GGB UNI/MINI/EXALIGN™

Self-Aligning Bearing Housings for Self-Lubricated and Lubricated Applications

The Global Leader
in High Performance Bearing Solutions

GGB

an Enpro company

GGB

GGB's history as the global leader in plain bearing technologies dates back more than 115 years, beginning with the founding of Glacier Antifriction Metal Company in 1899. GGB introduced the industry-leading DU® bearing in 1965. Since that time, GGB has continued to create innovative technologies and solutions that improve safety, performance and profitability in a wide range of markets. Today, our products can be found everywhere – from scientific vessels at the bottom of the ocean to racecars speeding down the tarmac to jumbo jets slicing through the sky to the Curiosity rover exploring the surface of Mars.

Throughout our history, safety, excellence and respect have formed the foundational values for the entire GGB family. They are of paramount importance as we seek to maximize personal possibility, achieve excellence and establish open, creative work environments with the highest safety standards in the industry.

- **Safety:** GGB's deep-rooted culture of safety places a relentless focus on creating a secure, healthy work environment for all. A core value of GGB, safety is critically essential at all levels of business in order to achieve our goal of having the safest employees in the industry.
- **Excellence:** A world-class organization is built by fostering excellence throughout the company in all positions and functional areas. Our world-class manufacturing plants are certified in quality and excellence in the industry according to ISO 9001, TS 16949, ISO 14001, ISO 50001 and OHSAS 18001, allowing us to access the industry's best practices while aligning our quality management system with global standards.
- **Respect:** We believe that respect is consistent with the growth of individuals and groups. Our teams work together with mutual respect regardless of background, nationality or function, embracing the diversity of people and learning from one another.

The GGB Advantage

With manufacturing facilities around the world, including cutting edge R&D facilities, flexible production platforms and extensive customer support networks, GGB offers unmatched technical expertise combined with razor sharp responsiveness and customized solutions. Our global presence and local logistics networks ensure our customers receive only the highest quality bearing solutions, in a timely manner and with extensive engineering support.

We don't just make products, we build partnerships. That's the GGB Advantage.

Quality

Our world-class manufacturing plants in the United States, Brazil, China, Germany, France and Slovakia are **CERTIFIED IN QUALITY AND EXCELLENCE IN THE INDUSTRY** according to ISO 9001, TS 16949, ISO 14001, ISO 50001 and OHSAS 18001. This allows us to access the industry's best practices while aligning our quality management system with global standards.

For a complete listing of our certifications, please visit our website:
www.ggbearings.com/en/company/certificates

Content

The Highest Standards in Quality

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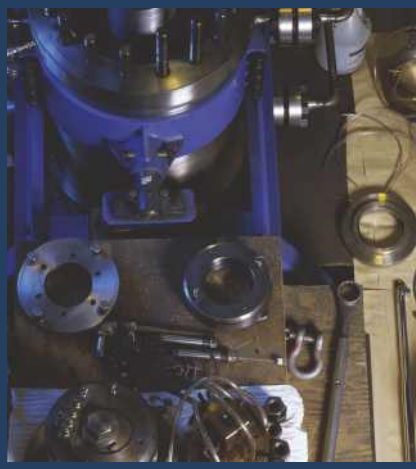


A Long History of Innovation

From our modest beginnings over 115 years ago, GGB grew through innovation and technical expertise to become the world's leading manufacturer of plain bearing solutions.

1899

Findlay and Battle founded Findlay Motor Metals. The company was renamed to Glacier Antifriction Metal Company two years later.

1910s

Began making plain bearings in response to increased demand for internal combustion engines.

1956

Inroduced DU®, the world's first steel backed metal-polymer bearing material with bronze and PTFE lining offering excellent low friction and wear resistance performance. Introduced DU-B with bronze backing for improved corrosion resistance.

1958

Garlock Inc. was founded as a bearing distributor when an agreement was reached with Glacier.

1965

Launched the marginally lubricated DX® metal-polymer material for greased applications.

1996

Launched new EP® solid polymer materials.

2002

Goodrich Corporation spun off its engineered industrial products division, creating EnPro Industries Inc., the new parent company of Glacier Garlock Bearings.

2003

Introduced lead-free DP31 metal-polymer material with improved performance under lubricated conditions. Acquired Saver North America, a producer of self-lubricating composite bearings. Glacier Garlock Bearings expanded business in Asia

2004

Glacier Garlock Bearings changed name to GGB. Opened new manufacturing plant Sučany, Slovakia

2007

Introduced SBC (Sealed Bearing Cartridges) for off-highway equipment applications. Acquired Böhringer Kunststofftechnik GmbH precision injection molder of high-performance solid polymer solutions.

2008

Production facility opened in Suzhou, China; new DX®10 bearings won Frost & Sullivan's product innovation of the year award in the Class 7-8 truck bearings category.

1974

Began continuous casting of the SICAL® range of aluminum alloys and high precision machining of bushing blocks in Dieuze, France.

1978

Introduced filament wound product range in the USA, including GAR-MAX®.

1995

Introduced lead-free steel backed DP4® metal-polymer material for automotive shock absorbers and other hydraulic applications. Introduced DP4-B with bronze backing for improved corrosion resistance.

1970s

Glacier licensed technology to a number of overseas bearing manufacturers. Licenses included: SIC (France), Garlock Bearings (USA).

1976

Glacier and Garlock Inc. established joint venture company Garlock Bearings Inc.

1986

Launched HI-EX™ metal-polymer material, designed for high temperature applications.

2009

Filament-wound product range introduced to the European and Asian markets; GGB North America certified to AS9100B, the aerospace industry's standard for quality management systems.

2011

Acquired PI Bearing Technologies, now GGB Chicago, a producer of PICAL® aluminum alloy bushing blocks for demanding fluid power applications. GGB plants certified to OHS18001 for health and safety management systems.

2013

Launched new self-lubricating metallic bearing materials GGB-CSM® and GGB-CBM® as well as FLASH-CLICK® two-piece, double-flanged solid polymer bearings.

