

MECHANICAL BRIDGE & INDUSTRIAL BEARINGS

IN ACCORDANCE WITH EN1337

DESIGNED TO SUPPORT. MADE TO LAST.



www.ekspan.com



INTRODUCTION

EXPERTS IN MOVEMENT CONTROL

EKSPAN ARE STRUCTURAL ENGINEERING SPECIALISTS, OPERATING IN THE MECHANICS OF MOVEMENT CONTROL FOR LARGE LOADS ON BRIDGES AND IN MOST STRUCTURAL APPLICATIONS.

We offer full product and site support - from design, manufacture supply and installation, to inspection, site maintenance and replacement work for bridge bearings, temporary works and expansion joints. Our depth of knowledge and expertise enables us to provide structural solutions by way of consultancy support or the delivery of a complete project management service to ensure cost efficiency.

Through early project engagement with stakeholders, we provide high-quality engineering solutions by way of consultancy support and the delivery of a complete management and installation service.

Our single point of responsibility offering, from design, manufacture and installation to inspection, site maintenance and replacement work, leaves EKSPAN uniquely placed to solve complex challenges on a truly global scale.

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OUR MACHINES

Milling Machines:

Hurco DCX3226i 3-Axis
Double Column Machining
Center;
Table Size: 3000 x 2100mm
Max Height 800mm

Hartford SUPER HCMC2110
–
Hartrol Premium:
Table Size: 2250 x 1020mm
Max Height: 650mm

Hurco VMX 64:
Table Size: 1676 x 889mm
Max height: 600mm

Hurco VMX 42i:
Table Size: 1270 x 670mm
Max Height: 560mm

Turning Machines:

Hyundai Wia LV800RM
Vertical Lathe:
Max turning Dia: 710mm
Max Height: 700mm

Hyundai Wia L300C
Horizontal Lathe W/
Hydrafeed bar feed:
Max Turning Dia: 500mm
Max Turning length:
650mm
Max bar length in bar feed:
1500mm x 10 bars

Fabrication:

We are EN1090 Ex Class 3
if you have any fabrication
enquires that you would
like us to tender for.

OUR STANDARDS





CONTRACTING & ENGINEERING CAPABILITY

Bridge Bearing Manufacture

EKSPAN, headquartered in Sheffield, is the preeminent bearing manufacturer in the United Kingdom. Our core expertise lies in delivering end-to-end solutions, encompassing in-house design and precision manufacturing of mechanical and structural bearings. These bearings find application across a wide spectrum, including bridges, marine installations, and various architectural structures.

Our commitment to excellence is underscored by our strict adherence to EN1337 standards during the manufacturing process. This dedication ensures that our products consistently meet the highest quality and performance benchmarks in the industry.

Inspections and Early Contractor Involvement

EKSPAN conducts comprehensive bridge surveys and inspections and engages in early contractor involvement for both new construction projects and existing structures across the United Kingdom and Ireland. Our services encompass the delivery of meticulously detailed specialist reports, evaluating the service life of entire structures or specific structural bridge components. Additionally, we offer specialised in-house design services to address unique project requirements.

All our assessments and designs strictly adhere to the latest British and DMRB Standards, reflecting our unwavering commitment to industry-leading quality and compliance.

Installation and Maintenance

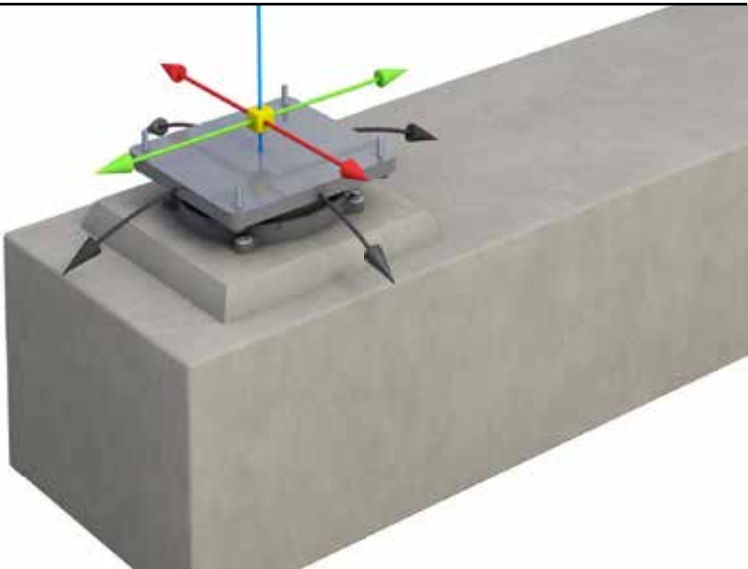
EKSPAN provide an all-encompassing range of structural fabrication and installation services, covering the entire project lifecycle from the initial concept to the final installation phase. Our dedicated team of highly skilled professionals is steadfast in delivering superior workmanship, consistently meeting project timelines and budgetary constraints.

In addition to our core services, EKSPAN offers an extensive selection of temporary works equipment designed for bridge jacking, complementing the capabilities of our in-house installation teams.

EKSPAN bearings are designed to transfer mloads between the superstructure and its supports and enable movement and rotation. Each is therefore broken down into three types of bearings.

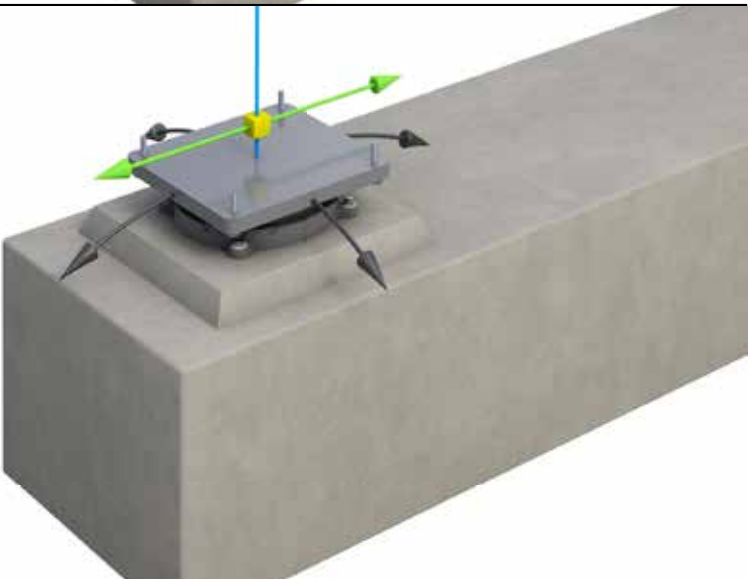
Free bearing

Transfer the vertical loads and allow all translational and rotational movements of the superstructure.



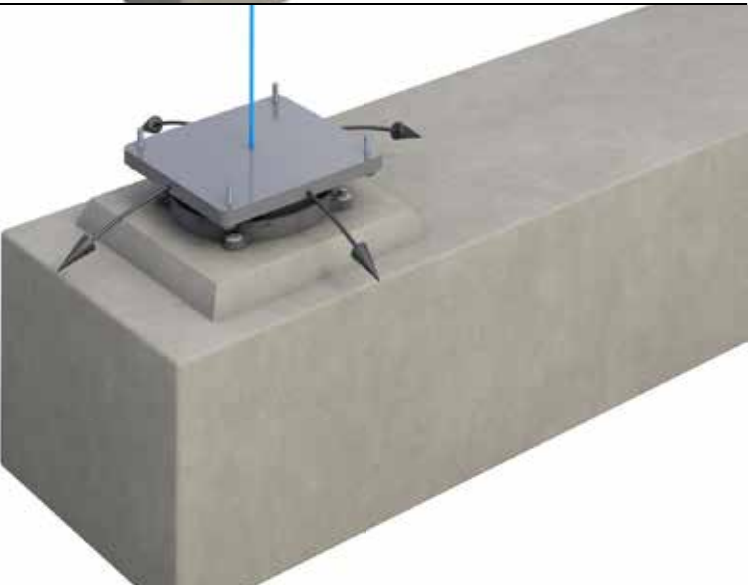
Guided bearing

Transfer the vertical loads and the horizontal loads in one direction. Translation in the perpendicular direction is allowed, as is rotation.



Fixed bearings

Transfer all vertical and horizontal loads, while allowing rotation of the superstructure.



Our bearing types are split into four main types, each with different criteria:

Elastomeric Bearing - Elastomeric bearings are used for vertical loads under 18,000kN.

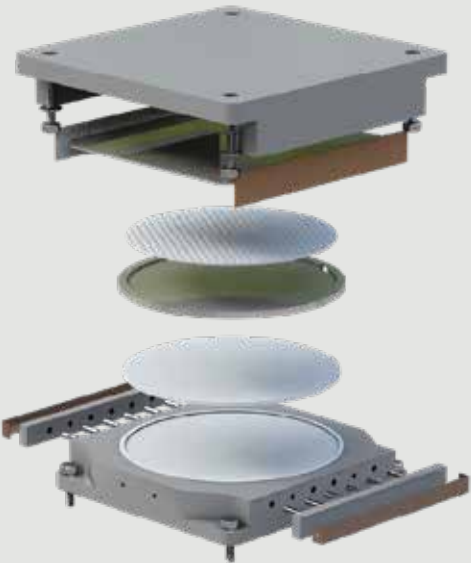
See our elastomeric bearing brochure for more information.



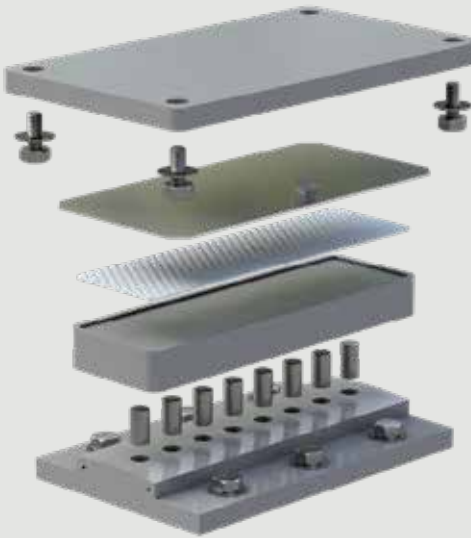
F-Type Bearing - F-type bearings are used alongside the elastomeric bearing to take any horizontal force.



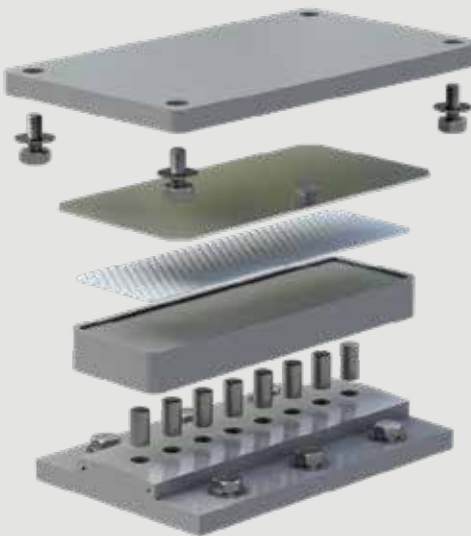
Pot Bearing - Pot bearings are used to restrain large vertical loads. They are built up of an elastomeric pad sandwiched between a steel pot and piston.



Spherical Bearing - Spherical bearings are used to restrain large vertical loads and large rotations. There is no elastomeric pad, and the rotations are facilitated by contact between a chromed spherical face and sliding surface.



Rocker Bearings - Rocker bearings are typically used on long span bridges and structures that are subjected to high horizontal force. They allow rotation in a single axis only.



Bespoke Bearings - Bespoke bearings are used when unique requirements are needed. Bespoke bearings such as uplift and linkspan bearings, are subject to high horizontal forces combined with low minimum load and high longitudinal rotations.

Description

KE series is a range of structural bearings which meets the full requirements of BS EN1337 Parts 1, 2, and 5, and those of the British Department of Transport. They are manufactured to international quality standards. The standard range comprises multi-axis rotation bearings in fixed, constrained and free configurations to support loads up to 46000 kN.

Bearing Type

The KE range of bearings are available in three forms:

- 1. 30KE Fixed
- 2. 31KE Guided - Free to move in one horizontal direction
- 3. 22KE Free to move in any horizontal direction

Typical 31KE Details - Exploded View



Attachments

Fixing holes are provided in the top and base members of the bearings. This enables a variety of fixings methods to be used. Standard fixings are designed to ensure the bearing can be removed as simply as possible. See page 10.

