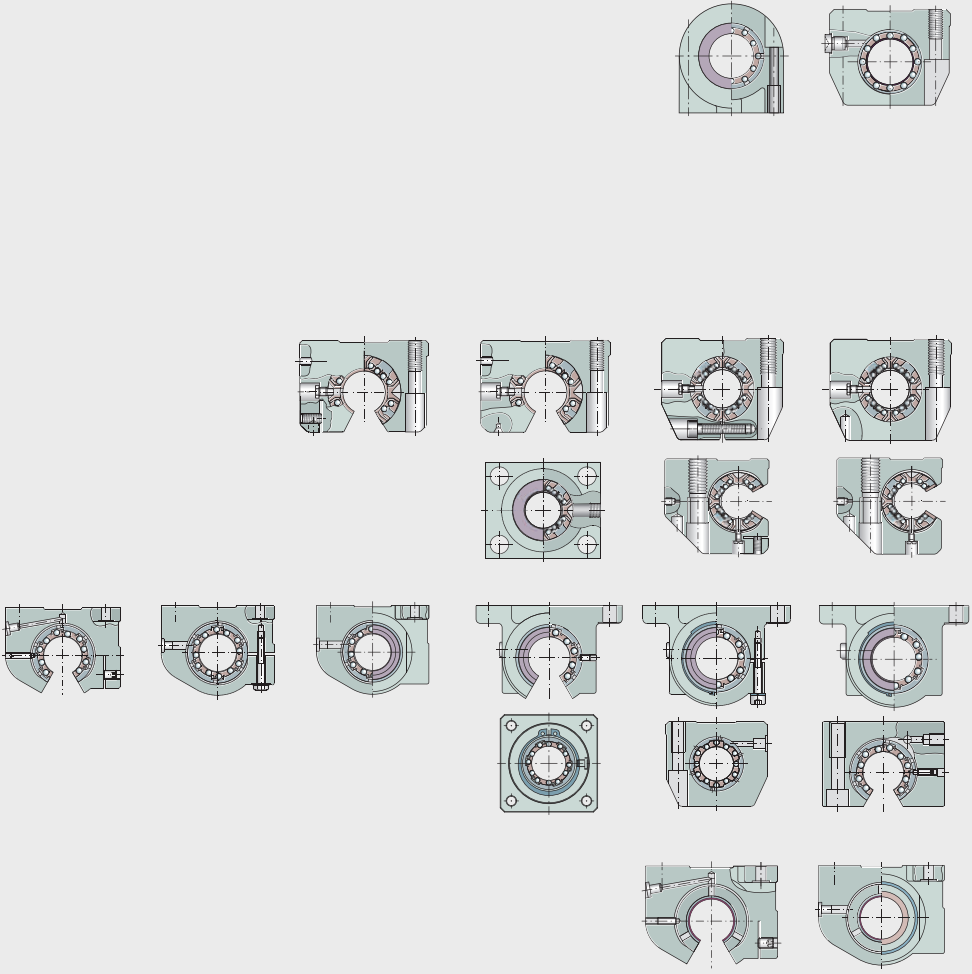
Product index

	Page
KH	Linear ball bearing, compact range..... 48
KGHA..-PP	Linear ball bearing and housing unit, compact range, closed, sealed 48
KGHK..-B-PP-AS	Linear ball bearing and housing unit, compact range, closed, sealed, relubrication facility 48
KTHK..-B-PP-AS	Linear ball bearing and housing unit, compact range, closed, bearings in tandem arrangement, sealed, relubrication facility 48
KN..-B	Linear ball bearing, light range, closed, self-aligning..... 48
KNO..-B	Linear ball bearing, light range, segment cutout, self-aligning 48
KS	Linear ball bearing, heavy duty range, closed, self-aligning..... 49
KSO	Linear ball bearing, heavy duty range, segment cutout, self-aligning 49
KGSC..-PP-AS	Linear ball bearing and housing unit, heavy duty range, segment cutout, sealed, relubrication facility 49
KGSCS..-PP-AS	Linear ball bearing and housing unit, heavy duty range, segment cutout, slotted housing, sealed, relubrication facility 49
KGSNG..-PP-AS	Linear ball bearing and housing unit, heavy duty range, closed, sealed, relubrication facility 49
KGSNO..-PP-AS	Linear ball bearing and housing unit, heavy duty range, segment cutout, sealed, relubrication facility 49
KGSNOS..-PP-AS	Linear ball bearing and housing unit, heavy duty range, segment cutout, slotted housing, sealed, relubrication facility 49
KGSNS..-PP-AS	Linear ball bearing and housing unit, heavy duty range, slotted housing, sealed, relubrication facility 49
KTFS	Linear ball bearing and housing unit, heavy duty range, closed, bearings in tandem arrangement, with centring collar, sealed, relubrication facility 49

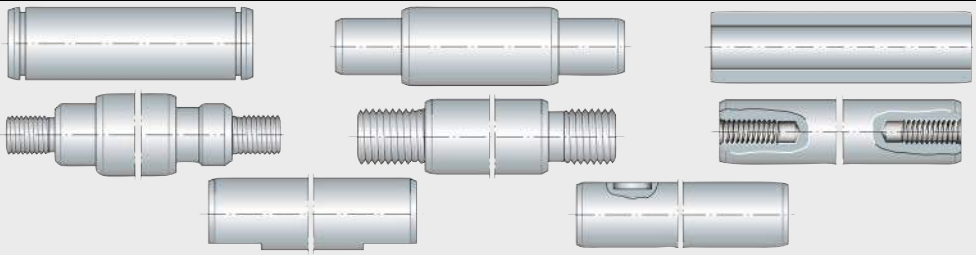
	Page
KTSG..-PP-AS	Linear ball bearing and housing unit, heavy duty range, closed, bearings in tandem arrangement, sealed, relubrication facility..... 49
KTSO..-PP-AS	Linear ball bearing and housing unit, heavy duty range, bearings in tandem arrangement, segment cutout, sealed, relubrication facility..... 49
KT SOS..-PP-AS	Linear ball bearing and housing unit, heavy duty range, bearings in tandem arrangement, segment cutout, slotted housing, sealed, relubrication facility 49
KTSS..-PP-AS	Linear ball bearing and housing unit, heavy duty range, closed, bearings in tandem arrangement, slotted housing, sealed, relubrication facility 49
KB	Linear ball bearing, machined range, closed 50
KBO	Linear ball bearing, machined range, closed, segment cutout..... 50
KBS	Linear ball bearing, machined range, slotted 50
KFB...-B-PP-AS	Linear ball bearing and housing unit, machined range, closed, with flange, sealed, relubrication facility..... 51
KGB..-PP-AS	Linear ball bearing and housing unit, machined range, closed, sealed, relubrication facility..... 50
KGBA..-PP-AS	Linear ball bearing and housing unit, machined range, closed, sealed, relubrication facility..... 50
KGBAO..-PP-AS	Linear ball bearing and housing unit, machined range, segment cutout, sealed, relubrication facility 50
KGBAS..-PP-AS	Linear ball bearing and housing unit, machined range, slotted housing, sealed, relubrication facility 50
KGBO..-PP-AS	Linear ball bearing and housing unit, machined range, segment cutout, sealed, relubrication facility 50
KGBS..-PP-AS	Linear ball bearing and housing unit, machined range, slotted housing, sealed, relubrication facility 50

Product index

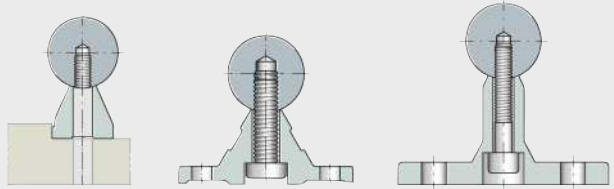
	Page
KTB..-PP-AS	Linear ball bearing and housing unit, machined range, closed, bearings in tandem arrangement, sealed, relubrication facility 50
KTBO..-PP-AS	Linear ball bearing and housing unit, machined range, segment cutout, bearings in tandem arrangement, sealed, relubrication facility 50
PAB..-PP-AS	Linear plain bearing, plain bearing range, closed, sealed, relubrication facility 51
PABO..-PP-AS	Linear plain bearing, plain bearing range, segment cutout, sealed, relubrication facility 51
PAGBA..-PP-AS	Linear plain bearing and housing unit, plain bearing range, closed, sealed, relubrication facility 51
PAGBAO..-PP-AS	Linear plain bearing and housing unit, plain bearing range, segment cutout, sealed, relubrication facility 51
W	Solid shafts 108
WH	Hollow shafts 108
TSNW	Shaft and support rail unit for fixing from above 132
TSNW..-G4	Shaft and support rail unit for fixing from above 132
TSNW..-G5	Shaft and support rail unit for fixing from above 132
TSUW	Shaft and support rail unit for fixing from below 132
TSWW	Shaft and support rail unit for fixing from above 132
TSWWA	Shaft and support rail unit for fixing from above 132
FW..-B	Shaft support block with flange 148
GW	Shaft support block 148
GWA..-B	Shaft support block 148
GWH..-B	Shaft support block 148
GWN..-B	Shaft support block 148



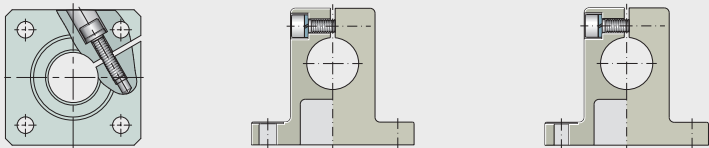
00019C1E



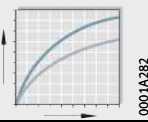
120 586



00019C1F



0007FCF2

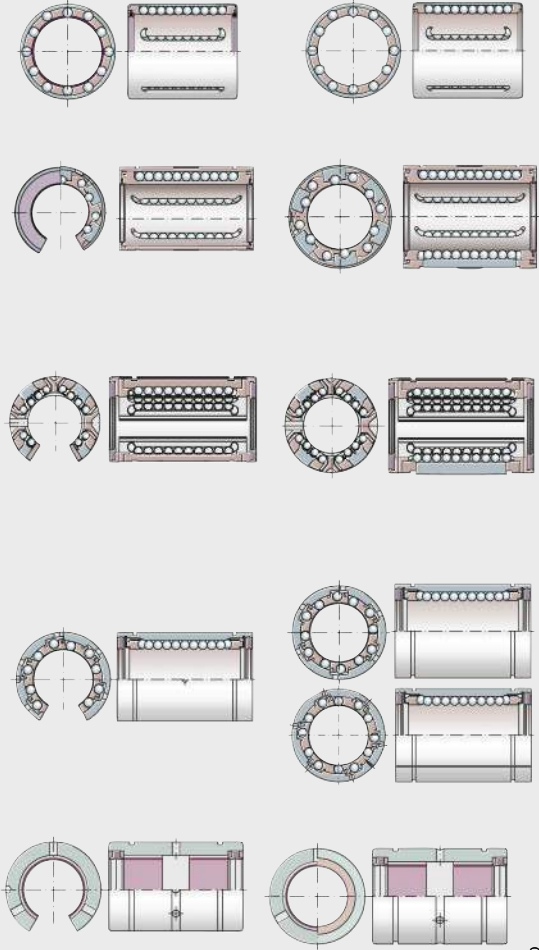


0001A282

Technical principles

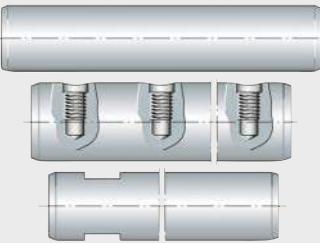
Linear bearings, linear bearing and housing units

- Compact range
- Light range
- Heavy duty range
- Machined range
- Plain bearing range



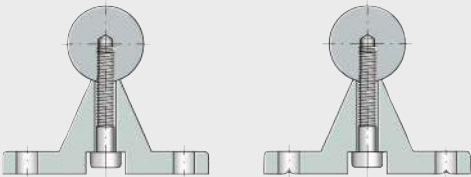
00019CE0

Solid shafts Hollow shafts



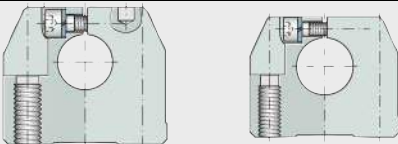
120 585

Shaft and support rail units



120 587

Shaft support blocks

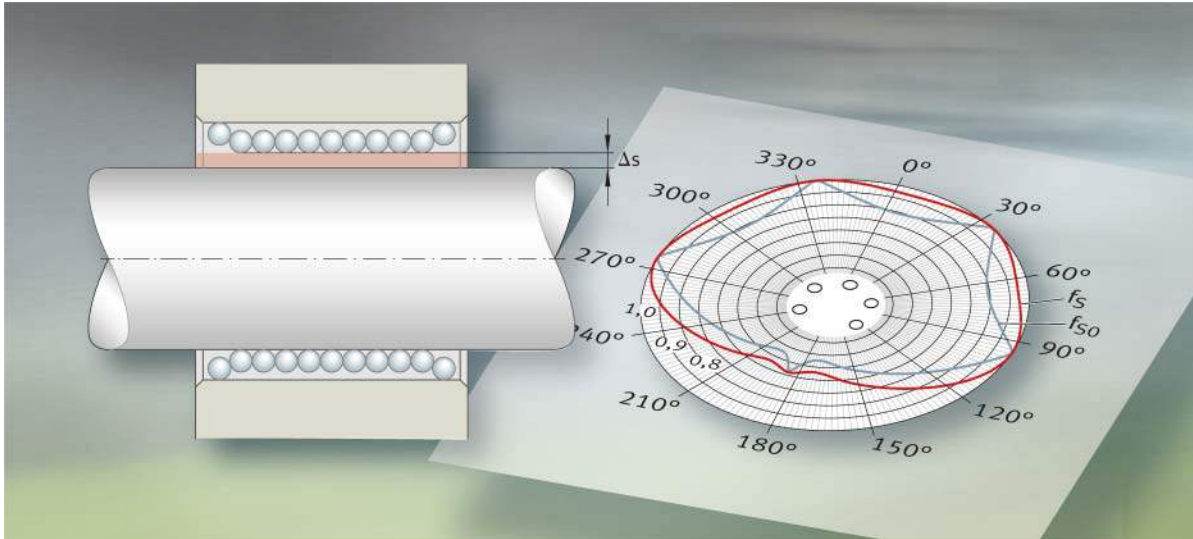


120 589

Appendix



0001A281



Technical principles

- Load carrying capacity and life
- Friction
- Lubrication
- Design of bearing arrangements
- Operating clearance
- Fitting



Technical principles

	Page	
Load carrying capacity and life	Basic rating life	15
	Operating life	16
	Static load safety factor	16
	Influence of the shaft raceway on basic load ratings	17
	Differences in raceway hardness	17
	Load direction and position of the ball rows	18
	Main load direction	18
	Linear ball bearings	19
	Linear ball bearing and housing units	19
	Misalignment of the shaft	25
	Load factors in misalignment	25
	Compensation of misalignments in the light and heavy duty range	26
	Friction	Coefficient of friction
Coefficient of friction in unsealed bearings		27
Lubrication	Grease lubrication	28
	Structure of suitable greases	28
	Initial greasing and operating life	28
	Relubrication of linear ball bearings in housings	29
	Lubrication nipples for housings	30
	Application in special environments	32
	Oil lubrication	32
Suitable oils	32	
Design of bearing arrangements	Location	33
	Linear ball bearings KH	33
	Linear ball bearings KN..-B, KB, KS and plain bearings PAB	33
	Linear ball bearings KNO..-B, KBO and plain bearings PABO	34
	Linear ball bearing and housing units	35
	Sealing	36
	Gap seals or contact seals	36

Technical principles

	Page
Operating clearance	
Tolerance and operating clearance	37
Mounting tolerances and operating clearance	38
Mounting	
Mounting of bearings	39
Linear ball bearings KH	39
Linear ball bearings KN..-B, KNO..-B, KB, KBS, KBO, KS, KSO and linear plain bearings PAB, PABO	40
Alignment of bearings and shafts	41
Bearings arranged in series	41
Bearings arranged in parallel	41
Very long guidance systems with supported shaft	42
Guidance systems with clearance-free or preloaded bearings	42
Parallel shaft and support rail units	42
Setting the operating clearance	43
Setting bearings clearance-free	43
Setting the preload	43
Suspended arrangement of guidance system	43



Load carrying capacity and life

The size of a linear ball bearing is determined by the demands made in terms of load carrying capacity, rating life and operational security.

The load carrying capacity is described in terms of:

- the basic dynamic load rating C
- the basic static load rating C₀.

The calculation of the basic dynamic and static load ratings given in the dimension tables is based on DIN 636-1.

Basic rating life

The basic rating life L is reached or exceeded by 90 % of a sufficiently large group of apparently identical bearings before the first evidence of material fatigue occurs.

$$L = \left(\frac{C}{P} \right)^3$$

$$L_h = \frac{833}{H \cdot n_{osc}} \cdot \left(\frac{C}{P} \right)^3$$

$$L_h = \frac{1666}{\bar{v}} \cdot \left(\frac{C}{P} \right)^3$$

L	m
Basic rating life L in 100 000 m	
C	N
Basic dynamic load rating	
P	N
Equivalent dynamic bearing load	
L _h	h
Basic rating life in operating hours	
H	m
Single stroke length	
n _{osc}	min ⁻¹
Number of return strokes per minute	
\bar{v}	m/min
Mean travel velocity.	



Influence of the shaft raceway on the basic load ratings

The basic load ratings in the dimension tables are only valid if a ground (Ra 0,3) and hardened shaft (at least 670 HV) is provided as a raceway.

Differences in raceway hardness

If shafts with a surface hardness lower than 670 HV are used (for example, shafts made from X46 or X90), a hardness factor must be applied, see equations and *Figure 1*.

$$C_H = f_H \cdot C$$

$$C_{0H} = f_{H0} \cdot C_0$$

C_H N
Effective dynamic load rating
 f_H –
Dynamic hardness factor, *Figure 1*
 C N
Basic dynamic load rating
 C_{0H} N
Effective static load rating
 f_{H0} –
Static hardness factor, *Figure 1*
 C_0 N
Basic static load rating.

f_{H0} = static hardness factor
 f_H = dynamic hardness factor
HV, HRC = surface hardness

- ① X90
- ② X46

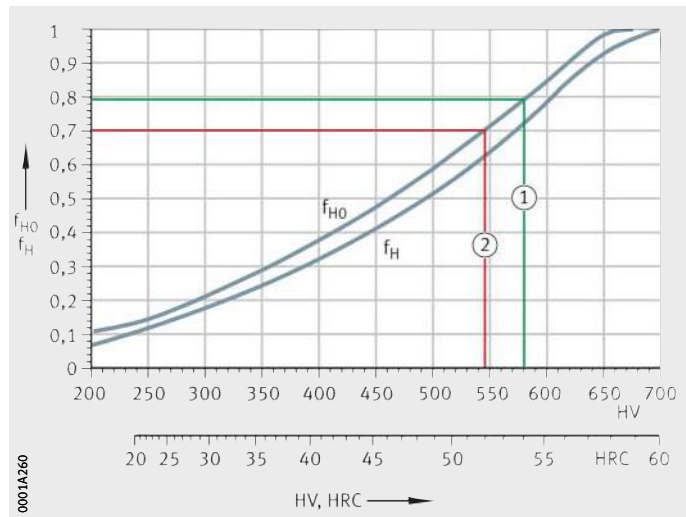


Figure 1

Static and dynamic hardness factors for lower hardness of raceways

Load carrying capacity and life

Load direction and orientation of the ball rows

The effective load rating of a linear ball bearing is dependent on the position of the load direction in relation to the position of the ball rows:

- The lowest load rating C_{\min} and $C_{0\min}$ occurs at the zenith position, *Figure 2*.
- The highest load rating C_{\max} and $C_{0\max}$ occurs at the symmetrical position, *Figure 2*.

If the bearings are mounted in correct alignment, the maximum load rating can be used. If aligned mounting is not possible or the direction of loading is not defined, the minimum load ratings must be assumed.

Main load direction

For linear ball bearings and linear ball bearing and housing units where the mounting position of the ball rows is defined, the basic load ratings C and C_0 in the main load direction are given, *Figure 3*. For other load directions, the effective load ratings can be determined using the load direction factors in *Figure 4*, page 20, to *Figure 21*, page 24.

If the mounting position of the ball rows is not defined, the minimum basic load ratings are stated.

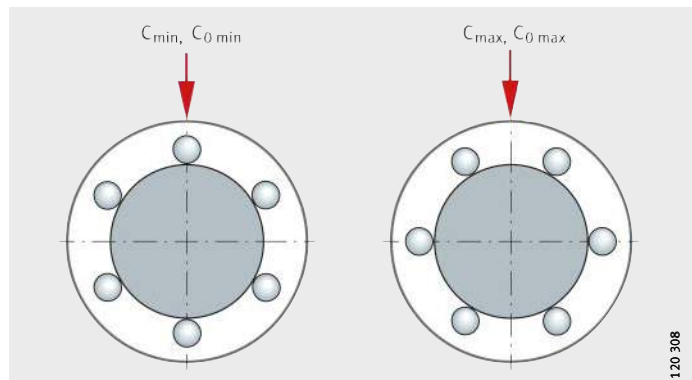
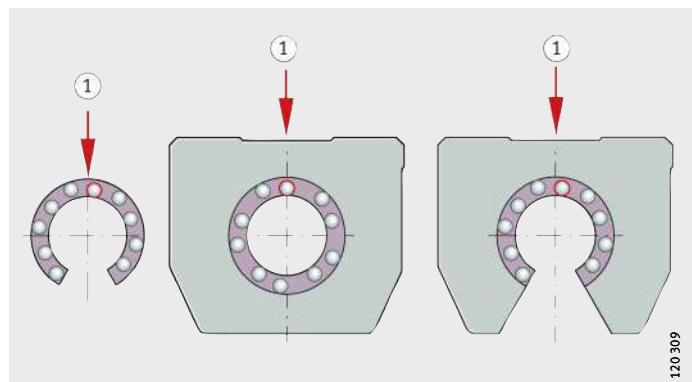


Figure 2
Load carrying capacity, dependent on the position of the ball rows



① Main load direction

Figure 3
Main load direction for bearings and housing units



Linear ball bearings

The basic load ratings given in the dimension tables are defined as follows:

- For KH, KN..-B, KS, KB and KBS, the minimum and maximum load ratings apply, *Figure 2*, page 18.
- For KNO..-B, KSO and KBO, the basic load ratings apply in the main load direction. In the case of other load directions, see *Figure 4*, page 20, to *Figure 13*, page 22.

Linear ball bearing and housing units

The basic load ratings given in the dimension tables are defined as follows:

Compact range

For the units KGHK, KTHK, the minimum load rating applies.

Heavy duty range

For the heavy duty range, the basic load rating applies in the main load direction. In the case of other load directions, see *Figure 14* to *Figure 17*, page 23.

Machined range

For the units KGB, KGBA, KTB, KGBS, KGBAS, the minimum load rating applies.

For the open units KGBO, KGBAO, the basic load rating applies in the main load direction. In the case of other load directions, see *Figure 20* to *Figure 21*, page 24.

Load direction factors

The factors in *Figure 4*, page 20, to *Figure 13*, page 22, are applied as follows:

$$C_w = f_s \cdot C$$

C_w	N
Effective dynamic load carrying capacity	
f_s	-
Dynamic load factor for load direction	
C	N
Basic dynamic load rating.	

$$C_{0w} = f_{s0} \cdot C_0$$

C_{0w}	N
Effective static load carrying capacity	
f_{s0}	-
Static load factor for load direction	
C_0	N
Basic static load rating.	

Load carrying capacity and life

Figure 4
Compact range
Load direction factor
for KH06, KH08, KH10

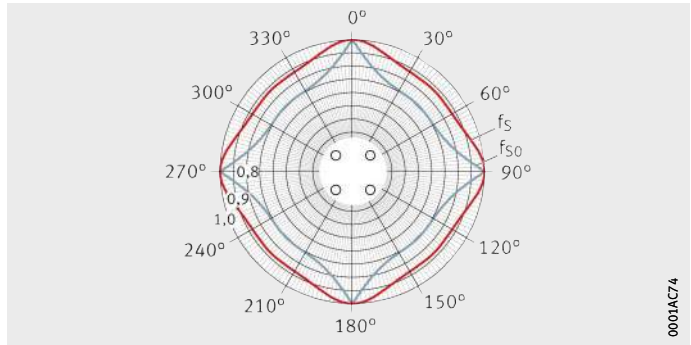


Figure 5
Compact range
Load direction factor
for KH12, KH14, KH16

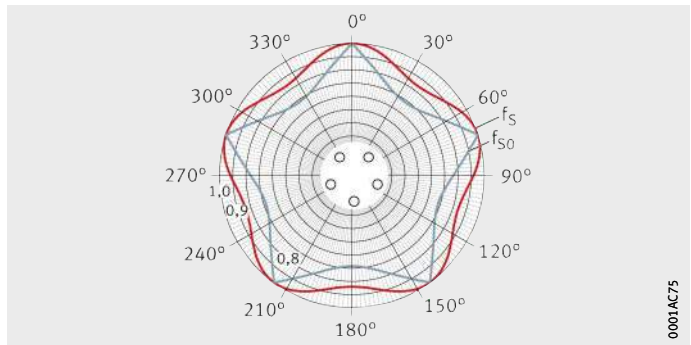


Figure 6
Compact range
Load direction factor
for KH20, KH25

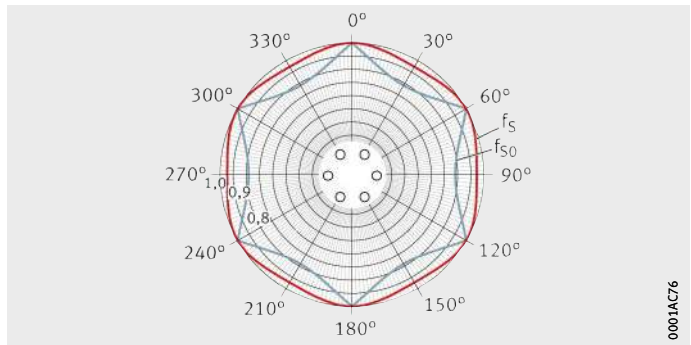




Figure 7
Compact range
Load direction factor
for KH30

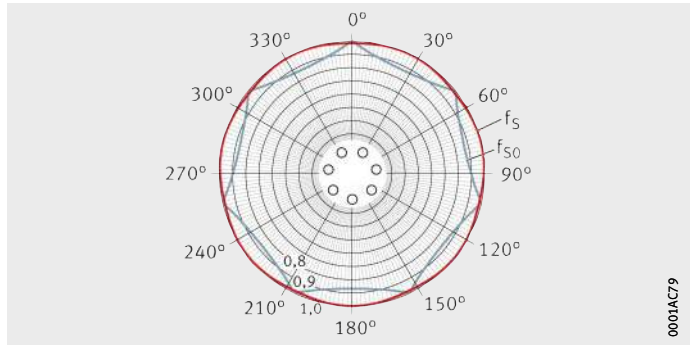


Figure 8
Compact range
Load direction factor
for KH40

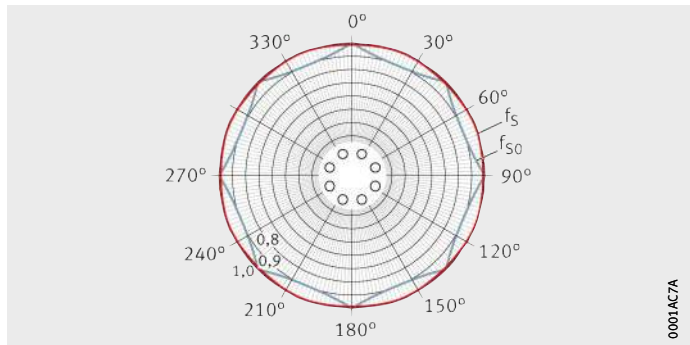
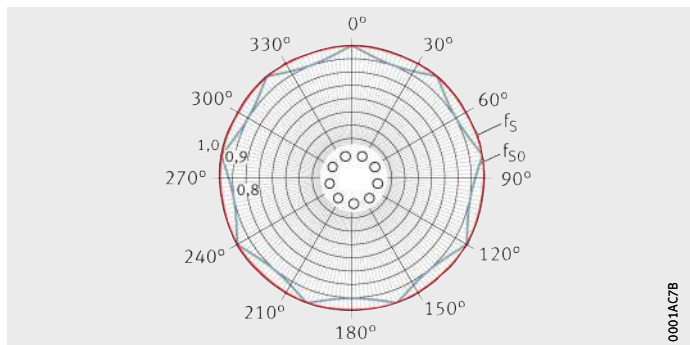
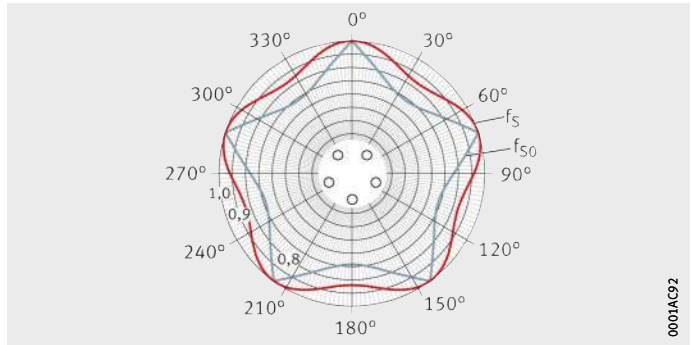


Figure 9
Compact range
Load direction factor
for KH50



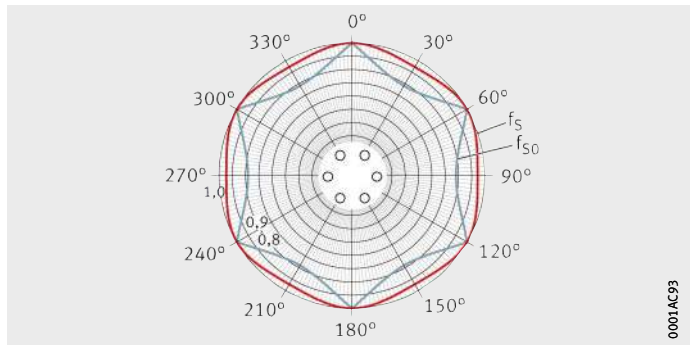
Load carrying capacity and life

Figure 10
Light range
 Load direction factor
 for KN12-B, KN16-B



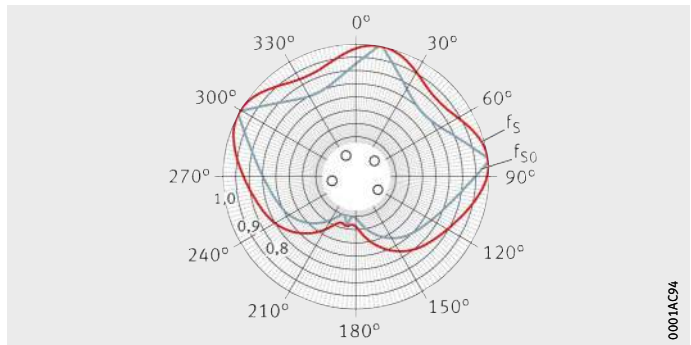
0001AC92

Figure 11
Light range
 Load direction factor
 for KN20-B, KN25-B,
 KN30-B, KN40-B, KN50-B



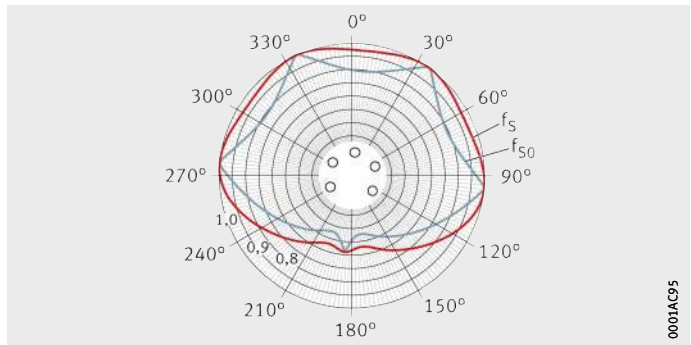
0001AC93

Figure 12
Light range
 Load direction factor
 for KNO12-B, KNO16-B



0001AC94

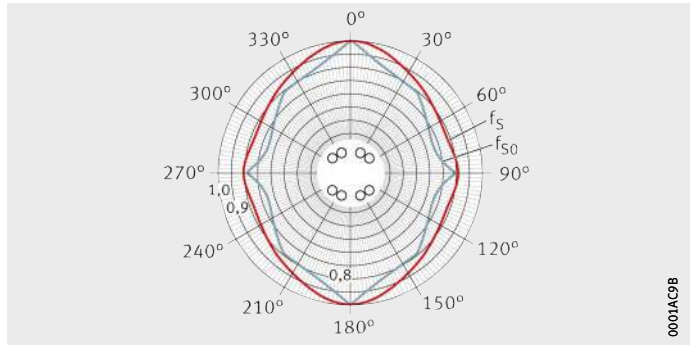
Figure 13
Light range
 Load direction factor
 for KNO20-B, KNO25-B,
 KNO30-B, KNO40-B, KNO50-B



0001AC95

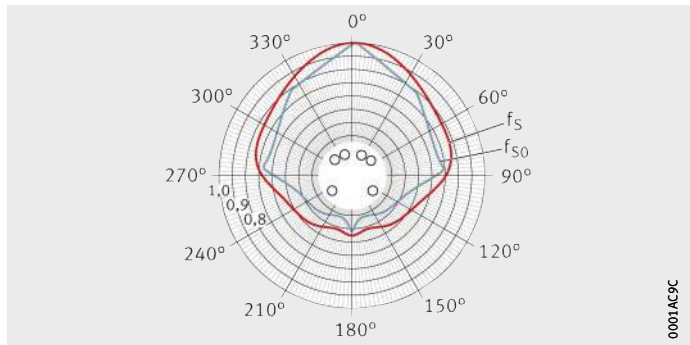


Figure 14
Heavy duty range
Load direction factor
for KS12, KS16, KS20, KS25,
KS30, KS40, KS50



