SCHAEFFLER

Schaeffler Aerospace Standard Products

We pioneer motion

Contents

1 Foreword

1.1 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 requirements according to AS9100. Our customers are world renowned manufacturers of airplanes, landing gear, passenger seats, actuation systems, and other equipment parts.

Our products are used in a wide range of applications in the aviation and aerospace industry. Our worldwide customer base, which includes all the renowned manufacturers of aircraft engines, helicopters, turbopumps, space systems, and parts of the medical technology sector, not only appreciates the quality of the products we manufacture, but also 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 aviation and aerospace quality standards
- cost savings through the use of standard production
- short delivery times
- wide product range
- customer-specific products
- high delivery reliability
- more than 50 years of aviation and aerospace expertise
- direct communication with customer service

Certifications

Schaeffler Aerospace is certified by the following civil aviation authorities:

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

1.2 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.

1 Failure categories

Category	Description
CAT0	Parts in subordinate functions that do not compromise the success of the flight or mission
CAT1	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)
CAT2	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)

1.3 Further information

More detailed information on the technical principles and product data for the standard products presented in this catalog can be found in the following documents.

- Catalog HR1, Rolling Bearings,
  Technical principles and product data for the design of rolling bearing arrangements
  Link:https://www.schaeffler.de/en/news_media/media_library/?filter=searchString:hr1&tab=mediathek-pub&uid=386195&subfilter=app:dc;language-vid:167;language-pub:167;mediatyp-pub:all;referencetyp-pub:0
- Catalog HG1, Plain Bearings
  Spherical plain bearings, Rod ends, Plain bushes, Thrust washers, strips
  Link: https://www.schaeffler.de/en/news_media/media_library/?filter=searchString:HG1&tab=mediathek-pub&uid=55235521&subfilter=app:dc;language-vid:167;language-pub:167;mediatyp-pub:all;referencetyp-pub:0

HR1 Rolling Bearings — Catalog HR1 is a fundamental information, selection, and advisory tool for technical issues relating to the wide-ranging field of rotary rolling bearings. It has become established worldwide as an important engineering compendium for the calculation and design of rolling bearing arrangements. It describes the rolling bearings in accordance with DIN EN ISO that are required for original equipment manufacture, distribution and the aftermarket, specific rolling bearing accessories, and further rolling bearing types and design variants.

HG1 Plain Bearings — Catalog HG1 contains radial, angular contact, and axial spherical plain bearings, rod ends, metal/polymer composite plain bearings in the form of plain bushes, thrust washers, and strips as well as ELGOTEX plain bushes and other plain bearings. 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 crowned outer slideway, they can perform spatial adjustment motions. The bearings can support static loads and are suitable for tilting 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.

medias — Under the name medias, Schaeffler publishes electronic media for the designer. The medias product catalog contains the entire range of rolling bearings, plain bearings, and linear systems, including the technical principles and comprehensive product descriptions.

In the medias product catalog, you can calculate the selected products to catalog standard and transfer these to your CAD drawing. Application examples show you how the requirements of bearing arrangements can be successfully fulfilled using INA and FAG products. Naturally our Application Engineering personnel and the Engineering Service will be pleased to support you in the selection of rolling bearings or linear guidance systems and assist you in the preparation of installation proposals.

Link: https://medias.schaeffler.de/en

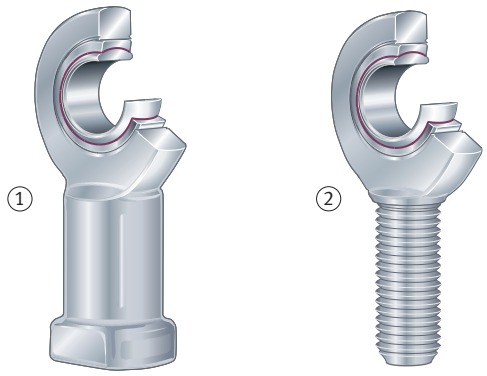
2 Rod ends

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 made up of PTFE composite, ELGOGLIDE, or PTFE film.

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.

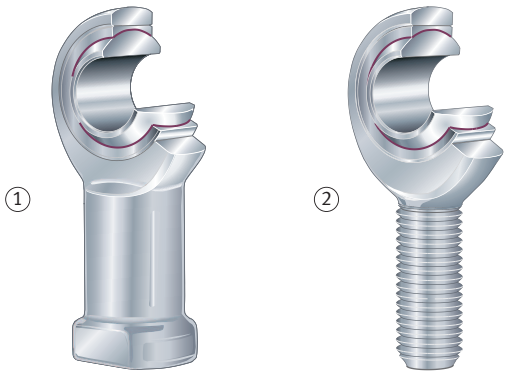
Rod ends to DIN ISO 12240-4, dimension series E, incorporate radial spherical plain bearings GE..-UK or GE..-UK-2RS(-2TS) and have a right or left hand internal or external thread. The sliding contact surfaces are hard chromium/PTFE composite or hard chromium/ELGOGLIDE. The thin walled design of the 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 Rod ends, dimension series E

1	With internal thread	2	With external thread

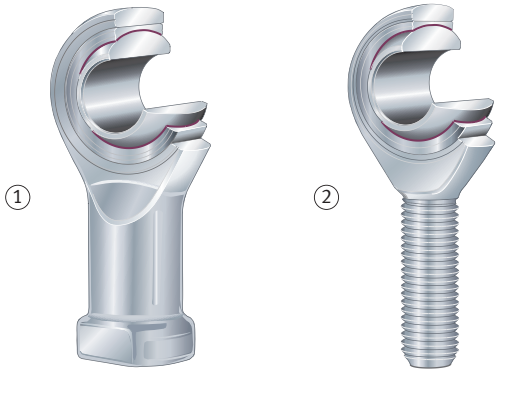
Rod ends to DIN ISO 12240-4, dimension series K, incorporate radial spherical plain bearings GE..-PW and have a right or left hand internal or external thread. The sliding contact surface is steel/PTFE film.



2 Rod ends, dimension series K

1	With internal thread	2	With external thread

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 e. 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.



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

1	With internal thread	2	With external thread

2.1 Clarification of product tables

a	mm	Contact cone apex spacing
A	mm	Flange width
b	mm	Extraction slot width
B	mm	Inner ring width
B	mm	Width
B_1	mm	Width over thrust washers
B_1	mm	Flange thickness
B_1	mm	Width, shaft locating washer, long
B_2	mm	Effective pin/stud length
B_2	mm	Shoulder width, shaft locating washer, long
B_3	mm	Lubrication hole spacing
B_e	mm	Eccentric collar width
B_{tol}	mm	Inner ring width, deviation

B_{UT}	mm	Inner ring width, lower deviation
C	mm	Outer ring width
C_{0a}	N	Basic static load rating, axial
C_{0r}	N	Basic static load rating, radial
$C_{0r\,w}$	N	Basic static load rating, radial
C_1	mm	Width of rod end eye housing
C_1	mm	Outer ring projection relative to thrust washer
C_1	mm	Lubrication hole spacing
C_a	N	Basic dynamic load rating, axial
c_{aL}	N/µm	Axial rigidity
c_{kL}	Nm/mrad	Tilting rigidity
C_r	N	Basic dynamic load rating, radial
$C_{r\,w}$	N	Basic dynamic load rating, radial
C_{tol}	mm	Outer ring width, deviation
C_{ua}	N	Fatigue limit load, axial
C_{ur}	N	Fatigue limit load, radial
$C_{ur\,w}$	N	Fatigue limit load, radial
d	mm	Bearing bore diameter
d	mm	Bore diameter
D	mm	Bearing outside diameter
D	inch or mm	Outside diameter
d_1	mm	Outside flange diameter, inner ring
d_1	mm	Fit diameter of roller stud/pin
d_1	mm	Rib diameter, inner ring
d_1	mm	Lubrication hole diameter
D_1	mm	Bore diameter, housing locating washer
D_1	mm	Rib diameter, outer ring
D_1	mm	Flange diameter
D_1	mm	Rib diameter, shaft locating washer
d_2		Thread size
d_2	mm	Outside eye diameter
d_2	mm	Shank diameter
d_2	mm	Shank diameter, large
d_2	mm	Outside diameter, thrust washer
d_2	mm	Locating diameter, thrust washer
d_2	mm	Groove diameter, inner ring
d_2	mm	Diameter, fixing holes
D_2	mm	Groove diameter, outer ring
D_2	mm	Shoulder diameter, shaft locating washer, long
d_3	mm	End face diameter of shaft locating washer
d_3	mm	Lubrication hole diameter
D_3	mm	Groove diameter, narrow lateral face of outer ring
D_3	mm	Outside diameter, shaft locating washer, long
d_a	mm	Abutment diameter, shaft shoulder
d_a	mm	Abutment diameter, shaft
D_a	mm	Housing shoulder diameter
D_a	mm	Abutment diameter, housing
$d_{a\,max}$	mm	Max. mounting dimension, inner ring
$D_{a\,min}$	mm	Min. housing mounting diameter
D_b	mm	Abutment diameter, outside, width S
$d_{b\,max}$	mm	Max. mounting dimension, inner ring
$D_{b\,min}$	mm	Min. mounting diameter
d_e	mm	Eccentric collar diameter
d_K	mm	Ball diameter
d_{tol}	mm	Bearing bore diameter, deviation
D_{tol}	mm	Bearing outside diameter, deviation
D_{UT}	mm	Bearing bore diameter, lower deviation
e	mm	Eccentricity
F	mm	Raceway diameter, inner ring
$F_{0r\,per}$	N	Permissible static radial load

$F_{r\,per}$	N	Outer ring limit load
F_W		Needle enveloping circle with tolerance class F6
G		Thread
$G_{r\,max}$	mm	Max. radial internal clearance
$G_{r\,min}$	mm	Min. radial internal clearance
h	mm	Shank length, external thread rod
H		Main load direction
H	mm	Height
H_1	mm	Outer ring height over shaft locating washer
I	mm	Extraction slot spacing
l_1	mm	Thread length, external thread
l_2	mm	Total length, external thread rod
l_3	mm	Thread length, internal thread
l_4	mm	Total length, internal thread on rod
l_5	mm	Flange length, rod end shank
l_7	mm	Hole spacing at start of shaft
J	mm	Pitch circle diameter, fixing holes
l_G	mm	Thread length
m	kg or lbs	Mass
M_A	Nm	Tightening torque
M_A	Nm	Tightening torque for the recommended INA precision locknuts
M_m	$kg \cdot cm^2$	Mass moment of inertia
M_R	Nm	Bearing frictional torque
n		Number of screw mounting holes
n		Number of fixing screws
n_a		Number of bores in the adjacent construction
n_a		Number of fixing screws
$n_{D\,G}$	min^{-1}	Speed during continuous operation with grease lubrication
n_G	min^{-1}	Limiting speed
n_δ	min^{-1}	Thermally safe operating speed
$n_{\delta r}$	min^{-1}	Speed rating
$r_{1\,min}$	mm	Min. chamfer dimension
$r_{2\,min}$	mm	Min. chamfer dimension
$r_{a\,max}$	mm	Max. undercut radius
$r_{a1\,max}$	mm	Max. undercut radius
r_{min}	mm	Min. chamfer dimension
s	mm	End face spacing
t	°	Pitch angle, fixing holes
t	°	Contact angle
T	mm	Height
t_1	mm	Positional tolerance of bore in housing
t_a	°	Pitch angle of bores in the adjacent construction
T_{tol}	mm	Height, deviation
W	mm	Width across flats
W	mm	Width across flats, nominal dimension for hexagonal socket
α	°	Tilt angle

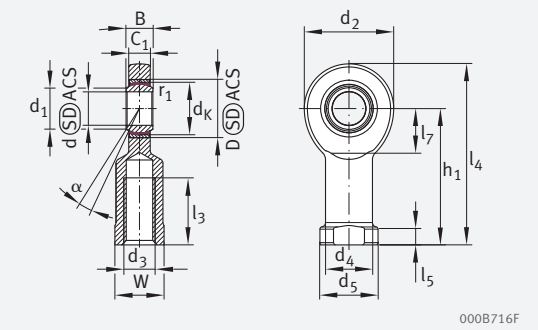
2.2 GIR..-UK

With internal thread, maintenance-free

DIN ISO 12240-4, type F

Inner ring curved surface with hard chromium coating

Open design



GIR..-UK (PTFE composite)

Designation	m	d	d_{UT}	D	B	B_{UT}	d_K	d_1	d_2	d_3	d_4
	kg	mm	mm	mm	mm	mm	mm	mm	mm		mm
GIR6-UK	0.023	6	–0.008	14	6	–0.12	10	8	21	M6	10
GIR8-UK	0.039	8	–0.008	16	8	–0.12	13	10.2	24	M8	12.5
GIR10-UK	0.066	10	–0.008	19	9	–0.12	16	13.2	29	M10	15
GIR12-UK	0.1	12	–0.008	22	10	–0.12	18	14.9	34	M12	17.5
GIR15-UK	0.18	15	–0.008	26	12	–0.12	22	18.4	40	M14	21
GIR17-UK	0.25	17	–0.008	30	14	–0.12	25	20.7	46	M16	24
GIR20-UK	0.36	20	–0.01	35	16	–0.12	29	24.2	53	M20×1.5	27.5
GIR25-UK	0.6	25	–0.01	42	20	–0.12	35.5	29.3	64	M24×2	33.5
GIR30-UK	0.98	30	–0.01	47	22	–0.12	40.7	34.2	73	M30×2	40

h_1	C_1	α	l_3	l_4	l_5	l_7	d_5	W	$r_{1\ min}$	C_r	C_{0r}	$G_{r\ min}$	$G_{r\ max}$
mm	mm	°	mm	mm	mm	mm	mm	mm	mm	N	N	mm	mm
30	4.4	13	11	40.5	5	12	13	11	0.3	3600	10300	0	0.032
36	6	15	15	48	5	14	16	14	0.3	5850	16000	0	0.032
43	7	12	20	57.5	6.5	15	19	17	0.3	8640	22000	0	0.032
50	8	11	23	67	6.5	18	22	19	0.3	11300	30400	0	0.032
61	10	8	30	81	8	20	26	22	0.3	17800	44800	0	0.04
67	11	10	34	90	10	23	30	27	0.3	22500	56500	0	0.04
77	13	9	40	103.5	10	27	35	32	0.3	31300	75600	0	0.04
94	17	7	48	126	12	32	42	36	0.6	51100	105000	0	0.05
110	19	6	56	146.5	15	37	50	41	0.6	65900	139000	0	0.05

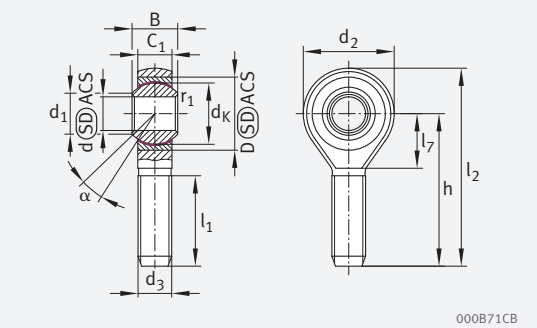
2.3 GIR..-UK-2RS, GIR..-UK-2TS

With internal thread, maintenance-free

DIN ISO 12240-4, type F

Inner ring curved surface with hard chromium coating

Sealed



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

Designation	m	d	d_{UT}	D	B	B_{UT}	d_K	d_1	d_2	d_3	d_4
	kg	mm	mm	mm	mm	mm	mm	mm	mm		mm
GIR17-UK-2RS	0.25	17	–0.008	30	14	–0.12	25	20.7	46	M16	24
GIR20-UK-2RS	0.36	20	–0.01	35	16	–0.12	29	24.2	53	M20×1.5	27.5
GIR25-UK-2RS	0.65	25	–0.01	42	20	–0.12	35.5	29.3	64	M24×2	33.5
GIR30-UK-2RS	0.97	30	–0.01	47	22	–0.12	40.7	34.2	73	M30×2	40
GIR30-UK-2TS	0.97	30	–0.01	47	22	–0.12	40.7	34.2	73	M30×2	40
GIR35-UK-2RS	1.43	35	–0.012	55	25	–0.12	47	39.8	82	M36×3	47
GIR35-UK-2TS	1.43	35	–0.012	55	25	–0.12	47	39.8	82	M36×3	47
GIR40-UK-2RS	2.1	40	–0.012	62	28	–0.12	53	45	92	M39×3	52
GIR40-UK-2TS	2.1	40	–0.012	62	28	–0.12	53	45	92	M39×3	52
GIR45-UK-2TS	2.7	45	–0.012	68	32	–0.12	60	50.8	102	M42×3	58
GIR45-UK-2RS	2.7	45	–0.012	68	32	–0.12	60	50.8	102	M42×3	58
GIR50-UK-2RS	3.54	50	–0.012	75	35	–0.12	66	56	112	M45×3	62
GIR50-UK-2TS	3.54	50	–0.012	75	35	–0.12	66	56	112	M45×3	62
GIR60-UK-2TS	5.6	60	–0.015	90	44	–0.15	80	66.8	135	M52×3	70
GIR60-UK-2RS	5.6	60	–0.015	90	44	–0.15	80	66.8	135	M52×3	70
GIR70-UK-2RS	8.61	70	–0.015	105	49	–0.15	92	77.9	160	M56×4	80
GIR70-UK-2TS	8.61	70	–0.015	105	49	–0.15	92	77.9	160	M56×4	80
GIR80-UK-2RS	13.2	80	–0.015	120	55	–0.15	105	89.4	180	M64×4	95
GIR80-UK-2TS	13.2	80	–0.015	120	55	–0.15	105	89.4	180	M64×4	95

h_1	C_1	α	l_3	l_4	l_5	l_7	d_5	W	$r_{1\ min}$	C_r	C_{0r}	$G_{r\ min}$	$G_{r\ max}$
mm	mm	°	mm	mm	mm	mm	mm	mm	mm	N	N	mm	mm
67	11	10	34	90	10	23	30	27	0.3	48800	56500	0	0.04
77	13	9	40	103.5	10	27	35	32	0.3	67900	75600	0	0.04
94	17	7	48	126	12	32	42	36	0.6	128000	105000	0	0.05
110	19	6	56	146.5	15	37	50	41	0.6	165000	139000	0	0.05
110	19	6	56	146.5	15	37	50	41	0.6	165000	139000	0	0.05
125	21	6	60	166	15	42	58	50	0.6	212000	159000	0	0.05
125	21	6	60	166	15	42	58	50	0.6	212000	159000	0	0.05
142	23	7	65	188	18	48	65	55	0.6	280000	194000	0	0.06
142	23	7	65	188	18	48	65	55	0.6	280000	194000	0	0.06
145	27	7	65	196	20	52	70	60	0.6	360000	259000	0	0.06
145	27	7	65	196	20	52	70	60	0.6	360000	259000	0	0.06
160	30	6	68	216	20	60	75	65	0.6	444000	314000	0	0.06
160	30	6	68	216	20	60	75	65	0.6	444000	314000	0	0.06
175	38	6	70	242.5	20	75	88	75	1	691000	485000	0	0.06
175	38	6	70	242.5	20	75	88	75	1	691000	485000	0	0.06
200	42	6	80	280	20	87	98	85	1	883000	564000	0	0.072
200	42	6	80	280	20	87	98	85	1	883000	564000	0	0.072
230	47	6	85	320	25	100	110	100	1	1130000	690000	0	0.072
230	47	6	85	320	25	100	110	100	1	1130000	690000	0	0.072

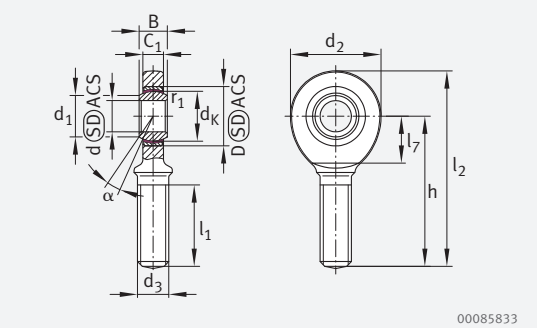
2.4 GAR..-UK

With external thread, maintenance-free

DIN ISO 12240-4, type M

Inner ring curved surface with hard chromium coating

Open design



GAR..-UK (PTFE composite)

Designation	m	d	d_{UT}	D	B	B_{UT}	d_K	d_1	d_2	d_3
	kg	mm	mm	mm	mm	mm	mm	mm	mm	
GAR6-UK	0.018	6	–0.008	14	6	–0.12	10	8	21	M6
GAR8-UK	0.033	8	–0.008	16	8	–0.12	13	10.2	24	M8
GAR10-UK	0.056	10	–0.008	19	9	–0.12	16	13.2	29	M10
GAR12-UK	0.086	12	–0.008	22	10	–0.12	18	14.9	34	M12
GAR15-UK	0.15	15	–0.008	26	12	–0.12	22	18.4	40	M14
GAR17-UK	0.21	17	–0.008	30	14	–0.12	25	20.7	46	M16
GAR20-UK	0.33	20	–0.01	35	16	–0.12	29	24.2	53	M20×1.5
GAR25-UK	0.6	25	–0.01	42	20	–0.12	35.5	29.3	64	M24×2
GAR30-UK	0.95	30	–0.01	47	22	–0.12	40.7	34.2	73	M30×2

h	C_1	α	l_1	l_2	l_7	$r_{1\ min}$	C_r	C_{0r}	$G_{r\ min}$	$G_{r\ max}$
mm	mm	°	mm	mm	mm	mm	N	N	mm	mm
36	4.4	13	18	46.5	12	0.3	3600	6930	0	0.032
42	6	15	22	54	14	0.3	5850	12900	0	0.032
48	7	12	26	62.5	15	0.3	8640	20600	0	0.032
54	8	11	28	71	18	0.3	11300	30200	0	0.032
63	10	8	34	83	20	0.3	17800	41600	0	0.04
69	11	10	36	92	23	0.3	22500	56500	0	0.04
78	13	9	43	104.5	27	0.3	31300	75600	0	0.04
94	17	7	53	126	32	0.6	51100	105000	0	0.05
110	19	6	65	146.5	37	0.6	65900	139000	0	0.05

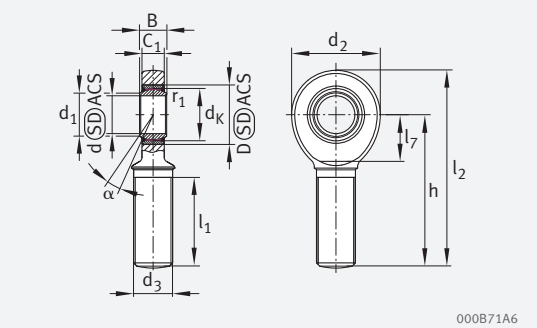
2.5 GAR..-UK-2RS, GAR..-UK-2TS

With external thread, maintenance-free

DIN ISO 12240-4, type M

Inner ring curved surface with hard chromium coating

Sealed



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

Designation	m	d	d_{UT}	D	B	B_{UT}	d_K	d_1	d_2
	kg	mm	mm	mm	mm	mm	mm	mm	mm
GAR17-UK-2RS	0.2	17	–0.008	30	14	–0.12	25	20.7	46
GAR20-UK-2RS	0.33	20	–0.01	35	16	–0.12	29	24.2	53
GAR25-UK-2RS	0.59	25	–0.01	42	20	–0.12	35.5	29.3	64
GAR30-UK-2TS	0.93	30	–0.01	47	22	–0.12	40.7	34.2	73
GAR30-UK-2RS	0.93	30	–0.01	47	22	–0.12	40.7	34.2	73
GAR35-UK-2TS	1.53	35	–0.012	55	25	–0.12	47	39.8	82
GAR35-UK-2RS	1.53	35	–0.012	55	25	–0.12	47	39.8	82
GAR40-UK-2TS	1.97	40	–0.012	62	28	–0.12	53	45	92
GAR40-UK-2RS	1.97	40	–0.012	62	28	–0.12	53	45	92
GAR45-UK-2RS	2.65	45	–0.012	68	32	–0.12	60	50.8	102
GAR45-UK-2TS	2.65	45	–0.012	68	32	–0.12	60	50.8	102
GAR50-UK-2TS	3.53	50	–0.012	75	35	–0.12	66	56	112
GAR50-UK-2RS	3.53	50	–0.012	75	35	–0.12	66	56	112
GAR60-UK-2RS	5.91	60	–0.015	90	44	–0.15	80	66.8	135
GAR60-UK-2TS	5.91	60	–0.015	90	44	–0.15	80	66.8	135
GAR70-UK-2TS	8.51	70	–0.015	105	49	–0.15	92	77.9	160
GAR70-UK-2RS	8.51	70	–0.015	105	49	–0.15	92	77.9	160
GAR80-UK-2RS	12.5	80	–0.015	120	55	–0.15	105	89.4	180
GAR80-UK-2TS	12.5	80	–0.015	120	55	–0.15	105	89.4	180

d_3	h	C_1	α	l_1	l_2	l_7	$r_{1\ min}$	C_r	C_{0r}	$G_{r\ min}$	$G_{r\ max}$
	mm	mm	°	mm	mm	mm	mm	N	N	mm	mm
M16	69	11	10	36	92	23	0.3	48800	56500	0	0.04
M20×1.5	78	13	9	43	104.5	27	0.3	67900	75600	0	0.04
M24×2	94	17	7	53	126	32	0.6	128000	105000	0	0.05
M30×2	110	19	6	65	146.5	37	0.6	165000	139000	0	0.05
M30×2	110	19	6	65	146.5	37	0.6	165000	139000	0	0.05
M36×3	140	21	6	82	181	42	0.6	212000	159000	0	0.05
M36×3	140	21	6	82	181	42	0.6	212000	159000	0	0.05
M39×3	150	23	7	86	196	48	0.6	280000	194000	0	0.06
M39×3	150	23	7	86	196	48	0.6	280000	194000	0	0.06
M42×3	163	27	7	94	214	52	0.6	360000	259000	0	0.06
M42×3	163	27	7	94	214	52	0.6	360000	259000	0	0.06
M45×3	185	30	6	107	241	60	0.6	444000	314000	0	0.06
M45×3	185	30	6	107	241	60	0.6	444000	314000	0	0.06
M52×3	210	38	6	115	277.5	75	1	691000	485000	0	0.06
M52×3	210	38	6	115	277.5	75	1	691000	485000	0	0.06
M56×4	235	42	6	125	315	87	1	883000	564000	0	0.072
M56×4	235	42	6	125	315	87	1	883000	564000	0	0.072
M64×4	270	47	6	140	360	100	1	1130000	690000	0	0.072
M64×4	270	47	6	140	360	100	1	1130000	690000	0	0.072

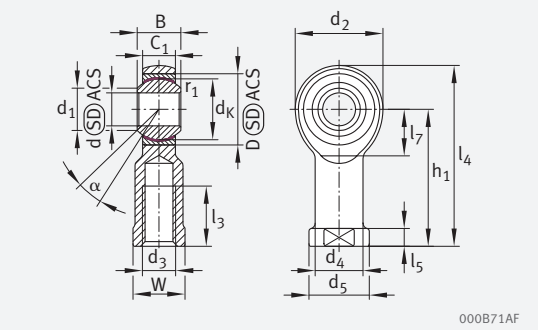
2.6 GIKR..-PW, GIKPR..-PW

With internal thread, maintenance-free

DIN ISO 12240-4, type F

Brass outer ring

Open design



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

Designation	m	d H7	d_{UT}	D	B	B_{UT}	d_K	d_1	d_2	d_3	d_4
	kg	mm	mm	mm	mm	mm	mm	mm	mm		mm
GIKR6-PW	0.028	6	0.012	16	9	–0.12	12.7	9	20	M6	10
GIKR8-PW	0.05	8	0.015	19	12	–0.12	15.875	10.4	24	M8	12.5
GIKPR10-PW	0.08	10	0.015	22	14	–0.12	19.05	12.9	28	M10×1.25	15
GIKR10-PW	0.08	10	0.015	22	14	–0.12	19.05	12.9	28	M10	15
GIKR12-PW	0.12	12	0.018	26	16	–0.12	22.225	15.4	32	M12	17.5
GIKPR12-PW	0.12	12	0.018	26	16	–0.12	22.225	15.4	32	M12×1.25	17.5
GIKR14-PW	0.18	14	0.018	28	19	–0.12	25.4	16.9	36	M14	21
GIKPR16-PW	0.24	16	0.018	32	21	–0.12	28.575	19.4	42	M16×1.5	22
GIKR16-PW	0.24	16	0.018	32	21	–0.12	28.575	19.4	42	M16	22
GIKR20-PW	0.43	20	0.021	40	25	–0.12	34.925	24.4	50	M20×1.5	27.5
GIKR25-PW	0.73	25	0.021	47	31	–0.12	42.85	29.6	60	M24×2	33.5
GIKR30-PW	1.17	30	0.021	55	37	–0.12	50.8	34.8	70	M30×2	40
GIKPR30-PW	1.17	30	0.021	55	37	–0.12	50.8	34.8	70	M27×2	40

h_1	C_1	α	l_3	l_4	l_5	l_7	d_5	W	$r_{1\ min}$	C_r	C_{0r}	$G_{r\ min}$	$G_{r\ max}$
mm	mm	°	mm	mm	mm	mm	mm	mm	mm	N	N	mm	mm
30	6.75	13	12	40	5	11	13	11	0.3	7750	7990	0	0.035
36	9	14	16	48	5	13	16	14	0.3	12900	13100	0	0.035
43	10.5	13	20	57	6.5	15	19	17	0.3	18100	18500	0	0.035
43	10.5	13	20	57	6.5	15	19	17	0.3	18100	18500	0	0.035
50	12	13	22	66	6.5	17	22	19	0.3	24000	20800	0	0.035
50	12	13	22	66	6.5	17	22	19	0.3	24000	20800	0	0.035
57	13.5	16	25	75	8	18	26	22	0.3	31000	32000	0	0.035
64	15	15	28	85	8	23	28	22	0.3	38600	45300	0	0.035
64	15	15	28	85	8	23	28	22	0.3	38600	45300	0	0.035
77	18	14	33	102	10	26	35	30	0.3	56600	45600	0	0.035
94	22	15	42	124	12	32	42	36	0.3	84800	72900	0	0.035
110	25	17	51	145	15	37	50	41	0.3	114000	95900	0	0.035
110	25	17	51	145	15	37	50	41	0.3	114000	95900	0	0.035

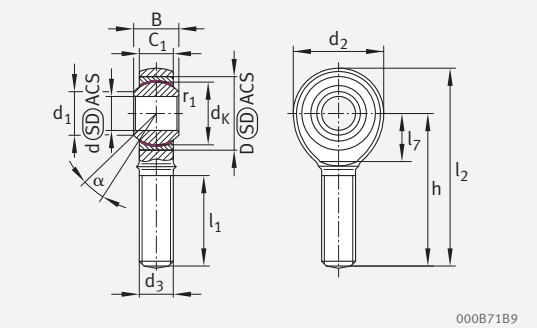
2.7 GAKR..-PW

With external thread, maintenance-free

DIN ISO 12240-4, type M

Brass outer ring

Open design



GAKR..-PW (PTFE film)

Designation	m	d H7	d_{UT}	D	B	B_{UT}	d_K	d_1	d_2
	kg	mm	mm	mm	mm	mm	mm	mm	mm
GAKR6-PW	0.022	6	0.012	16	9	–0.12	12.7	9	20
GAKR8-PW	0.042	8	0.015	19	12	–0.12	15.875	10.4	24
GAKR10-PW	0.069	10	0.015	22	14	–0.12	19.05	12.9	28
GAKR12-PW	0.11	12	0.018	26	16	–0.12	22.225	15.4	32
GAKR14-PW	0.16	14	0.018	28	19	–0.12	25.4	16.9	36
GAKR16-PW	0.23	16	0.018	32	21	–0.12	28.575	19.4	42
GAKR20-PW	0.39	20	0.021	40	25	–0.12	34.925	24.4	50
GAKR25-PW	0.67	25	0.021	47	31	–0.12	42.85	29.6	60
GAKR30-PW	1.1	30	0.021	55	37	–0.12	50.8	34.8	70

d_3	h	C_1	α	l_1	l_2	l_7	$r_{1\ min}$	C_r	C_{0r}	$G_{r\ min}$	$G_{r\ max}$
	mm	mm	°	mm	mm	mm	mm	N	N	mm	mm
M6	36	6.75	13	21	46	–	0.3	7750	6930	0	0.035
M8	42	9	14	25	54	–	0.3	12900	12900	0	0.035
M10	48	10.5	13	28	62	–	0.3	18100	18500	0	0.035
M12	54	12	13	32	70	–	0.3	24000	20800	0	0.035
M14	60	13.5	16	36	78	18	0.3	31000	32000	0	0.035
M16	66	15	15	37	87	23	0.3	38600	45300	0	0.035
M20×1.5	78	18	14	45	103	26	0.3	56600	45600	0	0.035
M24×2	94	22	15	55	124	32	0.3	84800	72900	0	0.035
M30×2	110	25	17	66	145	37	0.3	114000	95900	0	0.035

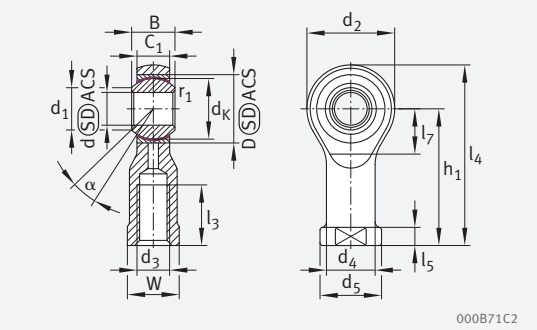
2.8 GIKSR..-PS, GIKPSR..-PS

With internal thread, maintenance-free

DIN ISO 12240-4, type F

Corrosion-resistant

Open design



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

Designation	m	d H7	d_{UT}	D	B	B_{UT}	d_K	d_1	d_2	d_3
	kg	mm	mm	mm	mm	mm	mm	mm	mm	
GIKSR5-PS	0.017	5	0.012	13	8	–0.12	11.1	7.7	19	M5
GIKPSR5-PS	0.017	5	0.012	13	8	–0.12	11.1	7.7	19	M4
GIKSR6-PS	0.025	6	0.012	16	9	–0.12	12.7	9	21	M6
GIKSR8-PS	0.043	8	0.015	19	12	–0.12	15.8	10.4	25	M8
GIKPSR10-PS	0.072	10	0.015	22	14	–0.12	19	12.9	29	M10×1.25
GIKSR10-PS	0.072	10	0.015	22	14	–0.12	19	12.9	29	M10
GIKSR12-PS	0.11	12	0.018	26	16	–0.12	22.2	15.4	33	M12
GIKPSR12-PS	0.11	12	0.018	26	16	–0.12	22.2	15.4	33	M12×1.25
GIKSR14-PS	0.16	14	0.018	28	19	–0.12	25.4	16.8	37	M14
GIKPSR16-PS	0.21	16	0.018	32	21	–0.12	28.5	19.4	43	M16×1.5
GIKSR16-PS	0.21	16	0.018	32	21	–0.12	28.5	19.4	43	M16
GIKSR18-PS	0.3	18	0.018	35	23	–0.12	31.7	21.9	47	M18×1.5
GIKSR20-PS	0.38	20	0.021	40	25	–0.12	34.9	24.4	51	M20×1.5
GIKSR22-PS	0.49	22	0.021	42	28	–0.12	38.1	25.8	55	M22×1.5
GIKSR25-PS	0.65	25	0.021	47	31	–0.12	42.8	29.6	61	M24×2
GIKSR30-PS	1.15	30	0.021	55	37	–0.12	50.8	34.8	71	M30×2
GIKPSR30-PS	1.15	30	0.021	55	37	–0.12	50.8	34.8	71	M27×2

d_4	h_1	C_1	α	l_3	l_4	l_5	l_7	d_5	W	$r_{1\ min}$	C_r	C_{0r}	$G_{r\ min}$	$G_{r\ max}$
mm	mm	mm	°	mm	mm	mm	mm	mm	mm	mm	N	N	mm	mm
9	27	6	13	8	36.5	4	9	11	9	0.3	6000	3800	0.003	0.035
9	27	6	13	8	36.5	4	9	11	9	0.3	6000	3800	0.003	0.035
10	30	6.75	13	9	40.5	5	10	13	11	0.3	7650	3400	0.003	0.035
12.5	36	9	13	12	48.5	5	12	16	14	0.3	12900	5700	0.005	0.04
15	43	10.5	13	15	57.5	6.5	14	19	17	0.3	18000	8000	0.005	0.04
15	43	10.5	13	15	57.5	6.5	14	19	17	0.3	18000	8000	0.005	0.04
17.5	50	12	13	18	66.5	6.5	16	22	19	0.3	24000	9100	0.005	0.045
17.5	50	12	13	18	66.5	6.5	16	22	19	0.3	24000	9100	0.005	0.045
20	57	13.5	15	21	75.5	8	18	25	22	0.3	31000	13700	0.005	0.045
22	64	15	15	24	85.5	8	21	27	22	0.3	39000	19000	0.005	0.045
22	64	15	15	24	85.5	8	21	27	22	0.3	39000	19000	0.005	0.045
25	71	16.5	15	27	94.5	10	23	31	27	0.3	47500	23000	0.005	0.045
27.5	77	18	15	30	102.5	10	25	34	30	0.3	57000	22800	0.01	0.055
30	84	20	15	33	111.5	12	27	37	32	0.3	68000	30400	0.01	0.055
33.5	94	22	15	36	124.5	12	30	42	36	0.3	85000	36200	0.01	0.055
40	110	25	15	45	145.5	15	35	50	41	0.3	114000	47500	0.01	0.055
40	110	25	15	45	145.5	15	35	50	41	0.3	114000	47500	0.01	0.055

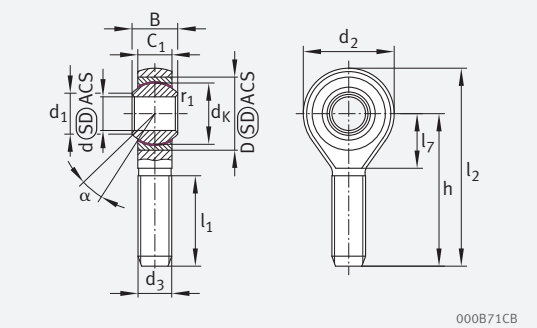
2.9 GAKSR..-PS

With external thread, maintenance-free

DIN ISO 12240-4, type M

Corrosion-resistant

Open design



GAKR..-PW (PTFE film)

Designation	m	d H7	d_{UT}	D	B	B_{UT}	d_K	d_1	d_2
	kg	mm	mm	mm	mm	mm	mm	mm	mm
GAKSR5-PS	0.01	5	0.012	13	8	–0.12	11.1	7.7	19
GAKSR6-PS	0.02	6	0.012	16	9	–0.12	12.7	9	21
GAKSR8-PS	0.03	8	0.015	19	12	–0.12	15.8	10.4	25
GAKSR10-PS	0.05	10	0.015	22	14	–0.12	19	12.9	29
GAKSR12-PS	0.09	12	0.018	26	16	–0.12	22.2	15.4	33
GAKSR14-PS	0.13	14	0.018	28	19	–0.12	25.4	16.9	37
GAKSR16-PS	0.19	16	0.018	32	21	–0.12	28.5	19.4	43
GAKSR18-PS	0.26	18	0.018	35	23	–0.12	31.7	21.9	47
GAKSR20-PS	0.34	20	0.021	40	25	–0.12	34.9	24.4	51
GAKSR22-PS	0.44	22	0.021	42	28	–0.12	38.1	25.8	55
GAKSR25-PS	0.59	25	0.021	47	31	–0.12	42.8	29.6	61
GAKSR30-PS	1.06	30	0.021	55	37	–0.12	50.8	34.8	71

d_3	h	C_1	α	l_1	l_2	l_7	$r_{1\ min}$	C_r	C_{0r}	$G_{r\ min}$	$G_{r\ max}$
	mm	mm	°	mm	mm	mm	mm	N	N	mm	mm
M5	33	6	13	19	42.5	9	0.3	6000	1800	0.003	0.035
M6	36	6.75	13	21	46.5	10	0.3	7650	2500	0.003	0.035
M8	42	9	13	25	54.5	12	0.3	12900	4600	0.005	0.04
M10	48	10.5	13	28	62.5	14	0.3	18000	7300	0.005	0.04
M12	54	12	13	32	70.5	16	0.3	24000	9100	0.005	0.045
M14	60	13.5	15	36	78.5	18	0.3	31000	13700	0.005	0.045
M16	66	15	15	37	87.5	21	0.3	39000	19000	0.005	0.045
M18×1.5	72	16.5	15	41	95.5	23	0.3	47500	23000	0.005	0.045
M20×1.5	78	18	15	45	104	25	0.3	57000	22800	0.01	0.055
M22×1.5	84	20	15	48	112	27	0.3	68000	30400	0.01	0.055
M24×2	94	22	15	55	125	30	0.3	85000	36200	0.01	0.055
M30×2	110	25	15	66	146	35	0.3	114000	47500	0.01	0.055

3 Spherical plain bearings

Spherical plain bearings allow spatial adjustment movements and, depending on the bearing type, can support radial, combined or axial loads.

