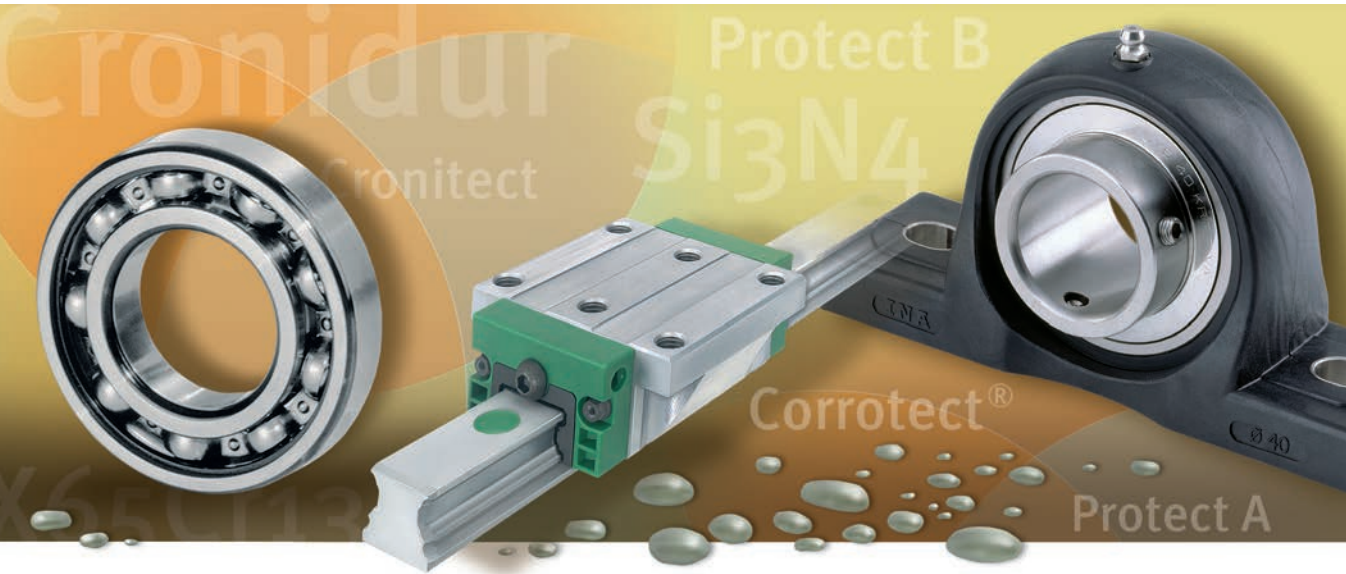




FAG



Corrosion-resistant products

SCHAEFFLER

Foreword

INA and FAG products have proved themselves over many years, even under critical and problematic environmental conditions. Their use may, however, be restricted by corrosive or chemical media such as those present in agriculture, mining, the chemical industry and in the food and drinks industry.

Product range

For applications involving these demanding requirements for anti-corrosion protection, reliability and operating life, we now offer an expanded range of corrosion-resistant products that are presented together in this publication:

- deep groove ball bearings, miniature deep groove ball bearings
- radial insert ball bearings and housing units
- yoke and stud type track rollers
- linear guidance systems
- maintenance-free metal/polymer composite plain bearings
- maintenance-free ELGES rod ends.

Special coatings, special materials

The bearings are made from high alloy, corrosion-resistant steels or are coated with the special coating Corrotect[®], Durotect[®] CK (Protect A) or Durotect[®] CK⁺ (Protect B). The housings are made from Corrotect[®] coated flake graphite cast iron or glass fibre reinforced plastic. The plastic is highly resistant to moisture, UV radiation, bacteriological and fungal attacks as well as many chemical media. The plain bearings are made from the maintenance-free and lead-free E40-B.

Additional measures

The positive characteristics of the products are completed by additional anti-corrosion measures such as high performance plastics for cases and seals as well as particularly high performance ceramic components matched to the application. As a result, there is no longer any obstacle to the successful, long term use of the machine elements under problematic and corrosive conditions.

Replacement for ...

This edition supersedes TPI 64 issued in June 2008. Any information in previous publications that does not concur with the data in this Product Information is therefore invalid.

Safety guidelines and symbols

High product safety

Our products correspond to the current level of research and technology. If the bearing arrangement is designed correctly, the products are handled and fitted correctly and as agreed and if they are maintained as instructed, they do not give rise to any direct hazards.

Follow instructions

This publication describes standard products. Since these are used in numerous applications, we cannot make a judgement as to whether any malfunctions will cause harm to persons or property.

It is always and fundamentally the responsibility of the designer and user to ensure that all specifications are observed and that all necessary safety 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.

Definition of guidelines and symbols

The warning and hazard symbols are defined along the lines of ANSI Z535.6–2006.

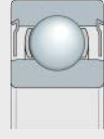
The meaning of the guidelines and symbols is as follows:



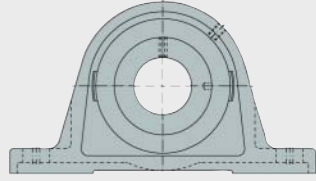
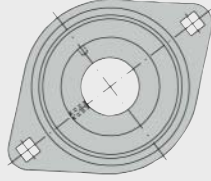
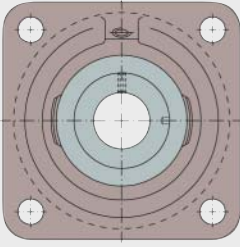
In case of non-compliance, damage or malfunctions in the product or the adjacent construction will occur.

Contents

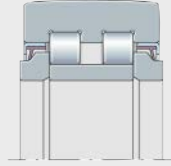
| | Page |
|---|------|
| Safety guidelines and symbols | 2 |
| Product overview | 4 |
| Technical principles..... | 6 |
| Deep groove ball bearings, miniature deep groove ball bearings | 26 |
| Radial insert ball bearings and housing units | 39 |
| Radial insert ball bearings..... | 42 |
| Housing units with cast iron or sheet steel housing..... | 50 |
| Housing units with plastic housing | 60 |
| Yoke and stud type track rollers | 80 |
| Linear guidance systems | 89 |
| Monorail guidance systems..... | 92 |
| Track roller guidance systems | 96 |
| Linear ball bearings and solid shafts | 98 |
| Miniature guidance systems..... | 108 |
| Driven linear units..... | 112 |
| Screw drives | 114 |
| Maintenance-free metal/polymer composite plain bearings | 116 |
| Maintenance-free ELGES rod ends..... | 125 |



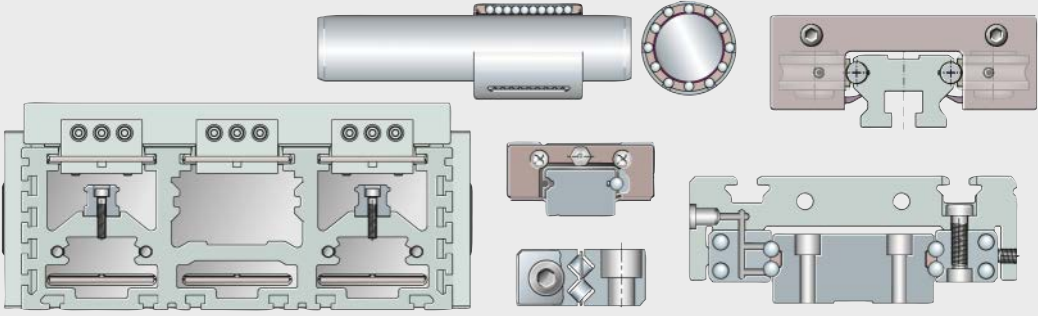
135 465



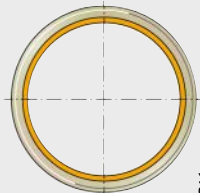
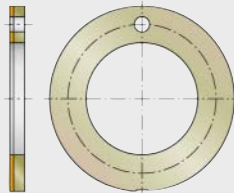
214 508



110 252



217 110



00087816

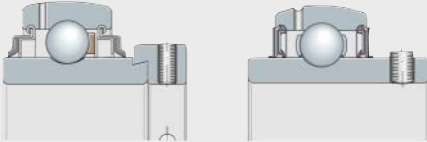


118129



135 453

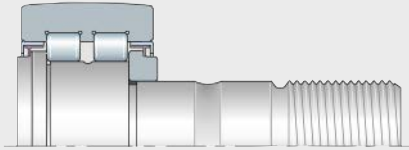
Deep groove ball bearings
Miniature deep groove ball bearings



214 507

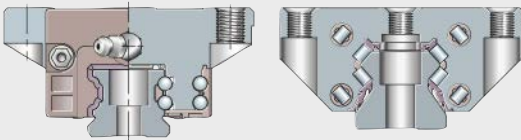
Radial insert ball bearings and housing units

- Radial insert ball bearings
- Housing units with flake graphite cast iron or sheet steel housing
- Housing units with plastic housing



110 251

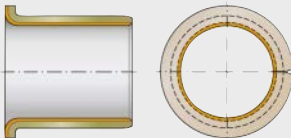
Yoke type track rollers
Stud type track rollers



217 109

Linear guidance systems

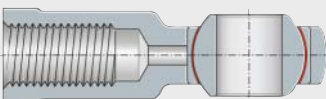
- Monorail guidance systems
- Track roller guidance systems
- Linear ball bearings and solid shafts
- Miniature guidance systems
- Driven linear units
- Screw drives



136 499

**Maintenance-free metal/
polymer composite plain bearings**

- Bushes
- Flanged bushes
- Thrust washers
- Strips

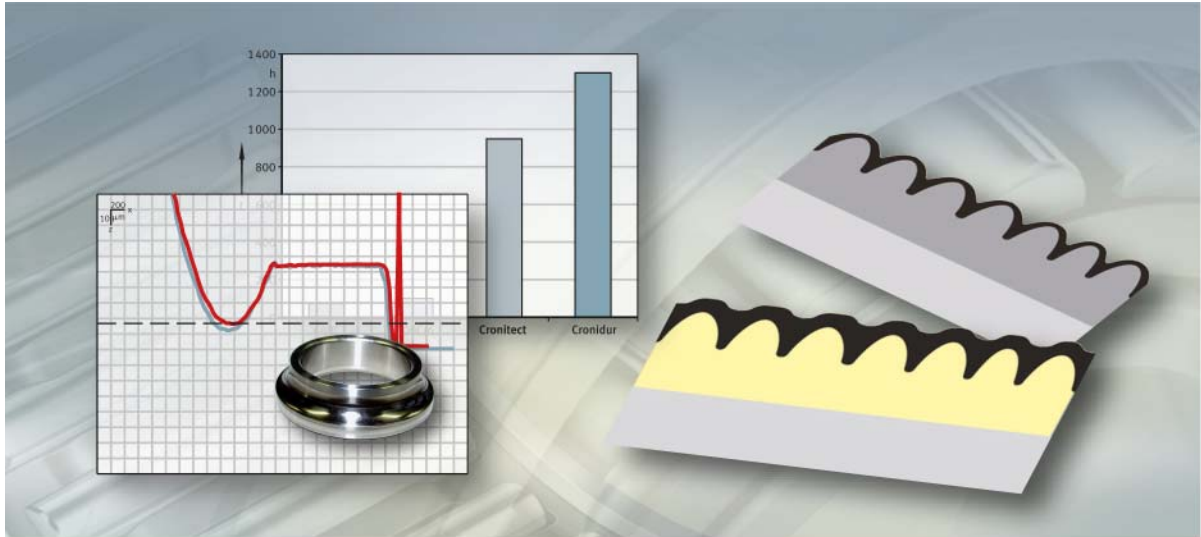


118 128

Maintenance-free ELGES rod ends



FAG



Materials
Coatings
Lubricants



Materials, coatings, lubricants

| | Page |
|------------------------------------|--|
| Materials | Corrosion-resistant steels 8 |
| | High performance steels Cronidur and Cronitect 8 |
| | Media resistance 10 |
| | Wear resistance 12 |
| | Fatigue life 13 |
| | Ceramic in hybrid bearings 14 |
| | Insensitive to inadequate lubrication and dry running 14 |
| | Media resistance of silicon nitride 15 |
| | High performance plastic PAEK 16 |
| | Characteristics of the plastic 16 |
| Applications 17 | |
| Coatings | Types of coatings 18 |
| | Special coating Corrotect® 19 |
| | Basic data 19 |
| | Characteristics of the coating 20 |
| | Durotect® CK (Protect A) 21 |
| | Anti-corrosion and anti-wear protection 21 |
| | Advantages of the coating 21 |
| | Technical/physical data 21 |
| | Durotect® CK+ (Protect B) 22 |
| | Anti-corrosion and high anti-wear protection 22 |
| Advantages of the coating 22 | |
| Technical/physical data 22 | |
| Lubricants | Greases 23 |
| | Arcanol greases for relubrication 23 |
| | Lubricants for the food industry 23 |
| | Greases with high media resistance 23 |
| | Greases for clean room applications 23 |
| Further information 23 | |

Materials

Corrosion-resistant steels

In addition to the special coatings Corrotect[®], Durotect[®] CK (Protect A) and Durotect[®] CK+ (Protect B), there is also a range of corrosion-resistant materials for rolling bearings operating in corrosive environments.

Steels used as standard and proven in this situation include: X90CrMoV18 (material no. 1.4112), X105CrMoV18 (material no. 1.4125) and X46Cr13 (material no. 1.4034).

These materials have satisfactory corrosion resistance in many media.

High performance steels Cronidur and Cronitect

For higher performance requirements, highly corrosion-resistant, nitrogen alloyed martensitic HNS steels (High Nitrogen Steel) such as Cronidur and the newly developed steel Cronitect are also available by agreement. In contrast to Cronidur, Cronitect has nitrogen introduced into the structure by means of a surface layer hardening process.

Both steels are clearly superior to conventional corrosion-resistant steels for rolling bearings in terms of corrosion resistance, wear resistance and fatigue strength.

Corrosion resistance

Objective statements on the corrosion resistance of a material can be obtained by means of passive current density measurements. As a function of the electrical voltage, the current flowing in an electrolyte between two electrodes made from the material under investigation is measured. The corrosion resistance increases as the current measured decreases.

Although steel classified as corrosion-resistant 440C has a higher chromium content, its corrosion resistance is significantly lower than that of Cronidur and Cronitect. The reason lies in the different interactions between the chemical compounds that chromium forms with carbon and nitrogen respectively. The chromium content effective against corrosion is reduced in comparison with its initial condition by carbon during heat treatment.

Due to their special quenching and tempering and surface treatment, Cronidur and Cronitect have very high corrosion resistance against aqueous media and heavily diluted acids, alkalines or salt solutions. They are therefore suitable for a wide range of applications, for example in clean rooms and electronic component manufacturing plant as well as in the pharmaceutical and food industries.

Salt spray test

In order to assess corrosion resistance, steels and coatings are subjected to a standardised salt spray test in accordance with DIN EN ISO 9 227.

The results show clearly the extremely high resistance of the high performance steels Cronidur and Cronitect compared to the classic corrosion-resistant steels and coatings.

While the typical rolling bearing steel X46Cr13 shows clear signs of corrosion after only approx. 6 h, Cronidur and Cronitect are up to 200 times more resistant compared to the corrosion-resistant steels, see *Figure 1* to *Figure 3*, page 9.



- ① Cronitect
- ② 440C steel

Figure 1
Corrosion resistance, comparison after 24 h in salt spray test



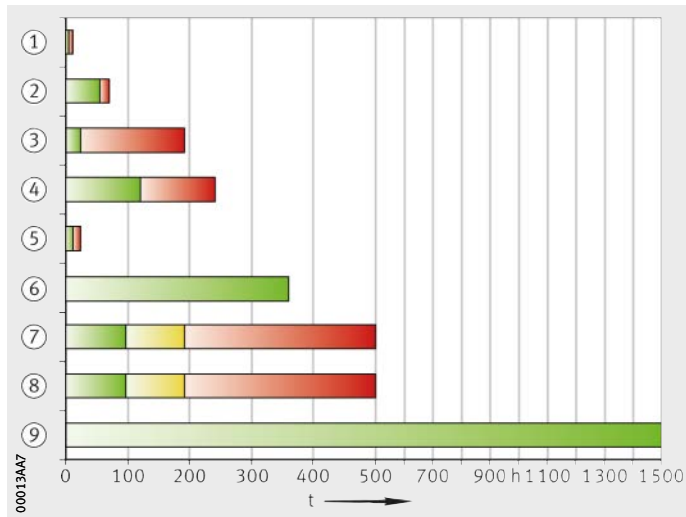
- ① Cronitect
- ② 440C steel

Figure 2
Corrosion resistance, comparison after 500 h in salt spray test



- t = corrosion resistance in hours
- ① X46Cr13
 - ② X105CrMo17 (440C)
 - ③ Durotect® CK (Protect A), 2 μm
 - ④ Durotect® CK+ (Protect B), 2 μm
 - ⑤ Durotect® CM, 2 μm
 - ⑥ Durotect® CM, 50 μm, to 360 h possible, depending on post-treatment
 - ⑦ Corrotect® A*, free from Cr(VI)
 - ⑧ Corrotect® C, containing Cr(VI)
 - ⑨ Cronitect

Figure 3
Corrosion resistance, comparison: Corrosion-resistant steels, coatings, Cronitect



Materials

Media resistance

In the food industry in particular, the resistance of the material in relation to various cleaning agents is of increasing importance.

In many cases, the corrosion resistance of conventional steels such as 440C is no longer sufficient. In this case too, the high performance steel Cronidur shows a significantly higher media resistance: see tables. The media resistance of Cronitact is comparable to that of Cronidur.

Resistance to media

| Medium | Concentration | X65Cr13 (1.4037) | | X5CrNi18-10 X4CrNi18-10 (1.4301) | | Cronidur | | X105CrMoV18 (440C) (1.4125) | |
|---|---------------|------------------|-----|----------------------------------|-----|----------|-----|-----------------------------|-----|
| | | 20 | 80 | 20 | 80 | 20 | 80 | 20 | 80 |
| | % | °C | | °C | | °C | | °C | |
| Hydrochloric acid HCl | 0,1 | - | - | + | + | + | + | - | - |
| | 1 | - | - | (+) | - | - | - | - | - |
| | 18 | - | - | - | - | - | - | - | - |
| Sulphuric acid H ₂ SO ₄ | 1 | - | - | + | - | - | - | - | - |
| | 10 | - | - | (+) | - | - | - | - | - |
| | 96 | (+) | - | + | (+) | - | - | - | - |
| Nitric acid HNO ₃ | 5 | - | - | + | + | + | + | - | - |
| | 25 | + | (+) | + | + | + | + | + | (+) |
| | 65 | + | (+) | + | + | + | (+) | + | (+) |
| Phosphoric acid H ₃ PO ₃ | 1 | + | + | + | + | + | + | + | + |
| | 10 | - | - | + | + | + | + | (+) | + |
| | 85 | + | - | + | + | + | (+) | + | - |
| Formic acid HCOOH | 5 | - | - | + | + | + | + | - | - |
| | 25 | - | - | + | + | + | (-) | - | - |
| Ethanoic acid CH ₃ COOH | 5 | (+) | - | + | + | + | + | + | - |
| | 25 | (+) | - | + | + | + | + | + | - |

- + Resistant
- (+) Moderately resistant
- Barely usable
- (-) Not resistant



Resistance to media

| Medium | Concentration % | X65Cr13 (1.4037) | | X5CrNi18-10 X4CrNi18-10 (1.4301) | | Cronidur | | X105CrMoV18 (440C) (1.4125) | |
|---|-----------------|------------------|-----|----------------------------------|-----|----------|---|-----------------------------|-----|
| | | | | | | | | | |
| Citric acid | 5 | (+) | - | + | + | + | + | + | + |
| | 25 | (+) | - | + | + | + | + | - | - |
| Sodium chloride NaCl | 10 | (-) | (-) | + | + | + | + | (-) | (-) |
| Sea water | 4 | (-) | (-) | + | + | + | + | (-) | (-) |
| Distilled water | - | + | + | + | + | + | + | + | + |
| Ammonia NH ₄ OH | 1 | + | + | + | + | + | + | + | + |
| | 10 | + | + | + | + | + | + | + | + |
| Potassium hydroxide solution KOH | 0,1 | + | + | + | + | + | + | + | + |
| | 1 | + | + | + | + | + | + | + | + |
| | 10 | + | + | + | + | + | + | + | + |
| Hydrogen fluoride HF | 1 | - | - | - | - | - | - | - | - |
| | 5 | n | - | n | - | n | - | n | - |
| Sulphurous acid H ₂ SO ₃ | 1 | - | - | + | + | + | + | - | - |
| Chloroacetic acid | 5 | (+) | - | + | (+) | + | - | (+) | - |
| Sodium hypochlorite bleach | 1 | n | (-) | n | + | n | + | n | (-) |
| Hydrogen peroxide H ₂ O ₂ | 5 | + | + | + | + | + | + | + | + |

+ Resistant
 (+) Moderately resistant
 - Barely usable
 (-) Not resistant
 n Not tested

The material is determined by the application

Which steels are used, whether a coating is more advisable or whether corrosion-resistant steels are better in technical terms or more cost-effective, is fundamentally dependent on the application.

Materials

Wear resistance

In order to achieve a long operating life, it is particularly important that a rolling bearing steel has high wear resistance where lubrication is poor, for example due to the effect of water. The wear resistance of a material can be assessed by methods including dry running tests.

Dry running test

Angular contact ball bearings 7205B with bearing rings made from 100Cr6 or Cronitect and ceramic rolling elements were compared in dry running. The speed was 1000 min^{-1} , the contact pressure was 1350 MPa and the dry running time was 300 h.

The red curve indicates the surface profile at the start of the test, the blue curve indicates the surface profile at the end of the test, see *Figure 4* and *Figure 5*. While the curve at the end of the test deviates considerably from the initial curve in the case of 100Cr6 steel, indicating considerable wear, the two lines are approximately congruent in the case of Cronitect. The raceways made from the high performance steel Cronitect and, to a comparable extent also Cronidur, show hardly any changes or wear. Due to the extremely high wear resistance, Cronidur and Cronitect are also suitable for dry running and media lubrication.

Figure 4
Bearing rings made from 100Cr6

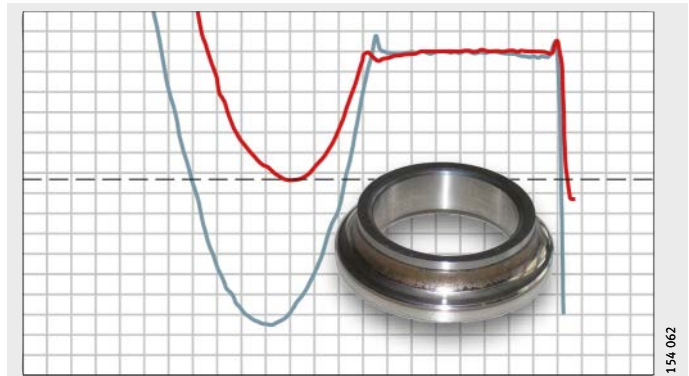
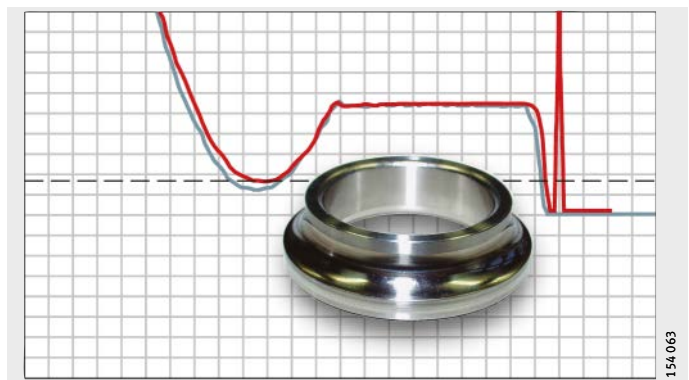


Figure 5
Bearing rings made from Cronitect





Fatigue life Where bearings are lubricated and the lubricant has good cleanliness, the bearing operating life is determined by the fatigue strength of the rolling bearing steel.

Life test The comparison of the material fatigue life determined for four materials in the test is shown in *Figure 6*. The contact pressure in the test was 2 500 MPa.

In comparison with the corrosion-resistant steel 440C, and to a similar extent for the standard rolling bearing steel 100Cr6, the fatigue limit life of Cronitect and Cronidur is higher by a factor 9 to 13.

The basic dynamic load rating C_1 of ball bearings with rings made from Cronidur or Cronitect is, in comparison with conventional rolling bearing steel, up to 50% higher depending on the design.

t = fatigue limit life in hours

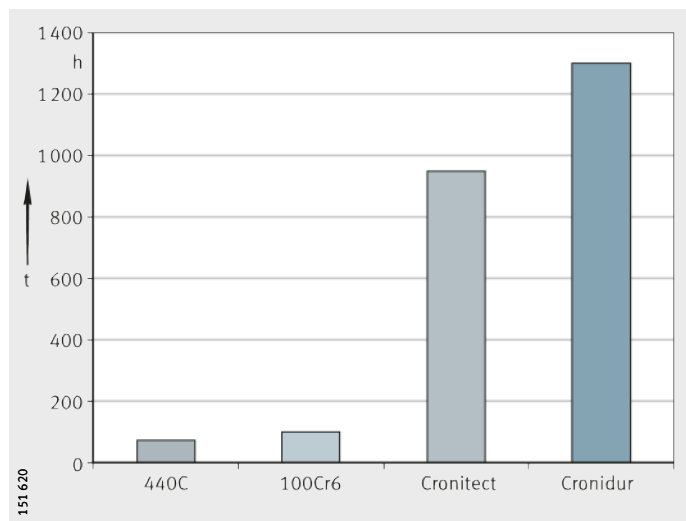


Figure 6
Fatigue limit life of various steels

Materials

Ceramic in hybrid bearings

Ceramic has become firmly established as an important group of materials for rolling bearing components. Since this material has a range of excellent characteristics, rolling elements made from silicon nitride Si_3N_4 are increasingly used in combination with coatings, special materials or very specific application-requirements.

Silicon nitride is light, has a long operating life and offers significant advantages in many applications. Ceramic balls made from Si_3N_4 are thus characterised, for example, by their low inherent mass together with high hardness, corrosion resistance and electrical insulation.

The significant differences compared to the classic rolling bearing steel 100Cr6 are shown in the table.

Advantages of pure hybrid bearings compared to steel bearings

| Characteristics | | Silicon nitride Si_3N_4 | Rolling bearing steel 100Cr6 |
|--|----------------------------------|---|-------------------------------------|
| Density | g/cm ³ | 3,2 | 7,8 |
| 4 point bending strength | MPa | 600 – 700 | >2 500 |
| Modulus of elasticity | GPa | 300 – 330 | 200 – 210 |
| Hardness HV10 | GPa | 1600 | 700 |
| Fracture toughness | MPa m ^{1/2} | 7 – 8 | 20 |
| Specific electrical resistance at +20 °C | Ω | 10 ¹⁷ – 10 ¹⁸ | 10 ⁻¹ – 1 |
| Coefficient of thermal expansion | 10 ⁻⁶ K ⁻¹ | 3,2 | 11,6 |
| Thermal conductivity | Wm ⁻¹ K ⁻¹ | 32 | 45 |
| Corrosion behaviour | | Good | Poor |
| Magnetism | | None | Yes |
| Hot hardness | | Good | Poor, good under certain conditions |
| Max. operating temperature | +°C | 800 – 1000 | 150 |

Insensitive to inadequate lubrication and dry running

Rolling bearings made from steel tend to undergo adhesive wear at the rolling contact in conditions of poor lubrication. Metallic contact leads, particularly under high contact pressure at the rolling contact, to cold bonding at the surface, resulting in wear. Steel bearings are therefore not suitable for dry running and media lubrication.

Due to the favourable tribological characteristics of the ceramic/steel material combination, the wear resistance is significantly higher in this case. In combination with the highly wear-resistant high performance steels Cronidur and Cronitect, a long bearing operating life is achieved with ceramic rolling elements under conditions of poor lubrication, media exposure or dry running.



Media resistance of silicon nitride

Silicon nitride has very good chemical resistance to most acids such as hydrochloric acid, sulphuric acid, nitric acid, phosphoric acid and alkalis such as sodium hydroxide solution at room temperature: see table. One exception is hydrofluoric acid. Ceramic has only moderate resistance in this case.

Resistance of various ceramics

| Medium | Concentration % | Si ₃ N ₄ NBD200 | | Si ₃ N ₄ TSN03NH | | ZrO ₂ | | SiC | |
|------------------------------|-----------------|---------------------------------------|-------|--|-------|------------------|-------|-----|-------|
| | | RT | 80 °C | RT | 80 °C | RT | 80 °C | RT | 80 °C |
| Deionised water | – | + | + | + | + | + | + | + | + |
| Sea water | – | + | + | + | + | + | + | + | + |
| Sodium chloride | 10 | + | + | + | + | + | + | + | + |
| Ammonia | 10 | + | + | + | + | + | + | + | + |
| Potassium hydroxide solution | 1 | + | + | + | + | X | X | X | X |
| | 10 | + | + | + | + | + | + | + | + |
| Sodium hydroxide solution | 1 | + | + | + | + | X | X | X | X |
| | 10 | + | + | + | + | + | + | + | + |
| Citric acid | 10 | + | + | + | (+) | X | X | X | X |
| Hydrochloric acid | 18 | + | + | + | (+) | X | X | X | X |
| Sulphuric acid | 49 | + | + | + | (+) | + | + | + | + |
| Nitrohydrochloric acid | – | + | + | + | (+) | + | + | + | + |
| Phosphoric acid | 10 | + | + | + | (+) | X | X | X | X |
| | 85 | + | + | + | + | + | + | + | + |
| Hydrofluoric acid | 1 | (+) | – | + | – | X | X | X | X |
| | 5 | (+) | – | + | – | (+) | – | + | + |
| | 20 | (+) | – | + | – | – | – | + | + |

+ Resistant
 (+) Moderately resistant
 – Not resistant
 X Not resistant

Applications

Bearings with ceramic rolling elements are used in spindles for machine tools, in turbomolecular pumps as well as in electric motors and generators.

They are also used in preference in areas of application including medical equipment and aerospace. Due to their high specific resistance, furthermore, they are ideally suited where complete electrical insulation is required.

They are indispensable in bearing arrangements operating in environments with little lubrication or oil as well as in aggressive media.

Materials

High performance plastic PAEK

Polyaryletherketone (PAEK) is a high performance polymer that is optimally suitable for demanding applications in corrosive environments. Due to its excellent characteristics, this material is also increasingly used as a substitute for metals, composites and other polymers.

Characteristics of the plastic

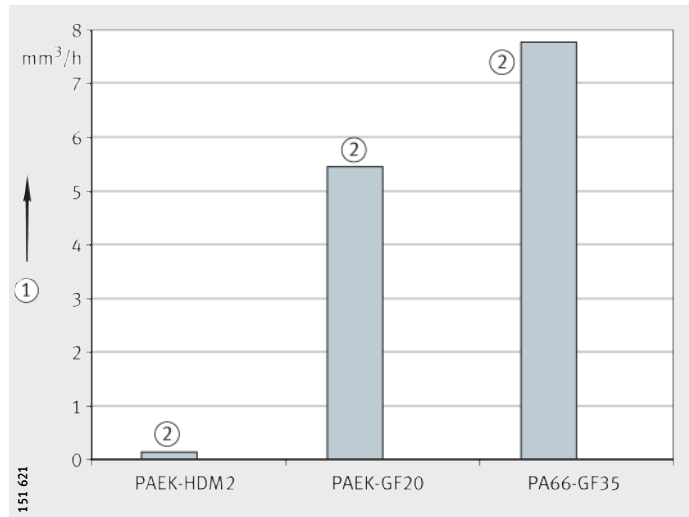
Temperature-resistant, wear-resistant, good for dry running

PAEK is resistant to high temperatures and, depending on the load, is suitable for operating temperatures up to +250 °C. The wear resistance is strongly influenced by the filler materials and is significantly better than that of the standard material PA66 with glass fibre reinforcement that is frequently used for cages.

It has good characteristics in dry running and excellent wear resistance at various grades of contact surface roughness over a wide range of pressures, speeds and temperatures, *Figure 7*.

- ① Volume loss
- ② Plastic cage and steel rolling elements

Figure 7
Wear of various cage materials in dry running



Resistant to chemicals

Polyaryletherketone is a partially crystalline material that is highly resistant even at high temperatures to chemicals as well as organic and inorganic fluids, see table Resistance of PAEK cages in cleaning agents, page 17.

The composition and inherent purity of the material lead to extremely low smoke development and emission of toxic gases in a fire.



**Resistance of PAEK cages
in cleaning agents**

| Medium | Max. chloride concentration mg/l | Max. concentration | Temperature + °C | Resistant |
|---|-------------------------------------|--|---------------------|-----------|
| Sodium hydroxide solution NaOH | 500 | 5% | 90 | Yes |
| Phosphoric acid H ₃ PO ₄ | 200 | 5% | 90 | |
| Nitric acid HNO ₃ | 200 | 5% | 90 | |
| Sulphuric acid H ₂ SO ₄ | 150 | 1,5% | 60 | |
| Peracetic acid (Aseptic) | 100 | 500 mg/l | 40 | |
| | 5 | 2 000 mg/l | 60 | |
| (Aseptic) | 5 | 4 000 mg/l | 60 | |
| | | | | |
| Monobromoacetic acid or mono-chloroacetic acid | 100 | 1% mixed with each of 1%: H ₃ PO ₄ , HNO ₃ , H ₂ SO ₄ | 30 | |
| NaOH + NaOCl Chloralkaline cleaner | 300 | 5% | 70 | |
| Sodium hypochlorite NaOCl | 300 | 300 mg/l active chlorine | 60 | |
| | | | 20 | |
| Hot water | 100 | – | 125 | |
| Steam approx. 0,5 bar | 100 | – | 110 | |
| Ozone | 80 | 3 mg/l | 30 | |

Resistant to hydrolysis

PAEK can, without any significant deterioration in its characteristics, be used for long periods at temperatures above +200 °C, in steam or water at high pressure.

High strength with low mass

The strength and rigidity are very high while density is low.

Purity

Due to its inherent purity, the material has extremely small quantities of extractable ions and is characterised by low outgassing in vacuum, even at high temperatures. The material is thus also highly suitable for use in the food industry. Some PAEK materials conform to the requirements of the US Food and Drug Administration (FDA).

Dimensional stability

The plastic has high dimensional stability and thus maintains its geometry and characteristics even at various temperatures, in moisture, under the influence of chemicals and when subjected to physical loading.

Applications

PAEK is highly suitable for rolling bearing cages, end pieces of linear guidance systems and tyres on track rollers.

Coatings

In order that standard components can function for long periods, without maintenance and reliably even under extreme operating conditions, Schaeffler has developed various coatings for such requirements.

These coatings increase the corrosion resistance and/or wear resistance of the surface.

The selection of the coating is always dependent on the area of operation and the application.

Types of coatings

Components at risk of corrosion are protected by:

- the special coating Corrotect[®], page 19
- the thin layer chromium coating Durotect[®] CK (Protect A), page 21
- the thin layer chromium coating Durotect[®] CK⁺ (Protect B), page 22.

The surface of the thin layer chromium coating holds a certain amount of lubricant. This gives protection against wear.

Particularly high wear resistance is achieved by means of the chromium mixed oxide layer LC in Durotect[®] CK⁺ (Protect B). Even under highly unfavourable environmental conditions, this coating still acts in a supportive capacity to the lubricant. Since the coating increases the wear resistance of the base material, the preload is maintained over an extended period.



For use in the food industry, compliance with exacting environmental and health conditions must be achieved. The coating Durotect[®] CK (Protect A) is free from Cr(VI) and can therefore be used in this sector too.



Special coating Corrotect®

Basic data

Composition:

- Zinc alloy (for example, with Ni, Fe or Co)
- Yellow or black chromate passivation (containing Cr(VI))
- Thick layer or nanoparticle-backed thick layer passivation (free from Cr(VI))
- Thickness ranges:
 - 0,5 μm to 3 μm
 - 2 μm to 5 μm .

Test method:

- neutral salt spray test in accordance with DIN EN ISO 9 227, ASTM B117, *Figure 1*.

The coating is effective against condensation, rainwater, contaminated water and weakly alkaline and weakly acidic cleaning agents.

The coating is attacked by strongly acidic or alkaline media and media containing high levels of salt.



Figure 1
Coated and uncoated part after 24 h in the salt spray test

Coatings

Characteristics of the coating

The special coating Corrotect® has the following characteristics:

- It is an extremely thin anti-corrosion coating with cathodic protection. Under load, the coating is compacted into the surface roughness profile and is partly worn away.
- The chromate coating and the passivation increase the anti-corrosion protection and contribute to the optical appearance of the component.
- Anti-corrosion protection in the seal area.

In comparison with many other coating systems and materials, combines good anti-corrosion protection with low cost.

Guidance on the handling and use of parts with Corrotect® coating

Before pressing in coated parts, light greasing is recommended in order to reduce the press-in forces.

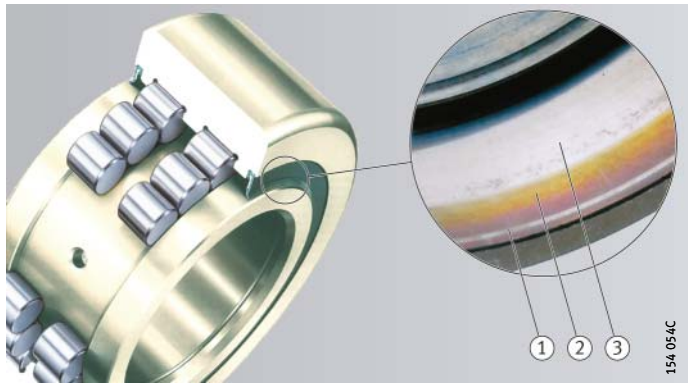
As with all zinc and zinc alloy coatings, the anti-corrosion protection is impaired in temperature ranges above +120 °C.

Even if there is no indication of impairment of the grease operating life, the interaction between the coating and the lubricant should be checked in each case and the relubrication intervals adapted as appropriate.

In the area of the seal lips, there is running-in of the extremely thin layer; an optically bright surface is formed. In contact with moisture or corrosive media, the formation of rust on this bright surface is prevented in the long term by the remote effect of the cathodic protection mechanism, *Figure 2*.