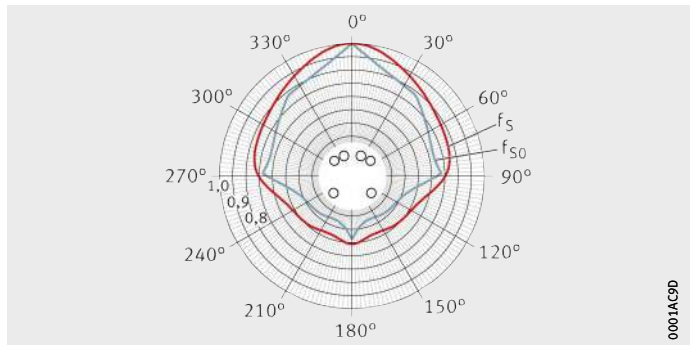
0001AC9B

Figure 15
Heavy duty range
Load direction factor
for KSO12, KSO16



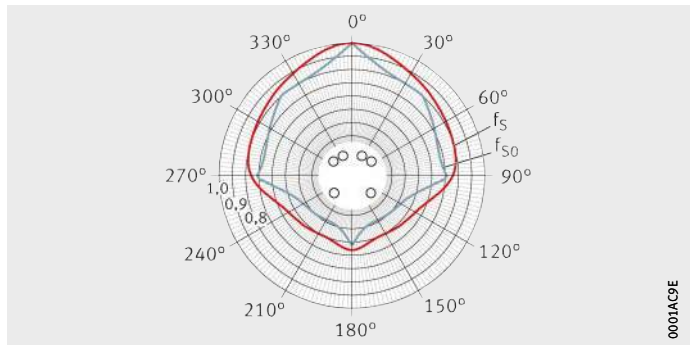
0001AC9C

Figure 16
Heavy duty range
Load direction factor
for KSO20, KSO25



0001AC9D

Figure 17
Heavy duty range
Load direction factor
for KSO30, KSO40, KSO50



0001AC9E

Load carrying capacity and life

Figure 18
Machined range
 Load direction factor
 for KB12, KB16

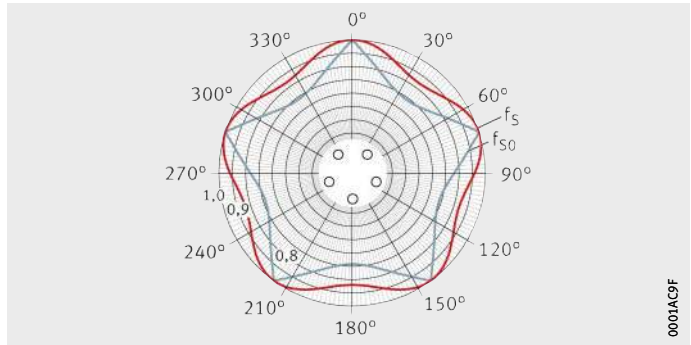


Figure 19
Machined range
 Load direction factor
 for KB20, KB25,
 KB30, KB40, KB50

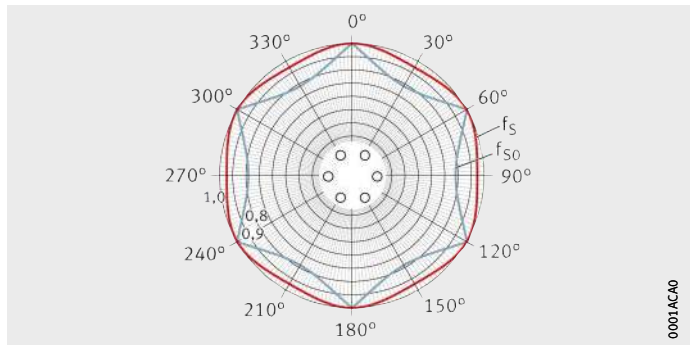


Figure 20
Machined range
 Load direction factor
 for KBO12, KBO16

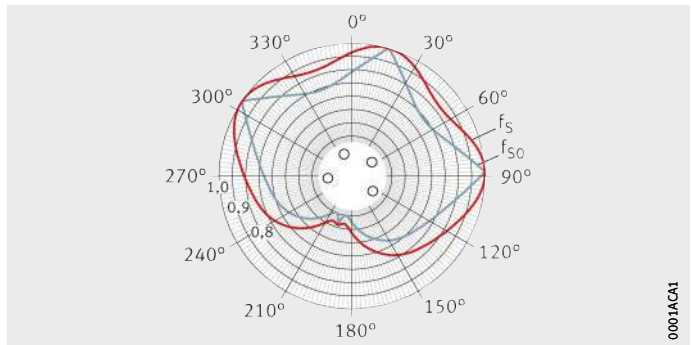
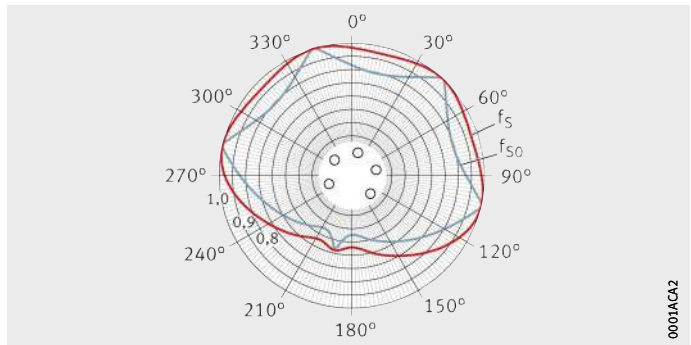


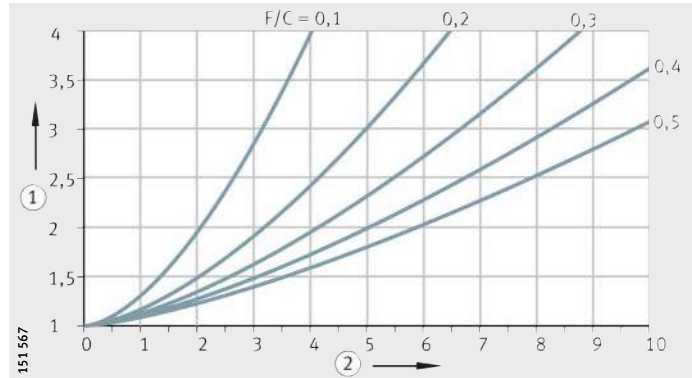
Figure 21
Machined range
 Load direction factor
 for KBO20, KBO25,
 KBO30, KBO40, KBO50



Load carrying capacity and life

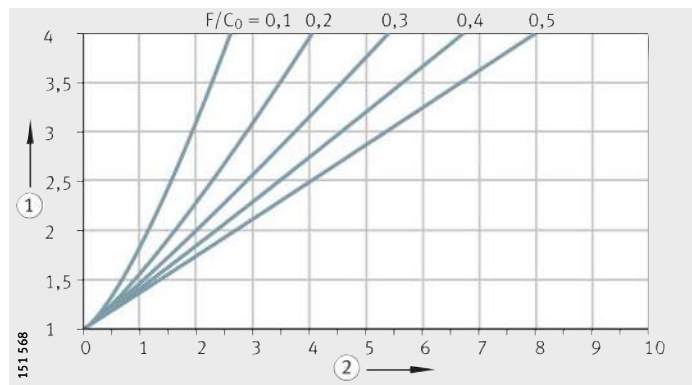
- ① Dynamic load factor K_F
- ② Misalignment φ in angular minutes

Figure 23
Dynamic load factor
for shaft misalignment



- ① Static load factor K_{F0}
- ② Misalignment φ in angular minutes

Figure 24
Static load factor
for shaft misalignment



Compensation of misalignments in the light and heavy duty range

Linear ball bearings KN..-B, KNO..-B, KS and KSO and linear ball bearing and housing units containing these bearings are self-aligning. They can compensate misalignments of up to ± 30 angular minutes (KN..-B and KNO..-B) or ± 40 angular minutes (KS and KSO) without detrimental effect on the load carrying capacity.



Friction

Linear ball bearings are frequently used where high positional accuracy and high efficiency are a priority. The bearings must therefore run without stick-slip and with only low friction.

The linear ball bearings KN...-B, KNO...-B, KS, KSO, KB, KBS, KBO have particularly low friction.

Coefficient of friction

The total friction consists of:

- rolling and sliding friction at the rolling contacts (sliding friction in linear plain bearings)
- friction in the return zones and recirculation guides
- lubricant friction
- seal friction.

The factors on which the coefficient of friction depends may act in a reciprocal manner, may act in a single direction or may counteract each other.

Coefficient of friction in unsealed bearings

The coefficients of friction for unsealed linear bearings with oil lubrication are given in the table.

In the case of linear plain bearings, the coefficient of friction is between 0,02 and 0,2.

Series and coefficient of friction

Series	Coefficient of friction
KH	0,003 – 0,005
KN...-B, KNO...-B	0,001 – 0,0025
KS, KSO	0,001 – 0,0025
KB, KBS, KBO	0,001 – 0,0025

Lubrication

Open linear ball bearings are supplied with a wet or dry preservative and can be lubricated using either grease or oil. The oil-based preservative is compatible and miscible with lubricants with a mineral oil base, which means that it is not generally necessary to wash out the bearings before mounting.

Bearings with a dry preservative must be greased or oiled immediately after they are removed from the packaging.

Grease lubrication

Grease lubrication should be used in preference to oil lubrication, since the grease adheres to the inside of the bearing and thus prevents the ingress of contamination. This sealing effect protects the rolling elements against corrosion.

In addition, the design work involved in providing grease lubrication is less than that for providing oil, since design of the sealing arrangement is less demanding.

Composition of suitable greases

The greases for linear ball bearings have the following composition:

- lithium or lithium complex soap
- base oil: mineral oil or poly-alpha-olefin (PAO)
- special anti-wear additives for loads $C/P < 8$, indicated by "P" in the DIN designation KP2K-30
- consistency to NLGI grade 2 in accordance with DIN 51818.

Initial greasing and operating life

Based on experience, the operating life is achieved when bearings are operated with grease lubrication in normal environmental conditions ($C/P > 10$), at room temperature and at $v \leq 0,6 \cdot v_{\max}$. If it is not possible to achieve these conditions, the bearings must be relubricated.

Sealed linear ball bearings are already adequately greased when delivered and are therefore maintenance-free in many applications.

Initial greasing and relubrication of bearings

The initial greasing and relubrication of linear ball bearings without seals and relubrication holes must be carried out via the shaft. It must be ensured that all rolling elements come into contact with grease during recirculation. The bearing must be moved over at least twice its length during relubrication.

During initial greasing, the bearing fitted on the shaft should be fed with lubricant until this begins to emerge from the bearing.

In the case of the linear ball bearings KH, KN..-B-PP-AS, KS..-PP-AS and PAB..-PP-AS, relubrication can be carried out via holes or openings in the retaining ring or outer ring.



Relubrication interval

The relubrication interval is dependent on many operating conditions such as load, temperature, speed, stroke length, lubricant, environmental conditions and the mounting position.



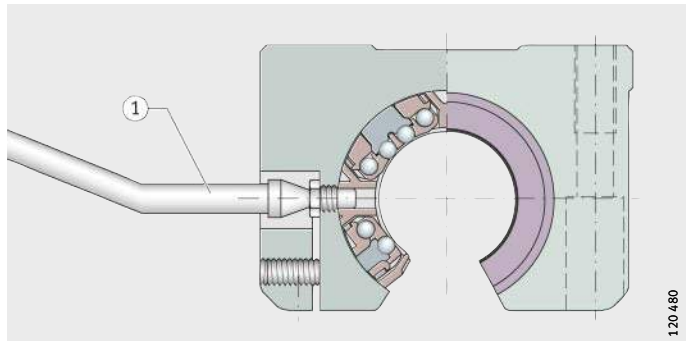
Precise lubrication intervals should be determined by tests conducted under application conditions.

Relubrication of linear ball bearings in housings

If linear ball bearings are mounted in a housing, special nozzle tubes may be required for relubrication, *Figure 1* and *Figure 2*. Sources for nozzle tubes with suitable needle point heads can be requested from us.



Figure 1
Nozzle tube



① Nozzle tube

Figure 2
Relubrication using nozzle tube

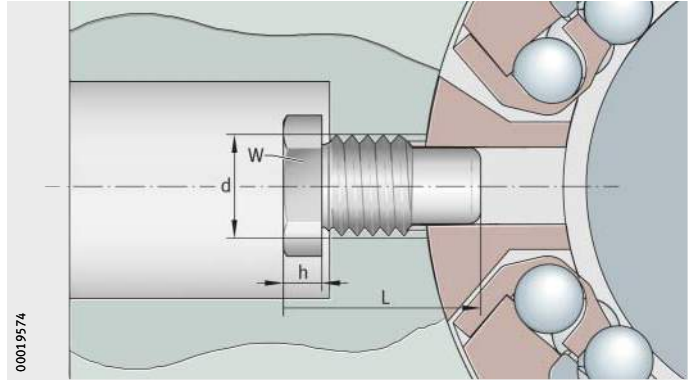
Lubrication

Lubrication nipples for housings

Lubrication nipples for housings with KS are shown in *Figure 3*, suitable DIN lubrication nipples for housings with KN...-B are shown in *Figure 4* and *Figure 5*, page 31, for other housings, see *Figure 6*, page 31. The dimensions are given in the tables.

NIP..MZ

Figure 3
Lubrication nipple for heavy duty range KS

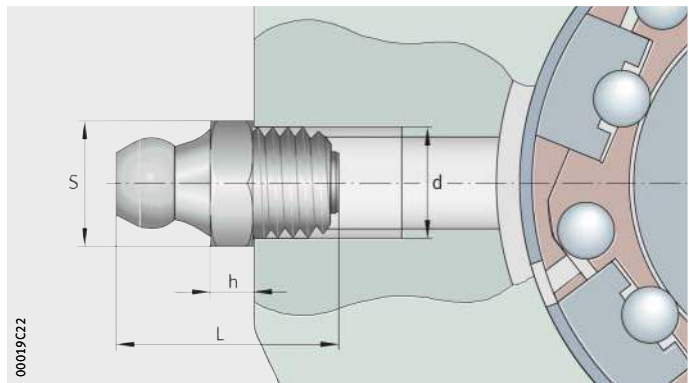


Lubrication nipples

Lubrication nipple	Width across flats W	Dimensions		
		d mm	L mm	h mm
NIP4MZ	5	M4	7,7	1,5
NIP5MZ	6	M5	11,1	2
NIP6MZ	7	M6	14,8	2,5

NIP DIN 71412

Figure 4
Lubrication nipple DIN 71412 type A for light range KN...-B



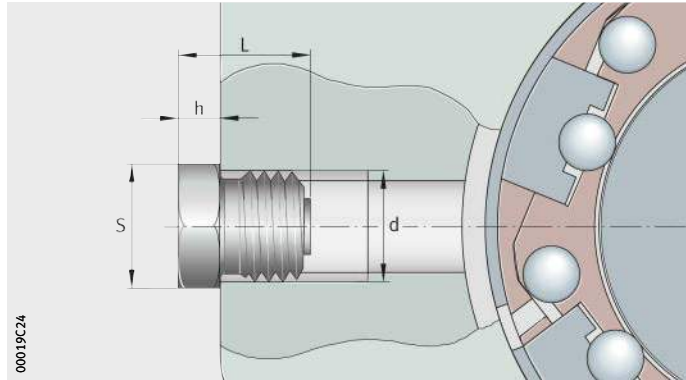
Taper type lubrication nipples

Taper type lubrication nipple	Dimensions			
	S h13 mm	d mm	L mm	h j16 mm
NIP DIN 71412-AM6	7	M6	16	3
NIP DIN 71412-AM8×1	9	M8×1	16	3



NIP DIN 3405

Figure 5
Alternative
lubrication nipple DIN 3405 type A
for light range KN...B

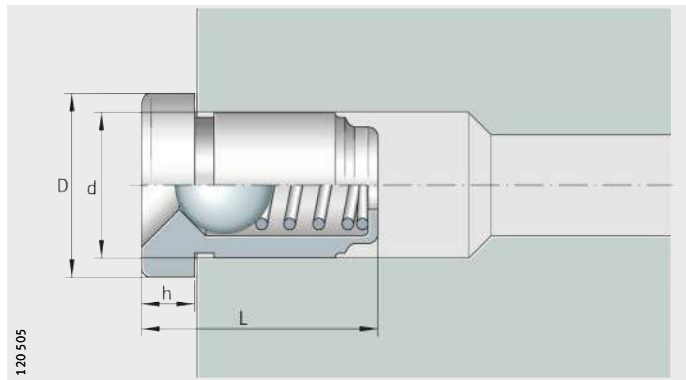


Funnel type lubrication nipples

Funnel type lubrication nipple	Dimensions			
	S h13 mm	d mm	L mm	h j16 mm
NIP DIN 3405-AM6	7	M6	9,5	3
NIP DIN 3405-AM8×1	9	M8×1	9,5	3

NIPA

Figure 6
Lubrication nipple
for compact range KH,
machined range KB,
plain bearing range PAB



Lubrication nipples

Lubrication nipple	Dimensions			
	D mm	d mm	L mm	h mm
NIPA1	6	4	6	1,5
NIPA2	8	6	9	2

Lubrication

Application in special environments

In vacuum applications, lubricants with low vapourisation rates are required in order to maintain the vacuum atmosphere.

In the foodstuffs sector and clean rooms, special requirements are also placed on lubricants in relation to emissions and compatibility. For such environmental conditions, please consult us.

Oil lubrication

Oil lubrication should be used in preference if heat is to be dissipated and contaminants are to be carried out of the bearing by the lubricant.

This advantage should be set against the increased design work required (lubricant feed, sealing).

Suitable oils

As a function of the load case, we recommend the following oils:

- for low to moderate loads ($C/P > 15$):
 - hydraulic oils HL to DIN 51524 and oils CL to DIN 51517 in the viscosity range ISO-VG 10 to ISO-VG 22
- for high loads ($C/P < 8$):
 - hydraulic oils HLP to DIN 51524 and oils CLP to DIN 51517 in the viscosity range ISO-VG 68 to ISO-VG 100.



Design of bearing arrangements

The good running characteristics of shaft guidance systems are dependent not only on the bearings. The geometrical and positional tolerances of the adjacent construction also play a significant role. The higher the accuracy to which the adjacent construction is produced and assembled, the better the running characteristics.

Location

Linear ball bearings KH

Linear ball bearings KH and KH..-PP are pressed into the housing bore. This provides axial and radial location. No additional means of location are required.

Linear ball bearings KN..-B, KB, KS and plain bearings PAB

Linear ball bearings KN..-B, KB, KS and plain bearings PAB require axial location.

Linear ball bearings KB and plain bearings PAB can be located by means of retaining rings or by the adjacent construction, *Figure 1 to Figure 3*, page 34.

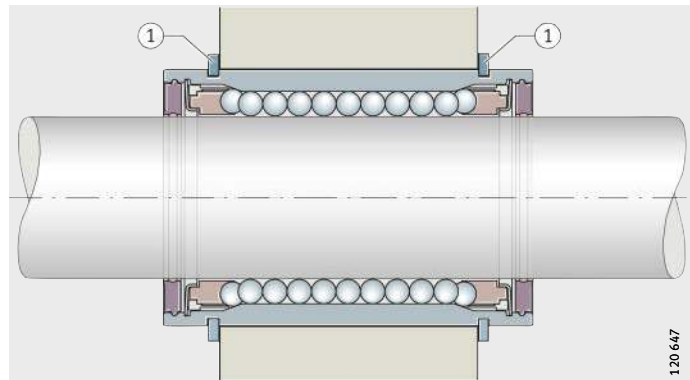
Linear ball bearings KN..-B and KS can be located in accordance with *Figure 2* and *Figure 3*, page 34.

Linear ball bearings KN..-B can also be located by means of a screw, *Figure 4*, page 34.



The series KN..-B and KS should not be located by means of shaft retaining rings according to *Figure 1*. This could impair the function of the bearing.

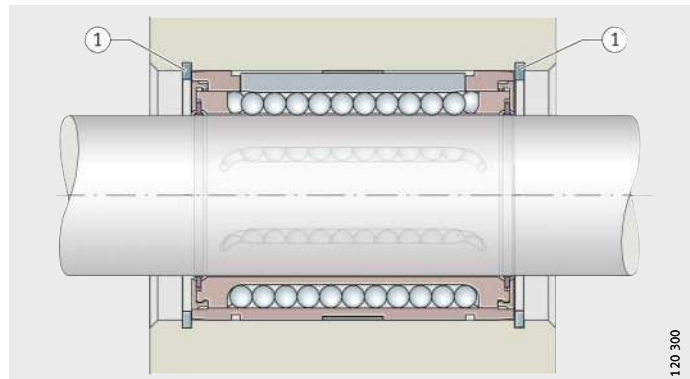
① Retaining rings



120 647

Figure 1
Retaining rings in the bearing slots

① Retaining rings



120 300

Figure 2
Retaining rings in the housing bore

Design of bearing arrangements

Linear ball bearings KNO..-B, KBO and plain bearings PABO

Linear ball bearings KNO..-B, KBO and plain bearings PABO must be axially located.

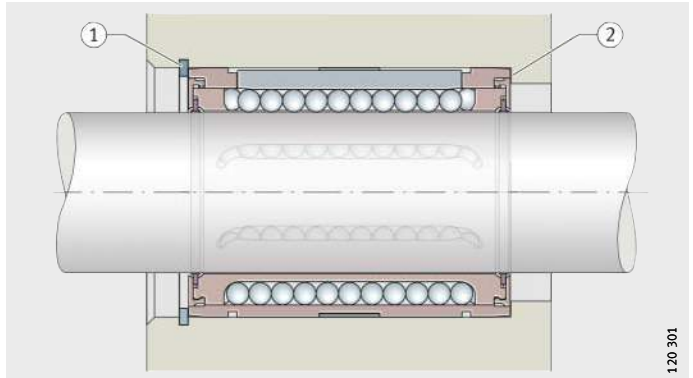
These bearings are located by external means. A dog point screw should preferably be used for location, *Figure 4*. Grub screws are also suitable.



The locating screw must not be allowed to deform the bearing. The screw must be secured against loosening.

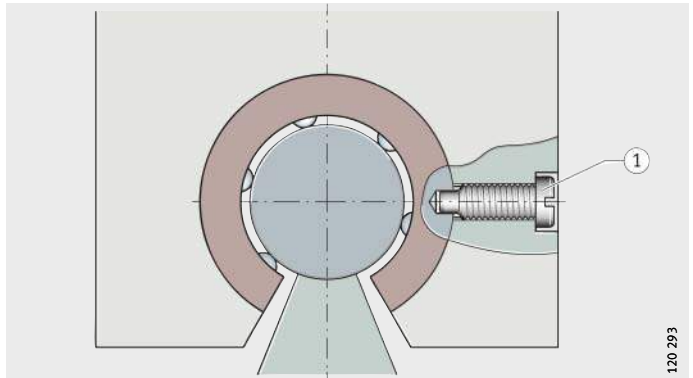
- ① Retaining ring
- ② Housing rib

Figure 3
Retaining ring and housing rib



- ① Dog point retaining screw

Figure 4
Location of the bearing using a screw





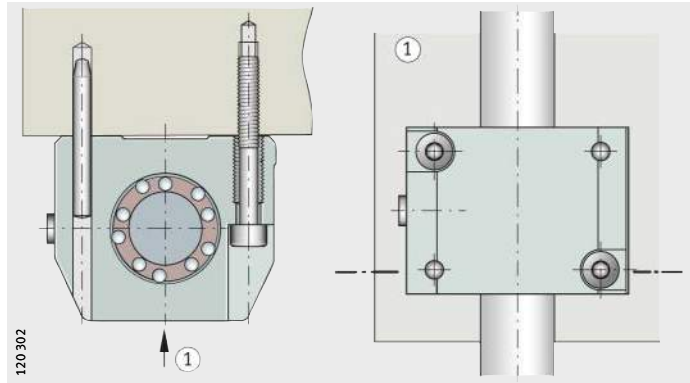
Linear ball bearing and housing units

Linear ball bearing and housing units and linear plain bearing units are screw mounted into or through the fixing holes, *Figure 5* and *Figure 6*.

Location of the units by means of dowels is only necessary in rare cases, but can be achieved easily by drilling out the centring holes.

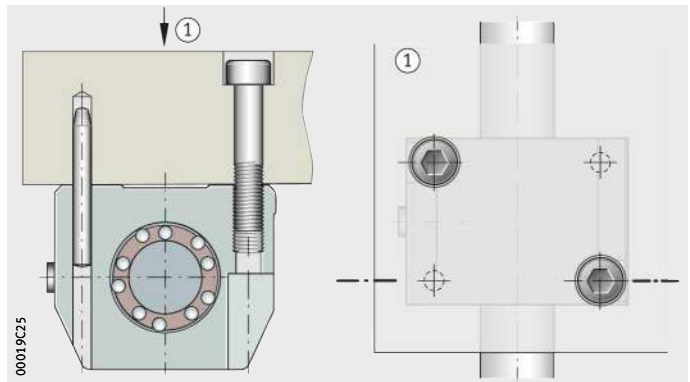
① Bottom view

Figure 5
Location of a unit from below



① Top view

Figure 6
Location of a unit from above



Design of bearing arrangements

Sealing

Clean raceways are necessary in order to prevent premature failure of the shaft and bearing. The bearing position should therefore always be sealed.

Gap seals or contact seals

The seals for the bearing series are shown in the table.

Gap seals protect the bearings against coarse contaminants.

Contact seals give protection against fine contaminants and also retain the grease in the bearing.

Linear ball bearings and linear plain bearings with contact seals have the PP, example KH..-PP.



If the bearing and shaft are in a highly aggressive environment, it is recommended that the guidance system should be provided with additional protection by means of bellows or telescopic covers.

Seals for bearings and units

Series ¹⁾	Seal		
	Open design	Gap seals	Contact seals
KH	●	–	●
KN..-B, KNO..-B	–	●	●
KS, KSO	–	●	●
KB, KBO	–	●	●
PAB, PABO	–	–	●

● Available design.

¹⁾ All linear bearing units have contact seals.



Operating clearance

Tolerance and operating clearance

The operating clearance of linear bearings is defined by the selection of shaft and housing tolerance, see tables, page 38.

The operating clearance of linear bearing units is defined either by the shaft or, in the case of slotted housings, is set by means of the adjustment screw.



In the case of non-rigid housings, tests must be carried out in order to achieve the required operating clearance by means of the housing and shaft tolerances.

For adjustment of the operating clearance see page 43.

Tolerance and operating clearance

Linear bearings, linear bearing and housing units	Designation	Tolerance		Operating clearance
		Shaft	Bore	
Compact range	KH	See table, page 38		
	KGHK, KTHK	h6	–	Standard
Light range	KN...-B, KNO...-B	h6	H7	Clearance-free
Heavy duty range	KS, KSO	h6	H7	Clearance-free
	KGSNG, KTSG, KGSNO, KTSO, KGSC, KTFS	h6	–	Slight preload
	KGSNS, KTSS, KGSNOS, KTSOS, KGSCS	–	–	Adjustable by means of screw
Machined range	KB	See table, page 38		
	KBS, KBO			
	KGB, KGBA, KTB, KGBO, KTBO	h6	–	See table, page 38
	KGBS, KGBAS, KGBAO	–	–	Adjustable by means of screw
Plain bearing range	PAB, PABO	h7	H7	Standard
	PAGBA, PAGBAO	h7	–	Standard

Operating clearance

Mounting tolerances and operating clearance

The theoretically possible operating clearance for the individual series is shown in the following tables and *Figure 1*.

Operating clearance for KH, KN...-B, KNO...-B

Mounting tolerance		Operating clearance All sizes	
Shaft	Bore		
h6	H7, K7	Normal operating clearance	Steel/ aluminium
j5	H6, K6	Operating clearance smaller than normal	Steel/ aluminium

Operating clearance for KS, KSO

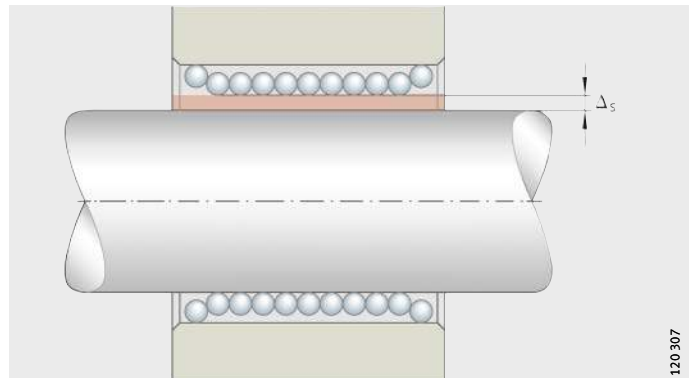
Mounting tolerance		Size and operating clearance						
Shaft	Bore	12 μm	16 μm	20 μm	25 μm	30 μm	40 μm	50 μm
h6	H6	+36 -8	+34 -10	+37 -12	+34 -15	+29 -20	+33 -22	+30 -25
h6	H7	+44 -8	+42 -10	+46 -12	+43 -15	+38 -20	+44 -22	+41 -25
h6	JS6	+29 -14,5	+27,5 -16,5	+29 -20	+26 -23	+21 -28	+23,5 -31,5	+20,5 -34,5

Operating clearance for KB

Mounting tolerance		Size and operating clearance						
Shaft	Bore	12 μm	16 μm	20 μm	25 μm	30 μm	40 μm	50 μm
h6	H6 (H7)	+19 0	+20 -1	+22 -1	+24 -1	+24 -1	+29 -2	+29 -2

Operating clearance for KBS, KBO

Mounting tolerance		Size and operating clearance						
Shaft	Bore	12 μm	16 μm	20 μm	25 μm	30 μm	40 μm	50 μm
h6	H6	+50 0	+51 -1	+60 -1	+62 -1	+62 -1	+74 -2	+74 -2
h6	H7	+58 0	+59 -1	+69 -1	+71 -1	+71 -1	+85 -2	+85 -2
h6	JS6	+43,5 -6,5	+44,5 -7,5	+52 -9	+54 -9	+54 -9	+64,5 -11,5	+64,5 -11,5



Δ_s = operating clearance

Figure 1
Operating clearance



Mounting

The bearings should only be removed from their packaging immediately before mounting. Bearings with dry preservative should be protected against corrosion immediately after removal from the packaging.



The mounting area and the adjacent construction must be clean. Contamination impairs the accuracy and operating life of the guidance systems.

The bearings must not be tilted.

In the case of sealed bearings with a segment cutout, it must be ensured at all costs that the ends of the seal lips are not turned inside out (pay attention to the packing slip).

Mounting of bearings Linear ball bearings KH

Linear ball bearings KH are pressed into the housing bore using a pressing mandrel, *Figure 1*. The mandrel dimensions must be in accordance with *Figure 1*.

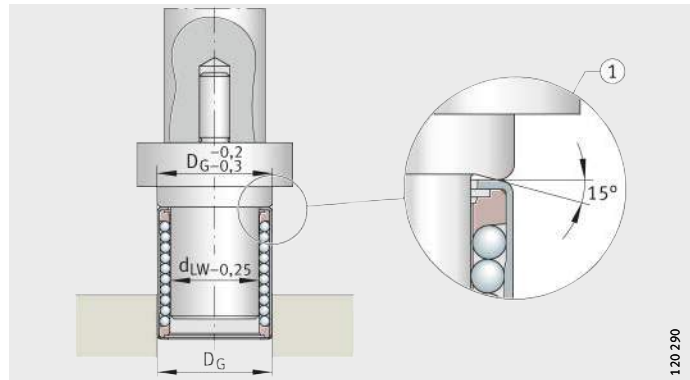
The marked end face of the linear ball bearing should be in contact with the flange of the mandrel.

Linear ball bearings can be mounted more easily if the outside surface is greased.

d_{LW} = shaft diameter
 D_G = housing bore

① Detail

Figure 1
Pressing in
of linear ball bearings KH



Mounting

Linear ball bearings KN..-B, KNO..-B, KB, KBS, KBO, KS, KSO and linear plain bearings PAB, PABO



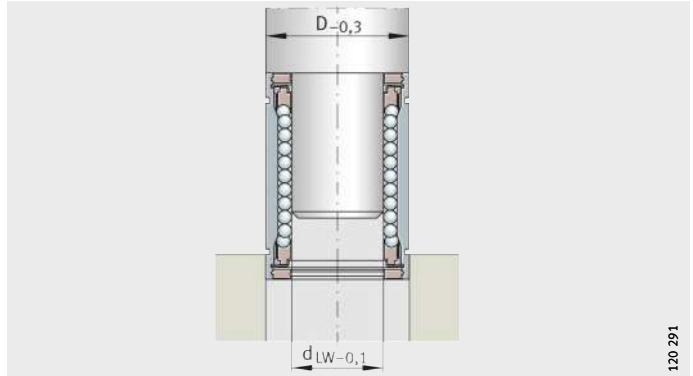
Smaller bearings of these series can be slid into the housing bore by hand. For larger bearings, it is advisable to use a mounting mandrel, *Figure 2*.

The bearings are then located by means of retaining rings or a screw, *Figure 3*.

In the case of all bearings located by means of a screw, it must be ensured that the screw does not deform the bearing and the screw is secured against loosening.

d_{LW} = shaft diameter

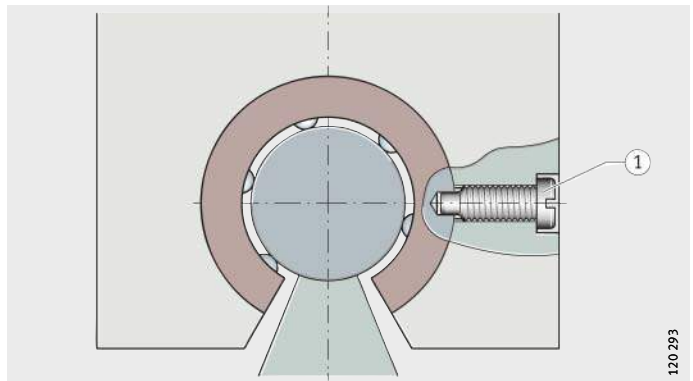
Figure 2
Mounting of linear ball bearings
using fitting mandrel



120 291

① Dog point retaining screw

Figure 3
Location of the bearing
using a screw



120 293



Alignment of bearings and shafts Bearings arranged in series

Bearings arranged in series should be aligned with a continuous shaft, positioned against a stop and then screw mounted firmly in place.

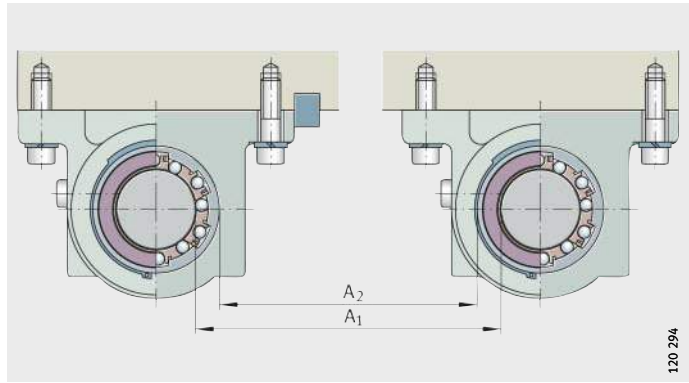
Bearings arranged in parallel

Bearings arranged in parallel are aligned by measuring the spacing between the shafts (A_1) or between the bearing outside diameters (A_2), *Figure 4*. This spacing can also be defined by means of spacers.

The first shaft is set (datum shaft) and screw mounted. The second shaft is aligned by moving the table to achieve the required spacing.

