



WITTENSTEIN

alpha

## alpha Premium Line Product brochure

Unique  
Individual  
Highly efficient





YOUR WORLD ...

... IS OUR DRIVE

It is good to know today what will be needed tomorrow. Applying it in practice is even better. We develop technology that shapes the future  
- ENGINEERING FUTURE SOLUTIONS.

## PERFORMANCE

**Performance where it counts:**

High torque, outstanding precision and high power density – essential for our products and systems.

## FUTURE PROOF

**We live processes:**

Only those who know the exact details of customer processes and requirements are in a position to develop solutions that offer added value in the short and long term.

## SCALABILITY

**You never make compromises:**

Whatever the performance area – we offer solutions that grow with your requirements.

## EFFICIENCY

**We like it „lean“:**

We offer products and systems that are energy-efficient and require minimal installation space in machines.

## AVAILABILITY

**You need reliability:**

We have the widest range of products on the market and can implement your application „just in time“.

## CONNECTIVITY

**We think in terms of interfaces:**

All of our systems can be integrated in a wide range of peripherals.





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# alpha Premium Line – unique, individual solutions that offer unparalleled power density

The requirements for highly complex applications used in machine tools or laser technology, for example, are becoming increasingly demanding and standard products are often unable to meet them. The alpha Premium Line is a completely new product program developed to meet the most demanding requirements. In addition to the products, we primarily focus on offering comprehensive consultancy services to ensure that your requirements are taken into full consideration and maximum machine utilization is achieved. We aim to provide unique "Best in Class" solutions that significantly exceed current standards and help you design your plants more efficiently.

## Maximum power density

We increased the performance of our gearboxes by up to 200 % compared to other commercially available standard gearboxes. Our Premium products therefore make a direct contribution to enhancing the performance of your plant.

## Maximum positioning accuracy

On request, the Premium planetary gearboxes are available with torsional backlash of less than one arc minute. In combination with maximum torsional rigidity, this backlash guarantees outstanding positioning accuracy.

## Easy installation

Specially designed output configurations allow for quick and easy installation.

## Top engineering and expert consultation

We use our extensive engineering expertise to develop unique solutions and produce the perfect design for your drive train. Our highly qualified employees provide support and advice from the initial idea and throughout the entire life cycle of your application.

alpha Premium solutions. Tailored precisely to meet your needs.

More performance in less space

- if you require an even more compact drive
- if you wish to enhance the performance of your machine
- if you require high-performance linear systems





A photograph of two men in a professional setting. On the left, a man with short grey hair, wearing a dark blue suit, light blue shirt, and blue tie, is smiling and looking towards the right. On the right, the back of another man's head and shoulders are visible; he is wearing a white shirt and glasses. They appear to be in a meeting or conversation. The background is a bright, out-of-focus window with greenery outside.

"We develop pioneering solutions for demanding applications in close dialog with our customers."

Sven Sanitz, Sales

## Reaching new heights: the alpha Premium Line

### Planetary gearboxes

The unique capabilities of planetary gearboxes from the alpha Premium Line are setting new standards on the market. These compact gearboxes are characterized by a power density far above the current industry standard. Your application can benefit directly from this increase in performance.



### Hypoid gearboxes

Maximum power density and high modularity are just two of the special characteristics of our hypoid gearboxes. Furthermore, gearboxes from the alpha Premium Line are characterized by an extremely robust overall design that guarantees a high degree of reliability and a long service life.





# Premium Line

## Bevel gearboxes

The low backlash bevel drives from our alpha Premium Line offer outstanding performance at low ratios during both cyclic and continuous operation. The perfect solution for dynamic applications with demanding requirements with regard to precision, torque and output speed. Increases in the performance of your plant can easily be achieved with a 97 % degree of efficiency.



XPC+



RPC+



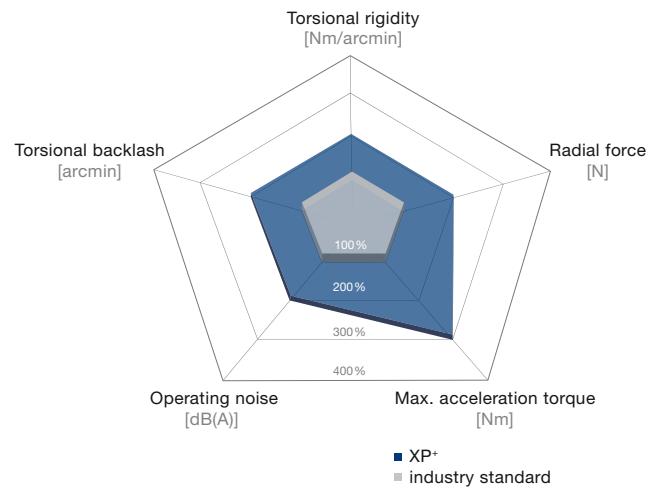
# XP+ – Perfection in a new dimension



The XP+ with specially designed output and extremely compact design offers new dimensions in power transmission that far exceed industry standards. The optimized interfaces on the output can generate much higher torques that directly benefit your application.

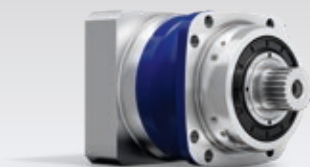
- The XP+ impresses with maximum power density
- if you require an even more compact drive
  - if you wish to enhance the performance of your machine
  - if you require high-performance linear systems

The XP+ compared to the industry standard

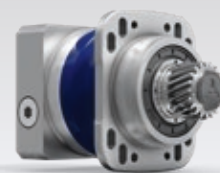


**Product highlights**

- Max. torsional backlash [arcmin]  $\leq 1$
- Maximum power density
- High axial and radial forces