2014

Series of self-lubricating sintered bronze and sintered iron bearings introduced, including GGB-BP25, GGB-FP20 and GGB-SO16.

Three plants mark milestone anniversaries: 40 years for Heilbronn, Germany and Dieuze, France and 10 years for Sučany, Slovakia.

2010

Introduced lead-free DP10 and DP11 metal-polymer materials for superior performance under marginally lubricated and dry running conditions.

2012

DTS10® machinable metal-polymer bearings are launched for the fluid power and compressor markets. GGB bearings land on Mars aboard NASA's Curiosity rover.

2015

Introduced HPMB®, a fully machinable, made-to-order filament wound bearing material.

Also introduced the lead-free GGB-SZ, for high specific loads with low-frequency, oscillating motion.

2016

Introduced GGB-SHB™ case hardened steel bearings

1 Introduction

The continuous improvements made in today's machinery and equipment are heavily dependent on the performance of the bearings.

The bearings are expected to perform under increasingly difficult operating conditions and still offer greater reliability, a longer service life with reduced maintenance and a lower cost of ownership.

GGB brings more than 115 years of experience and accumulated expertise in self-lubricating bearings, offering an extensive portfolio of bearing products and and technical application knowledge across a wide range of industries. Our application engineering team can provide assistance in:

- Selection of the optimal type of bearing for your application
- Design with either standard or custom products
- Calculation of estimated life expectancy
- Assembly and installation

GGB offers the most advanced bearing products in the industry, supported by laboratory testing in state-of-the-art facilities, produced according to the highest quality standards.

1.1 Self-Aligning Bearing Housings

The self-aligning bearing housings are available in standard ranges:

- EXALIGN™ PB plummer blocks and EXALIGN™ DF and FL flanged bearing housings
- MINI and UNI bearing housings that can be mounted as either plummer blocks or flanged bearing housings.

The brochure gives information on the various types of housings, their construction, dimensions, load capacity and the different options of assemblies incorporating maintenance-free and low maintenance plain bearings.

1.2 Characteristics and Advantages

- Self-aligning bearing housings enable simple compensation of system misalignment
- Misalignment up to ± 5° permitted
- All-purpose EXALIGN™ flanged DF and FL bearing housings and EXALIGN™ PB pedestal bearing housings are suitable for high loads
- Choice of various housings, spherical inserts and bearings to suit all configurations and operating conditions
- Mounting of GGB bearings for optimal bearing solutions
- Spherical insert is secured against distortion

1.3 Standard Housings

UNI Housing

MINI Housing

EXALIGN™ PB
Plummer Block

Housing Type	Bearing Ø D_i	Description
MINI	8 - 15 mm	Plummer block or flanged housing
UNI	10 - 100 mm	Plummer block or flanged housing
EXALIGN Type PB	10 - 100 mm	Plummer block
EXALIGN Type DF	10 - 100 mm	Flanged Housing – 2 bolts
EXALIGN Type FL	10 - 100 mm	Flanged Housing – 4 bolts

EXALIGN™ DF
Flanged Housing

Housing Type	Housing material	Spherical insert material
MINI bearing housing	Aluminium (AlMgSi12)	Steel (9SMn28K)
UNI bearing housing	Ductile cast iron (GGG40)	Steel (16MnCr5)
EXALIGN	Cast iron (GG20)	Cast iron (GG20)

EXALIGN™ FL
Flanged Housing

2 Loading Data

2.1 Radial Loads

GGB plain bearing products such as DU® and DX® can be used in high load applications. The maximum permissible loading for the bearing, particularly at slow sliding speeds, may exceed the load limit of the bearing housing or the fixing bolts.

The following data for MINI, UNI and EXALIGN™ bearing housings were determined by laboratory testing. They are dependant on housing material and design shape.

The load limits for the MINI bearing housings were determined by the housing strength or the load limits of the 6 mm fixing bolts and depend on the direction of the load.

UNI bearing housings are stronger than the fixing bolts. The load limits given apply for 12.9 bolts (tensile strength 1 200 N/mm², 0.2% yield strength 1 080 N/mm², elongation at rupture 8%).

The data given for EXALIGN™ housings is based on the strength of grey cast iron that is used in the standard housings and suitable for most applications. Alternatively, higher strength materials are available on request. Please contact your local GGB sales representative.

UNI Technical Data

Load Limit Values for Radial Forces				
Size	Bush ID	Max. Radial Load [N] (Housing)	Max. Radial Load [N] (Bolt)	Max. Shear Off Load [N] (Bolt)
1	10 - 25	20 000	10 000	1 000
2	28 - 40	30 000	15 000	1 500
3	45 - 60	50 000	25 000	2 500
4	65 - 80	90 000	45 000	4 500
5	85 - 100	125 000	62 500	6 000

The given data for UNI bearing housings are valid for 12.9 bolts (DIN EN 20898, part 1), as the housing load limit exceeds the load limit of the fixing bolts.

MINI Technical Data

Load Limit Values for Radial Forces				
Size	Bush ID	Max. Radial Load [N] (Housing)	Max. Radial Load [N] (Bolt)	Max. Shear Off Load [N] (Bolt)
0	8 - 15	10 000	5 000	500

The load limit for MINI bearing housings is determined by the housing load limit or by the load limit of the of the fixing bolts (6mm diameter), depending on the load direction.

EXALIGN™ Technical Data

Load Limit Values for Radial Forces		EXALIGN™ PB Plummer Block	EXALIGN™ FL / DF 4-Holes / 2-Holes Flanged Housing
Size	Bush ID	Max. Radial Load (N)	Max. Radial Load (N)
1	10 - 15	4 250	3 750
2	20 - 25	7 700	5 900
3	30	9 500	8 000
4	35 - 40	17 000	11 000
5	45	23 000	12 000
6	50	25 000	14 500
7	55 - 60	30 000	16 000
8	70 - 75	38 000	17 000
9	80 - 85	45 500	27 000
10	90 - 100	74 500	30 500

2.2 Axial Loads

All of the housing assemblies are designed to accommodate low axial loads only, for example, those arising from location forces. Axial loads should be limited in each case to no more than 5% of the maximum radial loads quoted above. Under service conditions of continuous axial loading, it is advisable to use a stepped shaft operating against either a flanged bearing or a KA Glacetal thrust washer.