Support and Installation

Important - See pages 11 - 13 for Installation and Maintenance.

Concrete Stress

Where suitable reinforcement of the concrete has been provided the allowable concrete stress is dependent on the relative dimensions of the bearing/structure interface, the total support area and the characteristic strength of the concrete. The stress on the structure should therefore be checked to ensure that it is acceptable.

Design Loads

The designation of loadings varies depending on the design code applicable. The tables show the capabilities determined in accordance with BS EN 1337.

Rotation

Maximum rotation on all our pot bearings range from 0.015 radians for KE0050 to KE1000, and 0.0125 radians for KE1200 to KE3000 respectively.

Translations

The dimensions for the 31KE (Constrained) and 22KE (Free) bearings are shown in the tables for the following movements -

Longitudinal

- 31KE 100mm total
- 22KE 100mm total

Transverse

- 31KE NIL (see page 6)
- 22KE 40mm total

Additional movements either in longitudinal or transverse directions, depending on bearing type whether it is restraint sliding or free sliding, top plate dimensions will increase accordingly. We will be pleased to advise.

N.B. 31KE bearings should not be used where movement is required at right angles to the constraints.

The required movements should be specified in the part number as described below. The clearance between the constraints must not be used to accommodate any structural movements.

Designation of Part No.

The part number of a bearing is simply built up as the below example:

Ref	Type	Maximum Working Load (kN)	Movement Longitudinal / Transverse		Fixings Top Base	
			(mm)	(mm)		
a	30KE	5000			S	S
b	31KE	5000	100		B	S
c	22KE	5000	100	40	N	B

e.g. For
a above the full part number would be 30KE 500/SS
b above the full part number would be 31KE 500/100/BS
c above the full part number would be 22KE 500/100/40/NB

Suffix Letters

By adding a two letter suffix to the bearing part number the type of fixing may be designated -

- First letter** - Top plate fixing
- Second letter** - Base plate fixing
- N** - No fixing
- B** - Bolts and washers only
- S** - Bolts, washers & sockets

e.g. - **BS** signifies:
B (top plate fixing) Bolt & washers
S (base plate fixing) Bolts, washers & sockets

N.B. If standard KE series fixing are not used, care should be taken to ensure that bolts can be fitted without dismantling the bearing.

'c' denotes a free KE series pot bearing of -
Working load capacity:
Movement:

Fixing method:

- 5000kN maximum
- Longitudinal - 100mm total
- Transverse - 40mm total
- No fixings in top plate.
- Bolts in base plate.

KE POT BEARING - FIXED



KE POT BEARING - GUIDED



KE POT BEARING - FREE



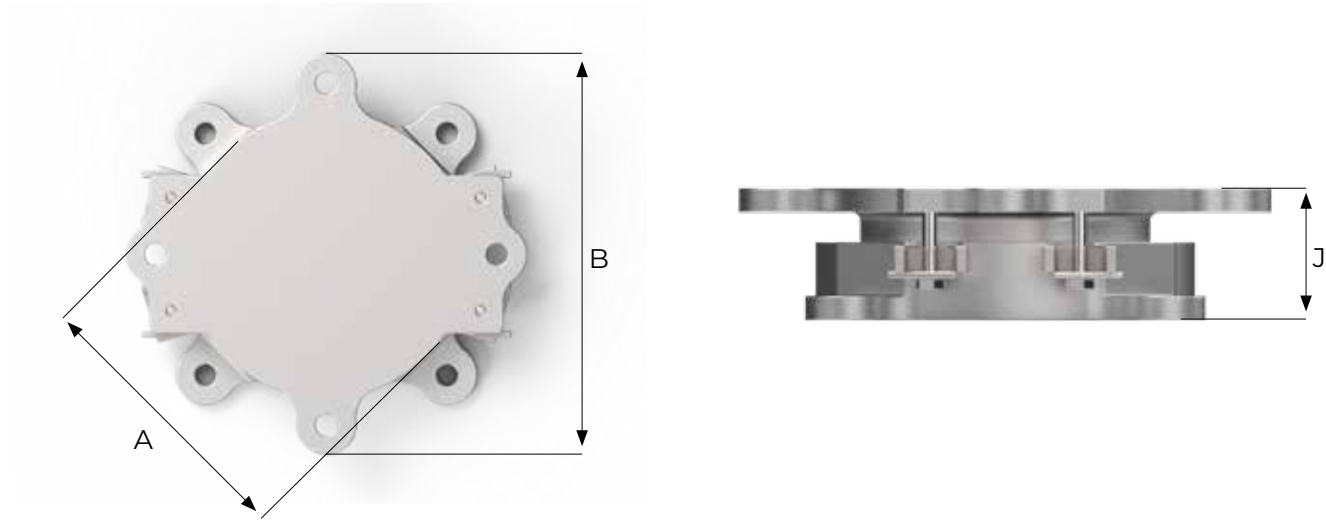
Typical 30KE Details - Exploded View

Bearings should be selected to suit the appropriate design code. The maximum vertical and horizontal loads shown in the tables may be taken in combination.

Where higher horizontal load capacities are required, special bearings can be offered for such requirements. Our experts can advise further.



Bearing No.	Serviceability Limit State Loads				Ultimate Limit State Loads			Rotation (Radians)
	Maximum Vertical (kN)	Permanent (kN)	Minimum Vertical (kN)	Horizontal (kN)	Maximum Vertical (kN)	Minimum Vertical (kN)	Horizontal (kN)	
30KE0050	653	490	182	102	816	293	136	0.015
30KE0075	940	705	242	146	1175	431	195	0.015
30KE0100	1279	959	317	195	1599	589	260	0.015
30KE0130	1602	1201	408	254	2002	751	338	0.015
30KE0160	2037	1528	492	307	2546	943	409	0.015
30KE0200	2524	1893	594	380	3155	1179	507	0.015
30KE0250	3158	2369	722	473	3948	1477	630	0.015
30KE0300	3758	2819	869	560	4698	1767	747	0.015
30KE0350	4411	3308	990	648	5514	2064	864	0.015
30KE0400	4995	3746	1127	736	6244	2361	981	0.015
30KE0450	5614	4211	1276	819	7018	2628	1092	0.015
30KE0500	6270	4703	1415	902	7838	2945	1202	0.015
30KE0550	6822	5116	1555	985	8527	3208	1313	0.015
30KE0600	7396	5547	1662	1063	9245	3460	1417	0.015
30KE0700	8773	6580	1958	1219	10966	4148	1625	0.015
30KE0800	9925	7444	2211	1365	12406	4695	1820	0.015
30KE0900	11148	8361	2425	1506	13935	5257	2008	0.015
30KE1000	12442	9331	2632	1638	15552	5783	2184	0.015
30KE1200	14826	11119	2969	1886	18532	6715	2515	0.0125
30KE1400	17418	13064	3259	2106	21773	7860	2808	0.0125
30KE1600	19738	14804	3511	2301	24673	8808	3068	0.0125
30KE1800	22203	16652	3754	2471	27754	9814	3295	0.0125
30KE2000	24813	18610	3963	2613	31016	10840	3484	0.0125
30KE2250	27813	20888	4196	2754	34814	11963	3672	0.0125
30KE2500	30000	23299	4221	2852	38831	13105	3802	0.0125
30KE3000	37030	27772	4245	2925	46287	16322	3900	0.0125



* full dims upon request.

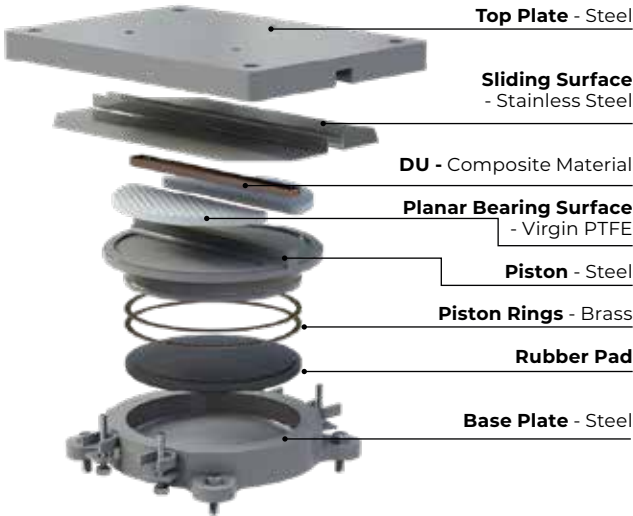
Bearing No.	Installation Dimensons (mm)														Bearing Weight (kg)
	A	B	C	F	G	H	J	K	L	M	N	O	P	WT	
30KE0050	190	267	200	160	12	12	66	4	14	30	30	35	110	13	
30KE0075	219	295	220	180	12	12	69	4	14	35	35	35	110	17	
30KE0100	258	355	265	215	16	16	76	4	18	40	40	40	140	27	
30KE0130	293	390	290	240	16	16	80	4	18	40	40	40	140	36	
30KE0160	332	428	317	267	16	16	82	4	18	40	40	40	140	46	
30KE0200	371	488	362	302	20	20	89	4	22	50	50	50	170	64	
30KE0250	419	536	396	336	20	20	92	4	22	50	50	50	170	82	
30KE0300	461	597	442	372	24	24	100	4	26	60	60	55	200	108	
30KE0350	502	638	471	401	24	24	107	4	26	60	60	55	200	137	
30KE0400	534	670	494	424	24	24	111	4	26	60	60	55	200	160	
30KE0450	568	740	549	459	30	30	119	4	32	70	70	70	240	196	
30KE0500	600	771	571	481	30	30	122	4	32	75	75	70	240	224	
30KE0550	632	803	594	504	30	30	124	4	32	75	75	70	240	246	
30KE0600	660	832	614	524	30	30	125	4	32	80	80	70	240	270	
30KE0700	709	880	648	558	30	30	133	4	32	80	80	70	240	337	
30KE0800	752	948	699	599	36	36	145	4	38	90	90	80	300	412	
30KE0900	808	1004	739	639	36	36	151	4	38	90	90	80	300	482	
30KE1000	852	1048	770	670	36	36	155	4	38	100	100	80	300	560	
30KE1200	933	1164	858	738	42	42	166	4	44	110	110	105	360	727	
30KE1400	1008	1239	911	791	42	42	173	4	44	110	110	105	360	873	
30KE1600	1070	1301	955	835	42	42	178	4	44	120	120	105	360	1007	
30KE1800	1130	1396	1028	888	48	48	191	4	50	120	120	120	410	1211	
30KE2000	1186	1453	1068	928	48	48	197	4	50	120	120	120	410	1369	
30KE2250	1250	1517	1113	973	48	48	204	4	50	120	120	120	410	1558	
30KE2500	1312	1579	1157	1017	48	48	209	4	50	120	120	120	410	1781	
30KE3000	1426	1692	1237	1097	48	48	218	4	50	120	120	120	410	2123	

Note: M = Length of base screw, N = Length of top screw, O = Diameter of top/base socket (mm), P = Length of top/base socket (mm)

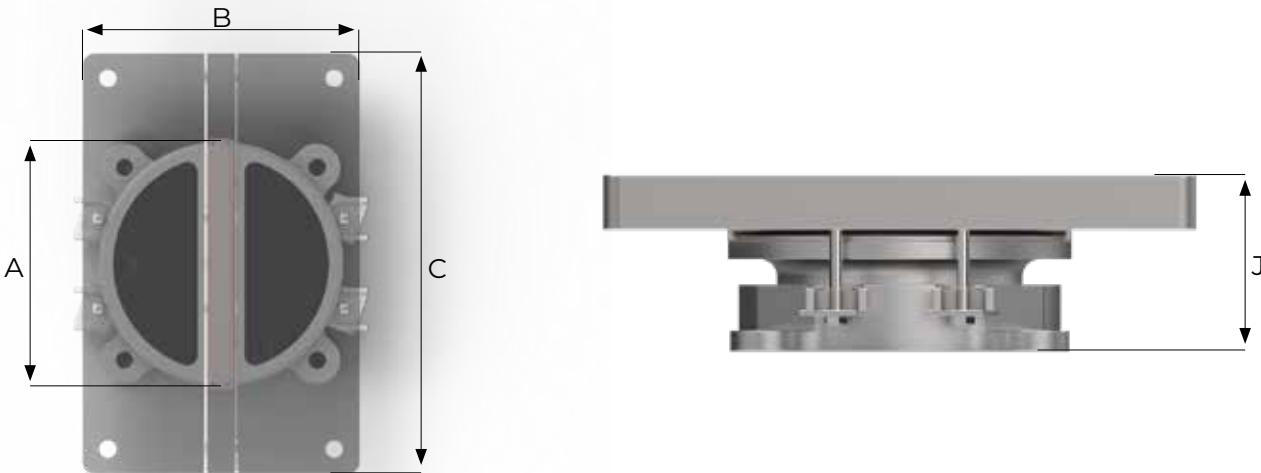
Typical 31KE Details - Exploded View

Bearings should be selected to suit the appropriate design code. The maximum vertical and horizontal loads shown in the tables may be taken in combination.

