

# Established



EtaCrown® –  
the high-performance bevel gearheads  
Powerful. Compact. Efficient.

EtaCrown®  
EtaCrown®Plus

**Crown technology – Traditional technology reinvented**

ZEITLAUF® has revolutionised the traditional crown gearhead and broken through technological barriers. With an innovative and efficient bevel gearhead family, we are opening new dimensions for possible application areas.

Crown kinematics were already used in wind and water mills in the past. Despite the publication of initial patents during the late 19th century, when crowns were produced via hobbing and grinding, it was not possible to achieve an efficient production process.

After years of research in conjunction with leading universities such as the RWTH Aachen and Munich Technical University, along with established engineering firms, we were successful in evolving this traditional transmission concept into a market-ready technology for gear heads and also in optimising the manufacturing process.

Using a specially developed gear cutting machine, we now produce efficient precision mechanics performance gears of the highest standard.

**EtaCrown® – Technology with a future.**



Traditional lantern gearhead in a mill: Technical template for the gearhead technology of EtaCrown®.

**EtaCrown® – the innovative bevel gearhead with crown technology.**

EtaCrown® is an impressive and technically mature gearhead concept that aims to deliver the best results for all performance ranges. Our vision of making crown gearheads more powerful, smaller and more efficient, and above all, of manufacturing them more economically, has become reality.

EtaCrown® has become the undisputed number 1\* among crown gearheads and offers an outstanding number of additional advantages:

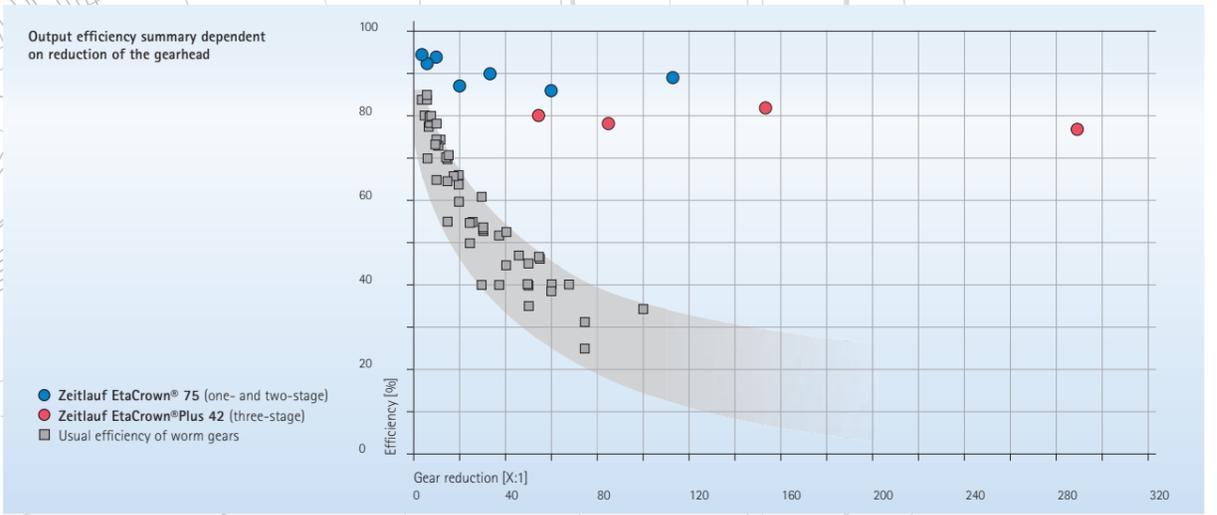
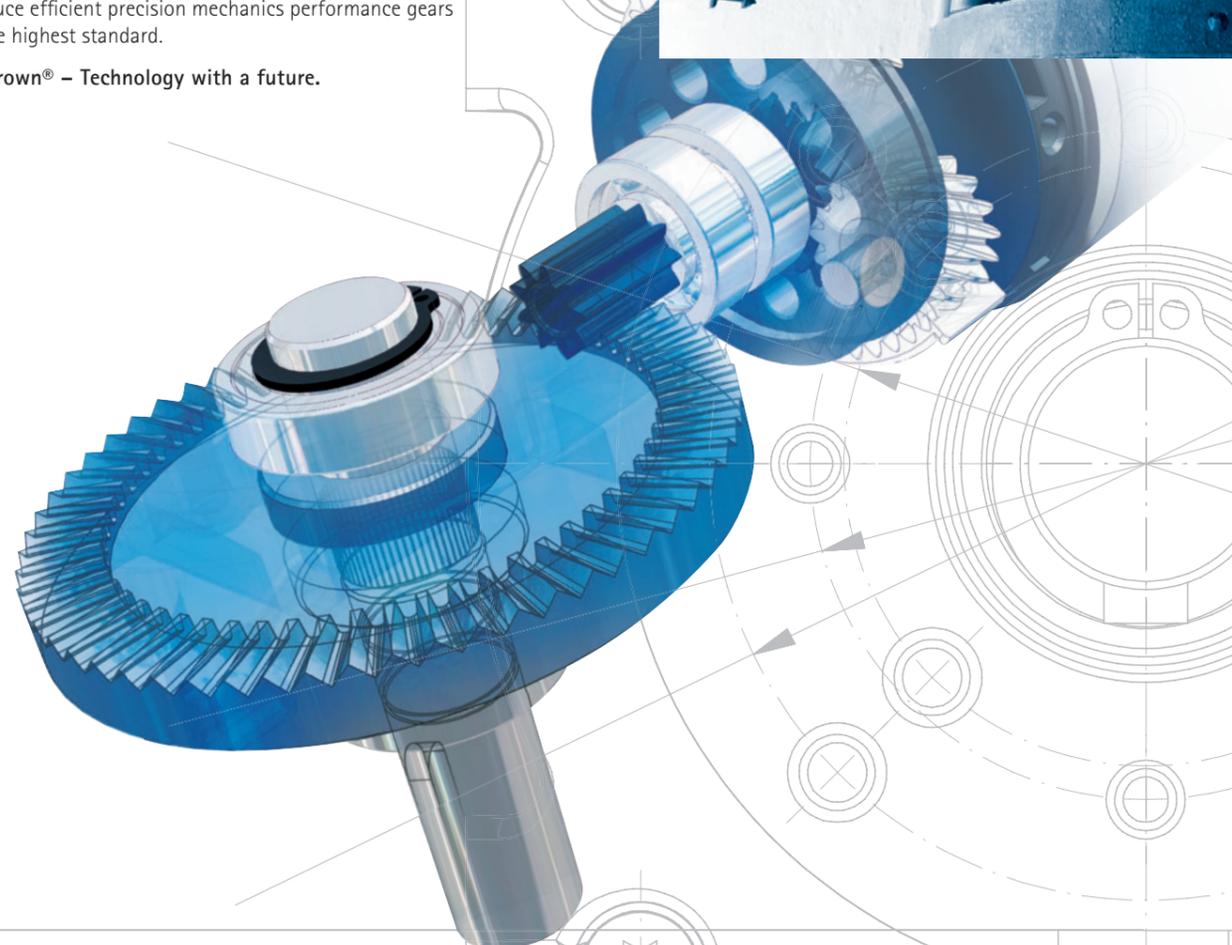
- More output power
- More efficiency
- More torque
- More cost savings

It is backed by engineering performance at the highest technical and scientific level. In addition, the modular design significantly increases the range of possible design and application options.

Each component impresses with excellent quality, ensuring low-wear operations and an extremely long time life.