Maintenance-free radial spherical plain bearings comprise inner rings, outer rings and maintenance-free sliding layers. The inner rings have a cylindrical bore and a curved outer slideway. The outer rings have a cylindrical outside surface and a concave inner slideway. Between the inner and outer ring is an ELGOGLIDE sliding surface. In series GE..-UK and GE..-FW the sliding surface is made up of PTFE composite, while the sliding surface in series GE..-PW is PTFE film. The bearings are available in open and sealed designs.

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 N/mm2. 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

Large radial spherical plain bearings GE..-DW and GE..-DW-2RS2 of d=320 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.

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, from a nominal diameter of 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 to DIN ISO 12240-1.

X-life

Axial spherical plain bearings GE..-AW of d=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.

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. Preloaded units can be achieved using paired arrangements. Angular contact spherical plain bearings are used to support high loads 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.

3.1 Clarification of product tables

a	mm	Contact cone apex spacing
A	mm	Flange width
b	mm	Extraction slot width
B	mm	Inner ring width
B	mm	Width
B_1	mm	Width over thrust washers
B_1	mm	Flange thickness
B_1	mm	Width, shaft locating washer, long
B_2	mm	Effective pin/stud length
B_2	mm	Shoulder width, shaft locating washer, long
B_3	mm	Lubrication hole spacing
B_e	mm	Eccentric collar width
B_{tol}	mm	Inner ring width, deviation
B_{UT}	mm	Inner ring width, lower deviation
C	mm	Outer ring width
C_{0a}	N	Basic static load rating, axial
C_{0r}	N	Basic static load rating, radial
$C_{0r\,w}$	N	Basic static load rating, radial
C_1	mm	Width of rod end eye housing
C_1	mm	Outer ring projection relative to thrust washer
C_1	mm	Lubrication hole spacing
C_a	N	Basic dynamic load rating, axial
c_{aL}	N/µm	Axial rigidity
c_{kL}	Nm/mrad	Tilting rigidity
C_r	N	Basic dynamic load rating, radial
$C_{r\,w}$	N	Basic dynamic load rating, radial
C_{tol}	mm	Outer ring width, deviation
C_{ua}	N	Fatigue limit load, axial
C_{ur}	N	Fatigue limit load, radial
$C_{ur\,w}$	N	Fatigue limit load, radial
d	mm	Bearing bore diameter
d	mm	Bore diameter
D	mm	Bearing outside diameter
D	inch or mm	Outside diameter
d_1	mm	Outside flange diameter, inner ring
d_1	mm	Fit diameter of roller stud/pin
d_1	mm	Rib diameter, inner ring
d_1	mm	Lubrication hole diameter
D_1	mm	Bore diameter, housing locating washer
D_1	mm	Rib diameter, outer ring
D_1	mm	Flange diameter

D_1	mm	Rib diameter, shaft locating washer
d_2		Thread size
d_2	mm	Outside eye diameter
d_2	mm	Shank diameter
d_2	mm	Shank diameter, large
d_2	mm	Outside diameter, thrust washer
d_2	mm	Locating diameter, thrust washer
d_2	mm	Groove diameter, inner ring
d_2	mm	Diameter, fixing holes
D_2	mm	Groove diameter, outer ring
D_2	mm	Shoulder diameter, shaft locating washer, long
d_3	mm	End face diameter of shaft locating washer
d_3	mm	Lubrication hole diameter
D_3	mm	Groove diameter, narrow lateral face of outer ring
D_3	mm	Outside diameter, shaft locating washer, long
d_a	mm	Abutment diameter, shaft shoulder
d_a	mm	Abutment diameter, shaft
D_a	mm	Housing shoulder diameter
D_a	mm	Abutment diameter, housing
$d_{a\ max}$	mm	Max. mounting dimension, inner ring
$D_{a\ min}$	mm	Min. housing mounting diameter
D_b	mm	Abutment diameter, outside, width S
$d_{b\ max}$	mm	Max. mounting dimension, inner ring
$D_{b\ min}$	mm	Min. mounting diameter
d_e	mm	Eccentric collar diameter
d_K	mm	Ball diameter
d_{tol}	mm	Bearing bore diameter, deviation
D_{tol}	mm	Bearing outside diameter, deviation
D_{UT}	mm	Bearing bore diameter, lower deviation
e	mm	Eccentricity
F	mm	Raceway diameter, inner ring
$F_{0r\ per}$	N	Permissible static radial load
$F_{r\ per}$	N	Outer ring limit load
F_W		Needle enveloping circle with tolerance class F6
G		Thread
$G_{r\ max}$	mm	Max. radial internal clearance
$G_{r\ min}$	mm	Min. radial internal clearance
h	mm	Shank length, external thread rod
H		Main load direction
H	mm	Height
H_1	mm	Outer ring height over shaft locating washer
I	mm	Extraction slot spacing
I_1	mm	Thread length, external thread
I_2	mm	Total length, external thread rod
I_3	mm	Thread length, internal thread
I_4	mm	Total length, internal thread on rod
I_5	mm	Flange length, rod end shank
I_7	mm	Hole spacing at start of shaft
J	mm	Pitch circle diameter, fixing holes
l_G	mm	Thread length
m	kg or lbs	Mass
M_A	Nm	Tightening torque
M_A	Nm	Tightening torque for the recommended INA precision locknuts
M_m	$kg \cdot cm^2$	Mass moment of inertia
M_R	Nm	Bearing frictional torque
n		Number of screw mounting holes
n		Number of fixing screws
n_a		Number of bores in the adjacent construction
n_a		Number of fixing screws

$n_{D\,G}$	min^{-1}	Speed during continuous operation with grease lubrication
n_G	min^{-1}	Limiting speed
n_δ	min^{-1}	Thermally safe operating speed
$n_{\delta r}$	min^{-1}	Speed rating
$r_{1\,min}$	mm	Min. chamfer dimension
$r_{2\,min}$	mm	Min. chamfer dimension
$r_{a\,max}$	mm	Max. undercut radius
$r_{a1\,max}$	mm	Max. undercut radius
r_{min}	mm	Min. chamfer dimension
s	mm	End face spacing
t	°	Pitch angle, fixing holes
t	°	Contact angle
T	mm	Height
t_1	mm	Positional tolerance of bore in housing
t_a	°	Pitch angle of bores in the adjacent construction
T_{tol}	mm	Height, deviation
W	mm	Width across flats
W	mm	Width across flats, nominal dimension for hexagonal socket
α	°	Tilt angle

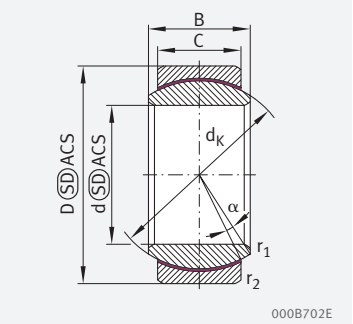
3.2 GE..-UK

Maintenance-free

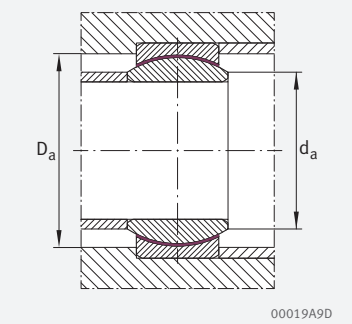
DIN ISO 12240-1, type E

Inner ring curved surface with hard chromium coating

Open design



GE..-UK (PTFE composite)



Mounting dimensions

Designation	m	d	d_{tol}	D	D_{tol}	B	B_{tol}	C	C_{tol}	d_K
	kg	mm	mm	mm	mm	mm	mm	mm	mm	mm
GE6-UK	0.004	6	–0.008	14	–0.008	6	–0.12	4	–0.24	10
GE8-UK	0.007	8	–0.008	16	–0.008	8	–0.12	5	–0.24	13
GE10-UK	0.011	10	–0.008	19	–0.009	9	–0.12	6	–0.24	16
GE12-UK	0.016	12	–0.008	22	–0.009	10	–0.12	7	–0.24	18
GE15-UK	0.027	15	–0.008	26	–0.009	12	–0.12	9	–0.24	22
GE17-UK	0.042	17	–0.008	30	–0.009	14	–0.12	10	–0.24	25
GE20-UK	0.067	20	–0.01	35	–0.011	16	–0.12	12	–0.24	29
GE25-UK	0.12	25	–0.01	42	–0.011	20	–0.12	16	–0.24	35.5
GE30-UK	0.15	30	–0.01	47	–0.011	22	–0.12	18	–0.24	40.7

α	$r_{1\ min}$	$r_{2\ min}$	$d_{a\ max}$	$D_{a\ min}$	C_r	C_{0r}	$G_{r\ min}$	$G_{r\ max}$
°	mm	mm	mm	mm	N	N	mm	mm
13	0.3	0.3	8	9.6	3600	9000	0	0.032
15	0.3	0.3	10.2	12.5	5850	14600	0	0.032
12	0.3	0.3	13.2	15.5	8640	21600	0	0.032
11	0.3	0.3	14.9	17.5	11300	28400	0	0.032
8	0.3	0.3	18.4	21	17800	44600	0	0.04
10	0.3	0.3	20.7	24	22500	56300	0	0.04
9	0.3	0.3	24.2	27.5	31300	78300	0	0.04
7	0.6	0.6	29.3	33	51100	128000	0	0.05
6	0.6	0.6	34.2	38	65900	165000	0	0.05

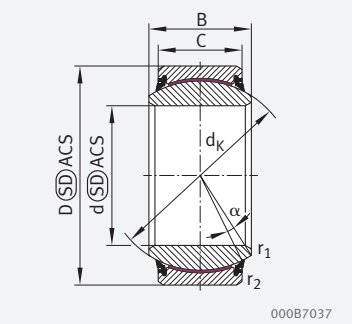
3.3 GE..-UK-2RS, GE..-UK-2TS

Maintenance-free

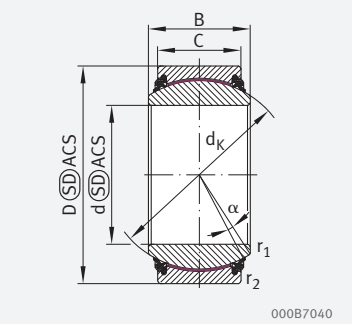
DIN ISO 12240-1, type G

Inner ring curved surface with hard chromium coating

Sealed

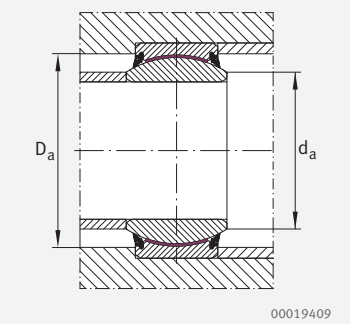


GE..-UK-2RS (ELGOGLIDE)



GE..-UK-2TS (ELGOGLIDE)

Designation	m	d	d_{tol}	D	D_{tol}	B	B_{tol}	C	C_{tol}
	kg	mm	mm	mm	mm	mm	mm	mm	mm
GE17-UK-2RS	0.038	17	–0.008	30	–0.009	14	–0.12	10	–0.24
GE20-UK-2RS	0.061	20	–0.01	35	–0.011	16	–0.12	12	–0.24
GE25-UK-2RS	0.11	25	–0.01	42	–0.011	20	–0.12	16	–0.24
GE30-UK-2TS	0.14	30	–0.01	47	–0.011	22	–0.12	18	–0.24
GE30-UK-2RS	0.14	30	–0.01	47	–0.011	22	–0.12	18	–0.24
GE35-UK-2TS	0.22	35	–0.012	55	–0.013	25	–0.12	20	–0.3
GE35-UK-2RS	0.22	35	–0.012	55	–0.013	25	–0.12	20	–0.3
GE40-UK-2RS	0.31	40	–0.012	62	–0.013	28	–0.12	22	–0.3
GE40-UK-2TS	0.31	40	–0.012	62	–0.013	28	–0.12	22	–0.3
GE45-UK-2TS	0.41	45	–0.012	68	–0.013	32	–0.12	25	–0.3
GE45-UK-2RS	0.41	45	–0.012	68	–0.013	32	–0.12	25	–0.3
GE50-UK-2RS	0.55	50	–0.012	75	–0.013	35	–0.12	28	–0.3
GE50-UK-2TS	0.55	50	–0.012	75	–0.013	35	–0.12	28	–0.3
GE60-UK-2TS	1	60	–0.015	90	–0.015	44	–0.15	36	–0.4
GE60-UK-2RS	1	60	–0.015	90	–0.015	44	–0.15	36	–0.4
GE70-UK-2TS	1.53	70	–0.015	105	–0.015	49	–0.15	40	–0.4
GE70-UK-2RS	1.53	70	–0.015	105	–0.015	49	–0.15	40	–0.4
GE80-UK-2TS	2.25	80	–0.015	120	–0.015	55	–0.15	45	–0.4
GE80-UK-2RS	2.25	80	–0.015	120	–0.015	55	–0.15	45	–0.4
GE90-UK-2TS	2.73	90	–0.02	130	–0.018	60	–0.2	50	–0.5
GE90-UK-2RS	2.73	90	–0.02	130	–0.018	60	–0.2	50	–0.5
GE100-UK-2RS	4.34	100	–0.02	150	–0.018	70	–0.2	55	–0.5
GE100-UK-2TS	4.34	100	–0.02	150	–0.018	70	–0.2	55	–0.5
GE110-UK-2TS	4.71	110	–0.02	160	–0.025	70	–0.2	55	–0.5
GE110-UK-2RS	4.71	110	–0.02	160	–0.025	70	–0.2	55	–0.5
GE120-UK-2RS	7.98	120	–0.02	180	–0.025	85	–0.2	70	–0.5
GE120-UK-2TS	7.98	120	–0.02	180	–0.025	85	–0.2	70	–0.5
GE140-UK-2TS	11.1	140	–0.025	210	–0.03	90	–0.25	70	–0.6
GE140-UK-2RS	11.1	140	–0.025	210	–0.03	90	–0.25	70	–0.6
GE160-UK-2RS	14	160	–0.025	230	–0.03	105	–0.25	80	–0.6
GE160-UK-2TS	14	160	–0.025	230	–0.03	105	–0.25	80	–0.6



Mounting dimensions

d_K	α	$r_{1\ min}$	$r_{2\ min}$	$d_{a\ max}$	$D_{a\ min}$	C_r	C_{0r}	$G_{r\ min}$	$G_{r\ max}$
mm	°	mm	mm	mm	mm	N	N	mm	mm
25	10	0.3	0.3	20.7	24	48800	81300	0	0.04
29	9	0.3	0.3	24.2	27.5	67900	113000	0	0.04
35.5	7	0.6	0.6	29.3	33	128000	213000	0	0.05
40.7	6	0.6	0.6	34.2	38	165000	275000	0	0.05
40.7	6	0.6	0.6	34.2	38	165000	275000	0	0.05
47	6	0.6	1	39.8	44.5	212000	353000	0	0.05
47	6	0.6	1	39.8	44.5	212000	353000	0	0.05
53	7	0.6	1	45	51	280000	466000	0	0.06
53	7	0.6	1	45	51	280000	466000	0	0.06
60	7	0.6	1	50.8	57	360000	600000	0	0.06
60	7	0.6	1	50.8	57	360000	600000	0	0.06
66	6	0.6	1	56	63	444000	739000	0	0.06
66	6	0.6	1	56	63	444000	739000	0	0.06
80	6	1	1	66.8	75	691000	1150000	0	0.06
80	6	1	1	66.8	75	691000	1150000	0	0.06
92	6	1	1	77.9	87	883000	1470000	0	0.072
92	6	1	1	77.9	87	883000	1470000	0	0.072
105	6	1	1	89.4	99	1130000	1890000	0	0.072
105	6	1	1	89.4	99	1130000	1890000	0	0.072
115	5	1	1	98.1	108	1380000	2300000	0	0.072
115	5	1	1	98.1	108	1380000	2300000	0	0.072
130	7	1	1	109.5	123	1720000	2860000	0	0.085
130	7	1	1	109.5	123	1720000	2860000	0	0.085
140	6	1	1	121.2	134	1850000	3080000	0	0.085
140	6	1	1	121.2	134	1850000	3080000	0	0.085
160	6	1	1	135.6	150	2690000	4480000	0	0.085
160	6	1	1	135.6	150	2690000	4480000	0	0.085
180	7	1	1	155.9	173	3020000	5040000	0	0.085
180	7	1	1	155.9	173	3020000	5040000	0	0.085
200	8	1	1	170.2	191	3840000	6400000	0	0.1
200	8	1	1	170.2	191	3840000	6400000	0	0.1

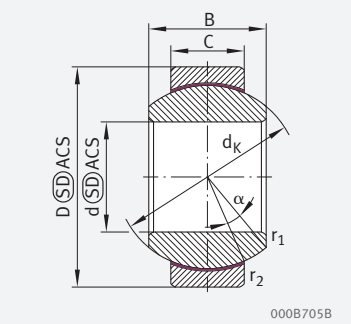
3.4 GE..-FW

Maintenance-free

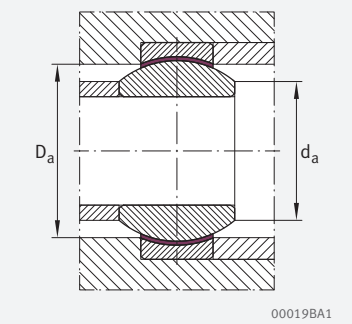
DIN ISO 12240-1, type G

Inner ring curved surface with hard chromium coating

Open design



GE..-FW (PTFE composite)



Mounting dimensions

Designation	m	d	d_{tol}	D	D_{tol}	B	B_{tol}	C	C_{tol}
	kg	mm	mm	mm	mm	mm	mm	mm	mm
GE6-FW	0.009	6	–0.008	16	–0.008	9	–0.12	5	–0.24
GE8-FW	0.015	8	–0.008	19	–0.009	11	–0.12	6	–0.24
GE10-FW	0.021	10	–0.008	22	–0.009	12	–0.12	7	–0.24
GE12-FW	0.037	12	–0.008	26	–0.009	15	–0.12	9	–0.24
GE15-FW	0.05	15	–0.008	30	–0.009	16	–0.12	10	–0.24
GE17-FW	0.083	17	–0.008	35	–0.011	20	–0.12	12	–0.24
GE20-FW	0.16	20	–0.01	42	–0.011	25	–0.12	16	–0.24
GE25-FW	0.21	25	–0.01	47	–0.011	28	–0.12	18	–0.24

d_K	α	$r_{1\ min}$	$r_{2\ min}$	$d_{a\ max}$	$D_{a\ min}$	C_r	C_{0r}	$G_{r\ min}$	$G_{r\ max}$
mm	°	mm	mm	mm	mm	N	N	mm	mm
13	21	0.3	0.3	9.4	12.5	5850	14600	0	0.032
16	21	0.3	0.3	11.6	15.5	8640	21600	0	0.032
18	18	0.3	0.3	13.4	17.5	11300	28400	0	0.032
22	18	0.3	0.3	16.1	21	17800	44600	0	0.04
25	16	0.3	0.3	19.2	24	22500	56300	0	0.04
29	19	0.3	0.3	21	27.5	31300	78300	0	0.04
35.5	17	0.3	0.3	25.2	33	51100	128000	0	0.05
40.7	17	0.6	0.6	29.5	38	65900	165000	0	0.05

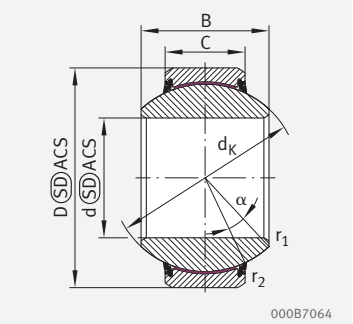
3.5 GE..-FW-2RS, GE..-FW-2TS

Maintenance-free

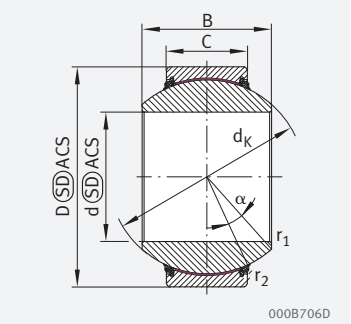
DIN ISO 12240-1, type K

Inner ring curved surface with hard chromium coating

Sealed

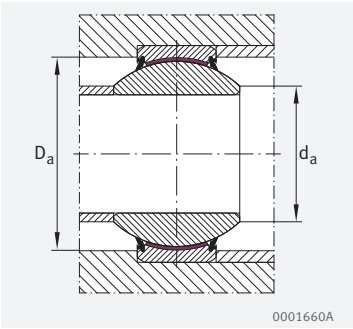


GE..-FW-2RS (ELGOGLIDE)



GE..-FW-2TS (ELGOGLIDE)

Designation	m	d	d_{tol}	D	D_{tol}	B	B_{tol}	C	C_{tol}
	kg	mm	mm	mm	mm	mm	mm	mm	mm
GE25-FW-2RS	0.2	25	–0.01	47	–0.011	28	–0.12	18	–0.24
GE25-FW-2TS	0.2	25	–0.01	47	–0.011	28	–0.12	18	–0.24
GE30-FW-2RS	0.29	30	–0.01	55	–0.013	32	–0.12	20	–0.3
GE30-FW-2TS	0.29	30	–0.01	55	–0.013	32	–0.12	20	–0.3
GE35-FW-2RS	0.4	35	–0.012	62	–0.013	35	–0.12	22	–0.3
GE35-FW-2TS	0.4	35	–0.012	62	–0.013	35	–0.12	22	–0.3
GE40-FW-2RS	0.53	40	–0.012	68	–0.013	40	–0.12	25	–0.3
GE40-FW-2TS	0.53	40	–0.012	68	–0.013	40	–0.12	25	–0.3
GE45-FW-2TS	0.69	45	–0.012	75	–0.013	43	–0.12	28	–0.3
GE45-FW-2RS	0.69	45	–0.012	75	–0.013	43	–0.12	28	–0.3
GE50-FW-2TS	1.4	50	–0.012	90	–0.015	56	–0.12	36	–0.4
GE50-FW-2RS	1.4	50	–0.012	90	–0.015	56	–0.12	36	–0.4
GE60-FW-2TS	2.1	60	–0.015	105	–0.015	63	–0.15	40	–0.4
GE60-FW-2RS	2.1	60	–0.015	105	–0.015	63	–0.15	40	–0.4
GE70-FW-2RS	3	70	–0.015	120	–0.015	70	–0.15	45	–0.4
GE70-FW-2TS	3	70	–0.015	120	–0.015	70	–0.15	45	–0.4
GE80-FW-2RS	3.6	80	–0.015	130	–0.018	75	–0.15	50	–0.5
GE80-FW-2TS	3.6	80	–0.015	130	–0.018	75	–0.15	50	–0.5
GE90-FW-2TS	5.34	90	–0.02	150	–0.018	85	–0.2	55	–0.5
GE90-FW-2RS	5.34	90	–0.02	150	–0.018	85	–0.2	55	–0.5
GE100-FW-2TS	6	100	–0.02	160	–0.025	85	–0.2	55	–0.5
GE100-FW-2RS	6	100	–0.02	160	–0.025	85	–0.2	55	–0.5
GE110-FW-2TS	9.7	110	–0.02	180	–0.025	100	–0.2	70	–0.5
GE110-FW-2RS	9.7	110	–0.02	180	–0.025	100	–0.2	70	–0.5
GE120-FW-2RS	15.1	120	–0.02	210	–0.03	115	–0.2	70	–0.6
GE120-FW-2TS	15.1	120	–0.02	210	–0.03	115	–0.2	70	–0.6



Mounting dimensions

d_K	α	$r_{1\ min}$	$r_{2\ min}$	$d_{a\ max}$	$D_{a\ min}$	C_r	C_{0r}	$G_{r\ min}$	$G_{r\ max}$
mm	°	mm	mm	mm	mm	N	N	mm	mm
40.7	17	0.6	0.6	29.5	38	165000	275000	0	0.05
40.7	17	0.6	0.6	29.5	38	165000	275000	0	0.05
47	17	0.6	1	34.4	44.5	212000	353000	0	0.05
47	17	0.6	1	34.4	44.5	212000	353000	0	0.05
53	16	0.6	1	39.8	51	280000	466000	0	0.06
53	16	0.6	1	39.8	51	280000	466000	0	0.06
60	17	0.6	1	44.7	57	360000	600000	0	0.06
60	17	0.6	1	44.7	57	360000	600000	0	0.06
66	15	0.6	1	50.1	63	444000	739000	0	0.06
66	15	0.6	1	50.1	63	444000	739000	0	0.06
80	17	0.6	1	57.1	75	691000	1150000	0	0.06
80	17	0.6	1	57.1	75	691000	1150000	0	0.06
92	17	1	1	67	87	883000	1470000	0	0.072
92	17	1	1	67	87	883000	1470000	0	0.072
105	16	1	1	78.3	99	1130000	1890000	0	0.072
105	16	1	1	78.3	99	1130000	1890000	0	0.072
115	14	1	1	87.2	108	1380000	2300000	0	0.072
115	14	1	1	87.2	108	1380000	2300000	0	0.072
130	15	1	1	98.4	123	1720000	2860000	0	0.085
130	15	1	1	98.4	123	1720000	2860000	0	0.085
140	14	1	1	111.2	134	1850000	3080000	0	0.085
140	14	1	1	111.2	134	1850000	3080000	0	0.085
160	12	1	1	124.9	150	2690000	4480000	0	0.085
160	12	1	1	124.9	150	2690000	4480000	0	0.085
180	16	1	1	138.5	173	3020000	5040000	0	0.085
180	16	1	1	138.5	173	3020000	5040000	0	0.085

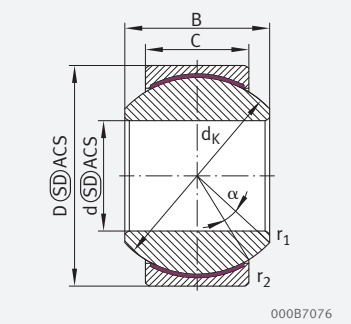
3.6 GE..-PW

Maintenance-free

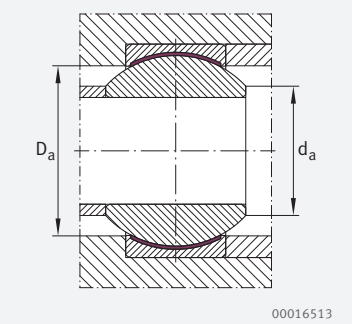
DIN ISO 12240-2

Brass outer ring

Open design



GE..-UK (PTFE film)



Mounting dimensions

Designation	m	d H7	d_{tol}	D	D_{tol}	B	B_{tol}	C	C_{tol}
	kg	mm	mm	mm	mm	mm	mm	mm	mm
GE6-PW	0.01	6	0.012	16	–0.008	9	–0.12	6.75	–0.24
GE8-PW	0.018	8	0.015	19	–0.009	12	–0.12	9	–0.24
GE10-PW	0.027	10	0.015	22	–0.009	14	–0.12	10.5	–0.24
GE12-PW	0.043	12	0.018	26	–0.009	16	–0.12	12	–0.24
GE14-PW	0.055	14	0.018	28	–0.009	19	–0.12	13.5	–0.24
GE16-PW	0.079	16	0.018	32	–0.011	21	–0.12	15	–0.24
GE18-PW	0.11	18	0.018	35	–0.011	23	–0.12	16.5	–0.24
GE20-PW	0.15	20	0.021	40	–0.011	25	–0.12	18	–0.24
GE22-PW	0.18	22	0.021	42	–0.011	28	–0.12	20	–0.24
GE25-PW	0.25	25	0.021	47	–0.011	31	–0.12	22	–0.24
GE30-PW	0.38	30	0.021	55	–0.013	37	–0.12	25	–0.3

d_K	α	$r_{1\ min}$	$r_{2\ min}$	$d_{a\ max}$	$D_{a\ min}$	C_r	C_{0r}	$G_{r\ min}$	$G_{r\ max}$
mm	°	mm	mm	mm	mm	N	N	mm	mm
12.7	13	0.3	0.3	9	11.5	7750	19400	0.006	0.035
15.875	14	0.3	0.3	10.4	14	12900	32100	0.006	0.035
19.05	13	0.3	0.3	12.9	17	18100	45200	0.006	0.035
22.225	13	0.3	0.3	15.4	19.5	24000	60000	0.006	0.035
25.4	16	0.3	0.3	16.9	22.5	31000	77500	0.006	0.035
28.575	15	0.3	0.3	19.4	25.5	38600	96400	0.006	0.035
31.75	15	0.3	0.3	21.9	28.5	47300	118000	0.006	0.035
34.925	14	0.3	0.6	24.4	31.5	56600	141000	0.006	0.035
38.1	15	0.3	0.6	25.8	34	68600	171000	0.006	0.035
42.85	15	0.3	0.6	29.6	38.5	84800	212000	0.006	0.035
50.8	17	0.3	0.6	34.8	46	114000	286000	0.006	0.035

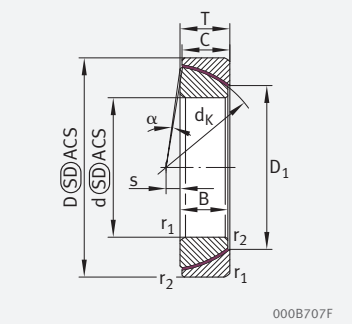
3.7 GE..-SW

Maintenance-free

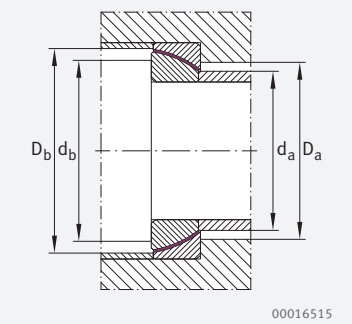
DIN ISO 12240-2

Inner ring curved surface with hard chromium coating

Open design

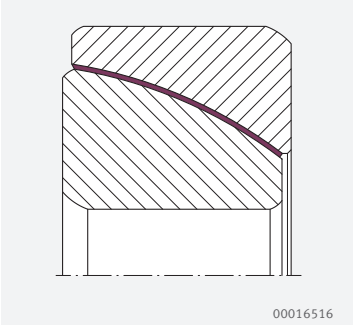


GE..-SW (ELGOGLIDE)



Mounting dimensions

Designation	m	d	d_{tol}	D	D_{tol}	T	T_{tol}	d_K	D_1	B	B_{tol}	C	C_{tol}
	kg	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
GE25-SW	0.14	25	–0.012	47	–0.014	15	0.25	42.5	31.4	14	–0.2	14	–0.2
GE28-SW	0.18	28	–0.012	52	–0.016	16	0.25	47	35.7	15	–0.2	15	–0.2
GE30-SW	0.21	30	–0.012	55	–0.016	17	0.25	50	36.1	16	–0.2	16	–0.2
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



Detailed view

s	α	$r_{1\ min}$	$r_{2\ min}$	$d_{a\ max}$	$d_{b\ max}$	$D_{a\ min}$	$D_{b\ min}$	C_r	C_{0r}
mm	°	mm	mm	mm	mm	mm	mm	N	N
1	2.7	0.6	0.3	30.1	39.5	34	43	143000	239000
1	2.4	1	0.3	34.4	42	40	47.5	173000	288000
2	2.3	1	0.3	34.7	45	40.5	50.5	194000	323000
2	2.1	1	0.3	41.1	50	47	57	236000	393000
1.5	1.9	1	0.3	45.6	54	52	61	272000	454000
1.5	1.7	1	0.3	51.7	60	58	67	319000	532000
4	1.6	1	0.3	58	67	65	75	355000	592000
4	1.4	1.5	0.6	60.8	71	70	81	448000	746000
5	1.3	1.5	0.6	66.9	77	76	87	483000	805000
5	1.3	1.5	0.6	74.5	83	84	93	520000	867000
7	1.1	1.5	0.6	81	92	90	104	627000	1040000
10	2	1.5	0.6	88	104	99	117	734000	1220000
11	1.8	2	0.6	100.9	118	112	132	941000	1570000
12	1.7	2	0.6	112	128	123	142	1020000	1700000
15	1.5	2.5	0.6	123.3	146	135	162	1410000	2340000
17	1.4	2.5	0.6	132.9	155	145	172	1500000	2490000

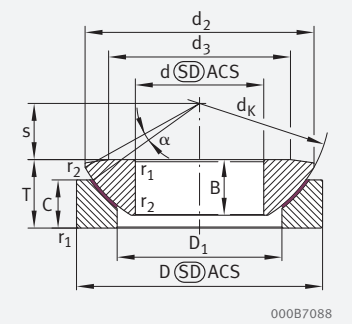
3.8 GE..-AW

Maintenance-free

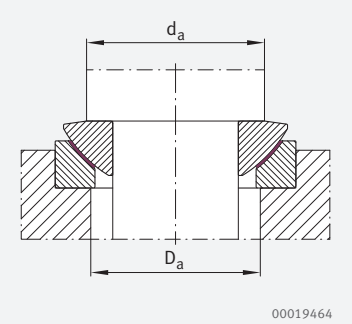
DIN ISO 12240-3

Shaft washer curved surface with hard chromium coating

Open design

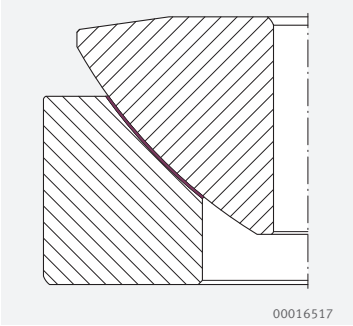


GE..-AW (ELGOGLIDE)



Mounting dimensions

Designation	X-life	m	d	d_{tol}	D	D_{tol}	T	T_{tol}	d_K	d_2	d_3	D_1
		kg	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
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



Detailed view

B	B_{tol}	C	C_{tol}	s	α	$r_{1\ min}$	$r_{2\ min}$	$d_{a\ max}$	$D_{a\ min}$	C_a	C_{0a}
mm	mm	mm	mm	mm	°	mm	mm	mm	mm	N	N
7.9	−0.24	6	−0.24	7	10	0.6	0.2	21	18.5	73200	122000
9.3	−0.24	9	−0.24	8	9	0.6	0.2	24	21.5	97300	162000
10.7	−0.24	11	−0.24	10	7	0.6	0.2	29	26	157000	261000
11.5	−0.24	11	−0.24	11	6	0.6	0.2	34	30.5	178000	296000
14.3	−0.24	13	−0.24	12.5	6	1	0.3	40	38	225000	376000
16	−0.24	17	−0.24	14	7	1	0.3	45	39	388000	646000
18	−0.24	19	−0.24	17.5	6	1	0.3	56	49	509000	848000
22	−0.24	20	−0.24	22	6	1	0.3	66	57	778000	1300000
27	−0.24	22	−0.24	24.5	6	1	0.3	78	64	1120000	1870000
31	−0.24	25	−0.24	27.5	6	1	0.3	89	74	1460000	2430000
33.5	−0.24	32	−0.24	30	5	1	0.3	98	75	1950000	3250000
37	−0.3	33	−0.3	35	7	1	0.3	108	92	2210000	3680000
40	−0.3	36	−0.3	35	6	1	0.3	121	102	2420000	4030000
42	−0.3	36	−0.3	42.5	6	1	0.3	130	115	3110000	5180000
50	−0.4	42	−0.4	45	7	1	0.3	155	141	3610000	6020000
52	−0.4	45	−0.4	52.5	6.5	1	0.3	170	162	3740000	6230000

4 Yoke type track rollers, stud type track rollers

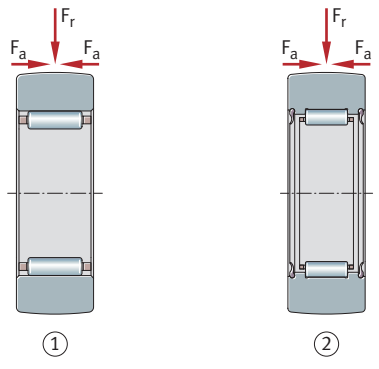
4.1 Yoke type track rollers

Yoke type track rollers are single or double row units mounted on shafts or studs. They comprise thick-walled outer rings with a profiled outside surface and needle roller and cage assemblies or full complement needle roller or cylindrical roller sets. Yoke type track rollers can support high radial loads as well as axial loads arising from slight misalignment and skewed running. The bearings are available with or without an inner ring, with or without axial guidance, and in sealed or open versions.

