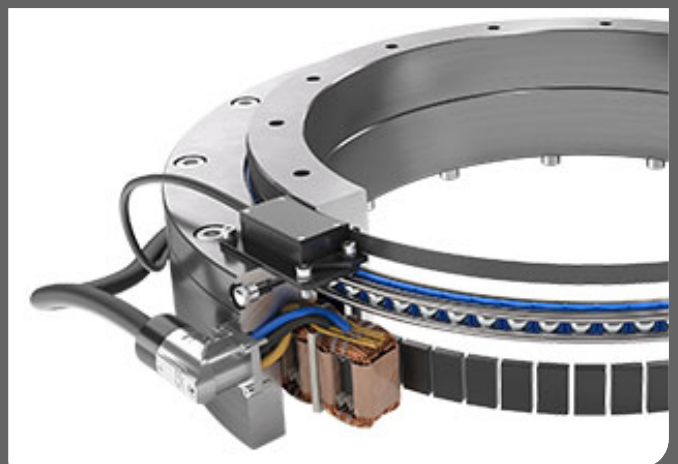
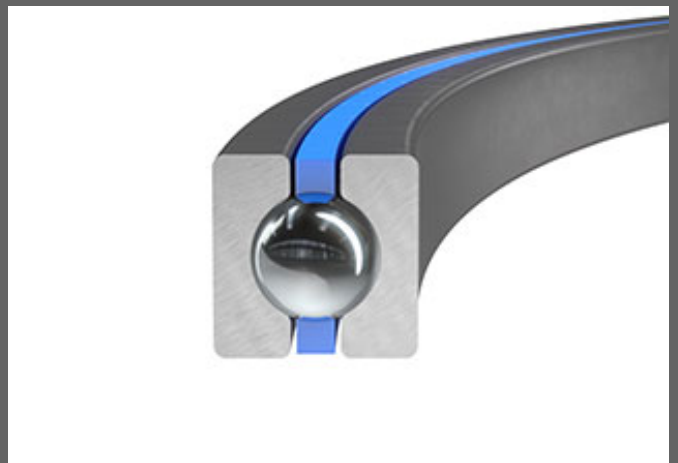
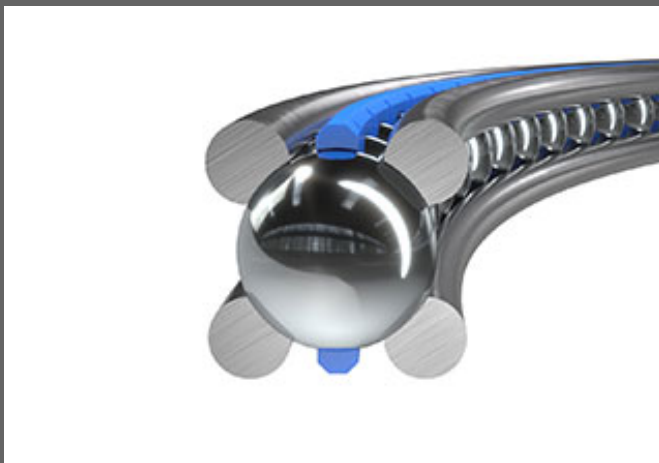

Wire Race Bearings Slim Bearings

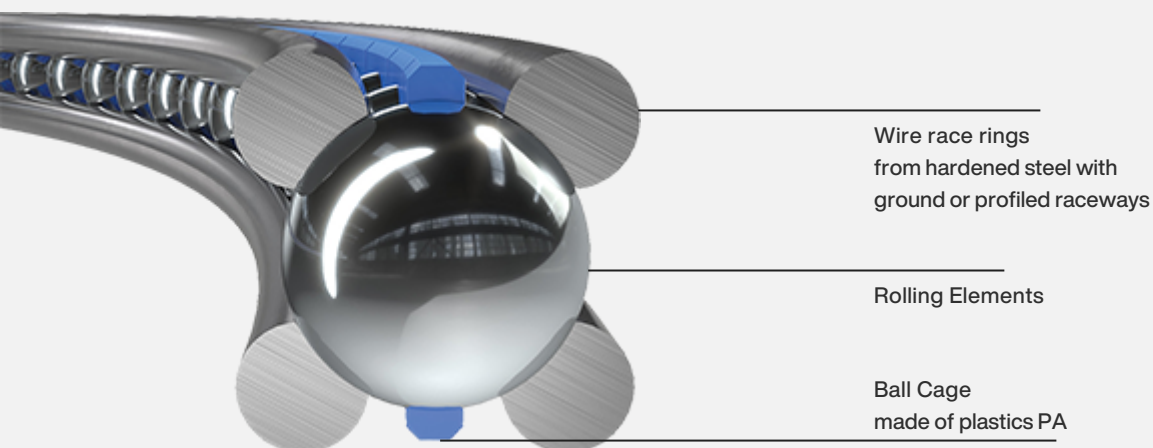
Bearing Assemblies Rotary Tables

Standard Program Rotational Movement



Four wires for better design

The decisive difference between an ordinary ball bearing and a Franke wire race bearing is in the raceways. In a wire race bearing, the rolling elements do not roll on solid housing rings, but on high performance wires. The flexibility of this principle makes it possible to design more freely and simply, in order to develop better products.

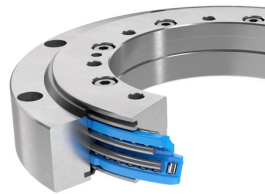


In a wire race bearing, highly resilient bearing rings made of wire assume the function of the bearing arrangement. This saves weight and space. The free choice of material and the free design of the enclosing structure also allow the weight of the overall product to be reduced considerably.

In wire race bearings, the raceways of the rolling elements are precisely matched to the diameter of the rolling elements. This ensures optimum functional characteristics and guarantees both, precise running and a long operating life.

Anything you wish. Only what you need.

You can purchase from Franke only the bearing elements or ready-to-install bearing assemblies. On request in customer-specific design, with toothing or with integrated torque motor.



Bearing Elements

All you need for your product solution with wire race bearings is a Franke bearing element. Franke bearing elements can be integrated directly into your design. You can easily assemble them yourself. The bearing element can be adapted in form and material bespoke to your requirements, for example by choosing amagnetic ceramic rolling elements.

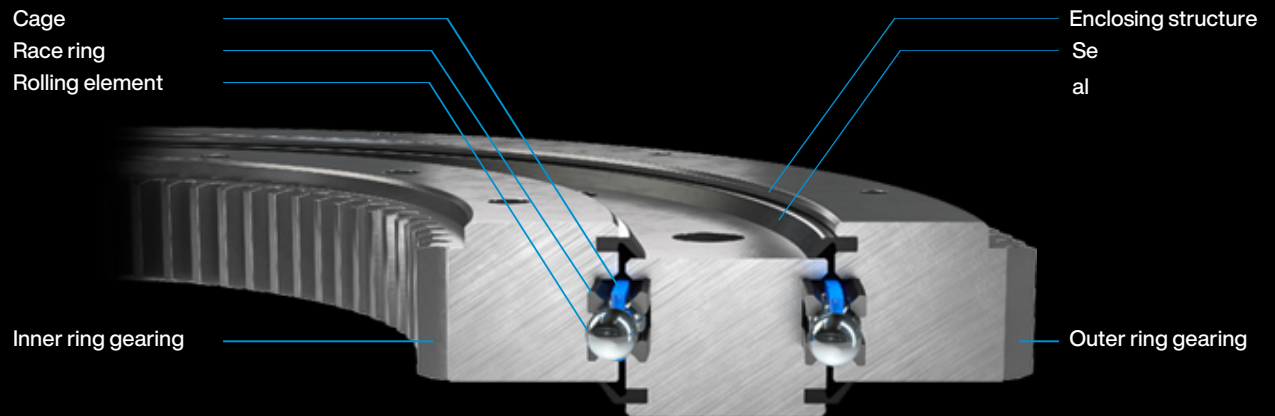
Bearing Assemblies

If required, we can also design and manufacture complete bearing assemblies for you. These can be mounted even more easily than bearing elements. Franke bearing assemblies are available in every size, with individual bores and toothings and in numerous materials such as aluminium, stainless steel, carbon or as a 3D printed housing.

Rotary Tables/Systems

You prefer a complete solution from one source? Franke offers complete customized positioning and drive units, optionally with proximity switch, coupling and motor. Systems with direct drive are a particular strength of Franke. They are used, for example, in many computer tomographs of renowned manufacturers.

Super individual



Rolling element



Ball



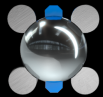
Roller



Special Version



Wire races



Round profile



Rectangular profile



Slim bearings



Roller bearing



4-Point-bearing



2-row angular ball bearing

Standard cage



Ball cage



Roller Cage



Flat cage



Comb cage



Steel / Teflon / Brass / ...

Special Version

Gearings



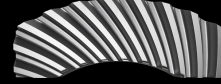
Straight Gear



Toothed Belt Gear



Helical Gear



Special Gear

configure

**Rolling Bearings re-invented:
The Franke Modular System.**

The Franke modular system gives you an overview of the numerous possibilities of adaptation when using a Franke wire race bearing.

You are sure to find your special solution tailored to your application.



www.franke-gmbh.com

Learn more on our website.

The Franke website is the best source of information about Franke products and about the company itself.

It provides further information about the Franke Modular System, the Comparison Tool and the Calculation Tool. The menu allows you to navigate through the website easily and intuitively. Detailed information on all products is supported by numerous application examples.

calculate

Calculate the load online: Calculation Tool

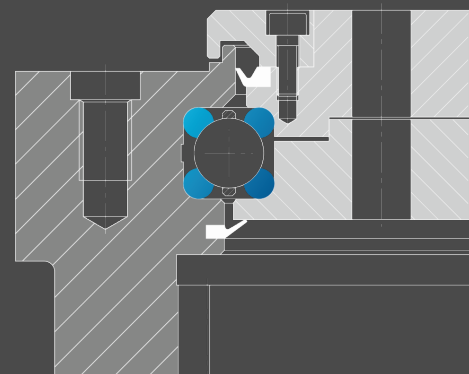
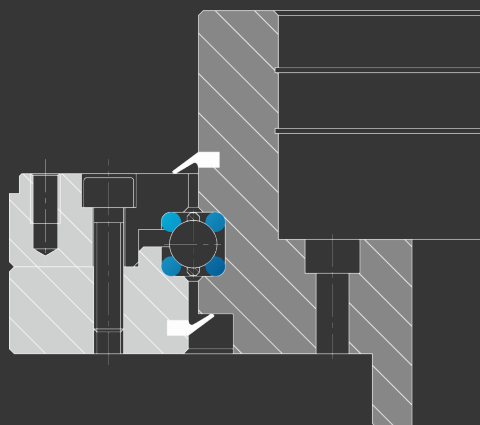
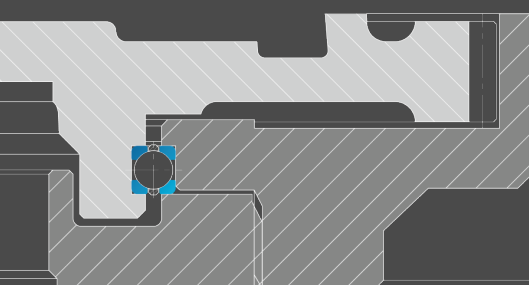
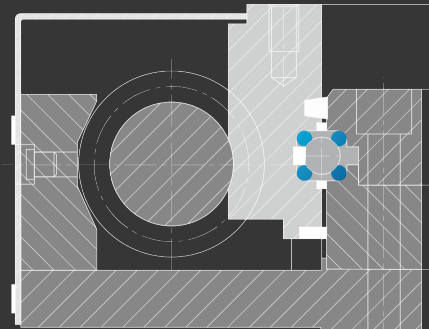
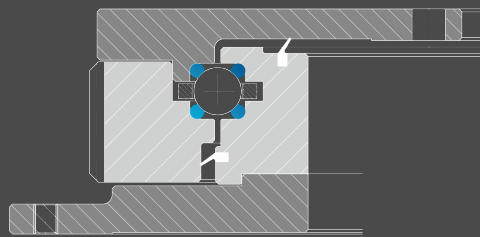
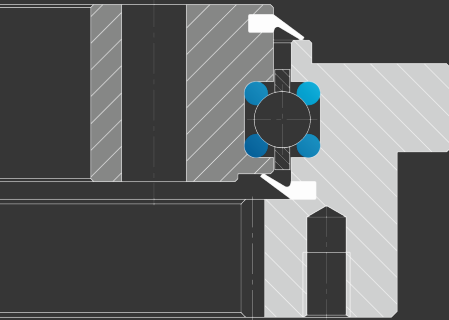
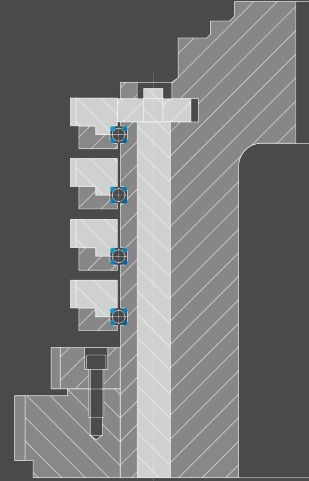
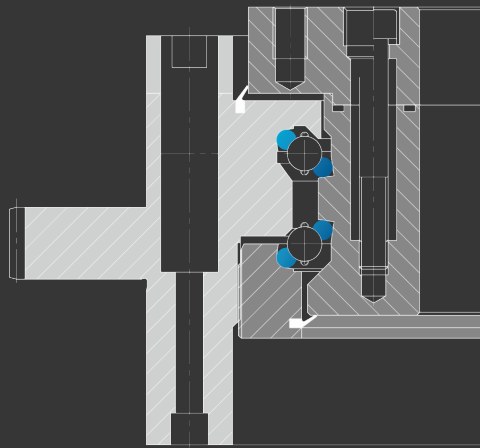
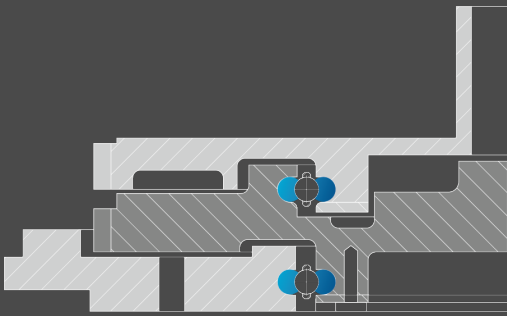
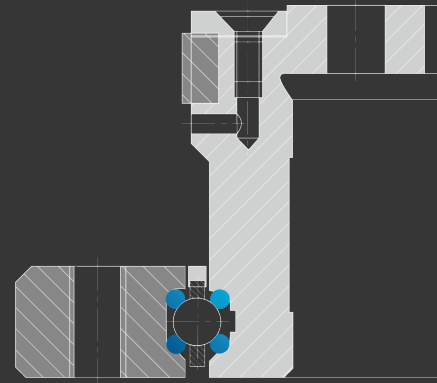
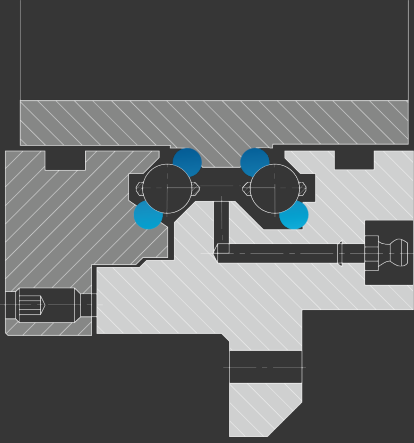
With the help of the calculation tool you can determine the expected service life online and make a preselection for your application. You can easily calculate the load case of the selected wire race bearing or linear system for the respective, individual application.

compare

Compare products: Comparison tool

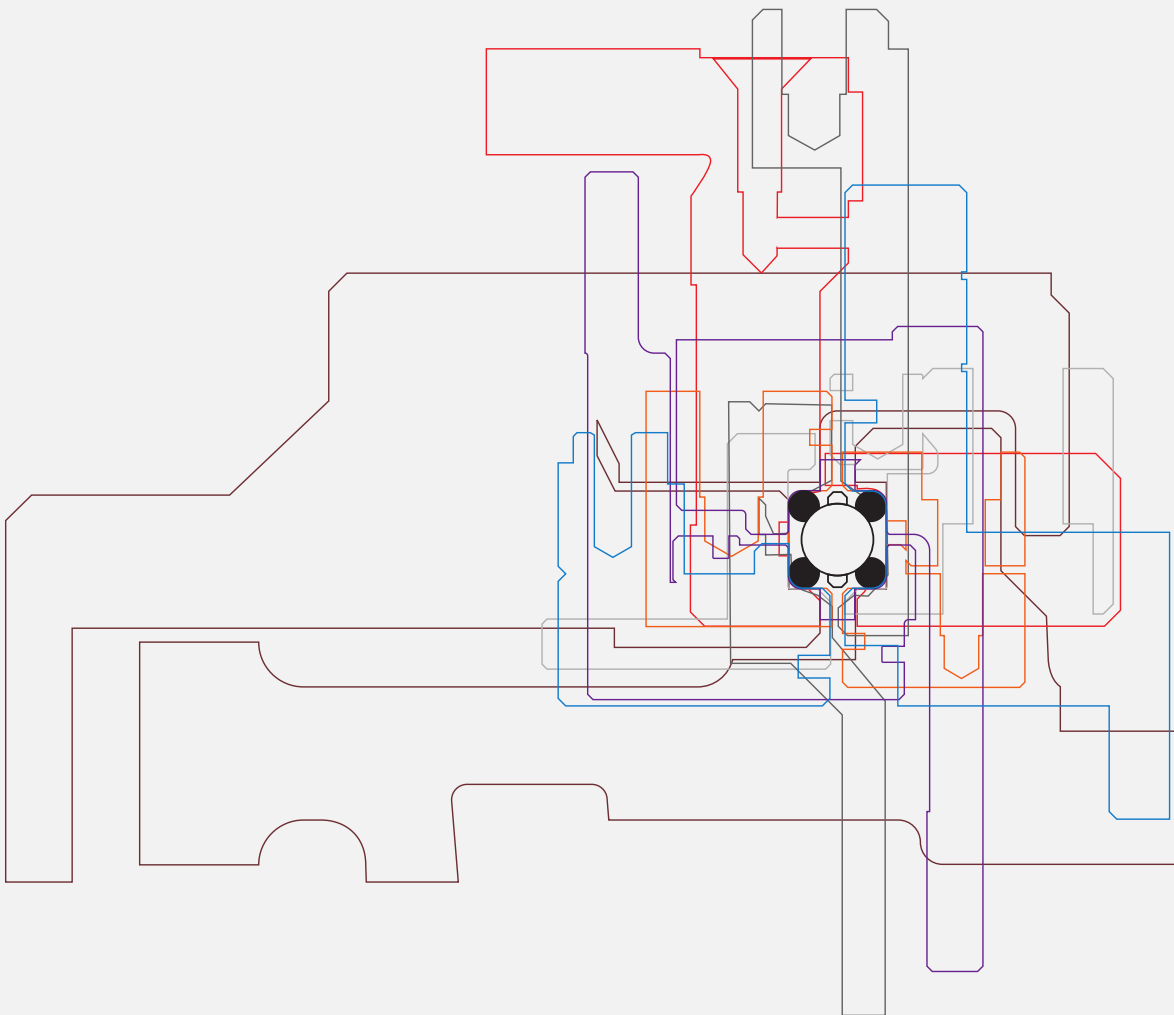
With the comparison tool you can see the key product features at a glance. The types of wire race bearings and linear systems can be compared quickly and easily. This gives you an overview of the most important values of the individual series, such as dimensions, load ratings or weight.





Infinite Possibilities

Franke Wire Race Bearings are space-saving, variable and individually adaptable.
Together with our customers we develop the optimal solution for every application.





Automotive



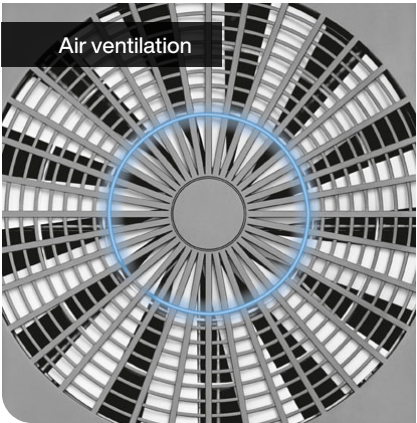
Satellite Antennas



Aerial Cameras



Filling Stations



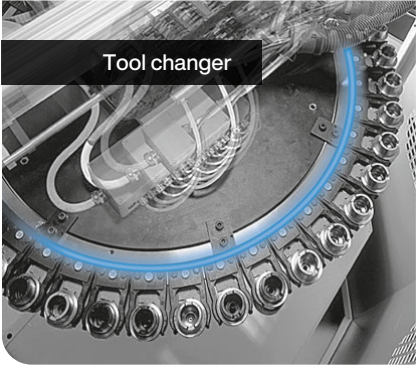
Air ventilation



Aircraft sensors

A grayscale photograph of a computer tomograph (CT scanner) with a blue line highlighting the circular opening of the gantry.

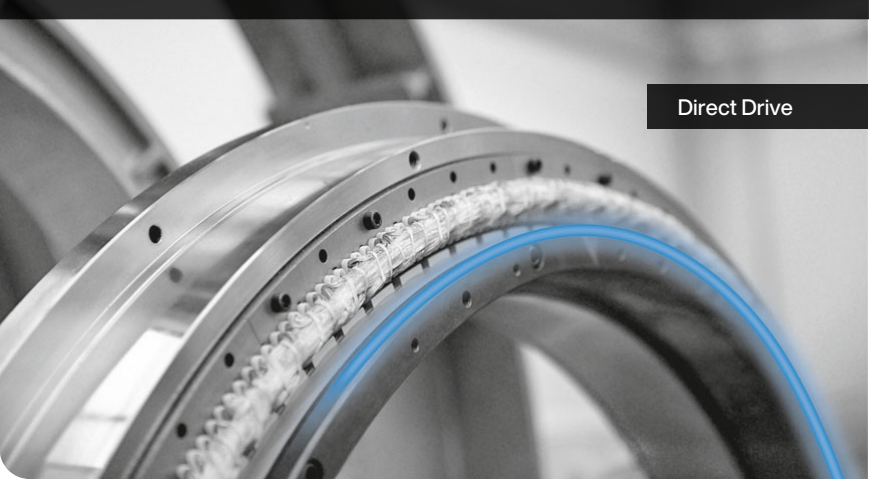
Computer tomograph

A grayscale photograph of a tool changer mechanism with a blue line highlighting the circular arrangement of tools.

Tool changer

For all industries

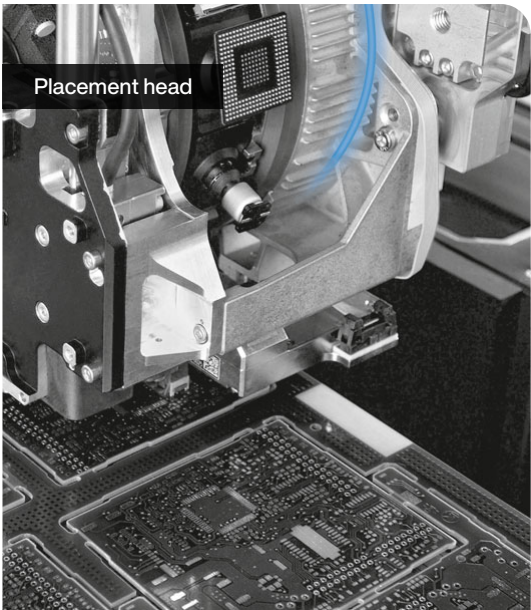
Franke Wire Race Bearings offer substantial design freedom and free selection of material. The minimal mounting space is ideal for innovative design

A grayscale photograph of a direct drive motor with a blue line highlighting the wire race bearing.

Direct Drive

A grayscale photograph of a C-Bow X-ray unit with a blue line highlighting the wire race bearing.

C-Bow X-ray unit

A grayscale photograph of a placement head with a blue line highlighting the wire race bearing.

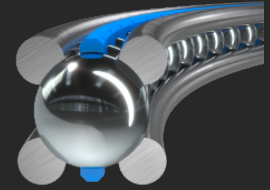
Placement head

A grayscale photograph of an E-Mobility component with a blue line highlighting the wire race bearing.

E-Mobility

Bearing elements with a ground raceway Type LEL	11
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Bearing elements with a ground raceway Type LEL



Franke bearing elements type LEL meet the highest demands with regard to running smoothness, accuracy and rotational speed.

Description

Franke bearing elements of type LEL are suitable for high demands on running characteristics and accuracy. Due to the hardened and CNC-ground raceway as well as the ideal geometrical adaptation of ball and raceway radius, they have outstanding bearing characteristics. Bearing elements of type LEL allow the greatest possible freedom of bearing design. The mounting space is between 5.9 mm and 20.9 mm. For special requirements, raceway thicknesses up to 20 mm and ball sizes up to 50 mm are possible.

