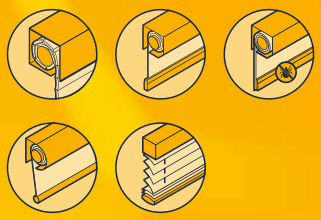
GEIGER
ANTRIEBSTECHNIK

GEIGER
Airtight spherical plain bearings with thermally separated output rod

product information

Table of contents



Airtight spherical plain bearings

Save energy and increase comfort – GEIGER's airtight spherical plain bearings fulfill this task. Many of our spherical plain bearing plates are available with a special plastic seal made of rubber. These airtight spherical plain bearings prevent air from flowing from the inside to the outside – both at the spherical plain bearing plate and at the bearing point. In addition to saving energy, this also increases the service life of the gearbox. The risk of condensation forming on the gearbox unit is reduced to a minimum.

Problem definition

Air tightness is an essential aspect in the planning and construction of low-energy and passive houses.

Leaks in the building envelope lead to uncontrolled air exchange and heat loss. Particular attention must be paid to the installation of the operating elements.

Due to their smaller cross-section, the crank drive and the installation using a spherical bearing have an advantage over the belt drive.

Thermal bridges are another aspect that must be taken into account.

Thermal bridges are areas in the building envelope where heat is dissipated to the outside more quickly than in adjacent components. They are problematic because they increase energy loss, reduce energy efficiency, and increase the risk of condensation and mold growth. The thermally separated drive rod is our approach to reducing such thermal bridges.

Design features of airtight spherical plain bearings

GEIGER has taken another step toward energy conservation by developing airtight spherical plain bearings. The goal was to reduce air permeability in spherical plain bearings to a minimum and lower heat conduction. To achieve this, various GEIGER spherical plain bearings were optimized in four areas:

Use of sealing elements made of EPDM cellular rubber

- The spherical plain bearing plates have been redesigned to ensure that the seal specially developed for each plate fits perfectly on the rear side. The elements effectively seal the spherical plain bearing against uneven surfaces (e.g., woodchip wallpaper, rough plaster, or window frames).

Special ball bearings for guiding the universal joint

- Compared to conventional bearings, airtight spherical plain bearings use specially sealed industrial ball bearings or plastic elements with tight manufacturing tolerances, depending on the design. This measure reliably prevents air exchange.

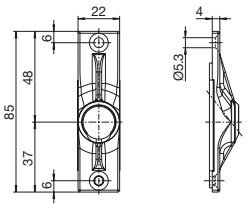
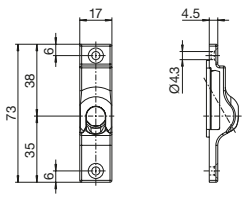
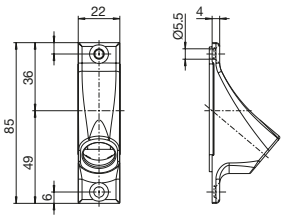
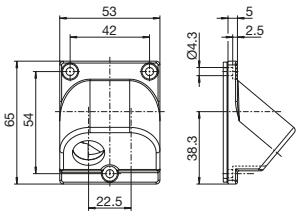
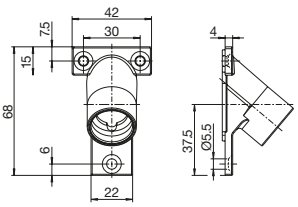
Thermally separated output rod

- The operating forces are transmitted by an interlinked, glass fiber reinforced plastic rod, which interrupts the steel output rod and thereby significantly reduces heat conduction.

