



Schaeffler Aerospace Standard Products

We pioneer motion

Foreword

Schaeffler Aerospace

We are committed to joint development partnerships with technology leaders in the aviation and aerospace industry. The products of Schaeffler Aerospace meet the highest quality standards according to AS9100. Our customers are world renowned manufacturers of airplanes, landing gears, passenger seats, cargo solutions, actuation systems, and other equipment parts.

Our products are used in a wide range of applications in the aerospace industry. Our worldwide customer base, which includes all the renowned manufacturers of aircraft engines, helicopters, turbo-pumps, space systems, and parts of the medical technology sector, not only appreciates the quality of the products we manufacture, but it also respects our innovative solutions for new developments. We are a system supplier of highly reliable special bearing supports, both in terms of the materials used and the design. In addition to the development of special bearings, Schaeffler Aerospace offers complex and highly integrated bearing systems and electromechanical units including the relevant sensor systems.

Your benefits:

- Highest Aerospace quality standards
- Cost savings by using standard production
- Short delivery times
- Wide product range
- Customized products
- High delivery performance
- More than 50 years of Aerospace expertise
- Direct communication with customer service

Certifications

Schaeffler Aerospace is certified from the following civil aviation authorities:

- AS9100
- EASA
- FAA
- CAAC
- TCCA
- Nadcap

Foreword

Standard Products Schaeffler Aerospace Standard Products are manufactured in Schaeffler Industrial plants and used in aviation applications. These parts are classified in categories (CAT 0 to CAT 4) according to their possible hazard potential in a case of impaired function or failure. The risk categories of the following Commodity Products are CAT 0 - CAT 2.

- CAT 0
 - Parts in subordinate functions that do not compromise the success of the flight or mission
- CAT 1 Parts, the failure of which is unlikely to cause:
 - Termination of the flight or
 - Failure of the device (slight impairment of function, ancillary drive outputs, accessory equipment)
- CAT 2 Parts, the failure of which is likely to cause:
 - Termination of the flight or
 - Failure of the device (significant impairment of function, ancillary drive outputs, accessory equipment)

Spherical plain bearings and rod ends

Spherical plain bearings are ready-to-fit precision machine elements. Due to the outer ring with its concave inner slideway and the inner ring with its curved outer slideway, they can perform spatial adjustment motions. The bearings can support static loads and are suitable for tilt and swivel motion. They can compensate for shaft misalignment, are not subject to edge stresses under misalignment and allow substantial manufacturing tolerances in the adjacent construction.

Rod ends are spherical plain bearing units. They comprise a housing and integral shank, into which a spherical plain bearing is integrated, and have an external or internal thread. Rod ends are used as connecting levers and connecting rods and as connecting elements between cylinders and their adjacent parts in hydraulic and pneumatic cylinders.

Spherical plain bearings and rod ends are available in numerous designs, dimension series and versions. They have high operational security and a long operating life. Maintenance-free versions are available with the sliding layers ELGOGLIDE, PTFE composite and PTFE film. Versions requiring maintenance have steel/steel or steel/bronze sliding contact surfaces and can be easily relubricated.

Plain bushes, thrust washers and strips

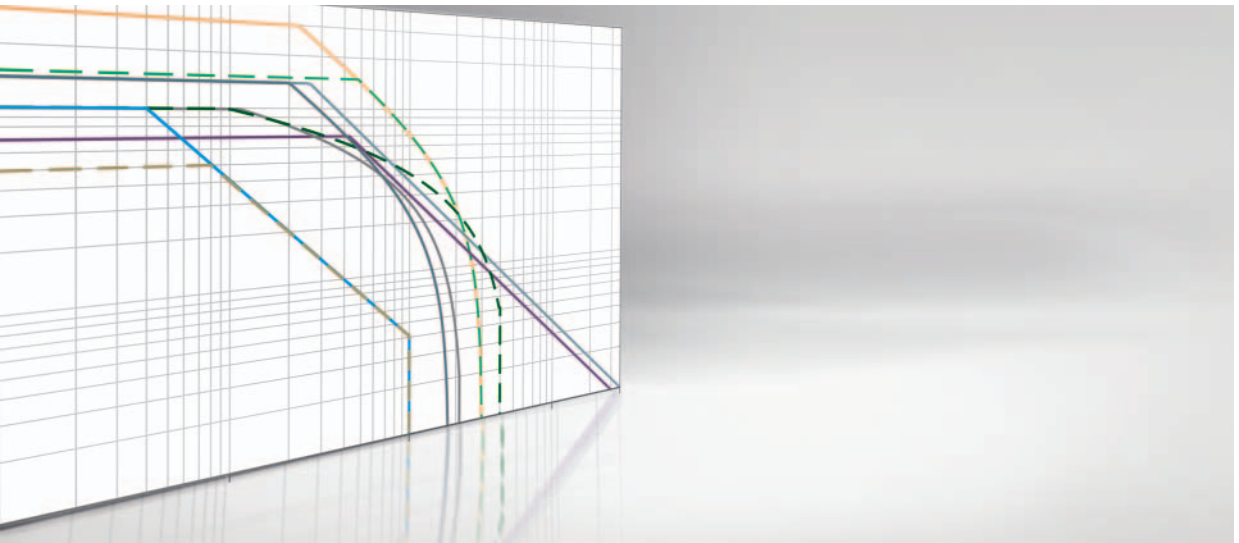
Plain bushes, thrust washers and strips are used not only for rotary and oscillating motion but also for linear motion with short or long stroke lengths. In the case of maintenance-free bearings with the sliding material E40, lubrication is not necessary at any point during the operating life due to the use of PTFE as a dry lubricant. The low-maintenance bearings with the sliding material E50 receive an initial lubrication at the start of operation. Since the sliding layer has lubrication pockets, this initial lubrication is sufficient in most cases.

All metal/polymer composite plain bearings are free from lead in accordance with the End of Life Vehicles Directive, Directive 2000/53/EC as well as the Directive 2011/65/EU (RoHS-II) for the restriction of hazardous substances. They are thus environmentally safe.

In addition to the polymer composite plain bearings with the sliding materials E40 and E50, there are also plain bushes with ELGOGLIDE and ELGOTEX filament wound bushes.

Contents

	Page
Technical principles.....	5
Spherical plain bearings	19
Maintenance-free.....	22
Rod ends.....	51
Maintenance-free.....	54



Technical principles

Selection of the correct plain bearing

Technical principles

	Page
Selection of the correct plain bearing	Areas of application..... 7
	Requirements of the application..... 7
	Selection by bearing type..... 8
	Sizes of bearing types 9
	Selection by material suitability..... 10
	Operating limits of plain bearing materials 11
	Estimation of the sliding distance..... 13
	Predimensioning 14
	Maintenance-free spherical plain bearings 14
	Spherical plain bearings requiring maintenance 16

Selection of the correct plain bearing

Areas of application

Plain bearings from Schaeffler are used under high specific loads and various possible types of motion, from swivel type motion to overlaid motion. They are ideally suited to intermittent operation occurring on a periodic or non-periodic basis.

The plain bearings are bearings for very small radial or axial design envelopes where high load carrying capacity is nevertheless required. They can also be used under vibration coinciding with small amounts of motion. The bearings offer excellent damping characteristics especially under static loading, such as those required under shock loads.

Many of the plain bearings are destined for maintenance-free applications and in cases where long rating values are required.

Requirements of the application

Plain bearings from Schaeffler are available in various bearing types, designs and sizes as well as with different plain bearing materials.

Selection of the suitable bearing is dependent principally on the requirements of the application. These include:

- load conditions
 - type of load
 - direction of load
 - magnitude of load
- motion conditions
 - type of motion
 - direction of motion
 - frequency of motion
- adjacent construction
 - available design envelope
 - shaft, housing
- rating life requirement
- environmental influences
 - temperature
 - influence of media
 - contamination
 - lubrication.

Selection of the correct plain bearing

Selection by bearing type

Depending on the type of plain bearing and the typical geometrical structure in the particular case, there are different possibilities for support of load and degrees of freedom of motion. Some bearing types facilitate additional functions such as the compensation of angular misalignment, see table.

Selection of the suitable spherical plain bearing for combined load is dependent on the ratio between the radial and axial force. Further information see HG 1, Plain Bearings.

Support of load and degrees of freedom of motion

Bearing type	Load			Motion			Compensation of angular misalignments	
Bush								
	■	-	-	■	-	■	-	-
Flanged bush								
	■	■	-	■	-	-	-	-
Thrust washer								
	-	■	-	■	-	-	-	-
Radial spherical plain bearing, rod end								
	■	■	■	■	■	-	■	-
Angular contact spherical plain bearing								
	■	■	-	■	■	-	■	-
Axial spherical plain bearing								
	■	■	-	■	■	-	■	-

Sizes of bearing types

The catalogue range of plain bearings from Schaeffler covers a range of shaft diameters from 3 mm to 1 000 mm, see table. The size required is dependent principally on the adjacent construction and the loads to be supported.

For an initial estimate of the size of spherical plain bearing required, predimensioning can be carried out, see page 14.

Shaft diameters in catalogue range

Bearing type	Shaft diameter	
	min. mm	max. mm
Bushes	3	300
Flanged bushes	6	40
Radial spherical plain bearings	6	320
Large radial spherical plain bearings	220	1 000
Rod ends	5	80
Hydraulic rod ends	10	200
Thrust washers	10	62
Angular contact spherical plain bearings	25	200
Axial spherical plain bearings	10	360

Selection of the correct plain bearing

Selection by material suitability

The various bearing types are available in different material combinations, see table. The suitable material will depend on the required performance capability and the environmental influences.

Based on the specific material combinations, bearing solutions can be achieved that are maintenance-free, low-maintenance or that require maintenance, see table.

Combinations of bearing type and material

Bearing type	Combination with sliding layer, sliding contact surface ¹⁾							
	PTFE film	PTFE composite	Steel/bronze	Steel/steel	ELGOGLIDE	ELGOTEX	E40	E50
Radial spherical plain bearings	■	■	■	■	■	–	–	–
Rod ends	■	■	■	■	■	–	–	–
Angular contact and axial spherical plain bearings	–	–	–	■	■	–	–	–
Thrust washers, strips	–	–	–	–	–	–	■	■
Flanged bushes	–	–	–	–	–	–	■	–
Bushes	–	–	–	–	■	■	■	■

¹⁾ Other combinations are available by agreement.

Type of maintenance of materials

Type of maintenance	Sliding layer Sliding contact surface	Description Page
Maintenance-free	E40 (metal/polymer composite)	► <i>HG 1</i>
	ELGOTEX (filament reinforced wound material)	► <i>HG 1</i>
	ELGOGLIDE (PTFE fabric)	28
	PTFE composite (metal/polymer composite)	29
	PTFE film (PTFE/metal fabric)	29
Low-maintenance	E50 (metal/polymer composite)	► <i>HG 1</i>
Requiring maintenance	Steel/steel	► <i>HG 1</i>
	Steel/bronze	► <i>HG 1</i>

Operating limits of plain bearing materials

The suitability of a plain bearing material can be estimated from the particular operating limits of the specific bearing load, *Figure 1*.

Further operating limits are determined from the comparison of sliding velocity, see table, page 12, the pv diagram, *Figure 2*, page 12, the temperature resistance, *Figure 3*, page 12, and the coefficient of friction.



Schaeffler recommends the use of the sliding layer ELGOGLIDE under dynamic bearing loads in the range from 25 N/mm² to 300 N/mm².

The sliding layer ELGOGLIDE-W11 should be used in preference in the range from 1 N/mm² to 100 N/mm². If the specific load is outside these ranges, the other ELGOGLIDE sliding layer is recommended.

For static loads of more than 180 N/mm², the design of ELGOTEX filament wound bushes must be checked by the Schaeffler engineering service. For loads at or over this range, we alternatively recommend the use of ELGOGLIDE plain bushes.

The actual load carrying capacity of a plain bearing is dependent on the material of the sliding layer and the supporting body as well as on the bearing geometry and the adjacent construction. The data and guidelines in the product chapters must be observed.

p = specific bearing load
(this may differ from the specific load parameter K)
p_{stat.} = static load
p_{dyn.} = dynamic load

- ① ELGOGLIDE
- ② ELGOGLIDE-W11
- ③ PTFE composite
- ④ PTFE film
- ⑤ E40
- ⑥ E50
- ⑦ ELGOTEX
- ⑧ Steel/steel
- ⑨ Steel/bronze

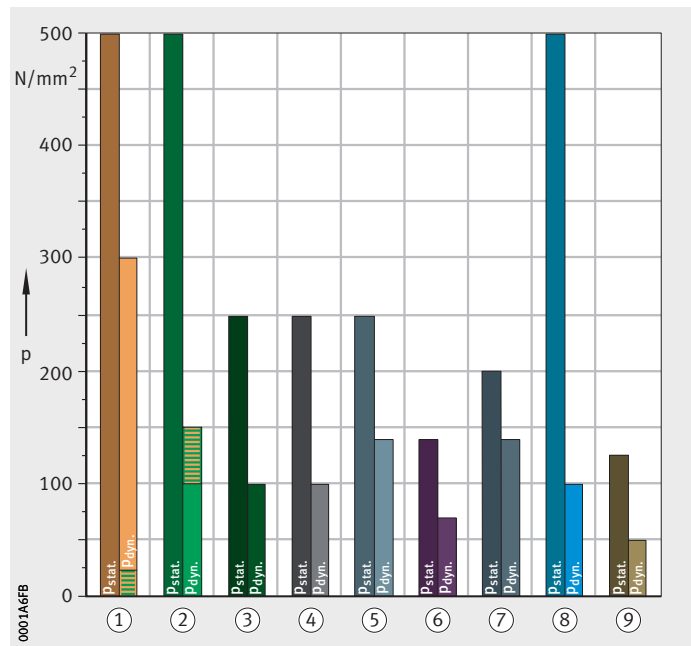


Figure 1
Comparison of specific bearing load

Selection of the correct plain bearing

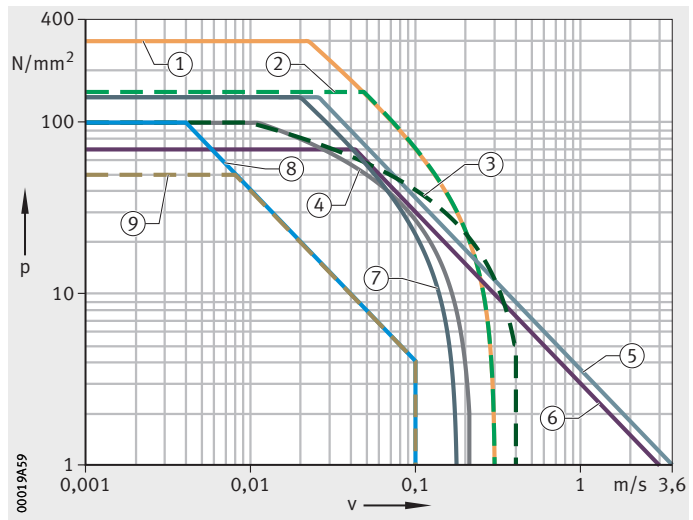
Comparison of sliding velocity

Sliding layer, sliding contact surface	Sliding velocity v m/s
E40	2,5
E50	2,5
ELGOTEX	0,18
ELGOGLIDE-W11	0,3
ELGOGLIDE	
PTFE composite	0,4
PTFE film	0,21
Steel/steel	0,1
Steel/bronze	0,1

p = specific bearing load
 v = sliding velocity

- ① ELGOGLIDE
- ② ELGOGLIDE-W11
- ③ PTFE composite
- ④ PTFE film
- ⑤ E40
- ⑥ E50
- ⑦ ELGOTEX
- ⑧ Steel/steel
- ⑨ Steel/bronze

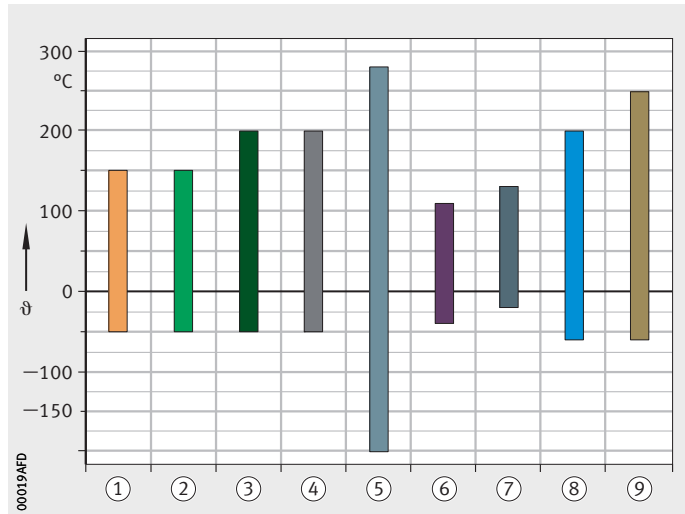
Figure 2
pv diagram



ϑ = temperature

- ① ELGOGLIDE
- ② ELGOGLIDE-W11
- ③ PTFE composite
- ④ PTFE film
- ⑤ E40
- ⑥ E50
- ⑦ ELGOTEX
- ⑧ Steel/steel
- ⑨ Steel/bronze

Figure 3
Comparison
of temperature resistance



Estimation of the sliding distance

If the rating life is the decisive selection criterion, a simple estimate of the achievable sliding distance can be made for maintenance-free and low-maintenance plain bearings. The sliding distance is the distance covered by the mating body along the sliding surface.