Properties

Smooth running	● ● ● ● ●
Accuracy	● ● ● ● ●
Speed	● ● ● ● ●
Stiffness	● ● ● ●
Assembly	● ● ●
Price	● ● ●

Technical data

Material

Ball race rings: hardened and tempered chrome-silicon steel
Rolling element: hardened rolling bearing steel
Cage: polyamide or thermoplastic polyurethane

Operating temperature

-30 °C to +80 °C, briefly up to +100 °C

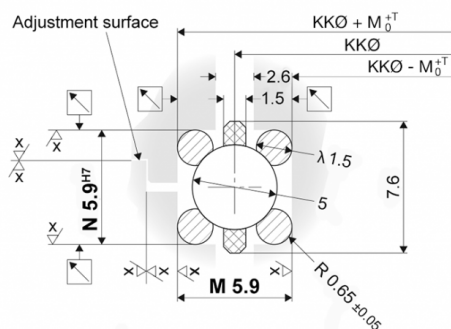
Peripheral speed

Max. 5 m/s, without seals max. 10 m/s

Lubricant

Klüber Isoflex Topas NCA52 (recommended)

Data tables

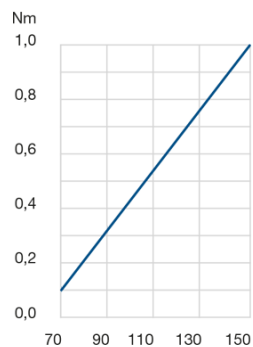


T = KKØ / 10000 [mm]

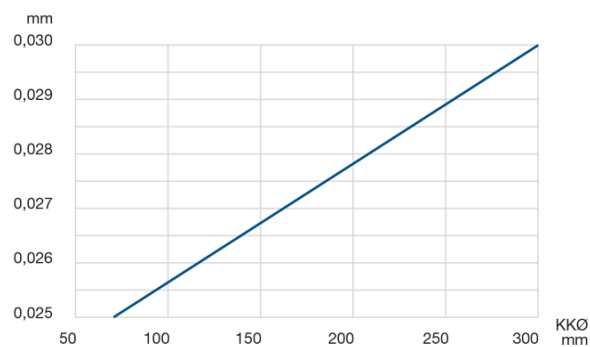
LEL 1,5 - M x N 5,9 x 5,9 mm

Name	KKØ mm	Load ratings kN				Stat. M. kNm	Weight kg	Order no.
		C _{0a}	C _{0r}	C _a	C _r			
LEL1.5-0070	70	14	6	8	7	0,2	0,03	68470A
LEL1.5-0080	80	16	7	8	7	0,3	0,03	68472A
LEL1.5-0090	90	18	8	8	7	0,4	0,04	68474A
LEL1.5-0100	100	19	9	9	8	0,5	0,04	68476A
LEL1.5-0110	110	21	10	9	8	0,6	0,04	68478A
LEL1.5-0120	120	23	11	9	8	0,7	0,05	68480A
LEL1.5-0130	130	26	12	10	8	0,8	0,05	68482A
LEL1.5-0140	140	28	13	10	9	0,9	0,06	68484A
LEL1.5-0150	150	30	14	10	9	1,0	0,06	71033A

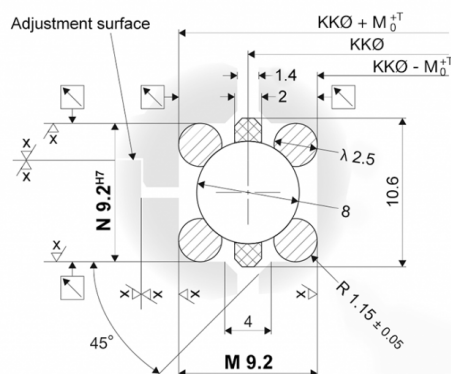
Rotational resistance



Radial and axial runout accuracy



Data tables


$$T = KK\phi / 10000 \text{ [mm]}$$

LEL 2.5 - M x N 9,2 x 9,2mm

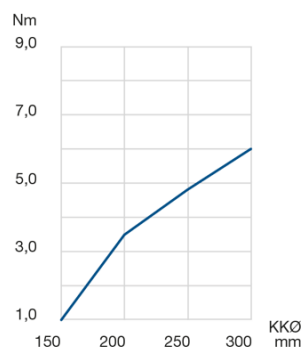
Name	KKØ mm	Load ratings kN				Stat. M. kNm	Weight kg	Order no.
		C _{0a}	C _{0r}	C _a	C _r	C _{0m}		
LEL2.5-0160	160	73	35	20	17	2,8	0,15	71037A
LEL2.5-0170	170	79	37	20	17	3,2	0,16	71041A
LEL2.5-0180	180	83	39	20	18	3,5	0,17	71045A
LEL2.5-0190	190	88	41	21	18	3,9	0,18	71049A
LEL2.5-0200	200	93	44	22	19	4,4	0,19	71053A
LEL2.5-0210	210	97	46	22	19	4,8	0,20	71057A
LEL2.5-0220	220	103	48	22	19	5,3	0,21	71061A
LEL2.5-0230	230	106	50	23	19	5,7	0,22	68487A
LEL2.5-0240	240	112	52	23	20	6,3	0,23	68489A
LEL2.5-0250	250	117	55	23	20	6,9	0,24	68491A
LEL2.5-0260	260	121	57	24	20	7,4	0,25	68493A
LEL2.5-0270	270	126	59	24	21	8,0	0,26	68495A
LEL2.5-0280	280	132	62	24	21	8,7	0,27	68497A
LEL2.5-0290	290	135	64	25	21	9,2	0,28	68499A
LEL2.5-0300	300	141	66	25	22	9,9	0,29	68501A

Bearing elements with a ground raceway Type LEL

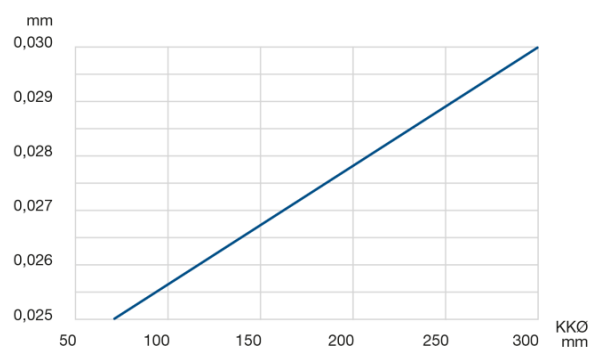
Innovation in Motion



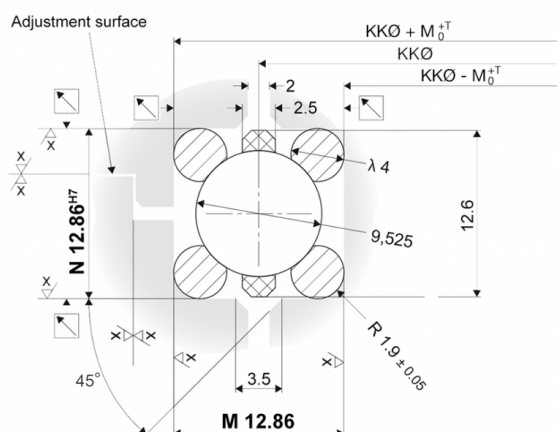
Rotational resistance



Radial and axial runout accuracy



Data tables


$$T = KK\phi / 10000 \text{ [mm]}$$

LEL 4 - M x N 12,86 x 12,86mm

Name	KKØ mm	Load ratings kN				Stat. M. kNm	Weight kg	Order no.
		C _{0a}	C _{0r}	C _a	C _r	C _{0m}		
LEL4-0200	200	117	55	25	21	5,5	0,39	68502A
LEL4-0210	210	123	58	25	22	6,1	0,40	68504A
LEL4-0220	220	131	62	26	22	6,8	0,43	68506A
LEL4-0230	230	136	64	26	23	7,4	0,44	68508A
LEL4-0240	240	142	67	27	23	8,0	0,46	68510A
LEL4-0250	250	147	69	27	23	8,7	0,48	68512A
LEL4-0260	260	155	73	28	24	9,5	0,50	68514A
LEL4-0270	270	161	76	28	24	10,2	0,52	68516A
LEL4-0280	280	166	78	28	24	11,0	0,54	68518A
LEL4-0290	290	172	81	29	25	11,7	0,56	68520A
LEL4-0300	300	180	85	29	25	12,7	0,58	67503A
LEL4-0320	320	191	90	30	26	14,4	0,62	67505A
LEL4-0340	340	202	95	30	26	16,1	0,66	67507A
LEL4-0360	360	215	101	31	27	18,2	0,70	67509A
LEL4-0380	380	226	106	32	27	20,2	0,73	67511A
LEL4-0400	400	240	113	32	28	22,6	0,77	68522A
LEL4-0420	420	250	118	33	28	24,8	0,81	68524A
LEL4-0440	440	264	124	34	29	27,3	0,85	68526A
LEL4-0460	460	275	129	34	29	29,8	0,89	68528A

Bearing elements with a ground raceway Type LEL

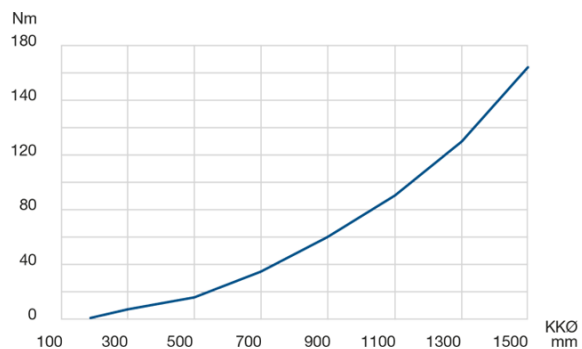
Innovation in Motion



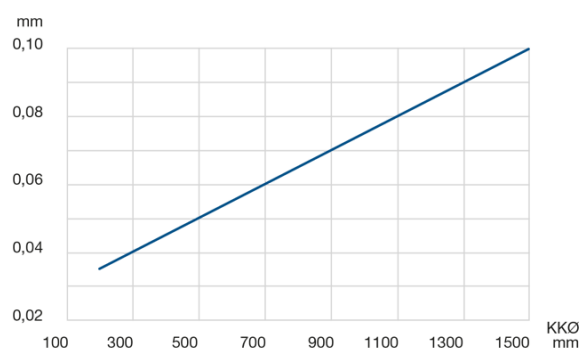
LEL 4 - M x N 12,86 x 12,86mm

Name	KKØ mm	Load ratings kN				Stat. M. kNm	Weight kg	Order no.
		C _{0a}	C _{0r}	C _a	C _r	C _{0m}		
LEL4-0480	480	288	136	35	30	32,6	0,93	68530A
LEL4-0500	500	299	141	35	30	35,2	0,97	68532A
LEL4-0520	520	313	147	36	31	38,3	1,01	68534A
LEL4-0540	540	324	152	36	31	41,1	1,04	68536A
LEL4-0560	560	337	159	37	32	44,5	1,09	68538A
LEL4-0570	570	343	161	37	32	46,0	1,10	68539A
LEL4-0580	580	348	164	37	32	47,5	1,12	68540A
LEL4-0600	600	362	170	38	33	51,1	1,16	68542A
LEL4-0620	620	373	175	38	33	54,4	1,20	68544A
LEL4-0640	640	384	181	38	33	57,8	1,24	68546A
LEL4-0660	660	397	187	39	34	61,7	1,28	68548A
LEL4-0680	680	408	192	39	34	65,3	1,31	68550A
LEL4-0700	700	422	199	40	34	69,4	1,36	68552A
LEL4-0720	720	432	204	40	35	73,3	1,39	68554A
LEL4-0740	740	446	210	41	35	77,6	1,43	68556A
LEL4-0760	760	457	215	41	35	81,7	1,47	68558A
LEL4-0780	780	470	222	41	36	86,3	1,51	68560A
LEL4-0800	800	481	227	42	36	90,6	1,55	68562A
LEL4-0820	820	495	233	42	37	95,5	1,59	68564A
LEL4-0840	840	506	238	43	37	99,9	1,63	68566A
LEL4-0860	860	519	245	43	37	105,1	1,67	68568A
LEL4-0880	880	530	250	43	37	109,8	1,70	68570A
LEL4-0900	900	544	256	44	38	115,1	1,74	68572A
LEL4-0920	920	555	261	44	38	120,0	1,78	68573A
LEL4-0960	960	579	273	45	39	130,8	1,86	68575A
LEL4-1000	1000	603	284	45	39	142,0	1,94	68577A
LEL4-1100	1100	663	312	47	41	171,6	2,13	68582A
LEL4-1200	1200	726	342	49	42	204,9	2,33	68587A
LEL4-1300	1300	785	370	50	43	240,2	2,52	68592A
LEL4-1400	1400	845	398	51	44	278,4	2,71	68597A
LEL4-1500	1500	908	427	53	46	320,3	2,91	68602A

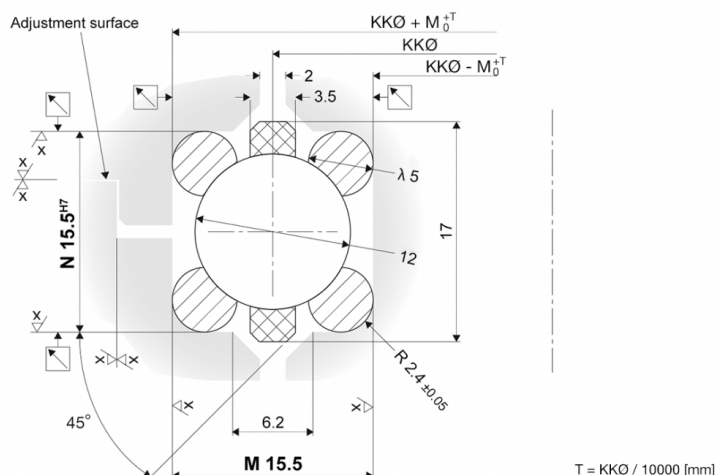
Rotational resistance



Radial and axial runout accuracy



Data tables



LEL 5 - M x N 15,5 x 15,5mm

Name	KKØ mm	Load ratings kN				Stat. M. kNm	Weight kg	Order no.
		C _{0a}	C _{0r}	C _a	C _r	C _{0m}		
LEL5-0220	220	257	121	41	35	13,0	0,70	97039A
LEL5-0230	230	267	126	41	36	15,0	0,73	97040A
LEL5-0240	240	279	131	42	36	16,0	0,76	97041A
LEL5-0250	250	289	136	43	37	17,0	0,79	97042A
LEL5-0260	260	305	144	41	35	18,7	0,82	97043A
LEL5-0270	270	316	149	44	38	20,0	0,85	97044A
LEL5-0280	280	327	154	45	39	22,0	0,88	97045A
LEL5-0290	290	343	162	43	37	23,4	0,92	97046A
LEL5-0300	300	348	164	46	39	25,0	0,94	97047A
LEL5-0320	320	375	176	47	41	28,0	1,02	97048A
LEL5-0340	340	403	190	45	39	32,3	1,08	97049A
LEL5-0360	360	423	199	49	42	36,0	1,14	97050A
LEL5-0380	380	444	209	50	43	40,0	1,20	97051A
LEL5-0400	400	471	222	51	44	44,0	1,26	97052A
LEL5-0420	420	493	232	52	45	49,0	1,33	97053A
LEL5-0440	440	523	247	50	43	54,2	1,39	97054A
LEL5-0460	460	541	254	54	46	59,0	1,46	97055A
LEL5-0480	480	567	267	55	47	64,0	1,53	97056A
LEL5-0500	500	589	277	55	48	69,0	1,59	97057A

Bearing elements with a ground raceway Type LEL

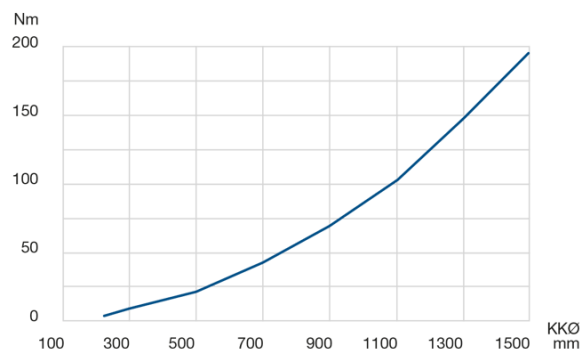
Innovation in Motion



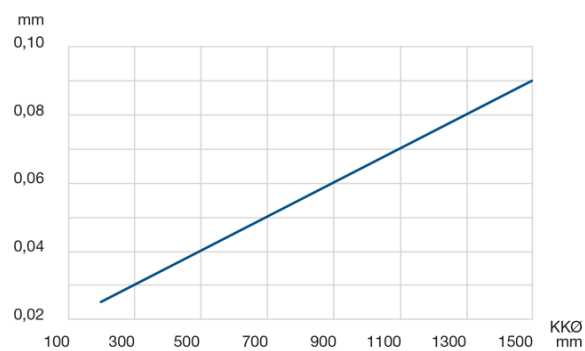
LEL 5 - M x N 15,5 x 15,5mm

Name	KKØ mm	Load ratings kN				Stat. M. kNm	Weight kg	Order no.
		C _{0a}	C _{0r}	C _a	C _r			
LEL5-0520	520	616	290	56	49	75,0	1,66	97058A
LEL5-0540	540	637	300	57	49	81,0	1,72	97059A
LEL5-0560	560	664	312	58	50	87,0	1,78	97060A
LEL5-0580	580	685	322	59	51	94,0	1,85	97061A
LEL5-0600	600	707	333	59	51	100,0	1,91	97062A
LEL5-0620	620	741	349	57	49	108,1	1,96	97063A
LEL5-0640	640	768	362	58	50	115,7	2,03	97064A
LEL5-0660	660	790	372	58	50	122,7	2,09	97065A
LEL5-0680	680	803	378	62	54	128,0	2,16	97066A
LEL5-0700	700	839	395	59	51	138,2	2,22	97067A
LEL5-0720	720	861	406	60	52	145,8	2,28	97068A
LEL5-0740	740	878	413	64	56	153,0	2,36	97069A
LEL5-0760	760	899	423	65	56	161,0	2,43	97070A
LEL5-0780	780	937	441	62	54	171,9	2,47	97071A
LEL5-0800	800	959	452	62	54	180,4	2,53	97072A
LEL5-0820	820	986	465	63	55	190,2	2,60	97073A
LEL5-0840	840	1008	475	64	55	199,1	2,66	97074A
LEL5-0860	860	1022	484	68	59	207,0	2,74	97075A
LEL5-0880	880	1044	491	68	59	216,0	2,80	97076A
LEL5-0900	900	1065	501	69	60	226,0	2,86	97077A
LEL5-0920	920	1092	514	70	60	236,0	2,92	97078A
LEL5-0940	940	1113	524	70	61	246,0	2,98	97080A
LEL5-0960	960	1127	531	66	57	249,3	2,98	97079A
LEL5-0980	980	1176	554	67	58	271,3	3,11	97081A
LEL5-1000	1000	1188	559	72	62	280,0	3,19	97082A
LEL5-1100	1100	1323	624	70	61	342,5	3,49	97083A
LEL5-1200	1200	1423	670	77	66	402,0	3,82	97084A
LEL5-1300	1300	1563	737	75	65	478,1	4,12	97085A
LEL5-1400	1400	1688	796	77	67	556,1	4,44	97086A
LEL5-1500	1500	1782	839	83	72	629,0	4,77	97087A

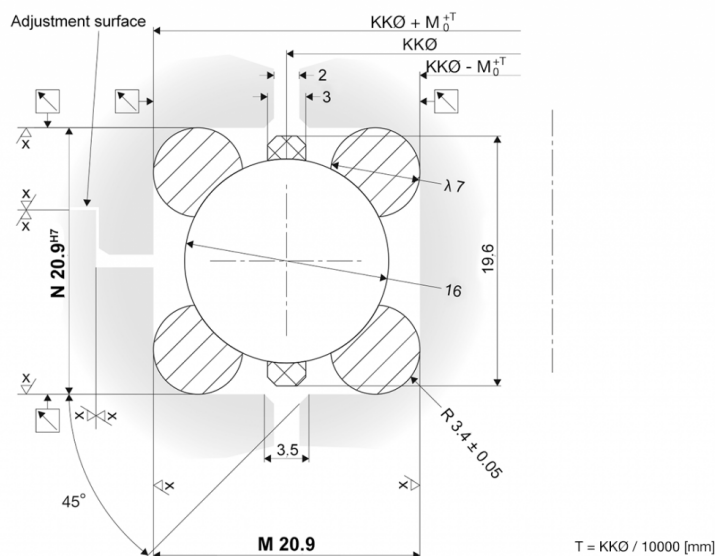
Rotational resistance



Radial and axial runout accuracy



Data tables



LEL 7 - M x N 20,9 x 20,9 mm

Name	KKØ mm	Load ratings kN				Stat. M. kNm	Weight kg	Order no.
		C _{0a}	C _{0r}	C _a	C _r			
LEL7-0340	340	470	221	59	51	37,6	1,86	68711A
LEL7-0360	360	497	234	60	52	42,1	1,97	68713A
LEL7-0380	380	524	246	61	53	46,8	2,08	68715A
LEL7-0400	400	551	259	62	54	51,8	2,19	68717A
LEL7-0420	420	578	272	63	55	57,1	2,29	68719A
LEL7-0440	440	605	285	64	56	62,6	2,40	68721A
LEL7-0460	460	632	297	65	56	68,4	2,51	68723A
LEL7-0480	480	668	314	67	58	75,4	2,63	68725A
LEL7-0500	500	695	327	68	59	81,7	2,74	68727A
LEL7-0520	520	722	340	69	59	88,3	2,85	68729A
LEL7-0540	540	749	352	70	60	95,1	2,96	68731A
LEL7-0560	560	776	365	71	61	102,2	3,06	68733A
LEL7-0580	580	803	378	71	62	109,6	3,17	68735A
LEL7-0600	600	830	390	72	62	117,2	3,28	68737A
LEL7-0620	620	857	403	73	63	125,0	3,39	68739A
LEL7-0640	640	893	420	74	64	134,5	3,51	68741A
LEL7-0660	660	920	433	75	65	142,9	3,62	68743A

Bearing elements with a ground raceway Type LEL

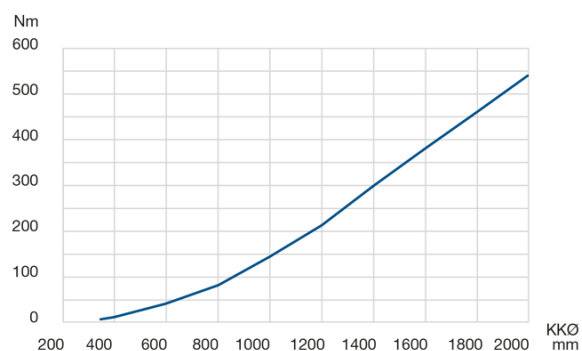
Innovation in Motion



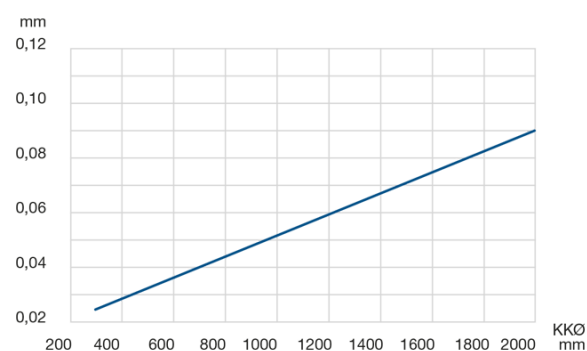
LEL 7 - M x N 20,9 x 20,9 mm

Name	KKØ mm	Load ratings kN				Stat. M. kNm	Weight kg	Order no.
		C _{0a}	C _{0r}	C _a	C _r			
LEL7-0680	680	947	445	76	66	151,5	3,73	68745A
LEL7-0700	700	974	458	77	66	160,4	3,83	68747A
LEL7-0720	720	1001	471	77	67	169,6	3,94	68749A
LEL7-0740	740	1028	484	78	68	179,0	4,05	68751A
LEL7-0760	760	1055	496	79	68	188,7	4,16	68753A
LEL7-0780	780	1082	509	80	69	198,6	4,26	68755A
LEL7-0800	800	1118	526	81	70	210,5	4,39	68757A
LEL7-0820	820	1145	539	81	70	220,9	4,50	68759A
LEL7-0840	840	1172	551	82	71	231,7	4,60	68761A
LEL7-0860	860	1199	564	83	72	242,7	4,71	68763A
LEL7-0880	880	1226	577	83	72	253,9	4,82	68765A
LEL7-0900	900	1253	590	84	73	265,4	4,93	68767A
LEL7-0920	920	1280	602	85	73	277,1	5,03	68768A
LEL7-0940	940	1307	615	85	74	289,1	5,14	68769A
LEL7-0960	960	1343	632	86	75	303,4	5,27	68770A
LEL7-0980	980	1370	645	87	75	316,0	5,37	68771A
LEL7-1000	1000	1397	657	88	76	328,8	5,48	68772A
LEL7-1060	1060	1478	695	89	77	368,7	5,80	68775A
LEL7-1100	1100	1532	721	90	78	396,6	6,02	68777A
LEL7-1160	1160	1623	763	93	80	442,9	6,36	68780A
LEL7-1200	1200	1677	789	94	81	473,4	6,57	68782A
LEL7-1260	1260	1758	827	95	82	521,1	6,90	68785A
LEL7-1300	1300	1821	856	97	83	556,9	7,13	68787A
LEL7-1360	1360	1902	895	98	85	608,6	7,45	68790A
LEL7-1400	1400	1956	920	99	86	644,3	7,67	68792A
LEL7-1460	1460	2046	962	101	87	702,8	8,01	68795A
LEL7-1500	1500	2100	988	102	88	741,1	8,22	68797A
LEL7-1600	1600	2244	1056	104	90	844,8	8,78	68799A
LEL7-1700	1700	2379	1119	106	92	951,7	9,32	68801A
LEL7-1800	1800	2523	1187	109	94	1.068,7	9,87	68803A
LEL7-1900	1900	2667	1255	111	96	1.192,5	10,43	68805A
LEL7-2000	2000	2811	1323	113	98	1.323,1	10,98	68807A

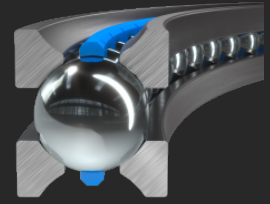
Rotational resistance



Radial and axial runout accuracy



Bearing elements with profiled raceways Type LER



Franke bearing elements of the type LER are characterized by their compact cross-section and their favourable price.

Description

Franke bearing elements type LER are suitable for medium rotational speeds and accuracies. They convince by smooth running, high dynamics and compact installation space. Due to the straight contact surfaces, they can be easily integrated into the surrounding design and have a high rigidity. The low price makes the bearing element of type LER an economical solution. LER are generally mounted without clearance. The preload can be individually adjusted according to the requirements.