Design modifications and precise manufacturing

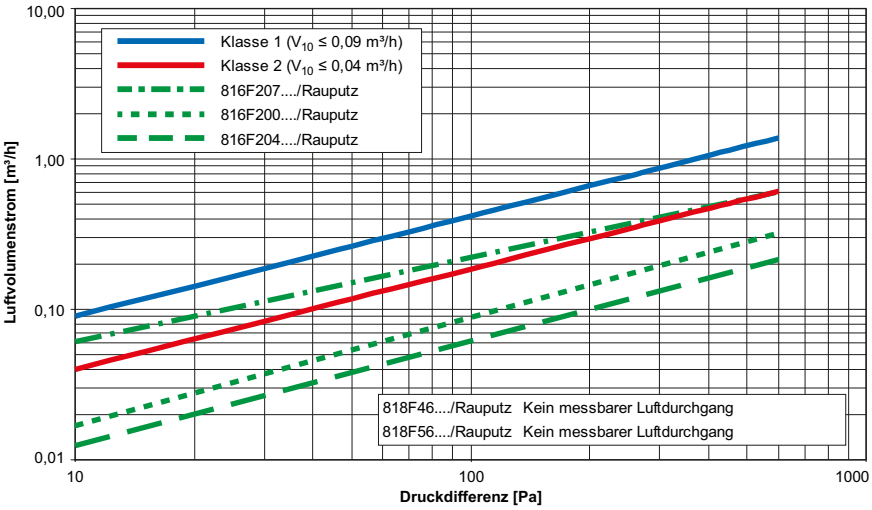
- Changes to the design of the bearing seat and the use of state-of-the-art manufacturing methods have reduced tolerances to a minimum, further increasing tightness.

Tested spherical plain bearings

		bearing plate	Air permeability in m³/h	airtightness class	Item no. Identical construction GL [1]
		22 x 85 mm zinc	V_{10} = 0,017 m³/h	**Class 2**	816F200...
		17 x 43 mm zinc	V_{10} = 0,013 m³/h	**Class 2**	816F204....
		22 x 85 mm zinc	V_{10} = 0 m³/h (no measurable air flow)	**Class 2**	818F46....
		53 x 65 mm plastic	V_{10} = 0 m³/h (no measurable air flow)	**Class 2**	818F56....
		42 x 68 mm zinc	V_{10} = 0,062 m³/h	**Class 1**	816F207....

[1] Universal spherical plain bearing identical in design, bearing plate equipped with sealing element

Presentation of measurement results



Measurement results

The air permeability values shown in the table and diagram were determined under the following conditions:

- Measurement according to EN 12114
- All joint bearings and sealing elements mounted on rough plaster
- Measuring range from 10 Pa to 600 Pa (overpressure or underpressure)
- The V10 value is specified, i.e., the air permeability in m³/h at 10 Pa differential pressure (overpressure).

The ift guideline AB-02/1 defines airtightness classes for control element penetrations:

- **Class 0:** not checked
- **Class 1:** $V_{10} \leq 0{,}09$ m³/h (Air permeability at 10 Pa differential pressure)
- **Class 2:** $V_{10} \leq 0{,}04$ m³/h (Air permeability at 10 Pa differential pressure)

Summary

- As expected, joint bearings without sealing elements on rough plaster result in the highest air permeability. Air permeability is lower with woodchip wallpaper and lowest with smooth surfaces.
- Properly installed GEIGER spherical bearings with sealing elements seal the connection surface almost completely, even with rough plaster.
- The measured values are identical for overpressure and underpressure.

The test report entitled "Air permeability of access panels for roller shutter control elements" (12-000822-PR01) in accordance with ift guideline AB-02/1 was published on June 22, 2012.

ift ROSENHEIM

ift Rosenheim is an internationally active scientific service provider for the window, facade, glass, door, gate, and accessory (fittings, seals, building materials, etc.) industry. ift tests the suitability for use of building components and conducts window tests, glass tests, facade tests, and building material tests. However, sound insulation tests, fire protection tests, and tests on other building components are also part of the scope of services. As a research institute and a notified body, ift is authorized to issue the test certificates required for the CE mark or building inspection certificates.

The range of services, which includes the performance of building material tests, fire protection tests, and glass tests, as well as the basis for CE marking or other certifications, is supplemented by services such as expert reports, seminars, and conferences.