- ① Seal running surface
- ② Coated surface
- ③ Coated raceway with overrolling

Figure 2
Seal running surface





Durotect® CK (Protect A)
Anti-corrosion
and anti-wear protection

Durotect® CK (Protect A) is a pure chromium coating with a pearly surface structure.

The coating is applied by electroplating. The parts to be coated are heated to approx. +50 °C. Since no structural changes occur, the parts retain full dimensional stability.

The matt grey chromium layer with its pearly structure retains a certain amount of lubricant between the pearls. As a result, effective anti-wear protection is achieved even under mixed friction or slippage conditions.

During running-in, the rolling elements and seals burnish the surface. This leads to reduced friction coefficients.

Advantages of the coating

This coating

- is resistant to various chlorides, various oils, sulphur compounds, chlorine compounds and weak acidic media
- does not influence the load carrying capacity and operating life of the coated products
- has higher wear resistance due to its high hardness
- ensures effective anti-wear protection even under mixed friction conditions
- offers good protection against EP additives
- has good thermal conductivity
- is moderately resistant to corrosion.

Durotect® CK (Protect A) contains no Cr(VI). Components with this coating are therefore particularly suitable for use in the food industry.

Technical/physical data

The table shows technical/physical data for Durotect® CK (Protect A).

Durotect® CK (Protect A)

| | Data |
|---|---|
| Suffix | KD |
| Colour | Matt grey |
| Coating thickness ¹⁾ | 1 µm – 3 µm 1 µm – 6 µm |
| Number of layers | 1 |
| Composition | Pure chromium layer with pearly surface |
| Hardness | 950 HV – 1 300 HV |
| Anti-corrosion protection ²⁾ | 24 h |
| Anti-wear protection | Under mixed friction |
| Maximum length | 4 000 mm |
| Contains Cr(VI) ³⁾ | no |

¹⁾ Thickness in functional area.

²⁾ Salt spray test to DIN EN ISO 9 227, no load.

³⁾ Parts containing Cr(VI) are not suitable for the food industry.

Coatings

Durotect® CK+ (Protect B) Anti-corrosion and high anti-wear protection

Durotect® CK+ (Protect B) comprises two layers: a thin layer chromium coating is covered by chromium mixed oxide. The corrosion resistance is provided by the chromium mixed oxide layer. The chromium mixed oxide layer acts in a supportive capacity to the lubricant when used in aggressive atmospheres and at high temperatures.

Advantages of the coating

This coating

- is resistant to various chlorides, various oils, sulphur compounds, chlorine compounds and weak acidic media
- does not influence the load carrying capacity and operating life of the coated products
- improves the running-in behaviour
- offers effective anti-wear protection under inadequate lubrication
- offers good protection against EP additives
- acts in a supportive capacity to the lubricant in aggressive atmospheres and at high temperatures
- has good thermal conductivity
- offers high anti-wear protection together with high anti-corrosion protection.

Where high requirements for anti-corrosion protection are present and continuous lubrication cannot be ensured, Durotect® CK+ (Protect B) is the suitable coating.

Technical/physical data

The table shows technical/physical data for Durotect® CK+ (Protect B).

Durotect® CK+ (Protect B)

| | Data |
|---|--|
| Suffix | KDC |
| Colour | Black |
| Coating thickness ¹⁾ | 4 µm – 6 µm |
| Number of layers | 2 |
| Composition | Thin layer chromium coating with coating of chromium mixed oxide |
| Hardness | 950 HV |
| Anti-corrosion protection ²⁾ | 120 h |
| Anti-wear protection | Under mixed friction |
| Maximum length | 4 000 mm |
| Contains Cr(VI) ³⁾ | yes |

1) Thickness in functional area.

2) Salt spray test to DIN EN ISO 9 227, no load.

3) Parts containing Cr(VI) are not suitable for the food industry.



Lubricants

Greases Lubrication and maintenance are extremely important for long, reliable operation of rolling bearings. Where special environmental conditions apply, however, there is often a requirement to achieve not only fundamental characteristics such as reduction of friction and anti-wear protection but also additional characteristics such as media resistance or suitability of the lubricants for the food industry. For these expanded requirements, there are various greases for initial greasing and relubrication.

Arcanol greases for relubrication Grease that are particularly suitable for relubrication are included in the Arcanol range, see table Rolling bearing lubricants for initial greasing and relubrication, page 24. The greases, which were developed in partnership with renowned lubricant manufacturers, are subjected to comprehensive series of tests before approval and, thereafter, every single batch is inspected.

Lubricants for the food industry Greases for use in the food industry are subject to various regulations and specifications around the world. Internationally, the most widely known of these are the US American regulations. Two grease classes have been defined for the food-producing industry, which are known as the lubricants H1 und H2. Approval as lubricant H1 and H2 is currently given by the NSF.

Lubricant H1 These lubricants are suitable for applications in which “incidental contact between food and lubricant unavoidable by technical measures” may occur. Such lubricants must be non-toxic and neutral in taste and odour.

Lubricant H2 Lubricants H2 may only be used in the food and pharmaceutical industries where the possibility of contact with food is completely eliminated.

Lubricants with high media resistance If fluids (water, contaminated water, weak acids or alkalis) can come into contact with rolling bearings, greases with good media resistance should be used. This can delay washout of lubricants and extend the operating life of greased bearings.

Greases for clean room applications In the area of semiconductor production or LCD production, the quantity of airborne particles plays an important role in the quality of the manufactured products. Through the selection of special greases, particle emission can be reduced in comparison with standard greases.

In high vacuum, special greases based on alkoxyfluoroethers with particularly favourable vapourisation characteristics are used.

Further information



Lubrication is a design element that has a decisive influence on the reliability and operating life of bearings. For the design of bearing arrangements, attention must be paid to the information on lubrication in Catalogue HR 1, Rolling Bearings.

Lubricants

Rolling bearing lubricants for initial greasing and relubrication

| Designation | Classification | Type of grease |
|-------------|--|--|
| GA32 | Grease with foodstuffs approval | Aluminium complex soap, SHC or white oil |
| GA47 | Rolling bearing grease resistant to media for temperatures up to +140 °C | Barium complex soap, mineral oil |
| GA11 | Rolling bearing grease resistant to media for temperatures up to +250 °C | PTFE, alkoxyfluoroether |
| GA08 | Grease for line contact | Lithium complex soap, mineral oil |
| L430 | Grease with low particle emission | Polycarbamide, ether oil |



| Operating temperature °C | Upper continuous temperature limit $T_{\text{limit, upper}}$ °C | NLGI class | Speed parameter $n \cdot d_M$ $\text{min}^{-1} \cdot \text{mm}$ | ISO VG class | H1 registration | Arcanol rolling bearing grease |
|-----------------------------|---|------------|---|--------------|-----------------|--------------------------------|
| -30 to +120 | +70 | 1 to 2 | 500 000 | 150 to 220 | yes | FOOD 2 |
| -20 to +140 | +70 | 1 to 2 | 350 000 | 150 to 320 | - | - |
| -40 to +250 | +180 | 2 | 300 000 | 460 to 680 | Possible | TEMP 200 |
| -30 to +140 | +95 | 2 to 3 | 500 000 | 150 to 320 | - | LOAD 150 |
| -40 to +180 | +100 | 2 | 500 000 | 100 | - | - |



Deep groove ball bearings
Miniature deep groove ball bearings

Deep groove ball bearings

Miniature deep groove ball bearings

| | | Page |
|-------------------------------------|---|------|
| Product overview | Deep groove ball bearings, miniature deep groove ball bearings | 28 |
| Features | Single row deep groove ball bearings | 29 |
| | Deep groove ball bearings made from Cronitect..... | 29 |
| | Single row miniature deep groove ball bearings | 31 |
| | Sealing..... | 31 |
| | Lubrication | 31 |
| | Operating temperature | 31 |
| | Prefixes and suffixes..... | 32 |
| | Further information..... | 32 |
| Design and safety guidelines | Axial load carrying capacity..... | 32 |
| | Minimum radial load | 32 |
| Accuracy | Main dimensions, dimensional and geometrical tolerances, radial internal clearance | 32 |
| Dimension tables | Deep groove ball bearings, single row, sealed | 33 |
| | Miniature deep groove ball bearings, single row, open or sealed | 35 |



Product overview

Deep groove ball bearings

Miniature deep groove ball bearings

Deep groove ball bearings

Single row
Lip seals

S618...-2RS, S619...-2RS,
S60...-2RS, S62...-2RS, S63...-2RS



135 451

Miniature deep groove ball bearings

Single row
Open

S60, S62, S63, S68, S69,
S60...-X, S68...-X, S69...-X, SMR



135 446

Gap seals

S60...-2Z, S62...-2Z, S63...-2Z, S68...-2Z, S69...-2Z,
S60...-X-2Z, S68...-X-2Z, S69...-X-2Z, SMR...-2Z



135 452

Deep groove ball bearings

Miniature deep groove ball bearings



Features

Single row deep groove ball bearings

Single row deep groove ball bearings are the most frequently used type of rolling bearing. They are produced in numerous sizes and designs and are particularly economical. Due to their low frictional torque, they are also suitable for high speeds.

Due to the raceway geometry, the use of balls as rolling elements and the design without a filling slot, deep groove ball bearings can support axial loads in both directions as well as radial loads; see Axial load carrying capacity, page 32.

The angular adjustment facility of single row deep groove ball bearings is limited, so the bearing positions must be well aligned.

By agreement, bearings of series 618 and 619 are also available with a flanged outer ring. The flange allows axial location of the bearings by compact means.

Anti-corrosion protection

The bearing rings, cages and rolling elements are made from corrosion-resistant steel and have the prefix S.

As a result, they are resistant to moisture, contaminated water, salt spray mist and weak alkaline or weak acidic cleaning agents.

In the sealed version (suffix 2RS) the acid resistance is limited by the sealing ring material nitrile butadiene rubber NBR.

Deep groove ball bearings made from Cronitect

By agreement, deep groove ball bearings made from Cronitect are available in three designs.



The corrosion resistance and suitability of the bearing under the influence of the media must be checked by the user for the specific application.

Design 1

- Inner ring and outer ring made from Cronitect
- Highly effective contact seal, type SHRS made from FKM, with alloy steel sheathing
- Balls made from corrosion-resistant steel.

Advantages

In comparison with standard deep groove ball bearings made from corrosion-resistant steel, such as the design S6001-2RS, the following advantages apply:

- significantly higher corrosion and media resistance
- considerably better sealing against fluids
- significantly higher dynamic load carrying capacity
- significantly longer operating life even under problematic operating conditions
- no rust formation even in aggressive media.

Ordering example

X6001-2SHRS-FKM

Deep groove ball bearings

Miniature deep groove ball bearings

- Design 2**
- Inner ring and outer ring made from Cronitect
 - Highly effective contact seal, type SHRS made from FKM, with alloy steel sheathing
 - Balls made from ceramic Si_3N_4 .

- Advantages**
- In comparison with design 1, the following additional advantages apply:
- increased wear resistance
 - suitable for heavy exposure to water and fluid media
 - very long operating life even under the most problematic operating conditions
 - increased operational security.

Ordering example **XHC6001-2SHRS-FKM**

- Design 3**
- Inner ring and outer ring made from Cronitect
 - Open, without seals
 - Balls made from ceramic Si_3N_4
 - Cage made from PAEK-HDM2.

- Advantages**
- In comparison with standard deep groove ball bearings made from corrosion-resistant steel, such as the design S6001, the following advantages apply:
- significantly higher corrosion and media resistance
 - suitable for dry running and media lubrication
 - significantly higher dynamic load carrying capacity
 - long operating life even under extreme operating conditions
 - operation without lubricant possible.

Ordering example **XHC6001**



Single row miniature deep groove ball bearings

Single row miniature deep groove ball bearings correspond in their structure, function and area of application to single row deep groove ball bearings. Due to their small dimensions, with an inside diameter starting at $d = 1$ mm, however, they are particularly suitable for small electric motors, office machinery, medical equipment, household appliances, power tools and similar applications in the miniature sector.

By agreement, these bearings are also available with a flanged outer ring. This allows axial location of the bearings by compact means.

Sealing Deep groove ball bearings

The bearings are sealed on both sides by lip seals made from nitrile butadiene rubber NBR. By agreement, however, the deep groove ball bearings are also available in an open version (without suffix) or with gap seals on both sides (suffix 2Z).

Miniature deep groove ball bearings

The deep groove ball bearings are available in an open version and with gap seals. By agreement, they are also available with lip seals on both sides (suffix 2RS).

Lubrication

The bearings have an initial greasing using a standard grease. The grease filling is sufficient for the entire operating life of the bearings.

Special greases, such as those for clean room or food processing applications, are available by agreement.

Operating temperature

Deep groove ball bearings without seals can be used up to an operating temperature of $+120$ °C.

For applications at temperatures above $+120$ °C, please contact us.

Deep groove ball bearings with lip seals can be used at operating temperatures from -30 °C to $+110$ °C, limited by the grease and sealing ring material.

Bearings with gap seals can be used at temperatures from -30 °C to $+120$ °C.

Deep groove ball bearings

Miniature deep groove ball bearings

Prefixes and suffixes

Prefixes and suffixes for available designs:
see table Available designs.

Available designs

| Prefix | Suffix | Description | Design |
|--------|--------|---|------------------------|
| S | – | Corrosion-resistant steel | Standard |
| X | – | Cronitect steel | Available by agreement |
| HC | – | Hybrid bearing with ceramic balls made from Si_3N_4 | |
| – | 2RS | Contact lip seals on both sides | Standard |
| – | 2SHRS | Contact high performance lip seals with alloy steel sheathing on both sides | Available by agreement |
| – | FKM | Seal material FKM | |
| – | 2Z | Gap seals on both sides | |
| – | – | Open, not sealed | – |

Further information



For information on the load carrying capacity and life, design of bearing arrangements, lubrication, fitting and operation of the bearings, attention must be paid to Catalogue HR 1, Rolling Bearings.

Design and safety guidelines

Axial load carrying capacity



Deep groove ball bearings are also suitable for low axial loads.

If the bearing is subjected to high loads and high speeds, a reduced life as well as increased friction and bearing temperature must be taken into consideration.

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 $P/C_r > 0,01$ is necessary for ball bearings with cage.

Accuracy

Main dimensions, dimensional and geometrical tolerances, radial internal clearance

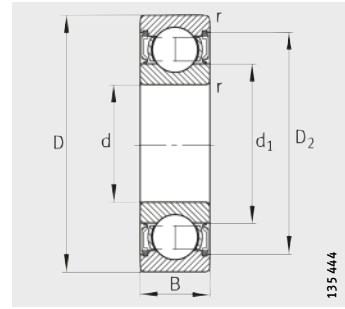
The main dimensions of single row deep groove ball bearings correspond to DIN 625-1.

The dimensional and running tolerances correspond to tolerance class PN to DIN 620.

The radial internal clearance is CN.

Deep groove ball bearings

Single row
Sealed



Seal 2RS

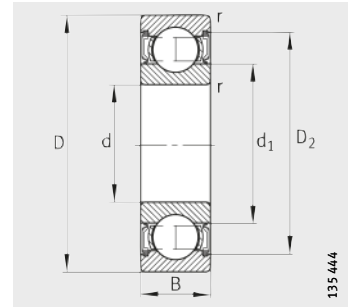
Dimension table · Dimensions in mm

| Designation ¹⁾ | Mass m ≈g | Dimensions | | | | | | Basic load ratings | | Limiting speed n _G min ⁻¹ |
|---------------------------|-----------------|------------|----|---|-----|----------------|----------------|-----------------------------|-------------------------------|---|
| | | d | D | B | r | d ₁ | D ₂ | dyn. C _r N | stat. C _{0r} N | |
| S61800-2RS | 5,6 | 10 | 19 | 5 | 0,3 | 11,8 | 17,15 | 1 462 | 672 | 22 000 |
| S61900-2RS | 10 | 10 | 22 | 6 | 0,3 | 13,2 | 19,37 | 2 295 | 1 016 | 21 000 |
| S61801-2RS | 6,5 | 12 | 21 | 5 | 0,3 | 13,8 | 19,15 | 1 632 | 832 | 20 000 |
| S61901-2RS | 12 | 12 | 24 | 6 | 0,3 | 15,35 | 21,4 | 2 456 | 1 176 | 18 000 |
| S61802-2RS | 7,6 | 15 | 24 | 5 | 0,3 | 16,8 | 22,15 | 1 759 | 1 000 | 16 000 |
| S61902-2RS | 19 | 15 | 28 | 7 | 0,3 | 18,8 | 25,3 | 3 672 | 1 808 | 15 000 |
| S61803-2RS | 8,2 | 17 | 26 | 5 | 0,3 | 18,8 | 24,3 | 1 895 | 1 168 | 15 000 |
| S61903-2RS | 20 | 17 | 30 | 7 | 0,3 | 21 | 27,8 | 3 901 | 2 056 | 13 000 |
| S61804-2RS | 18 | 20 | 32 | 7 | 0,3 | 22,6 | 29,52 | 3 417 | 1 968 | 13 000 |
| S61904-2RS | 40 | 20 | 37 | 9 | 0,3 | 23,65 | 33,5 | 5 423 | 2 944 | 11 000 |
| S61805-2RS | 24 | 25 | 37 | 7 | 0,3 | 28,2 | 34,12 | 3 655 | 2 344 | 10 000 |
| S61905-2RS | 47 | 25 | 42 | 9 | 0,3 | 30,9 | 39,45 | 5 950 | 3 632 | 9 300 |
| S61806-2RS | 27 | 30 | 42 | 7 | 0,3 | 33,11 | 39,2 | 3 859 | 2 720 | 9 000 |
| S61807-2RS | 32 | 35 | 47 | 7 | 0,3 | 38,21 | 43,69 | 4 020 | 3 056 | 7 500 |
| S61808-2RS | 35 | 40 | 52 | 7 | 0,3 | 43,21 | 48,99 | 4 182 | 3 344 | 6 700 |
| S61809-2RS | 42 | 45 | 58 | 7 | 0,3 | 48,2 | 54,96 | 5 261 | 4 304 | 6 000 |
| S61810-2RS | 52 | 50 | 65 | 7 | 0,3 | 54,2 | 60,96 | 5 618 | 4 872 | 5 300 |

¹⁾ Deep groove ball bearings are available by agreement in an open version.

Deep groove ball bearings

Single row
Sealed



Seal 2RS

Dimension table - Dimensions in mm

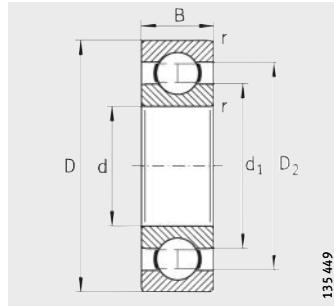
| Designation ¹⁾²⁾ | Mass m ≈g | Dimensions | | | | | | Basic load ratings | | Limiting speed n _G min ⁻¹ |
|-----------------------------|-----------------|------------|----|----|-----------|----------------|----------------|--------------------|------------------------------|---|
| | | d | D | B | r min. | d ₁ | D ₂ | dyn. C N | stat. C ₀ N | |
| S6000-2RS | 19 | 10 | 26 | 8 | 0,3 | 12,9 | 22,4 | 3 860 | 1 570 | 19 000 |
| S6200-2RS | 32 | 10 | 30 | 9 | 0,6 | 15,3 | 25,28 | 4 340 | 1 920 | 16 000 |
| S6300-2RS | 53 | 10 | 35 | 11 | 0,6 | 17,7 | 24,3 | 6 870 | 2 750 | 16 000 |
| S6001-2RS | 22 | 12 | 28 | 8 | 0,3 | 17,2 | 25,5 | 4 340 | 1 910 | 17 000 |
| S6201-2RS | 37 | 12 | 32 | 10 | 0,6 | 18,5 | 27,95 | 5 770 | 2 450 | 15 000 |
| S6301-2RS | 60 | 12 | 37 | 12 | 1 | 19,3 | 31,9 | 8 240 | 3 360 | 15 000 |
| S6002-2RS | 30 | 15 | 32 | 9 | 0,3 | 20,2 | 28,7 | 4 750 | 2 270 | 14 000 |
| S6202-2RS | 45 | 15 | 35 | 11 | 0,6 | 21,7 | 31,4 | 6 490 | 3 000 | 13 000 |
| S6302-2RS | 82 | 15 | 42 | 13 | 1 | 24,5 | 36,8 | 9 710 | 4 370 | 12 000 |
| S6003-2RS | 39 | 17 | 35 | 10 | 0,3 | 23,5 | 31,85 | 5 090 | 2 630 | 12 000 |
| S6203-2RS | 65 | 17 | 40 | 12 | 0,6 | 24,9 | 35,8 | 8 130 | 3 850 | 12 000 |
| S6303-2RS | 115 | 17 | 47 | 14 | 1 | 27,5 | 41,1 | 11 550 | 5 330 | 10 000 |
| S6004-2RS | 69 | 20 | 42 | 12 | 0,6 | 27,6 | 38,7 | 7 960 | 4 050 | 10 000 |
| S6204-2RS | 106 | 20 | 47 | 14 | 1 | 29,5 | 40,9 | 10 910 | 5 360 | 9 700 |
| S6304-2RS | 144 | 20 | 52 | 15 | 1,1 | 30 | 45,4 | 13 490 | 6 310 | 9 500 |
| S6005-2RS | 80 | 25 | 47 | 12 | 0,6 | 31,7 | 42,7 | 8 550 | 4 690 | 9 000 |
| S6205-2RS | 128 | 25 | 52 | 15 | 1 | 34 | 45,7 | 11 900 | 6 300 | 8 400 |
| S6305-2RS | 232 | 25 | 62 | 17 | 0,1 | 38,1 | 53,2 | 17 490 | 9 060 | 7 500 |
| S6006-2RS | 116 | 30 | 55 | 13 | 1 | 38 | 49,9 | 11 240 | 6 610 | 7 500 |
| S6206-2RS | 199 | 30 | 62 | 16 | 1 | 40,7 | 55,1 | 16 530 | 9 080 | 7 000 |
| S6306-2RS | 346 | 30 | 72 | 19 | 1 | 44,9 | 62,35 | 22 630 | 12 080 | 6 400 |
| S6007-2RS | 155 | 35 | 62 | 14 | 1 | 44 | 57,05 | 13 560 | 8 250 | 6 500 |
| S6207-2RS | 288 | 35 | 72 | 17 | 1,1 | 47,6 | 64,83 | 21 810 | 12 360 | 6 000 |
| S6307-2RS | 457 | 35 | 80 | 21 | 1,5 | 50,49 | 71,58 | 28 290 | 15 270 | 5 700 |
| S6008-2RS | 192 | 40 | 68 | 15 | 1 | 49,2 | 62,5 | 14 250 | 9 220 | 5 800 |
| S6208-2RS | 366 | 40 | 80 | 18 | 1,1 | 52,93 | 70,8 | 24 730 | 14 330 | 5 400 |
| S6009-2RS | 245 | 45 | 75 | 16 | 1 | 54,5 | 69 | 15 150 | 9 660 | 5 300 |
| S6209-2RS | 407 | 45 | 85 | 19 | 1,1 | 56,56 | 74,48 | 27 790 | 16 300 | 5 100 |
| S6010-2RS | 261 | 50 | 80 | 16 | 1 | 60 | 74,55 | 18 510 | 13 260 | 4 800 |
| S6210-2RS | 463 | 50 | 90 | 20 | 1,1 | 63,46 | 81,38 | 29 800 | 18 610 | 4 600 |

1) Deep groove ball bearings are available by agreement in an open version.

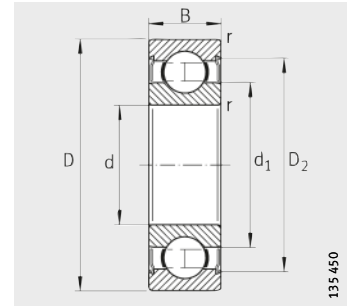
2) Available by agreement:
S6011 – S6012,
S6211 – S6212,
S6308 – S6310.

Miniature deep groove ball bearings

Single row
Open or sealed



Open



Seal 2Z



Dimension table - Dimensions in mm

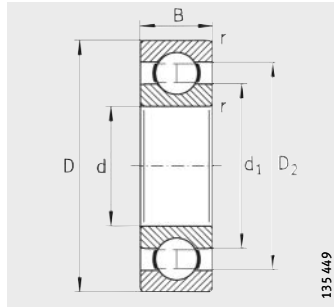
| Designation ¹⁾²⁾ | Mass m ≈g | Dimensions | | | | | | Basic load ratings | | Limiting speeds n _G min ⁻¹ |
|-----------------------------|-----------------|------------|----|-----|------|----------------|----------------|-----------------------------|-------------------------------|--|
| | | d | D | B | r | d ₁ | D ₂ | dyn. C _r N | stat. C _{0r} N | |
| S681 | 0,03 | 1 | 3 | 1 | 0,05 | 1,6 | 2,4 | 51 | 12 | 130 000 |
| S681-X | 0,1 | 1,5 | 4 | 1,2 | 0,05 | 2,15 | 3,05 | 75 | 21 | 100 000 |
| S681-X-2Z | 0,14 | 1,5 | 4 | 2 | 0,05 | 2,15 | 3,5 | 75 | 21 | 100 000 |
| S601-X | 0,31 | 1,5 | 6 | 2,5 | 0,15 | 3 | 4,8 | 232 | 60 | 75 000 |
| S601-X-2Z | 0,4 | 1,5 | 6 | 3 | 0,15 | 3 | 5,4 | 232 | 60 | 75 000 |
| S682 | 0,15 | 2 | 5 | 1,5 | 0,08 | 2,7 | 3,9 | 92 | 30 | 85 000 |
| S682-2Z | 0,2 | 2 | 5 | 2,3 | 0,08 | 2,7 | 4,4 | 92 | 30 | 85 000 |
| S692 | 0,28 | 2 | 6 | 2,3 | 0,15 | 3 | 4,8 | 232 | 60 | 75 000 |
| S692-2Z | 0,35 | 2 | 6 | 3 | 0,15 | 3 | 5,4 | 232 | 60 | 75 000 |
| S682-X | 0,2 | 2,5 | 6 | 1,8 | 0,08 | 3,7 | 4,9 | 129 | 36 | 71 000 |
| S682-X-2Z | 0,35 | 2,5 | 6 | 2,6 | 0,08 | 3,7 | 5,4 | 129 | 36 | 71 000 |
| S692-X | 0,4 | 2,5 | 7 | 2,5 | 0,15 | 3,85 | 5,65 | 265 | 78 | 63 000 |
| S692-X-2Z | 0,55 | 2,5 | 7 | 3,5 | 0,15 | 3,85 | 6,2 | 265 | 78 | 63 000 |
| S602-X | 0,61 | 2,5 | 8 | 2,8 | 0,15 | 4,1 | 6,44 | 381 | 108 | 60 000 |
| S602-X-2Z | 0,85 | 2,5 | 8 | 4 | 0,15 | 4,1 | 7,04 | 381 | 108 | 60 000 |
| SMR63 | 0,2 | 3 | 6 | 2 | 0,1 | 3,7 | 4,9 | 143 | 45 | 71 000 |
| SMR63-2Z | 0,28 | 3 | 6 | 2,5 | 0,1 | 3,7 | 5,4 | 143 | 45 | 71 000 |
| S683 | 0,32 | 3 | 7 | 2 | 0,1 | 4,28 | 5,75 | 218 | 66 | 63 000 |
| S683-2Z | 0,45 | 3 | 7 | 3 | 0,1 | 3,85 | 6,35 | 218 | 66 | 63 000 |
| SMR83 | 0,51 | 3 | 8 | 2,5 | 0,15 | 5 | 6,8 | 272 | 884 | 60 000 |
| SMR83-2Z | 0,67 | 3 | 8 | 3 | 0,15 | 5 | 7,4 | 272 | 884 | 60 000 |
| S693 | 0,6 | 3 | 8 | 3 | 0,15 | 4,35 | 6,65 | 388 | 108 | 60 000 |
| S693-2Z | 0,8 | 3 | 8 | 4 | 0,15 | 4,35 | 7,25 | 388 | 108 | 60 000 |
| S603 | 0,84 | 3 | 9 | 3 | 0,15 | 4,86 | 7,2 | 395 | 94 | 56 000 |
| S603-2Z | 1,43 | 3 | 9 | 5 | 0,15 | 4,35 | 7,9 | 395 | 94 | 56 000 |
| S623 | 1,45 | 3 | 10 | 4 | 0,15 | 4,8 | 7,08 | 436 | 132 | 50 000 |
| S623-2Z | 1,65 | 3 | 10 | 4 | 0,15 | 4,35 | 7,98 | 436 | 132 | 50 000 |

1) Bearings with RS seals are available by agreement.

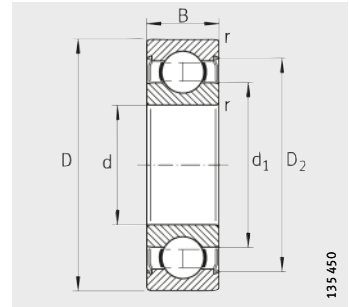
2) Bearings with a flanged outer ring are available by agreement.

Miniature deep groove ball bearings

Single row
Open or sealed



Open



Seal ZZ

Dimension table (continued) · Dimensions in mm

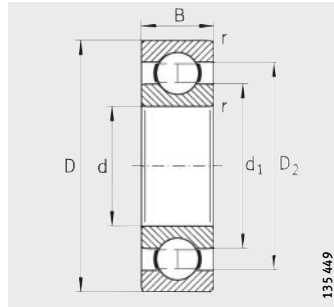
| Designation ¹⁾²⁾ | Mass m ≈g | Dimensions | | | | | | Basic load ratings | | Limiting speeds n _G min ⁻¹ |
|-----------------------------|-----------------|------------|----|-----|------|----------------|----------------|-----------------------------|-------------------------------|--|
| | | d | D | B | r | d ₁ | D ₂ | dyn. C _r N | stat. C _{0r} N | |
| SMR74-ZZ | 0,33 | 4 | 7 | 2,5 | 0,1 | 4,8 | 6,3 | 177 | 66 | 60 000 |
| SMR84 | 0,39 | 4 | 8 | 2 | 0,15 | 5 | 6,8 | 272 | 84 | 56 000 |
| SMR84-ZZ | 0,56 | 4 | 8 | 3 | 0,15 | 5 | 7,4 | 272 | 84 | 56 000 |
| S684 | 0,65 | 4 | 9 | 2,5 | 0,1 | 5,2 | 7,5 | 442 | 138 | 53 000 |
| S684-ZZ | 1 | 4 | 9 | 4 | 0,1 | 5,2 | 8,1 | 442 | 138 | 53 000 |
| SMR104 | 0,95 | 4 | 10 | 3 | 0,2 | 6,15 | 8,35 | 408 | 126 | 48 000 |
| SMR104-ZZ | 1,33 | 4 | 10 | 4 | 0,2 | 5,6 | 8,95 | 408 | 126 | 48 000 |
| S694 | 1,69 | 4 | 11 | 4 | 0,15 | 6,15 | 8,95 | 667 | 216 | 48 000 |
| S694-ZZ | 1,75 | 4 | 11 | 4 | 0,15 | 5,6 | 9,85 | 667 | 216 | 48 000 |
| S604 | 2,19 | 4 | 12 | 4 | 0,2 | 6,15 | 8,95 | 667 | 216 | 48 000 |
| S604-ZZ | 2,34 | 4 | 12 | 4 | 0,2 | 5,6 | 9,85 | 667 | 216 | 48 000 |
| S624 | 3,1 | 4 | 13 | 5 | 0,2 | 6,95 | 10,45 | 904 | 300 | 40 000 |
| S624-ZZ | 3,2 | 4 | 13 | 5 | 0,2 | 6 | 11,35 | 904 | 300 | 40 000 |
| S634 | 5,24 | 4 | 16 | 5 | 0,3 | 8,2 | 11,7 | 932 | 318 | 36 000 |
| S634-ZZ | 5,44 | 4 | 16 | 5 | 0,3 | 6,7 | 11 | 932 | 318 | 36 000 |
| SMR85 | 0,25 | 5 | 8 | 2 | 0,1 | 5,75 | 7,25 | 211 | 72 | 53 000 |
| SMR85-ZZ | 0,34 | 5 | 8 | 2,5 | 0,1 | 5,8 | 7,4 | 150 | 54 | 53 000 |
| SMR95 | 0,54 | 5 | 9 | 2,5 | 0,15 | 6 | 7,8 | 300 | 102 | 50 000 |
| SMR95-ZZ | 0,58 | 5 | 9 | 3 | 0,15 | 6 | 8,2 | 300 | 102 | 50 000 |
| S685 | 1,16 | 5 | 11 | 3 | 0,15 | 6,81 | 9,19 | 496 | 180 | 45 000 |
| S685-ZZ | 1,93 | 5 | 11 | 5 | 0,15 | 6,2 | 9,9 | 496 | 180 | 45 000 |
| S695 | 2,39 | 5 | 13 | 4 | 0,2 | 7,5 | 10,5 | 748 | 264 | 43 000 |
| S695-ZZ | 2,31 | 5 | 13 | 4 | 0,2 | 6,6 | 11,2 | 748 | 264 | 43 000 |
| S605 | 3,46 | 5 | 14 | 5 | 0,2 | 7,79 | 11,28 | 925 | 312 | 40 000 |
| S605-ZZ | 3,75 | 5 | 14 | 5 | 0,2 | 6,9 | 12,2 | 925 | 312 | 40 000 |
| S625 | 4,95 | 5 | 16 | 5 | 0,3 | 8,55 | 12,5 | 1 197 | 414 | 36 000 |
| S625-ZZ | 5,1 | 5 | 16 | 5 | 0,3 | 7,5 | 13,8 | 1 197 | 414 | 36 000 |
| S635 | 8,5 | 5 | 19 | 6 | 0,3 | 10,12 | 15,02 | 1 618 | 546 | 32 000 |
| S635-ZZ | 8,89 | 5 | 19 | 6 | 0,3 | 8,5 | 16,5 | 1 618 | 546 | 32 000 |

1) Bearings with RS seals are available by agreement.

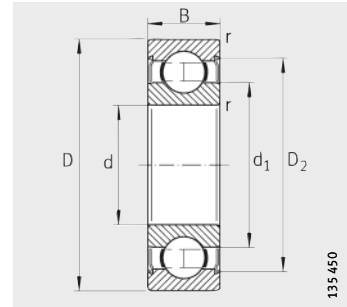
2) Bearings with a flanged outer ring are available by agreement.

Miniature deep groove ball bearings

Single row
Open or sealed



Open



Seal 2Z



Dimension table (continued) · Dimensions in mm

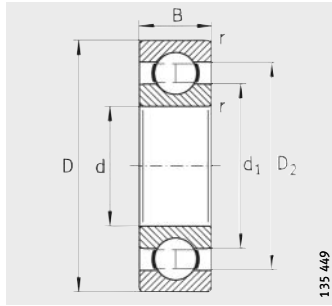
| Designation ¹⁾²⁾ | Mass m ≈g | Dimensions | | | | | | Basic load ratings | | Limiting speeds n _G min ⁻¹ |
|-----------------------------|-----------------|------------|----|-----|------|----------------|----------------|-----------------------------|-------------------------------|--|
| | | d | D | B | r | d ₁ | D ₂ | dyn. C _r N | stat. C _{0r} N | |
| SMR106 | 0,55 | 6 | 10 | 2,5 | 0,15 | 7,04 | 8,9 | 347 | 132 | 45 000 |
| SMR106-2Z | 0,7 | 6 | 10 | 3 | 0,15 | 7,04 | 9,3 | 347 | 132 | 45 000 |
| SMR126 | 1,25 | 6 | 12 | 3 | 0,2 | 7,73 | 10,19 | 496 | 180 | 43 000 |
| SMR126-2Z | 1,66 | 6 | 12 | 4 | 0,2 | 7,2 | 10,9 | 496 | 180 | 43 000 |
| S686 | 1,87 | 6 | 13 | 3,5 | 0,15 | 8 | 11 | 748 | 270 | 40 000 |
| S686-2Z | 2,68 | 6 | 13 | 5 | 0,15 | 7,4 | 11,7 | 748 | 270 | 40 000 |
| S696 | 3,85 | 6 | 15 | 5 | 0,2 | 8,2 | 11,7 | 932 | 318 | 40 000 |
| S696-2Z | 3,65 | 6 | 15 | 5 | 0,2 | 7,5 | 13 | 932 | 318 | 40 000 |
| S606 | 5,94 | 6 | 17 | 6 | 0,3 | 8,92 | 13,75 | 1 571 | 516 | 38 000 |
| S606-2Z | 6,89 | 6 | 17 | 6 | 0,3 | 8,2 | 14,8 | 1 571 | 516 | 38 000 |
| S626 | 8,12 | 6 | 19 | 6 | 0,3 | 10,12 | 15,02 | 1 619 | 546 | 32 000 |
| S626-2Z | 8,65 | 6 | 19 | 6 | 0,3 | 8,5 | 16,5 | 1 619 | 546 | 32 000 |
| SMR117 | 0,59 | 7 | 11 | 2,5 | 0,15 | 8,04 | 9,96 | 313 | 126 | 43 000 |
| SMR117-2Z | 0,71 | 7 | 11 | 3 | 0,15 | 8,04 | 10,26 | 313 | 126 | 43 000 |
| S687 | 2,03 | 7 | 14 | 3,5 | 0,15 | 9 | 12 | 816 | 312 | 40 000 |
| S687-2Z | 2,95 | 7 | 14 | 5 | 0,15 | 8,5 | 12,7 | 816 | 312 | 40 000 |
| S697 | 5,26 | 7 | 17 | 5 | 0,3 | 10,4 | 13,6 | 1 116 | 438 | 36 000 |
| S697-2Z | 5,01 | 7 | 17 | 5 | 0,3 | 9,3 | 14,3 | 1 116 | 438 | 36 000 |
| S607 | 7,8 | 7 | 19 | 6 | 0,3 | 10,12 | 15,02 | 1 618 | 546 | 36 000 |
| S607-2Z | 8,24 | 7 | 19 | 6 | 0,3 | 9 | 16,5 | 1 618 | 546 | 36 000 |
| S627 | 12,7 | 7 | 22 | 7 | 0,3 | 12,14 | 18 | 2 278 | 846 | 30 000 |
| S627-2Z | 13,1 | 7 | 22 | 7 | 0,3 | 10,5 | 19,03 | 2 278 | 846 | 30 000 |

¹⁾ Bearings with RS seals are available by agreement.