The failure mechanism of maintenance-free and low-maintenance plain bearing materials is based on wear. The sliding distance s can therefore be determined from a diagram as a function of the specific load p , *Figure 4*.

In the case of plain bearing materials requiring maintenance, the failure mechanism is based on material fatigue. An estimate of the sliding distance cannot therefore be made in the case of steel/steel and steel/bronze sliding contact surfaces.

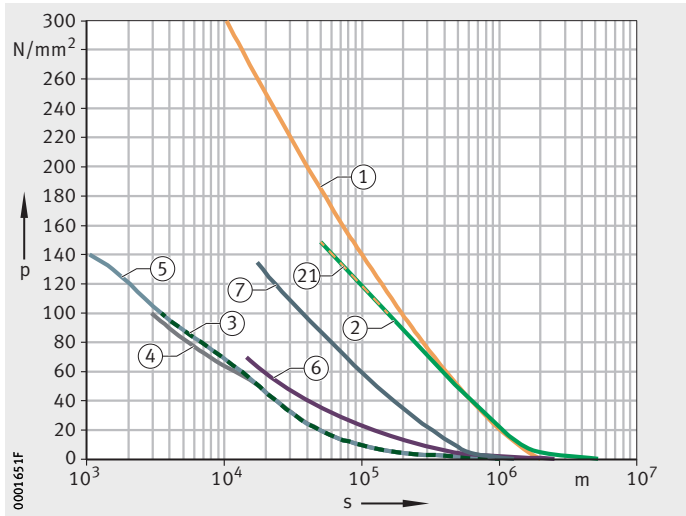


The achievable sliding distance applies if all other factors influencing the rating life are assumed to be ideal.

p = specific load
 s = sliding distance

- ① ELGOGLIDE
- ② ELGOGLIDE-W11
- ③ PTFE composite
- ④ PTFE film
- ⑤ E40
- ⑥ E50
- ⑦ ELGOTEX
- ⑳ ELGOGLIDE is recommended

Figure 4
 Sliding distance s



Selection of the correct plain bearing

Predimensioning

In the case of spherical plain bearings, predimensioning can be carried out in order to estimate the bearing size.

Predimensioning of the bearing size is carried out on the basis of:

- the ratio C/P
 - basic load rating C , see dimension tables
 - bearing load P , see HG 1, Plain Bearings
- the type of load (alternating or unilateral)
- the magnitude of the load
- the bearing series.



The ratio C_r/P or C_a/P is dependent on the series and must not be < 1 .

Predimensioning for spherical plain bearings is not a substitute for more extensive bearing calculation.

For calculation of the rating life L_h in operating hours or oscillations taking account of the operating data applicable to the application, the rating life calculation method is available for almost all products, see HG 1, Plain bearings.

Maintenance-free spherical plain bearings

Guide values for C_r/P or C_a/P are used in conjunction with the diagram for preselection of the bearing size for maintenance-free spherical plain bearings under dynamic load, see table and Figure 5, page 15.

Guide values for the ratio C/P

Series	Dynamic load ¹⁾ C/P				
	Alternating		Unilateral		
	Suitability	from	Suitability	from	to
GE..-UK	○	≥ 2	●	5	1
GE..-UK-2RS GE..-UK-2TS	●	≥ 2			
GE..-DW GE..-DW-2RS2	●	> 2	●	3	1
GE..-FW	○	≥ 2	●	5	1
GE..-FW-2RS GE..-FW-2TS	●	≥ 2			
GE..-PW	○	≥ 2	●	5	1
GE..-SW GE..-AW	●	≥ 2	●	5	1

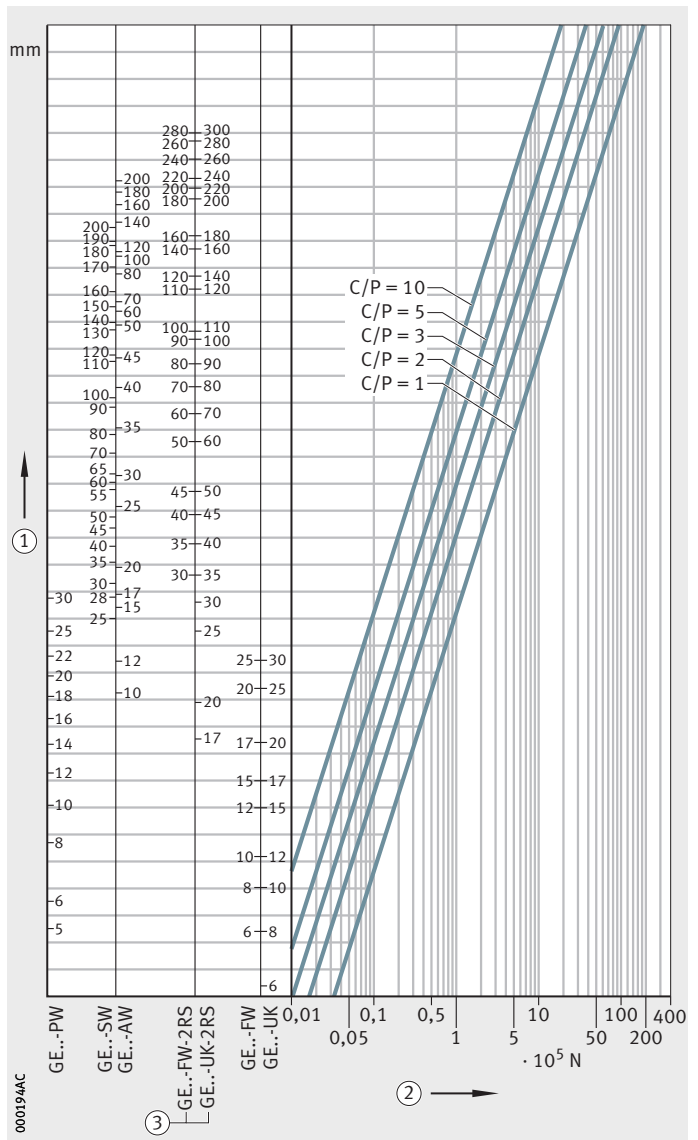
- Suitable subject to restrictions
- Suitable

¹⁾ Dynamic load C_r/P for radial consideration, C_a/P for axial consideration.

- ① Nominal bearing size
- ② Bearing load
- ③ Also valid for 2TS designs

$$C/P = C_r/P \text{ or } C_a/P$$

Figure 5
 Predimensioning
 of maintenance-free
 spherical plain bearings



Selection of the correct plain bearing

Spherical plain bearings requiring maintenance

If the basic dynamic load rating C_r or C_a is utilised to the full, there is often a considerable reduction in the operating life of the bearings. The degree to which the basic load rating is utilised should therefore always be matched to the required operating life.

Guide values for C_r/P or C_a/P are used in conjunction with the diagram for preselection of the bearing size for spherical plain bearings requiring maintenance under dynamic load, see table and Figure 6, page 17.

Guide values for the ratio C/P

Series	Dynamic load ¹⁾ C/P			
	Alternating		Unilateral	
	from	to	from	to
GE..-DO GE..-DO-2RS GE..-DO-2TS GE..-DO-2RS4 GE..-FO GE..-FO-2RS GE..-FO-2TS	3	1	4	1,7
GE..-PB	3	1	4	1
GE..-LO GE..-HO-2RS GE..-ZO	3	1	4	1,7
GE..-SX	3	1,5	4	2
GE..-AX	–	–	4	2

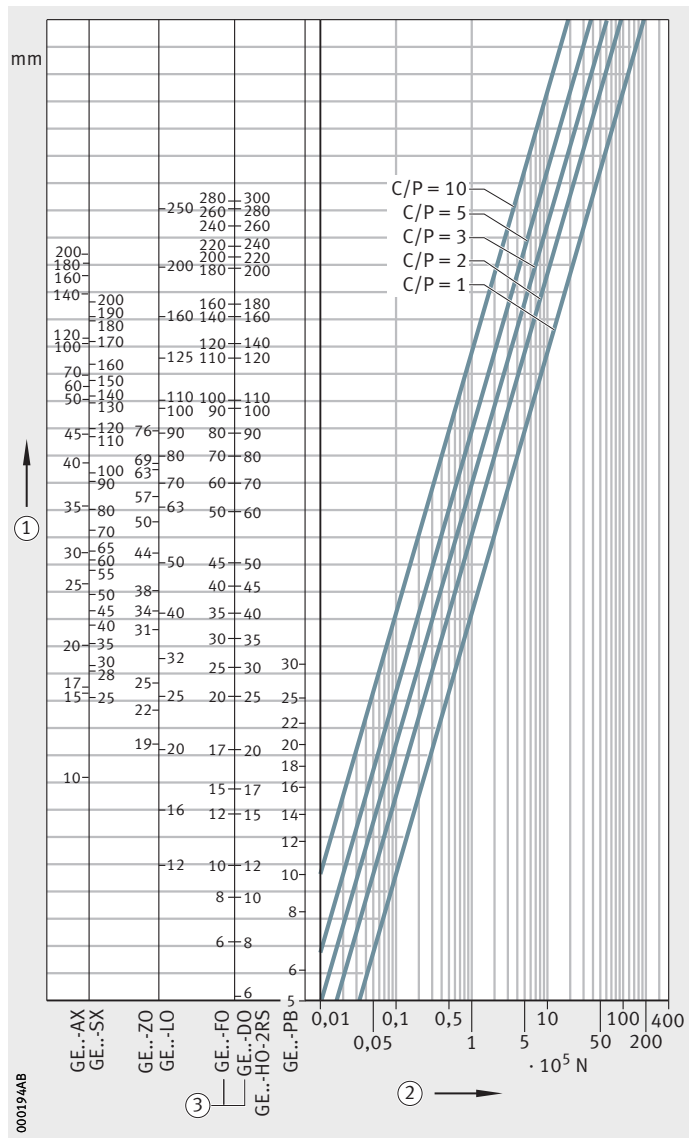
¹⁾ Dynamic load C_r/P for radial consideration, C_a/P for axial consideration.

- ① Nominal bearing size
- ② Bearing load
- ③ Also valid in the case of GE...DO for seal types 2RS, 2TS and 2RS4 and in the case of GE...FO for seal types 2RS and 2TS

$$C/P = C_r/P \text{ or } C_a/P$$

Figure 6
Predimensioning
of spherical plain bearings
requiring maintenance

Further Informations



■ Catalog HG 1, Plain Bearings



Spherical plain bearings

Maintenance-free

Spherical plain bearings

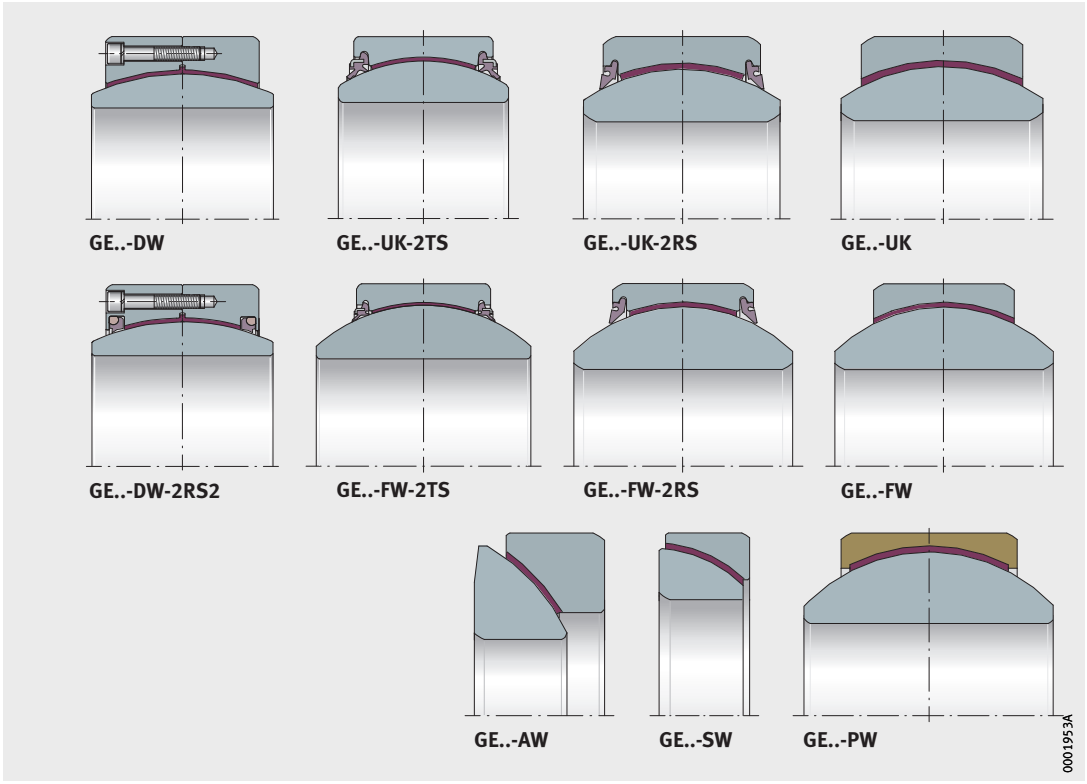
Spherical plain bearings, maintenance-free 22

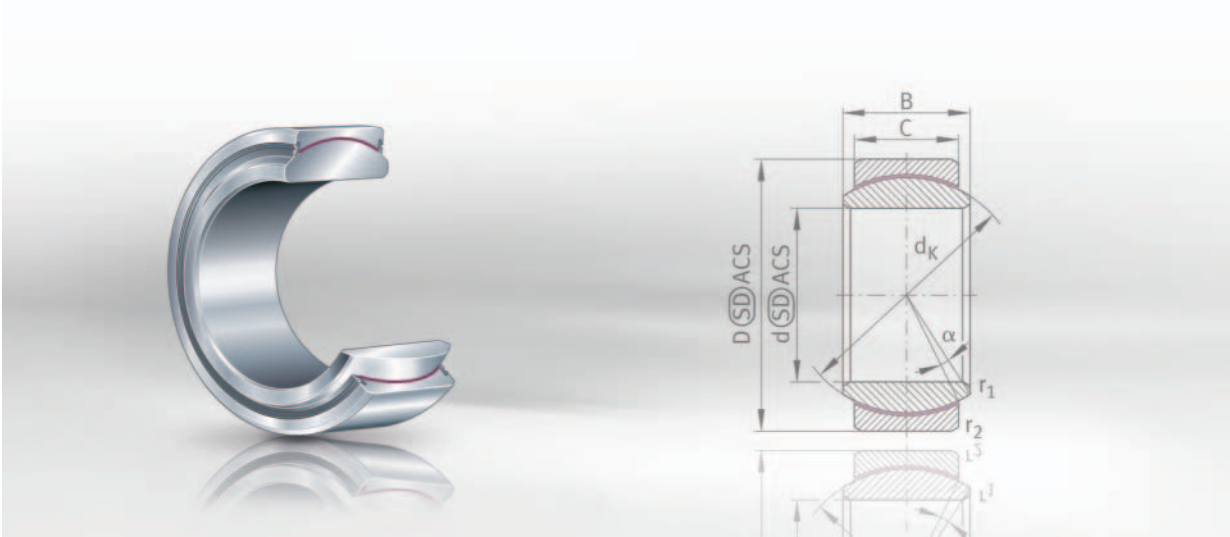
Spherical plain bearings are ready-to-fit, standardised machine elements. Due to the outer ring with its concave inner slideway and the inner ring with its curved outer slideway, they can perform spatial adjustment motions.