The 31KE guided bearing will resist a horizontal force acting at right angles to the main direction of movement. In order for the bearing to support the maximum horizontal loads stated in the tables, a minimum concurrent vertical load as shown in the table must co-exist. Where higher horizontal load capacities are required, special bearings can be offered for such requirements. We will be pleased to advise



Bearing No.	Serviceability Limit State Loads				Ultimate Limit State Loads			Rotation (Radians)
	Maximum Vertical (kN)	Permanent (kN)	Minimum Vertical (kN)	Horizontal (kN)	Maximum Vertical (kN)	Minimum Vertical (kN)	Horizontal (kN)	
31KE0050	653	490	297	102	816	293	136	0.015
31KE0075	940	705	424	146	1175	431	195	0.015
31KE0100	1279	959	566	195	1599	589	260	0.015
31KE0130	1602	1201	720	254	2002	751	338	0.015
31KE0160	2037	1528	894	307	2546	943	409	0.015
31KE0200	2524	1893	1112	380	3155	1179	507	0.015
31KE0250	3158	2369	1391	473	3948	1477	630	0.015
31KE0300	3758	2819	1656	560	4698	1767	747	0.015
31KE0350	4411	3308	1929	648	5514	2064	864	0.015
31KE0400	4995	3746	2200	736	6244	2361	981	0.015
31KE0450	5614	4211	2446	819	7018	2628	1092	0.015
31KE0500	6270	4703	2731	902	7838	2945	1202	0.015
31KE0550	6822	5116	2982	985	8527	3208	1313	0.015
31KE0600	7396	5547	3207	1063	9245	3460	1417	0.015
31KE0700	8773	6580	3808	1219	10966	4148	1625	0.015
31KE0800	9925	7444	4298	1365	12406	4695	1820	0.015
31KE0900	11148	8361	4791	1506	13935	5257	2008	0.015
31KE1000	12442	9331	5242	1638	15552	5783	2184	0.015
31KE1200	14826	11119	6060	1886	18532	6715	2515	0.0125
31KE1400	17418	13064	7043	2106	21773	7860	2808	0.0125
31KE1600	19738	14804	7869	2301	24673	8808	3068	0.0125
31KE1800	22203	16652	8727	2471	27754	9814	3295	0.0125
31KE2000	24813	18610	9575	2613	31016	10840	3484	0.0125
31KE2250	27813	20888	10506	2754	34814	11963	3672	0.0125
31KE2500	30000	23299	11441	2852	38831	13105	3802	0.0125
31KE3000	37030	27772	12934	2925	46287	16322	3900	0.0125



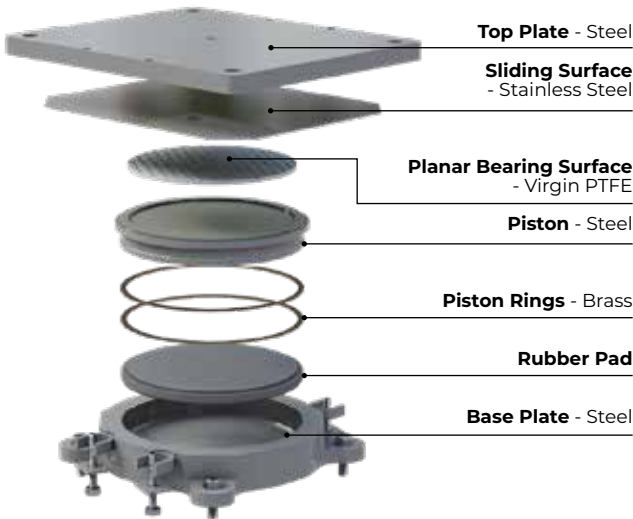
* full dims upon request.

Bearing No.	Installation Dimensons (mm)																Bearing Weight (kg)
	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	WT	
31KE0050	190	230	350	188	308	160	12	32	104	4	14	30	50	35	110	28	
31KE0075	219	250	380	208	338	180	12	32	106	4	14	35	50	35	110	35	
31KE0100	258	290	405	236	351	215	16	32	108	4	18	40	55	40	140	47	
31KE0130	293	325	430	271	376	240	16	33	113	4	18	40	60	40	140	60	
31KE0160	332	365	460	311	406	267	16	34	114	4	18	40	60	40	140	76	
31KE0200	371	405	485	339	419	302	20	35	118	4	22	50	65	50	170	96	
31KE0250	419	460	530	394	464	336	20	37	123	4	22	50	65	50	170	126	
31KE0300	461	505	560	427	482	372	24	38	128	4	26	60	80	55	200	155	
31KE0350	502	545	585	467	507	401	24	39	136	4	26	60	80	55	200	191	
31KE0400	534	575	610	497	532	424	24	40	141	4	26	60	80	55	200	220	
31KE0450	568	610	635	514	539	459	30	41	144	4	32	70	90	70	240	252	
31KE0500	600	640	660	544	564	481	30	42	148	4	32	75	90	70	240	286	
31KE0550	632	675	675	579	579	504	30	43	151	4	32	75	90	70	240	319	
31KE0600	660	700	700	604	604	524	30	43	152	4	32	80	90	70	240	347	
31KE0700	709	750	750	654	654	558	30	44	161	4	32	80	90	70	240	422	
31KE0800	752	795	795	681	681	599	36	46	169	4	38	90	100	80	300	501	
31KE0900	808	860	860	746	746	639	36	52	181	4	38	90	110	80	300	633	
31KE1000	852	905	905	791	791	670	36	54	187	4	38	100	110	80	300	728	
31KE1200	933	985	985	853	853	738	42	61	199	4	44	110	120	105	360	940	
31KE1400	1008	1060	1060	928	928	791	42	67	212	4	44	110	130	105	360	1171	
31KE1600	1070	1120	1120	988	988	835	42	71	221	4	44	120	130	105	360	1376	
31KE1800	1130	1180	1180	1030	1030	888	48	76	233	4	50	120	150	120	410	1624	
31KE2000	1186	1240	1240	1090	1090	928	48	77	240	4	50	120	150	120	410	1834	
31KE2250	1250	1300	1300	1150	1150	973	48	80	250	4	50	120	150	120	410	2107	
31KE2500	1312	1365	1365	1215	1215	1017	48	82	257	4	50	120	150	120	410	2379	
31KE3000	1426	1480	1480	1330	1330	1097	48	87	271	4	50	120	160	120	410	2951	

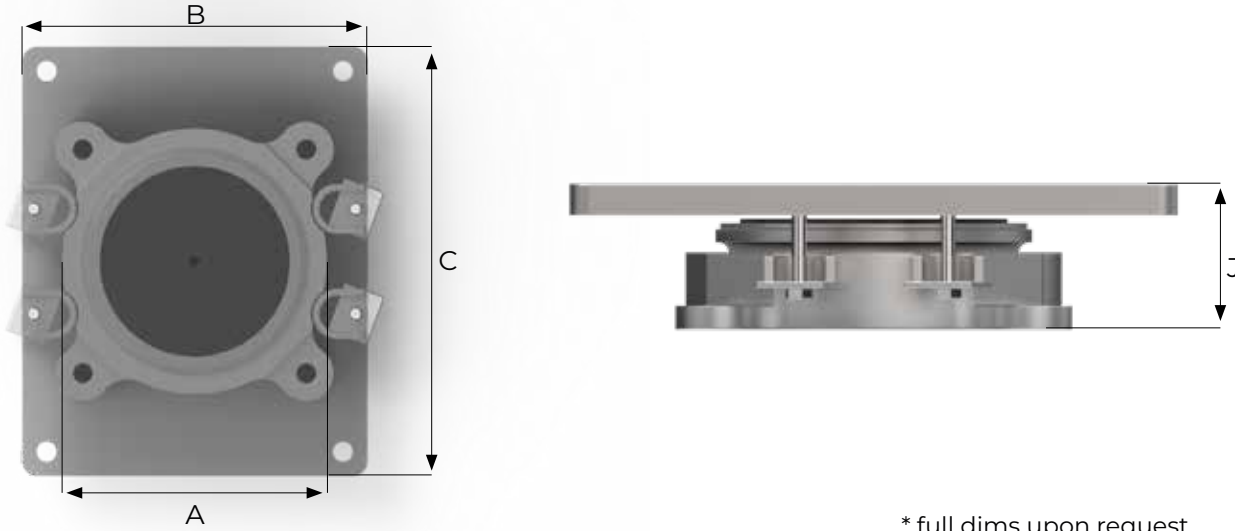
Note: M = Length of base screw, N = Length of top screw, O = Diameter of top/base socket (mm), P = Length of top/base socket (mm)

Typical 22KE Details - Exploded View

Bearings should be selected to suit the appropriate design code. The maximum vertical and horizontal loads shown in the tables may be taken in combination.



Bearing No.	Serviceability Limit State Loads			Ultimate Limit State Loads		Rotation (Radians)
	Maximum Vertical (kN)	Permanent (kN)	Minimum Vertical (kN)	Maximum Vertical (kN)	Minimum Vertical (kN)	
22KE0050	612	408	198	816	247	0.015
22KE0075	881	588	214	1175	267	0.015
22KE0100	1199	800	289	1599	361	0.015
22KE0130	1502	1001	366	2002	458	0.015
22KE0160	1910	1273	467	2546	584	0.015
22KE0200	2366	1578	574	3155	717	0.015
22KE0250	2961	1974	709	3948	887	0.015
22KE0300	3524	2349	837	4698	1046	0.015
22KE0350	4136	2757	970	5514	1213	0.015
22KE0400	4683	3122	1085	6244	1356	0.015
22KE0450	5264	3509	1201	7018	1501	0.015
22KE0500	5879	3919	1338	7838	1672	0.015
22KE0550	6395	4264	1452	8527	1815	0.015
22KE0600	6934	4623	1569	9245	1961	0.015
22KE0700	8225	5483	1858	10966	2322	0.015
22KE0800	9305	6203	2097	12406	2621	0.015
22KE0900	10451	6968	2351	13935	2939	0.015
22KE1000	11664	7776	2619	15552	3274	0.015
22KE1200	13899	9266	3049	18532	3811	0.0125
22KE1400	16330	10887	3550	21773	4438	0.0125
22KE1600	18505	12337	4019	24673	5023	0.0125
22KE1800	20816	13877	4505	27754	5631	0.0125
22KE2000	23262	15508	5030	31016	6288	0.0125
22KE2250	26111	17407	5624	34814	7030	0.0125
22KE2500	29123	19416	6264	38831	7830	0.0125
22KE3000	34715	23144	7434	46287	9293	0.0125



* full dims upon request.