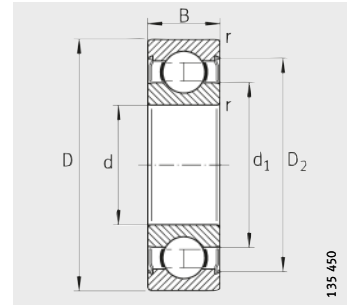
²⁾ Bearings with a flanged outer ring are available by agreement.

Miniature deep groove ball bearings

Single row
Open or sealed



Open



Seal ZZ

Dimension table (continued) · Dimensions in mm

| Designation ¹⁾²⁾ | Mass m ≈g | Dimensions | | | | | | Basic load ratings | | Limiting speeds n _G min ⁻¹ |
|-----------------------------|-----------------|------------|----|-----|------|----------------|----------------|-----------------------------|-------------------------------|--|
| | | d | D | B | r | d ₁ | D ₂ | dyn. C _r N | stat. C _{0r} N | |
| SMR128 | 0,7 | 8 | 12 | 2,5 | 0,15 | 9,05 | 10,9 | 374 | 168 | 40 000 |
| SMR128-ZZ | 0,99 | 8 | 12 | 3,5 | 0,15 | 9,05 | 11,33 | 374 | 168 | 40 000 |
| S688 | 3,11 | 8 | 16 | 4 | 0,2 | 10,5 | 13,5 | 871 | 360 | 36 000 |
| S688-ZZ | 4,05 | 8 | 16 | 5 | 0,2 | 9,65 | 14,2 | 871 | 360 | 36 000 |
| S698 | 7,12 | 8 | 19 | 6 | 0,3 | 10,5 | 15,5 | 1 551 | 564 | 36 000 |
| S698-ZZ | 7,57 | 8 | 19 | 6 | 0,3 | 9,8 | 16,66 | 1 551 | 564 | 36 000 |
| S608 | 11,8 | 8 | 22 | 7 | 0,3 | 12,14 | 18 | 2 285 | 846 | 34 000 |
| S608-ZZ | 12,9 | 8 | 22 | 7 | 0,3 | 10,5 | 19,03 | 2 285 | 846 | 34 000 |
| S628 | 17,1 | 8 | 24 | 8 | 0,3 | 12,8 | 18,7 | 2 312 | 870 | 28 000 |
| S628-ZZ | 18,5 | 8 | 24 | 8 | 0,3 | 11,9 | 19,9 | 2 312 | 870 | 28 000 |
| S689 | 3,41 | 9 | 17 | 4 | 0,2 | 11,5 | 14,5 | 918 | 408 | 36 000 |
| S689-ZZ | 4,38 | 9 | 17 | 5 | 0,2 | 10,7 | 15,2 | 918 | 408 | 36 000 |
| S629 | 19 | 9 | 26 | 8 | 0,3 | 14,5 | 21,3 | 3 169 | 1 212 | 28 000 |
| S629-ZZ | 21,8 | 9 | 26 | 8 | 0,3 | 13,9 | 22,38 | 3 169 | 1 212 | 28 000 |

¹⁾ Bearings with RS seals are available by agreement.

²⁾ Bearings with a flanged outer ring are available by agreement.



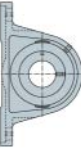
Insert bearings and housing units

Insert bearings
Housing units
with cast iron, sheet steel or plastic housings

Insert bearings and housing units

| | Page |
|-------------------------------------|---|
| Product overview | Insert bearings..... 42 |
| Features | Ready to fit, easy to fit, robust 43 |
| | Compensation of static misalignments..... 43 |
| | Insert bearings in corrosion-resistant VA design 43 |
| | Insert bearings with Corrotect® coating 44 |
| | Suffixes 45 |
| | Further information 45 |
| Design and safety guidelines | Axial load carrying capacity of insert bearings 45 |
| | Speed limits for insert bearings..... 45 |
| | Shaft tolerances for insert bearings..... 45 |
| Accuracy | Radial internal clearance and normal tolerances..... 45 |
| Dimension tables | Insert bearings, corrosion-resistant VA design, grub screws in inner ring 46 |
| | Insert bearings, Corrotect® coating, with eccentric locking collar 48 |
| Product overview | Housing units with cast iron or sheet steel housing 50 |
| Features | Housings with integral insert bearing 51 |
| | Units with cast iron housing..... 51 |
| | Units with sheet steel housing 51 |
| | Operating temperature..... 52 |
| | Suffixes 53 |
| | Further information 53 |
| Design and safety guidelines | Cast iron housings 53 |
| | Sheet steel housings 53 |
| Accuracy | Cast iron housings 53 |
| | Sheet steel housings 53 |
| Dimension tables | Housing units with cast iron housing, plummer block housing units, with Corrotect® coating 54 |
| | Housing units with cast iron housing, flanged housing units, with Corrotect® coating..... 56 |
| | Housing units with sheet steel housing, flanged housing units, corrosion-resistant VA design..... 58 |

| | Page |
|-------------------------------------|--|
| Product overview | Housing units with plastic housing 60 |
| Features | Housings with integral insert bearing 61 |
| | Housing units 62 |
| | End caps 63 |
| | Operating temperature 65 |
| | Suffixes 65 |
| | Further information 65 |
| Design and safety guidelines | Load carrying capacity of insert bearings and housings 65 |
| | Speed limits for insert bearings 65 |
| | Shaft tolerances for insert bearings 65 |
| Accuracy | Tolerances of plastic housings 65 |
| Dimension tables | Housing units with plastic housing, plummer block housing units, insert bearing in corrosion-resistant VA design or with Corrotect [®] coating 66 |
| | Housing units with plastic housing, flanged housing units, insert bearing in corrosion-resistant VA design or with Corrotect [®] coating 70 |
| | Housing units with plastic housing, flanged housing units, insert bearing with Corrotect [®] coating 72 |
| | Housing units with plastic housing, flanged housing units, insert bearing in corrosion-resistant VA design or with Corrotect [®] coating 74 |
| | Housing units with plastic housing, take-up housing units, insert bearing in corrosion-resistant VA design or with Corrotect [®] coating 76 |

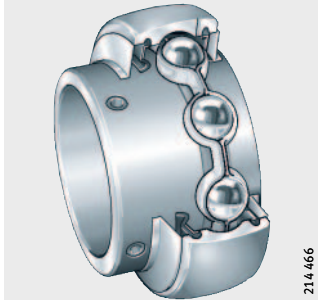


Product overview Insert bearings

Radial insert ball bearings

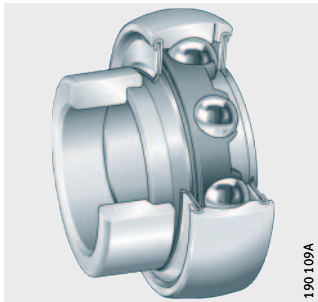
With grub screws in inner ring
Corrosion-resistant VA design

GYE...KRR-B-VA

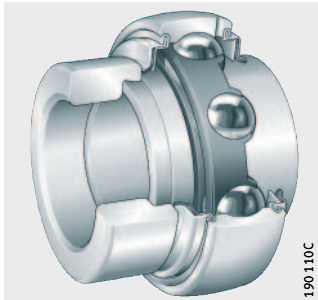


With eccentric locking collar
With Corrotect® coating

GRAE...NPP-B-FA125.5



GE...KRR-B-FA125.5



Insert bearings

Features

Corrosion-resistant insert bearings are designed for corrosion-resistant bearing arrangements. They are therefore equally suitable for applications involving moisture, contaminated water, salt spray mist and for weakly alkaline or weakly acidic cleaning agents. The classic areas of application include the agricultural, construction and mining sectors, conveying equipment, textile, paper and woodworking machinery as well as machinery for the food and drink industry.

Ready to fit, easy to fit, robust

The bearings are available in a corrosion-resistant VA design or with Corrotect® coating. They correspond in their design to single row deep groove ball bearings of series 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.



Compensation of static misalignments

The outer ring of the bearings has a spherical outside surface. In housings with a concave bore, they can therefore compensate static misalignment of the shaft:

- if relubrication is used, up to $\pm 2,5^\circ$
- if relubrication is not used, up to $\pm 5^\circ$.



The units must not be used to support swivelling or tumbling motion.

Insert bearings in corrosion-resistant VA design

In series GYE...KRR-B-VA, the bearing rings 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.

Location by means of corrosion-resistant grub screws

The inner ring is located axially on the shaft by means of two corrosion-resistant grub screws offset by 120° , material number 1.4301. 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. Tightening torques, see table.

Tightening torques for metric grub screws, corrosion-resistant design

| Grub screw | | |
|-------------------------------|----------|--|
| 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 INA grub screws.

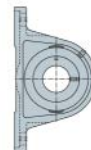
Insert bearings

| | |
|--|--|
| Sealing and lubrication | <p>Single-piece seals RSR seal the insert bearings on both sides. Additional outer flinger shields made from corrosion-resistant steel, material number 1.4301, protect the seals against mechanical damage.</p> <p>Initial greasing is carried out with an aluminium complex soap grease with food applications approval to NSF-H1 that is sufficient in many cases for the entire operating life of the bearings. For relubrication, the outer rings have lubrication holes on their circumference.</p> |
| Operating temperature | <p>The insert bearings are suitable for operating temperatures from -35 °C to $+100\text{ °C}$.</p> |
| Insert bearings with Corrotect® coating | <p>The series GRAE..-NPP-B-FA125.5 and GE..-KRR-B-FA125.5 are coated on all faces with Corrotect®.</p> <p>The special coating Corrotect® is an economical alternative to insert bearings with conventional anti-corrosion protection. For a description of the Corrotect® coating, see page 19.</p> <p>Plastic cages made from polyamide PA66 retain and guide the rolling elements.</p> |
| Location by locking collar | <p>The bearings are located on the shaft by a locking collar. They are therefore 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 and lubrication | <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> <p>Initial greasing is carried out with GA47, a barium complex soap grease with a mineral oil base that is sufficient in many cases for the entire operating life of the bearings; for information on grease GA47 see Catalogue HR 1, Rolling Bearings.</p> <p>In order to increase the grease quantity, insert 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 insert bearings are suitable for operating temperatures from -20 °C to $+120\text{ °C}$.</p> |

Suffixes Suffixes for available designs: see table Available designs.

Available designs

| Suffix | Description |
|---------|---|
| B | Bearing with spherical outside surface of outer ring |
| FA125.5 | With Corrotect® coating, protected against corrosion |
| KRR | Lip seals on both sides (seal R, three-piece) |
| NPP | Lip seals on both sides (seal P, three-piece) |
| 2RSR | Lip seals on both sides (vulcanised, single-piece) |
| VA | Corrosion-resistant design made from high alloy rolling bearing steel |
| FA107 | Bearing with lubrication holes on the locating side |



Further information



For further details on Corrotect®, see page 19.

For information on the design of bearing arrangements, lubrication, fitting and operation of the bearings, attention must be paid to Catalogue HR 1, Rolling Bearings.

Design and safety guidelines
Axial load carrying capacity of insert bearings

The axial load carrying capacity of insert bearings is determined significantly by the method by which they are located on the shaft; see Catalogue HR 1, Rolling Bearings.

Speed limits for insert bearings

The speed limits are dependent on the load, the clearance between the bearing bore and the shaft and the friction of the seals; see Catalogue HR 1, Rolling Bearings.

Shaft tolerances for insert bearings

The permissible shaft tolerance is determined by the speed and load. Tolerances from h6 to h9 are possible. Conventional drawn shafts will suffice for most applications.

Accuracy
Radial internal clearance and normal tolerances

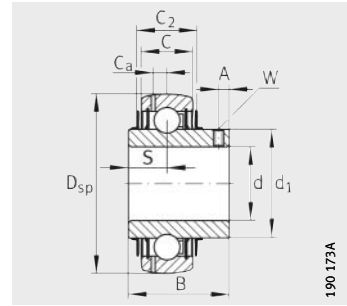
The outside diameter of the bearings corresponds to tolerance class PN to DIN 620-2. The inner ring bore has a plus tolerance to facilitate assembly of the bearings.

The radial internal clearance is C3 and is thus larger than in normal deep groove ball bearings. The larger internal clearance allows better support of angular misalignment and shaft deflection.

The normal tolerances of the bearings and the values for radial internal clearance are described in Catalogue HR 1, Rolling Bearings.

Insert bearings

Corrosion-resistant VA design
 Grub screws in the inner ring



GYE...KRR-B-VA

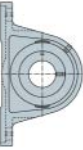
Dimension table - Dimensions in mm

| Designation ¹⁾ | Mass m ≈kg | Dimensions | | | | |
|--------------------------------------|------------------|------------|-----------------|----|------------------------|------|
| | | d | D _{sp} | C | C ₂ max. | B |
| GYE12-KRR-B-VA | 0,11 | 12 | 40 | 12 | 12,6 | 25 |
| GYE15-KRR-B-VA | 0,1 | 15 | 40 | 12 | 12,6 | 25 |
| GYE17-KRR-B-VA | 0,08 | 17 | 40 | 12 | 12,6 | 25 |
| GYE20-KRR-B-VA²⁾³⁾ | 0,15 | 20 | 47 | 16 | 16,6 | 31 |
| GYE25-KRR-B-VA²⁾³⁾ | 0,2 | 25 | 52 | 17 | 17,6 | 34,1 |
| GYE30-KRR-B-VA²⁾³⁾ | 0,3 | 30 | 62 | 19 | 19,6 | 38,1 |
| GYE35-KRR-B-VA²⁾³⁾ | 0,5 | 35 | 72 | 20 | 20,6 | 42,9 |
| GYE40-KRR-B-VA²⁾³⁾ | 0,6 | 40 | 80 | 21 | 21,6 | 49,2 |
| GYE45-KRR-B-VA²⁾³⁾ | 0,66 | 45 | 85 | 22 | 22,6 | 49,2 |
| GYE50-KRR-B-VA²⁾³⁾ | 0,78 | 50 | 90 | 23 | 23,6 | 51,6 |

¹⁾ Speed limits for insert bearings: see page 45 and Catalogue HR 1, Rolling Bearings.

²⁾ Lubrication groove and two lubrication holes in the outer ring.

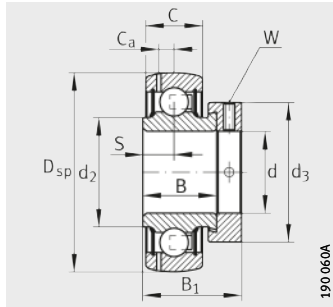
³⁾ Optionally available in design FA 107, see page 45.



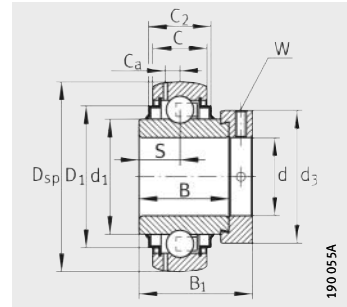
| S | d ₁ | C _a | A | W | Basic load ratings | |
|------|----------------|----------------|-----|-----|-----------------------------|-------------------------------|
| | | | | | dyn. C _r N | stat. C _{0r} N |
| 9,6 | 23,9 | 3,4 | 4 | 2,5 | 9 800 | 4 750 |
| 9,6 | 23,9 | 3,4 | 4 | 2,5 | 9 800 | 4 750 |
| 9,6 | 23,9 | 3,4 | 4 | 2,5 | 9 800 | 4 750 |
| 12,7 | 29,05 | 4 | 5 | 2,5 | 12 800 | 6 600 |
| 14,3 | 34,03 | 4,15 | 5 | 2,5 | 14 000 | 7 800 |
| 15,9 | 40,31 | 5 | 6 | 3 | 19 500 | 11 300 |
| 17,5 | 47,4 | 5,7 | 6,5 | 3 | 25 500 | 15 300 |
| 19 | 52,83 | 5,9 | 8 | 4 | 32 500 | 19 800 |
| 19 | 57,3 | 6,5 | 8 | 4 | 32 500 | 20 400 |
| 19 | 62,92 | 6,5 | 9 | 5 | 35 000 | 23 200 |

Insert bearings

With Corroctec® coating
 With eccentric locking collar



GRAE..-NPP-B-FA125.5

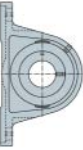


GE..-KRR-B-FA125.5

Dimension table - Dimensions in mm

| Designation ¹⁾ | Mass m ≈kg | Dimensions | | | | | |
|---------------------------|------------------|------------|-----------------|----|----------------|------|------|
| | | d | D _{sp} | C | C ₂ | B | S |
| GRAE20-NPP-B-FA125.5 | 0,16 | 20 | 47 | 14 | – | 21,4 | 7,5 |
| GE20-KRR-B-FA125.5 | 0,19 | 20 | 47 | 14 | 16,6 | 34,1 | 17,1 |
| GRAE25-NPP-B-FA125.5 | 0,19 | 25 | 52 | 15 | – | 21,4 | 7,5 |
| GE25-KRR-B-FA125.5 | 0,25 | 25 | 52 | 15 | 16,7 | 34,9 | 17,5 |
| GRAE30-NPP-B-FA125.5 | 0,32 | 30 | 62 | 18 | – | 23,8 | 9 |
| GE30-KRR-B-FA125.5 | 0,39 | 30 | 62 | 18 | 20,7 | 36,5 | 18,3 |
| GRAE35-NPP-B-FA125.5 | 0,47 | 35 | 72 | 19 | – | 25,4 | 9,5 |
| GE35-KRR-B-FA125.5 | 0,55 | 35 | 72 | 19 | 22,5 | 37,7 | 18,8 |
| GRAE40-NPP-B-FA125.5 | 0,62 | 40 | 80 | 21 | – | 30,2 | 11 |
| GE40-KRR-B-FA125.5 | 0,73 | 40 | 80 | 21 | 23,5 | 42,9 | 21,4 |
| GRAE45-NPP-B-FA125.5 | 0,69 | 45 | 85 | 22 | – | 30,2 | 11 |
| GE45-KRR-B-FA125.5 | 0,83 | 45 | 85 | 22 | 26,4 | 42,9 | 21,4 |
| GRAE50-NPP-B-FA125.5 | 0,73 | 50 | 90 | 22 | – | 30,2 | 11 |
| GE50-KRR-B-FA125.5 | 0,99 | 50 | 90 | 22 | 26,4 | 49,2 | 24,6 |
| GRAE60-NPP-B-FA125.5 | 1,4 | 60 | 110 | 24 | – | 37,1 | 13,5 |

¹⁾ Speed limits for insert bearings: see page 45 and Catalogue HR 1, Rolling Bearings.



| | | | | | | | Basic load ratings | |
|----------------|----------------|----------------|----------------|----------------|------------------------|---|-----------------------------|-------------------------------|
| d ₁ | d ₂ | D ₁ | C _a | B ₁ | d ₃ max. | W | dyn. C _r N | stat. C _{0r} N |
| – | 26,9 | – | 4 | 31 | 33 | 3 | 12 800 | 6 600 |
| 27,6 | – | 37,4 | 4 | 43,7 | 33 | 3 | 12 800 | 6 600 |
| – | 30,5 | – | 3,9 | 31 | 37,5 | 3 | 14 000 | 7 800 |
| 33,8 | – | 42,5 | 3,9 | 44,5 | 37,5 | 3 | 14 000 | 7 800 |
| – | 37,4 | – | 4,7 | 35,8 | 44 | 4 | 19 500 | 11 300 |
| 40,2 | – | 52 | 4,7 | 48,5 | 44 | 4 | 19 500 | 11 300 |
| – | 44,6 | – | 5,6 | 39 | 51 | 5 | 25 500 | 15 300 |
| 46,8 | – | 60,3 | 5,6 | 51,3 | 51 | 5 | 25 500 | 15 300 |
| – | 49,4 | – | 6,4 | 43,8 | 58 | 5 | 32 500 | 19 800 |
| 52,3 | – | 68,3 | 6,4 | 56,5 | 58 | 5 | 32 500 | 19 800 |
| – | 54,3 | – | 6,4 | 43,8 | 63 | 5 | 32 500 | 20 400 |
| 57,9 | – | 72,3 | 6,4 | 56,5 | 63 | 5 | 32 500 | 20 400 |
| – | 59,4 | – | 6,9 | 43,8 | 69 | 5 | 35 000 | 23 200 |
| 62,8 | – | 77,3 | 6,9 | 62,8 | 69 | 5 | 35 000 | 23 200 |
| – | 72 | – | 7,2 | 53,1 | 84 | 5 | 52 000 | 36 000 |

Product overview

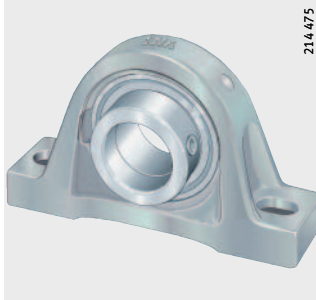
Housing units

With cast iron or sheet steel housing

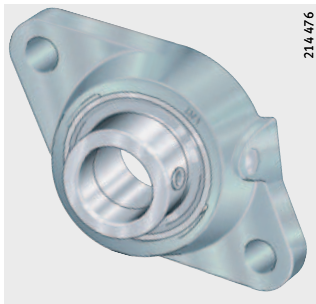
Housing units with cast iron housing

With Corrotect® coating

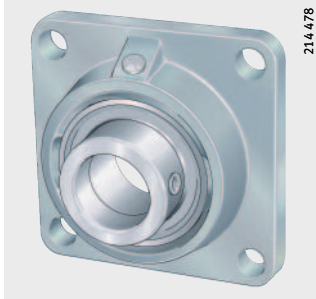
PASE..-N-FA125,
RASE..-N-FA125



PCJT..-N-FA125,
RCJT..-N-FA125



PCJ..-N-FA125,
RCJ..-N-FA125



Housing units with sheet steel housing

Corrosion-resistant VA design

GRRY..-VA,
RRY..-VA



Housing units

With cast iron or sheet steel housing

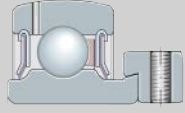
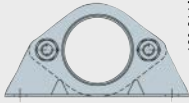
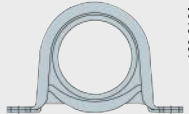
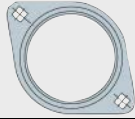
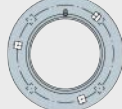
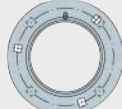
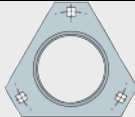
| | |
|--|---|
| Features | Corrosion-resistant units are available as plummer block and flanged housing units. Their area of application corresponds to that of the insert bearings, in other words where moisture, contaminated water, salt spray mist or weakly alkaline and weakly acidic cleaning agents are present. |
| Housings with integral insert bearing | <p>The units are ready to fit and comprise INA sheet steel or INA cast iron housings in which INA insert bearings are integrated; for a description of the insert bearings, see page 43 and page 44. In order to ensure function and reliability under all operating conditions, the bearing and housing are matched to each other. 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 Insert bearings, page 43.</p> <p>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 to the adjacent construction. Less stringent tolerances are sufficient for the screw mounting surfaces.</p> |
| Units with cast iron housing | <p>Cast iron units are available as plummer block housing units PASE...-N-FA125 and RASE...-N-FA125 as well as flanged housing units PCJT...-N-FA125, RCJT...-N-FA125, PCJ...-N-FA125 and RCJ...-N-FA125.</p> <p>The housings and insert bearings are coated with Corrotect® and have 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 4 762 are suitable.</p> |
| Relubrication facility | For relubrication of insert bearings, the housing bore has a lubrication groove and the housing has a lubrication hole for conventional tapered lubrication nipples to DIN 71 412. In the delivered condition, the hole in the housing is closed off by a plastic plug. |
| Units with sheet steel housings | <p>These units are available in their preferred versions as series GRRY...-VA and RRY...-VA. GRRY can be relubricated via a lubrication nipple.</p> <p>The units comprise insert bearings in a corrosion-resistant VA design, for insert bearings see page 43, and two-piece sheet steel housings made from corrosion-resistant steel, material number 1.4301. The bearings and units have the suffix VA.</p> <p>The units are designed for moderate loads and lightweight constructions.</p> |
| Further possible combinations | Sheet steel housings with Corrotect® coating can also be combined with the insert bearing GRAE...-NPP-B-FA125.5. Possible combinations and available diameters d: see table Possible combinations, page 52. The housings and bearings must be ordered separately. |



Housing units

With cast iron or sheet steel housing¹⁾

Possible combinations

| | | | |
|--|---|----------|---|
| Combination Insert bearing with sheet steel housing ¹⁾ |  | | GRAE..-NPP-B-FA125.5 190 425C |
| Plummer block housings | | | |
| GEH..-PBS-FA125 |  | 190 941A | d = 20 mm to 40 mm |
| GEH..-BT-FA125 |  | 190 942A | d = 20 mm to 30 mm |
| Two-bolt flanged housings | | | |
| FLAN..-MST-FA125 (2 pieces) |  | 190 945A | d = 20 mm to 40 mm |
| Three-bolt flanged housings | | | |
| FLAN..-MSB-FA125 (2 pieces) |  | 190 947A | d = 20 mm to 55 mm |
| FLAN..-MSA-FA125 FLAN..-MSB-FA125 |  | 190 947A | d = 25 mm to 45 mm With relubrication facility |
| FLAN..-MSTR-FA125 |  | 190 948A | d = 20 mm to 35 mm |

¹⁾ For housing code and bearing bore, see table.

Housing code and bearing bore

| | | | | | | | | |
|-----------------------|----|----|----|----|----|----|----|-----|
| Housing code | 47 | 52 | 62 | 72 | 80 | 85 | 90 | 100 |
| Bearing bore diameter | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 55 |

Operating temperature

Corrosion-resistant units are suitable for operating temperatures from -20 °C to +120 °C.

Suffixes

Suffixes for available designs: see table Available designs.

Available designs

| Suffix | Design |
|--------|--|
| FA125 | With Corrotect® coating, protected against corrosion |
| VA | Design made from corrosion-resistant steel |

Further information

For further details on Corrotect®, see page 19.

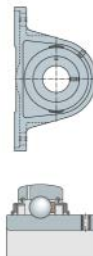


For information on the design of bearing arrangements, lubrication, fitting and operation of the bearings and units, attention must be paid to Catalogue HR 1, Rolling Bearings.

Design and safety guidelines



Due to their versatile characteristics, INA housed bearing 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.



Cast iron housings

Radial load carrying capacity

Cast iron housings can support the same radial loads as the insert bearings fitted.

The static load carrying capacity of insert bearings C_{0r} is stated in the dimension tables.

For shock loads, appropriate safety factors must be applied. In this case, please contact us.

Axial load carrying capacity

The axial load carrying capacity of cast iron housings is $0,5 \times C_{0r}$.

Sheet steel housings

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 $0,5 \times C_{0rG}$.

Accuracy

The housings correspond predominantly to DIN 626-2 and ISO 3 228, insofar as they are described therein.

Cast iron housings

The dimensional tolerances for the machined surfaces of cast iron housings are $\pm 0,25$ mm.

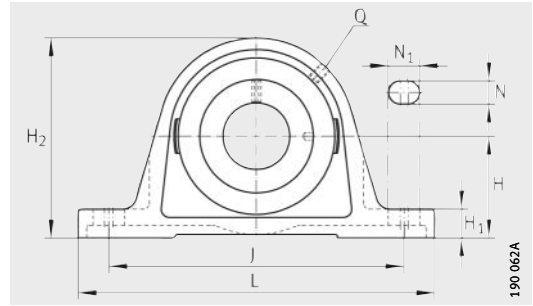
The dimensional tolerances for unmachined as well as machined to unmachined surfaces correspond to GTB 14, DIN 1 680-2.

Sheet steel housings

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.

Housing units with cast iron housing

Plummer block housing units
With Corrotect® coating

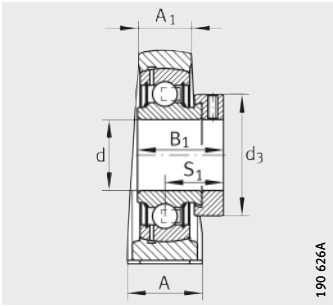


PASE..-N-FA125, RASE..-N-FA125

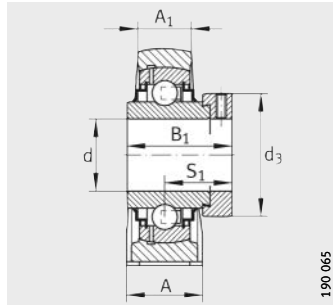
Dimension table - Dimensions in mm

| Designation | | | Mass m ≈ kg | Dimensions | | | | | |
|-----------------------|-----------------------|----------------------------|-------------------|------------|------|-----|-----|----|----------------|
| Unit | Housing | Radial insert ball bearing | | d | H | J | L | A | A ₁ |
| PASE20-N-FA125 | GG.ASE04-E-N-FA125.1 | GRAE20-NPP-B-FA125.5 | 0,6 | 20 | 33,3 | 97 | 130 | 32 | 19 |
| RASE20-N-FA125 | GG.ASE04-E-N-FA125.1 | GE20-KRR-B-FA125.5 | 0,63 | 20 | 33,3 | 97 | 130 | 32 | 19 |
| PASE25-N-FA125 | GG.ASE05-N-FA125.1 | GRAE25-NPP-B-FA125.5 | 0,67 | 25 | 36,5 | 103 | 130 | 36 | 21 |
| RASE25-N-FA125 | GG.ASE05-N-FA125.1 | GE25-KRR-B-FA125.5 | 0,75 | 25 | 36,5 | 103 | 130 | 36 | 21 |
| PASE30-N-FA125 | GG.ASE06-N-FA125.1 | GRAE30-NPP-B-FA125.5 | 1,13 | 30 | 42,9 | 118 | 158 | 40 | 25 |
| RASE30-N-FA125 | GG.ASE06-N-FA125.1 | GE30-KRR-B-FA125.5 | 1,18 | 30 | 42,9 | 118 | 158 | 40 | 25 |
| PASE35-N-FA125 | GG.ASE07-N-FA125.1 | GRAE35-NPP-B-FA125.5 | 1,57 | 35 | 47,6 | 126 | 163 | 45 | 27 |
| RASE35-N-FA125 | GG.ASE07-N-FA125.1 | GE35-KRR-B-FA125.5 | 1,65 | 35 | 47,6 | 126 | 163 | 45 | 27 |
| PASE40-N-FA125 | GG.ASE/AK08-N-FA125.1 | GRAE40-NPP-B-FA125.5 | 1,84 | 40 | 49,2 | 138 | 179 | 48 | 30 |
| RASE40-N-FA125 | GG.ASE/AK08-N-FA125.1 | GE40-KRR-B-FA125.5 | 1,95 | 40 | 49,2 | 138 | 179 | 48 | 30 |
| PASE50-N-FA125 | GG.ASE10-N-FA125.1 | GRAE50-NPP-B-FA125.5 | 2,59 | 50 | 57,2 | 158 | 200 | 54 | 34 |
| RASE50-N-FA125 | GG.ASE10-N-FA125.1 | GE50-KRR-B-FA125.5 | 2,8 | 50 | 57,2 | 158 | 200 | 54 | 34 |
| PASE60-N-FA125 | GG.ASE12-N-FA125.1 | GRAE60-NPP-B-FA125.5 | 4,35 | 60 | 69,9 | 190 | 240 | 60 | 42 |

¹⁾ To be ordered separately.
For a description of the end caps, see Catalogue HR 1, Rolling Bearings.



PASE...-N-FA125



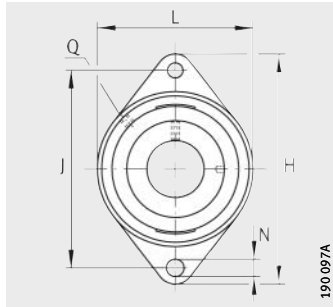
RASE...-N-FA125

| H ₁ | H ₂ | N | N ₁ | B ₁ | S ₁ | Q | d ₃ max. | Basic load ratings | | End cap ¹⁾ |
|----------------|----------------|----|----------------|----------------|----------------|--------------------|------------------------|-----------------------------|-------------------------------|-----------------------|
| | | | | | | | | dyn. C _r N | stat. C _{0r} N | |
| 14,5 | 64 | 11 | 19 | 31 | 23,5 | R _p 1/8 | 33 | 12 800 | 6 600 | KASK04 |
| 14,5 | 64 | 11 | 19 | 43,7 | 26,6 | R _p 1/8 | 33 | 12 800 | 6 600 | KASK04 |
| 14,5 | 70 | 11 | 19 | 31 | 23,5 | R _p 1/8 | 37,5 | 14 000 | 7 800 | KASK05 |
| 14,5 | 70 | 11 | 19 | 44,5 | 27 | R _p 1/8 | 37,5 | 14 000 | 7 800 | KASK05 |
| 17 | 82 | 14 | 22 | 35,8 | 26,8 | R _p 1/8 | 44 | 19 500 | 11 300 | KASK06 |
| 17 | 82 | 14 | 22 | 48,5 | 30,2 | R _p 1/8 | 44 | 19 500 | 11 300 | KASK06 |
| 19 | 93 | 14 | 21 | 39 | 29,5 | R _p 1/8 | 51 | 25 500 | 15 300 | KASK07 |
| 19 | 93 | 14 | 21 | 51,3 | 32,5 | R _p 1/8 | 51 | 25 500 | 15 300 | KASK07 |
| 19 | 99 | 14 | 26 | 43,8 | 32,8 | R _p 1/8 | 58 | 32 500 | 19 800 | KASK08 |
| 19 | 99 | 14 | 26 | 56,5 | 35,1 | R _p 1/8 | 58 | 32 500 | 19 800 | KASK08 |
| 21,5 | 115 | 18 | 23 | 43,8 | 32,8 | R _p 1/8 | 69 | 35 000 | 23 200 | KASK10 |
| 21,5 | 115 | 18 | 23 | 62,8 | 38,2 | R _p 1/8 | 69 | 35 000 | 23 200 | KASK10 |
| 25 | 140 | 18 | 28 | 53,1 | 39,6 | R _p 1/8 | 84 | 52 000 | 36 000 | KASK12 |

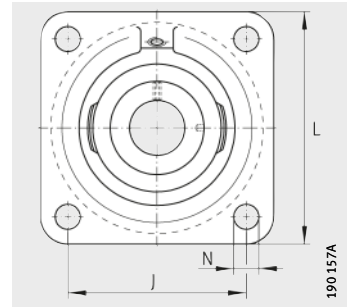


Housing units with cast iron housing

Flanged housing units With Corrotect® coating



PCJT...-N-FA125, RCJT...-N-FA125

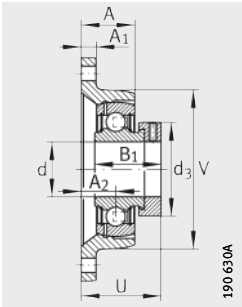


PCJ...-N-FA125, RCJ...-N-FA125

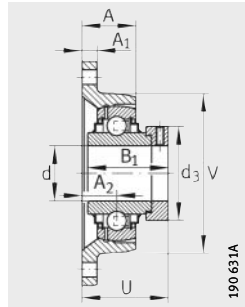
Dimension table - Dimensions in mm

| Designation | | | Mass m ≈kg | Dimensions | | | | |
|-----------------------|--------------------|----------------------------|------------------|------------|-----|-----|----------------|------|
| Unit | Housing | Radial insert ball bearing | | d | L | H | A ₁ | N |
| PCJT20-N-FA125 | GG.CJT04-N-FA125.1 | GRAE20-NPP-B-FA125.5 | 0,44 | 20 | 61 | 112 | 10 | 11,5 |
| RCJT20-N-FA125 | GG.CJT04-N-FA125.1 | GE20-KRR-B-FA125.5 | 0,48 | 20 | 61 | 112 | 10 | 11,5 |
| PCJ20-N-FA125 | GG.CJ04-N-FA125.1 | GRAE20-NPP-B-FA125.5 | 0,6 | 20 | 86 | - | 10 | 11,5 |
| RCJ20-N-FA125 | GG.CJ04-N-FA125.1 | GE20-KRR-B-FA125.5 | 0,63 | 20 | 86 | - | 10 | 11,5 |
| PCJT25-N-FA125 | GG.CJT05-N-FA125.1 | GRAE25-NPP-B-FA125.5 | 0,58 | 25 | 70 | 124 | 11 | 11,5 |
| RCJT25-N-FA125 | GG.CJT05-N-FA125.1 | GE25-KRR-B-FA125.5 | 0,63 | 25 | 70 | 124 | 11 | 11,5 |
| PCJ25-N-FA125 | GG.CJ05-N-FA125.1 | GRAE25-NPP-B-FA125.5 | 0,76 | 25 | 95 | - | 11 | 11,5 |
| RCJ25-N-FA125 | GG.CJ05-N-FA125.1 | GE25-KRR-B-FA125.5 | 0,81 | 25 | 95 | - | 11 | 11,5 |
| PCJT30-N-FA125 | GG.CJT06-N-FA125.1 | GRAE30-NPP-B-FA125.5 | 0,83 | 30 | 80 | 142 | 12 | 11,5 |
| RCJT30-N-FA125 | GG.CJT06-N-FA125.1 | GE30-KRR-B-FA125.5 | 0,9 | 30 | 80 | 142 | 12 | 11,5 |
| PCJ30-N-FA125 | GG.CJ06-N-FA125.1 | GRAE30-NPP-B-FA125.5 | 1,11 | 30 | 108 | - | 12 | 11,5 |
| RCJ30-N-FA125 | GG.CJ06-N-FA125.1 | GE30-KRR-B-FA125.5 | 1,17 | 30 | 108 | - | 12 | 11,5 |
| PCJT35-N-FA125 | GG.CJT07-N-FA125.1 | GRAE35-NPP-B-FA125.5 | 1,13 | 35 | 92 | 155 | 12,5 | 14 |
| RCJT35-N-FA125 | GG.CJT07-N-FA125.1 | GE35-KRR-B-FA125.5 | 1,21 | 35 | 92 | 155 | 12,5 | 14 |
| PCJ35-N-FA125 | GG.CJ07-N-FA125.1 | GRAE35-NPP-B-FA125.5 | 1,46 | 35 | 118 | - | 12,5 | 14 |
| RCJ35-N-FA125 | GG.CJ07-N-FA125.1 | GE35-KRR-B-FA125.5 | 1,54 | 35 | 118 | - | 12,5 | 14 |
| PCJT40-N-FA125 | GG.CJT08-N-FA125.1 | GRAE40-NPP-B-FA125.5 | 1,57 | 40 | 105 | 172 | 13 | 14 |
| RCJT40-N-FA125 | GG.CJT08-N-FA125.1 | GE40-KRR-B-FA125.5 | 1,68 | 40 | 105 | 172 | 13 | 14 |
| PCJ40-N-FA125 | GG.CJ08-N-FA125.1 | GRAE40-NPP-B-FA125.5 | 1,89 | 40 | 130 | - | 13 | 14 |
| RCJ40-N-FA125 | GG.CJ08-N-FA125.1 | GE40-KRR-B-FA125.5 | 2,01 | 40 | 130 | - | 13 | 14 |
| PCJT50-N-FA125 | GG.CJT10-N-FA125.1 | GRAE50-NPP-B-FA125.5 | 1,98 | 50 | 116 | 190 | 13 | 18 |
| RCJT50-N-FA125 | GG.CJT10-N-FA125.1 | GE50-KRR-B-FA125.5 | 2,2 | 50 | 116 | 190 | 13 | 18 |
| PCJ50-N-FA125 | GG.CJ10-N-FA125.1 | GRAE50-NPP-B-FA125.5 | 2,3 | 50 | 143 | - | 13 | 18 |
| RCJ50-N-FA125 | GG.CJ10-N-FA125.1 | GE50-KRR-B-FA125.5 | 2,53 | 50 | 143 | - | 13 | 18 |
| PCJT60-N-FA125 | GG.CJT12-N-FA125.1 | GRAE60-NPP-B-FA125.5 | 3,25 | 60 | 138 | 238 | 16 | 18 |

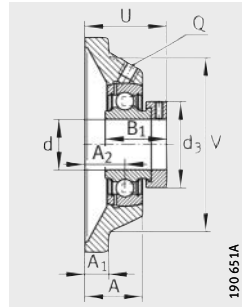
¹⁾ To be ordered separately.
For a description of the end caps, see Catalogue HR 1, Rolling Bearings.