The bearings are available as radial and axial spherical plain bearings. They can support static loads, are suitable for tilt and swivel motion, compensate for shaft misalignment, are not subject to edge stresses under misalignment and allow substantial manufacturing tolerances in the adjacent construction.

These spherical plain bearings are completely maintenance-free. They are used where particular requirements for operating life apply in conjunction with maintenance-free operation or where, for reasons of lubrication, bearings with metallic sliding contact surfaces are not suitable, for example under unilateral load.

The standard sliding layer used is ELGOGLIDE.





Spherical plain bearings, maintenance-free

Radial spherical plain bearings

Large radial spherical plain bearings

Angular contact spherical plain bearings

Axial spherical plain bearings

Spherical plain bearings, maintenance-free

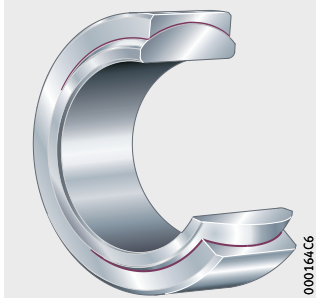
	Page
Product overview	Spherical plain bearings, maintenance-free..... 24
Features	Radial spherical plain bearings 26
	Angular contact spherical plain bearings 27
	Axial spherical plain bearings 27
	Sliding layers..... 28
	Bearing materials..... 30
	Sealing..... 33
	Lubrication 33
	Operating temperature..... 34
	Suffixes 35
Dimension tables	Radial spherical plain bearings, maintenance-free, dimension series E..... 36
	Radial spherical plain bearings, maintenance-free, dimension series G 40
	Radial spherical plain bearings, maintenance-free, dimension series K 44
	Angular contact spherical plain bearings, maintenance-free..... 46
	Axial spherical plain bearings, maintenance-free..... 48

Product overview Spherical plain bearings, maintenance-free

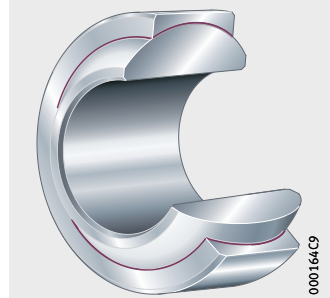
Radial spherical plain bearings

Sliding contact surface
hard chromium/PTFE composite
Open design

GE..-UK

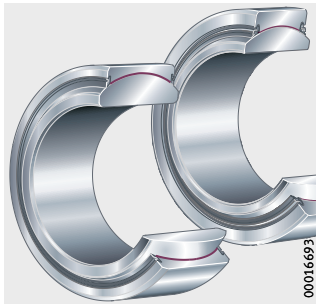


GE..-FW

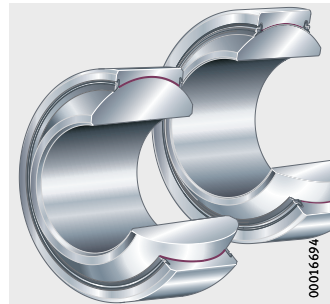


Sliding contact surface
hard chromium/ELGOLIDE
With lip seals or
high performance seals

GE..-UK-2RS, GE..-UK-2TS

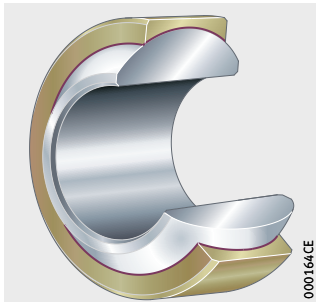


GE..-FW-2RS, GE..-FW-2TS



Sliding contact surface
steel/PTFE film
Open design

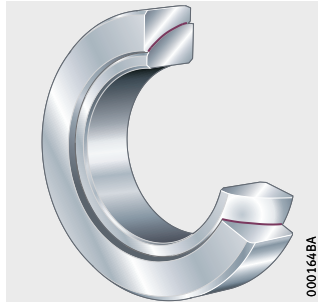
GE..-PW



**Angular contact
spherical plain bearings**

Sliding contact surface
hard chromium/ELGOGLIDE
Open design

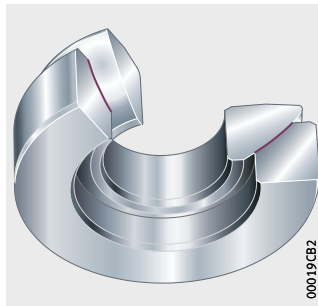
GE...-SW



**X-life
Axial
spherical plain bearings**

Sliding contact surface
hard chromium/ELGOGLIDE
Open design

GE...-AW



Spherical plain bearings, maintenance-free

Features	Spherical plain bearings allow spatial adjustment movements and, depending on the bearing type, can support radial, combined or axial loads.
Radial spherical plain bearings	<p>Maintenance-free radial spherical plain bearings comprise inner rings, outer rings and maintenance-free sliding layers. The inner rings have a cylindrical bore with a curved outer slideway.</p> <p>The outer rings have a cylindrical outside surface and a concave inner slideway.</p> <p>Between the inner and outer ring is an ELGOGLIDE sliding surface. The sliding surface in the series GE..-UK and GE..-FW is PTFE composite, while the sliding surface in series GE..-PW is PTFE film.</p> <p>For a description of the sliding surfaces, see page 28.</p> <p>The bearings are available in open and sealed designs.</p>
Area of application	Radial spherical plain bearings are preferably used to support radial forces. GE..-UK-2RS(-2TS), GE..-FW-2RS(-2TS), GE..-DW and GE..-DW-2RS2 are also suitable for alternating loads up to a contact pressure of $p = 150 \text{ N/mm}^2$. The bearings are used where particular requirements for operating life apply in conjunction with maintenance-free operation or where, for reasons of lubrication, bearings with metallic sliding contact surfaces are not suitable, for example under unilateral load.
X-life	<p>Large radial spherical plain bearings GE..-DW and GE..-DW-2RS2 of $d \geq 320 \text{ mm}$ are X-life bearings and are indicated as such in the dimension tables.</p> <p>These bearings have even higher performance materials, lower coefficients of friction and lower running-in wear than comparable bearings.</p>
Split outer ring	<p>In series GE..-UK-2RS(-2TS) up to a diameter $d \leq 140 \text{ mm}$, the outer ring is axially split at one point, while for diameters $d \geq 160 \text{ mm}$ it is axially split at two points and held together by means of heavy-section retaining washers.</p> <p>In the case of bearings GE..-FW-2RS(-2TS) up to a diameter $d \leq 120 \text{ mm}$, the outer ring is axially split at one point, while for diameters $d \geq 140 \text{ mm}$ it is axially split at two points and held together by means of heavy-section retaining washers. In the case of GE..-DW and GE..-DW-2RS2, the outer ring is radially split. It is held together by means of screws and dowel pins.</p>
Extended inner rings	GE..-FW-2RS(-2TS) and GE..-FW have extended inner rings. As a result, larger tilt angles are possible.

Series, sliding layer, standard

Radial spherical plain bearings are designed according to their specific series with different sliding layers, see table and section Sliding layers, page 28.

Series and design

Series	Sliding layer	DIN ISO	Dimension series	Shaft d mm	
				over	incl.
GE...UK-2RS	ELGOGLIDE	12240-1	E	17	300
GE...UK-2TS	ELGOGLIDE	12240-1	E	30	300
GE...FW-2RS	ELGOGLIDE	12240-1	G	25	280
GE...FW-2TS	ELGOGLIDE	12240-1	G	25	280
GE...DW	ELGOGLIDE (X-life)	12240-1	C	320	1000
GE...DW-2RS2	ELGOGLIDE (X-life)	12240-1	C	320	1000
GE...UK	PTFE composite	12240-1	E	6	30
GE...FW	PTFE composite	12240-1	G	6	25
GE...PW	PTFE film	12240-1	K	6	30

Angular contact spherical plain bearings

Angular contact spherical plain bearings GE...SW correspond to DIN ISO 12240-2. They have inner rings with a curved outer slideway and outer rings with a concave inner slideway to which the sliding layer ELGOGLIDE is attached by adhesive.

The bearings are available for shaft diameters from 25 mm to 200 mm. Other sizes are available by agreement.

Area of application

The bearings can support radial and axial loads and are suitable for alternating dynamic loads. They can be used in paired arrangements as preloaded units.

Angular contact spherical plain bearings are used to support high loads occurring in conjunction with small motions. They are a good plain bearing alternative to tapered roller bearings 320...X in accordance with ISO 355 and DIN 720, since they have the same mounting dimensions.

Axial spherical plain bearings

Axial spherical plain bearings GE...AW correspond to DIN ISO 12240-3. In these units, the shaft locating washer is supported in the ball socket-shaped sliding zone of the housing locating washer.

The sliding material in the housing locating washer is ELGOGLIDE or, in the case of a nominal diameter $d \geq 220$ mm, ELGOGLIDE in X-life.

The bearings are available for shaft diameters from 10 mm to 360 mm. Other sizes are available by agreement.

Area of application

The bearings are preferably used to support axial forces. They are suitable as support or base bearings and can also be combined with radial spherical plain bearings of dimension series E in accordance with DIN ISO 12240-1.

X-life

Axial spherical plain bearings GE...AW of $d \geq 220$ mm are X-life bearings and are indicated as such in the dimension tables.

These bearings have even higher performance materials, lower coefficients of friction and lower running-in wear than comparable bearings.

Spherical plain bearings, maintenance-free

Sliding layers

Maintenance-free spherical plain bearings have special sliding layers based on polytetrafluorethylene PTFE in the outer ring.

In descending order of performance capability, these are:

- ELGOGLIDE, the highest performance sliding layer
- ELGOGLIDE-W11, the sliding layer for low friction
- PTFE film
- PTFE composite.

These materials form the slideway, transmit the forces occurring and perform the lubrication function.



Maintenance-free bearings must not be lubricated.

ELGOGLIDE

The sliding layer comprises a 0,5 mm thick layer of ELGOGLIDE, is embedded in synthetic resin and attached by a high strength bond to the support body, *Figure 1*.

The flow behaviour of the sliding layer is, in conjunction with the supporting body, almost negligible even under very high load. The adhesive bond is resistant to moisture and swelling.

ELGOGLIDE is a registered trademark and product of Schaeffler.

- ① PTFE fabric, comprising PTFE and support fibres
- ② Resin matrix
- ③ Support fibres
- ④ Steel supporting body
- ⑤ Adhesive bond

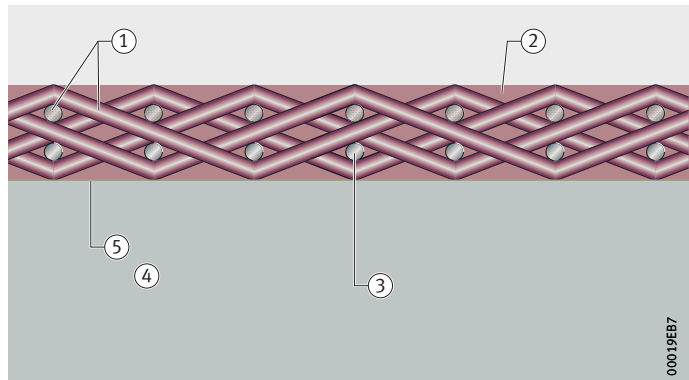


Figure 1
ELGOGLIDE,
maintenance-free
plain bearing material

ELGOGLIDE designs

For differing requirements, the following are available:

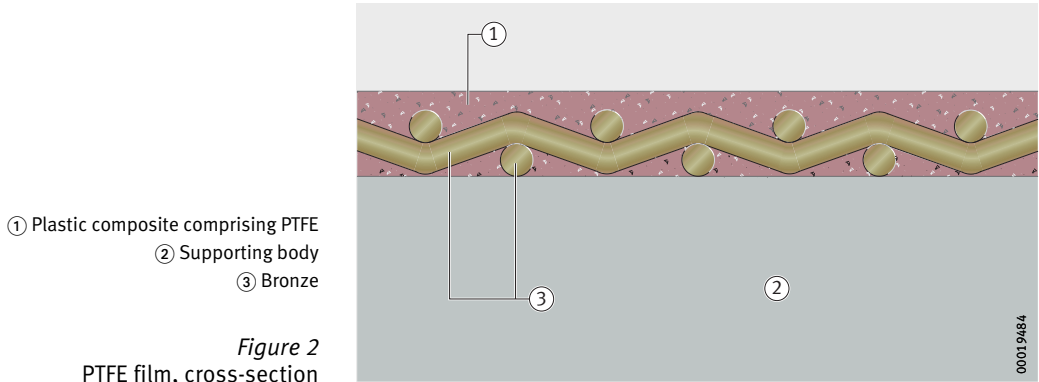
- ELGOGLIDE
the standard material for very high dynamic contact pressures from 25 N/mm² to 300 N/mm² and a long operating life
- ELGOGLIDE-W11
the material for dynamic contact pressures from 1 N/mm² to 150 N/mm² and with low coefficients of friction even at low contact pressures.

The operating limits of the plain bearing materials must be observed, see page 11.

PTFE film

The PTFE film (metal fabric material) is fixed to the outer ring curved surface, *Figure 2*.

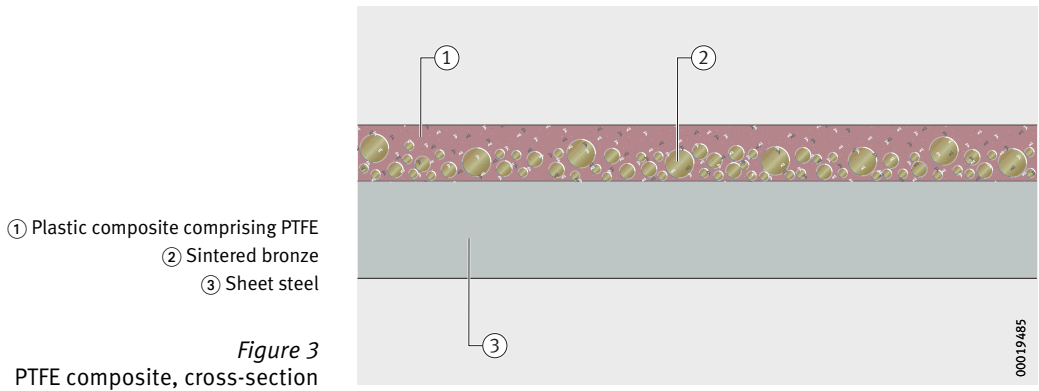
The metal fabric is made from high strength bronze and acts as a stabiliser for the sintered PTFE composite.