Properties

Smooth running	● ● ●
Accuracy	● ● ●
Speed	● ● ● ● ●
Stiffness	● ● ● ●
Assembly	● ● ● ●
Price	● ● ● ●

Technical data

Material

Ball race rings: hardened and tempered chrome-silicon steel

Rolling element: hardened rolling bearing steel

Cage: polyamide or thermoplastic polyurethane

Operating temperature

-30 °C to +80 °C, short-term up to +100 °C

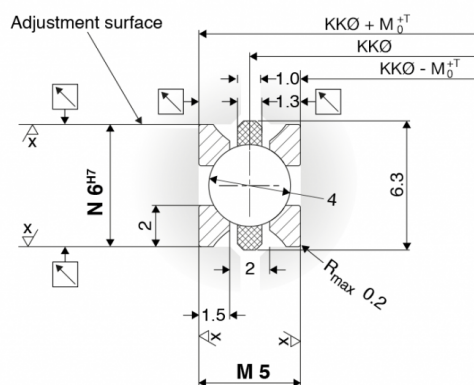
Peripheral speed

Max. 5 m/s, without seal max. 10 m/s

Lubricant

Shell Gadus S3 V220 C2

Data tables

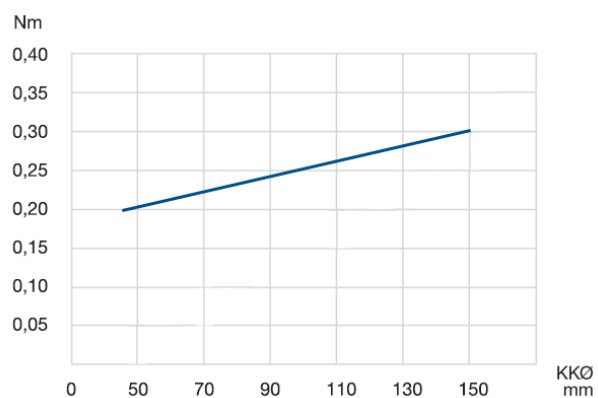


T = KKØ / 10000 [mm]

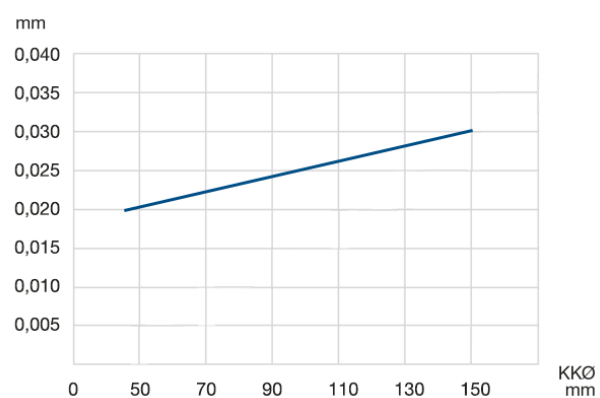
LER 1.5 - M x N 5 x 6 mm

Name	KKØ mm	Load ratings kN				Stat. M. kNm	Weight kg	Order no.
		C _{0a}	C _{0r}	C _a	C _r			
LER1.5-0040	40	8	4	5	4	0,1	0,01	610704
LER1.5-0050	50	11	5	5	4	0,1	0,02	610705
LER1.5-0060	60	13	6	6	5	0,2	0,02	610706
LER1.5-0070	70	15	7	6	5	0,2	0,03	610707
LER1.5-0080	80	17	8	6	5	0,3	0,03	610708
LER1.5-0090	90	20	9	6	6	0,4	0,03	610709
LER1.5-0100	100	22	10	7	6	0,5	0,04	610710
LER1.5-0110	110	24	11	7	6	0,6	0,04	610711
LER1.5-0120	120	26	12	7	6	0,7	0,05	610712
LER1.5-0130	130	29	13	7	6	0,9	0,05	610713
LER1.5-0140	140	31	14	8	7	1,0	0,05	610714
LER1.5-0150	150	33	15	8	7	1,2	0,06	610715

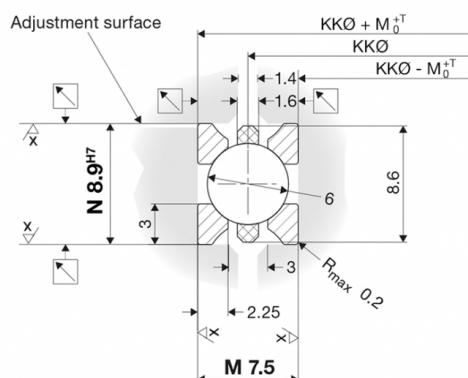
Rotational resistance



Radial and axial runout accuracy



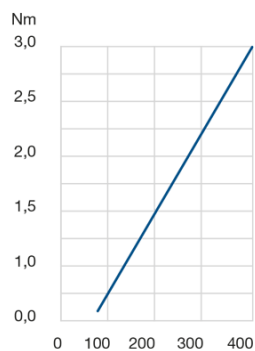
Data tables


$$T = KK\phi / 10000 \text{ [mm]}$$

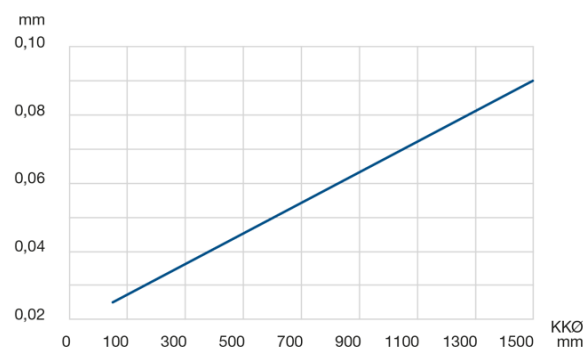
LER 2 - M x N 7,5 x 9 mm

Name	KKØ mm	Load ratings kN				Stat. M. kNm	Weight kg	Order no.
		C _{0a}	C _{0r}	C _a	C _r	C _{0m}		
LER2-0080	80	28	13	11	9	0,5	0,06	97000A
LER2-0100	100	35	17	12	10	0,8	0,08	97001A
LER2-0120	120	42	20	12	11	1,2	0,10	97002A
LER2-0140	140	49	23	13	11	1,6	0,11	97003A
LER2-0160	160	56	27	14	12	2,1	0,13	97004A
LER2-0180	180	64	30	14	12	2,7	0,15	97005A
LER2-0200	200	71	33	15	13	3,3	0,16	97006A
LER2-0220	220	77	36	15	13	4,0	0,18	97007A
LER2-0240	240	85	40	16	14	4,8	0,19	97008A
LER2-0260	260	92	43	17	14	5,6	0,21	97009A
LER2-0280	280	100	47	17	15	6,6	0,23	97010A
LER2-0300	300	107	50	17	15	7,6	0,24	97011A
LER2-0320	320	113	53	18	15	8,5	0,26	97012A
LER2-0340	340	121	57	18	16	9,7	0,28	97013A
LER2-0360	360	128	60	19	16	10,9	0,29	97014A
LER2-0380	380	136	64	19	16	12,1	0,31	97015A
LER2-0400	400	143	67	19	17	13,5	0,33	97016A

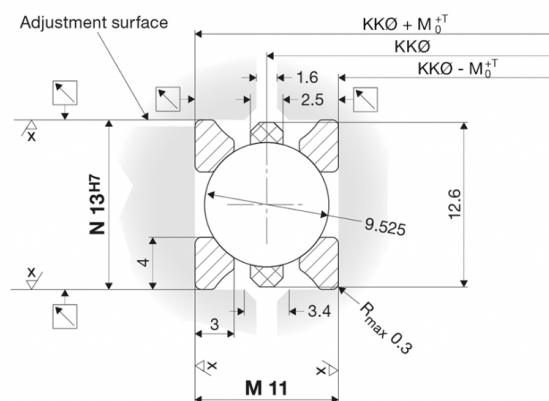
Rotational resistance



Radial and axial runout accuracy



Data tables


$$T = KK\phi / 10000 \text{ [mm]}$$

LER 3 - M x N 11 x 13 mm

Name	KKØ mm	Load ratings kN				Stat. M. kNm	Weight kg	Order no.
		C _{0a}	C _{0r}	C _a	C _r	C _{0m}		
LER3-0100	100	54	25	18	15	1,3	0,17	68460A
LER3-0150	150	82	39	21	18	2,9	0,26	74060A
LER3-0200	200	110	52	23	20	5,2	0,34	74070A
LER3-0250	250	138	65	25	22	8,1	0,43	74080A
LER3-0300	300	168	79	27	24	11,9	0,52	74090A
LER3-0350	350	196	92	29	25	16,2	0,60	74095A
LER3-0400	400	224	105	30	26	21,1	0,69	74100A
LER3-0450	450	252	119	32	27	26,7	0,77	74105A
LER3-0500	500	280	132	33	28	33,0	0,86	74110A
LER3-0550	550	308	145	34	29	39,9	0,94	74115A
LER3-0600	600	339	159	35	30	47,8	1,03	74120A
LER3-0650	650	367	172	36	31	56,1	1,12	74125A
LER3-0700	700	395	186	37	32	65,0	1,20	74130A
LER3-0750	750	423	199	38	33	74,6	1,29	74135A
LER3-0800	800	451	212	39	34	84,8	1,37	74140A
LER3-0850	850	479	225	40	34	95,7	1,46	74145A
LER3-0900	900	509	239	41	35	107,8	1,55	74150A
LER3-0950	950	537	253	44	38	120,0	1,67	74151A
LER3-1000	1000	565	266	42	37	133,0	1,72	74155A

Bearing elements with profiled raceways Type LER

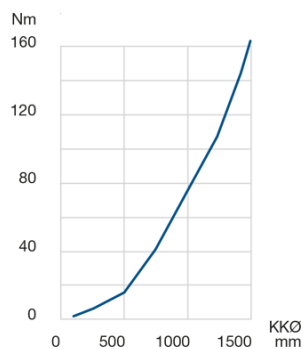
Innovation in Motion



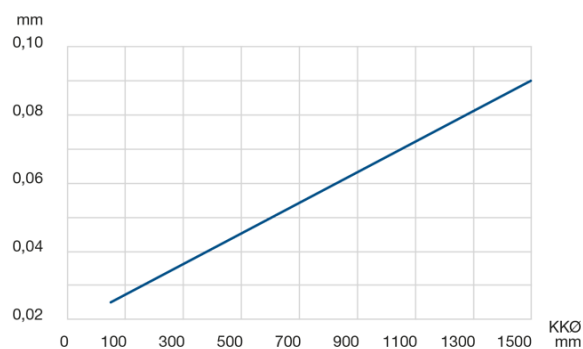
LER 3 - M x N 11 x 13 mm

Name	KKØ mm	Load ratings kN				Stat. M. kNm	Weight kg	Order no.
		C _{0a}	C _{0r}	C _a	C _r	C _{0m}		
LER3-1100	1100	621	292	44	38	160,8	1,89	74160A
LER3-1200	1200	680	319	45	39	191,9	2,06	74165A
LER3-1300	1300	736	346	47	40	225,0	2,23	74170A
LER3-1400	1400	791	372	48	41	260,7	2,41	74175A
LER3-1500	1500	850	399	49	43	300,0	2,58	74180A

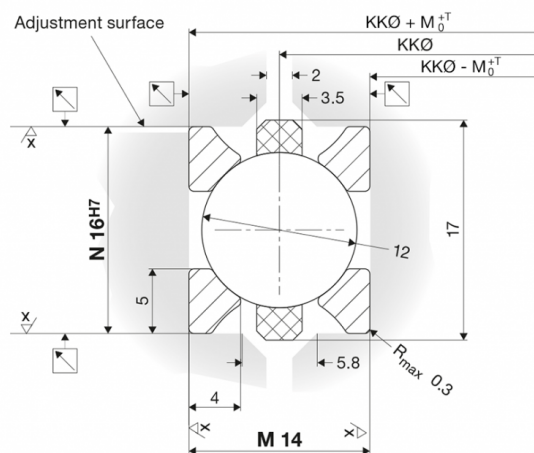
Rotational resistance



Radial and axial runout accuracy



Data tables


$$T = KK\phi / 10000 \text{ [mm]}$$

LER 4 - M x N 14 x 16 mm

Name	KKØ mm	Load ratings kN				Stat. M. kNm	Weight kg	Order no.
		C _{0a}	C _{0r}	C _a	C _r	C _{0m}		
LER4-0200	200	175	82	40	34	8,2	0,61	97017A
LER4-0250	250	219	103	43	37	12,9	0,76	97018A
LER4-0300	300	264	124	46	40	18,6	0,91	97019A
LER4-0350	350	308	145	49	42	25,4	1,06	97020A
LER4-0400	400	353	166	51	44	33,2	1,21	97021A
LER4-0450	450	401	189	54	47	42,5	1,37	97022A
LER4-0500	500	446	210	56	49	52,5	1,53	97023A
LER4-0550	550	491	231	58	50	63,5	1,68	97024A
LER4-0600	600	535	252	60	52	75,6	1,83	97025A
LER4-0650	650	580	273	62	53	88,7	1,98	97026A
LER4-0700	700	624	294	64	55	102,8	2,13	97027A
LER4-0750	750	669	315	65	56	118,0	2,29	97028A
LER4-0800	800	714	336	67	58	134,3	2,44	97029A
LER4-0850	850	758	357	68	59	151,6	2,59	97030A
LER4-0900	900	803	378	70	60	170,0	2,74	97031A
LER4-0950	950	851	401	71	62	190,3	2,90	97032A
LER4-1000	1000	896	422	73	63	210,8	3,05	97033A
LER4-1100	1100	985	464	75	65	254,9	3,36	97034A
LER4-1200	1200	1074	506	77	67	303,3	3,66	97035A

Bearing elements with profiled raceways Type LER

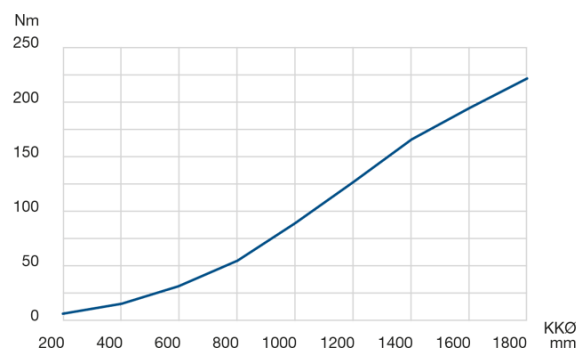
Innovation in Motion



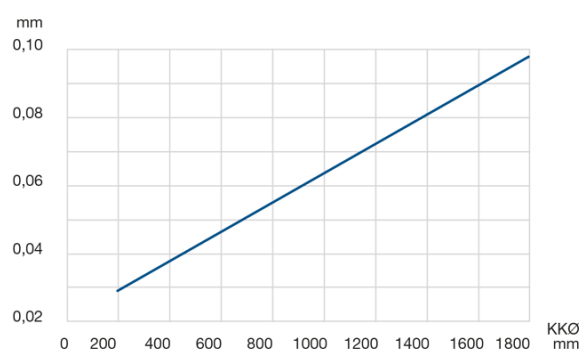
LER 4 - M x N 14 x 16 mm

Name	KKØ mm	Load ratings kN				Stat. M. kNm	Weight kg	Order no.
		C _{0a}	C _{0r}	C _a	C _r	C _{0m}		
LER4-1300	1300	1163	548	80	69	355,8	3,96	97036A
LER4-1400	1400	1257	592	82	71	413,9	4,27	97037A
LER4-1500	1500	1346	633	84	73	474,9	4,58	97038A

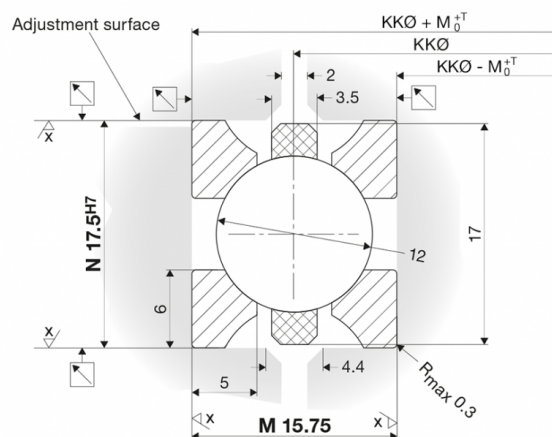
Rotational resistance



Radial and axial runout accuracy



Data tables



T = KKØ / 10000 [mm]

LER 5 - M x N 15,75 x 17,5 mm

Name	KKØ mm	Load ratings kN				Stat. M. kNm	Weight kg	Order no.
		C _{0a}	C _{0r}	C _a	C _r			
LER5-0250	250	260	123	43	37	15,3	0,94	75899A
LER5-0300	300	313	148	46	40	22,1	1,13	75713A
LER5-0350	350	366	172	49	42	30,2	1,31	97088A
LER5-0400	400	419	197	51	44	39,5	1,50	75718A
LER5-0450	450	477	225	54	47	50,5	1,70	97089A
LER5-0500	500	530	250	56	49	62,4	1,88	75723A
LER5-0550	550	583	274	58	50	75,5	2,07	97090A
LER5-0600	600	636	299	60	52	89,8	2,26	75728A
LER5-0650	650	689	324	62	53	105,4	2,45	97091A
LER5-0700	700	742	349	64	55	122,2	2,64	75733A
LER5-0750	750	795	374	65	56	140,3	2,82	97092A
LER5-0800	800	848	399	67	58	159,6	3,01	75738A
LER5-0850	850	901	424	68	59	180,2	3,20	97093A
LER5-0900	900	954	449	70	60	202,0	3,39	75743A
LER5-0950	950	1012	476	71	62	226,1	3,58	97094A
LER5-1000	1000	1065	501	73	63	250,5	3,77	75745A
LER5-1100	1100	1171	551	75	65	303,0	4,14	75746A
LER5-1200	1200	1277	601	77	67	360,4	4,52	75747A
LER5-1300	1300	1383	651	80	69	422,9	4,90	75748A

Bearing elements with profiled raceways Type LER

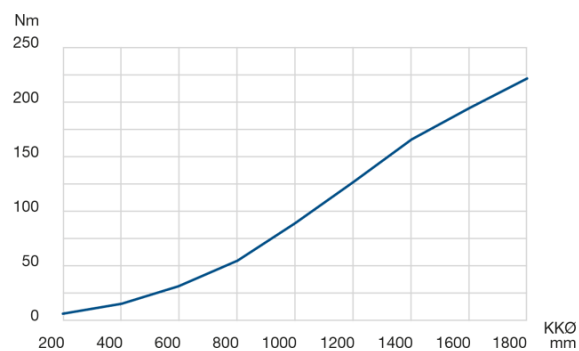
Innovation in Motion



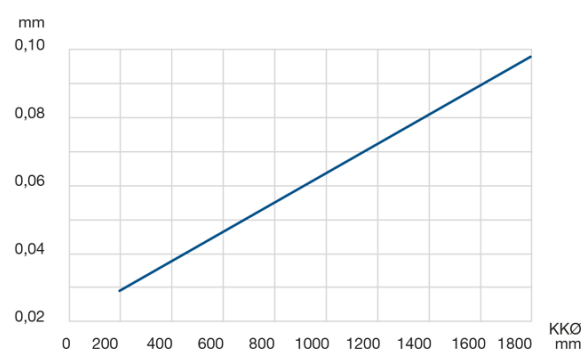
LER 5 - M x N 15,75 x 17,5 mm

Name	KKØ mm	Load ratings kN				Stat. M. kNm	Weight kg	Order no.
		C _{0a}	C _{0r}	C _a	C _r	C _{0m}		
LER5-1400	1400	1493	703	82	71	491,9	5,28	75749A
LER5-1500	1500	1599	753	84	73	564,4	5,65	75750A
LER5-1600	1600	1705	803	86	75	641,9	6,03	97257A
LER5-1700	1700	1811	853	88	76	724,4	6,40	97258A
LER5-1800	1800	1922	905	90	78	814,0	6,79	97259A

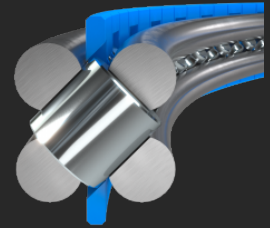
Drehwiderstand



Radial and axial runout accuracy



Crossed roller bearings with ground raceways Type LEW



Franke bearing elements of type LEW offer maximum rigidity with high running smoothness and accuracy.

Description

Franke bearing elements type LEW are suitable for medium rotational speeds and accuracies. They convince by smooth running even under tilt moment loads, high rigidity and compact installation space. The crosswise arranged rollers can support high loads from all directions. Bearing elements of model LEW are insensitive to shock and vibration. They offer the greatest possible flexibility in terms of preload, running characteristics and diameter ranges.

Properties

Smooth running	● ● ● ●
Accuracy	● ● ● ●
Speed	● ● ●
Stiffness	● ● ● ● ●
Assembly	● ●
Price	● ● ●

Technical data

Material

Ball race rings: hardened and tempered chrome-silicon steel

Rolling element: hardened rolling bearing steel

Cage: polyamide or thermoplastic polyurethane

Operating temperature

-30 °C to +80 °C, short-term up to +100 °C

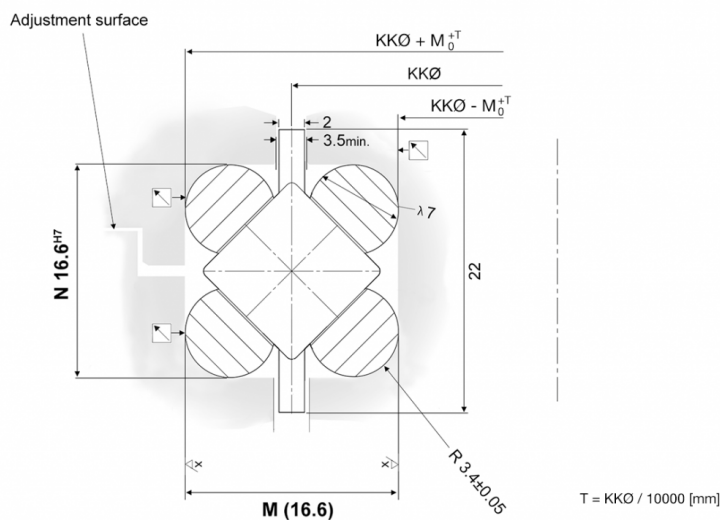
Peripheral speed

Max. 2 m/s

Lubricant

Shell Gadus S3 V220 C2

Data tables



LEW 7 - M x N 16,6 x 16,6 mm

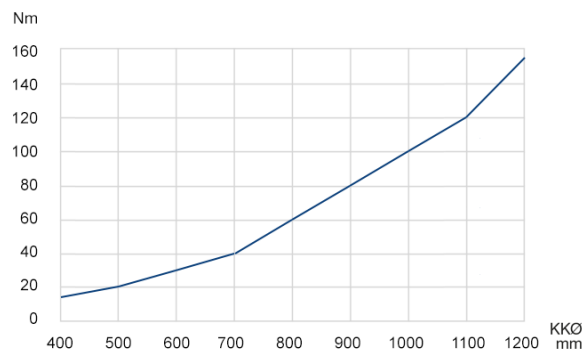
Name	KKØ mm	Load ratings kN				Weight kg	Order no.
		C _{0a}	C _{0r}	C _a	C _r		
LEW7-0400	400	350	140	90	47	1,9	607907
LEW7-0500	500	440	176	99	52	2,3	607918
LEW7-0600	600	530	212	113	59	2,8	607909
LEW7-0700	700	624	250	128	67	3,2	607919
LEW7-0800	800	714	286	144	75	3,7	607910
LEW7-0900	900	804	322	163	85	4,1	607920
LEW7-1000	1000	894	358	184	96	4,6	607921
LEW7-1100	1100	984	394	207	108	5,1	607922
LEW7-1200	1200	1074	430	234	122	5,5	607923

Crossed roller bearings with ground raceways Type LEW

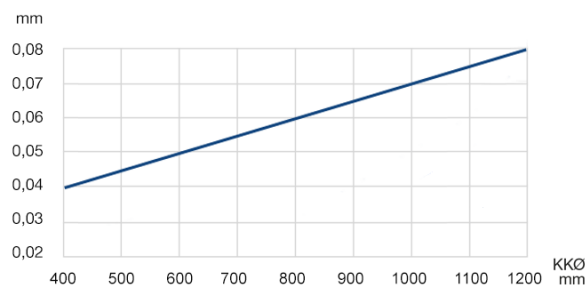
Innovation in Motion



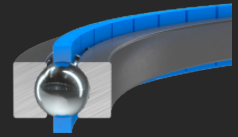
Rotational resistance



Radial-/Axial runout accuracy



Slim bearings with profiled raceways Type LSA



Franke slim bearings of type LSA are a cost-effective alternative to conventional thin-section bearings.

Description

Franke slim bearings of the type LSA convince by their smooth running, extremely compact installation space, simple mounting and favourable price. Slim bearings of type LSA consist of an inner and outer race with hardened and profiled raceways and a plastic cage with retained balls. The rolling elements rest against the raceways at two points each, thus maintaining the 4-point system. The raceways are split and can therefore be changed elastically in diameter for installation.

Properties

Smooth running	● ●
Accuracy	● ●
Speed	● ● ● ●
Stiffness	● ●
Assembly	● ● ● ● ● ●
Price	● ● ● ● ● ●

Technical data

Material

Ball race rings: hardened and tempered chrome-silicon steel
Rolling element: hardened rolling bearing steel
Cage: polyamide or thermoplastic polyurethane

Operating temperature

-20 °C to +80 °C, short-term up to +100 °C

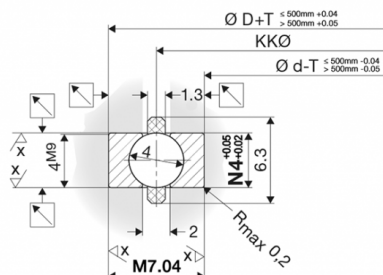
Peripheral speed

Max. 5 m/s, without seal max. 10 m/s

Lubricant

Shell Gadus S3 V220 C2

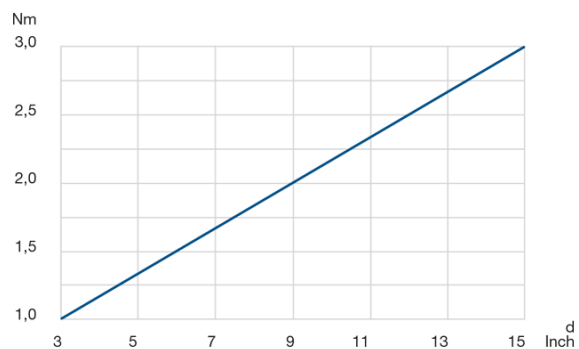
Data tables



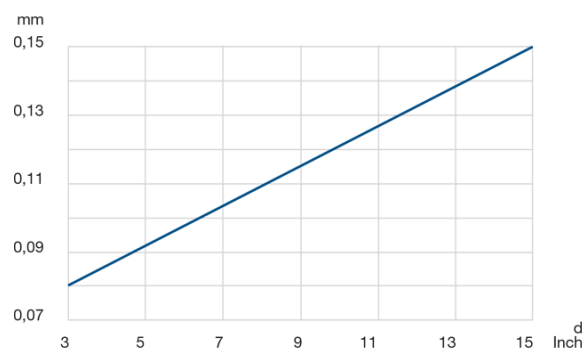
LSA 4 - M x N 7,04 x 4 mm

Name	d inch	Dimensions mm		Load ratings kN				Stat. M. kNm	Weight kg	Order no.
		D	d	C _{0a}	C _{0r}	C _a	C _r	C _{0m}		
LSA4-04.0	4,0	115,68	101,6	25	12	7	6	0,6	0,05	97206A
LSA4-04.5	4,5	128,38	114,3	28	13	7	6	0,8	0,06	97207A
LSA4-05.0	5,0	141,08	127,0	31	15	7	6	0,9	0,07	97208A
LSA4-05.5	5,5	153,78	139,7	34	16	8	7	1,2	0,07	97209A
LSA4-06.0	6,0	166,48	152,4	37	18	8	7	1,4	0,08	97210A
LSA4-06.5	6,5	179,18	165,1	40	19	8	7	1,6	0,08	97211A
LSA4-07.0	7,0	191,88	177,8	43	20	8	7	1,9	0,09	97212A
LSA4-07.5	7,5	204,58	190,5	47	22	9	7	2,1	0,10	97213A
LSA4-08.0	8,0	217,28	203,2	49	23	9	7	2,4	0,10	97214A
LSA4-08.5	8,5	229,98	215,9	53	25	9	8	2,7	0,11	97215A
LSA4-09.0	9,0	242,68	228,6	55	26	9	8	3,0	0,12	97216A
LSA4-09.5	9,5	255,38	241,3	58	27	9	8	3,4	0,12	97217A
LSA4-10.0	10,0	268,08	254,0	62	29	9	8	3,7	0,13	97218A
LSA4-11.0	11,0	293,48	279,4	68	32	10	8	4,5	0,14	97219A
LSA4-12.0	12,0	318,88	304,8	73	35	10	9	5,3	0,15	97220A
LSA4-13.0	13,0	344,28	330,2	79	37	10	9	6,3	0,17	97221A
LSA4-14.0	14,0	369,68	355,6	86	40	11	9	7,3	0,18	97222A
LSA4-15.0	15,0	395,08	381,0	92	43	11	9	8,3	0,19	97223A