**EtaCrown® – a highlight that moves.**

*EtaCrown® impresses with a very high average efficiency. The toothed wheels of a crown gearhead roll off one another and do not slide, as is the case with worm gears. The loss of energy from rolling friction is significantly lower than with sliding friction, which is why with the crown gearhead a considerably greater share of the power supplied is available as output power. This means up to 70 % less loss of power.*



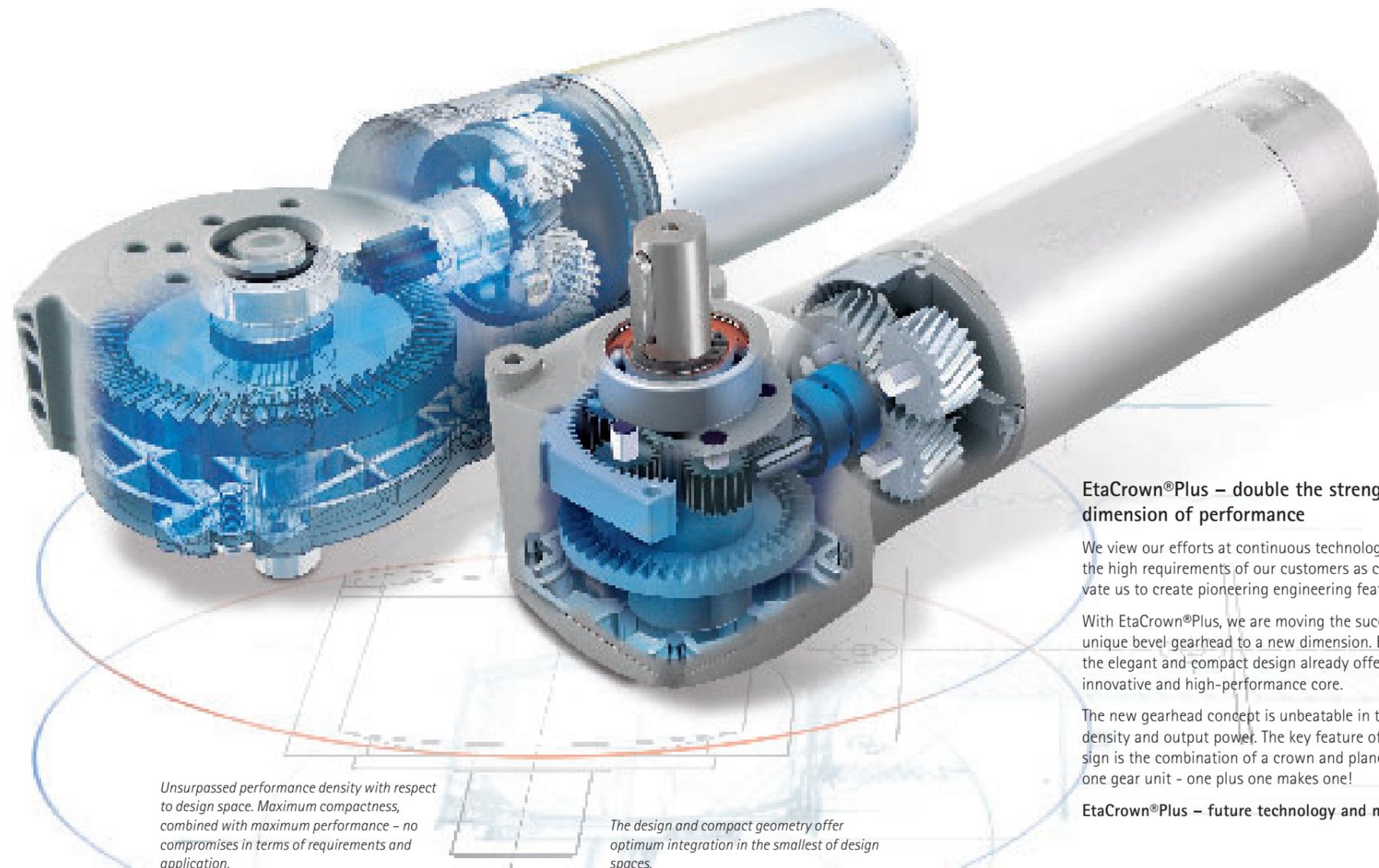
\*The only crown gearhead as a modular system.

## Focus on performance and efficiency

EtaCrown® significantly improves the energy efficiency and viability of your application. The modular design can be flexibly adapted for any drive task:

- Average efficiency between 76 and 95 % over the entire range, which means unique energy efficiency
- Very compact design and space-saving geometry with a symmetrical structure and maximum performance density, modern industrial design
- Gear reductions of 4:1 to 289:1 available as standard, jolt-free start-up due to rolling tooth gripping
- Smooth running due to intelligent gear-tooth technology and gearhead design, maximum radial load thanks to double-sided support of the drive shaft
- Long lifetime thanks to high efficiency, optimized tooth gripping and adapted tooth materials
- Highest degree of safety in design and operation without self-locking and protection against vandalism
- Numerous possible combinations with various AC, DC and EC motors
- Unsurpassed economy in terms of investment and operations

**Innovation that cannot be more perfect!**



*Unsurpassed performance density with respect to design space. Maximum compactness, combined with maximum performance – no compromises in terms of requirements and application.*

*The design and compact geometry offer optimum integration in the smallest of design spaces.*

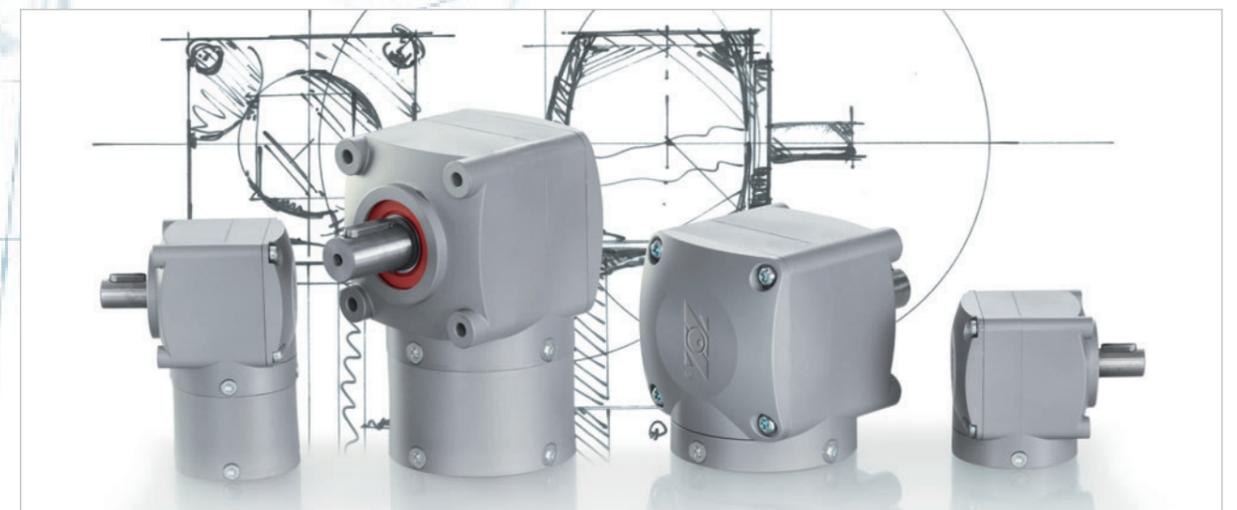
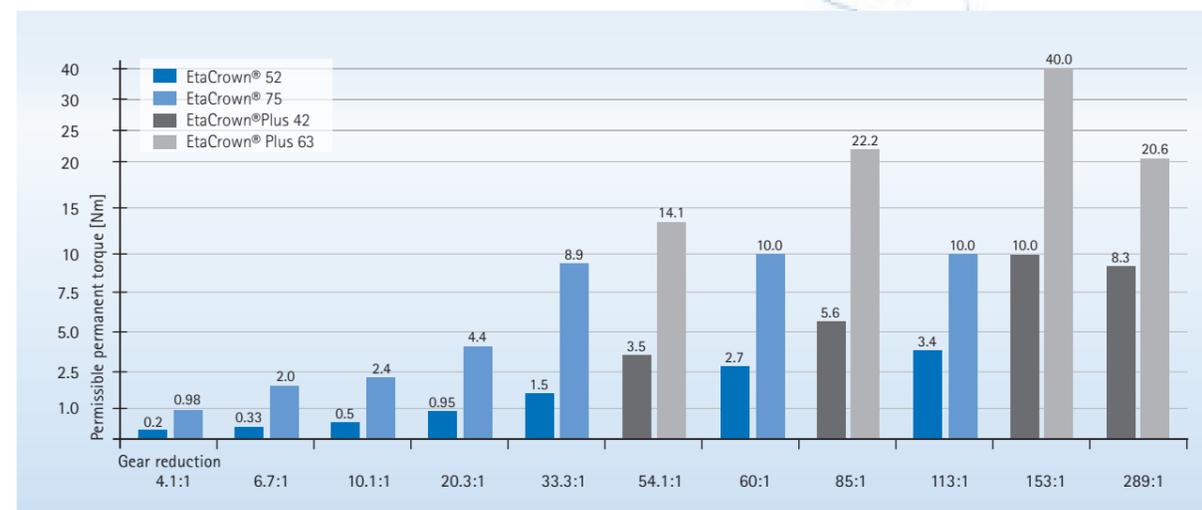
## EtaCrown®Plus – double the strength in a redefined dimension of performance

We view our efforts at continuous technological innovations and the high requirements of our customers as challenges that motivate us to create pioneering engineering feats.