PTFE composite

PTFE composite comprises sheet steel with bronze attached by sintering and an embedded plastic composite made from PTFE, *Figure 3*.

The composite is embedded with form fit between the inner ring curved surface and the outer steel surface.



Spherical plain bearings, maintenance-free

Bearing materials

Maintenance-free spherical plain bearings fulfil all the requirements in terms of fatigue and wear resistance, hardness, toughness and structural stability as well as maintenance-free operation.

The materials used for the inner and outer rings and the shaft and housing locating washers are generally hardened and ground rolling bearing steel, see table.

Materials and design

Series	Material	
	Inner ring or shaft locating washer	Outer ring or housing locating washer
GE..-UK-2RS GE..-UK-2TS GE..-FW-2RS GE..-FW-2TS	Hardened and ground rolling bearing steel, curved surface finished or polished (from $d \geq 240$ mm) and Durotect CMT coated.	Axially split at one point in GE..-UK-2RS(-2TS) to $d \leq 140$ mm and in GE..-FW-2RS(-2TS) to $d \leq 120$ mm. In larger sizes, axially split at two points and held together by means of heavy-section retaining washers on the outside diameter. ELGOGLIDE fixed by adhesive in the outer ring curved surface.
GE..-DW GE..-DW-2RS2	Hardened rolling bearing steel, curved surface ground, polished and Durotect CMT coated.	42CrMo4-TQ in accordance with DIN EN 10083-1, radially split and held together by means of screws and dowel pins arranged axially on one side. ELGOGLIDE fixed by adhesive in the outer ring curved surface.
GE..-UK GE..-FW	Hardened rolling bearing steel, curved surface finished and Durotect CMT coated.	Formed around inner ring by special upset process from two bushes pushed into each other, outer steel surface subsequently precision machined. PTFE composite embedded with form contact between the inner ring curved surface and the outer steel surface.
GE..-PW	Hardened and ground rolling bearing steel, curved surface finished.	Brass, formed about inner ring, outside surface subsequently precision machined. PTFE film fixed by adhesive in the outer ring curved surface.
GE..-SW GE..-AW	Hardened rolling bearing steel, curved surface ground, polished and Durotect CMT coated.	Outer ring in GE..-SW and housing locating washer in GE..-AW made from hardened rolling bearing steel. Curved surface ground, in the case of GE..-AW ≥ 160 mm, housing locating washer made from unhardened steel. ELGOGLIDE fixed by adhesive in the outer ring or housing locating washer curved surface.

Durotect CM, Durotect CMT

Microcracked hard chrome plating.

Coating process

- Electroplating method
- Subsequent heat treatment recommended for high strength materials (against hydrogen embrittlement).

Advantages, benefits

- Improved friction and wear behaviour under lubricant starvation
- Increased life due to hard surfaces as wear protection
- Good corrosion protection and high resistance to many chemicals with coating thicknesses greater than 30 μm
- Protection against tribocorrosion
- Protection against standstill marks (false brinelling)
- Low friction coefficient, good sliding characteristics
- Anti-adhesive characteristics.

Common applications

Applications with high wear load in automotive and industrial sectors:

- spherical plain bearings
- shafts
- bearing and engine components.

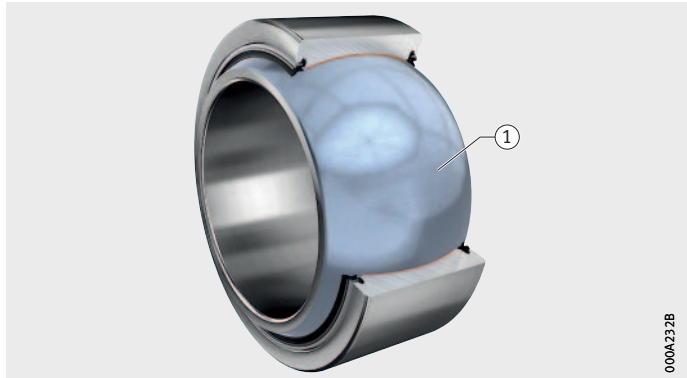
Characteristics

Feature	Coating
Composition	Hard chrome plating
Colour	Silver (lustrous)
Structure	Microcracked hard chromium layer, initial roughness substantially maintained
Layer thickness	0,1 μm – 500 μm (depending on application)
Hardness	850 HV – 1 100 HV
Temperature resistance	Colour stable up to +300 °C Hardness stable up to +700 °C

Spherical plain bearings, maintenance-free

① Durotect CMT-coated inner ring

Figure 4
Radial spherical plain bearing
GE60-UK-2TS,
maintenance-free



000A232B

① Durotect CMT-coated spherical plain bearing

Figure 5
Application example
with high wear load:
spherical plain bearings
in excavator



000A20E3

Sealing

Sealed radial spherical plain bearings have the suffix 2RS, 2RS2 or 2TS. They are protected by lip seals on both sides against contaminants and water spray.

Large radial spherical plain bearings GE..-DW-2RS2 have seals with increased sealing action for very high requirements.

Radial spherical plain bearings GE..-UK-2TS and GE..-FW-2TS are sealed on both sides by integrated, triple lip high performance seals.

Angular contact and axial spherical plain bearings are not sealed but can be protected by means of an external seal, see HG 1, Plain Bearings.

Lubrication

Maintenance-free spherical plain bearings do not have relubrication facilities and must not be lubricated.



Maintenance-free spherical plain bearings must be subjected to dry running-in. Any lubricant will impair the smoothing effect necessary and will considerably reduce the operating life of the bearings.

Spherical plain bearings, maintenance-free

Operating temperature

The permissible operating temperature is dependent on the sliding contact surface and the sealing arrangement, see table.



If the temperature exceeds the stated values, there will be a reduction in the operating life and the effect of the sealing arrangement.

Operating temperature

Series	Temperature °C	
	over	incl.
GE..-UK	-50	+200
GE..-UK-2RS ¹⁾	-30	+130
GE..-UK-2TS ¹⁾	-30	+100
GE..-DW	-50	+150
GE..-DW-2RS ¹⁾	-40	+120
GE..-FW	-50	+200
GE..-FW-2RS ¹⁾	-30	+130
GE..-FW-2TS ¹⁾	-30	+100
GE..-PW	-50	+200
GE..-SW	-50	+150
GE..-AW	-50	+150

¹⁾ Due to the different sliding layers in the series, see table, page 27, these bearings are suitable, if they are used without seals, for temperatures from -50 °C to +150 °C.

Temperature-resistant seals

If sealed bearings must be used at higher temperatures, an unsealed bearing with external, temperature-resistant seals can be used, *Figure 6*.

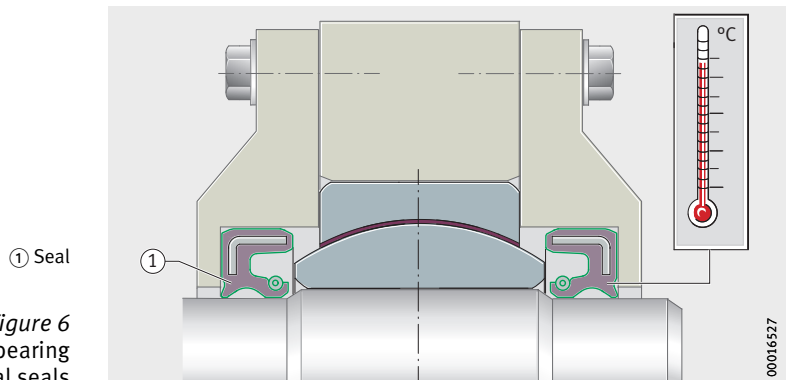


Figure 6
Open spherical plain bearing
with external seals

Suffixes Suffixes for available designs: see table.

Available designs

Suffix	Description	Design
2RS	Standard lip seals on both sides	Standard
2RS2	Double lip seals with increased sealing action on both sides	
2RS4	Triple lip seals with increased sealing action on both sides	
2TS	Triple lip high performance seals on both sides with steel reinforcement for applications with high contamination	
W1	Inner and outer ring made from corrosion-resistant steel	Special design, available by agreement only
W3	Inner ring made from corrosion-resistant steel	
W7	Inner ring bore with ELGOGLIDE lining; inside diameter d reduced by 1,08 mm ($d_{NEW} = d - 1,08$)	
W8	Inner ring bore with ELGOGLIDE lining; inside diameter d remains in accordance with nominal diameter ($d_{NEW} = d$)	
W11	For low contact pressures (starting as low as 1 N/mm ²) and minimal friction	
G8	Outer ring with Corrotect ZN ¹⁾ coating, curved and end surfaces of inner ring with Durotect CMT coating	

¹⁾ Other surface coatings are available by agreement.

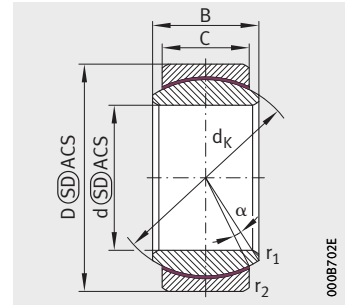
Radial spherical plain bearings

Maintenance-free

DIN ISO 12240-1, dimension series E

Inner ring curved surface with hard chromium coating

Open design



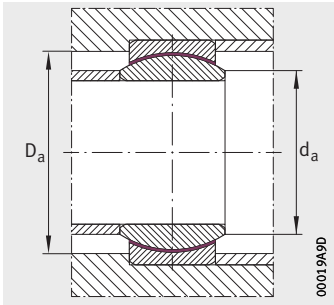
GE...UK
PTFE composite

Dimension table · Dimensions in mm

Designation	Mass m ≈kg	Dimensions					
		d	D	B	C	d _k	α ¹⁾ °
GE6-UK	0,004	6 _{-0,008}	14 _{-0,008}	6 _{-0,12}	4 _{-0,24}	10	13
GE8-UK	0,007	8 _{-0,008}	16 _{-0,008}	8 _{-0,12}	5 _{-0,24}	13	15
GE10-UK	0,011	10 _{-0,008}	19 _{-0,009}	9 _{-0,12}	6 _{-0,24}	16	12
GE12-UK	0,016	12 _{-0,008}	22 _{-0,009}	10 _{-0,12}	7 _{-0,24}	18	11
GE15-UK	0,027	15 _{-0,008}	26 _{-0,009}	12 _{-0,12}	9 _{-0,24}	22	8
GE17-UK	0,042	17 _{-0,008}	30 _{-0,009}	14 _{-0,12}	10 _{-0,24}	25	10
GE20-UK	0,067	20 _{-0,01}	35 _{-0,011}	16 _{-0,12}	12 _{-0,24}	29	9
GE25-UK	0,12	25 _{-0,01}	42 _{-0,011}	20 _{-0,12}	16 _{-0,24}	35,5	7
GE30-UK	0,15	30 _{-0,01}	47 _{-0,011}	22 _{-0,12}	18 _{-0,24}	40,7	6

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

2) This differs from DIN ISO 12240-1, dimension series E.



Mounting dimensions

Chamfer dimensions		Mounting dimensions		Basic load ratings		Radial internal clearance ²⁾
r_1 min.	r_2 min.	d_a max.	D_a min.	dyn. C_r N	stat. C_{0r} N	
0,3	0,3	8	9,6	3 600	9 000	0 – 0,032
0,3	0,3	10,2	12,5	5 850	14 600	0 – 0,032
0,3	0,3	13,2	15,5	8 640	21 600	0 – 0,032
0,3	0,3	14,9	17,5	11 300	28 400	0 – 0,032
0,3	0,3	18,4	21	17 800	44 600	0 – 0,04
0,3	0,3	20,7	24	22 500	56 300	0 – 0,04
0,3	0,3	24,2	27,5	31 300	78 300	0 – 0,04
0,6	0,6	29,3	33	51 100	128 000	0 – 0,05
0,6	0,6	34,2	38	65 900	165 000	0 – 0,05

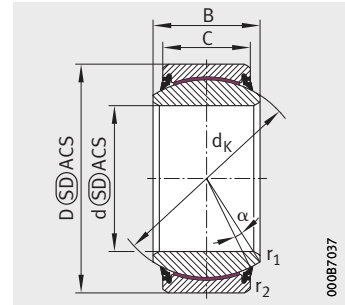
Radial spherical plain bearings

Maintenance-free

DIN ISO 12240-1, dimension series E

Inner ring curved surface with hard chromium coating

Sealed



GE..-UK-2RS
ELGOGLIDE

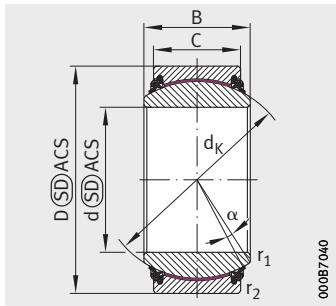
Dimension table · Dimensions in mm

Designation		Mass m ≈kg	Dimensions					
			d	D	B	C	d _k	α ²⁾ °
GE17-UK-2RS	–	0,038	17 _{-0,008}	30 _{-0,009}	14 _{-0,12}	10 _{-0,24}	25	10
GE20-UK-2RS	–	0,061	20 _{-0,01}	35 _{-0,011}	16 _{-0,12}	12 _{-0,24}	29	9
GE25-UK-2RS	–	0,11	25 _{-0,01}	42 _{-0,011}	20 _{-0,12}	16 _{-0,24}	35,5	7
GE30-UK-2RS	GE30-UK-2TS	0,14	30 _{-0,01}	47 _{-0,011}	22 _{-0,12}	18 _{-0,24}	40,7	6
GE35-UK-2RS	GE35-UK-2TS	0,22	35 _{-0,012}	55 _{-0,013}	25 _{-0,12}	20 _{-0,3}	47	6
GE40-UK-2RS	GE40-UK-2TS	0,31	40 _{-0,012}	62 _{-0,013}	28 _{-0,12}	22 _{-0,3}	53	7
GE45-UK-2RS	GE45-UK-2TS	0,41	45 _{-0,012}	68 _{-0,013}	32 _{-0,12}	25 _{-0,3}	60	7
GE50-UK-2RS	GE50-UK-2TS	0,55	50 _{-0,012}	75 _{-0,013}	35 _{-0,12}	28 _{-0,3}	66	6
GE60-UK-2RS	GE60-UK-2TS	1	60 _{-0,015}	90 _{-0,015}	44 _{-0,15}	36 _{-0,4}	80	6
GE70-UK-2RS	GE70-UK-2TS	1,53	70 _{-0,015}	105 _{-0,015}	49 _{-0,15}	40 _{-0,4}	92	6
GE80-UK-2RS	GE80-UK-2TS	2,25	80 _{-0,015}	120 _{-0,015}	55 _{-0,15}	45 _{-0,4}	105	6
GE90-UK-2RS	GE90-UK-2TS	2,73	90 _{-0,02}	130 _{-0,018}	60 _{-0,2}	50 _{-0,5}	115	5
GE100-UK-2RS	GE100-UK-2TS	4,34	100 _{-0,02}	150 _{-0,018}	70 _{-0,2}	55 _{-0,5}	130	7
GE110-UK-2RS	GE110-UK-2TS	4,71	110 _{-0,02}	160 _{-0,025}	70 _{-0,2}	55 _{-0,5}	140	6
GE120-UK-2RS	GE120-UK-2TS	7,98	120 _{-0,02}	180 _{-0,025}	85 _{-0,2}	70 _{-0,5}	160	6
GE140-UK-2RS	GE140-UK-2TS	11,1	140 _{-0,025}	210 _{-0,03}	90 _{-0,25}	70 _{-0,6}	180	7
GE160-UK-2RS	GE160-UK-2TS	14	160 _{-0,025}	230 _{-0,03}	105 _{-0,25}	80 _{-0,6}	200	8

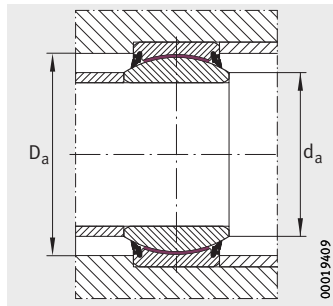
1) Price and delivery by agreement.