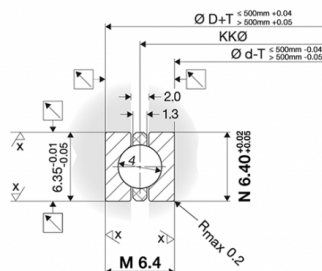
Rotational resistance



Radial and axial accuracy



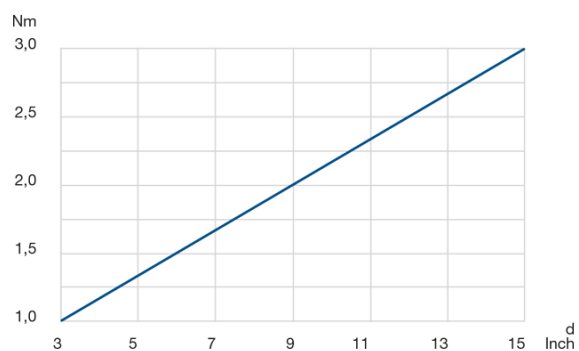
Data tables



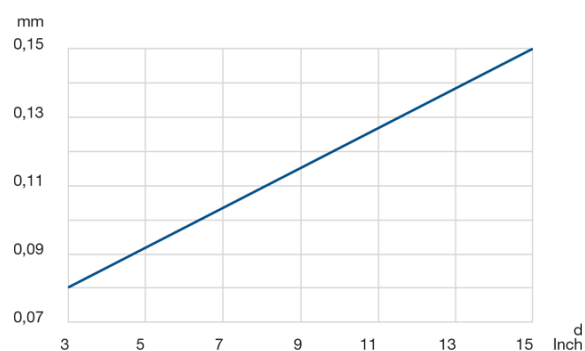
LSA 6 - M x N 6,4 x 6,4 mm

Name	d inch	Dimensions mm		Load ratings kN				Stat. M. kNm	Weight kg	Order no.
		D	d	C _{0a}	C _{0r}	C _a	C _r	C _{0m}		
LSA6-04.5	4,5	127,10	114,3	39	18	7	6	1,1	0,09	97224A
LSA6-05.0	5,0	139,80	127,0	44	21	7	6	1,3	0,10	97225A
LSA6-05.5	5,5	152,50	139,7	48	23	8	7	1,6	0,11	97226A
LSA6-06.0	6,0	165,20	152,4	52	25	8	7	1,9	0,12	97227A
LSA6-06.5	6,5	177,90	165,1	57	27	8	7	2,2	0,13	97228A
LSA6-07.0	7,0	190,60	177,8	61	29	8	7	2,6	0,14	97229A
LSA6-07.5	7,5	203,30	190,5	65	31	8	7	3,0	0,15	97230A
LSA6-08.0	8,0	216,00	203,2	69	33	9	8	3,4	0,16	97231A
LSA6-08.5	8,5	228,70	215,9	73	34	9	8	3,8	0,17	97232A
LSA6-09.0	9,0	241,40	228,6	78	37	9	8	4,3	0,18	97233A
LSA6-09.5	9,5	254,10	241,3	82	39	9	8	4,8	0,19	97234A
LSA6-10.0	10,0	266,80	254,0	86	40	9	8	5,2	0,20	97235A
LSA6-11.0	11,0	292,20	279,4	95	45	10	8	6,3	0,21	97236A
LSA6-12.0	12,0	317,60	304,8	103	49	10	9	7,5	0,23	97237A
LSA6-13.0	13,0	343,00	330,2	112	53	10	9	8,8	0,25	97238A
LSA6-14.0	14,0	368,40	355,6	120	56	11	9	10,2	0,27	97239A
LSA6-15.0	15,0	393,80	381,0	129	61	11	9	11,7	0,29	97240A

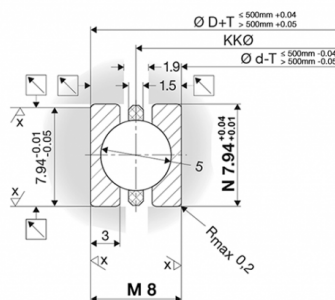
Rotational resistance



Radial and axial accuracy



Data tables



LSA 8 - M x N 8 x 7,94 mm

Name	d inch	Dimensions mm		Load ratings kN				Stat. M. kNm	Weight kg	Order no.
		D	d	C _{0a}	C _{0r}	C _a	C _r	C _{0m}		
LSA8-05.5	5,5	155,70	139,7	59	28	13	11	2,0	0,17	75751A
LSA8-06.0	6,0	168,40	152,4	64	30	13	11	2,4	0,19	75752A
LSA8-06.5	6,5	181,10	165,1	69	32	13	12	2,8	0,20	75753A
LSA8-07.0	7,0	193,80	177,8	74	35	14	12	3,2	0,22	75754A
LSA8-07.5	7,5	206,50	190,5	79	37	14	12	3,7	0,23	75755A
LSA8-08.0	8,0	219,20	203,2	84	40	15	13	4,2	0,25	75756A
LSA8-08.5	8,5	231,90	215,9	90	42	15	13	4,7	0,26	75757A
LSA8-09.0	9,0	244,60	228,6	94	44	15	13	5,2	0,28	75758A
LSA8-09.5	9,5	257,30	241,3	100	47	15	13	5,8	0,29	75759A
LSA8-10.0	10,0	270,00	254,0	105	50	16	14	6,5	0,31	75760A
LSA8-11.0	11,0	295,40	279,4	115	54	16	14	7,8	0,34	75761A
LSA8-12.0	12,0	320,80	304,8	125	59	17	15	9,2	0,37	75762A
LSA8-13.0	13,0	346,20	330,2	136	64	17	15	10,8	0,40	75763A
LSA8-14.0	14,0	371,60	355,6	146	69	18	15	12,5	0,43	75764A
LSA8-15.0	15,0	397,00	381,0	156	73	18	16	14,3	0,46	75765A
LSA8-16.0	16,0	422,40	406,4	167	78	19	16	16,3	0,49	75766A
LSA8-17.0	17,0	447,80	431,8	177	83	19	16	18,3	0,52	75767A
LSA8-18.0	18,0	473,20	457,2	187	88	19	17	20,4	0,55	75768A
LSA8-19.0	19,0	498,60	482,6	198	93	20	17	22,8	0,58	75769A

Slim bearings
with profiled raceways
Type LSA

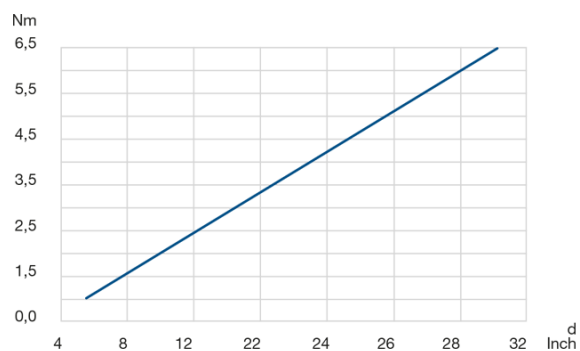
Innovation in Motion



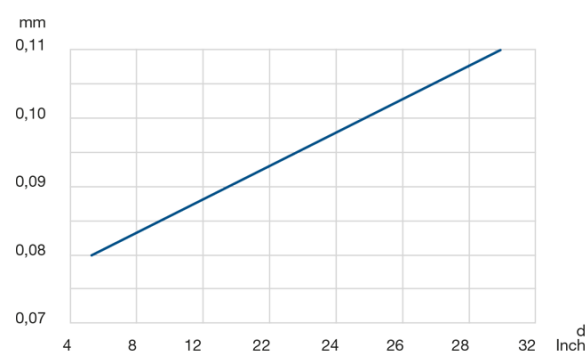
LSA 8 - M x N 8 x 7,94 mm

Name	d inch	Dimensions mm		Load ratings kN				Stat. M. kNm	Weight kg	Order no.
		D	d	C _{0a}	C _{0r}	C _a	C _r	C _{0m}		
LSA8-20.0	20,0	524,00	508,0	208	98	20	17	25,2	0,61	75770A
LSA8-22.0	22,0	574,80	558,8	228	107	21	18	30,4	0,67	75771A
LSA8-24.0	24,0	625,60	609,6	248	117	22	19	36,1	0,73	75772A
LSA8-26.0	26,0	676,40	660,4	269	127	22	19	42,3	0,79	75773A
LSA8-28.0	28,0	727,20	711,2	290	136	23	20	49,0	0,85	75774A
LSA8-30.0	30,0	778,00	762,0	311	146	23	20	56,3	0,91	75775A

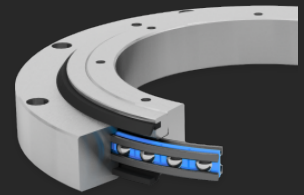
Rotational resistance



Radial and axial accuracy



Steel bearing assemblies Type LVA



Franke type LVA bearing assemblies offer good load capacity and smooth running - at an attractive price.

Description

Franke Bearing Assemblies Type LVA are ready-to-install bearing assemblies with steel housing rings and integrated bearing element. They are suitable for medium rotational speeds and accuracies. They are available at short notice, some of them even from stock. Designed as 4 point bearings, they can support equally high loads from all directions and are insensitive to shocks and vibrations. Type LVA bearing assemblies are sealed on both sides and adjusted with preload.

Properties

Smooth running	● ● ●
Resilience	● ● ● ●
Speed	● ● ● ●
Stiffness	● ● ●
Weight	● ● ●
Price	● ● ● ● ●

Technical data

Material

Inner / Outer ring: C45N

Ball race rings: hardened and tempered chrome-silicon steel

Rolling element: hardened rolling bearing steel

Cage: polyamide or thermoplastic polyurethane

Sealing: NBR

Operating temperature

-20 °C to +80 °C, short-term up to +100 °C

Peripheral speed

Max. 5 m/s, without seal max. 10 m/s

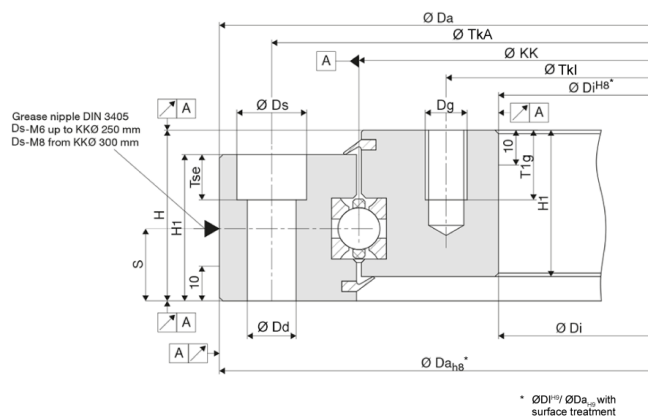
Lubricant

Shell Gadus S3 V220 C2

Relubrication

Via grease nipples to DIN 3405

Data tables



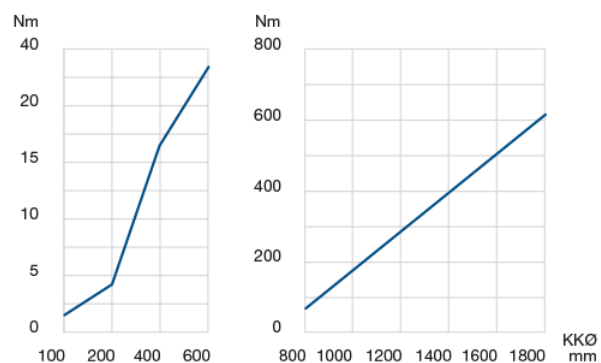
LVA Table part 1

Name	KKØ mm	Dimensions mm											Attachment per ring
		Ds	Dd	H	H1	Dg	Tse	T1g	Da	Di	TkA	Tkl	
LVA-0100	100	11	6,6	34 ^{+/-0,4}	27	M 6	6,8	10	150	50	135	65	6x
LVA-0150	150	11	6,6	34 ^{+/-0,4}	27	M 6	6,8	10	200	100	185	115	6x
LVA-0200	200	11	6,6	34 ^{+/-0,4}	27	M 6	6,8	10	250	150	235	165	8x
LVA-0250	250	11	6,6	34 ^{+/-0,4}	27	M 6	6,8	10	300	200	285	215	10x
LVA-0300	300	15	9,0	38 ^{+/-0,4}	31	M 8	9,0	15	360	240	340	260	12x
LVA-0350	350	15	9,0	38 ^{+/-0,4}	31	M 8	9,0	15	410	290	390	310	14x
LVA-0400	400	18	11,0	44 ^{+/-0,5}	37	M 10	11,0	15	470	330	445	355	14x
LVA-0450	450	18	11,0	44 ^{+/-0,5}	37	M 10	11,0	15	520	380	495	405	14x
LVA-0500	500	20	14,0	49 ^{+/-0,5}	42	M 12	13,0	20	580	420	550	450	14x
LVA-0600	600	20	14,0	49 ^{+/-0,5}	42	M 12	13,0	20	680	520	650	550	16x
LVA-0700	700	20	14,0	53 ^{+/-0,5}	45	M 12	13,0	20	790	610	750	650	22x
LVA-0800	800	20	14,0	53 ^{+/-0,6}	45	M 12	13,0	20	890	710	850	750	24x
LVA-0900	900	20	14,0	53 ^{+/-0,7}	45	M 12	13,0	20	990	810	950	850	24x
LVA-1000	1000	20	14,0	53 ^{+/-0,7}	45	M 12	13,0	20	1090	910	1050	950	26x
LVA-1200	1200	26	18,0	60 ^{+/-0,5}	52	M 16	17,5	25	1300	1100	1265	1135	30x
LVA-1400	1400	26	18,0	60 ^{+/-0,6}	52	M 16	17,5	25	1500	1300	1465	1335	36x
LVA-1600	1600	26	18,0	90 ^{+/-0,5}	82	M 16	17,5	25	1730	1470	1685	1515	42x
LVA-1800	1800	26	18,0	90 ^{+/-0,5}	82	M 16	17,5	25	1930	1670	1885	1715	46x

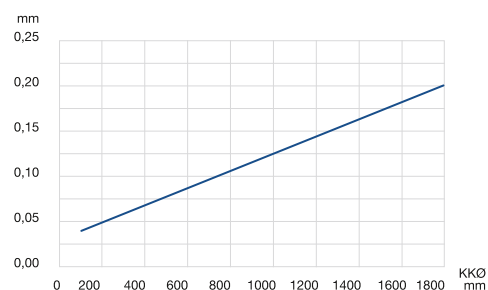
LVA Table part 2

Name	KKØ mm	Load ratings kN				Stat. M. kNm	Weight kg	Order no.
		C _{0a}	C _{0r}	C _a	C _r	C _{0m}		
LVA-0100	100	54	25	18	15	1	3,0	94065A
LVA-0150	150	82	39	21	18	3	4,6	97151A
LVA-0200	200	110	52	23	20	5	6,1	94066A
LVA-0250	250	138	65	25	22	8	7,6	97153A
LVA-0300	300	168	79	27	24	12	12,8	94067A
LVA-0350	350	196	92	29	25	16	15,0	97155A
LVA-0400	400	419	197	51	44	39	23,7	94109A
LVA-0450	450	477	225	54	47	51	26,7	97157A
LVA-0500	500	530	250	56	49	62	39,1	94115A
LVA-0600	600	636	299	60	52	90	46,9	94116A
LVA-0700	700	742	349	64	55	122	66,5	97160A
LVA-0800	800	848	399	67	58	160	76,0	97161A
LVA-0900	900	954	449	70	60	202	85,6	97162A
LVA-1000	1000	1065	501	73	63	251	95,0	97163A
LVA-1200	1200	1677	789	94	81	473	114,8	97164A
LVA-1400	1400	1956	920	99	86	644	169,0	97165A
LVA-1600	1600	1984	933	140	121	747	399,0	97166A
LVA-1800	1800	2234	1050	146	126	946	449,0	97167A

Rotational resistance

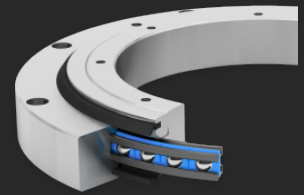


Radial and axial runout accuracy



Aluminium bearing assemblies

Type LVB



Type LVB aluminium bearing assemblies are characterised by their low weight. They are suitable for medium speeds and some are available from stock.

Description

Franke bearing assemblies type LVB are ready-to-install bearing assemblies with housing rings made of aluminium and integrated bearing elements. Franke LVB are suitable for medium rotational speeds and accuracies and convince by their light weight. LVB bearing assemblies are available at short notice, some of them even from stock. Designed as 4-point bearings, they can support equally high loads from all directions and are insensitive to shocks and vibrations. LVB bearing assemblies are sealed on both sides and are set with preload.

Properties

Smooth running	● ● ●
Resilience	● ● ● ●
Speed	● ● ● ●
Stiffness	● ● ●
Weight	● ● ● ● ●
Price	● ● ●

Technical data

Material

Inner / Outer ring: aluminium, anodized
 Ball race rings: hardened and tempered chrome-silicon steel
 Rolling element: hardened rolling bearing steel
 Cage: polyamide or thermoplastic polyurethane
 Sealing: NBR

Operating temperature

-20 °C to +80 °C, short-term up to +100 °C

Peripheral speed

Max. 5 m/s, without seal max. 10 m/s

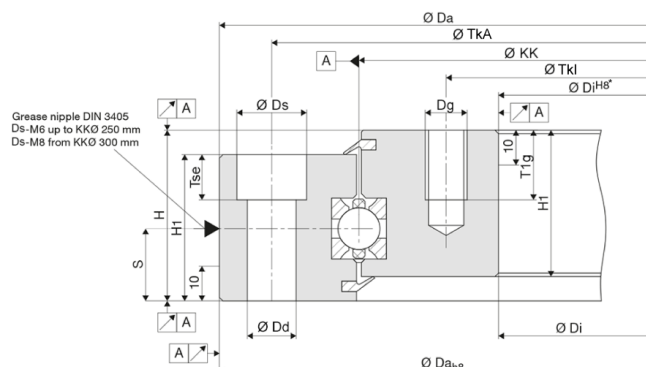
Lubricant

Shell Gadus S3 V220 C2

Relubrication

Via grease nipples to DIN 3405

Data tables



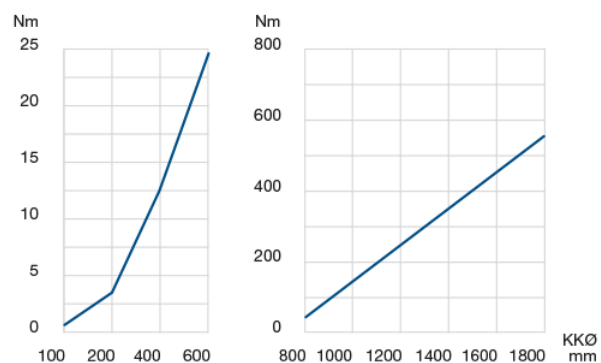
LVB Table part 1

Name	KKØ mm	Dimensions mm											Attachment per ring
		Ds	Dd	H	H1	Dg	Tse	T1g	Da _{h8}	Di ^{+h8}	TkA	TkI	
LVB-0100	100	11	6,6	34 ^{+/-0,4}	27	M 6	6,8	10	150	50	135	65	6X
LVB-0150	150	11	6,6	34 ^{+/-0,4}	27	M 6	6,8	10	200	100	185	115	6x
LVB-0200	200	11	6,6	34 ^{+/-0,4}	27	M 6	6,8	10	250	150	235	165	8x
LVB-0250	250	11	6,6	34 ^{+/-0,4}	27	M 6	6,8	10	300	200	285	215	10x
LVB-0300	300	15	9,0	38 ^{+/-0,4}	31	M 8	9,0	15	360	240	340	260	12x
LVB-0350	350	15	9,0	38 ^{+/-0,4}	31	M 8	9,0	15	410	290	390	310	14x
LVB-0400	400	18	11,0	44 ^{+/-0,5}	37	M 10	11,0	15	470	330	445	355	14x
LVB-0450	450	18	11,0	44 ^{+/-0,6}	37	M 10	11,0	15	520	380	495	405	14x
LVB-0500	500	20	14,0	49 ^{+/-0,5}	42	M 12	13,0	20	580	420	550	450	14x
LVB-0600	600	20	14,0	49 ^{+/-0,5}	42	M 12	13,0	20	680	520	650	550	16x
LVB-0700	700	20	14,0	53 ^{+/-0,5}	45	M 12	13,0	20	790	610	750	650	22x
LVB-0800	800	20	14,0	53 ^{+/-0,5}	45	M 12	13,0	20	890	710	850	750	24x
LVB-0900	900	20	14,0	53 ^{+/-0,5}	45	M 12	13,0	20	990	810	950	850	24x
LVB-1000	1000	20	14,0	53 ^{+/-0,5}	45	M 12	13,0	20	1090	910	1050	950	26x
LVB-1200	1200	26	18,0	60 ^{+/-0,5}	52	M 16	17,5	25	1300	1100	1265	1135	30x
LVB-1400	1400	26	18,0	60 ^{+/-0,5}	52	M 16	17,5	25	1500	1300	1465	1335	36x
LVB-1600	1600	26	18,0	90 ^{+/-0,5}	82	M 16	17,5	25	1730	1470	1685	1515	42x
LVB-1800	1800	26	18,0	90 ^{+/-0,5}	82	M 16	17,5	25	1930	1670	1885	1715	46x

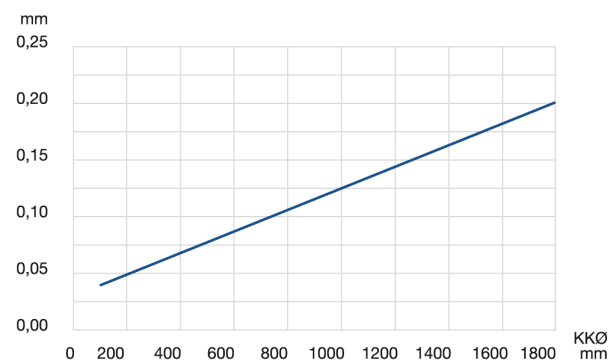
LVB Table part 2

Name	KKØ mm	Load ratings kN				Stat. M. kNm	Weight kg	Order no.
		C _{0a}	C _{0r}	C _a	C _r			
LVB-0100	100	54	25	18	15	1	1,2	69715L
LVB-0150	150	82	39	21	18	3	1,8	97132A
LVB-0200	200	110	52	23	20	5	2,4	66276L
LVB-0250	250	138	65	25	22	8	3,0	97134A
LVB-0300	300	168	79	27	24	12	4,9	66277L
LVB-0350	350	196	92	29	25	16	5,8	97136A
LVB-0400	400	419	197	51	44	39	9,5	97137A
LVB-0450	450	477	225	54	47	51	10,6	97138A
LVB-0500	500	530	250	56	49	62	15,1	97139A
LVB-0600	600	636	299	60	52	90	18,2	97140A
LVB-0700	700	742	349	64	55	122	25,5	97141A
LVB-0800	800	848	399	67	58	160	29,1	97142A
LVB-0900	900	954	449	70	60	202	32,8	97143A
LVB-1000	1000	1065	501	73	63	251	36,4	97144A
LVB-1200	1200	1677	789	94	81	473	56,0	97145A
LVB-1400	1400	1956	920	99	86	644	65,3	97146A
LVB-1600	1600	1984	933	140	121	747	148,2	97147A
LVB-1800	1800	2234	1050	146	126	946	166,7	97148A

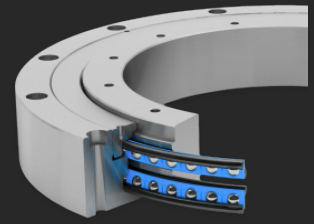
Rotational resistance



Radial and axial runout accuracy



Double row steel bearing assembly, highly dynamic Type LVC



Double row bearing assemblies LVC are suitable for the highest circumferential speeds. Excellent dynamics and very low rotational resistance are the outstanding characteristics of this type.

Description

Franke bearing assemblies type LVC are bearing assemblies made of steel, designed as double row angular contact ball bearings with integrated bearing elements. Franke LVC are suitable for highest circumferential speeds. They convince by very high dynamics and a very low rotational resistance. The double row angular contact ball bearings in a 4-point arrangement are preloaded. They are insensitive to shocks and vibrations. The low rotational resistance and the minimal breakaway torque reduce the required drive power. Due to the low coefficients of friction, Type LVC bearing assemblies operate almost maintenance-free and achieve a long service life.

Properties

Smooth running	● ● ● ● ● ●
Resilience	● ● ● ●
Speed	● ● ● ● ● ●
Stiffness	● ● ● ●
Weight	● ●
Price	● ●

Technical data

Material

Inner / Outer ring: C45N

Ball race rings: hardened and tempered chrome-silicon steel

Rolling element: hardened rolling bearing steel

Cage: polyamide or thermoplastic polyurethane

Sealing: NBR

Operating temperature

-20 °C to +80 °C, short-term up to +100 °C

Peripheral speed

Max. 20 m/s

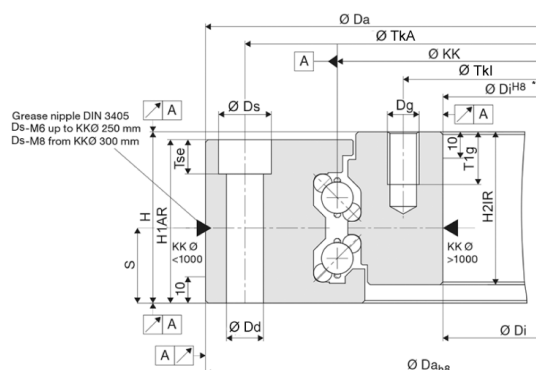
Lubricant

Shell Gadus S3 V220 C2

Relubrication

Via grease nipples to DIN 3405

Data tables



LVC Table part 1

Name	KKØ mm	Dimensions mm												Attachment per ring
		Ds	Dd	H	H1AR	H2IR	Dg	Tse	T1g	Da _{ns}	Di ^{HB}	TkA	Tkl	
LVC-0100	100	11	6,6	34	33	33	M 6	6,8	10	150	50	135	65	6x
LVC-0150	150	11	6,6	34	33	33	M 6	6,8	10	200	100	185	115	6x
LVC-0200	200	11	6,6	34	33	33	M 6	6,8	10	250	150	235	165	8x
LVC-0250	250	11	6,6	34	33	33	M 6	6,8	10	300	200	285	215	10x
LVC-0300	300	18	11,0	57	54	50	M 10	11,0	15	380	230	355	255	12x
LVC-0350	350	18	11,0	57	54	50	M 10	11,0	15	430	280	405	305	14x
LVC-0400	400	18	11,0	57	54	50	M 10	11,0	15	480	330	455	355	14x
LVC-0450	450	18	11,0	57	54	50	M 10	11,0	15	530	380	505	405	14x
LVC-0500	500	20	14,0	65	62	58	M 12	13,0	20	600	420	570	450	14x
LVC-0600	600	20	14,0	65	62	58	M 12	13,0	20	700	520	670	550	16x
LVC-0700	700	20	14,0	65	62	58	M 12	13,0	20	800	620	770	650	22x
LVC-0800	800	20	14,0	65	62	58	M 12	13,0	20	900	720	870	750	24x
LVC-0900	900	20	14,0	65	62	58	M 12	13,0	20	1000	820	970	850	24x
LVC-1000	1000	20	14,0	65	62	58	M 12	13,0	20	1100	920	1070	950	26x
LVC-1200	1200	26	18,0	69	67	61	M 16	17,5	25	1300	1085	1265	1130	30x
LVC-1400	1400	26	18,0	69	67	61	M 16	17,5	25	1500	1285	1465	1330	36x
LVC-1600	1600	26	18,0	84	82	76	M 16	17,5	25	1730	1470	1685	1515	42x
LVC-1800	1800	26	18,0	84	82	76	M 16	17,5	25	1930	1670	1885	1715	46x

Double row steel bearing assembly, highly dynamic Type LVC

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LVC Table part 2

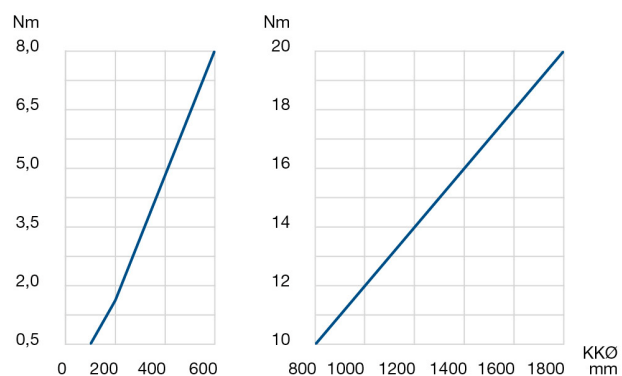
Name	KKØ mm	Load ratings kN				Stat. M. kNm	Weight kg	Order no.
		C _{0a}	C _{0r}	C _a	C _r	C _{0m}		
LVC-0100	100	53	25	11	10	1	3,7	97168A
LVC-0150	150	80	38	13	11	3	5,6	97169A
LVC-0200	200	155	73	21	18	7	7,4	97170A
LVC-0250	250	195	92	22	19	11	9,2	97171A
LVC-0300	300	254	120	28	24	18	27,7	94154A
LVC-0350	350	296	140	30	26	24	32,2	97173A
LVC-0400	400	338	159	31	27	32	36,7	94155A
LVC-0450	450	381	179	33	28	40	41,2	97175A
LVC-0500	500	636	299	53	46	75	63,7	97176A
LVC-0600	600	763	359	56	49	108	76,2	97177A
LVC-0700	700	890	419	60	52	147	88,6	97178A
LVC-0800	800	1017	479	63	54	191	101,1	97179A
LVC-0900	900	1144	538	65	57	242	113,6	97180A
LVC-1000	1000	1277	601	68	59	300	126,0	97181A
LVC-1200	1200	1531	720	73	63	432	192,6	97182A
LVC-1400	1400	1791	843	77	67	590	224,7	97183A
LVC-1600	1600	2045	962	81	70	770	389,0	97184A
LVC-1800	1800	2305	1085	85	73	976	437,4	97185A

Double row steel bearing assembly, highly dynamic Type LVC

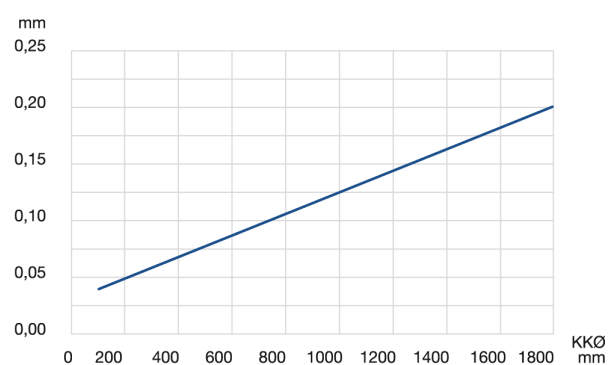
Innovation in Motion



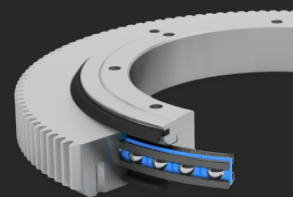
Rotational resistance



Radial and axial runout accuracy



Steel Bearing assembly with external gear Type LVD



Franke LVD bearing assemblies with external gear offer high load capacity and are suitable for medium-high speeds.