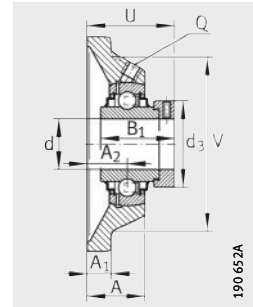
PCJT..-N-FA125



RCJT..-N-FA125



PCJ..-N-FA125



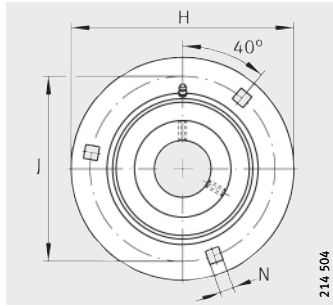
RCJ..-N-FA125

| B ₁ | J | A ₂ | Q | d ₃ max. | A | U | V | Basic load ratings | | End cap ¹⁾ |
|----------------|-------|----------------|--------------------|------------------------|------|------|-----|-----------------------------|-------------------------------|-----------------------|
| | | | | | | | | dyn. C _r N | stat. C _{0r} N | |
| 31 | 90 | 19 | R _p 1/8 | 33 | 28 | 42,5 | 61 | 12 800 | 6 600 | KASK04 |
| 43,7 | 90 | 19 | R _p 1/8 | 33 | 28 | 45,6 | 61 | 12 800 | 6 600 | KASK04 |
| 31 | 63,5 | 19 | R _p 1/8 | 33 | 29 | 42,5 | 68 | 12 800 | 6 600 | KASK04 |
| 43,7 | 63,5 | 19 | R _p 1/8 | 33 | 29 | 45,6 | 68 | 12 800 | 6 600 | KASK04 |
| 31 | 99 | 19 | R _p 1/8 | 37,5 | 29 | 42,5 | 70 | 14 000 | 7 800 | KASK05 |
| 44,5 | 99 | 19 | R _p 1/8 | 37,5 | 29 | 46 | 70 | 14 000 | 7 800 | KASK05 |
| 31 | 70 | 19 | R _p 1/8 | 37,5 | 29 | 42,5 | 74 | 14 000 | 7 800 | KASK05 |
| 44,5 | 70 | 19 | R _p 1/8 | 37,5 | 29 | 46 | 74 | 14 000 | 7 800 | KASK05 |
| 35,8 | 116,5 | 20 | R _p 1/8 | 44 | 29 | 46,8 | 80 | 19 500 | 11 300 | KASK06 |
| 48,5 | 116,5 | 20 | R _p 1/8 | 44 | 29 | 50,2 | 80 | 19 500 | 11 300 | KASK06 |
| 35,8 | 82,5 | 20 | R _p 1/8 | 44 | 29 | 46,8 | 85 | 19 500 | 11 300 | KASK06 |
| 48,5 | 82,5 | 20 | R _p 1/8 | 44 | 29 | 50,2 | 85 | 19 500 | 11 300 | KASK06 |
| 39 | 130 | 21 | R _p 1/8 | 51 | 30,5 | 50,5 | 92 | 25 500 | 15 300 | KASK07 |
| 51,3 | 130 | 21 | R _p 1/8 | 51 | 30,5 | 53,5 | 92 | 25 500 | 15 300 | KASK07 |
| 39 | 92 | 21 | R _p 1/8 | 51 | 30,5 | 50,5 | 100 | 25 500 | 15 300 | KASK07 |
| 51,3 | 92 | 21 | R _p 1/8 | 51 | 30,5 | 53,5 | 100 | 25 500 | 15 300 | KASK07 |
| 43,8 | 143,5 | 24 | R _p 1/8 | 58 | 34,5 | 56,8 | 105 | 32 500 | 19 800 | KASK08 |
| 56,5 | 143,5 | 24 | R _p 1/8 | 58 | 34,5 | 59,1 | 105 | 32 500 | 19 800 | KASK08 |
| 43,8 | 101,5 | 24 | R _p 1/8 | 58 | 34,5 | 56,8 | 110 | 32 500 | 19 800 | KASK08 |
| 56,5 | 101,5 | 24 | R _p 1/8 | 58 | 34,5 | 59,1 | 110 | 32 500 | 19 800 | KASK08 |
| 43,8 | 157 | 28 | R _p 1/8 | 69 | 39 | 60,8 | 116 | 35 000 | 23 200 | KASK10 |
| 62,8 | 157 | 28 | R _p 1/8 | 69 | 39 | 66,2 | 116 | 35 000 | 23 200 | KASK10 |
| 43,8 | 111 | 28 | R _p 1/8 | 69 | 39 | 60,8 | 125 | 35 000 | 23 200 | KASK10 |
| 62,8 | 111 | 28 | R _p 1/8 | 69 | 39 | 66,2 | 125 | 35 000 | 23 200 | KASK10 |
| 53,1 | 202 | 34 | R _p 1/8 | 84 | 46 | 73,6 | 138 | 52 000 | 36 000 | KASK12 |

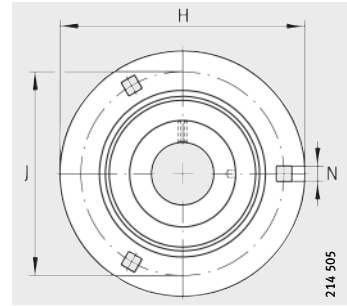


Housing units with sheet steel housing

Flanged housing units
Corrosion-resistant
VA design



GRRY..-VA



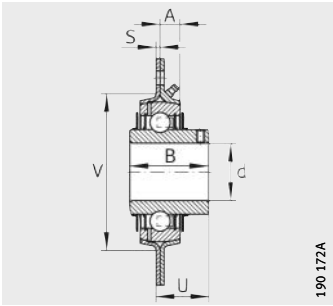
RRY..-VA

Dimension table - Dimensions in mm

| Designation | | | Mass m ≈kg | Dimensions | | |
|-------------------------------|--|----------------------------|------------------|------------|-------|-----|
| Unit | Housing | Radial insert ball bearing | | d | H | S |
| RRY12-VA ¹⁾ | FLAN40-MSB-VA (2 pieces) | GYE12-KRR-B-VA | 0,21 | 12 | 81 | 2 |
| RRY15-VA ¹⁾ | FLAN40-MSB-VA (2 pieces) | GYE15-KRR-B-VA | 0,2 | 15 | 81 | 2 |
| RRY17-VA ¹⁾ | FLAN40-MSB-VA (2 pieces) | GYE17-KRR-B-VA | 0,19 | 17 | 81 | 2 |
| GRRY20-VA²⁾ | FLAN47-MSB-VA/FLAN47-MSA-VA (1 piece each) | GYE20-KRR-B-VA | 0,34 | 20 | 90,5 | 2 |
| RRY20-VA | FLAN47-MSB-VA (2 pieces) | GYE20-KRR-B-VA | 0,34 | 20 | 90,5 | 2 |
| GRRY25-VA²⁾ | FLAN52-MSB-VA/FLAN52-MSA-VA (1 piece each) | GYE25-KRR-B-VA | 0,38 | 25 | 95 | 2 |
| RRY25-VA | FLAN52-MSB-VA (2 pieces) | GYE25-KRR-B-VA | 0,38 | 25 | 95 | 2 |
| GRRY30-VA²⁾ | FLAN62-MSB-VA/FLAN62-MSA-VA (1 piece each) | GYE30-KRR-B-VA | 0,63 | 30 | 112,7 | 2,5 |
| RRY30-VA | FLAN62-MSB-VA (2 pieces) | GYE30-KRR-B-VA | 0,63 | 30 | 112,7 | 2,5 |

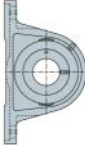
¹⁾ Housing and radial insert ball bearing must be ordered separately.

²⁾ Bearing can be relubricated.



190 172A

GRRY..-VA, RRY..-VA



| N | B | J | A | U | V | Number of screw mounting holes n | Load carrying capacity of housing C_{0rG} N | Basic load ratings | |
|------|------|------|-----|------|----|-------------------------------------|---|--------------------|------------------------|
| | | | | | | | | dyn. C_r N | stat. C_{0r} N |
| 7,1 | 25 | 63,5 | 7 | 17,4 | 48 | 3 | 2 700 | 9 800 | 4 750 |
| 7,1 | 25 | 63,5 | 7 | 17,4 | 48 | 3 | 2 700 | 9 800 | 4 750 |
| 7,1 | 25 | 63,5 | 7 | 17,4 | 48 | 3 | 2 700 | 9 800 | 4 750 |
| 8,7 | 31 | 71,5 | 8 | 20,3 | 55 | 3 | 3 200 | 12 800 | 6 800 |
| 8,7 | 31 | 71,5 | 8 | 20,3 | 55 | 3 | 3 200 | 12 800 | 6 800 |
| 8,7 | 34 | 76 | 8,7 | 21,7 | 60 | 3 | 3 650 | 14 000 | 7 800 |
| 8,7 | 34 | 76 | 8,7 | 21,7 | 60 | 3 | 3 650 | 14 000 | 7 800 |
| 10,5 | 38,1 | 90,5 | 9 | 24,7 | 71 | 3 | 5 000 | 19 500 | 11 300 |
| 10,5 | 38,1 | 90,5 | 9 | 24,7 | 71 | 3 | 5 000 | 19 500 | 11 300 |

Product overview **Housing units** With plastic housing

Plummer block housing units

RASEY..-TV-VA,
PASE..-TV-FA125.5



RSHEY..-TV-VA,
PSHE..-TV-FA125.5



Flanged housing units

RCJTY..-TV-VA,
PCJT..-TV-FA125.5



GLCTE..-TV-FA125.5



RCJY..-TV-VA,
PCJ..-TV-FA125.5



Take-up housing units

RTUEY..-TV-VA,
PTUE..-TV-FA125.5



RHEY..-TV-VA,
PHE..-TV-FA125.5



Housing units With plastic housing

Features Housing units with a plastic housing are available as plummer block and flanged housing units as well as take-up housing units and have the suffix TV.

The glass fibre reinforced material PBT is highly resistant to moisture, UV radiation, bacterial and fungal attacks as well as many chemical media.

Housings with integral insert bearing

The units are ready to fit and comprise plastic housings in which INA insert bearings are integrated; for a description of the insert bearings, see page 43 and page 44. In order to ensure function and reliability under all operating conditions, the bearing and housing are matched to each other.

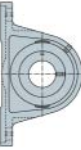
Bearings of the corrosion-resistant VA design are located on the shaft by means of grub screws, bearings with the suffix FA125.5 are located by means of an eccentric locking collar.

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 to the adjacent construction. Less stringent tolerances are sufficient for the screw mounting surfaces.

Compensation of static misalignments

Due to the spherical outside surface of the bearing outer ring and the concave housing bore, INA housing units can compensate for static angular misalignment of the shaft.



Housing units

With plastic housing

| | |
|------------------------------------|--|
| Housing units | The housing units are available with insert bearings in the corrosion-resistant VA design or with Corrotect® coating to FA125.5. |
| Plummer block housing units | <p>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.</p> <p>For relubrication of radial insert ball bearings, the housing bore has a radial groove and the housing has a lubrication hole suitable for conventional lubrication nipples to 1/4"-28 UNF to ANSI B1.1. The lubrication nipple is supplied already fitted, a bearing end cap is supplied loose at the time of delivery.</p> |
| Flanged housing units | <p>Flanged housing units are available as two-bolt and four-bolt units. For location, the housings have through holes for screws to DIN EN ISO 4762.</p> <p>The housing material, the design of lubrication arrangements and the delivered condition correspond to those of plummer block housing units.</p> |
| Take-up housing units | <p>Take-up housing units allow some displacement. They are used where shafts must carry out long displacement motions.</p> <p>The housing material, the design of lubrication arrangements and the delivered condition correspond to those of plummer block housing units.</p> |

End caps

Closed design Each housing unit is supplied with a closed end cap KASK...S-G.

Open design For all units, open end caps are available by agreement with an integral rotary shaft seal KASK...S-R-NBR, *Figure 1* and table.

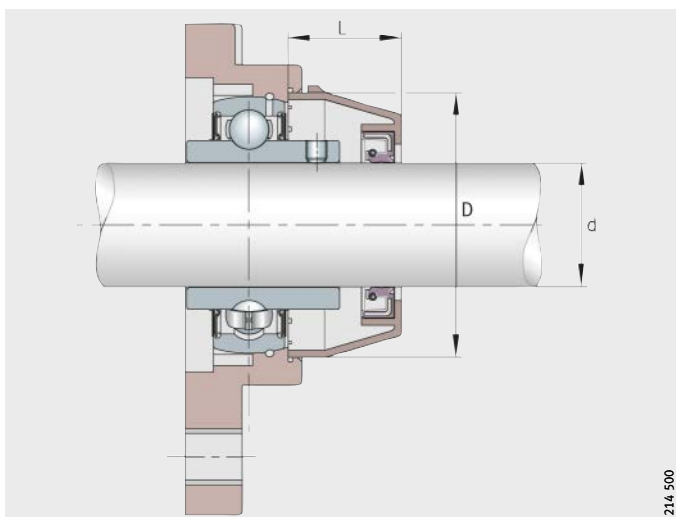


Figure 1
Open end cap
with integral rotary shaft seal

End caps, designations and dimensions

| Designation | | Dimensions (mm) | | |
|---------------------------|-------------------------|-----------------|------|----|
| End cap, closed design | End cap, open design | d | D | L |
| KASK04-S-G | KASK04-S-R-NBR | 20 | 50 | 23 |
| KASK05-S-G | KASK05-S-R-NBR | 25 | 55 | 25 |
| KASK06-S-G | KASK06-S-R-NBR | 30 | 64 | 30 |
| KASK07-S-G | KASK07-S-R-NBR | 35 | 74,5 | 32 |
| KASK08-S-G | KASK08-S-R-NBR | 40 | 84 | 37 |
| KASK09-S-G | KASK09-S-R-NBR | 45 | 89 | 41 |
| KASK10-S-G | KASK10-S-R-NBR | 50 | 94 | 47 |

Housing units With plastic housing

Back Seal component

For series PCJT...-TV-FA125.5 and PCJ...-TV-FA125.5, a Back Seal component RWDR...-R-NBR is available that closes off the rear face of the housing, *Figure 2*.

For dimensions see *Figure 3* and table.



① Back Seal component

Figure 2
PCJ with Back Seal component

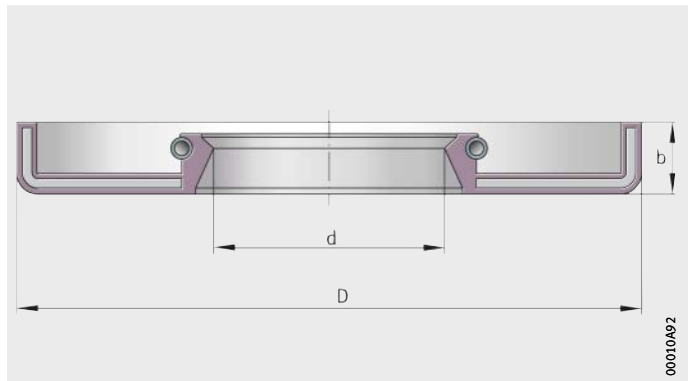


Figure 3
Dimensions
of Back Seal component

Designations and dimensions

| Designation | Dimensions (mm) | | |
|--------------|-----------------|---|----|
| | d | b | D |
| RWDR04-R-NBR | 20 | 6 | 52 |
| RWDR05-R-NBR | 25 | 6 | 62 |
| RWDR06-R-NBR | 30 | 6 | 72 |
| RWDR07-R-NBR | 35 | 6 | 82 |
| RWDR08-R-NBR | 40 | 6 | 88 |
| RWDR09-R-NBR | 45 | 6 | 93 |
| RWDR10-R-NBR | 50 | 6 | 98 |

Operating temperature Units with a plastic housing are suitable for operating temperatures from $-20\text{ }^{\circ}\text{C}$ to $+80\text{ }^{\circ}\text{C}$.

Suffixes Suffixes for the available designs: see table.

Available designs

| Suffix | Design |
|---------|---|
| TV | Housing made from glass fibre reinforced plastic |
| VA | Corrosion-resistant design made from high alloy rolling bearing steel |
| FA125.5 | Bearing with Corrotect® coating, protected against corrosion |

Further information



For information on the design of bearing arrangements, lubrication, fitting and operation of the bearings, attention must be paid to Catalogue HR 1, Rolling Bearings.

Design and safety guidelines



Due to their versatile characteristics, INA housed bearing 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.

Load carrying capacity of insert bearings and housings

The axial load carrying capacity of insert bearings must not exceed the axial load carrying capacity of the housing.

Radial and axial load carrying capacity of housings

The housings can support radial loads up to C_{0rG} and axial loads up to $0,25 \times C_{0r}$.

Speed limits for insert bearings

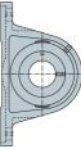
The speed limits are dependent on the load, the clearance between the bearing bore and the shaft and the friction of the seals; see Catalogue HR 1, Rolling Bearings.

Shaft tolerances for insert bearings

Tolerances from h6 to h9 are suitable for unit shafts. Conventional drawn shafts will suffice for most applications.

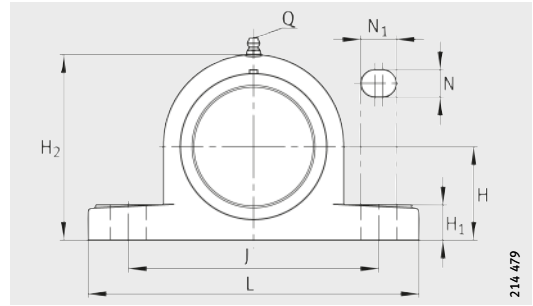
Accuracy Tolerances of plastic housings

The dimensional and geometrical tolerances of plastic housings correspond to DIN 16 901.



Housing units with plastic housing

Plummer block housing units
Insert bearings
in corrosion-resistant VA design
or with Corrotect® coating



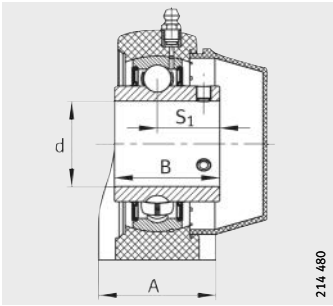
RASEY...-TV-VA, PASE...-TV-FA125.5

Dimension table - Dimensions in mm

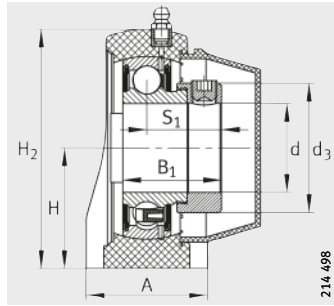
| Designation | | | Mass m ≈kg | Dimensions | | | | |
|---------------------------------------|--------------|----------------------------|------------------|------------|------|-----|-------|----|
| Unit ¹⁾ | Housing | Radial insert ball bearing | | d | H | J | L | A |
| RASEY20-TV-VA | GEH.ASE04-TV | GYE20-KRR-B-FA107-VA | 0,31 | 20 | 33,3 | 95 | 127 | 38 |
| PASE20-TV-FA125.5 | GEH.ASE04-TV | GRAE20-NPP-B-FA107/125.5 | 0,32 | 20 | 33,3 | 95 | 127 | 38 |
| RASEY25-TV-VA | GEH.ASE05-TV | GYE25-KRR-B-FA107-VA | 0,38 | 25 | 36,5 | 105 | 140,5 | 38 |
| PASE25-TV-FA125.5 | GEH.ASE05-TV | GRAE25-NPP-B-FA107/125.5 | 0,37 | 25 | 36,5 | 105 | 140,5 | 38 |
| RASEY30-TV-VA | GEH.ASE06-TV | GYE30-KRR-B-FA107-VA | 0,58 | 30 | 42,9 | 119 | 163 | 46 |
| PASE30-TV-FA125.5 | GEH.ASE06-TV | GRAE30-NPP-B-FA107/125.5 | 0,6 | 30 | 42,9 | 119 | 163 | 46 |
| RASEY35-TV-VA | GEH.ASE07-TV | GYE35-KRR-B-FA107-VA | 0,81 | 35 | 47,6 | 127 | 168 | 48 |
| PASE35-TV-FA125.5 | GEH.ASE07-TV | GRAE35-NPP-B-FA107/125.5 | 0,82 | 35 | 47,6 | 127 | 168 | 48 |
| RASEY40-TV-VA | GEH.ASE08-TV | GYE40-KRR-B-FA107-VA | 1,05 | 40 | 49,2 | 137 | 184 | 54 |
| PASE40-TV-FA125.5 | GEH.ASE08-TV | GRAE40-NPP-B-FA107/125.5 | 1,06 | 40 | 49,2 | 137 | 184 | 54 |
| RASEY45-TV-VA²⁾ | GEH.ASE09-TV | GYE45-KRR-B-FA107-VA | 1,16 | 45 | 54 | 146 | 192 | 54 |
| PASE45-TV-FA125.5²⁾ | GEH.ASE09-TV | GRAE45-NPP-B-FA107/125.5 | 1,19 | 45 | 54 | 146 | 192 | 54 |
| RASEY50-TV-VA²⁾ | GEH.ASE10-TV | GYE50-KRR-B-FA107-VA | 1,41 | 50 | 57,2 | 159 | 206 | 60 |
| PASE50-TV-FA125.5²⁾ | GEH.ASE10-TV | GRAE50-NPP-B-FA107/125.5 | 1,37 | 50 | 57,2 | 159 | 206 | 60 |

¹⁾ Available end caps: see page 63.

²⁾ Available by agreement.

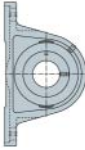


RASEY..TV-VA



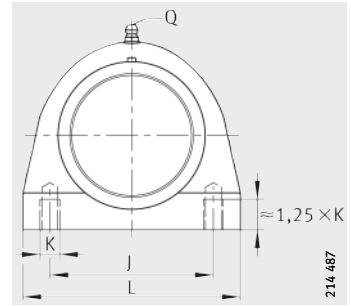
PASE..TV-FA125.5

| | | | | | | | | | | Basic load ratings | | Load carrying capacity of housing |
|----------------|----------------|----|----------------|------|----------------|----------------|--------------|----------------|--|---------------------|-----------------------|-----------------------------------|
| H ₁ | H ₂ | N | N ₁ | B | B ₁ | S ₁ | Q | d ₃ | | dyn. C _r | stat. C _{0r} | C _{0rG} |
| | | | | | | | | max. | | N | N | N |
| 14,2 | 65,5 | 11 | 14 | 31 | - | 18,3 | 1/4 - 28 UNF | - | | 12 800 | 6 600 | 7 700 |
| 14,2 | 65,5 | 11 | 14 | - | 31 | 23,5 | 1/4 - 28 UNF | 33 | | 12 800 | 6 600 | 7 700 |
| 14,5 | 71 | 11 | 14 | 34,1 | - | 19,8 | 1/4 - 28 UNF | - | | 14 000 | 7 800 | 10 000 |
| 14,5 | 71 | 11 | 14 | - | 31 | 23,5 | 1/4 - 28 UNF | 37,5 | | 14 000 | 7 800 | 10 000 |
| 17,8 | 84 | 14 | 18 | 38,1 | - | 22,2 | 1/4 - 28 UNF | - | | 19 500 | 11 300 | 10 600 |
| 17,8 | 84 | 14 | 18 | - | 35,8 | 26,8 | 1/4 - 28 UNF | 44 | | 19 500 | 11 300 | 10 600 |
| 18 | 94,5 | 14 | 18 | 42,9 | - | 25,4 | 1/4 - 28 UNF | - | | 25 500 | 15 300 | 10 800 |
| 18 | 94,5 | 14 | 18 | - | 39 | 29,5 | 1/4 - 28 UNF | 51 | | 25 500 | 15 300 | 10 800 |
| 19,5 | 99 | 14 | 18 | 49,2 | - | 30,2 | 1/4 - 28 UNF | - | | 32 500 | 19 800 | 11 100 |
| 19,5 | 99 | 14 | 18 | - | 43,8 | 32,8 | 1/4 - 28 UNF | 58 | | 32 500 | 19 800 | 11 100 |
| 23 | 106 | 17 | 20 | 49,2 | - | 30,2 | 1/4 - 28 UNF | - | | 32 500 | 20 400 | 11 400 |
| 23 | 106 | 17 | 20 | - | 43,8 | 32,7 | 1/4 - 28 UNF | 63 | | 32 500 | 20 400 | 11 400 |
| 23 | 114 | 17 | 20 | 51,6 | - | 32,6 | 1/4 - 28 UNF | - | | 35 000 | 23 200 | 11 700 |
| 23 | 114 | 17 | 20 | - | 43,8 | 32,7 | 1/4 - 28 UNF | 69 | | 35 000 | 23 200 | 11 700 |



Housing units with plastic housing

Plummer block housing units
Insert bearings
in corrosion-resistant VA design
or with Corrotect® coating



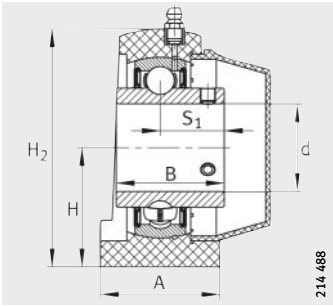
RSHEY...TV-VA,
PSHE...TV-FA125.5

Dimension table - Dimensions in mm

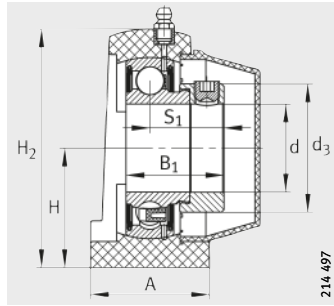
| Designation | | | Mass m ≈kg | Dimensions | | | |
|---------------------------------------|--------------|----------------------------|------------------|------------|------|------|----------------|
| Unit ¹⁾ | Housing | Radial insert ball bearing | | d | H | A | H ₂ |
| RSHEY20-TV-VA | GEH.SHE04-TV | GYE20-KRR-B-FA107-VA | 0,29 | 20 | 33,3 | 34,5 | 66 |
| PSHE20-TV-FA125.5 | GEH.SHE04-TV | GRAE20-NPP-B-FA107/125.5 | 0,3 | 20 | 33,3 | 34,5 | 66 |
| RSHEY25-TV-VA | GEH.SHE05-TV | GYE25-KRR-B-FA107-VA | 0,36 | 25 | 36,5 | 39,5 | 73,5 |
| PSHE25-TV-FA125.5 | GEH.SHE05-TV | GRAE25-NPP-B-FA107/125.5 | 0,35 | 25 | 36,5 | 39,5 | 73,5 |
| RSHEY30-TV-VA | GEH.SHE06-TV | GYE30-KRR-B-FA107-VA | 0,55 | 30 | 42,9 | 42,5 | 84 |
| PSHE30-TV-FA125.5 | GEH.SHE06-TV | GRAE30-NPP-B-FA107/125.5 | 0,57 | 30 | 42,9 | 42,5 | 84 |
| RSHEY35-TV-VA | GEH.SHE07-TV | GYE35-KRR-B-FA107-VA | 0,79 | 35 | 47,6 | 47,5 | 95 |
| PSHE35-TV-FA125.5 | GEH.SHE07-TV | GRAE35-NPP-B-FA107/125.5 | 0,8 | 35 | 47,6 | 47,5 | 95 |
| RSHEY40-TV-VA | GEH.SHE08-TV | GYE40-KRR-B-FA107-VA | 0,97 | 40 | 49,2 | 48 | 100,5 |
| PSHE40-TV-FA125.5 | GEH.SHE08-TV | GRAE40-NPP-B-FA107/125.5 | 0,99 | 40 | 49,2 | 48 | 100,5 |
| RSHEY45-TV-VA²⁾ | GEH.SHE09-TV | GYE45-KRR-B-FA107-VA | 1,09 | 45 | 54 | 50 | 108,5 |
| PSHE45-TV-FA125.5²⁾ | GEH.SHE09-TV | GRAE45-NPP-B-FA107/125.5 | 1,12 | 45 | 54 | 50 | 108,5 |
| RSHEY50-TV-VA²⁾ | GEH.SHE10-TV | GYE50-KRR-B-FA107-VA | 1,26 | 50 | 57,2 | 54 | 115 |
| PSHE50-TV-FA125.5²⁾ | GEH.SHE10-TV | GRAE50-NPP-B-FA107/125.5 | 1,22 | 50 | 57,2 | 54 | 115 |

¹⁾ Available end caps: see page 63.

²⁾ Available by agreement.

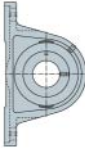


RSHEY..-TV-VA



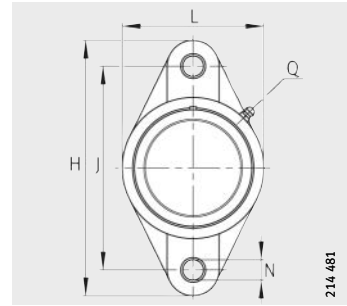
PSHE..-TV-FA125.5

| | | | | | | | | Basic load ratings | | Load carrying capacity of housing |
|-----|------|----------------|-------|----------------|--------------|------------------------|------|-----------------------------|-------------------------------|-----------------------------------|
| K | B | B ₁ | J | S ₁ | Q | d ₃ max. | L | dyn. C _r N | stat. C _{0r} N | C _{0rG} N |
| M8 | 31 | – | 50,8 | 18,3 | 1/4 – 28 UNF | – | 72,8 | 12 800 | 6 600 | 6 900 |
| M8 | – | 31 | 50,8 | 23,5 | 1/4 – 28 UNF | 33 | 72,8 | 12 800 | 6 600 | 6 900 |
| M10 | 34,1 | – | 50,8 | 19,8 | 1/4 – 28 UNF | – | 76,2 | 14 000 | 7 800 | 7 000 |
| M10 | – | 31 | 50,8 | 23,5 | 1/4 – 28 UNF | 37,5 | 76,2 | 14 000 | 7 800 | 7 000 |
| M10 | 38,1 | – | 76,2 | 22,2 | 1/4 – 28 UNF | – | 101 | 19 500 | 11 300 | 6 500 |
| M10 | – | 35,8 | 76,2 | 26,8 | 1/4 – 28 UNF | 44 | 101 | 19 500 | 11 300 | 6 500 |
| M10 | 42,9 | – | 82,6 | 25,4 | 1/4 – 28 UNF | – | 110 | 25 500 | 15 300 | 8 000 |
| M10 | – | 39 | 82,6 | 29,5 | 1/4 – 28 UNF | 51 | 110 | 25 500 | 15 300 | 8 000 |
| M12 | 49,2 | – | 88,9 | 30,2 | 1/4 – 28 UNF | – | 120 | 32 500 | 19 800 | 9 100 |
| M12 | – | 43,8 | 88,9 | 32,8 | 1/4 – 28 UNF | 58 | 120 | 32 500 | 19 800 | 9 100 |
| M12 | 49,2 | – | 95,3 | 30,2 | 1/4 – 28 UNF | – | 124 | 32 500 | 20 400 | 10 400 |
| M12 | – | 43,8 | 95,3 | 32,7 | 1/4 – 28 UNF | 63 | 124 | 32 500 | 20 400 | 10 400 |
| M16 | 51,6 | – | 101,6 | 32,6 | 1/4 – 28 UNF | – | 135 | 35 000 | 23 200 | 11 000 |
| M16 | – | 43,8 | 101,6 | 32,7 | 1/4 – 28 UNF | 69 | 135 | 35 000 | 23 200 | 11 000 |



Housing units with plastic housing

Flanged housing units
Insert bearings
in corrosion-resistant VA design
or with Corrotect® coating



RCJTY...TV-VA, PCJT...TV-FA125.5

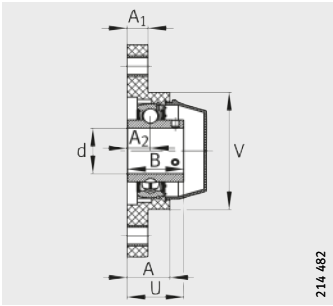
Dimension table - Dimensions in mm

| Designation | | | Mass m ≈kg | Dimensions | | | | |
|---|--------------|----------------------------|------------------|------------|------|-------|----------------|----|
| Unit ¹⁾ | Housing | Radial insert ball bearing | | d | L | H | A ₁ | N |
| RCJTY20-TV-VA | GEH.CJT04-TV | GYE20-KRR-B-FA107-VA | 0,26 | 20 | 63,8 | 114 | 11,4 | 11 |
| PCJT20-TV-FA125.5²⁾ | GEH.CJT04-TV | GRAE20-NPP-B-FA107/125.5 | 0,27 | 20 | 63,8 | 114 | 11,4 | 11 |
| RCJTY25-TV-VA | GEH.CJT05-TV | GYE25-KRR-B-FA107-VA | 0,33 | 25 | 70 | 130 | 13,5 | 11 |
| PCJT25-TV-FA125.5²⁾ | GEH.CJT05-TV | GRAE25-NPP-B-FA107/125.5 | 0,33 | 25 | 70 | 130 | 13,5 | 11 |
| RCJTY30-TV-VA | GEH.CJT06-TV | GYE30-KRR-B-FA107-VA | 0,47 | 30 | 80 | 148 | 13,3 | 11 |
| PCJT30-TV-FA125.5²⁾ | GEH.CJT06-TV | GRAE30-NPP-B-FA107/125.5 | 0,49 | 30 | 80 | 148 | 13,3 | 11 |
| RCJTY35-TV-VA | GEH.CJT07-TV | GYE35-KRR-B-FA107-VA | 0,68 | 35 | 90 | 163 | 16,1 | 13 |
| PCJT35-TV-FA125.5²⁾ | GEH.CJT07-TV | GRAE35-NPP-B-FA107/125.5 | 0,69 | 35 | 90 | 163 | 16,1 | 13 |
| RCJTY40-TV-VA | GEH.CJT08-TV | GYE40-KRR-B-FA107-VA | 0,92 | 40 | 100 | 176 | 20 | 14 |
| PCJT40-TV-FA125.5²⁾ | GEH.CJT08-TV | GRAE40-NPP-B-FA107/125.5 | 0,93 | 40 | 100 | 176 | 20 | 14 |
| RCJTY45-TV-VA³⁾ | GEH.CJT09-TV | GYE45-KRR-B-FA107-VA | 1,05 | 45 | 108 | 188,5 | 21 | 17 |
| PCJT45-TV-FA125.5²⁾³⁾ | GEH.CJT09-TV | GRAE45-NPP-B-FA107/125.5 | 1,09 | 45 | 108 | 188,5 | 21 | 17 |
| RCJTY50-TV-VA³⁾ | GEH.CJT10-TV | GYE50-KRR-B-FA107-VA | 1,23 | 50 | 115 | 197 | 21 | 17 |
| PCJT50-TV-FA125.5²⁾³⁾ | GEH.CJT10-TV | GRAE50-NPP-B-FA107/125.5 | 1,18 | 50 | 115 | 197 | 21 | 17 |

¹⁾ Available end caps: see page 63.

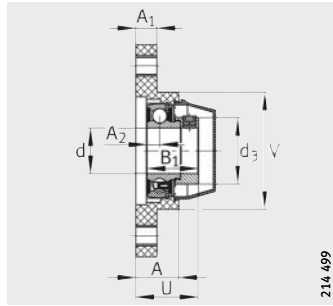
²⁾ For these series, Back Seal components are also available.

³⁾ Available by agreement.