Proven areas of application of these products include cam gears, bed ways, conveying equipment, and linear guidance systems.

Series PWTR is supplied as an X-life design. Due to a modified material and the optimized raceway geometry of the outer rings, the basic rating life of this design 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 optimized lateral surface profile and its improved surface quality. In conclusion, these advantages improve the overall cost-efficiency of the bearing position significantly and thus bring about a sustainable increase in the efficiency of the machine and equipment. X-life yoke type track rollers include the suffix XL in the designation

Yoke type track rollers RSTO and RNA22..-2RSR do not have an inner ring. Depending on the design, yoke type track rollers are also available as sealed versions. They are particularly compact but require a hardened and ground raceway on the shaft or stud. Series RSTO is not self-retaining, which means that the outer ring and the needle roller and cage assembly can be fitted independently of each other. This gives simplified mounting of the bearings. The rolling elements are guided by the cage. These designs do not have axial guidance of the outer ring. Axial guidance of the outer ring and needle roller and cage assembly (for RSTO only) must be provided in the adjacent construction.

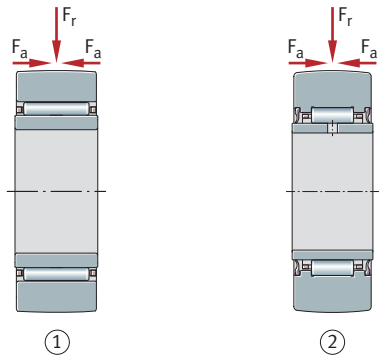


4 Yoke type track rollers without inner ring, without axial guidance, open or sealed on both sides

F_r	Radial load	F_a	Axial load
1	Open (RSTO)	2	Contact seals (RNA22..-2RSR)

Yoke type track rollers STO and NA22..-2RSR have an inner ring. Depending on the design, yoke type track rollers are also available as sealed versions. Bearings with an inner ring are used if the shaft or stud does not have a hardened and ground

raceway. Series STO is not self-retaining. This means that the outer ring, inner ring, and the needle roller and cage assembly can be fitted independently of each other. This gives simplified mounting of the bearings. The rolling elements are guided by the cage. These designs do not have axial guidance of the outer ring. Axial guidance of the outer ring and needle roller and cage assembly (for STO only) must be provided in the adjacent construction.

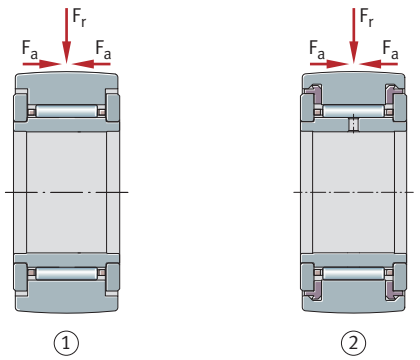


5 Yoke type track rollers with inner ring, without axial guidance, open or sealed on both sides

F_r	Radial load	F_a	Axial load
1	Open (RSTO)	2	Contact seals (NA22..-2RSR)

Yoke type track rollers with an inner ring are used if the shaft or stud does not have a hardened and ground raceway. Series NATR and NATR..-PP have a cage. Series NATV and NATV..-PP have a full complement needle roller set, while yoke type track rollers NUTR have a full complement cylindrical roller set. Yoke type track rollers PWTR..-2RS and NNTR..-2ZL have a full complement cylindrical roller set and a central rib. Depending on the design, yoke type track rollers are also available as sealed versions. Bearings without a cage have the largest possible number of rolling elements and therefore have particularly high load carrying capacity. Due to the kinematic conditions, however, the speeds achievable with these bearings are somewhat lower than those achievable with the cage-guided yoke type track rollers. Axial guidance of outer ring. In NATR and NATV, axial guidance is provided directly by thrust washers, while in NATR..-PP and NATV..-PP this is provided by thrust washers and plastic axial plain washers. In NUTR, the outer ring is guided by the rolling elements, in PWTR..-2RS and NNTR..-2ZL it is guided by the central rib and the rolling elements.

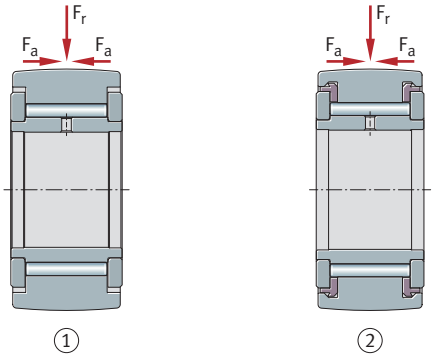
Series PWTR..-2RS-RR is protected against corrosion by the special Cr(VI)free coating Corrotect. These bearings have the suffix RR.



000A655D

6 Yoke type track rollers with inner ring, with cage, with axial guidance, open or sealed on both sides

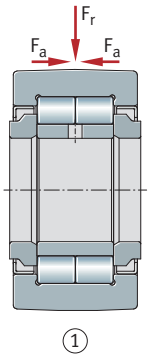
F_r	Radial load	F_a	Axial load
1	Gap seals (NATR)	2	Plastic axial plain washers (NATR..-PP)



000A7507

7 Yoke type track rollers with inner ring, full complement needle roller set, with axial guidance, open or sealed on both sides

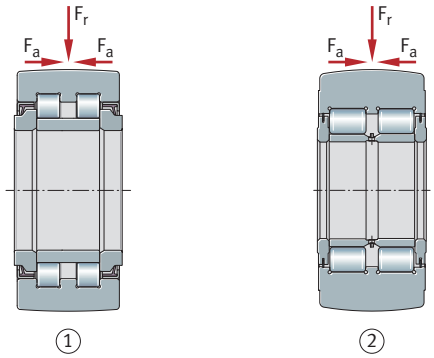
F_r	Radial load	F_a	Axial load
1	Gap seals (NATV)	2	Plastic axial plain washers (NATV..-PP)



000A750A

8 Yoke type track rollers with inner ring, full complement cylindrical roller set, with axial guidance, sealed on both sides

F_r	Radial load	F_a	Axial load
1	Labyrinth seals (NUTR)		



000A750D

9 Yoke type track rollers with inner ring, full complement cylindrical roller set, with central rib, with axial guidance, sealed on both sides

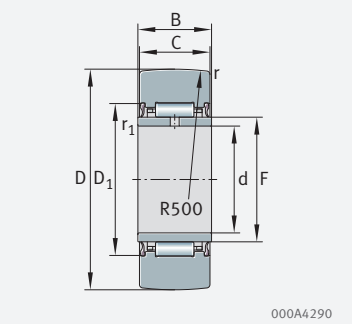
F_r	Radial load	F_a	Axial load
1	Protected lip seals (PWTR..-2RS)	2	Thrust washers with lamellar ring (NNTR..-2ZL)

4.1.1 NA22..-2RSR

Without axial guidance

Sealed

With inner ring



NA22 with seal 2RSR

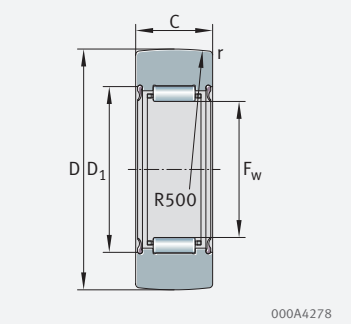
Designation	m	D	F	C	dyn. $C_{r\,w}$	stat. $C_{0r\,w}$	$C_{ur\,w}$	$n_{D\,G}$	d	B	D_1	r_{min}	$r_{1\,min}$
	kg	mm	mm	mm	N	N	N	min^{-1}	mm	mm	min.	mm	mm
NA22/6-2RSR	0.022	19	10	11.8	3350	3650	495	9000	6	12	16	0.3	0.3
NA22/8-2RSR	0.034	24	12	11.8	4100	4300	650	7000	8	12	18	0.3	0.3
NA2200-2RSR	0.06	30	14	13.8	6100	6900	1120	5500	10	14	20	0.6	0.3
NA2201-2RSR	0.067	32	16	13.8	6600	8300	1300	4700	12	14	22	0.6	0.3
NA2202-2RSR	0.075	35	20	13.8	6700	9500	1400	3400	15	14	26	0.6	0.3
NA2203-2RSR	0.112	40	22	15.8	8900	13600	1890	3000	17	16	28	1	0.3
NA2204-2RSR	0.177	47	25	17.8	14000	18600	2700	2300	20	18	33	1	0.3
NA2205-2RSR	0.209	52	30	17.8	14500	20300	2950	1800	25	18	38	1	0.3
NA2206-2RSR	0.324	62	35	19.8	17100	26500	3600	1400	30	20	43	1	0.3
NA2207-2RSR	0.505	72	42	22.7	21500	36500	5300	1100	35	23	50	1.1	0.6
NA2208-2RSR	0.628	80	48	22.7	26000	41500	5400	850	40	23	57	1.1	0.6
NA2210-2RSR	0.69	90	58	22.7	26000	44000	5700	650	50	23	68	1.1	0.6

4.1.2 RNA22..-2RSR

Without axial guidance

Sealed

Without inner ring



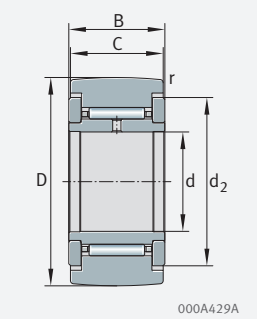
RNA22 with seal 2RSR

Designation	m	D	F F_w	C	dyn. $C_{r\,w}$	stat. $C_{0r\,w}$	$C_{ur\,w}$	$n_{D\,G}$	D_1	r_{min}
	kg	mm	mm	mm	N	N	N	min^{-1}	min.	mm
RNA22/6-2RSR	0.018	19	10	11.8	3350	3650	495	9000	15.15	0.3
RNA22/8-2RSR	0.029	24	12	11.8	4100	4300	650	7000	18	0.3
RNA2200-2RSR	0.052	30	14	13.8	6100	6900	1120	5500	20	0.6
RNA2201-2RSR	0.057	32	16	13.8	6600	8300	1300	4700	22	0.6
RNA2202-2RSR	0.06	35	20	13.8	6700	9500	1400	3400	26	0.6
RNA2203-2RSR	0.094	40	22	15.8	8900	13600	1890	3000	28	1
RNA2204-2RSR	0.152	47	25	17.8	14000	18600	2700	2300	33	1
RNA2205-2RSR	0.179	52	30	17.8	14500	20300	2950	1800	38	1
RNA2206-2RSR	0.284	62	35	19.8	17100	26500	3600	1400	43	1
RNA2207-2RSR	0.432	72	42	22.7	21500	36500	5300	1100	50	1.1
RNA2208-2RSR	0.53	80	48	22.7	26000	41500	5400	850	57	1.1

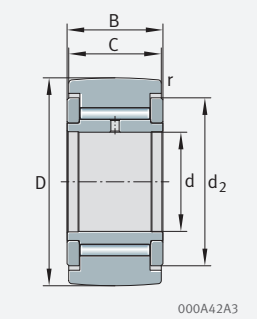
4.1.3 NATR, NATV

With axial guidance

Gap seal



NATR (R = 500 mm) with gap seal



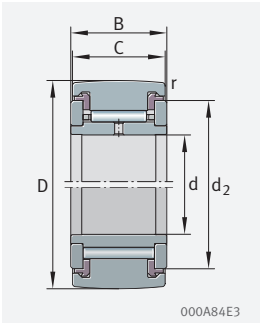
NATV (R = 500 mm) with gap seal

Designation	m	d	D	B	dyn. $C_{r\,w}$	stat. $C_{0r\,w}$	$C_{ur\,w}$	$n_{D\,G}$	C	d_2	r_{min}
	kg	mm	mm	mm	N	N	N	min^{-1}	mm	mm	mm
NATR5	0.014	5	16	12	3200	3450	465	14000	11	12.5	0.15
NATV5	0.015	5	16	12	4850	6700	970	3800	11	12.5	0.15
NATR6	0.02	6	19	12	3550	4100	560	11000	11	15	0.15
NATV6	0.021	6	19	12	5400	8100	1190	3100	11	15	0.15
NATR8	0.041	8	24	15	5500	6700	940	7500	14	19	0.3
NATV8	0.042	8	24	15	7800	11700	1620	2500	14	19	0.3
NATR10	0.064	10	30	15	6800	8700	1240	5500	14	23	0.6
NATV10	0.065	10	30	15	9500	15100	2080	2100	14	23	0.6
NATR12	0.071	12	32	15	7000	9200	1320	4500	14	25	0.6
NATV12	0.072	12	32	15	9600	15900	2210	1800	14	25	0.6
NATR15	0.101	15	35	19	9700	14500	1860	3600	18	27.6	0.6
NATV15	0.109	15	35	19	12700	23400	3250	1600	18	27.6	0.6
NATR17	0.144	17	40	21	10900	16000	2130	2900	20	31.5	1
NATV17	0.152	17	40	21	14700	27000	3550	1400	20	31.5	1
NATR20	0.246	20	47	25	15400	26000	3450	2400	24	36.5	1
NATV20	0.254	20	47	25	20200	42500	6000	1300	24	36.5	1
NATR25	0.275	25	52	25	15200	27000	3600	1800	24	41.5	1
NATV25	0.285	25	52	25	20100	44500	6300	1000	24	41.5	1
NATR30	0.47	30	62	29	23300	39500	5300	1300	28	51	1
NATV30	0.481	30	62	29	30000	63000	9000	850	28	51	1

4.1.4 NATR..-PP, NATV..-PP

With axial guidance

Axial plain washer



NATR, NATV with optimized INA profile and axial plain washer

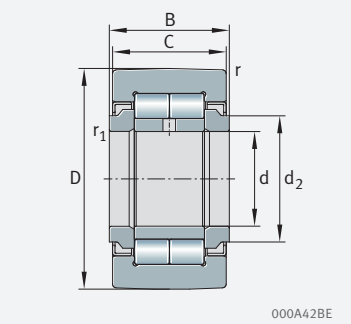
Designation	m	d	D	B	dyn. $C_{r\,w}$	stat. $C_{0r\,w}$	$C_{ur\,w}$	$n_{D\,G}$	C	d_2	r_{min}
	kg	mm	mm	mm	N	N	N	min^{-1}	mm	mm	mm
NATR5-PP	0.014	5	16	12	3200	3450	465	14000	11	12.5	0.15
NATV5-PP	0.015	5	16	12	4850	6700	970	3800	11	12.5	0.15
NATR6-PP	0.019	6	19	12	3550	4100	560	11000	11	15	0.15
NATV6-PP	0.021	6	19	12	5400	8100	1190	3100	11	15	0.15
NATR8-PP	0.038	8	24	15	5500	6700	940	7500	14	19	0.3
NATV8-PP	0.041	8	24	15	7800	11700	1620	2500	14	19	0.3
NATR10-PP	0.064	10	30	15	6800	8700	1240	5500	14	23	0.6
NATV10-PP	0.064	10	30	15	9500	15100	2080	2100	14	23	0.6
NATR12-PP	0.066	12	32	15	7000	9200	1320	4500	14	25	0.6
NATV12-PP	0.069	12	32	15	9600	15900	2210	1800	14	25	0.6
NATR15-PP	0.095	15	35	19	9700	14500	1860	3600	18	27.6	0.6
NATV15-PP	0.101	15	35	19	12700	23400	3250	1600	18	27.6	0.6
NATR17-PP	0.139	17	40	21	10900	16000	2130	2900	20	31.5	1
NATV17-PP	0.147	17	40	21	14700	27000	3550	1400	20	31.5	1
NATR20-PP	0.236	20	47	25	15400	26000	3450	2400	24	36.5	1
NATV20-PP	0.245	20	47	25	20200	42500	6000	1300	24	36.5	1
NATR25-PP	0.271	25	52	25	15200	27000	3600	1800	24	41.5	1
NATV25-PP	0.281	25	52	25	20100	44500	6300	1000	24	41.5	1
NATR30-PP	0.444	30	62	29	23300	39500	5300	1300	28	51	1
NATV30-PP	0.468	30	62	29	30000	63000	9000	850	28	51	1
NATR35-PP	0.547	35	72	29	24800	45000	6000	1000	28	58	1.1
NATV35-PP	0.63	35	72	29	32000	72000	10300	750	28	58	1.1
NATR40-PP	0.795	40	80	32	32500	59000	8400	850	30	66	1.1
NATV40-PP	0.832	40	80	32	39500	89000	13200	650	30	66	1.1
NATR50-PP	0.867	50	90	32	31000	60000	8500	650	30	76	1.1
NATV50-PP	0.969	50	90	32	39500	93000	13800	550	30	76	1.1

4.1.5 NUTR, PWTR..-2RS

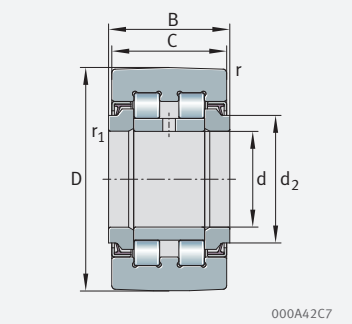
With optimized INA profile

With axial guidance

Sealed



NUTR, with optimized INA profile, with labyrinth seal



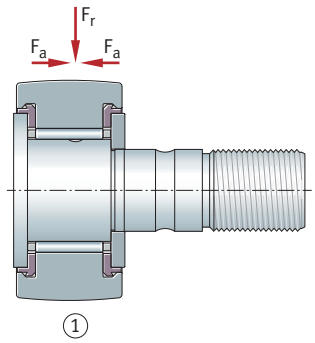
PWTR, with optimized INA profile, with seal 2RS

Designation	m	D	d	B	dyn. $C_{r\,w}$	stat. $C_{0r\,w}$	dyn. $F_{r\,per}$	stat. $F_{0r\,per}$	$C_{ur\,w}$	$n_{D\,G}$	C	d_2	r_{min}	$r_{1\,min}$
	kg	mm	mm	mm	N	N	N	N	N	min^{-1}	mm	mm	mm	mm
NUTR15	0.099	35	15	19	15600	18600	8500	16800	2480	6500	18	20	0.6	0.3
PWTR15-2RS-XL	0.099	35	15	19	12500	14900	10600	14900	1790	6000	18	20	0.6	0.3
NUTR17	0.147	40	17	21	19100	24800	12900	24800	3250	5500	20	22	1	0.5
PWTR17-2RS-XL	0.147	40	17	21	14300	18200	16400	18200	2200	5000	20	22	1	0.5
NUTR1542	0.158	42	15	19	18700	24200	24200	24200	3200	6500	18	20	0.6	0.3
PWTR1542-2RS-XL	0.158	42	15	19	14600	16200	16200	16200	2180	6000	18	20	0.6	0.3
NUTR1747	0.22	47	17	21	22000	30500	30500	30500	3950	5500	20	22	1	0.5
PWTR1747-2RS-XL	0.22	47	17	21	15900	18400	18400	18400	2480	5000	20	22	1	0.5
NUTR20	0.245	47	20	25	28500	38000	16300	32500	4950	4200	24	27	1	0.5
PWTR20-2RS-XL	0.245	47	20	25	24400	31000	20600	31000	3800	3800	24	27	1	0.5
NUTR2052	0.321	52	20	25	31500	44500	38000	44500	5800	4200	24	27	1	0.5
PWTR2052-2RS-XL	0.321	52	20	25	27000	35500	31000	35500	4350	3800	24	27	1	0.5
NUTR25	0.281	52	25	25	29000	41500	17100	34000	5400	4200	24	31	1	0.5
PWTR25-2RS-XL	0.281	52	25	25	25500	33500	21800	33500	4200	3800	24	31	1	0.5
NUTR2562	0.45	62	25	25	35500	54000	54000	54000	7000	4200	24	31	1	0.5
PWTR2562-2RS-XL	0.45	62	25	25	30000	42500	42500	42500	5300	3800	24	31	1	0.5
NUTR30	0.465	62	30	29	41000	54000	23300	46000	7400	2600	28	38	1	0.5
PWTR30-2RS-XL	0.465	62	30	29	35000	44500	28500	44500	6000	2200	28	38	1	0.5
NUTR3072	0.697	72	30	29	49000	69000	68000	69000	9400	2600	28	38	1	0.5
PWTR3072-2RS-XL	0.697	72	30	29	41000	56000	53000	56000	7400	2200	28	38	1	0.5
NUTR35	0.63	72	35	29	45500	65000	31500	62000	8900	2100	28	44	1.1	0.6
PWTR35-2RS-XL	0.63	72	35	29	39000	53000	38500	53000	7100	1800	28	44	1.1	0.6
NUTR3580	0.836	80	35	29	52000	77000	76000	77000	10500	2100	28	44	1.1	0.6
PWTR3580-2RS-XL	0.836	80	35	29	43500	62000	59000	62000	8300	1800	28	44	1.1	0.6
NUTR40	0.816	80	40	32	57000	80000	31000	60000	11300	1600	30	50.5	1.1	0.6
PWTR40-2RS-XL	0.816	80	40	32	45000	60000	39000	60000	8100	1500	30	50.5	1.1	0.6
NUTR45	0.883	85	45	32	57000	83000	31500	62000	11800	1400	30	55.2	1.1	0.6
PWTR45-2RS-XL	0.883	85	45	32	46000	62000	40500	62000	8400	1300	30	55.2	1.1	0.6
NUTR4090	1.129	90	40	32	67000	101000	83000	101000	14200	1600	30	50.5	1.1	0.6
PWTR4090-2RS-XL	1.129	90	40	32	53000	74000	66000	74000	9900	1500	30	50.5	1.1	0.6
NUTR50	0.95	90	50	32	58000	86000	32500	63000	12200	1300	30	59.8	1.1	0.6
PWTR50-2RS-XL	0.95	90	50	32	46500	64000	41500	64000	8700	1100	30	59.8	1.1	0.6
NUTR45100	1.396	100	45	32	73000	114000	105000	114000	16100	1400	30	55.2	1.1	0.6
PWTR45100-2RS-XL	1.396	100	45	32	56000	83000	83000	83000	11100	1300	30	55.2	1.1	0.6
NUTR50110	1.69	110	50	32	77000	127000	127000	127000	18000	1300	30	59.8	1.1	0.6
PWTR50110-2RS-XL	1.69	110	50	32	60000	92000	92000	92000	12300	1100	30	59.8	1.1	0.6

4.2 Stud type track rollers

Stud type track rollers are similar in their construction to single and double row yoke type track rollers with axial guidance, except that the raceway is formed by a heavy-section roller stud with a fixing thread and type-dependent relubrication facility. Due to the thick-walled outer ring with profiled outside surface and the rolling element set, they can support high radial loads as well as axial loads arising from slight misalignment and skewed running. The stud type track rollers are available with or without an eccentric collar. Proven areas of application of these products include cam gears, bed ways, conveying equipment, and linear guidance systems.

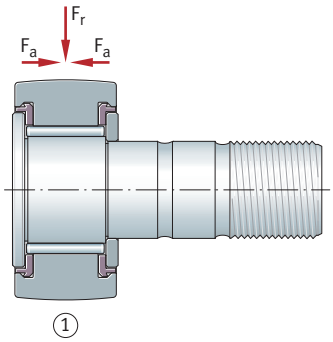
Stud type track rollers without an eccentric collar do not have a defined adjustment facility in relation to the mating track on the adjacent construction in mounting of the bearings. The series KR and KR..-PP have a cage, the design KRV..-PP has a full complement needle roller set. Series NUKR has a full complement cylindrical roller set, series PWKR..-2RS has a full complement cylindrical roller set and a central rib. Bearings without a cage have the largest possible number of rolling elements and therefore have particularly high load carrying capacity. Due to the kinematic conditions, however, the speeds achievable with these bearings are somewhat lower than those achievable with the cage-guided stud type track rollers. The type of guidance is dependent on the series. In KR, axial guidance is provided directly by the contact flange and thrust washer, while in KR..-PP and KRV..-PP this is provided by plastic axial plain washers, the contact flange, and thrust washer. The outer rings of series NUKR and PWKR..-2RS are guided by the rolling elements and ribs. Relubrication facility Stud type track rollers KR16 and KR19 with a hexagonal socket cannot be relubricated, while stud type track rollers KR16 and KR19 with a mounting slot have a relubrication facility.



000A7522

10 Stud type track roller without eccentric collar, with cage, sealed on both sides

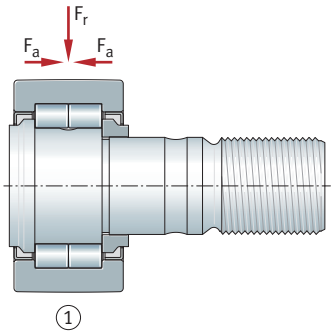
F_r	Radial load	F_a	Axial load
1	Plastic axial plain washers (for KR..-PP) or gap seals (for KR)		



000A7525

11 Stud type track roller without eccentric collar, full complement needle roller set, sealed on both sides

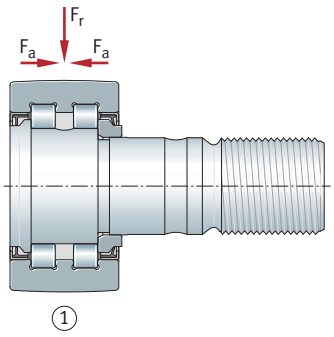
F_r	Radial load	F_a	Axial load
1	Plastic axial plain washers (KRV..-PP)		



000A7534

12 Stud type track roller without eccentric collar, full complement cylindrical roller set, sealed on both sides

F_r	Radial load	F_a	Axial load
1	Labyrinth seals (NUKR)		



000A7538

13 Stud type track roller without eccentric collar, full complement cylindrical roller set, with central rib, sealed on both sides

F_r	Radial load	F_a	Axial load
1	Protected lip seals (PWKR..-2RS)		

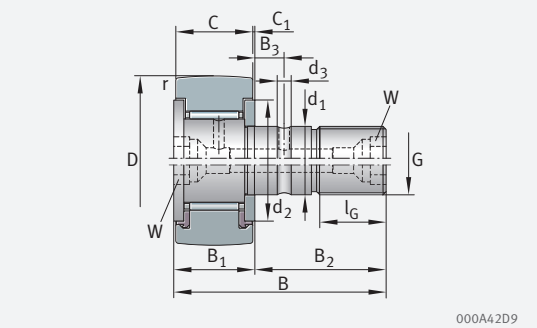
4.2.1 KR, KR..-PP

With axial guidance

Open or sealed

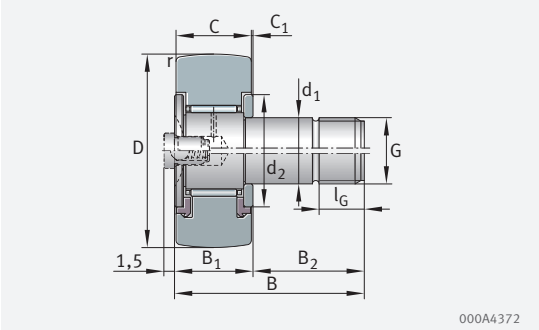
Without eccentric collar

KR, KR..-PP

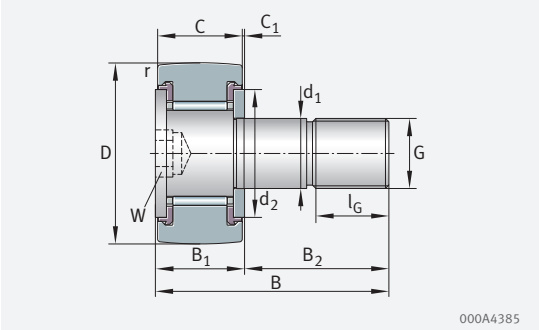


D ≥ 22 mm: KR (top: R = 500 mm);
KR..-PP (bottom: with optimized INA profile)

Designation	m	D	d_1 h7	B	dyn. C_{rw}	stat. C_{0rw}	C_{urw}	n_{DG}	B_1	B_2	B_3
	kg	mm	mm	mm	N	N	N	min^{-1}	max.	mm	mm
KR16	0.019	16	6	28	3200	3450	465	14000	12.2	16	–
KR16-PP	0.018	16	6	28	3200	3450	465	14000	12.2	16	–
KR16-SK-PP	0.019	16	6	28	3200	3450	465	14000	12.2	16	–
KR19	0.029	19	8	32	3550	4100	560	11000	12.2	20	–
KR19-PP	0.029	19	8	32	3550	4100	560	11000	12.2	20	–
KR19-SK-PP	0.029	19	8	32	3550	4100	560	11000	12.2	20	–
KR22	0.045	22	10	36	4500	5400	740	8000	13.2	23	–
KR22-PP	0.043	22	10	36	4500	5400	740	8000	13.2	23	–
KR26	0.059	26	10	36	5100	6500	860	8000	13.2	23	–
KR26-PP	0.057	26	10	36	5100	6500	860	8000	13.2	23	–
KR30	0.092	30	12	40	6800	8700	1240	5500	15.2	25	6
KR30-PP	0.088	30	12	40	6800	8700	1240	5500	15.2	25	6
KR32	0.103	32	12	40	7100	9300	1320	5500	15.2	25	6
KR32-PP	0.098	32	12	40	7100	9300	1320	5500	15.2	25	6
KR35	0.173	35	16	52	9700	14500	1860	3600	19.6	32.5	8
KR35-PP	0.164	35	16	52	9700	14500	1860	3600	19.6	32.5	8
KR40	0.247	40	18	58	10900	16000	2130	2900	21.6	36.5	8
KR40-PP	0.239	40	18	58	10900	16000	2130	2900	21.6	36.5	8
KR47-PP	0.381	47	20	66	15400	26000	3450	2400	25.6	40.5	9
KR52-PP	0.454	52	20	66	16700	29500	3850	2400	25.6	40.5	9
KR62-PP	0.77	62	24	80	26000	48500	7000	1900	30.6	49.5	11
KR72-PP	1.01	72	24	80	28000	53000	7300	1900	30.6	49.5	11
KR80-PP	1.608	80	30	100	38500	78000	11200	1300	37	63	15
KR90-PP	1.975	90	30	100	40500	84000	11900	1300	37	63	15



KR16, KR19 (top), KR16-PP, KR19-PP (bottom)



KR16-SK-PP, KR19-SK-PP

C	C_1	r_{min}	d_2	d_3	G	l_G	W	Drive fit lubrication nipple	M_A
mm	mm	mm	mm	mm		mm	mm		Nm
11	0.6	0.15	12.5	–	M6	8	–	NIPA1	3
11	0.6	0.15	12.5	–	M6	8	–	NIPA1	3
11	0.6	0.15	12.5	–	M6	8	4	–	3
11	0.6	0.15	15	–	M8	10	–	NIPA1	8
11	0.6	0.15	15	–	M8	10	–	NIPA1	8
11	0.6	0.15	15	–	M8	10	4	–	8
12	0.6	0.3	17.5	–	M10×1	12	5	NIPA1×4,5	15
12	0.6	0.3	17.5	–	M10×1	12	5	NIPA1×4,5	15
12	0.6	0.3	17.5	–	M10×1	12	5	NIPA1×4,5	15
12	0.6	0.3	17.5	–	M10×1	12	5	NIPA1×4,5	15
14	0.6	0.6	23	3	M12×1.5	13	6	NIPA1×4,5	22
14	0.6	0.6	23	3	M12×1.5	13	6	NIPA1×4,5	22
14	0.6	0.6	23	3	M12×1.5	13	6	NIPA1×4,5	22
14	0.6	0.6	23	3	M12×1.5	13	6	NIPA1×4,5	22
18	0.8	0.6	27.6	3	M16×1.5	17	8	NIPA2×7,5	58
18	0.8	0.6	27.6	3	M16×1.5	17	8	NIPA2×7,5	58
20	0.8	1	31.5	3	M18×1.5	19	8	NIPA2×7,5	87
20	0.8	1	31.5	3	M18×1.5	19	8	NIPA2×7,5	87
24	0.8	1	36.5	4	M20×1.5	21	10	NIPA2×7,5	120
24	0.8	1	36.5	4	M20×1.5	21	10	NIPA2×7,5	120
29	0.8	1	44	4	M24×1.5	25	14	NIPA3×9,5	220
29	0.8	1.1	44	4	M24×1.5	25	14	NIPA3×9,5	220
35	1	1.1	53	4	M30×1.5	32	14	NIPA3×9,5	450
35	1	1.1	53	4	M30×1.5	32	14	NIPA3×9,5	450