Bearing No.	Installation Dimensons (mm)															Bearing Weight (kg)
	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	WT
22KE0050	190	247	307	212	272	160	12	16	74	4	14	30	35	35	110	19
22KE0075	219	274	334	239	299	180	12	18	79	4	14	30	40	35	110	26
22KE0100	258	302	362	257	317	215	16	20	84	4	18	40	45	40	140	36
22KE0130	293	330	390	285	345	240	16	24	92	4	18	40	50	40	140	50
22KE0160	332	364	416	319	371	267	16	28	98	4	18	40	50	40	140	67
22KE0200	371	400	445	345	390	302	20	31	104	4	22	50	60	50	170	87
22KE0250	419	446	480	391	425	336	20	35	111	4	22	50	65	50	170	117
22KE0300	461	490	518	425	453	372	24	38	118	4	26	60	70	55	200	149
22KE0350	502	529	550	464	485	401	24	41	128	4	26	60	80	55	200	190
22KE0400	534	559	578	494	513	424	24	42	133	4	26	60	80	55	200	219
22KE0450	568	591	608	511	528	459	30	43	136	4	32	70	90	70	240	252
22KE0500	600	621	633	541	553	481	30	45	141	4	32	70	90	70	240	289
22KE0550	632	651	653	571	573	504	30	49	147	4	32	70	90	70	240	333
22KE0600	660	677	677	597	597	524	30	51	150	4	32	70	100	70	240	369
22KE0700	709	723	723	643	643	558	30	52	160	4	32	70	100	70	240	444
22KE0800	752	763	763	668	668	599	36	54	168	4	38	90	110	80	300	523
22KE0900	808	816	816	721	721	639	36	61	181	4	38	90	110	80	300	654
22KE1000	852	857	857	762	762	670	36	63	187	4	38	90	120	80	300	749
22KE1200	933	944	944	834	834	738	42	69	198	4	44	100	130	105	360	963
22KE1400	1008	1014	1014	904	904	791	42	72	208	4	44	100	130	105	360	1166
22KE1600	1070	1072	1072	962	962	835	42	76	217	4	44	100	140	105	360	1367
22KE1800	1130	1129	1129	1004	1004	888	48	78	226	4	50	120	150	120	410	1578
22KE2000	1186	1181	1181	1056	1056	928	48	80	234	4	50	120	150	120	410	1786
22KE2250	1250	1241	1241	1116	1116	973	48	81	242	4	50	120	150	120	410	2030
22KE2500	1312	1300	1300	1175	1175	1017	48	83	249	4	50	120	150	120	410	2287
22KE3000	1426	1407	1407	1282	1282	1097	48	87	262	4	50	120	160	120	410	2813

Note: M = Length of base screw, N = Length of top screw, O = Diameter of top/base socket (mm), P = Length of top/base socket (mm)

Description

GE Series is a range of spherical structural bearings designed to permit angular rotations about any axis. Fixed, Free & Constrained bearings are available as standards to support loads up to 30,000kN.

The bearings fully meet the requirements of the British Department of Transport and EN1337 - 1,2,7 standards.

They are manufactured to meet all know quality standards throughout the world.

Bearing Types

The GE range of bearings are available in three types: -

- 13GE - Fixed
- 12GE - Free
- 11GE - Enhanced

Attachment

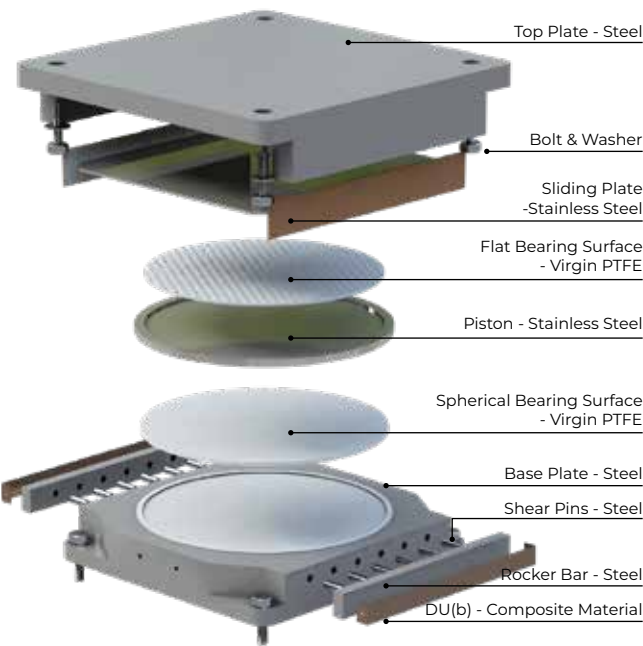
Fixing holes are provided in the top and base members of the bearings. This enables a variety of fixing methods to be used. Standard fixings are designed to ensure the bearings can be removed as simply as possible. See page 10.

Design Loads

The designation of loadings varies depending on the design code employed. The tabulated load capacities list nominal rating, at which load the base concrete stress is 20N/mm2 maximum. The working stress / serviceability limit state maximum loads are determined by the allowable PTFE stresses. The ultimate limit state maximum load characteristics are determined by the strength characteristics of the bearing and incorporate the material and partial safety factors as required by EN1337.

The practice of stating working loads, or nominal loads is inappropriate for limit state designs. The SLS and ULS capacities represent design load effects, i.e. nominal loads to which ALL the appropriate factors have been applied. Factored loads must be provided to ensure correct bearing selection.

Typical 11GE Details - Exploded View



Rotation

All the bearings can rotate at least 0.035 radians about any horizontal axis. The maximum for each bearing is shown in the tables.

Translations

The dimensions for the 11GE (Constrained) and 12GE (Free) bearings are shown in the tables for the following movements -

Longitudinal	Transverse
11GE 100mm total	11GE NIL
12GE 100mm total	12GE 20mm total

Designation of Part No.

The part number of a bearing is simply built up as below –

Examples:

Ref	Type	Maximum Working Load (kN)	Movement Longitudinal / Transverse (mm) (mm)		Fixings Top Base	
a	30KE	5000			S	S
b	31KE	5000	100		B	S
c	22KE	5000	100	40	N	B

Full part number for c above is 12G500/100/20/NB

This denotes a Free Spherical GE bearing comprising of:

Working Load Capacity:	5000kN maximum
Movement - Longitudinal:	100mm total
- Transverse:	20mm total
Fixing Method:	No fixings in top plate
	Bolts in base plate

Movements in increments of 50mm total can be supplied. The top plate dimensions and the top fixing centres should be increased accordingly.

Note: 11GE bearings should not be used where movement is required at right angles to the constraint.

The required movements should be specified in the part number as described opposite.

GE SPHERICAL BEARING - FREE



GE SPHERICAL BEARING - GUIDED



GE SPHERICAL BEARING - FIXED



Bearing Design Loads

Bearings should be selected to suit the appropriate design code. The maximum vertical and horizontal loads shown in the tables may be taken in combination.

Horizontal Loading

The 11GE guided bearing will resist a horizontal force acting at right angles to the main direction of movement.
The horizontal load capacity is the lesser of two conditions -
a) 25% of the vertical load operating at the moment the horizontal force is present or
b) The loading shown in the load / dimension tables.

At EKSPAN, the actual load combination may permit the use of a vertical load higher than that shown in the table.

Our experts can advise further.

Transverse Movement

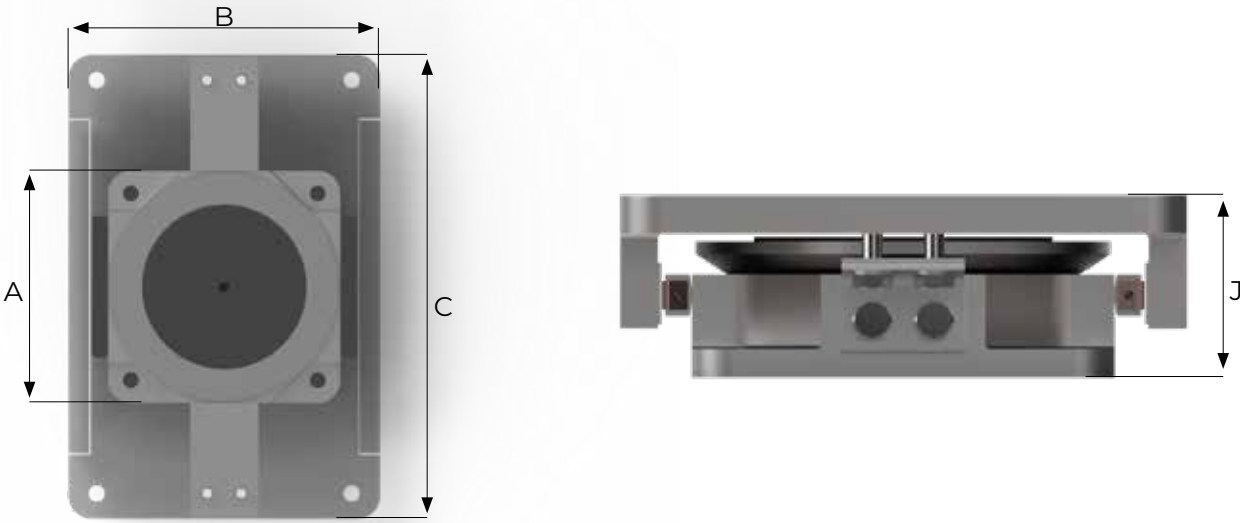
11GE bearings are designed to accommodate movement in one direction only. Movement transverse to the guide bars is nominally zero. In practice the transverse movement is 1.5mm maximum. Standard 11GE bearings should not be used where movement is required at right angles to the constraint. Special bearings can be offered for such requirements.

Concrete Stress

Where suitable reinforcement of the concrete has been provided the allowable concrete stress is dependent on the relative dimensions of the bearing / structure interface, the total support area, and the characteristic strength of the concrete. The stress on the structure should therefore be checked to ensure that it is acceptable.

At the nominal rating capacity tabulated the mean stress approaches 20N/mm2.

Bearing No.	Serviceability Limit State Loads				Ultimate Limit State Loads		
	Maximum Vertical	Permanent	Minimum Vertical	Horizontal	Maximum Vertical	Minimum Vertical	Horizontal
	(kN)	(kN)	(kN)	(kN)	(kN)	(kN)	(kN)
11GE0050	500	429	175	80	650	227	104
11GE0075	750	642	262	120	975	341	156
11GE0100	1000	851	350	160	1300	455	208
11GE0150	1500	1301	525	240	1950	682	312
11GE0200	2000	1718	700	320	2600	910	416
11GE0250	2500	2121	875	400	3250	1137	520
11GE0300	3000	2566	1050	480	3900	1365	624
11GE0350	3500	2970	1225	560	4550	1592	728
11GE0400	4000	3403	1400	640	5200	1820	832
11GE0450	4500	3865	1575	720	5850	2047	936
11GE0500	5000	4256	1750	800	6500	2275	1040
11GE0550	5500	4666	1925	880	7150	2502	1144
11GE0600	6000	5095	2100	960	7800	2730	1248
11GE0700	7000	5891	2450	1120	9100	3185	1456
11GE0800	8000	6745	2800	1280	10400	3640	1664
11GE0900	9000	7656	3150	1440	11700	4095	1872
11GE1000	10000	8483	3500	1600	13000	4550	2080
11GE1200	12000	10110	4200	1920	15600	5460	2496
11GE1400	14000	11879	4900	2240	18200	6370	2912
11GE1600	16000	13611	5600	2560	20800	7280	3328
11GE1800	18000	15271	6300	2880	23400	8190	3744
11GE2000	20000	16826	7000	3200	26000	9100	4160
11GE2250	22500	19088	7875	3600	29250	10237	4680
11GE2500	25000	21044	8750	4000	32500	11375	5200
11GE3000	30000	25243	10500	4800	39000	13650	6240



* full dims upon request.

Bearing No.	Installation Dimensons (mm)											Bearing Weight (kg)
	A	B	C	D	E	F	G	H	I	J	K	WT
11GE0050	269	410	225	365	200	155	14	12	35	110	88.7	40
11GE0075	287	440	245	395	210	165	14	12	35	110	95.7	51
11GE0100	323	460	280	415	240	195	14	12	35	110	103.7	67
11GE0150	365	500	320	455	270	225	14	12	35	110	109.7	89
11GE0200	419	530	365	475	310	255	18	16	40	140	122.7	129
11GE0250	479	570	425	515	350	295	18	16	40	140	140.7	190
11GE0300	529	600	475	545	390	335	18	16	40	140	148.7	227
11GE0350	575	630	505	560	430	360	22	20	50	170	162.7	272
11GE0400	615	630	545	560	460	390	22	20	50	170	172.7	364
11GE0450	651	710	585	640	490	420	22	20	50	170	177.7	439
11GE0500	677	730	595	650	510	430	26	24	55	200	186.7	497
11GE0550	666	730	585	650	495	415	26	24	55	200	192.7	508
11GE0600	717	750	635	670	530	450	26	24	55	200	202.7	626
11GE0700	756	790	675	710	575	495	26	24	55	200	206.7	703
11GE0800	801	820	705	720	600	500	32	30	70	240	217.7	806
11GE0900	990	1040	855	940	690	590	32	30	70	240	243.7	1340
11GE1000	1100	900	895	800	730	630	32	30	70	240	283.7	1647
11GE1200	1180	1165	980	1065	795	695	32	30	70	240	292.7	2067
11GE1400	1250	1165	1005	1065	810	710	32	30	70	240	318.7	2367
11GE1600	1200	1300	1030	1185	820	705	38	36	80	300	316.6	2725
11GE1800	1300	1385	1045	1270	840	725	38	36	80	300	344.6	3129
11GE2000	1350	1480	1075	1365	860	745	38	36	80	300	354.6	3576
11GE2250	1380	1480	1175	1365	920	805	38	36	80	300	368.6	3780
11GE2500	1440	1570	1200	1455	970	855	38	36	80	300	382.6	4387
11GE3000	1550	1780	1290	1665	1050	935	38	36	80	300	394.6	5427

Bearing Design Loads

Bearings should be selected to suit the appropriate design code.