Description

Franke bearing assemblies type LVD are ready to install bearing assemblies with external gear, steel housing rings and integrated bearing elements. Franke bearing assemblies type LVD are suitable for medium rotational speeds and accuracies. They can be supplied at short notice, in some cases even from stock. Designed as 4-point bearings, they can support equally high loads from all directions and are insensitive to shocks and vibrations. The bearing elements are sealed on both sides and adjusted to preload.

Properties

Smooth running	● ● ●
Resilience	● ● ● ●
Speed	● ● ● ●
Stiffness	● ● ●
Weight	● ● ●
Price	● ● ●

Technical data

Material

Outer ring: 42CrMo4V

Inner ring: C45N

Ball race rings: hardened and tempered chrome-silicon steel

Rolling element: hardened rolling bearing steel

Cage: polyamide or thermoplastic polyurethane

Sealing: NBR

Gearing

DIN 3967, quality 8e25, straight toothed, module see table below

Operating temperature

-20 °C to +80 °C, short-term up to +100 °C

Peripheral speed

Max. 5 m/s, without seal max. 10 m/s

Lubricant

Shell Gadus S3 V220 C2

Relubrication

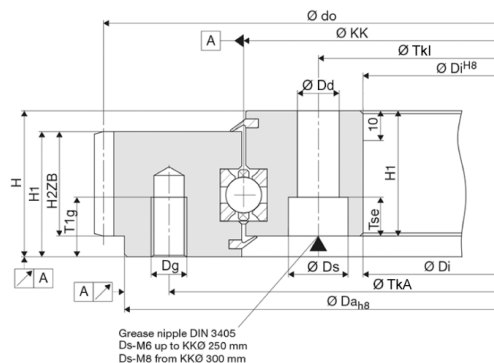
Via grease nipples to DIN 3405

Steel Bearing assembly with external gear Type LVD

Innovation in Motion



Data tables



LVD Table part 1

Name	KKØ mm	Dimensions mm													Attachment per ring
		Ds	Dd	H	H1	H2ZB	Dg	Tse	T1g	Da _{H8}	Di ^{H8}	TkA	Tkl	do	
LVD-0100	100	11	6,6	34 ^{+/-0,4}	27	22	M 6	6,8	10	150	50	135	65	160	6x
LVD-0150	150	11	6,6	34 ^{+/-0,4}	27	22	M 6	6,8	10	200	100	185	115	210	6x
LVD-0200	200	11	6,6	34 ^{+/-0,4}	27	22	M 6	6,8	10	250	150	235	165	260	8x
LVD-0250	250	11	6,6	34 ^{+/-0,4}	27	22	M 6	6,8	10	300	200	285	215	320	10x
LVD-0300	300	15	9,0	38 ^{+/-0,4}	31	26	M 8	9,0	15	360	240	340	260	372	12x
LVD-0350	350	15	9,0	38 ^{+/-0,4}	31	26	M 8	9,0	15	410	290	390	310	423	14x
LVD-0400	400	18	11,0	44 ^{+/-0,5}	37	32	M 10	11,0	15	470	330	445	355	483	14x
LVD-0450	450	18	11,0	44 ^{+/-0,5}	37	32	M 10	11,0	15	520	380	495	405	534	14x
LVD-0500	500	20	14,0	49 ^{+/-0,5}	42	35	M 12	13,0	20	580	420	550	450	594	14x
LVD-0600	600	20	14,0	49 ^{+/-0,5}	42	35	M 12	13,0	20	680	520	650	550	693	16x
LVD-0700	700	20	14,0	53 ^{+/-0,5}	45	38	M 12	13,0	20	790	610	750	650	808	22x
LVD-0800	800	20	14,0	53 ^{+/-0,5}	45	38	M 12	13,0	20	890	710	850	750	920	24x
LVD-0900	900	20	14,0	53 ^{+/-0,5}	45	38	M 12	13,0	20	990	810	950	850	1020	24x
LVD-1000	1000	20	14,0	53 ^{+/-0,5}	45	38	M 12	13,0	20	1090	910	1050	950	1120	26x
LVD-1200	1200	26	18,0	60 ^{+/-0,5}	52	44	M 16	17,5	25	1300	1100	1265	1135	1320	30x
LVD-1400	1400	26	18,0	60 ^{+/-0,5}	52	44	M 16	17,5	25	1500	1300	1465	1335	1520	36x
LVD-1600	1600	26	18,0	90 ^{+/-0,5}	82	69	M 16	17,5	25	1730	1470	1685	1515	1752	42x
LVD-1800	1800	26	18,0	90 ^{+/-0,5}	82	69	M 16	17,5	25	1930	1670	1885	1715	1956	46x

Steel Bearing assembly with external gear Type LVD

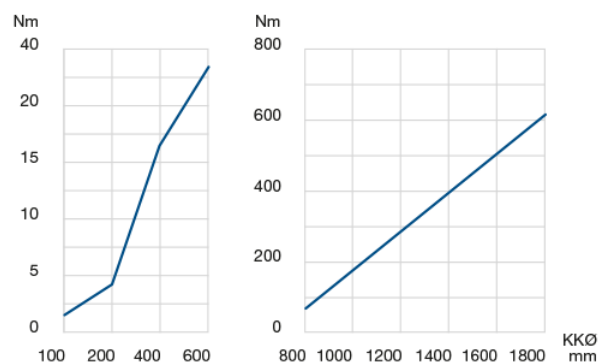
Innovation in Motion



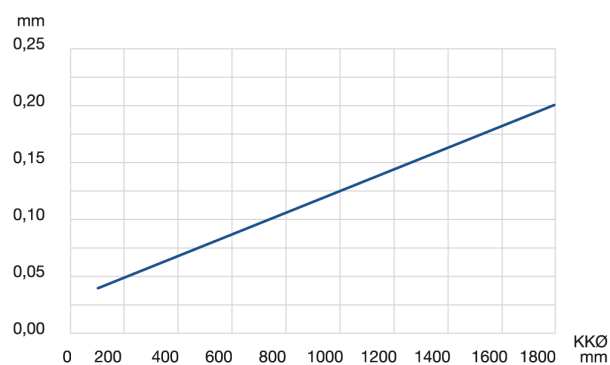
LVD Table part 2

Name	KKØ mm	Load ratings kN				Stat. M. kNm	Gearing		Weight kg	Order no.
		C _{0a}	C _{0r}	C _a	C _r	C _{0m}	Module m	Number of teeth		
LVD-0100	100	54	25	18	15	1	2	80	3,4	97186A
LVD-0150	150	82	39	21	18	3	2	105	5,0	97187A
LVD-0200	200	110	52	23	20	5	2	130	6,7	94119A
LVD-0250	250	138	65	25	22	8	2	160	8,4	97189A
LVD-0300	300	168	79	27	24	12	3	124	14,1	94120A
LVD-0350	350	196	92	29	25	16	3	141	16,5	97191A
LVD-0400	400	419	197	51	44	39	3	161	26,0	94121A
LVD-0450	450	477	225	54	47	51	3	178	29,2	97193A
LVD-0500	500	530	250	56	49	62	3	198	42,4	94117A
LVD-0600	600	636	299	60	52	90	3	231	50,8	94118A
LVD-0700	700	742	349	64	55	122	4	202	73,0	97196A
LVD-0800	800	848	399	67	58	160	5	184	83,2	97197A
LVD-0900	900	954	449	70	60	202	5	204	93,6	97198A
LVD-1000	1000	1065	501	73	63	251	5	224	104,0	97199A
LVD-1200	1200	1677	789	94	81	473	5	264	158,5	97200A
LVD-1400	1400	1956	920	99	86	644	5	304	184,9	97201A
LVD-1600	1600	1984	933	140	121	747	6	292	430,8	97202A
LVD-1800	1800	2234	1050	146	126	946	6	326	484,2	97203A

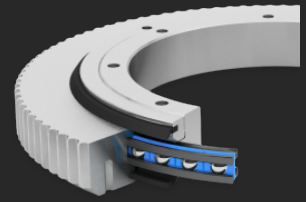
Rotational resistance



Radial and axial runout accuracy



Aluminium Bearing assembly with external gear Type LVE



Franke LVE bearing assemblies with external gear are made of weight-saving aluminium. They offer a high load capacity and are suitable for medium-high speeds.

Description

Franke bearing assemblies type LVE are bearing assemblies with toothed belt gearing, aluminium housing rings and integrated bearing elements. Franke bearing assemblies type LVE are suitable for medium rotational speeds and accuracies. They convince by their low weight and are available at short notice, in some cases even from stock. Designed as 4-point bearings, they can support equally high loads from all directions and are insensitive to shocks and vibrations. The bearing assemblies are sealed on both sides and adjusted to preload.

Properties

Smooth running	● ● ●
Resilience	● ● ● ●
Speed	● ● ● ●
Stiffness	● ● ●
Weight	● ● ● ● ●
Price	● ● ●

Technical data

Material

Inner / Outer ring: aluminium, anodized
Ball race rings: hardened and tempered chrome-silicon steel
Rolling element: hardened rolling bearing steel
Cage: polyamide or thermoplastic polyurethane
Sealing: NBR

Gearing

AT10

Operating temperature

-20 °C to +80 °C, short-term up to +100 °C

Peripheral speed

Max. 5 m/s, without seal max. 10 m/s

Lubricant

Shell Gadus S3 V220 C2

Relubrication

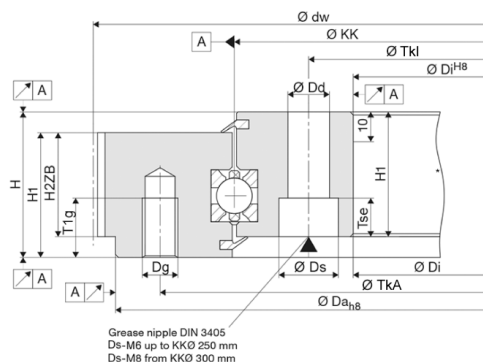
Via grease nipples to DIN 3405

Aluminium Bearing assembly with external gear Type LVE

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Data tables



LVE Table part 1

Name	KKØ mm	Dimensions mm													Attachment per ring
		Ds	Dd	H	H1	H2ZB	Dg	dw	Tse	T1g	Da _{H8}	DI ^{H8}	TkA	Tkl	
LVE-0100	100	11	6,6	34 ^{+/-0,4}	27	22	M 6		6,8	10	150	50	135	65	6x
LVE-0150	150	11	6,6	34 ^{+/-0,4}	27	22	M 6		6,8	10	200	100	185	115	6x
LVE-0200	200	11	6,6	34 ^{+/-0,4}	27	22	M 6		6,8	10	250	150	235	165	8x
LVE-0250	250	11	6,6	34 ^{+/-0,4}	27	22	M 6		6,8	10	300	200	285	215	10x
LVE-0300	300	15	9,0	38 ^{+/-0,4}	31	26	M 8		9,0	15	360	240	340	260	12x
LVE-0350	350	15	9,0	38 ^{+/-0,4}	31	26	M 8		9,0	15	410	290	390	310	14x
LVE-0400	400	18	11,0	44 ^{+/-0,5}	37	32	M 10		11,0	15	470	330	445	355	14x
LVE-0450	450	18	11,0	44 ^{+/-0,6}	37	32	M 10		11,0	15	520	380	495	405	14x
LVE-0500	500	20	14,0	49 ^{+/-0,5}	42	35	M 12		13,0	20	580	420	550	450	14x
LVE-0600	600	20	14,0	49 ^{+/-0,5}	42	35	M 12		13,0	20	680	520	650	550	16x
LVE-0700	700	20	14,0	53 ^{+/-0,5}	45	38	M 12		13,0	20	790	610	750	650	22x
LVE-0800	800	20	14,0	53 ^{+/-0,5}	45	38	M 12		13,0	20	890	710	850	750	24x
LVE-0900	900	20	14,0	53 ^{+/-0,7}	45	38	M 12		13,0	20	990	810	950	850	24x
LVE-1000	1000	20	14,0	53 ^{+/-0,7}	45	38	M 12		13,0	20	1090	910	1050	950	26x
LVE-1200	1200	26	18,0	60 ^{+/-0,5}	52	44	M 16		17,5	25	1300	1100	1265	1135	30x
LVE-1400	1400	26	18,0	60 ^{+/-0,5}	52	44	M 16		17,5	25	1500	1300	1465	1335	36x
LVE-1600	1600	26	18,0	90 ^{+/-0,5}	82	69	M 16		17,5	25	1730	1470	1685	1515	42x
LVE-1800	1800	26	18,0	90 ^{+/-0,5}	82	69	M 16		17,5	25	1930	1670	1885	1715	46x

Aluminium Bearing assembly with external gear Type LVE

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LVE Table part 2

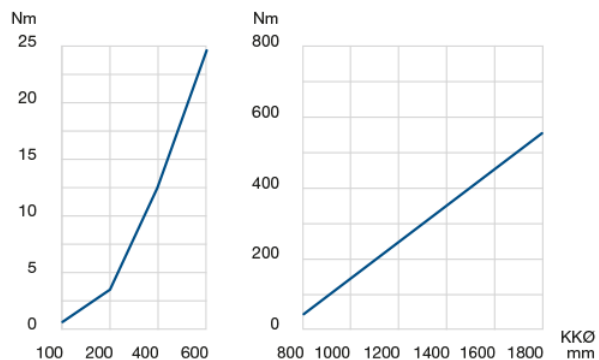
Name	KKØ mm	Load ratings kN				Stat. M. kNm	Effective circle diameter mm		Weight kg	Order no.
		C _{0a}	C _{0r}	C _a	C _r	C _{0m}	AT10	z		
LVE-0100	100	54	25	18	15	1,27	165,52	52	1,2	97131A
LVE-0150	150	82	39	21	18	2,90	216,45	68	1,8	97114A
LVE-0200	200	110	52	23	20	5,18	264,20	83	2,4	97115A
LVE-0250	250	138	65	25	22	8,12	324,68	102	3,0	97116A
LVE-0300	300	168	79	27	24	11,89	378,79	119	5,0	97117A
LVE-0350	350	196	92	29	25	16,18	429,72	135	5,8	97118A
LVE-0400	400	419	197	51	44	39,47	490,20	154	9,5	97119A
LVE-0450	450	477	225	54	47	50,52	541,13	170	10,7	97120A
LVE-0500	500	530	250	56	49	62,36	598,42	188	15,1	97121A
LVE-0600	600	636	299	60	52	89,80	700,28	220	18,2	97122A
LVE-0700	700	742	349	64	55	122,21	814,87	256	25,9	97123A
LVE-0800	800	848	399	67	58	159,61	929,47	292	29,6	97124A
LVE-0900	900	954	449	70	60	202,00	1.028,14	323	33,3	97125A
LVE-1000	1000	1065	501	73	63	250,50	1.126,82	354	37,0	97126A
LVE-1200	1200	1677	789	94	81	473,39	1.330,54	418	59,9	97127A
LVE-1400	1400	1956	920	99	86	644,27	1.527,89	480	69,9	97128A
LVE-1600	1600	1984	933	140	121	747,10	1.763,44	554	161,0	97129A
LVE-1800	1800	2234	1050	146	126	946,00	1.967,16	618	181,0	97130A

Aluminium Bearing assembly with external gear Type LVE

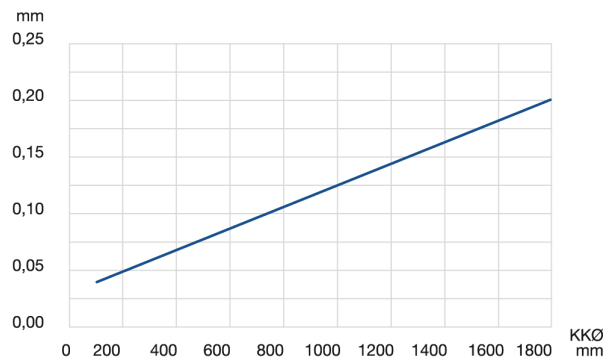
Innovation in Motion



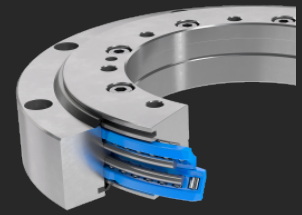
Rotational resistance



Radial and axial accuracy



Aluminium bearing assemblies with rollers, highly loadable Type LVG



Franke LVG bearing assemblies are suitable for the highest load capacities and convince with excellent running smoothness and rigidity.

Description

Franke bearing assemblies type LVG are bearing assemblies made of aluminum, designed as double row angular contact roller bearings with integrated bearing elements. LVG bearing assemblies are suitable for the highest load ratings. They convince by high rigidity, low rotational resistance and low weight. Designed as roller bearings, they can support high loads from all directions and are insensitive to shocks and vibrations. Franke LVG are sealed on both sides and are set with preload. By using aluminum, Franke bearing assemblies type LVG are 60% lighter than comparable steel bearings.

Properties

Smooth running	● ● ● ● ●
Resilience	● ● ● ● ●
Speed	● ● ●
Stiffness	● ● ● ● ●
Weight	● ● ● ● ●
Price	● ●

Technical data

Material

Inner / Outer ring: aluminium, anodized
Ball race rings: hardened and tempered chrome-silicon steel
Rolling element: hardened rolling bearing steel
Cage: polyamide or thermoplastic polyurethane
Sealing: NBR

Operating temperature

-20 °C to +80 °C, short-term up to +100 °C

Peripheral speed

Max. 4 m/s

Lubricant

Shell Gadus S3 V220 C2

Relubrication

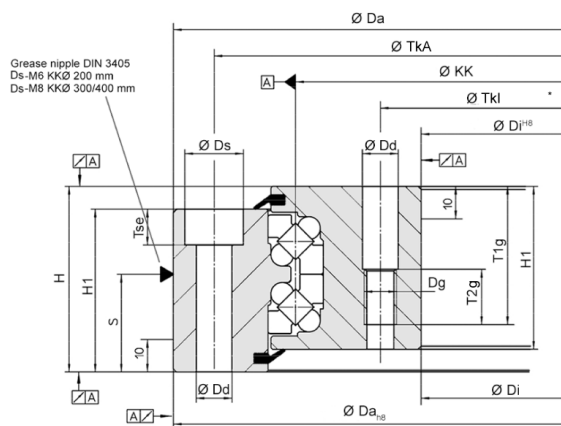
Via grease nipples to DIN 3405

Aluminium bearing assemblies with rollers, highly loadable Type LVG

Innovation in Motion



Data tables



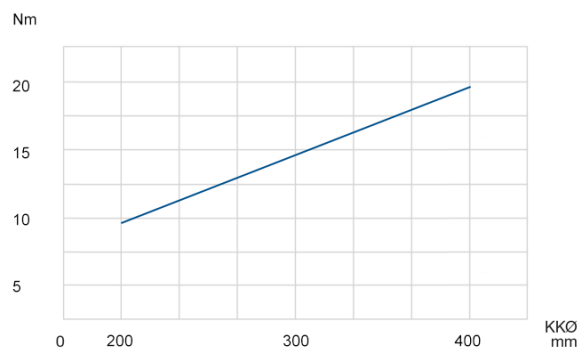
LVG Table part 1

Name	KKØ mm	Dimensions mm												Attachment per ring
		Ds	Dd	H	H1	Dg	Tse	T1g	T2g	Da _{H8}	Di ^{H8}	TkA	Tkl	
LVG-200	200	15	9	47	40	M 8	9	35	15	262	140	243	159	8x
LVG-300	300	18	11	57	50	M 10	11	43	17	375	223	350	248	10x
LVG-400	400	18	11	57	50	M 10	11	43	17	475	323	450	348	14x

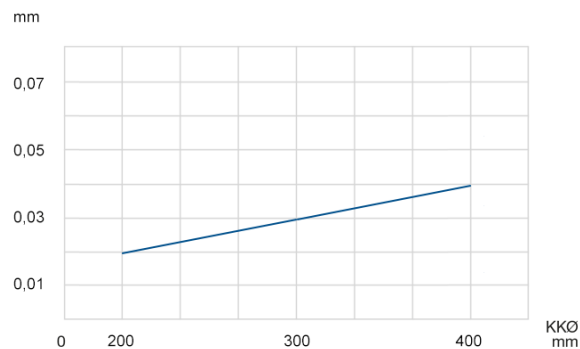
LVG Table part 2

Name	KKØ mm	Load ratings kN				Stat. M. N	Weight kg	Order no.
		C _{0a}	C _{0r}	C _a	C _r	C _{0m}		
LVG-200	200	309	124	39	36	12.400	4,1	604617
LVG-300	300	617	247	78	72	37.050	9,3	606236
LVG-400	400	827	331	90	83	66.200	12,4	604618

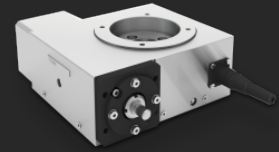
Rotational resistance



Radial and axial runout accuracy



Rotary table, high dynamic Type LTA



Franke rotary tables LTA are particularly suitable for dynamic applications in the fields of machining, handling and assembly.

Description

Franke rotary tables type LTA are light, compact, ready to install positioning units for speeds up to 100 rpm. They are highly loadable and have excellent concentricity and axial run-out accuracy. Rotary tables LTA are versatile and are particularly suitable for light machining tasks as well as dynamic handling and assembly applications.

Properties

Accuracy	● ● ● ●
Speed	● ●
Ø-Range	● ●
Price	● ● ● ● ●

Technical data

Material

Base plate: Aluminium

Housing: V2A

Ball race rings: hardened and tempered chrome-silicon steel

Rolling element: hardened rolling bearing steel

Worm wheel: Wear-resistant bronze alloy

Worm shaft: CK45N hardened and grinded

Operating temperature

-10 °C to +80 °C

Rotational speed

Max. 100 min⁻¹

Mounting position

Any, preferably horizontal

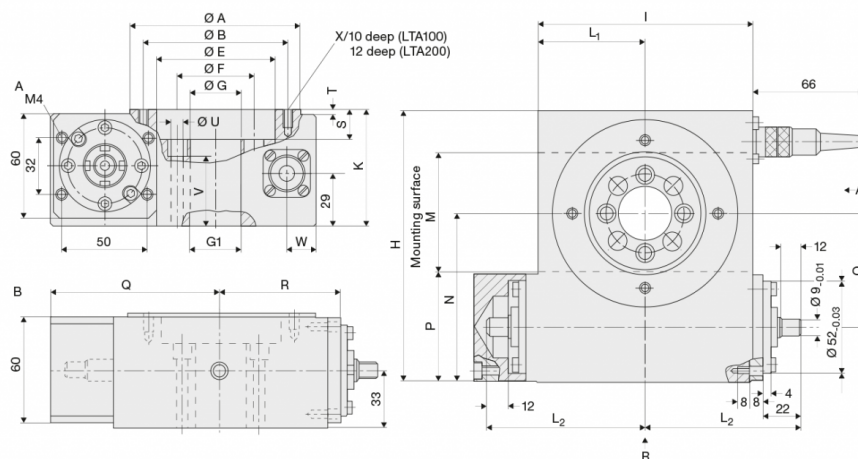
Lubricant

With bearing grease via grease nipples

Options

Inductive proximity switch, flange/coupling to mount the motor, motorization

Data tables



LTA Table part 1

Name	Nominal Ø mm	Dimensions mm									
	A	B	ØE ^{H7} _{6 tief}	ØF	ØG	ØG ₁ ^{H7} _{12 tief}	H	I	K	L ₁	L ₂
LTA-0100	100	85	70	45	30	30	155	125	65	62,5	91,5
LTA-0200	200	175	160	130	110	110	255	220	70	110,0	139,0

LTA Table part 2

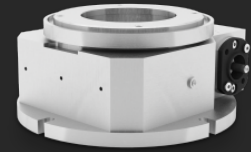
Name	Nominal Ø mm	Load ratings KN		Dimensions mm										
		C ₀	C	M	N	P	Q	R	S	T	U	V	W	X
LTA-0100	100	17,5	9	70	96,0	61	99,5	69,5	17	2	4xØ6,6	39	17	4xM6
LTA-0200	200	43,0	18	165	145,5	63	147,0	117,0	22	7	6xØ9,0	39	22	6xM8

LTA Table part 3

Name	Nominal Ø mm	Tilting moments Nm	Input speed rpm	Reduction ratio	Output speed rpm	Weight kg	Order no.
	A	C _{0m}	N _{1max}	i	N _{2max}		
LTA-0100	100	289	1800	18	100	5,5	91800A
LTA-0200	200	433	2200	36	61	10,0	91801A

Performance Overview			LTA-0100	LTA-0200
Reduction			18:1	36:1
Input torque	M _{1max}	Nm	5	5
Output torque	M _{2max}	Nm	54	108
Axial / radial accuracy		µm	30	30
Positioning accuracy		sec	160	120
Repeatability		sec	20	14

Rotary table, high precision Type LTB



Franke rotary tables LTB impress with their excellent angular accuracy and high resolution. This makes them particularly suitable for tasks in the fields of measuring, testing and orientation.