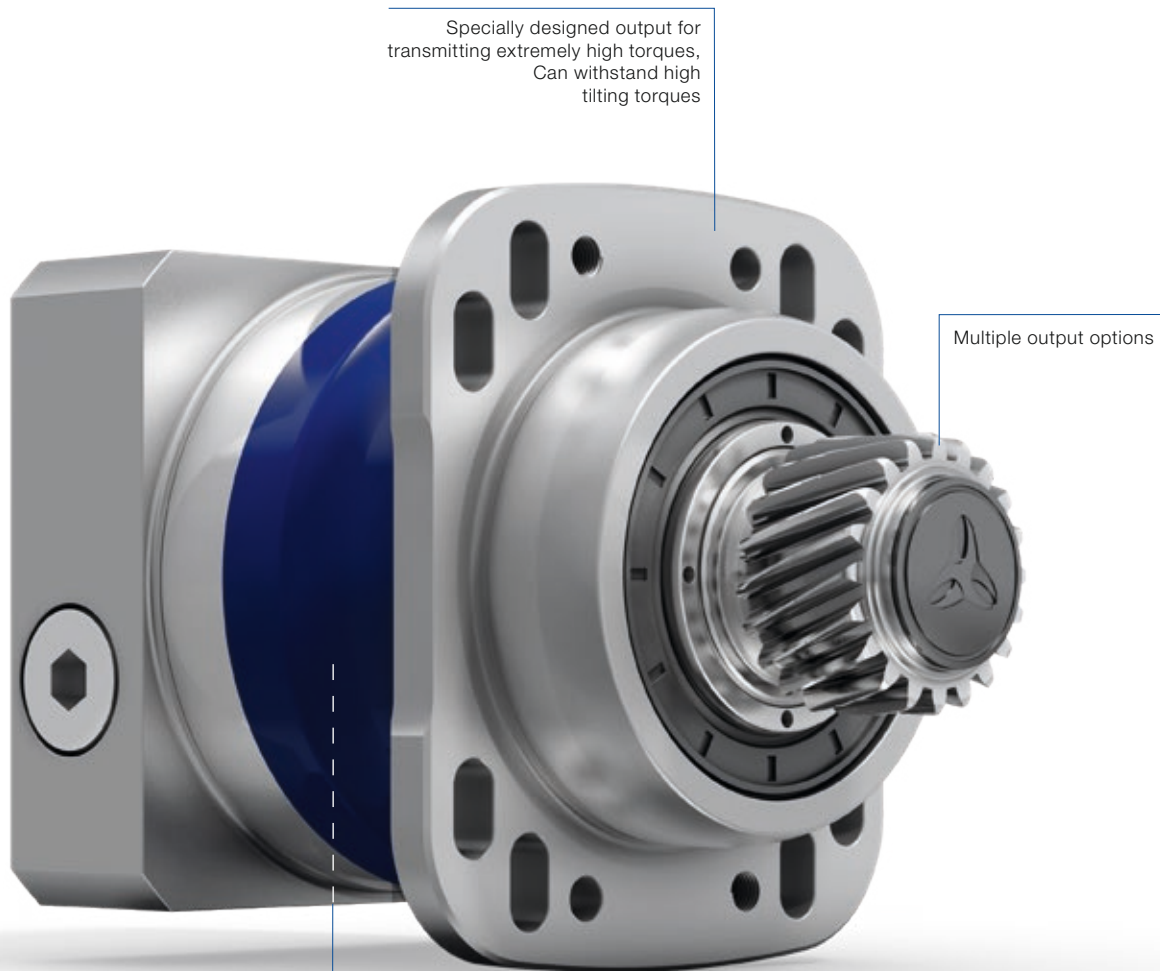


XP+ with splined shaft



XP+ with pinion and slots



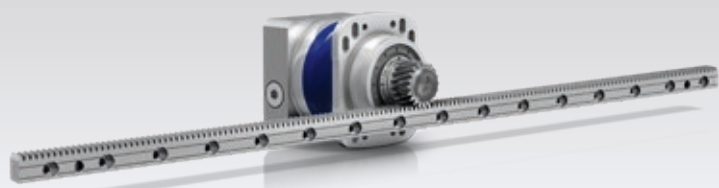


Specially designed output for transmitting extremely high torques, Can withstand high tilting torques

Multiple output options

XP+ with pinion and slots

Outstanding tothing quality minimizes torsional backlash



XP+ with pinion, slots and rack



premo® High Line with pinion

# XP+ – Product features

## Your benefits

	XP+ MF-Version / MC-Version
<b>Features</b>	
Power density	++++
Positioning accuracy (e.g. clamped drives)	++++
Highly dynamic applications	+++
Torsional rigidity	++++
Space-saving design	+++
Easy assembly	++++

## Technical data

		XP+ MF-Version / MC-Version
Ratio	$i$	3 – 100
Number of sizes		5
Max. torsional backlash	$j_i$ [Nm/arcmin]	Standard $\leq 3$
		Reduced $\leq 1$
Max. torque	$T_{2\alpha}$ [Nm]	42 – 3840
Max. input speed	$n_{1Max}$ [rpm]	8500
Max. tilting moment	$M_{2KMMax}$ [Nm]	3256
Torsional rigidity	$C_{t2}$ [Nm/armin]	5 – 290



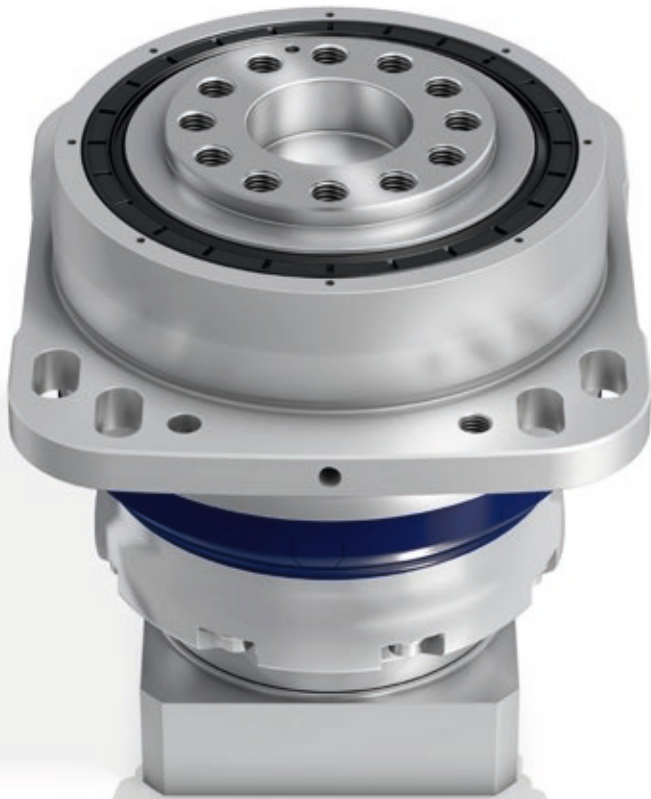
## Options

	XP+ MF-Version / MC-Version
<b>Output type</b>	
Smooth shaft	✓
Shaft with key	✓
Splined shaft (DIN 5480)	✓
Blind hollow shaft	✓
System output with pinion	✓
<b>Input type</b>	
Motor-mounted version	✓
Input shaft	✓
<b>Design</b>	
Food-grade lubrication <sup>a) b)</sup>	✓
Optimized mass inertia	✓
<b>Accessories</b>	
Coupling	✓
Rack	✓
Pinion	✓
Shrink disc	✓