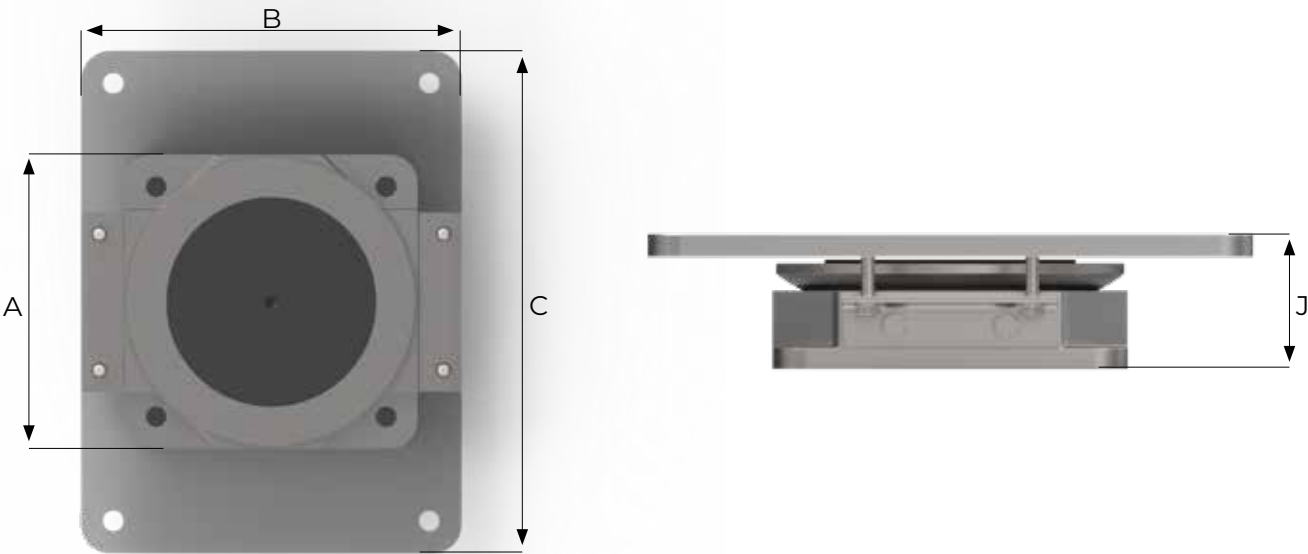
If in doubt please speak to our experts.

Concrete Stress

Where suitable reinforcement of the concrete has been provided the allowable concrete stress is dependent on the relative dimensions of the bearing / structure interface, the total support area, and the characteristic strength of the concrete. The stress on the structure should therefore be checked to ensure that it is acceptable.

At the nominal rating capacity tabulated the mean stress approaches 20N/mm2.

Bearing No.	Serviceability Limit State Loads			Ultimate Limit State Loads	
	Maximum Vertical	Permanent Vertical	Minimum Vertical	Maximum Vertical	Minimum Vertical
	(kN)	(kN)	(kN)	(kN)	(kN)
12GE0050	500	429	175	650	227
12GE0075	750	642	262	975	341
12GE0100	1000	851	350	1300	455
12GE0150	1500	1301	525	1950	682
12GE0200	2000	1718	700	2600	910
12GE0250	2500	2121	875	3250	1137
12GE0300	3000	2566	1050	3900	1365
12GE0350	3500	2970	1225	4550	1592
12GE0400	4000	3403	1400	5200	1820
12GE0450	4500	3865	1575	5850	2047
12GE0500	5000	4256	1750	6500	2275
12GE0550	5500	4666	1925	7150	2502
12GE0600	6000	5095	2100	7800	2730
12GE0700	7000	5891	2450	9100	3185
12GE0800	8000	6745	2800	10400	3640
12GE0900	9000	7656	3150	11700	4095
12GE1000	10000	8483	3500	13000	4550
12GE1200	12000	10110	4200	15600	5460
12GE1400	14000	11879	4900	18200	6370
12GE1600	16000	13611	5600	20800	7280
12GE1800	18000	15271	6300	23400	8190
12GE2000	20000	16826	7000	26000	9100
12GE2250	22500	19088	7875	29250	10237
12GE2500	25000	21044	8750	32500	11375
12GE3000	30000	25243	10500	39000	13650



* full dims upon request.

Bearing No.	Installation Dimensions (mm)												Bearing Weight (kg)
	A	B	C	D	E	F	G	H	I	J	K	L	WT
12GE0050	270	350	225	305	200	155	14	12	35	110	26.16	77.8	26
12GE0075	305	385	260	340	210	165	14	12	35	110	35.18	81.8	35
12GE0100	325	405	280	360	240	195	14	12	35	110	44.98	85.8	40
12GE0150	360	440	315	395	270	225	14	12	35	110	65.63	95.8	60
12GE0200	385	465	340	420	300	255	14	12	35	110	90.21	106.8	84
12GE0250	430	510	375	455	350	295	18	16	40	140	121.83	114.8	110
12GE0300	440	515	385	460	390	335	18	16	40	140	162.56	124.8	143
12GE0350	470	545	415	490	390	335	18	16	40	140	198.63	128.8	163
12GE0400	500	575	445	520	405	350	18	16	40	140	253.02	137.8	191
12GE0450	525	595	470	540	430	375	18	16	40	140	292.58	143.8	225
12GE0500	555	610	485	540	460	390	22	20	50	170	333.58	154.8	270
12GE0550	575	630	505	560	485	415	22	20	50	170	394.57	165.8	395
12GE0600	620	670	550	600	530	460	22	20	50	170	470.7	174.8	468
12GE0700	670	720	600	650	575	505	22	20	50	170	591.03	186.8	496
12GE0800	705	755	635	685	590	520	22	20	50	170	538.51	187.8	690
12GE0900	745	780	665	700	610	530	26	24	55	200	615.13	199.8	765
12GE1000	785	825	705	745	635	555	26	24	55	200	735.06	205.8	830
12GE1200	805	850	725	770	665	585	26	24	55	200	897.79	230.8	955
12GE1400	860	900	780	820	735	655	26	24	55	200	1063.74	239.8	1063
12GE1600	910	945	830	865	750	670	26	24	55	200	1166.71	249.6	1162
12GE1800	950	980	850	880	790	690	32	30	70	240	1358.05	261.6	1358
12GE2000	1000	1020	900	920	830	730	32	30	70	240	1545.37	269.6	1546
12GE2250	1030	1060	930	960	860	760	32	30	70	240	1786.01	288.6	1786
12GE2500	1060	1100	960	1000	920	820	32	30	70	240	2111.7	307.6	2112
12GE3000	1175	1175	1075	1075	1000	900	32	30	70	240	2693.12	332.6	2692

Bearing Design Loads

Bearings should be selected to suit the appropriate design code. The maximum vertical and horizontal loads shown in the tables may be taken in combination.

Concrete Stress

Where suitable reinforcement of the concrete has been provided the allowable concrete stress is dependent on the relative dimensions of the bearing / structure interface, the total support area, and the characteristic strength of the concrete. The stress on the structure should therefore be checked to ensure that it is acceptable.

At the nominal rating capacity tabulated the mean stress approaches 20N/mm2.

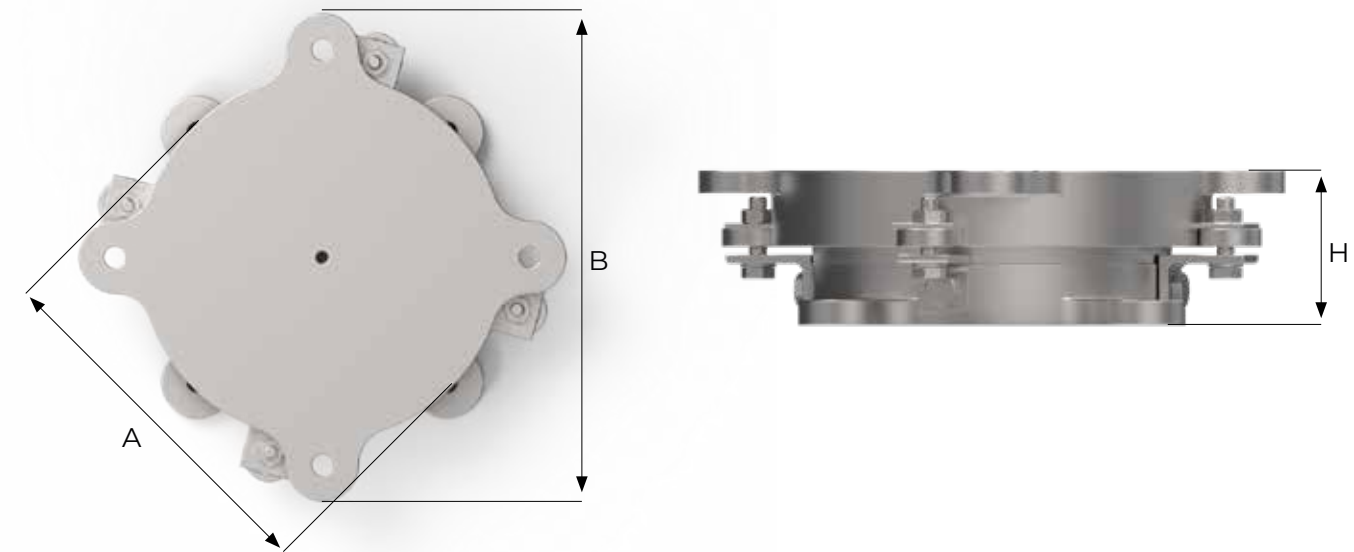
Horizontal Loading

The 13G fixed bearing will resist a horizontal force acting in any direction.
The horizontal load capacity is the lesser of two conditions -
a) 25% of the vertical load operating at the moment the horizontal force is present or
b) The loading shown in the load/dimension tables.

At EKSPAN, the actual load combination may permit the use of a vertical load higher than that shown in the table.

Our experts can advise further.

Bearing No.	Serviceability Limit State Loads				Ultimate Limit State Loads		
	Maximum Vertical (kN)	Permanent Vertical (kN)	Minimum Vertical (kN)	Horizontal (kN)	Maximum Vertical (kN)	Minimum Vertical (kN)	Horizontal (kN)
13GE0050	500	429	175	87	650	227	113
13GE0075	750	642	262	131	975	341	170
13GE0100	1000	851	350	175	1300	455	227
13GE0150	1500	1301	525	262	1950	682	341
13GE0200	2000	1718	700	350	2600	910	455
13GE0250	2500	2121	875	437	3250	1137	568
13GE0300	3000	2566	1050	525	3900	1365	682
13GE0350	3500	2970	1225	612	4550	1592	796
13GE0400	4000	3403	1400	700	5200	1820	910
13GE0450	4500	3865	1575	787	5850	2047	1023
13GE0500	5000	4256	1750	875	6500	2275	1137
13GE0550	5500	4666	1925	962	7150	2502	1251
13GE0600	6000	5095	2100	1050	7800	2730	1365
13GE0700	7000	5891	2450	1225	9100	3185	1592
13GE0800	8000	6745	2800	1400	10400	3640	1820
13GE0900	9000	7656	3150	1575	11700	4095	2047
13GE1000	10000	8483	3500	1750	13000	4550	2275
13GE1200	12000	10110	4200	2100	15600	5460	2730
13GE1400	14000	11879	4900	2450	18200	6370	3185
13GE1600	16000	13611	5600	2800	20800	7280	3640
13GE1800	18000	15271	6300	3150	23400	8190	4095
13GE2000	20000	16826	7000	3500	26000	9100	4550
13GE2250	22500	19088	7875	3937	29250	10237	5118
13GE2500	25000	21044	8750	4375	32500	11375	5687
13GE3000	30000	25243	10500	5250	39000	13650	6825



* full dims upon request.