With EtaCrown®Plus, we are moving the success story of our unique bevel gearhead to a new dimension. Even on the outside, the elegant and compact design already offers a glimpse of the innovative and high-performance core.

The new gearhead concept is unbeatable in terms of performance density and output power. The key feature of this intelligent design is the combination of a crown and planetary gear stage in one gear unit – one plus one makes one!

**EtaCrown®Plus – future technology and more.**

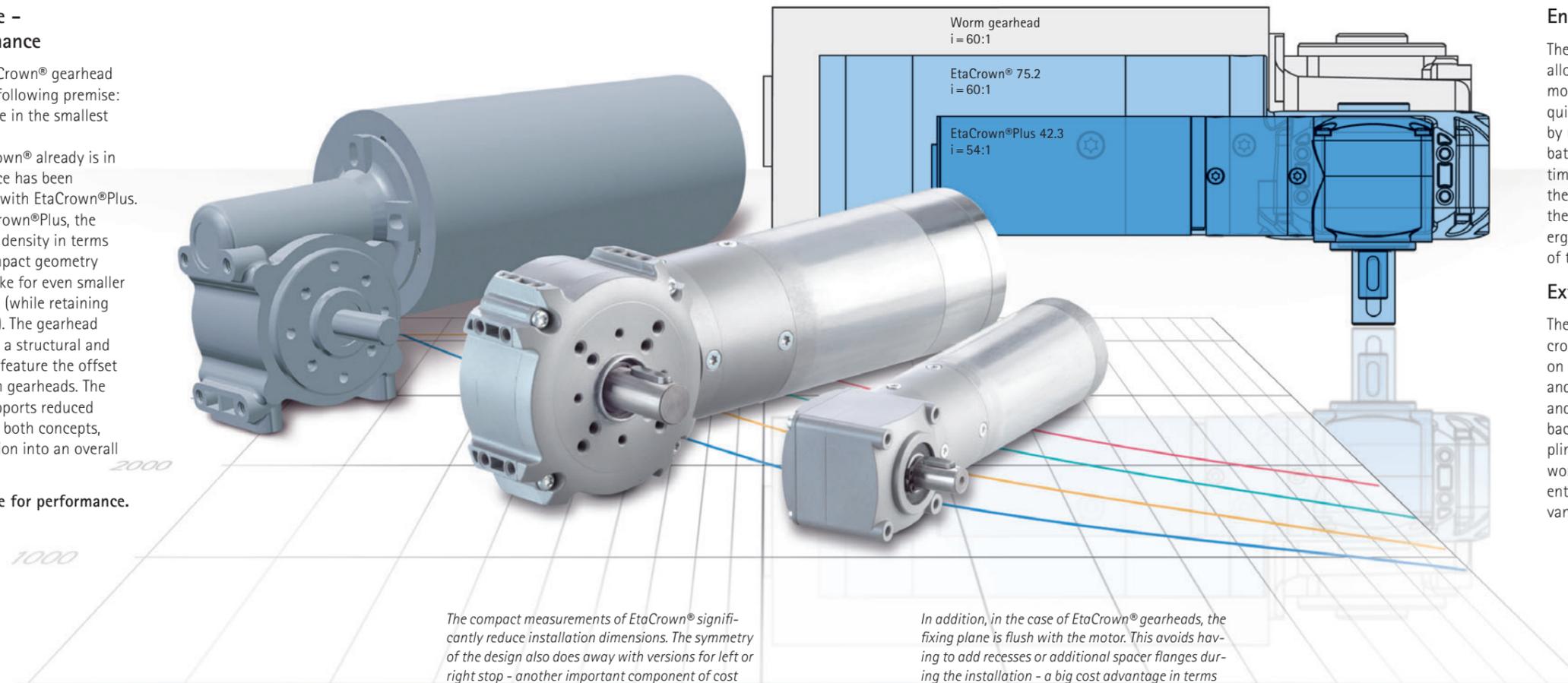


**Small design space – maximum performance**

The concept of the EtaCrown® gearhead family is based on the following premise: "Maximum performance in the smallest design space".

As impressive as EtaCrown® already is in this regard, performance has been increased even further with EtaCrown®Plus. In the case of the EtaCrown®Plus, the improved performance density in terms of output power, a compact geometry and smaller motors make for even smaller installation dimensions (while retaining the output power level). The gearhead design and motor form a structural and visual unit, and do not feature the offset that is typical for worm gearheads. The symmetrical design supports reduced space requirements for both concepts, and facilitates integration into an overall system.

**EtaCrown® – the drive for performance.**



The compact measurements of EtaCrown® significantly reduce installation dimensions. The symmetry of the design also does away with versions for left or right stop – another important component of cost efficiency.

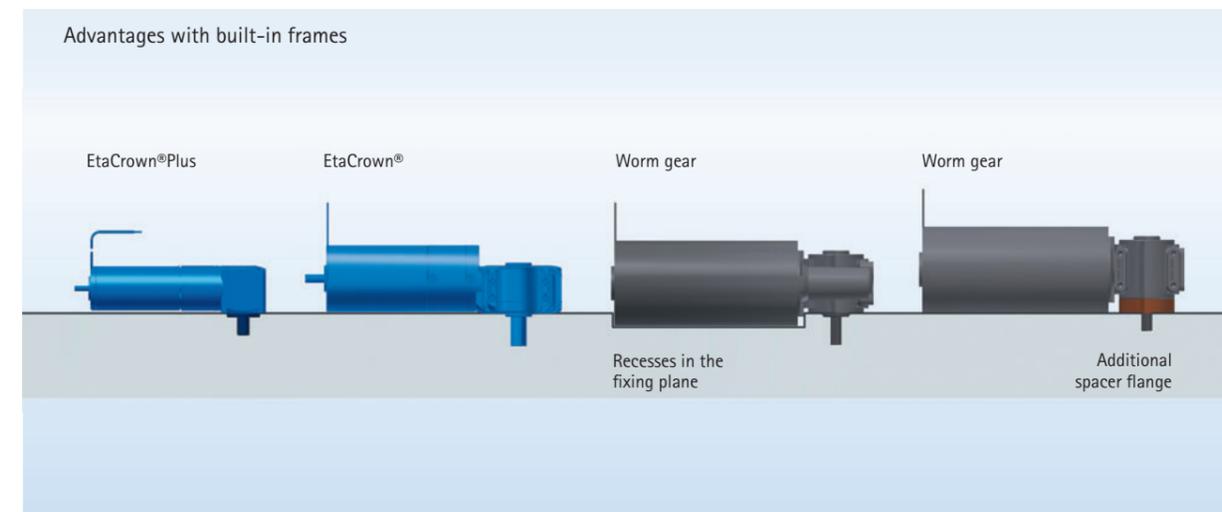
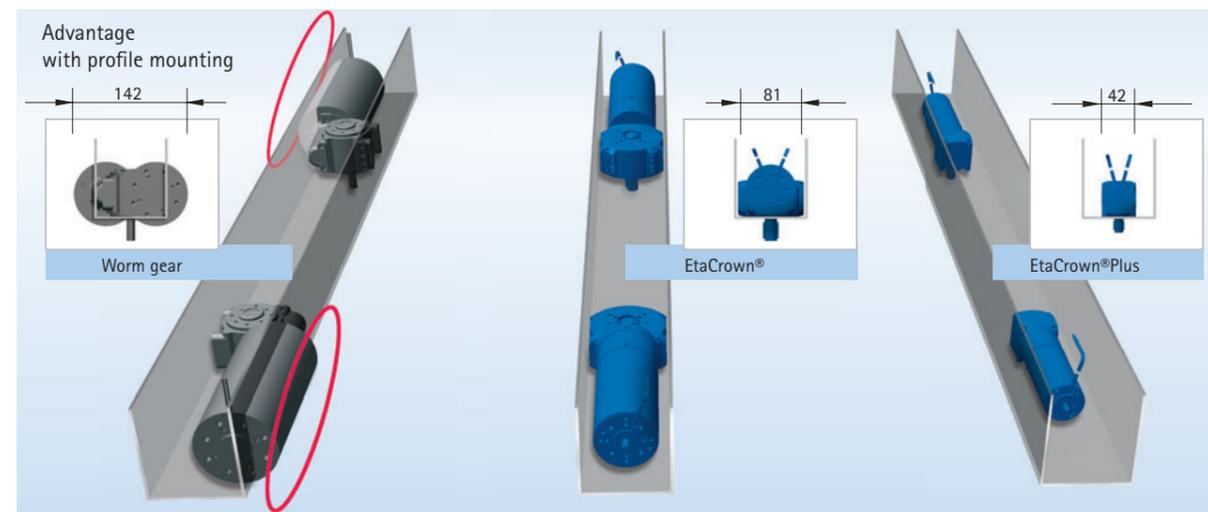
In addition, in the case of EtaCrown® gearheads, the fixing plane is flush with the motor. This avoids having to add recesses or additional spacer flanges during the installation – a big cost advantage in terms of design and implementation.