Description

Franke rotary tables of type LTB are centerless, ready to install positioning units. The housing is made of light aluminium. Franke LTB are highly loadable and have an excellent angular accuracy and resolution. They can be used in a wide range of applications and are particularly suitable for movement and positioning tasks in the field of measuring, testing and orientation.

Properties

Accuracy	● ● ● ● ●
Speed	● ● ●
Ø-Range	● ● ●
Price	● ● ● ●

Technical data

Material

Housing: Aluminium ribbed
 Ball race rings: hardened and tempered chrome-silicon steel
 Rolling element: hardened rolling bearing steel
 Worm wheel: Wear-resistant bronze alloy
 Worm shaft: CK45N hardened and grinded

Operating temperature

-10 °C to +80 °C

Rotational speed

Max. 7 min⁻¹

Mounting position

Any, preferably horizontal

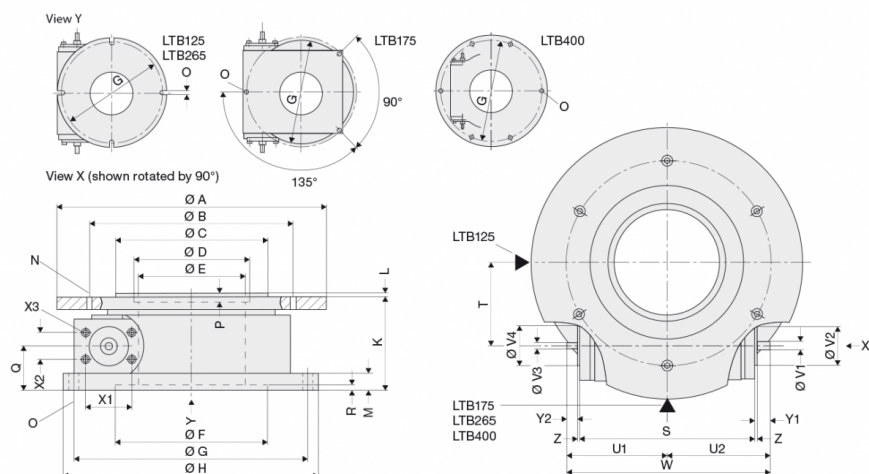
Lubricant

With bearing grease via grease nipples

Options

Inductive proximity switch, flange/coupling to mount the motor, motorization

Data tables



LTB Table part 1

Name	Nominal Ø mm	Dimensions mm										
	A	B	C ^{g6}	D ^{H7}	E	F ^{H7}	G	H	K	L	M	N
LTB-0125	125	100	-	70	70	100	150	165	75	-	10	4xM5
LTB-0175	175	126	-	102	70	102	178	-	82	-	12	6xM6
LTB-0265	265	200	150	-	105	150	230	250	90	4	16	6xM10
LTB-0400	400	340	300	200	190	270	380	400	100	4	16	6xM10

LTB Table part 2

Name	Nominal Ø mm	Load ratings KN		Dimensions mm												
	A	C ₀	C	O	P	Q	R	S	T	U1	U2	V ^{1g6}	V ^{2g6}	V ^{3g6}	V ^{4g6}	W
LTB-0125	125	2,0		4x7,0	5	34	5	112	60	67,5	67,5	6	22	6	22	135
LTB-0175	175	2,6		3x6,6	4	31	4	152	63	98,0	98,0	6	52	6	52	196
LTB-0265	265	4,2		4x10,0	-	43	5	171	81	95,0	98,0	8	38	6	38	193
LTB-0400	400	14,1		6x11,0	5	43	5	229	139	124,0	127,0	8	38	6	38	251

LTB Table part 3

Name	Nominal Ø mm	Tilting moments Nm	Input speed rpm	Reduction ratio	Output speed rpm	Weight kg	Order no.
	A	C _{0m}	N _{1max}	i	N _{2max}		
LTB-0125	125	110	2500	360	7	3,0	91042A
LTB-0175	175	140	2500	360	7	6,0	91043A
LTB-0265	265	310	2500	360	7	10,0	91044A
LTB-0400	400	1780	2500	360	7	27,0	91045A

Performance overview			LTB-0125	LTB-0175	LTB-0265	LTB-0400
Reduction			360:1	360:1	360:1	360:1
Input torque	M _{1max}	Nm	0,7	0,9	1,5	2,0
Output torque	M _{2max}	Nm	70	75	160	290
Axial- / radial accuracy		µm	20	20	20	30
Positioning accuracy		sec	80	80	70	50
Repeatability		sec	16	14	10	8

Bearing assembly with Torque-Motor Type LTD



Franke bearing assemblies with integrated direct drive (torque motor) are characterized by high dynamics, maximum energy efficiency and a compact installation space combined with center-free design.

Description

Bearing assemblies with direct drive are suitable for applications where high performance and low space requirements are important criteria. The integration of the drive into the bearing housing means that wear-prone assemblies for transmitting drive power, such as toothed belts, shafts or chains, can be dispensed with. This reduces the required drive energy and also benefits more accurate positioning.

Properties

Accuracy	● ● ● ●
Speed	● ● ● ● ●
Ø-Range	● ● ●
Price	● ● ●

Technical data

Material

C45N (optionally aluminium)

Operating temperature

-10 °C to +80 °C

Mounting position

Any

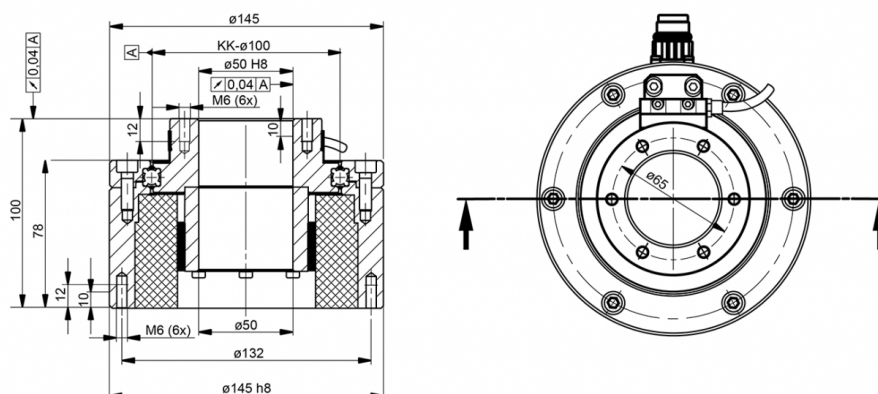
Lubricant

With bearing grease via grease nipple

Options

Absolute measuring system, axial cable outlet, control units
incl. cables, water-cooling

Data tables



LTD0100

Name	□□Ø mm	Load ratings kN				Torque Nm		Power A		Speed 1/min.	Weight kg	Order no.
		C _{0a}	C _{0r}	C _a	C _r	M _{Nom}	M _{Peak}	I _{Nom}	I _{Peak}	n _{max}		
LTD-0100	100	46	22	17	14	4,5	16	1,8	7	2140	8,0	609818

Power comparison

LTD-0100

LTD-0215

LTD-0320

LTD-0385

Nominal Data (free air convection)

Nominal Torque	T _{NomAC}	Nm	4,5	26,4	77	118
Nominal Current	I _{NomAC}	A _{rms}	1,8	3,1	4,3	4,3
Nominal Speed	n _{NomACLk}	rpm	2140	640	299	193
Nominal Power	NomAC	W	1005	1770	2409	2386
Winding Losses ¹	PV _{DAC}	W	54	131	230	309
Total Losses ²	PD _{AC}	W	96	179	295	357
Holding Torque	TH _{AC}	Nm	3,2	18,7	54	83
Holding Current	IH _{AC}	A _{rms}	1,2	2,2	3	3

Peak Data

Peak Torque	T _{Peak}	Nm	16	105	329	522
Peak Current	I _{Peak}	A _{rms}	7	12,8	21,6	21,7
Speed at Peak Torque	n _{Peak}	rpm	1130	320	126	74

Bearing assembly with Torque-Motor Type LTD

Innovation in Motion



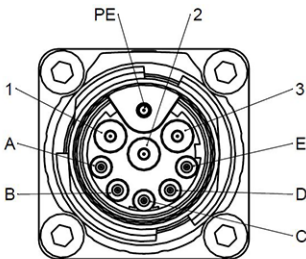
Power comparison			LTD-0100	LTD-0215	LTD-0320	LTD-0385
Peak Power	P_{Peak}	W	1897	3526	4343	4049
Winding Losses ¹	P_{Peak}	W	863	2236	5886	7876
Total Losses ²	PD_{Peak}	W	877	2253	5904	7889

Power Data						
Torque Constant	kt	Nm/A _{rms}	2,549	8,51	18,037	27,449
		V _{rms} /(rad/s)	1,577	5,2	11,094	16,694
BEMF Constant (Phase - Phase)	ke	V _{rms} /(rpm)	0,165	0,545	1,162	1,748
Motor Constant	km	Nm/vW	0,459	1,973	4,483	6,25
Idle Speed	n _{idle}	rpm	2390	727	340	226
max. Speed (Fieldweaking)	n _{max}	rpm	-	-	-	-
max. Frequency (Idle/Fieldweaking)	f _{max}	Hz	398	254	159	124
DC Bus Voltage	UDC	VDC	560	560	560	560
Ø Resistance per Phase (winding only)	RPh20	Ω	4,419	3,457	3,206	4,235
Ø Inductance per Phase (winding only)	LPh	mH	21,727	19,532	21,071	28,049
electr. Time Constant t=L/R	Tel	ms	4,92	5,65	6,57	6,62
Number of Polepairs	n		10	21	28	33
Winding Connection			Star	Star	Star	Star

Measuring System				
Measuring Method	incremental			
Reference mark	single coded			
Measuring principle	inductive			
Interface	1 Vss			
Cable length	1 m			
Grating period	1000 µm			
Line count	256	640	938	1200
Interpolation	10-fold			
Number of signal periods	2560	6400	9380	12000
Position error per grating period	±11"	±4,5"	±3"	±2,5"
Grating period accuracy (±10µm arc length)	±51"	±20"	±14"	±11"
Max. scanning frequency	40 kHz			
Voltage supply	4V to 7V DC			
Electrical connection	cable with M23, 12 pin male			

Pin assignment motor

Socket 917, M17x1 (9-pin)

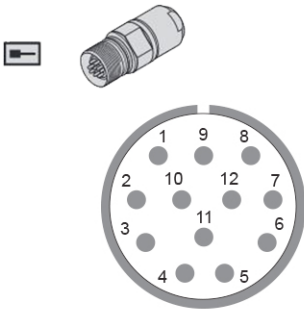


Pin assignment

PIN	Signal	PIN	Signal	
1	Phase U	A	PT1000	
2	Phase V	B	PT1000	
3	Phase W	C	PTC 120°	
PE	protective conductor	D	PTC 120°	
		E	free	

Pin assignment measuring system

03S12 12-pin coupling M23



Pin assignment

Power supply		Incremental signals		Other signals	
12	Up	5	A+	/	free
2	Sensor Up	6	A-	7	Diag+
10	0 V	8	B+	9	Diag-
11	Sensor 0 V	1	B-		
		3	R+		
		4	R-		

Annotations

¹Winding Losses are referred to a Coil Temperature of 100°C.

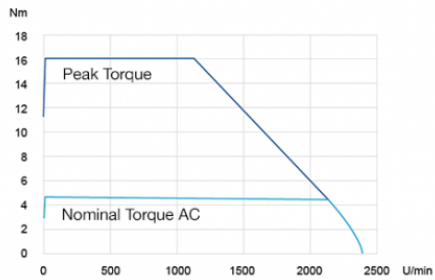
² The total Losses are made up of: Winding Losses; Stator Iron Losses; Rotor Losses;
Calculation of total Losses: Winding Losses + Stator Iron Losses (at speed X) + Rotor Losses (at speed X)

Ensure that your servo drive can handle the Nominal- and Peakcurrent of the Motor. An adjustment of the Speed and DC Bus Voltage can be done after consultation. The nominal data in this datasheet are based on an ambient/coolant temperature of 20°C. The stated nominal Torques are without consideration of friction losses through Bearings or Sealings.

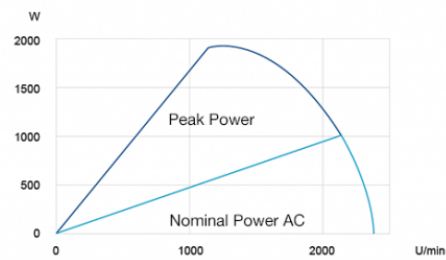
Because the exact duty type depends also on the thermal connection of the motor, the embedded thermal monitoring system has to be analysed and attended. However, attention has to be payed that the temperature sensors do not show the exact temperature of the winding and this could be up to 20 K higher due to thermal capacities. Despite an electrical insulation towards the winding, you are only allowed to connect the sensors to your controller by using a galvanic separation in between.

Power Graphs

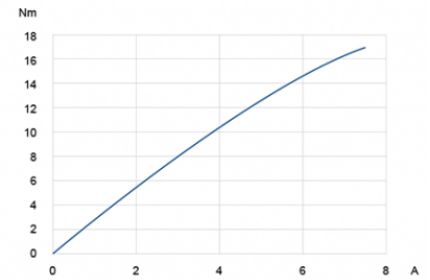
Speed-Torque-Graph



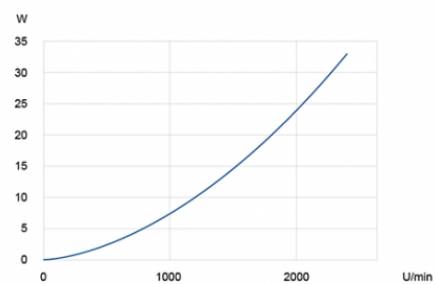
Speed-Power-Graph



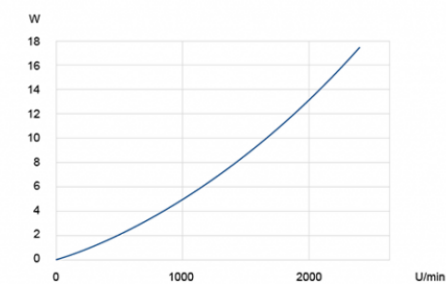
Current-Torque-Graph



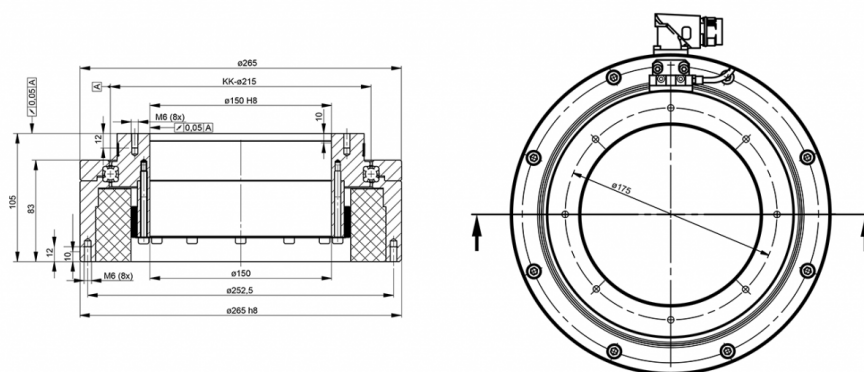
Stator Iron Losses



Rotor Losses



Data tables



LTD0215

Name	□□Ø mm	Load ratings kN				Torque Nm		Power A		Speed 1/min.	Weight kg	Order no.
		C _{0a}	C _{0r}	C _a	C _r	M _{Nom}	M _{Peak}	I _{Nom}	I _{Peak}	n _{max}		
LTD-0215	215	128	60	26	22	26,4	105	3,1	12,8	640	21,0	609885

Power comparison

LTD-0100

LTD-0215

LTD-0320

LTD-0385

Nominal Data (free air convection)

Nominal Torque	T _{NomAC}	Nm	4,5	26,4	77	118
Nominal Current	I _{NomAC}	A _{rms}	1,8	3,1	4,3	4,3
Nominal Speed	n _{NomAC}	rpm	2140	640	299	193
Nominal Power	P _{NomAC}	W	1005	1770	2409	2386
Winding Losses ¹	P _W	W	54	131	230	309
Total Losses ²	P _T	W	96	179	295	357
Holding Torque	T _H	Nm	3,2	18,7	54	83
Holding Current	I _H	A _{rms}	1,2	2,2	3	3

Peak Data

Peak Torque	T _{Peak}	Nm	16	105	329	522
Peak Current	I _{Peak}	A _{rms}	7	12,8	21,6	21,7
Speed at Peak Torque	n _{Peak}	rpm	1130	320	126	74

Bearing assembly with Torque-Motor Type LTD

Innovation in Motion



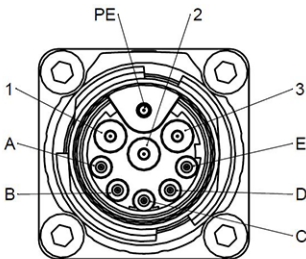
Power comparison			LTD-0100	LTD-0215	LTD-0320	LTD-0385
Peak Power	P_{Peak}	W	1897	3526	4343	4049
Winding Losses ¹	P_{Peak}	W	863	2236	5886	7876
Total Losses ²	PD_{Peak}	W	877	2253	5904	7889

Power Data						
Torque Constant	kt	Nm/A _{rms}	2,549	8,51	18,037	27,449
		V _{rms} /(rad/s)	1,577	5,2	11,094	16,694
BEMF Constant (Phase - Phase)	ke	V _{rms} /(rpm)	0,165	0,545	1,162	1,748
Motor Constant	km	Nm/vW	0,459	1,973	4,483	6,25
Idle Speed	n _{idle}	rpm	2390	727	340	226
max. Speed (Fieldweaking)	n _{max}	rpm	-	-	-	-
max. Frequency (Idle/Fieldweaking)	f _{max}	Hz	398	254	159	124
DC Bus Voltage	UDC	VDC	560	560	560	560
Ø Resistance per Phase (winding only)	RPh20	Ω	4,419	3,457	3,206	4,235
Ø Inductance per Phase (winding only)	LPh	mH	21,727	19,532	21,071	28,049
electr. Time Constant t=L/R	Tel	ms	4,92	5,65	6,57	6,62
Number of Polepairs	n		10	21	28	33
Winding Connection			Star	Star	Star	Star

Measuring System				
Measuring Method	incremental			
Reference mark	single coded			
Measuring principle	inductive			
Interface	1 Vss			
Cable length	1 m			
Grating period	1000 µm			
Line count	256	640	938	1200
Interpolation	10-fold			
Number of signal periods	2560	6400	9380	12000
Position error per grating period	±11"	±4,5"	±3"	±2,5"
Grating period accuracy (±10µm arc length)	±51"	±20"	±14"	±11"
Max. scanning frequency	40 kHz			
Voltage supply	4V to 7V DC			
Electrical connection	cable with M23, 12 pin male			

Pin assignment motor

Socket 917, M17x1 (9-pin)

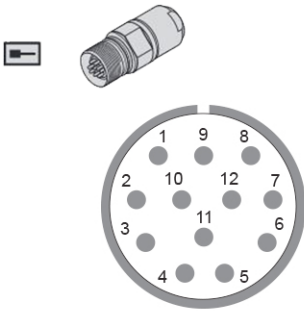


Pin assignment

PIN	Signal	PIN	Signal	
1	Phase U	A	PT1000	
2	Phase V	B	PT1000	
3	Phase W	C	PTC 120°	
PE	protective conductor	D	PTC 120°	
		E	free	

Pin assignment measuring system

03S12 12-pin coupling M23



Pin assignment

Power supply		Incremental signals		Other signals	
12	Up	5	A+	/	free
2	Sensor Up	6	A-	7	Diag+
10	0 V	8	B+	9	Diag-
11	Sensor 0 V	1	B-		
		3	R+		
		4	R-		

Annotations

¹Winding Losses are referred to a Coil Temperature of 100°C.

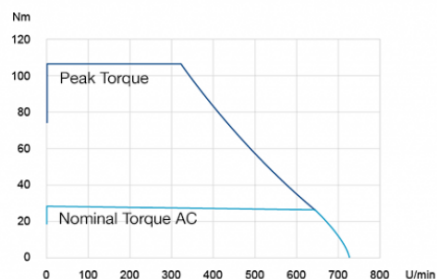
² The total Losses are made up of: Winding Losses; Stator Iron Losses; Rotor Losses;
Calculation of total Losses: Winding Losses + Stator Iron Losses (at speed X) + Rotor Losses (at speed X)

Ensure that your servo drive can handle the Nominal- and Peakcurrent of the Motor. An adjustment of the Speed and DC Bus Voltage can be done after consultation. The nominal data in this datasheet are based on an ambient/coolant temperature of 20°C. The stated nominal Torques are without consideration of friction losses through Bearings or Sealings.

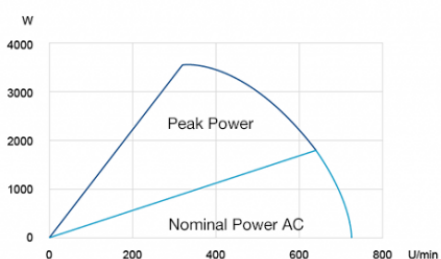
Because the exact duty type depends also on the thermal connection of the motor, the embedded thermal monitoring system has to be analysed and attended. However, attention has to be payed that the temperature sensors do not show the exact temperature of the winding and this could be up to 20 K higher due to thermal capacities. Despite an electrical insulation towards the winding, you are only allowed to connect the sensors to your controller by using a galvanic separation in between.

Power Graphs

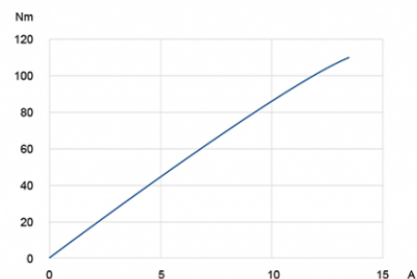
Speed-Torque-Graph



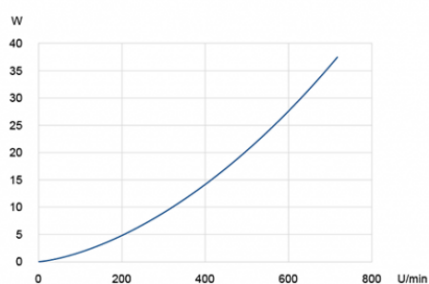
Speed-Power-Graph



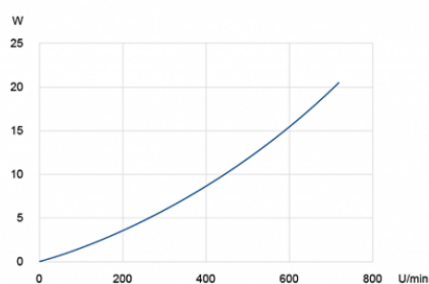
Current-Torque-Graph



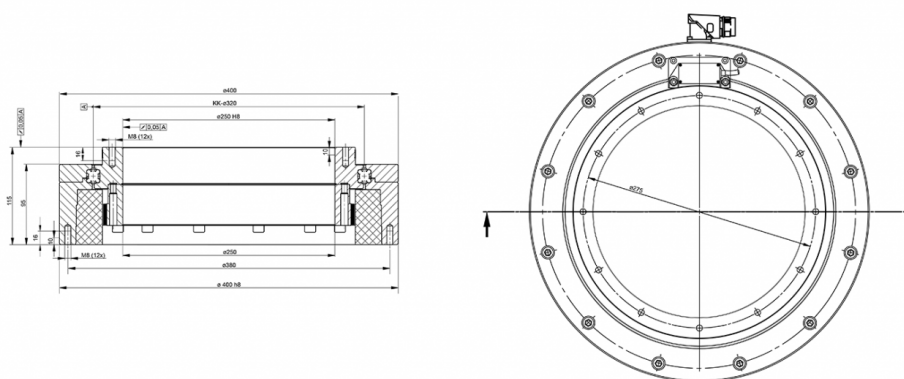
Stator Iron Losses



Rotor Losses



Data tables



LTD0320

Name	□□Ø mm	Load ratings kN				Torque Nm		Power A		Speed 1/min.	Weight kg	Order no.
		C _{0a}	C _{0r}	C _a	C _r	M _{Nom}	M _{Peak}	I _{Nom}	I _{Peak}	n _{max}		
LTD-0320	320	382	180	45	39	77	329	4,3	21,6	300	44,0	609886

Power comparison

LTD-0100

LTD-0215

LTD-0320

LTD-0385

Nominal Data (free air convection)

Nominal Torque	T _{NomAC}	Nm	4,5	26,4	77	118
Nominal Current	I _{NomAC}	A _{rms}	1,8	3,1	4,3	4,3
Nominal Speed	n _{NomAC}	rpm	2140	640	299	193
Nominal Power	P _{NomAC}	W	1005	1770	2409	2386
Winding Losses ¹	P _W	W	54	131	230	309
Total Losses ²	P _T	W	96	179	295	357
Holding Torque	T _H	Nm	3,2	18,7	54	83
Holding Current	I _H	A _{rms}	1,2	2,2	3	3

Peak Data

Peak Torque	T _{Peak}	Nm	16	105	329	522
Peak Current	I _{Peak}	A _{rms}	7	12,8	21,6	21,7
Speed at Peak Torque	n _{Peak}	rpm	1130	320	126	74

Bearing assembly with Torque-Motor Type LTD

Innovation in Motion



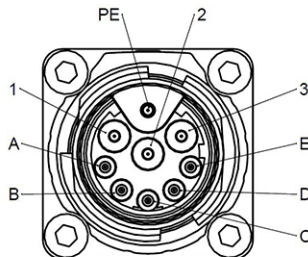
Power comparison			LTD-0100	LTD-0215	LTD-0320	LTD-0385
Peak Power	P_{Peak}	W	1897	3526	4343	4049
Winding Losses ¹	P_{Peak}	W	863	2236	5886	7876
Total Losses ²	PD_{Peak}	W	877	2253	5904	7889

Power Data						
Torque Constant	kt	Nm/A _{rms}	2,549	8,51	18,037	27,449
		V _{rms} /(rad/s)	1,577	5,2	11,094	16,694
BEMF Constant (Phase - Phase)	ke	V _{rms} /(rpm)	0,165	0,545	1,162	1,748
Motor Constant	km	Nm/vW	0,459	1,973	4,483	6,25
Idle Speed	n _{idle}	rpm	2390	727	340	226
max. Speed (Fieldweaking)	n _{max}	rpm	-	-	-	-
max. Frequency (Idle/Fieldweaking)	f _{max}	Hz	398	254	159	124
DC Bus Voltage	UDC	VDC	560	560	560	560
Ø Resistance per Phase (winding only)	RPh20	Ω	4,419	3,457	3,206	4,235
Ø Inductance per Phase (winding only)	LPh	mH	21,727	19,532	21,071	28,049
electr. Time Constant t=L/R	Tel	ms	4,92	5,65	6,57	6,62
Number of Polepairs	n		10	21	28	33
Winding Connection			Star	Star	Star	Star

Measuring System				
Measuring Method	incremental			
Reference mark	single coded			
Measuring principle	inductive			
Interface	1 Vss			
Cable length	1 m			
Grating period	1000 µm			
Line count	256	640	938	1200
Interpolation	10-fold			
Number of signal periods	2560	6400	9380	12000
Position error per grating period	±11"	±4,5"	±3"	±2,5"
Grating period accuracy (±10µm arc length)	±51"	±20"	±14"	±11"
Max. scanning frequency	40 kHz			
Voltage supply	4V to 7V DC			
Electrical connection	cable with M23, 12 pin male			

Pin assignment motor

Socket 917, M17x1 (9-pin)

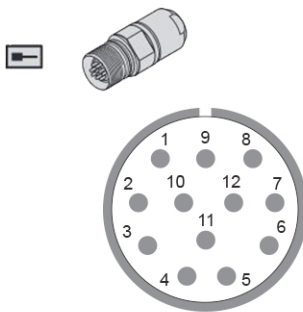


Pin assignment

PIN	Signal	PIN	Signal
1	Phase U	A	PT1000
2	Phase V	B	PT1000
3	Phase W	C	PTC 120°
PE	protective conductor	D	PTC 120°
		E	free

Pin assignment measuring system

03S12 12-pin coupling M23



Pin assignment

Power supply	Incremental signals	Other signals
12 Up	5 A+	/ free
2 Sensor Up	6 A-	7 Diag+
10 0 V	8 B+	9 Diag-
11 Sensor 0 V	1 B-	
	3 R+	
	4 R-	

Annotations

¹ Winding Losses are referred to a Coil Temperature of 100°C.