The estimated service life for the axial bearing should be calculated using the actual axial loads.

3 Lubrication

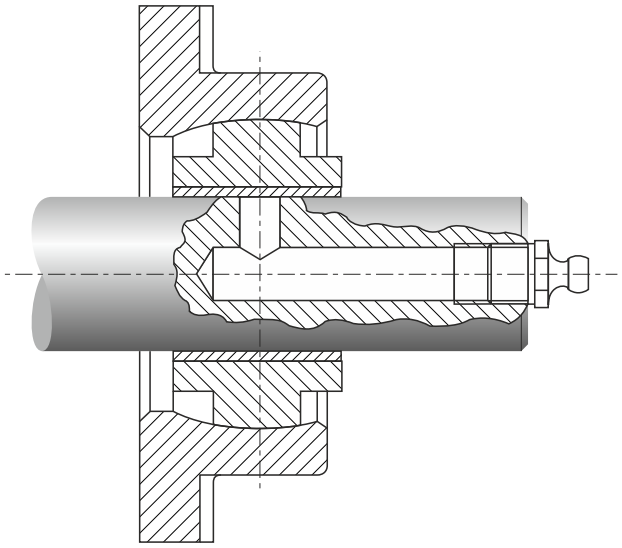
Re-greasing will significantly increase the life of grease lubricated bearings such as GGB DX.

Lubrication between the outer housing and inner spherical will reduce friction, thus aiding assembly, and may prevent fretting corrosion that can occur with repeated movement.

In general, the standard housings are not recommended for applications with dynamic angular movement. Under these conditions, it is necessary to provide a low friction bearing surface between the outer housing and the inner spherical in order to minimise static friction effects and consequential edge loading of the inner bearing bush.

All standard bearing housings are supplied with an initial lubrication of the spherical self-aligning surfaces using a long-life grease.

Where a greased bearing is fitted it is required to periodically relubricate the bearing in-situ, the recommended option is through a shaft drilling as shown on the right.



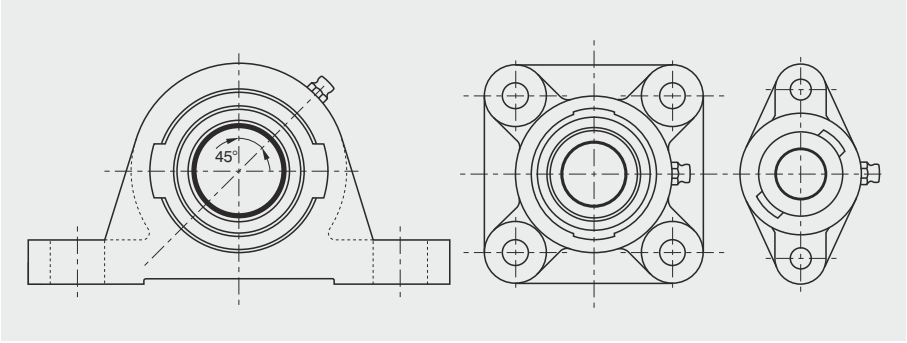
Re-greasing through the shaft

If this is not possible, the UNI, MINI and EXALIGN™ housings can be supplied with a standard grease nipple on request - see figure below.

If a grease nipple is fitted, greasing is best carried out when the lubricant drilling through the outer housing is in line with the drilling through the inner spherical. However, a certain amount of angular misalignment is acceptable when grease will penetrate and adequately lubricate the bearing surface. The maximum angles of misalignment for EXALIGN™ bearings are given in the following table. If these angles are exceeded, the misalignment of grease holes in the inner and outer housings will prevent lubricant reaching the bearing surface.

The greasing option for UNI bearing housings will depend on the bearing application.

EXALIGN bearing size	Maximum angle (α) for optimum distribution of lubricant
1	± 4.5°
2	± 4.0°
3	± 3.0°
4 - 7	± 2.5°
8 - 9	± 2.0°
10	± 1.5°



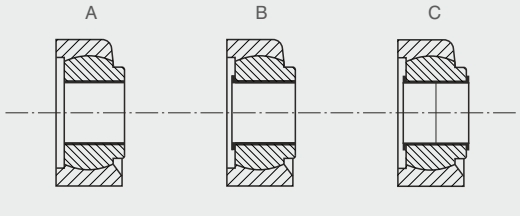
Typical arrangement of grease nipples in EXALIGN™ bearing housings

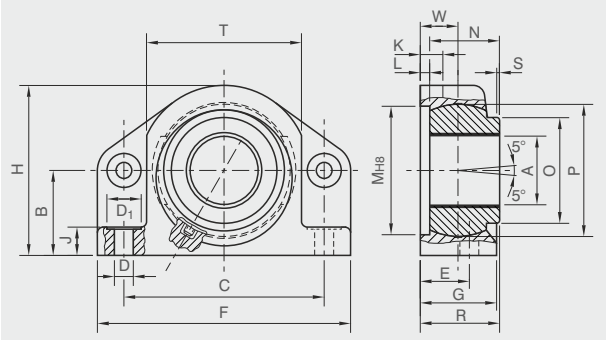
4 Dimensions

4.1 UNI Self-Aligning Bearing Housing

UNI Bearing Housing

Design:





Housing material: GGG40
Spherical insert material: 16 MnCr5
Corrosion-resistant version on request.