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

3) This differs from DIN ISO 12240-1, dimension series E.



GE...UK-2TS
ELGOGLIDE



Mounting dimensions

Chamfer dimensions		Mounting dimensions		Basic load ratings		Radial internal clearance ²⁾
r ₁	r ₂	d _a	D _a	dyn. C _r	stat. C _{0r}	
min.	min.	max.	min.	N	N	
0,3	0,3	20,7	24	48 800	81 300	0 – 0,04
0,3	0,3	24,2	27,5	67 900	113 000	0 – 0,04
0,6	0,6	29,3	33	128 000	213 000	0 – 0,05
0,6	0,6	34,2	38	165 000	275 000	0 – 0,05
0,6	1	39,8	44,5	212 000	353 000	0 – 0,05
0,6	1	45	51	280 000	466 000	0 – 0,06
0,6	1	50,8	57	360 000	600 000	0 – 0,06
0,6	1	56	63	444 000	739 000	0 – 0,06
1	1	66,8	75	691 000	1 150 000	0 – 0,06
1	1	77,9	87	883 000	1 470 000	0 – 0,072
1	1	89,4	99	1 130 000	1 890 000	0 – 0,072
1	1	98,1	108	1 380 000	2 300 000	0 – 0,072
1	1	109,5	123	1 720 000	2 860 000	0 – 0,085
1	1	121,2	134	1 850 000	3 080 000	0 – 0,085
1	1	135,6	150	2 690 000	4 480 000	0 – 0,085
1	1	155,9	173	3 020 000	5 040 000	0 – 0,085
1	1	170,2	191	3 840 000	6 400 000	0 – 0,1

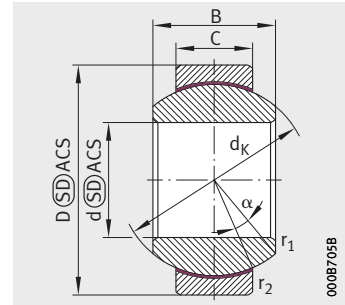
Radial spherical plain bearings

Maintenance-free

DIN ISO 12240-1, dimension series G

Inner ring curved surface with hard chromium coating

Open design



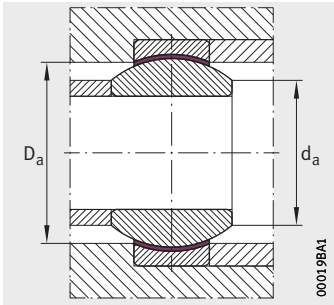
GE...FW
PTFE composite

Dimension table · Dimensions in mm

Designation	Mass m ≈kg	Dimensions					
		d	D	B	C	d _k	α ¹⁾ °
GE6-FW	0,009	6 _{-0,008}	16 _{-0,008}	9 _{-0,12}	5 _{-0,24}	13	21
GE8-FW	0,015	8 _{-0,008}	19 _{-0,009}	11 _{-0,12}	6 _{-0,24}	16	21
GE10-FW	0,021	10 _{-0,008}	22 _{-0,009}	12 _{-0,12}	7 _{-0,24}	18	18
GE12-FW	0,037	12 _{-0,008}	26 _{-0,009}	15 _{-0,12}	9 _{-0,24}	22	18
GE15-FW	0,05	15 _{-0,008}	30 _{-0,009}	16 _{-0,12}	10 _{-0,24}	25	16
GE17-FW	0,083	17 _{-0,008}	35 _{-0,011}	20 _{-0,12}	12 _{-0,24}	29	19
GE20-FW	0,16	20 _{-0,01}	42 _{-0,011}	25 _{-0,12}	16 _{-0,24}	35,5	17
GE25-FW	0,21	25 _{-0,01}	47 _{-0,011}	28 _{-0,12}	18 _{-0,24}	40,7	17

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

2) This differs from DIN ISO 12240-1, dimension series G.



Mounting dimensions

Chamfer dimensions		Mounting dimensions		Basic load ratings		Radial internal clearance ²⁾
r_1 min.	r_2 min.	d_a max.	D_a min.	dyn. C_r N	stat. C_{Or} N	
0,3	0,3	9,4	12,5	5 850	14 600	0 – 0,032
0,3	0,3	11,6	15,5	8 640	21 600	0 – 0,032
0,3	0,3	13,4	17,5	11 300	28 400	0 – 0,032
0,3	0,3	16,1	21	17 800	44 600	0 – 0,04
0,3	0,3	19,2	24	22 500	56 300	0 – 0,04
0,3	0,3	21	27,5	31 300	78 300	0 – 0,04
0,3	0,6	25,2	33	51 100	128 000	0 – 0,05
0,6	0,6	29,5	38	65 900	165 000	0 – 0,05

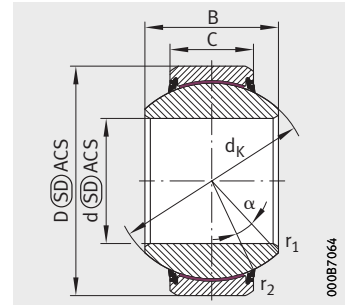
Radial spherical plain bearings

Maintenance-free

DIN ISO 12240-1, dimension series G

Inner ring curved surface with hard chromium coating

Sealed



GE...FW-2RS
ELGOGLIDE

000B7064

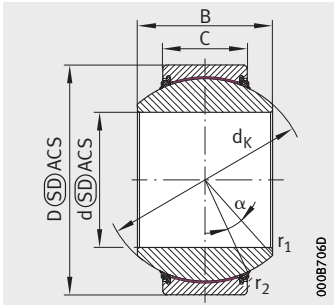
Dimension table · Dimensions in mm

Designation		Mass m ≈kg	Dimensions					
			d	D	B	C	d _k	α ¹⁾ °
GE25-FW-2RS	GE25-FW-2TS	0,2	25 _{-0,01}	47 _{-0,011}	28 _{-0,12}	18 _{-0,24}	40,7	17
GE30-FW-2RS	GE30-FW-2TS	0,29	30 _{-0,01}	55 _{-0,013}	32 _{-0,12}	20 _{-0,3}	47	17
GE35-FW-2RS	GE35-FW-2TS	0,4	35 _{-0,012}	62 _{-0,013}	35 _{-0,12}	22 _{-0,3}	53	16
GE40-FW-2RS	GE40-FW-2TS	0,53	40 _{-0,012}	68 _{-0,013}	40 _{-0,12}	25 _{-0,3}	60	17
GE45-FW-2RS	GE45-FW-2TS	0,69	45 _{-0,012}	75 _{-0,013}	43 _{-0,12}	28 _{-0,3}	66	15
GE50-FW-2RS	GE50-FW-2TS	1,4	50 _{-0,012}	90 _{-0,015}	56 _{-0,12}	36 _{-0,4}	80	17
GE60-FW-2RS	GE60-FW-2TS	2,1	60 _{-0,015}	105 _{-0,015}	63 _{-0,15}	40 _{-0,4}	92	17
GE70-FW-2RS	GE70-FW-2TS	3	70 _{-0,015}	120 _{-0,015}	70 _{-0,15}	45 _{-0,4}	105	16
GE80-FW-2RS	GE80-FW-2TS	3,6	80 _{-0,015}	130 _{-0,018}	75 _{-0,15}	50 _{-0,5}	115	14
GE90-FW-2RS	GE90-FW-2TS	5,34	90 _{-0,02}	150 _{-0,018}	85 _{-0,2}	55 _{-0,5}	130	15
GE100-FW-2RS	GE100-FW-2TS	6	100 _{-0,02}	160 _{-0,025}	85 _{-0,2}	55 _{-0,5}	140	14
GE110-FW-2RS	GE110-FW-2TS	9,7	110 _{-0,02}	180 _{-0,025}	100 _{-0,2}	70 _{-0,5}	160	12
GE120-FW-2RS	GE120-FW-2TS	15,1	120 _{-0,02}	210 _{-0,03}	115 _{-0,2}	70 _{-0,6}	180	16

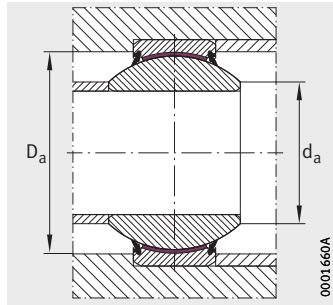
1) The values for the tilt angle α are subject to tolerances.

2) This differs from DIN ISO 12240-1, dimension series G.

3) Price and delivery by agreement.



GE...-FW-2TS
ELGOGLIDE



Mounting dimensions

Chamfer dimensions		Mounting dimensions		Basic load ratings		Radial internal clearance ²⁾
r ₁	r ₂	d _a	D _a	dyn. C _r N	stat. C _{0r} N	
min.	min.	max.	min.			
0,6	0,6	29,5	38	165 000	275 000	0 – 0,05
0,6	1	34,4	44,5	212 000	353 000	0 – 0,05
0,6	1	39,8	51	280 000	466 000	0 – 0,06
0,6	1	44,7	57	360 000	600 000	0 – 0,06
0,6	1	50,1	63	444 000	739 000	0 – 0,06
0,6	1	57,1	75	691 000	1 150 000	0 – 0,06
1	1	67	87	883 000	1 470 000	0 – 0,072
1	1	78,3	99	1 130 000	1 890 000	0 – 0,072
1	1	87,2	108	1 380 000	2 300 000	0 – 0,072
1	1	98,4	123	1 720 000	2 860 000	0 – 0,085
1	1	111,2	134	1 850 000	3 080 000	0 – 0,085
1	1	124,9	150	2 690 000	4 480 000	0 – 0,085
1	1	138,5	173	3 020 000	5 040 000	0 – 0,085

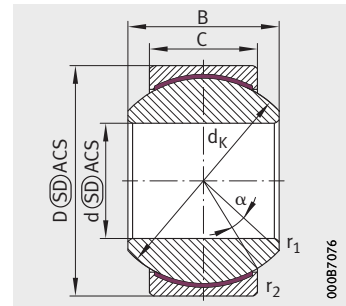
Radial spherical plain bearings

Maintenance-free

DIN ISO 12240-1, dimension series K

Brass outer ring

Open design



GE...PW
PTFE film

00087076

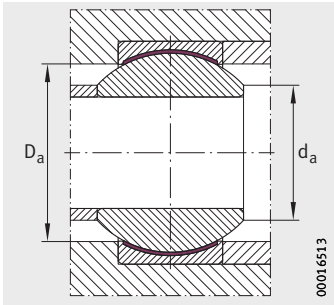
Dimension table · Dimensions in mm

Designation ¹⁾	Mass m ≈kg	Dimensions					
		d	D	B	C	d _K	α ²⁾
GE6-PW	0,01	6^{+0,012}	16 _{-0,008}	9 _{-0,12}	6,75 _{-0,24}	12,7	13
GE8-PW	0,018	8^{+0,015}	19 _{-0,009}	12 _{-0,12}	9 _{-0,24}	15,875	14
GE10-PW	0,027	10^{+0,015}	22 _{-0,009}	14 _{-0,12}	10,5 _{-0,24}	19,05	13
GE12-PW	0,043	12^{+0,018}	26 _{-0,009}	16 _{-0,12}	12 _{-0,24}	22,225	13
GE14-PW	0,055	14^{+0,018}	28 _{-0,009³⁾}	19 _{-0,12}	13,5 _{-0,24}	25,4	16
GE16-PW	0,079	16^{+0,018}	32 _{-0,011}	21 _{-0,12}	15 _{-0,24}	28,575	15
GE18-PW	0,11	18^{+0,018}	35 _{-0,011}	23 _{-0,12}	16,5 _{-0,24}	31,75	15
GE20-PW	0,15	20^{+0,021}	40 _{-0,011}	25 _{-0,12}	18 _{-0,24}	34,925	14
GE22-PW	0,18	22^{+0,021}	42 _{-0,011}	28 _{-0,12}	20 _{-0,24}	38,1	15
GE25-PW	0,25	25^{+0,021}	47 _{-0,011}	31 _{-0,12}	22 _{-0,24}	42,85	15
GE30-PW	0,38	30^{+0,021}	55 _{-0,013}	37 _{-0,12}	25 _{-0,3}	50,8	17

1) Price and delivery by agreement.

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

3) This differs from DIN ISO 12240-1, dimension series K.



Mounting dimensions

Chamfer dimensions		Mounting dimensions		Basic load ratings		Radial internal clearance ³⁾
r_1 min.	r_2 min.	d_a max.	D_a min.	dyn. C_r N	stat. C_{0r} N	
0,3	0,3	9	11,5	7 750	19 400	0,006 – 0,035
0,3	0,3	10,4	14	12 900	32 100	0,006 – 0,035
0,3	0,3	12,9	17	18 100	45 200	0,006 – 0,035
0,3	0,3	15,4	19,5	24 000	60 000	0,006 – 0,035
0,3	0,3	16,9	22,5	31 000	77 500	0,006 – 0,035
0,3	0,3	19,4	25,5	38 600	96 400	0,006 – 0,035
0,3	0,3	21,9	28,5	47 300	118 000	0,006 – 0,035
0,3	0,6	24,4	31,5	56 600	141 000	0,006 – 0,035
0,3	0,6	25,8	34	68 600	171 000	0,006 – 0,035
0,3	0,6	29,6	38,5	84 800	212 000	0,006 – 0,035
0,3	0,6	34,8	46	114 000	286 000	0,006 – 0,035

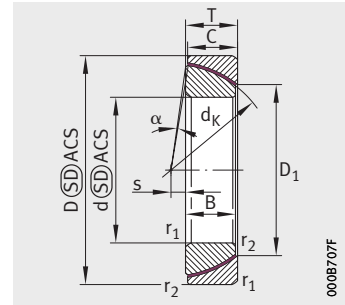
Angular contact spherical plain bearings

Maintenance-free

DIN ISO 12240-2

Inner ring curved surface with hard chromium coating

Open design



GE..-SW
ELGOGLIDE

Dimension table - Dimensions in mm

Designation ¹⁾	Mass m ≈kg	Dimensions						
		d	D	T	d _k	D ₁	B	C
GE25-SW	0,14	25 _{-0,012}	47 _{-0,014}	15±0,25	42,5	31,4	14 _{-0,2} ⁴⁾	14 _{-0,2} ⁴⁾
GE28-SW	0,18	28 _{-0,012}	52 _{-0,016}	16±0,25	47	35,7	15 _{-0,2} ⁴⁾	15 _{-0,2} ⁴⁾
GE30-SW	0,21	30 _{-0,012}	55 _{-0,016}	17±0,25	50	36,1	16 _{-0,2} ⁴⁾	16 _{-0,2} ⁴⁾
GE35-SW	0,28	35 _{-0,012}	62 _{-0,016}	18±0,25	56	42,4	17 _{-0,24}	17 _{-0,24}
GE40-SW	0,34	40 _{-0,012}	68 _{-0,016}	19±0,25	60	46,8	18 _{-0,24}	18 _{-0,24}
GE45-SW	0,42	45 _{-0,012}	75 _{-0,016}	20±0,25	66	52,9	19 _{-0,24}	19 _{-0,24}
GE50-SW	0,46	50 _{-0,012}	80 _{-0,016}	20±0,25	74	59,1	19 _{-0,24}	19 _{-0,24}
GE55-SW	0,68	55 _{-0,015}	90 _{-0,018}	23±0,25	80	62	22 _{-0,3}	22 _{-0,3}
GE60-SW	0,73	60 _{-0,015}	95 _{-0,018}	23±0,25	86	68,1	22 _{-0,3}	22 _{-0,3}
GE65-SW	0,78	65 _{-0,015}	100 _{-0,018}	23±0,25	92	75,6	22 _{-0,3}	22 _{-0,3}
GE70-SW	1,1	70 _{-0,015}	110 _{-0,018}	25±0,25	102	82,2	24 _{-0,3}	24 _{-0,3}
GE80-SW	1,56	80 _{-0,015}	125 _{-0,02}	29±0,25	115	90,5	27 _{-0,3}	27 _{-0,3}
GE90-SW	2,15	90 _{-0,02}	140 _{-0,02}	32±0,25	130	103,3	30 _{-0,4}	30 _{-0,4}
GE100-SW	2,33	100 _{-0,02}	150 _{-0,02}	32±0,25	140	114,3	30 _{-0,4}	30 _{-0,4}
GE110-SW	3,76	110 _{-0,02}	170 _{-0,025}	38±0,25	160	125,8	36 _{-0,4}	36 _{-0,4}
GE120-SW	4,1	120 _{-0,02}	180 _{-0,025}	38±0,25	170	135,4	36 _{-0,4}	36 _{-0,4}

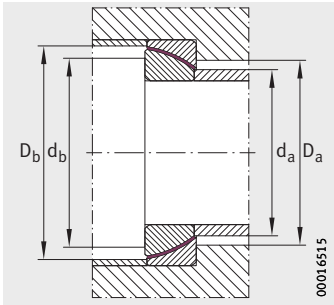
1) Other sizes available by agreement.