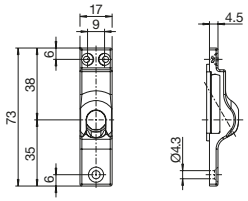
Gerhard Geiger GmbH & Co. KG | 100W0421 EN 0126 | Subject to technical changes

Spherical plain bearing plates

816F... | Spherical plain bearing plates 45°

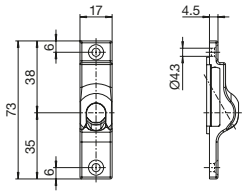
Features

- Max. torque 3 Nm
- Steel universal joints
- Various connecting pins and connecting rods available
- Mounting plates made of die-cast zinc (bright nickel-plated or powder-coated)
- Swivel range depends on the plate



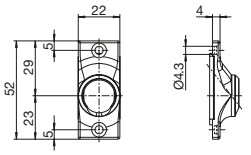
Item no.	swivel range	Material	Höhe	Width	Tightness class
816F205....	50°	Zinc	73,0 mm	17,0 mm	**2**

Airtight design, optimized for wooden windows



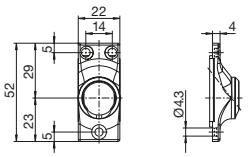
Item no.	Swivel range	Material	Height	Width	Tightness class
816F204....	50°	Zinc	73,0 mm	17,0 mm	**2**

Airtight design



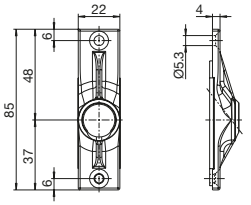
Item no.	Swivel range	Material	Height	Width	Tightness class
816F202....	50°	Zinc	52,0 mm	22,0 mm	**2**

Airtight design



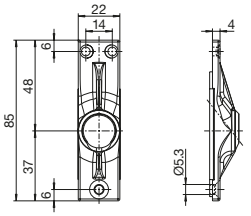
Item no.	Swivel range	Material	Height	Width	Tightness class
816F203....	50°	Zinc	52,0 mm	22,0 mm	**2**

Airtight design, optimized for wooden windows



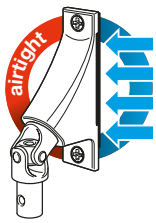
Item no.	Swivel range	Material	Height	Width	Tightness class
816F200....	50°	Zinc	85,0 mm	22,0 mm	**2**

Airtight design

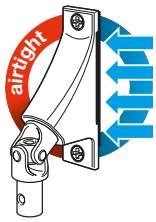


Item no.	Swivel range	Material	Height	Width	Tightness class
816F201....	50°	Zinc	85,0 mm	22,0 mm	**2**

Airtight design, optimized for wooden windows

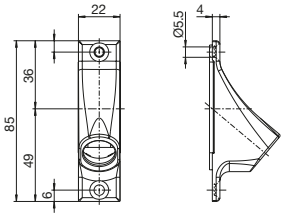


816F... | Spherical plain bearing plates 90°



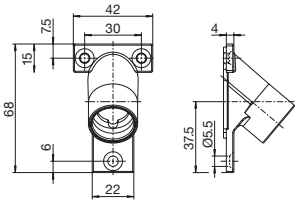
Features

- Max. torque 3 Nm
- Steel universal joints
- Various connecting pins and connecting rods available
- Mounting plates made of die-cast zinc (bright nickel-plated or powder-coated)
- Swivel range depends on the plate



Item no.	Swivel range	Material	Height	Width	Tightness class
816F46....	46°	Zinc	85,0 mm	22,0 mm	**2**

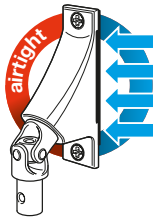
Airtight design



Item no.	Swivel range	Material	Height	Width	Tightness class
816F207....	46°	Zinc	68,0 mm	42,0 mm	**1**

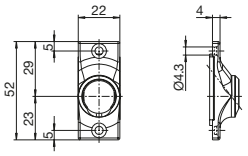
Airtight design

818F... | Spherical plain bearing plates 45°



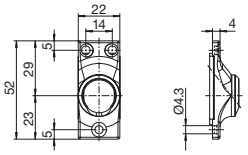
Features

- Max. torque 5 Nm
- Aluminum universal joints
- Various connecting pins and connecting rods available
- Mounting plates made of die-cast zinc (bright nickel-plated or powder-coated)
- Swivel range depends on the plate



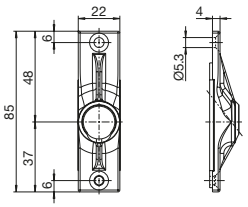
Item no.	Swivel range	Material	Height	Width	Tightness class
818F202....	50°	Zinc	52,0 mm	22,0 mm	**2**