A_1 = spacing between
the shafts
 A_2 = spacing between
the bearing outside diameters

Figure 4
Alignment
of bearings arranged in parallel



Mounting

Very long guidance systems with supported shaft

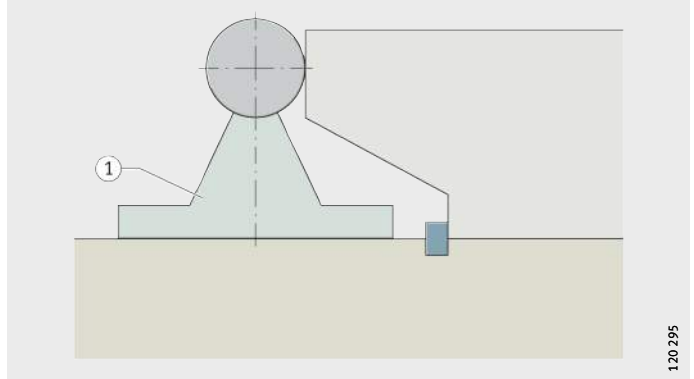
In very long guidance systems with supported shaft, one shaft and support rail unit is first aligned by means of the shaft and screw mounted firmly in place in stages (datum shaft), *Figure 5*.

The procedure described in section Bearings arranged in parallel is then carried out.

- ① Shaft and support rail unit

Figure 5

Alignment of a shaft and support rail unit by means of the shaft



Guidance systems with clearance-free or preloaded bearings

Only one row of bearings arranged in series should be set clearance-free or preloaded. The bearings parallel thereto should have a substantial operating clearance.

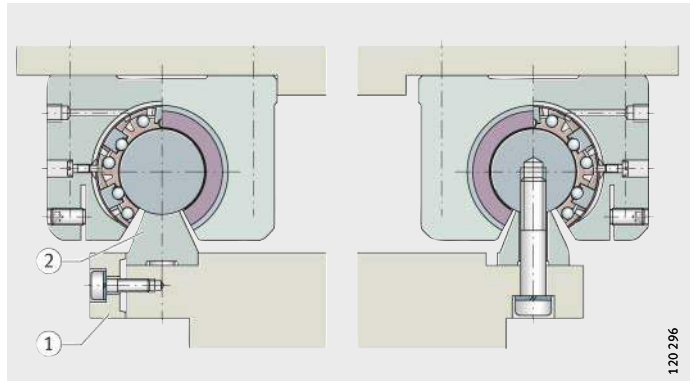
Parallel shaft and support rail units

Clamp the datum support rail against a stop, *Figure 6*.

- ① Stop
- ② Datum support rail

Figure 6

Clamping of the support rail when using two shaft and support rail units TSUW





Setting the operating clearance

Setting bearings clearance-free

In the case of linear ball bearings KBS and slotted housings, the operating clearance can be adjusted. The screw must be adjusted until resistance to further rotation can be felt between the shaft and bearing.



The adjusted bearing should not be rotated any further on the shaft.

Setting the preload

Preloaded bearings are set clearance-free on a master shaft that is smaller than the actual shaft in the application by the amount of the preload dimension.

Suspended arrangement of guidance system



If the guidance system is in a suspended arrangement, a drop guard ① is recommended, *Figure 7*.

- ① Drop guard
- ② Mounting position 180°

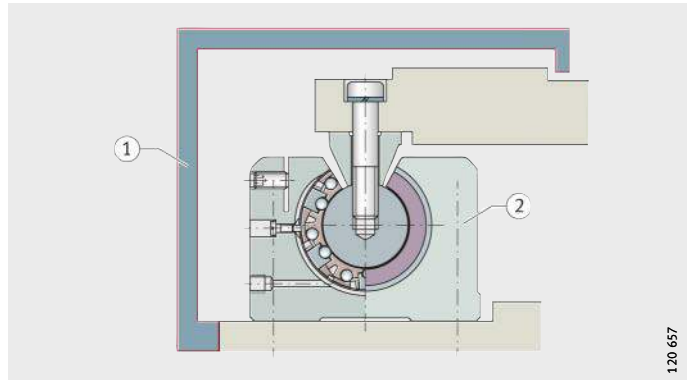
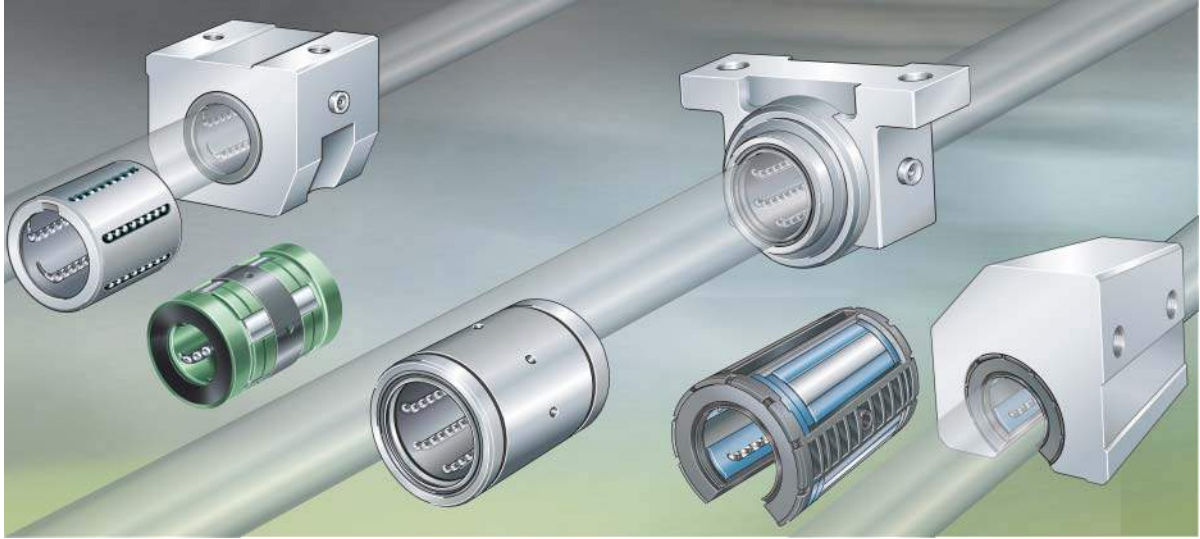


Figure 7
Suspended shaft guidance system
with drop guard

120 657



Linear bearings and linear bearing and housing units

Compact range





Light range

Heavy duty range

Machined range

Plain bearing range

Linear bearings and linear bearing and housing units

		Page	
Matrix	Matrix for preselection of linear bearings and linear bearing and housing units.....	46	
Product overview	Linear bearings and linear bearing and housing units.....	48	
	Compact range.....	48	
	Light range.....	48	
	Heavy duty range	49	
	Machined range	50	
	Plain bearing range	51	
Features	Linear bearings.....	52	
	Linear bearing and housing units	53	
	Sealing.....	54	
	Lubrication	55	
	Operating temperature	55	
	Operating limits.....	55	
	Suffixes	55	
	Compact range	56	
	Light range	58	
	Heavy duty range.....	60	
	Machined range	62	
	Plain bearing range.....	64	
Dimension tables	Compact range, linear ball bearings	67	
	Compact range, linear ball bearing and housing units	68	
	Light range, linear ball bearings	74	
	Heavy duty range, linear ball bearings.....	76	
	Heavy duty range, linear ball bearing and housing units	78	
	Machined range, linear ball bearings	90	
	Machined range, linear ball bearing and housing units.....	92	
	Plain bearing range, linear plain bearings	100	
	Plain bearing range, linear plain bearing and housing units	102	

**Matrix for preselection
of linear bearings and
linear bearing and housing units**

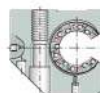
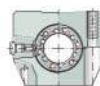
Linear bearings and linear bearing and housing units	For shaft diameter d_{LW} in mm					
	06	08	10	12	14	16
Compact range						
KH, KH...PP	●	●	●	●	●	●
KGHK...PP-AS	●	●	●	●	●	●
KTHK...PP-AS	–	–	–	●	–	●
KGHA...PP	–	–	–	–	–	●
Light range						
KN...B KN...B-PP KNO...B KNO...B-PP	–	–	–	●	–	●
Heavy duty range						
KS, KS...PP	–	–	–	●	–	●
KSO, KSO...PP	–	–	–	●	–	●
KGSNG...PP-AS	–	–	–	●	–	●
KGSNS...PP-AS	–	–	–	●	–	●
KTSG...PP-AS	–	–	–	●	–	●
KTSS...PP-AS	–	–	–	●	–	●
KGSNO...PP-AS	–	–	–	●	–	●
KGSNOS...PP-AS	–	–	–	●	–	●
KTSO...PP-AS	–	–	–	●	–	●
KTSOS...PP-AS	–	–	–	●	–	●
KGSC...PP-AS	–	–	–	●	–	●
KGSCS...PP-AS	–	–	–	●	–	●
KTFS...PP-AS	–	–	–	●	–	●
Machined range						
KB, KBS, KBO KB...PP, KBS...PP KBO...PP KB...PP-AS KBS...PP-AS KBO...PP-AS KGB...PP-AS KGBS...PP-AS KGBO...PP-AS KGBA...PP-AS KGBAS...PP-AS KGBAO...PP-AS KFB...B-PP-AS KTB...PP-AS KTBO...PP-AS	–	–	–	●	–	●
Plain bearing range						
PAB...PP-AS PABO...PP-AS PAGBA...PP-AS PAGBAO...PP-AS	–	–	–	●	–	●

Definition of symbols
 +++ Very good
 ++ Good
 + Satisfactory
 ● Available
 for shaft diameter

Linear bearings KH, KN...B, KNO...B, KS, KSO with the suffix PP are sealed on both sides.

Linear bearings with the suffix PP-AS are sealed on both sides and can be relubricated.

					Design		Characteristics					
20	25	30	40	50	Closed	Segment cutout	Feature	Load carrying capacity	Precision	Self-alignment	Adjustable	Description, page
●	●	●	●	●	KH	–	Low section height	+	+	–	–	53, 56
●	●	●	●	●								
●	●	●	●	●								
●	●	●	●	–								
●	●	●	●	●	KN...B	KNO...B	Robust design	+	+	up to ±30	all	53, 58
●	●	●	●	●	KS	KSO	High load capacity	++	++	up to ±40	all	53, 60
●	●	●	●	●								
●	●	●	●	●								
●	●	●	●	●								
●	●	●	–	–								
●	●	●	–	–								
●	●	●	●	●								
●	●	●	●	●								
●	●	●	–	–								
●	●	●	–	–								
●	●	●	●	●								
●	●	●	●	●								
●	●	●	–	–								
●	●	●	●	●	KB	KBO	High precision	+	+++	–	KBS	53, 62
●	●	●	●	●	PAB	PABO	Plain bearings	+++	++	–	–	53, 64



Product overview

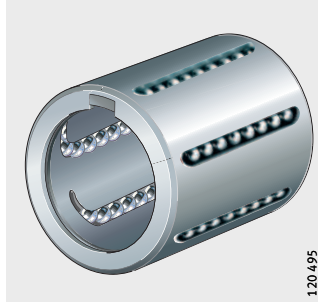
Linear bearings and linear bearing and housing units

Compact range

Linear ball bearings
With and without seals

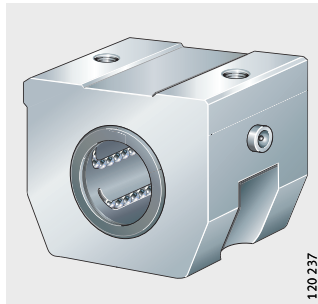
Features, see page 56

KH, KH...-PP

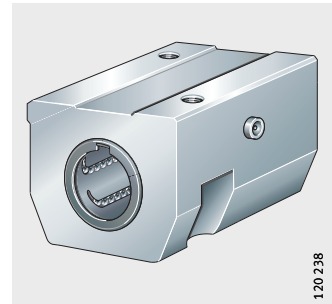


Closed units
Bearings in single or tandem arrangement

KGHK...-B-PP-AS

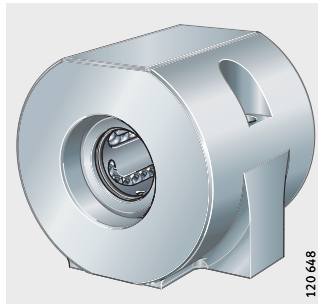


KTHK...-B-PP-AS



Closed unit

KGHA...-PP



Light range

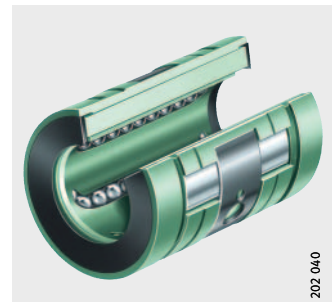
Linear ball bearings
Closed or with segment cutout
With and without seals

Features, see page 58

KN...-B, KN...-B-PP



KNO...-B, KNO...-B-PP

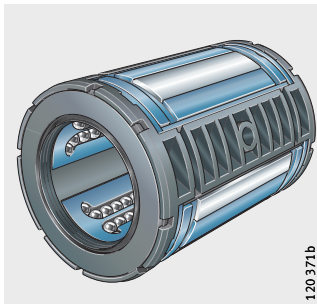


Heavy duty range

Linear ball bearings
 Closed or with segment cutout
 With and without seals

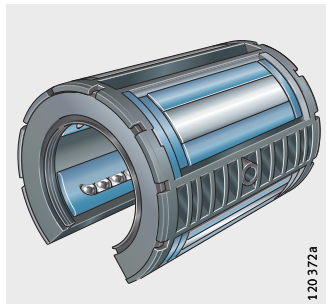
Features, see page 60

KS, KS..-PP



120 371b

KSO, KSO..-PP

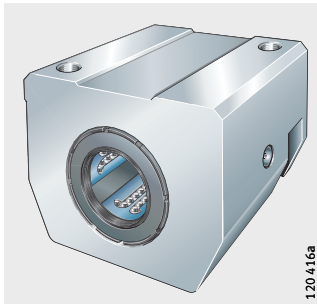


120 372a



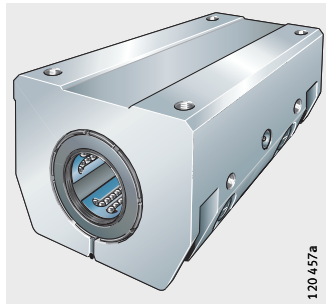
Closed units
 Housing closed or slotted
 Bearings in single or tandem arrangement

KGSNG...-PP-AS,
 KGSNS...-PP-AS



120 416a

KTSG...-PP-AS,
 KTSS...-PP-AS

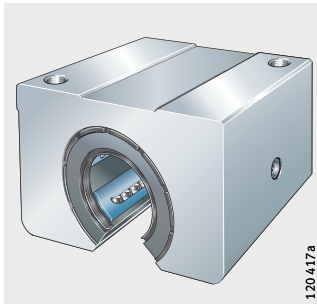


120 457a



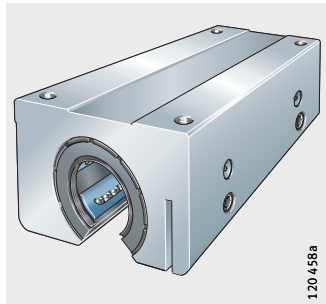
Units with segment cutout
 Housing not slotted or slotted
 Bearings in single or tandem arrangement

KGSNO...-PP-AS,
 KGSNOS...-PP-AS



120 417a

KTSO...-PP-AS,
 KTSOS...-PP-AS

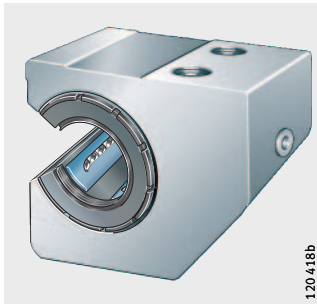


120 458a



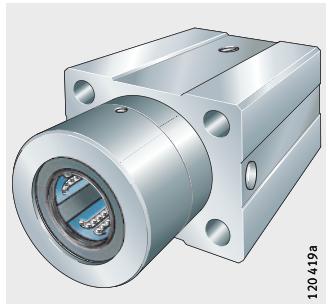
Bearings in single or tandem arrangement
 Housing not slotted or slotted
 Unit with centring collar

KGSC...-PP-AS,
 KGSCS...-PP-AS



120 418b

KTFS



120 419a

Product overview

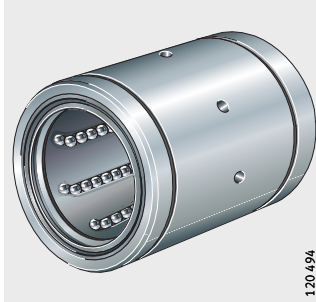
Linear bearings and linear bearing and housing units

Machined range

Linear ball bearings
Closed or with slot
With segment cutout
With and without seals

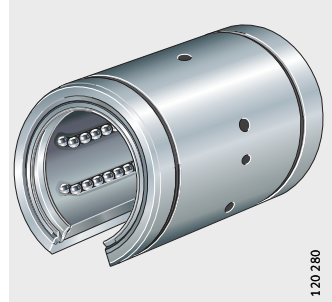
Features, see page 62

KB, KB...-PP, KB...-PP-AS,
KBS, KBS...-PP, KBS...-PP-AS



120 494

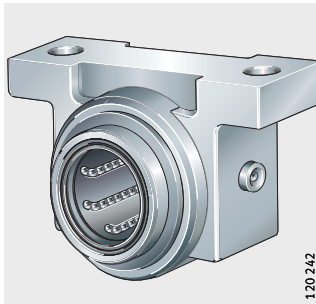
KBO, KBO...-PP, KBO...-PP-AS



120 280

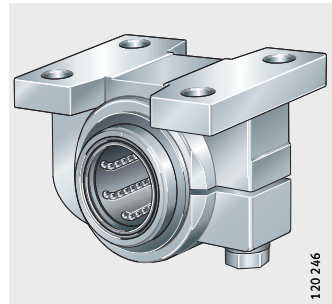
Closed units
Housing closed or slotted

KGB...-PP-AS,
KGBS...-PP-AS



120 242

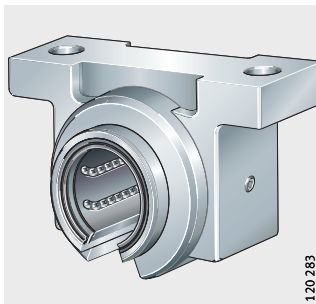
KGBA...-PP-AS,
KGBAS...-PP-AS



120 246

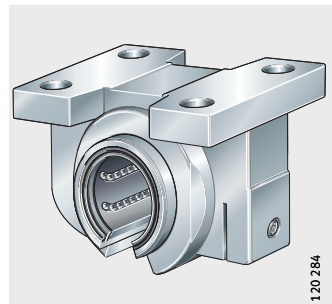
Units with segment cutout
Housing not slotted or slotted

KGBO...-PP-AS



120 283

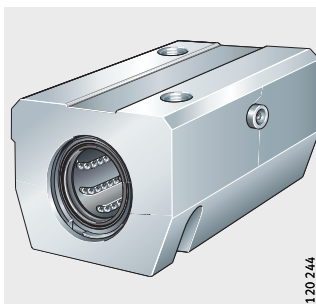
KGBAO...-PP-AS



120 284

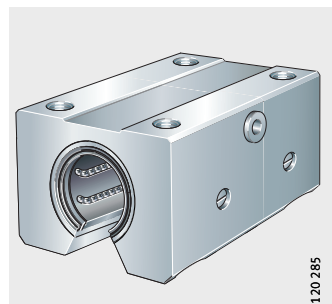
Closed units or
units with segment output
Bearings in tandem arrangement

KTB...-PP-AS



120 244

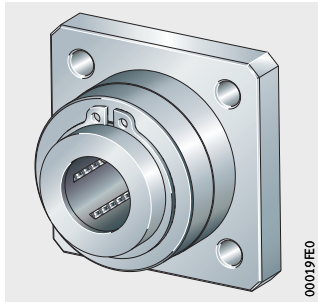
KTBO...-PP-AS



120 285

Closed unit
Housing with flange

KFB..-B-PP-AS

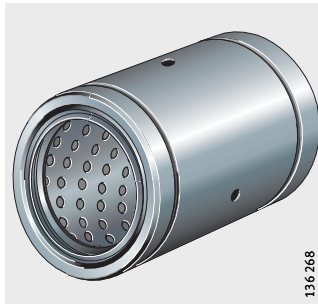


Plain bearing range

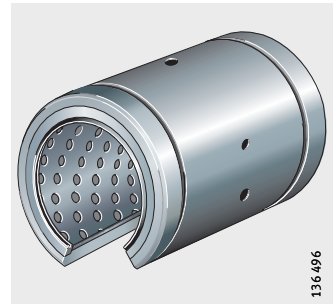
Linear plain bearings
Closed or with segment cutout
Sealed

Features, see page 64

PAB..-PP-AS

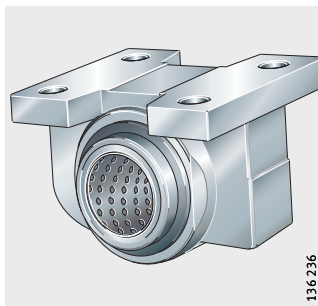


PABO..-PP-AS

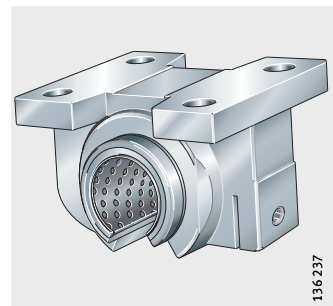


Linear plain bearing and housing units
Closed or with segment cutout

PAGBA..-PP-AS



PAGBAO..-PP-AS



Linear bearings and linear bearing and housing units

Features

Linear bearings and linear bearing and housing units are available in the compact, light, heavy duty, machined and plain bearing range. The bearings can support high loads while having a relatively low mass and allow the construction of linear guidance systems with unlimited travel.

Each series has highly specific characteristics that precisely define it as suitable for particular applications. These may include, for example, requirements for compensation of misalignments, low-friction running, high accelerations and travel velocities or long operating life.

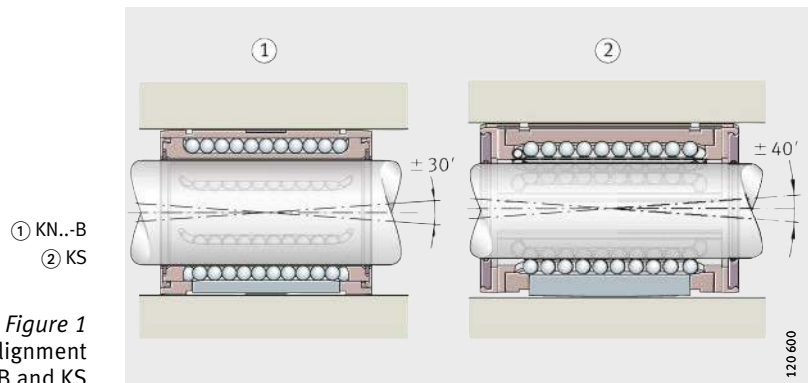
The range, which has been constructed and expanded in accordance with a modular concept, provides the best technical and economic solution, in relation to each application, for bearing arrangements with shaft guidance systems.

Linear bearings

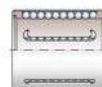
Linear ball bearings and linear plain bearings are available in open or closed designs. The open design has a segment cut out and is intended for supported shafts. Several series allow, in conjunction with the corresponding housings, adjustment of the radial clearance in order to achieve clearance-free or preloaded guidance systems.

Compensation of misalignment

Misalignment can be caused by tolerance defects, mounting errors or inaccuracies in the adjacent construction. Linear ball bearings of the series KN...-B and KNO...-B can compensate static misalignment of up to $\pm 30'$, linear ball bearings of the series KS and KSO can compensate static misalignment of up to $\pm 40'$, *Figure 1*.



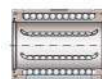
Due to the self-alignment function, the balls run without difficulty into the load zone. At the same time, the load distribution over the whole ball row is more uniform. This leads to smoother running, allows higher accelerations and prevents overloading of the individual balls.



Overall, this means that the bearings can achieve higher loads and a longer operating life; if necessary, the adjacent construction can be designed to be smaller and more economical.



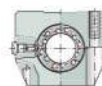
In order to fully utilise the basic load ratings given in the dimension table, the shaft raceway must be hardened (670 HV + 165 HV) and ground. The indications in section Design of bearing arrangements must be observed, page 33.



Linear bearing and housing units

Linear ball bearings and plain bearings are also available in conjunction with INA housings as complete bearing units. The linear bearing is located in the housing by means of a radial fixing screw to prevent axial displacement.

The housings are made from a high rigidity, high strength aluminium alloy that allows the full load carrying capacity of the bearings fitted to be utilised. In the machined series, pressure diecast housings are also available.



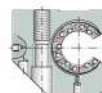
Due to the comparatively low total mass, the units are particularly suitable for reduced mass designs with high loads and where higher accelerations and travel velocities are required.

Simple location

Threaded or counterbored holes in the housing allow straightforward screw mounting on the adjacent construction, if necessary from below.

For rapid alignment, the housings have a locating edge. This also prevents distortion of the linear bearings when the housings are being mounted.

Centring holes allow rapid additional location of the housings by dowels on the adjacent construction.



Linear bearings and linear bearing and housing units

Housing designs	The housings are available in closed design, with a segment cutout and in open, slotted and tandem versions (with and without a centring collar).
Closed design	In this variant, the bearings and housings are closed. As a result, high precision standard guidance systems with a fixed enveloping circle can be easily achieved.
With segment cutout	Open designs with a segment cutout are used where, in the case of long guidance systems, the shaft must be supported and the bearing arrangement must be highly rigid.
Slotted design	Closed designs and designs with a segment cutout are also available in several series with a slot. Slotted variants are suitable for clearance-free or preloaded guidance systems. The operating clearance is set by means of an adjusting screw.
Tandem design	The tandem version contains two linear bearings. As a result, the units have particularly high load carrying capacity. Tandem ball bearing and housing units are available in open and closed designs. Both variants are also available in the named design with a slot.
With centring collar	For special applications, there is also a tandem version with a centring collar for locating bores to H7.
Highly cost-effective	As a result of volume production in large quantities, the complete units are normally considerably more economical than customers' own designs.
Sealing	The bearings are available in an open version and with contact seals on both sides (suffix PP). The linear bearings of type KH, KN..-B and KB have seals with two seal lips on their end faces; the outer lip prevents the ingress of contamination, the inner lip retains the lubricant in the bearing. The linear bearings of type KS have contact seals with one seal lip.

Lubrication Due to the initial greasing with a high quality grease and the integral lubricant reservoir, the linear bearings are maintenance-free for many applications; if necessary, however, they can be relubricated. Linear ball bearings can be lubricated, depending on the design, via the openings in the outer ring or radial holes arranged in the centre of the bearing.

In the units, lubrication is carried out via a separate lubrication nipple in the housing; location of the bearing in the housing and the relubrication devices are thus separate from each other.



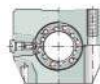
Operating temperature The bearings and housings can be used at operating temperatures from $-30\text{ }^{\circ}\text{C}$ to $+80\text{ }^{\circ}\text{C}$.



Operating limits The table shows the operating limits for linear bearings. Once the interrelationships of bearing size and design, load, operating clearance, location of bearings and lubrication have been checked, it may be possible in individual cases to use higher values. In this case, please contact us.



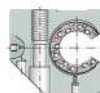
Linear bearing and housing units should be allocated in accordance with the linear bearing fitted.



Dynamic values for linear bearings

Acceleration, velocity	Linear bearing series				
	KH	KN..-B	KB	KS	PAB
Acceleration in m/s^2	50	50	50	100	50
Velocity in m/s	2	up to 5	up to 5	up to 5	up to 3

In the case of linear ball bearings with seals, suffix PP, velocities up to 2 m/s are permissible.



Suffixes Suffixes for available designs: see table.



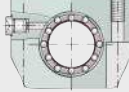
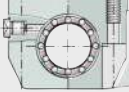

Available designs

Suffix	Description	Design
PP	Lip seals on both sides	Standard
PPL	Sealing strips on bearings with segment cutout	Available by agreement
AS	Bearing and unit with relubrication facility	Standard

Linear bearings and linear bearing and housing units

Compact range	<p>Linear ball bearings KH and linear ball bearing and housing units of the compact range have a small radial design envelope and are particularly economical. Their low section height automatically makes them attractive for applications in which only a small amount of radial space is available.</p> <p>Due to the closed design, they are suitable for use on shafts.</p>
Linear ball bearings	<p>The bearings have an outer ring with openings. This contains a ball and cage assembly with a plastic cage. The outer ring is formed and hardened. The balls undergo return travel along the openings in the outer ring.</p>
Seals	<p>The bearings are available in an open version and with lip seals on both sides (suffix PP). The end face seals have two seal lips; the outer lip prevents the ingress of contamination, the inner lip retains the lubricant in the bearing.</p>
Linear ball bearing and housing units	<p>Linear ball bearing and housing units of the compact range are available with one integral bearing and, in the tandem version with particularly high load carrying capacity, with two bearings. The housings are made from high strength aluminium.</p>
Anti-corrosion protection	<p>The housings are two-piece components made from sheet steel with a Corrotect® coating. The bearings and housing parts are packed separately. The bearing is firmly seated once it is mounted in the housing.</p>
Further information	<p>Further information is given on the following pages:</p> <ul style="list-style-type: none">■ dimension tables, see page 67■ shafts, see page 104■ shaft and support rail units, see page 128■ accessories, see page 144.

**Linear ball bearings and
linear ball bearing and
housing units, compact range**

Series ¹⁾	Feature
KH 	<ul style="list-style-type: none"> ■ Linear ball bearings ■ Not sealed
KH...PP 	<ul style="list-style-type: none"> ■ Linear ball bearings ■ Lip seals on both sides
KGHK...PP-AS 	<ul style="list-style-type: none"> ■ Closed design ■ Relubrication facility
KTHK...PP-AS 	<ul style="list-style-type: none"> ■ Closed design ■ Tandem design ■ Relubrication facility
KGHA...PP 	<ul style="list-style-type: none"> ■ Unit ■ Closed design



¹⁾ Bearings with the suffix PP have lip seals on both sides.

Linear bearings and linear bearing and housing units

Light range The light range is available as linear ball bearings KN..-B of a closed design and as linear ball bearings KNO..-B with a segment cutout. In order to compensate misalignments arising from manufacturing tolerances, mounting errors and shaft deflection, the linear bearings of series KN..-B are self-aligning up to $\pm 30'$. Their robust construction allows operation even under aggressive operating conditions. The series KN..-B is of a closed construction and is designed for use on shafts. KNO..-B has a segment cutout and is used with shaft and support rail units.

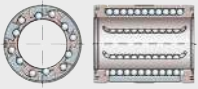
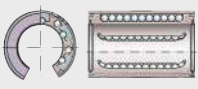
Linear ball bearings Linear ball bearings KN..-B and KNO..-B comprise a plastic cage with inserted raceway plates. The plates are supported in the housing bore by means of a retaining ring. Due to the retaining ring, the plates can “rock” and thus compensate for static misalignments.

Seals The bearings are available in an open version and with lip seals on both sides (suffix PP). The end face seals have two seal lips; the outer lip prevents the ingress of contamination, the inner lip retains the lubricant in the bearing.

Further information Further information is given on the following pages:

- dimension tables, see page 74
- shafts, see page 104
- shaft and support rail units, see page 128
- accessories, see page 144.

Linear ball bearings, light range

Series ¹⁾	Feature
KN..-B KN..-B-PP 	<ul style="list-style-type: none"> ■ Linear ball bearings ■ Closed design ■ Self-aligning ■ With or without lip seals
KNO..-B KNO..-B-PP 	<ul style="list-style-type: none"> ■ Linear ball bearings ■ With segment cutout ■ Self-aligning ■ With or without lip seals

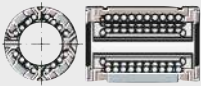

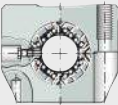

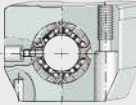
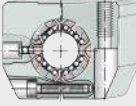
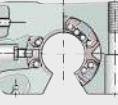
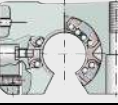
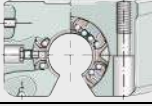

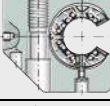
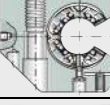
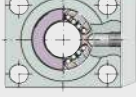
¹⁾ Bearings with the suffix PP have lip seals on both sides.



Linear bearings and linear bearing and housing units

Heavy duty range	Linear ball bearings of the heavy duty range KS and KSO and the corresponding ball bearing and housing units have particularly high load carrying capacity and have an angular adjustment facility for compensation of misalignments. They have very good running characteristics.
Linear ball bearings	<p>Linear ball bearings KS and KSO comprise a plastic cage with loosely retained segments. The double row segments with crowned raceway plates can realign themselves in all directions and thus compensate misalignments. Since the complete segment undergoes realignment, there is no disruption to the recirculation of the balls. This results in uniformly low displacement resistance.</p> <p>The series KS is of a closed construction and is designed for use on shafts. KSO has a segment cutout and is used in conjunction with shaft and support rail units.</p>
Seals	The bearings are available with contact seals or gap seals. The contact seals on the end faces have two seal lips; the outer lip prevents the ingress of contamination, the inner lip retains the lubricant in the bearing.
Linear ball bearing and housing units	<p>Linear ball bearing and housing units of the heavy duty range are available with one integral bearing and, in the tandem version with particularly high load carrying capacity, with two bearings. The housings are made from high strength aluminium.</p> <p>The housings are available in a closed design, with a segment cutout for supported shafts and with or without a slot. In designs with a slot, the radial clearance can be adjusted by means of an adjusting screw. All series have a locating edge and centring holes for dowel holes. The bearings are sealed on both sides, they have an initial greasing and can be relubricated via a lubrication nipple in the housing.</p>
Further information	<p>Further information is given on the following pages:</p> <ul style="list-style-type: none">■ dimension tables, see page 76■ shafts, see page 104■ shaft and support rail units, see page 128■ accessories, see page 144.

Linear ball bearings and linear ball bearing and housing units, heavy duty range

Series ¹⁾		Feature
KS KS...PP		<ul style="list-style-type: none"> Linear ball bearings Self-aligning With or without lip seals
KSO KSO...PP		<ul style="list-style-type: none"> Linear ball bearings With segment cutout Self-aligning With or without lip seals
KGNG...PP-AS		<ul style="list-style-type: none"> Closed design Relubrication facility
KGSNS...PP-AS		<ul style="list-style-type: none"> Closed design Slotted housing Relubrication facility
KTSG...PP-AS		<ul style="list-style-type: none"> Closed design Tandem arrangement Relubrication facility
KTSS...PP-AS		<ul style="list-style-type: none"> Closed design Tandem arrangement Slotted housing Relubrication facility
KGNO...PP-AS		<ul style="list-style-type: none"> With segment cutout Relubrication facility
KGNOS...PP-AS		<ul style="list-style-type: none"> With segment cutout Slotted housing Relubrication facility
KTSO...PP-AS		<ul style="list-style-type: none"> With segment cutout Tandem arrangement Relubrication facility
KTSOS...PP-AS		<ul style="list-style-type: none"> With segment cutout Tandem arrangement Slotted housing Relubrication facility
KGSC...PP-AS		<ul style="list-style-type: none"> Open at side Relubrication facility
KGSCS...PP-AS		<ul style="list-style-type: none"> Open at side Slotted housing Relubrication facility
KTFS...PP-AS		<ul style="list-style-type: none"> With centring collar Tandem arrangement Relubrication facility

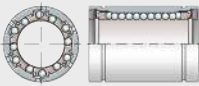
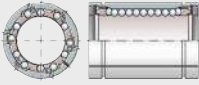




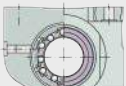
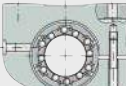
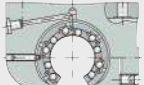
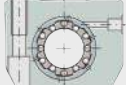




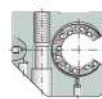
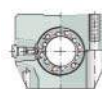
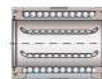
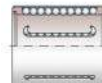
¹⁾ Bearings with the suffix PP have lip seals on both sides.