Bearing No.	Installation Dimensons (mm)										Bearing Weight (kg)
	A	B	C	D	E	F	G	H	I	L	WT
13GE0050	250	200	220	170	14	12	35	110	28	87	28
13GE0075	270	215	240	190	14	12	35	110	35	96	35
13GE0100	315	265	265	215	14	12	35	110	48	99	49
13GE0150	335	270	300	240	18	16	40	140	68	99	69
13GE0200	390	305	335	270	18	16	40	140	98	122	98
13GE0250	440	345	385	305	18	16	40	140	136	133	136
13GE0300	470	370	405	325	22	20	50	170	169	143	169
13GE0350	495	385	430	340	22	20	50	170	196	151	196
13GE0400	545	425	465	365	22	20	50	170	245	159	246
13GE0450	575	450	490	390	26	24	55	200	289	168	289
13GE0500	605	470	515	400	26	24	55	200	326	171	326
13GE0550	655	510	560	435	26	24	55	200	403	182	404
13GE0600	675	525	575	450	26	24	55	200	437	186	437
13GE0700	720	560	615	485	32	30	70	240	543	199	544
13GE0800	770	600	650	510	32	30	70	240	640	208	641
13GE0900	810	640	690	540	32	30	70	240	754	220	755
13GE1000	860	670	730	575	38	36	80	300	922	240	923
13GE1200	940	725	795	625	38	36	80	300	1117	245	1118
13GE1400	1020	775	860	670	38	36	80	300	1310	250	1340
13GE1600	1090	845	920	725	38	36	80	300	1931	265	1632
13GE1800	1150	890	975	765	38	36	80	300	1913	278	1915
13GE2000	1230	940	1030	795	38	36	80	300	2219	295	2220
13GE2250	1300	990	1090	840	38	36	80	300	2621	303	2625
13GE2500	1370	1040	1150	900	38	36	80	300	2972	308	2975
13GE3000	1470	1110	1260	960	38	36	80	300	3613	321	3615

Description

The FE Series are designed to resist only horizontal loads. Restraint and guide bearings are available as standard for loads up to 2000 kN. The bearings fully meet the requirements of EN1337-8.

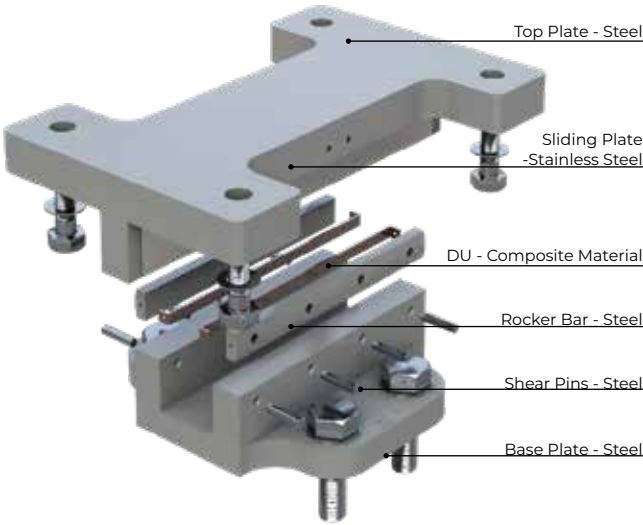
Bearing Types

The FE range of bearings are available in three types: -

- 10FE - Restraint
- 21FE - Guided
- 31FE - Enhanced guided

In addition to these fundamental features all the above bearings have a capacity for vertical translation, which in accordance with EN1337-8, equates to 15mm positive translation and 10mm negative translation. This feature provides the added benefit that these bearings can be considered as part of a client's temporary works restraint criteria during a bearing replacement, as the guide/restraint should never disengage.

Bearing Details - Exploded View



Attachment

All three types, 10FE, 21FE and 31FE, have the facility for bolted attachment of the top and base to sockets, or an independent tapered / adaptor plate.

Support and Installation

Important - See pages 8 - 10 for Installation and Maintenance. The bearings are fitted with transport brackets which maintain a clearance for vertical movement. These must be removed after installation.

Concrete Stress

Where suitable reinforcement has been provided the allowable concrete stress is dependent on the relative dimensions of the bearing / structure interface, the total support area and the characteristic strength of the concrete. The stress on the structure should therefore be checked to ensure that it is acceptable.

With these bearings it is important to ensure that the sockets are embedded in structural concrete not less than the depth indicated on page 7. A material of adequate strength must be used in conjunction with suitable reinforcement to resist bursting and tensile forces.

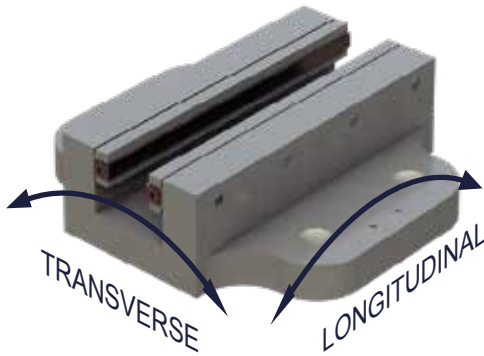
Design Loads

Bearings are designed to ultimately limit state criteria in accordance with EN1337-1, EN1337-2 and EN1337-8.

Rotation

The 10FE and 21FE bearing is designed to accommodate rotations in both the transverse and longitudinal direction of 0.01 radians.

The 31FE bearing is designed to allow an enhanced rotation capacity of 0.04 radians transversely and 0.01 radians longitudinally.



Translations

The dimensions for the 21FE and 31FE bearings allow for a longitudinal translation of ± 50mm. Additional translations can be accommodated. Please contact our sales team for further information.

Designation of Part No.

The part number of a bearing is simply built up as below –

Examples:

Ref	Type	Maximum Working Load (kN)	Movement Longitudinal (mm)	Fixings Top Base	
a	10FE	224	+ - 0	S	S
b	21FE	217	+ - 50	N	S
c	31FE	217	+ - 50	B	S

The basic part number is shown in the tables on pages 4 and 5. Select the type of attachment required and the smallest bearing in that range which can accommodate the specified operating conditions.

- e.g. For -
- a above the full part number would be 10FE25/SS
 - b above the full part number would be 21FE25/100/NS
 - c above the full part number would be 31FE25/100/BS

'c' above denotes a guide bearing with bolted attachment to the top plate and bolts and sockets to the base plate. Maximum load capacity is 224kN SLS/320kN ULS for a 10FE and 217kN SLS/310kN ULS for a 21FE/31FE bearing and total movement capacity is 100mm.

