



Product Datasheet

GEIGER bevel gears for rolling shutters

Series 444F.../446F.../456F...

■ Benefits and Advantages

1. Comfort with low operating force and easy crank operation

A crank gear must be easy to handle whatever the size of the rolling shutter on which it is adapted. The convenience of use is defined by the number of crank movements necessary to operate the rolling shutter as well as the necessary effort to be done by the user. The GEIGER 444F.../446F.../456F... gears meet these **ergonomic requirements** and can easily be used by the elderly.

2. Optimized safety with integrated free wheel clutch

A faulty winding of the curtain in the lower position is excluded when using the GEIGER bevel gears. **Damages caused by improper winding are avoided.** If the curtain runs up against an obstacle the **GEIGER free wheel clutch triggers** and stops the curtain. This system offers complete safety while lowering the number of unnecessary customer service calls and **improving consumer satisfaction.**

3. Optimized assembly with integrated free wheel clutch

The GEIGER bevel gears allow you to **save time and money** during installation or replacement: **no need to adjust the limit stop.** Simply insert the GEIGER bevel gear, that's all.

The gear **adapts to any given situation** and automatically **activates the free wheel clutch when reaching the lower end stop.**

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4. Durability and operating reliability with the GEIGER brake unit

A subsequent assembly of rolling shutter gears can be quite a lot of work – depending on the accessibility of the head rail.

GEIGER bevel gears are designed to achieve **more than 10.000 rotations**.

This corresponds to a **lifetime of over 10 years** depending on the efficiency.

This unique **GEIGER brake unit provides a secure operation** of the system.

The **“shark teeth” gearing** prevents an unintentional falling down of the shutter curtain.

5. Made by GEIGER / Made in Germany – A solid product

Reduction in reclamation costs

Customer service and support operations are an expensive undertaking for the sun protection manufacturers.

GEIGER relies on Germany as production location: the GEIGER gears are developed and **produced in Germany**. This situation allows an optimal combination of R & D, manufacturing processes and quality management (according to DIN EN ISO 9001:2000).

We offer our customers a solid, reliable and high quality product having the advantages of a **robust gearing** and a **wear resistant brake unit**.

6. Optimized gear range for each shutter size

Oversized gears are expensive. GEIGER offers its customers a bevel gear adapted to each shutter size:

Small rolling shutters:	Series 444F...
Medium rolling shutters:	Series 446F...
Large rolling shutters:	Series 456F...

Main focus for all 3 series:

- ▶ **easy and smooth operation**
- ▶ **durability of the gear meets the requirements of the shutte.**

7. Efficient assembly with screwless fixation system

Customers do not really want to have the cover caps drilled through.

Our bevel gears 444F and 446F are available with a screwless fixation system. Thus, the GEIGER bevel gears can be mounted easily, quickly and safely and without screw holes into the cover caps.

8. Saving energy with air sealed universals

Our manual crank drives are **most energy-efficient**: no electricity, no stand-by power!

In times of high energy prices, methods and processes to thermal insulation are priority issues. **With the new generation of GEIGER universals** we contribute to environmental protection and help to reduce the consumption of resources.

The new sealed universals contribute to follow the demand after energy saving buildings. They **prevent the inside/outside air circulation** both at the plate and at the bearing.

Series 444F.../446F.../456F...

1. Size

The bevel gears 444F.../446F.../456F... are designed to allow the shutter manufacturer to select the curtain width according to the guide rails.

The driving of the roller tube is effected into the tube by means of special plastic drivers that are adapted to the different profiles.

2. Reduction ratio

The choice of the reduction is particularly important for a **comfortable operation** of the crank. The GEIGER bevel gear units have **very small reduction ratios** in order to **reduce the number of crank rotations**.

Series 444F...	2:1
Series 446F...	3:1
Series 456F...	4:1

GEIGER free wheel clutch

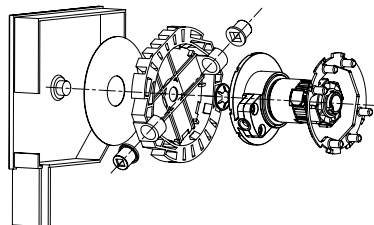
The curtain is shut down. After the closing of the light slots, the suspension springs build some pressure on the roller tube. This pressure is sufficient to have the GEIGER-free wheel clutch trigger: the roller tube bounces just inside the box, but does not rotate any longer.

Advantage: **this free wheel clutch requires no adjustment.**

It detects automatically the falling of the curtain on the window sill or any other obstacle.