Ordering example:

Size Design
UNI-1-10-B-DU — Bush product
Standard bush D_i

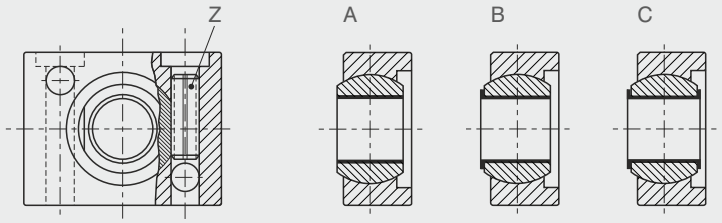
Dimensions [mm] UNI Bearing Housing																				
Size	Ø-range A*	B	C	D	D_1	E	F	G	H	J	K	L	M	N	O	P	R	S	T	W
1	10 - 25	28	72	8.5	13.5	17	95	25	56	12	8	3	46	20	34	42	23	0.5 x 45°	52	11
2	30 - 40	42	104	10.5	18	25	130	41	84	14	14	5	72	40	51	68	45	2 x 45°	83	20
3	45 - 60	60	142	13.5	27	35	180	55	120	20	15	7	92	50	74	95	57	1 x 45°	112	27
4	65 - 80	75	182	17.5	33	45	220	75	150	24	18	10	130	70	96	125	80	1 x 45°	140	37
5	85 - 100	90	222	21	40	50	280	80	180	28	20	10	155	70	125	150	80	1 x 45°	172	40

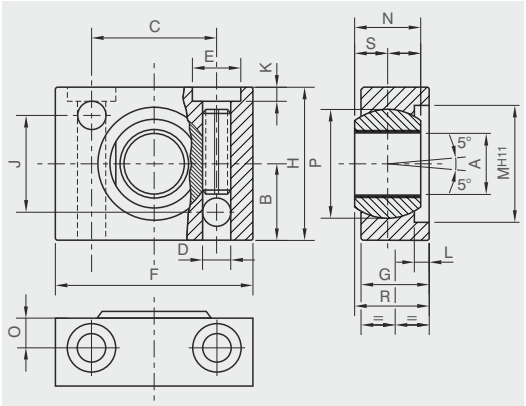
Note: Dimensions [mm] without statement of tolerances in accordance with DIN 7168m.
Other dimensions are available on request.
**Dimension A is with the standard bush pressed in.*

4.2 MINI Self-Aligning Bearing Housing

MINI Bearing Housing

Design:





Housing material: AlMgSi12
Spherical insert material: 9SMn28K

Ordering example:

Size Design

MINI-0-8-BZ-DU — Bush product

Standard bush D_i — Clamping pin

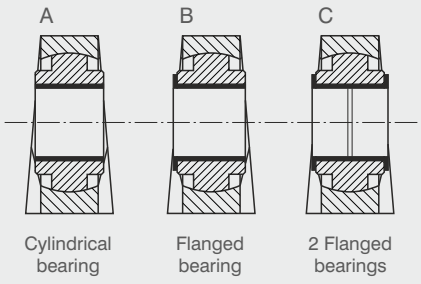
Dimensions [mm] MINI Bearing Housing																	
Size	Ø-range A*	B	C	D	E	F	G	H	J	K	L	M	N	O	P	R	S
0	8 - 15	17.5	28.5	6.4	10.5	45	15	35	22	3	2.5	26	15	6	25	16	7.5

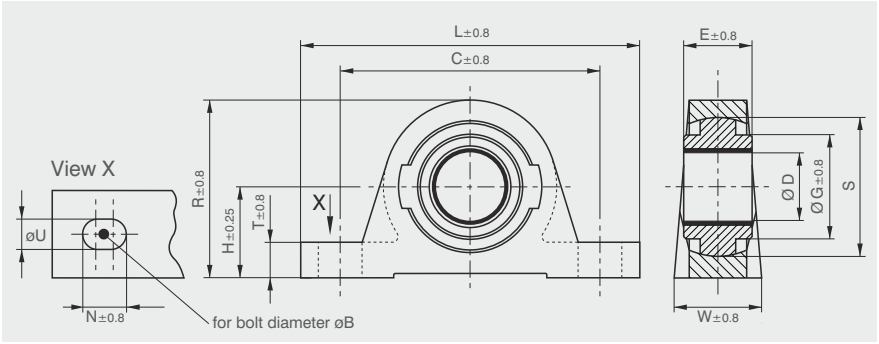
Note: Dimensions [mm] without statement of tolerances in accordance with DIN 7168m.
Other dimensions are available on request.
**Dimension A is with the standard bush pressed in.*

4.3 EXALIGN™ Self-Aligning Bearing Housing

PB Plummer Block

Design:





Housing material: GG 20
Spherical insert material: GG 20
Stainless and corrosion-resistant versions are available on request.

Ordering Example:

Plummer block — **PB1-10M-B-DU**

- PB1-10: Size / Standard bush Ø D
- M: Design (see sketch above)
- B: Design (see sketch above)
- DU: Bush product for dry applications

Size		Design (see sketch above)	
PB1	M Metric	A	Cylindrical bearing
PB2	E Inch	B	Flanged bearing
PB3		C	2 Flanged bearings
PB4			
PB5			
PB6			
PB7			
PB8			
PB9			
PB10			

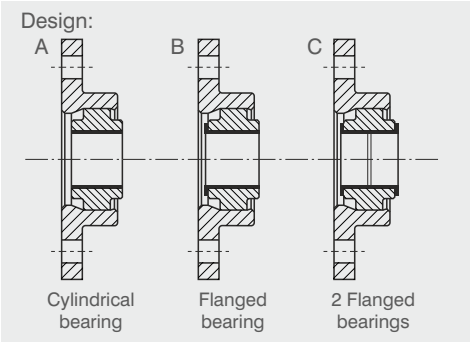
Bush product for dry applications	with design	Bush product for greased applications	with design
DP4®	A, B or C	DX®	A
DP4-B	A, B or C	DX®10	A
DU®	A, B or C	HI-EX™	A
DU-B	A, B or C	DS	A
DP10	A, B or C	SY	A
DP11	A, B or C	GGB-SZ	A
DS	A		
GGB-CSM®	A		
GGB-CBM®	A		
GAR-MAX®	A (D>28mm)		
GAR-FIL	A (D>28mm)		
HPM	A (D>28mm)		
HPF	A (D>28mm)		
HSG	A (D>28mm)		
HPMB®	A (D>28mm)		