Linear bearings and linear bearing and housing units

Machined range	Linear ball bearings of the machined range KB, KBS and KBO and the corresponding linear ball bearing and housing units are high precision and particularly rigid. They have excellent running characteristics.
Linear ball bearings	<p>Linear ball bearings KB, KBS and KBO comprise a hardened and ground outer ring in which a ball and cage assembly with a plastic cage is integrated.</p> <p>The balls are guided with high precision throughout the return area by a special spring washer. This ensures that the displacement resistance remains uniformly low even under difficult operating conditions and irrespective of the mounting position.</p> <p>The series KB is of a closed construction and is designed for use on shafts. KBO has a segment cutout and is used in conjunction with shaft and support rail units. KBS has a slot for adjustment of the radial clearance.</p>
Seals	The bearings have contact seals or gap seals.
Linear ball bearing and housing units	<p>Linear ball bearing and housing units of the machined range are available with one integral bearing and, in the tandem version with particularly high load carrying capacity, with two bearings.</p> <p>The housings are made from high strength aluminium or are pressure diecast.</p> <p>The housings are available in a closed design, with a segment cutout for supported shafts and with or without a slot. In designs with a slot, the radial clearance can be adjusted by means of an adjusting screw.</p> <p>All series have a locating edge and centring holes for dowel holes.</p> <p>The bearings are sealed on both sides, they have an initial greasing and can be relubricated via a lubrication nipple in the housing.</p>
Further information	<p>Further information is given on the following pages:</p> <ul style="list-style-type: none">■ dimension tables, see page 90■ shafts, see page 104■ shaft and support rail units, see page 128■ accessories, see page 144.

Linear ball bearings and linear ball bearing and housing units, machined range

Series ¹⁾²⁾		Feature
KB KB...PP KB...PP-AS		<ul style="list-style-type: none"> ■ Linear ball bearings ■ With or without lip seals depending on the design ■ Relubrication facility
KBS KBS...PP KBS...PP-AS		<ul style="list-style-type: none"> ■ Linear ball bearings ■ With or without lip seals depending on the design ■ Relubrication facility ■ Slotted design
KBO KBO...PP KBO...PP-AS		<ul style="list-style-type: none"> ■ Linear ball bearings ■ With or without lip seals depending on the design ■ Relubrication facility ■ With segment cutout
KGB...PP-AS		<ul style="list-style-type: none"> ■ Closed design ■ Relubrication facility
KGBS...PP-AS		<ul style="list-style-type: none"> ■ Closed design ■ Slotted housing ■ Relubrication facility
KGBO...PP-AS		<ul style="list-style-type: none"> ■ With segment cutout ■ Relubrication facility
KGBA...PP-AS		<ul style="list-style-type: none"> ■ Closed design ■ Relubrication facility
KGBAS...PP-AS		<ul style="list-style-type: none"> ■ Closed design ■ Slotted housing ■ Relubrication facility
KGBAO...PP-AS		<ul style="list-style-type: none"> ■ With segment cutout ■ Relubrication facility
KTB...PP-AS		<ul style="list-style-type: none"> ■ Closed design ■ Tandem arrangement ■ Relubrication facility
KTBO...PP-AS		<ul style="list-style-type: none"> ■ With segment cutout ■ Tandem arrangement ■ Relubrication facility
KFB...B-PP-AS		<ul style="list-style-type: none"> ■ Closed design ■ Relubrication facility



1) Bearings with the suffix PP have lip seals on both sides.

2) Bearings and units with the suffix AS can be relubricated.

Linear bearings and linear bearing and housing units

Plain bearing range

Linear plain bearings PAB and PABO and the corresponding plain bearing and housing units have very high load carrying capacity, are extremely robust and have particularly low running noise. They have excellent emergency running characteristics.

Linear plain bearings

Linear plain bearings PAB and PABO comprise an outer ring made from high strength aluminium into which plain bearing bushes PAP..-P20 are fixed by adhesive.

The series PAB is of a closed construction and is designed for use on shafts. PABO has a segment cutout and is used in conjunction with shaft and support rail units.



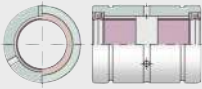
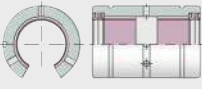
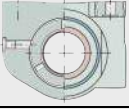

Plain bushes must not be used in conjunction with the special coating Corrotect®. Crevice corrosion may occur that would impair the function of the bearing.

Further information

Further information is given on the following pages:

- dimension tables, see page 100
- shafts, see page 104
- shaft and support rail units, see page 128
- accessories, see page 144.

**Linear plain bearings and
linear plain bearing and
housing units,
plain bearing range**

Series ¹⁾	Feature
PAB...-PP-AS 	<ul style="list-style-type: none"> ■ Closed design ■ Lip seals on both sides ■ Relubrication facility
PABO...-PP-AS 	<ul style="list-style-type: none"> ■ With segment cutout ■ Lip seals on both sides ■ Relubrication facility
PAGBA...-PP-AS 	<ul style="list-style-type: none"> ■ Closed design ■ Relubrication facility
PAGBAO...-PP-AS 	<ul style="list-style-type: none"> ■ With segment cutout ■ Slotted housing ■ Relubrication facility

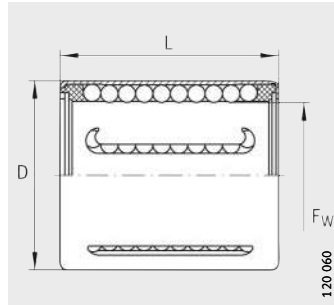
¹⁾ Bearings with the suffix PP have lip seals on both sides.



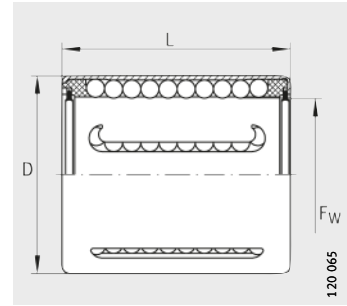
Compact range

Linear ball bearings

Open or sealed
Relubrication facility



KH



KH...-PP

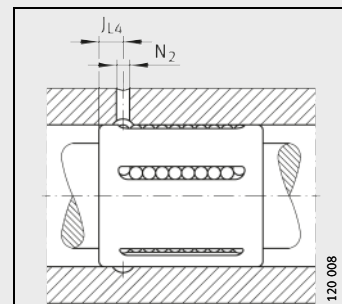


Dimension table · Dimensions in mm

Designation		Mass m g	Dimensions			Mounting dimensions		Basic load ratings ¹⁾			
2)	3)		F _w	D	L	J _{L4}	N ₂	dyn. C _{min} N	stat. C _{0 min} N	dyn. C _{max} N	stat. C _{0 max} N
KH06	KH06-PP	7	6	12	22	4	2	340	240	390	340
KH08	KH08-PP	12	8	15	24	6	2	410	280	475	400
KH10	KH10-PP	14,5	10	17	26	6	2,5	510	370	590	520
KH12	KH12-PP	18,5	12	19	28	6	2,5	670	510	800	740
KH14	KH14-PP	20,5	14	21	28	6	2,5	690	520	830	760
KH16	KH16-PP	27,5	16	24	30	7	2,5	890	620	1060	910
KH20	KH20-PP	32,5	20	28	30	7	2,5	1110	790	1170	1010
KH25	KH25-PP	66	25	35	40	8	2,5	2280	1670	2420	2130
KH30	KH30-PP	95	30	40	50	8	2,5	3300	2700	3300	3100
KH40	KH40-PP	182	40	52	60	9	2,5	5300	4450	5300	4950
KH50	KH50-PP	252	50	62	70	9	2,5	6800	6300	6800	7000

Corrosion-resistant designs have the suffix -RROC.
This must be stated when ordering.

- 1) The basic load ratings are only valid for hardened (670 HV + 165 HV) and ground shaft raceways.
- 2) With preservative.
- 3) With initial greasing, sealed on both sides.

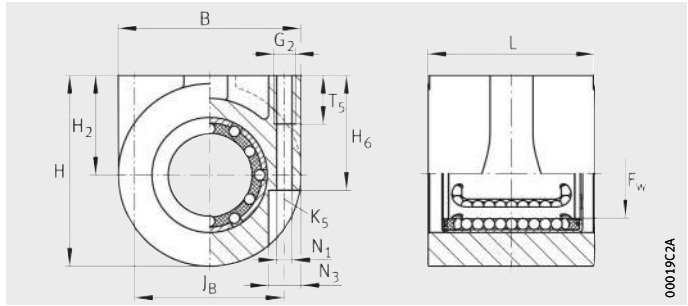


Mounting dimensions

Compact range

Linear ball bearing and housing units

Sealed
Greased



KGHA..-PP

00019C2A

Dimension table - Dimensions in mm

Designation	Mass m ≈g	Dimensions				
		F _w	H ₂ ±0,015	H	B	L +0,5
KGHA16-PP	228	16	20	41	42	37
KGHA20-PP	303	20	25	48,5	47	39
KGHA25-PP	496	25	30	57,5	55	49
KGHA30-PP	860	30	35	67,5	65	59
KGHA40-PP	1 434	40	45	84	78	71

1) The basic load ratings are only valid for hardened (670 HV + 165 HV) and ground shaft raceways.

2) For fixing screws ISO 4762-8.8.

If there is a possibility of settling, the screws should be secured against rotation.

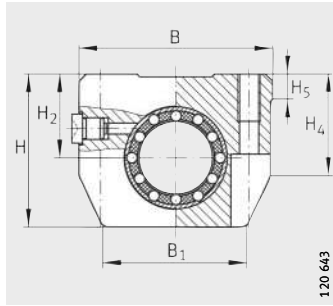


Mounting dimensions							Basic load ratings ¹⁾	
H ₆	T ₅	J _B ±0,1	G ₂	N ₁	N ₃	K ₅ ²⁾	dyn. C N	stat. C ₀ N
27	15	32	M6	5,1	8,1	M4	890	620
29	15	38	M6	5,1	8,1	M4	1 110	790
35	15	46	M6	5,1	8,1	M4	2 280	1 670
39	20	54	M8	6,7	11,1	M6	3 300	2 700
49	20	66	M8	6,7	11,1	M6	5 300	4 450

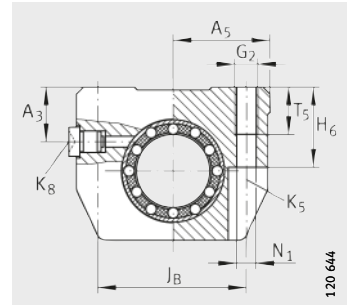
Compact range

Linear ball bearing and housing units

Sealed
Greased,
with relubrication facility



KGHK...-B-PP-AS



KGHK...-B-PP-AS

Dimension table - Dimensions in mm

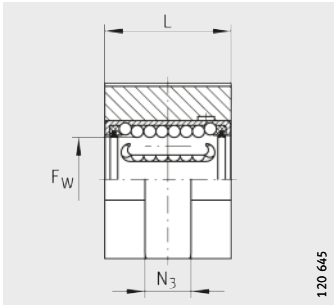
Designation	Mass m ≈g	Dimensions				Mounting dimensions		
		F _w	B	L	H	J _B	B ₁	A ₅
KGHK06-B-PP-AS	40	6	32	22,2	27	±0,15	25	16
KGHK08-B-PP-AS	50	8	32	24,2	27	±0,15	25	16
KGHK10-B-PP-AS	70	10	40	26,2	33	±0,15	32	20
KGHK12-B-PP-AS	80	12	40	28,2	33	±0,15	32	20
KGHK14-B-PP-AS	100	14	43	28,2	36,5	±0,15	34	21,5
KGHK16-B-PP-AS	110	16	43	30,2	36,5	±0,15	34	21,5
KGHK20-B-PP-AS	150	20	53	30,2	42,5	±0,15	40	26,5
KGHK25-B-PP-AS	270	25	60	40,2	52,5	±0,15	44	30
KGHK30-B-PP-AS	400	30	67	50,2	60	±0,15	49,6	33,5
KGHK40-B-PP-AS	750	40	87	60,2	73,5	±0,15	63	43,5
KGHK50-B-PP-AS	1 250	50	103	70,2	92	±0,15	74	51,5

1) The basic load ratings are only valid for hardened (670 HV + 165 HV) and ground shaft raceways.

2) For fixing screws ISO 4762-8.8.

If there is a possibility of settling, the screws should be secured against rotation.

3) Lubrication nipple, see page 31.



120 645

KGHK..-B-PP-AS

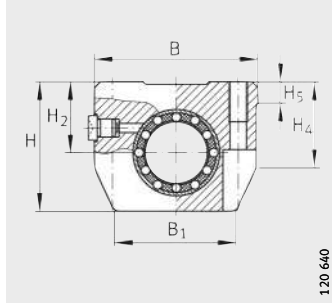


											Basic load ratings ¹⁾	
H ₂ +0,010 -0,014	H ₄	H ₅	T ₅	H ₆	A ₃	G ₂	N ₁	N ₃	K ₅ ²⁾	K ₈ ³⁾	dyn. C N	stat. C ₀ N
13	20,6	5	9	13	9	M4	3,4	7	M3	NIPA1	340	240
14	20,6	5	9	13	9	M4	3,4	7	M3	NIPA1	410	280
16	25,1	5	11	16	11	M5	4,3	10	M4	NIPA1	510	370
17	25,1	5	11	16	11	M5	4,3	10	M4	NIPA1	670	510
18	28,1	6,9	11	18	13	M5	4,3	10	M4	NIPA1	690	520
19	28,1	6,9	11	18	13	M5	4,3	10	M4	NIPA1	890	620
23	29,8	7,4	13	22	15	M6	5,3	11	M5	NIPA2	1 110	790
27	36,6	9,9	18	26	17,5	M8	6,6	15	M6	NIPA2	2 280	1 670
30	42,7	8	18	29	18	M8	6,6	15	M6	NIPA2	3 300	2 700
39	49,7	12,8	22	38	23	M10	8,4	18	M8	NIPA2	5 300	4 450
47	62,3	10,9	26	46	28	M12	10,5	20	M10	NIPA2	6 800	6 300

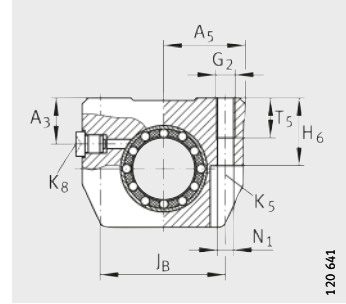
Compact range

Linear ball bearing and housing units

Tandem arrangement
Sealed
Greased,
with relubrication facility



KTHK...-B-PP-AS



KTHK...-B-PP-AS

Dimension table - Dimensions in mm

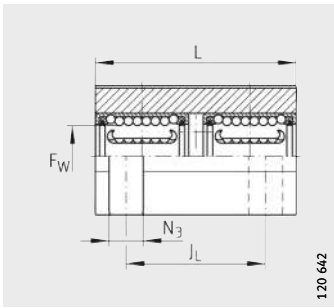
Designation	Mass m ≈g	Dimensions				Mounting dimensions			
		F _w	B	L	H	J _B	B ₁	A ₅	J _L ²⁾
KTHK12-B-PP-AS	170	12	40	60	33	±0,15	32	20	±0,15
KTHK16-B-PP-AS	230	16	43	65	36,5	34	34	21,5	40
KTHK20-B-PP-AS	320	20	53	65	42,5	40	40	26,5	45
KTHK25-B-PP-AS	580	25	60	85	52,5	48	44	30	55
KTHK30-B-PP-AS	850	30	67	105	60	53	49,6	33,5	70
KTHK40-B-PP-AS	1 600	40	87	125	73,5	69	63	43,5	85
KTHK50-B-PP-AS	2 700	50	103	145	92	82	74	51,5	100

1) The basic load ratings are only valid for hardened (670 HV + 165 HV) and ground shaft raceways and where the two linear ball bearings are subjected to equal loading.

2) Dimension J_L and lubrication hole symmetrical to the bearing length L.

3) For fixing screws ISO 4762-8.8.
If there is a possibility of settling, the screws should be secured against rotation.

4) Lubrication nipple, see page 31.



KTHK...B-PP-AS

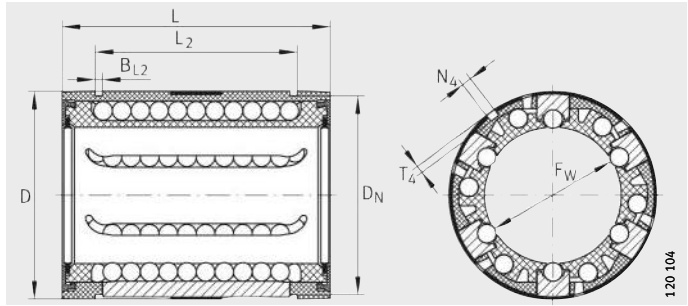


											Basic load ratings ¹⁾	
H ₂ +0,010 -0,014	H ₄	H ₅	T ₅	H ₆	A ₃	G ₂	N ₁	N ₃	K ₅ ³⁾	K ₈ ⁴⁾	dyn. C N	stat. C ₀ N
17	25,1	5	11	16	11	M5	4,3	10	M4	NIPA1	1 090	1 020
19	28,1	6,9	11	18	13	M5	4,3	10	M4	NIPA1	1 440	1 240
23	29,8	7,4	13	22	15	M6	5,3	11	M5	NIPA2	1 800	1 580
27	36,6	9,9	18	26	17,5	M8	6,6	11	M6	NIPA2	3 700	3 350
30	42,7	8	18	29	18	M8	6,6	15	M6	NIPA2	5 400	5 400
39	49,7	12,8	22	38	23	M10	8,4	18	M8	NIPA2	8 600	6 900
47	62,3	10,9	26	46	28	M12	10,5	20	M10	NIPA2	11 000	12 600

Light range

Linear ball bearings

- Self-aligning
- Closed or with segment cutout
- Open or sealed
- Relubrication facility



KN..-B-PP, KN..-B

Dimension table - Dimensions in mm

Designation				Mass m ≈g	Dimensions			Mounting dimensions	
					F _W	D	L	B ₂ ²⁾	L ₂
KN12-B-PP	KN12-B	-	-	20	12	22	32	-	22,6
-	-	KNO12-B-PP	KNO12-B					6,5	-
KN16-B-PP	KN16-B	-	-	30	16	26	36	-	24,6
-	-	KNO16-B-PP	KNO16-B					9	-
KN20-B-PP	KN20-B	-	-	60	20	32	45	-	31,2
-	-	KNO20-B-PP	KNO20-B					9	-
KN25-B-PP	KN25-B	-	-	130	25	40	58	-	43,7
-	-	KNO25-B-PP	KNO25-B					11,5	-
KN30-B-PP	KN30-B	-	-	190	30	47	68	-	51,7
-	-	KNO30-B-PP	KNO30-B					14	-
KN40-B-PP	KN40-B	-	-	350	40	62	80	-	60,3
-	-	KNO40-B-PP	KNO40-B					19	-
KN50-B-PP	KN50-B	-	-	670	50	75	100	-	77,3
-	-	KNO50-B-PP	KNO50-B					22,5	-

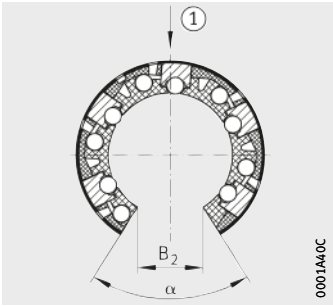
1) The basic load ratings are only valid for hardened (670 HV + 165 HV) and ground shaft raceways.

2) Dimension B₂ on diameter F_W.

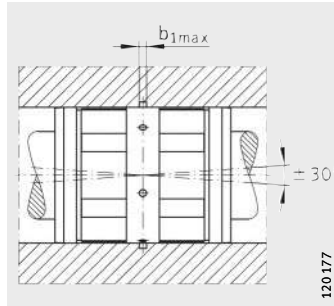
3) Hole position symmetrical to bearing length L.

4) Basic load rating in main load direction.

5) ① Main load direction



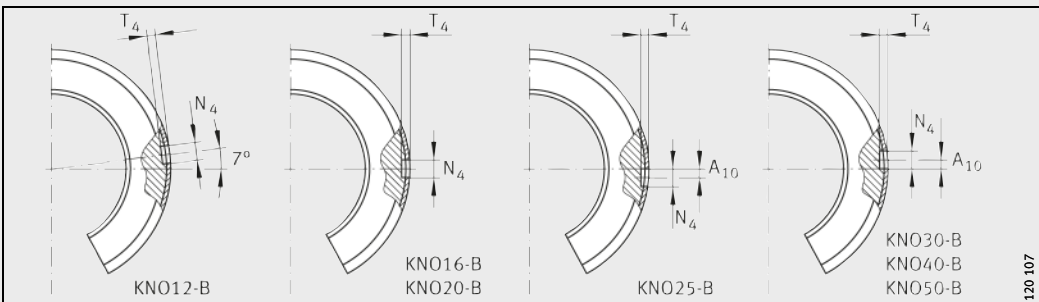
KNO..-B-PP, KNO..-B
① 5)



Self-aligning up to $\pm 30'$



B _{L2}	D _N	T ₄	A ₁₀	N ₄ ³⁾	α °	Ball rows		Basic load ratings ¹⁾			
						b _{1 max}	Quantity	dyn. C _{min} N	stat. C _{0 min} N	dyn. C _{max} N	stat. C _{0 max} N
1,3	21	0,7	-	3	-	1,5	5	730	510	870	740
-	-				66		4	-	-	840 ⁴⁾	640 ⁴⁾
1,3	25	0,7	-	3	-	1,5	5	870	620	1 040	910
-	-				68		4	-	-	1 000 ⁴⁾	750 ⁴⁾
1,6	30,7	0,9	-	3	-	2,5	6	1 730	1 230	1 830	1 570
-	-				55		5	-	-	1 740 ⁴⁾	1 240 ⁴⁾
1,85	38,5	1,4	-	3	-	2,5	6	3 100	2 220	3 250	2 850
-	-		1,5		5		-	-	3 100 ⁴⁾	2 260 ⁴⁾	
1,85	44,7	2,2	-	3	-	2,5	6	3 750	2 850	3 950	3 650
-	-		2		5		-	-	3 750 ⁴⁾	2 850 ⁴⁾	
2,15	59,4	2,2	-	3	-	3	6	6 300	4 350	6 700	5 600
-	-		1,5		5		-	-	6 300 ⁴⁾	4 350 ⁴⁾	
2,65	71,4	2,3	-	5	-	3	6	9 300	6 500	9 800	8 300
-	-		2,5		5		-	-	9 300 ⁴⁾	6 500 ⁴⁾	

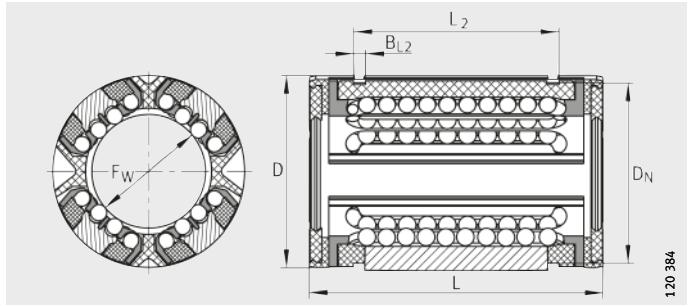


Fixing holes

Heavy duty range

Linear ball bearings

- Self-aligning
- Closed or with segment cutout
- Open or sealed
- Relubrication facility

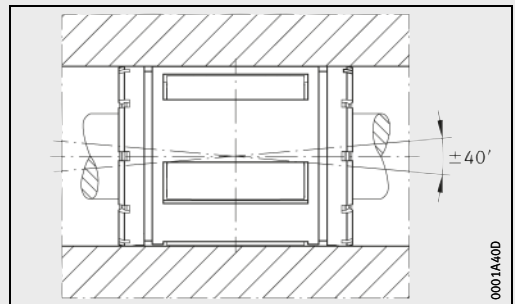


KS, KS..-PP

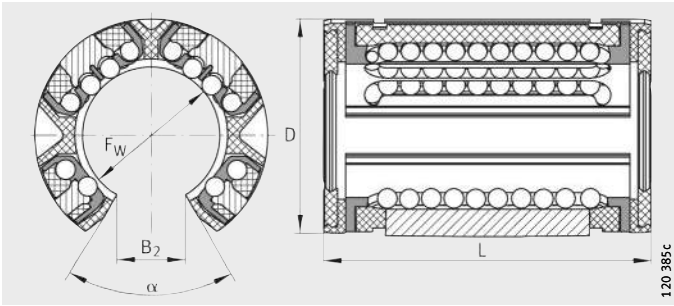
Dimension table - Dimensions in mm

Designation				Mass m ≈g	Dimensions			Mounting dimensions		
3)	4)	3)	4)		F _w	D	L	B ₂ ⁵⁾	L ₂ H13	B _{L2}
KS12	KS12-PP	–	–	18	12	22	32	–	22,6	1,3
–	–	KS012	KS012-PP	13				7,6	–	–
KS16	KS16-PP	–	–	28	16	26	36	–	24,6	1,3
–	–	KS016	KS016-PP	19				10,1	–	–
KS20	KS20-PP	–	–	51	20	32	45	–	31,2	1,6
–	–	KS020	KS020-PP	38				10	–	–
KS25	KS25-PP	–	–	102	25	40	58	–	43,7	1,85
–	–	KS025	KS025-PP	75				12,5	–	–
KS30	KS30-PP	–	–	172	30	47	68	–	51,7	1,85
–	–	KS030	KS030-PP	135				14,3	–	–
KS40	KS40-PP	–	–	335	40	62	80	–	60,3	2,15
–	–	KS040	KS040-PP	259				18,2	–	–
KS50	KS50-PP	–	–	589	50	75	100	–	77,3	2,65
–	–	KS050	KS050-PP	454				22,7	–	–

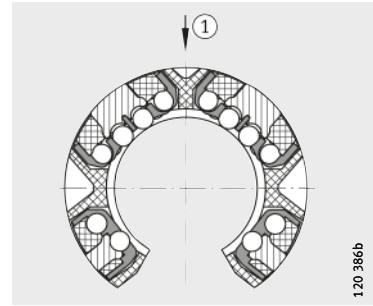
- The basic load ratings are only valid for hardened (670 HV + 165 HV) and ground shaft raceways.
- Basic load rating in main load direction.
- With preservative, gap seals on both sides.
- With initial greasing, contact seals on both sides.
- Dimension B₂ on diameter F_w.
- Hole position symmetrical to bearing length L.
- Only one lubrication and fixing hole each in size 16 and 20.
- ① Main load direction



Self-aligning up to ±40'

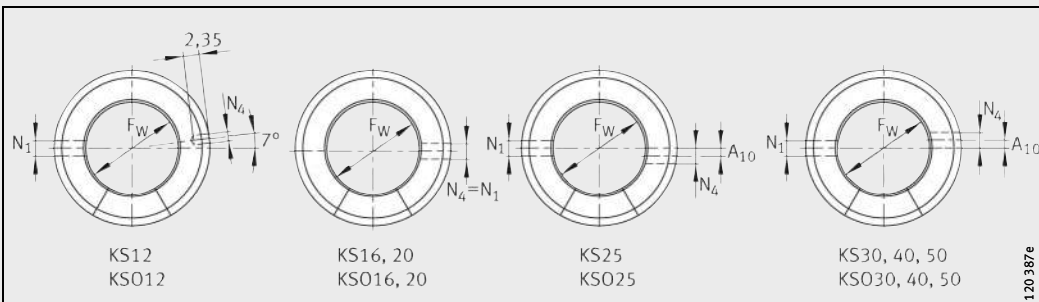


KSO, KSO..-PP



KSO, KSO..-PP
① 8)

D _N	A ₁₀	N ₁ ⁶⁾	N ₄ ⁶⁾	α °	Ball rows Quantity	Basic load ratings ¹⁾			
						dyn. C _{min} N	stat. C _{0 min} N	dyn. C _{max} N	stat. C _{0 max} N
21	-	-	3	-	8	630	600	900	1 100
-		3		78	6	-	-	900 ²⁾	1 100 ²⁾
25	-	3 ⁷⁾	3 ⁷⁾	-	8	1 060	950	1 430	1 550
-				78	6	-	1 430 ²⁾	1 550 ²⁾	
30,7	-	3 ⁷⁾	3 ⁷⁾	-	8	1 780	1 600	2 200	2 310
-				60	6	-	2 200 ²⁾	2 310 ²⁾	
38	1,5	3,5	3	-	8	2 700	2 430	3 950	4 300
-				60	6	-	3 950 ²⁾	4 300 ²⁾	
44,7	2	3,5	3	-	8	4 650	3 970	5 900	6 000
-				57	6	-	5 900 ²⁾	6 000 ²⁾	
59,4	1,5	3,5	3	-	8	8 800	7 200	10 200	9 600
-				54	6	-	10 200 ²⁾	9 600 ²⁾	
71,4	2,5	4,5	5	-	8	12 300	9 700	15 100	13 900
-				54	6	-	15 100 ²⁾	13 900 ²⁾	



Fixing holes⁷⁾

Heavy duty range

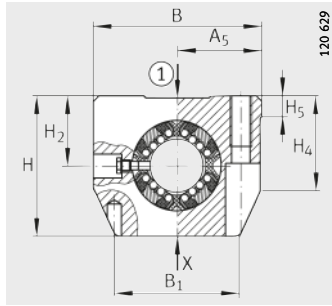
Linear ball bearing and housing units

Closed or with slot

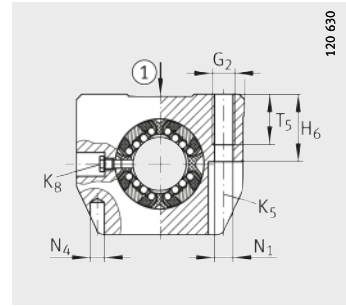
Sealed

Greased,

with relubrication facility



KGSNG...-PP-AS, KGSNS...-PP-AS
① 7)



KGSNG...-PP-AS, KGSNS...-PP-AS
① 7)

Dimension table - Dimensions in mm

Designation		Mass m ≈g	Dimensions				Mounting dimensions			
			F _W	B	L	H	J _B	B ₁	A ₅	J _L ³⁾
KGSNG12-PP-AS	–	110	12	43	32	35	32	34	21,5	23
–	KGSNS12-PP-AS	100								
KGSNG16-PP-AS	–	220	16	53	37	42	40	40	26,5	26
–	KGSNS16-PP-AS	200								
KGSNG20-PP-AS	–	370	20	60	45	50	45	44	30	32
–	KGSNS20-PP-AS	360								
KGSNG25-PP-AS	–	630	25	78	58	60	60	59,4	39	40
–	KGSNS25-PP-AS	550								
KGSNG30-PP-AS	–	890	30	87	68	70	68	63	43,5	45
–	KGSNS30-PP-AS	730								
KGSNG40-PP-AS	–	1 300	40	108	80	90	86	76	54	58
–	KGSNS40-PP-AS	1 350								
KGSNG50-PP-AS	–	2 200	50	132	100	105	108	90	66	50
–	KGSNS50-PP-AS	2 250								

1) The basic load ratings are only valid for hardened (670 HV + 165 HV) and ground shaft raceways.

2) Basic load rating in main load direction.

3) Dimension J_L and lubrication hole symmetrical to the bearing length L.

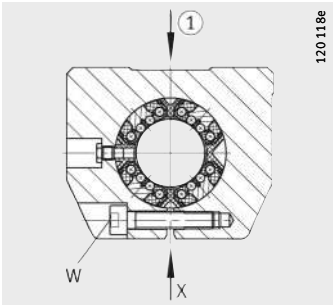
4) Centring for dowel hole.

5) For fixing screws ISO 4762-8.8.

If there is a possibility of settling, the screws should be secured against rotation.

6) Lubrication nipple. Designs and dimensions, see page 30.

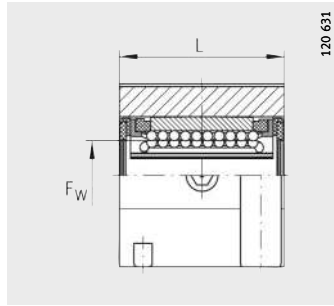
7) ① Main load direction



120 118e

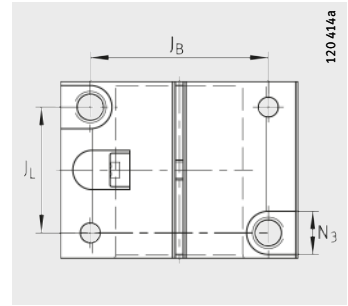
KGSNS...-PP-AS

① 7)



120 631

KGSNG...-PP-AS, KGSNS...-PP-AS



120 414a

KGSNS...-PP-AS

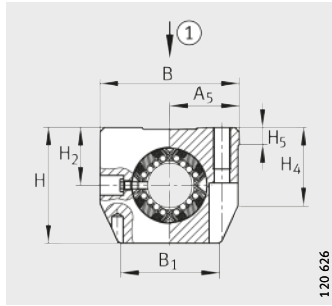


H ₂	H ₅	H ₄	T ₅	H ₆	G ₂	N ₁	N ₄ ⁴⁾	N ₃	K ₅ ⁵⁾	K ₈ ³⁾⁶⁾	Width across flats W	Ball rows Quantity	Basic load ratings ¹⁾²⁾	
													dyn. C _{max}	stat. C _{0 max}
+0,008 -0,016												N	N	
18	5,4	26,6	11	16,5	M5	4,3	4	8	M4	NIP4MZ	— 2,5	8	900	1 100
22	6,9	29,3	13	21	M6	5,3	4	10	M5	NIP4MZ	— 3	8	1 430	1 550
25	7,4	34,1	18	24	M8	6,6	5	11	M6	NIP4MZ	— 4	8	2 200	2 310
30	8,3	41,5	22	29	M10	8,4	6	15	M8	NIP5MZ	— 5	8	3 950	4 300
35	9,3	46,2	22	34	M10	8,4	6	15	M8	NIP5MZ	— 5	8	5 900	6 000
45	11,7	57,6	26	44	M12	10,5	8	18	M10	NIP5MZ	— 6	8	10 200	9 600
50	10,6	62	35	49	M16	13,5	10	20	M12	NIP6MZ	— 8	8	15 100	13 900

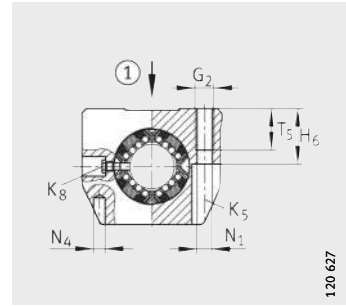
Heavy duty range

Linear ball bearing and housing units

Tandem arrangement
 Closed or with slot
 Sealed
 Greased,
 with relubrication facility



KTSG...-PP-AS, KTSS...-PP-AS
 ① 7)



KTSG...-PP-AS, KTSS...-PP-AS
 ① 7)

Dimension table - Dimensions in mm

Designation		Mass m ≈g	Dimensions				Mounting dimensions				
			F _W	B	L	H	J _B	B ₁	A ₅	J _L ³⁾	L ₆ ³⁾
KTSG12-PP-AS	-	210	12	43	70	35	32	34	21,5	56	24
-	KTSS12-PP-AS										
KTSG16-PP-AS	-	380	16	53	78	42	40	40	26,5	64	26
-	KTSS16-PP-AS										
KTSG20-PP-AS	-	550	20	60	96	50	45	44	30	76	33
-	KTSS20-PP-AS										
KTSG25-PP-AS	-	1130	25	78	122	60	60	59,4	39	94	44
-	KTSS25-PP-AS										
KTSG30-PP-AS	-	1780	30	87	142	70	68	63	43,5	106	54
-	KTSS30-PP-AS										

1) The basic load ratings are only valid for hardened (670 HV + 165 HV) and ground shaft raceways.