a) Power reduction: Technical data available on request

b) Please contact WITTENSTEIN alpha

# RP+ – The high-precision powerhouse



RP+

## Product highlights

- Max. torsional backlash [arcmin]  $\leq 1$
- High axial and radial forces
- Easy installation
- Optimized for rack and pinion applications

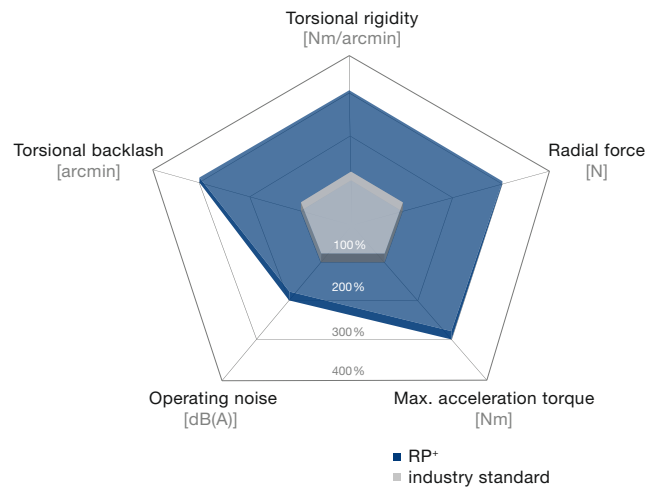
This gearbox series sets standards in terms of power density, modularity and easy installation. It is used in all applications where the individual requirements far exceed what has previously been possible. RP+ gearboxes combine all the advantages of the familiar gearbox series:

- Reduced backlash of  $\leq 1$  arcmin
- Maximum power density
- Extremely smooth-running thanks to helical toothing
- Maximum positioning accuracy and world-class lifespan

The RP+ impresses with maximum power density

- If your drive requires maximum performance
- If you value world-class engineering
- If you require an even more compact system

The RP+ compared to the industry standard

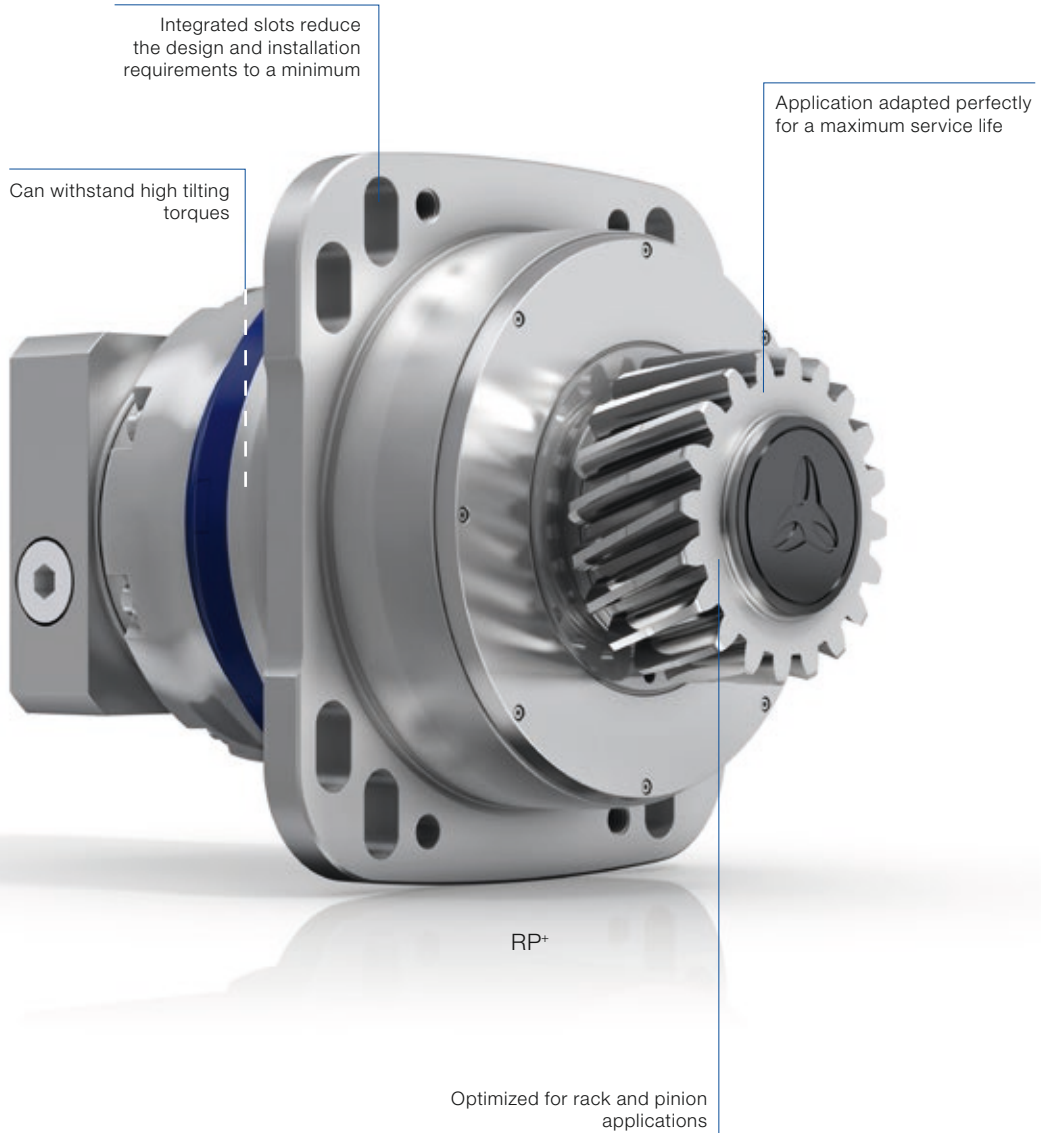


RP+ with rack and pinion



RPK+ with hypoid angle section





Integrated slots reduce the design and installation requirements to a minimum

Can withstand high tilting torques

Application adapted perfectly for a maximum service life

RP+

Optimized for rack and pinion applications

Further information is available in the "alpha Linear Systems" catalog or online at [www.wittenstein-alpha.com](http://www.wittenstein-alpha.com)