RCJT...-TV-VA

214 482



PCJT...-TV-FA125.5

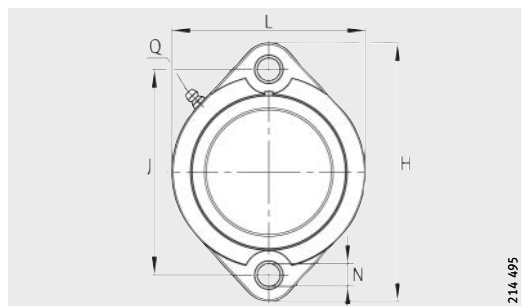
214 499



| | | | | | | | | | Basic load ratings | | Load carrying capacity of housing |
|------|----------------|-------|----------------|--------------|------------------------|------|------|------|-----------------------------|-------------------------------|-----------------------------------|
| B | B ₁ | J | A ₂ | Q | d ₃ max. | A | U | V | dyn. C _r N | stat. C _{0r} N | C _{0rG} N |
| 31 | – | 90 | 15,4 | 1/4 – 28 UNF | – | 26,5 | 33,7 | 63,8 | 12 800 | 6 600 | 8 500 |
| – | 31 | 90 | 15,4 | 1/4 – 28 UNF | 33 | 26,5 | 38,9 | 63,8 | 12 800 | 6 600 | 8 500 |
| 34,1 | – | 99 | 17 | 1/4 – 28 UNF | – | 29,1 | 36,8 | 70 | 14 000 | 7 800 | 11 100 |
| – | 31 | 99 | 17 | 1/4 – 28 UNF | 37,5 | 29,1 | 40,5 | 70 | 14 000 | 7 800 | 11 100 |
| 38,1 | – | 117 | 19 | 1/4 – 28 UNF | – | 30,6 | 41,2 | 80 | 19 500 | 11 300 | 14 200 |
| – | 35,8 | 117 | 19 | 1/4 – 28 UNF | 44 | 30,6 | 45,8 | 80 | 19 500 | 11 300 | 14 200 |
| 42,9 | – | 130 | 18 | 1/4 – 28 UNF | – | 32,8 | 43,4 | 90 | 25 500 | 15 300 | 14 900 |
| – | 39 | 130 | 18 | 1/4 – 28 UNF | 51 | 32,8 | 47,5 | 90 | 25 500 | 15 300 | 14 900 |
| 49,2 | – | 144 | 21,5 | 1/4 – 28 UNF | – | 36,5 | 51,7 | 100 | 32 500 | 19 800 | 14 900 |
| – | 43,8 | 144 | 21,5 | 1/4 – 28 UNF | 58 | 36,5 | 54,3 | 100 | 32 500 | 19 800 | 14 900 |
| 49,2 | – | 148,5 | 24 | 1/4 – 28 UNF | – | 41 | 54,2 | 108 | 32 500 | 20 400 | 15 100 |
| – | 43,8 | 148,5 | 24 | 1/4 – 28 UNF | 63 | 41 | 56,8 | 108 | 32 500 | 20 400 | 15 100 |
| 51,6 | – | 157 | 25 | 1/4 – 28 UNF | – | 43 | 57,6 | 115 | 35 000 | 23 200 | 15 600 |
| – | 43,8 | 157 | 25 | 1/4 – 28 UNF | 69 | 43 | 57,8 | 115 | 35 000 | 23 200 | 15 600 |

Housing units with plastic housing

Flanged housing units
Insert bearings
with Corrotect® coating

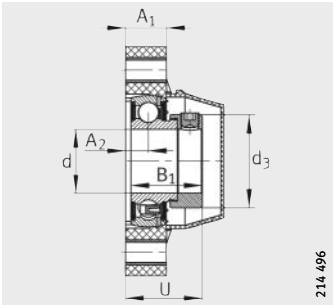


GLCTE...TV-FA125.5

Dimension table - Dimensions in mm

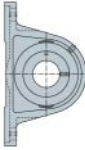
| Designation | | | Mass m ≈kg | Dimensions | | | | |
|---------------------------|----------------|----------------------------|------------------|------------|------|-------|----------------|----|
| Unit ¹⁾ | Housing | Radial insert ball bearing | | d | L | H | A ₁ | N |
| GLCTE20-TV-FA125.5 | GEH.GLCTE04-TV | GRAE20-NPP-B-FA107/125.5 | 0,26 | 20 | 66,5 | 90,5 | 18,4 | 9 |
| GLCTE25-TV-FA125.5 | GEH.GLCTE05-TV | GRAE25-NPP-B-FA107/125.5 | 0,29 | 25 | 71 | 97 | 18,4 | 9 |
| GLCTE30-TV-FA125.5 | GEH.GLCTE06-TV | GRAE30-NPP-B-FA107/125.5 | 0,47 | 30 | 84 | 112,5 | 20,5 | 11 |
| GLCTE35-TV-FA125.5 | GEH.GLCTE07-TV | GRAE35-NPP-B-FA107/125.5 | 0,66 | 35 | 94 | 126 | 22,5 | 11 |
| GLCTE40-TV-FA125.5 | GEH.GLCTE08-TV | GRAE40-NPP-B-FA107/125.5 | 0,86 | 40 | 100 | 150 | 24 | 14 |

¹⁾ Available end caps: see page 63.



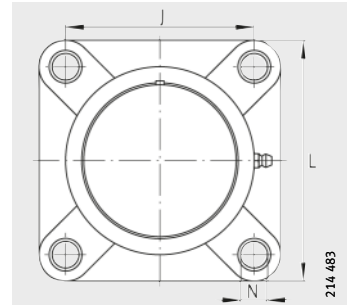
GLCTE..-TV-FA125.5

| | | | | | | Basic load ratings | | Load carrying capacity of housing |
|----------------|------|----------------|--------------|------------------------|------|-----------------------------|-------------------------------|-----------------------------------|
| B ₁ | J | A ₂ | Q | d ₃ max. | U | dyn. C _r N | stat. C _{0r} N | C _{0rG} N |
| 31 | 71,4 | 9,5 | 1/4 – 28 UNF | 33 | 33 | 12 800 | 6 600 | 7 200 |
| 31 | 76,2 | 10 | 1/4 – 28 UNF | 37,5 | 33,5 | 14 000 | 7 800 | 9 400 |
| 35,8 | 90,5 | 11,5 | 1/4 – 28 UNF | 44 | 38,3 | 19 500 | 11 300 | 12 000 |
| 39 | 100 | 12,5 | 1/4 – 28 UNF | 51 | 42 | 25 500 | 15 300 | 12 600 |
| 43,8 | 119 | 13,5 | 1/4 – 28 UNF | 58 | 46,3 | 32 500 | 19 800 | 12 800 |



Housing units with plastic housing

Flanged housing units
Insert bearings
in corrosion-resistant VA design
or with Corrotect® coating



RCJY...-TV-VA, PCJ...-TV-FA125.5

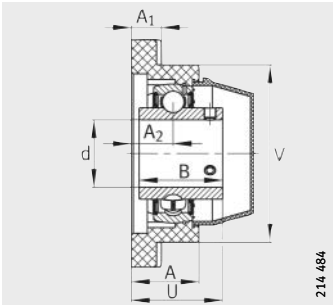
Dimension table - Dimensions in mm

| Designation | | | Mass m ≈kg | Dimensions | | | | |
|--|-------------|----------------------------|------------------|------------|-----|----------------|----|------|
| Unit ¹⁾ | Housing | Radial insert ball bearing | | d | L | A ₁ | N | B |
| RCJY20-TV-VA | GEH.CJ04-TV | GYE20-KRR-B-FA107-VA | 0,32 | 20 | 87 | 13,4 | 11 | 31 |
| PCJ20-TV-FA125.5²⁾ | GEH.CJ04-TV | GRAE20-NPP-B-FA107/125.5 | 0,33 | 20 | 87 | 13,4 | 11 | – |
| RCJY25-TV-VA | GEH.CJ05-TV | GYE25-KRR-B-FA107-VA | 0,4 | 25 | 95 | 14,3 | 11 | 34,1 |
| PCJ25-TV-FA125.5²⁾ | GEH.CJ05-TV | GRAE25-NPP-B-FA107/125.5 | 0,39 | 25 | 95 | 14,3 | 11 | – |
| RCJY30-TV-VA | GEH.CJ06-TV | GYE30-KRR-B-FA107-VA | 0,55 | 30 | 107 | 14,3 | 11 | 38,1 |
| PCJ30-TV-FA125.5²⁾ | GEH.CJ06-TV | GRAE30-NPP-B-FA107/125.5 | 0,57 | 30 | 107 | 14,3 | 11 | – |
| RCJY35-TV-VA | GEH.CJ07-TV | GYE35-KRR-B-FA107-VA | 0,78 | 35 | 118 | 15,5 | 13 | 42,9 |
| PCJ35-TV-FA125.5²⁾ | GEH.CJ07-TV | GRAE35-NPP-B-FA107/125.5 | 0,79 | 35 | 118 | 15,5 | 13 | – |
| RCJY40-TV-VA | GEH.CJ08-TV | GYE40-KRR-B-FA107-VA | 1,04 | 40 | 130 | 17 | 14 | 49,2 |
| PCJ40-TV-FA125.5²⁾ | GEH.CJ08-TV | GRAE40-NPP-B-FA107/125.5 | 1,05 | 40 | 130 | 17 | 14 | – |
| RCJY45-TV-VA³⁾ | GEH.CJ09-TV | GYE45-KRR-B-FA107-VA | 1,16 | 45 | 137 | 19 | 17 | 49,2 |
| PCJ45-TV-FA125.5²⁾³⁾ | GEH.CJ09-TV | GRAE45-NPP-B-FA107/125.5 | 1,2 | 45 | 137 | 19 | 17 | – |
| RCJY50-TV-VA³⁾ | GEH.CJ10-TV | GYE50-KRR-B-FA107-VA | 1,36 | 50 | 143 | 21 | 17 | 51,6 |
| PCJ50-TV-FA125.5²⁾³⁾ | GEH.CJ10-TV | GRAE50-NPP-B-FA107/125.5 | 1,32 | 50 | 143 | 21 | 17 | – |

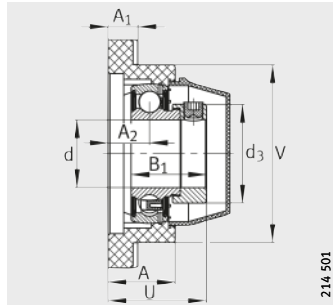
¹⁾ Available end caps: see page 63.

²⁾ For these series, Back Seal components are also available.

³⁾ Available by agreement.



RCJY..-TV-VA



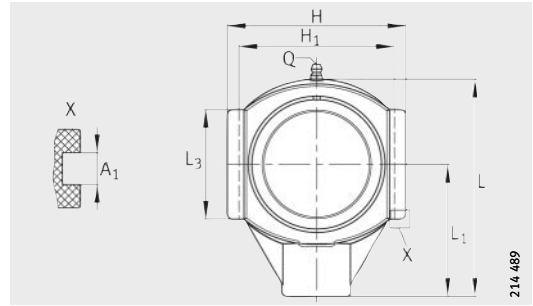
PCJ..-TV-FA125.5



| | | | | | | | | Basic load ratings | | Load carrying capacity of housing |
|----------------|------|----------------|--------------|------------------------|------|------|------|-----------------------------|-------------------------------|-----------------------------------|
| B ₁ | J | A ₂ | Q | d ₃ max. | A | U | V | dyn. C _r N | stat. C _{0r} N | C _{0rG} N |
| - | 63,5 | 18 | 1/4 – 28 UNF | - | 28 | 36,3 | 63,5 | 12 800 | 6 600 | 10 200 |
| 31 | 63,5 | 18 | 1/4 – 28 UNF | 33 | 28 | 41,5 | 63,5 | 12 800 | 6 600 | 10 200 |
| - | 70 | 17 | 1/4 – 28 UNF | - | 28 | 36,8 | 70 | 14 000 | 7 800 | 12 100 |
| 31 | 70 | 17 | 1/4 – 28 UNF | 37,5 | 28 | 40,5 | 70 | 14 000 | 7 800 | 12 100 |
| - | 83 | 19,2 | 1/4 – 28 UNF | - | 31,5 | 41,4 | 80 | 19 500 | 11 300 | 17 700 |
| 35,8 | 83 | 19,2 | 1/4 – 28 UNF | 44 | 31,5 | 46 | 80 | 19 500 | 11 300 | 17 700 |
| - | 92 | 21,5 | 1/4 – 28 UNF | - | 34,8 | 46,9 | 90 | 25 500 | 15 300 | 18 500 |
| 39 | 92 | 21,5 | 1/4 – 28 UNF | 51 | 34,8 | 51 | 90 | 25 500 | 15 300 | 18 500 |
| - | 102 | 23 | 1/4 – 28 UNF | - | 37,5 | 53,2 | 99 | 32 500 | 19 800 | 19 200 |
| 43,8 | 102 | 23 | 1/4 – 28 UNF | 58 | 37,5 | 55,8 | 99 | 32 500 | 19 800 | 19 200 |
| - | 105 | 24 | 1/4 – 28 UNF | - | 41 | 54,2 | 105 | 32 500 | 20 400 | 19 300 |
| 43,8 | 105 | 24 | 1/4 – 28 UNF | 63 | 41 | 56,8 | 105 | 32 500 | 20 400 | 19 300 |
| - | 111 | 25 | 1/4 – 28 UNF | - | 43 | 57,6 | 111 | 35 000 | 23 200 | 19 600 |
| 43,8 | 111 | 25 | 1/4 – 28 UNF | 69 | 43 | 57,8 | 111 | 35 000 | 23 200 | 19 600 |

Housing units with plastic housing

Take-up housing units
Insert bearings
in corrosion-resistant VA design
or with Corroprotect® coating



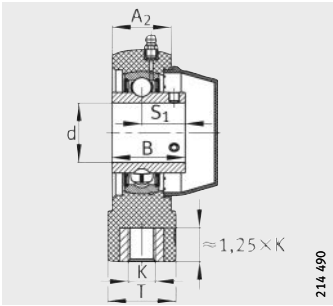
RTUEY..-TV-VA, PTUE..-TV-FA125.5

Dimension table - Dimensions in mm

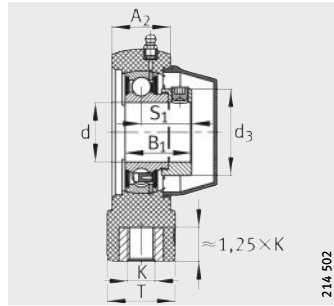
| Designation | | | Mass m ≈kg | Dimensions | | | | | |
|---------------------------------------|--------------|----------------------------|------------------|------------|----------------|----------------|-----|----------------|-----|
| Unit ¹⁾ | Housing | Radial insert ball bearing | | d | A ₂ | A ₁ | L | L ₁ | K |
| RTUEY20-TV-VA | GEH.TUE04-TV | GYE20-KRR-B-FA107-VA | 0,39 | 20 | 27,5 | 12 | 99 | 64 | M16 |
| PTUE20-TV-FA125.5 | GEH.TUE04-TV | GRAE20-NPP-B-FA107/125.5 | 0,4 | 20 | 27,5 | 12 | 99 | 64 | M16 |
| RTUEY25-TV-VA | GEH.TUE05-TV | GYE25-KRR-B-FA107-VA | 0,42 | 25 | 27,5 | 12 | 99 | 64 | M16 |
| PTUE25-TV-FA125.5 | GEH.TUE05-TV | GRAE25-NPP-B-FA107/125.5 | 0,41 | 25 | 27,5 | 12 | 99 | 64 | M16 |
| RTUEY30-TV-VA | GEH.TUE06-TV | GYE30-KRR-B-FA107-VA | 0,69 | 30 | 34,5 | 12 | 125 | 76 | M16 |
| PTUE30-TV-FA125.5 | GEH.TUE06-TV | GRAE30-NPP-B-FA107/125.5 | 0,71 | 30 | 34,5 | 12 | 125 | 76 | M16 |
| RTUEY35-TV-VA | GEH.TUE07-TV | GYE35-KRR-B-FA107-VA | 0,81 | 35 | 34,5 | 12 | 125 | 76 | M16 |
| PTUE35-TV-FA125.5 | GEH.TUE07-TV | GRAE35-NPP-B-FA107/125.5 | 0,82 | 35 | 34,5 | 12 | 125 | 76 | M16 |
| RTUEY40-TV-VA | GEH.TUE08-TV | GYE40-KRR-B-FA107-VA | 1,04 | 40 | 33,5 | 16 | 140 | 85 | M16 |
| PTUE40-TV-FA125.5 | GEH.TUE08-TV | GRAE40-NPP-B-FA107/125.5 | 1,05 | 40 | 33,5 | 16 | 140 | 85 | M16 |
| RTUEY45-TV-VA²⁾ | GEH.TUE09-TV | GYE45-KRR-B-FA107-VA | 1,16 | 45 | 40 | 16 | 149 | 90 | M20 |
| PTUE45-TV-FA125.5²⁾ | GEH.TUE09-TV | GRAE45-NPP-B-FA107/125.5 | 1,19 | 45 | 40 | 16 | 149 | 90 | M20 |
| RTUEY50-TV-VA²⁾ | GEH.TUE10-TV | GYE50-KRR-B-FA107-VA | 1,32 | 50 | 40 | 16 | 149 | 90 | M20 |
| PTUE50-TV-FA125.5²⁾ | GEH.TUE10-TV | GRAE50-NPP-B-FA107/125.5 | 1,28 | 50 | 40 | 16 | 149 | 90 | M20 |

¹⁾ Available end caps: see page 63.

²⁾ Available by agreement.

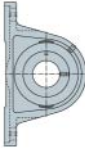


RTUEY..-TV-VA



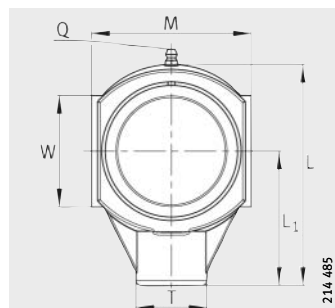
PTUE..-TV-FA125.5

| | | | | | | | | | | Basic load ratings | | Load carrying capacity of housing |
|------|----------------|-------|----------------|----------------|--------------|----|----------------|----------------|---------------------|-----------------------|-------------------------|-----------------------------------|
| B | B ₁ | H | H ₁ | S ₁ | Q | T | L ₃ | d ₃ | d ₃ max. | dyn. C _r N | stat. C _{0r} N | C _{0rG} N |
| 31 | – | 89 | 76 | 18,3 | 1/4 – 28 UNF | 36 | 47 | – | – | 12 800 | 6 600 | 9 600 |
| – | 31 | 89 | 76 | 23,5 | 1/4 – 28 UNF | 36 | 47 | 33 | – | 12 800 | 6 600 | 9 600 |
| 34,1 | – | 89 | 76 | 19,8 | 1/4 – 28 UNF | 36 | 47 | – | – | 14 000 | 7 800 | 10 000 |
| – | 31 | 89 | 76 | 23,5 | 1/4 – 28 UNF | 36 | 47 | 37,5 | – | 14 000 | 7 800 | 10 000 |
| 38,1 | – | 102,5 | 89 | 22,2 | 1/4 – 28 UNF | 40 | 63 | – | – | 19 500 | 11 300 | 10 200 |
| – | 35,8 | 102,5 | 89 | 26,8 | 1/4 – 28 UNF | 40 | 63 | 44 | – | 19 500 | 11 300 | 10 200 |
| 42,9 | – | 102,5 | 89 | 25,4 | 1/4 – 28 UNF | 40 | 63 | – | – | 25 500 | 15 300 | 10 700 |
| – | 39 | 102,5 | 89 | 29,5 | 1/4 – 28 UNF | 40 | 63 | 51 | – | 25 500 | 15 300 | 10 700 |
| 49,2 | – | 113 | 102 | 30,2 | 1/4 – 28 UNF | 40 | 80 | – | – | 32 500 | 19 800 | 11 200 |
| – | 43,8 | 113 | 102 | 32,8 | 1/4 – 28 UNF | 40 | 80 | 58 | – | 32 500 | 19 800 | 11 200 |
| 49,2 | – | 117 | 102 | 30,2 | 1/4 – 28 UNF | 50 | 85 | – | – | 32 500 | 20 400 | 11 800 |
| – | 43,8 | 117 | 102 | 32,8 | 1/4 – 28 UNF | 50 | 85 | 63 | – | 32 500 | 20 400 | 11 800 |
| 51,6 | – | 117 | 102 | 32,6 | 1/4 – 28 UNF | 50 | 85 | – | – | 35 000 | 23 200 | 12 200 |
| – | 43,8 | 117 | 102 | 32,8 | 1/4 – 28 UNF | 50 | 85 | 69 | – | 35 000 | 23 200 | 12 200 |



Housing units with plastic housing

Take-up housing units
Insert bearings
in corrosion-resistant VA design
or with Corrotect® coating



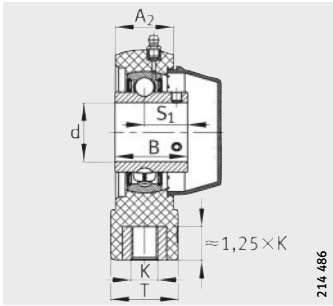
RHEY..-TV-VA, PHE..-TV-FA125.5

Dimension table - Dimensions in mm

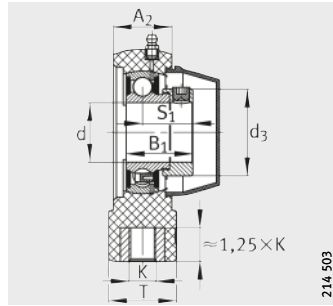
| Designation | | | Mass m ≈kg | Dimensions | | | | |
|--------------------------------------|-------------|----------------------------|------------------|------------|-----|----------------|----------------|-----|
| Unit ¹⁾ | Housing | Radial insert ball bearing | | d | L | A ₂ | L ₁ | K |
| RHEY20-TV-VA | GEH.HE04-TV | GYE20-KRR-B-FA107-VA | 0,36 | 20 | 99 | 27,5 | 63,5 | M16 |
| PHE20-TV-FA125.5 | GEH.HE04-TV | GRAE20-NPP-B-FA107/125.5 | 0,37 | 20 | 99 | 27,5 | 63,5 | M16 |
| RHEY25-TV-VA | GEH.HE05-TV | GYE25-KRR-B-FA107-VA | 0,4 | 25 | 99 | 27,5 | 63,5 | M16 |
| PHE25-TV-FA125.5 | GEH.HE05-TV | GRAE25-NPP-B-FA107/125.5 | 0,4 | 25 | 99 | 27,5 | 63,5 | M16 |
| RHEY30-TV-VA | GEH.HE06-TV | GYE30-KRR-B-FA107-VA | 0,67 | 30 | 125 | 34,5 | 76 | M16 |
| PHE30-TV-FA125.5 | GEH.HE06-TV | GRAE30-NPP-B-FA107/125.5 | 0,69 | 30 | 125 | 34,5 | 76 | M16 |
| RHEY35-TV-VA | GEH.HE07-TV | GYE35-KRR-B-FA107-VA | 0,78 | 35 | 125 | 34,5 | 76 | M16 |
| PHE35-TV-FA125.5 | GEH.HE07-TV | GRAE35-NPP-B-FA107/125.5 | 0,79 | 35 | 125 | 34,5 | 76 | M16 |
| RHEY40-TV-VA | GEH.HE08-TV | GYE40-KRR-B-FA107-VA | 1,01 | 40 | 140 | 34,5 | 85 | M16 |
| PHE40-TV-FA125.5 | GEH.HE08-TV | GRAE40-NPP-B-FA107/125.5 | 1,02 | 40 | 140 | 34,5 | 85 | M16 |
| RHEY45-TV-VA²⁾ | GEH.HE09-TV | GYE45-KRR-B-FA107-VA | 1,13 | 45 | 149 | 40 | 90 | M20 |
| PHE45-TV-FA125.5²⁾ | GEH.HE09-TV | GRAE45-NPP-B-FA107/125.5 | 1,16 | 45 | 149 | 40 | 90 | M20 |
| RHEY50-TV-VA²⁾ | GEH.HE10-TV | GYE50-KRR-B-FA107-VA | 1,28 | 50 | 149 | 40 | 90 | M20 |
| PHE50-TV-FA125.5²⁾ | GEH.HE10-TV | GRAE50-NPP-B-FA107/125.5 | 1,24 | 50 | 149 | 40 | 90 | M20 |

¹⁾ Available end caps: see page 63.

²⁾ Available by agreement.

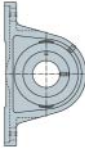


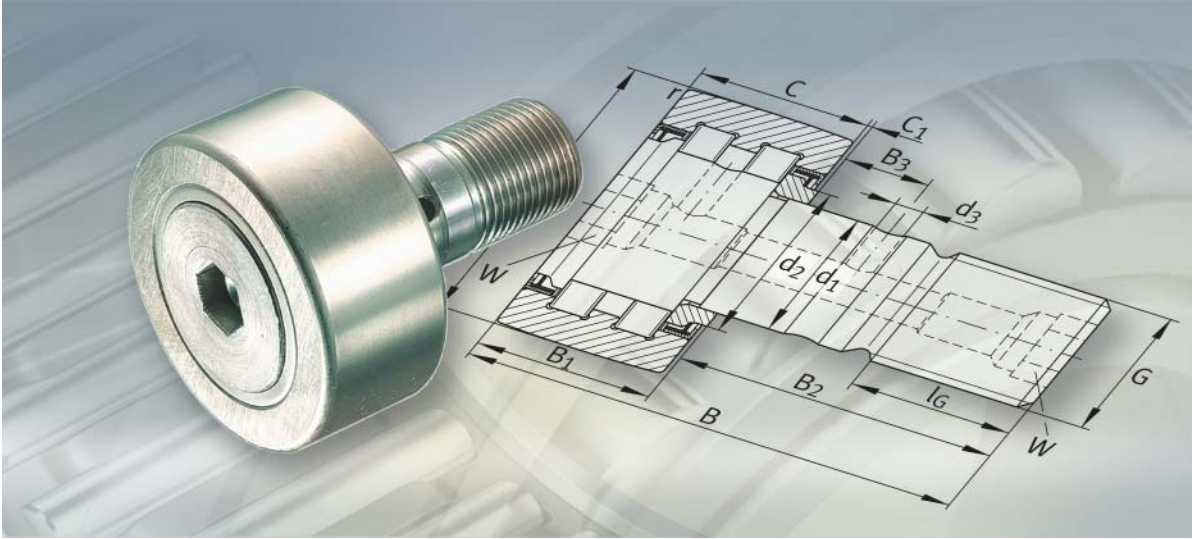
RHEY..-TV-VA



PHE..-TV-FA125.5

| | | | | | | | | | Basic load ratings | | Load carrying capacity of housing |
|------|----------------|-----|----------------|--------------|------------------------|----|----|-----------------------------|-------------------------------|-----------------------|-----------------------------------|
| B | B ₁ | M | S ₁ | Q | d ₃ max. | T | W | dyn. C _r N | stat. C _{0r} N | C _{0rG} N | |
| 31 | – | 65 | 18,3 | 1/4 – 28 UNF | – | 36 | 47 | 12 800 | 6 600 | 9 600 | |
| – | 31 | 65 | 23,5 | 1/4 – 28 UNF | 33 | 36 | 47 | 12 800 | 6 600 | 9 600 | |
| 34,1 | – | 74 | 19,8 | 1/4 – 28 UNF | – | 36 | 47 | 14 000 | 7 800 | 10 000 | |
| – | 31 | 74 | 23,5 | 1/4 – 28 UNF | 37,5 | 36 | 47 | 14 000 | 7 800 | 10 000 | |
| 38,1 | – | 90 | 22,2 | 1/4 – 28 UNF | – | 40 | 63 | 19 500 | 11 300 | 10 200 | |
| – | 35,8 | 90 | 26,8 | 1/4 – 28 UNF | 44 | 40 | 63 | 19 500 | 11 300 | 10 200 | |
| 42,9 | – | 90 | 25,4 | 1/4 – 28 UNF | – | 40 | 63 | 25 500 | 15 300 | 10 700 | |
| – | 39 | 90 | 29,5 | 1/4 – 28 UNF | 51 | 40 | 63 | 25 500 | 15 300 | 10 700 | |
| 49,2 | – | 100 | 30,2 | 1/4 – 28 UNF | – | 40 | 80 | 32 500 | 19 800 | 11 200 | |
| – | 43,8 | 100 | 32,8 | 1/4 – 28 UNF | 58 | 40 | 80 | 32 500 | 19 800 | 11 200 | |
| 49,2 | – | 110 | 30,2 | 1/4 – 28 UNF | – | 50 | 85 | 32 500 | 20 400 | 11 800 | |
| – | 43,8 | 110 | 32,8 | 1/4 – 28 UNF | 63 | 50 | 85 | 32 500 | 20 400 | 11 800 | |
| 51,6 | – | 110 | 32,6 | 1/4 – 28 UNF | – | 50 | 85 | 35 000 | 23 200 | 12 200 | |
| – | 43,8 | 110 | 32,8 | 1/4 – 28 UNF | 69 | 50 | 85 | 35 000 | 23 200 | 12 200 | |

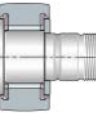




Yoke type track rollers
Stud type track rollers

Yoke type track rollers Stud type track rollers

| | Page |
|-------------------------|---|
| Product overview | Yoke type track rollers, stud type track rollers..... 82 |
| Features | Yoke type track rollers 83 |
| | Stud type track rollers..... 83 |
| | Outside surface profile of the outer ring 83 |
| | X-life 83 |
| | Anti-corrosion protection 83 |
| | Radial internal clearance 84 |
| | Sealing and lubrication..... 84 |
| | Operating temperature 84 |
| | Suffixes 84 |
| | Further information 84 |
| Dimension tables | Yoke type track rollers, with Corrotect® coating, sealed..... 85 |
| | Stud type track rollers, with Corrotect® coating, sealed 86 |



Product overview

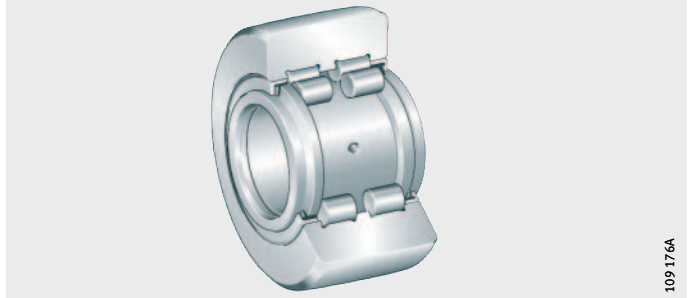
Yoke type track rollers

Stud type track rollers

Yoke type track rollers

Full complement
cylindrical roller set,
with central rib
Protected lip seals

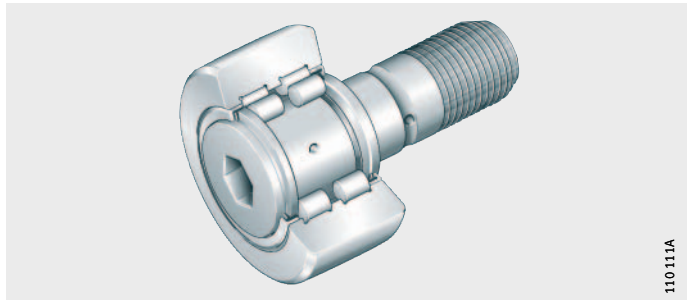
PWTR..-2RS-RR



Stud type track rollers

Full complement
cylindrical roller set,
with central rib
Protected lip seals

PWKR..-2RS-RR



Yoke type track rollers

Stud type track rollers

Features

Yoke type track rollers

Yoke type track rollers of series PWTR are double row units mounted on shafts or studs. They comprise thick-walled outer rings with a profiled outside surface and full complement cylindrical roller sets.

Bearings without a cage have the largest possible number of rolling elements and therefore have particularly high load carrying capacity. They can support high radial loads as well as axial loads arising from slight misalignment and skewed running; they are suitable for cam gears, bed ways, conveying equipment etc.

Stud type track rollers

Stud type track rollers PWKR comprise thick-walled outer rings with a profiled outside surface, solid section roller studs with a fixing thread, axial washers and full complement, double row cylindrical roller sets.

They can support high radial loads as well as axial loads arising from slight misalignment and skewed running.

Outside surface profile of the outer ring

In most cases, yoke and stud type track rollers with a crowned outside surface are used since they are often inclined in relation to the mating track and edge stresses must be avoided.

The series PWTR and PWKR have an outside surface with the optimised INA profile.

X-life

The new X-life yoke and stud type track rollers PWTR and PWKR have been improved in several respects and, as a result, give even higher performance.

Due to a modified material and the optimised raceway geometry of the outer rings, the basic rating life has been increased by up to 30%. The static and dynamic load carrying capacity has also been increased. At the same time, the stress placed on the mating track has been reduced as a result of the optimised outside surface profile and its improved outer ring surface quality.

This gives a highly robust bearing arrangement with an extended operating life.

Anti-corrosion protection

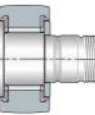
In principle, corrosion-resistant steels may be used for yoke and stud type track rollers. In many applications, however, the special coating Corrotect® is more cost-effective.

The coating is effective against moisture, contaminated water, salt spray and weakly alkaline and weakly acidic cleaning agents. For a description of the Corrotect® coating, see page 19.

Coated as standard

Yoke type track rollers PWTR..-RR and stud type track rollers PWKR..-RR are supplied as standard with the Cr(VI)-free Corrotect® coating. All other yoke and stud type track rollers with the Corrotect® coating are treated as special designs.

Figure 1 shows an uncoated stud type track roller after a salt spray test, *Figure 2* shows a coated stud type track roller after the test, page 84.



Yoke type track rollers

Stud type track rollers

Fitting of coated track rollers

In order to reduce the press-in force required, the surface of the parts should be lightly greased – the tolerances are increased by the thickness of the coating.



Before fitting, the compatibility of track rollers with Corrotect® coating with the media concerned should always be checked.

Figure 1
NUKR52 without coating
after salt spray test



Figure 2
PWKR52-2RS-RR
with Corrotect® coating
after salt spray test



Radial internal clearance

The radial internal clearance corresponds approximately to class C2.

Sealing and lubrication

The series PWTR and PWKR are sealed on both sides by protected lip seals.

They are greased using a lithium complex soap grease to GA08 and can be lubricated via the roller stud. For relubrication, Arcanol LOAD150 is suitable.

Operating temperature

The bearings are suitable for temperatures from -30 °C to $+120\text{ °C}$.

Suffixes

Suffixes for the available designs: see table.

Available designs

| Suffix | Description |
|--------|---|
| RR | Corrosion-resistant by means of special coating Corrotect® |
| 2RS | Protected lip seals on both sides of the yoke type track roller |

Further information

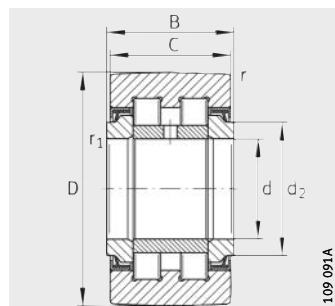


For information on the load carrying capacity and life, design of bearing arrangements, lubrication, fitting and operation of the bearings, attention must be paid to Catalogue HR 1, Rolling Bearings.

Yoke type track rollers

With Corrotect® coating

Sealed



109 091A

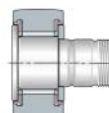
PWTR...-2RS-RR
(optimised INA profile)

X-life

Dimension table · Dimensions in mm

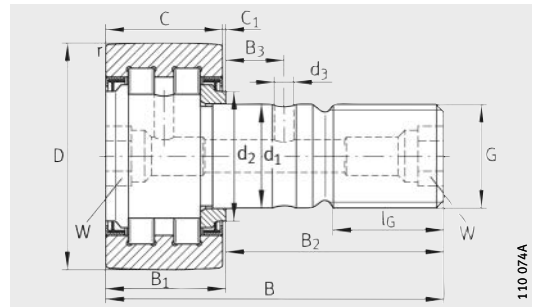
| Designation | x-life | Mass m ≈g | Dimensions | | | | | | | Basic load ratings ¹⁾ | | | | Fatigue limit load C _{urw} N | Speed n _{DG} min ⁻¹ |
|------------------|--------|-----------------|------------|----|----------|----|----------------|-----------|------------------------|----------------------------------|--------------------------------|---------------------------------|-----------------------------------|---|---|
| | | | D | d | B h12 | C | d ₂ | r min. | r ₁ min. | dyn. C _{rw} N | stat. C _{0rw} N | dyn. F _{r per} N | stat. F _{0r per} N | | |
| PWTR15-2RS-RR | XL | 99 | 35 | 15 | 19 | 18 | 20 | 0,6 | 0,3 | 12 600 | 14 600 | 10 600 | 14 600 | 1 760 | 6 000 |
| PWTR17-2RS-RR | XL | 147 | 40 | 17 | 21 | 20 | 22 | 1 | 0,5 | 14 300 | 18 000 | 16 400 | 18 000 | 2 160 | 5 000 |
| PWTR1542-2RS-RR | XL | 158 | 42 | 15 | 19 | 18 | 20 | 0,6 | 0,3 | 14 700 | 16 200 | 16 200 | 16 200 | 2 140 | 6 000 |
| PWTR1747-2RS-RR | XL | 220 | 47 | 17 | 21 | 20 | 22 | 1 | 0,5 | 15 900 | 18 400 | 18 400 | 18 400 | 2 440 | 5 000 |
| PWTR20-2RS-RR | XL | 245 | 47 | 20 | 25 | 24 | 27 | 1 | 0,5 | 24 600 | 30 500 | 20 700 | 30 500 | 3 750 | 3 800 |
| PWTR2052-2RS-RR | XL | 321 | 52 | 20 | 25 | 24 | 27 | 1 | 0,5 | 27 000 | 35 000 | 31 000 | 35 000 | 4 250 | 3 800 |
| PWTR25-2RS-RR | XL | 281 | 52 | 25 | 25 | 24 | 31 | 1 | 0,5 | 25 500 | 33 000 | 21 800 | 33 000 | 4 100 | 3 800 |
| PWTR2562-2RS-RR | XL | 450 | 62 | 25 | 25 | 24 | 31 | 1 | 0,5 | 30 000 | 42 500 | 42 500 | 42 500 | 5 200 | 3 800 |
| PWTR30-2RS-RR | XL | 465 | 62 | 30 | 29 | 28 | 38 | 1 | 0,5 | 35 000 | 45 500 | 29 000 | 45 500 | 5 800 | 2 200 |
| PWTR3072-2RS-RR | XL | 697 | 72 | 30 | 29 | 28 | 38 | 1 | 0,5 | 41 000 | 56 000 | 54 000 | 56 000 | 7 200 | 2 200 |
| PWTR35-2RS-RR | XL | 630 | 72 | 35 | 29 | 28 | 44 | 1,1 | 0,6 | 38 500 | 54 000 | 39 000 | 54 000 | 7 000 | 1 800 |
| PWTR3580-2RS-RR | XL | 836 | 80 | 35 | 29 | 28 | 44 | 1,1 | 0,6 | 43 500 | 64 000 | 59 000 | 64 000 | 8 100 | 1 800 |
| PWTR40-2RS-RR | XL | 816 | 80 | 40 | 32 | 30 | 50,5 | 1,1 | 0,6 | 45 000 | 61 000 | 39 500 | 61 000 | 7 900 | 1 500 |
| PWTR45-2RS-RR | XL | 883 | 85 | 45 | 32 | 30 | 55,2 | 1,1 | 0,6 | 45 500 | 63 000 | 41 000 | 63 000 | 8 200 | 1 300 |
| PWTR4090-2RS-RR | XL | 1 129 | 90 | 40 | 32 | 30 | 50,5 | 1,1 | 0,6 | 52 000 | 75 000 | 67 000 | 75 000 | 9 700 | 1 500 |
| PWTR50-2RS-RR | XL | 950 | 90 | 50 | 32 | 30 | 59,8 | 1,1 | 0,6 | 46 000 | 66 000 | 42 000 | 66 000 | 8 500 | 1 100 |
| PWTR45100-2RS-RR | XL | 1 396 | 100 | 45 | 32 | 30 | 55,2 | 1,1 | 0,6 | 56 000 | 85 000 | 85 000 | 85 000 | 10 900 | 1 300 |
| PWTR50110-2RS-RR | XL | 1 690 | 110 | 50 | 32 | 30 | 59,8 | 1,1 | 0,6 | 59 000 | 94 000 | 94 000 | 94 000 | 12 100 | 1 100 |

¹⁾ Values are only valid for bearings marked as X-life.