2) Basic load rating in main load direction.

3) Dimensions J_L, L₆ and lubrication hole symmetrical to the bearing length L.

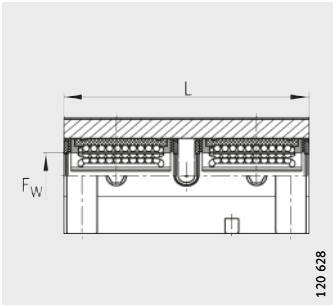
4) Centring for dowel hole.

5) For fixing screws ISO 4762-8.8.

If there is a possibility of settling, the screws should be secured against rotation.

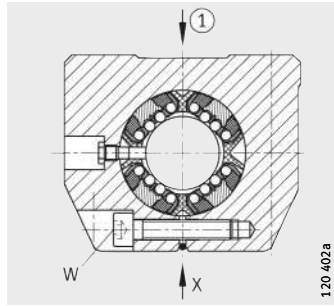
6) Lubrication nipple. Designs and dimensions, see page 30.

7) ① Main load direction



KTSG...-PP-AS, KTSS...-PP-AS

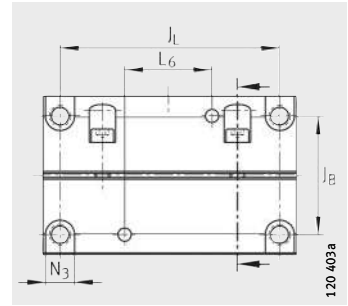
120 628



KTSS...-PP-AS

① 7)

120 402a



KTSS...-PP-AS

120 403a

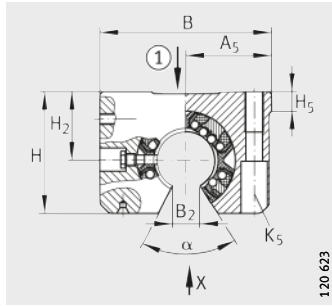


												Ball rows	Basic load ratings ¹⁾²⁾	
H ₂	H ₅	H ₄	T ₅	H ₆	G ₂	N ₁	N ₄ ⁴⁾	N ₃	K ₅ ⁵⁾	K ₈ ³⁾⁶⁾	Width across flats W		Quantity	dyn. C _{max}
+0,008 -0,016													N	N
18	5,4	26,6	11	16,5	M5	4,3	4	8	M4	NIP4MZ	— 2,5	8	1 460	2 100
22	6,9	29,3	13	21	M6	5,3	4	10	M5	NIP4MZ	— 3	8	2 330	3 100
25	7,4	34,1	18	24	M8	6,6	5	11	M6	NIP4MZ	— 4	8	3 500	4 600
30	8,3	41,5	22	29	M10	8,4	6	15	M8	NIP5MZ	— 5	8	6 400	8 600
35	9,3	46,2	22	34	M10	8,4	6	15	M8	NIP5MZ	— 5	8	9 600	12 000

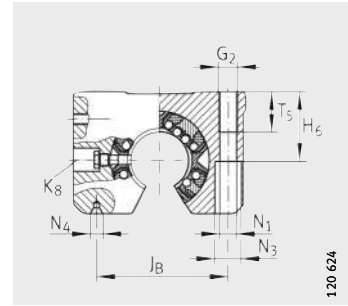
Heavy duty range

Linear ball bearing and housing units

- With segment cutout
- With or without slot
- Sealed
- Greased, with relubrication facility



Starting KGSNO16-PP-AS,
KGSNOS16-PP-AS
① 8)



Starting KGSNO16-PP-AS,
KGSNOS16-PP-AS

Dimension table - Dimensions in mm

Designation		Mass m ≈g	Dimensions				Mounting dimensions			
			F _w	B	L	H	J _B	A ₅	B ₂ ³⁾	J _L ⁴⁾
KGSNO12-PP-AS	–	80	12	43	32	28	32	21,5	7,6	23
–	KGSNOS12-PP-AS	90								
KGSNO16-PP-AS	–	150	16	53	37	35	40	26,5	10,1	26
–	KGSNOS16-PP-AS	150								
KGSNO20-PP-AS	–	200	20	60	45	42	45	30	10	32
–	KGSNOS20-PP-AS	250								
KGSNO25-PP-AS	–	410	25	78	58	51	60	39	12,5	40
–	KGSNOS25-PP-AS	520								
KGSNO30-PP-AS	–	600	30	87	68	60	68	43,5	14,3	45
–	KGSNOS30-PP-AS	760								
KGSNO40-PP-AS	–	1 100	40	108	80	77	86	54	18,2	58
–	KGSNOS40-PP-AS	1 400								
KGSNO50-PP-AS	–	2 870	50	132	100	88	108	66	22,7	50
–	KGSNOS50-PP-AS	2 670								

1) The basic load ratings are only valid for hardened (670 HV + 165 HV) and ground shaft raceways.

2) Basic load rating in main load direction.

3) Dimension B₂ on diameter F_w.

4) Dimension J_L and lubrication hole symmetrical to the bearing length L.

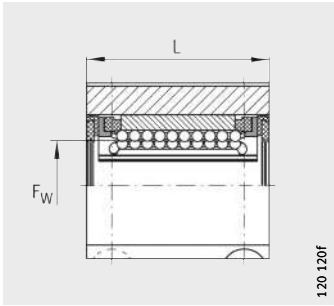
5) Centring hole DIN 332 type A.

6) For fixing screws ISO 4762-8.8.

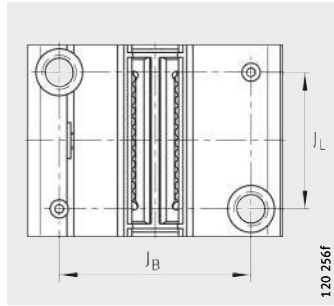
If there is a possibility of settling, the screws should be secured against rotation.

7) Lubrication nipple. Designs and dimensions, see page 30.

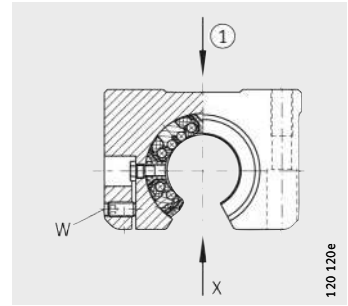
8) ① Main load direction



KGSNO...-PP-AS, KGSNOS...-PP-AS

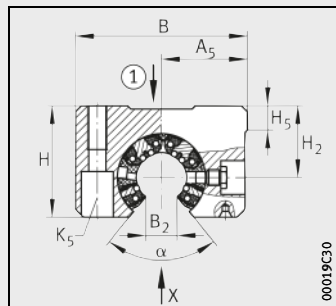


KGSNOS...-PP-AS
View X

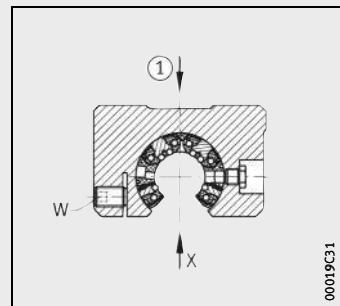


Starting KGSNOS16-PP-AS
①⁸⁾

H ₂	H ₅	T ₅	H ₆	G ₂	N ₁	N ₄ ⁵⁾	N ₃	K ₅ ⁶⁾	K ₈ ^{4) 7)}	Width across flats W	α	Ball rows Quantity	Basic load ratings ^{1) 2)}		
													dyn. C _{max} N	stat. C _{0 max} N	
+0,008 -0,016															
18	6,1	11	16,5	M5	4,3	1,6×3,35	8	M4	NIP4MZ	— 2,5	78	6	900	1 100	
22	7,5	13	21	M6	5,3	1,6×3,35	10	M5	NIP4MZ	— 2,5	68	6	1 430	1 550	
25	8	18	24	M8	6,6	2×4,25	11	M6	NIP4MZ	— 2,5	55	6	2 200	2 310	
30	8,8	22	29	M10	8,4	2,5×5,3	15	M8	NIP5MZ	— 3	57	6	3 950	4 300	
35	9,7	22	34	M10	8,4	2,5×5,3	15	M8	NIP5MZ	— 3	57	6	5 900	6 000	
45	12,4	26	44	M12	10,5	3,15×6,7	18	M10	NIP5MZ	— 4	56	6	10 200	9 600	
50	11,1	35	49	M16	13,5	4×8,5	20	M12	NIP5MZ	— 5	54	6	15 100	13 900	



KGSNO12-PP-AS,
KGSNOS12-PP-AS

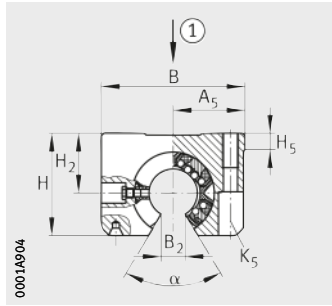


KGSNOS12-PP-AS

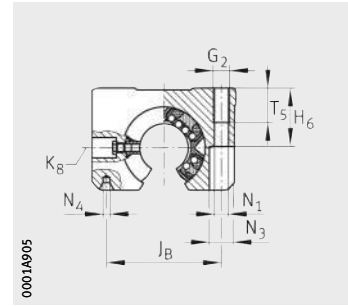
Heavy duty range

Linear ball bearing and housing units

- Tandem arrangement
- With segment cutout
- With or without slot
- Sealed
- Greased, with relubrication facility



KTSO...-PP-AS
① 8)



KTSO...-PP-AS

Dimension table - Dimensions in mm

Designation		Mass m ≈g	Dimensions				Mounting dimensions			
			F _w	B	L	H	J _B	A ₅	B ₂ ³⁾	J _L ⁴⁾
KTSO12-PP-AS	-	190	12	43	70	28	32	21,5	7,6	56
-	KTSOS12-PP-AS									
KTSO16-PP-AS	-	320	16	53	78	35	40	26,5	10,1	64
-	KTSOS16-PP-AS									
KTSO20-PP-AS	-	520	20	60	96	42	45	30	10	76
-	KTSOS20-PP-AS									
KTSO25-PP-AS	-	1060	25	78	122	51	60	39	12,5	94
-	KTSOS25-PP-AS									
KTSO30-PP-AS	-	1550	30	87	142	60	68	43,5	14,3	106
-	KTSOS30-PP-AS									

1) The basic load ratings are only valid for hardened (670 HV + 165 HV) and ground shaft raceways.

2) Basic load rating in main load direction.

3) Dimension B₂ on diameter F_w.

4) Dimensions J_L, L₆ and lubrication hole symmetrical to the bearing length L.

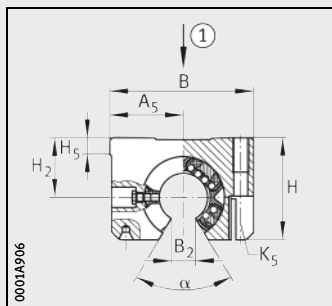
5) Centring hole DIN 332 type A.

6) For fixing screws ISO 4762-8.8.

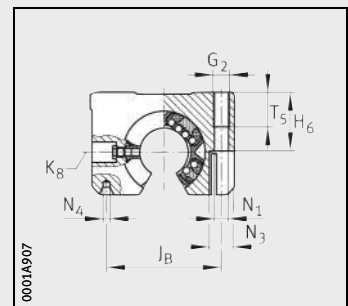
If there is a possibility of settling, the screws should be secured against rotation.

7) Lubrication nipple. Designs and dimensions, see page 30.

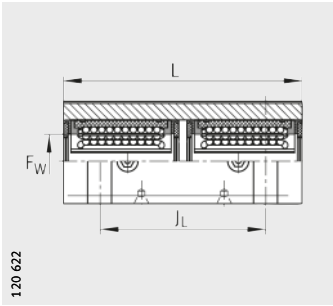
8) ① Main load direction



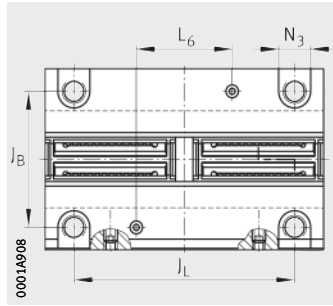
KTSOS...-PP-AS
① 8)



KTSOS...-PP-AS



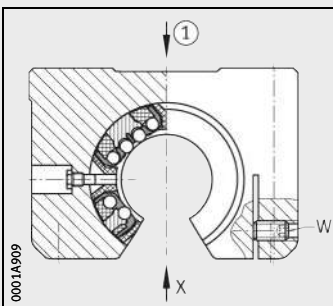
KTSO...-PP-AS, KTSOS...-PP-AS



KTSO...-PP-AS
View X



L ₆ ⁴⁾	H ₂ +0,008 -0,016	H ₅	T ₅	H ₆	G ₂	N ₁	N ₄ ⁵⁾	N ₃	K ₅ ⁶⁾	K ₈ ⁴⁾⁷⁾	Width across flats W	α °	Ball rows Quantity	Basic load ratings ¹⁾²⁾	
														dyn. C _{max} N	stat. C _{0 max} N
24	18	6,1	11	16,5	M5	4,3	1,6×3,35	8	M4	NIP4MZ	— 2,5	66	6	1 460	2 100
26	22	7,5	13	21	M6	5,3	1,6×3,35	10	M5	NIP4MZ	— 2,5	68	6	2 330	3 100
33	25	8	18	24	M8	6,6	2×4,25	11	M6	NIP4MZ	— 2,5	55	6	3 500	4 600
44	30	8,8	22	29	M10	8,4	2,5×5,3	15	M8	NIP5MZ	— 3	57	6	6 400	8 600
54	35	9,7	22	34	M10	8,4	2,5×5,3	15	M8	NIP5MZ	— 3	57	6	9 600	12 000



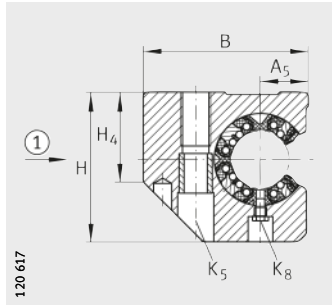
KTSOS...-PP-AS

① 8)

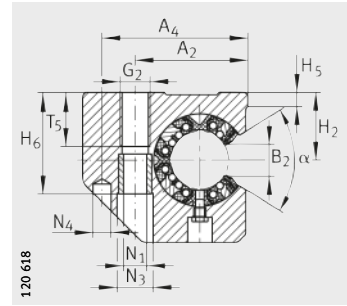
Heavy duty range

Linear ball bearing and housing units

Lateral segment cutout
With or without slot
Sealed
Greased,
with relubrication facility



KGSC...-PP-AS, KGSCS...-PP-AS
① 8)



KGSC...-PP-AS, KGSCS...-PP-AS

Dimension table - Dimensions in mm

Designation		Mass m ≈g	Dimensions				Mounting dimensions					
			F _w	B	L	H	A ₂	A ₄	A ₅	B ₂ ³⁾	J _L ⁴⁾	L ₆ ⁴⁾
KGSC20-PP-AS	-	350	20	60	47	60	39	51	17	10	30	36
-	KGSCS20-PP-AS											
KGSC25-PP-AS	-	680	25	75	58	72	49	64	21	12,5	36	45
-	KGSCS25-PP-AS											
KGSC30-PP-AS	-	1000	30	86	68	82	59	76	25	14,3	42	52
-	KGSCS30-PP-AS											
KGSC40-PP-AS	-	1800	40	110	80	100	75	97	32	18,2	48	60
-	KGSCS40-PP-AS											
KGSC50-PP-AS	-	2900	50	127	100	115	88	109	38	22,7	62	80
-	KGSCS50-PP-AS											

1) The basic load ratings are only valid for hardened (670 HV + 165 HV) and ground shaft raceways.

2) Basic load rating in main load direction.

3) Dimension B₂ on diameter F_w.

4) Dimensions J_L, L₆ and lubrication hole symmetrical to the bearing length L.

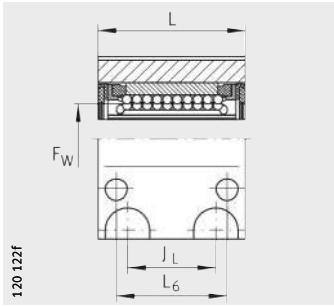
5) Centring for dowel hole.

6) For fixing screws ISO 4762-8.8.

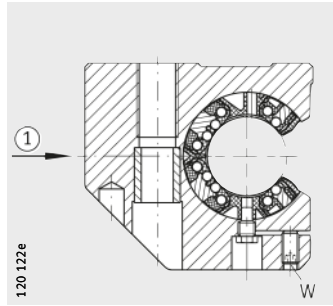
If there is a possibility of settling, the screws should be secured against rotation.

7) Lubrication nipple. Designs and dimensions, see page 30.

8) ① Main load direction



KGSC...-PP-AS, KGSCS...-PP-AS



KGSCS...-PP-AS
① 8)



													Ball rows	Basic load ratings ¹⁾²⁾	
H ₂	H ₅	H ₄	T ₅	H ₆	G ₂	N ₁	N ₄ ⁵⁾	N ₃	K ₅ ⁶⁾	K ₈ ⁴⁾⁷⁾	Width across flats W	α		Quantity	dyn. C _{max}
+0,008 -0,016												°			N
30	8,3	37,5	18	42,6	M10	8,4	6	15	M8	NIP4MZ	— 2,5	55	6	2 200	2 310
35	8,2	45	22	50,6	M12	10,5	8	18	M10	NIP5MZ	— 3	57	6	3 950	4 300
40	9	52	29	55,6	M16	13,5	10	20	M12	NIP5MZ	— 3	57	6	5 900	6 000
45	9,5	60	36	67,6	M20	15,5	12	24	M14	NIP5MZ	— 4	56	6	10 200	9 600
50	8,6	70	36	78,8	M20	17,5	12	26	M16	NIP6MZ	— 5	54	6	15 100	13 900

Heavy duty range

Linear ball bearing and housing units

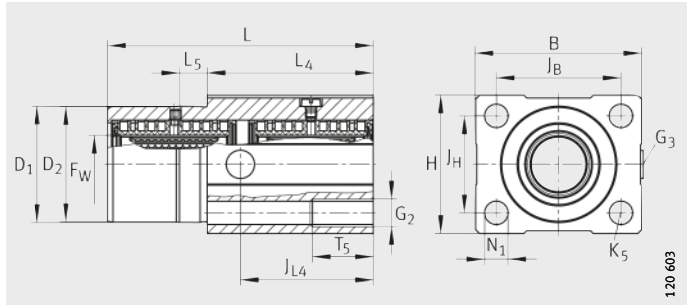
Centring collar

Tandem arrangement

Sealed

Greased,

with relubrication facility



KTFS..-PP-AS

Dimension table - Dimensions in mm

Designation	Mass m ≈g	Dimensions				Mounting dimensions		
		FW	B	L	H	JB ±0,15	L4	L5
KTFS12-PP-AS	180	12	42	70	34	32	46	10
KTFS16-PP-AS	260	16	50	78	40	38	50	10
KTFS20-PP-AS	550	20	60	96	50	45	60	10
KTFS25-PP-AS	700	25	74	122	60	56	73	10
KTFS30-PP-AS	1 100	30	84	142	70	64	82	10

1) The basic load ratings are only valid for hardened (670 HV + 165 HV) and ground shaft raceways.

2) Recommended locating bore for D₁ = H7.

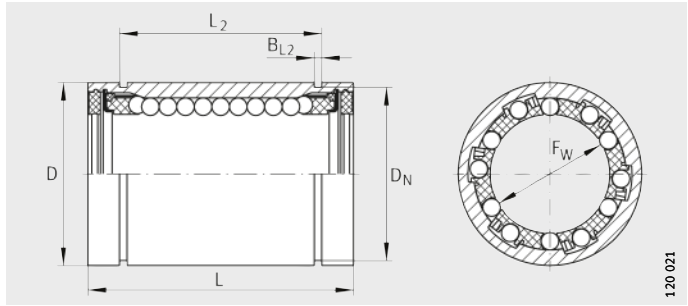


J _{L4}	D ₁ ²⁾ g7	D ₂ -0,1 -0,3	J _H ±0,15	T ₅	G ₂	N ₁	K ₅	G ₃	Ball rows Quantity	Basic load ratings ¹⁾	
										dyn. C _{min} N	stat. C _{0 min} N
35	30	30	24	13	M6	5,3	M5	M8×1	8	1 020	1 200
39	35	35	28	18	M8	6,6	M6	M8×1	8	1 790	1 900
48	42	42	35	22	M10	8,4	M8	M8×1	8	3 100	3 200
61	52	52	42	26	M12	10,5	M10	M8×1	8	4 400	4 850
71	61	61	50	35	M16	13,5	M12	M8×1	8	7 550	7 900

Machined range

Linear ball bearings

Closed, slotted or with segment cutout
 Open or sealed
 Not greased, greased, with relubrication facility



KB

Dimension table - Dimensions in mm

Designation			Mass m ≈g	Dimensions			Mounting dimensions			
3)	4)	5)		F _w	D ⁶⁾	L	B ₂ ⁷⁾	L ₂	B _{L2} ⁸⁾	
				Tolerances ⁶⁾	h5	h12		H13		
KB12	KB12-PP	KB12-PP-AS	40	12	+0,008 0	22	32	-	22,6	1,3
KBS12	KBS12-PP	KBS12-PP-AS						7,7		
KBO12	KBO12-PP	KBO12-PP-AS								
KB16	KB16-PP	KB16-PP-AS	50	16	+0,009 -0,001	26	36	-	24,6	1,3
KBS16	KBS16-PP	KBS16-PP-AS						10,1		
KBO16	KBO16-PP	KBO16-PP-AS								
KB20	KB20-PP	KB20-PP-AS	90	20	+0,009 -0,001	32	45	-	31,2	1,6
KBS20	KBS20-PP	KBS20-PP-AS						10		
KBO20	KBO20-PP	KBO20-PP-AS								
KB25	KB25-PP	KB25-PP-AS	190	25	+0,011 -0,001	40	58	-	43,7	1,85
KBS25	KBS25-PP	KBS25-PP-AS						12,5		
KBO25	KBO25-PP	KBO25-PP-AS								
KB30	KB30-PP	KB30-PP-AS	300	30	+0,011 -0,001	47	68	-	51,7	1,85
KBS30	KBS30-PP	KBS30-PP-AS						13,6		
KBO30	KBO30-PP	KBO30-PP-AS								
KB40	KB40-PP	KB40-PP-AS	600	40	+0,013 -0,002	62	80	-	60,3	2,15
KBS40	KBS40-PP	KBS40-PP-AS						18,2		
KBO40	KBO40-PP	KBO40-PP-AS								
KB50	KB50-PP	KB50-PP-AS	1000	50	+0,013 -0,002	75	100	-	77,3	2,65
KBS50	KBS50-PP	KBS50-PP-AS						22,7		
KBO50	KBO50-PP	KBO50-PP-AS								

1) The basic load ratings are only valid for hardened (670 HV + 165 HV) and ground shaft raceways.

2) Basic load rating in main load direction.

3) With preservative.

4) With initial greasing, sealed on both sides.

5) With initial greasing, sealed on both sides, with relubrication facility.

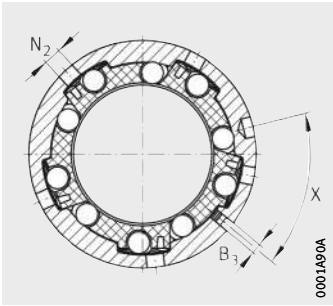
6) The tolerances are only valid for KB.

7) Dimension B₂ on diameter F_w.

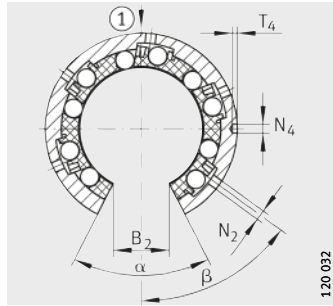
8) Slot dimensions suitable for retaining rings to DIN 471.

9) Hole position symmetrical to bearing length L.

10) ① Main load direction



KBS..-PP-AS



KBO..-PP-AS
① 10)

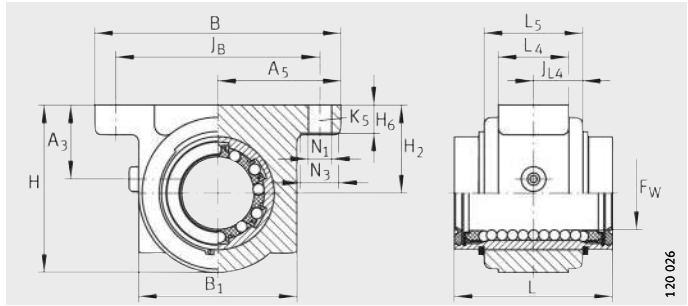


B ₃	D _N ⁸⁾	T ₄	N ₄ ⁹⁾	N ₂	α	β	X	Ball rows Quantity	Basic load ratings ¹⁾			
									dyn. C _{min} N	stat. C _{0 min} N	dyn. C _{max} N	stat. C _{0 max} N
–	21	–	–	1,5	–	–	–	5	540	385	640	570
1		1,2	2,2		78	64	–					
–	24,9	–	–	2	–	–	–	5	710	530	840	780
1		1,2	2,2		78	64	–					
–	30,3	–	–	2	–	–	–	6	1 570	1 230	1 660	1 570
1		1,2	2,2		60	52	–					
–	37,5	–	–	2,5	–	–	–	6	2 800	2 220	2 950	2 850
1		1,5	3		60	53	–					
–	44,5	–	–	2,5	–	–	–	6	3 600	2 850	3 800	3 600
1		1,5	3		54	55	–					
–	59	–	–	3	–	–	–	6	6 000	4 400	6 400	5 600
1		1,5	3		54	54	–					
–	72	–	–	4	–	–	–	6	8 700	6 300	9 200	8 000
1		1,5	3		54	54	–					

Machined range

Linear ball bearing and housing units

Closed, slotted or with segment cutout
Sealed
Greased,
with relubrication facility



KGB..-PP-AS

Dimension table - Dimensions in mm

Designation			Mass m ≈g	Dimensions				Mounting dimensions				
				F _W		B	L	H	J _B	B ₁	A ₅	B ₂ ⁴⁾
				Tolerances ⁶⁾		h12						
KGB12-PP-AS	-	-	100	12	+0,008 0	52	32	35,8	42 ±0,15	31,6	26 ±0,02	-
-	KGBS12-PP-AS	-										7,7
-	-	KGB012-PP-AS	90									
KGB16-PP-AS	-	-	140	16	+0,009 -0,001	56	36	37,5	46 ±0,15	35	28 ±0,02	-
-	KGBS16-PP-AS	-										10,1
-	-	KGB016-PP-AS	120									
KGB20-PP-AS	-	-	300	20	+0,009 -0,001	70	45	47,5	58 ±0,15	45	35 ±0,02	-
-	KGBS20-PP-AS	-										10
-	-	KGB020-PP-AS	250									
KGB25-PP-AS	-	-	580	25	+0,011 -0,001	80	58	57,5	68 ±0,15	55	40 ±0,02	-
-	KGBS25-PP-AS	-										12,5
-	-	KGB025-PP-AS	490									
KGB30-PP-AS	-	-	900	30	+0,011 -0,001	88	68	66,5	76 ±0,2	63	44 ±0,02	-
-	KGBS30-PP-AS	-										13,6
-	-	KGB030-PP-AS	780									
KGB40-PP-AS	-	-	1 430	40	+0,013 -0,002	108	80	83,5	94 ±0,2	77	54 ±0,02	-
-	KGBS40-PP-AS	-										18,2
-	-	KGB040-PP-AS	1 280									
KGB50-PP-AS	-	-	2 780	50	+0,013 -0,002	135	100	98	116 ±0,2	96	67,5 ±0,02	-
-	KGBS50-PP-AS	-										22,7
-	-	KGB050-PP-AS	2 460									

1) Designs and dimensions, see page 31.

2) The basic load ratings are only valid for hardened (670 HV + 165 HV) and ground shaft raceways.

3) Basic load rating in main load direction.

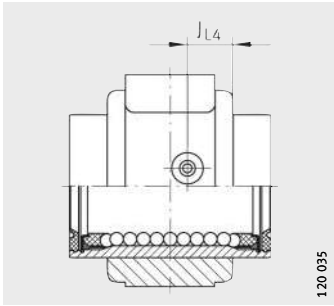
4) Dimension B₂ on diameter F_W.

5) For fixing screws ISO 4762-8.8.

If there is a possibility of settling, the screws should be secured against rotation.

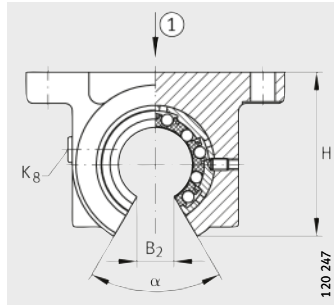
6) The tolerances are valid for KGB..-PP-AS.

7) ① Main load direction



KGBO..-PP-AS

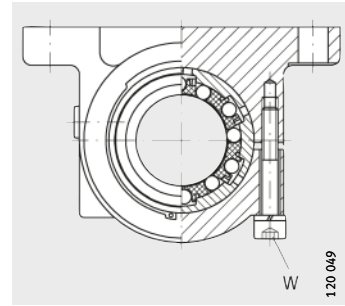
120 035



KGBO, KGBO..-PP-AS

① 7)

120 247



KGBS..-PP-AS

120 049

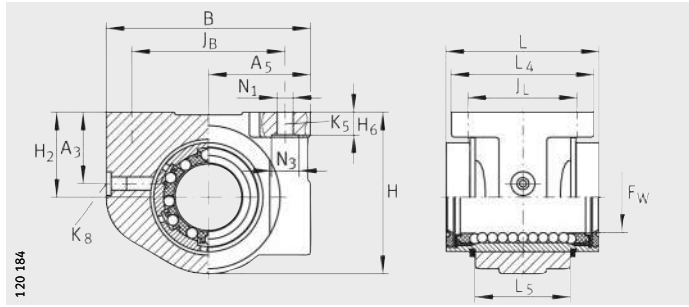


L ₅	L ₄	J _{L4}	H ₂ ±0,015	A ₃	H ₆	N ₁	N ₃	K ₅ ⁵⁾	α °	Width across flats W	Lubrication nipple ¹⁾ K ₈	Ball rows Quantity	Basic load ratings ²⁾	
													dyn. C N	stat. C ₀ N
20	12	10	20	15	6	5,5	10	M5	-	-	NIPA1	5	540	385
		6,5								2				
22	15	11	20	15	6	5,5	10	M5	-	-	NIPA1	5	710	530
		6,5								2				
28	20	14	25	21	8	6,6	11	M6	-	-	NIPA1	6	1 570	1 230
		9,5								3				
40	28	20	30	23	10	6,6	11	M6	-	-	NIPA1	6	2 800	2 220
		15								3				
48	32	24	35	25	10	6,6	11	M6	-	-	NIPA2	6	3 600	2 850
		19								4				
56	40	28	45	30	12	9	15	M8	-	-	NIPA2	6	6 000	4 400
		23								4				
72	52	36	50	34	14	11	18	M10	-	-	NIPA2	6	8 700	6 300
		28								5				
												5	8 900 ³⁾	6 600 ³⁾

Machined range

Linear ball bearing and housing units

Closed, slotted or with segment cutout
Sealed
Greased,
with relubrication facility



KGBA...PP-AS

Dimension table - Dimensions in mm

Designation			Mass m ≈g	Dimensions			Mounting dimensions					
				F _W		B	L	H	J _B	A ₅	B ₂ ⁴⁾	L ₄
				Tolerances ⁷⁾								
KGBA12-PP-AS	-	-	80	12	+0,008 0	42	32	34	32±0,15	21±0,01	-	32
-	KGBAS12-PP-AS	-						30,5			7,7	
-	-	KGBAO12-PP-AS						70				
KGBA16-PP-AS	-	-	120	16	+0,009 -0,001	50	36	41	40±0,15	25±0,01	-	35
-	KGBAS16-PP-AS	-						37			10,1	
-	-	KGBAO16-PP-AS						100				
KGBA20-PP-AS	-	-	200	20	+0,009 -0,001	60	45	47,5	45±0,15	30±0,01	-	42
-	KGBAS20-PP-AS	-						44,5			10	
-	-	KGBAO20-PP-AS						170				
KGBA25-PP-AS	-	-	410	25	+0,011 -0,001	74	58	60	60±0,2	37±0,01	-	54
-	KGBAS25-PP-AS	-						56			12,5	
-	-	KGBAO25-PP-AS						350				
KGBA30-PP-AS	-	-	610	30	+0,011 -0,001	84	68	67	68±0,2	42±0,01	-	60
-	KGBAS30-PP-AS	-						63,5			13,6	
-	-	KGBAO30-PP-AS						530				
KGBA40-PP-AS	-	-	1200	40	+0,013 -0,002	108	80	87	86±0,2	54±0,015	-	78
-	KGBAS40-PP-AS	-						82,5			18,2	
-	-	KGBAO40-PP-AS						1070				
KGBA50-PP-AS	-	-	1880	50	+0,013 -0,002	130	100	98	108±0,2	65±0,015	-	70
-	KGBAS50-PP-AS	-						93			22,7	
-	-	KGBAO50-PP-AS						1650				

1) Designs and dimensions, see page 31.

2) The basic load ratings are only valid for hardened (670 HV + 165 HV) and ground shaft raceways.

3) Basic load rating in main load direction.

4) Dimension B₂ on diameter F_W.