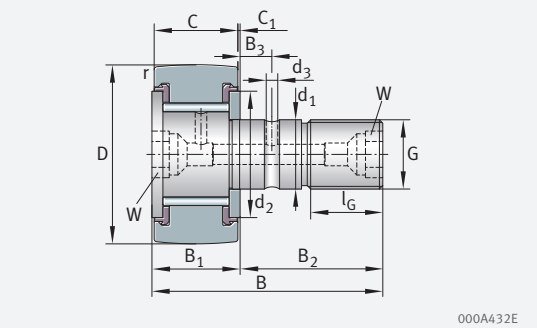
4.2.2 KRV..-PP

With axial guidance

Open or sealed

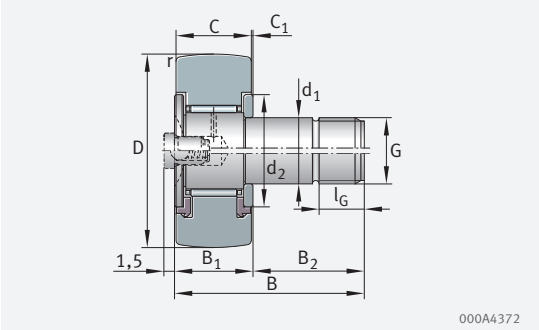
Without eccentric collar

KRV..-PP



D ≥ 22 mm: KRV..-PP, with optimized INA profile

Designation	m	D	d_1 h7	B	dyn. $C_{r\,w}$	stat. $C_{0r\,w}$	$C_{ur\,w}$	$n_{D\,G}$	B_1	B_2	B_3
	kg	mm	mm	mm	N	N	N	min^{-1}	max.	mm	mm
KRV16-PP	0.019	16	6	28	4850	6700	970	3800	12.2	16	–
KRV19-PP	0.031	19	8	32	5400	8100	1190	3100	12.2	20	–
KRV22-PP	0.045	22	10	36	6200	9300	1230	2600	13.2	23	–
KRV26-PP	0.059	26	10	36	7300	11600	1520	2600	13.2	23	–
KRV30-PP	0.091	30	12	40	9500	15100	2080	2100	15.2	25	6
KRV32-PP	0.101	32	12	40	10000	16300	2240	2100	15.2	25	6
KRV35-PP	0.166	35	16	52	12700	23400	3250	1600	19.6	32.5	8
KRV40-PP	0.247	40	18	58	14700	27000	3550	1400	21.6	36.5	8
KRV47-PP	0.39	47	20	66	20200	42500	6000	1300	25.6	40.5	9
KRV52-PP	0.463	52	20	66	22200	48500	6800	1300	25.6	40.5	9
KRV62-PP	0.787	62	24	80	33500	76000	11400	1100	30.6	49.5	11
KRV72-PP	1.027	72	24	80	36500	86000	12800	1100	30.6	49.5	11
KRV80-PP	1.636	80	30	100	48000	118000	17600	850	37	63	15
KRV90-PP	2.003	90	30	100	51000	130000	19400	850	37	63	15



KR16, KR19 (top), KRV16-PP, KRV19-PP (bottom)

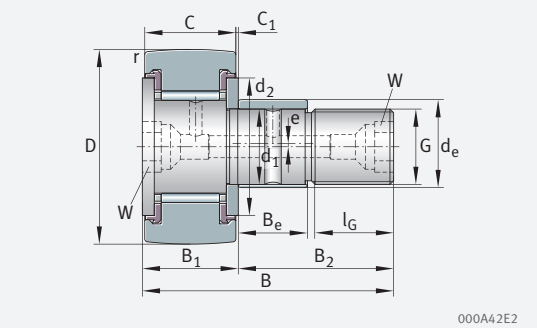
C	C_1	r_{min}	d_2	d_3	G	l_G	W	Drive fit lubrication nipple	M_A
mm	mm	mm	mm	mm		mm	mm		Nm
11	0.6	0.15	12.5	–	M6	8	–	NIPA1	3
11	0.6	0.15	15	–	M8	10	–	NIPA1	8
12	0.6	0.3	17.5	–	M10×1	12	5	NIPA1×4,5	15
12	0.6	0.3	17.5	–	M10×1	12	5	NIPA1×4,5	15
14	0.6	0.6	23	3	M12×1.5	13	6	NIPA1×4,5	22
14	0.6	0.6	23	3	M12×1.5	13	6	NIPA1×4,5	22
18	0.8	0.6	27.6	3	M16×1.5	17	8	NIPA2×7,5	58
20	0.8	1	31.5	3	M18×1.5	19	8	NIPA2×7,5	87
24	0.8	1	36.5	4	M20×1.5	21	10	NIPA2×7,5	120
24	0.8	1	36.5	4	M20×1.5	21	10	NIPA2×7,5	120
29	0.8	1	44	4	M24×1.5	25	14	NIPA3×9,5	220
29	0.8	1.1	44	4	M24×1.5	25	14	NIPA3×9,5	220
35	1	1.1	53	4	M30×1.5	32	14	NIPA3×9,5	450
35	1	1.1	53	4	M30×1.5	32	14	NIPA3×9,5	450

4.2.3 KRE..-PP

With axial guidance

Open or sealed

With eccentric collar



KRE..-PP, with optimized INA profile

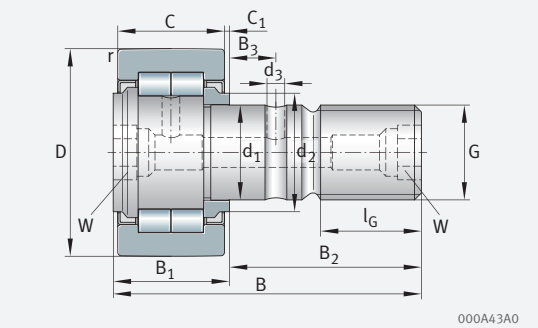
Designation	m	D	d_1 h7	B	dyn. C_{rw}	stat. C_{0rw}	C_{urw}	n_{DG}	B_1	B_2	B_3
	kg	mm	mm	mm	N	N	N	min^{-1}	max.	mm	mm
KRE16-PP	0.02	16	6	28	3200	3450	465	14000	12.2	16	–
KRE19-PP	0.032	19	8	32	3550	4100	560	11000	12.2	20	–
KRE22-PP	0.047	22	10	36	4500	5400	740	8000	13.2	23	–
KRE26-PP	0.062	26	10	36	5100	6500	860	8000	13.2	23	–
KRE30-PP	0.093	30	12	40	6800	8700	1240	5500	15.2	25	6
KRE32-PP	0.104	32	12	40	7100	9300	1320	5500	15.2	25	6
KRE35-PP	0.177	35	16	52	9700	14500	1860	3600	19.6	32.5	8
KRE40-PP	0.255	40	18	58	10900	16000	2130	2900	21.6	36.5	8
KRE47-PP	0.4	47	20	66	15400	26000	3450	2400	25.6	40.5	9
KRE52-PP	0.473	52	20	66	16700	29500	3850	2400	25.6	40.5	9
KRE62-PP	0.789	62	24	80	26000	48500	7000	1900	30.6	49.5	11
KRE72-PP	1.038	72	24	80	28000	53000	7300	1900	30.6	49.5	11
KRE80-PP	1.665	80	30	100	38500	78000	11200	1300	37	63	15
KRE90-PP	2.032	90	30	100	40500	84000	11900	1300	37	63	15

C	C_1	r_{min}	d_2	d_3	G	l_G	W	d_e h9	B_e	e	Drive fit lubrication nipple	M_A
mm	mm	mm	mm	mm		mm	mm	mm	mm	mm		Nm
11	0.6	0.15	12.5	–	M6	8	–	9	7	0.5	NIPA1	3
11	0.6	0.15	15	–	M8	10	–	11	9	0.5	NIPA1	8
12	0.6	0.3	17.5	–	M10×1	12	5	13	10	0.5	NIPA1×4,5	15
12	0.6	0.3	17.5	–	M10×1	12	5	13	10	0.5	NIPA1×4,5	15
14	0.6	0.6	23	3	M12×1.5	13	6	15	11	0.5	NIPA1×4,5	22
14	0.6	0.6	23	3	M12×1.5	13	6	15	11	0.5	NIPA1×4,5	22
18	0.8	0.6	27.6	3	M16×1.5	17	8	20	14	1	NIPA2×7,5	58
20	0.8	1	31.5	3	M18×1.5	19	8	22	16	1	NIPA2×7,5	87
24	0.8	1	36.5	4	M20×1.5	21	10	24	18	1	NIPA2×7,5	120
24	0.8	1	36.5	4	M20×1.5	21	10	24	18	1	NIPA2×7,5	120
29	0.8	1	44	4	M24×1.5	25	14	28	22	1	NIPA3×9,5	220
29	0.8	1.1	44	4	M24×1.5	25	14	28	22	1	NIPA3×9,5	220
35	1	1.1	53	4	M30×1.5	32	14	35	29	1.5	NIPA3×9,5	450
35	1	1.1	53	4	M30×1.5	32	14	35	29	1.5	NIPA3×9,5	450

4.2.4 NUKR, PWKR..-2RS

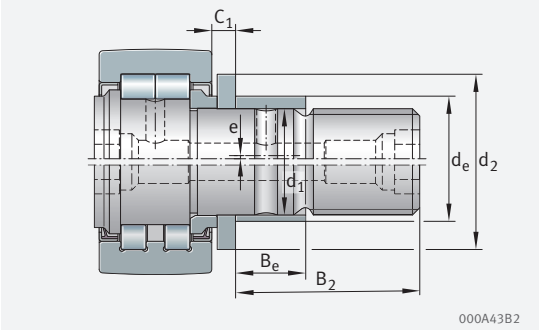
With axial guidance

Without eccentric collar



NUKR, with optimized INA profile

Designation	m	D	d_1 h7	B	dyn. $C_{r\,w}$	stat. $C_{0r\,w}$	dyn. $F_{r\,per}$	stat. $F_{0r\,per}$	$C_{ur\,w}$	$n_{D\,G}$
	kg	mm	mm	mm	N	N	N	N	N	min^{-1}
NUKR35	0.164	35	16	52	15600	18600	8500	16800	2480	6500
PWKR35-2RS-XL	0.164	35	16	52	12500	14900	10600	14900	1790	6000
NUKR40	0.242	40	18	58	19100	24800	12900	24800	3250	5500
PWKR40-2RS-XL	0.242	40	18	58	14300	18200	16400	18200	2200	5000
NUKR47	0.38	47	20	66	28500	38000	16300	32500	4950	4200
PWKR47-2RS-XL	0.38	47	20	66	24400	31000	20600	31000	3800	3800
NUKR52	0.45	52	20	66	29000	41500	17100	34000	5400	4200
PWKR52-2RS-XL	0.45	52	20	66	25500	33500	21800	33500	4200	3800
NUKR62	0.795	62	24	80	41000	54000	23300	46000	7400	2600
PWKR62-2RS-XL	0.795	62	24	80	35000	44500	28500	44500	6000	2200
NUKR72	1.02	72	24	80	45500	65000	31500	62000	8900	2600
PWKR72-2RS-XL	1.02	72	24	80	39000	53000	38500	53000	7100	2200
NUKR80	1.6	80	30	100	71000	103000	47000	94000	14400	1800
PWKR80-2RS-XL	1.6	80	30	100	57000	77000	59000	77000	10900	1800
NUKR90	1.96	90	30	100	80000	123000	76000	123000	17000	1800
PWKR90-2RS-XL	1.96	90	30	100	63000	89000	89000	89000	12500	1800



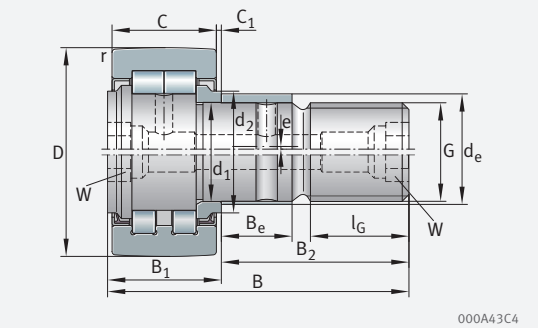
PWKR..-2RS, with optimized INA profile

B_1	B_2	B_3	C	C_1	r_{min}	d_2	d_3	G	l_G	W	Drive fit lubrication nipple	M_A
max.	mm	mm	mm	mm	mm	mm	mm		mm	mm		Nm
19.6	32.5	7.8	18	0.8	0.6	20	3	M16×1.5	17	8	NIPA2×7,5	58
19.6	32.5	7.8	18	0.8	0.6	20	3	M16×1.5	17	8	NIPA2×7,5	58
21.6	36.5	8	20	0.8	1	22	3	M18×1.5	19	8	NIPA2×7,5	87
21.6	36.5	8	20	0.8	1	22	3	M18×1.5	19	8	NIPA2×7,5	87
25.6	40.5	9	24	0.8	1	27	4	M20×1.5	21	10	NIPA2×7,5	120
25.6	40.5	9	24	0.8	1	27	4	M20×1.5	21	10	NIPA2×7,5	120
25.6	40.5	9	24	0.8	1	31	4	M20×1.5	21	10	NIPA2×7,5	120
25.6	40.5	9	24	0.8	1	31	4	M20×1.5	21	10	NIPA2×7,5	120
30.6	49.5	11	28	1.3	1	38	4	M24×1.5	25	14	NIPA3×9,5	220
30.6	49.5	11	28	1.3	1	38	4	M24×1.5	25	14	NIPA3×9,5	220
30.6	49.5	11	28	1.3	1.1	44	4	M24×1.5	25	14	NIPA3×9,5	220
30.6	49.5	11	28	1.3	1.1	44	4	M24×1.5	25	14	NIPA3×9,5	220
37	63	15	35	1	1.1	47	4	M30×1.5	32	14	NIPA3×9,5	450
37	63	15	35	1	1.1	47	4	M30×1.5	32	14	NIPA3×9,5	450
37	63	15	35	1	1.1	47	4	M30×1.5	32	14	NIPA3×9,5	450
37	63	15	35	1	1.1	47	4	M30×1.5	32	14	NIPA3×9,5	450

4.2.5 NUKRE, PWKRE..-2RS

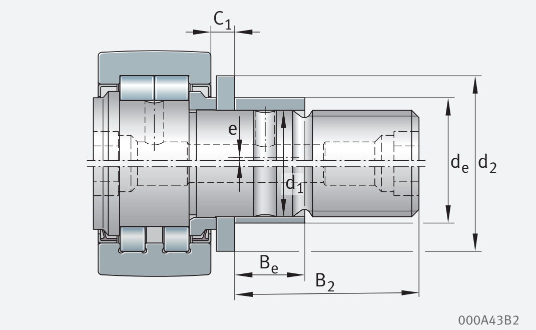
With axial guidance

With eccentric collar



NUKRE (top), PWKRE..-2RS (bottom),
with optimized INA profile

Designation	m	D	d_1 h7	B	dyn. $C_{r\,w}$	stat. $C_{0r\,w}$	dyn. $F_{r\,per}$	stat. $F_{0r\,per}$	$C_{ur\,w}$	$n_{D\,G}$
	kg	mm	mm	mm	N	N	N	N	N	min^{-1}
NUKRE35	0.177	35	16	52	15600	18600	8500	16800	2480	6500
PWKRE35-2RS-XL	0.177	35	16	52	12500	14900	10600	14900	1790	6000
NUKRE40	0.258	40	18	58	19100	24800	12900	24800	3250	5500
PWKRE40-2RS-XL	0.258	40	18	58	14300	18200	16400	18200	2200	5000
NUKRE47	0.4	47	20	66	28500	38000	16300	32500	4950	4200
PWKRE47-2RS-XL	0.4	47	20	66	24400	31000	20600	31000	3800	3800
NUKRE52	0.47	52	20	66	29000	41500	17100	34000	5400	4200
PWKRE52-2RS-XL	0.47	52	20	66	25500	33500	21800	33500	4200	3800
NUKRE62	0.824	62	24	80	41000	54000	23300	46000	7400	2600
PWKRE62-2RS-XL	0.824	62	24	80	35000	44500	28500	44500	6000	2200
NUKRE72	1.05	72	24	80	45500	65000	31500	62000	8900	2600
PWKRE72-2RS-XL	1.05	72	24	80	39000	53000	38500	53000	7100	2200
NUKRE80	1.67	80	30	100	71000	103000	47000	94000	14400	1800
PWKRE80-2RS-XL	1.67	80	30	100	57000	77000	59000	77000	10900	1800
NUKRE90	2.02	90	30	100	80000	123000	76000	123000	17000	1800
PWKRE90-2RS-XL	2.02	90	30	100	63000	89000	89000	89000	12500	1800



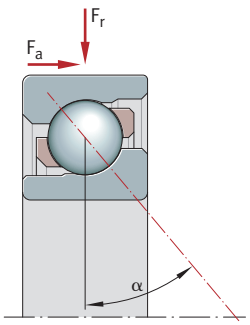
NUKRE35/NUKRE40 (top), PWKRE35-2RS/
PWKRE40-2RS (bottom), with optimized INA profile

B_1	B_2	B_3	C	C_1	r_{min}	d_2	d_3	G	l_G	W	d_e h9	B_e	e	Drive fit lubrication nipple	M_A
max.	mm	mm	mm	mm	mm	mm	mm		mm	mm	mm	mm	mm		Nm
22.6	29.5	–	18	3.8	0.6	27.6	–	M16×1.5	17	8	20	12	1	NIPA2×7,5	58
22.6	29.5	–	18	3.8	0.6	27.6	–	M16×1.5	17	8	20	12	1	NIPA2×7,5	58
24.6	33.5	–	20	3.8	1	30	–	M18×1.5	19	8	22	14	1	NIPA2×7,5	87
24.6	33.5	–	20	3.8	1	30	–	M18×1.5	19	8	22	14	1	NIPA2×7,5	87
25.6	40.5	9	24	0.8	1	27	4	M20×1.5	21	10	24	18	1	NIPA2×7,5	120
25.6	40.5	9	24	0.8	1	27	4	M20×1.5	21	10	24	18	1	NIPA2×7,5	120
25.6	40.5	9	24	0.8	1	31	4	M20×1.5	21	10	24	18	1	NIPA2×7,5	120
25.6	40.5	9	24	0.8	1	31	4	M20×1.5	21	10	24	18	1	NIPA2×7,5	120
30.6	49.5	11	28	1.3	1	38	4	M24×1.5	25	14	28	22	1	NIPA3×9,5	220
30.6	49.5	11	28	1.3	1	38	4	M24×1.5	25	14	28	22	1	NIPA3×9,5	220
30.6	49.5	11	28	1.3	1.1	44	4	M24×1.5	25	14	28	22	1	NIPA3×9,5	220
30.6	49.5	11	28	1.3	1.1	44	4	M24×1.5	25	14	28	22	1	NIPA3×9,5	220
37	63	15	35	1	1.1	47	4	M30×1.5	32	14	35	29	1.5	NIPA3×9,5	450
37	63	15	35	1	1.1	47	4	M30×1.5	32	14	35	29	1.5	NIPA3×9,5	450
37	63	15	35	1	1.1	47	4	M30×1.5	32	14	35	29	1.5	NIPA3×9,5	450
37	63	15	35	1	1.1	47	4	M30×1.5	32	14	35	29	1.5	NIPA3×9,5	450

5 Single row angular contact ball bearings

Bearings of basic design for bearing arrangements with single bearings

Single row angular contact ball bearings are part of the group of radial ball bearings. These self-retaining units have solid outer and inner rings. The rolling elements are guided by cages made from polyamide, sheet steel, or brass. The bearing rings are designed with one high shoulder and one low shoulder. As a result of the different shoulder heights, the mounting method differs from that of deep groove ball bearings. The possible number of balls for angular contact ball bearings with identical dimensions is higher than for deep groove ball bearings. In contrast to deep groove ball bearings, the raceways on the inner and outer rings are arranged obliquely to each other in the direction of the bearing axis. As a result, the forces are transmitted from one raceway to the other at a defined contact angle (oblique to the radial plane). These angular contact ball bearings can be considered when only one bearing is used per bearing position. As the bearings have standard bearing ring tolerances (they are manufactured to tolerance class Normal), they are not suitable for mounting directly adjacent to each other. In such cases, universal bearings should be used



14 Single row angular contact ball bearing of basic design

F_r	Radial load	F_a	Axial load
α	Nominal contact angle		

Universal bearings for mounting in sets

Single row angular contact ball bearings, which are intended for mounting in pairs (in sets) directly adjacent to each other, are manufactured in the so-called universal design. These bearings can be used in pairs in any arrangement without shims. Depending on the design selected, the mounted bearing pair has the required axial clearance, freedom from clearance, or preload. This gives easier design of the bearing arrangement and mounting of the bearings. When ordering, please state the number of bearings, not the number of bearing pairs.

Suffixes

Bearings of a universal design are indicated by the suffix UA, UB, UO, UL, UM, or UH. If bearings of the universal design are arranged in sets, this gives a defined axial clearance or an axial preload:

- UA = bearing set with small axial internal clearance
- UB = bearing set with smaller axial internal clearance than UA

- UO = bearing set clearance-free in O or X arrangement
- UL = bearing set with light preload
- UM = bearing set with moderate preload
- UH = bearing set with high preload

Single row angular contact ball bearings are mounted in sets if:

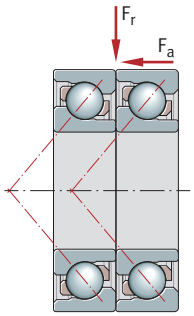
- the load carrying capacity of one bearing is not sufficient (bearing set in a tandem arrangement)
- combined or axial loads occur in both directions and the bearing arrangement must have a defined axial clearance (bearing set in O or X arrangement)

The following arrangements are possible for mounting in sets:

- tandem arrangement
- O arrangement
- X arrangement

Universal bearings, mounted in sets in a tandem arrangement

In a tandem arrangement, the contact lines run parallel to each other. Axial forces are distributed equally over both bearings, but can only be supported by the bearing set from one direction. In order to support axial forces from the opposing direction, as well as combined loads, the bearing set is always adjusted against a further bearing.

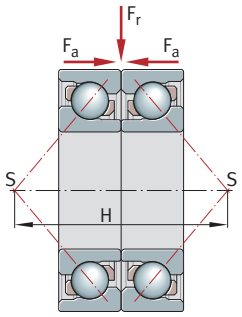


15 Universal bearings, mounted in sets in a tandem arrangement

F_r	Radial load	F_a	Axial load

Universal bearings, mounted in sets in an O arrangement

In an O arrangement, the apexes of the cones formed by the contact lines point outwards, i.e. they diverge relative to the bearing axis. Bearing sets in an O arrangement support axial forces from both directions, but only ever with one bearing. Due to the large support spacing (this is the spacing between the contact cone apexes), these give relatively rigid bearing arrangements (small tilting clearance) and are also suitable for supporting tilting moments.

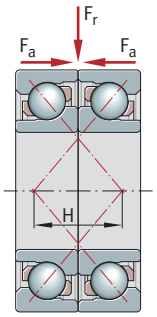


16 Universal bearings, mounted in sets in an O arrangement

F_r	Radial load	F_a	Axial load
S	Contact cone apex	H	Support spacing

Universal bearings, mounted in sets in an X arrangement

In an X arrangement, the apexes of the cones formed by the contact lines point inwards, i.e. they converge relative to the bearing axis. Once again, bearing sets of this type support axial forces from both directions, but also only ever with one bearing. The support base is, however, smaller than in an O arrangement. As a result, the sets are not as rigid as in an O arrangement. Furthermore, they are less suitable for supporting tilting moments.



17 Universal bearings, mounted in sets in an X arrangement

F_r	Radial load	F_a	Axial load
H	Support spacing		

X-life premium quality

Many sizes in series 70..-B, 72..-B, 73..-B, and 74..-B are available as X-life bearings. These bearings exhibit considerably higher performance than standard single row angular contact ball bearings. This is achieved, for example, through the modified internal construction, higher surface quality of the contact surfaces, and optimized cage design, as well as through the improved quality of the steel and rolling elements.

The technical enhancements offer a range of advantages, such as:

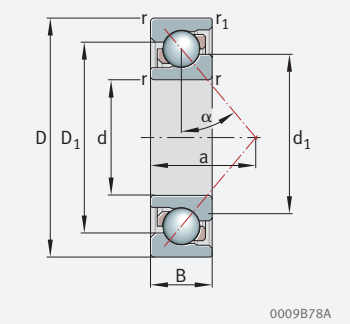
- a more favorable load distribution in the bearing and thus a higher dynamic load carrying capacity of the bearings
- quieter running
- running with reduced friction and greater energy efficiency
- lower heat generation in the bearing
- higher possible speeds

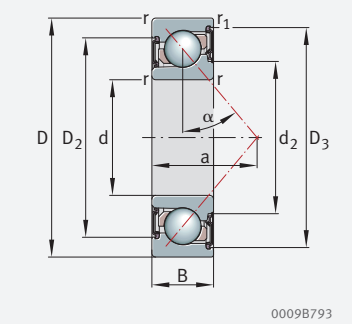
- lower lubricant consumption and, consequently, longer maintenance intervals
- a measurably longer operating life of the bearings
- high operational security
- compact, environmentally-friendly bearing arrangements

Single row X-life angular contact ball bearings include the suffix XL in the designation.

5.1 7..-B-TVH, 7..-B-XL-TVP, 7..-B-XL-2RS-TVP, 7..-B-XL-JP, 7..-B-XL-MP

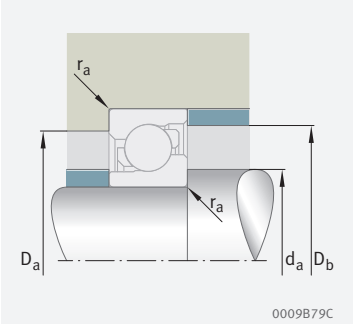
Single row



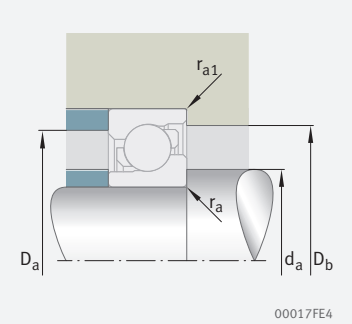


With seal 2RS

Designation	m	d	D	B	D_1	D_2	D_3	d_1	d_2	r_{min}	$r_{1\ min}$
	kg	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
71806-B-TVH	0.026	30	42	7	37.3	–	–	34.7	–	0.3	0.2
7006-B-XL-TVP	0.109	30	55	13	47.1	–	–	41.3	–	1	0.6
7006-B-XL-2RS-TVP	0.109	30	55	13	47.1	47.7	51.9	41.3	38	1	0.6
7206-B-XL-JP	0.203	30	62	16	49.5	–	–	43.2	–	1	0.6
7206-B-XL-TVP	0.197	30	62	16	49.5	–	–	43.2	–	1	0.6
7206-B-XL-2RS-TVP	0.204	30	62	16	49.5	51.7	57.1	43.2	39.5	1	0.6
7306-B-XL-JP	0.362	30	72	19	55.9	–	–	47.1	–	1.1	0.6
7306-B-XL-TVP	0.341	30	72	19	55.9	–	–	47.1	–	1.1	0.6
7306-B-XL-2RS-TVP	0.341	30	72	19	55.9	58.5	65.9	47.1	42.7	1.1	0.6
7406-B-XL-MP	0.791	30	90	23	66	–	–	55.3	–	1.5	1
71807-B-TVH	0.029	35	47	7	42.3	–	–	39.7	–	0.3	0.2
7007-B-XL-TVP	0.14	35	62	14	53.4	–	–	47	–	1	0.6
7007-B-XL-2RS-TVP	0.14	35	62	14	53.4	54	58.9	47	43.6	1	0.6
7207-B-XL-JP	0.29	35	72	17	57.6	–	–	50.2	–	1.1	0.6
7207-B-XL-TVP	0.282	35	72	17	57.6	–	–	50.2	–	1.1	0.6
7207-B-XL-2RS-TVP	0.292	35	72	17	57.6	60.2	66.5	50.2	45.8	1.1	0.6
7307-B-XL-JP	0.48	35	80	21	63	–	–	53.1	–	1.5	1
7307-B-XL-TVP	0.48	35	80	21	63	–	–	53.1	–	1.5	1
7307-B-XL-2RS-TVP	0.477	35	80	21	63	65.6	73.9	53.1	48.7	1.5	1
7407-B-XL-MP	1.01	35	100	25	79.8	–	–	66.7	–	1.5	1
71808-B-TVH	0.033	40	52	7	47.3	–	–	44.7	–	0.3	0.2
7008-B-XL-TVP	0.176	40	68	15	58.8	–	–	51.9	–	1	0.6
7008-B-XL-2RS-TVP	0.17	40	68	15	58.8	59.4	65	51.9	48.3	1	0.6
7208-B-XL-JP	0.372	40	80	18	64.4	–	–	56.4	–	1.1	0.6
7208-B-XL-TVP	0.367	40	80	18	64.4	–	–	56.4	–	1.1	0.6
7208-B-XL-2RS-TVP	0.379	40	80	18	64.4	67	73.8	56.4	52	1.1	0.6
7308-B-XL-JP	0.646	40	90	23	71.3	–	–	60	–	1.5	1
7308-B-XL-TVP	0.61	40	90	23	71.3	–	–	60	–	1.5	1
7308-B-XL-2RS-TVP	0.61	40	90	23	71.3	73.9	83.3	60	55.6	1.5	1
7408-B-XL-MP	1.34	40	110	27	87.6	–	–	73.1	–	2	1
71809-B-TVH	0.041	45	58	7	52.8	–	–	50.2	–	0.3	0.2
7209-B-XL-JP	0.411	45	85	19	69.8	–	–	61.2	–	1.1	0.6
7209-B-XL-TVP	0.405	45	85	19	69.8	–	–	61.2	–	1.1	0.6
7209-B-XL-2RS-TVP	0.405	45	85	19	69.8	72.4	79.6	61.2	56.8	1.1	0.6
7309-B-XL-JP	0.937	45	100	25	79.8	–	–	66.7	–	1.5	1
7309-B-XL-TVP	0.937	45	100	25	79.8	–	–	66.7	–	1.5	1
7409-B-XL-MP	1.68	45	120	29	95.3	–	–	80.3	–	2	1
71810-B-TVH	0.058	50	65	7	59.3	–	–	56.7	–	0.3	0.2
7210-B-XL-JP	0.466	50	90	20	74.8	–	–	66.3	–	1.1	0.6
7210-B-XL-TVP	0.456	50	90	20	74.8	–	–	66.3	–	1.1	0.6
7210-B-XL-2RS-TVP	0.468	50	90	20	74.8	77.4	84.6	66.3	61.8	1.1	0.6



Mounting dimensions

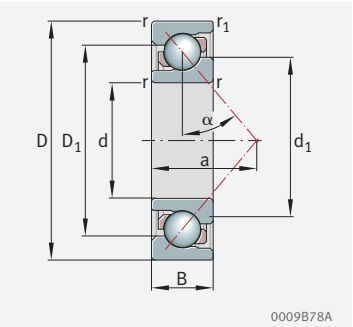


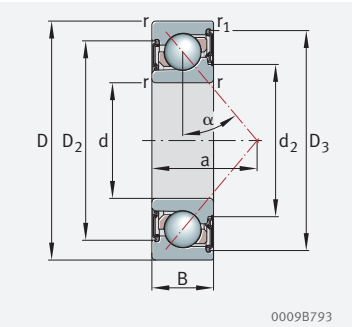
Mounting dimensions

a	α	d_a	D_a	D_b	$r_{a\,max}$	$r_{a1\,max}$	dyn. C_r	stat. C_{0r}	C_{ur}	n_G	$n_{\vartheta r}$
mm	°	min.	max.	max.	mm	mm	N	N	N	min^{-1}	min^{-1}
18.6	40	32	40	40	0.3	0.2	5600	4550	300	20600	9600
24	40	34.6	50.4	51.8	1	0.6	19900	13400	930	16800	10200
24	40	34.6	50.4	51.8	1	0.6	19900	13400	930	6900	–
27	40	35.6	56.4	57.8	1	0.6	23100	14100	980	15800	11200
27	40	35.6	56.4	57.8	1	0.6	23100	14100	980	15800	11200
27	40	35.6	56.4	57.8	1	0.6	23100	14100	980	6500	–
31	40	37	65	67.8	1	0.6	37500	22100	1530	13500	8600
31	40	37	65	67.8	1	0.6	37500	22100	1530	13500	8600
31	40	37	65	67.8	1	0.6	37500	22100	1530	6000	–
37	40	41	79	84.4	1.5	1	51000	30500	2110	14500	6800
20.7	40	37	45	45.6	0.3	0.2	6000	5300	360	18100	8200
27	40	39.6	57.4	58.8	1	0.6	24300	17200	1200	14700	9000
27	40	39.6	57.4	58.8	1	0.6	24300	17200	1200	6000	–
31	40	42	65	67.8	1	0.6	30000	19000	1320	13400	9600
31	40	42	65	67.8	1	0.6	30000	19000	1320	13400	9600
31	40	42	65	67.8	1	0.6	30000	19000	1320	5600	–
35	40	44	71	74.4	1.5	1	45500	27500	1910	11900	7900
35	40	44	71	74.4	1.5	1	45500	27500	1910	11900	7900
35	40	44	71	74.4	1.5	1	45500	27500	1910	5300	–
41	40	46	94.4	100	1.5	1	65000	43000	3000	12100	5400
22.8	40	42	50	50	0.3	0.2	6300	5800	405	16200	7200
30	40	44.6	63.4	64.8	1	0.6	28000	20300	1410	13300	8400
30	40	44.6	63.4	64.8	1	0.6	28000	20300	1410	5400	–
34	40	47	73	75.8	1	0.6	36000	23500	1630	11900	8600
34	40	47	73	75.8	1	0.6	36000	23500	1630	11900	8600
34	40	47	73	75.8	1	0.6	36000	23500	1630	5000	–
39	40	49	81	84.4	1.5	1	57000	34500	2390	10400	7100
39	40	49	81	84.4	1.5	1	57000	34500	2390	10400	7100
39	40	49	81	84.4	1.5	1	57000	34500	2390	4650	–
45	40	53	97	104.4	2	1	75000	50000	3500	10900	5000
25.1	40	47	56	56	0.3	0.2	6600	6500	465	14500	6300
37	40	52	78	80.8	1	0.6	40000	27000	1870	11000	8000
37	40	52	78	80.8	1	0.6	40000	27000	1870	11000	8000
37	40	52	78	80.8	1	0.6	40000	27000	1870	4550	–
43	40	54	91	94.4	1.5	1	69000	43000	3000	9300	6500
43	40	54	91	94.4	1.5	1	69000	43000	3000	9300	6500
49	40	58	107	114.4	2	1	86000	61000	4250	10000	4650
27.8	40	52	63	63	0.3	0.2	7000	7400	540	12900	5400
39	40	57	83	85.8	1	0.6	41500	28500	1970	10300	7600
39	40	57	83	85.8	1	0.6	41500	28500	1970	10300	7600
39	40	57	83	85.8	1	0.6	41500	28500	1970	4200	–