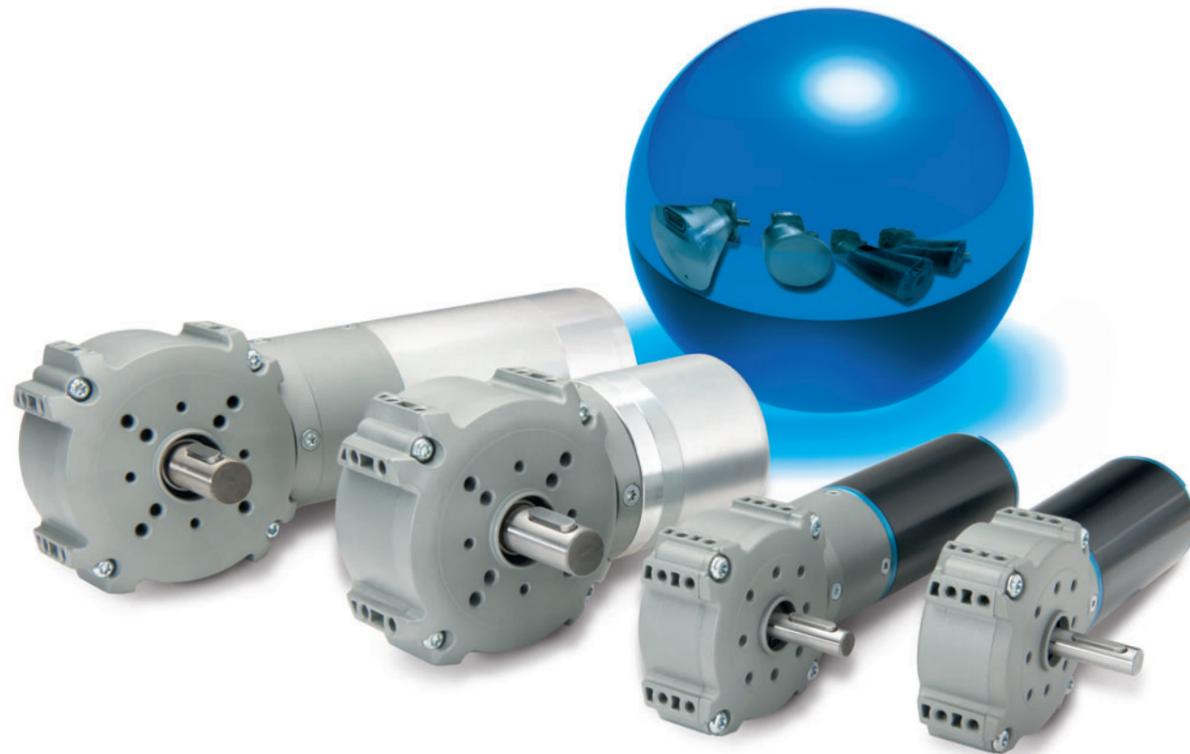
**Energy efficiency**

The high capacity and enormous efficiency allow for the use of significantly smaller motors with considerably lower energy requirements. Power consumption is reduced by up to 70 %, increasing the tool life of battery-operated solutions by up to three times compared to worm gears. Thanks to the significant reduction in waste heat in the gear units and motors, additional energy can also be saved in the infrastructure of the gear environment.

**Extremely high safety level**

The tooth-gear geometry of the EtaCrown® crown gearhead has an enormous impact on the safety aspects regarding concept and use. The gearhead has no self-locking and thus enables the drive to be turned back without any damage. Additional coupling mechanisms that are necessary with worm gears are no longer required. The entire gearhead is protected against vandalism.





EtaCrown® 75.1 – one-stage crown gearhead



EtaCrown® 75.2 – two-stage crown gearhead with planetary pre-stage



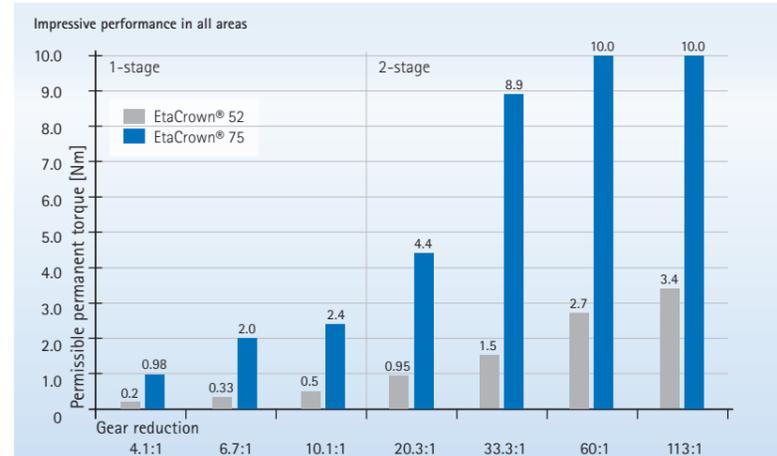
EtaCrown® 75.2 – two-stage crown gearhead with planetary output stage

## EtaCrown® – successful across the entire spectrum

EtaCrown® offers an unlimited number of application options with enormous innovation potential for more productivity and efficiency, and great flexibility with respect to possible design variants. With regard to profitability, it generates unsurpassed cost advantages in terms of investment and operations.

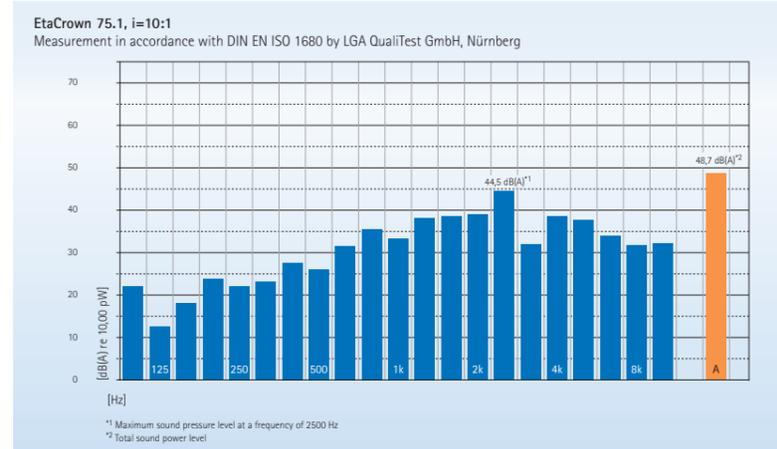
- Average efficiency of more than 85 %, almost 3.5 times better than worm gears
- Standard gear reductions of 4:1 to 113:1 are available (from one-stage to two-stage design)
- Can be combined with AC, DC and ED motors, as well as brakes and sensors

EtaCrown® – technology with a future.