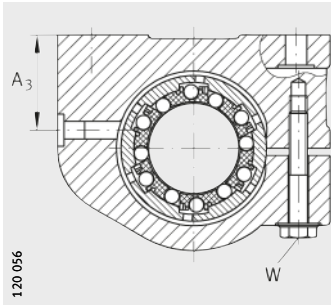
5) For fixing screws ISO 4762-8.8.

If there is a possibility of settling, the screws should be secured against rotation.

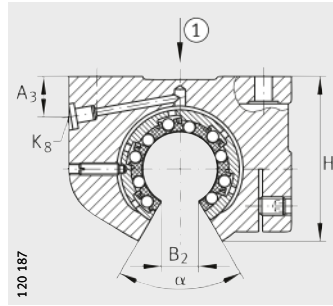
6) Note maximum tightening torques.

7) The tolerances are valid for KGBA...PP-AS.

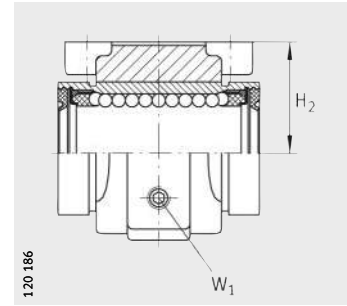
8) ① Main load direction



KGBAS...-PP-AS



KGBAO...-PP-AS
① 8)



KGBAO...-PP-AS

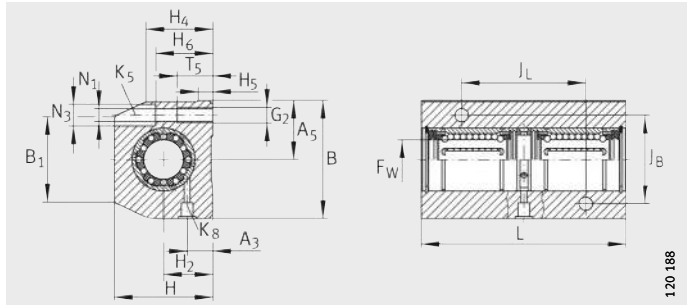


J _L	L ₅	H ₂	A ₃	H ₆ -0,5	N ₁	N ₃	K ₅ ⁵⁾	α °	Width across flats			K ₈	Ball rows Quantity	Basic load ratings ²⁾	
									W	W ₁ ⁶⁾				dyn. C	stat. C ₀
											max. Nm				
23±0,15	20	18±0,01	15	4,8	4,7	8	M4	-	-	-	-	NIPA1	5	540	385
			7,8						7	2	1				
26±0,15	22	22±0,01	15	5,4	4,7	8	M4	-	-	-	-	NIPA1	5	710	530
			10						7	2,5	1,5				
32±0,15	28	25±0,01	21	6,7	4,7	8	M4	-	-	-	-	NIPA1	6	1 570	1 230
			11						7	2,5	1,5				
40±0,2	40	30±0,01	23	7,8	5,7	10	M5	-	-	-	-	NIPA1	6	2 800	2 220
			13						8	3	3				
45±0,2	48	35±0,01	25	8,7	6,8	11	M6	-	-	-	-	NIPA2	6	3 600	2 850
			14						10	3	4				
58±0,2	56	45±0,01	30	11	9,2	15	M8	-	-	-	-	NIPA2	6	6 000	4 400
			18						13	4	5				
50±0,2	72	50±0,015	34	12,5	9,2	15	M8	-	-	-	-	NIPA2	6	8 700	6 300
			19						13	4	7				

Machined range

Linear ball bearing and housing units

- Tandem arrangement
- Closed or with segment cutout
- Sealed
- Greased,
with relubrication facility



KTB...-PP-AS

Dimension table - Dimensions in mm

Designation		Mass m ≈g	Dimensions				Mounting dimensions					
			F _W	B	L	H	J _B	A ₅	B ₁	B ₂ ³⁾	J _L ⁴⁾	H ₂
KTB12-PP-AS	-	310	12	43	76	35	30	21,5	34	-	40	18
-	KTBO12-PP-AS	260		42		30		-	-	7,7		
KTBO12-PP-AS	-	260	16	53	84	42	36	26,5	40	-	45	22
-	KTBO16-PP-AS	360		50		35		-	-	10,1		
KTBO16-PP-AS	-	360	20	60	104	50	45	30	44	-	55	25
-	KTBO20-PP-AS	620		60		42		-	-	10		
KTBO20-PP-AS	-	620	25	78	130	60	54	39	60	-	70	30
-	KTBO25-PP-AS	1180		74		51		-	-	12,5		
KTBO25-PP-AS	-	1180	30	87	152	70	62	43,5	63	-	85	35
-	KTBO30-PP-AS	1840		84		60		-	-	13,6		
KTBO30-PP-AS	-	1840	40	108	176	90	80	54	76	-	100	45
-	KTBO40-PP-AS	3000		108		77		-	-	18,2		
KTBO40-PP-AS	-	3000	50	132	224	105	100	66	90	-	125	50
-	KTBO50-PP-AS	5100		130		88		-	-	22,7		

1) The basic load ratings are only valid for hardened (670 HV + 165 HV) and ground shaft raceways and where the two linear ball bearings are subjected to equal loading.

2) Basic load rating in main load direction.

3) Dimension B₂ on diameter F_W.

4) Dimension J_L and lubrication hole symmetrical to the bearing length L.

5) Lubrication nipple. Designs and dimensions, see page 31.

6) The tolerances are valid for KTB...-PP-AS.

7) ① Main load direction

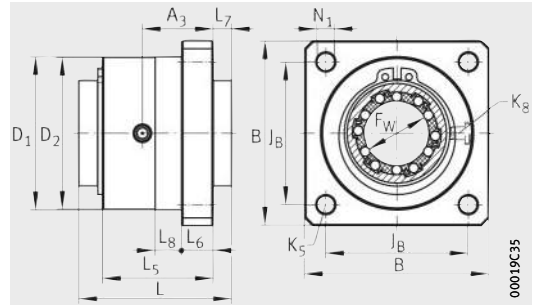
Machined range

Linear ball bearing and housing unit

With flange

Sealed

Greased, with relubrication facility



KFB..-B-PP-AS

Dimension table - Dimensions in mm

Designation	Mass m ≈g	Dimensions				Mounting dimensions			
		F _w		B	L	L ₅	L ₆	L ₇	A ₃
			Tolerances						
KFB12-B-PP-AS	80	12	$\begin{matrix} +0,008 \\ 0 \end{matrix}$	40	32	22	6	4,2	11,5
KFB16-B-PP-AS	120	16	$\begin{matrix} +0,009 \\ -0,001 \end{matrix}$	50	36	24	8	5,2	12,5
KFB20-B-PP-AS	220	20	$\begin{matrix} +0,009 \\ -0,001 \end{matrix}$	60	45	30	10	6,7	15,8
KFB25-B-PP-AS	430	25	$\begin{matrix} +0,011 \\ -0,001 \end{matrix}$	70	58	42	12	7	22
KFB30-B-PP-AS	640	30	$\begin{matrix} +0,011 \\ -0,001 \end{matrix}$	80	68	50	14	8	26
KFB40-B-PP-AS	1 280	40	$\begin{matrix} +0,013 \\ -0,002 \end{matrix}$	100	80	59	16	9,2	30,3
KFB50-B-PP-AS	2 160	50	$\begin{matrix} +0,013 \\ -0,002 \end{matrix}$	130	100	75	18	11,2	38,8

1) The basic load ratings are only valid for hardened (670 HV + 165 HV) and ground shaft raceways.

2) For fixing screws ISO 4762-8.8.

If there is a possibility of settling, the screws should be secured against rotation.

3) Lubrication nipple. Designs and dimensions, see page 31.



N ₁	K _S ²⁾	D ₁ +0,2	D ₂ g7	J _B	L ₈	K ₈ ³⁾	Ball rows	Basic load ratings ¹⁾	
							Quantity	dyn. C N	stat. C ₀ N
5,5	M5	31,5	32	30	10	NIPD3	5	540	385
5,5	M5	37,5	38	35	10	NIPD3	5	710	530
6,6	M6	45,5	46	42	10	NIPD3	6	1 570	1 230
6,6	M6	57,5	58	54	10	NIPA1	6	2 800	2 220
9	M8	65,5	66	60	10	NIPA1	6	3 600	2 850
11	M10	89,5	90	78	10	NIPA1	6	6 000	4 400
11	M10	97,5	98	98	10	NIPA2	6	8 700	6 300

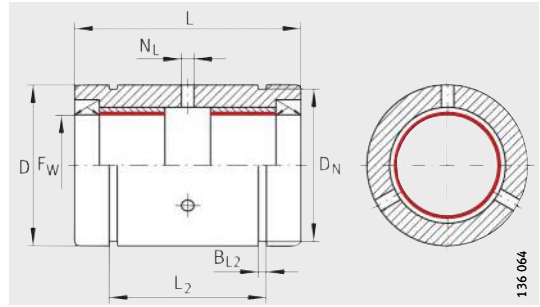
Plain bearing range

Linear plain bearings

Closed or with segment cutout

Sealed

Greased, with relubrication facility



PAB...PP-AS, PABO...PP-AS

Dimension table - Dimensions in mm

Designation		Mass m ≈g	Dimensions			Mounting dimensions	
			F _W	D h7 ²⁾	L h12	L ₂ ³⁾ H13	B _{L2} ⁴⁾ H13
PAB12-PP-AS	-	26	12	22	32	22,6	1,3
-	PABO12-PP-AS	21					
PAB16-PP-AS	-	34	16	26	36	24,6	1,3
-	PABO16-PP-AS	28					
PAB20-PP-AS	-	68	20	32	45	31,2	1,6
-	PABO20-PP-AS	58					
PAB25-PP-AS	-	132	25	40	58	43,7	1,85
-	PABO25-PP-AS	113					
PAB30-PP-AS	-	169	30	47	68	51,7	1,85
-	PABO30-PP-AS	143					
PAB40-PP-AS	-	426	40	62	80	60,3	2,15
-	PABO40-PP-AS	362					
PAB50-PP-AS	-	773	50	75	100	77,3	2,65
-	PABO50-PP-AS	657					

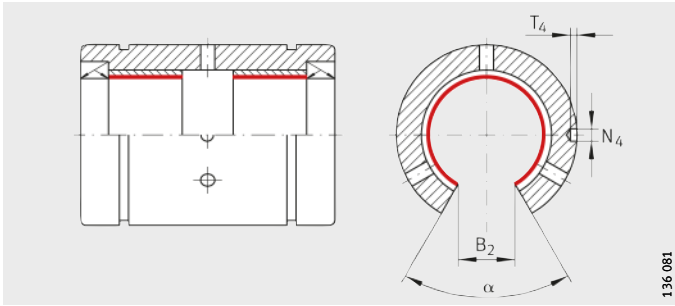
1) The basic static load ratings are not valid if the bearings above are fitted – as shown on the following pages – in housings.

2) The tolerance is only valid for PAB...PP-AS.

3) Holes symmetrical to bearing length L.

4) Slot dimensions suitable for retaining rings to DIN 471.

5) Dimension B₂ on diameter F_W.



PABO..PP-AS
Segment cutout and fixing hole

D _N	B ₂ ⁵⁾	T ₄	N ₄	N _L H13	α °	Basic load ratings ¹⁾
						stat. C ₀ N
21	–	–	–	2,5	–	60 000
	7,6	1,2	2,2		78	
24,9	–	–	–	2,5	–	96 000
	10,1	1,2	2,2		78	
30,3	–	–	–	2,5	–	150 000
	10	1,2	2,2		60	
37,5	–	–	–	2,5	–	250 000
	12,5	1,5	3		60	
44,5	–	–	–	3	–	375 000
	13,6	1,5	3		54	
59	–	–	–	3	–	600 000
	18,2	1,5	3		54	
72	–	–	–	4	–	1 000 000
	22,7	1,5	3		54	



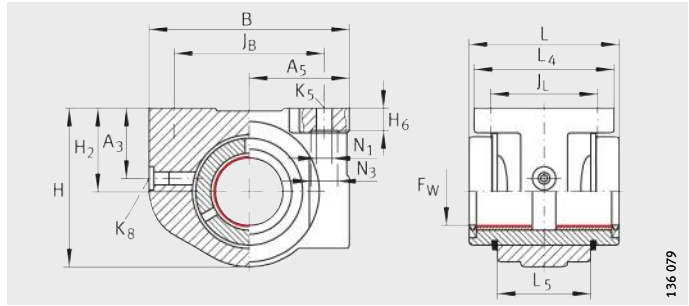
Plain bearing range

Linear plain bearing units

Closed or with segment cutout

Sealed

Greased,
with relubrication facility



PAGBA...PP-AS, PAGBA...PP-AS

Dimension table - Dimensions in mm

Designation		Mass m ≈g	Dimensions			Mounting dimensions				
			F _W	B	L h12	H	J _B	A ₅	B ₂ ²⁾	L ₄
PAGBA12-PP-AS	-	70	12	42	32	34	32 ± 0,15	21 ± 0,01	-	32
-	PAGBAO12-PP-AS	60				30,5		21	7,6	
PAGBA16-PP-AS	-	110	16	50	36	41	40 ± 0,15	25 ± 0,01	-	35
-	PAGBAO16-PP-AS	90				36,8		25	10,1	
PAGBA20-PP-AS	-	180	20	60	45	47,5	45 ± 0,15	30 ± 0,01	-	42
-	PAGBAO20-PP-AS	160				44,5		30	10	
PAGBA25-PP-AS	-	350	25	74	58	60	60 ± 0,2	37 ± 0,01	-	54
-	PAGBAO25-PP-AS	310				56		37	12,5	
PAGBA30-PP-AS	-	480	30	84	68	67	68 ± 0,2	42 ± 0,01	-	60
-	PAGBAO30-PP-AS	430				63,5		42	13,6	
PAGBA40-PP-AS	-	1 070	40	108	80	87	86 ± 0,2	54 ± 0,015	-	78
-	PAGBAO40-PP-AS	910				82,4		54	18,2	
PAGBA50-PP-AS	-	1 650	50	130	100	98	108 ± 0,2	65 ± 0,015	-	70
-	PAGBAO50-PP-AS	1 460				92,8		65	22,7	

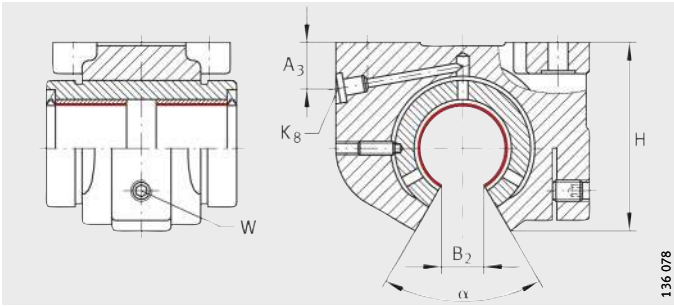
1) Designs and dimensions, see page 31.

2) Dimension B₂ on diameter F_W.

3) For fixing screws ISO 4762-8.8.

If there is a possibility of settling, the screws should be secured against rotation.

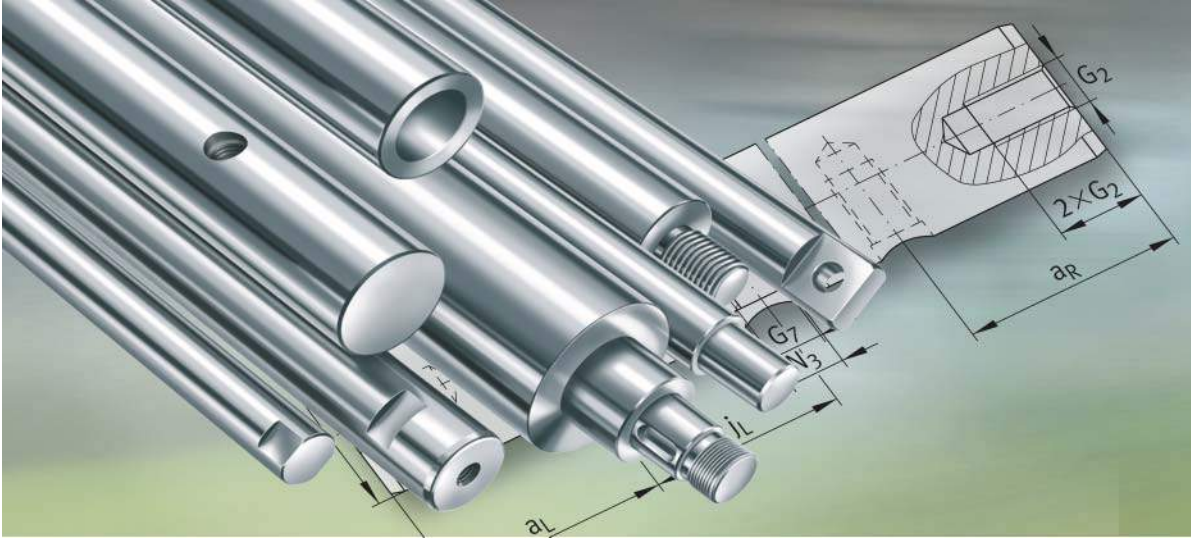
4) Note maximum tightening torques.



PAGBAO...PP-AS
Segment cutout

J _L	L ₅	H ₂	A ₃	H ₆	N ₁ ³⁾	N ₃ ³⁾	K ₅	Width across flats W ⁴⁾		α	K ₈	Lubrication nipple ¹⁾
									max. Nm			
23±0,15	20	18±0,01	15	4,8	4,7	8	M4	–	–	–	NIPA1	
		18	7,8					2	1	78		
26±0,15	22	22±0,01	15	5,4	4,7	8	M4	–	–	–	NIPA1	
		22	10					2,5	1,5	78		
32±0,15	28	25±0,01	21	6,7	4,7	8	M4	–	–	–	NIPA1	
		25	11					2,5	1,5	60		
40±0,2	40	30±0,01	23	7,8	5,7	10	M5	–	–	–	NIPA1	
		30	13					3	3	60		
45±0,2	48	35±0,01	25	8,7	6,8	11	M6	–	–	–	NIPA2	
		35	14					3	4	54		
58±0,2	56	45±0,01	30	11	9,2	15	M8	–	–	–	NIPA2	
		45	18					4	5	54		
50±0,2	72	50±0,015	34	12,5	9,2	15	M8	–	–	–	NIPA2	
		50	19					4	7	54		










Solid shafts
Hollow shafts

Solid shafts, hollow shafts

	Page
Matrix	Matrix for preselection of solid and hollow shafts..... 106
Product overview	Solid shafts, hollow shafts..... 108
Features	High precision raceway for economical linear guidance systems 109
	Steels, hardness, surface, tolerances, lengths 109
	Coatings..... 110
	Available materials, coatings, tolerances 112
	Solid shafts with threaded holes..... 113
	Shafts according to customer requirements 114
	Shaft machining, shaft specification 118
Accuracy	Length tolerance..... 120
	Straightness value to ISO 13012..... 120
Ordering example, ordering designation	Solid shaft, without machining 121
	Hollow shaft, without machining..... 121
	Solid shaft, with machining 121
	Solid shaft, according to customer requirements..... 122
	Shaft guidance system 123
Dimension tables	Solid shafts..... 124
	Recommended threaded holes for solid shafts..... 125
	Hollow shafts 126



**Matrix for preselection
of solid and hollow shafts**

Solid shafts and hollow shafts		Shaft diameter d_{LW} mm from ... to	Standard tolerance for shaft
Solid shafts Without threaded holes	W 	4 – 80	h6
Solid shafts With threaded holes	W 	10 – 80	h6
Hollow shafts	WH 	12 – 80	h7
Shafts According to customer requirements	W  	10 – 80	h6, h7

Definition:

- Available by agreement
- Available

1) Not available for all diameters.

2) For WH, Cf53 or C60.

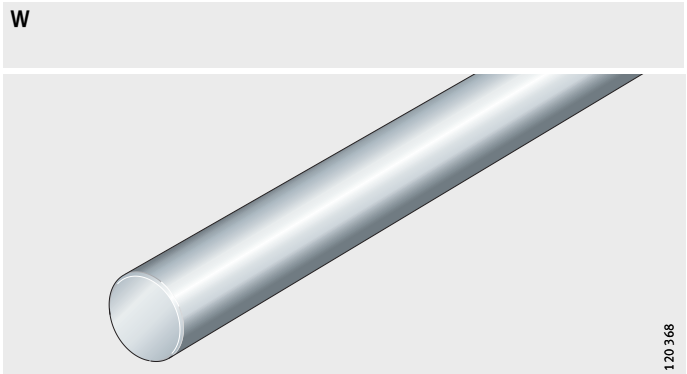
Special tolerances, only for shafts made from quenched and tempered steel		Steel			Coating ¹⁾		Description
		Quenched and tempered steel ²⁾ Cf53	Corrosion-resistant steel ¹⁾		Hard chromium	Corrotect®	
			X46Cr13	X90CrMoV18			Page
j5	f7	●	■	■	■	■	109
j5	f7	●	■	■	■	■	113
h7	–	●	–	–	■	■	109
j5	f7	●	■	■	■	■	114



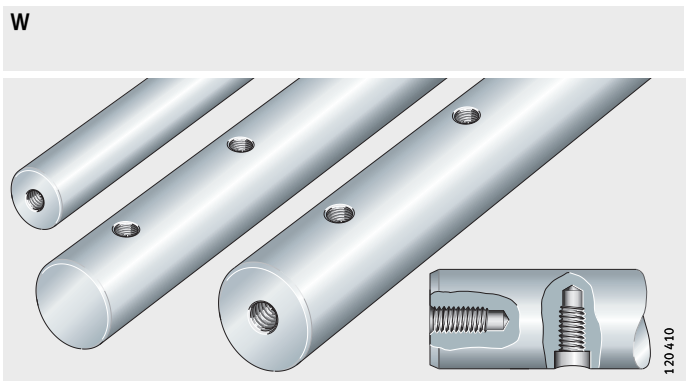
Product overview Solid shafts, hollow shafts

Solid shafts

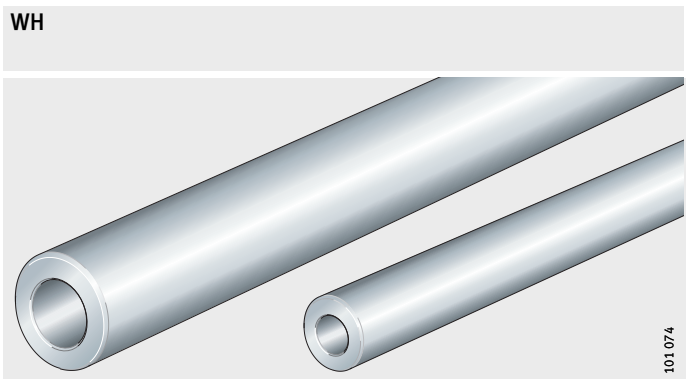
Without threaded holes



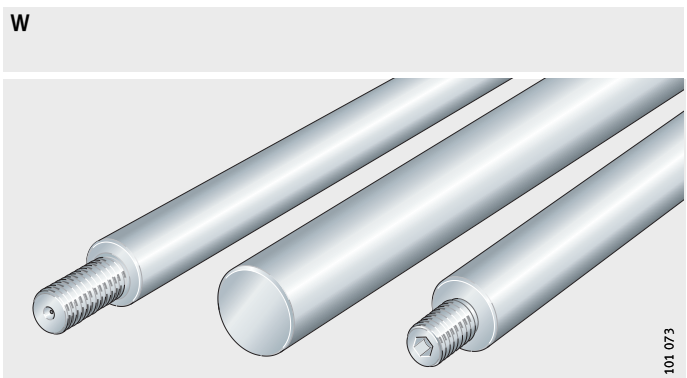
Axial and radial threaded holes



Hollow shafts



Shafts according to customer requirements



Solid shafts, hollow shafts

Features

Solid and hollow shafts are high precision shafts made from quenched and tempered steel to rolling bearing quality and are supplied in metric sizes.

Hollow shafts are particularly suitable for reduced-mass designs. For location, solid shafts can be provided with radial and axial threaded holes or can, by agreement, be produced completely in accordance with a customer drawing, see page 113 to page 117.

High precision raceway for economical linear guidance systems

The material quality of the shafts guarantees high dimensional and geometrical accuracy (roundness, parallelism). Due to their high surface hardness and surface quality, the shafts are highly suitable as precision raceways for linear ball bearings.

High precision shafts are also suitable as guide rods for plain bushes, as stretch and levelling rollers and in the construction of equipment and automatic machinery.

They can be combined with linear ball bearings, yoke type, stud type, ball bearing and profiled track rollers to give linear guidance systems that are rigid, precise, economical and ready to fit, with high load carrying capacity and a long operating life.

Steels, hardness, surface, tolerances, lengths

Shafts made from Cf53 (material number 1.1213) are induction hardened and ground; the surface hardness is 670 HV + 165 HV (59 HRC + 6 HRC).

Hollow shafts are only available made from quenched and tempered steel.

Shafts made from corrosion-resistant steel to ISO 683-17 and EN 10880

As an alternative to quenched and tempered steel, solid shafts are also available in corrosion-resistant steels, for example X46Cr13 (material number 1.4034) or X90CrMoV18 (material number 1.4112). The surface hardness in the case of X46 is 520 HV + 115 HV (52 HRC + 4 HRC). The surface hardness in the case of X90 is 580 HV + 85 HV (54 HRC + 4 HRC).

These steels are particularly suitable for use in the foodstuffs industry, medical equipment and semiconductor technology. The suffix is X46 or X90.



Due to the hardness curve, shafts made from the materials X46Cr13 and X90CrMoV18 have only limited corrosion resistance on the end faces. This also applies to any soft-annealed areas.



Solid shafts, hollow shafts

Hardness, surface, tolerances, lengths

A uniform hardening depth will ensure a smooth transition from the hardened surface layer to the tough, normally annealed core, which can support bending stresses.

The standard surface is Ra 0,3.

Solid shafts have the normal tolerance h6, while hollow shafts have h7.

High precision shafts are available in single piece lengths up to 6 000 mm. Longer shafts are available by agreement and are assembled (with mortice and tenon joints).

Available steels and tolerances, see page 112.

Coatings

Coatings and hard chromium coating provide optimum anti-wear and anti-corrosion protection for shafts and are optional.

The characteristics of the coatings are also shown in the table Coatings, page 111.

Hard chromium coating – Anti-wear protection

Hard chromium coating is suitable for applications in which a high degree of anti-wear protection is required. The chromium coating also offers good corrosion resistance.

Chromium coated shafts are to tolerance h7.

The thickness of the chromium coating is at least 5 µm, the hardness is 800 HV to 1 050 HV.

The suffix is CR.

Corrotect® – Anti-corrosion protection

Corrosion-resistant shafts are coated with the special coating Corrotect® and, for production reasons, have centring or threaded holes in the end faces.

The inside diameter of hollow shafts is not coated.

Corrotect® is resistant to neutral, organic fluids such as oil, brake fluid and petrol. For applications where aqueous salt solutions in the pH range from 5 to 10 are present, Corrotect® is also suitable due to its good resistance.

The suffix is RRF.



Corrotect® reduces the adhesion of weld spatter.

Corrotect® can be worn away by contact seals.

The coating is not permitted for direct contact with foodstuffs and is not suitable in abrasive ambient media.

For application in the food industry, the Schaeffler Group also offers the special coating Corrotect® Cr(VI)-free.

It thus complies with the requirements for RoHS in accordance with EU Directive 2002/95/EC. All other advantages are identical with the standard Corrotect® coating.

The suffix is RROC.

Coatings

Feature	Coating		
	Corrotect®		Hard chromium
	Cr(VI)-containing ¹⁾	CR(VI)-free	
Suffix	RRF	RROC	–
Colour	Black	Colourless, blue to iridescent	Chromium
Coating thickness in µm	0,5 – 5,0	0,5 – 5,0	5,0 – 15,0
Composition	Zinc alloyed with iron and cobalt	Zinc alloyed with iron	Chromium
Coating hardness in HV	300	300	800 – 1 050
Anti-corrosion protection ²⁾ in h	96	96	120
Anti-wear protection	–	–	yes
Maximum shaft length in mm	3 500	3 500	∅ 6 – 8 = 3 900 ∅ ≧ 10 = 5 900
Cr(VI)-free	no	yes	no

1) Cr(VI)-containing parts are not suitable for the food industry.

2) Salt spray test to DIN 50021.



Machined surfaces, end faces and bores may be uncoated.



Solid shafts, hollow shafts

Available materials, coatings, tolerances Solid and hollow shafts

Shaft diameter	Solid shafts					Hollow shafts
	Material					
	Quenched and tempered steel			X46Cr13	X90CrMoV18	Quenched and tempered steel
	Tolerance ³⁾	CR ¹⁾	RRF RROC ²⁾			Tolerance
mm	h6	h7	h6	h6	h7	
4	●	–	■	–	●	–
5	●	–	■	–	–	–
6	●	●	■	●	●	–
8	●	●	■	●	●	–
10	●	●	■	●	●	–
12	●	●	■	●	●	●
14	●	●	■	●	●	–
15	●	●	■	●	●	–
16	●	●	■	●	●	●
20	●	●	■	●	●	●
25	●	●	■	●	●	●
30	●	●	■	●	●	●
40	●	●	■	●	●	●
50	●	●	■	●	●	●
60	●	●	■	–	–	●
80	●	●	■	–	–	●

■ Available by agreement.

● Available design.

1) Hard chromium coating, see page 110.

2) Corrotect® coating, see page 110.

3) Other tolerances available by agreement.

Solid shafts with threaded holes






Where shafts are to be supported or connected to other elements, fixing holes are required.

The standard threaded holes for solid shafts are defined as hole patterns B01 to B05 in accordance with the table.

In addition, holes may be made in accordance with a customer drawing with or without threads, *Figure 1*, page 114 to *Figure 13*, page 117.

Ordering examples, see page 121.

Codes for hole patterns

Code		Design of holes
B01		Axial threaded hole on one side
B02		Axial threaded holes on both sides
B03		Radial threaded holes
B04		Radial threaded holes and axial threaded hole on one side
B05		Radial threaded holes and axial threaded holes on both sides

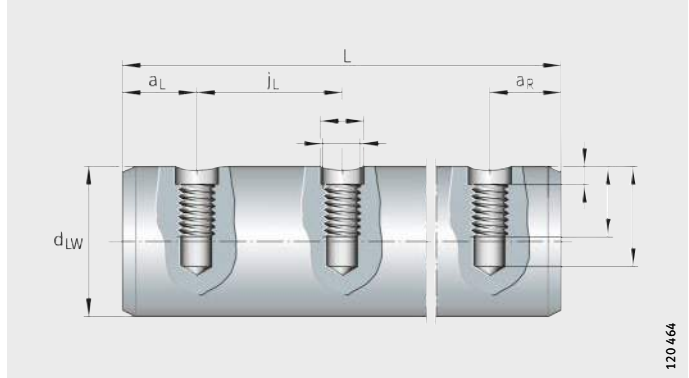


Solid shafts, hollow shafts

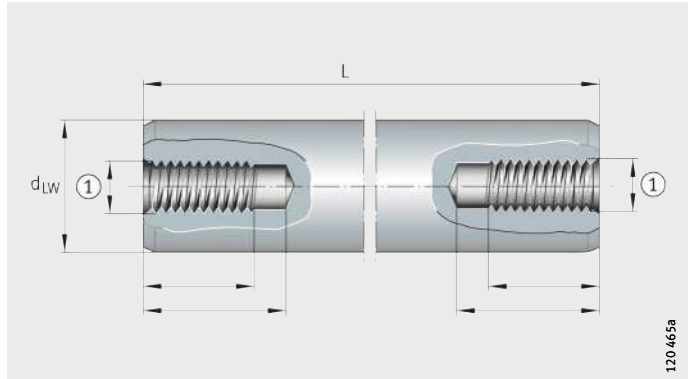
Shafts according to customer requirements

In order to place enquiries for special shafts, please use your own drawing or copy our templates and complete using the required values, *Figure 1 to Figure 13*, page 117.