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

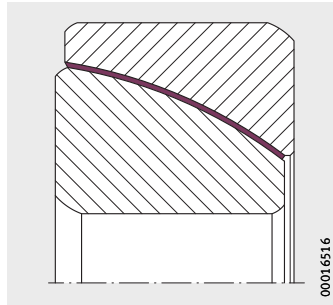
3) Basic load ratings in radial direction.

4) Tolerance deviates from DIN ISO 12240-2.

5) Price and delivery by agreement.



Mounting dimensions



Detail

		Chamfer dimensions		Mounting dimensions				Basic load ratings ³⁾	
s	$\alpha^{2)}$ °	r ₁ min.	r ₂ min.	d _a max.	d _b max.	D _a min.	D _b min.	dyn. C _r N	stat. C _{0r} N
1	2,7	0,6	0,3	30,1	39,5	34	43	143 000	239 000
1	2,4	1	0,3	34,4	42	40	47,5	173 000	288 000
2	2,3	1	0,3	34,7	45	40,5	50,5	194 000	323 000
2	2,1	1	0,3	41,1	50	47	57	236 000	393 000
1,5	1,9	1	0,3	45,6	54	52	61	272 000	454 000
1,5	1,7	1	0,3	51,7	60	58	67	319 000	532 000
4	1,6	1	0,3	58	67	65	75	355 000	592 000
4	1,4	1,5	0,6	60,8	71	70	81	448 000	746 000
5	1,3	1,5	0,6	66,9	77	76	87	483 000	805 000
5	1,3	1,5	0,6	74,5	83	84	93	520 000	867 000
7	1,1	1,5	0,6	81	92	90	104	627 000	1 040 000
10	2	1,5	0,6	88	104	99	117	734 000	1 220 000
11	1,8	2	0,6	100,9	118	112	132	941 000	1 570 000
12	1,7	2	0,6	112	128	123	142	1 020 000	1 700 000
15	1,5	2,5	0,6	123,3	146	135	162	1 410 000	2 340 000
17	1,4	2,5	0,6	132,9	155	145	172	1 500 000	2 490 000

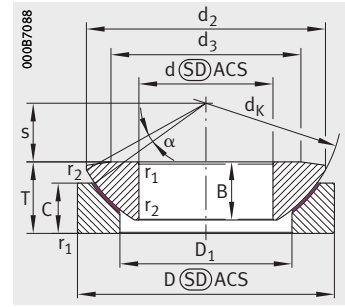
Axial spherical plain bearings

Maintenance-free

DIN ISO 12240-3

Shaft locating washer curved surface
with hard chromium coating

Open design



GE..-AW
ELGOGLIDE

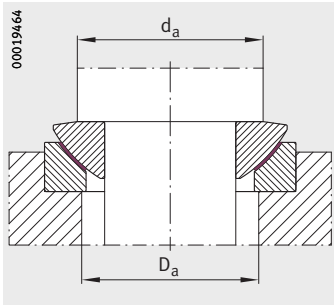
Dimension table · Dimensions in mm

Designation	X-life	Mass m ≈ kg	Dimensions						
			d	D	T	dk	d ₂	d ₃	D ₁
GE10-AW	-	0,039	10 _{-0,008}	30 _{-0,009}	9,5 _{-0,4}	32	27,5	21	16,5
GE12-AW	-	0,071	12 _{-0,008}	35 _{-0,011}	13 _{-0,4}	37	32	24	19,5
GE15-AW	-	0,12	15 _{-0,008}	42 _{-0,011}	15 _{-0,4}	45	38,9	29	24
GE17-AW	-	0,16	17 _{-0,008}	47 _{-0,011}	16 _{-0,4}	50	43,4	34	28
GE20-AW	-	0,27	20 _{-0,01}	55 _{-0,013}	20 _{-0,4}	60	50	40	33,5
GE25-AW	-	0,39	25 _{-0,01}	62 _{-0,013}	22,5 _{-0,4}	66	57,5	45	34,5
GE30-AW	-	0,65	30 _{-0,01}	75 _{-0,013}	26 _{-0,4}	80	69	56	44
GE35-AW	-	1,04	35 _{-0,012}	90 _{-0,015}	28 _{-0,4}	98	84	66	52
GE40-AW	-	1,65	40 _{-0,012}	105 _{-0,015}	32 _{-0,4}	114	98	78	59
GE45-AW	-	2,48	45 _{-0,012}	120 _{-0,015}	36,5 _{-0,4}	130	112	89	68
GE50-AW	-	3,43	50 _{-0,012}	130 _{-0,018}	42,5 _{-0,4}	140	122,5	98	69
GE60-AW	-	4,65	60 _{-0,015}	150 _{-0,018}	45 _{-0,4}	160	139,5	109	86
GE70-AW	-	5,65	70 _{-0,015}	160 _{-0,025}	50 _{-0,4}	170	149,5	121	95
GE80-AW	-	7,16	80 _{-0,015}	180 _{-0,025}	50 _{-0,4}	194	168	130	108
GE100-AW	-	10,7	100 _{-0,02}	210 _{-0,03}	59 _{-0,4}	220	195,5	155	133
GE120-AW	-	13,1	120 _{-0,02}	230 _{-0,03}	64 _{-0,4}	245	214	170	154

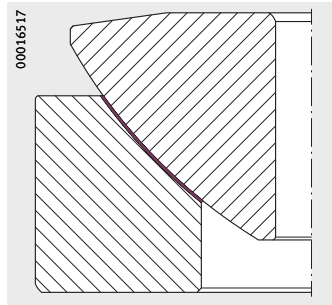
1) The values for the tilt angle α are subject to tolerances.

2) Price and delivery by agreement.

3) Not included in DIN ISO 12240-3.



Mounting dimensions



Detail

B	C	s	α^1 °	Chamfer dimensions		Mounting dimensions		Basic axial load ratings	
				r_1 min.	r_2 min.	d_a max.	D_a min.	dyn. C_a N	stat. C_{0a} N
7,9 _{-0,24}	6 _{-0,24}	7	10	0,6	0,2	21	18,5	73 200	122 000
9,3 _{-0,24}	9 _{-0,24}	8	9	0,6	0,2	24	21,5	97 300	162 000
10,7 _{-0,24}	11 _{-0,24}	10	7	0,6	0,2	29	26	157 000	261 000
11,5 _{-0,24}	11,5 _{-0,24}	11	6	0,6	0,2	34	30,5	178 000	296 000
14,3 _{-0,24}	13 _{-0,24}	12,5	6	1	0,3	40	38	225 000	376 000
16 _{-0,24}	17 _{-0,24}	14	7	1	0,3	45	39	388 000	646 000
18 _{-0,24}	19,5 _{-0,24}	17,5	6	1	0,3	56	49	509 000	848 000
22 _{-0,24}	20 _{-0,24}	22	6	1	0,3	66	57	778 000	1 300 000
27 _{-0,24}	22 _{-0,24}	24,5	6	1	0,3	78	64	1 120 000	1 870 000
31 _{-0,24}	25 _{-0,24}	27,5	6	1	0,3	89	74	1 460 000	2 430 000
33,5 _{-0,24}	32 _{-0,24}	30	5	1	0,3	98	75	1 950 000	3 250 000
37 _{-0,3}	33 _{-0,3}	35	7	1	0,3	108	92	2 210 000	3 680 000
40 _{-0,3}	36 _{-0,3}	35	6	1	0,3	121	102	2 420 000	4 030 000
42 _{-0,3}	36 _{-0,3}	42,5	6	1	0,3	130	115	3 110 000	5 180 000
50 _{-0,4}	42 _{-0,4}	45	7	1	0,3	155	141	3 610 000	6 020 000
52 _{-0,4}	45 _{-0,4}	52,5	6,5	1	0,3	170	162	3 740 000	6 230 000



Rod ends

Maintenance-free

Rod ends

Rod ends, maintenance-free 54

Maintenance-free rod ends comprise a housing with integral shank and a maintenance-free spherical plain bearing. The integral shank has an internal or external thread. The spherical plain bearing is firmly seated and located in the housing. The housings and shanks are protected against corrosion by a zinc coating.

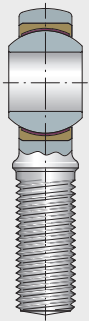
The rod ends can support radial loads in a tensile or compressive direction. They are suitable for slow movements with small to moderate swivel angles, for unilateral load and under certain conditions for alternating loads (also suitable for alternating loads with GE.-UK-2RS). Sealed rod ends have lip seals on both sides and are thus protected against contamination and water spray.

Corrosion-resistant rod ends, maintenance-free 54

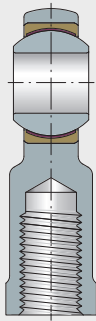
Corrosion-resistant rod ends made from high-grade steel correspond in their construction to the maintenance-free rod ends but are of a corrosion-resistant design.

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.



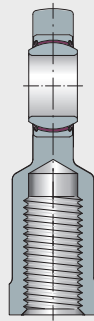
GAKR..-PW



**GIKR..-PW
GIKPR..-PW**



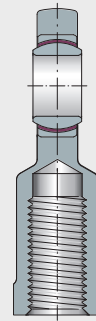
**GAR..-UK-2RS
GAR..-UK-2TS**



**GIR..-UK-2RS
GIR..-UK-2TS**

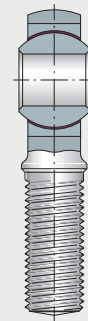


GAR..-UK

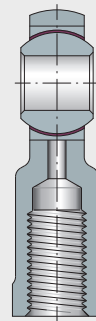


GIR..-UK

0001953C



GAKSR..-PS



**GIKSR..-PS
GIKPSR..-PS**

0001953D



Rod ends, maintenance-free

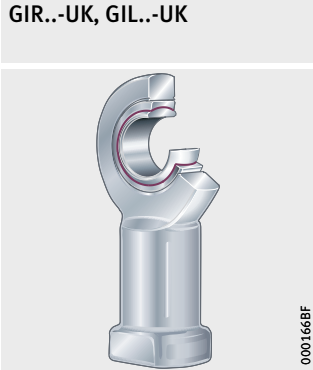
Rod ends, maintenance-free

	Page
Product overview	Rod ends, maintenance-free 56
Features	Area of application..... 58
	Dimension series E 58
	Dimension series K 59
	Series, sliding layer, standard 60
	Materials 61
	Sealing..... 61
	Lubrication 61
	Operating temperature..... 62
	Special designs 62
	Suffixes 62
Dimension tables	Rod ends, with internal thread, dimension series E, type F..... 64
	Rod ends, with external thread, dimension series E, type M 68
	Rod ends, with internal thread, dimension series K, type F..... 72
	Rod ends, with external thread, dimension series K, type M 74
	Corrosion-resistant rod ends, with internal thread, dimension series K, type F..... 76
	Corrosion-resistant rod ends, with external thread, dimension series K, type M 78

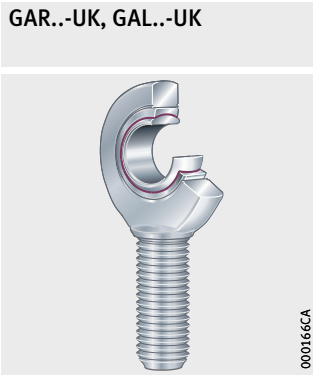
Product overview Rod ends, maintenance-free

Dimension series E

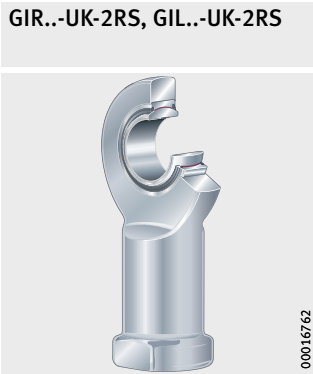
Sliding contact surface
hard chromium/PTFE composite
Right or left hand thread
Open design
With internal thread



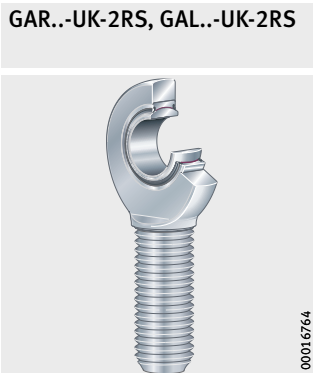
With external thread



Sliding contact surface
hard chromium/ELGOGLIDE
Right or left hand thread
With lip seals or
high performance seals
With internal thread



With external thread



Dimension series K

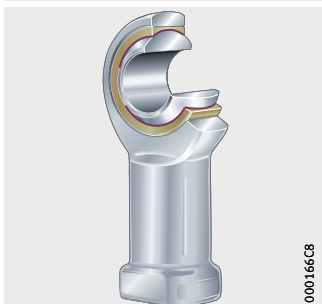
Sliding contact surface
steel/PTFE film

Right or left hand thread

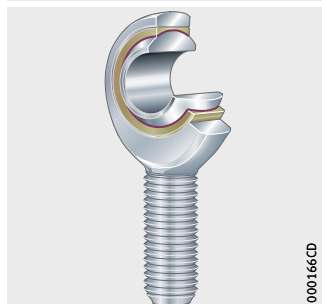
Open design

With internal or external thread

GIKR...PW, GIKPR...PW,
GIKL...PW



GAKR...PW, GAKL...PW



Corrosion-resistant rod ends

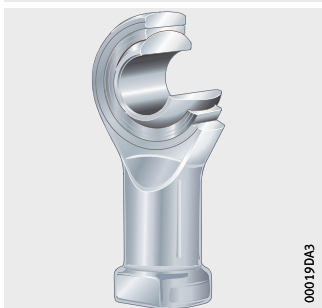
Sliding contact surface
corrosion-resistant steel/PTFE film

Right or left hand thread

Open design

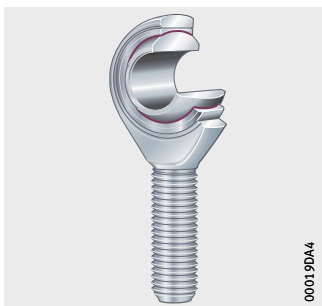
With internal thread

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



With external thread

GAKSR...PS, GAKSL...PS



Rod ends, maintenance-free

Features Maintenance-free rod ends and maintenance-free corrosion-resistant rod ends comprise a housing with integral shank and a maintenance-free spherical plain bearing. The shank has an internal or external thread, the spherical plain bearing is firmly seated and located in the housing.