RP+ available as RPM+ actuator version (series in an even more compact design)

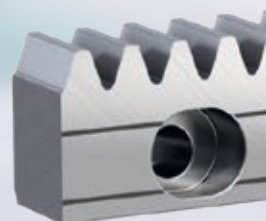
# RP+ – Product features

## Your benefits

	RP+ MF-Version / MA-Version
<b>Features</b>	
Power density	++++
Positioning accuracy (e.g. clamped drives)	++++
Highly dynamic applications	+++
Torsional rigidity	++++
Space-saving design	+++
Easy assembly	++++

## Technical data

		RP+ MF-Version / MA-Version
Ratio	$i$	3 – 220
Number of sizes		5
Max. torsional backlash	$j_t$ [Nm/arcmin]	Standard $\leq 1$
		Reduced $\leq 1$
Max. torque	$T_{2\alpha}$ [Nm]	540 – 10450
Max. input speed	$n_{1Max}$ [rpm]	6250
Max. tilting moment	$M_{2KMMax}$ [Nm]	34000
Torsional rigidity	$C_{tZ}$ [Nm/armin]	123 – 2000

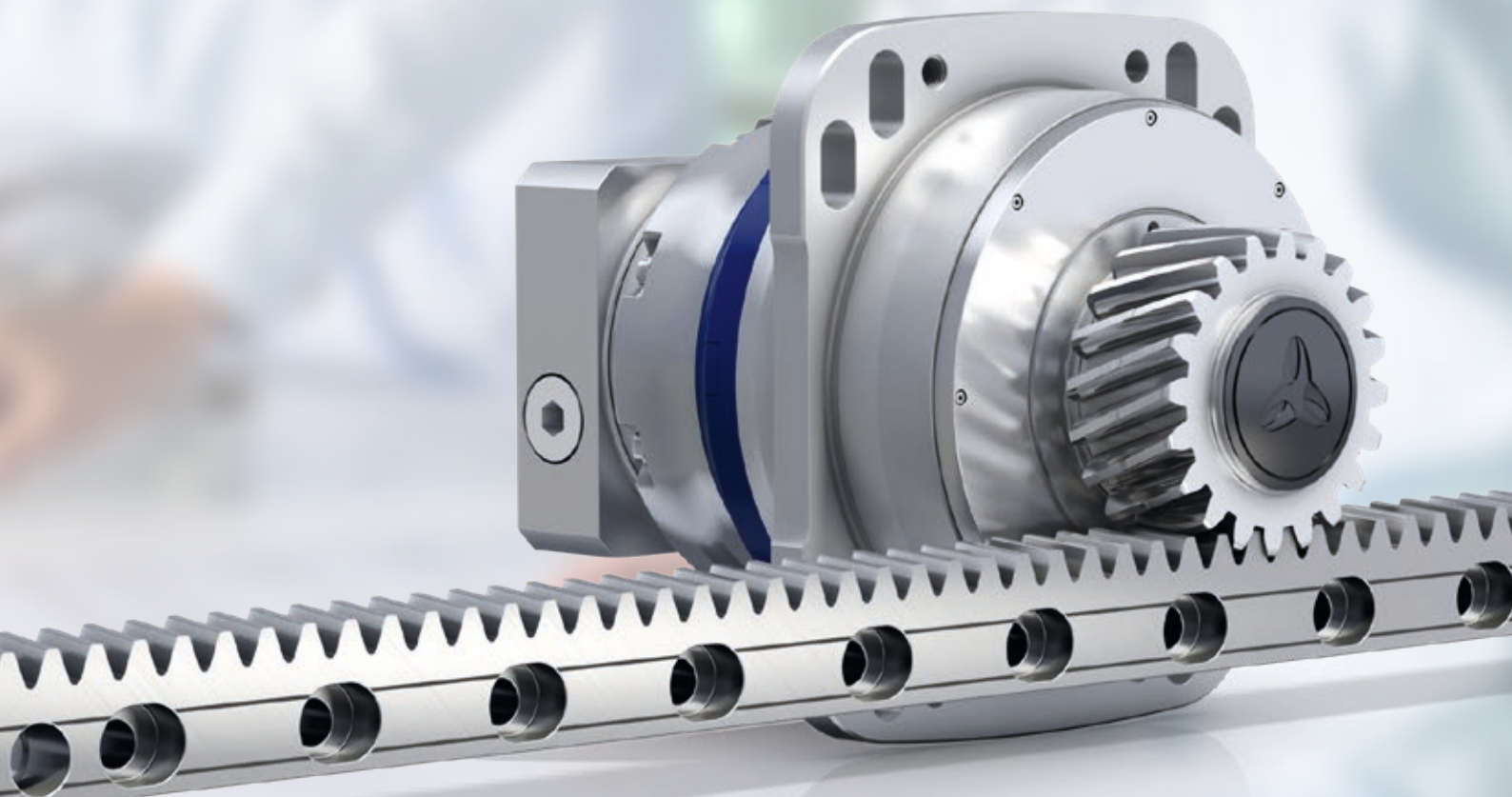


## Options

	RP+ MF-Version / MA-Version
<b>Output type</b>	
Flange	✓
System output with pinion	✓
<b>Input type</b>	
Motor-mounted version	✓
<b>Design</b>	
Food-grade lubrication <sup>a) b)</sup>	✓
Optimized mass inertia	✓
<b>Accessories</b>	
Rack	✓
Pinion	✓