Stud type track rollers

With Corrotect® coating
Sealed



PWKR..-2RS-RR
(optimised INA profile)

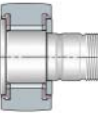
110 07/4A

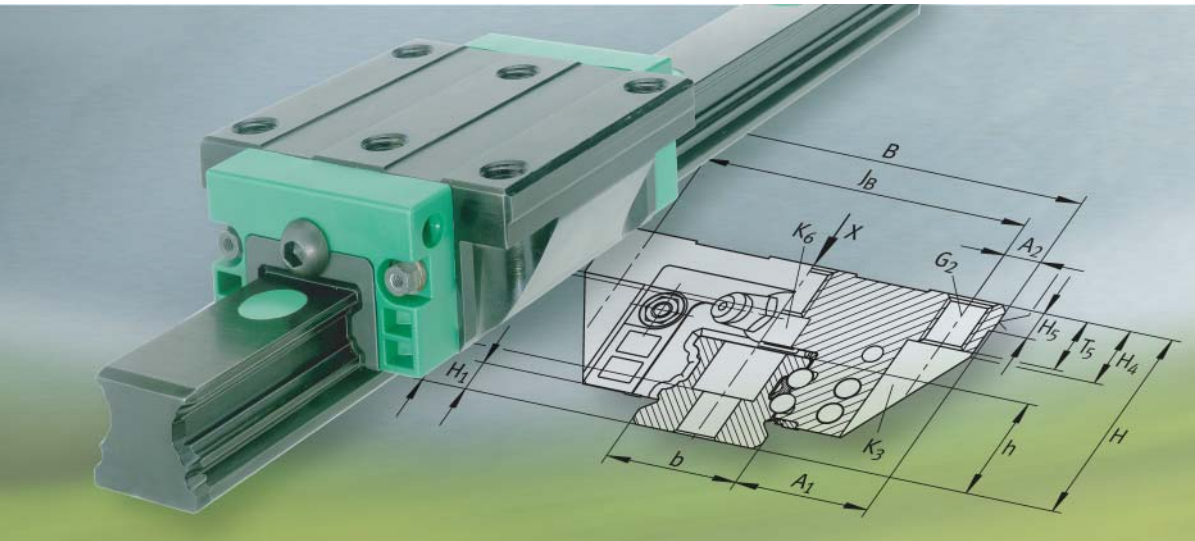
Dimension table - Dimensions in mm

| Designation | x-life | Mass m ≈ g | Dimensions | | | | | | | | | | |
|---------------|--------|------------------|------------|----------------------|-----|------------------------|----------------|----------------|----|----------------|-----------|----------------|----------------|
| | | | D | d ₁ h7 | B | B ₁ max. | B ₂ | B ₃ | C | C ₁ | r min. | d ₂ | d ₃ |
| PWKR35-2RS-RR | XL | 164 | 35 | 16 | 52 | 19,6 | 32,5 | 7,8 | 18 | 0,8 | 0,6 | 20 | 3 |
| PWKR40-2RS-RR | XL | 242 | 40 | 18 | 58 | 21,6 | 36,5 | 8 | 20 | 0,8 | 1 | 22 | 3 |
| PWKR47-2RS-RR | XL | 380 | 47 | 20 | 66 | 25,6 | 40,5 | 9 | 24 | 0,8 | 1 | 27 | 4 |
| PWKR52-2RS-RR | XL | 450 | 52 | 20 | 66 | 25,6 | 40,5 | 9 | 24 | 0,8 | 1 | 31 | 4 |
| PWKR62-2RS-RR | XL | 795 | 62 | 24 | 80 | 30,6 | 49,5 | 11 | 28 | 1,3 | 1 | 38 | 4 |
| PWKR72-2RS-RR | XL | 1020 | 72 | 24 | 80 | 30,6 | 49,5 | 11 | 28 | 1,3 | 1,1 | 44 | 4 |
| PWKR80-2RS-RR | XL | 1600 | 80 | 30 | 100 | 37 | 63 | 15 | 35 | 1 | 1,1 | 47 | 4 |
| PWKR90-2RS-RR | XL | 1960 | 90 | 30 | 100 | 37 | 63 | 15 | 35 | 1 | 1,1 | 47 | 4 |

- 1) Drive fit lubrication nipples are supplied loose. Only these lubrication nipples should be used.
- 2) Nominal dimension for hexagonal socket.
- 3) Values are only valid for bearings marked as X-life.

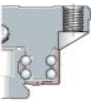
| | | | Drive fit lubrication nipple ¹⁾ | Nut tightening torque M _A Nm | Basic load ratings ³⁾ | | | | Fatigue limit load C _{urw} N | Speed n _{D G} min ⁻¹ |
|---------|----------------|-----------------|--|---|----------------------------------|--------------------------------|---------------------------------|-----------------------------------|--|--|
| G | l _G | W ²⁾ | | | dyn. C _{rw} N | stat. C _{0rw} N | dyn. F _{r per} N | stat. F _{0r per} N | | |
| M16X1,5 | 17 | 8 | NIPA2X7,5 | 58 | 12 600 | 14 600 | 10 600 | 14 600 | 1 760 | 6 000 |
| M18X1,5 | 19 | 8 | NIPA2X7,5 | 87 | 14 300 | 18 000 | 16 400 | 18 000 | 2 160 | 5 000 |
| M20X1,5 | 21 | 10 | NIPA2X7,5 | 120 | 24 600 | 30 500 | 20 700 | 30 500 | 3 750 | 3 800 |
| M20X1,5 | 21 | 10 | NIPA2X7,5 | 120 | 25 500 | 33 000 | 21 800 | 33 000 | 4 100 | 3 800 |
| M24X1,5 | 25 | 14 | NIPA3X9,5 | 220 | 35 000 | 45 500 | 29 000 | 45 500 | 5 800 | 2 200 |
| M24X1,5 | 25 | 14 | NIPA3X9,5 | 220 | 38 500 | 54 000 | 39 000 | 54 000 | 7 000 | 2 200 |
| M30X1,5 | 32 | 14 | NIPA3X9,5 | 450 | 56 000 | 79 000 | 60 000 | 79 000 | 10 600 | 1 800 |
| M30X1,5 | 32 | 14 | NIPA3X9,5 | 450 | 62 000 | 92 000 | 92 000 | 92 000 | 12 300 | 1 800 |





Linear guidance systems

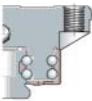
- Monorail guidance systems
- Track roller guidance systems
- Linear ball bearings and solid shafts
- Miniature guidance systems
- Driven linear units
- Screw drives



Linear guidance systems

| | Page |
|-------------------------|--|
| Product overview | Monorail guidance systems..... 92 |
| Features | Linear recirculating roller bearing and guideway assemblies 93 |
| | Six-row linear recirculating ball bearing and guideway assemblies 93 |
| | Four-row linear recirculating ball bearing and guideway assemblies 94 |
| | Two-row linear recirculating ball bearing and guideway assemblies 94 |
| | Two-row linear recirculating ball bearing units 95 |
| | Anti-corrosion and anti-wear protection by coatings 95 |
| | Further information 95 |
| Product overview | Track roller guidance systems 96 |
| Features | Carriages 97 |
| | Composite guideways 97 |
| | Profiled track rollers 97 |
| | Anti-corrosion and anti-wear protection 97 |
| | Further information 97 |
| Product overview | Linear ball bearings and solid shafts 98 |
| Features | Linear ball bearings 99 |
| | Anti-corrosion and anti-wear protection 100 |
| | Solid shafts 100 |
| | Operating temperature 101 |
| | Suffixes 101 |
| | Further information 101 |
| Dimension tables | Compact range, linear ball bearings, open or sealed, with anti-corrosion protection 102 |
| | Light range, linear ball bearings, sealed, self-aligning 103 |
| | Heavy duty range, linear ball bearings, gap seals or contact seals, self-aligning 104 |
| | Machined range, linear ball bearings, sealed, with anti-corrosion protection 106 |
| | Solid shafts 107 |

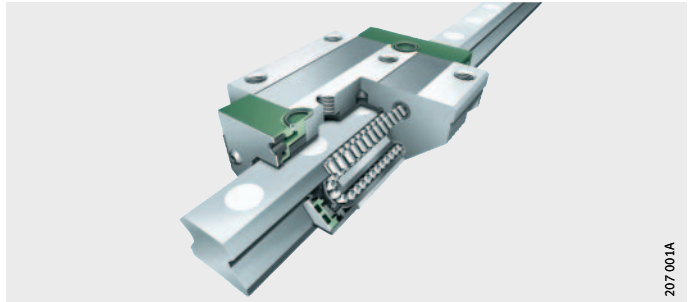
| | Page |
|-------------------------|---|
| Product overview | Miniature guidance systems 108 |
| Features | Miniature linear recirculating ball bearing and guideway assemblies..... 109 |
| | Further information..... 110 |
| | Miniature carriage units..... 110 |
| | Further information..... 111 |
| | Miniature linear guidance sets..... 111 |
| | Further information..... 111 |
| Product overview | Driven linear units 112 |
| Features | Support rails 113 |
| | Carriages..... 113 |
| | Return units..... 113 |
| | Further information..... 113 |
| Product overview | Screw drives..... 114 |
| Features | Design of screw drive..... 115 |



Product overview Monorail guidance systems

Linear recirculating roller bearing and guideway assemblies

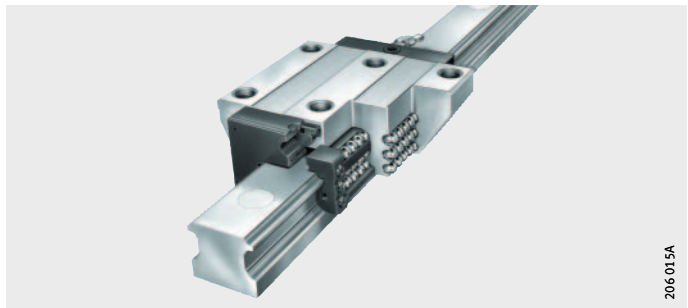
RUE...-E



207 001A

Six-row linear recirculating ball bearing and guideway assemblies

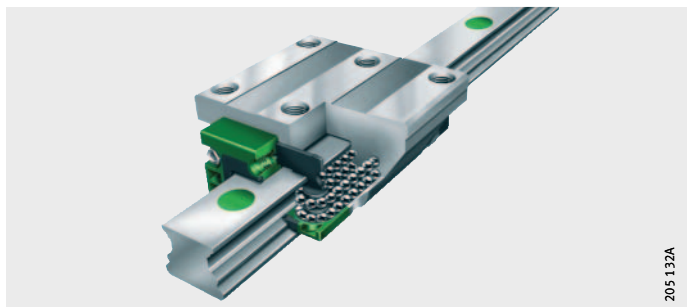
KUSE



206 015A

Four-row linear recirculating ball bearing and guideway assemblies

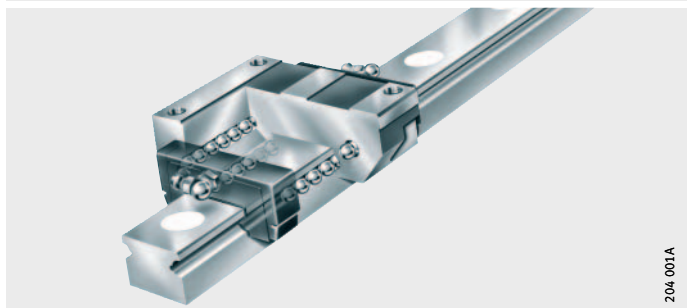
KUVE...-B



205 132A

Two-row linear recirculating ball bearing and guideway assemblies

KUE



204 001A

Monorail guidance systems

Features Monorail guidance systems are compact linear guidance systems based on rollers or balls with high rigidity and load carrying capacity. These guidance systems can support forces from all directions – apart from the direction of motion – and moments about all axes. They are available in various accuracy and preload classes and are therefore also suitable for applications with high guidance and positioning requirements. In order to reduce the frequency and costs of maintenance, the monorail guidance systems have a lubricant reservoir. All-round sealing of the carriages protects the linear systems against contamination even under critical environmental conditions.

Linear recirculating roller bearing and guideway assemblies

Linear recirculating roller bearing and guideway assemblies RUE...-E are, due to the full complement cylindrical rollers, the INA monorail guidance systems with the highest load carrying capacity and rigidity. They comprise at least one carriage with a full complement roller system, a guideway, integral elastic wipers on the end faces of the carriage, sealing strips on the upper side and underside of the carriage and closing plugs to close off the fixing holes in the guideway.

Linear recirculating roller bearing and guideway assemblies are suitable for accelerations up to 100 m/s^2 , speeds up to 180 m/min and operating temperatures from $-10 \text{ }^\circ\text{C}$ to $+100 \text{ }^\circ\text{C}$.

Guidance systems with roller chain

In this case, the rolling elements are not in a full complement arrangement, but are guided instead by a rolling element chain. Solutions with a rolling element chain run with less noise than full complement guidance systems. Due to the rolling element chain, there are fewer load-bearing rolling elements in the load zone. Since the longer saddle plate variant is used in the chain version, however, the basic load ratings and rigidity values are similar to those of the full complement standard version.

Guidance systems with an integral rolling element chain are available in the series RUE...-E-KT-L and RUE...-E-KT-HL.

Six-row linear recirculating ball bearing and guideway assemblies

Six-row linear recirculating ball bearing and guideway assemblies KUSE are the guidance systems based on balls with the highest load carrying capacity and rigidity. They comprise at least one carriage with a full complement ball system, a guideway, integral elastic wipers on the end faces of the carriage, sealing strips on the underside of the carriage and plastic closing plugs.

Linear recirculating ball bearing and guideway assemblies KUSE are suitable for accelerations up to 150 m/s^2 , speeds up to 300 m/min and operating temperatures from $-10 \text{ }^\circ\text{C}$ to $+100 \text{ }^\circ\text{C}$. They are used in applications with long unrestricted strokes, high and very high loads and high to very high rigidity.



Monorail guidance systems

Four-row linear recirculating ball bearing and guideway assemblies

Four-row linear recirculating ball bearing and guideway assemblies KUBE...-B are the most versatile and most extensively developed range of monorail guidance systems available from Schaeffler, *Figure 1*. These units comprise at least one carriage with a full complement ball system, a guideway, integral elastic wipers on the end faces of the carriage, sealing strips on the upper and lower sides of the carriage and plastic closing plugs.

Linear recirculating ball bearing and guideway assemblies KUBE are suitable for accelerations up to 150 m/s^2 , speeds up to 360 m/min and operating temperatures from $-10 \text{ }^\circ\text{C}$ to $+100 \text{ }^\circ\text{C}$.

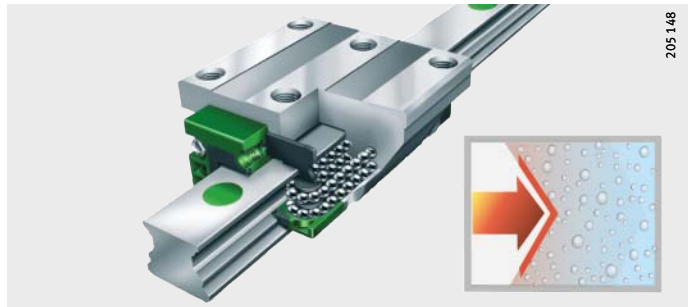


Figure 1
KUBE...-B-RB,
corrosion-resistant steel

Low-noise guidance system by means of Quad-Spacers

Running noise in linear guidance systems can be reduced by various methods. Schaeffler decided in favour of plastic spacer elements – known as Quad-Spacers. Since the balls are not in contact with each other, there is no collision noise. This reduces the noise in the recirculation system and the guidance systems run significantly more quietly.

Under highly dynamic operating conditions or with ingress of contaminant particles into the guidance system, this design also averts the risk of fracture.

KUBE...-B-KT is particularly suitable where the emphasis is on high dynamic characteristics and low noise.

Both new carriage versions can be used on the existing guideways.

Two-row linear recirculating ball bearing and guideway assemblies

Two-row linear recirculating ball bearing and guideway assemblies KUE are the economical alternative where guidance systems with moderate load capacity are required. The units comprise at least one carriage with a full complement ball system, a guideway, integral elastic wipers on the end faces of the carriage, sealing strips on the underside of the carriage and plastic closing plugs.

Linear recirculating ball bearing and guideway assemblies KUE are suitable for accelerations up to 150 m/s^2 , speeds up to 180 m/min and operating temperatures from $-10 \text{ }^\circ\text{C}$ to $+100 \text{ }^\circ\text{C}$. They are used for long unrestricted strokes, moderate loads, moderate rigidity and low friction.

Two-row linear recirculating ball bearing units

These full complement, ball-based linear guidance systems with high load carrying capacity comprise a guideway and one or more linear recirculating ball bearing units or carriages in which the linear recirculating ball bearing units KUVS are screw mounted, *Figure 2*.

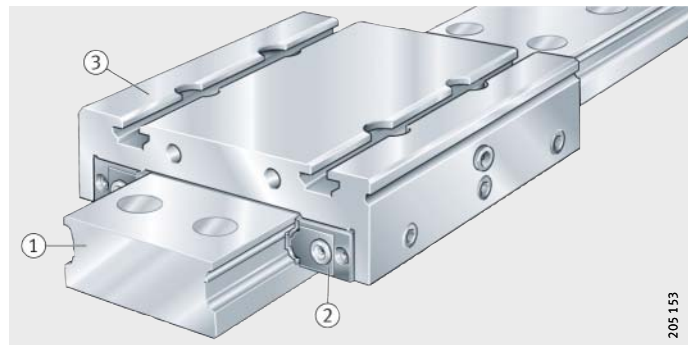
The guidance systems have adjustable clearance and allow large support distances.

The carriage has threaded through holes for fixing to the adjacent construction. The linear recirculating ball bearing units are sealed on all sides by the wipers on the end faces and the sealing strips which form a gap seal in conjunction with the guideway.

The carriage has a saddle plate made from anodised aluminium and accommodates two linear recirculating ball bearing units as standard. For simple fixing to the adjacent construction, T-slots are present that can be used with conventional hexagonal nuts and T-bolts.

- ① Guideway
- ② Linear recirculating ball bearing unit
- ③ Carriage

Figure 2
Linear guidance system with linear recirculating ball bearing units, carriage and guideway



Anti-corrosion and anti-wear protection by coatings

Coatings increase the corrosion resistance and/or wear resistance of the surface.

Components at risk of corrosion are protected by:

- the special coating Corrotect®
- the thin layer chromium coating Protect A (Durotect® CK)
- the thin layer chromium coating Protect B (Durotect® CK+).

For information on the coatings, see page 18.



Suffixes

Suffixes for the available designs: see table.

Available designs

| Suffix | Description |
|-------------------|---|
| RRF | Carriage and guideway with Corrotect® coating |
| RRFT | Guideway only with Corrotect® coating |
| KD ¹⁾ | Protect A (Durotect® CK), high anti-wear protection, moderate anti-corrosion protection |
| KDC ¹⁾ | Protect B (Durotect® CK+), high anti-wear and high anti-corrosion protection |
| RB ²⁾ | Corrosion-resistant steel |

¹⁾ Only for KUVS...-B and RUE...-E.

²⁾ Only for KUVS...-B.

Further information

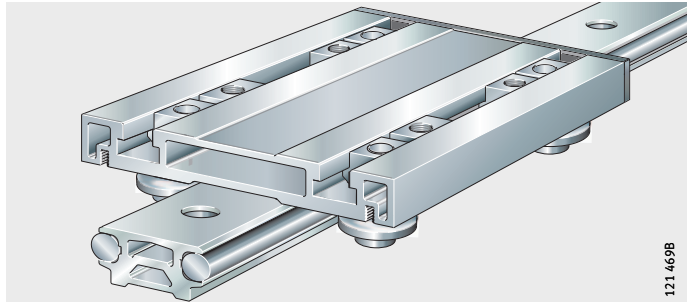


For information on the load carrying capacity and life, design of bearing arrangements, lubrication, fitting and operation of the guidance systems, attention must be paid to Publication PF 1.

Product overview Track roller guidance systems

With hollow section carriage
Clearance-free

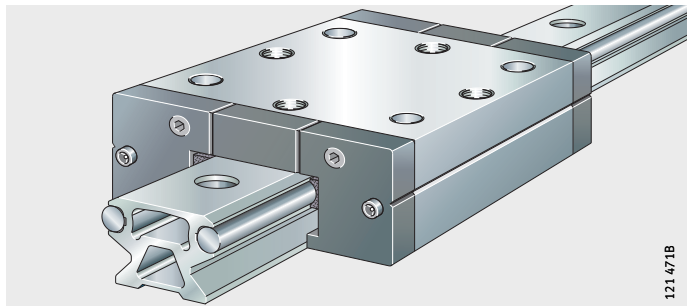
LFCL



121 469B

With compact carriage
Clearance-free

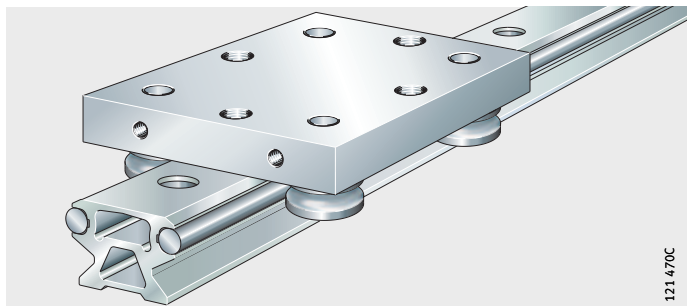
LFKL...SF



121 471B

With open carriage
Clearance-free

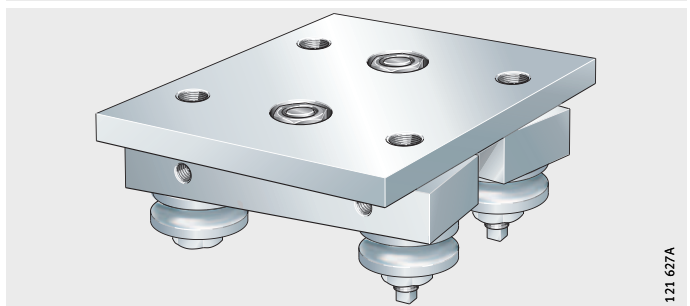
LFL...SF



121 470C

With bogie carriage
Adjustable clearance

LFDL...B



121 627A

Track roller guidance systems

Features Track roller guidance systems LF are preferably used, due to their lightweight construction, for tasks in handling systems, where quiet running, high speeds and long travel distances are required together with uniformly low displacement resistance.

In order to cover a wide spectrum of requirements using standard components, the guidance systems are structured according to a modular concept. On the basis of the carriages, composite guideway, track rollers as system elements and a precisely suitable range of accessories, designs exactly matched to the application can be achieved. Such guidance systems directly matched to the specific requirements give very successful support to the increasing demand for optimally configured individual components.

Carriages Carriages LF are supplied as:

- cost-effective, lightweight hollow section carriages
- robust, open carriages for high performance guidance systems of 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 guideway-based systems running in parallel
- bogie carriages for curved or closed oval or circular tracks.

Composite guideways Composite guideways are available as solid and hollow section guideways with a support rail having high bending rigidity, half guideways, curved elements and in a flat design.

Profiled track rollers Profiled track rollers without a filling slot are used for the guidance of carriages and support of forces. These double row angular contact ball bearings have an outer ring with a gothic arch raceway profile, 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.

Anti-corrosion and anti-wear protection Aluminium parts are anodised, shafts and track rollers are made from corrosion-resistant steel, material number 1.4125 and have the suffix VA.

Further information



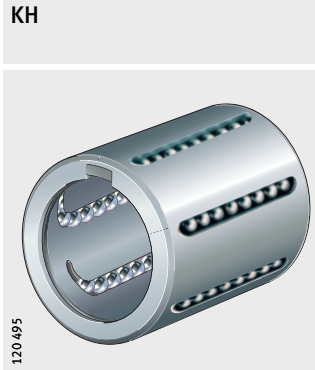
For information on the load carrying capacity and life, design of bearing arrangements, lubrication, fitting and operation of the guidance systems, attention must be paid to Catalogue LF 1, Track Roller Guidance Systems.



Product overview Linear ball bearings and solid shafts

Compact range

Gap seals or lip seals on both sides



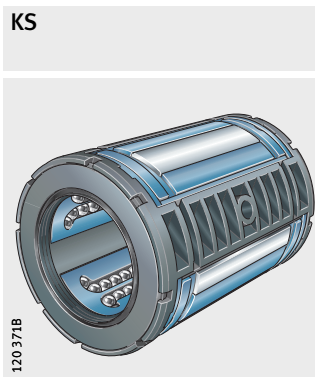
Light range

Lip seals on both sides

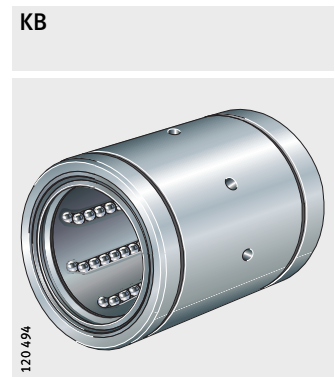


Heavy duty and machined range

Lip seals on both sides



KB



Solid shafts

Corrosion-resistant



Linear ball bearings and solid shafts

Features

Linear ball bearings

Corrosion-resistant linear ball bearings are available in the compact and machined ranges. The series have an anti-corrosion coating, are of a closed construction and are designed for use on shafts. They can support high loads while having a relatively low mass and allow the construction of linear guidance systems with unlimited travel.

For simple mounting on the adjacent construction, the bearings are also supplied as complete linear bearing units. In this case the linear ball bearings are integrated in a high strength, rigid aluminium or pressure diecast housing.

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 speeds are required. The holes in the housings allow simple screw mounting of the units to the adjacent construction.

Compact range

Linear ball bearings 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.

For economical surrounding constructions, the bearings are simply pressed into the locating bore. No additional axial location is required.

Light range

The linear ball bearings comprise a hardened and ground outer ring in which a plastic cage with inserted load plates is integrated. 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.

In the appropriate housing, the bearings have adjustable clearance. In order to compensate misalignments arising from manufacturing tolerances, mounting errors and shaft deflection, the linear bearings are self-aligning up to $\pm 30'$.

Their robust construction allows operation even under aggressive operating conditions.

Heavy duty range

These linear ball bearings 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.

Linear ball bearings of the heavy duty range and the corresponding ball bearing units have particularly high load carrying capacity. They have very good running characteristics.

In the appropriate housing, the bearings have adjustable clearance. In order to compensate misalignments arising from manufacturing tolerances, mounting errors and shaft deflection, the linear bearings are self-aligning up to $\pm 40'$.



Linear ball bearings and solid shafts

| | |
|--|---|
| Machined range | <p>Bearings of the machined range have high precision and particularly high rigidity. They have excellent running characteristics. The balls are guided with high precision throughout the return area by a special spring washer. As a result, the displacement resistance remains uniformly low even under difficult operating conditions and irrespective of the mounting position.</p> <p>For axial location of the bearings, retaining rings in accordance with DIN 471 are suitable.</p> |
| Sealing and lubrication | <p>Linear ball bearings are available in an open version and with contact seals on both sides (suffix PP).</p> <p>Due to the initial greasing with a high quality grease and the integral lubricant reservoir, the linear ball bearings are maintenance-free for many applications. If necessary, series KB..-PP-RR-AS can also be relubricated via openings in the outer ring or radial holes in the centre of the bearing.</p> |
| Anti-corrosion and anti-wear protection | <p>Linear ball bearings of the compact and machined ranges are supplied with Corrotect[®] coating. In the light and heavy duty ranges, the load plates can be supplied coated by agreement.</p> <p>By agreement, however, the linear ball bearings are also available with the anti-corrosion and anti-wear coating Protect A (Durotect[®] CK) or Protect B (Durotect[®] CK+).</p> <p>For a description of the coating, see page 18.</p> |
| Solid shafts | <p>Solid shafts are precision shafts made from corrosion-resistant steels and have metric dimensions. Suitable steels used include X46Cr13, material number 1.4034, or X90CrMoV18, material number 1.4112.</p> <p>The surface hardness is 550 HV + 70 HV (54 HRC + 4 HRC).</p> <p>For location, the shafts can be provided with radial and axial threaded holes or can by agreement be produced completely in accordance with a customer drawing.</p> |
| Suitable as precision raceway | <p>The material quality 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. They can be combined with linear bearings, yoke type, stud type 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.</p> <p> 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.</p> |

Coatings for shafts

In addition to shafts made from corrosion-resistant steels, all precision shafts made from quenched and tempered steel can be supplied with hard chromium coating, Corrotect[®], Protect A and Protect B. Corrotect[®] provides a good level of anti-corrosion protection, Protect A (Durotect[®] CK) and Protect B (Durotect[®] CK+) provide high to very high levels of anti-corrosion and anti-wear protection.

Hard chromium coating is suitable for applications in which a high level of anti-wear protection is required. The chromium coating also offers good corrosion resistance. The thickness of the chromium coating is at least 5 μm, the hardness is 800 HV to 1050 HV. Chromium coated shafts are to tolerance h7.

For information on the coatings, see page 18.

Operating temperature

Linear ball bearings are suitable for operating temperatures from -30 °C to +80 °C.

Suffixes

Suffixes for the available designs: see table.

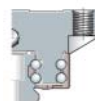
Available designs

| Suffix | Description |
|--------|--|
| AS | With relubrication facility |
| KD | Protect A, high wear protection and moderate anti-corrosion protection, by agreement |
| KDC | Protect B, high anti-corrosion and high anti-wear protection, by agreement |
| PP | Lip seals on both sides |
| RR | With Corrotect [®] coating |
| X46 | Corrosion-resistant steel X46Cr13, material number 1.4034 |
| X90 | Corrosion-resistant steel X90CrMoV18, material number 1.4112 |

Further information



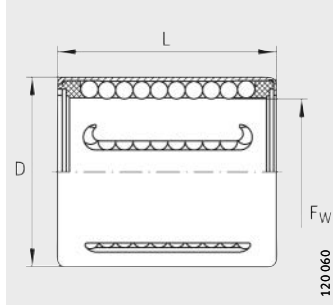
For information on the load carrying capacity and life, design of bearing arrangements, lubrication, fitting and operation of the bearings and shafts, attention must be paid to Catalogue WF 1, Shaft Guidance Systems.



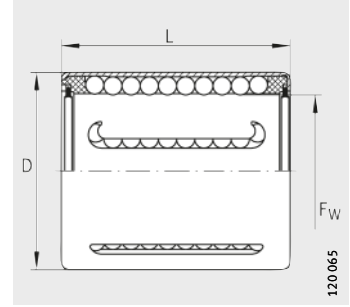
Compact range

Linear ball bearings

Open or sealed
With anti-corrosion protection



KH..-RR
Open



KH..-PP-RR
Sealed

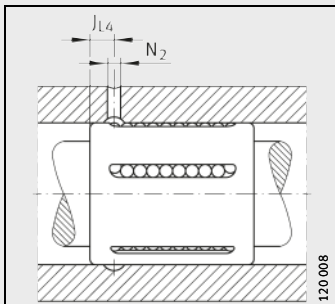
Dimension table - Dimensions in mm

| Designation | | Mass m ≈g | Dimensions | | | | | Basic load ratings ³⁾ | | | |
|----------------|-------------------|-----------------|----------------|----|----|-----------------|----------------|----------------------------------|----------------------------------|-------------------------------|----------------------------------|
| 1) | 2) | | 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-RR | KH06-PP-RR | 7 | 6 | 12 | 22 | 4 | 2 | 340 | 240 | 390 | 340 |
| KH08-RR | KH08-PP-RR | 12 | 8 | 15 | 24 | 6 | 2 | 410 | 280 | 475 | 400 |
| KH10-RR | KH10-PP-RR | 14,5 | 10 | 17 | 26 | 6 | 2,5 | 510 | 370 | 590 | 520 |
| KH12-RR | KH12-PP-RR | 18,5 | 12 | 19 | 28 | 6 | 2,5 | 670 | 510 | 800 | 740 |
| KH14-RR | KH14-PP-RR | 20,5 | 14 | 21 | 28 | 6 | 2,5 | 690 | 520 | 830 | 760 |
| KH16-RR | KH16-PP-RR | 27,5 | 16 | 24 | 30 | 7 | 2,5 | 890 | 620 | 1060 | 910 |
| KH20-RR | KH20-PP-RR | 32,5 | 20 | 28 | 30 | 7 | 2,5 | 1110 | 790 | 1170 | 1010 |
| KH25-RR | KH25-PP-RR | 66 | 25 | 35 | 40 | 8 | 2,5 | 2280 | 1670 | 2420 | 2130 |
| KH30-RR | KH30-PP-RR | 95 | 30 | 40 | 50 | 8 | 2,5 | 3300 | 2700 | 3300 | 3100 |
| KH40-RR | KH40-PP-RR | 182 | 40 | 52 | 60 | 9 | 2,5 | 5300 | 4450 | 5300 | 4950 |
| KH50-RR | KH50-PP-RR | 252 | 50 | 62 | 70 | 9 | 2,5 | 6800 | 6300 | 6800 | 7000 |

1) With preservative.

2) With initial greasing, sealed on both sides.

3) The basic load ratings are only valid for hardened (670 HV + 170 HV) and ground shaft raceways.

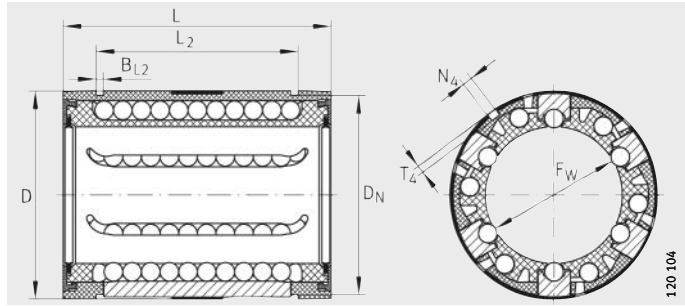


Light range

Linear ball bearings

Sealed

Self-aligning



KN..-B

120 104

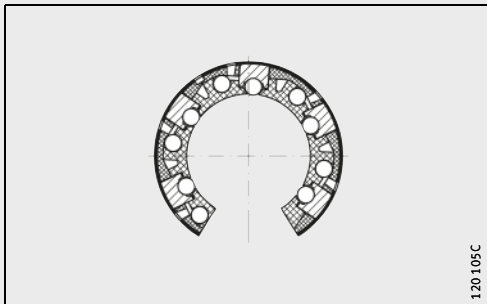
Dimension table · Dimensions in mm

| Designation ³⁾ | Mass m ≈g | Dimensions | | | | | | | | Ball rows | | Basic load ratings ¹⁾ | | | |
|---------------------------|-----------------|----------------|----|-----|----------------|-----------------|----------------|----------------|------------------------------|--------------------|----------|----------------------------------|----------------------------------|-------------------------------|----------------------------------|
| | | F _W | D | L | L ₂ | B _{L2} | D _N | T ₄ | N ₄ ²⁾ | b _{1 max} | Quantity | dyn. C _{min} N | stat. C _{0 min} N | dyn. C _{max} N | stat. C _{0 max} N |
| KN16-B | 30 | 16 | 26 | 36 | 24,6 | 1,3 | 25 | 0,7 | 3 | 1,5 | 5 | 870 | 620 | 1 040 | 910 |
| KN20-B | 60 | 20 | 32 | 45 | 31,2 | 1,6 | 30,7 | 0,9 | 3 | 2,5 | 6 | 1 730 | 1 230 | 1 830 | 1 570 |
| KN25-B | 130 | 25 | 40 | 58 | 43,7 | 1,85 | 38,5 | 1,4 | 3 | 2,5 | 6 | 3 100 | 2 220 | 3 250 | 2 850 |
| KN30-B | 190 | 30 | 47 | 68 | 51,7 | 1,85 | 44,7 | 2,2 | 3 | 2,5 | 6 | 3 750 | 2 850 | 3 950 | 3 650 |
| KN40-B | 350 | 40 | 62 | 80 | 60,3 | 2,15 | 59,4 | 2,2 | 3 | 3 | 6 | 6 300 | 4 350 | 6 700 | 5 600 |
| KN50-B | 670 | 50 | 75 | 100 | 77,3 | 2,65 | 71,4 | 2,3 | 3 | 3 | 6 | 9 300 | 6 500 | 9 800 | 8 300 |

¹⁾ The basic load ratings are only valid for hardened (670 HV + 170 HV) and ground shaft raceways.