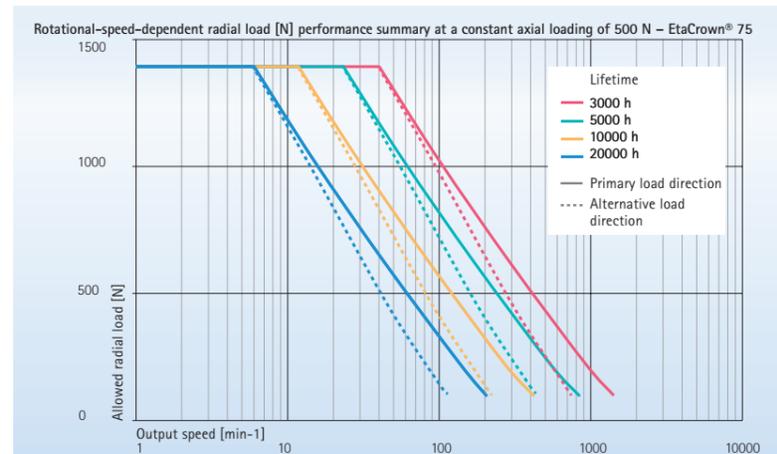
## Broad reduction series

Standard gear reductions ranging from 4:1 to 113:1 (from one-stage to two-stage design) can be increased to reductions of up to 170:1 with a two-stage design for customer-specific solutions (three-stage reductions on request).



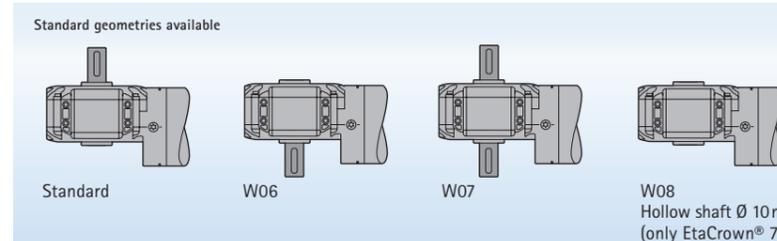
## Extremely smooth

Of course, EtaCrown® also features the extremely smooth running properties that are typical for ZEITLAUF® gearheads. Excellent noise reduction is achieved with intelligent gear tooth technology and the use of plastic materials with optimised sliding properties for crown gears (one-stage design) or for planetary wheels and the hollow wheel in the preliminary stage in connection with an optimum bearing design of the crown stage (two-stage design).



## Maximum radial loads

The double-sided support of the drive shaft using deep groove ball bearings and high-quality plastic slide bearings facilitates maximum radial loads regardless of output speed and lifetime, and allows for a gearhead lifetime of 20,000 hours.



## Multitude of applications

EtaCrown® is convincing thanks to flexible application possibilities with different optional shaft outputs and geometries available – to perfectly match application requirements.

**Support washer**

Used to insert the bearing needles used as the planetary axis, and establishes the power flow to the pinion shaft

**Ball bearing**

Covered deep groove ball bearings for precisely positioning the pinion shaft in relation to the crown gear

**Pinion shaft**

Hardened steel crown gear spigot with smoothed ball bearing seat and knurling for a permanent connection with the support washer of the planetary gear

**Crown gearhead housing**

Corrosion-resistant housing made of zinc diecasting with variable fastening options

**Deep groove ball bearing**

Compacted deep groove ball bearing for absorbing external radial and axial loads

**Crown gear**

Optimised crown gear toothing made of plastic (one-stage gearheads) or steel or hardened steel (two-stage gearheads) produced with the shaping method

**Output shaft**

Standard hardened and smoothed drive shaft with feather key groove; optionally output to the front, back or on both sides; available with hollow shaft design for EtaCrown® 75

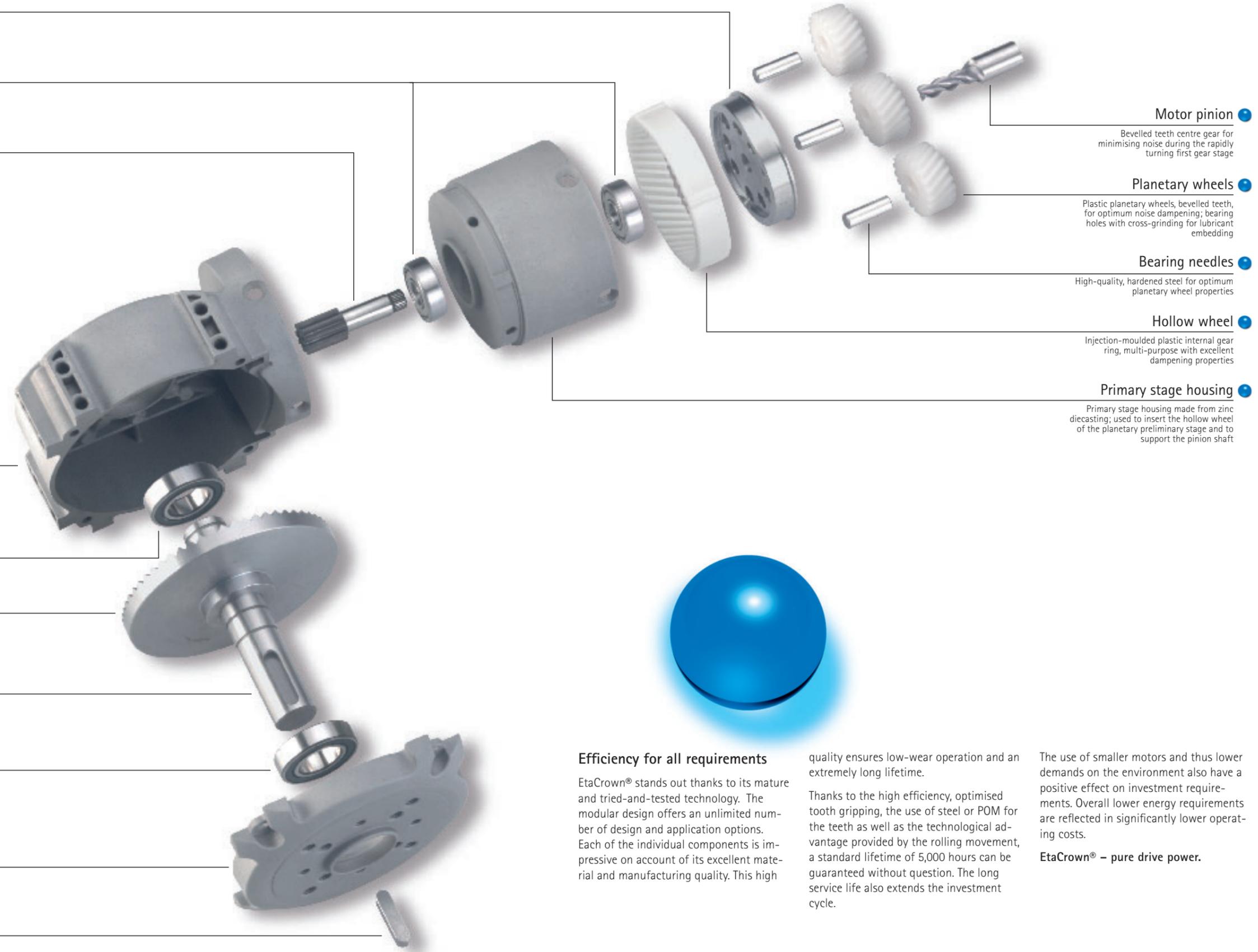
**Ball bearing**

Compacted deep groove ball bearing for absorbing external radial and axial loads

**Gear cover**

Cover made of zinc diecasting with three different thread pitches for customised gearhead mounting

**Feather key**



**Motor pinion**

Bevelled teeth centre gear for minimising noise during the rapidly turning first gear stage

**Planetary wheels**

Plastic planetary wheels, bevelled teeth, for optimum noise dampening; bearing holes with cross-grinding for lubricant embedding

**Bearing needles**

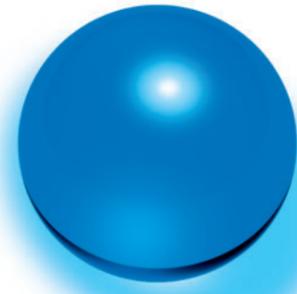
High-quality, hardened steel for optimum planetary wheel properties

**Hollow wheel**

Injection-moulded plastic internal gear ring, multi-purpose with excellent dampening properties

**Primary stage housing**

Primary stage housing made from zinc diecasting; used to insert the hollow wheel of the planetary preliminary stage and to support the pinion shaft



**Efficiency for all requirements**

EtaCrown® stands out thanks to its mature and tried-and-tested technology. The modular design offers an unlimited number of design and application options. Each of the individual components is impressive on account of its excellent material and manufacturing quality. This high

quality ensures low-wear operation and an extremely long lifetime.