7..-B-TVH, 7..-B-XL-TVP, 7..-B-XL-2RS-TVP, 7..-B-XL-JP, 7..-B-XL-MP

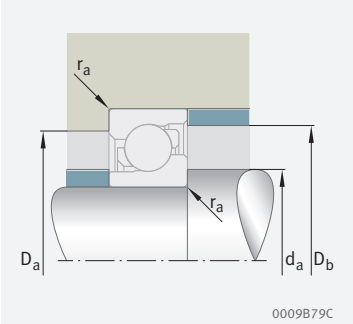
Single row



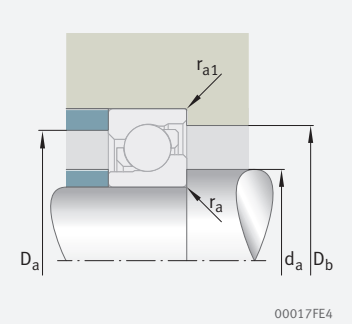


With seal 2RS

Designation	m	d	D	B	D_1	D_2	D_3	d_1	d_2	r_{min}	$r_{1\ min}$
	kg	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
7310-B-XL-JP	1.13	50	110	27	87.6	–	–	73.1	–	2	1
7310-B-XL-TVP	1.05	50	110	27	87.6	–	–	73.1	–	2	1
7410-B-XL-MP	2.05	50	130	31	103.4	–	–	87.3	–	2.1	1.1
71811-B-TVH	0.084	55	72	9	65.3	–	–	61.7	–	0.3	0.2
7211-B-XL-JP	0.645	55	100	21	83	–	–	72.6	–	1.5	1
7211-B-XL-TVP	0.604	55	100	21	83	–	–	72.6	–	1.5	1
7311-B-XL-JP	1.46	55	120	29	95.3	–	–	80.3	–	2	1
7311-B-XL-TVP	1.38	55	120	29	95.3	–	–	80.3	–	2	1
7411-B-XL-MP	2.64	55	140	33	111.5	–	–	95.3	–	2.1	1.1
71812-B-TVH	0.11	60	78	10	70.8	–	–	67.2	–	0.3	0.2
7212-B-XL-JP	0.782	60	110	22	90.8	–	–	80.3	–	1.5	1
7212-B-XL-TVP	0.808	60	110	22	90.8	–	–	80.3	–	1.5	1
7212-B-XL-2RS-TVP	0.78	60	110	22	90.8	94.4	103.4	80.3	75.3	1.5	1
7312-B-XL-JP	1.74	60	130	31	103.4	–	–	87.3	–	2.1	1.1
7312-B-XL-TVP	1.71	60	130	31	103.4	–	–	87.3	–	2.1	1.1
7412-B-XL-MP	3.1	60	150	35	119.6	–	–	102.3	–	2.1	1.1
71813-B-TVH	0.13	65	85	10	77	–	–	73	–	0.6	0.3
7213-B-XL-JP	1.08	65	120	23	98.9	–	–	86.3	–	1.5	1
7213-B-XL-TVP	1	65	120	23	98.9	–	–	86.3	–	1.5	1
7313-B-XL-JP	2.22	65	140	33	111.5	–	–	95.3	–	2.1	1.1
7313-B-XL-TVP	2.12	65	140	33	111.5	–	–	95.3	–	2.1	1.1
7413-B-XL-MP	3.71	65	160	37	128	–	–	109.2	–	2.1	1.1
71814-B-TVH	0.14	70	90	10	82	–	–	78	–	0.6	0.3
7214-B-XL-JP	1.17	70	125	24	104	–	–	92.3	–	1.5	1
7214-B-XL-TVP	1.08	70	125	24	104	–	–	92.3	–	1.5	1
7214-B-XL-2RS-TVP	1.08	70	125	24	104	107.6	117.9	92.3	87.3	1.5	1
7314-B-XL-JP	2.76	70	150	35	119.6	–	–	102.3	–	2.1	1.1
7314-B-XL-TVP	2.58	70	150	35	119.6	–	–	102.3	–	2.1	1.1
7414-B-XL-MP	5.39	70	180	42	144.3	–	–	123.1	–	3	1.1
71815-B-TVH	0.15	75	95	10	87	–	–	83	–	0.6	0.3
7215-B-XL-JP	1.25	75	130	25	109.2	–	–	96.5	–	1.5	1
7215-B-XL-TVP	1.16	75	130	25	109.2	–	–	96.5	–	1.5	1
7315-B-XL-JP	3.29	75	160	37	128	–	–	109.2	–	2.1	1.1
7315-B-XL-TVP	3.1	75	160	37	128	–	–	109.2	–	2.1	1.1
7415-B-XL-MP	6.7	75	190	45	144.3	–	–	123.1	–	3	1.1
71816-B-TVH	0.155	80	100	10	92	–	–	88	–	0.6	0.3
7216-B-XL-JP	1.53	80	140	26	117.2	–	–	102.9	–	2	1
7216-B-XL-TVP	1.42	80	140	26	117.2	–	–	102.9	–	2	1
7316-B-XL-JP	3.86	80	170	39	136.7	–	–	115.7	–	2.1	1.1
7316-B-XL-TVP	3.66	80	170	39	136.7	–	–	115.7	–	2.1	1.1
7416-B-XL-MP	7.48	80	200	48	153.9	–	–	129	–	3	1.1



Mounting dimensions



Mounting dimensions

a	α	d_a	D_a	D_b	$r_{a\,max}$	$r_{a1\,max}$	dyn. C_r	stat. C_{0r}	C_{ur}	n_G	$n_{\delta r}$
mm	°	min.	max.	max.	mm	mm	N	N	N	min^{-1}	min^{-1}
47	40	61	99	104.4	2	1	80000	50000	3500	8400	6100
47	40	61	99	104.4	2	1	80000	50000	3500	8400	6100
53	40	64	116	121	2.1	1	96000	69000	4750	9200	4400
31.1	40	57	70	70	0.3	0.2	11800	11800	780	11400	5600
43	40	64	91	94.4	1.5	1	52000	38500	2650	9200	6800
43	40	64	91	94.4	1.5	1	52000	38500	2650	9200	6800
51	40	66	109	114.4	2	1	91000	61000	4250	7700	5600
51	40	66	109	114.4	2	1	91000	61000	4250	7700	5600
57	40	69	126	131	2.1	1	110000	82000	5600	8400	4150
33.9	40	62	76	76.6	0.3	0.2	12300	12800	870	10500	5400
47	40	69	101	104.4	1.5	1	62000	45000	3150	8300	6200
47	40	69	101	104.4	1.5	1	62000	45000	3150	8300	6200
47	40	69	101	104.4	1.5	1	62000	45000	3150	3450	–
55	40	72	118	123	2.1	1	96000	69000	4750	7000	5300
55	40	72	118	123	2.1	1	96000	69000	4750	7000	5300
62	40	74	136	141	2.1	1	126000	93000	6200	7800	3950
36.5	40	68.2	81.8	83	0.6	0.3	15200	15800	1000	9600	4850
51	40	74	111	114.4	1.5	1	71000	55000	3850	7600	5700
51	40	74	111	114.4	1.5	1	71000	55000	3850	7600	5700
60	40	77	128	133	2.1	1	110000	82000	5600	6500	5000
60	40	77	128	133	2.1	1	110000	82000	5600	6500	5000
66	40	79	146	151	2.1	1	140000	107000	6900	7300	3800
38.5	40	73.2	86.8	88	0.6	0.3	15800	17200	1100	9000	4500
53	40	79	116	119.4	1.5	1	74000	62000	4300	7200	5400
53	40	79	116	119.4	1.5	1	74000	62000	4300	7200	5400
53	40	79	116	119.4	1.5	1	74000	62000	4300	3000	–
64	40	82	138	143	2.1	1	126000	93000	6200	6000	4750
64	40	82	138	143	2.1	1	126000	93000	6200	6000	4750
73	40	86	164	171	2.5	1	167000	138000	8300	6400	3450
40.7	40	78.2	91.8	93	0.6	0.3	16200	18100	1170	8500	4150
56	40	84	121	124.4	1.5	1	73000	62000	4250	6900	5300
56	40	84	121	124.4	1.5	1	73000	62000	4250	6900	5300
68	40	87	148	153	2.1	1	140000	107000	6900	5600	4500
68	40	87	148	153	2.1	1	140000	107000	6900	5600	4500
78	40	91	174	181	2.5	1	167000	138000	8300	6400	3750
42.8	40	85.2	96.8	98	0.6	0.3	16500	19100	1240	8000	3900
59	40	91	129	134.4	2	1	85000	72000	4800	6400	4950
59	40	91	129	134.4	2	1	85000	72000	4800	6400	4950
72	40	92	158	163	2.1	1	155000	124000	7700	5200	4250
72	40	92	158	163	2.1	1	155000	124000	7700	5200	4250
83	40	96	184	191	2.5	1	200000	169000	9900	5800	3600

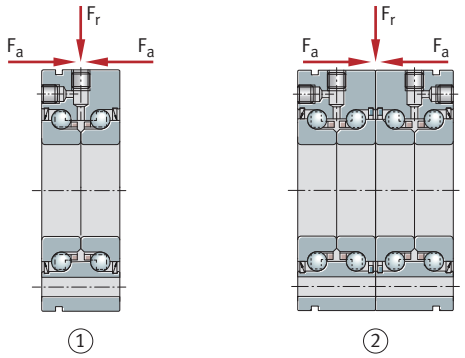
6 Axial angular contact ball bearings

Axial angular contact ball bearings are precision bearings for screw drive bearing arrangements. Depending on the series, they can support radial forces as well as axial forces in one or both directions. Contact seals protect the rolling element system against contamination and moisture. For higher speeds, non-contact minimal gap seals can be used. The bearings are available with and without fixing holes in the outer ring. Bearings with holes are screw mounted directly on the adjacent construction. This solution is particularly economical since there is then no need for the locating bore that would otherwise be required or for the bearing cover with the associated matching work. For some areas of application, a bearing arrangement of lower precision is often sufficient. For this purpose, bearings with less stringent tolerances are available.

Screw drive bearing arrangements are subjected to requirements that often cannot be optimally fulfilled by the design construction of conventional bearings. For the design of bearing arrangements that have high accuracy, high load carrying capacity, high rigidity, low friction, are easy to fit and maintenance-free or low-maintenance and are suitable for the highly dynamic operating conditions of threaded spindles, there is a wide range of INA and FAG axial angular contact ball bearings. With this product range, solutions can be found to all the technical and economic demands placed on the bearing arrangements of screw drives.

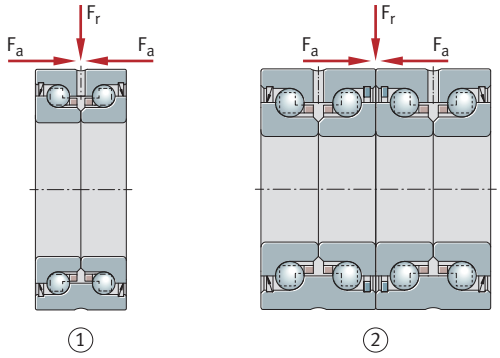
Axial angular contact ball bearings are available as single, double, or triple row ready-to-fit units. They are self-retaining and comprise thick-walled, geometrically stable outer rings, ball and cage assemblies, and one-piece or two-piece inner rings. In several series, the outer ring has through holes for simple flange mounting of the bearing to the adjacent construction. The bearing rings are matched to each other such that a defined preload is achieved when the rings are clamped in place using a precision locknut. Due to the 60° contact angle, the bearings can support high axial forces as well as radial forces. In arrangements of multiple row angular contact ball bearings, a distinction is made between O, X and tandem arrangements in relation to the arrangement of contact angles. The arrangement of contact angles has an essential influence on the tilting rigidity of the bearing position.

Axial angular contact ball bearings ZKLF and ZKLN are supplied in the X-life design. As a result of increased raceway accuracy and raceway quality, there is a significant reduction in the stress conditions present on the rolling elements and raceway under the same load, compared to the standard bearings. The improved quality gives reduced friction in the bearing and lower bearing temperatures; running resistance is lower, less strain is placed on the lubricant and the grease operating life and, where applicable, necessary relubrication intervals are extended. As a result of the lower frictional energy, there is a simultaneous increase in the energy efficiency of the bearing arrangement. The basic dynamic load ratings C_a of axial angular contact ball bearings in the X-life design are 10% higher than those of the previous standard designs. This leads to a longer rating life L_{10} or can be used to allow higher loads on the bearing arrangement while achieving the same rating life. The lower bearing friction and associated reduction in heat generation in the bearing permit significantly higher limiting speeds $n_{G\ grease}$.



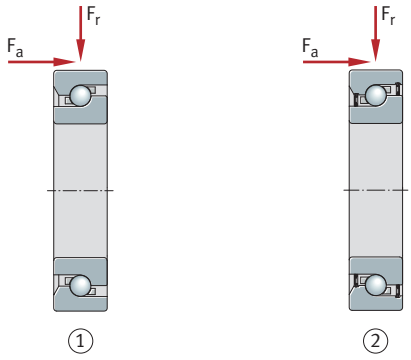
18 Axial angular contact ball bearings, double row, with fixing holes

F_r	Radial load	F_a	Axial load
1	With lip seals or minimal gap seals ZKLF..-2RS, ZKLF..-2Z, ZKLF..-2RS-PE	2	Matched pair ZKLF..-2RS-2AP



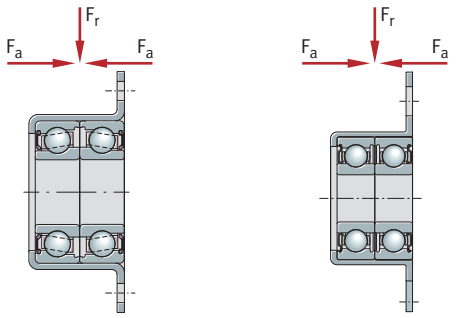
19 Axial angular contact ball bearings, double row, without fixing holes

F_r	Radial load	F_a	Axial load
1	With lip seals or minimal gap seals ZKLN..-2RS, ZKLN..-2Z, ZKLN..-2RS-PE	2	Matched pair ZKLN..-2RS-2AP



20 Axial angular contact ball bearings, single row, for any combination

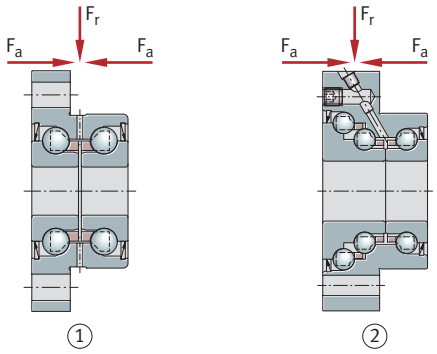
F_r	Radial load	F_a	Axial load
1	Without seals 7602, 7603, BSB, BSB..-SU	2	With seals 7602..-2RS, 7603..-2RS, BSB..-2RS, BSB..-2Z-SU



000A8CFB

21 Angular contact ball bearing unit, with fixing holes

F_r	Radial load	F_a	Axial load
	Lip seals or gap seals ZKLR..-2RS, ZKLR..-2Z		



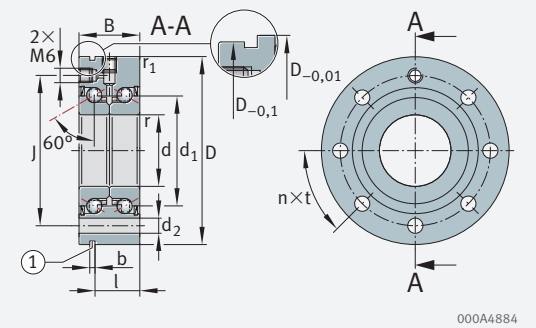
000A8CFC

22 Axial angular contact ball bearings, double or triple row, flange with flattened areas, with fixing holes

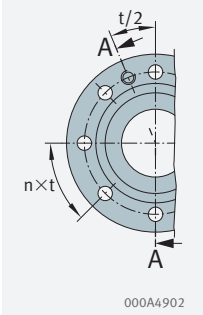
F_r	Radial load	F_a	Axial load
1	Double row, lip seals or minimal gap seals ZKLFA..-2RS, ZKLFA..-2Z	2	Triple row, lip seals DKLFA..-2RS

6.1 ZKLF..-2RS, ZKLF..-2Z

With fixing holes

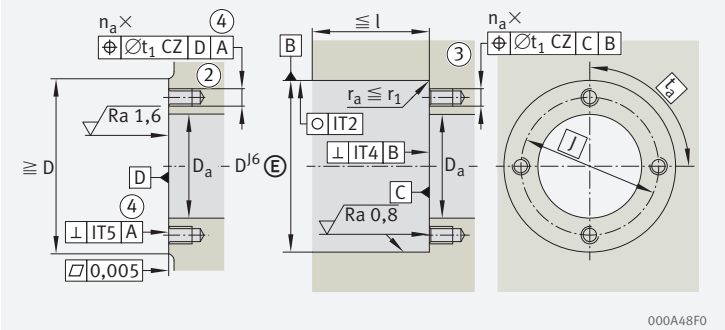


ZKLF..-2RS, ZKLF..-2Z (d ≤ 50 mm)

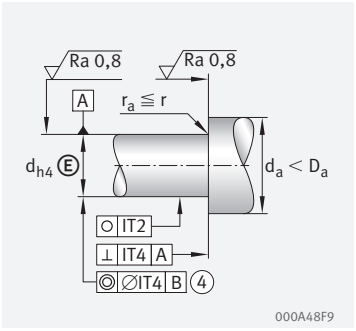


ZKLF30100

Designation	m	d	D	B	d_1	r_{min}	$r_{1\ min}$
	kg	mm	mm	mm	mm	mm	mm
ZKLF1255-2RS-XL	0.37	12	55	25	25	0.3	0.6
ZKLF1255-2Z-XL	0.37	12	55	25	25	0.3	0.6
ZKLF1560-2RS-XL	0.43	15	60	25	28	0.3	0.6
ZKLF1560-2Z-XL	0.43	15	60	25	28	0.3	0.6
ZKLF1762-2RS-XL	0.45	17	62	25	30	0.3	0.6
ZKLF1762-2Z-XL	0.45	17	62	25	30	0.3	0.6
ZKLF2068-2RS-XL	0.61	20	68	28	34.5	0.3	0.6
ZKLF2068-2Z-XL	0.61	20	68	28	34.5	0.3	0.6
ZKLF2575-2RS-XL	0.72	25	75	28	40.5	0.3	0.6
ZKLF2575-2Z-XL	0.72	25	75	28	40.5	0.3	0.6
ZKLF3080-2RS-XL	0.78	30	80	28	45.5	0.3	0.6
ZKLF3080-2Z-XL	0.78	30	80	28	45.5	0.3	0.6
ZKLF30100-2RS-XL	1.63	30	100	38	51	0.3	0.6
ZKLF30100-2Z-XL	1.63	30	100	38	51	0.3	0.6
ZKLF3590-2RS-XL	1.13	35	90	34	52	0.3	0.6
ZKLF3590-2Z-XL	1.13	35	90	34	52	0.3	0.6



Housing design

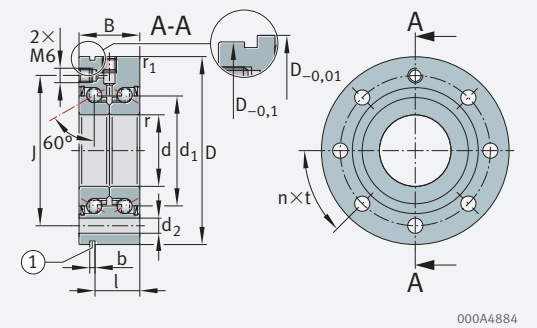


Shaft design (threaded spindle)

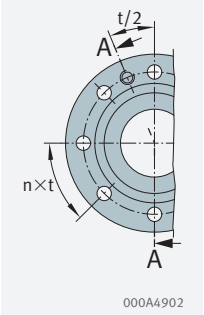
J	d_2	b	l	n	t	D_a	d_a	t_1	Screws Size	n_a	t_a
mm	mm	mm	mm	mm	°	max.	min.	mm			°
42	6.8	3	17	3	120	33	16	0.1	M6	3	120
42	6.8	3	17	3	120	33	16	0.1	M6	3	120
46	6.8	3	17	3	120	35	20	0.1	M6	3	120
46	6.8	3	17	3	120	35	20	0.1	M6	3	120
48	6.8	3	17	6	60	37	23	0.1	M6	3	120
48	6.8	3	17	6	60	37	23	0.1	M6	3	120
53	6.8	3	19	8	45	43	25	0.1	M6	4	90
53	6.8	3	19	8	45	43	25	0.1	M6	4	90
58	6.8	3	19	8	45	48	32	0.1	M6	4	90
58	6.8	3	19	8	45	48	32	0.1	M6	4	90
63	6.8	3	19	12	30	53	40	0.1	M6	6	60
63	6.8	3	19	12	30	53	40	0.1	M6	6	60
80	8.8	3	30	8	45	64	47	0.2	M8	8	45
80	8.8	3	30	8	45	64	47	0.2	M8	8	45
75	8.8	3	25	8	45	62	45	0.2	M8	4	90
75	8.8	3	25	8	45	62	45	0.2	M8	4	90

ZKLF..-2RS, ZKLF..-2Z

With fixing holes

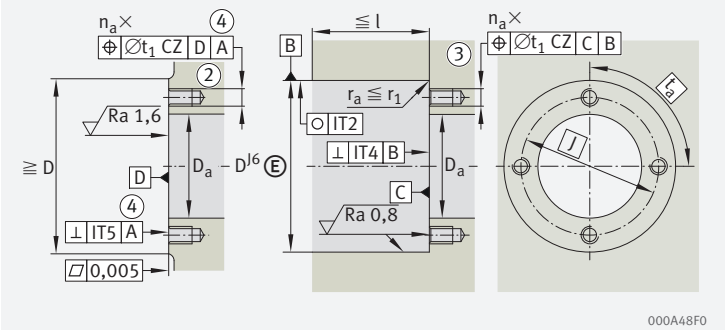


ZKLF..-2RS, ZKLF..-2Z (d ≤ 50 mm)

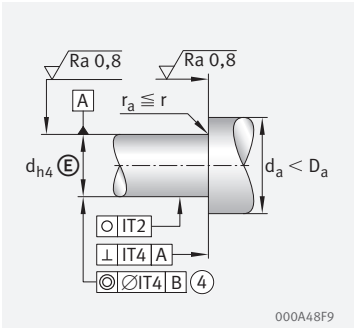


ZKLF30100

Designation	d	dyn. C_a	stat. C_{0a}	C_{ua}	n_G grease	n_ϑ	M_R
	mm	N	N	N	min^{-1}	min^{-1}	Nm
ZKLF1255-2RS-XL	12	18800	25000	1520	9200	3800	0.16
ZKLF1255-2Z-XL	12	18800	25000	1520	12000	7600	0.08
ZKLF1560-2RS-XL	15	19800	28500	1730	8200	3500	0.2
ZKLF1560-2Z-XL	15	19800	28500	1730	10800	7000	0.1
ZKLF1762-2RS-XL	17	20800	31500	1920	7600	3300	0.24
ZKLF1762-2Z-XL	17	20800	31500	1920	10100	6600	0.12
ZKLF2068-2RS-XL	20	28500	47000	2850	6600	3000	0.3
ZKLF2068-2Z-XL	20	28500	47000	2850	8700	5400	0.15
ZKLF2575-2RS-XL	25	30500	55000	3350	5700	2600	0.4
ZKLF2575-2Z-XL	25	30500	55000	3350	7500	4700	0.2
ZKLF3080-2RS-XL	30	32000	64000	3850	5000	2200	0.5
ZKLF3080-2Z-XL	30	32000	64000	3850	6700	4300	0.25
ZKLF30100-2RS-XL	30	65000	108000	6500	4500	2100	0.8
ZKLF30100-2Z-XL	30	65000	108000	6500	5600	4000	0.4
ZKLF3590-2RS-XL	35	45000	89000	5400	4400	2000	0.6
ZKLF3590-2Z-XL	35	45000	89000	5400	5800	3800	0.3



Housing design

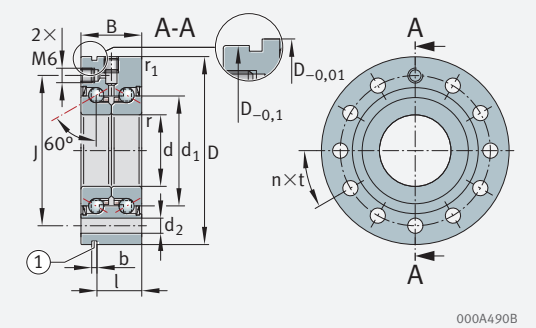


Shaft design (threaded spindle)

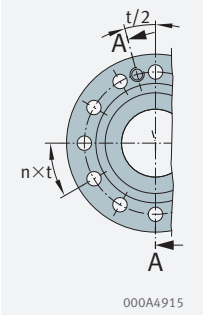
c_{aL}	c_{kL}	M_m	Axial runout	Locknut for radial clamping	Locknut for axial clamping	Locknut M_A	Locknut force axial
N/µm	Nm/mrad	kg · cm^2	µm			Nm	N
375	50	0.068	2	ZM12	–	8	5307
375	50	0.068	2	ZM12	–	8	5307
400	65	0.102	2	ZM15	AM15	10	5484
400	65	0.102	2	ZM15	AM15	10	5484
450	80	0.132	2	ZM17	AM17	15	7514
450	80	0.132	2	ZM17	AM17	15	7514
650	140	0.273	2	ZM20	AM20	18	8258
650	140	0.273	2	ZM20	AM20	18	8258
750	200	0.486	2	ZM25	AM25	25	9123
750	200	0.486	2	ZM25	AM25	25	9123
850	300	0.73	2.5	ZM30	AM30	32	9947
850	300	0.73	2.5	ZM30	AM30	32	9947
950	400	1.91	2.5	ZMA30/52	AM30	65	19509
950	400	1.91	2.5	ZMA30/52	AM30	65	19509
900	400	1.51	2.5	ZM35	AM35/58	40	10770
900	400	1.51	2.5	ZM35	AM35/58	40	10770

ZKLF..-2RS, ZKLF..-2Z

With fixing holes

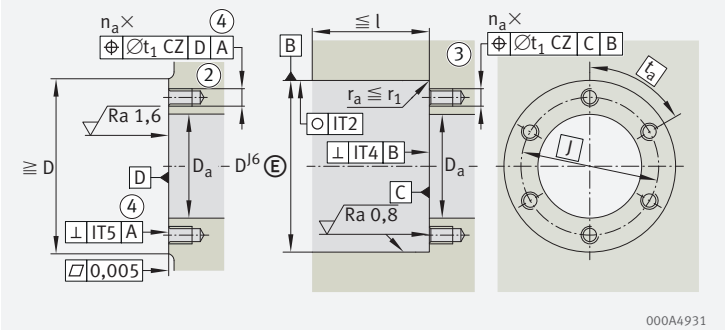


ZKLF..-2RS, ZKLF..-2Z (d ≤ 50 mm)

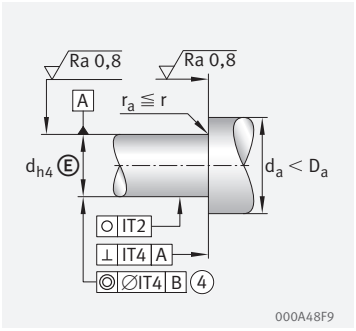


ZKLF40115, ZKLF50140

Designation	m	d	D	B	d_1	r_{min}	$r_{1\ min}$
	kg	mm	mm	mm	mm	mm	mm
ZKLF40100-2RS-XL	1.46	40	100	34	58	0.3	0.6
ZKLF40100-2Z-XL	1.46	40	100	34	58	0.3	0.6
ZKLF40115-2RS-XL	2.2	40	115	46	65	0.6	0.6
ZKLF40115-2Z-XL	2.2	40	115	46	65	0.6	0.6
ZKLF50115-2RS-XL	1.86	50	115	34	72	0.3	0.6
ZKLF50115-2Z-XL	1.86	50	115	34	72	0.3	0.6
ZKLF50140-2RS-XL	4.7	50	140	54	80	0.6	0.6
ZKLF50140-2Z-XL	4.7	50	140	54	80	0.6	0.6



Housing design

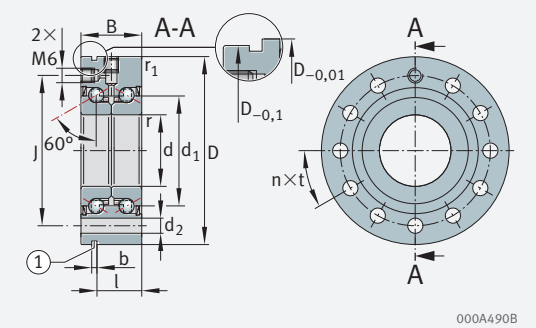


Shaft design (threaded spindle)

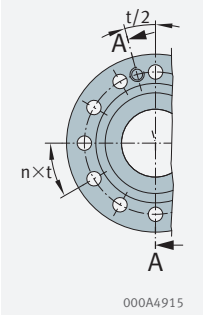
J	d_2	b	l	n	t	D_a	d_a	t_1	Screws Size	n_a	t_a
mm	mm	mm	mm	mm	°	max.	min.	mm			°
80	8.8	3	25	8	45	67	50	0.2	M8	4	90
80	8.8	3	25	8	45	67	50	0.2	M8	4	90
94	8.8	3	36	12	30	80	56	0.2	M8	12	30
94	8.8	3	36	12	30	80	56	0.2	M8	12	30
94	8.8	3	25	12	30	82	63	0.2	M8	6	60
94	8.8	3	25	12	30	82	63	0.2	M8	6	60
113	11	3	45	12	30	98	63	0.2	M10	12	30
113	11	3	45	12	30	98	63	0.2	M10	12	30

ZKLF..-2RS, ZKLF..-2Z

With fixing holes

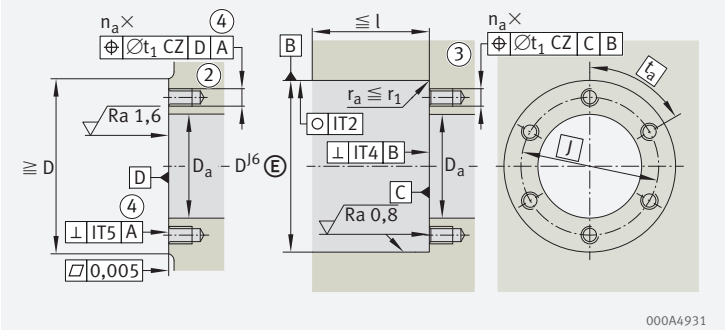


ZKLF..-2RS, ZKLF..-2Z (d ≤ 50 mm)

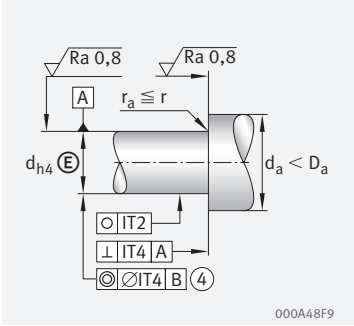


ZKLF40115, ZKLF50140

Designation	d	dyn. C_a	stat. C_{0a}	C_{ua}	n_G grease	n_ϑ	M_R
	mm	N	N	N	min^{-1}	min^{-1}	Nm
ZKLF40100-2RS-XL	40	47500	101000	6100	4000	1800	0.7
ZKLF40100-2Z-XL	40	47500	101000	6100	5200	3300	0.35
ZKLF40115-2RS-XL	40	79000	149000	9100	3500	1600	1.3
ZKLF40115-2Z-XL	40	79000	149000	9100	4400	3100	0.65
ZKLF50115-2RS-XL	50	46500	126000	7700	3200	1500	0.9
ZKLF50115-2Z-XL	50	46500	126000	7700	4200	3000	0.45
ZKLF50140-2RS-XL	50	125000	250000	15200	2900	1200	2.6
ZKLF50140-2Z-XL	50	125000	250000	15200	3500	2500	1.3



Housing design

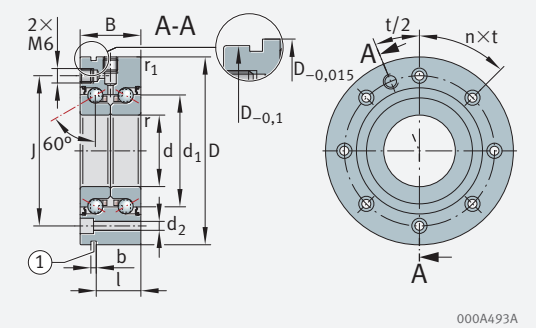


Shaft design (threaded spindle)

c_{aL}	c_{kL}	M_m	Axial runout	Locknut for radial clamping	Locknut for axial clamping	Locknut M_A	Locknut force axial
N/µm	Nm/mrad	kg · cm^2	µm			Nm	N
1000	550	2.26	2.5	ZM40	AM40	55	13412
1000	550	2.26	2.5	ZM40	AM40	55	13412
1200	750	5.5	2.5	ZMA40/62	AM40	110	25185
1200	750	5.5	2.5	ZMA40/62	AM40	110	25815
1250	1000	5.24	2.5	ZM50	AM50	85	16280
1250	1000	5.24	2.5	ZM50	AM50	85	16280
1400	1500	15.2	2.5	ZMA50/75	AM50	150	28451
1400	1500	15.2	2.5	ZMA50/75	AM50	150	28451

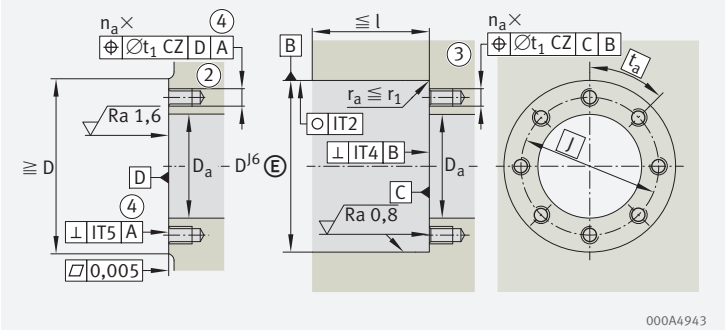
ZKLF..-2Z

With fixing holes

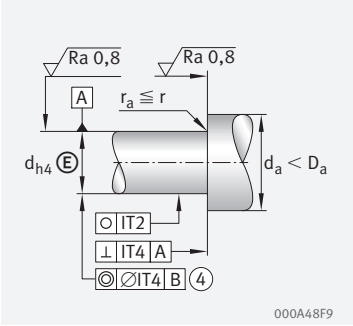


ZKLF..-2Z (60 mm ≤ d ≤ 100 mm)

Designation	m	d	D	B	d_1	r_{min}	$r_{1\ min}$
	kg	mm	mm	mm	mm	mm	mm
ZKLF60145-2Z-XL	4.3	60	145	45	85	0.6	0.6
ZKLF70155-2Z-XL	4.9	70	155	45	95	0.6	0.6
ZKLF80165-2Z-XL	5.3	80	165	45	105	0.6	0.6
ZKLF90190-2Z-XL	8.7	90	190	55	120	0.6	0.6
ZKLF100200-2Z-XL	9.3	100	200	55	132	0.6	0.6
ZKLF100230-2Z	17.6	100	230	85	146	0.6	0.6



Housing design

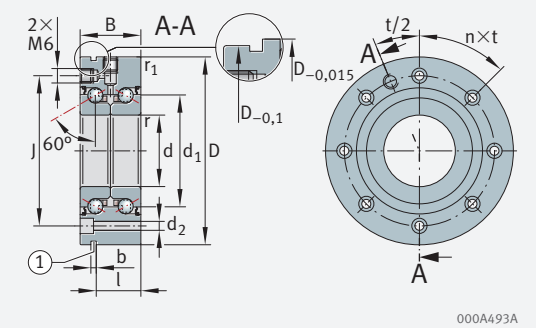


Shaft design (threaded spindle)

J	d_2	b	l	n	t	D_a	d_a	t_1	Screws Size	n_a	t_a
mm	mm	mm	mm	mm	°	max.	min.	mm			°
120	8.8	3	35	8	45	100	82	0.2	M8	8	45
130	8.8	3	35	8	45	110	92	0.2	M8	8	45
140	8.8	3	35	8	45	120	102	0.2	M8	8	45
165	11	3	45	8	45	138	116	0.2	M10	8	45
175	11	3	45	8	45	150	128	0.2	M10	8	45
200	14	3	73	12	30	175	130	0.4	M12	12	30