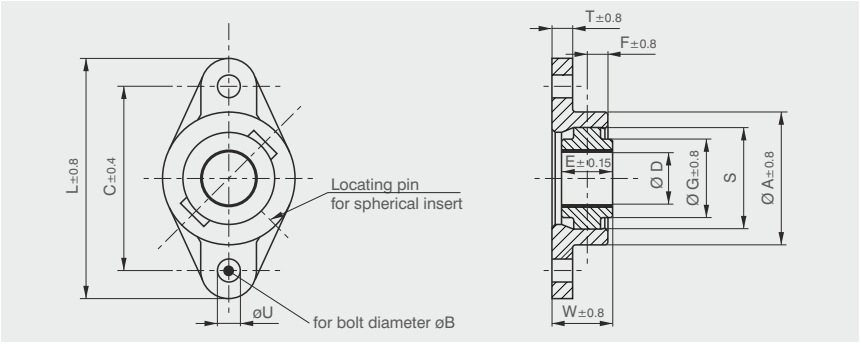
Order-No.	Dimensions [mm] EXALIGN™ PB Plummer Block													
GGB	D*	Insert bore H7	øU	øB	E	H	C	L	W	T	R	G	N	S
PB1-10M	10	12	9.5	8	15	28.6	76	102	25	10	56	33.3	13	41.2
PB1-12M	12	14	9.5	8	15	28.6	76	102	25	10	56	33.3	13	41.2
PB1-13M	13	15	9.5	8	15	28.6	76	102	25	10	56	33.3	13	41.2
PB1-14M	14	16	9.5	8	15	28.6	76	102	25	10	56	33.3	13	41.2
PB1-15M	15	17	9.5	8	15	28.6	76	102	25	10	56	33.3	13	41.2
PB1-16M	16	18	9.5	8	15	28.6	76	102	25	10	56	33.3	13	41.2
PB1-17M	17	19	9.5	8	15	28.6	76	102	25	10	56	33.3	13	41.2
PB1-18M	18	20	9.5	8	15	28.6	76	102	25	10	56	33.3	13	41.2
PB2-20M	20	23	11.1	10	20	33.3	95	124	32	13	65	39.7	16	50.7
PB2-22M	22	25	11.1	10	20	33.3	95	124	32	13	65	39.7	16	50.7
PB2-24M	24	27	11.1	10	20	33.3	95	124	32	13	65	39.7	16	50.7
PB2-25M	25	28	11.1	10	25	33.3	95	124	32	13	65	39.7	16	50.7
PB2-28M	28	32	14.3	12	30	41.3	122	159	41	16	81	51	22	63.4
PB3-30M	30	34	14.3	12	30	41.3	122	159	41	16	81	51	22	63.4
PB3-32M	32	36	14.3	12	30	41.3	122	159	41	16	81	51	22	63.4
PB4-35M	35	39	14.3	12	35	49.2	137	183	48	16	102	60.3	22	76.1
PB4-40M	40	44	14.3	12	40	49.2	137	183	48	16	102	60.3	22	76.1
PB5-45M	45	50	14.3	12	45	54	152	194	54	16	113	73	22	88.8
PB6-50M	50	55	17.5	16	50	61.9	168	214	57	19	122	79.3	22	100
PB7-55M	55	60	17.5	16	55	66.7	197	247	64	22	135	83	22	110
PB7-60M	60	65	17.5	16	60	66.7	197	247	64	22	135	83	22	110
PB7-65M	65	70	17.5	16	60	66.7	197	247	64	22	135	83	22	110
PB8-70M	70	75	17.5	16	65	71.4	200	254	70	25	143	89	22	120
PB8-75M	75	80	17.5	16	65	71.4	200	254	70	25	143	89	22	120
PB9-80M	80	85	22.2	20	80	87.3	235	295	89	32	175	108	27	139.7
PB9-85M	85	90	22.2	20	80	87.3	235	295	89	32	175	108	27	139.7
PB10-90M	90	95	22.2	20	80	101.6	279	330	102	32	206	130	30	170
PB10-95M	95	100	22.2	20	80	101.6	279	330	102	32	206	130	30	170
PB10-100M	100	105	22.2	20	80	101.6	279	330	102	32	206	130	30	170

Other dimensions are available on request.
**Dimension D is with the standard bush pressed in.*

4.4 EXALIGN™ Self-Aligning Bearing Housing

DF Flanged Bearing Housing - 2 Bolts





Housing material: GG 20
Spherical insert material: GG 20
Stainless and corrosion-resistant versions are available on request.

Ordering Example:

Flanged housing — **DF1-10M-B-DU**

Size | Standard bush Ø D | Design (see sketch above)

DF1	**M** Metric	**A** Cylindrical bearing
DF2	**E** Inch	**B** Flanged bearing
DF3		**C** 2 Flanged bearings
DF4		
DF5		
DF6		
DF7		
DF8		
DF9		
DF10		

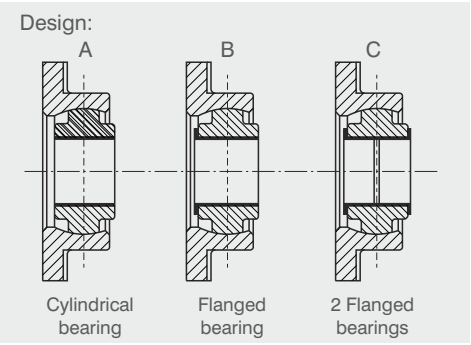
Bush product for dry applications	with design	Bush product for greased applications	with design
DP4®	**A, B or C**	**DX®**	**A**
DP4-B	**A, B or C**	**DX®10**	**A**
DU®	**A, B or C**	**HI-EX™**	**A**
DU-B	**A, B or C**	**DS**	**A**
DP10	**A, B or C**	**SY**	**A**
DP11	**A, B or C**	**GGB-SZ**	**A**
DS	**A**		
GGB-CSM®	**A**		
GGB-CBM®	**A**		
GAR-MAX®	**A** (D>28mm)		
GAR-FIL	**A** (D>28mm)		
HPM	**A** (D>28mm)		
HPF	**A** (D>28mm)		
HSG	**A** (D>28mm)		
HPMB®	**A** (D>28mm)		