Thanks to the high efficiency, optimised tooth gripping, the use of steel or POM for the teeth as well as the technological advantage provided by the rolling movement, a standard lifetime of 5,000 hours can be guaranteed without question. The long service life also extends the investment cycle.

The use of smaller motors and thus lower demands on the environment also have a positive effect on investment requirements. Overall lower energy requirements are reflected in significantly lower operating costs.

**EtaCrown® – pure drive power.**



EtaCrown®Plus, combined planetary/crown gearhead, two-stage, sizes 63 and 42



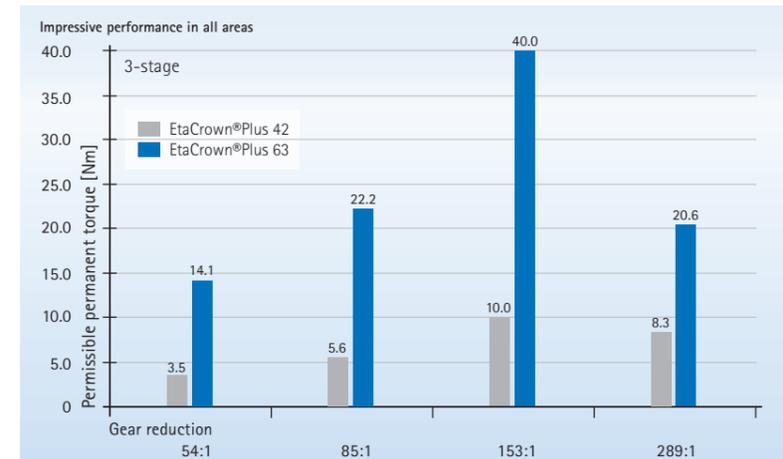
EtaCrown®Plus, combined planetary/crown gearhead, three-stage, sizes 63 and 42

## EtaCrown®Plus – Upgrade of a successful concept

The EtaCrown® bevel gearhead has progressed into an unbeatable drive concept. The numerous technological benefits, multi-faceted efficiency and the performance range itself speak their own language. With EtaCrown®Plus, we are moving performance to a new dimension:

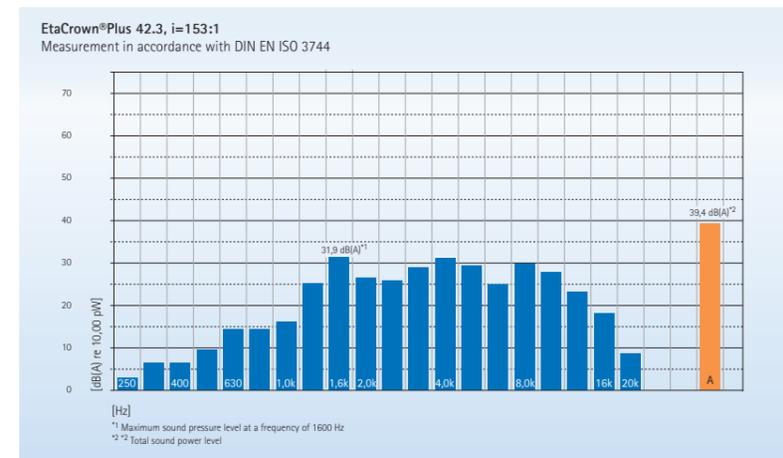
- Two-stage gearhead combination (crown and planetary gearhead) extremely compact in one gear unit
- Standard reductions of 54:1 to 289:1 with a three-stage design
- Nominal torque 10 Nm (EtaCrown®Plus 42) and 40 Nm (EtaCrown®Plus 63), peak torque of 25 and 100 Nm
- Can be combined with different DC and EC motors - also with integrated electronics

EtaCrown®Plus – powerful, compact, efficient.



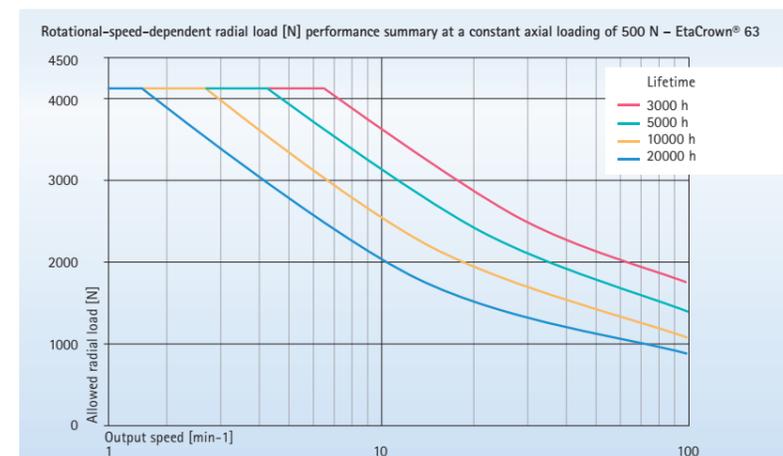
## Maximum reduction density

EtaCrown®Plus significantly increases the reduction density as compared to EtaCrown®. Due to the performance range as regards the design space, this innovative gearhead is the world's most compact bevel gearhead, and is available as a modular system. With reductions of 54:1 to 289:1 as part of the standard three-stage model, we offer a unique range with maximum performance.



## Extremely smooth

The extremely smooth running properties of EtaCrown® have been further enhanced for the EtaCrown®Plus. Bevelled teeth planetary wheels and a hollow wheel made of high-performance plastic in the standard planetary preliminary stage, intelligent gear-tooth technology and the optimum bearing design of the crown stage, as well as five oil-soaked planetary wheels made of hardened sinter steel stand for optimum noise reduction.



## Maximum radial loads

The double-sided support of the drive shaft using deep groove ball bearings and high-quality plastic slide bearings facilitates maximum radial loads according to output speed and lifetime, and allows for a gearhead lifetime of 20,000 hours.

# EtaCrown®Plus – double the performance

## Pinion shaft

Hardened steel crown gear spigot with smoothed ball bearing seat and knurling for a permanent connection with the support washer of the planetary gear

## Feather key

## Housing

Installation space-optimised, corrosion-resistant housing made of zinc diecasting

## Ball bearing

Compacted deep groove ball bearing for absorbing external radial and axial loads

## Hollow wheel

Form-fit embedded hollow wheel made of hardened sinter steel

## Output shaft

Standard hardened and smoothed drive shaft with feather key groove

## Support washer

Support washer for inserting the bearing needles used as the planetary axis; establishes the power flow to the pinion shaft

## Planetary wheels

5 planetary wheels made of hardened sinter steel with optimum emergency operation properties due to oil soaking

## Centre gear

Made of hardened steel, pressed into crown gear

## Crown gear

Optimised crown gear toothing made of hardened steel using the shaping method, with inside plastic sliding bearing for friction-free positioning on the drive shaft

## Sliding bearing

Sliding bearing made of high-performance plastic for radial and axial positioning of crown gear

## Gearhead cover

Closed gearhead cover made of zinc diecasting with optional additional seal to seal against housing

## Motor pinion

Bevelled teeth centre gear for minimising noise during the rapidly turning first gear stage