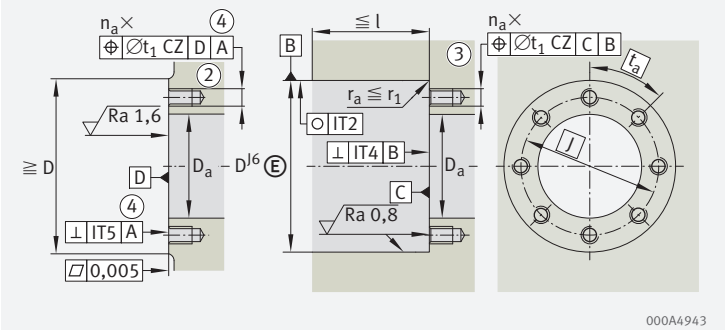
ZKLF..-2Z

With fixing holes

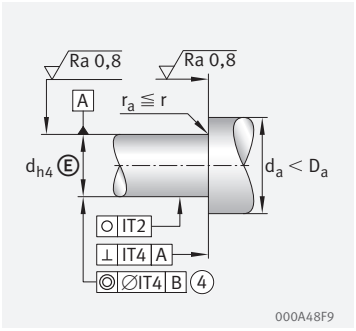


ZKLF..-2Z (60 mm ≤ d ≤ 100 mm)

Designation	d	dyn. C_a	stat. C_{0a}	C_{ua}	n_G grease	n_ϑ	M_R
	mm	N	N	N	min^{-1}	min^{-1}	Nm
ZKLF60145-2Z-XL	60	93000	214000	13000	4000	3000	1
ZKLF70155-2Z-XL	70	97000	241000	14600	3800	2800	1.2
ZKLF80165-2Z-XL	80	100000	265000	15800	3600	2700	1.4
ZKLF90190-2Z-XL	90	149000	395000	21900	3500	2300	2.3
ZKLF100200-2Z-XL	100	154000	435000	23000	3300	2150	2.6
ZKLF100230-2Z	100	295000	790000	30000	2900	2000	3



Housing design



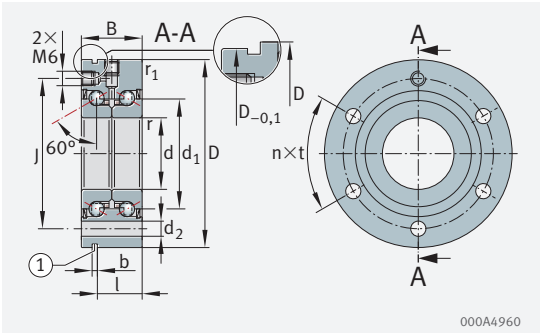
Shaft design (threaded spindle)

c_{aL}	c_{kL}	M_m	Axial runout	Locknut for radial clamping	Locknut for axial clamping	Locknut M_A	Locknut force axial
N/µm	Nm/mrad	kg · cm^2	µm			Nm	N
1300	1650	13.7	3	ZMA60/98	AM60	100	16700
1450	2250	19.8	3	ZMA70/110	AM70	130	19031
1600	3000	27.6	3	ZMA80/120	AM80	160	20604
1700	4400	59.9	3	ZMA90/130	AM90	200	22731
1900	5800	85.3	3	ZMA100/140	AM100	250	25624
2450	8200	185	3	–	AM100	500	52000

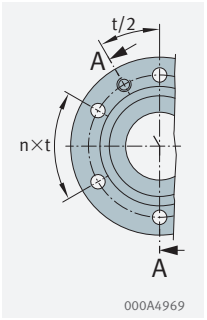
6.2 ZKLF..-2RS-PE

With fixing holes

Less stringent tolerances

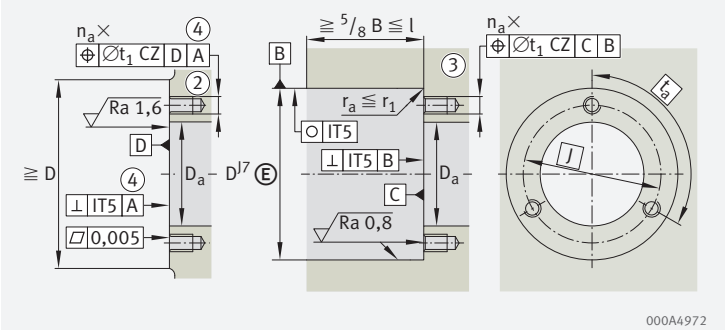


ZKLF..-2RS-PE

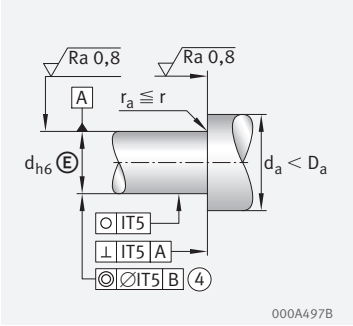


ZKLF12, ZKLF15

Designation	m	d	D	B	d_1	r_{min}	$r_{1\ min}$
	kg	mm	mm	mm	mm	mm	mm
ZKLF1255-2RS-PE	0.37	12	55	25	25	0.3	0.6
ZKLF1560-2RS-PE	0.43	15	60	25	28	0.3	0.6
ZKLF1762-2RS-PE	0.45	17	62	25	30	0.3	0.6
ZKLF2068-2RS-PE	0.61	20	68	28	34.5	0.3	0.6
ZKLF2575-2RS-PE	0.72	25	75	28	40.5	0.3	0.6
ZKLF3080-2RS-PE	0.78	30	80	28	45.5	0.3	0.6
ZKLF3590-2RS-PE	1.13	35	90	34	52	0.3	0.6
ZKLF40100-2RS-PE	1.46	40	100	34	58	0.3	0.6
ZKLF50115-2RS-PE	1.86	50	115	34	72	0.3	0.6



Housing design



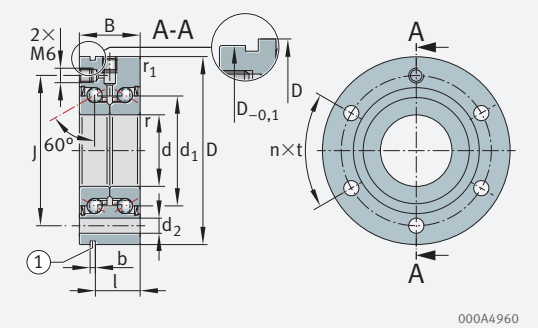
Shaft design (threaded spindle)

J	d_2	b	l	n	t	D_a	d_a	t_1	Screws Size	n_a	t_a
mm	mm	mm	mm	mm	°	max.	min.	mm			°
42	6.8	3	17	3	120	33	16	0.1	M6	3	120
46	6.8	3	17	3	120	35	20	0.1	M6	3	120
48	6.8	3	17	6	60	37	23	0.1	M6	3	120
53	6.8	3	19	8	45	43	25	0.1	M6	4	90
58	6.8	3	19	8	45	48	32	0.1	M6	4	90
63	6.8	3	19	12	30	53	40	0.1	M6	6	60
75	8.8	3	25	8	45	62	45	0.2	M8	4	90
80	8.8	3	25	8	45	67	50	0.2	M8	4	90
94	8.8	3	25	12	30	82	63	0.2	M8	6	60

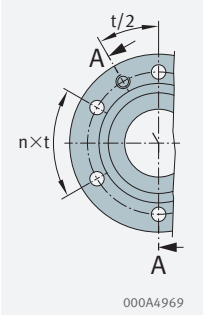
ZKLF..-2RS-PE

With fixing holes

Less stringent tolerances

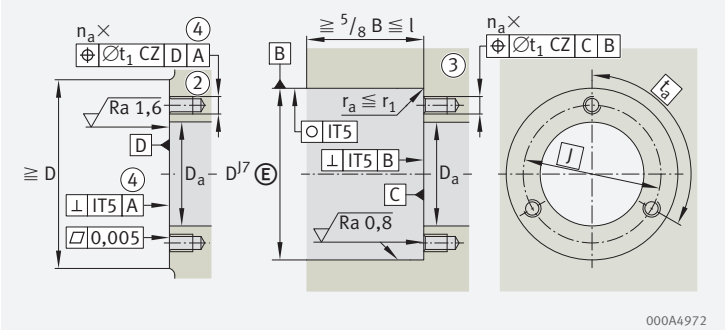


ZKLF..-2RS-PE

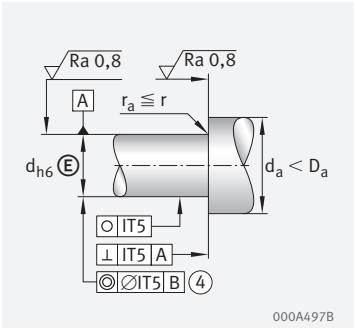


ZKLF12, ZKLF15

Designation	d	dyn. C_a	stat. C_{0a}	C_{ua}	n_G grease	n_ϑ	M_R
	mm	N	N	N	min^{-1}	min^{-1}	Nm
ZKLF1255-2RS-PE	12	17100	25000	1140	9200	3800	0.16
ZKLF1560-2RS-PE	15	18000	28500	1300	8200	3500	0.2
ZKLF1762-2RS-PE	17	18900	31500	1440	7600	3300	0.24
ZKLF2068-2RS-PE	20	26000	47000	2130	6600	3000	0.3
ZKLF2575-2RS-PE	25	27500	55000	2500	5700	2600	0.4
ZKLF3080-2RS-PE	30	29000	64000	2900	5000	2200	0.5
ZKLF3590-2RS-PE	35	41000	89000	4050	4400	2000	0.6
ZKLF40100-2RS-PE	40	43000	101000	4600	4000	1800	0.7
ZKLF50115-2RS-PE	50	46500	126000	5800	3200	1500	0.9



Housing design



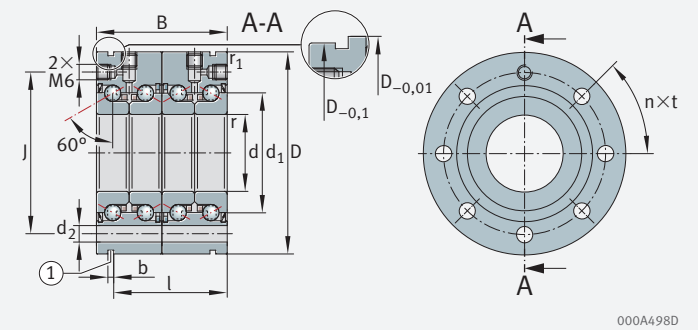
Shaft design (threaded spindle)

c_{aL}	c_{kL}	M_m	Axial runout	Locknut for radial clamping	Locknut for axial clamping	Locknut M_A	Locknut force axial
N/µm	Nm/mrad	kg · cm²	µm			Nm	N
375	50	0.068	5	ZM12	–	8	5307
400	65	0.102	5	ZM15	AM15	10	5484
450	80	0.132	5	ZM17	AM17	15	7514
650	140	0.273	5	ZM20	AM20	18	8258
750	200	0.486	5	ZM25	AM25	25	9123
850	300	0.73	5	ZM30	AM30	32	9947
900	400	1.51	5	ZM35	AM35/58	40	10770
1000	550	2.26	5	ZM40	AM40	55	13412
1250	1000	5.24	5	ZM50	AM50	85	16280

6.3 ZKLF..-2RS-2AP

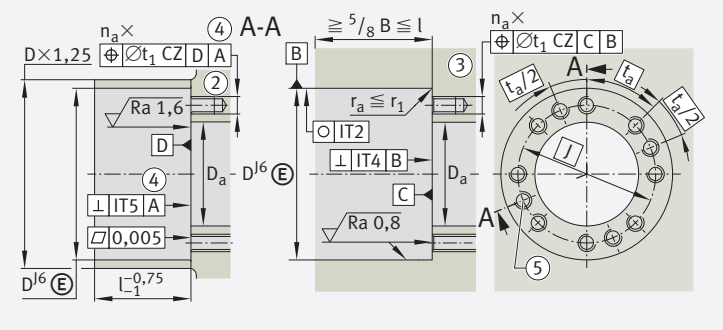
With fixing holes

Matched pair

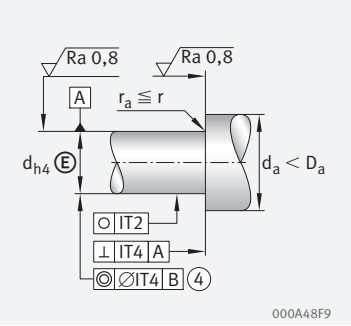


ZKLF..-2RS-2AP

Designation	m	d	D	B	d_1	r_{min}	$r_{1\ min}$
	kg	mm	mm	mm	mm	mm	mm
ZKLF1762-2RS-2AP-XL	0.9	17	62	50	30	0.3	0.6
ZKLF2068-2RS-2AP-XL	1.22	20	68	56	34.5	0.3	0.6
ZKLF2575-2RS-2AP-XL	1.44	25	75	56	40.5	0.3	0.6
ZKLF3080-2RS-2AP-XL	1.56	30	80	56	45.5	0.3	0.6
ZKLF3590-2RS-2AP-XL	2.26	35	90	68	52	0.3	0.6
ZKLF40100-2RS-2AP-XL	2.92	40	100	68	58	0.3	0.6
ZKLF50115-2RS-2AP-XL	3.72	50	115	68	72	0.3	0.6



Housing design



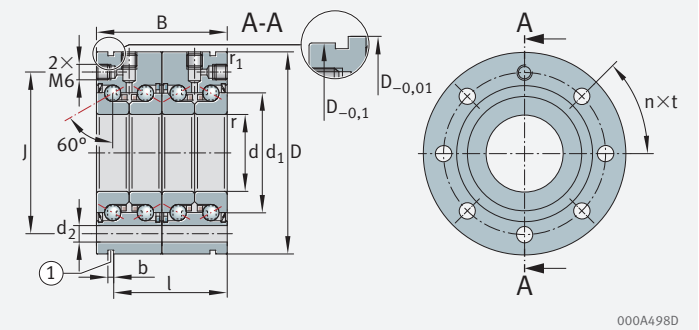
Shaft design (threaded spindle)

J	d_2	b	l	n	t	D_a	d_a	t_1	Screws Size	n_a	t_a
mm	mm	mm	mm	mm	°	max.	min.	mm			°
48	6.8	3	42	6	60	37	23	0.1	M6×60	6	60
53	6.8	3	47	8	45	43	25	0.1	M6×70	8	45
58	6.8	3	47	8	45	48	32	0.1	M6×70	8	45
63	6.8	3	47	12	30	53	40	0.1	M6×70	12	30
75	8.8	3	59	8	45	62	45	0.2	M8×80	8	45
80	8.8	3	59	8	45	67	50	0.2	M8×80	8	45
94	8.8	3	59	12	30	82	63	0.2	M8×80	12	30

ZKLF..-2RS-2AP

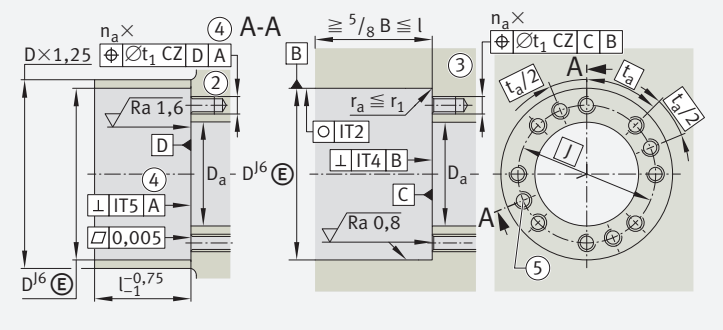
With fixing holes

Matched pair

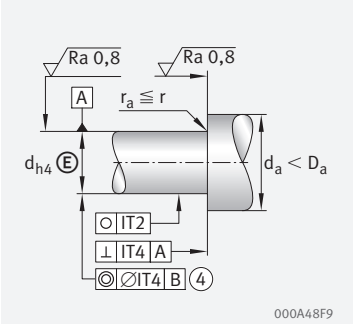


ZKLF..-2RS-2AP

Designation	d	dyn. C_a	stat. C_{0a}	C_{ua}	n_G grease	n_ϑ	M_R
	mm	N	N	N	min^{-1}	min^{-1}	Nm
ZKLF1762-2RS-2AP-XL	17	34000	63000	3850	7600	3300	0.36
ZKLF2068-2RS-2AP-XL	20	46000	94000	5700	6600	3000	0.45
ZKLF2575-2RS-2AP-XL	25	49000	111000	6700	5700	2600	0.6
ZKLF3080-2RS-2AP-XL	30	52000	127000	7700	5000	2200	0.75
ZKLF3590-2RS-2AP-XL	35	73000	177000	10800	4400	2000	0.9
ZKLF40100-2RS-2AP-XL	40	77000	202000	12300	4000	1800	1.05
ZKLF50115-2RS-2AP-XL	50	76000	250000	15300	3200	1500	1.35



Housing design

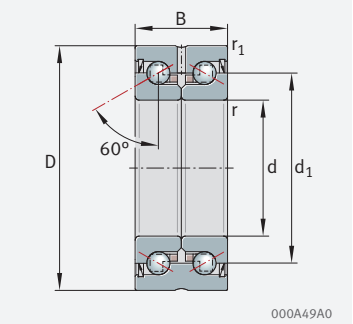


Shaft design (threaded spindle)

c_{aL}	c_{kL}	M_m	Axial runout	Locknut for radial clamping	Locknut for axial clamping	Locknut M_A	Locknut force axial
N/µm	Nm/mrad	kg · cm²	µm			Nm	N
800	200	0.264	2	ZM17	AM17	15	7514
1150	320	0.564	2	ZMA20/38	AM20	18	8258
1300	450	0.972	2	ZMA25/45	AM25	25	9123
1500	620	1.46	2.5	ZMA30/52	AM30	32	9947
1600	900	3.02	2.5	ZMA35/58	AM35/58	40	10770
1750	1200	4.52	2.5	ZMA40/62	AM40	55	13412
2200	2250	10.48	2.5	ZMA50/75	AM50	85	16280

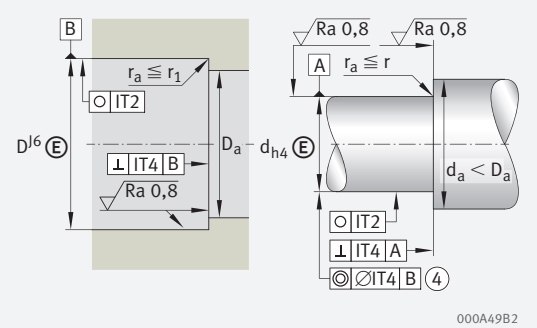
6.4 ZKLN..-2RS, ZKLN..-2Z

Without fixing holes



ZKLN..-2RS, ZKLN..-2Z

Designation	m	d	D	B
	kg	mm	mm	mm
ZKLN0619-2Z-XL	0.02	6	19	12
ZKLN0624-2RS-XL	0.03	6	24	15
ZKLN0624-2Z-XL	0.03	6	24	15
ZKLN0832-2RS-XL	0.09	8	32	20
ZKLN0832-2Z-XL	0.09	8	32	20
ZKLN1034-2RS-XL	0.1	10	34	20
ZKLN1034-2Z-XL	0.1	10	34	20
ZKLN1242-2RS-XL	0.2	12	42	25
ZKLN1242-2Z-XL	0.2	12	42	25
ZKLN1545-2RS-XL	0.21	15	45	25
ZKLN1545-2Z-XL	0.21	15	45	25
ZKLN1747-2RS-XL	0.22	17	47	25
ZKLN1747-2Z-XL	0.22	17	47	25
ZKLN2052-2RS-XL	0.31	20	52	28
ZKLN2052-2Z-XL	0.31	20	52	28
ZKLN2557-2RS-XL	0.34	25	57	28
ZKLN2557-2Z-XL	0.34	25	57	28
ZKLN3062-2RS-XL	0.39	30	62	28
ZKLN3062-2Z-XL	0.39	30	62	28
ZKLN3072-2RS-XL	0.72	30	72	38
ZKLN3072-2Z-XL	0.72	30	72	38
ZKLN3572-2RS-XL	0.51	35	72	34
ZKLN3572-2Z-XL	0.51	35	72	34
ZKLN4075-2RS-XL	0.61	40	75	34
ZKLN4075-2Z-XL	0.61	40	75	34
ZKLN4090-2RS-XL	0.95	40	90	46
ZKLN4090-2Z-XL	0.95	40	90	46
ZKLN50110-2RS-XL	2.5	50	110	54
ZKLN50110-2Z-XL	2.5	50	110	54
ZKLN5090-2RS-XL	0.88	50	90	34
ZKLN5090-2Z-XL	0.88	50	90	34
ZKLN60110-2Z-XL	2.2	60	110	45
ZKLN70120-2Z-XL	2.4	70	120	45
ZKLN80130-2Z-XL	2.7	80	130	45
ZKLN90150-2Z-XL	4.5	90	150	55
ZKLN100160-2Z-XL	4.9	100	160	55

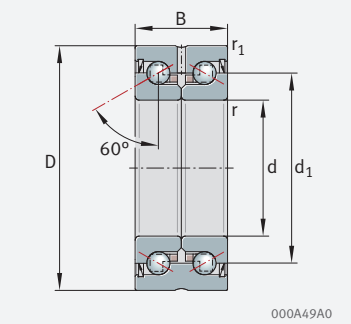


Design of housing and shaft (threaded spindle)

M_m	Axial runout	d_1	r_{min}	$r_{1\ min}$	D_a	d_a
kg · cm²	µm	mm	mm	mm	max.	min.
0.0019	2	12	0.3	0.3	16	9
0.0044	2	14	0.3	0.6	19	9
0.0044	2	14	0.3	0.6	19	9
0.02	2	19	0.3	0.6	26	11
0.02	2	19	0.3	0.6	26	11
0.029	2	21	0.3	0.6	28	14
0.029	2	21	0.3	0.6	28	14
0.068	2	25	0.3	0.6	33	16
0.068	2	25	0.3	0.6	33	16
0.102	2	28	0.3	0.6	35	20
0.102	2	28	0.3	0.6	35	20
0.132	2	30	0.3	0.6	37	23
0.132	2	30	0.3	0.6	37	23
0.273	2	34.5	0.3	0.6	43	25
0.273	2	34.5	0.3	0.6	43	25
0.486	2	40.5	0.3	0.6	48	32
0.486	2	40.5	0.3	0.6	48	32
0.73	2.5	45.5	0.3	0.6	53	40
0.73	2.5	45.5	0.3	0.6	53	40
1.91	2.5	51	0.3	0.6	64	47
1.91	2.5	51	0.3	0.6	64	47
1.51	2.5	52	0.3	0.6	62	45
1.51	2.5	52	0.3	0.6	62	45
2.26	2.5	58	0.3	0.6	67	50
2.26	2.5	58	0.3	0.6	67	50
5.5	2.5	65	0.6	0.6	80	56
5.5	2.5	65	0.6	0.6	80	56
15.2	2.5	80	0.6	0.6	98	63
15.2	2.5	80	0.6	0.6	98	63
5.24	2.5	72	0.3	0.6	82	63
5.24	2.5	72	0.3	0.6	82	63
13.7	3	85	0.6	0.6	100	82
19.8	3	95	0.6	0.6	110	92
27.6	3	105	0.6	0.6	120	102
59.9	3	120	0.6	0.6	138	116
85.3	3	132	0.6	0.6	150	128

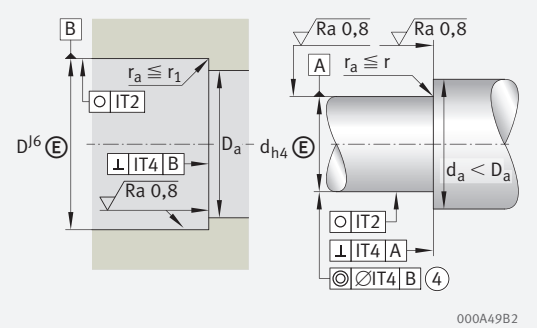
ZKLN..-2RS, ZKLN..-2Z

Without fixing holes



ZKLN..-2RS, ZKLN..-2Z

Designation	d	dyn. C_a	stat. C_{0a}	C_{ua}	n_G grease	n_ϑ	M_R
	mm	N	N	N	min^{-1}	min^{-1}	Nm
ZKLN0619-2Z-XL	6	5000	5700	345	22800	14000	0.01
ZKLN0624-2RS-XL	6	7600	8500	520	16400	6800	0.04
ZKLN0624-2Z-XL	6	6900	8500	520	19900	12000	0.02
ZKLN0832-2RS-XL	8	13800	16300	990	12100	5100	0.08
ZKLN0832-2Z-XL	8	13800	16300	990	15500	9500	0.04
ZKLN1034-2RS-XL	10	13400	18800	1140	10900	4600	0.12
ZKLN1034-2Z-XL	10	13400	18800	1140	14400	8600	0.06
ZKLN1242-2RS-XL	12	18800	25000	1520	9200	3800	0.16
ZKLN1242-2Z-XL	12	18800	25000	1520	12000	7600	0.08
ZKLN1545-2RS-XL	15	19800	28500	1730	8200	3500	0.2
ZKLN1545-2Z-XL	15	19800	28500	1730	10800	7000	0.1
ZKLN1747-2RS-XL	17	20800	31500	1920	7600	3300	0.24
ZKLN1747-2Z-XL	17	20800	31500	1920	10100	6600	0.12
ZKLN2052-2RS-XL	20	28500	47000	2850	6600	3000	0.3
ZKLN2052-2Z-XL	20	26000	47000	2850	8700	5400	0.15
ZKLN2557-2RS-XL	25	30500	55000	3350	5700	2600	0.4
ZKLN2557-2Z-XL	25	30500	55000	3350	7500	4700	0.2
ZKLN3062-2RS-XL	30	29000	64000	3850	5000	2200	0.5
ZKLN3062-2Z-XL	30	29000	64000	3850	6700	4300	0.25
ZKLN3072-2RS-XL	30	59000	108000	6500	4500	2100	0.8
ZKLN3072-2Z-XL	30	59000	180000	6500	5600	4000	0.4
ZKLN3572-2RS-XL	35	41000	89000	5400	4400	2000	0.6
ZKLN3572-2Z-XL	35	41000	89000	5400	5800	3800	0.3
ZKLN4075-2RS-XL	40	43000	101000	6100	4000	1800	0.7
ZKLN4075-2Z-XL	40	43000	101000	6100	5200	3300	0.35
ZKLN4090-2RS-XL	40	79000	149000	9100	3500	1600	1.3
ZKLN4090-2Z-XL	40	79000	149000	9100	4400	3100	0.65
ZKLN50110-2RS-XL	50	113000	250000	15200	2900	1200	2.6
ZKLN50110-2Z-XL	50	125000	250000	15200	3500	2500	1.3
ZKLN5090-2RS-XL	50	51000	126000	7700	3200	1500	0.9
ZKLN5090-2Z-XL	50	51000	126000	7700	4200	3000	0.45
ZKLN60110-2Z-XL	60	93000	214000	13000	4000	3000	1
ZKLN70120-2Z-XL	70	97000	241000	14600	3800	2800	1.2
ZKLN80130-2Z-XL	80	100000	265000	15800	3600	2700	1.4
ZKLN90150-2Z-XL	90	149000	395000	21900	3500	2300	2.3
ZKLN100160-2Z-XL	100	154000	435000	23000	3300	2150	2.6



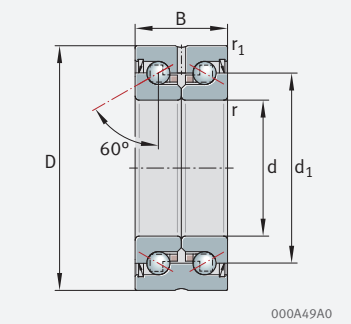
Design of housing and shaft (threaded spindle)

c_{aL}	c_{kL}	Locknut for radial clamping	Locknut for axial clamping	Locknut M_A	Locknut force axial
N/µm	Nm/mrad			Nm	N
150	4	ZM06	–	1	2010
200	8	ZM06	–	2	2404
200	8	ZM06	–	2	2404
250	20	ZM08	–	4	3468
250	20	ZM08	–	4	3468
325	25	ZM10	–	6	4891
325	25	ZM10	–	6	4891
375	50	ZM12	–	8	5307
375	50	ZM12	–	8	5307
400	65	ZM15	AM15	10	5484
400	65	ZM15	AM15	10	5484
450	80	ZM17	AM17	15	7514
450	80	ZM17	AM17	15	7514
650	140	ZM20	AM20	18	8258
650	140	ZM20	AM20	18	8258
750	200	ZM25	AM25	25	9123
750	200	ZM25	AM25	25	9123
850	300	ZM30	AM30	32	9947
850	300	ZM30	AM30	32	9947
950	400	ZMA30/52	AM30	65	19509
950	400	ZMA30/52	AM30	65	19509
900	400	ZM35	AM35/58	40	10770
900	400	ZM35	AM35/58	40	10770
1000	550	ZM40	AM40	55	13412
1000	550	ZM40	AM40	55	13412
1200	750	ZMA40/62	AM40	110	25185
1200	750	ZMA40/62	AM40	110	25185
1400	1500	ZMA50/75	AM50	150	28451
1400	1500	ZMA50/75	AM50	150	28451
1250	1000	ZM50	AM50	85	16280
1250	1000	ZM50	AM50	85	16280
1300	1650	ZMA60/98	AM60	100	16700
1450	2250	ZMA70/110	AM70	130	19031
1600	3000	ZMA80/120	AM80	160	20604
1700	4400	ZMA90/130	AM90	200	22731
1900	5800	ZMA100/140	AM100	250	25624

6.5 ZKLN..-2RS-PE

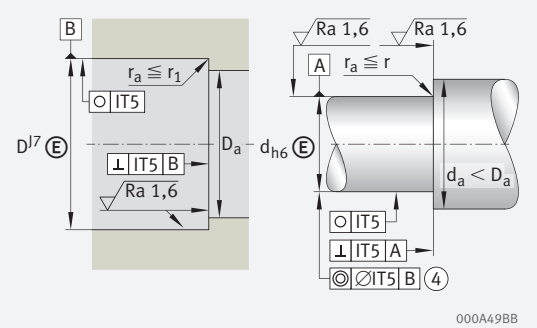
Without fixing holes

Less stringent tolerances



ZKLN..-2RS-PE

Designation	m	d	D	B
	kg	mm	mm	mm
ZKLN0624-2RS-PE	0.03	6	24	15
ZKLN1034-2RS-PE	0.1	10	34	20
ZKLN1242-2RS-PE	0.2	12	42	25
ZKLN1545-2RS-PE	0.21	15	45	25
ZKLN1747-2RS-PE	0.22	17	47	25
ZKLN2052-2RS-PE	0.31	20	52	28
ZKLN2557-2RS-PE	0.34	25	57	28
ZKLN3062-2RS-PE	0.39	30	62	28
ZKLN3572-2RS-PE	0.51	35	72	34
ZKLN5090-2RS-PE	0.88	50	90	34



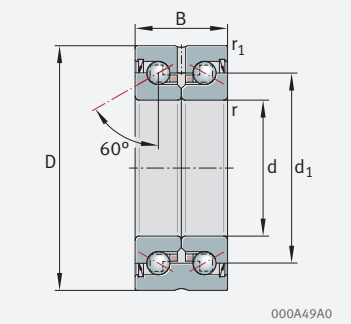
Design of housing and shaft (threaded spindle)

M_m	Axial runout	d_1	r_{min}	$r_{1\ min}$	D_a	d_a
kg · cm²	µm	mm	mm	mm	max.	min.
0.0044	5	14	0.3	0.6	19	9
0.029	5	21	0.3	0.6	28	14
0.068	5	25	0.3	0.6	33	16
0.102	5	28	0.3	0.6	35	20
0.132	5	30	0.3	0.6	37	23
0.273	5	34.5	0.3	0.6	43	25
0.486	5	40.5	0.3	0.6	48	32
0.73	5	45.5	0.3	0.6	53	40
1.51	5	52	0.3	0.6	62	45
5.24	5	72	0.3	0.6	82	63

ZKLN..-2RS-PE

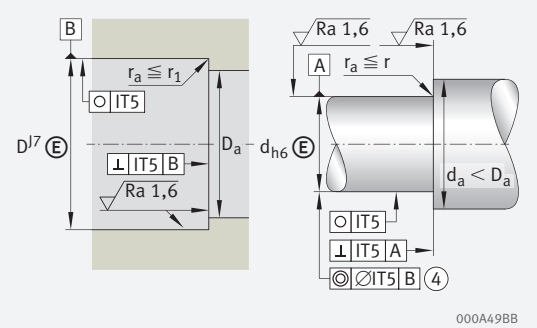
Without fixing holes

Less stringent tolerances



ZKLN..-2RS-PE

Designation	d	dyn. C_a	stat. C_{0a}	C_{ua}	n_G grease	n_ϑ	M_R
	mm	N	N	N	min^{-1}	min^{-1}	Nm
ZKLN0624-2RS-PE	6	6900	8500	385	16400	6800	0.04
ZKLN1034-2RS-PE	10	13400	18800	850	10900	4600	0.12
ZKLN1242-2RS-PE	12	17100	25000	1140	9200	3800	0.16
ZKLN1545-2RS-PE	15	18000	28500	1300	8200	3500	0.2
ZKLN1747-2RS-PE	17	18900	31500	1440	7600	3300	0.24
ZKLN2052-2RS-PE	20	26000	47000	2130	6600	3000	0.3
ZKLN2557-2RS-PE	25	27500	55000	2500	5700	2600	0.4
ZKLN3062-2RS-PE	30	29000	64000	2900	5000	2200	0.5
ZKLN3572-2RS-PE	35	41000	89000	4050	4400	2000	0.6
ZKLN5090-2RS-PE	50	46500	126000	5800	3200	1500	0.9



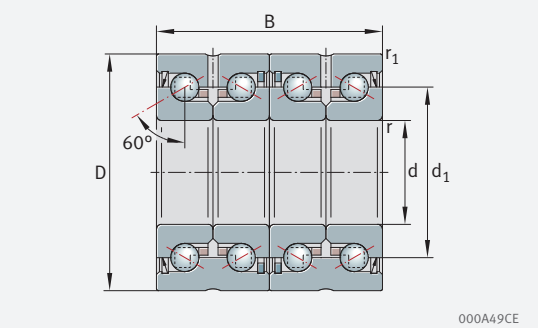
Design of housing and shaft (threaded spindle)

c_{aL}	c_{kL}	Locknut for radial clamping	Locknut for axial clamping	Locknut M_A	Locknut force axial
N/µm	Nm/mrad			Nm	N
200	8	ZM06	–	2	2404
325	25	ZM10	–	6	4891
375	50	ZM12	–	8	5307
400	65	ZM15	AM15	10	5484
450	80	ZM17	AM17	15	7514
650	140	ZM20	AM20	18	8258
750	200	ZM25	AM25	25	9123
850	300	ZM30	AM30	32	9947
900	400	ZM35	AM35/38	40	10770
1250	1000	ZM50	AM50	85	16280

6.6 ZKLN..-2RS-2AP

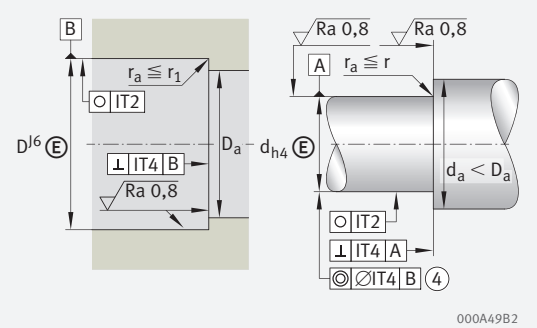
Without fixing holes

Matched pair



ZKLN..-2RS-2AP

Designation	m	d	D	B
	kg	mm	mm	mm
ZKLN1747-2RS-2AP-XL	0.44	17	47	50
ZKLN2052-2RS-2AP-XL	0.62	20	52	56
ZKLN2557-2RS-2AP-XL	0.68	25	57	56
ZKLN3062-2RS-2AP-XL	0.78	30	62	56
ZKLN3572-2RS-2AP-XL	1.02	35	72	68
ZKLN4075-2RS-2AP-XL	1.22	40	75	68
ZKLN5090-2RS-2AP-XL	1.76	50	90	68



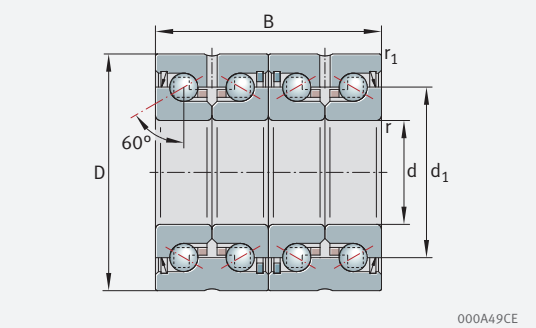
Design of housing and shaft (threaded spindle)