10FE



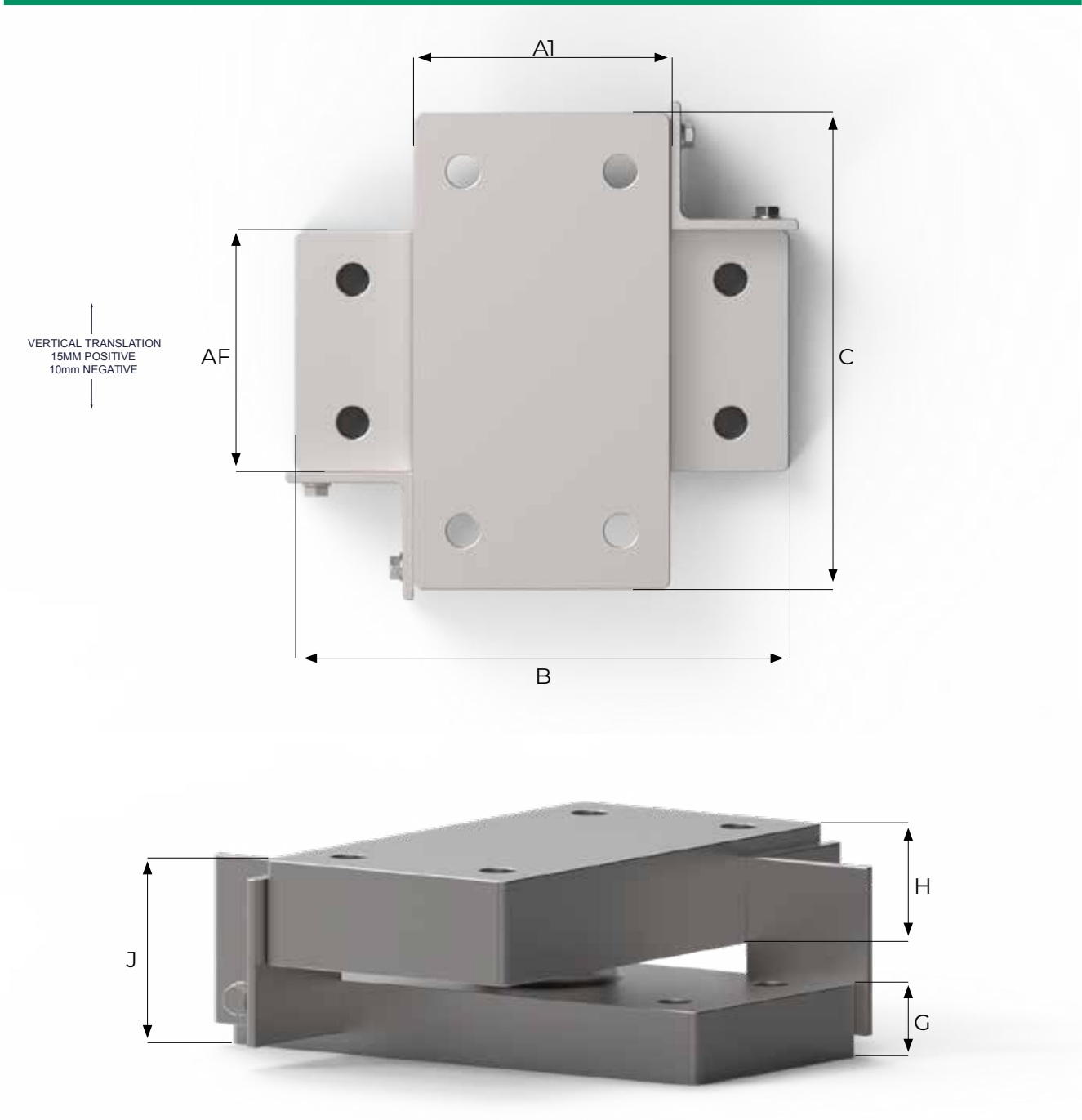
21FE



31FE



10FE - RESTRAINT BEARING

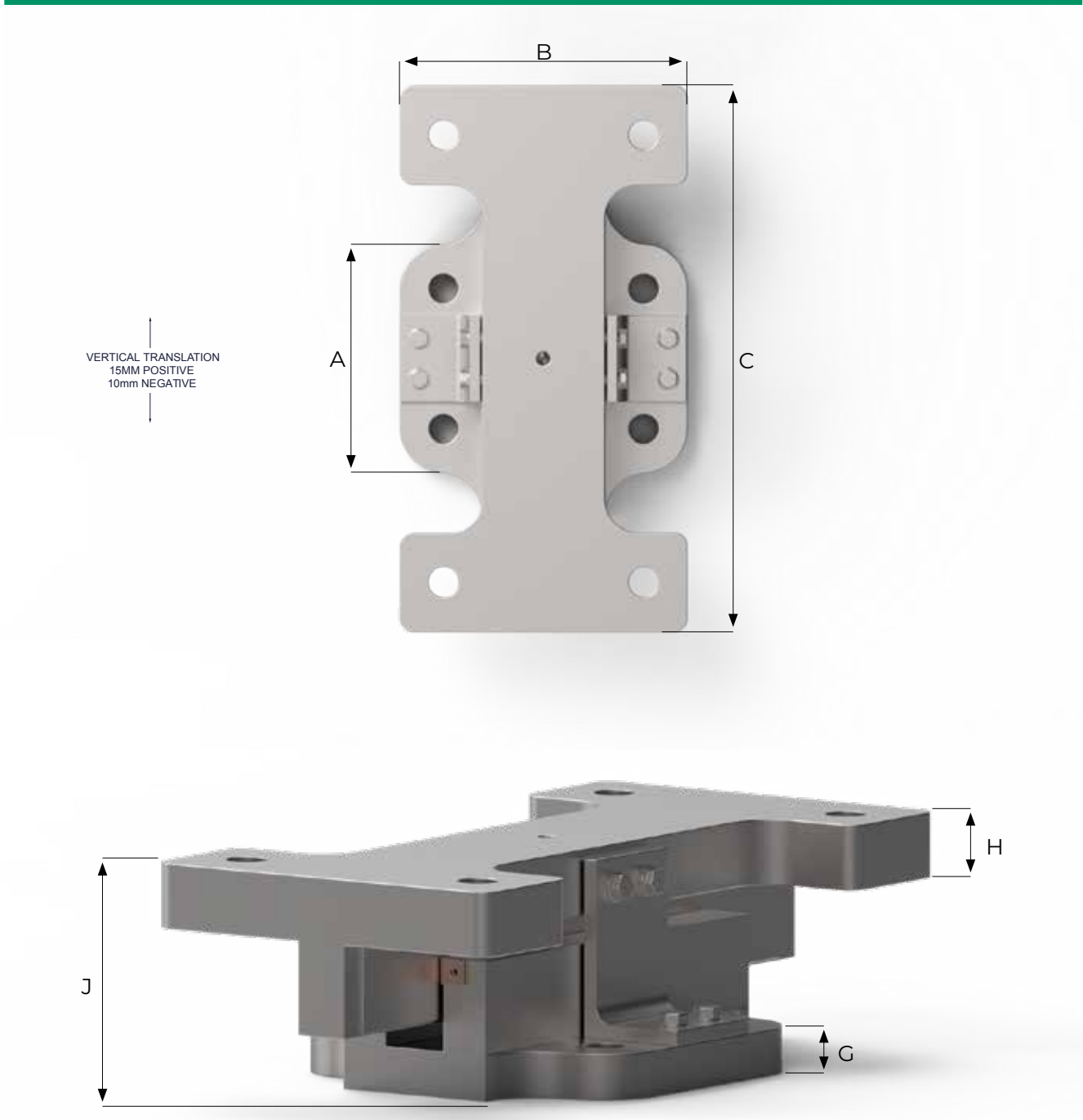


* full dims upon request.

Bearing No.	Bearing Dimensons (mm)															SLS Load	ULS Load	Approx Weight
	A	A1	B	C	D	E	F	F1	G	H	J	K	L	M	N	(kN)	(kN)	*(KG)
10FE15	132	270	140	260	86	196	206	78	35	50	99	18	4	18	4	119	170	24
10FE25	173	335	175	330	97	252	257	95	50	60	128	26	4	26	4	224	320	49
10FE35	220	410	216	390	120	294	314	124	60	75	154	32	4	32	4	392	560	91
10FE75	316	525	330	505	234	409	429	220	70	90	179	32	6	32	6	665	950	205
10FE90	354	595	375	590	261	476	481	240	75	95	188	38	6	32	6	896	1280	283
10FE110	444	700	444	690	310	556	586	310	90	110	220	44	6	44	6	1260	1800	471

* Weight excludes fixings

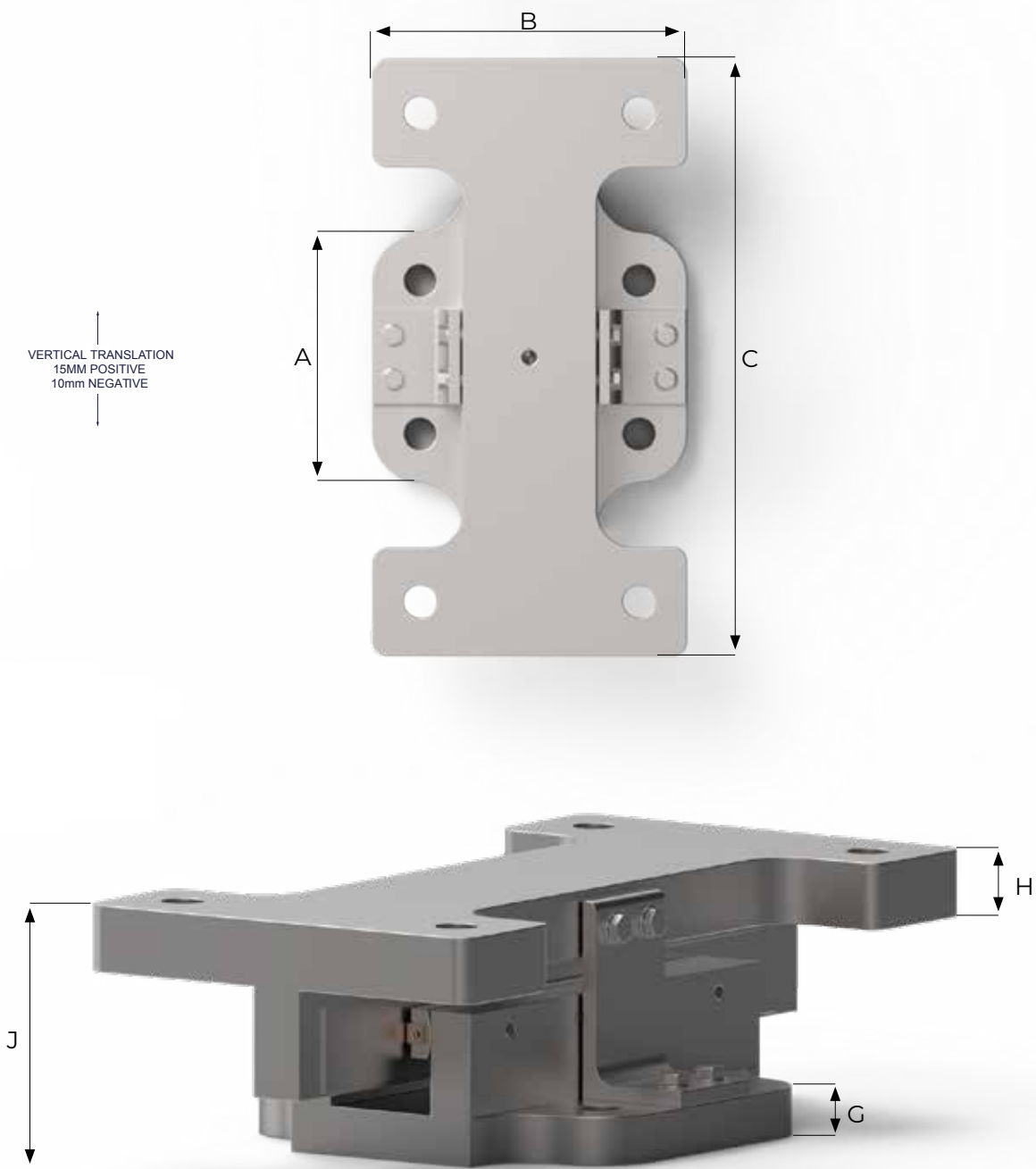
21FE - RESTRAINT BEARING



* full dims upon request.

Bearing No.	Bearing Dimensons (mm)																SLS Load	ULS Load	Approx Weight
	A	A1	B	C	D	E	E1	F	F1	G	H	J	K	L	M	N	(kN)	(kN)	*(KG)
21FE15	240	216	216	410	150	335	0	150	105	25	35	125	22	4	22	4	144	205	35
21FE25	290	270	270	470	190	382	0	190	120	30	45	148	26	4	26	4	217	310	58
21FE35	340	310	310	525	214	429	0	214	140	37	50	163	32	4	32	4	322	460	85
21FE75	450	358	358	860	258	534	764	258	240	40	52	167	32	6	32	8	651	930	174
21FE90	530	390	390	970	275	61	855	275	280	52	57	190	38	6	38	8	980	1400	246
21FE110	620	465	465	1150	335	685	1015	335	330	60	68	211	44	6	44	8	1400	2000	402

* Weight excludes fixings



* full dims upon request.

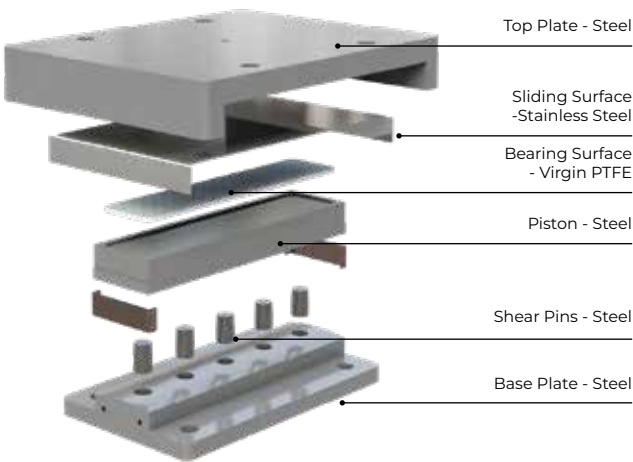
Bearing No.	Bearing Dimensons (mm)																	SLS Load	ULS Load	Approx Weight
	A	AI	B	C	D	E	E1	F	F1	G	H	J	K	L	M	N		(kN)	(kN)	*(KG)
31FE15	250	234	234	430	168	335	0	168	110	25	34	130	22	4	22	4		144	205	40
31FE25	290	308	308	470	228	382	0	228	115	30	42	149	26	4	26	4		217	310	68
31FE35	350	352	352	530	256	434	0	256	140	35	49	161	32	4	32	4		322	460	101
31FE75	450	387	387	860	287	534	764	287	240	40	50	173	32	6	32	8		651	930	193
31FE90	550	420	420	980	305	600	835	305	280	45	56	188	38	6	38	8		980	1400	272
31FE110	620	512	512	1115	382	655	985	382	330	55	70	215	44	6	44	8		1400	2000	455

* Weight excludes fixings

Line Rocker Bearings

The DE range of linear rocker bearings are designed to suit a comprehensive range of requirements and are custom built in our factory in Sheffield.

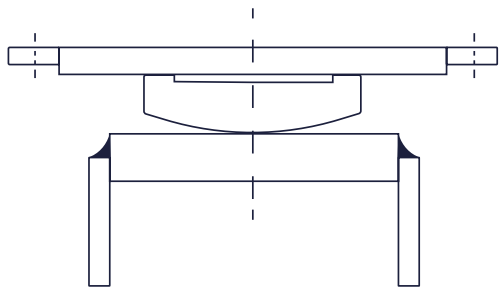
The oscillating linear bearing consists of a lower plate on which a rocker oscillates. Shear pins are used to hold the rocker in place and allows for rotation in one direction.



Bearing Types

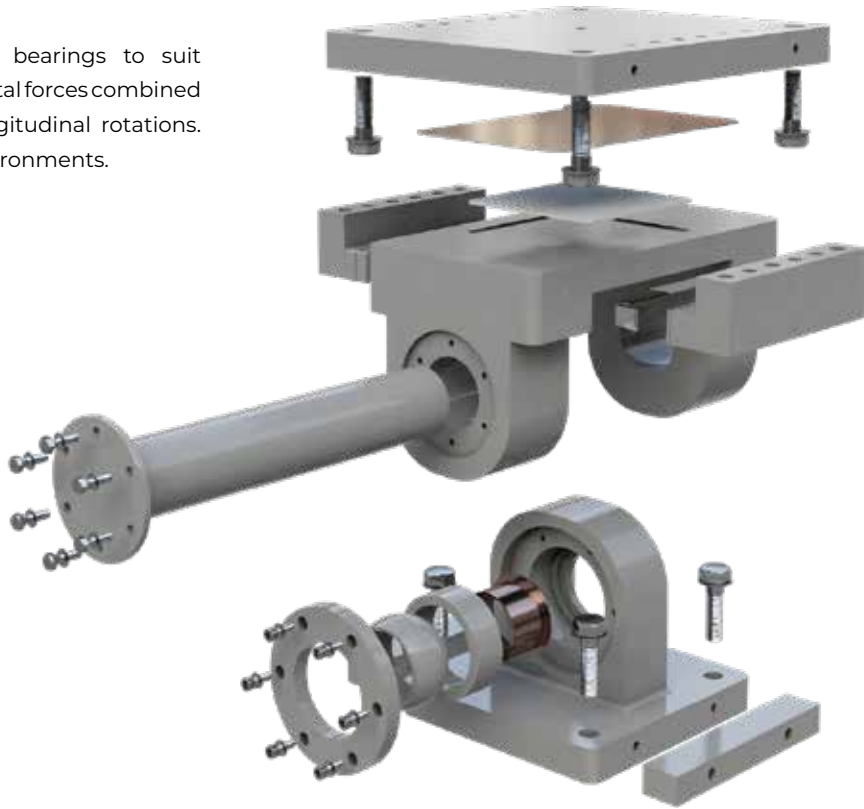
The D range of bearings are in three forms: -

- 10DE** - Fixed - No horizontal movement
- 11DE** - Constrained - Horizontal movement in one direction only
- 12DE** - Free - Horizontal movement in any direction



Linkspan Bearings BS5400

Linkspan bearings are custom made bearings to suit structures that are subject to high horizontal forces combined with low minimum loads and high longitudinal rotations. These are commonly used in marine environments.