Figure 1
Radial holes
with and without threads

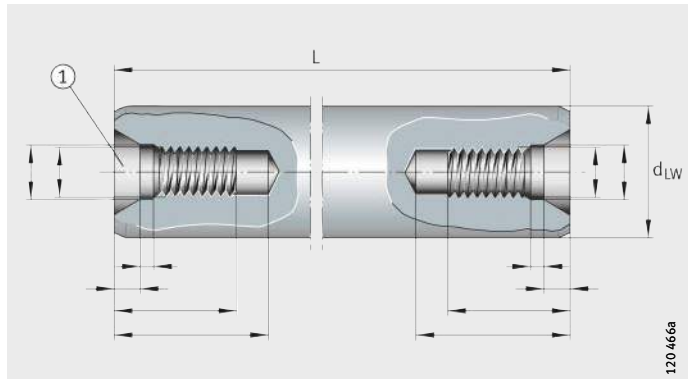


① Diameter to
DIN 336 or DIN 13
Figure 2
Internal threaded hole,
on one or both sides



① For threaded hole with centring hole
DIN 332-D recommended

Figure 3
Internal threaded hole
with centring hole



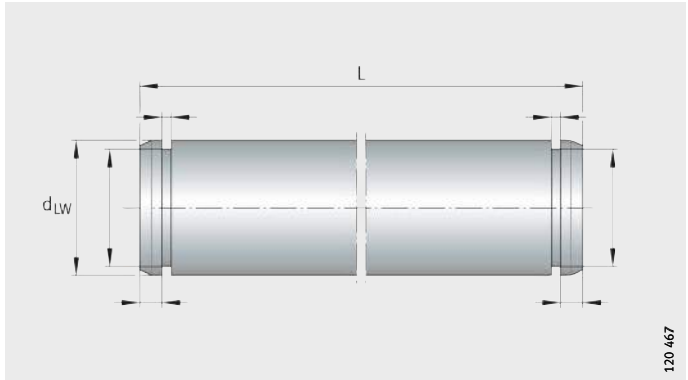


Figure 4
Undercut for retaining ring

120 467

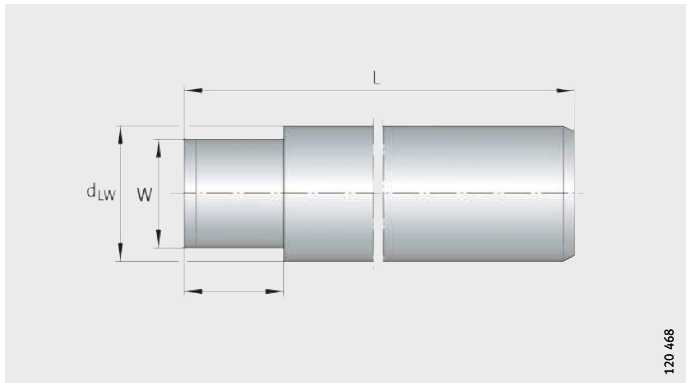
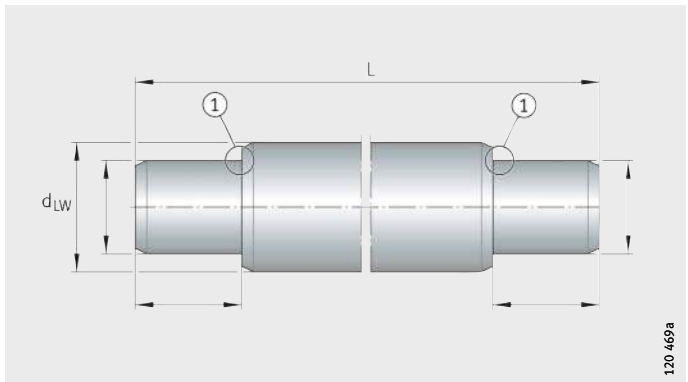


Figure 5
Width across flats W

120 468



① Undercut type F DIN 509 (both sides)

Figure 6
Journal

120 469a

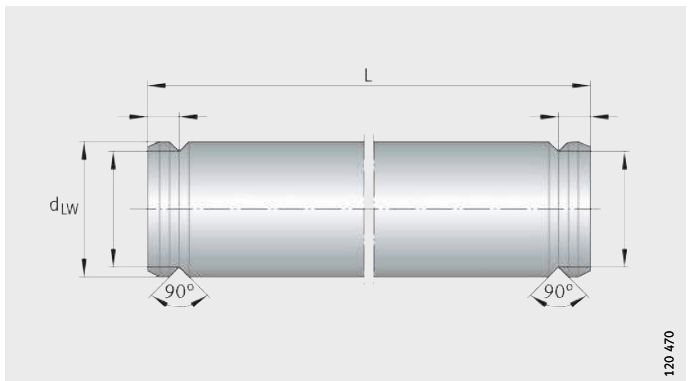


Figure 7
90° undercut

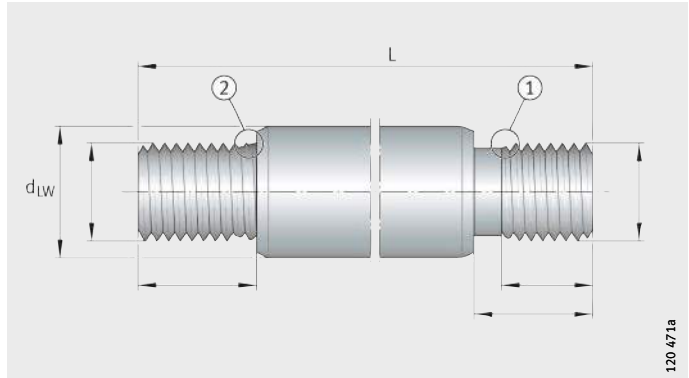
120 470



Solid shafts, hollow shafts

- ① Thread runout to DIN 76-1A, with undercut to DIN 76-A
- ② With undercut, DIN 76-A recommended

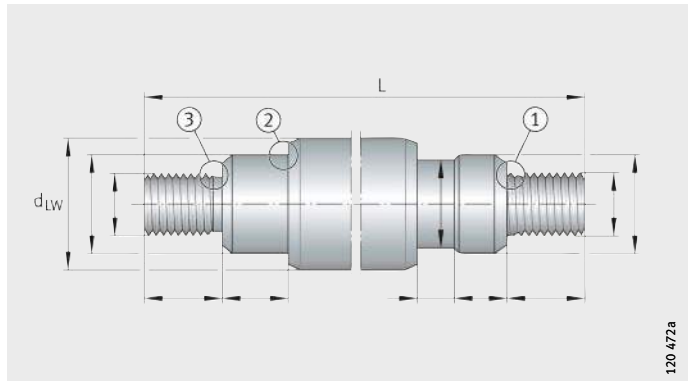
Figure 8
Threaded journal



120 471a

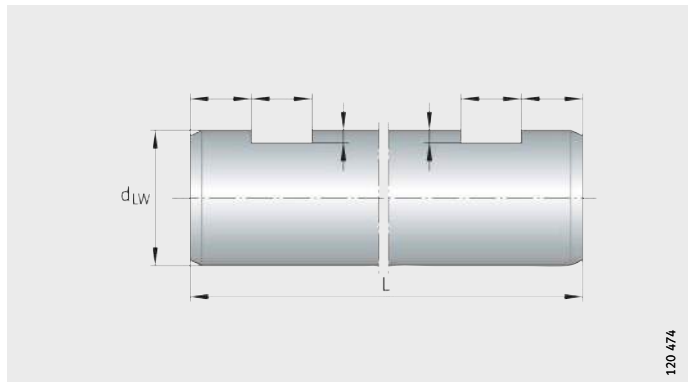
- ① With undercut, DIN 76-A recommended
- ② With undercut type F, DIN 509 recommended
- ③ Thread runout to DIN 76-1A

Figure 9
Journal and threaded journal



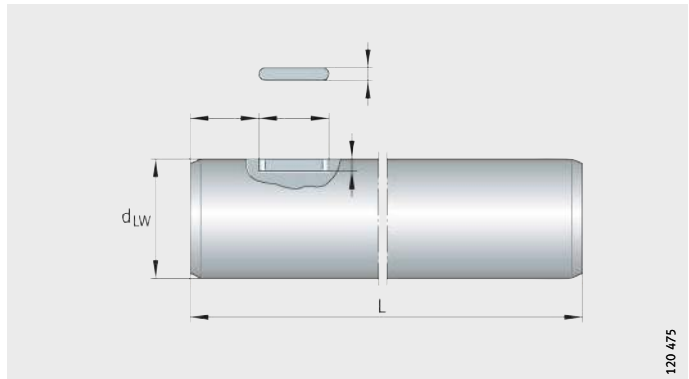
120 472a

Figure 10
Slot



120 474

Figure 11
Keyway



120 475

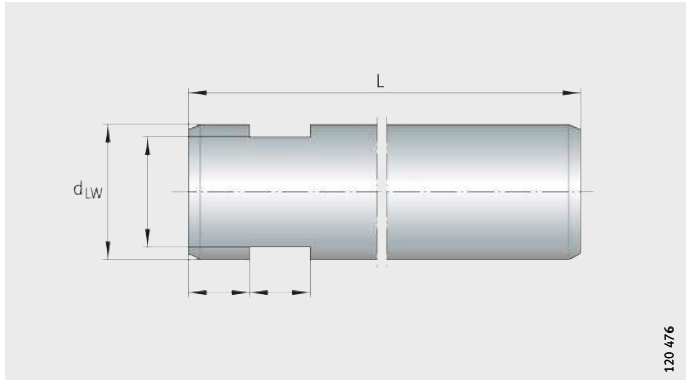


Figure 12
Width across flats

120 476

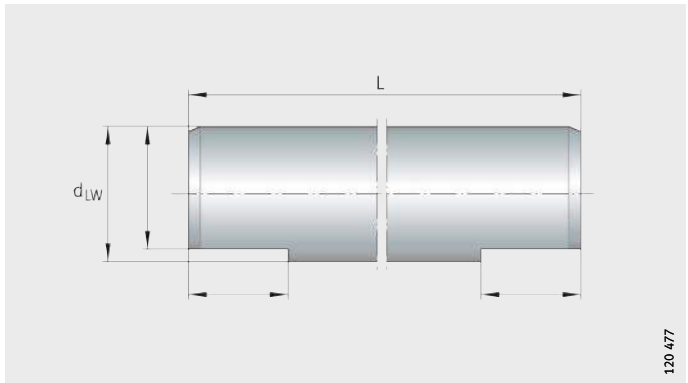


Figure 13
Flattened area

120 477



Solid shafts, hollow shafts

Shaft machining, shaft specification

Soft annealed shafts

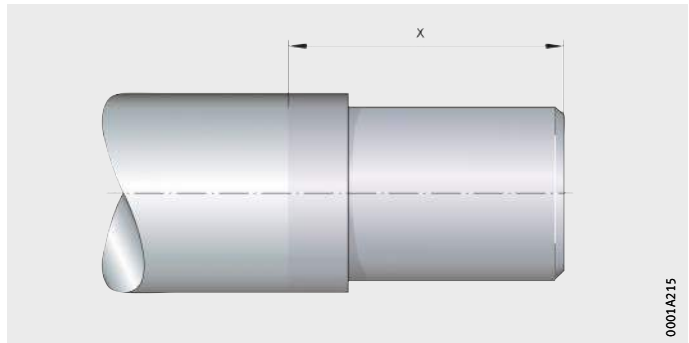
Additional machining (such as journals, flattened areas, external threads) may require soft annealing of the corresponding areas. In this case, slight changes may occur in the dimensional and geometrical tolerances as well as the surface quality of the soft annealed area, *Figure 14*. Material discoloration may occur in the annealed area and there may be residual hardness in the transitional zone.



In the case of corrosion-resistant steels, the X class materials, the anti-corrosion protection is restricted here.

x = soft annealed area

Figure 14
Soft annealed shaft



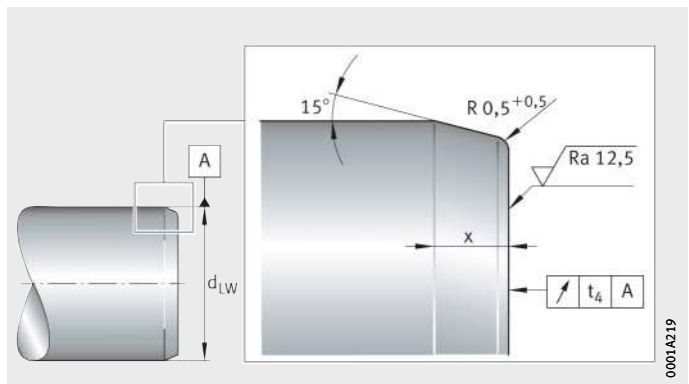
Standard chamfer

After cutting to length, both ends of the shaft are chamfered, *Figure 15* and table. However, they can also be supplied without chamfers as a parting cut, *Figure 16*, page 119.

Chamfer, as a function of shaft diameter

Shaft diameter d_{LW} mm	Chamfer x mm	Axial runout t_4 mm
$d_{LW} \leq 8$	$0,5 \times 45^\circ$	0,2
$8 < d_{LW} \leq 10$	1^{+1}	0,2
$10 < d_{LW} \leq 30$	$1,5^{+1}$	0,3
$30 < d_{LW} \leq 80$	$2,5^{+1}$	0,5

Figure 15
Standard chamfer



Parting cut In the case of a parting cut, the shaft is only cut to length, *Figure 16*. There is no additional machining of the end faces. A burr may be present. The suffix is T.

t_4 = axial runout tolerance, table, page 118

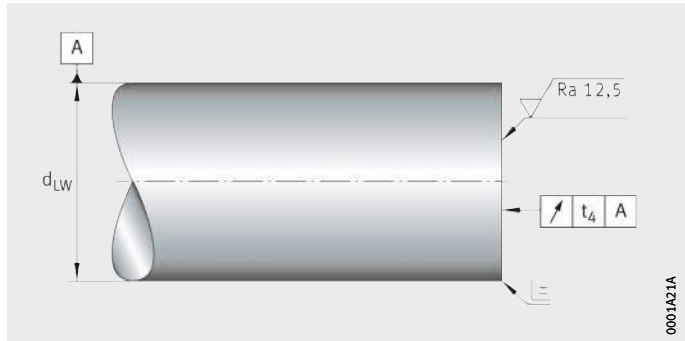


Figure 16
Parting cut

Straightness The standard straightness is shown in *Figure 17*.

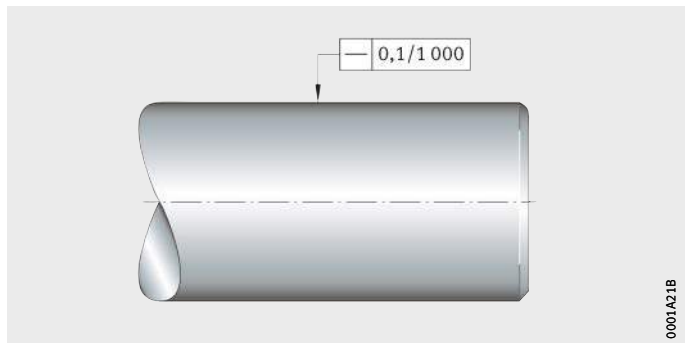


Figure 17
Straightness

Shafts with mortice and tenon joint If the shaft length is in excess of the stock length, the shafts are joined together.

The individual sections of shafts are joined by means of mortice and tenon joints, *Figure 18*. The joints are marked accordingly. Shafts screwed together are available by agreement.

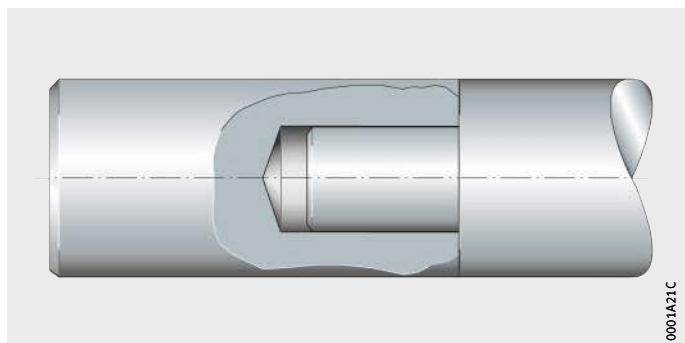


Figure 18
Shaft with mortice and tenon joint

Solid shafts, hollow shafts

Accuracy Length tolerance

Length tolerances are dependent on the shaft length, see table and *Figure 19*.

Special tolerances are available by agreement.

Tolerance

Shaft length L mm		Tolerance mm
over	incl.	max.
–	400	±0,5
400	1 000	±0,8
1 000	2 000	±1,2
2 000	4 000	±2
4 000	6 000	±3

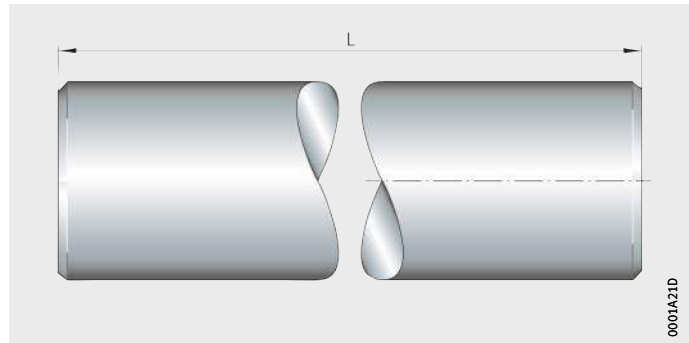


Figure 19
Length tolerance

Straightness value to ISO 13012

The measurement points are separated by a distance of 1 000 mm. Shafts < 1 000 mm have a maximum of two measurement points, *Figure 20*.

The straightness tolerance is half of the dial gauge value with a shaft revolution of 360°.

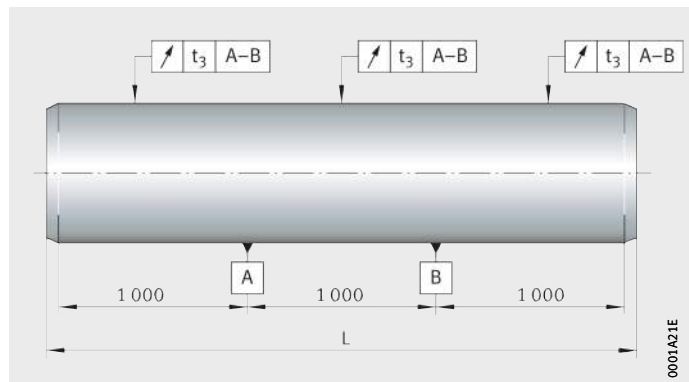


Figure 20
Straightness measurement

**Ordering example,
ordering designation**

Solid shaft, without machining	Type	W
	Shaft diameter d_{LW}	20
	Tolerance	h6
	Material	Cf53
	Coating	–
	Length	1 200
	Parting cut	–
	Standard chamfer	No suffix
Ordering designation	W20/h6-Cf53-1 200	
Hollow shaft, without machining	Type	WH
	Shaft diameter d_{LW}	20
	Tolerance	h7
	Material	C60
	Coating	–
	Length	1 500
	Parting cut	T
	Standard chamfer	–
Ordering designation	WH20/h7-C60-1 500-T	
Solid shaft, with machining	Type	W
	Shaft diameter d_{LW}	30
	Tolerance	h7
	Material	Cf53
	Coating	Cr
	Hole pattern	B05
	Axial threaded hole	M12
	Radial threaded hole	M10
	Hole pitch, radial threaded hole	100
	Length	1 110
	Parting cut	T
	Standard chamfer	–
	Distance a_L	60
	Distance a_R	50
Ordering designation	W30/h7-Cf53-Cr-B05/M12-M10×100-1110-T-60-50	



Solid shafts, hollow shafts

Solid shaft, according to customer requirements

If the standard designations are not sufficient to describe the shaft, please submit a drawing with your enquiry.

Possible ordering designation for standard shafts

Type	W, WH
Shaft diameter d_{LW}	10 to 80
Tolerance ¹⁾	h6, h7
Material ²⁾	Cf53, X46, X90
Coating	Cr, RROC
Hole pattern	B01, B02, B03, B04, B05
Axial threaded hole ³⁾	M3 to M24
Radial threaded hole ³⁾	M4 to M14
Hole pitch, radial threaded hole j_L	Measured from centre point of hole, <i>Figure 21</i>
Length ³⁾	Single piece up to 6 000
Parting cut	T
Standard chamfer	No suffix
Distance a_L	Start of shaft – first hole, <i>Figure 21</i>
Distance a_R	Last hole – end of shaft, <i>Figure 21</i>

1) Available tolerances are dependent on diameter, see dimension table page 124 and page 126.

2) Hollow shafts are only available in Cf53 and C60.

3) Dependent on diameter, see dimension table page 124 to page 126.

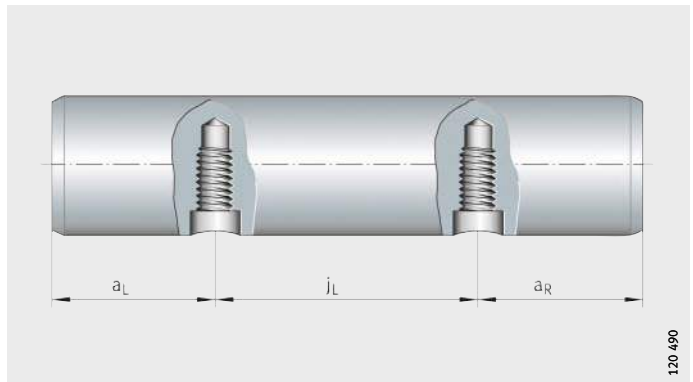


Figure 21
Hole pitch of radial threaded hole j_L

Shaft guidance system

Elements of shaft guidance systems (linear ball bearings, solid and hollow shafts) must be ordered separately.

The ordering designation of an element comprises the designation and additional specific data – where necessary, see ordering designation for shaft with axial threaded hole, linear ball bearing and *Figure 22*.

The designations are given in the dimension tables. The unit is described in greater detail by means of the additional data.

Required

A shaft guidance system in a corrosion-resistant design with two sealed and corrosion-resistant linear ball bearings.

Shaft with axial threaded holes	Corrosion-resistant shaft	W20/h6-X90
	Code for hole pattern	B02
	Axial threaded hole	M8
	Shaft length	3 500
Ordering designation	1×W20/h6-X90-B02/M8-3500	
Linear ball bearing	Linear ball bearing	KB
	Size code	20
	Contact seals on both end faces	PP
	Corrotect® coating	RR
	Relubrication facility	AS
Ordering designation	2×KB20-PP-RR-AS	

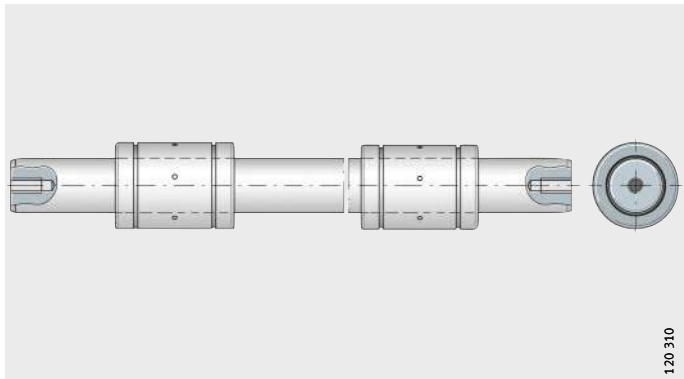
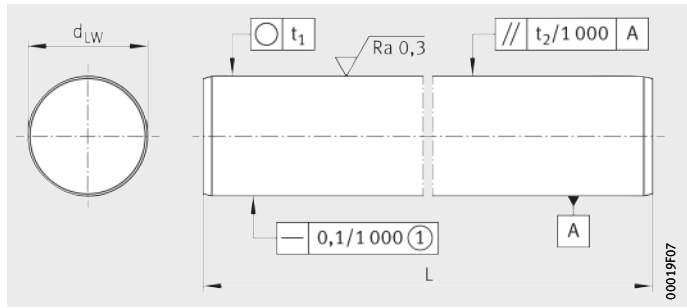


Figure 22

Shaft with axial threaded holes,
two linear ball bearings



Solid shafts



W
①³⁾

Dimension table - Dimensions in mm

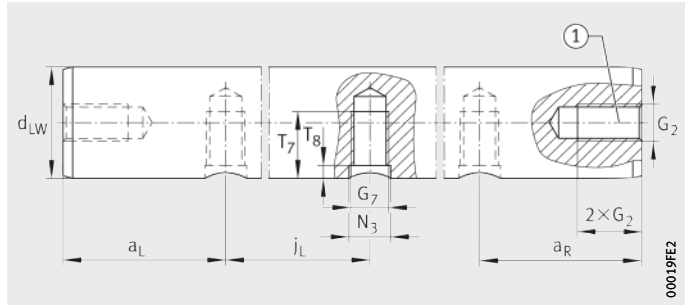
Designation	Mass m ≈kg/m	Dimensions		Tolerance h6 μm	Roundness t ₁ μm	Parallelism t ₂ ¹⁾ μm	Surface hardening depth SHD ²⁾ min.
		d _{LW}	L				
W04	0,1	4	2 500	$\begin{matrix} 0 \\ -8 \end{matrix}$	4	5	0,4
W05	0,15	5	4 000	$\begin{matrix} 0 \\ -8 \end{matrix}$	4	5	0,4
W06	0,22	6	4 000	$\begin{matrix} 0 \\ -8 \end{matrix}$	4	5	0,4
W08	0,39	8	4 000	$\begin{matrix} 0 \\ -9 \end{matrix}$	4	6	0,4
W10	0,62	10	6 000	$\begin{matrix} 0 \\ -9 \end{matrix}$	4	6	0,4
W12	0,89	12	6 000	$\begin{matrix} 0 \\ -11 \end{matrix}$	5	8	0,6
W14	1,21	14	6 000	$\begin{matrix} 0 \\ -11 \end{matrix}$	5	8	0,6
W15	1,39	15	6 000	$\begin{matrix} 0 \\ -11 \end{matrix}$	5	8	0,6
W16	1,58	16	6 000	$\begin{matrix} 0 \\ -11 \end{matrix}$	5	8	0,6
W20	2,47	20	6 000	$\begin{matrix} 0 \\ -13 \end{matrix}$	6	9	0,9
W25	3,85	25	6 000	$\begin{matrix} 0 \\ -13 \end{matrix}$	6	9	0,9
W30	5,55	30	6 000	$\begin{matrix} 0 \\ -13 \end{matrix}$	6	9	0,9
W40	9,87	40	6 000	$\begin{matrix} 0 \\ -16 \end{matrix}$	7	11	1,5
W50	15,41	50	6 000	$\begin{matrix} 0 \\ -16 \end{matrix}$	7	11	1,5
W60	22,2	60	6 000	$\begin{matrix} 0 \\ -19 \end{matrix}$	8	13	2,2
W80	39,45	80	6 000	$\begin{matrix} 0 \\ -19 \end{matrix}$	8	13	2,2

1) Differential diameter measurement.

2) To DIN ISO 13012.

3) ① For shaft length < 400 mm, max. straightness tolerance of 0,04 mm.

Recommended threaded holes for solid shafts



Axial and radial threaded holes
① ②

Dimension table · Dimensions in mm

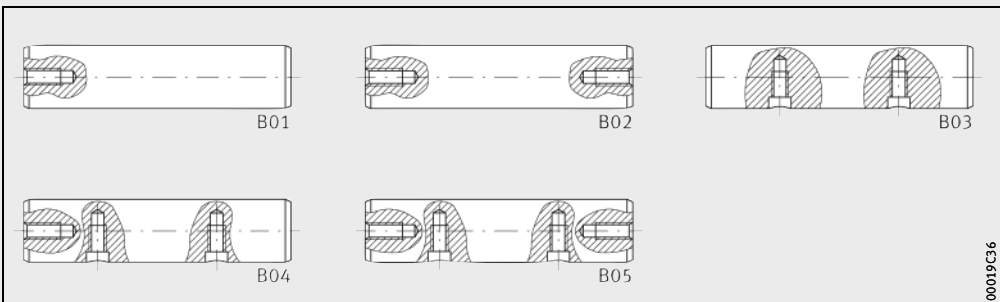
Designation d_{LW}	Axial threaded hole										Radial threaded hole								
	G_2										j_L	$a_{L \min}^{1)}$ Hole pattern B03	$a_{R \min}^{1)}$ Hole pattern B04–B05	T_7	T_8	N_3	G_7		
W08	M3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		
W10	M3	M4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		
W12	–	M4	M5	–	–	–	–	–	–	75	–	120	10	–	7	2	5	M4	
W14	–	M4	M5	M6	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
W15	–	–	M5	M6	M8	–	–	–	–	–	–	–	–	–	–	–	–	–	
W16	–	–	M5	M6	M8	–	–	–	–	75	100	150	15	–	9	2,5	6	M5	
W20	–	–	–	–	–	–	–	–	–	–	–	150	15	–	9	2,5	6	M5	
W20	–	–	–	M6	M8	M10	–	–	–	75	100	150	15	–	11	3	7	M6	
W25	–	–	–	–	–	–	–	–	–	–	–	150	15	–	11	3	7	M6	
W25	–	–	–	–	M8	M10	M12	–	–	75	120	200	15	$3 \cdot G_2 + G_7$	15	3	9	M8	
W30	–	–	–	–	–	–	–	–	–	–	–	150	15	–	11	3	7	M6	
W30	–	–	–	–	–	M10	M12	M16	–	100	150	200	20	–	17	3,5	11	M10	
W40	–	–	–	–	–	M10	M12	M16	–	150	200	300	20	–	19	4	11	M10	
W40	–	–	–	–	–	M10	M12	M16	–	100	–	–	20	–	21	4	13	M12	
W40	–	–	–	–	–	–	–	–	–	–	–	150	20	–	19	4	11	M10	
W50	–	–	–	–	–	–	M12	M16	M20	–	–	200	300	20	–	21	4	13	M12
W50	–	–	–	–	–	–	M12	M16	M20	–	100	–	–	20	–	25	4	15	M14
W60	–	–	–	–	–	–	–	M16	M20	M24	–	–	–	–	–	–	–	–	–
W80	–	–	–	–	–	–	–	M16	M20	M24	–	–	–	–	–	–	–	–	–

1) a_L , a_R are dependent on the length of the shaft.

Calculation, see page 134.

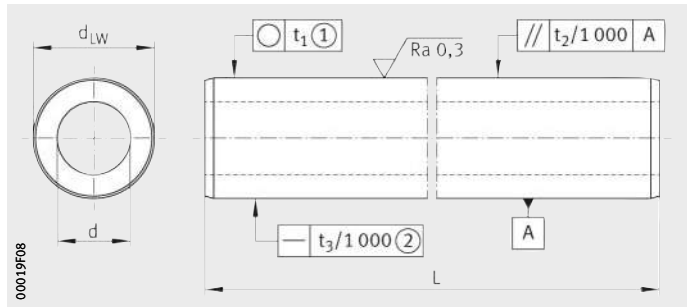
In the case of variants in accordance with codes B04 and B05, the axial threaded holes must be taken into consideration.

2) ① Depending on the hole diameter, the shaft diameter may be larger in the region of the axial hole, as a result of which there may be a deviation from the tolerances.



Codes B01 to B05 for hole patterns

Hollow shafts



WH
①, ② 4)

Dimension table - Dimensions in mm

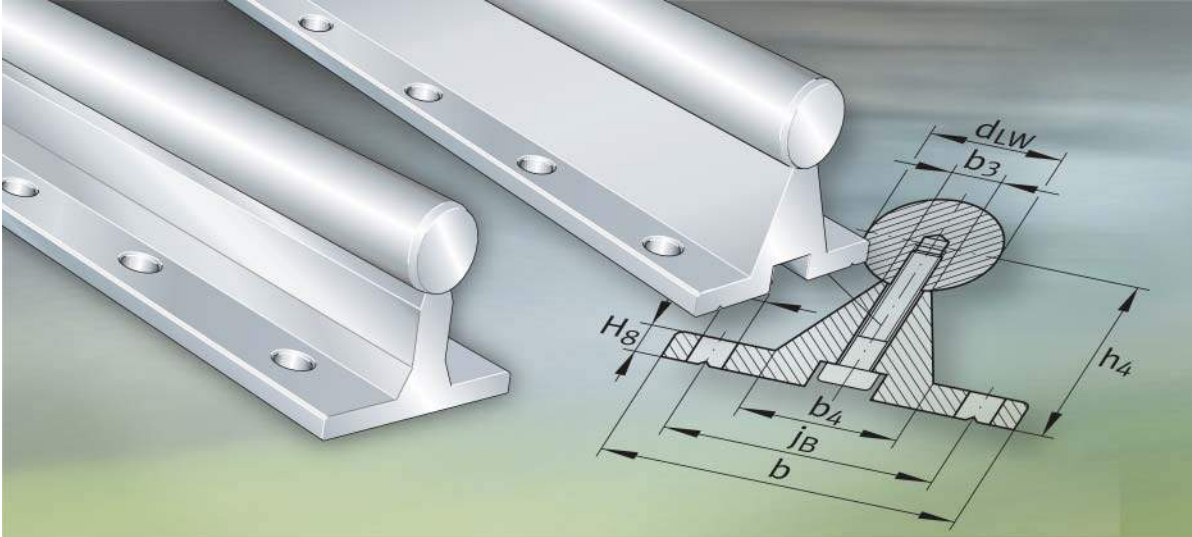
Designation	Mass m ≈kg/m	Dimensions		Inside diameter d ¹⁾	Tolerance d _{LW} h7 ³⁾ μm	Parallelism t ₂ μm	Straightness tolerance t ₃ μm	Surface hardening depth SHD ²⁾ min.
		d _{LW}	L max.					
WH12	0,79	12	5 700	4 ±0,45	⁰ ₋₁₈	7	0,3	0,8
WH16	1,26	16	5 700	7 ±0,15	⁰ ₋₁₈	7	0,3	0,8
WH20	1,28	20	6 000	14 ±0,15	⁰ ₋₂₁	9	0,2	1,2
WH25	2,4	25	7 100	15,4±0,15	⁰ ₋₂₁	9	0,2	1,2
WH30	3,55	30	7 100	18 ±0,15	⁰ ₋₂₁	9	0,2	1,5
WH40	5,7	40	7 100	26 ±0,15	⁰ ₋₂₅	11	0,1	1,5
WH50	10,58	50	6 500	28 ±0,25	⁰ ₋₂₅	11	0,1	1,5
WH60	14,2	60	7 300	36 ±0,3	⁰ ₋₃₀	13	0,1	1,5
WH80	20,8	80	7 300	57,4±0,35	⁰ ₋₃₀	13	0,1	2,2

1) Difference in the wall thickness relative to the original material ±5%.

2) To DIN ISO 13012.

3) Diameter tolerance h6 available by agreement.

4) ① The roundness corresponds to no more than half the diameter tolerance.
② For shaft length < 500 mm, max. straightness tolerance of 0,1 mm.



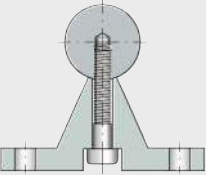
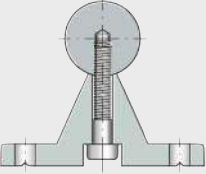
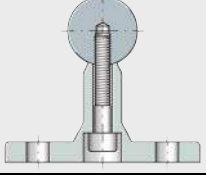
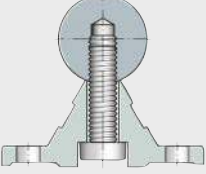
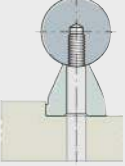
Shaft and support rail units

Shaft and support rail units

	Page
Matrix	Matrix for preselection of shaft and support rail units 130
Product overview	Shaft and support rail units 132
Features	Multi-piece raceway shafts and shaft and support rail units 133
Design and safety guidelines	Hole patterns for shaft and support rail units 134
Accuracy	Length tolerances for shafts and shaft and support rail units 136
Ordering example, ordering designation	Shaft and support rail unit 136 Possible ordering designation for standard shaft and support rail units 136
Dimension tables	Shaft and support rail units 138



**Matrix for preselection
of shaft and support rail units**

Shaft and support rail units	Precision
TSNW 	+++
TSWW 	+++
TSWWA 	+++
TSNW..-G4 TSNW..-G5 	++
TSUW 	+++

Definition:
 +++ Very good
 ++ Good
 ● Available

¹⁾ Location by screw mounting from below; threaded hole in the shaft.

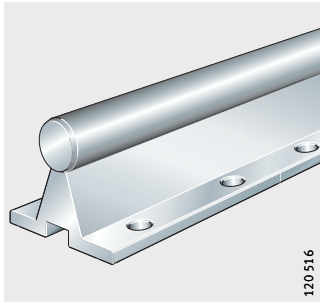
Shaft diameter d_{LW} in mm							Features	Location		Description
								Thread	Through hole	
12	16	20	25	30	40	50			Page	
●	●	●	●	●	●	●	<input type="checkbox"/> For location from above	–	yes	133
●	●	●	●	●	●	●	<input type="checkbox"/> For location from above <input type="checkbox"/> High position of shaft	–	yes	133
●	●	●	●	●	–	–	<input type="checkbox"/> For location from above <input type="checkbox"/> Narrow crosspiece	–	yes	133
●	●	●	●	●	●	–	<input type="checkbox"/> For location from above <input type="checkbox"/> Accuracy class (G4, G5) dependent on shaft diameter <input type="checkbox"/> Economical	–	yes	133
●	●	●	●	●	●	●	<input type="checkbox"/> Threaded holes from below	¹⁾	–	133



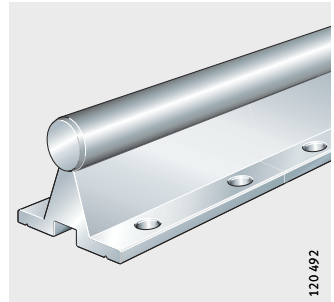
Product overview Shaft and support rail units

Shaft and support rail units

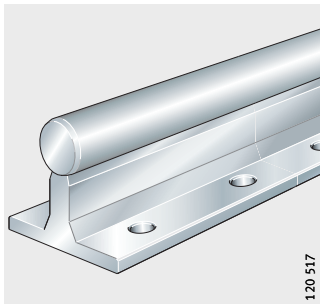
TSNW



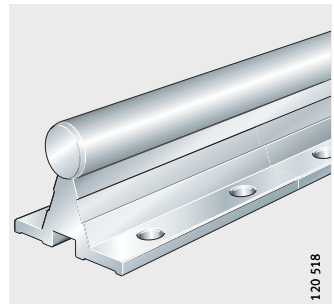
TSWW



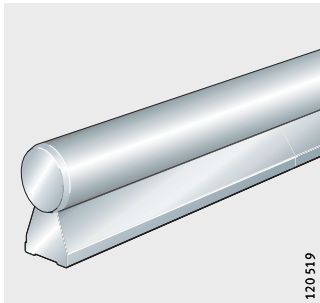
TSWWA



TSNW..-G4, TSNW..-G5



TSUW



Shaft and support rail units

Features

Shaft and support rail units TS..W are composite units comprising a raceway shaft screw mounted to an aluminium support rail. The shaft protrudes approx. 2 mm to 3 mm beyond the end of the support rail at both ends.