M_m	Axial runout	d_1	r_{min}	$r_{1\ min}$	D_a	d_a
kg · cm²	µm	mm	mm	mm	max.	min.
0.264	2	30	0.3	0.6	37	23
0.546	2	34.5	0.3	0.6	43	25
0.972	2	40.5	0.3	0.6	48	32
1.46	2.5	45.5	0.3	0.6	53	40
3.02	2.5	52	0.3	0.6	62	45
4.52	2.5	58	0.3	0.6	67	50
10.48	2.5	72	0.3	0.6	82	63

ZKLN..-2RS-2AP

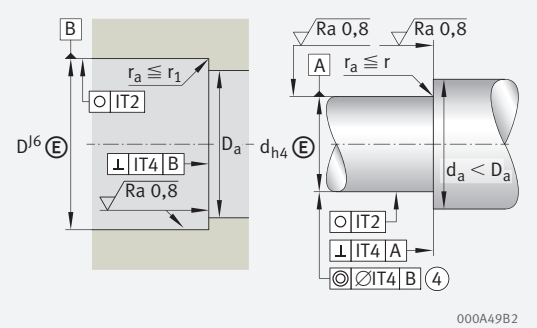
Without fixing holes

Matched pair



ZKLN..-2RS-2AP

Designation	d	dyn. C_a	stat. C_{0a}	C_{ua}	n_G grease	n_ϑ	M_R
	mm	N	N	N	min^{-1}	min^{-1}	Nm
ZKLN1747-2RS-2AP-XL	17	34000	63000	3850	7600	3300	0.36
ZKLN2052-2RS-2AP-XL	20	46000	94000	5700	6600	3000	0.45
ZKLN2557-2RS-2AP-XL	25	44500	111000	6700	5700	2600	0.6
ZKLN3062-2RS-2AP-XL	30	52000	127000	7700	5000	2200	0.75
ZKLN3572-2RS-2AP-XL	35	73000	177000	10800	4400	2000	0.9
ZKLN4075-2RS-2AP-XL	40	77000	202000	12300	4000	1800	1.05
ZKLN5090-2RS-2AP-XL	50	83000	250000	15300	3200	1500	1.35

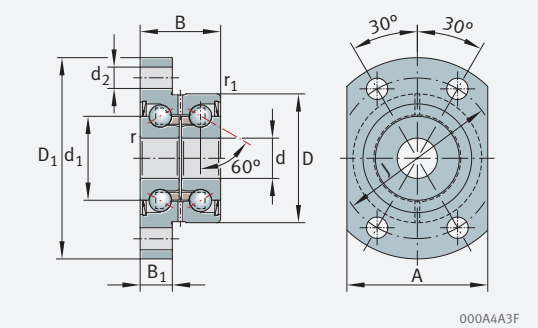


Design of housing and shaft (threaded spindle)

c_{aL}	c_{kL}	Locknut for radial clamping	Locknut for axial clamping	Locknut M_A	Locknut force axial
N/µm	Nm/mrad			Nm	N
800	200	ZM17	AM17	15	7514
1150	320	ZMA20/38	AM20	18	8258
1300	450	ZMA25/45	AM25	25	9123
1500	620	ZMA30/52	AM30	32	9947
1600	900	ZMA35/58	AM35/58	40	10770
1750	1200	ZMA40/62	AM40	55	13412
2200	2250	ZMA50/75	AM50	85	16280

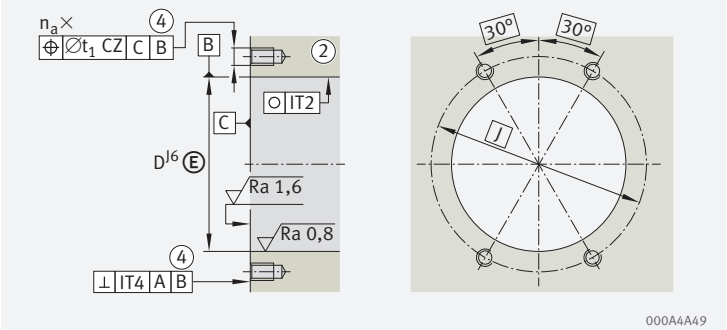
6.7 ZKLFA..-2RS, ZKLFA..-2Z

With fixing holes

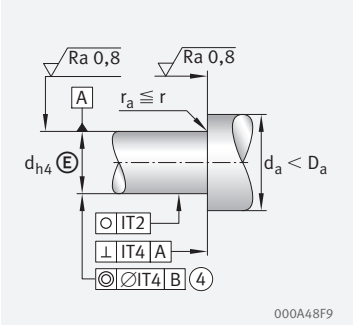


ZKLFA..-2RS, ZKLFA..-2Z

Designation	m	d	D	B	d_1	D_1	r_{min}
	kg	mm	mm	mm	mm	mm	mm
ZKLFA0630-2Z	0.05	6	19	12	12	30	0.3
ZKLFA0640-2RS	0.08	6	24	15	14	40	0.3
ZKLFA0640-2Z	0.08	6	24	15	14	40	0.3
ZKLFA0850-2RS	0.17	8	32	20	19	50	0.3
ZKLFA0850-2Z	0.17	8	32	20	19	50	0.3
ZKLFA1050-2RS	0.18	10	32	20	21	50	0.3
ZKLFA1050-2Z	0.18	10	32	20	21	50	0.3
ZKLFA1263-2RS	0.3	12	42	25	25	63	0.3
ZKLFA1263-2Z	0.3	12	42	25	25	63	0.3
ZKLFA1563-2RS	0.31	15	42	25	28	63	0.3
ZKLFA1563-2Z	0.31	15	42	25	28	63	0.3



Housing design

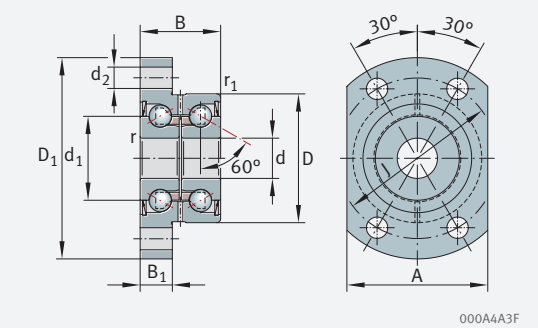


Shaft design (threaded spindle)

$r_{1\ min}$	B_1	d_2	J	A	d_a	d_a	t_1	Screws Size	n_a
mm	mm	mm	mm	mm	min.	max.	mm		
0.3	5	3.5	24	22	9	15	0.1	M3	4
0.6	6	4.5	32	27	9	18	0.1	M4	4
0.6	6	4.5	32	27	9	18	0.1	M4	4
0.6	8	5.5	40	35	11	25	0.1	M5	4
0.6	8	5.5	40	35	11	25	0.1	M5	4
0.6	8	5.5	40	35	14	27	0.1	M5	4
0.6	8	5.5	40	35	14	27	0.1	M5	4
0.6	10	6.8	53	45	16	31	0.1	M6	4
0.6	10	6.8	53	45	16	31	0.1	M6	4
0.6	10	6.8	53	45	20	34	0.1	M6	4
0.6	10	6.8	53	45	20	34	0.1	M6	4

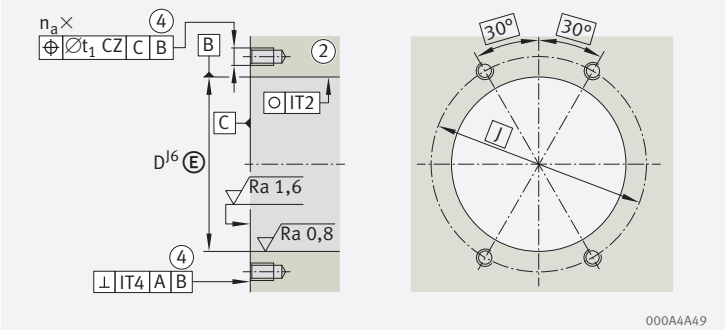
ZKLFA..-2RS, ZKLFA..-2Z

With fixing holes

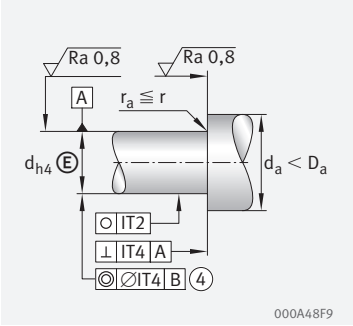


ZKLFA..-2RS, ZKLFA..-2Z

Designation	d	dyn. C_a	stat. C_{0a}	C_{ua}	n_G grease	n_ϑ	M_R
	mm	N	N	N	min^{-1}	min^{-1}	Nm
ZKLFA0630-2Z	6	4550	5700	260	22800	14000	0.01
ZKLFA0640-2RS	6	6900	8500	385	16400	–	0.04
ZKLFA0640-2Z	6	6900	8500	385	19900	12000	0.02
ZKLFA0850-2RS	8	12500	16300	740	12100	–	0.08
ZKLFA0850-2Z	8	12500	16300	740	15500	9500	0.04
ZKLFA1050-2RS	10	13400	18800	850	10900	–	0.12
ZKLFA1050-2Z	10	13400	18800	850	14400	8600	0.06
ZKLFA1263-2RS	12	17100	25000	1140	9200	–	0.16
ZKLFA1263-2Z	12	17100	25000	1140	12000	7600	0.08
ZKLFA1563-2RS	15	18000	28500	1300	8200	–	0.2
ZKLFA1563-2Z	15	18000	28500	1300	10800	7000	0.1



Housing design

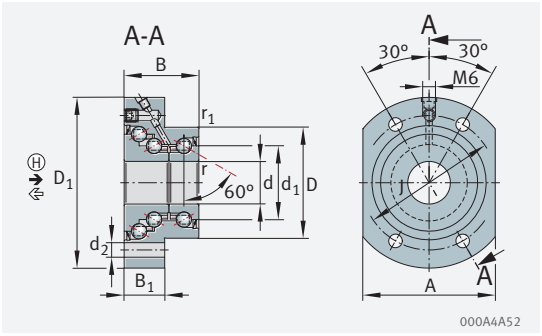


Shaft design (threaded spindle)

c_{aL}	c_{kL}	M_m	Axial runout	Locknut for radial clamping	Locknut for axial clamping	Locknut M_A	Locknut force axial
N/µm	Nm/mrad	kg · cm^2	µm			Nm	N
150	4	0.0019	2	ZM06	–	2	2010
200	8	0.0044	2	ZM06	–	2	2404
200	8	0.0044	2	ZM06	–	2	2404
250	20	0.02	2	ZM08	–	4	3468
250	20	0.02	2	ZM08	–	4	3468
325	25	0.029	2	ZM10	–	6	4891
325	25	0.029	2	ZM10	–	6	4891
375	50	0.068	2	ZM12	–	8	5307
375	50	0.068	2	ZM12	–	8	5307
400	65	0.102	2	ZM15	AM15	10	5484
400	65	0.102	2	ZM15	AM15	10	5484

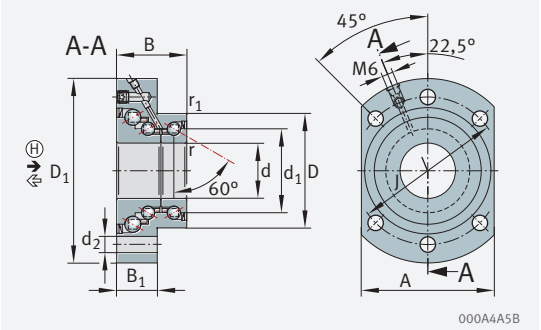
6.8 DKLFA..-2RS

With fixing holes

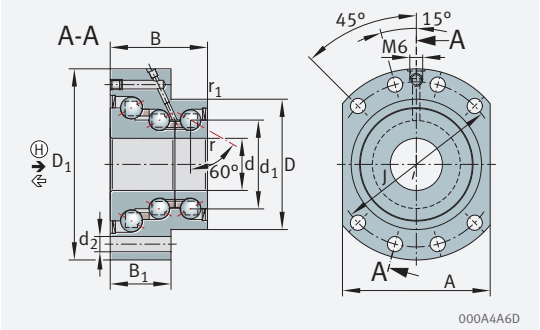


DKLFA..-2RS (d ≤ 20 mm)

Designation	m	d	D	B	d_1	D_1	r_{min}
	kg	mm	mm	mm	mm	min.	mm
DKLFA1575-2RS	0.53	15	45	32	28	75	0.3
DKLFA2080-2RS	0.7	20	52	35	34.5	80	0.3
DKLFA2590-2RS	0.9	25	57	38	40.5	90	0.3
DKLFA30100-2RS	1	30	62	38	45.5	100	0.3
DKLFA30110-2RS	2.5	30	75	56	51	110	0.3
DKLFA40115-2RS	1.5	40	72	42	58	115	0.3
DKLFA40140-2RS	4.2	40	90	60	65	140	0.3



DKLFA..-2RS (d ≥ 25 mm)

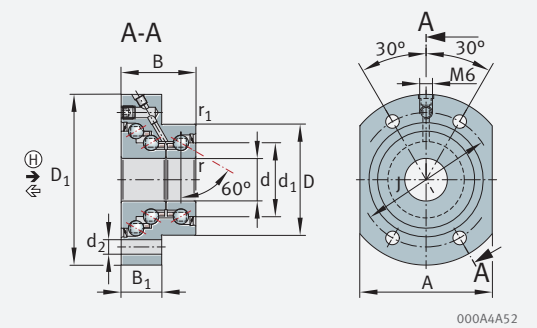


DKLFA..-2RS, heavy series

$r_{1\ min}$	B_1	d_2	J	A	d_a	d_a	Screws Size	n	t
mm	mm	mm	mm	mm	min.	max.			°
0.6	18	6.8	58	55	20	35	M6	4	60
0.6	19	6.8	63	62	25	43	M6	4	60
0.6	22	8.8	75	70	32	48	M8	6	60
0.6	22	8.8	80	72	40	53	M8	6	60
0.6	35	8.8	95	85	47	64	M8	8	60
0.6	23	8.8	94	90	50	67	M8	6	60
0.6	35	11	118	110	56	80	M10	8	60

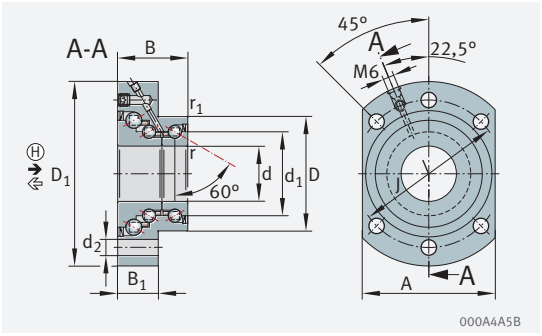
DKLFA..-2RS

With fixing holes

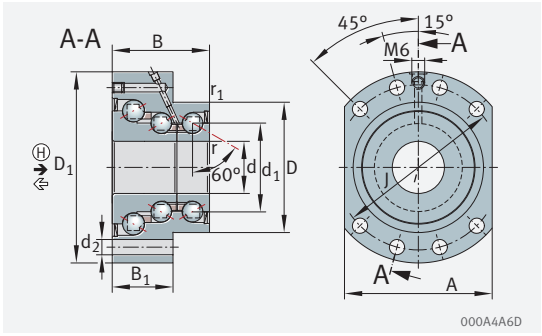


DKLFA..-2RS (d ≤ 20 mm)

Designation	d	dyn. C_a axial ⇦	stat. C_{0a} axial ⇦	dyn. C_a axial H ➡	stat. C_{0a} axial H ➡	C_{ua}	C_{ua} H	n_G grease	n_ϑ	M_R
		N	N	N	N	N	N	min^{-1}	min^{-1}	Nm
DKLFA1575-2RS	15	17900	28000	37000	83000	1240	2450	5700	2600	0.35
DKLFA2080-2RS	20	26000	47000	44500	110000	2070	2800	5000	2200	0.45
DKLFA2590-2RS	25	27500	55000	53000	144000	2450	3950	4400	2000	0.6
DKLFA30100-2RS	30	29000	64000	56000	165000	2800	4450	4000	1800	0.75
DKLFA30110-2RS	30	59000	108000	107000	255000	4800	6600	3500	1600	1.5
DKLFA40115-2RS	40	43000	101000	73000	227000	4450	5600	3200	1500	1
DKLFA40140-2RS	40	72000	149000	127000	365000	6600	9500	2900	1200	2.5



DKLFA..-2RS (d ≥ 25 mm)

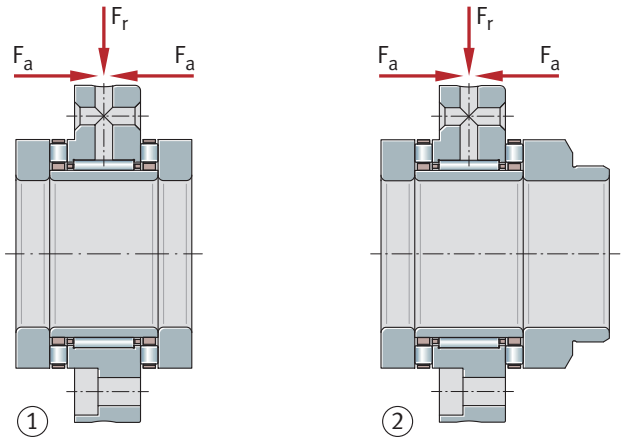


DKLFA..-2RS, heavy series

c_{aL} axial ⇦	c_{aL} axial H ➡	c_{kL}	M_m	Axial runout	Locknut for radial clamping	Locknut for radial clamping	Locknut for axial clamping	Locknut M_A	Required locknut force axial
N/µm	N/µm	Nm/mrad	kg · cm²	µm				Nm	N
500	950	140	0.278	5	ZMA15/33	ZM17	AM15	10	6270
750	1100	260	0.553	5	ZMA20/38	ZM25	AM20	18	8580
850	1200	370	1.12	5	ZMA25/45	ZM30	AM25	25	9670
900	1400	500	1.7	5	ZMA30/52	ZM35	AM30	32	10350
1300	1600	650	3.23	5	ZM35	ZM35	AM30/65	65	20500
1100	1700	1000	4.23	5	ZMA40/62	ZM45	AM40	55	13420
1800	2000	1370	9.32	5	ZM45	ZM45	AM40/85	110	26600

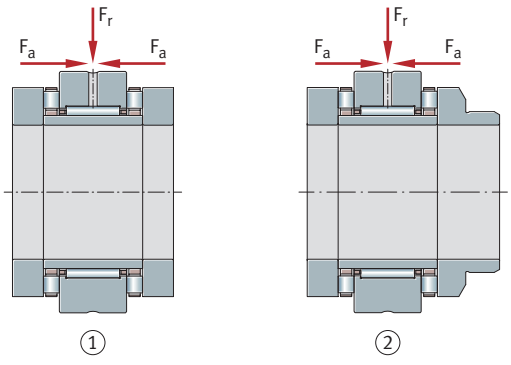
7 Needle roller/axial cylindrical roller bearings

These precision bearings are double direction axial cylindrical roller bearings with a radial bearing component. The bearings are available with and without fixing holes in the outer ring. Bearings with holes are screw mounted directly on the adjacent construction. The large contact surface and the small pitch of the holes allow a connection to the adjacent construction that is extremely rigid and with low tendency to settling. There is therefore no need for the bearing cover that would otherwise be required to hold the bearing, and the matching work required. If the axial abutment of the shaft locating washer is not sufficient or a seal raceway is required, bearings with a stepped shaft locating washer extended on one side are suitable.



23 Needle roller/axial cylindrical roller bearings, for screw mounting

1	ZARF	2	With stepped shaft locating washer extended on one side ZARF..-L



24 Needle roller/axial cylindrical roller bearings, not for screw mounting

1	ZARN	2	With stepped shaft locating washer extended on one side ZARN..-L

Needle roller/axial cylindrical roller bearings comprise an outer ring with radial and axial raceways, shaft locating washers, an inner ring, a radial needle roller and cage assembly, and axial cylindrical roller and cage assemblies. The bearings are available with or without fixing holes. In addition to radial forces, the bearings can also support axial forces from both directions and tilting moments. The outer ring, inner ring, and axial cages are matched to each other such that the bearing

is axially clearance-free after preloading by means of an INA precision locknut. The radial internal clearance corresponds to Group 2 in accordance with ISO 5753-1 (DIN 620-4).

Bearings for screw mounting

Needle roller/axial cylindrical roller bearings ZARF..-L have holes in the outer ring. These are used for screw mounting directly on the adjacent construction or in a radial locating bore. Due to screw mounting of the outer ring, the cover that would otherwise be required and the matching work can therefore be dispensed with. The bearings are preloaded against the shaft shoulder by means of a locknut AM or ZM(A). In the interests of a simpler design, a seal carrier assembly DRS is recommended. The seal carrier assembly is centered on the outer ring and seals the bearing against external influences.

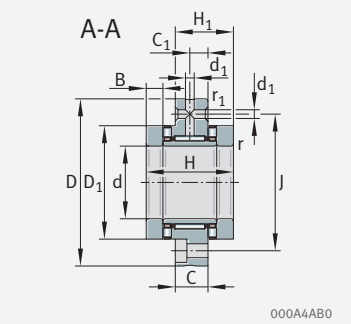
Bearings not for screw mounting

Bearings ZARN..-L are mounted in a housing bore and the outer ring is located using a cover. The bearings are preloaded against the shaft shoulder by means of a locknut AM or ZM(A). ZARN/F..-L has a stepped shaft locating washer extended on one side. These series are used in preference where the shaft locating washer is not adequately supported axially by the shaft shoulder or the bearing unit cannot be sealed on the outside surface of the normal shaft locating washer due to space conditions in the adjacent construction. ZARN/F..-L is also available in a heavy series. This series has a larger cross-section for the same shaft diameter and therefore higher basic load ratings.

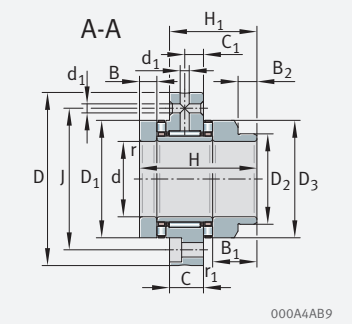
7.1 ZARF, ZARF..-L

Light series

With fixing holes

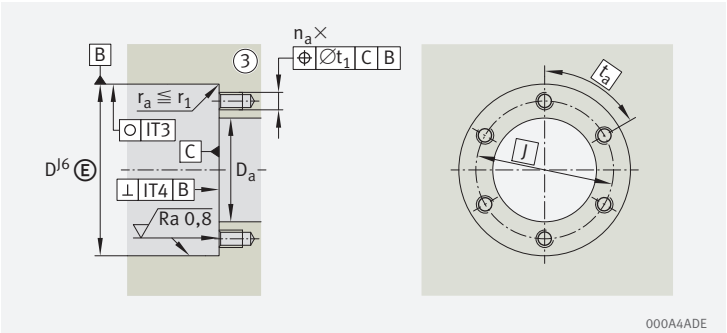


ZARF

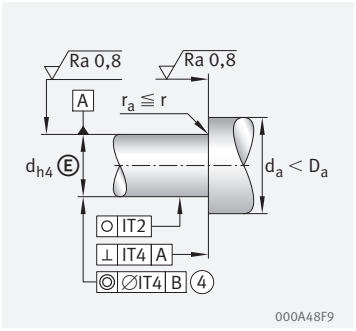


ZARF..-L

Designation	m	d	D	H	dyn. C_a	stat. C_{0a}	dyn. C_r	stat. C_{0r}	C_{ua}	C_{ur}	n_G oil	n_G grease	M_R
	kg	mm	mm	mm	N	N	N	N	N	N	min^{-1}	min^{-1}	Nm
ZARF1560-TV	0.42	15	60	40	24900	53000	13000	17500	7500	2650	8500	2200	0.35
ZARF1560-L-TV	0.45	15	60	53	24900	53000	13000	17500	7500	2650	8500	2200	0.35
ZARF1762-TV	0.49	17	62	43	26000	57000	14000	19900	8000	3000	7800	2100	0.4
ZARF1762-L-TV	0.52	17	62	57	26000	57000	14000	19900	8000	3000	7800	2100	0.4
ZARF2068-TV	0.56	20	68	46	33500	76000	14900	22400	6400	3400	7000	2000	0.5
ZARF2068-L-TV	0.61	20	68	60	33500	76000	14900	22400	6400	3400	7000	2000	0.5
ZARF2575-TV	0.78	25	75	50	35500	86000	22600	36000	7300	5200	6000	1900	0.55
ZARF2575-L-TV	0.84	25	75	65	35500	86000	22600	36000	7300	5200	6000	1900	0.55
ZARF3080-TV	0.85	30	80	50	39000	101000	24300	41500	8500	6000	5500	1800	0.65
ZARF3080-L-TV	0.9	30	80	65	39000	101000	24300	41500	8500	6000	5500	1800	0.65
ZARF3590-TV	1.12	35	90	54	56000	148000	26000	47000	12900	6800	4800	1700	0.9
ZARF3590-L-TV	1.25	35	90	70	56000	148000	26000	47000	12900	6800	4800	1700	0.9
ZARF40100-TV	1.35	40	100	54	59000	163000	27500	53000	14200	7600	4400	1600	1
ZARF40100-L-TV	1.45	40	100	70	59000	163000	27500	53000	14200	7600	4400	1600	1
ZARF45105-TV	1.7	45	105	60	61000	177000	38000	74000	15500	10400	4000	1500	1.2
ZARF45105-L-TV	1.85	45	105	75	61000	177000	38000	74000	15500	10400	4000	1500	1.2
ZARF50115-TV	2.1	50	115	60	90000	300000	40000	82000	28000	11500	3600	1200	2.2
ZARF50115-L-TV	2.45	50	115	78	90000	300000	40000	82000	28000	11500	3600	1200	2.2



Housing design



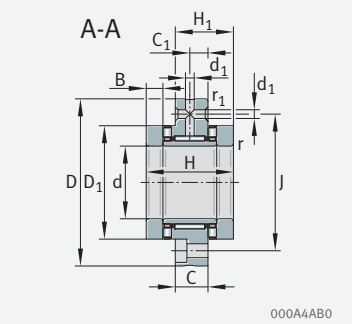
Shaft design (threaded spindle)

H_1	C	C_1	D_1	D_2	D_3	B	B_1	B_2	r_{min}	$r_{1\ min}$	d_1	J	n	t	D_a	d_a	t_1	M_m
mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm		°	max.	min.	mm	kg · cm^2
26	14	8	35	–	–	7.5	–	–	0.3	0.6	3.2	46	6	60	36	28	0.1	0.24
39	14	8	35	24	34	7.5	20.5	11	0.3	0.6	3.2	46	6	60	36	22	0.1	0.274
27.5	14	8	38	–	–	9	–	–	0.3	0.6	3.2	48	6	60	39	28	0.1	0.373
41.5	14	8	38	28	38	9	23	11	0.3	0.6	3.2	48	6	60	39	26	0.1	0.464
29	14	8	42	–	–	10	–	–	0.3	0.6	3.2	53	8	45	43	33	0.1	0.615
43	14	8	42	30	40	10	24	12	0.3	0.6	3.2	53	8	45	43	28	0.1	0.683
33	18	10	47	–	–	10	–	–	0.3	0.6	3.2	58	8	45	48	39	0.1	0.989
48	18	10	47	36	45	10	25	12	0.3	0.6	3.2	58	8	45	48	34	0.1	1.15
33	18	10	52	–	–	10	–	–	0.3	0.6	3.2	63	12	30	53	44	0.1	1.46
48	18	10	52	40	50	10	25	13	0.3	0.6	3.2	63	12	30	53	38	0.1	1.7
35	18	10	60	–	–	11	–	–	0.3	0.6	3.2	73	12	30	61	50	0.1	2.8
51	18	10	60	45	58	11	27	13	0.3	0.6	3.2	73	12	30	61	43	0.1	3.21
35	18	10	65	–	–	11	–	–	0.3	0.6	3.2	80	8	45	66	55	0.2	3.78
51	18	10	65	50	63	11	27	14	0.3	0.6	3.2	80	8	45	66	48	0.2	4.35
40	22.5	12.5	70	–	–	11.5	–	–	0.3	0.6	6	85	8	45	71	60	0.2	5.33
55	22.5	12.5	70	56	68	11.5	26.5	13	0.3	0.6	6	85	8	45	71	54	0.2	6.03
40	22.5	12.5	78	–	–	11.5	–	–	0.3	0.6	6	94	12	30	79	67	0.2	8.42
58	22.5	12.5	78	60	78	11.5	29.5	14	0.3	0.6	6	94	12	30	79	58	0.2	10.46

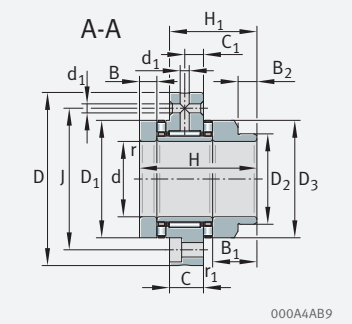
ZARF, ZARF..-L

Light series

With fixing holes

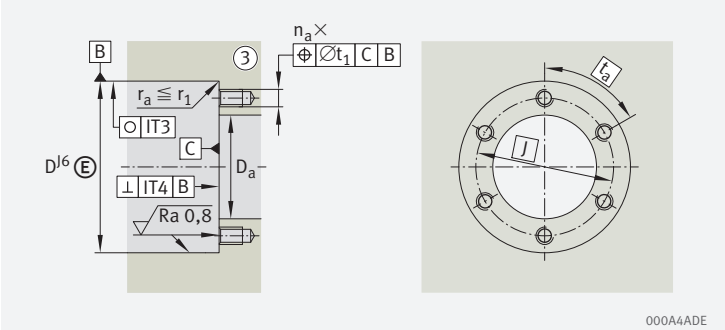


ZARF

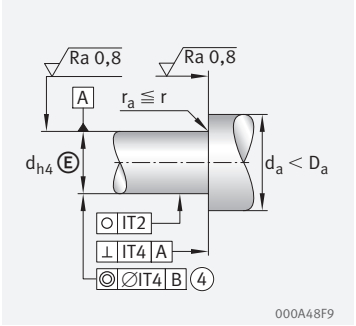


ZARF..-L

Designation	d	C_{aL}	C_{kL}	Axial runout
	mm	N/µm	Nm/mrad	µm
ZARF1560-TV	15	1400	110	1
ZARF1560-L-TV	15	1400	110	1
ZARF1762-TV	17	1600	160	1
ZARF1762-L-TV	17	1600	160	1
ZARF2068-TV	20	1800	230	1
ZARF2068-L-TV	20	1800	230	1
ZARF2575-TV	25	1900	350	1
ZARF2575-L-TV	25	1900	350	1
ZARF3080-TV	30	2200	520	1
ZARF3080-L-TV	30	2200	520	1
ZARF3590-TV	35	2600	740	1
ZARF3590-L-TV	35	2600	740	1
ZARF40100-TV	40	2800	1030	1
ZARF40100-L-TV	40	2800	1030	1
ZARF45105-TV	45	3000	1340	1
ZARF45105-L-TV	45	3000	1340	1
ZARF50115-TV	50	4800	2470	1
ZARF50115-L-TV	50	4800	2470	1



Housing design



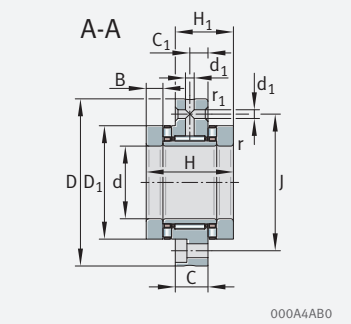
Shaft design (threaded spindle)

Locknut for radial clamping	Locknut for axial clamping	Locknut M_A	Locknut force axial	Sealing ring radial	Screws Size	n_a	t_a
		Nm	N				°
ZMA15/33	AM15	10	6506	–	M6	6	60
ZMA15/33	AM15	10	6506	24×35×7	M6	–	60
ZM17	AM17	12	7078	–	M6	6	60
ZM17	AM17	12	7078	28×40×7	M6	6	60
ZMA20/38	AM20	18	8972	–	M6	8	45
ZMA20/38	AM20	18	8972	30×42×7	M6	–	45
ZMA25/45	AM25	25	9745	–	M6	8	45
ZMA25/45	AM25	25	9745	36×47×7	M6	–	45
ZMA30/52	AM30	32	10662	–	M6	12	30
ZMA30/52	AM30	32	10662	40×52×7	M6	–	30
ZMA35/58	AM35/58	40	12143	–	M6	12	30
ZMA35/58	AM35/58	40	12143	45×60×8	M6	–	30
ZMA40/62	AM40	55	14240	–	M8	8	45
ZMA40/62	AM40	55	14240	50×65×8	M8	–	45
ZMA45/68	AM45	65	15112	–	M8	8	45
ZMA45/68	AM45	65	15112	56×70×8	M8	–	45
ZMA50/75	AM50	85	18410	–	M8	12	30
ZMA50/75	AM50	85	18410	60×80×8	M8	–	30

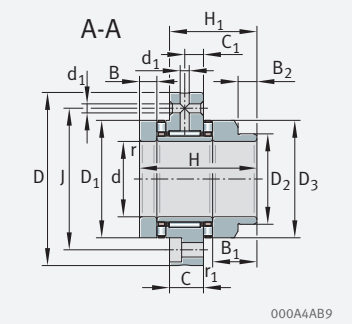
ZARF, ZARF..-L

Heavy series

With fixing holes

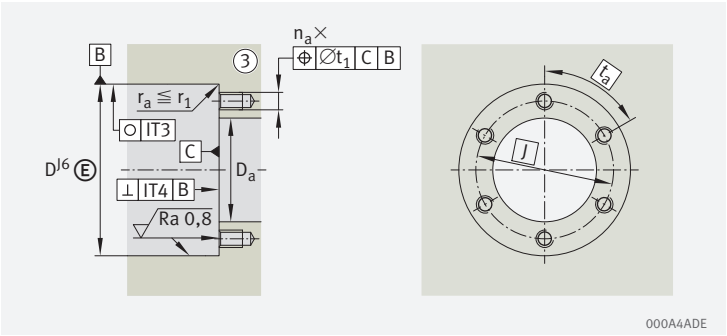


ZARF

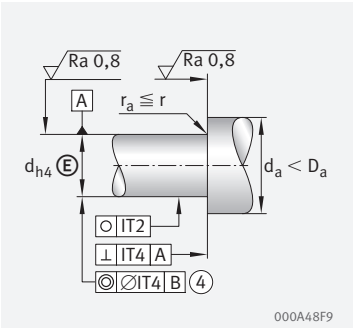


ZARF..-L

Designation	m	d	D	H	dyn. C_a	stat. C_{0a}	dyn. C_r	stat. C_{0r}	C_{ua}	C_{ur}	n_G oil	n_G grease	M_R
	kg	mm	mm	mm	N	N	N	N	N	N	min^{-1}	min^{-1}	Nm
ZARF2080-TV	1.1	20	80	60	64000	141000	22600	36000	13100	5200	6000	1500	1.3
ZARF2080-L-TV	1.22	20	80	75	64000	141000	22600	36000	13100	5200	6000	1500	1.3
ZARF2590-TV	1.6	25	90	60	80000	199000	24300	41500	18600	6000	4900	1400	1.6
ZARF2590-L-TV	1.75	25	90	75	80000	199000	24300	41500	18600	6000	4900	1400	1.6
ZARF30105-TV	1.95	30	105	66	107000	265000	26000	47000	22900	6800	4400	1300	2.1
ZARF30105-L-TV	2.15	30	105	82	107000	265000	26000	47000	22900	6800	4400	1300	2.1
ZARF35110-TV	1.6	35	110	66	105000	265000	27500	53000	22900	7600	4000	1250	2.3
ZARF35110-L-TV	1.85	35	110	82	105000	265000	27500	53000	22900	7600	4000	1250	2.3
ZARF40115-TV	2.7	40	115	75	117000	315000	38000	74000	27000	10400	3700	1200	2.5
ZARF40115-L-TV	3	40	115	93	117000	315000	38000	74000	27000	10400	3700	1200	2.5
ZARF45130-TV	3.9	45	130	82	154000	405000	40000	82000	37500	11500	3300	1150	3.5
ZARF45130-L-TV	4.3	45	130	103	154000	405000	40000	82000	37500	11500	3300	1150	3.5
ZARF50140-TV	4.2	50	140	82	172000	480000	46500	103000	44500	12700	3100	1100	3.8
ZARF50140-L-TV	4.65	50	140	103	172000	480000	46500	103000	44500	12700	3100	1100	3.8
ZARF55145-TV	4.5	55	145	82	177000	500000	44000	98000	46500	13800	2900	1000	4
ZARF55145-L-TV	5	55	145	103	177000	500000	44000	98000	46500	13800	2900	1000	4
ZARF60150-TV	4.7	60	150	82	187000	550000	44500	92000	51000	12900	2700	950	4.2
ZARF60150-L-TV	5.35	60	150	103	187000	550000	44500	92000	51000	12900	2700	950	4.2
ZARF65155-TV	5.1	65	155	82	172000	500000	54000	104000	46500	14900	2600	900	4
ZARF65155-L-TV	5.7	65	155	103	172000	500000	54000	104000	46500	14900	2600	900	4
ZARF70160-TV	5.2	70	160	82	201000	630000	56000	119000	58000	16100	2400	800	4.8
ZARF70160-L-TV	5.95	70	160	103	201000	630000	56000	119000	58000	16100	2400	800	4.8
ZARF75185-TV	9.4	75	185	100	290000	890000	81000	132000	85000	19100	2100	700	8
ZARF75185-L-TV	10.6	75	185	125	290000	890000	81000	132000	85000	19100	2100	700	8
ZARF90210-TV	13.7	90	210	110	325000	1030000	98000	210000	95000	29000	1800	700	10.5
ZARF90210-L-TV	15.1	90	210	135	325000	1030000	98000	210000	95000	29000	1800	700	10.5