Airtight design



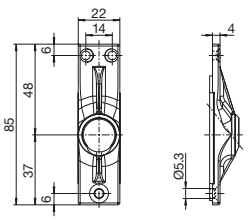
Item no.	Swivel range	Material	Height	Width	Tightness class
818F203....	50°	Zinc	52,0 mm	22,0 mm	**2**

Airtight design, optimized for wooden windows



Item no.	Swivel range	Material	Height	Width	Tightness class
816F200....	50°	Zinc	85,0 mm	22,0 mm	**2**

Airtight design



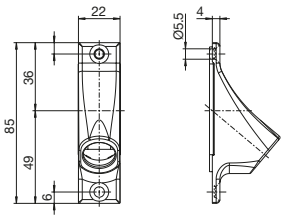
Item no.	Swivel range	Material	Height	Width	Tightness class
816F201....	50°	Zinc	85,0 mm	22,0 mm	**2**

Airtight design, optimized for wooden windows

818F... | Spherical plain bearing plates 90°

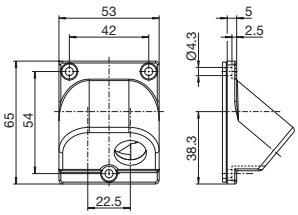
Features

- Max. torque 5 Nm
- Aluminum universal joints
- Various connecting pins and connecting rods available
- Mounting plates made of die-cast zinc (bright nickel-plated or powder-coated) or plastic in 3 standard colors (white, gray, brown)
- Swivel range depends on the plate



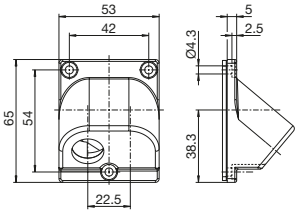
Item no.	Swivel range	Material	Height	Width	Tightness class
818F46....	46°	Zinc	85,0 mm	22,0 mm	**2**

Airtight design



Item no.	Swivel range	Material	Height	Width	Tightness class
818F562	60°	Plastic	65,0 mm	53,0 mm	**2**

Airtight design



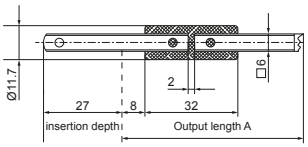
Item no.	Swivel range	Material	Height	Width	Tightness class
818F563	60°	Plastic	65,0 mm	53,0 mm	**2**

Airtight design

816B10. | Output rods with thermal separation

Features

- Max. torque 5 Nm
- 4-sided rod (6 mm)
- Various output lengths available
- Made of steel with galvanized surface



Item no.	Profile	Diameter	Output length A
816B100	■ **6 mm**	11,7 mm	300 mm
816B101	■ **6 mm**	11,7 mm	500 mm
816B102	■ **6 mm**	11,7 mm	700 mm

Info: The total length is calculated from the output length A + 27 mm insertion depth, which disappears into the spherical plain bearing.