a) Power reduction: Technical data available on request

b) Please contact WITTENSTEIN alpha





# XPK<sup>+</sup>/RPK<sup>+</sup> – Power and precision in a compact design



XPK<sup>+</sup>

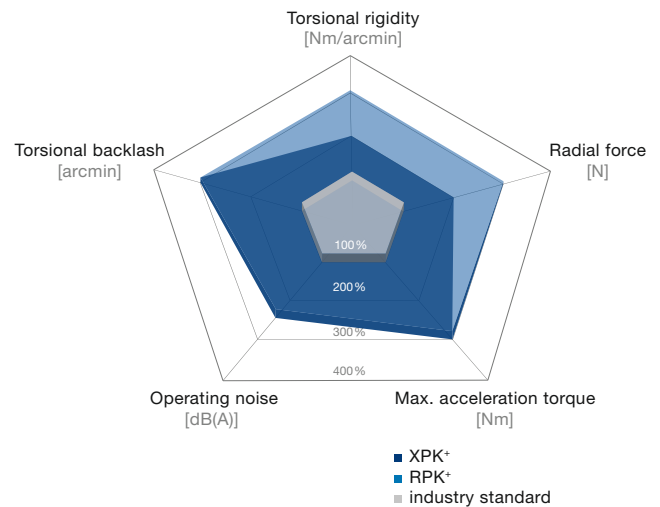
New standard now also available as a hypoid version

Both the XP<sup>+</sup> and RP<sup>+</sup> Premium planetary gearboxes are now available in a right-angle version with hypoid gearing. The axis offset of hypoid gearboxes allows both higher ratios in one section (ratio  $i = 3 - 10$ ) as well as higher torques compared to bevel gearboxes. The high torque density allows for an extremely compact, space-saving design. The mesh frequency and high torsional rigidity of the gearbox are also extremely impressive since they ensure a higher degree of positioning accuracy and extremely smooth operation.

XPK<sup>+</sup> and RPK<sup>+</sup> compared to industry standard

**Product highlights**

- XPK<sup>+</sup>: Max. torsional backlash [arcmin] ≤ 2**
- RPK<sup>+</sup>: Max. torsional backlash [arcmin] ≤ 1.8**
  
- XPK<sup>+</sup> and RPK<sup>+</sup>:**
- Range of transmission ratios:  $i = 12 - 5,500$**
- High axial and radial forces**
- High torsional rigidity**
- Maximum performance in small installation space**
- Optimized for rack and pinion applications**



XPK<sup>+</sup> with pinion and slots



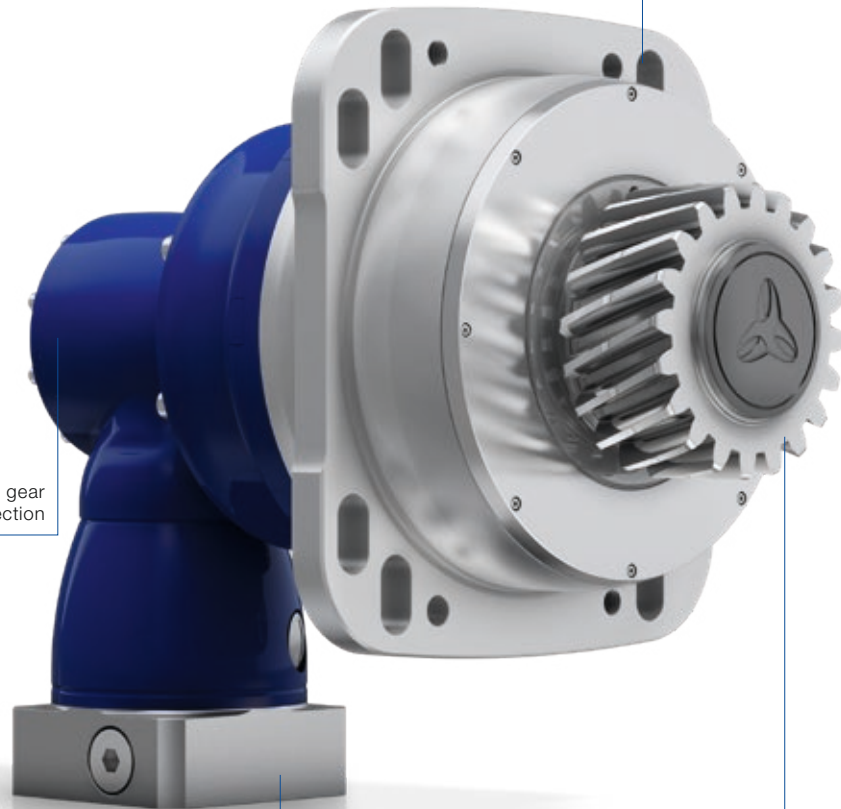
XPK<sup>+</sup> with pinion, slots and rack

## The ideal partnership

High-performance linear systems with the XPK+ or RPK+ are used in all applications where the individual requirements far exceed what has previously been possible. Compared to the industry standard, the values of the RPK+ have been improved by 150 % on average.

Integrated slots reduce the design and installation requirements to a minimum

High-quality hypoid section with gear ratios of  $i = 3 - 10$  in the angle section



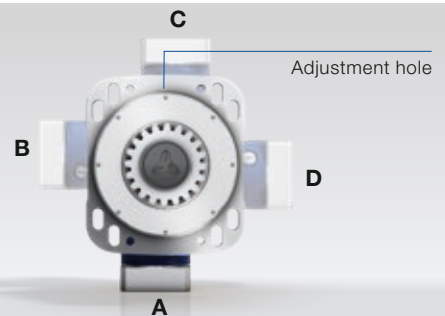
RPK+ with pinion

Metal bellows coupling incorporated for thermal length compensation and protection of the motor bearing

The pinions are specially adapted to the gearbox and allow the transmission of extremely high feed forces



RPK+ with rack and pinion



Flexibility during installation

# XPK+ – Product features

## Your benefits

	XPK+ MF-Version
<b>Features</b>	
Power density	++++
Positioning accuracy (e.g. clamped drives)	++++
Highly dynamic applications	+++
Torsional rigidity	++++
Space-saving design	++++
Easy assembly	++++