Housing design



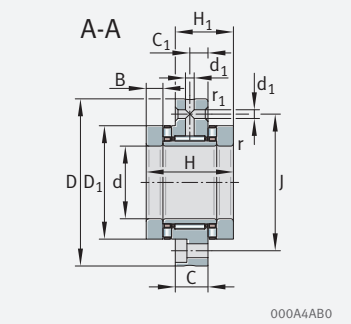
Shaft design (threaded spindle)

H_1	C	C_1	D_1	D_2	D_3	B	B_1	B_2	r_{min}	$r_{1\,min}$	d_1	J	n	t	D_a	d_a	t_1	M_m
mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm		°	max.	min.	mm	kg · cm^2
38	18	10	52	–	–	12.5	–	–	0.3	0.6	3.2	63	12	30	53	38	0.1	1.98
53	18	10	52	40	50	12.5	27.5	13	0.3	0.6	3.2	63	12	30	53	38	0.1	2.27
38	18	10	62	–	–	12.5	–	–	0.3	0.6	3.2	73	12	30	63	45	0.1	3.88
53	18	10	62	48	60	12.5	27.5	13	0.3	0.6	3.2	73	12	30	63	45	0.1	4.51
41	18	10	68	–	–	14	–	–	0.3	0.6	3.2	85	12	30	69	52	0.2	6.53
57	18	10	68	52	66	14	30	13	0.3	0.6	3.2	85	12	30	69	50	0.2	7.43
41	18	10	73	–	–	14	–	–	0.3	0.6	3.2	88	12	30	74	60	0.2	8.47
57	18	10	73	60	73	14	30	13	0.3	0.6	3.2	88	12	30	74	58	0.2	10.4
47.5	22.5	12.5	78	–	–	16	–	–	0.3	0.6	6	94	12	30	79	65	0.2	13.3
65.5	22.5	12.5	78	60	78	16	34	14	0.3	0.6	6	94	12	30	79	58	0.2	15.5
51	22.5	12.5	90	–	–	17.5	–	–	0.3	0.6	6	105	12	30	91	70	0.2	23.7
72	22.5	12.5	90	70	88	17.5	38.5	18	0.3	0.6	6	105	12	30	91	68	0.2	28.1
51	22.5	12.5	95	–	–	17.5	–	–	0.3	0.6	6	113	12	30	96	75	0.2	29.8
72	22.5	12.5	95	75	93	17.5	38.5	18	0.3	0.6	6	113	12	30	96	73	0.2	35.3
51	22.5	12.5	100	–	–	17.5	–	–	0.3	0.6	6	118	12	30	101	85	0.2	36.1
72	22.5	12.5	100	80	98	17.5	38.5	18	0.3	0.6	6	118	12	30	101	78	0.2	43
51	22.5	12.5	105	–	–	17.5	–	–	0.3	0.6	6	123	12	30	106	90	0.2	43.8
72	22.5	12.5	105	90	105	17.5	38.5	18	0.3	0.6	6	123	12	30	106	88	0.2	54.5
51	22.5	12.5	110	–	–	17.5	–	–	0.3	0.6	6	128	12	30	111	97	0.2	51
72	22.5	12.5	110	90	108	17.5	38.5	18	0.3	0.6	6	128	12	30	111	88	0.2	60.1
51	22.5	12.5	115	–	–	17.5	–	–	0.3	0.6	6	133	12	30	116	100	0.2	62.2
72	22.5	12.5	115	100	115	17.5	38.5	18	0.3	0.6	6	133	12	30	116	98	0.2	77.3
62	27	15	135	–	–	21	–	–	0.3	1	6	155	12	30	136	113	0.4	149
87	27	15	135	115	135	21	46	20	0.3	1	6	155	12	30	136	110	0.4	188
69.5	32	17.5	160	–	–	22.5	–	–	0.3	1	8	180	16	22.5	161	130	0.4	312
94.5	32	17.5	160	130	158	22.5	47.5	18	0.3	1	8	180	16	22.5	161	125	0.4	372

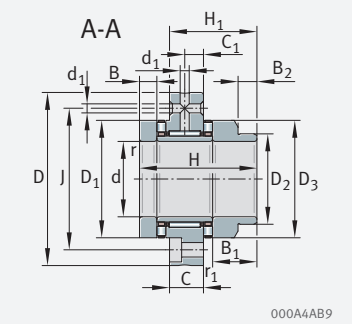
ZARF, ZARF..-L

Heavy series

With fixing holes

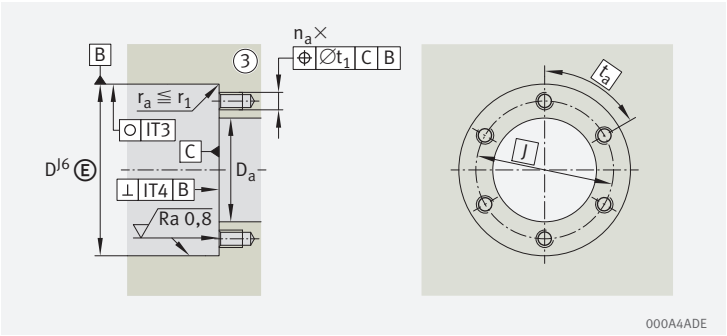


ZARF

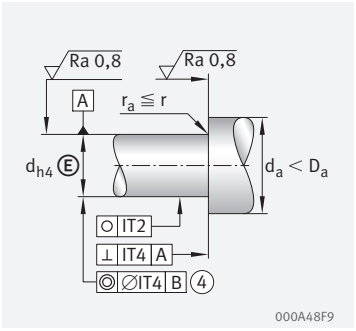


ZARF..-L

Designation	d	C_{aL}	C_{kL}	Axial runout
	mm	N/µm	Nm/mrad	µm
ZARF2080-TV	20	2300	400	1
ZARF2080-L-TV	20	2300	400	1
ZARF2590-TV	25	3000	800	1
ZARF2590-L-TV	25	3000	800	1
ZARF30105-TV	30	3300	1100	1
ZARF30105-L-TV	30	3300	1100	1
ZARF35110-TV	35	3500	1300	1
ZARF35110-L-TV	35	3500	1300	1
ZARF40115-TV	40	3800	1800	1
ZARF40115-L-TV	40	3800	1800	1
ZARF45130-TV	45	4000	2100	1
ZARF45130-L-TV	45	4000	2100	1
ZARF50140-TV	50	4600	2900	1
ZARF50140-L-TV	50	4600	2900	1
ZARF55145-TV	55	4900	3600	1
ZARF55145-L-TV	55	4900	3600	1
ZARF60150-TV	60	5300	4300	1
ZARF60150-L-TV	60	5300	4300	1
ZARF65155-TV	65	4800	4000	1
ZARF65155-L-TV	65	4800	4000	1
ZARF70160-TV	70	5800	6000	1
ZARF70160-L-TV	70	5800	6000	1
ZARF75185-TV	75	6600	8500	2
ZARF75185-L-TV	75	6600	8500	2
ZARF90210-TV	90	7700	14500	2
ZARF90210-L-TV	90	7700	14500	2



Housing design



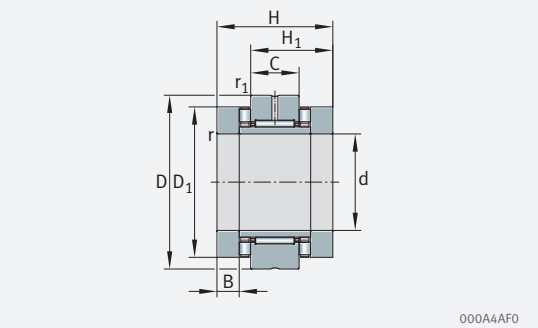
Shaft design (threaded spindle)

Locknut for radial clamping	Locknut for axial clamping	Locknut M_A	Locknut force axial	Sealing ring radial	Screws Size	n_a	t_a
		Nm	N				°
ZMA20/52	AM20	38	17623	–	M6	12	30
ZMA20/52	AM20	38	17623	40×52×7	M6	–	30
ZMA25/58	AM25	55	20790	–	M6	12	30
ZMA25/58	AM25	55	20790	48×62×8	M6	–	30
ZMA30/65	AM30	75	24287	–	M8	12	30
ZMA30/65	AM30	75	24287	52×68×8	M8	–	30
ZMA35/70	AM35	100	27480	–	M8	12	30
ZMA35/70	AM35	100	27480	60×75×8	M8	–	30
ZMA40/75	AM40	120	29834	–	M8	12	30
ZMA40/75	AM40	120	29834	60×80×8	M8	–	30
ZMA45/85	AM45	150	33549	–	M8	12	30
ZMA45/85	AM45	150	33549	70×90×10	M8	–	30
ZMA50/92	AM50	180	36224	–	M10	12	30
ZMA50/92	AM50	180	36224	75×95×10	M10	–	30
ZMA55/98	AM55	220	39807	–	M10	12	30
ZMA55/98	AM55	220	39807	80×100×10	M10	–	30
ZMA60/98	AM60	250	41144	–	M10	12	30
ZMA60/98	AM60	250	41144	90×110×12	M10	–	30
ZMA65/105	AM65	270	40652	–	M10	12	30
ZMA65/105	AM65	270	40652	90×110×12	M10	–	30
ZMA70/110	AM70	330	46786	–	M10	12	30
ZMA70/110	AM70	330	46786	100×120×12	M10	–	30
ZMA75/125	AM75	580	72971	–	M12	12	30
ZMA75/125	AM75	580	72971	115×140×12	M12	–	30
ZMA90/155	AM90	960	100669	–	M12	16	22.5
ZMA90/155	AM90	960	100669	130×160×12	M12	–	22.5

7.2 ZARN, ZARN..-L

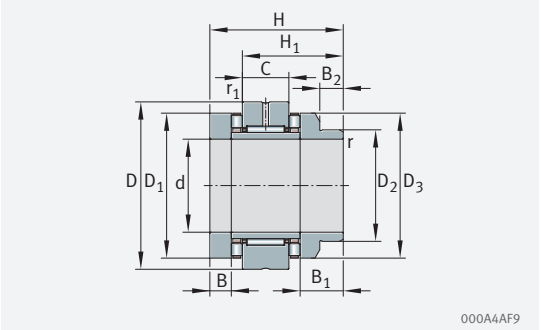
Light series

Without fixing holes

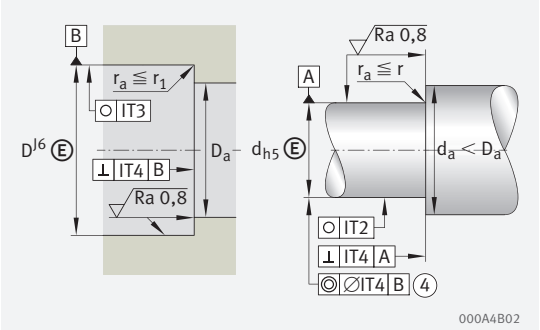


ZARN

Designation	m	d	D	H	dyn. C_a	stat. C_{0a}	dyn. C_r	stat. C_{0r}	C_{ua}	C_{ur}	n_G oil	n_G grease	M_R
	kg	mm	mm	mm	N	N	N	N	N	N	min^{-1}	min^{-1}	Nm
ZARN1545-TV	0.34	15	45	40	24900	53000	13000	17500	7500	2650	8500	2200	0.35
ZARN1545-L-TV	0.37	15	45	53	24900	53000	13000	17500	7500	2650	8500	2200	0.35
ZARN1747-TV	0.37	17	47	43	26000	57000	14000	19900	8000	3000	7800	2100	0.4
ZARN1747-L-TV	0.41	17	47	57	26000	57000	14000	19900	8000	3000	7800	2100	0.4
ZARN2052-TV	0.41	20	52	46	33500	76000	14900	22400	6400	3400	7000	2000	0.5
ZARN2052-L-TV	0.46	20	52	60	33500	76000	14900	22400	6400	3400	7000	2000	0.5
ZARN2557-TV	0.53	25	57	50	35500	86000	22600	36000	7300	5200	6000	1900	0.55
ZARN2557-L-TV	0.59	25	57	65	35500	86000	22600	36000	7300	5200	6000	1900	0.55
ZARN3062-TV	0.6	30	62	50	39000	101000	24300	41500	8500	6000	5500	1800	0.65
ZARN3062-L-TV	0.75	30	62	65	39000	101000	24300	41500	8500	6000	5500	1800	0.65
ZARN3570-TV	0.8	35	70	54	56000	148000	26000	47000	12900	6800	4800	1700	0.9
ZARN3570-L-TV	0.93	35	70	70	56000	148000	26000	47000	12900	6800	4800	1700	0.9
ZARN4075-TV	0.9	40	75	54	59000	163000	27500	53000	14200	7600	4400	1600	1
ZARN4075-L-TV	1	40	75	70	59000	163000	27500	53000	14200	7600	4400	1600	1
ZARN4580-TV	1.12	45	80	60	61000	177000	38000	74000	15500	10400	4000	1500	1.2
ZARN4580-L-TV	1.27	45	80	75	61000	177000	38000	74000	15500	10400	4000	1500	1.2
ZARN5090-TV	1.43	50	90	60	90000	300000	40000	82000	28000	11500	3600	1200	2.2
ZARN5090-L-TV	1.78	50	90	78	90000	300000	40000	82000	28000	11500	3600	1200	2.2



ZARN..-L



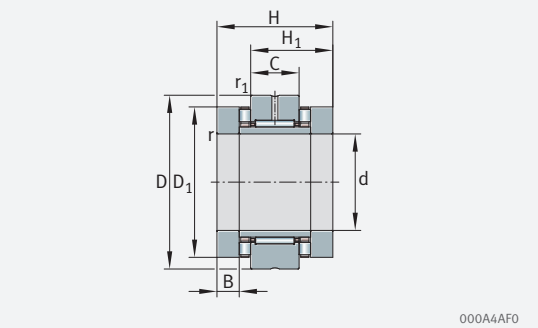
Design of housing and shaft (threaded spindle)

H_1	C	D_1	D_2	D_3	B	B_1	B_2	r_{min}	$r_{1\ min}$	D_a	d_a
mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	max.	min.
28	16	35	–	–	7.5	–	–	0.3	0.6	36	28
41	16	–	24	34	7.5	20.5	11	0.3	0.6	36	22
29.5	16	38	–	–	9	–	–	0.3	0.6	39	28
43.5	16	–	28	38	9	23	11	0.3	0.6	39	26
31	16	42	–	–	10	–	–	0.3	0.6	43	33
45	16	–	42	30	10	24	12	0.3	0.6	43	28
35	20	47	–	–	10	–	–	0.3	0.6	48	39
50	20	–	36	45	10	25	12	0.3	0.6	48	34
35	20	52	–	–	10	–	–	0.3	0.6	53	44
50	20	–	40	50	10	25	13	0.3	0.6	53	38
37	20	60	–	–	11	–	–	0.3	0.6	61	50
53	20	–	45	58	11	27	13	0.3	0.6	61	43
37	20	65	–	–	11	–	–	0.3	0.6	66	55
53	20	–	50	63	11	27	14	0.3	0.6	66	48
42.5	25	70	–	–	11.5	–	–	0.3	0.6	71	60
57.5	25	–	56	68	11.5	26.5	13	0.3	0.6	71	54
42.5	25	78	–	–	11.5	–	–	0.3	0.6	79	67
60.5	25	–	60	78	11.5	29.5	14	0.3	0.6	79	58

ZARN, ZARN..-L

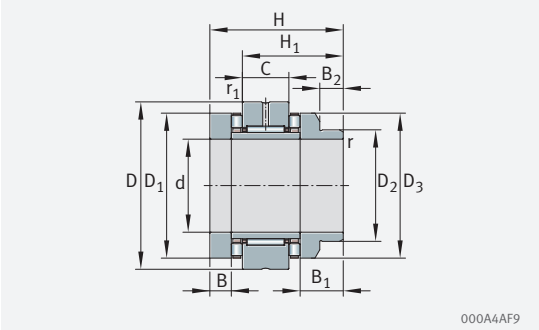
Light series

Without fixing holes

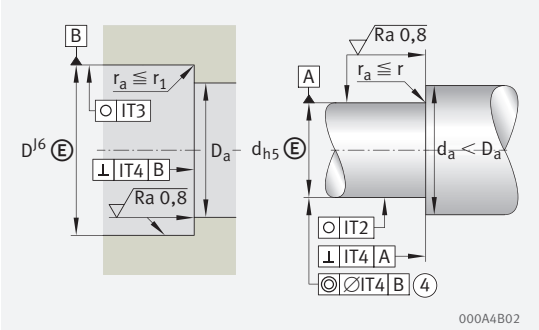


ZARN

Designation	d	C_{aL}	C_{kL}	M_m	Axial runout
	mm	N/µm	Nm/mrad	kg · cm²	µm
ZARN1545-TV	15	1400	110	0.24	1
ZARN1545-L-TV	15	1400	110	274	1
ZARN1747-TV	17	1600	160	0.373	1
ZARN1747-L-TV	17	1600	160	0.464	1
ZARN2052-TV	20	1800	230	0.615	1
ZARN2052-L-TV	20	1800	230	0.683	1
ZARN2557-TV	25	1900	350	0.989	1
ZARN2557-L-TV	25	1900	350	1.15	1
ZARN3062-TV	30	2200	520	1.46	1
ZARN3062-L-TV	30	2200	520	1.7	1
ZARN3570-TV	35	2600	740	2.8	1
ZARN3570-L-TV	35	2600	740	3.21	1
ZARN4075-TV	40	2800	1030	3.78	1
ZARN4075-L-TV	40	2800	1030	4.35	1
ZARN4580-TV	45	3000	1340	5.33	1
ZARN4580-L-TV	45	3000	1340	6.03	1
ZARN5090-TV	50	4800	2470	8.42	1
ZARN5090-L-TV	50	4800	2470	10.46	1



ZARN..-L



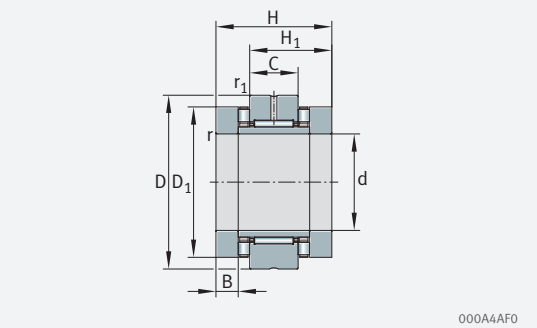
Design of housing and shaft (threaded spindle)

Locknut for radial clamping	Locknut for axial clamping	Locknut M_A	Locknut force axial	Sealing ring radial
		Nm	N	
ZMA15/33	AM15	10	6506	–
ZMA15/33	AM15	10	6506	–
ZM17	AM17	12	7078	–
ZM17	AM17	12	7078	–
ZMA20/38	AM20	18	8972	–
ZMA20/38	AM20	18	8972	–
ZMA25/45	AM25	25	9745	–
ZMA25/45	AM25	25	9745	–
ZMA30/52	AM30	32	10662	–
ZMA30/52	AM30	32	10662	–
ZMA35/58	AM35/58	40	12143	–
ZMA35/58	AM35/58	40	12143	–
ZMA40/62	AM40	55	14240	–
ZMA40/62	AM40	55	14240	–
ZMA45/68	AM45	65	15112	–
ZMA45/68	AM45	65	15112	–
ZMA50/75	AM50	85	18410	–
ZMA50/75	AM50	85	18410	–

ZARN, ZARN..-L

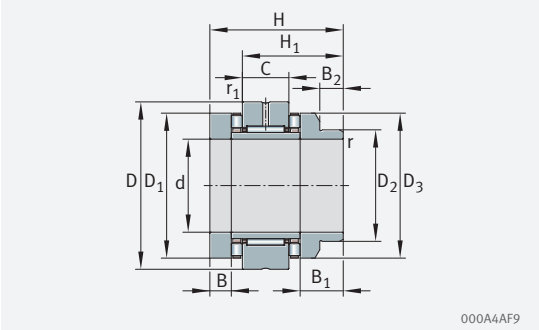
Heavy series

Without fixing holes



ZARN

Designation	m	d	D	H	dyn. C_a	stat. C_{0a}	dyn. C_r	stat. C_{0r}	C_{ua}	C_{ur}	n_G oil	n_G grease	M_R
	kg	mm	mm	mm	N	N	N	N	N	N	min^{-1}	min^{-1}	Nm
ZARN2062-TV	0.87	20	62	60	64000	141000	22600	36000	13100	5200	6000	1500	1.3
ZARN2062-L-TV	0.99	20	62	75	64000	141000	22600	36000	13100	5200	6000	1500	1.3
ZARN2572-TV	1.17	25	72	60	80000	199000	24300	41500	18600	6000	4900	1400	1.6
ZARN2572-L-TV	1.32	25	72	75	80000	199000	24300	41500	18600	6000	4900	1400	1.6
ZARN3080-TV	1.5	30	80	66	107000	265000	26000	47000	22900	6800	4400	1300	2.1
ZARN3080-L-TV	1.7	30	80	82	107000	265000	26000	47000	22900	6800	4400	1300	2.1
ZARN3585-TV	1.65	35	85	66	105000	265000	27500	53000	22900	7600	4000	1250	2.3
ZARN3585-L-TV	1.8	35	85	82	105000	265000	27500	53000	22900	7600	4000	1250	2.3
ZARN4090-TV	2.09	40	90	75	117000	315000	38000	74000	27000	10400	3700	1200	2.5
ZARN4090-L-TV	2.39	40	90	93	117000	315000	38000	74000	27000	10400	3700	1200	2.5
ZARN45105-TV	3.02	45	105	82	154000	405000	40000	82000	37500	11500	3300	1150	3.5
ZARN45105-L-TV	3.42	45	105	103	154000	405000	40000	82000	37500	11500	3300	1150	3.5
ZARN50110-TV	3.3	50	110	82	172000	480000	46500	103000	44500	12700	3100	1100	3.8
ZARN50110-L-TV	3.75	50	110	103	172000	480000	46500	103000	44500	12700	3100	1100	3.8
ZARN55115-TV	3.5	55	115	82	177000	500000	44000	98000	46500	13800	2900	1000	4
ZARN55115-L-TV	4	55	115	103	177000	500000	44000	98000	46500	13800	2900	1000	4
ZARN60120-TV	3.7	60	120	82	187000	550000	44500	92000	51000	12900	2700	950	4.2
ZARN60120-L-TV	4.85	60	120	103	187000	550000	44500	92000	51000	12900	2700	950	4.2
ZARN65125-TV	4	65	125	82	172000	500000	54000	104000	46500	14900	2600	900	4
ZARN65125-L-TV	4.6	65	125	103	172000	500000	54000	104000	46500	14900	2600	900	4
ZARN70130-TV	4.1	70	130	82	201000	630000	56000	119000	58000	16100	2400	800	4.8
ZARN70130-L-TV	4.85	70	130	103	201000	630000	56000	119000	58000	16100	2400	800	4.8
ZARN75155-TV	7.9	75	155	100	290000	890000	81000	132000	85000	19100	2100	700	8
ZARN75155-L-TV	9.1	75	155	125	290000	890000	81000	132000	85000	19100	2100	700	8
ZARN90180-TV	11.8	90	180	110	325000	1030000	98000	210000	95000	29000	1800	700	10.5
ZARN90180-L-TV	13.2	90	180	135	325000	1030000	98000	210000	95000	29000	1800	700	10.5



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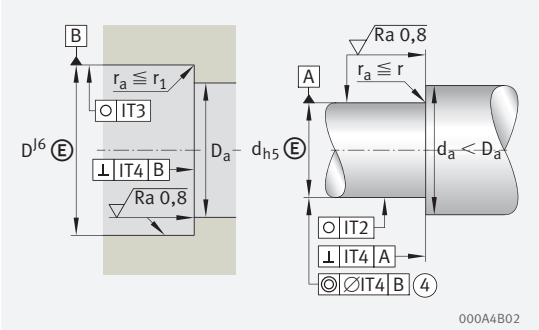


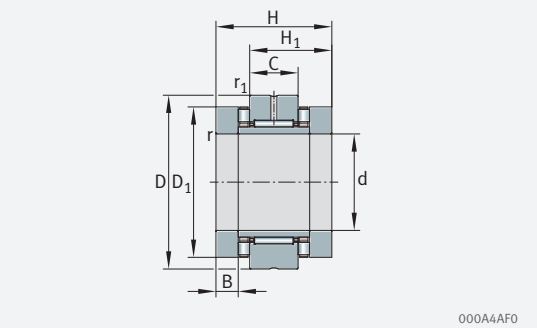
Design of housing and shaft (threaded spindle)

H_1	C	D_1	D_2	D_3	B	B_1	B_2	r_{min}	$r_{1\ min}$	D_a	d_a
mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	max.	min.
40	20	52	–	–	12.5	–	–	0.3	0.6	53	38
55	20	–	40	50	12.5	27.5	13	0.3	0.6	53	38
40	20	62	–	–	12.5	–	–	0.3	0.6	63	45
55	20	–	48	60	12.5	27.5	13	0.3	0.6	63	45
43	20	68	–	–	14	–	–	0.3	0.6	69	52
4359	20	–	52	66	14	30	13	0.3	0.6	69	50
43	20	73	–	–	14	–	–	0.3	0.6	74	60
59	20	–	60	73	14	30	13	0.3	0.6	74	58
50	25	78	–	–	16	–	–	0.3	0.6	79	65
68	25	–	60	78	16	34	14	0.3	0.6	79	58
53.5	25	90	–	–	17.5	–	–	0.3	0.6	91	70
74.5	25	–	70	88	17.5	38.5	18	0.3	0.6	91	68
53.5	25	95	–	–	17.5	–	–	0.3	0.6	96	75
74.5	25	–	75	93	17.5	38.5	18	0.3	0.6	96	73
53.5	25	100	–	–	17.5	–	–	0.3	0.6	101	85
74.5	25	–	80	98	17.5	38.5	18	0.3	0.6	101	78
53.5	25	105	–	–	17.5	–	–	0.3	0.6	106	90
74.5	25	–	90	105	17.5	18.5	18	0.3	0.6	106	88
53.5	25	110	–	–	17.5	–	–	0.3	0.6	111	97
74.5	25	–	90	108	17.5	38.5	18	0.3	0.6	111	88
53.5	25	115	–	–	17.5	–	–	0.3	0.6	116	100
74.5	25	–	100	115	17.5	38.5	18	0.3	0.6	116	98
65	30	135	–	–	21	–	–	0.3	1	136	113
90	30	–	115	135	21	46	20	0.3	1	136	110
72.5	35	160	–	–	22.5	–	–	0.3	1	161	130
97.5	35	–	130	158	22.5	47.5	18	0.3	1	161	125

ZARN, ZARN..-L

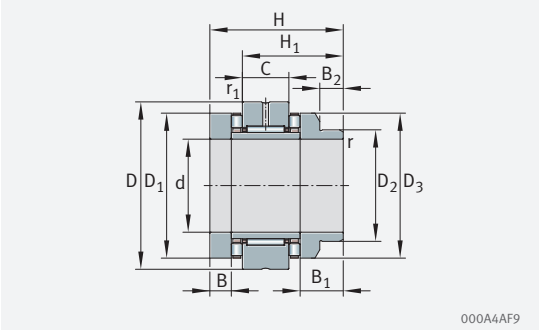
Heavy series

Without fixing holes



ZARN

Designation	d	C_{aL}	C_{kL}	M_m	Axial runout
	mm	N/µm	Nm/mrad	kg · cm²	µm
ZARN2062-TV	20	2300	400	1.98	1
ZARN2062-L-TV	20	2300	400	2.27	1
ZARN2572-TV	25	3000	800	3.88	1
ZARN2572-L-TV	25	3000	800	4.51	1
ZARN3080-TV	30	3300	1100	6.53	1
ZARN3080-L-TV	30	3300	1100	7.43	1
ZARN3585-TV	35	3500	1300	8.47	1
ZARN3585-L-TV	35	3500	1300	10.4	1
ZARN4090-TV	40	3800	1800	13.3	1
ZARN4090-L-TV	40	3800	1800	15.5	1
ZARN45105-TV	45	4000	2100	23.7	1
ZARN45105-L-TV	45	4000	2100	28.1	1
ZARN50110-TV	50	4600	2900	29.8	1
ZARN50110-L-TV	50	4600	2900	35.3	1
ZARN55115-TV	55	4900	3600	36.1	1
ZARN55115-L-TV	55	4900	3600	43	1
ZARN60120-TV	60	5300	4300	43.8	1
ZARN60120-L-TV	60	5300	4300	54.5	1
ZARN65125-TV	65	4800	4000	51	1
ZARN65125-L-TV	65	4800	4000	60.1	1
ZARN70130-TV	70	5800	6000	62.2	1
ZARN70130-L-TV	70	5800	6000	77.3	1
ZARN75155-TV	75	6600	8500	149	2
ZARN75155-L-TV	75	6600	8500	188	1
ZARN90180-TV	90	7700	14500	312	2
ZARN90180-L-TV	90	7700	14500	372	1



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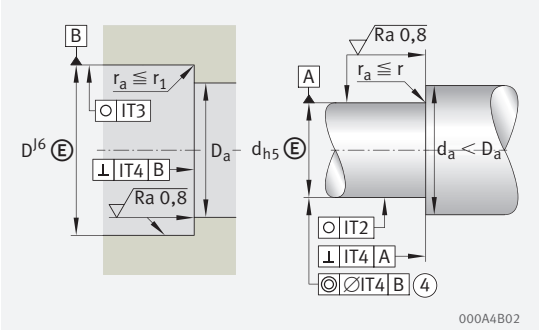
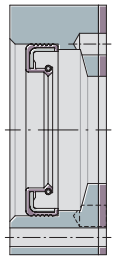


Design of housing and shaft (threaded spindle)

Locknut for radial clamping	Locknut for axial clamping	Locknut M_A	Locknut force axial	Sealing ring radial
		Nm	N	
ZMA20/52	AM20	38	17623	–
ZMA20/52	AM20	38	17623	–
ZMA25/58	AM25	55	20790	–
ZMA25/58	AM25	55	20790	–
ZMA30/65	AM30	75	24287	–
ZMA30/65	AM30	75	24287	–
ZMA35/70	AM35	100	27480	–
ZMA35/70	AM35	100	27480	–
ZMA40/75	AM40	120	29834	–
ZMA40/75	AM40	120	29834	–
ZMA45/85	AM45	150	33549	–
ZMA45/85	AM45	150	33549	–
ZMA50/92	AM50	180	36224	–
ZMA50/92	AM50	180	36224	–
ZMA55/98	AM55	220	39807	–
ZMA55/98	AM55	220	39807	–
ZMA60/98	AM60	250	41144	–
ZMA60/98	AM60	250	41144	–
ZMA65/105	AM65	270	40652	–
ZMA65/105	AM65	270	40652	–
ZMA70/110	AM70	330	46786	–
ZMA70/110	AM70	330	46786	–
ZMA75/125	AM75	580	72971	–
ZMA75/125	AM75	580	72971	–
ZMA90/155	AM90	960	100669	–
ZMA90/155	AM90	960	100669	–

8 Seal carrier assemblies for ZARF

Seal carrier assemblies DRS are complete sealing sets that are screw mounted on the outer ring of needle roller/axial cylindrical roller bearings ZARF(-L). They are precisely centered in this position and seal the bearings against external influences.

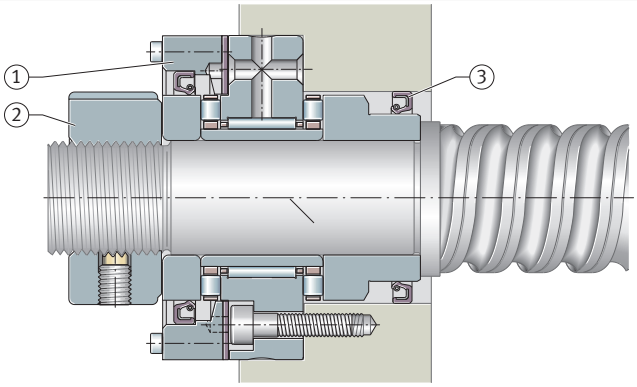


000A8BB0

25 Seal carrier assembly DRS

The sealing elements are supplied as a complete set of individual parts and comprise:

- a seal flange
- a rotary shaft seal to DIN 3670, with an elastomer part made from NBR
- a gasket
- hexagonal socket head screws for fixing the carrier to the central washer of the bearing



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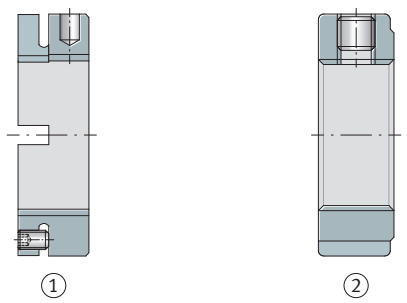
26 Needle roller/axial cylindrical roller bearing ZARF..-L with seal carrier assembly

1	Seal carrier assembly DRS	2	Precision locknut ZM or ZMA
3	Rotary shaft seal to DIN 3670		

9 Precision locknuts

Precision locknuts are used to achieve a defined axial preload in bearings for screw drives. They are also used where high axial forces must be supported and high axial runout accuracy and rigidity are required.

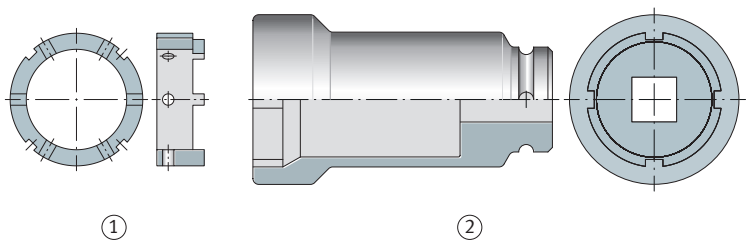


27 Precision locknuts

1	For axial clamping AM	2	For radial clamping ZM or ZMA

10 Sockets

For simple tightening and loosening of precision locknuts ZM on shafts, the sockets LOCKNUT-SOCKET-KM are suitable. In combination with the socket AMS, this socket is also suitable for precision locknuts AM. They require less space on the circumference of the locknut than hook wrenches and allow the use of torque wrenches. For increased reliability, FAG sockets should be secured using a locking pin and rubber washer. They therefore have a hole for the locking pin and a groove for the rubber washer. The locking pin and rubber washer are included in the scope of delivery.



28 Sockets for precision locknuts ZM and sockets AMS

1	Socket AMS	2	Socket LOCKNUT-SOCKET-KM

For safer working, the sockets should be secured using a locking pin and rubber washer. They therefore have a hole for the locking pin and a groove for the rubber washer. The locking pin and rubber washer are included in the scope of delivery.

Notes

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