We usually deliver our gear with a release torque of about 0.34 Nm. For special applications, various release torques are available on request.



3. GEIGER brake spring with free wheel

The unique GEIGER brake spring with free wheel ensures that

▶ **the brake spring does not rub on the brake cylinder during the upward movement of the curtain**

- Consequently an extremely smooth operation is possible.

▶ **In case of an interruption of the upward movement the brake unit immediately operates ("shark teeth" gearing)**

- Thus, the curtain is kept in place even in the middle position.

You have here **an exceptional technical solution** with a combination of **security** (prevents unintentional falling down of the curtain) and **comfort** (easy operation).

Notice: the **upwards and downwards forces required** to operate the shutter are **identical. The ease of use is optimized.**

4. GEIGER free wheel clutch

The Geiger free wheel clutch **prevents a winding up of the shutter curtain in the wrong direction.** Damages on the curtain can be avoided.

Please note: burglary resistant

- When using anti-lift devices, the curtain will be pushed from outside into the head rail, since the shaft is not blocked by the gear.
- If the shutter box can be opened from the outside, it is possible that burglars move the shaft by hand and wind up the curtain.
- For an effective anti-lift protection, we recommend our range 447F... (with integrated limit switch, without free wheel clutch).

5. Screwless fixation system 444F2.../446F2...

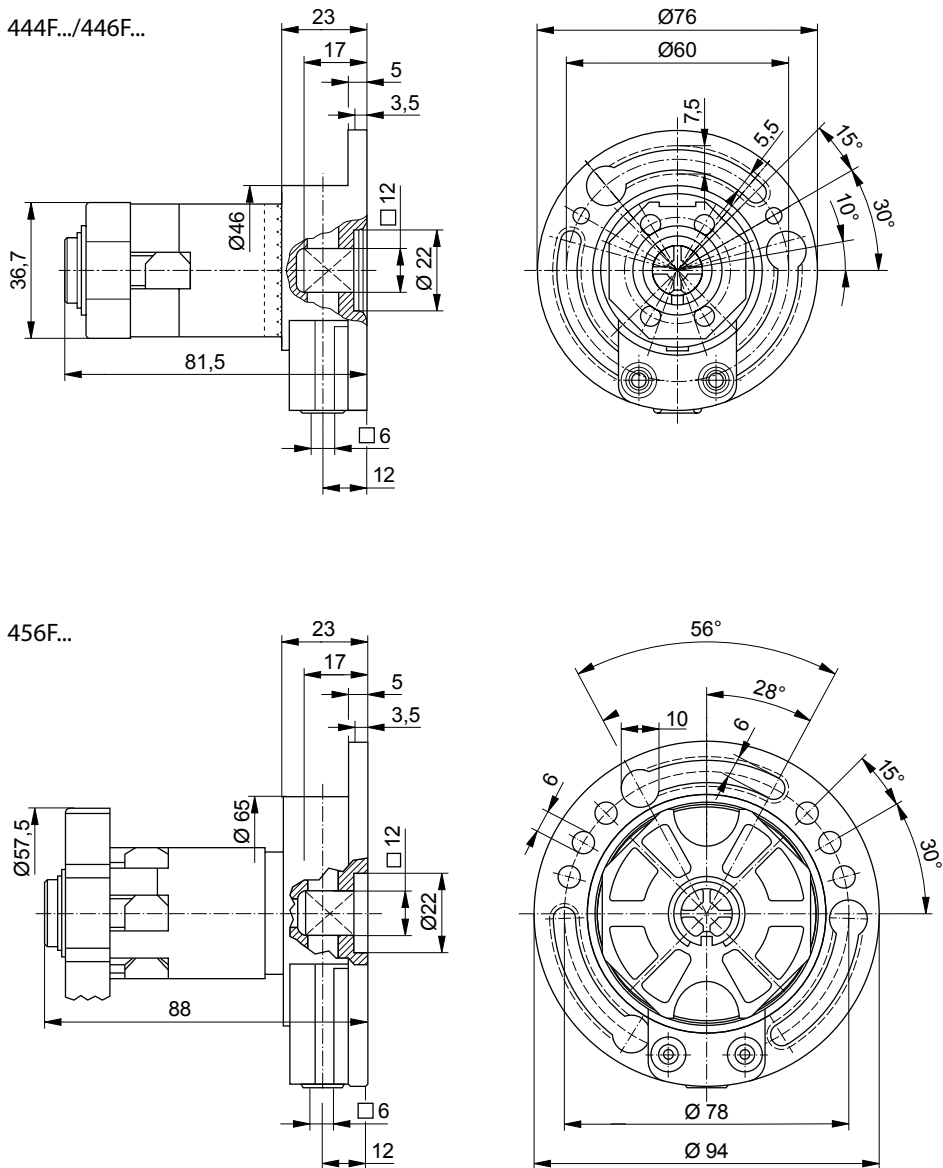
The gear series 444F... and 446F... are available with a special screwless fixation system:

- **Extremely fast installation**
- **No screwing into the cover capes**
- Readjustment of the gear without any tools (the drive insert can easily be placed into the gear).
- **Complete mounting kit** with rubber disc, support plate and safety ring.
- A **thermal break** between cover cap and gear: less condensation on the gear and therefore **higher gear lifetime.**

Assembly instructions: See appendix

Dimensions and technical data

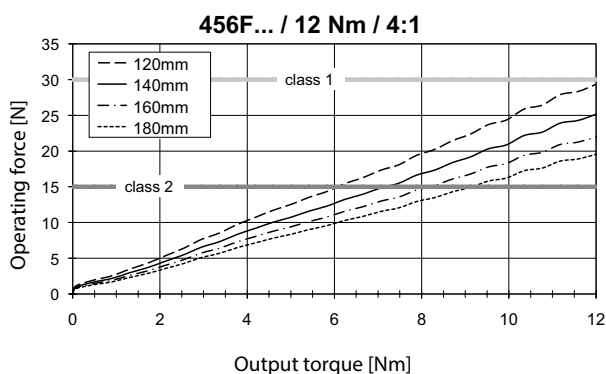
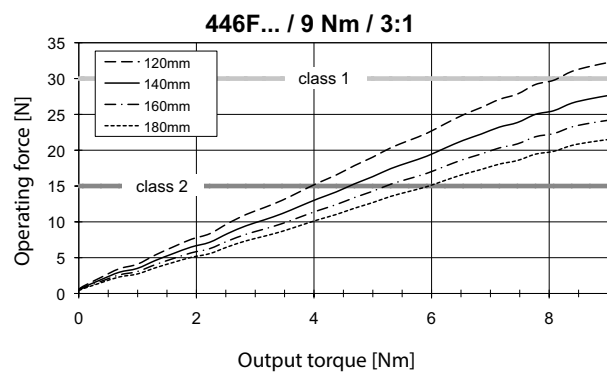
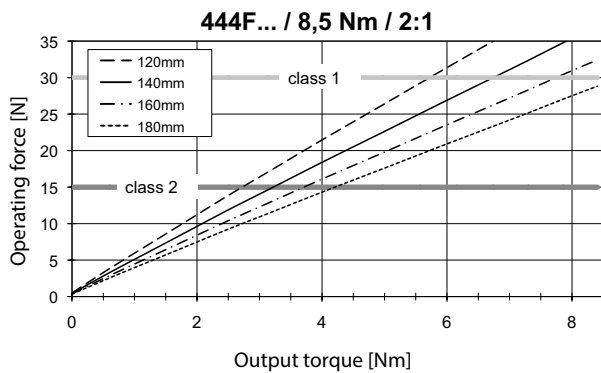
1. Sizes of series 444F.../446F.../456F...



2. Available models: input and output profiles

	444F...	446F...	456F...
Drive	6 mm square drive-through	6 mm square drive-through	6 mm square drive-through
	6 mm hexagonal drive-through	6 mm hexagonal drive-through	6 mm hexagonal drive-through
Output	36.7 mm octagonal	36.7 mm octagonal	36.7 mm octagonal
	38 mm octagonal.	50 mm octagonal	38 mm octagonal
	50 mm octagonal	57,5 mm octagonal	50 mm octagonal
	57,5 mm octagonal	40,5 mm KITTelberger	57,5 mm octagonal
	40,5 mm KITTelberger	38 mm octagonal	40,5 mm KITTelberger
Release torque	approx. 0.34 Nm	approx. 0.34 Nm	approx. 0.34 Nm
	approx. 1.2 Nm	approx. 1.2 Nm	approx. 1.2 Nm
Box design	standard	standard	standard
	with trunnion	with trunnion	
	Screwless fixation system	Screwless fixation system	
Pitch circle -\varnothing	$\varnothing 60$	$\varnothing 60$	$\varnothing 78$
Application range	rolling shutters up to 16 kg with 40 mm octagonal shaft	rolling shutters up to 21 kg with 40 mm octagonal shaft	rolling shutters up to 28 kg with 40 mm octagonal shaft

3. Diagrams



Idle torque:

	444F...	446F...	456F...
Upwards	0,1 Nm	0,1 Nm	0,1 Nm
Downwards	1,2 Nm	1,0 Nm	0,7 Nm

4. Notes:

- The series 444F.../446F.../456F... are available with a right and left version. This is necessary so that the free wheel clutch and the brake spring with freewheel are effective in the right direction.
- For a constant rotation when using a gear left or right, this gear must rotate by 180° according to the situation.