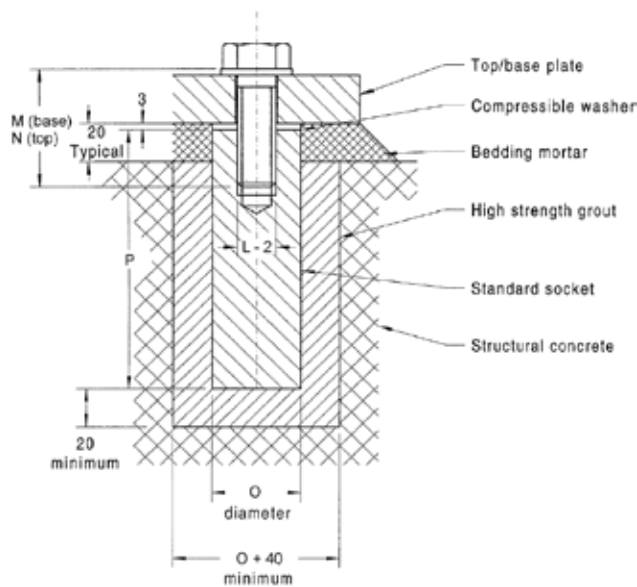


Uplift Bearings BS5400

Our Pot, Spherical and Linkspan bearings can all be modified to withstand occasional or permanent vertical uplift. These bearings can be designed and modified to work with specific loading conditions and are mostly used on roofs, footbridges and structures that are subject to seismic activity.



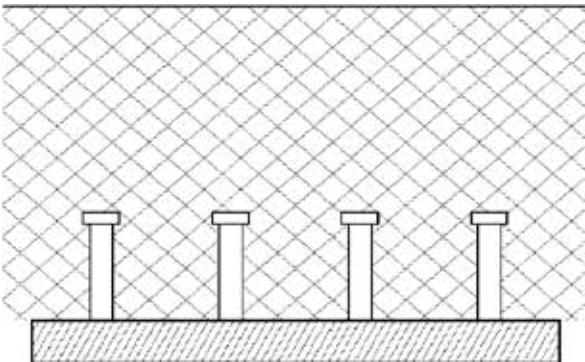
Fixing - With Socket



Notations To Dimensional References For Bearing Diagrams

- A** - Base plate square dimension - length or breadth of base plate (square dimension - mm)
- B** - Width of top plate (mm)
- C** - Length of top plate (mm)
- D** - Transverse width between the fixings on top plate (mm)
- E** - Longitudinal length between the fixings on top plate (mm)
- F** - Longitudinal / transverse distance between the fixings on base plate (square dimension - mm)
- G** - Lug thickness of base plate (mm)

Fixing - With Socket



With steel to steel connections bolting or welding of EKSPAN sub-plates is possible.

- H** - Lug thickness of top plate (mm)
- J** - Overall height of the nominal bearing (mm)
- K** - Hole diameter of the fixings on top and base plate
- L** - No. of fixings on top and base plate
- M** - Length and breadth of base sub plate (square dimension - mm)
- N** - Thickness of base or top sub plate (mm)
- O** - Diameter of top/base socket (mm)
- P** - Length of top/base socket (mm)

GOOD INSTALLATION

Mechanical guide bearing and upper adaptor plate correctly installed. All bearing interfacing surfaces are horizontal. All surfaces are free from contaminants.

BAD INSTALLATION

No tapered plate installed inducing additional rotations over maximum allowable. Incorrect fixings utilised. Welding completed with bearing in situ. Dirt and debris in and around the bearing slide area.

Presetting

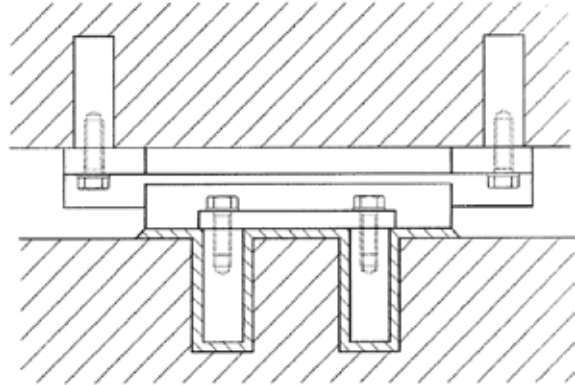
If bearings are required to be preset eg where once only large movements may occur during stressing operations, this should be specified as a requirement and should only be carried out in our works prior to despatch. Do not attempt this operation on site.

Bedding

Bearings must be supported on a flat rigid bed. Steel spreader plates must be machined flat and smooth to mate exactly with the bearings' upper and lower faces. Bearings may also be bedded on epoxy or cement mortar or by dry packing. Whichever system is preferred for the particular structure it is of extreme importance that the final bedding is free from high or hard spots, shrinkage, voids, etc.

Unless there is a specific design requirement, the planar surfaces must be installed in a horizontal plane. The correct installation of bearings is vital for the bearing performance. Costly repairs become necessary all too often due to inadequate specification or poor site supervision. The bearings should not be loaded until the bedding mortar has cured.

Fixing bearings to concrete using permanent anchor plates

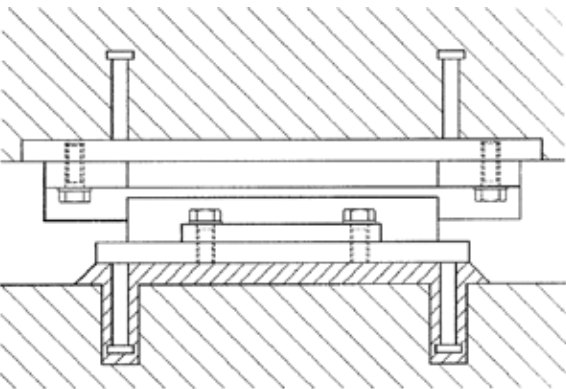


Cast-In-Situ Structures

Care must be taken to ensure that the bearings are not damaged by the formwork or contaminated by concrete seepage. The interface between the top plate and the formwork should be protected and sealed.

Owing to the loading effects of a wet concrete mass, the top plates should be propped to prevent rotation and plate distortion.

Fixing cast-in-situ structures ensure that the bearing working surfaces are protected and supported to prevent distortion and rotation.



Bearing Removability

Where possible, bearings should be fixed in such a manner as to facilitate removal. Our bearings have generally been designed with this in mind. However, when selecting the bearing type preferred, the removability feature should be highlighted in your enquiry.

Removal of Transport Brackets

These brackets, normally painted red should only be removed once the bearing is properly installed and ready for operation.

Bearing Installation Check List

Do -

1. Handle carefully and where necessary with adequate craneage.
2. Store in a clean dry place.
3. Ensure that the bearings are installed in the correct location and orientation.
4. Ensure that the bearings are installed on a flat rigid bed before the design loads are applied.
5. Ensure that the fixings are uniformly tightened.
6. Complete any site coatings and make good paint damaged during handling and installation.
7. Protect working surfaces during the placing of in-situ concrete.
8. Keep the bearing and surrounding areas clean.
9. Remove any temporary transit clamps etc. before the bearings are required to operate.
10. Take special care to support top plates when casting in-situ concrete.

DO NOT -

1. Dismantle the bearing on site.
2. Leave the bearing uncovered.
3. Attempt to modify without our approval.
4. Install without qualified supervision.

Site Coating

Care should be taken to ensure that working surfaces are not damaged in any site coating operation. After installation damaged coatings must be repaired irrespective of any call for site coatings. Exposed fixing bolts should be protected after final tightening. Any tapped holes exposed after removal of transportation brackets etc. (coloured red) should be sealed with self-vulcanizing silicone sealant.

Routine Maintenance of Bearings

1. Immediately following installation bearings shall be inspected to ensure that all aspects of 'Installation of bearings' have been adhered to and bearings shall subsequently be re-inspected not less frequently than every two years.
2. Paint and /or other specified protective coatings must be maintained in good and efficient condition and free from scratches or chips. Any areas of the protective coating showing damage or distress must be rectified. Attempt to modify without our approval.
3. Areas surrounding the bearings must be kept clean and dry and free from the adverse effects of external influences such as airborne debris or water / salt (for example emanating from leaking joints).
4. The wearing surfaces of the bearing must be checked to ensure that they are continuing to operate efficiently.
5. Fixing bolts must be checked for tightness.
6. Any bedding material showing signs of distress or ineffectiveness must be replaced and the reason for its failure investigated and corrected.
7. Routine inspections shall include a check that translational and rotational capacities of the bearing have not been exceeded and show no sign of being likely to exceed the requirements specified at the design stage.



Bridge Name										
Bearing Identification										
Special Requirements										
Bearing Type										
Number off										
Seating Material		Upper Surface								
		Lower Surface								
Allowable average contact pressure (N/mm²)		Upper face	Serviceability							
			Ultimate							
		Lower face	Serviceability							
			Ultimate							
Design Load effects (kN)	Serviceability limit state	Vertical	max							
			Permanent							
			min							
		Transverse								
		Longitudinal								
	Ultimate limit state	Vertical	max							
			min							
		Transverse								
Longitudinal										
Translation (mm)	Serviceability limit state	Irreversible	Transverse							
			Longitudinal							
		Reversible	Transverse							
			Longitudinal							
	Ultimate limit state	Irreversible	Transverse							
			Longitudinal							
		Reversible	Transverse							
			Longitudinal							
Rotation (Radians) (State whether +ve or -ve rotation)	Serviceability limit state	Irreversible	Transverse							
			Longitudinal							
		Reversible	Transverse							
			Longitudinal							
	Maximum rate (radians/100kN)		Transverse							
			Longitudinal							
Maximum bearing dimensions (mm)	Upper surface		Transverse							
			Longitudinal							
	Lower surface		Transverse							
			Longitudinal							
	Overall height									
Tolerable movement of bearing under transient loads (mm), serviceability		Vertical								
		Transverse								
		Longitudinal								
Allowable resistance to translation under serviceability limit state (kN)		Transverse								
		Longitudinal								
Allowable resistance to rotation under serviceability limit state (kN)		Transverse								
		Longitudinal								
Type of fixing required		Upper face								
		Lower face								
Maximum Vertical Stiffness of Bearing kN/mm										
Number of complete bearings to be subjected to Acceptance Testing	Bearing other than elastomeric bearings	Combined vertical & horizontal load test at serviceability limit state								
		Combined vertical & horizontal load test at ultimate limit state								
	Laminated elastomeric bearings	Quick prodcedure test								
		Compressive stiffness test								
Shear stiffness test										



WE ARE **E**XPERTS. WE MAKE A DIFFERENCE.
WE SHARE **K**NOWLEDGE. ONE TEAM. ONE GOAL.
WE ARE THE **S**UPPORT THAT MATTERS.
WE ARE **P**RECISION ENGINEERS.
WE ARE **A**DAPTABLE PROBLEM SOLVERS.
WE ARE **N**IMBLE, AGILE AND EFFICIENT.



DESIGNED TO SUPPORT. MADE TO LAST.



DESIGNED TO SUPPORT.MADE TO LAST.

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