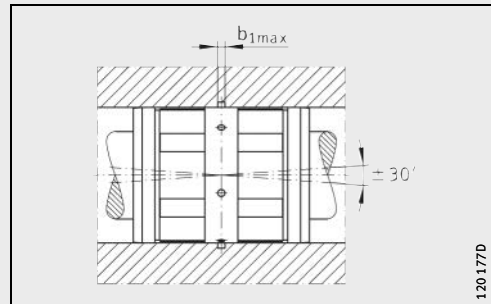
²⁾ Hole position symmetrical to bearing width C.

³⁾ Also available with segment cutout.



120 105C

KNO..-B
With segment cutout³⁾



120 177D

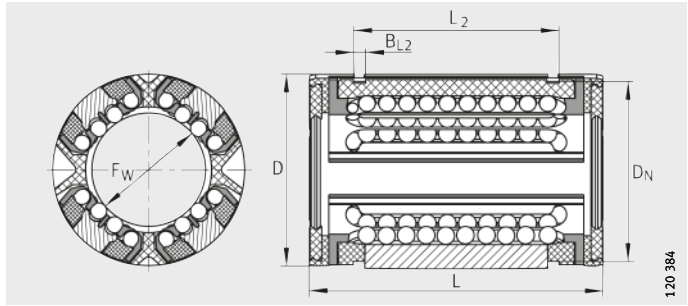
Self-aligning up to ±30'

Heavy duty range

Linear ball bearings

Gap seals or contact seals

Self-aligning



KS

Dimension table - Dimensions in mm

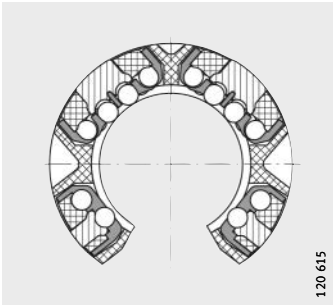
| Designation ⁴⁾ | Mass m ≈g | Dimensions | | | | | |
|---------------------------|-----------------|----------------|----|-----|-----------------------|-----------------|----------------|
| | | F _w | D | L | L ₂ H13 | B _{L2} | D _N |
| KS12 | 18 | 12 | 22 | 32 | 22,6 | 1,3 | 21 |
| KS16 | 28 | 16 | 26 | 36 | 24,6 | 1,3 | 25 |
| KS20 | 51 | 20 | 32 | 45 | 31,2 | 1,6 | 30,7 |
| KS25 | 102 | 25 | 40 | 58 | 43,7 | 1,85 | 38 |
| KS30 | 172 | 30 | 47 | 68 | 51,7 | 1,85 | 44,7 |
| KS40 | 335 | 40 | 62 | 80 | 60,3 | 2,15 | 59,4 |
| KS50 | 589 | 50 | 75 | 100 | 77,3 | 2,65 | 71,4 |

1) The basic load ratings are only valid for hardened (670 HV + 170 HV) and ground shaft raceways.

2) Hole position symmetrical to bearing width L.

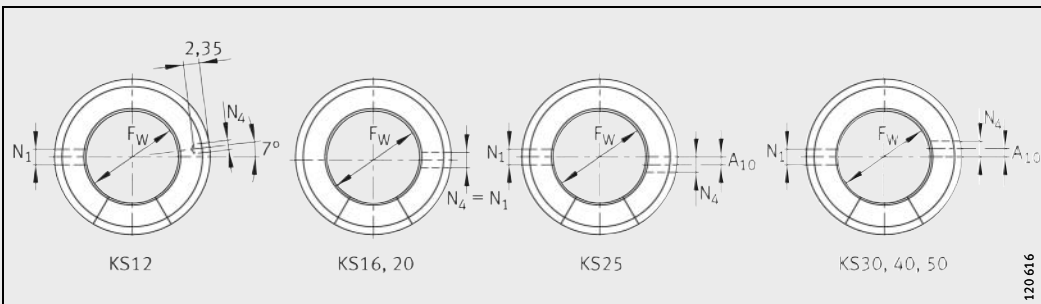
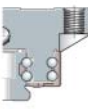
3) Only one lubrication and fixing hole each in size 16 and 20.

4) Also available with segment cutout.



KSO
With segment cutout⁴⁾

| A ₁₀ | N ₁ ²⁾ | N ₄ ²⁾ | 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 |
| – | – | 3 | 8 | 630 | 600 | 900 | 1 100 |
| – | 3 ³⁾ | 3 ³⁾ | 8 | 1 060 | 950 | 1 430 | 1 550 |
| – | 3 ³⁾ | 3 ³⁾ | 8 | 1 780 | 1 600 | 2 200 | 2 310 |
| 1,5 | 3,5 | 3 | 8 | 2 700 | 2 430 | 3 950 | 4 300 |
| 2 | 3,5 | 3 | 8 | 4 650 | 3 970 | 5 900 | 6 000 |
| 1,5 | 3,5 | 3 | 8 | 8 800 | 7 200 | 10 200 | 9 600 |
| 2,5 | 4,5 | 5 | 8 | 12 300 | 9 700 | 15 100 | 13 900 |

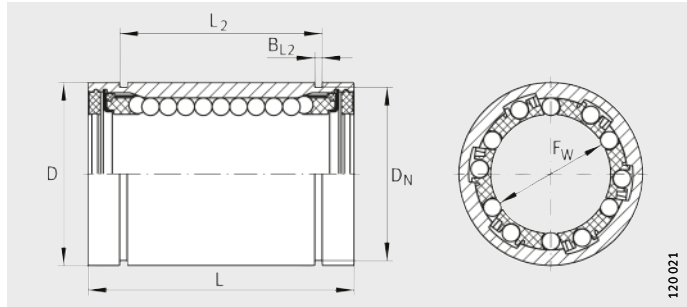


Machined range

Linear ball bearings

Sealed

With anti-corrosion protection



KB
Closed, sealed

Dimension table - Dimensions in mm

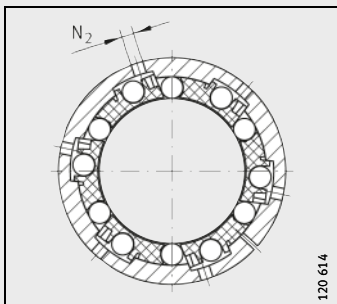
| Designation ¹⁾⁴⁾ | Mass m ≈g | Dimensions | | | | | | | Ball rows Quantity | Basic load ratings ³⁾ | | | |
|-----------------------------|-----------------|--|----|-----|----------------|-------------------------------|------------------------------|----------------|-----------------------|----------------------------------|----------------------------------|---------------------------------|----------------------------------|
| | | F _w | D | L | L ₂ | B _{L2} ²⁾ | D _N ²⁾ | N ₂ | | dyn. C _{0 min} N | stat. C _{0 min} N | dyn. C _{0 max} N | stat. C _{0 max} N |
| KB12-PP-RR-AS | 40 | 12 ^{+0,008 0} | 22 | 32 | 22,6 | 1,3 | 21 | 1,5 | 5 | 540 | 385 | 640 | 570 |
| KB16-PP-RR-AS | 50 | 16 ^{+0,009 -0,001} | 26 | 36 | 24,6 | 1,3 | 24,9 | 2 | 5 | 710 | 530 | 840 | 780 |
| KB20-PP-RR-AS | 90 | 20 ^{+0,009 -0,001} | 32 | 45 | 31,2 | 1,6 | 30,3 | 2 | 6 | 1 570 | 1 230 | 1 660 | 1 570 |
| KB25-PP-RR-AS | 190 | 25 ^{+0,011 -0,001} | 40 | 58 | 43,7 | 1,85 | 37,5 | 2,5 | 6 | 2 800 | 2 220 | 2 950 | 2 850 |
| KB30-PP-RR-AS | 300 | 30 ^{+0,011 -0,001} | 47 | 68 | 51,7 | 1,85 | 44,5 | 2,5 | 6 | 3 600 | 2 850 | 3 800 | 3 600 |
| KB40-PP-RR-AS | 600 | 40 ^{+0,013 -0,002} | 62 | 80 | 60,3 | 2,15 | 59 | 3 | 6 | 6 000 | 4 400 | 6 400 | 5 600 |
| KB50-PP-RR-AS | 1 000 | 50 ^{+0,013 -0,002} | 75 | 100 | 77,3 | 2,65 | 72 | 4 | 6 | 8 700 | 6 300 | 9 200 | 8 000 |

1) With initial greasing, sealed on both sides, with relubrication facility.

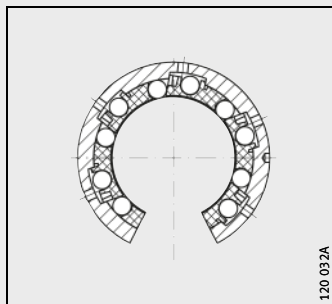
2) Slot dimensions suitable for retaining rings to DIN 471.

3) The basic load ratings are only valid for hardened (670 HV + 170 HV) and ground shaft raceways.

4) Also available in slotted design and with segment cutout.

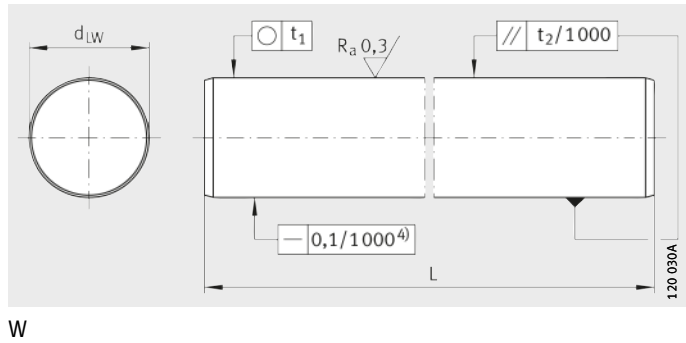


KBS
Slotted⁴⁾



KBO
With segment cutout⁴⁾

Solid shafts



Dimension table - Dimensions in mm

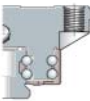
| Designation | Mass m ≈kg/m | Dimensions | | Tolerance | | | Roundness t_1 μm | Parallelism $t_2^{2)}$ μm | Surface hardening depth Rht ³⁾ min. |
|-------------|--------------------|------------|-------|--|--|--|--------------------------|---------------------------------|---|
| | | d_{LW} | L | h6 μm | Special tolerance ¹⁾ | | | | |
| | | | | | j5 μm | f7 μm | | | |
| W04 | 0,1 | 4 | 2 500 | $\begin{smallmatrix} 0 \\ -8 \end{smallmatrix}$ | - | - | 4 | 5 | 0,4 |
| W05 | 0,15 | 5 | 3 600 | $\begin{smallmatrix} 0 \\ -8 \end{smallmatrix}$ | - | - | 4 | 5 | 0,4 |
| W06 | 0,22 | 6 | 4 000 | $\begin{smallmatrix} 0 \\ -8 \end{smallmatrix}$ | - | - | 4 | 5 | 0,4 |
| W08 | 0,39 | 8 | 4 000 | $\begin{smallmatrix} 0 \\ -9 \end{smallmatrix}$ | - | - | 4 | 6 | 0,4 |
| W10 | 0,62 | 10 | 6 000 | $\begin{smallmatrix} 0 \\ -9 \end{smallmatrix}$ | - | - | 4 | 6 | 0,4 |
| W12 | 0,89 | 12 | 6 000 | $\begin{smallmatrix} 0 \\ -11 \end{smallmatrix}$ | - | - | 5 | 8 | 0,6 |
| W14 | 1,21 | 14 | 6 000 | $\begin{smallmatrix} 0 \\ -11 \end{smallmatrix}$ | - | - | 5 | 8 | 0,6 |
| W15 | 1,39 | 15 | 6 000 | $\begin{smallmatrix} 0 \\ -11 \end{smallmatrix}$ | - | $\begin{smallmatrix} -16 \\ -34 \end{smallmatrix}$ | 5 | 8 | 0,6 |
| W16 | 1,58 | 16 | 6 000 | $\begin{smallmatrix} 0 \\ -11 \end{smallmatrix}$ | $\begin{smallmatrix} +5 \\ -3 \end{smallmatrix}$ | $\begin{smallmatrix} -16 \\ -34 \end{smallmatrix}$ | 5 | 8 | 0,6 |
| W18 | 2 | 18 | 6 000 | $\begin{smallmatrix} 0 \\ -11 \end{smallmatrix}$ | - | $\begin{smallmatrix} -16 \\ -34 \end{smallmatrix}$ | 5 | 8 | 0,6 |
| W20 | 2,47 | 20 | 6 000 | $\begin{smallmatrix} 0 \\ -13 \end{smallmatrix}$ | $\begin{smallmatrix} +5 \\ -4 \end{smallmatrix}$ | $\begin{smallmatrix} -20 \\ -41 \end{smallmatrix}$ | 6 | 9 | 0,9 |
| W24 | 3,55 | 24 | 6 000 | $\begin{smallmatrix} 0 \\ -13 \end{smallmatrix}$ | - | - | 6 | 9 | 0,9 |
| W25 | 3,85 | 25 | 6 000 | $\begin{smallmatrix} 0 \\ -13 \end{smallmatrix}$ | $\begin{smallmatrix} +5 \\ -4 \end{smallmatrix}$ | $\begin{smallmatrix} -20 \\ -41 \end{smallmatrix}$ | 6 | 9 | 0,9 |
| W30 | 5,55 | 30 | 6 000 | $\begin{smallmatrix} 0 \\ -13 \end{smallmatrix}$ | $\begin{smallmatrix} +5 \\ -4 \end{smallmatrix}$ | $\begin{smallmatrix} -20 \\ -41 \end{smallmatrix}$ | 6 | 9 | 0,9 |
| W32 | 6,31 | 32 | 6 000 | $\begin{smallmatrix} 0 \\ -16 \end{smallmatrix}$ | +6,5 | $\begin{smallmatrix} -25 \\ -50 \end{smallmatrix}$ | 7 | 11 | 1,5 |
| W40 | 9,87 | 40 | 6 000 | $\begin{smallmatrix} 0 \\ -16 \end{smallmatrix}$ | $\begin{smallmatrix} +6 \\ -5 \end{smallmatrix}$ | - | 7 | 11 | 1,5 |
| W50 | 15,41 | 50 | 6 000 | $\begin{smallmatrix} 0 \\ -16 \end{smallmatrix}$ | $\begin{smallmatrix} +6 \\ -5 \end{smallmatrix}$ | - | 7 | 11 | 1,5 |
| W60 | 22,2 | 60 | 6 000 | $\begin{smallmatrix} 0 \\ -19 \end{smallmatrix}$ | - | - | 8 | 13 | 2,2 |
| W80 | 39,45 | 80 | 6 000 | $\begin{smallmatrix} 0 \\ -19 \end{smallmatrix}$ | - | - | 8 | 13 | 2,2 |

1) Only for shafts made from quenched and tempered steel.

2) Differential diameter measurement.

3) To DIN ISO 13 012.

4) For shaft length < 400 mm max. straightness tolerance of 0,04 mm.

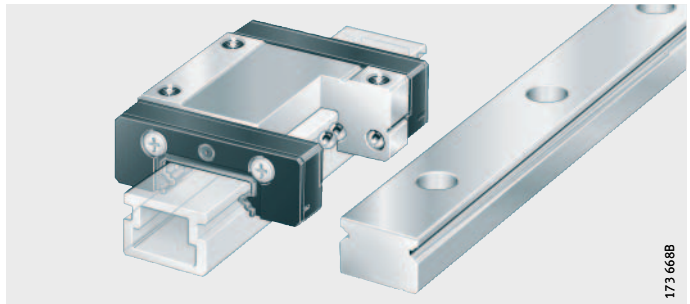


Product overview Miniature guidance systems

Miniature linear recirculating ball bearing and guideway assemblies

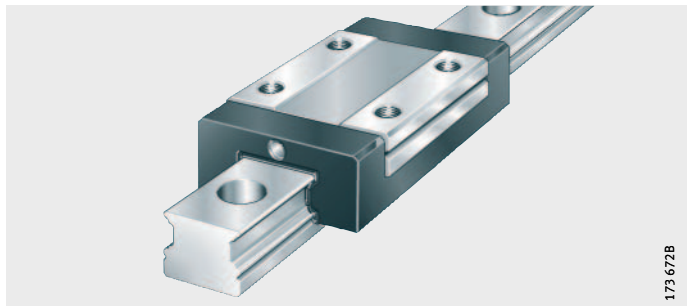
Two-row

KWEM, TKDM



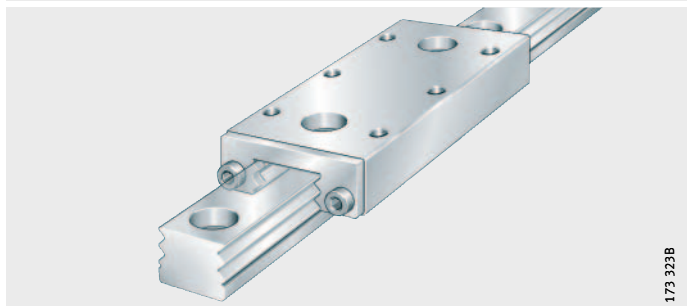
Four-row

KUME...-C



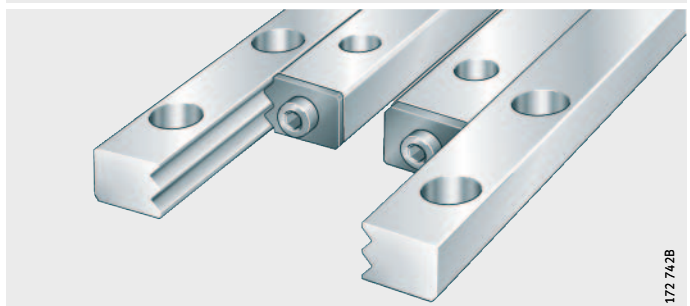
Miniature carriage units

RMWE



Miniature linear guidance sets

RWS



Miniature guidance systems

Features

Miniature linear recirculating ball bearing and guideway assemblies

Miniature linear recirculating ball bearing and guideway assemblies are available in two-row and four-row designs. Due to the steels used for the saddle plates and guideways, the units are corrosion-resistant. If very high levels of corrosion resistance are required, the suitability of the bearings for the specific application must be investigated.

The linear guidance systems are preloaded and are used as linear locating bearings. They can support forces from all directions – apart from the direction of motion – and moments about all axes.

Two-row linear recirculating ball bearing and guideway assemblies

These units have moderate load carrying capacity and moderate to high moment load carrying capacity.

The saddle plates and guideways are corrosion-resistant. Seals on the end faces of the carriages protect the rolling element system against contamination. The carriages are greased and can be relubricated.

The units are suitable for accelerations up to 50 m/s^2 and speeds up to 180 m/min.

Two-row units are available in the accuracy classes G1 and G2.

Four-row linear recirculating ball bearing and guideway assemblies

Four-row miniature linear recirculating ball bearing and guideway assemblies are ready-to-fit guidance systems for unlimited stroke lengths. They have high load carrying capacity and rigidity. Due to the lubricant reservoir in the carriage, they are maintenance-free in many applications after initial greasing.

The units are suitable for accelerations up to 40 m/s^2 and speeds up to 180 m/min.

Four-row units are in the accuracy class G2.

Interchangeability

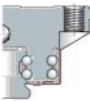
The guideways and carriages can be used in any combination within the same accuracy and interchangeability class. This simplifies the fitting of guidance systems, gives easier spare parts purchasing and allows very economical stockholding.

Preload

Miniature linear recirculating ball bearing and guideway assemblies are available in the preload classes according to the table. TKDM5 is only available in V0.

Preload

| Preload class | Preload setting |
|---------------|-----------------------------------|
| V0 | (Standard) zero to slight preload |
| V1 | Preload |



Miniature guidance systems

- Sealing and lubrication** Two-row units have seals on the end faces of the carriages to seal the rolling element system. In the four-row units, the rolling element system is sealed by means of gap seals on the end faces of the carriages.
- The two-row design is greased, but it can also be supplied ungreased.
Four-row series are not greased.
Lubrication can be carried out using conventional pointed nozzles.
- Operating temperature** Two-row units can be used at temperatures from $-40\text{ }^{\circ}\text{C}$ to $+100\text{ }^{\circ}\text{C}$, four-row units at temperatures from $-40\text{ }^{\circ}\text{C}$ to $+80\text{ }^{\circ}\text{C}$.

Further information



For information on the load carrying capacity and life, design of bearing arrangements, lubrication, fitting and operation of the units, attention must be paid to Technical Product Information TPI 163, Miniature linear recirculating ball bearing and guideway assemblies.

Miniature carriage units

Miniature carriage units with cylindrical roller flat cages are corrosion-resistant, ready-to-fit cage guidance systems for limited stroke lengths. The saddle plates of the carriages, the guideways, the cage strip and the end pieces are made from corrosion-resistant steel. If very high levels of corrosion resistance are required, the suitability of the bearings for the specific application must be investigated.

The units are produced in numerous carriage and guideway lengths, giving highly cost-effective designs. They have a high load carrying capacity, high rigidity and high accuracy whilst requiring very little space. Due to their compact design, they can often be used to replace guidance systems which require significantly more space.

As linear locating bearings with at least one carriage, they can support forces from all directions – apart from the direction of motion – and moments about all axes. They have higher rigidity than recirculating ball guidance systems, are very smooth-running and have high running accuracy. The standard accuracy class is G2.

The carriage units are particularly suitable for short stroke lengths, oscillating and low-friction motion and for high loads where high rigidity is required.

Sealing In order to prevent damage to the guidance systems, the raceways must be kept clean at all times. If the end pieces used as standard are not adequate for this purpose, additional seals must be provided in the adjacent construction.

Preload Miniature carriage units are in preload class V1 in accordance with the table.

Preload class

| Class | Preload | Application |
|-------|---|--|
| V1 | $0,005 \cdot C$ to $0,02 \cdot C$ | Low to moderate loads; moderate to high rigidity; moment loads |

Further information



For information on the load carrying capacity and life, design of bearing arrangements, lubrication, fitting and operation of the carriage units, attention must be paid to Technical Product Information TPI 160, Miniature carriage units.

Miniature linear guidance sets

Miniature linear guidance sets with cylindrical roller flat cages are corrosion-resistant locating bearings for limited stroke lengths and are preloaded during fitting.

They can support forces from all directions – apart from the direction of motion – and moments about all axes and have higher load carrying capacity and rigidity than recirculating systems. The standard accuracy is G1.

Due to their design, they are particularly suitable for short stroke lengths, low-friction and oscillating motion and for high loads where very high rigidity is required, as well as requiring very little space.

The units are produced in numerous standard lengths, giving especially cost-effective designs. Since the spacing between support points can be varied by design, they can be easily matched to predetermined adjacent constructions. The guidance systems can be located through the adjacent construction or through the guideways.

Sealing

In order to prevent damage to the guidance systems, the raceways must be kept clean at all times. If the end pieces used as standard are not adequate for this purpose, additional seals must be provided in the adjacent construction.

Preload

The guidance systems must be preloaded in accordance with the table.

Preload class

| Class | Preload | Application |
|-------|---|--|
| V1 | $0,005 \cdot C$ to $0,02 \cdot C$ | Low to moderate loads; moderate to high rigidity; moment loads |

Further information



For information on the load carrying capacity and life, design of bearing arrangements, lubrication, fitting and operation of the sets, attention must be paid to Technical Product Information TPI 162, Miniature linear guidance sets.

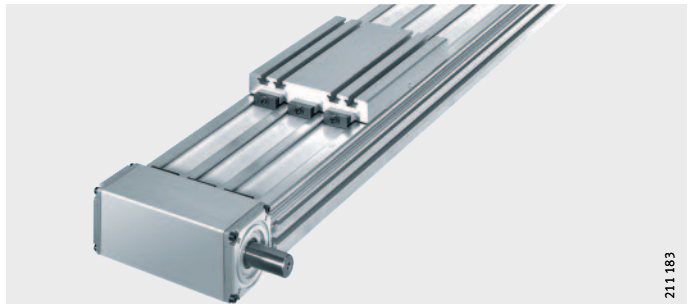


Product overview **Driven linear units**

Driven linear units

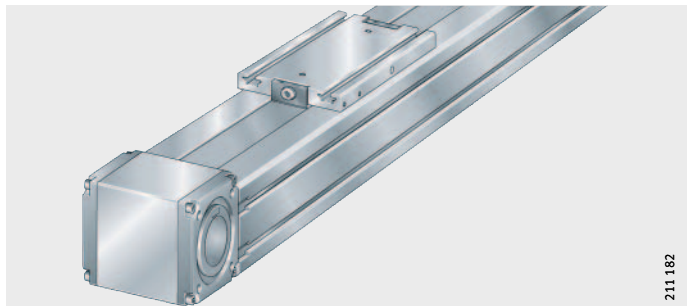
With four-row linear recirculating ball guidance systems KUVÉ and triple toothed belt drive

MDKUVÉ..-3ZR-VA



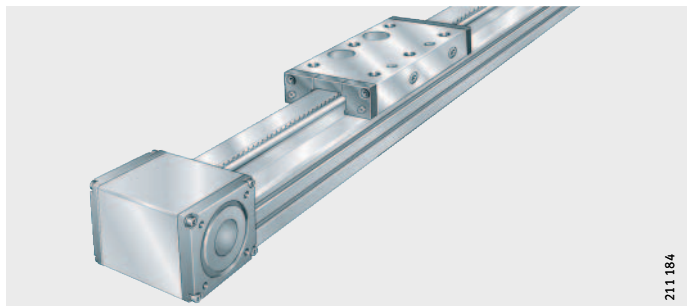
With six-row linear recirculating ball guidance systems KUSE and toothed belt drive

MKUSE..-ZR-VA



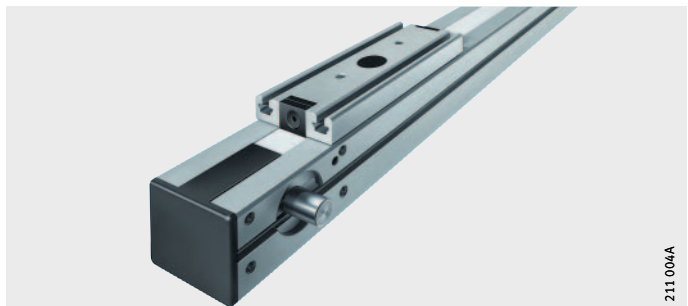
With external track roller guidance system LF and toothed belt drive

MLF..-VA



With internal track roller guidance system LF and toothed belt drive

MLFI..-VA



Driven linear units

Features In automation and handling applications, the traverse and positioning systems must be capable of moving small and large masses over various stroke lengths quickly, reliably and to high accuracy. In order to fulfil these tasks, there are proven linear actuators with recirculating ball guidance systems or track roller guidance systems and toothed belt drive.

Linear actuators of a corrosion-resistant design comprise a support rail, guidance system, carriage, toothed belt drive, return units and bellows (in the case of recirculating ball guidance systems). With the exception of the rolling elements, all the steel parts are made from steel that is corrosion-resistant or protected against corrosion (suffix VA).

Support rail Support rails are composite rails with a carrier profile made from anodised aluminium. In the case of recirculating ball guidance systems, the linear recirculating ball bearing and guideway assemblies KUVE and KUSE run on guideways.

In the case of track roller guidance systems, hardened and ground shafts are incorporated in the guideway for the track rollers LF.

Carriages The saddle plate of the carriages is an anodised aluminium plate. This is guided clearance-free by the recirculating ball guidance systems or adjustable track rollers. There are integral clamping devices for the toothed belt in both sides of the carriage.

Carriages of different lengths are available to support higher moment loads.

The carriage is driven by maintenance-free toothed belts.

In the case of the track roller guidance systems, the carriage is protected by lubrication and wiper units. The raceways on the support rails can be relubricated through lubrication nipples arranged on the end faces of the carriage.

For location on the adjacent construction, the carriages have threaded holes or T-slots.

Return units The return units comprise an anodised profiled aluminium housing, two covers and a shaft unit.

The shafts are supported by tapered roller bearings arranged on both sides. The bearings are lubricated for life.

The toothed belt recirculates about a gear set mounted on the shaft.



Further information

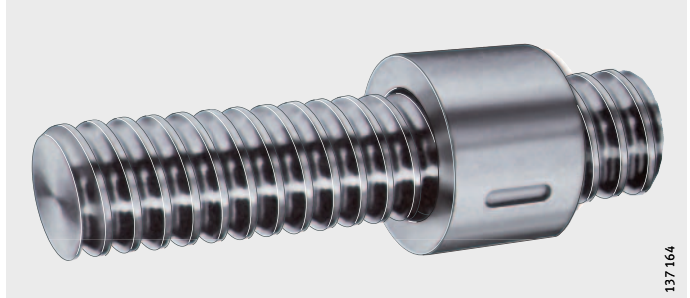


For information on the load carrying capacity and life, design of bearing arrangements, lubrication, fitting and operation of the linear actuators, attention must be paid to Catalogue AL 1 (ALE), Driven Linear Units.

Product overview Screw drives

Screw drives With single nut

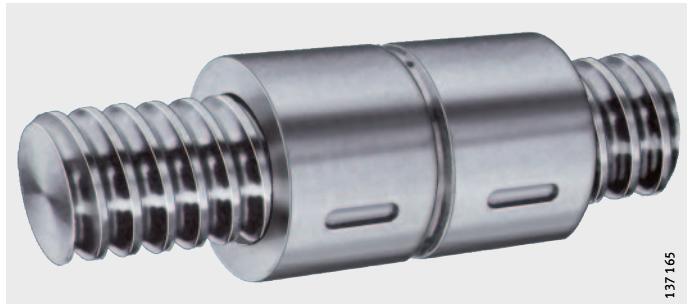
KGT...-VA



137 164

With double nut

KGT...-VA



137 165

Screw drive

| | |
|----------------------------------|--|
| Features | Ball screw drives convert rotary motion into linear motion and vice versa. |
| Design of screw drive | A ball screw drive comprises a spindle, spindle nut with a ball return system and balls. Due to the balls rolling between the spindle shaft and the nut, they achieve an efficiency of up to 90% compared to trapezoidal lead screw drives. |
| Spindle | The ball raceways on the spindle are induction hardened; the effective hardening depth is dependent on the pitch and ball size. |
| Nut | Nuts with axial clearance can be supplied premounted on the spindle or separately on sleeves. Nuts with slight or moderate preload are premounted on the spindles. The bearings for the locating and non-locating bearing sides can be supplied separately or premounted on machined spindle seats. |
| Anti-corrosion protection | Corrosion-resistant screw drives are available by agreement. |





Maintenance-free metal/ polymer composite plain bearings

- Bushes
- Flanged bushes
- Thrust washers
- Strips

Maintenance-free metal/ polymer composite plain bearings

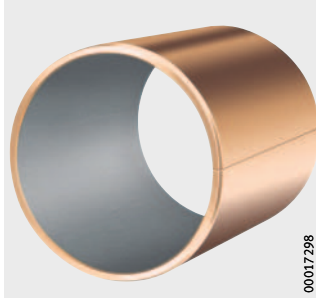
| | Page |
|---|------|
| Product overview | |
| Maintenance-free metal/ polymer composite plain bearings | 118 |
| Features | |
| Maintenance-free plain bearing material E40-B | 119 |
| Further information | 120 |
| Dimension tables | |
| Bushes, maintenance-free, with bronze backing..... | 121 |
| Flanged bushes, maintenance-free, with bronze backing..... | 123 |
| Thrust washers, maintenance-free, with bronze backing..... | 124 |



Product overview Maintenance-free metal/ polymer composite plain bearings

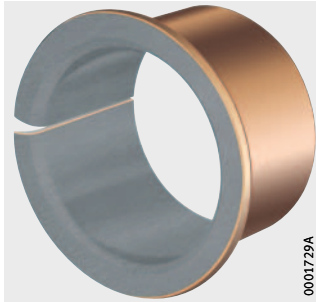
Bushes

EGB..-E40-B



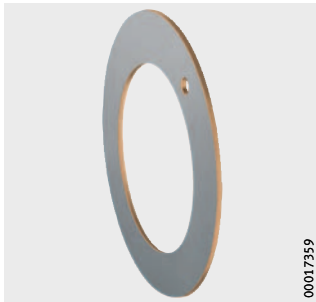
Flanged bushes

EGF..-E40-B



Thrust washers

EGW..-E40-B



Strips

Available by agreement

EGS..-E40-B



Maintenance-free metal/ polymer composite plain bearings

Features

These plain bearings are bearings for very small radial or axial design envelopes. These products are available as bushes, flanged bushes, thrust washers and by agreement as strips. The bushes are available in metric sizes.

The plain bearings are supplied with a bronze backing have high corrosion resistance and thermal conductivity and are antimagnetic.

The maintenance-free material E40-B conforms to the regulations for lead-free plain bearings. It thus complies with Richtlinie 2000/53/EG (End of Life Vehicles Directive) as well as the Richtlinie 2011/65/EU (RoHS-II) for the restriction of hazardous substances.



If the plain bearings are to be used in the medical or aerospace sectors or in the food or pharmaceuticals industry, please contact the Schaeffler engineering service.

Maintenance-free plain bearing material E40-B

For corrosion-resistant and maintenance-free metal/polymer composite plain bearings from Schaeffler, the sliding material E40-B is used. The dry lubricant is based on polytetrafluoroethylene PTFE with embedded chemically non-reactive additives. These bearings are designed for dry running and are thus particularly suitable where the bearing position must be maintenance-free, there is a risk of lubricant starvation or where lubricant is unacceptable or undesirable. The material E40-B can be used not only for rotary and oscillating motion but also for short stroke linear motion.

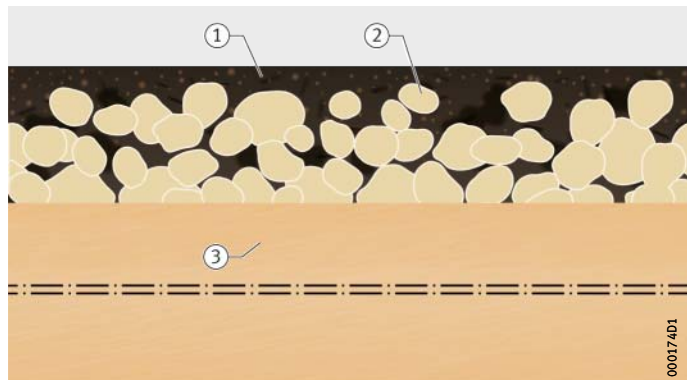
Typical areas of application can be found, for example, in fluid technology, in sports gear, in medical or electrical equipment as well as in automotive engineering.

Material E40-B, structure

In the three-layered material, the bronze backing has a sintered porous tin/bronze sliding layer whose pores are filled with the super-imposed running-in layer, *Figure 1*. The running-in layer is a plastic composite comprising PTFE and additives.

- ① Running-in layer
- ② Sliding layer
- ③ Bronze backing

Figure 1
Maintenance-free
plain bearing material E40-B



Maintenance-free metal/ polymer composite plain bearings

Technical data The sliding layer E40-B is maintenance-free. It can be used for rotary and oscillating motion as well as for short stroke linear motion. The low-wear material has good sliding characteristics (no stick-slip), a low coefficient of friction and high resistance to chemicals. It does not absorb water (it is highly resistant to swelling), does not tend to weld to metal and is also suitable for hydrodynamic operation. The plain bearing material has the following mechanical and physical characteristics, see table.

Characteristics of E40-B

| Characteristic | Load | | |
|---|------------------------|------------------|---------------------------------------|
| Maximum pv value for dry running | Continuous operation | pv | 1,8 N/mm ² · m/s |
| | Short periods | | 3,6 N/mm ² · m/s |
| Permissible specific bearing load | Static | p _{max} | 250 N/mm ² |
| | Rotary, oscillating | | 140 N/mm ² |
| Permissible sliding velocity | Dry running | v _{max} | 2,5 m/s |
| | Hydrodynamic operation | | >2,5 m/s |
| Permissible operating temperature | ϑ | | -200 °C to +280 °C |
| Coefficient of thermal expansion | Bronze backing | α _{Bz} | 17 · 10 ⁻⁶ K ⁻¹ |
| Coefficient of thermal conductivity | Bronze backing | λ _{Bz} | >70 Wm ⁻¹ K ⁻¹ |
| Relative electrical resistance after running-in | R _{rel min} | | >1 Ω · cm ² |

Available designs For the available standard dimension ranges for bushes and washers made from E40-B, see table.

Product and size range

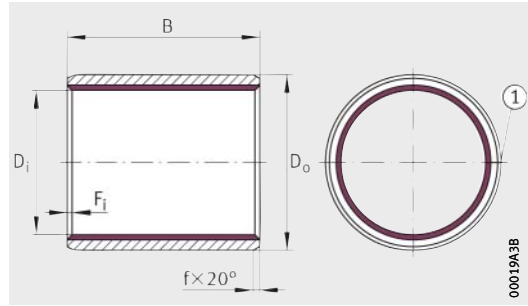
| Plain bearings made from material E40-B | Designation | For shafts with the following dimensions |
|---|-------------|--|
| Bushes | EGB...E40-B | 4 mm to 100 mm |
| Flanged bushes | EGF...E40-B | 6 mm to 40 mm |
| Thrust washers | EGW...E40-B | 10 mm to 62 mm |

Further information

The complete standard range of metal/polymer composite plain bearings is described in detail in Catalogue HG 1, Plain Bearings.