816F... | Standard configurations

All with

- Thermal separation
- 6 mm square rod

Item no.	Description	Degree	Plate	Plate color	Cone	Output length	PU
816F2020001	Spherical plain bearing 45° 22x52 M	45°	22 X 52 M	NICKEL-PLATED	Cone 12,9	300 mm	50
816F2020011	Spherical plain bearing 45° 22x52 M	45°	22 X 52 M	NICKEL-PLATED	Cone 11,9	300 mm	50
816F2080005	Spherical plain bearing 45° 22x52 M	45°	22 X 52 M	NICKEL-PLATED	Cone 11,9	500 mm	50
816F2040001	Spherical plain bearing 45° 17x73 M	45°	17 X 73 M	NICKEL-PLATED	Cone 12,9	300 mm	50
816F2040010	Spherical plain bearing 45° 17x73 M	45°	17 X 73 M	NICKEL-PLATED	Cone 11,9	300 mm	50
816F2040011	Spherical plain bearing 45° 17x73 M	45°	17 X 73 M	RAL 9016	CLIPSYSTEM	300 mm	50
816F2000001	Spherical plain bearing 45° 22x85 M	45°	22 X 85 M	NICKEL-PLATED	Cone 12,9	300 mm	50
816F2060001	Spherical plain bearing 90° 22x85 M	90°	22 X 85 M	NICKEL-PLATED	Cone 12,9	300 mm	25
816F2060026	Spherical plain bearing 90° 22x85 M	90°	22 X 85 M	RAL 9005	CLIPSYSTEM	300 mm	25
816F2060027	Spherical plain bearing 90° 22x85 M	90°	22 X 85 M	NICKEL-PLATED	CLIPSYSTEM	300 mm	25
816F2060028	Spherical plain bearing 90° 22x85 M	90°	22 X 85 M	RAL 9016	CLIPSYSTEM	300 mm	25
816F2060002	Spherical plain bearing 90° 22x85 M	90°	22 X 85 M	NICKEL-PLATED	Cone 12,9	500 mm	25
816F2060032	Spherical plain bearing 90° 22x85 M	90°	22 X 85 M	NICKEL-PLATED	Cone 11,9	500 mm	25
816F2000002	Spherical plain bearing 45° 22x85 M	45°	22 X 85 M	NICKEL-PLATED	Cone 12,9	700 mm	50
816F2060003	Spherical plain bearing 90° 22x85 M	90°	22 X 85 M	NICKEL-PLATED	Cone 12,9	700 mm	25
816F2060033	Spherical plain bearing 90° 22x85 M	90°	22 X 85 M	NICKEL-PLATED	Cone 11,9	700 mm	25
816F2070001	Spherical plain bearing 90° 42x68 T-PI	90°	42 X 68 T	NICKEL-PLATED	Cone 12,9	300 mm	25

With spherical plain bearing plate optimized for wooden windows

Item no.	Description	Degree	Plate	Plate color	Cone	Output length	PU
816F2010001	Spherical plain bearing 16Ø 45° 22x85 H	45°	22 X 85 H	NICKEL-PLATED	Cone 12,9	300 mm	50
816F2010016	Spherical plain bearing 16Ø 45° 22x85 H	45°	22 X 85 H	NICKEL-PLATED	Cone 11,9	300 mm	50
816F2030001	Spherical plain bearing 16Ø 45° 22x52 W	45°	22 X 52 H	NICKEL-PLATED	Cone 12,9	300 mm	50
816F2050001	Spherical plain bearing 16Ø 45° 17x73 H	45°	17 X 73 H	NICKEL-PLATED	Cone 12,9	300 mm	50
816F2050008	Spherical plain bearing 16Ø 45° 17x73 H	45°	17 X 73 H	NICKEL-PLATED	CLIPSYSTEM	300 mm	50
816F2050009	Spherical plain bearing 16Ø 45°17x73 H	45°	17 X 73 H	RAL 9016	CLIPSYSTEM	300 mm	50
816F2050017	Spherical plain bearing 16Ø 45° 17x73 H	45°	17 X 73 H	NICKEL-PLATED	Cone 11,9	300 mm	50
816F2010002	Spherical plain bearing 16Ø 45° 22x85 H	45°	22 X 85 H	NICKEL-PLATED	Cone 12,9	500 mm	50
816F2010014	Spherical plain bearing 16Ø 45° 22x85 H	45°	22 X 85 H	NICKEL-PLATED	Cone 11,9	500 mm	50
816F2090002	Spherical plain bearing 16Ø 45° 22x52 H	45°	22 X 52 H	NICKEL-PLATED	Cone 11,9	500 mm	50
816F2010003	Spherical plain bearing 16Ø 45° 22x85 H	45°	22 X 85 H	NICKEL-PLATED	Cone 12,9	700 mm	50
816F2010015	Spherical plain bearing 16Ø 45° 22x85 H	45°	22 X 85 H	NICKEL-PLATED	Cone 11,9	700 mm	50

The name GEIGER Antriebstechnik is synonymous worldwide with innovative drive solutions in the field of sun protection. With over 250 employees, we are now one of the leading manufacturers of mechanical and electric drives for blinds, awnings, and roller shutters.

As a renowned medium-sized company, we supply drive components for sun protection all over the world.

Gerhard Geiger GmbH & Co. KG
Schleifmühle 6 | D-74321 Bietigheim-Bissingen
T +49 (0) 7142 9380 | **F** +49 (0) 7142 938 230
info@geiger.de | www.geiger.de

GEIGER
ANTRIEBSTECHNIK

100W0421 EN 0126