The rod ends are available in open designs and in designs sealed on both sides. The housings and shanks are protected against corrosion by a zinc coating.

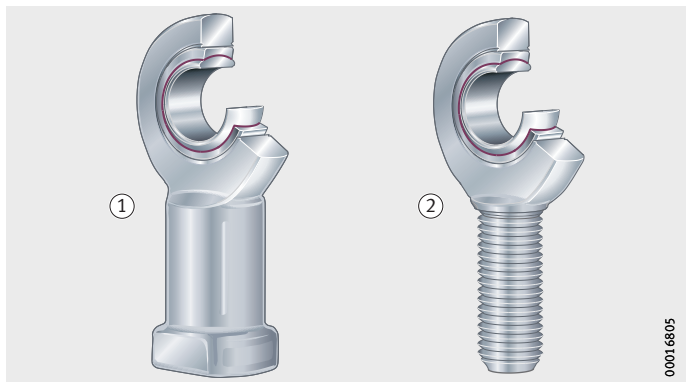
The sliding layer between the inner ring and outer ring is PTFE composite, ELGOGLIDE or PTFE film, see page 28.

Area of application Maintenance-free rod ends can support radial loads in a tensile or compressive direction. They are particularly suitable for slow movements with small to moderate swivel angles and unilateral loads. For alternating loads, rod ends with bearings of series GE..-UK-2RS(-2TS) and GE..-FW-2RS(-2TS) can be used.

Dimension series E Rod ends to DIN ISO 12240-4, dimension series E incorporate radial spherical plain bearings GE..-UK or GE..-UK-2RS(-2TS) and have a right or left internal or external thread, *Figure 1*. The sliding contact surfaces are hard chromium/PTFE composite or hard chromium/ELGOGLIDE. The thin walled design of the eye housing allows compact adjacent constructions. These rod ends are also available by agreement with radial spherical plain bearings GE..-FW or GE..-FW-2RS(-2TS) of dimension series G.

- ① With internal thread
- ② With external thread

Figure 1
Rod ends,
dimension series E

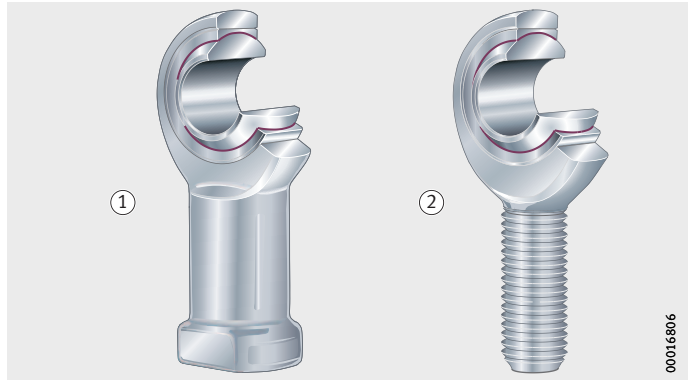


Dimension series K

Rod ends to DIN ISO 12240-4, dimension series K incorporate radial spherical plain bearings GE...PW and have a right hand or left hand internal or external thread, *Figure 2*. The sliding contact surface is steel/PTFE film.

- ① With internal thread
- ② With external thread

Figure 2
Rod ends,
dimension series K



Corrosion-resistant rod ends

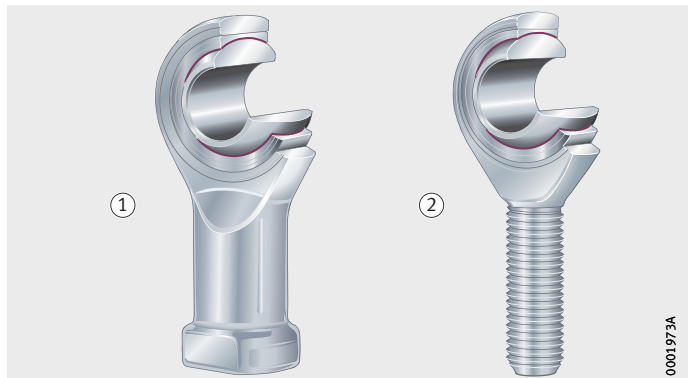
Corrosion-resistant rod ends to DIN ISO 12240-4, dimension series K incorporate radial spherical plain bearings GE...PS and have a right hand or left hand internal or external thread, *Figure 3*. The sliding contact surface comprises corrosion-resistant steel and corrosion-resistant PTFE film attached to the curved outer ring surface.

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 @.

Corrosion-resistant rod ends with an internal thread are also available with CETOP mounting dimensions to ISO 8139 for pneumatic cylinders. These are used in preference in control and automation engineering.

- ① With internal thread
- ② With external thread

Figure 3
Corrosion-resistant rod ends,
corrosion-resistant,
dimension series K



Rod ends, maintenance-free

Series, sliding layer, standard

Maintenance-free rod ends are designed according to their specific series with different sliding layers, see tables and page 28.

Series and design for sliding layer ELGOGLIDE or PTFE composite

Series	Thread	DIN ISO	Dimension series	Shaft d mm	
				over	incl.
GIR...-UK	Internal, right hand	12240-4	E, type F	6	30
GIR...-UK-2RS				17	80
GIR...-UK-2TS				30	80
GIL...-UK	Internal, left hand			6	30
GIL...-UK-2RS				17	80
GIL...-UK-2TS				30	80
GAR...-UK	External, right hand	12240-4	E, type M	6	30
GAR...-UK-2RS				17	80
GAR...-UK-2TS				30	80
GAL...-UK	External, left hand			6	30
GAL...-UK-2RS				17	80
GAL...-UK-2TS				30	80

Series and design for sliding layer PTFE film

Series	Thread	DIN ISO	Dimension series	Shaft d mm	
				over	incl.
GIKR...-PW	Internal, right hand	12240-4	K, type F	5	30
GIKSR...-PS					
GIKPR...-PW	Internal, right hand, fine pitch thread for standard pneumatic cylinders to DIN ISO 15552				
GIKPSR...-PS					
GIKL...-PW	Internal, left hand				
GIKSL...-PS					
GAKR...-PW	External, right hand	12240-4	K, type M	5	30
GAKSR...-PS					
GAKL...-PW	External, left hand				
GAKSL...-PS					

Materials Maintenance-free rod ends fulfil all the requirements in terms of fatigue and wear resistance, hardness, toughness and structural stability as well as maintenance-free operation.

Maintenance-free rod ends are manufactured from drop forged quenched and tempered steel C45 QT in accordance with DIN EN 10083-2 and have a zinc coated surface.

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.

Sealing Sealed rod ends of dimension series E have the suffix 2RS or 2TS. They are protected by lip seals on both sides against contaminants and water spray. Rod ends GIR..-UK-2TS, GIL..-UK-2TS, GAR..-UK-2TS and GAL..-UK-2TS are sealed on both sides by integrated, triple lip high performance seals.

Rod ends of dimension series K are not sealed.

Lubrication During the running-in phase, PTFE particles are transferred from the sliding layer to the opposing running surface. As a result, the small roughness features of the inner ring surface are filled in. It is only once this tribologically smooth surface is produced in conjunction with the detached PTFE particles that the bearings can achieve a long operating life.



Maintenance-free rod ends do not have relubrication facilities and must not be lubricated.

Any lubrication of maintenance-free rod ends after dry running-in will impair the smoothing effect necessary and will considerably reduce the operating life of the bearings.

Rod ends, maintenance-free

Operating temperature

The permissible operating temperature is dependent on the sliding contact surface and the sealing arrangement, see table.



If the temperature exceeds the stated values, there will be a reduction in the operating life and the effect of the sealing arrangement.

At temperatures below 0 °C, a reduction in the load carrying capacity of the rod ends must be taken into consideration.

Operating temperature

Series	Temperature °C		Reduced load carrying capacity °C from
	over	incl.	
GIR...-UK GIL...-UK GAR...-UK GAL...-UK	-50	+200	+100
GIR...-UK-2RS GIL...-UK-2RS GAR...-UK-2RS GAL...-UK-2RS	-30	+130	
GIR...-UK-2TS GIL...-UK-2TS GAR...-UK-2TS GAL...-UK-2TS	-30	+100	
GAKR...-PW, GAKL...-PW	-50	+200	
GIKSR...-PS, GIKPSR...-PS, GAKSR...-PS	-10	+80	+80

Special designs

The following are available by agreement:

- rod ends with special threads
- rod ends with different anti-corrosion protection.

Suffixes

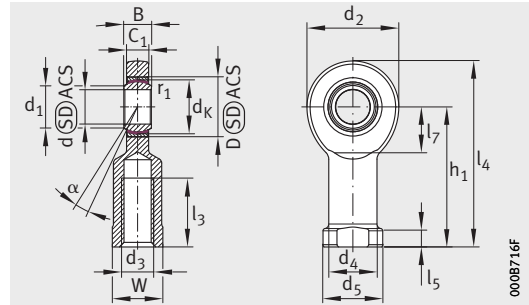
Suffixes for available designs: see table.

Available designs

Suffix	Description	Design
2RS	Standard lip seals on both sides	Standard
2TS	Triple lip high performance seals on both sides	
-	With special thread	Special design, available by agreement only
-	With different anti-corrosion protection	

Rod ends

With internal thread, maintenance-free
 DIN ISO 12240-4, dimension series E, type F
 Inner ring curved surface
 with hard chromium coating
 Open design



GIR...UK
 PTFE composite

Dimension table · Dimensions in mm

Designation ¹⁾	Mass m ≈kg	Dimensions									
		d	D	B	d _K	d ₁	d ₂	d ₃	d ₄	h ₁	C ₁
GIR6-UK	0,023	6_{-0,008}	14	6 _{-0,12}	10	8	21	M6	10	30	4,4
GIR8-UK	0,039	8_{-0,008}	16	8 _{-0,12}	13	10,2	24	M8	12,5	36	6
GIR10-UK	0,066	10_{-0,008}	19	9 _{-0,12}	16	13,2	29	M10	15	43	7
GIR12-UK	0,1	12_{-0,008}	22	10 _{-0,12}	18	14,9	34	M12	17,5	50	8
GIR15-UK	0,18	15_{-0,008}	26	12 _{-0,12}	22	18,4	40	M14	21	61	10
GIR17-UK	0,25	17_{-0,008}	30	14 _{-0,12}	25	20,7	46	M16	24	67	11
GIR20-UK	0,36	20_{-0,01}	35	16 _{-0,12}	29	24,2	53	M20×1,5	27,5	77	13
GIR25-UK	0,6	25_{-0,01}	42	20 _{-0,12}	35,5	29,3	64	M24×2	33,5	94	17
GIR30-UK	0,98	30_{-0,01}	47	22 _{-0,12}	40,7	34,2	73	M30×2	40	110	19

1) For a left hand thread, the R in the designation is replaced by an L, for example GIL6-UK.

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

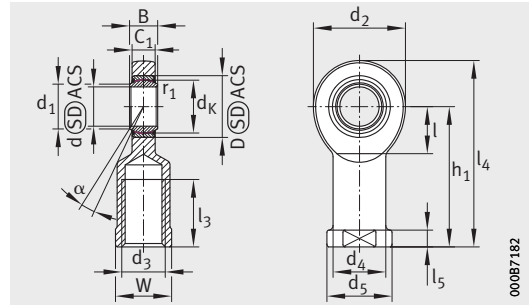
3) Basic load rating of housing.

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

							Chamfer dimension	Basic load ratings		Radial internal clearance ⁴⁾
$\alpha^{2)}$ °	l_3	l_4	l_5	l_7	d_5	W		r_1 min.	dyn. C_r N	
13	11	40,5	5	12	13	11	0,3	3 600	10 300	0 – 0,032
15	15	48	5	14	16	14	0,3	5 850	16 000	0 – 0,032
12	20	57,5	6,5	15	19	17	0,3	8 640	22 000	0 – 0,032
11	23	67	6,5	18	22	19	0,3	11 300	30 400	0 – 0,032
8	30	81	8	20	26	22	0,3	17 800	44 800	0 – 0,04
10	34	90	10	23	30	27	0,3	22 500	56 500	0 – 0,04
9	40	103,5	10	27	35	32	0,3	31 300	75 600	0 – 0,04
7	48	126	12	32	42	36	0,6	51 100	105 000	0 – 0,05
6	56	146,5	15	37	50	41	0,6	65 900	139 000	0 – 0,05

Rod ends

With internal thread, maintenance-free
 DIN ISO 12240-4, dimension series E, type F
 Inner ring curved surface
 with hard chromium coating
 Sealed



GIR...UK-2RS, GIR..-UK-2TS
 ELGOGLIDE

00/087182

Dimension table · Dimensions in mm

Designation ¹⁾		Mass m ≈kg	Dimensions								
			d	D	B	d _K	d ₁	d ₂	d ₃	d ₄	h ₁
GIR17-UK-2RS	–	0,25	17 _{-0,008}	30	14 _{-0,12}	25	20,7	46	M16	24	67
GIR20-UK-2RS	–	0,36	20 _{-0,01}	35	16 _{-0,12}	29	24,2	53	M20×1,5	27,5	77
GIR25-UK-2RS	–	0,65	25 _{-0,01}	42	20 _{-0,12}	35,5	29,3	64	M24×2	33,5	94
GIR30-UK-2RS	GIR30-UK-2TS	0,97	30 _{-0,01}	47	22 _{-0,12}	40,7	34,2	73	M30×2	40	110
GIR35-UK-2RS	GIR35-UK-2TS	1,43	35 _{-0,012}	55	25 _{-0,12}	47	39,8	82	M36×3	47	125
GIR40-UK-2RS	GIR40-UK-2TS	2,1	40 _{-0,012}	62	28 _{-0,12}	53	45	92	M39×3 ⁵⁾	52	142
GIR45-UK-2RS	GIR45-UK-2TS	2,7	45 _{-0,012}	68	32 _{-0,12}	60	50,8	102	M42×3 ⁵⁾	58	145
GIR50-UK-2RS	GIR50-UK-2TS	3,54	50 _{-0,012}	75	35 _{-0,12}	66	56	112	M45×3 ⁵⁾	62	160
GIR60-UK-2RS	GIR60-UK-2TS	5,6	60 _{-0,015}	90	44 _{-0,15}	80	66,8	135	M52×3 ⁵⁾	70	175
GIR70-UK-2RS	GIR70-UK-2TS	8,61	70 _{-0,015}	105	49 _{-0,15}	92	77,9	160	M56×4 ⁵⁾	80	200
GIR80-UK-2RS	GIR80-UK-2TS	13,2	80 _{-0,015}	120	55 _{-0,15}	105	89,4	180	M64×4 ⁵⁾	95	230

1) For a left hand thread, the R in the designation is replaced by an L, for example GIL17-UK-2RS.

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

3) Basic load rating of housing.

Attention!

In the case of rod ends with $d \geq 25$ mm and the sliding material ELGOGLIDE, the basic static load rating C_{0r} of the rod end is lower than the basic dynamic load rating C_r of the bearing.

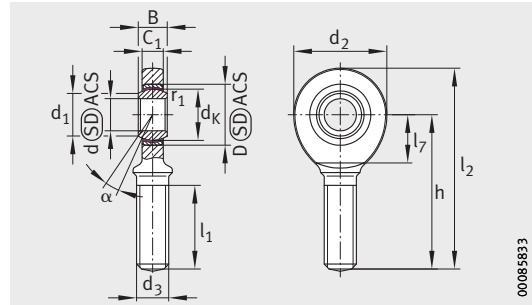
4) This differs from DIN ISO 12240-4, dimension series E.

5) Thread runout or thread groove at manufacturer's discretion.