Drive-through gear

- Measures to increase the durability of gears
 Rain water and condensation reduce the life time of gears. For maximum durability we recommend:
 - GEIGER screwless fixation system
 - GEIGER air sealed universals to avoid condensation on the gear
 - Perforation of the plate for better air circulation within the shutter box
 - No plaster residues on gears or universals
 - Airing out rooms: experts recommend the fast and efficient exchange of room air by allowing fresh air to enter the room in bursts. By opening the windows entirely, already five to ten minutes are sufficient to replace the used, moist air with dry fresh air.

Identify left-hand and right-hand gears

This is very easy with our bevel gears 444F..., 446F... and 456F... Just place the gear with the mounting side on the palm of your hand. When the coupling elements show to the left this is a left version and vice versa.



Left version

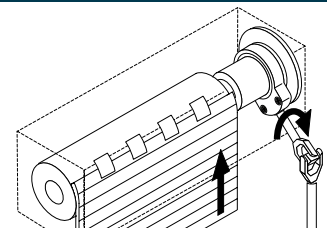
Right version

Determining the gear version left / right for the bevel gears 444F..., 446F..., 456F...

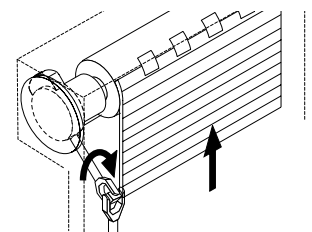
The crank rod should be rotated clockwise for opening the shutter curtains.

Since the direction of rotation should stay the same for different types of assembly, please observe the drawings below:

Left roller

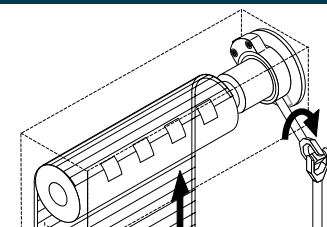


Gear version right

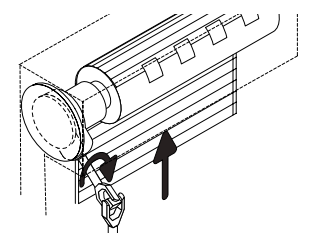


Gear version left

Right roller



Gear version left



Gear version right



The energy saver

The new GEIGER universals 90° and 45° are available with a slender base plate 22 x 85 mm.

The scratch-and abrasion-resistant powder coating is applied in ultra thin layers. Various colours are available.

In the aluminium version the joints have small plastic pieces. The industrial ball bearing is equipped with rubber pieces on both sides which contribute to air tightness and provide a smooth and accurate running.

A special cellular rubber seal reduces the air circulation between the wall and the universal. This system reduces the thermal decoupling on the drive rod.

Air sealed universals

In times of high energy prices, methods and processes to thermal insulation are priority issues. In this context, GEIGER introduces a new generation of universals which contribute to follow the demand after energy-saving buildings.

Through the use of a specific cellular rubber seal, also on uneven surfaces, the air circulation between interior and shutter box is excluded.

The energy loss through the opening in the building is virtually eliminated.

The gears, particularly in case of subsequent installation, were vulnerable to condensation risk – humid air from the interior through the wall into the shutter box. With the new generation of Geiger universals, the air circulation into the box is reduced and the condensation on the gear is strongly minimized. Moreover, the risk of moisture damage in the wall and in the shutter box is greatly reduced.

The effectiveness of the air sealed universals has been confirmed within the project „air-tightness of rolling shutter boxes“ in Rosenheim. The company Gerhard Geiger GmbH is project partner.

The research results will be included in the revision of the standard DIN 4108-2.

A new generation of GEIGER products: the air-sealed universals are a high-quality product which increase the operator convenience and help make your home more energy efficient.

Building Experts and Energy Consultants attach particular importance to the use of this new product generation.