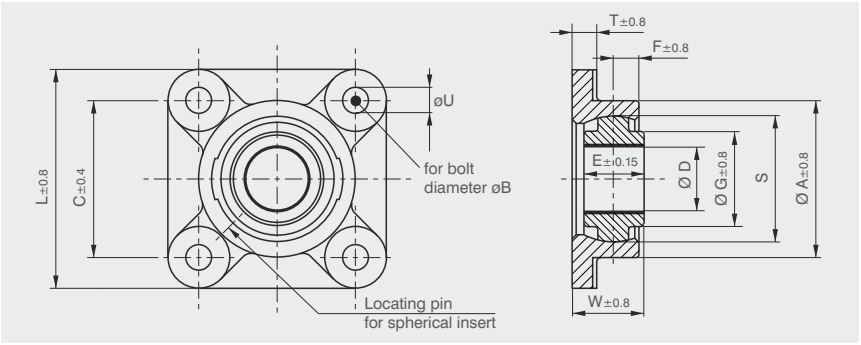
Order-No.	Dimensions [mm] EXALIGN™ DF Flanged Bearing Housing												
GGB	D*	Insert bore H7	øU	øB	E	C	L	T	W	A	F	G	S
DF1-10M	10	12	9.5	8	15	81	103	8	23	54	6	33.3	41.2
DF1-12M	12	14	9.5	8	15	81	103	8	23	54	6	33.3	41.2
DF1-13M	13	15	9.5	8	15	81	103	8	23	54	6	33.3	41.2
DF1-14M	14	16	9.5	8	15	81	103	8	23	54	6	33.3	41.2
DF1-15M	15	17	9.5	8	15	81	103	8	23	54	6	33.3	41.2
DF1-16M	16	18	9.5	8	15	81	103	8	23	54	6	33.3	41.2
DF1-17M	17	19	9.5	8	15	81	103	8	23	54	6	33.3	41.2
DF1-18M	18	20	9.5	8	15	81	103	8	23	54	6	33.3	41.2
DF2-20M	20	23	11.1	10	20	89	116	10	27	64	10	39.7	50.7
DF2-22M	22	25	11.1	10	20	89	116	10	27	64	10	39.7	50.7
DF2-24M	24	27	11.1	10	20	89	116	10	27	64	10	39.7	50.7
DF2-25M	25	28	11.1	10	25	89	116	10	30	64	10	39.7	50.7
DF2-28M	28	32	14.3	12	30	113	143	11	36	79	13	51	63.4
DF3-30M	30	34	14.3	12	30	113	143	11	36	79	13	51	63.4
DF3-32M	32	36	14.3	12	30	113	143	11	36	79	13	51	63.4
DF4-35M	35	39	14.3	12	35	130	159	14	45	95	16	60.3	76.1
DF4-40M	40	44	14.3	12	40	130	159	14	45	95	16	60.3	76.1
DF5-45M	45	50	14.3	12	45	144	175	16	51	108	16	73	88.8
DF6-50M	50	55	17.5	16	50	157	190	16	58	117	21	79.3	100
DF7-55M	55	60	17.5	16	55	184	216	17	62	137	22	83	110
DF7-60M	60	65	17.5	16	60	184	216	17	65	137	22	83	110
DF7-65M	65	70	17.5	16	60	184	216	17	65	137	22	83	110
DF8-70M	70	75	17.5	16	65	202	236	19	71	143	25	89	120
DF8-75M	75	80	17.5	16	65	202	236	19	71	143	25	89	120
DF9-80M	80	85	22.2	20	80	214	259	22	28	117	129	108	139.7
DF9-85M	85	90	22.2	20	80	214	259	22	28	117	129	108	139.7
DF10-90M	90	95	22.2	20	80	279	324	25	91	210	32	130	170
DF10-95M	95	100	22.2	20	80	279	324	25	91	210	32	130	170
DF10-100M	100	105	22.2	20	80	279	324	25	91	210	32	130	170

Other dimensions are available on request.
**Dimension D is with the standard bush pressed in.*

4.5 EXALIGN™ Self-Aligning Bearing Housing

FL Flanged Bearing Housing - 4 Bolts





Housing material: GG 20
Spherical insert material: GG 20
Stainless and corrosion-resistant versions are available on request.

Ordering Example:

Flanged housing — **FL1-10M-B-DU**

Size: **FL1** … **FL10**

Standard bush Ø D: **M** Metric, **E** Inch

Design (see sketch above): **A** Cylindrical bearing, **B** Flanged bearing, **C** 2 Flanged bearings

Bush product for dry applications	with design	Bush product for greased applications	with design
DP4®	A, B or C	DX®	A
DP4-B	A, B or C	DX®10	A
DU®	A, B or C	HI-EX™	A
DU-B	A, B or C	DS	A
DP10	A, B or C	SY	A
DP11	A, B or C	GGB-SZ	A
DS	A		
GGB-CSM®	A		
GGB-CBM®	A		
GAR-MAX®	A (D>28mm)		
GAR-FIL	A (D>28mm)		
HPM	A (D>28mm)		
HPF	A (D>28mm)		
HSG	A (D>28mm)		
HPMB®	A (D>28mm)		