The raceway shaft is made from quenched and tempered steel, see page 109. Corrosion-resistant design available by agreement.

Shaft and support rail units are composed of several individual sections depending on their length.

Shafts made from special materials such as those with coatings are available by agreement.

Multi-piece raceway shafts and shaft and support rail units

If the guidance systems are of such a length that shaft and support rail units TS..W cannot be achieved using single-piece shafts, shafts and support rails are supplied as multi-piece units, *Figure 1*. The joint locations on the shaft sections have mortice and tenon joints and are polished.

The joint locations on the shafts and support rails are offset from each other.

The maximum length of single-piece shaft and support rail units is 6 000 mm.

- ① Shaft
- ② Support rail 1
- ③ Support rail 2

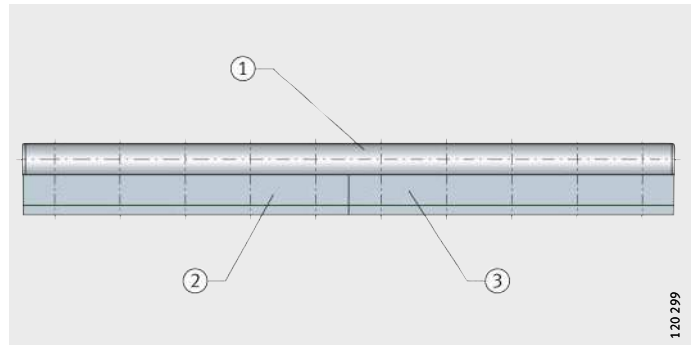


Figure 1
Shaft and support rail unit
with multiple support rail sections



Shaft and support rail units

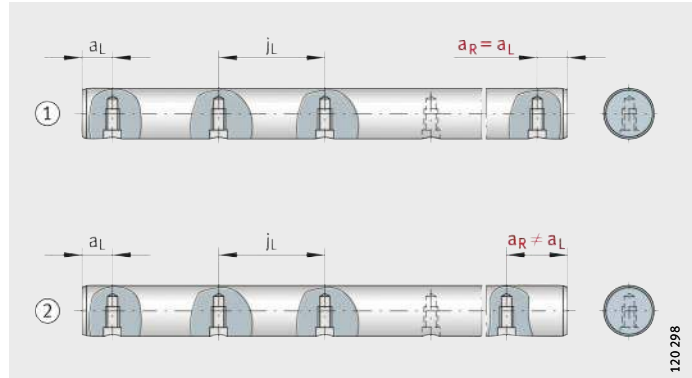
Design and safety guidelines Hole patterns for shaft and support rail units

Unless stated otherwise, raceway shafts and shaft and support rail units are supplied with a symmetrical hole pattern, *Figure 2* to *Figure 4*.

An asymmetrical hole pattern may be available at customer request. In this case, $a_{L\ max} \geq a_L \geq a_{L\ min}$ and $a_{R\ max} \geq a_R \geq a_{R\ min}$.

- ① Symmetrical hole pattern
- ② Asymmetrical hole pattern

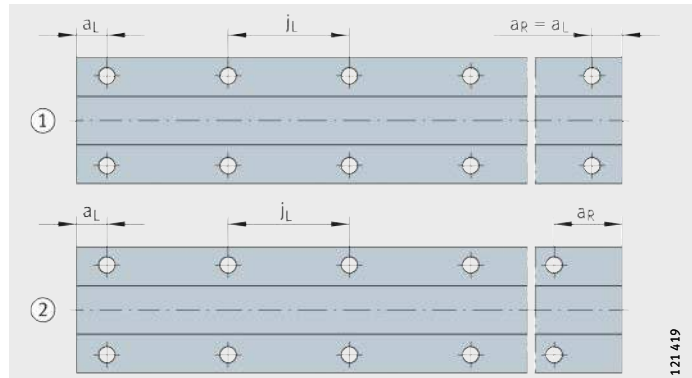
Figure 2
Hole patterns for shafts
with one row of holes



120.298

- ① Symmetrical hole pattern
- ② Asymmetrical hole pattern

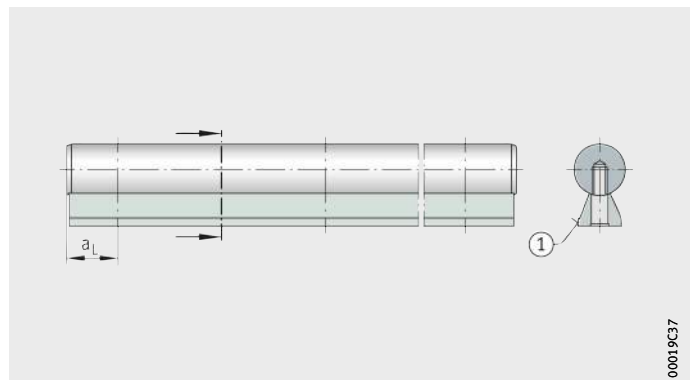
Figure 3
Hole patterns for support rails
with two rows of holes



121.419

- ① Support rail

Figure 4
Hole patterns
for shaft and support rail unit TSUW



00019C37

Maximum number of pitches between holes

The number of pitches between holes is the rounded whole number equivalent to:

$$n = \frac{l - 2 \cdot a_{L \min}}{j_L}$$

The distances a_L and a_R are generally determined by:

$$a_L + a_R = l - n \cdot j_L$$

For raceway shafts and shaft and support rail units with a symmetrical hole pattern:

$$a_L = a_R = \frac{1}{2} \cdot (l - n \cdot j_L)$$

Number of holes:

$$x = n + 1$$

n	mm
Maximum possible number of pitches or recommended distance between screws on shaft and support rail units with T-slots	
l	mm
Length of shaft and support rail unit	
a_L, a_R	mm
Distance between start or end of shaft and support rail unit and nearest hole	
$a_{L \min}, a_{R \min}$	mm
Minimum values for a_L, a_R according to dimension tables	
$a_{L \max}, a_{R \max}$	mm
Maximum values for a_L, a_R according to dimension tables	
j_L	mm
Distance between holes	
x	mm
Number of holes on shaft and support rail units with T-slots: number of screws.	



If the minimum and maximum values for a_L and a_R are not observed, the counterbores of the holes may be intersected. The position a_L for shaft and support rail unit TSUW is shown in *Figure 4*, page 134.



Shaft and support rail units

Accuracy Length tolerances for shafts and shaft and support rail units

The length tolerances are shown in the table.

Tolerances

Length of shaft or shaft and support rail unit L mm	Length tolerance mm
Single-piece and multi-piece raceway shaft and support rail units	$\pm 0,1\%$ of total length
$L \leq 400$	$\pm 0,5$
$400 < L \leq 1\,000$	$\pm 0,8$
$1\,000 < L \leq 2\,000$	$\pm 1,2$
$2\,000 < L \leq 4\,000$	± 2
$4\,000 < L \leq 6\,000$	± 3

Ordering example, ordering designation

Shaft and support rail unit

Type	TSNW
Shaft diameter d_{LW}	25
Length	1 253
Distance a_L	26
Distance a_R	27
Corrosion-resistant design	Available by agreement

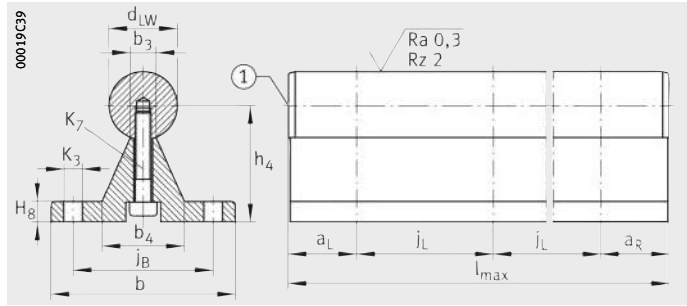
Ordering designation

TSNW25-1253-26-27

Possible ordering designation for standard shaft and support rail units

Type	TSWW, TSNW, TSUW, TSWWA
Shaft diameter d_{LW}	12 to 50
Length	1 200
Distance a_L	Start of shaft – first hole
Distance a_R	Last hole – end of shaft
Corrosion-resistant design	Available by agreement

Shaft and support rail units



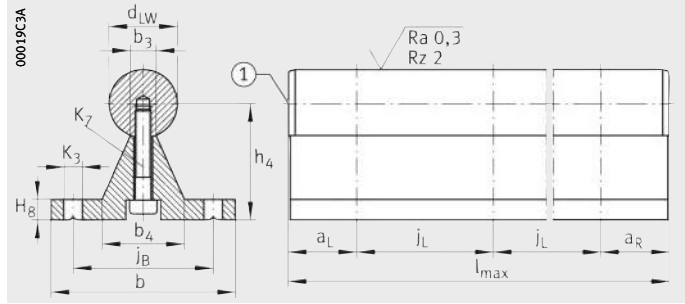
TSNW
①⁵⁾

Dimension table - Dimensions in mm

Designation	Mass m ≈g/m	Dimensions				Mounting dimensions								
		d _{LW} h ₆	b	h ₄ ¹⁾ ±0,02	l _{max} ²⁾ ±3	b ₃	b ₄	j _B	j _L	a _L /a _R ³⁾		H ₈	K ₃ ⁴⁾	K ₇ ISO 4762
										min.	max.			
TSNW12	1 670	12	40	22	6 000	5	17	29	75	20	69	5	4,5	M4×18
TSNW16	2 950	16	45	26	6 000	6,8	22,4	33	100	20	93	5	5,5	M5×22
TSNW20	3 950	20	52	32	6 000	7,5	26,3	37	100	20	92	6	6,6	M6×25
TSNW25	5 600	25	57	36	6 000	9,8	30	42	120	20	110	6	6,6	M8×30
TSNW30	7 880	30	69	42	6 000	11	33,4	51	150	20	139	7	9	M10×35
TSNW40	12 830	40	73	50	6 000	14,5	39,4	55	200	20	189	8	9	M10×35
TSNW50	19 380	50	84	60	6 000	18,5	45,2	63	200	20	188	9	11	M12×40

- 1) In relation to the nominal shaft diameter, measured whilst clamped.
- 2) Maximum length of single-piece shaft and support rail units; longer shaft and support rail units, see page 133. Depending on the length of the shaft and support rail unit, the support rail is composed of several individual sections.
- 3) Dimensions a_L/a_R are dependent on the length of the shaft and support rail unit. Calculation, see page 135.
- 4) For fixing screws DIN 7984. If there is a possibility of settling, the screws should be secured against rotation.
- 5) ① The shaft may if necessary protrude on both sides beyond the support rail by approx. 3 mm.

Shaft and support rail units



TSWW
① 5)

Dimension table · Dimensions in mm

Designation	Mass m ≈g/m	Dimensions				Mounting dimensions								
		d _{LW} h6	b	h ₄ ¹⁾ ±0,02	l _{max} ²⁾ ±3	b ₃	b ₄	j _B	j _L	a _L /a _R ³⁾		H ₈	K ₃ ⁴⁾	K ₇ ISO 4762
										min.	max.			
TSWW12	1 670	12	40	22	6 000	5	17	29	120	20	114	5	4,5	M4×18
TSWW16	3 150	16	54	32	6 000	6,8	24,7	41	150	20	143	6	5,5	M5×25
TSWW20	4 030	20	54	34,02	6 000	7,8	24,7	41	150	20	143	6	5,5	M5×25
TSWW25	5 900	25	65	39,66	6 000	9,3	30,3	51	150	20	142	6	6,6	M6×30
TSWW30	7 580	30	65	42,19	6 000	9,3	30,3	51	150	20	142	6	6,6	M6×30
TSWW40	14 250	40	85	60	6 000	16,3	46	65	150	20	139	10	9	M10×45
TSWW50	19 750	50	85	65,06	6 000	16,3	46	65	150	20	139	10	9	M10×45

1) In relation to the nominal shaft diameter, measured whilst clamped.

2) Maximum length of single-piece shaft and support rail units; longer shaft and support rail units, see page 133.
Depending on the length of the shaft and support rail unit, the support rail is composed of several individual sections.

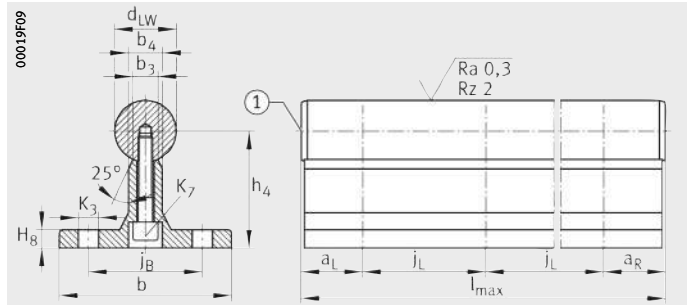
3) Dimensions a_L/a_R are dependent on the length of the shaft and support rail unit.
Calculation, see page 135.

4) For fixing screws ISO 4762 or ISO 4017 (TSWW12, DIN 7984).
If there is a possibility of settling, the screws should be secured against rotation.

5) ① The shaft may if necessary protrude on both sides beyond the support rail by approx. 3 mm.



Shaft and support rail units



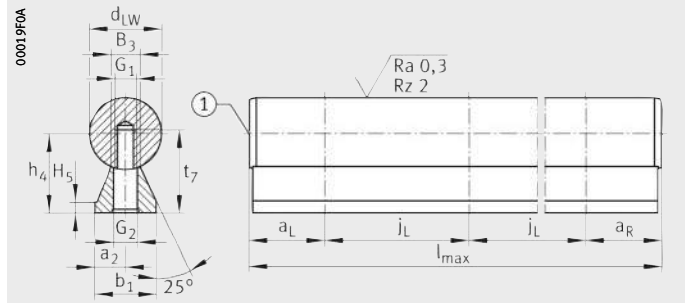
TSWWA
① ⑥

Dimension table - Dimensions in mm

Designation	Mass m ≈g/m	Dimensions				Mounting dimensions								
		d _{LW} h6	b	h ₄ ¹⁾ ±0,02	l _{max} ²⁾ ±3	b ₃	b ₄	j _B	j _L	a _L /a _R ³⁾		H ₈	K ₃ ⁴⁾	K ₇ ISO 4762
										min.	max.			
TSWWA12	1 930	12	43	28	6 000	5,4	9	29	75	20	69	5	4,5	M4×25 ⁵⁾
TSWWA16	2 800	16	48	30	6 000	7	10	33	100	20	93	5	5,5	M5×25
TSWWA20	4 120	20	56	38	6 000	8,2	11	37	100	20	92	6	6,6	M6×30
TSWWA25	5 830	25	60	42	6 000	10,4	14	42	120	20	110	6	6,6	M8×30
TSWWA30	8 500	30	74	53	6 000	11	14	51	150	20	139	8	9	M10×40

- 1) In relation to the nominal shaft diameter, measured whilst clamped.
- 2) Maximum length of single-piece shaft and support rail units; longer shaft and support rail units, see page 133. Depending on the length of the shaft and support rail unit, the support rail is composed of several individual sections.
- 3) Dimensions a_L/a_R are dependent on the length of the shaft and support rail unit. Calculation, see page 135.
- 4) For fixing screws ISO 4762 or ISO 4017. If there is a possibility of settling, the fixing screws should be secured against rotation.
- 5) Screws DIN 7984.
- 6) ① The shaft protrudes on both sides beyond the support rail by approx. 2 mm.

Shaft and support rail units



TSUW
① 4)

Dimension table · Dimensions in mm

Designation	Mass m ≈g/m	Dimensions					Mounting dimensions							
		d _{LW}	b ₁	h ₄ ¹⁾	l _{max} ²⁾	a ₂	B ₃	j _L	a _L /a _R ³⁾		H ₅	G ₁	G ₂	t ₇
		h6		±0,02	±3				min.	max.				
TSUW12	1 100	12	11	14,5	6 000	5,5	5	75	20	70	3	M4	4,5	15,5
TSUW16	1 880	16	14	18	6 000	7	6,8	75	20	70	3	M5	5,5	19
TSUW20	2 920	20	17	22	6 000	8,5	7,8	75	20	69	3	M6	6,6	23
TSUW25	4 420	25	21	26	6 000	10,5	9,8	75	20	68	3	M8	9	28,5
TSUW30	6 220	30	23	30	6 000	11,5	11	100	20	92	3	M10	11	31,5
TSUW40	11 030	40	30	39	6 000	15	14,5	100	20	91	4	M12	13,5	39,5
TSUW50	16 980	50	35	46	6 000	17,5	18,5	100	20	90	5	M14	15,5	46

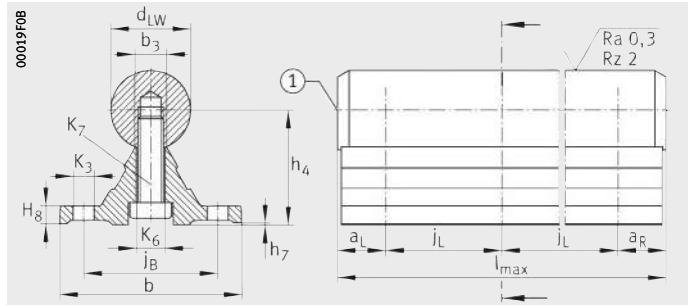
Attention!

The shaft and support rail are supplied unassembled.

- 1) In relation to the nominal shaft diameter, measured whilst clamped.
- 2) Maximum length of single-piece shaft and support rail units; longer shaft and support rail units, see page 133.
Depending on the length of the shaft and support rail unit, the support rail is composed of several individual sections.
- 3) Dimensions a_L/a_R are dependent on the length of the shaft and support rail unit.
Calculation, see page 135.
- 4) ① The shaft protrudes on both sides beyond the support rail by approx. 2 mm.



Shaft and support rail units



TSNW..-G4, TSNW..-G5

① ⑥

Dimension table - Dimensions in mm

Designation	Mass m ≈g/m	Dimensions				Mounting dimensions		
		d _{LW}	b	h ₄ ¹⁾	l _{max} ²⁾	b ₃	j _B	j _L
		h6			±2			
TSNW12-G4	1 600	12	40	22±0,1	4 000	5	29	75
TSNW16-G4	2 500	16	45	26±0,1	4 000	6,8	33	100
TSNW20-G4	3 800	20	52	32±0,1	4 000	7,8	37	100
TSNW25-G4	5 300	25	57	36±0,1	4 000	9,8	42	120
TSNW30-G5	7 500	30	69	42±0,15	4 000	11	51	150
TSNW40-G5	12 400	40	73	50±0,15	4 000	14,5	55	200

1) In relation to the nominal shaft diameter, measured whilst clamped.

2) Maximum length of single-piece shaft and support rail units.

3) Dimensions a_L/a_R are dependent on the length of the shaft and support rail unit. Calculation, see page 135.

4) For fixing screws DIN 7964.

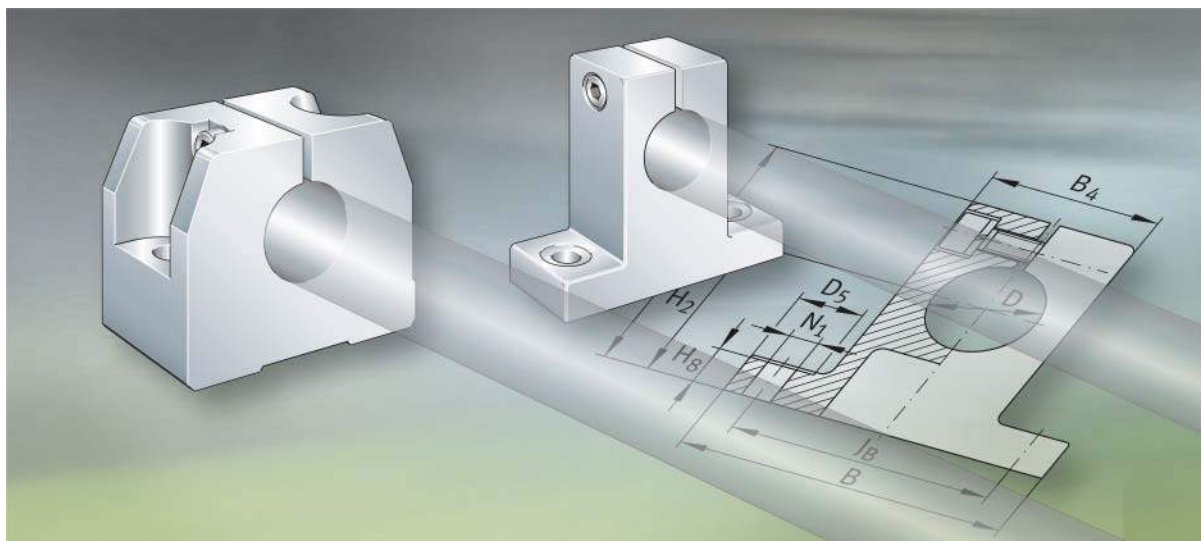
If there is a possibility of settling, the screws should be secured against rotation.

5) Maximum variation of dimension h₄, measured on the same shaft and support rail unit over a length of 1 000 mm.

6) ① The shaft protrudes on both sides beyond the support rail by approx. 2 mm.

a _L /a _R ³⁾		H ₈	h ₇	K ₃ ⁴⁾	K ₆	K ₇	Variation of h ₄ ⁵⁾	
							Accuracy class	Variation mm
min.	max.					ISO 4762		
20	69	5	0,2	4,5	4,5	M4×18	G4	0,03
20	93	5	0,2	5,5	5,5	M5×22	G4	0,03
20	92	6	0,2	6,6	6,6	M6×25	G4	0,03
20	110	6	0,3	6,6	9	M8×30	G4	0,03
20	139	7	0,3	9	11	M10×30	G5	0,04
20	189	8	0,3	9	11	M10×35	G5	0,04





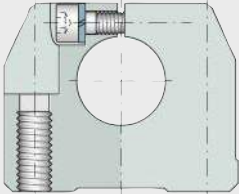
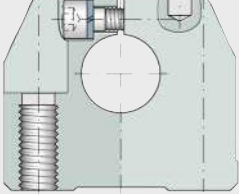
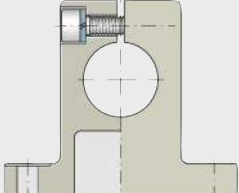
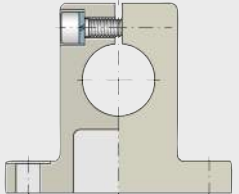
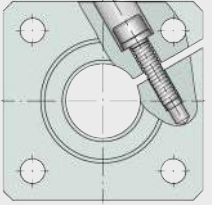
Shaft support blocks

Shaft support blocks

	Page
Matrix Matrix for preselection of shaft support blocks	146
Product overview Shaft support blocks	148
Features	149
Dimension tables Shaft support blocks	150
Shaft support block with flange	154



**Matrix for preselection
of shaft support blocks**

Shaft support blocks	Material
<p>GWH...-B</p> 	Aluminium
<p>GWN...-B</p> 	Aluminium
<p>GW</p> 	Diecast zinc
<p>GWA...-B</p> 	Diecast zinc
<p>FW...-B</p> 	Aluminium

Definition:

- Available for stated shaft diameter d_{LW}

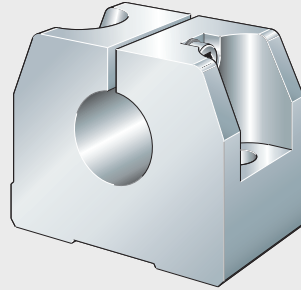
For shaft diameter d_{LW} in mm											Features	Location		Description
06	08	10	12	14	16	20	25	30	40	50		Thread	Through hole	
●	●	●	●	●	●	●	●	●	●	●	<input type="checkbox"/> Low position of shaft	yes	yes	149
-	-	-	●	-	●	●	●	●	●	●	<input type="checkbox"/> Suitable for dowelling	yes	yes	149
-	-	●	●	●	●	●	●	●	●	●	<input type="checkbox"/> Space-saving design	-	yes	149
-	-	●	●	-	●	●	●	●	●	●	<input type="checkbox"/> For larger fixing screws <input type="checkbox"/> Space-saving design	-	yes	149
-	-	-	●	-	●	●	●	●	●	●	<input type="checkbox"/> Suitable for dowelling	yes	yes	149



Product overview Shaft support blocks

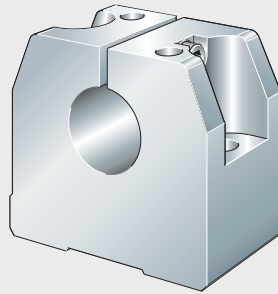
Shaft support blocks

GWH..-B



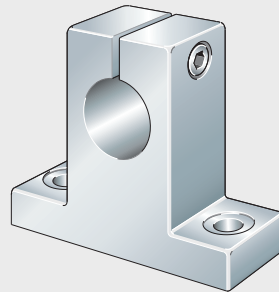
120 461

GWN..-B



120 462

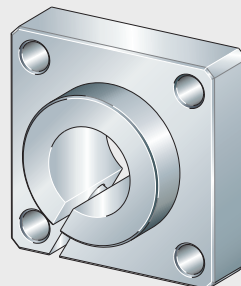
GW, GWA..-B



120 460

Shaft support block with flange

FW..-B



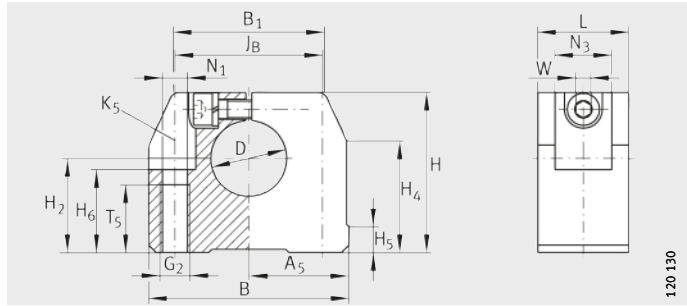
00019DF

Shaft support blocks

- Features** Shaft support blocks are used to support shafts and locate the ends of the shaft.
- They are suitable for all the solid and hollow shafts in this catalogue.
- They are made from either an aluminium alloy or pressure diecast zinc.
- Series GWA...B is identical in design to series GW but is suitable for larger fixing screws.
- Depending on the series, the shaft support blocks have through holes or threaded holes.



Shaft support blocks



GWH..-B

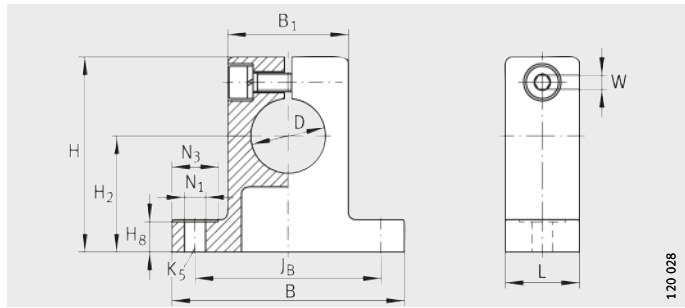
Dimension table - Dimensions in mm

Designation	Mass m ≈g	Dimensions				Mounting dimensions													
		D H8	B	L	H	J_B ±0,15	A_5	B_1	H_2 ±0,01	H_4	H_5	T_5	H_6	G_2	N_1	N_3	K_5 ¹⁾	W ²⁾	
GWH06-B	30	6	32	16	27	22	16	25	15	20,6	5	11	13	M5	4,3	10	M4	2,5	
GWH08-B	30	8	32	16	27	22	16	25	16	20,6	5	11	13	M5	4,3	10	M4	2,5	
GWH10-B	50	10	40	18	33	27	20	32	18	25,1	5	13	16	M6	5,3	11	M5	3	
GWH12-B	50	12	40	18	33	27	20	32	19	25,1	5	13	16	M6	5,3	11	M5	3	
GWH14-B	70	14	43	20	36,5	32	21,5	34	20	28,1	6,9	13	18	M6	5,3	11	M5	3	
GWH16-B	70	16	43	20	36,5	32	21,5	34	22	28,1	6,9	13	22	M6	5,3	11	M5	3	
GWH20-B	120	20	53	24	42,5	39	26,5	40	25	29,8	7,4	18	22	M8	6,6	15	M6	4	
GWH25-B	170	25	60	28	52,5	44	30	44	31	36,6	9,9	22	26	M10	8,4	18	M8	5	
GWH30-B	220	30	67	30	60	49	33,5	49,5	34	42,7	8	22	29	M10	8,4	18	M8	5	
GWH40-B	480	40	87	40	73,5	66	43,5	63	42	49,7	12,8	26	38	M12	10,5	20	M10	6	
GWH50-B	820	50	103	50	92	80	51,5	74	50	62,3	10,9	34	46	M16	13,5	24	M12	8	

1) For fixing screws ISO 4762-8.8.
If there is a possibility of settling, the screws should be secured against rotation.

2) Width across flats.

Shaft support blocks



GW, GWA..-B

Dimension table · Dimensions in mm

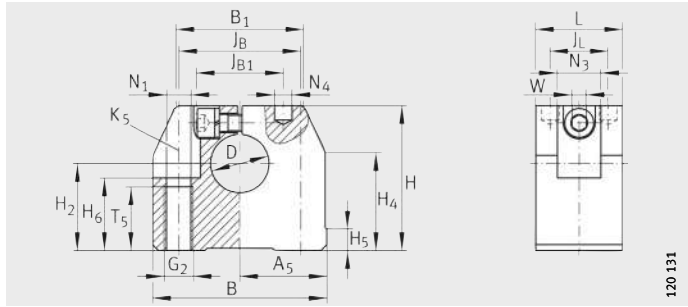
Designation	Mass m ≈g	Dimensions				Mounting dimensions							
		D	B	L	H	J _B	B ₁	H ₂	H ₈	N ₁ ¹⁾	N ₃	K ₅	Width across flats W
GW10	30	10	37	11	30	28±0,15	18	17	5	3,4	8	M3	2,5
GWA10-B										4,5	9	M4	
GW12	40	12	42	12	35	32±0,15	20	20	5,5	4,5	10	M4	3
GWA12-B										5,5	11	M5	
GW14	60	14	46	14	38	36±0,15	23	22	6	4,5	10	M4	3
GWA14-B										5,5	11	M5	
GW16	80	16	50	16	42	40±0,15	26	25	6,5	4,5	10	M4	3
GWA16-B										5,5	11	M5	
GW20	150	20	60	20	50	45±0,15	32	30	7,5	4,5	10	M4	3
GWA20-B										5,5	11	M5	
GW25	260	25	74	25	58	60±0,15	38	35	8,5	5,5	11	M5	4
GWA25-B										6,6	13	M6	
GW30	380	30	84	28	68	68±0,2	45	40	9,5	6,6	13	M6	5
GWA30-B										9	18	M8	
GW40	670	40	108	32	86	86±0,2	56	50	12	9,1	18	M8	6
GWA40-B										11,1	22	M10	
GW50	1 380	50	130	40	100	108±0,2	80	60	14	9	18	M8	6
GWA50-B										11	22	M10	

¹⁾ For fixing screws ISO 4762-8.8.

If there is a possibility of settling, the screws should be secured against rotation.



Shaft support blocks



GWN..-B

120 131

Dimension table - Dimensions in mm

Designation	Mass m ≈g	Dimensions				Mounting dimensions				
		D	B	L	H	J _B	J _{B1}	B ₁	A ₅	J _L
		H8							±0,01	
GWN12-B	60	12	43	20	35	30±0,15	20	34	21,5	13
GWN16-B	100	16	53	24	42	38±0,15	26	40	26,5	16
GWN20-B	170	20	60	30	50	42±0,15	30	44	30	20
GWN25-B	330	25	78	38	60	56±0,15	40	60	39	25
GWN30-B	450	30	87	40	70	64±0,15	45	63	43,5	26
GWN40-B	850	40	108	48	90	82±0,15	65	76	54	32
GWN50-B	1 400	50	132	58	105	100±0,2	70	90	66	36

¹⁾ Centring for dowel hole.

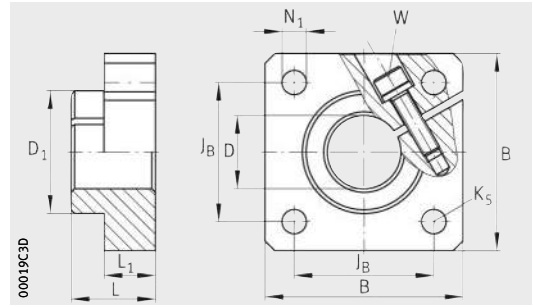
²⁾ For fixing screws ISO 4762-8.8.

If there is a possibility of settling, the screws should be secured against rotation.

H ₂ ±0,01	H ₄	H ₅	T ₅	H ₆	G ₂	N ₁	N ₄ ¹⁾	N ₃	K ₅ ²⁾	Width across flats W
20	26,6	5,4	13	16,5	M6	5,3	4	10	M5	3
25	26,6	5,4	18	21	M8	6,6	5	11	M6	4
30	34,1	7,4	22	25	M10	8,4	6	15	M8	5
35	41,5	8,3	26	30	M12	10,5	8	18	M10	6
40	46,2	9,3	26	34	M12	10,5	8	18	M10	6
50	57,6	11,7	34	44	M16	13,5	10	20	M12	8
60	62	10,6	43	49	M20	17,5	12	26	M16	10



Shaft support block with flange



FW-B

Dimension table - Dimensions in mm

Designation	Mass m ≈g	Dimensions			Mounting dimensions					
		D H8	B	L	L ₁	D ₁	N ₁ H13	K ₅ ¹⁾	J _B	Width across flats W
FW12-B	50	12	40	20	12	23,5	5,5	M5	30	3
FW16-B	80	16	50	20	12	27,5	5,5	M5	35	3
FW20-B	100	20	50	23	14	33,5	6,6	M6	38	4
FW25-B	160	25	60	25	16	42	6,6	M6	42	5
FW30-B	260	30	70	30	19	49,5	9	M8	54	6
FW40-B	700	40	100	40	26	65	11	M10	68	8
FW50-B	900	50	100	50	36	75	11	M10	75	8

¹⁾ For fixing screws ISO 4762-8.8.
If there is a possibility of settling, the screws should be secured against rotation.