## Planetary wheels

Plastic planetary wheels, bevelled teeth, for optimum noise dampening; bearing holes with cross-grinding for lubricant embedding

## Bearing needles

High-quality, hardened steel for optimum planetary wheel properties

## Support washer

Support washer for inserting the bearing needles used as the planetary axis; establishes the power flow to the pinion shaft

## Hollow wheel

Injection-moulded plastic internal gear ring, multi-purpose with excellent dampening properties

## Ball bearing

Covered deep groove ball bearing for precisely positioning the pinion shaft in relation to the crown gear

## Primary stage housing

Primary stage housing made from zinc diecasting; used to insert the hollow wheel of the planetary preliminary stage and to support the pinion shaft

## EtaCrown®Plus – the benchmark for performance

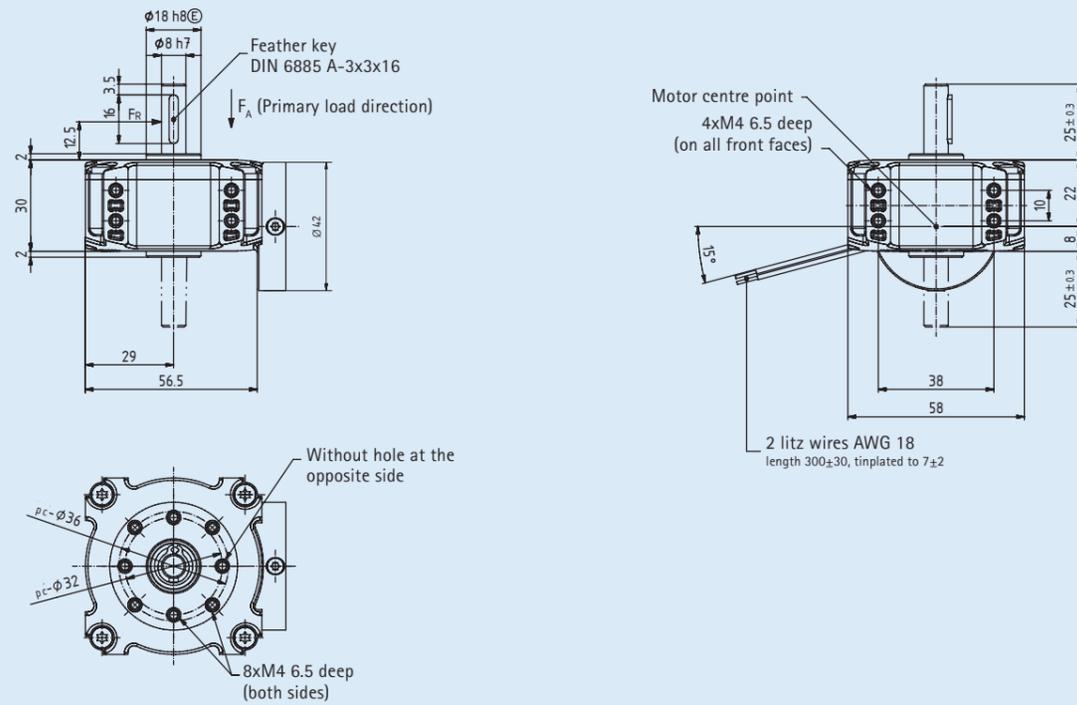
The powerful combination of the two gearhead technologies is impressively reflected in each detail. Components are optimally aligned in terms of their performance aspects and functions, and fulfil all important criteria for the entire performance of the gear motors.

They include bevelled tooth plastic planetary wheels at the input stage for optimum noise minimisation, as well as oil-soaked planetary wheels made of hardened sinter steel with optimum emergency operation properties at the integrated planetary output stage.

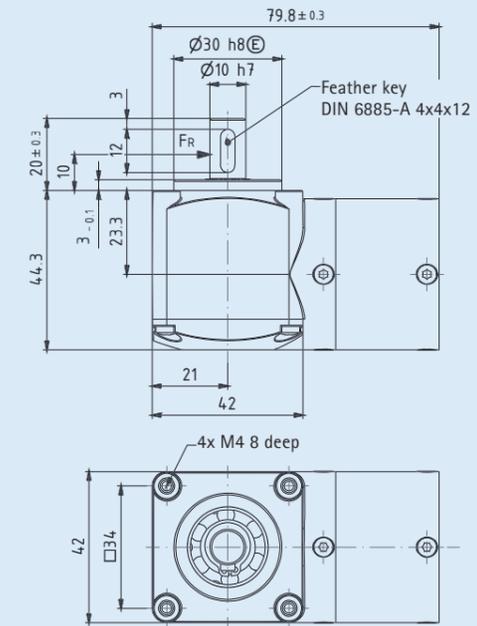
Damage-free turning back – since the design of the gearhead does not allow for self-locking – also allows for maximum safety in application.