								Chamfer dimension	Basic load ratings		Radial internal clearance ⁴⁾
C ₁	α ²⁾ °	l ₃	l ₄	l ₅	l ₇	d ₅	W		r ₁ min.	dyn. C _r N	
11	10	34	90	10	23	30	27	0,3	48 800	56 500	0 – 0,04
13	9	40	103,5	10	27	35	32	0,3	67 900	75 600	0 – 0,04
17	7	48	126	12	32	42	36	0,6	128 000	105 000	0 – 0,05
19	6	56	146,5	15	37	50	41	0,6	165 000	139 000	0 – 0,05
21	6	60	166	15	42	58	50	0,6	212 000	159 000	0 – 0,05
23	7	65	188	18	48	65	55	0,6	280 000	194 000	0 – 0,06
27	7	65	196	20	52	70	60	0,6	360 000	259 000	0 – 0,06
30	6	68	216	20	60	75	65	0,6	444 000	314 000	0 – 0,06
38	6	70	242,5	20	75	88	75	1	691 000	485 000	0 – 0,06
42	6	80	280	20	87	98	85	1	883 000	564 000	0 – 0,072
47	6	85	320	25	100	110	100	1	1 130 000	690 000	0 – 0,072

Rod ends

With external thread, maintenance-free
 DIN ISO 12240-4, dimension series E, type M
 Inner ring curved surface
 with hard chromium coating
 Open design



GAR..-UK
 PTFE composite

Dimension table · Dimensions in mm

Designation ¹⁾	Mass m ≈kg	Dimensions								
		d	D	B	d _K	d ₁	d ₂	d ₃	h	C ₁
GAR6-UK	0,018	6 _{-0,008}	14	6	10	8	21	M6	36	4,4
GAR8-UK	0,033	8 _{-0,008}	16	8	13	10,2	24	M8	42	6
GAR10-UK	0,056	10 _{-0,008}	19	9	16	13,2	29	M10	48	7
GAR12-UK	0,086	12 _{-0,008}	22	10	18	14,9	34	M12	54	8
GAR15-UK	0,15	15 _{-0,008}	26	12	22	18,4	40	M14	63	10
GAR17-UK	0,21	17 _{-0,008}	30	14	25	20,7	46	M16	69	11
GAR20-UK	0,33	20 _{-0,01}	35	16	29	24,2	53	M20×1,5	78	13
GAR25-UK	0,6	25 _{-0,01}	42	20	35,5	29,3	64	M24×2	94	17
GAR30-UK	0,95	30 _{-0,01}	47	22	40,7	34,2	73	M30×2	110	19

1) For a left hand thread, the R in the designation is replaced by an L, for example GAL6-UK.

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

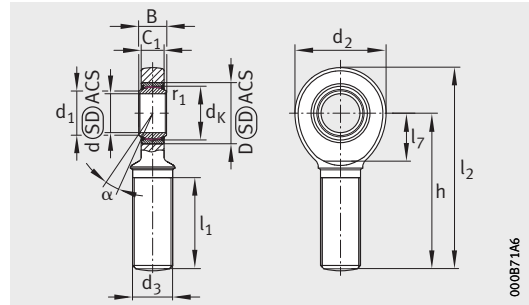
3) Basic load rating of housing.

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

				Chamfer dimension	Basic load ratings		Radial internal clearance ⁴⁾
$\alpha^{2)}$ °	l_1	l_2	l_7		r_1 min.	dyn. C_r N	
13	18	46,5	12	0,3	3 600	6 930	0 – 0,032
15	22	54	14	0,3	5 850	12 900	0 – 0,032
12	26	62,5	15	0,3	8 640	20 600	0 – 0,032
11	28	71	18	0,3	11 300	30 200	0 – 0,032
8	34	83	20	0,3	17 800	41 600	0 – 0,04
10	36	92	23	0,3	22 500	56 500	0 – 0,04
9	43	104,5	27	0,3	31 300	75 600	0 – 0,04
7	53	126	32	0,6	51 100	105 000	0 – 0,05
6	65	146,5	37	0,6	65 900	139 000	0 – 0,05

Rod ends

With external thread, maintenance-free
 DIN ISO 12240-4, dimension series E, type M
 Inner ring curved surface
 with hard chromium coating
 Sealed



GAR..-UK-2RS, GAR..-UK-2TS
 ELGOGLIDE

Dimension table · Dimensions in mm

Designation ¹⁾	Mass m ≈ kg	Dimensions								
		d	D	B	d _K	d ₁	d ₂	d ₃	h	
GAR17-UK-2RS	–	0,2	17 _{-0,008}	30	14 _{-0,12}	25	20,7	46	M16	69
GAR20-UK-2RS	–	0,33	20 _{-0,01}	35	16 _{-0,12}	29	24,2	53	M20×1,5	78
GAR25-UK-2RS	–	0,59	25 _{-0,01}	42	20 _{-0,12}	35,5	29,3	64	M24×2	94
GAR30-UK-2RS	GAR30-UK-2TS	0,93	30 _{-0,01}	47	22 _{-0,12}	40,7	34,2	73	M30×2	110
GAR35-UK-2RS	GAR35-UK-2TS	1,53	35 _{-0,012}	55	25 _{-0,12}	47	39,8	82	M36×3	140
GAR40-UK-2RS	GAR40-UK-2TS	1,97	40 _{-0,012}	62	28 _{-0,12}	53	45	92	M39×3	150
GAR45-UK-2RS	GAR45-UK-2TS	2,65	45 _{-0,012}	68	32 _{-0,12}	60	50,8	102	M42×3	163
GAR50-UK-2RS	GAR50-UK-2TS	3,53	50 _{-0,012}	75	35 _{-0,12}	66	56	112	M45×3	185
GAR60-UK-2RS	GAR60-UK-2TS	5,91	60 _{-0,015}	90	44 _{-0,15}	80	66,8	135	M52×3	210
GAR70-UK-2RS	GAR70-UK-2TS	8,51	70 _{-0,015}	105	49 _{-0,15}	92	77,9	160	M56×4	235
GAR80-UK-2RS	GAR80-UK-2TS	12,5	80 _{-0,015}	120	55 _{-0,15}	105	89,4	180	M64×4	270

1) For a left hand thread, the R in the designation is replaced by an L, for example GAL17-UK-2RS.

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

3) Basic load rating of housing.

Attention!

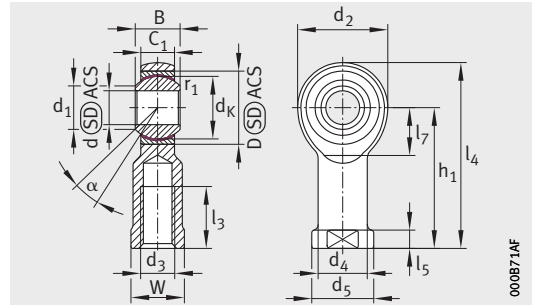
In the case of rod ends with $d \geq 25$ mm and the sliding material ELGOGLIDE, the basic static load rating C_{0r} of the rod end is lower than the basic dynamic load rating C_r of the bearing.

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

					Chamfer dimension	Basic load ratings		Radial internal clearance ⁴⁾
C ₁	α ²⁾ °	l ₁	l ₂	l ₇		r ₁ min.	dyn. C _r N	
11	10	36	92	23	0,3	48 800	56 500	0 – 0,04
13	9	43	104,5	27	0,3	67 900	75 600	0 – 0,04
17	7	53	126	32	0,6	128 000	105 000	0 – 0,05
19	6	65	146,5	37	0,6	165 000	139 000	0 – 0,05
21	6	82	181	42	0,6	212 000	159 000	0 – 0,05
23	7	86	196	48	0,6	280 000	194 000	0 – 0,06
27	7	94	214	52	0,6	360 000	259 000	0 – 0,06
30	6	107	241	60	0,6	444 000	314 000	0 – 0,06
38	6	115	277,5	75	1	691 000	485 000	0 – 0,06
42	6	125	315	87	1	883 000	564 000	0 – 0,072
47	6	140	360	100	1	1 130 000	690 000	0 – 0,072

Rod ends

With internal thread, maintenance-free
DIN ISO 12240-4, dimension series K, type F
Brass outer ring
Open design



GIKR...-PW, GIKPR...-PW
PTFE film

Dimension table · Dimensions in mm

Designation ¹⁾²⁾	Mass m ≈ kg	Dimensions							
		d H7	D	B	d _K	d ₁	d ₂	d ₃	d ₄
GIKR6-PW ⁶⁾	0,028	6 +0,012	16	9 ^{-0,12}	12,7	9	20	M6	10
GIKR8-PW ⁶⁾	0,05	8 +0,015	19	12 ^{-0,12}	15,875	10,4	24	M8	12,5
GIKR10-PW GIKPR10-PW ⁶⁾	0,08	10 +0,015	22	14 ^{-0,12}	19,05	12,9	28	M10 M10×1,25	15
GIKR12-PW GIKPR12-PW ⁶⁾	0,12	12 +0,018	26	16 ^{-0,12}	22,225	15,4	32	M12 M12×1,25	17,5
GIKR14-PW	0,18	14 +0,018	28 ⁵⁾	19 ^{-0,12}	25,4	16,9	36	M14	21
GIKR16-PW GIKPR16-PW ⁶⁾	0,24	16 +0,018	32	21 ^{-0,12}	28,575	19,4	42	M16 M16×1,5	22
GIKR20-PW ⁶⁾	0,43	20 +0,021	40	25 ^{-0,12}	34,925	24,4	50	M20×1,5	27,5
GIKR25-PW ⁶⁾	0,73	25 +0,021	47	31 ^{-0,12}	42,85	29,6	60	M24×2	33,5
GIKR30-PW GIKPR30-PW ⁶⁾	1,17	30 +0,021	55	37 ^{-0,12}	50,8	34,8	70	M30×2 M27×2	40

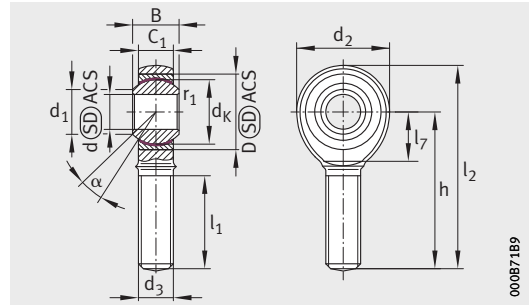
Other dimensions by agreement.

- 1) For a left hand thread, the R in the designation is replaced by an L, for example GIKL6-PW.
- 2) Series GIKPR...-PW has a fine pitch thread connector for standard pneumatic cylinders to DIN ISO 15552 (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.
- 6) In accordance with ISO 8139.

									Chamfer dimension	Basic load ratings		Radial internal clearance ⁵⁾
h_1	C_1	$\alpha^{3)}$ °	l_3	l_4	l_5	l_7	d_5	W		r_1 min.	dyn. C_r N	
30	6,75	13	12	40	5	11	13	11	0,3	7 750	7 990	0 – 0,035
36	9	14	16	48	5	13	16	14	0,3	12 900	13 100	0 – 0,035
43	10,5	13	20	57	6,5	15	19	17	0,3	18 100	18 500	0 – 0,035
50	12	13	22	66	6,5	17	22	19	0,3	24 000	20 800	0 – 0,035
57	13,5	16	25	75	8	18	26	22	0,3	31 000	32 000	0 – 0,035
64	15	15	28	85	8	23	28	22	0,3	38 600	45 300	0 – 0,035
77	18	14	33	102	10	26	35	30	0,3	56 600	45 600	0 – 0,035
94	22	15	42	124	12	32	42	36	0,3	84 800	72 900	0 – 0,035
110	25	17	51	145	15	37	50	41	0,3	114 000	95 900	0 – 0,035

Rod ends

With external thread, maintenance-free
 DIN ISO 12240-4, dimension series K, type M
 Brass outer ring
 Open design



GAKR...-PW
 PTFE film

Dimension table - Dimensions in mm

Designation ¹⁾	Mass m ≈kg	Dimensions						
		d H7	D	B	d _K	d ₁	d ₂	d ₃
GAKR6-PW	0,022	6 +0,012	16	9 _{-0,12}	12,7	9	20	M6
GAKR8-PW	0,042	8 +0,015	19	12 _{-0,12}	15,875	10,4	24	M8
GAKR10-PW	0,069	10 +0,015	22	14 _{-0,12}	19,05	12,9	28	M10
GAKR12-PW	0,11	12 +0,018	26	16 _{-0,12}	22,225	15,4	32	M12
GAKR14-PW	0,16	14 +0,018	28 ⁴⁾	19 _{-0,12}	25,4	16,9	36	M14
GAKR16-PW	0,23	16 +0,018	32	21 _{-0,12}	28,575	19,4	42	M16
GAKR20-PW	0,39	20 +0,021	40	25 _{-0,12}	34,925	24,4	50	M20×1,5
GAKR25-PW	0,67	25 +0,021	47	31 _{-0,12}	42,85	29,6	60	M24×2
GAKR30-PW	1,1	30 +0,021	55	37 _{-0,12}	50,8	34,8	70	M30×2

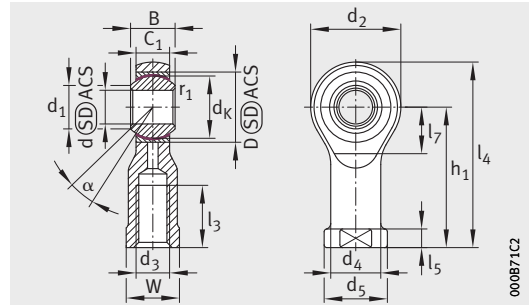
Other dimensions by agreement.

- 1) For a left hand thread, the R in the designation is replaced by an L, for example GAKL6-PW.
- 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	Basic load ratings		Radial internal clearance ⁴⁾
h	C ₁	α ²⁾ °	l ₁	l ₂	l ₇		r ₁ min.	dyn. C _r N	
36	6,75	13	21	46	–	0,3	7 750	6 930	0 – 0,035
42	9	14	25	54	–	0,3	12 900	12 900	0 – 0,035
48	10,5	13	28	62	–	0,3	18 100	18 500	0 – 0,035
54	12	13	32	70	–	0,3	24 000	20 800	0 – 0,035
60	13,5	16	36	78	18	0,3	31 000	32 000	0 – 0,035
66	15	15	37	87	23	0,3	38 600	45 300	0 – 0,035
78	18	14	45	103	26	0,3	56 600	45 600	0 – 0,035
94	22	15	55	124	32	0,3	84 800	72 900	0 – 0,035
110	25	17	66	145	37	0,3	114 000	95 900	0 – 0,035

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) No relubrication facility.

2) Series GIKPSR...PS has a fine pitch thread connector for standard pneumatic cylinders to DIN ISO 15552 (right hand thread only).

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

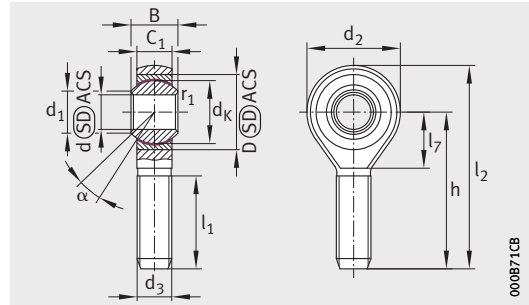
4) Basic load rating of housing.

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

								Chamfer dimension	Basic load ratings		Radial internal clearance ⁵⁾
C ₁	α ³⁾ °	l ₃ min.	l ₄	l ₅ ≈	l ₇ min.	d ₅	W		r ₁ min.	dyn. C _r 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

000B71CB

Dimension table · Dimensions in mm

Designation ¹⁾	Mass m ≈kg	Dimensions							
		d H7	D	B	d _K	d ₁	d ₂ max.	d ₃	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	Basic load ratings		Radial internal clearance ⁴⁾
C ₁	α ²⁾ °	l ₁	l ₂	l ₇		r ₁ min.	dyn. C _r 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

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