² The total Losses are made up of: Winding Losses; Stator Iron Losses; Rotor Losses;

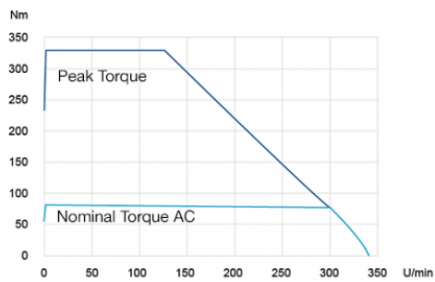
Calculation of total Losses: Winding Losses + Stator Iron Losses (at speed X) + Rotor Losses (at speed X)

Ensure that your servo drive can handle the Nominal- and Peakcurrent of the Motor. An adjustment of the Speed and DC Bus Voltage can be done after consultation. The nominal data in this datasheet are based on an ambient/coolant temperature of 20°C. The stated nominal Torques are without consideration of friction losses through Bearings or Sealings.

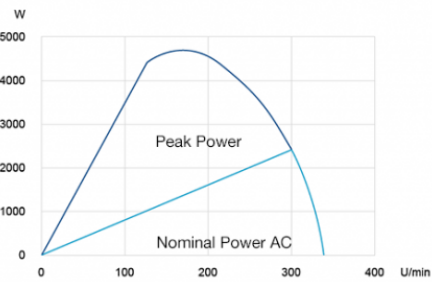
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Power Graphs

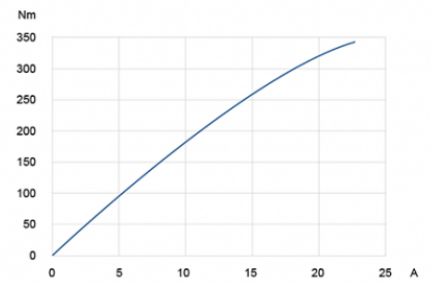
Speed-Torque-Graph



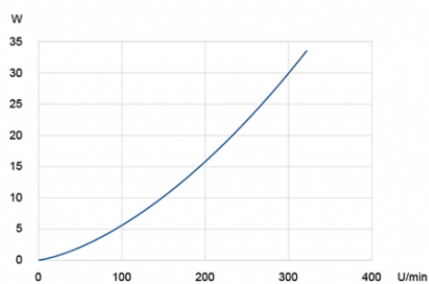
Speed-Power-Graph



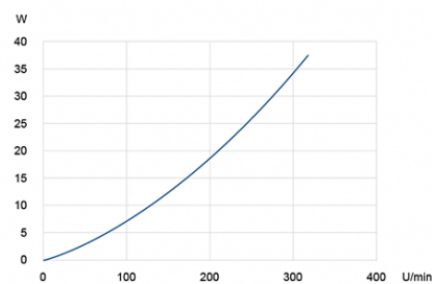
Current-Torque-Graph



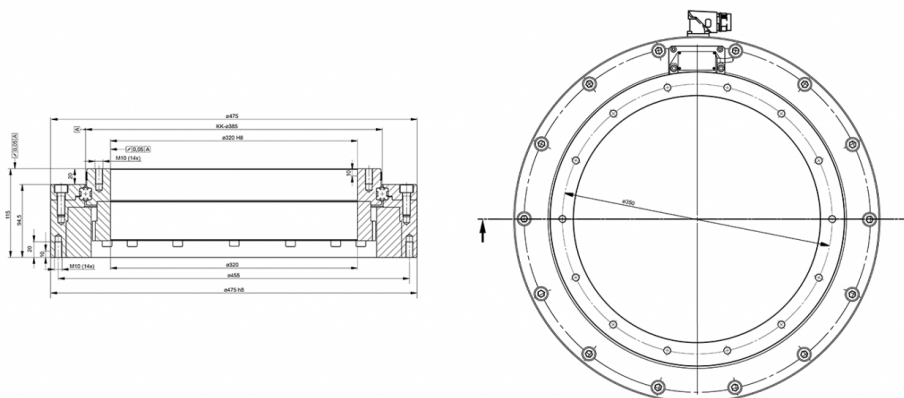
Stator Iron Losses



Rotor Losses



Data tables



LTD0385

Name	□□Ø mm	Load ratings kN				Torque Nm		Power A		Speed 1/min.	Weight kg	Order no.
		C _{0a}	C _{0r}	C _a	C _r	M _{Nom}	M _{Peak}	I _{Nom}	I _{Peak}	n _{max}		
LTD-0385	385	458	216	48	41	118	522	4,3	21,7	193	57,0	609913

Power comparison

LTD-0100

LTD-0215

LTD-0320

LTD-0385

Nominal Data (free air convection)

Nominal Torque	T _{NomAC}	Nm	4,5	26,4	77	118
Nominal Current	I _{NomAC}	A _{rms}	1,8	3,1	4,3	4,3
Nominal Speed	n _{NomAC}	rpm	2140	640	299	193
Nominal Power	P _{NomAC}	W	1005	1770	2409	2386
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Total Losses ²	P _T	W	96	179	295	357
Holding Torque	T _H	Nm	3,2	18,7	54	83
Holding Current	I _H	A _{rms}	1,2	2,2	3	3

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Peak Torque	T _{Peak}	Nm	16	105	329	522
Peak Current	I _{Peak}	A _{rms}	7	12,8	21,6	21,7
Speed at Peak Torque	n _{Peak}	rpm	1130	320	126	74

Bearing assembly with Torque-Motor Type LTD

Innovation in Motion



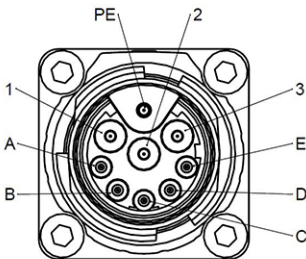
Power comparison			LTD-0100	LTD-0215	LTD-0320	LTD-0385
Peak Power	P_{Peak}	W	1897	3526	4343	4049
Winding Losses ¹	P_{Peak}	W	863	2236	5886	7876
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DC Bus Voltage	UDC	VDC	560	560	560	560
Ø Resistance per Phase (winding only)	RPh20	Ω	4,419	3,457	3,206	4,235
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Number of Polepairs	n		10	21	28	33
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Reference mark	single coded			
Measuring principle	inductive			
Interface	1 Vss			
Cable length	1 m			
Grating period	1000 µm			
Line count	256	640	938	1200
Interpolation	10-fold			
Number of signal periods	2560	6400	9380	12000
Position error per grating period	±11"	±4,5"	±3"	±2,5"
Grating period accuracy (±10µm arc length)	±51"	±20"	±14"	±11"
Max. scanning frequency	40 kHz			
Voltage supply	4V to 7V DC			
Electrical connection	cable with M23, 12 pin male			

Pin assignment motor

Socket 917, M17x1 (9-pin)

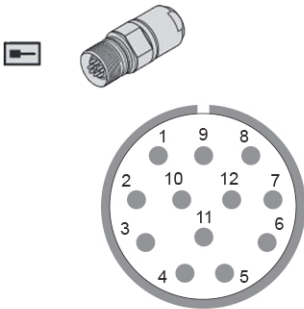


Pin assignment

PIN	Signal	PIN	Signal	
1	Phase U	A	PT1000	
2	Phase V	B	PT1000	
3	Phase W	C	PTC 120°	
PE	protective conductor	D	PTC 120°	
		E	free	

Pin assignment measuring system

03S12 12-pin coupling M23



Pin assignment

Power supply		Incremental signals		Other signals	
12	Up	5	A+	/	free
2	Sensor Up	6	A-	7	Diag+
10	0 V	8	B+	9	Diag-
11	Sensor 0 V	1	B-		
		3	R+		
		4	R-		

Annotations

¹Winding Losses are referred to a Coil Temperature of 100°C.

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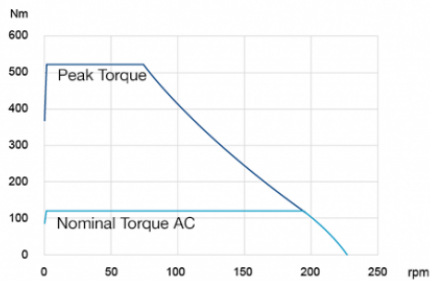
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Bearing assembly with Torque-Motor Type LTD

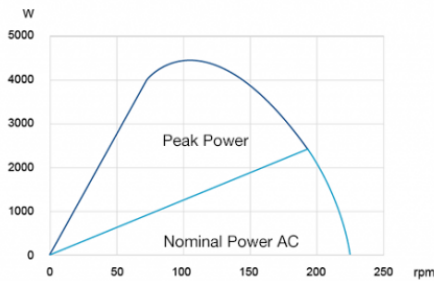
Innovation in Motion



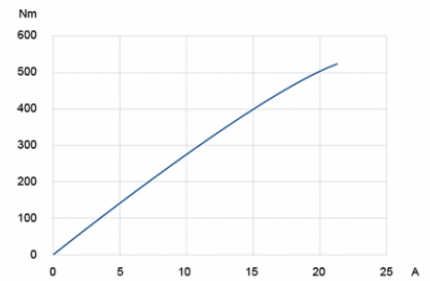
Speed-Torque-Graph



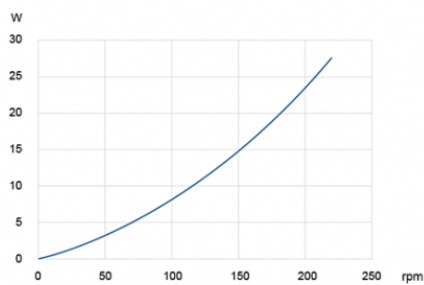
Speed-Power-Graph



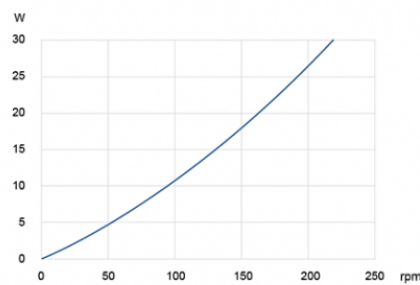
Current-Torque-Graph



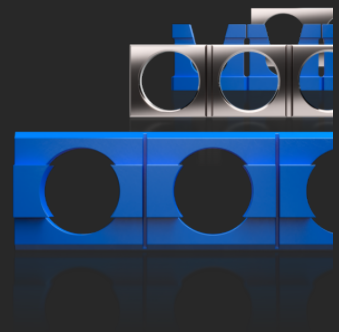
Stator Iron Losses



Rotor Losses

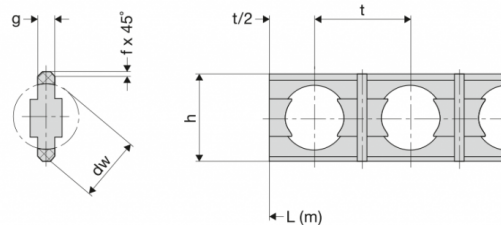


Cages



Band cages of series LBK

The band cage is supplied segmented in the respective required length and fitted with balls ready for installation. The number of segments depends on the bearing diameter and the ball size. For special applications, the band cage can also be supplied as a single piece.



Band cages of series LBK

Cage size	dw		Dimensions mm				Order no.
	mm	Inch	h	g	t	f	
LBK5	5,0	3/16	7,6	1,5	7,5	0,4	78916A
LBK6	6,0		8,6	1,6	9,2	0,4	78917A
LBK8	8,0	5/16	10,6	2,0	12,0	0,6	78918A
LBK9,5	9,5	3/8	12,6	2,5	14,0	0,7	78920A

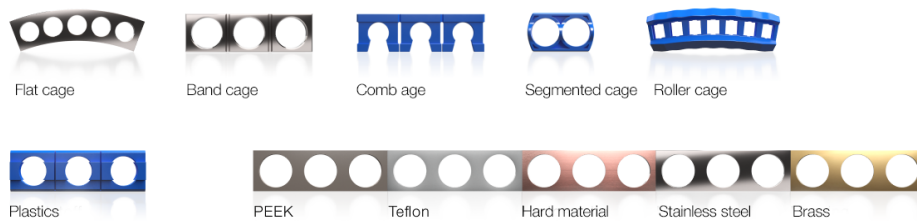
Band cages of series LBK

Cage size	dw		Dimensions mm				Order no.
	mm	Inch	h	g	t	f	
LBK10	10,0		13,2	2,5	14,0	0,7	78921A
LBK11	11,0		13,2	2,5	14,0	0,7	78922A
LBK12V	12,0		17,0	3,5	14,0	0,7	600997
LBK15	15,0		18,6	3,0	18,6	0,7	78924A
LBK16	16,0		19,6	3,0	20,0	0,7	78925A
LBK20	20,0	25/32	24,2	3,5	26,0	0,7	78926A

Special Cages

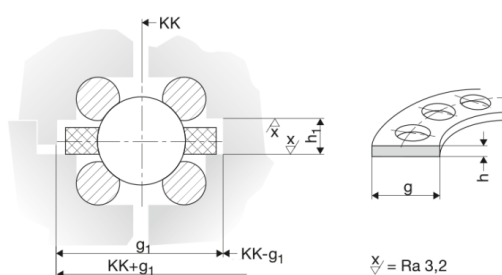
Special cages in the form of band or comb cages are available for special requirements with regard to environmental influences or the installation space.

Franke also offers materials such as plastic, stainless steel, brass and Teflon.



Flat cages of hard fabric, stainless steel, brass

The use of a flat cage is mandatory at temperatures above 100 °C and for ball diameters greater than 20 mm. Special solutions such as complete corrosion protection or radiation resistance are also possible.



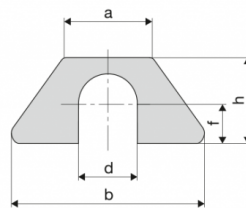
Flat cages

Ball diameter mm	Enclosure mm		Flat cage mm		Order no.
dw	g1	h1	g	h	
5	13	2,7	10	2	on request
6	15	2,7	12	2	on request
8	18	4,0	15	3	on request
9	18	4,0	16	3	on request
9,525	20	4,0	16	3	on request
12	23	5,5	20	4	on request
16	30	6,5	26	5	on request
20	35	7,5	31	6	on request
25	43	10,0	38	8	on request
30	50	10,0	45	8	on request
40	61	14,0	56	12	on request
50	88	17,5	80	15	on request

Washers



In the case of larger bearings and bearing elements, adjustment of the rotational resistance is simplified by using washers between the split inner or outer rings. The washers are made of stainless steel. For the coordination it is advisable to provide a theoretical starting gap of 0.5 mm in the design.



Size	Dimensions mm					Order no. Thickness mm							
	a	b	d	f	h	0,025	0,1	0,15	0,2	0,25	0,3	0,5	1,0
M 6	11,0	24,4	7,0	5,0	11,0	79015A	79034A	79035A	79036A	79037A	79038A	79039A	79040A
M 8	14,7	34,2	9,0	6,0	13,5	79041A	79023A	79042A	79000A	79026A	79043A	79044A	79045A
M 10	16,4	42,3	11,0	7,0	16,0	79046A	79012A	79010A	79011A	79047A	79048A	79049A	79050A
M 12	20,3	46,0	13,0	8,0	18,0	79118A	79051A	79052A	79053A	79054A	79055A	79056A	79065A
M 16	25,4	54,0	17,0	11,0	24,0	79119A	79024A	79066A	79057A	79058A	79059A	79060A	79060A

Seals

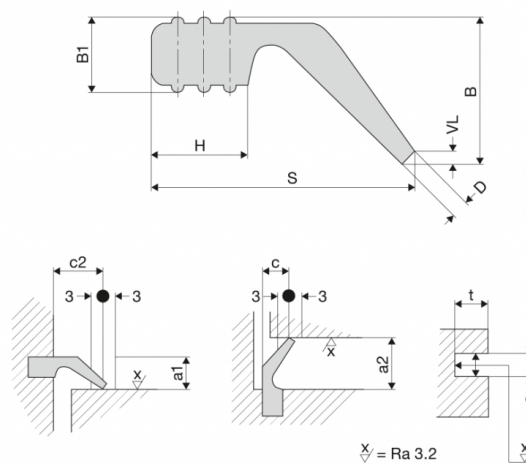


Standard and special seals

The bearing assemblies are equipped with the S10 boot seal as standard. Temperature: -30°C to $+80^{\circ}\text{C}$ (NBR). Max. Peripheral speed: 5 m / s.

For the sealing of the construction (e.g. when using a bearing element) the seal can be ordered by the meter. The joint is then glued with Loctite 401® adhesive.

Special seals are available on request. Franke offers Viton seals for high temperatures or aggressive media.

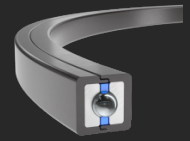


Profile	Dimensions mm				Material	Preload mm	Weight kg/m	Order no.
S	H	$B^{\pm 0,3}$	$B1^{\pm 0,2}$	D		VL^1		
09	3,5	4,8	2,5	0,8	Perbunan 70NBR/221	1,0	0,026	00928
10	4,2	5,3	3,0	0,8	Perbunan 70NBR/221	0,5...1,5	0,026	09080
15	5,5	$8,1 \pm 0,7$	$4,3 \pm 0,5$	1,0	Perbunan 70NBR/221	0,5...2,0	0,051	09190

Profile	Dimensions mm				Material	Preload mm	Weight kg/m	Order no.
S	H	B ^{+0,3}	B1 ^{+0,2}	D		VL ¹		
15	5,5	8,1 ± 0,7	4,3 ± 0,5	1,0	Perbunan 70NBR/221	0,5...2,0	0,051	09190

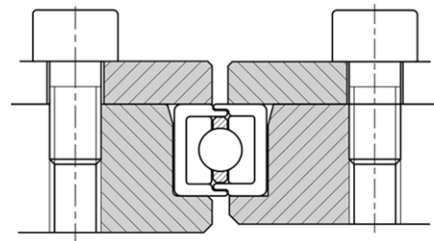
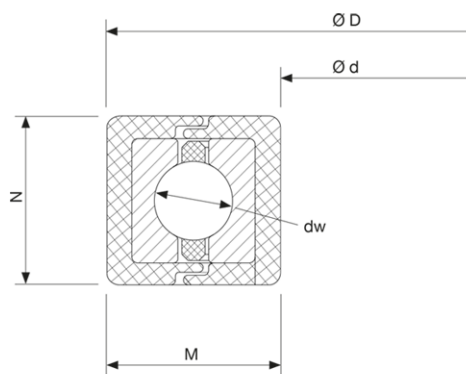
Profile	Installation dimensions mm				Groove dimensions mm	
S	c	c2	a1	a2	t ^{+0,2}	s
09	4,5 + 1	3,65 + 1	3,1...4,1	4,0...5,0	3,5	2,35+/-0,05
10	5 + 1	5,5 + 1	3,6...4,6	4,3...5,3	4,2	2,9 + 0,1
15	8 + 1,5	9,0 + 1,5	6,3...7,7	7,5...9,0	5,5	3,9 + 0,1

Elastomer sleeves



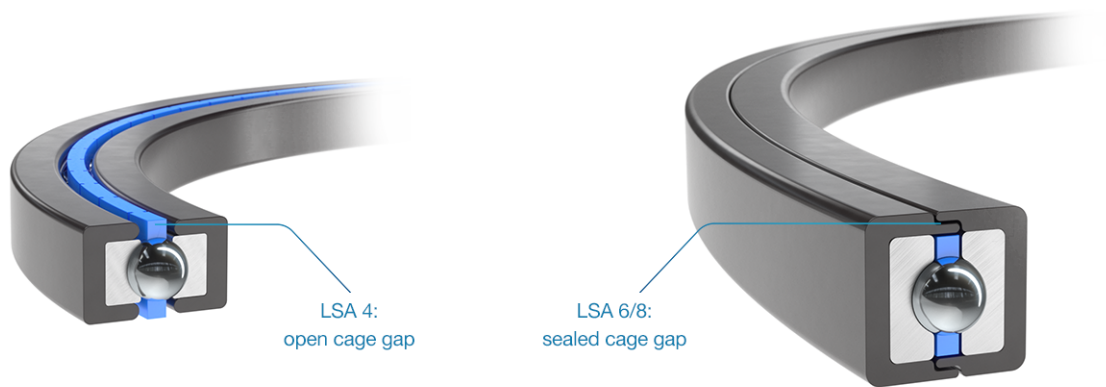
Elastomer Sleeves

Elastomer sleeves are available on request for Franke LSA slim bearings. They are used for tolerance compensation and for vibration decoupling. The smooth running can be significantly increased by an elastomer sleeve. Elastomer sleeves for the LSA 6/8 also offer additional sealing of the bearing due to the overlapping of the edges.



Size	Dimensions mm			Order-no.	Technical Details
	Ø D	Ø d	M x N		
LSA 4	119,25 - 398,65	97,95 - 377,35	10,65 x 6	101622	Material: NBR Operation Temperature: -30 °C to +80 °C "
LSA 6	130,3 - 397	111,1 - 377,8	9,6 x 9,6	102674	
LSA 8	158,81 - 781,11	136,47 - 758,77	11,17 x 10,74	100202	

Elastomer sleeves for Franke slim bearings are available from stock. They can be ordered when you buy a slim bearing and are then included in the delivery. For series production, elastomer sleeves are available by the meter for self-cutting. We recommend gluing the ends with cyanoacrylate glue (e.g. Loctite 406). The use of the elastomer sleeve slightly reduces the stiffness and accuracy of the bearing. The basic static load rating of the bearing also decreases slightly. We would be happy to advise you on the design and construction.



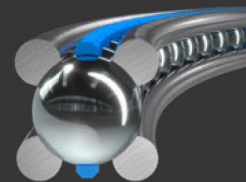
Lubrication



Für unsere Drehverbindungen und Linearsysteme verwenden wir standardmäßig hochwertige Schmierstoffe, die für die meisten Anwendungen geeignet sind. Besondere Einsatzbedingungen erfordern spezielle Schmierstoffe. Standard- und Spezialfette erhalten Sie in den jeweiligen Gebindegrößen bei uns als Zubehör. Sie können beim Ersteinsatz unserer Lagerelemente verwendet werden oder zur Nachschmierung von Drehverbindungen.

Einsatzbereich	Hersteller	Bezeichnung	Verwendung	Gebinde	Bestellnr.
Standard					
Universell einsetzbar	Shell	Gadus S3 V220C	ab Werk in allen LVA, LVB, LVC, LVD, LVE, LVG	400g	45176
Spezial					
Hochdynamik	Klüber	Isoflex Topas NCA52	bei hohen Drehzahlen oder Verfahrgeschwindigkeiten	1kg	10004
Hochtemperatur	Klüber	Barrierta L55/2	für Temperaturen in Bereichen bis max. +260°C	180g	06439
Lebensmitteltauglich	Klüber	Klübersynt UH1 64-1302	Paraffinfrei (z.B. für Lebensmittel, Pharmazie)	400g	47612
Reinraum/Vakuum	Klüber	Klüberalfa YVI93-152	hohe chem. Stabilität für extreme Umgebungen	1kg / 50gr	48055

Technical Information on Wire Race Bearings



Bearings Elements and Slim Bearings | Bearing Assemblies | Rotary Tables and Direct Drive

1 Wire race bearing selection

An optimum selection or dimensioning of the bearing should be made before the design work is started. The individual series offer the following advantages:

- Bearing elements (Type LEL, LER):
 - highest possible degree of integration
 - cost-sensitive series applications
 - greatest possible flexibility with regard to preload, running properties and diameter ranges
- Slim bearings (Type LSA):
 - simple, space-saving integration into your construction
 - Low-cost alternative to conventional slim bearings
 - non-preloaded bearings
 - rather subordinate quality requirements regarding accuracy and play
- Bearing assemblies (Type LVA, LVB, LVD, LVE):
 - ready-to-install standard bearings with a wide selection range
 - backlash-free preloaded (optimized with regard to stiffness, speed and service life)
 - short-term availability (partly from stock)
- Bearing assemblies (Type LVC, LVG):
 - ready-to-install standard bearing for high rotational speeds (LVC)
 - ready-to-install standard bearing for high loads (LVG)
- Rotary tables (Type LTA, LTB):
 - robust rotary table with worm drive for fast moving handling and positioning tasks (LTA)
 - rotary table with worm drive for high-precision measuring and positioning tasks (LTB)
- Bearing assemblies with direct drive (Type LTD):
 - Rotary joint with integrated torque motor for energy-efficient, highly dynamic movements

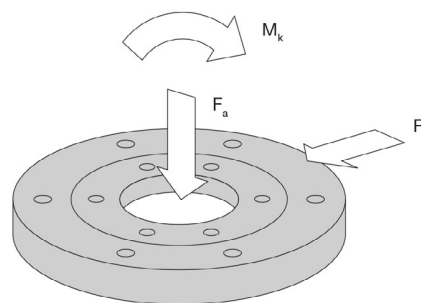
1.1 Parameters for bearing selection

- permissible dimensions and material information of the bearing
- loads with load spectra and associated time shares in %
- speed/number of swivel movements and angles per time unit
- peripheral forces to be transmitted by the gearing
- operating conditions (temperature, vacuum, clean room, humidity)
- required bearing life in revolutions or operating hours

1.2 Static and dynamic load capacity - Calculation

The basic static and dynamic load ratings stated in the catalogue are only sufficient for preliminary design. The basic load ratings shown correspond to the radial load ratings. The static axial and radial load carrying capacities or the dynamic axial and radial load carrying capacities are required for an optimum design. For more complex loads, please contact our technical sales department.

2 Calculation



All forces and moments acting on the bearing are to be combined by vectorial addition into centrally acting forces F_a and F_r and resulting moments M_a . For complex load cases and load spectra with variable loads and speeds, we will be pleased to calculate the values for you.

2.1 Terms, unit of measurement

C	dynamic load rating	(N)
C ₀	static load rating	(N)
F _a	centrically acting axial force	(N)
F _r	centrically acting radial force	(N)
KKØ	ball and cage diameter = (D + d)/2	(M)
L _n	nominal lifetime	(h)
M _k	tilting moment	(Nm)
n	rotational speed	(min – 1)
P	equivalent dynamic load	(N)
P ₀	equivalent static load	(N)
S _{st}	static safety	
X	radial factor	
Y	axial factor	
Z	moment factor	

2.2 Static calculation

A static calculation is sufficient if the bearing is loaded at standstill.
A bearing with sufficient load carrying capacity has been selected if the recommended static safety is achieved.

$$S_{st} = \frac{1}{\frac{F_a}{C_{oa}} + \frac{F_r}{C_{or}} + \frac{M}{C_{om}}}$$

2.2.1 Axial and radial factors

	X ₀	Y ₀
All bearing types	1,0	0,47

2.2.2 Recommended static safety S_{st}

ball diameter > 6	S _{st}
For quiet, vibration-free operation	> 1,8
For normal operation	> 2,5
For heavy impact loads and high demands on running accuracy	> 8,0

2.3 Dynamic calculation

At a circulation speed of v > 0.1 m/s, a static and dynamic calculation is required, whereby the static safety factor S_{st} must at least reach the recommended value of the respective load.