Bushes

Maintenance-free
ISO 3547
With bronze backing



EGB
① Butt joint

Dimension table · Dimensions in mm

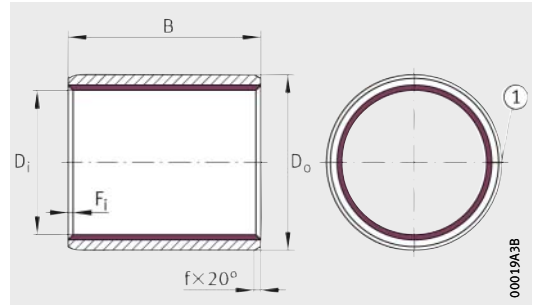
| Designation | Mass m ≈g | Dimensions | | | | | | Basic load ratings | |
|-----------------|-----------------|----------------|----------------|------------|---------|----------------|------|-----------------------------|-------------------------------|
| | | D _i | D _o | B ±0,25 | f | F _i | | dyn. C _r N | stat. C _{0r} N |
| | | | | | | min. | max. | | |
| EGB0406-E40-B-6 | 0,7 | 4 | 6 | 6 | 0,6±0,4 | 0,1 | 0,6 | 3 360 | 6 000 |
| EGB0505-E40-B | 0,7 | 5 | 7 | 5 | 0,6±0,4 | 0,1 | 0,6 | 3 500 | 6 250 |
| EGB0606-E40-B | 1 | 6 | 8 | 6 | 0,6±0,4 | 0,1 | 0,6 | 5 040 | 9 000 |
| EGB0610-E40-B | 1,6 | 6 | 8 | 10 | 0,6±0,4 | 0,1 | 0,6 | 8 400 | 15 000 |
| EGB0808-E40-B | 1,7 | 8 | 10 | 8 | 0,6±0,4 | 0,1 | 0,6 | 8 960 | 16 000 |
| EGB0810-E40-B | 2,1 | 8 | 10 | 10 | 0,6±0,4 | 0,1 | 0,6 | 11 200 | 20 000 |
| EGB0812-E40-B | 2,6 | 8 | 10 | 12 | 0,6±0,4 | 0,1 | 0,6 | 13 400 | 24 000 |
| EGB1005-E40-B | 1,3 | 10 | 12 | 5 | 0,6±0,4 | 0,1 | 0,6 | 7 000 | 12 500 |
| EGB1010-E40-B | 2,6 | 10 | 12 | 10 | 0,6±0,4 | 0,1 | 0,6 | 14 000 | 25 000 |
| EGB1015-E40-B | 4 | 10 | 12 | 15 | 0,6±0,4 | 0,1 | 0,6 | 21 000 | 37 500 |
| EGB1020-E40-B | 5,3 | 10 | 12 | 20 | 0,6±0,4 | 0,1 | 0,6 | 28 000 | 50 000 |
| EGB1210-E40-B | 3,1 | 12 | 14 | 10 | 0,6±0,4 | 0,1 | 0,6 | 16 800 | 30 000 |
| EGB1212-E40-B | 3,7 | 12 | 14 | 12 | 0,6±0,4 | 0,1 | 0,6 | 20 200 | 36 000 |
| EGB1215-E40-B | 4,7 | 12 | 14 | 15 | 0,6±0,4 | 0,1 | 0,6 | 25 200 | 45 000 |
| EGB1220-E40-B | 6,3 | 12 | 14 | 20 | 0,6±0,4 | 0,1 | 0,6 | 33 600 | 60 000 |
| EGB1225-E40-B | 7,9 | 12 | 14 | 25 | 0,6±0,4 | 0,1 | 0,6 | 42 000 | 75 000 |
| EGB1415-E40-B | 5,4 | 14 | 16 | 15 | 0,6±0,4 | 0,1 | 0,6 | 29 400 | 52 500 |
| EGB1515-E40-B | 5,8 | 15 | 17 | 15 | 0,6±0,4 | 0,1 | 0,6 | 31 500 | 56 300 |
| EGB1525-E40-B | 9,7 | 15 | 17 | 25 | 0,6±0,4 | 0,1 | 0,6 | 52 500 | 93 800 |
| EGB1615-E40-B | 6,2 | 16 | 18 | 15 | 0,6±0,4 | 0,1 | 0,6 | 33 600 | 60 000 |
| EGB1625-E40-B | 10,3 | 16 | 18 | 25 | 0,6±0,4 | 0,1 | 0,6 | 56 000 | 100 000 |
| EGB1815-E40-B | 6,9 | 18 | 20 | 15 | 0,6±0,4 | 0,1 | 0,6 | 37 800 | 67 500 |
| EGB1825-E40-B | 11,6 | 18 | 20 | 25 | 0,6±0,4 | 0,1 | 0,6 | 63 000 | 113 000 |
| EGB2015-E40-B | 12,2 | 20 | 23 | 15 | 0,6±0,4 | 0,1 | 0,7 | 42 000 | 75 000 |
| EGB2020-E40-B | 16,3 | 20 | 23 | 20 | 0,6±0,4 | 0,1 | 0,7 | 56 000 | 100 000 |
| EGB2025-E40-B | 20,4 | 20 | 23 | 25 | 0,6±0,4 | 0,1 | 0,7 | 70 000 | 125 000 |
| EGB2030-E40-B | 24,5 | 20 | 23 | 30 | 0,6±0,4 | 0,1 | 0,7 | 84 000 | 150 000 |
| EGB2215-E40-B | 13,3 | 22 | 25 | 15 | 0,6±0,4 | 0,1 | 0,7 | 46 200 | 82 500 |
| EGB2220-E40-B | 17,8 | 22 | 25 | 20 | 0,6±0,4 | 0,1 | 0,7 | 61 600 | 110 000 |
| EGB2225-E40-B | 22,3 | 22 | 25 | 25 | 0,6±0,4 | 0,1 | 0,7 | 77 000 | 138 000 |

Recommended mounting tolerances: see Catalogue HG 1, Plain Bearings.



Bushes

Maintenance-free
 ISO 3547
 With bronze backing



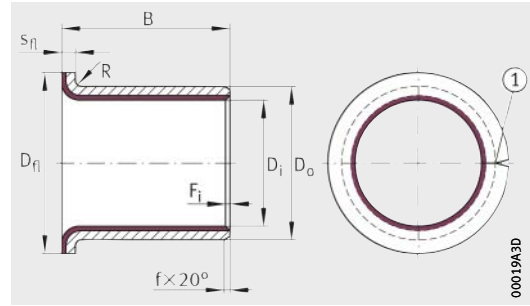
EGB
 ① Butt joint

| Dimension table (continued) · Dimensions in mm | | | | | | | | | |
|--|-----------------|----------------|----------------|-----|---------|----------------|------|-----------------------------|-------------------------------|
| Designation | Mass m ≈g | Dimensions | | | | | | Basic load ratings | |
| | | D _i | D _o | B | f | F _i | | dyn. C _r N | stat. C _{0r} N |
| | | | | | | min. | max. | | |
| EGB2430-E40-B | 29,1 | 24 | 27 | 30 | 0,6±0,4 | 0,1 | 0,7 | 101 000 | 180 000 |
| EGB2525-E40-B | 25,2 | 25 | 28 | 25 | 0,6±0,4 | 0,1 | 0,7 | 87 500 | 156 000 |
| EGB2530-E40-B | 30,2 | 25 | 28 | 30 | 0,6±0,4 | 0,1 | 0,7 | 105 000 | 188 000 |
| EGB2830-E40-B | 46,1 | 28 | 32 | 30 | 1,2±0,4 | 0,1 | 0,7 | 118 000 | 210 000 |
| EGB3020-E40-B | 32,6 | 30 | 34 | 20 | 1,2±0,4 | 0,1 | 0,7 | 84 000 | 150 000 |
| EGB3030-E40-B | 49,2 | 30 | 34 | 30 | 1,2±0,4 | 0,1 | 0,7 | 126 000 | 225 000 |
| EGB3040-E40-B | 65,8 | 30 | 34 | 40 | 1,2±0,4 | 0,1 | 0,7 | 168 000 | 300 000 |
| EGB3520-E40-B | 37,7 | 35 | 39 | 20 | 1,2±0,4 | 0,1 | 0,7 | 98 000 | 175 000 |
| EGB3530-E40-B | 56,9 | 35 | 39 | 30 | 1,2±0,4 | 0,1 | 0,7 | 147 000 | 263 000 |
| EGB4050-E40-B | 108 | 40 | 44 | 50 | 1,2±0,4 | 0,1 | 0,7 | 280 000 | 500 000 |
| EGB4550-E40-B | 154 | 45 | 50 | 50 | 1,8±0,6 | 0,2 | 1 | 315 000 | 563 000 |
| EGB5030-E40-B | 101 | 50 | 55 | 30 | 1,8±0,6 | 0,2 | 1 | 210 000 | 375 000 |
| EGB5040-E40-B | 136 | 50 | 55 | 40 | 1,8±0,6 | 0,2 | 1 | 280 000 | 500 000 |
| EGB5060-E40-B | 204 | 50 | 55 | 60 | 1,8±0,6 | 0,2 | 1 | 420 000 | 750 000 |
| EGB5540-E40-B | 149 | 55 | 60 | 40 | 1,8±0,6 | 0,2 | 1 | 308 000 | 550 000 |
| EGB6040-E40-B | 161 | 60 | 65 | 40 | 1,8±0,6 | 0,2 | 1 | 336 000 | 600 000 |
| EGB6050-E40-B | 202 | 60 | 65 | 50 | 1,8±0,6 | 0,2 | 1 | 420 000 | 750 000 |
| EGB6060-E40-B | 243 | 60 | 65 | 60 | 1,8±0,6 | 0,2 | 1 | 504 000 | 900 000 |
| EGB6070-E40-B | 284 | 60 | 65 | 70 | 1,8±0,6 | 0,2 | 1 | 588 000 | 1 050 000 |
| EGB7050-E40-B | 235 | 70 | 75 | 50 | 1,8±0,6 | 0,2 | 1 | 490 000 | 875 000 |
| EGB7070-E40-B | 329 | 70 | 75 | 70 | 1,8±0,6 | 0,2 | 1 | 686 000 | 1 230 000 |
| EGB8060-E40-B | 321 | 80 | 85 | 60 | 1,8±0,6 | 0,2 | 1 | 672 000 | 1 200 000 |
| EGB80100-E40-B | 537 | 80 | 85 | 100 | 1,8±0,6 | 0,2 | 1 | 1 120 000 | 2 000 000 |
| EGB9060-E40-B | 360 | 90 | 95 | 60 | 1,8±0,6 | 0,2 | 1 | 756 000 | 1 350 000 |
| EGB90100-E40-B | 602 | 90 | 95 | 100 | 1,8±0,6 | 0,2 | 1 | 1 260 000 | 2 250 000 |
| EGB9560-E40-B | 379 | 95 | 100 | 60 | 1,8±0,6 | 0,2 | 1 | 798 000 | 1 430 000 |
| EGB10060-E40-B | 399 | 100 | 105 | 60 | 1,8±0,6 | 0,2 | 1 | 840 000 | 1 500 000 |
| EGB100115-E40-B | 767 | 100 | 105 | 115 | 1,8±0,6 | 0,2 | 1 | 1 610 000 | 2 880 000 |

Recommended mounting tolerances: see Catalogue HG 1, Plain Bearings.

Flanged bushes

Maintenance-free
ISO 3547
With bronze backing



EGF
① Butt joint

Dimension table · Dimensions in mm

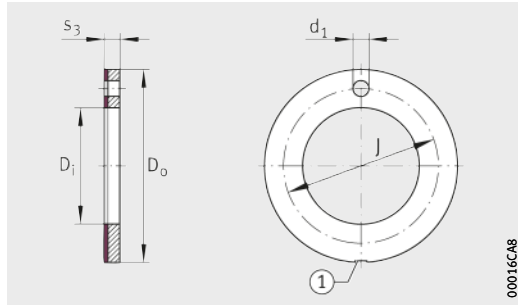
| Designation | Mass m ≈g | Dimensions | | | | | | | | | Basic load ratings | | | |
|----------------|-----------------|------------|----|-------------|------------|----------------------|-----------|---------|------|------|--------------------|-------------------|-----------------|-------------------|
| | | Di | Do | Dfl ±0,5 | B ±0,25 | sfl +0,05 -0,2 | R max. | f | Fi | | dyn. Cr N | stat. C0r N | axial | |
| | | | | | | | | | min. | max. | | | dyn. Ca N | stat. C0a N |
| EGF06080-E40-B | 1,7 | 6 | 8 | 12 | 8 | 1 | 1 | 0,6±0,4 | 0,1 | 0,6 | 5 040 | 9 000 | 4 840 | 8 640 |
| EGF08055-E40-B | 1,8 | 8 | 10 | 15 | 5,5 | 1 | 1 | 0,6±0,4 | 0,1 | 0,6 | 3 920 | 7 000 | 8 910 | 15 900 |
| EGF08095-E40-B | 2,7 | 8 | 10 | 15 | 9,5 | 1 | 1 | 0,6±0,4 | 0,1 | 0,6 | 8 400 | 15 000 | 8 910 | 15 900 |
| EGF10070-E40-B | 2,8 | 10 | 12 | 18 | 7 | 1 | 1 | 0,6±0,4 | 0,1 | 0,6 | 7 000 | 12 500 | 14 100 | 25 100 |
| EGF10120-E40-B | 4,1 | 10 | 12 | 18 | 12 | 1 | 1 | 0,6±0,4 | 0,1 | 0,6 | 14 000 | 25 000 | 14 100 | 25 100 |
| EGF10170-E40-B | 5,5 | 10 | 12 | 18 | 17 | 1 | 1 | 0,6±0,4 | 0,1 | 0,6 | 21 000 | 37 500 | 14 100 | 25 100 |
| EGF12070-E40-B | 3,2 | 12 | 14 | 20 | 7 | 1 | 1 | 0,6±0,4 | 0,1 | 0,6 | 8 400 | 15 000 | 15 800 | 28 300 |
| EGF12090-E40-B | 3,9 | 12 | 14 | 20 | 9 | 1 | 1 | 0,6±0,4 | 0,1 | 0,6 | 11 800 | 21 000 | 15 800 | 28 300 |
| EGF12120-E40-B | 4,8 | 12 | 14 | 20 | 12 | 1 | 1 | 0,6±0,4 | 0,1 | 0,6 | 16 800 | 30 000 | 15 800 | 28 300 |
| EGF15120-E40-B | 5,9 | 15 | 17 | 23 | 12 | 1 | 1 | 0,6±0,4 | 0,1 | 0,6 | 21 000 | 37 500 | 18 500 | 33 000 |
| EGF15170-E40-B | 7,8 | 15 | 17 | 23 | 17 | 1 | 1 | 0,6±0,4 | 0,1 | 0,6 | 31 500 | 56 300 | 18 500 | 33 000 |
| EGF16120-E40-B | 6,2 | 16 | 18 | 24 | 12 | 1 | 1 | 0,6±0,4 | 0,1 | 0,6 | 22 400 | 40 000 | 19 400 | 34 600 |
| EGF18100-E40-B | 6 | 18 | 20 | 26 | 10 | 1 | 1 | 0,6±0,4 | 0,1 | 0,6 | 20 200 | 36 000 | 21 100 | 37 700 |
| EGF18220-E40-B | 11,6 | 18 | 20 | 26 | 22 | 1 | 1 | 0,6±0,4 | 0,1 | 0,6 | 50 400 | 90 000 | 21 100 | 37 700 |
| EGF20115-E40-B | 12,1 | 20 | 23 | 30 | 11,5 | 1,5 | 1,5 | 0,6±0,4 | 0,1 | 0,7 | 23 800 | 42 500 | 24 600 | 44 000 |
| EGF20165-E40-B | 16,2 | 20 | 23 | 30 | 16,5 | 1,5 | 1,5 | 0,6±0,4 | 0,1 | 0,7 | 37 800 | 67 500 | 24 600 | 44 000 |
| EGF25215-E40-B | 24,9 | 25 | 28 | 35 | 21,5 | 1,5 | 1,5 | 0,6±0,4 | 0,1 | 0,7 | 64 800 | 115 600 | 29 000 | 51 800 |
| EGF30160-E40-B | 32 | 30 | 34 | 42 | 16 | 2 | 2 | 1,2±0,4 | 0,1 | 0,7 | 50 400 | 90 000 | 35 200 | 62 800 |
| EGF30260-E40-B | 48,6 | 30 | 34 | 42 | 26 | 2 | 2 | 1,2±0,4 | 0,1 | 0,7 | 92 400 | 165 000 | 35 200 | 62 800 |
| EGF35260-E40-B | 56 | 35 | 39 | 47 | 26 | 2 | 2 | 1,2±0,4 | 0,1 | 0,7 | 108 000 | 193 000 | 39 600 | 70 700 |
| EGF40260-E40-B | 64,8 | 40 | 44 | 53 | 26 | 2 | 2 | 1,2±0,4 | 0,1 | 0,7 | 123 000 | 220 000 | 55 500 | 99 200 |

Recommended mounting tolerances: see Catalogue HG 1, Plain Bearings.

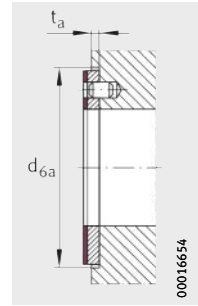


Thrust washers

Maintenance-free
 Material in accordance
 with ISO 3547-4
 With bronze backing



EGW
 ① Cutout¹⁾



Mounting
 dimensions

Dimension table - Dimensions in mm

| Designation | Mass m ≈g | Dimensions | | | | | Mounting dimensions | | Basic load ratings | |
|---------------------------------|-----------------|------------|-------|-------|-------|--------------|------------------------|-------|--------------------|--------------|
| | | Di | Do | s3 | J | d1 | ta | d6a | dyn. Ca | stat. C0a |
| | | +0,25 | -0,25 | -0,05 | ±0,12 | +0,4 +0,1 | ±0,2 | +0,12 | N | N |
| EGW10-E40-B²⁾ | 2,8 | 10 | 20 | 1,5 | — | — | 1 | 20 | 33 000 | 58 900 |
| EGW12-E40-B | 4,1 | 12 | 24 | 1,5 | 18 | 1,5 | 1 | 24 | 47 500 | 84 800 |
| EGW14-E40-B | 4,5 | 14 | 26 | 1,5 | 20 | 2 | 1 | 26 | 52 800 | 94 200 |
| EGW16-E40-B | 6,1 | 16 | 30 | 1,5 | 22 | 2 | 1 | 30 | 70 800 | 126 000 |
| EGW18-E40-B | 6,6 | 18 | 32 | 1,5 | 25 | 2 | 1 | 32 | 77 000 | 137 000 |
| EGW20-E40-B | 8,4 | 20 | 36 | 1,5 | 28 | 3 | 1 | 36 | 98 500 | 176 000 |
| EGW22-E40-B | 9,1 | 22 | 38 | 1,5 | 30 | 3 | 1 | 38 | 106 000 | 188 000 |
| EGW26-E40-B | 11,9 | 26 | 44 | 1,5 | 35 | 3 | 1 | 44 | 139 000 | 247 000 |
| EGW28-E40-B | 14,4 | 28 | 48 | 1,5 | 38 | 4 | 1 | 48 | 167 000 | 298 000 |
| EGW32-E40-B | 17,9 | 32 | 54 | 1,5 | 43 | 4 | 1 | 54 | 208 000 | 371 000 |
| EGW38-E40-B | 22,8 | 38 | 62 | 1,5 | 50 | 4 | 1 | 62 | 264 000 | 471 000 |
| EGW42-E40-B | 24,7 | 42 | 66 | 1,5 | 54 | 4 | 1 | 66 | 285 000 | 509 000 |
| EGW48-E40-B | 41 | 48 | 74 | 2 | 61 | 4 | 1,5 | 74 | 349 000 | 623 000 |
| EGW52-E40-B | 43,7 | 52 | 78 | 2 | 65 | 4 | 1,5 | 78 | 372 000 | 664 000 |
| EGW62-E40-B | 55,1 | 62 | 90 | 2 | 76 | 4 | 1,5 | 90 | 468 000 | 836 000 |

Thrust washers in special sizes available by agreement.

- 1) Cutouts permissible on the inside or outside diameter in any quantity and position.
- 2) No fixing hole.



Maintenance-free ELGES corrosion-resistant rod ends



Maintenance-free ELGES corrosion-resistant rod ends

| | Page |
|-------------------------------------|---|
| Product overview | Maintenance-free ELGES corrosion-resistant rod ends 127 |
| Features | Corrosion resistance 128 |
| | Applications 128 |
| Design and safety guidelines | Dimensioning 129 |
| | Basic static load rating..... 130 |
| | Basic dynamic load rating 130 |
| Accuracy | 131 |
| Dimension tables | Corrosion-resistant rod ends, with internal thread, maintenance-free, DIN ISO 12240-4, dimension series K, type F, corrosion-resistant, open design..... 132 |
| | Corrosion-resistant rod ends, with external thread, maintenance-free, DIN ISO 12240-4, dimension series K, type M, corrosion-resistant, open design..... 134 |

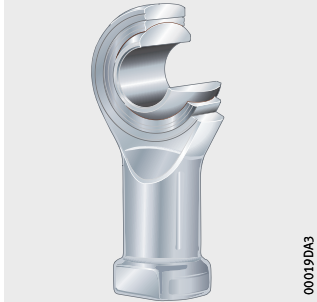
Product overview

Maintenance-free ELGES corrosion-resistant rod ends

Corrosion-resistant rod ends

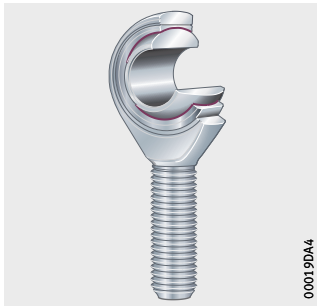
Sliding contact surface
corrosion-resistant steel/PTFE film
With right or left hand thread
Open design
With internal thread

GIKSR..-PS, GIKPSR..-PS,
GIKSL..-PS



With external thread

GAKSR..-PS, GAKSL..-PS



Maintenance-free ELGES corrosion-resistant rod ends

Features

Maintenance-free ELGES rod ends made from high-grade steel comprise a housing with integral shank and a maintenance-free spherical plain bearing, *Figure 1*. The housing and shank has a thread to DIN 13 and the diameter range extends from 5 mm to 30 mm. The bore tolerance of the spherical plain bearings is H7.

The rod ends conform to DIN ISO 12 240-4, dimension series K and have a radial spherical plain bearing GE..-PS and a right or left hand internal or external thread. The sliding contact surface comprises corrosion-resistant steel and corrosion-resistant PTFE film attached to the curved outer ring surface. Due to this sliding contact pair, they are completely maintenance-free.

All rod ends with an internal thread are also available with CETOP mounting dimensions in accordance with ISO 8139 for pneumatic cylinders.



Figure 1
Rod ends, corrosion-resistant,
dimension series K

Corrosion resistance

Corrosion-resistant rod ends have an inner ring made from a corrosion-resistant steel such as X105CrMo17. The outer ring and the housing are made from X8CrNiS18-9. Alternative materials are permissible.

Applications

These materials have corrosion resistance corresponding to market requirements in many media.

The preferred areas of application include machinery for the food and drink industry, butchery machines, the chemical industry and medical equipment. The products have also proven effective in aircraft and ship building as well as for applications in buses and rail vehicles.

Rod ends with CETOP mounting dimensions are often used in control and automation engineering.

Temperature range

The rod ends can be used without restriction in the temperature range from $-10\text{ }^{\circ}\text{C}$ to $+80\text{ }^{\circ}\text{C}$. At operating temperatures above $+80\text{ }^{\circ}\text{C}$, the load carrying capacity and thus the operating life of the bearings is reduced.

Design and safety guidelines

The essential guidelines on the subjects of friction, rating life and the adjacent construction are brought together in the chapter Technical principles in Catalogue HG 1, Plain Bearings, Technical principles.

Dimensioning

In the case of rod ends, the permissible static load of the housing and shank must always be checked. In calculation of the rating life of the rod end, the decisive factor is the rating life of the spherical plain bearing fitted in the housing, see Catalogue HG 1, Plain Bearings.

The direction of load and the type of load determine the design of the rod end and the sliding contact surface of the spherical plain bearing.

Permissible loading of rod ends

The permissible load depends on the type of load.

Pulsating or alternating loads subject the material of the rod ends to greater stress than constant loads. For calculation, these operating conditions must be taken into consideration by means of the load factor f_b , see table, page 130.



The maximum equivalent bearing load P must not exceed the permissible load on the rod end P_{per} , see equation.

Loading of rod end

The following applies:

$$P_{per} \geq P$$

The permissible load on the rod end P_{per} is calculated as follows:


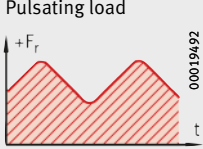
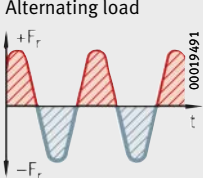
$$P_{per} = \frac{C_{0r}}{f_b}$$

| | |
|---|---|
| P | N |
| Maximum equivalent bearing load | |
| P_{per} | N |
| Permissible load on the rod end | |
| C_{0r} | N |
| Basic static load rating of the rod end | |
| f_b | - |
| Load factor, see table, page 130. | |



Maintenance-free ELGES corrosion-resistant rod ends

Load factors

| Type of load | Series | Load factor f_b |
|---|--|----------------------|
| Unilateral load  | All series | 1 |
| Pulsating load  | GIKSR...-PS GIKPSR...-PS GAKSR...-PS | 2,25 2,25 3 |
| Alternating load  | | |

Basic static load rating

In this case, the basic static load rating C_{0r} indicates the load carrying capacity of the housing and shank under static tensile load, see dimension table. At room temperature, it includes a safety factor of at least 1,2 in relation to the yield strength of the material used for the housing and shank. The basic load rating describes the maximum permissible static tensile load when utilising 83% of the material yield strength at the most highly stressed cross-section.



The basic static load rating C_{0r} of the rod end refers only to the load carrying capacity of the rod end housing, see dimension table. It is based on tensile and compressive loads acting across or in the direction of the rod end shank.

If the basic static load rating C_{0r} is used to the full, the shaft and housing must be made from high-strength materials.

Basic dynamic load rating

The basic dynamic load rating C_r refers to the spherical plain bearing fitted and is a parameter for calculating the bearing rating life, see dimension table.

It is dependent on the sliding contact surface and has a significant influence on the rating life of the rod ends.



The equivalent bearing load and additional bending stresses in the shank area must be taken into consideration if, in addition to radial load in a tensile or compressive direction, other transverse forces act in an axial direction to the shank.

Accuracy

The accuracy of metric ISO threads conforms to DIN 13.
Tolerances for the mounting bore should be selected according to the table.

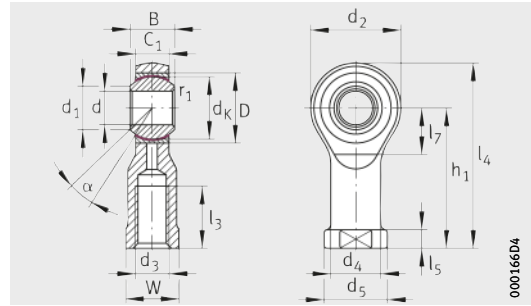
Shaft tolerance

| Radial spherical plain bearing | Shaft tolerance (recommended) |
|--------------------------------|-------------------------------|
| GE..-PS | m6 |



Corrosion-resistant rod ends

With internal thread, maintenance-free
 DIN ISO 12240-4, dimension series K, type F
 Corrosion-resistant
 Open design



GIKSR...-PS, GIKPSR...-PS
 PTFE film

Dimension table - Dimensions in mm

| Designation ¹⁾²⁾ | Mass m ≈kg | Dimensions | | | | | | | | |
|-----------------------------|------------------|----------------------------|------------------|---------------------|----------------|----------------|------------------------|----------------|----------------|----------------|
| | | d H7 | D | B | d _K | d ₁ | d ₂ max. | d ₃ | d ₄ | h ₁ |
| GIKSR5-PS | 0,017 | 5^{+0,012} | 13 | 8 _{-0,12} | 11,1 | 7,7 | 19 | M5 | 9 | 27 |
| GIKPSR5-PS | | | | | | | | M4 | | |
| GIKSR6-PS | 0,025 | 6^{+0,012} | 16 | 9 _{-0,12} | 12,7 | 9 | 21 | M6 | 10 | 30 |
| GIKSR8-PS | 0,043 | 8^{+0,015} | 19 | 12 _{-0,12} | 15,8 | 10,4 | 25 | M8 | 12,5 | 36 |
| GIKSR10-PS | 0,072 | 10^{+0,015} | 22 | 14 _{-0,12} | 19 | 12,9 | 29 | M10 | 15 | 43 |
| GIKPSR10-PS | | | | | | | | M10×1,25 | | |
| GIKSR12-PS | 0,11 | 12^{+0,018} | 26 | 16 _{-0,12} | 22,2 | 15,4 | 33 | M12 | 17,5 | 50 |
| GIKPSR12-PS | | | | | | | | M12×1,25 | | |
| GIKSR14-PS | 0,16 | 14^{+0,018} | 28 ⁵⁾ | 19 _{-0,12} | 25,4 | 16,8 | 37 | M14 | 20 | 57 |
| GIKSR16-PS | 0,21 | 16^{+0,018} | 32 | 21 _{-0,12} | 28,5 | 19,4 | 43 | M16 | 22 | 64 |
| GIKPSR16-PS | | | | | | | | M16×1,5 | | |
| GIKSR18-PS | 0,3 | 18^{+0,018} | 35 | 23 _{-0,12} | 31,7 | 21,9 | 47 | M18×1,5 | 25 | 71 |
| GIKSR20-PS | 0,38 | 20^{+0,021} | 40 | 25 _{-0,12} | 34,9 | 24,4 | 51 | M20×1,5 | 27,5 | 77 |
| GIKSR22-PS | 0,49 | 22^{+0,021} | 42 | 28 _{-0,12} | 38,1 | 25,8 | 55 | M22×1,5 | 30 | 84 |
| GIKSR25-PS | 0,65 | 25^{+0,021} | 47 | 31 _{-0,12} | 42,8 | 29,6 | 61 | M24×2 | 33,5 | 94 |
| GIKSR30-PS | 1,15 | 30^{+0,021} | 55 | 37 _{-0,12} | 50,8 | 34,8 | 71 | M30×2 | 40 | 110 |
| GIKPSR30-PS | | | | | | | | M27×2 | | |

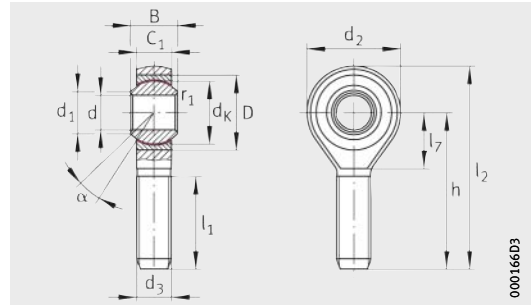
- 1) For a left hand thread, the R in the designation is replaced by an L, for example GIKSL5-PS.
- 2) Series GIKPSR...-PS has a fine pitch thread connector for standard pneumatic cylinders to DIN 24335 (right hand thread only).
- 3) The values for the tilt angle α are subject to tolerances.
- 4) Basic load rating of housing.
- 5) This differs from DIN ISO 12240-4, dimension series K.

| C ₁ | α ³⁾ ° | l ₃ min. | l ₄ | l ₅ ≈ | l ₇ min. | d ₅ | W | Chamfer dimension r ₁ min. | Basic load ratings | | Radial internal clearance ⁵⁾ |
|----------------|----------------------|------------------------|----------------|---------------------|------------------------|----------------|----|--|-----------------------------|---|--|
| | | | | | | | | | dyn. C _r N | stat. C _{0r} ⁴⁾ N | |
| 6 | 13 | 8 | 36,5 | 4 | 9 | 11 | 9 | 0,3 | 6 000 | 3 800 | 0,003 – 0,035 |
| 6,75 | 13 | 9 | 40,5 | 5 | 10 | 13 | 11 | 0,3 | 7 650 | 3 400 | 0,003 – 0,035 |
| 9 | 13 | 12 | 48,5 | 5 | 12 | 16 | 14 | 0,3 | 12 900 | 5 700 | 0,005 – 0,040 |
| 10,5 | 13 | 15 | 57,5 | 6,5 | 14 | 19 | 17 | 0,3 | 18 000 | 8 000 | 0,005 – 0,040 |
| 12 | 13 | 18 | 66,5 | 6,5 | 16 | 22 | 19 | 0,3 | 24 000 | 9 100 | 0,005 – 0,045 |
| 13,5 | 15 | 21 | 75,5 | 8 | 18 | 25 | 22 | 0,3 | 31 000 | 13 700 | 0,005 – 0,045 |
| 15 | 15 | 24 | 85,5 | 8 | 21 | 27 | 22 | 0,3 | 39 000 | 19 000 | 0,005 – 0,045 |
| 16,5 | 15 | 27 | 94,5 | 10 | 23 | 31 | 27 | 0,3 | 47 500 | 23 000 | 0,005 – 0,045 |
| 18 | 15 | 30 | 102,5 | 10 | 25 | 34 | 30 | 0,3 | 57 000 | 22 800 | 0,010 – 0,055 |
| 20 | 15 | 33 | 111,5 | 12 | 27 | 37 | 32 | 0,3 | 68 000 | 30 400 | 0,010 – 0,055 |
| 22 | 15 | 36 | 124,5 | 12 | 30 | 42 | 36 | 0,3 | 85 000 | 36 200 | 0,010 – 0,055 |
| 25 | 15 | 45 | 145,5 | 15 | 35 | 50 | 41 | 0,3 | 114 000 | 47 500 | 0,010 – 0,055 |



Corrosion-resistant rod ends

With external thread, maintenance-free
 DIN ISO 12240-4, dimension series K, type M
 Corrosion-resistant
 Open design



GAKSR..-PS
 PTFE film

Dimension table - Dimensions in mm

| Designation ¹⁾ | Mass m ≈kg | Dimensions | | | | | | | |
|---------------------------|------------------|----------------------------|------------------|---------------------|------|------|------------|---------|-----|
| | | d H7 | D | B | dk | d1 | d2 max. | d3 | h |
| GAKSR5-PS | 0,01 | 5^{+0,012} | 13 | 8 _{-0,12} | 11,1 | 7,7 | 19 | M5 | 33 |
| GAKSR6-PS | 0,02 | 6^{+0,012} | 16 | 9 _{-0,12} | 12,7 | 9 | 21 | M6 | 36 |
| GAKSR8-PS | 0,03 | 8^{+0,015} | 19 | 12 _{-0,12} | 15,8 | 10,4 | 25 | M8 | 42 |
| GAKSR10-PS | 0,05 | 10^{+0,015} | 22 | 14 _{-0,12} | 19 | 12,9 | 29 | M10 | 48 |
| GAKSR12-PS | 0,09 | 12^{+0,018} | 26 | 16 _{-0,12} | 22,2 | 15,4 | 33 | M12 | 54 |
| GAKSR14-PS | 0,13 | 14^{+0,018} | 28 ⁴⁾ | 19 _{-0,12} | 25,4 | 16,9 | 37 | M14 | 60 |
| GAKSR16-PS | 0,19 | 16^{+0,018} | 32 | 21 _{-0,12} | 28,5 | 19,4 | 43 | M16 | 66 |
| GAKSR18-PS | 0,26 | 18^{+0,018} | 35 | 23 _{-0,12} | 31,7 | 21,9 | 47 | M18×1,5 | 72 |
| GAKSR20-PS | 0,34 | 20^{+0,021} | 40 | 25 _{-0,12} | 34,9 | 24,4 | 51 | M20×1,5 | 78 |
| GAKSR22-PS | 0,44 | 22^{+0,021} | 42 | 28 _{-0,12} | 38,1 | 25,8 | 55 | M22×1,5 | 84 |
| GAKSR25-PS | 0,59 | 25^{+0,021} | 47 | 31 _{-0,12} | 42,8 | 29,6 | 61 | M24×2 | 94 |
| GAKSR30-PS | 1,06 | 30^{+0,021} | 55 | 37 _{-0,12} | 50,8 | 34,8 | 71 | M30×2 | 110 |

1) For a left hand thread, the R in the designation is replaced by an L, for example GAKSL5-PS.

2) The values for the tilt angle α are subject to tolerances.

3) Basic load rating of housing.

4) This differs from DIN ISO 12240-4, dimension series K.

| | | | | | Chamfer dimension r ₁ min. | Basic load ratings | | Radial internal clearance ⁴⁾ |
|----------------|----------------------|----------------|----------------|----------------|---|-----------------------------|---|---|
| C ₁ | α ²⁾ ° | l ₁ | l ₂ | l ₇ | | dyn. C _r N | stat. C _{0r} ³⁾ N | |
| 6 | 13 | 19 | 42,5 | 9 | 0,3 | 6 000 | 1 800 | 0,003 – 0,035 |
| 6,75 | 13 | 21 | 46,5 | 10 | 0,3 | 7 650 | 2 500 | 0,003 – 0,035 |
| 9 | 13 | 25 | 54,5 | 12 | 0,3 | 12 900 | 4 600 | 0,005 – 0,040 |
| 10,5 | 13 | 28 | 62,5 | 14 | 0,3 | 18 000 | 7 300 | 0,005 – 0,040 |
| 12 | 13 | 32 | 70,5 | 16 | 0,3 | 24 000 | 9 100 | 0,005 – 0,045 |
| 13,5 | 15 | 36 | 78,5 | 18 | 0,3 | 31 000 | 13 700 | 0,005 – 0,045 |
| 15 | 15 | 37 | 87,5 | 21 | 0,3 | 39 000 | 19 000 | 0,005 – 0,045 |
| 16,5 | 15 | 41 | 95,5 | 23 | 0,3 | 47 500 | 23 000 | 0,005 – 0,045 |
| 18 | 15 | 45 | 104 | 25 | 0,3 | 57 000 | 22 800 | 0,010 – 0,055 |
| 20 | 15 | 48 | 112 | 27 | 0,3 | 68 000 | 30 400 | 0,010 – 0,055 |
| 22 | 15 | 55 | 125 | 30 | 0,3 | 85 000 | 36 200 | 0,010 – 0,055 |
| 25 | 15 | 66 | 146 | 35 | 0,3 | 114 000 | 47 500 | 0,010 – 0,055 |



Notes



**Schaeffler Technologies
GmbH & Co. KG**

Industriestraße 1 – 3
91074 Herzogenaurach
Germany
Internet www.ina.com
E-mail info.de@schaeffler.com

In Germany:

Phone 0180 5003872
Fax 0180 5003873

From other countries:

Phone +49 9132 82-0
Fax +49 9132 82-4950



**Schaeffler Technologies
GmbH & Co. KG**

Georg-Schäfer-Straße 30
97421 Schweinfurt
Germany
Internet www.fag.com
E-mail faginfo@schaeffler.com

In Germany:

Phone 0180 5003872
Fax 0180 5003873

From other countries:

Phone +49 9721 91-0
Fax +49 9721 91-3435



Every care has been taken to ensure the correctness of the information contained in this publication but no liability can be accepted for any errors or omissions. We reserve the right to make technical changes.

Schaeffler Technologies GmbH & Co. KG
Issued: 2014, November

This publication or parts thereof may not be reproduced without our permission.