## Options

	XPK+ MF-Version
<b>Output type</b>	
Smooth shaft	✓
Shaft with key	✓
Splined shaft (DIN 5480)	✓
Blind hollow shaft	✓
System output with pinion	✓
<b>Input type</b>	
Motor-mounted version	✓
<b>Design</b>	
Food-grade lubrication <sup>a) b)</sup>	✓
<b>Accessories</b>	
Coupling	✓
Rack	✓
Pinion	✓
Shrink disc	✓

a) Power reduction: Technical data available on request

b) Please contact WITTENSTEIN alpha

## Technical data

		XPK+ MF-Version
Ratio	$i$	12 – 1000
Number of sizes		4
Max. torsional backlash	$j_t$ [Nm/arcmin]	Standard ≤ 4
		Reduced ≤ 2
Max. torque	$T_{2\alpha}$ [Nm]	80 – 2520
Max. input speed	$n_{1Max}$ [rpm]	7500
Max. tilting moment	$M_{2KMMax}$ [Nm]	3256
Torsional rigidity	$C_{tz1}$ [Nm/arcmin]	11 – 226



# RPK+ – Product features

## Your benefits

	RPK+ MA-Version
<b>Features</b>	
Power density	++++
Positioning accuracy (e.g. clamped drives)	++++
Highly dynamic applications	+++
Torsional rigidity	++++
Space-saving design	++++
Easy assembly	++++

## Options

	RPK+ MA-Version
<b>Output type</b>	
Flange	✓
System output with pinion	✓
<b>Input type</b>	
Motor-mounted version	✓
<b>Design</b>	
Food-grade lubrication <sup>a) b)</sup>	✓
<b>Accessories</b>	
Rack	✓
Pinion	✓

a) Power reduction: Technical data available on request

b) Please contact WITTENSTEIN alpha



## Technical data

		RPK+ MA-Version
Ratio	$i$	48 – 5500
Number of sizes		4
Max. torsional backlash	$j_t$ [Nm/arcmin]	Standard ≤ 1,3
		Reduced ≤ 1,8
Max. torque	$T_{2\alpha}$ [Nm]	1100 – 10540
Max. input speed	$n_{1Max}$ [rpm]	7500
Max. tilting moment	$M_{2KMax}$ [Nm]	34000
Torsional rigidity	$C_{t21}$ [Nm/armin]	202 – 1901

# XPC+/RPC+ – High precision and low ratios around the corner



New performance standard, also available in the bevel version

Both the XP+ and RP+ Premium planetary gearboxes are now available in a right-angle version with bevel toothing. Bevel gearboxes are primarily characterized by low gear ratios (ratio 1 and 2) in the angle section. Consequently, right-angle and planetary gearbox combinations can achieve the same low ratios as planetary gearboxes. The product design has a positive influence on temperature development in the gearbox and reduces overall heat development in the system as a result. The overall system achieves a higher degree of positioning accuracy as a consequence.

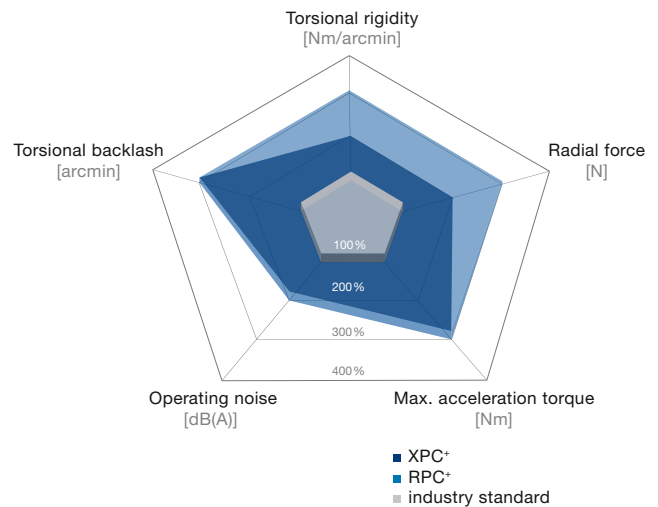
## XPC+ and RPC+ compared to industry standard

### Product highlights

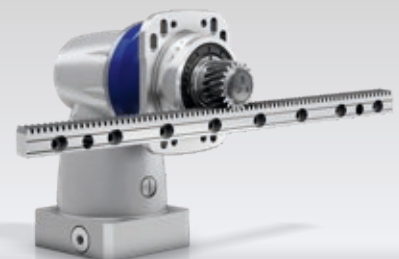
- RPC+:** Max. torsional backlash [arcmin] ≤ 1.8
- XPC+:** Max. torsional backlash [arcmin] ≤ 2

**RPC+ and XPC+:**

- Low ratios of  $i = 4 - 88$  possible
- Optimized temperature distribution, even at high speeds
- High tilting moments and torsional rigidity
- Optimized for rack and pinion applications