Order-No.	Dimensions [mm] EXALIGN™ FL Flanged Bearing Housing												
GGB	D*	Insert bore H7	øU	øB	E	C	L	T	W	A	F	G	S
FL1-10M	10	12	9.5	8	15	57	76	8	23	54	6	33.3	41.2
FL1-12M	12	14	9.5	8	15	57	76	8	23	54	6	33.3	41.2
FL1-13M	13	15	9.5	8	15	57	76	8	23	54	6	33.3	41.2
FL1-14M	14	16	9.5	8	15	57	76	8	23	54	6	33.3	41.2
FL1-15M	15	17	9.5	8	15	57	76	8	23	54	6	33.3	41.2
FL1-16M	16	18	9.5	8	15	57	76	8	23	54	6	33.3	41.2
FL1-17M	17	19	9.5	8	15	57	76	8	23	54	6	33.3	41.2
FL1-18M	18	20	9.5	8	15	57	76	8	23	54	6	33.3	41.2
FL2-20M	20	23	11.1	10	20	64	89	10	27	64	10	39.7	50.7
FL2-22M	22	25	11.1	10	20	64	89	10	27	64	10	39.7	50.7
FL2-24M	24	27	11.1	10	20	64	89	10	27	64	10	39.7	50.7
FL2-25M	25	28	11.1	10	25	64	89	10	30	64	10	39.7	50.7
FL2-28M	28	32	14.3	12	30	79	110	11	36	79	13	51	63.4
FL3-30M	30	34	14.3	12	30	79	110	11	36	79	13	51	63.4
FL3-32M	32	36	14.3	12	30	79	110	11	36	79	13	51	63.4
FL4-35M	35	39	14.3	12	35	92	121	14	45	95	16	60.3	76.1
FL4-40M	40	44	14.3	12	40	92	121	14	45	95	16	60.3	76.1
FL5-45M	45	50	14.3	12	45	102	133	16	51	108	16	73	88.8
FL6-50M	50	55	17.5	16	50	111	143	16	58	117	21	79.3	100
FL7-55M	55	60	17.5	16	55	130	165	17	62	137	22	83	110
FL7-60M	60	65	17.5	16	60	130	165	17	65	137	22	83	110
FL7-65M	65	70	17.5	16	60	130	165	17	65	137	22	83	110
FL8-70M	70	75	17.5	16	65	143	175	19	71	143	25	89	120
FL8-75M	75	80	17.5	16	65	143	175	19	71	143	25	89	120
FL9-80M	80	85	22.2	20	80	152	197	22	28	117	129	108	139.7
FL9-85M	85	90	22.2	20	80	152	197	22	28	117	129	108	139.7
FL10-90M	90	95	22.2	20	80	197	241	25	91	210	32	130	170
FL10-95M	95	100	22.2	20	80	197	241	25	91	210	32	130	170
FL10-100M	100	105	22.2	20	80	197	241	25	91	210	32	130	170

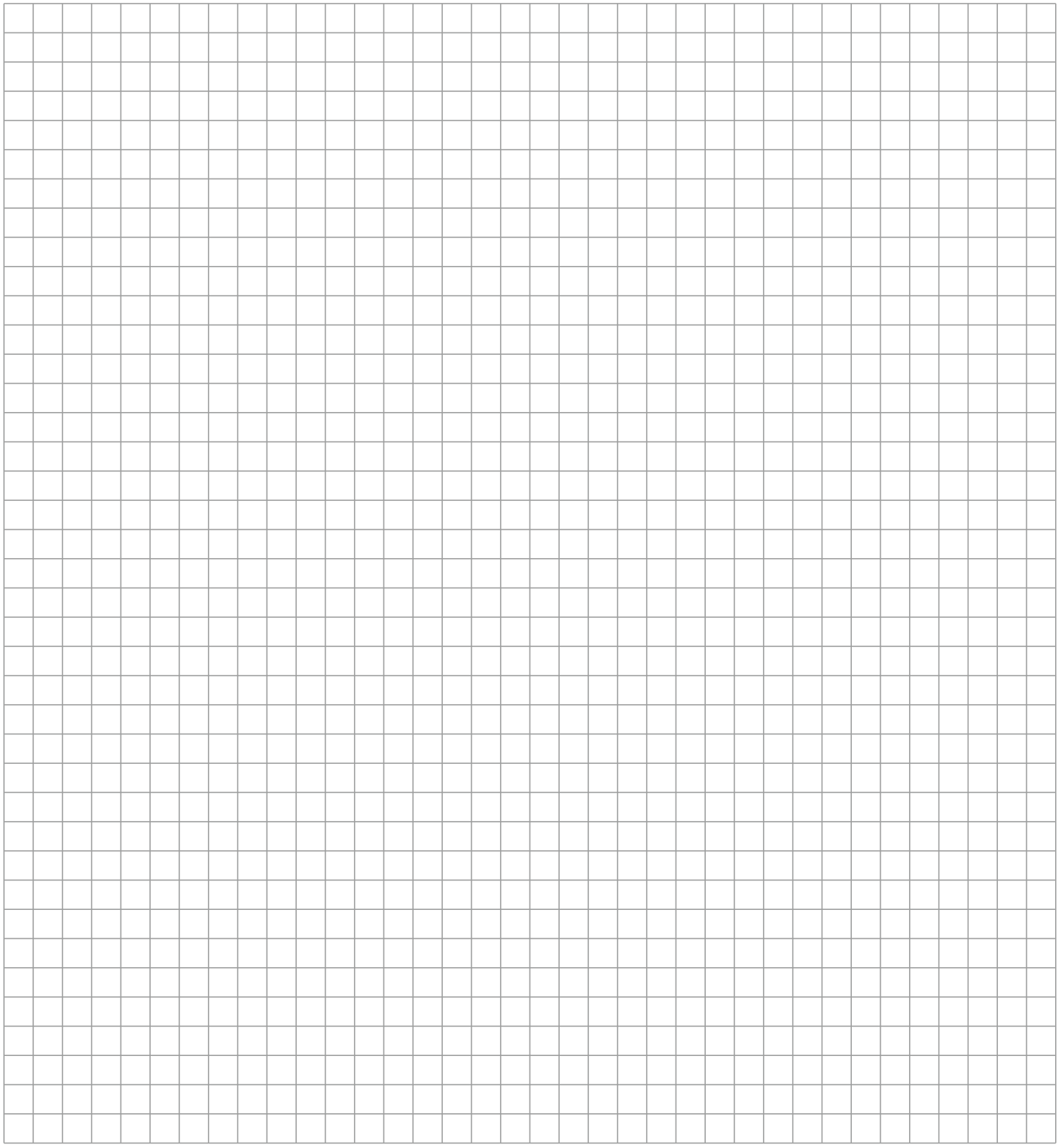
Other dimensions are available on request.
**Dimension D is with the standard bush pressed in.*

5 Applications

Potential applications for GGB self-aligning bearing housings include:

- Wind energy
- Car washing machines
- Cleaning machines
- Drum systems
- Bevelling equipment
- Handling systems
- Conveyor belts (pulleys)
- Printing machines
- Heating and ventilation equipment
- Hoists
- Cranes
- Textile machinery
- Special machines
- Bakery equipment
- Marine equipment.