**EtaCrown® – doubly powerful and extremely compact.**

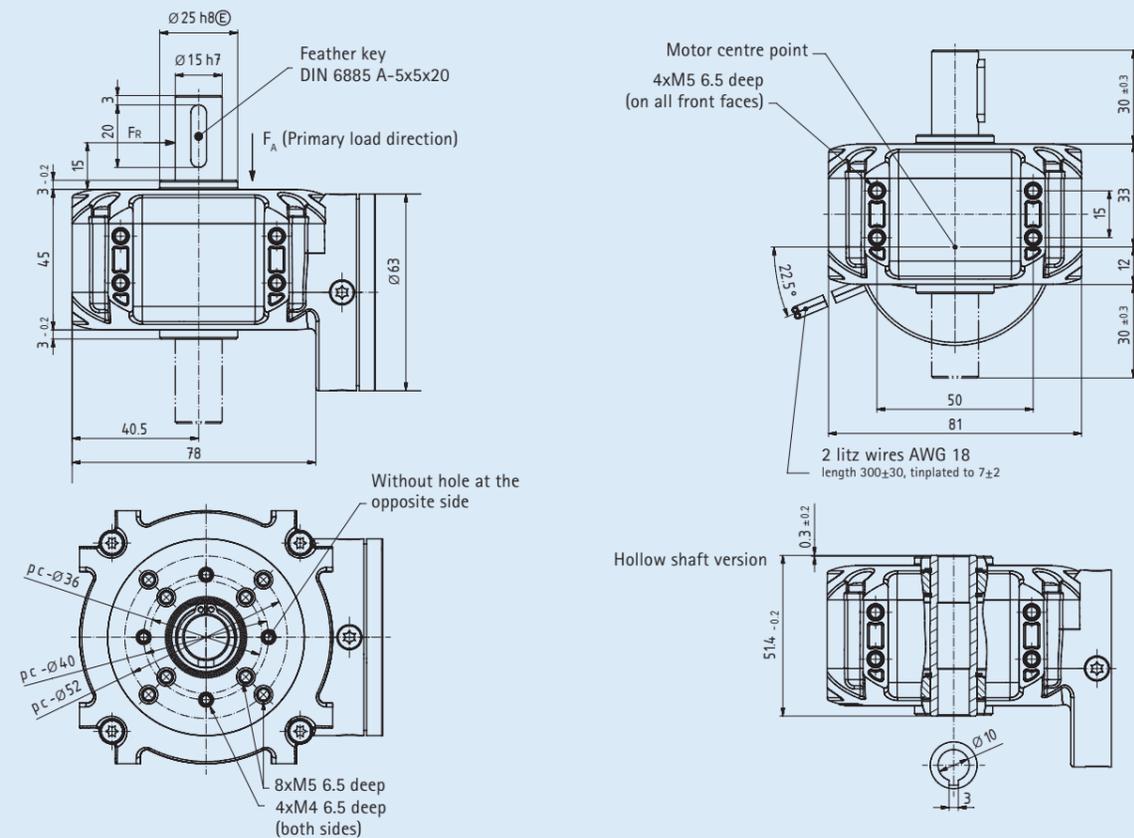
EtaCrown® 52 with preliminary stage



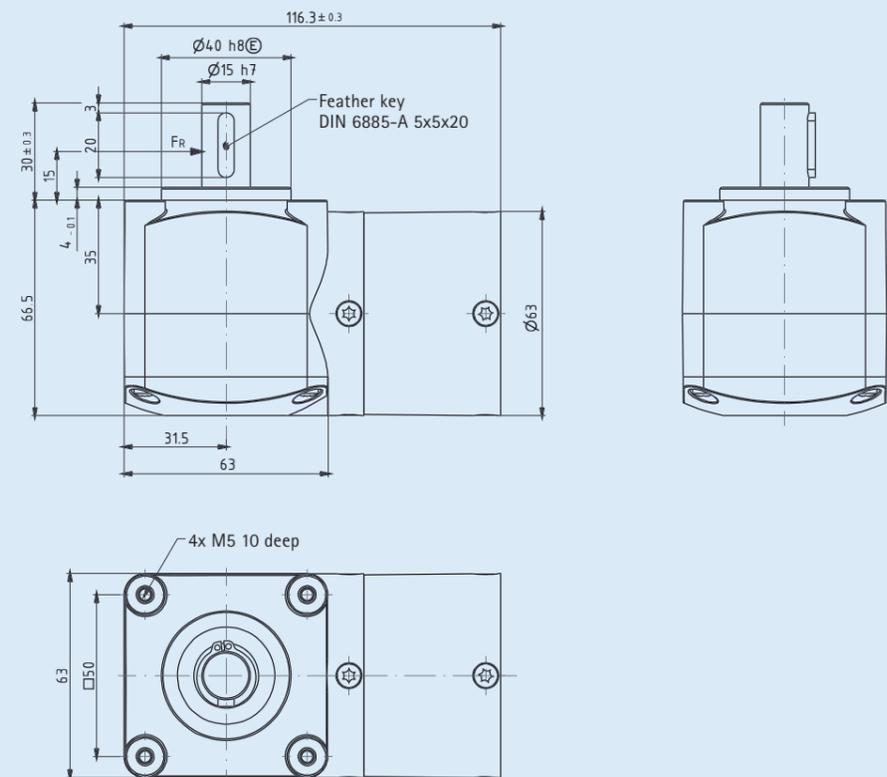
EtaCrown®Plus 42 with preliminary stage



EtaCrown® 75 with preliminary stage



EtaCrown®Plus 63 with preliminary stage



**Proof of performance for our engineering expertise.**

The quality and value of our development work is clearly demonstrated again and again whenever we face the challenge of individual special requirements. This is where our capacity and variety come in especially useful. Above all, the intelligent adaptation or integration of in-house developed system components into a new, complete functional unit is what makes us stand out from the rest.



**Traction drive for operating tables**

Two-stage EtaCrown® 75 with special protection class IP 40 plug connection and powerful DC motor. High radial loads mean that the efficient gearhead provides safe and flexible operating table movement, even with significant weight loads. The nominal torque is approximately 7 Nm. The service life of the gearhead is 5,000 hours.



**Gearheads for water canons**

These applications use two two-stage EtaCrown® 75 for pivoting as well as up and down movements. The gearhead are upstream of a subsequent reduction provided by the customer. Crown gear and shaft are hardened and rust-protected, the gearhead (fitted with dual-side shaft seals and additional lacquer) and motor are of protection class IP 54. A second shaft output, with attached hand wheels, is used for problem-free operations in the case of a fault.



**Drive for railway technology**

With its technologically exemplary drive concepts, Zeitlauf® implements innovative and reliable gear motors for many conceivable motion requirements in the area of passenger transportation. The EtaCrown® gearhead family is the ideal drive solution for many application fields, ensuring safe operations with high loads, a large number of movement cycles and often extreme environmental conditions. This also includes vibration resistance to compensate for vibration responses, along with high corrosion resistance.

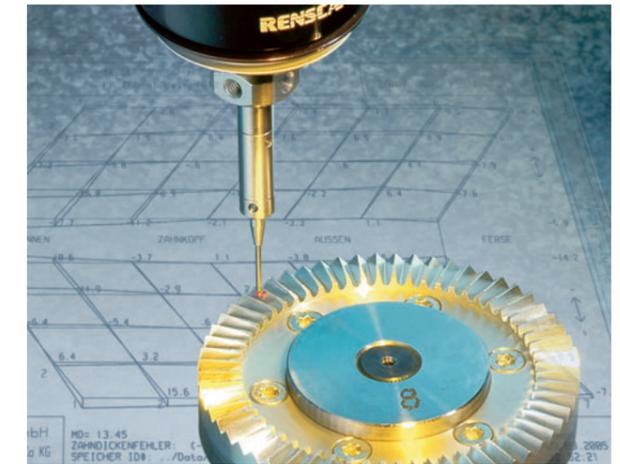


**Our drive is achieving intelligent solutions.**

High-quality drive solutions demand perfection. This is the drive we need to achieve maximum performance in all our activities. Consistently focussed on your requirements, to create an unbeatable advantage for you.

We develop innovations in drive technology for you, let our expertise and know how design a solution which will work for you. Precise and first-class, with a strong team that acts with passion and precision.

**ZEITLAUF® – assuring you the decisive lead in your markets.**



**The focus is on your requirements.**

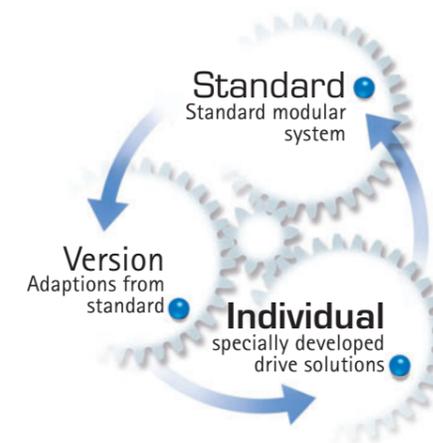
We are your partner at every stage of the process chain, coming up with new ideas while keeping the solution of the whole project in mind:

- The basis is always formed by our **standards**, which contain our complete experience and engineering competence and covers a wide range of our customers requirements.
- During the qualification process we quickly recognize the need for **variations**. We can modify our drive solutions to help you achieve your objective effectively and economically.
- Quite often, we can achieve your objectives only through **individual development – our quite special strength**. This is where we prove our passion and performance capability at the highest level.

Every stage of the development process is subjected to our optimised quality and process management system. Combined with state-of-the-art technology and an unbeatable network of knowledge, we stand for your performance- and future-oriented solutions and for our joint success – we call it „Simultaneous Engineering“.

In close conceptual cooperation we push what is feasible as far as possible. All process stages are part of our tried-and-trusted system, where everyone benefits from the know-how of the other divisions.

**ZEITLAUF® is your competent partner for successful drive solutions.**



## Our standard modular system – a unique concept



### 4,209 Drive solutions

For each demand, we have the correct drive. A high standard of engineering competency and logistical finesse, for optimal achievement and maximum efficiency, in an unbeatable modular system:

- 4,209 different drive solutions with unique power densities and application ranges
- "Assembling on demand" – fast and customised combination of the components you need to the highest standard of perfection.



### 48 Hours service

We react flexibly to the demands of a market with short-lived tendencies. After receipt of the order, we are able to dispatch to you your specifically configured drive – up to 20 pieces – within 48 hours\*. Even a larger number of items and small-batch items can be ordered from our standard modular system.



### Keep-Word-Warranty

We push back the limits with a singular warranty promise and go to exceptional lengths:

- replacement or repair of a defective gear motor, twice within a year – without question of blame
- an error log for the cause of failure with each return consignment
- in the case of overloading of the gear motor, you may exchange for a more powerful solution, which a full credit is applied to the price of the original drive cost



### 3D data available free of charge

For the purpose of speeding up and simplifying project planning, our Online Shop provides the user with all the specific data concerning our entire standard range. Users also benefit from a free CAD data call-up facility (3D models) in around 30 standard formats. It is simply not possible to design drive solutions faster and to better effect.



### Standard modular system, online shop

Our unbeatable standard modular system is of course also available online. Our Internet portal contains a unique product configurator which you can use to put together all of our 4,209 solutions according to your specific requirements. Select and order the product you require intuitively, conveniently and smoothly.

Click our online shop – [www.zeitlauf.com](http://www.zeitlauf.com)