XPC+ with pinion and slots



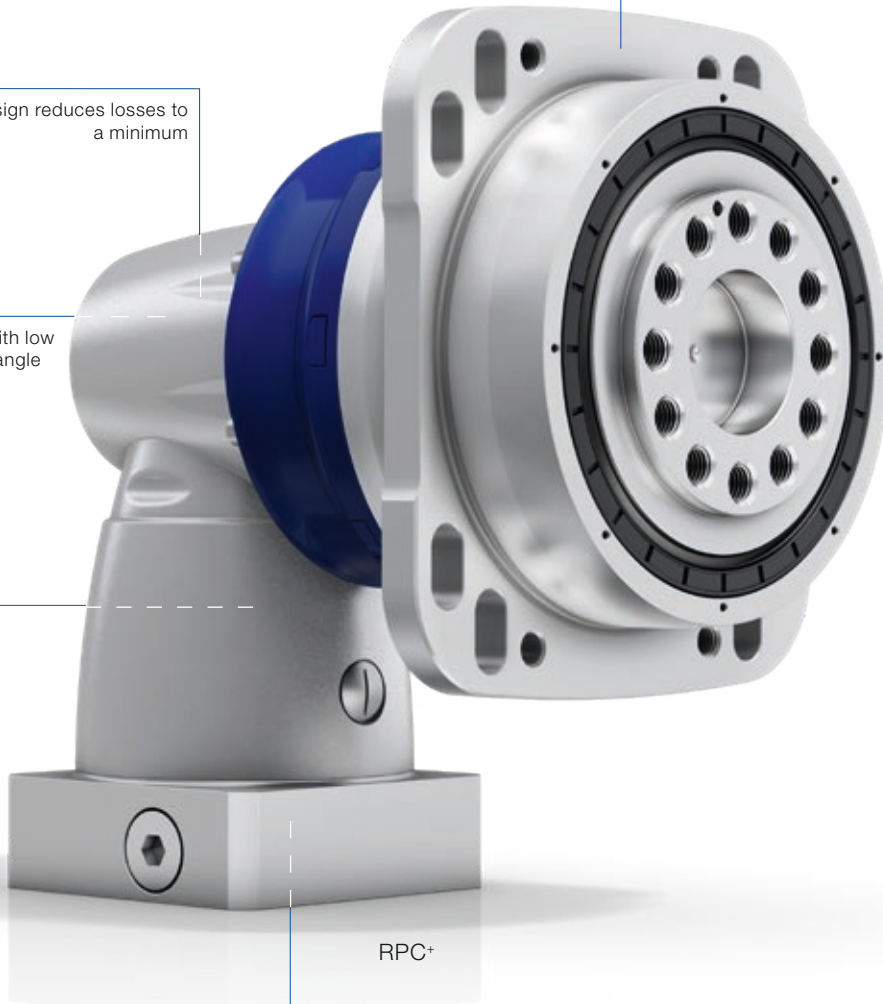
XPC+ with pinion, slots and rack

Specially designed output for transmitting extremely high torques

Intelligent design reduces losses to a minimum

High-quality bevel toothing with low gear ratios of  $i = 1 - 2$  in the angle section

Low temperature development, even at high speeds



RPC+

Metal bellows coupling incorporated for thermal length compensation and protection of the motor bearing



RPC+ with pinion



RPC+ with rack and pinion



# XPC+ – Product features

## Your benefits

	XPC+ MF-Version
<b>Features</b>	
Power density	++++
Positioning accuracy (e.g. clamped drives)	++++
Highly dynamic applications	+++
Torsional rigidity	++++
Space-saving design	++++
Easy assembly	++++



## Options

	XPC+ MF-Version
<b>Output type</b>	
Smooth shaft	✓
Shaft with key	✓
Splined shaft (DIN 5480)	✓
Blind hollow shaft	✓
System output with pinion	✓
<b>Input type</b>	
Motor-mounted version	✓
<b>Design</b>	
Food-grade lubrication <sup>a) b)</sup>	✓
<b>Accessories</b>	
Coupling	✓
Rack	✓
Pinion	✓
Shrink disc	✓

a) Power reduction: Technical data available on request

b) Please contact WITTENSTEIN alpha

## Technical data

		XPC+ MF-Version
Ratio	$i$	4 – 20
Number of sizes		5
Max. torsional backlash	$j_t$ [Nm/arcmin]	Standard ≤ 4
		Reduced ≤ 2
Max. torque	$T_{2a}$ [Nm]	48 – 2646
Max. input speed	$n_{1Max}$ [rpm]	6000
Max. tilting moment	$M_{2KMax}$ [Nm]	3256
Torsional rigidity	$C_{t2l}$ [Nm/arcmin]	3,1 – 215

# RPC+ – Product features

## Your benefits

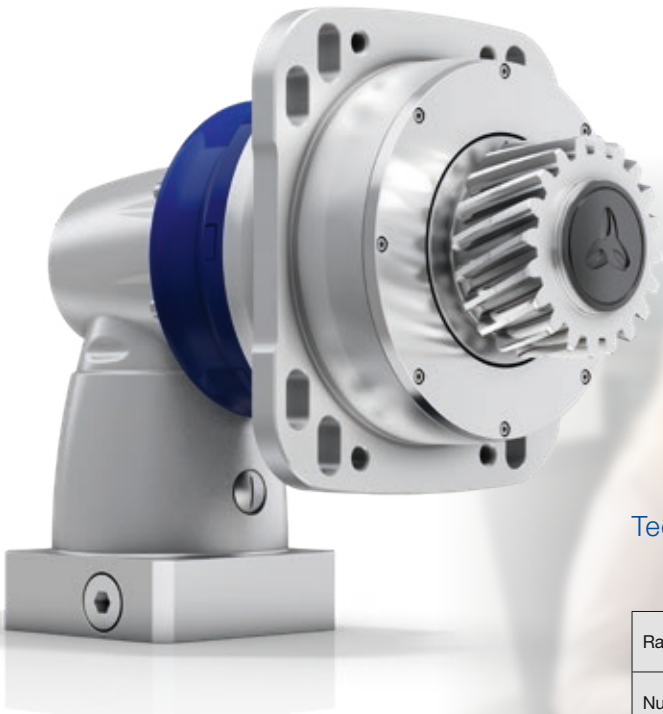
	RPC+ MA-Version
<b>Features</b>	
Power density	++++
Positioning accuracy (e.g. clamped drives)	++++
Highly dynamic applications	+++
Torsional rigidity	++++
Space-saving design	++++
Easy assembly	++++

## Options

	RPC+ MA-Version
<b>Output type</b>	
Flange	✓
System output with pinion	✓
<b>Input type</b>	
Motor-mounted version	✓
<b>Design</b>	
Food-grade lubrication <sup>a) b)</sup>	✓
<b>Accessories</b>	
Rack	✓
Pinion	✓

a) Power reduction: Technical data available on request

b) Please contact WITTENSTEIN alpha



## Technical data

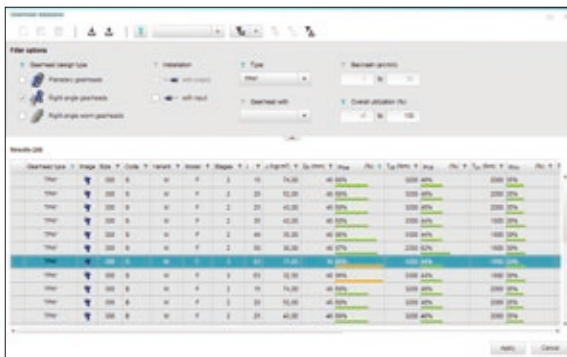
		RPC+ MA-Version
Ratio	$i$	22 – 55
Number of sizes		3
Max. torsional backlash	$j_t$ [Nm/arcmin]	Standard $\leq 1,3$
Max. torque	$T_{2\alpha}$ [Nm]	1400 – 7535
Max. input speed	$n_{1Max}$ [rpm]	4500
Max. tilting moment	$M_{2KMax}$ [Nm]	34000
Torsional rigidity	$C_{121}$ [Nm/armin]	194 – 1171

# cymex<sup>®</sup>5 is the current standard

With cymex<sup>®</sup> 5, the dimensioning and design of complete drive trains (application + transformation + gearbox + motor) is now fast, simple and reliable. Calculation is made much easier through predefined standard applications. Consideration for all major influencing factors guarantees an optimal design and increases the efficiency of your machine.