Notes:



Bearing Application Data Sheet

Not sure which GGB part fits your application requirements? Go to ggbpartfinder.com to complete a Bearing Application Data Sheet online, and one of our GGB bearing specialists will reach out to you with recommended options that meet your application requirements. You can also complete the form below and share it with your GGB sales person or distributor representative.

DATA FOR BEARING DESIGN CALCULATION

Application: _____

_____

Project / No.: _____ Quantity: _____ ☐ New Design ☐ Existing Design

DIMENSIONS (mm)

Inside diameter	D_i	
Outside diameter	D_o	
Length	B	
Outer ring length	B_F	
Flange diameter	D_{fl}	
Flange thickness	B_{fl}	
Wall thickness	S_T	
Length of slide plate	L	
Width of slide plate	W	
Thickness of slide plate	S_S	

LOAD

Radial load F	static [N]	
	dynamic [N]	
Axial load F	static [N]	
	dynamic [N]	
Specific load p	radial [MPa]	
	axial [MPa]	

MOVEMENT

Rotational speed	n [1/min]	
Speed	U [m/s]	
Length of stroke	L_S [mm]	
Frequency of stroke	[1/min]	
Oscillating cycle	ϕ [°]	
Osc. frequence	N_{OSZ} [1/min]	

MATING SURFACE

Material		
Hardness	HB/HRC	
Surface finish	Ra [µm]	

FITS & TOLERANCES

Shaft	D_J	
Bearing housing	D_H	

OPERATING ENVIRONMENT

Ambient temperature	T_{amb}[°]	

☐ Housing with good heating transfer properties

☐ Light pressing or insulated housing with poor heat transfer properties

☐ Non metal housing with poor heat transfer properties

☐ Alternate operation in water and dry

LUBRICATION

☐ Dry

☐ Continuous lubrication

☐ Process fluid lubrication

☐ Initial lubrication only

☐ Hydrodynamic conditions

Process fluid		
Lubricant		
Dynamic viscosity	η	

SERVICE HOURS PER DAY

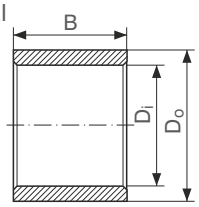
Continuous operation	
Intermittent operation	
Operating time	
Days per year	

SERVICE LIFE

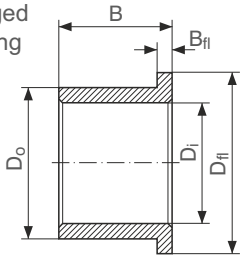
Required service life	L_H [h]	

BEARING TYPE:

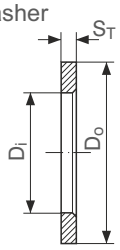
☐ Cylindrical bearing



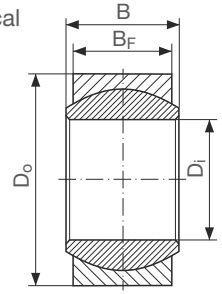
☐ Flanged bearing



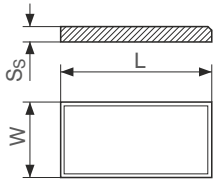
☐ Thrust washer



☐ Spherical bearing



☐ Slide plate



☐ Special parts (sketch)

☐ Steady load

☐ Rotating load

☐ Rotational movement

☐ Oscillating movement

☐ Linear movement

CUSTOMER INFORMATION

Company _____

Street _____

City / State / Province / Post Code _____

Telephone _____ Fax _____

Name _____

Email Address _____ Date _____

Product Information

GGB gives an assurance that the products described in this document have no manufacturing errors or material deficiencies.

The details set out in this document are registered to assist in assessing the material's suitability for the intended use. They have been developed from our own investigations as well as from generally accessible publications. They do not represent any assurance for the properties themselves.

Unless expressly declared in writing, GGB gives no warranty that the products described are suited to any particular purpose or specific operating circumstances. GGB accepts no liability for any losses, damages or costs however they may arise through direct or indirect use of these products.

GGB's sales and delivery terms and conditions, included as an integral part of quotations, stock and price lists, apply absolutely to all business conducted by GGB. Copies can be made available on request.

Products are subject to continual development. GGB retains the right to make specification amendments or improvements to the technical data without prior announcement.

Edition 2016 (This edition replaces earlier editions which hereby lose their validity).

Statement Regarding Lead Content in GGB Products & EU Directive Compliance

GGB is committed to adhering to all U.S., European and international standards and regulations with regard to lead content. We have established internal processes that monitor any changes to existing standards and regulations, and we work collaboratively with customers and distributors to ensure that all requirements are strictly followed. This includes RoHS and REACH guidelines.

GGB makes it a top priority to operate in an environmentally conscious and safe manner. We follow numerous industry best practices, and are committed to meeting or exceeding a variety of internationally recognized standards for emissions control and workplace safety.

Each of our global locations has management systems in place that adhere to ISO TS 16949, ISO 9001, ISO 14001, ISO 50001 and OHSAS 18001 quality regulations.

All of our certificates can be found here: http://www.ggbearings.com/en/company/certificates. A detailed explanation of our commitment to REACH and RoHS directives can be found at www.ggbearings.com/en/company/quality-and-environment.

The Global Leader in High Performance Bearing Solutions

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