2.3.1 Nominal lifetime

$$L_h = \left(\frac{C}{P}\right)^3 \cdot \frac{10^6}{60 \cdot n} \quad (h)$$

2.3.2 Axial and radial loads

$$P = X \cdot F_r + Y \cdot F_a \quad (N)$$

	$\frac{F_a}{F_r} \geq 1$	$\frac{F_a}{F_r} > 1$
	X	Y
All bearing types	1,26	0,45
	0,86	0,86

2.3.3 Axial and moment load and axial load with F_r = 0, M_k = 0

$$P = Y \cdot F_a + Z \cdot \frac{M_k}{KKØ} \quad (N)$$

	$0 < \frac{M_k}{F_a \cdot KKØ} \leq 0,5$	$\frac{M_k}{F_a \cdot KKØ} \leq 0,5$
	Y	Z
All bearing types	0,86	1,72
	0,45	2,54

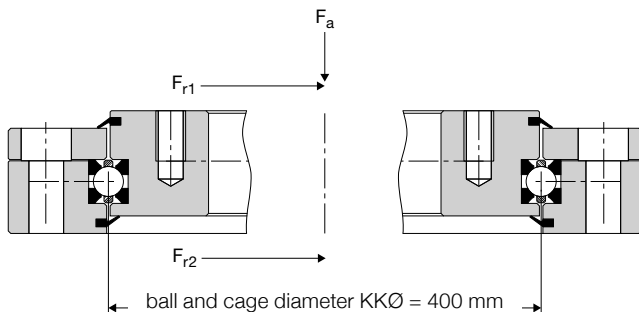
2.3.4 Radial and moment load and radial load with F_a = 0, M_k = 0

$$P = X \cdot F_r + Z \cdot \frac{M_k}{KKØ} \quad (N)$$

	$0 \geq \frac{M_k}{F_r \cdot KKØ} \leq 0,5$	$\frac{M_k}{F_r \cdot KKØ} \geq 0,5$
	X	Z
All bearing types	1,0	1,68
	0,86	1,96

For radial, axial and moment loads, we will be pleased to carry out the calculation for you.

3 Calculation example bearing elements



3.1 Load details:

Load case A (static stress)

Centric axial force from

Tare weight + load

Radial force from working pressure

$$F_a = 22 \text{ kN}$$

$$F_{r1} = 4,2 \text{ kN}$$

Load case B (dynamic stress)

Centric axial force from

Tare weight + load

Radial force from drive

Average operating speed

$$F_a = 22 \text{ kN}$$

$$F_{r2} = 1,5 \text{ kN}$$

$$n = 9,5 \text{ 1/min}$$

Calculation for bearing element LER5 with KKØ 400 mm.

Details: $C0_a = 419 \text{ kN}$ und $C0_r = 197 \text{ kN}$

3.2 Calculation:

Load case A (static stress)

$$S_{st} = \frac{1}{\frac{F_a}{C_{0a}} + \frac{F_r}{C_{0r}} + \frac{M}{C_{0m}}} = \frac{1}{\frac{22}{419} + \frac{4,2}{197} + \frac{-}{-}} = 13,5$$

Safety $S_{st} = 13,5$ (sufficient for normal operation)

Load case B (dynamic stress)

$$S_{st} = \frac{1}{\frac{F_a}{C_{0a}} + \frac{F_r}{C_{0r}} + \frac{M}{C_{0m}}} = \frac{1}{\frac{22}{419} + \frac{1,5}{197} + \frac{-}{-}} = 16,6$$

Safety $S = 9,5$ (above the minimum security level specified in 2.2.2)

$$\text{Lifetime } L_h = \left(\frac{44}{20,2} \right)^3 \cdot \frac{10^6}{60 \cdot 9,5} = 18.100 \text{ h}$$

$$(P = 0,86 \cdot 1,5 \text{ kN} + 0,86 \cdot 22 \text{ kN} = 20,2 \text{ kN})$$

4 Design and manufacture of the bearing bed

Bearing elements consist of two inner and outer raceways and a multi-piece segmented cage with balls. The races are open and can therefore be changed elastically in diameter for installation.

The balls correspond to class G20 (DIN 5401:2002-08). Only the balls included in the delivery may be used. If balls are lost, all balls must be replaced in order not to impair the running characteristics of the bearing.

The design and technically optimum production as well as the correct setting of the preload are important prerequisites for a long service life. This guarantees that all raceways are involved in load carrying and that the balls roll optimally in the predetermined position.

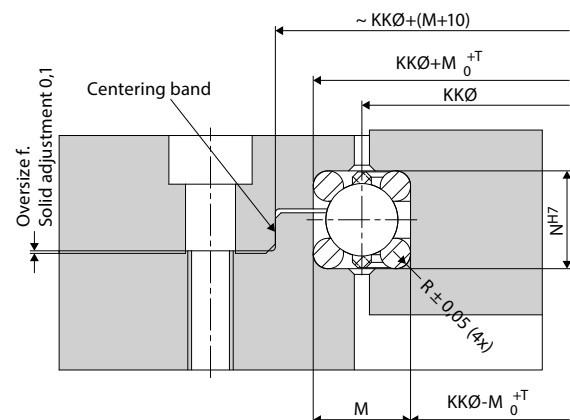
Design and manufacture of the wire bed differ for the individual bearing elements and slim bearings and are described below for these.

4.1 Wire bed design for bearing elements Type LEL

The bearing elements LEL offer the highest running culture and running accuracy. They also place the highest demands on the design of the wire bed. Two dimensional sketches illustrate the most important parameters here:

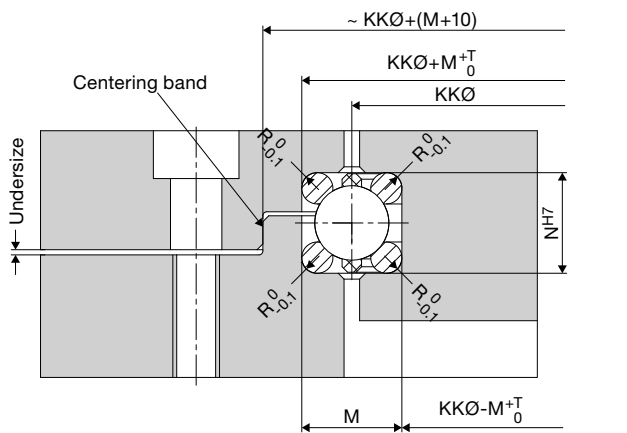
4.4.1 Tuning by grinding (Massive tuning)

When designing the enclosing parts, care must be taken that the two housing parts to be joined are manufactured with oversize in order to achieve the desired preload in the bearing by grinding the cover.



4.1.2 Adjustment with shims

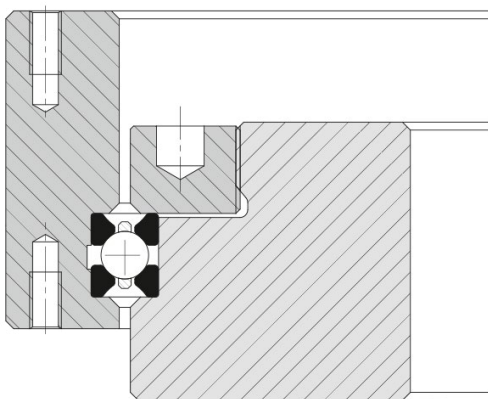
When designing the enclosing parts, it must be ensured that the two housing parts to be joined are undersized so that the desired preload in the bearing can be achieved by enclosing shims.



4.1.3 Adjustment with threaded ring

In this case the use of LER bearing elements is recommended. The wire bed diameters can be manufactured in one piece, then the bearing setting is adjusted by screwing in the threaded ring. This must be secured by means of a set screw after correct bearing adjustment.

With LEL bearing elements, the threaded ring must be fitted with a race to ensure sufficient concentricity.



4.1.4 Dimensions and tolerances

The dimensions and tolerances are calculated as follows:

$$R = \frac{\lambda}{2} - 0,1$$

$$T = KKØ / 10.000 \text{ (dimensions in mm)}$$

Grinding oversize or undersize for shims: 0.1 mm

Fitting tolerance centering fit

bore:	lower tolerance: +0,05;
	upper tolerance: +0,05 + IT6
shaft:	upper tolerance: -0,05;
	lower tolerance: -0,05 - IT6

It is advisable to design the stator of the bearing in a split design. The rotor should be made in one piece. The accuracy to be achieved is influenced by the individual accuracies, therefore it applies that split rings 2/3 receive the runout/ axial runout tolerances, the one-piece ring receives half of the runout/axial runout tolerances.

Half the diameter tolerance applies to the roundness of the wire bed. The screw mounting surface of the adjacent construction is the basis for the axial runout of the wire bed. The basis for radial runout is the wire bed centre line. Flatness and parallelism of the individual parts are designed with half the total tolerance.

When designing the enclosing parts, it must be ensured that parallel surfaces that are not joined (e.g. surface above the centring collar) are designed with sufficient clearance so that they still have clearance after the bearing has been adjusted. Chamfers and radii at the fit must be designed in such a way that the joining surfaces can be screwed together without causing collisions in the area of the cylinder edges.

Basically, it can be said that the accuracy of the bearing assembly can be improved if the wire bed of the split ring is manufactured when both rings are bolted and additionally pinned. In general, the locating fit of the bearing together with the wire bed can also be machined in one clamping. It is sufficient to manufacture the wire bed by turning or milling, in this case surface qualities of < Ra 3.2 should be aimed for, since the setting behaviour of the bearing is positively influenced by high surface quality.

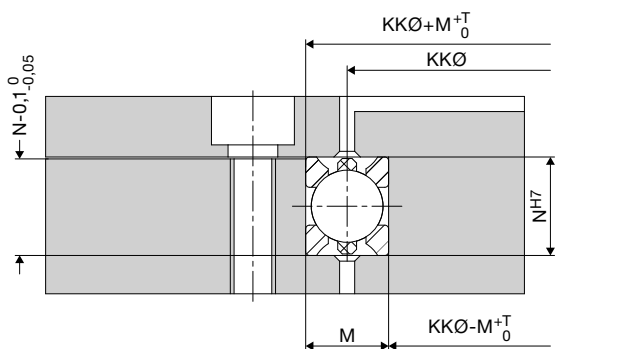
The wire bed should always be machined in one setting with the contours that are related to the centering or running accuracy, thus achieving optimum accuracy and bearing life.

For soft materials such as aluminum, we recommend protecting the wire bed against wear (e.g. by anodizing, chemical nickel plating, etc.). The layer thickness should not be less than 20µm.

4.2 Wire bed design for bearing elements Type LER

The bearing elements LER offer a significant simplification compared to the LEL series with regard to the production of the enclosing turned parts. Here it is possible to adjust the bearing using a simple cover plate and shims. The wire bed does not have to be split - as with the LEL - no centering on the split ring is required.

Even in the case of the design with cover, care must be taken when designing the enclosing parts to ensure that the wire bed, which is provided with cover, is manufactured with undersize in order to be able to achieve the desired preload in the bearing by enclosing shims.



The statements made in the section for LEL apply to the constructive design. The wire bed has no radii to accommodate the race, but the tool radii must not exceed 0.2 mm.

$$T = KK\varnothing / 10.000 \text{ (dimensions in mm)}$$

Undersize for shims: 0,1 mm

It makes sense to design the stator of the bearing divided, the rotor should be one piece. The accuracy to be achieved is influenced by the individual accuracies. However, since the wire bed of the split ring also has no offset in concentricity, the concentricity and axial runout tolerances are divided equally between the two rings.

Half the diameter tolerance applies for the roundness of the wire bed, the screw mounting surface of the adjacent construction is the basis for the axial runout of the wire bed. The basis for radial runout is generally the wire bed centre line.

Flatness and parallelism of the individual parts are designed with half the total tolerance. The locating fit of the bearing is to be machined together with the wire bed in one clamping.

It is sufficient to produce the wire bed by turning or milling. Surface qualities of < Ra 3.2 should be aimed for here, since the setting behaviour of the bearing arrangement is positively influenced by high surface quality.

4.3 Wire bed design for bearing elements Type LEW

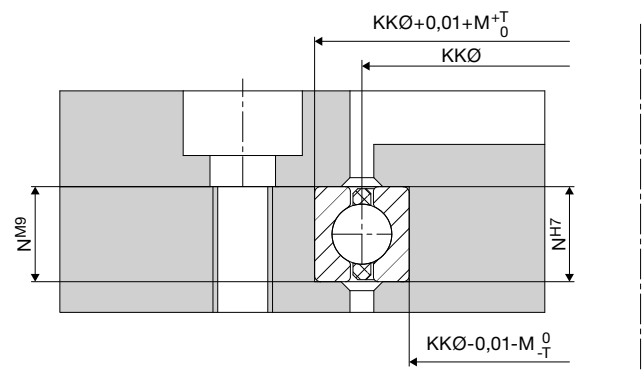
For the design of wire rod beds of bearing element series LEW, the same guidelines apply accordingly as for bearing elements of series LEL.

When ordering the bearing elements, it is absolutely necessary to specify which bearing ring will be manufactured split.

4.4 Wire bed design for slim bearing Type LSA

In contrast to the bearing elements described above, the bearing elements LSA are not adjustable and are always subject to play. According to the following specifications, the resulting bearing arrangements have play between 0.02 and 0.12 mm. As with the LER, the wire bed is undivided, and adjustment of the play is not possible.

When designing, it makes sense to integrate the outer ring into the split element of the surrounding structure, as this makes it easier to insert the ring into the surrounding structure.



The wire bed has no radii to accommodate the race, but the tool radii must not exceed 0.2 mm. $T = 0.03 \text{ mm}$ for KK up to 300 | 0.04 mm for KK greater than 300 (mm).

Half the diameter tolerance applies for the roundness of the wire bed, the screw mounting surface of the adjacent construction is the basis for the axial runout of the wire bed. The basis for radial runout is generally the wire bed centre line.

The locating fit of the bearing must be machined together with the wire bed in one clamping. It is sufficient to produce the wire bed by turning or milling, in this case surface qualities of < Ra 3.2 should be aimed for, since the setting behaviour of the bearing arrangement is positively influenced by high surface quality.

5 Assembly

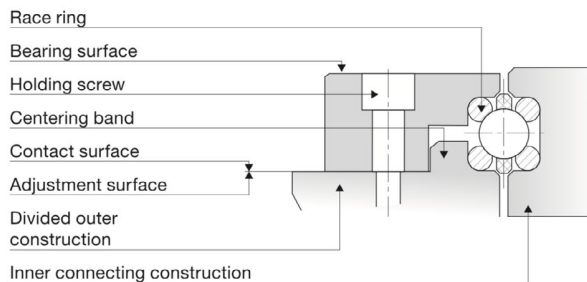
5.1 Installation and adjustment of bearing elements

5.1.1 Adjustment with shims

Adjustment with shims is the most economical and flexible procedure, since subsequent changes to the rotational resistance are also possible. Shims are available in different thicknesses depending on the screw diameter.

Requirements:

- Division of the inner or outer construction.
- The height of the raceway bed is 0,3 to 0,5 mm smaller on the side of the split adjacent construction. This gap is required to accommodate the shims.
- The split side of the adjacent construction should be fixed using a centring collar. This is the only way to guarantee the concentricity of the two raceways.



Installation and adjustment:

Before installation, both the raceways and the wire bed must be cleaned. The races are inserted in the adjacent construction. In order to hold the races in position during fitting, the race beds can be coated with grease. The joints of the opposing race rings in the same part are each fitted at an angle of approx. 180°. The split side of the adjacent construction is then brought into the intended position.

Then insert the cage segments with the balls and grease the bearing element (see 6.1 Lubrication and maintenance). Before the adjacent construction of the split side is closed, the shims must be distributed over the screw holes of the retaining screws. The thickness depends on the designed gap (see above).

After the screws (see 6.5 Screw connections) have been tightened and the rotary joint has been turned through 360° approx. 2 to 3 times, check the rotational resistance. If the measured value deviates more than 5 to 10 %, the thickness of all shims must be changed and the procedure repeated.

5.1.2 Adjustment by massive tuning

When using solid tuning, the tuning surface is brought to the required dimension by grinding over it. This method achieves the best accuracy since the interface between the split side of the adjacent construction is interlocking and no tension can build up.

Requirements:

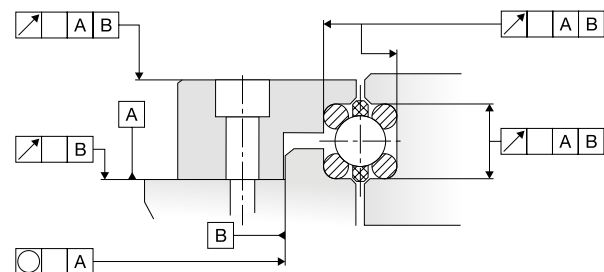
- Division of the inner or outer construction.
- Surface grinding machine of suitable size.
- The height of the raceway bed on the side of the split adjacent construction is 0.1 mm greater. This allowance is required for the adjustment.
- The split side of the adjacent construction should be fixed using a centring collar. This determines the concentricity of the two raceways.

Installation and adjustment:

The cage segments with the balls are inserted and the bearing assembly is sealed with the second split side of the adjacent construction (shim ring). After the screws have been tightened as specified (see 6.5 Screw connections) and the bearing assembly has been turned through 360° approx. 2 or 3 times, the clearance between the inner and outer ring is measured using a dial gauge. The tuning ring is then dismantled again and the measured value determined plus 0.02 to 0.03 mm is ground off with the surface grinding machine.

To ensure that this surface remains parallel to the raceway support, a suitable mounting surface must be provided at the design stage.

After the grinding dust has been thoroughly removed, the ring is remounted as described above and the bearing is moved. Then check the rotational resistance. If this measured value deviates more than 5 to 10 %, the procedure must be repeated. Finally the bearing assembly is greased via the lubrication holes provided (see 6.1



Lubrication and maintenance).

The bearings are suitable for continuous operation at temperatures between -10 °C and +70 °C - for short periods up to +120 °C.

Peripheral speeds of 10 m/s with grease lubrication and 12 m/s with oil lubrication can be achieved. The setting of the preload is an important prerequisite for a long service life of the bearing element. The preload ensures that all raceways are involved in load carrying and that the balls run optimally at their predetermined position. The preload is correctly adjusted when the rotational resistance without seal corresponds to the values in the diagram under point 6.

Note: It is advisable to adjust the preload, because even with optimum production there are tolerances which must be compensated.

5.2 Installation and adjustment of slim bearings

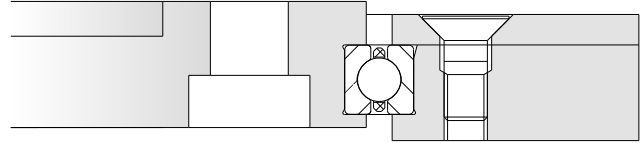
In the LSA, two running wires are combined into a single wire.

The special profile of the raceways maintains the 4-point principle. This makes installation just as easy as with conventional slim bearings.

The assembly is carried out in the following steps:

1. Clean components with a clean, lint-free cloth.
2. Grease the raceways (rear side).
3. Insert the race ring inner ring in the inner ring of the adjacent construction. Ensure that the raceway ends are separated by a gap.
4. Place the cage and outer race onto the inner race. Hold the raceway ends of the outer race together so that the ball cage cannot slip out.
5. Position the outer ring and push it in axially.
6. Replace the cover and screw it on.

Installation suggestion:



6 Installation and adjustment of bearing assemblies

Franke bearing assemblies are ready-to-install complete bearings. The specified or defined running accuracy, rotational resistance, rigidity and general characteristics depend both on the adjacent construction and on the correctness or completeness of the data transmitted. They must therefore be given particular attention.

6.1 Lubrication and maintenance

In order to keep friction low and to protect the bearing arrangement permanently against corrosion, sufficient lubrication should be ensured. All lubricants are subject to an ageing process that limits the operating life. The best resistance to ageing is achieved with fully synthetic lubricants. The grease SHELL GADUS S3 V 2200C for Franke bearing assemblies is used for initial greasing. The ageing resistance of this lubricant is approx. three years. This lubricant is also recommended for the use of bearing elements.

As an alternative, high-quality lithium soap greases based on synthetic oils or mineral oil or according to DIN 51825-K2 K-40. Questions regarding the lubricant, such as miscibility, aggressiveness, extreme temperatures, disposal, areas of application, etc. must be clarified with the respective manufacturer of the lubricant.

6.2 Initial lubrication and relubrication

The amount of lubricant required by a wire-race bearing for lubrication is relatively small and is self-adjusting depending on the speed. If the quantity of lubricant is too large, the rolling action will cause increased temperatures which will limit or suspend the lubricity. The service life of the bearing is considerably reduced by the increased wear. The lubricant quantity depends on the calculated clearance inside the bearing assembly. The calculated volume must be filled with 20 to 30 % lubricant. For swivel bearings, 30 to 40 % is recommended.

Franke bearing assemblies are ready-to-install complete bearings. Bearing elements and slim bearings are treated with corrosion protection oil for transport and must be greased during assembly.

6.3 Relubrication and lubrication intervals

The lubricity decreases as a result of mechanical stress and signs of ageing. It is therefore necessary to supplement the existing lubricant quantity or to renew it completely (e.g. in case of heavy contamination). The bearing must be rotated during relubrication. Relubrication should be carried out at below operating temperature if possible.

6.3.2 Relubrication and lubrication intervals for bearing elements LV

The relubrication quantity is calculated as follows:

- m = $KK\varnothing \times H1 / 3 \times X$
- $H1$ = Bearing ring height in mm
- $KK\varnothing$ = Ball and cage diameter in mm
- m = Relubrication quantity in g
- X = Factor according to Table 1 in mm^{-1}

Relubrication intervals:

An exact determination of the intervals is specific to the application and can therefore only be determined correctly by tests (for reference values see Table 1). To determine the factor X (Table 2), the time value read off is set in relation to the duty cycle of the application.

Note: For standard bearings, it is sufficient to fit a relubrication facility, since the lubricant is distributed evenly by the bearing movement. In the case of swivel bearings, at least three relubrication possibilities must be provided ($3 \times 120^\circ$).

V_u m/s	Intervall h
0 bis < 3	5000
3 bis < 5	1000
5 bis < 8	600
8 bis < 10	200

Table 1: Relubrication time limits

intervall	weekly	monthly	annually	2–3 years
X	0,002	0,003	0,004	0,005

Table 2: Relubrication intervals

Circulating oil lubrication is basically possible and should be agreed with the respective manufacturer of the lubricant. Lubricant-free bearings are available for special applications (e.g. clean room or ultra high vacuum).

Calculation example:

Bearing assembly type LVA, $KK\varnothing$ 500 mm,

Peripheral speed 3 m/s

Duty cycle approx. 16 h/day

Relubrication period for 3 m/s is 1000 h (see Table 1) = $1000 \text{ (h)} / 16 \text{ (h/day)} = 63 \text{ days} \sim 3 \text{ months}$ for 16 h/day duty cycle

Relubrication should be carried out quarterly. Accordingly, the factor X (Table 2) is rounded and amounts to 0.003. Dimension $H1$ is 42 mm (see www.franke-gmbh.de).

$$m = 500 \text{ mm} \times 42 / 3 \text{ mm}^{-1} \times 0.003 \text{ g} = 21 \text{ g}$$

The relubrication quantity is 21 g SHELL GADUS every three months. The shelf life of the lubricant is three years.

6.4 Lubrication and lubrication intervals for the gearing

Automatic gear lubrication is recommended. In the case of manual lubrication, the gear teeth and pinion must be adequately lubricated before commissioning. The lubrication interval depends on the design and the peripheral speed and must therefore be considered individually.

6.5 Screw connections

The number and diameter of the screws for mounting on the adjacent construction should always be checked. The distance X from retaining screw to retaining screw should not exceed 125 mm to avoid bridging. The fixing screws are tightened crosswise with a torque wrench in relation to the screw quality - according to the specifications in Table 3.

	Quality Nm	
	8.8	12.9
M 6	10	17
M 8	25	41
M10	49	83
M12	86	145
M16	210	355

Table 3: Tightening torques

To compensate for settlement effects, the screws must be retightened to the specified tightening torque. This procedure should be carried out if possible when the screws are free of additional forces.

The checks must be carried out after approximately 100 and then every 600 operating hours. For special operating conditions (e.g. due to strong vibrations) this period can be considerably shorter.

6.6 Gearing

As standard Franke supplies a straight gearing without hardening (material 42CrMo4V) and special gearing on request. The material, the design and the quality can also be changed on request.

6.7 Tolerances and accuracies

All tolerances and accuracies are stated on the respective catalogue pages. The greatest possible accuracies are achieved if the design of the enclosing parts is such that all diameters and surfaces in relation to each other can be machined in one clamping. The running accuracies in the catalogue are average values and can be further improved by limiting the tolerances. The tolerance specification T = IT6 or T = IT7 refers to the diameter-dependent basic tolerances according to DIN ISO 286.

Nominal dimension range mm starting from ... up to		Basic tolerances µm IT6 IT7	
80...	120	22	35
120...	180	25	40
180...	250	29	46
250...	315	32	52
315...	400	36	57
400...	500	40	63
500...	630	44	70
630...	800	50	80
800...	1000	56	90
1000...	1250	66	105
1250...	1600	78	125

Table 4: Tolerance specifications DIN ISO 286 T1 (11.90)

7 Rotary tables and direct drives

Franke rotary tables are highly resilient and particularly suitable for assembly, measuring and testing tasks. All rotary tables have a compact aluminum housing with integrated Franke components. A worm gear guarantees high accuracy even under continuous load. The rotary tables are extremely tilt resistant at a low tare weight.

Bearing assemblies with direct drive are suitable for applications where high performance and low space requirements are important criteria. The integration of the drive into the bearing housing means that wear-prone components for transmitting drive power such as toothed belts, shafts or chains are no longer needed. This reduces the required drive energy and also benefits more precise positioning.

7.1 Load capacity

The recommended safety for Franke turntables is $Sst \geq 3$ for simple load ratios and $Sst \geq 6$ for dynamically changing load and lever ratios. Franke will calculate the load and service life if required.

7.2 Temperature range

The rotary tables can be operated at an operating temperature of -10 °C to $+80\text{ °C}$. Extended temperature ranges are possible on request.

7.3 Lubrication

In general, all standard rotary tables are provided ex works with long-term lubrication with the wire-race bearing grease ISOFLEX TOPAS NCA52. It is recommended to relubricate Franke rotary tables - depending on the application - every six months to annually.

Lubrication point	Lubrication quantity g		
	left	front	right
LTA100		1	1
LTA200		1	1
LTB125	2		
LTB175		3	
LTB265		3	
LTB400		4	
LTD100			
LTD205			
LTD320			
LTD385			

7.4 Options

- One or two integrated inductive proximity switches
- Freely positionable trip cams
- Mounting kits for motors according to customer requirements
- Motorization depending on the application with stepper or servo motors
- Encoder mounting on the second shaft end of the worm shaft
- Complete automation solutions

For all technical information, please also refer to our assembly and maintenance instructions for the respective products.



Technical Information on Wire Race Bearings
We reserve the right for errors and alterations.

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