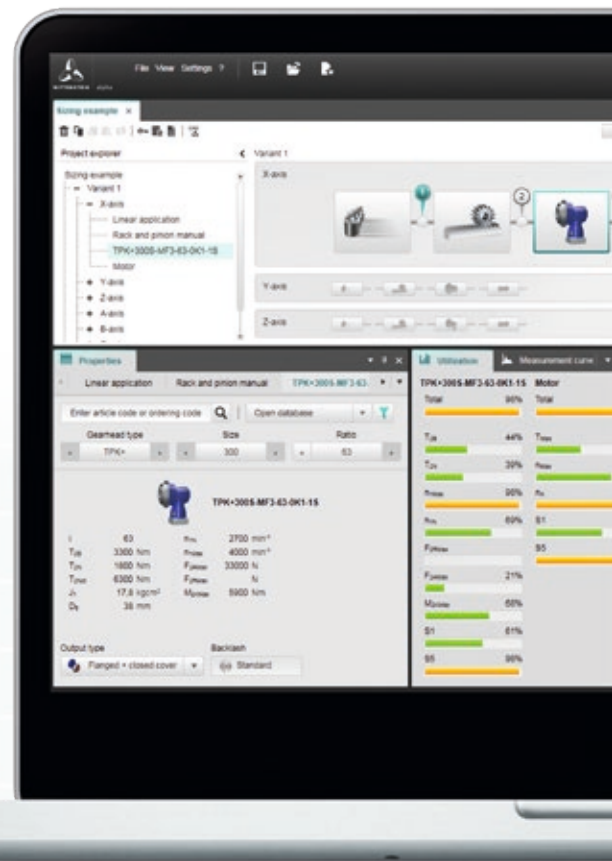
**cymex<sup>®</sup> 5 can define any number of axes simultaneously**

In contrast to other design tools, cymex<sup>®</sup> 5 can define any number of axes at the same time. The version calculation is up to 60 % quicker as a result.



**cymex<sup>®</sup> 5 has an extremely extensive database**

More than 14,000 motors from the 50 most prominent motor manufacturers are stored in the design tool. Continuously updated, always state-of-the-art. Moreover, more than 8,000 gearbox versions from WITTENSTEIN alpha and over 200 combinations of linear systems with all relevant technical specifications can be found here.

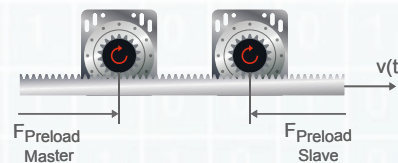


Free download

The basic version of cymex<sup>®</sup> 5 design software is available as a free download.



[www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)



**cymex<sup>®</sup> 5 incorporates the completely new Master / Slave function\***

The Master / Slave function enables the electrically clamped configuration of two drives. The mutual tensioning of master and slave eliminates the backlash in the drive train and provides for a high degree of rigidity in the machine.

\*Premium function, on request.



# cymex®5



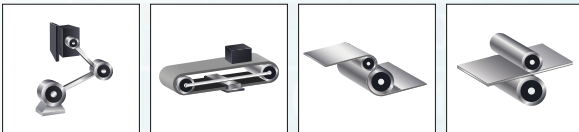
## 👍 cymex® 5 has a unique optimization calculator\*

During the design process, cymex® 5 provides optimization suggestions for the selected gearbox, which increase reliability and efficiency while ensuring your gearbox has the perfect dimensions e.g. through downsizing. This saves on costs and reduces the installation space in the machine.



## 👍 cymex® 5 offers comprehensive documentation

Following the geometry comparison, cymex®5 creates calculation documentation and generates data sheets for gearbox and motor on request. Furthermore, the 2D and 3D CAD data of selected components can be retrieved.



## 👍 cymex® 5 enables the precise simulation of motion and load variables

The optimized software offers many options for the individual design of the drive train. These have been integrated to supplement the existing applications already in cymex® 3: the crank, conveyor, center winder and feed roll.



11 languages

# Support at each interaction stage

With the WITTENSTEIN alpha service concept, we are also setting new standards in the field of customer support.

## Global presence

Our global consultation network will help you overcome your complex challenges through our extensive experience, a variety of design tools and individual engineering services.

## Speed counts

Our speedline® team guarantees fast response times in the area of logistics. We provide on-site support during the installation and commissioning of mechanical systems to give you a sustained competitive edge.

## Personal consultation

Our highly qualified and committed expert personnel will accompany you throughout the entire product lifecycle - around the clock. When it comes to customer support, you can count on us!

## Design

Consultation  
CAD POINT  
SIZING ASSISTANT  
Sizing software cymex®  
Engineering

## Installation

speedline® delivery  
Installation on-site  
Operating & installation instructions  
Pick-up & return service



We are happy to advise you:

**24 h service hotline:** +49 7931 493-12900

### No matter where you need us:

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## Maintenance

24 h service hotline  
Maintenance and inspection  
Repair  
cymex® statistics  
Modernization

## Training

Product training  
Sizing training  
Installation training  
Service training



alpha

WITTENSTEIN Inc. · 1249 Humbracht Circle · Bartlett, IL 60103 · USA · Phone 1-630-540-5300

## WITTENSTEIN alpha – **Intelligent** drive systems

[www.wittenstein-us.com](http://www.wittenstein-us.com)

The entire world of drive technology – Catalogs available on request or online at [www.wittenstein-alpha.de/download/kataloge](http://www.wittenstein-alpha.de/download/kataloge).



**alpha Premium Line.** Unique, individual solutions that offer unparalleled power density.



**alpha Advanced Line.** Maximum power density and outstanding positioning accuracy for complex applications.



**alpha Basic & Value Line.** Reliable, flexible and economical solutions for a wide range of applications.



**alpha Linear Systems.** Precise, dynamic system solutions for every requirement.



**alpha Mechatronic Systems.** Energy-efficient, versatile and flexible mechatronic drive systems.